UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549

FORM 10-K/A
(Amendment No. 1)

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

For the fiscal year ended December 31, 2022

or

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

For the transition period from to
Commission File Number: 001-35068

ACELRX PHARMACEUTICALS, INC.
(Exact name of registrant as specified in its charter)

Delaware	**41-2193603**
(State or other jurisdiction of incorporation or organization)	**(IRS Employer Identification No.)**

25821 Industrial Boulevard, Suite 400
Hayward, CA 94545
(650) 216-3500

(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

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

Title of Each Class	**Trading Symbol(s)**	**Name of Each Exchange on Which Registered**
Common Stock, $0.001 par value	**ACRX**	**The Nasdaq Global Market**

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

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

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

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

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

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

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

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

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

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

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

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

The aggregate market value of the voting stock held by non-affiliates of the registrant on June 30, 2022 (the last business day of the registrant's most recently completed second fiscal quarter), based upon the last sale price reported on the Nasdaq Global Market on that date, was approximately $35,604,258. The calculation excludes 79,603 shares of the registrant's common stock held by current executive officers and directors that the registrant has concluded are affiliates of the registrant. Exclusion of such shares should not be construed to indicate that any such person possesses the power, direct or indirect, to direct or cause the direction of the management or policies of the registrant or that such person is controlled by or under common control with the registrant.

As of March 20, 2023, the number of outstanding shares of the registrant's common stock was 10,918,452.

DOCUMENTS INCORPORATED BY REFERENCE

None.

EXPLANATORY NOTE

On March 31, 2023, AcelRx, Inc, filed its Annual Report on Form 10-K for the year ended December 31, 2022, or the 2022 Annual Report. The 2022 Annual Report omitted Part III, Items 10 (*Directors, Executive Officers and Corporate Governance*), 11 (*Executive Compensation*), 12 (*Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters*), 13 (*Certain Relationships and Related Transactions, and Director Independence*) and 14 (*Principal Accountant Fees and Services*) in reliance on General Instruction G(3) to Form 10-K, which provides that such information may be either incorporated by reference from the registrant's definitive proxy statement or included in an amendment to Form 10-K, in either case filed with the Securities and Exchange Commission, or the SEC, not later than 120 days after the end of the fiscal year.

We currently expect that our definitive proxy statement for our 2023 annual meeting of stockholders will be filed later than the 120th day after the end of the last fiscal year. Accordingly, this Amendment No. 1 to Form 10-K, or this Amendment, is being filed solely to:

- amend Part III, Items 10, 11, 12, 13 and 14 of the 2022 Annual Report to include the information required by such items;
- delete the reference on the cover of the 2022 Annual Report to the incorporation by reference of portions of our proxy statement into Part III of the 2022 Annual Report; and
- file new certifications of our principal executive officer and principal financial officer as exhibits and refile exhibits 4.7, 10.20, 10.21 and 10.23 to this Amendment under Item 15 of Part IV hereof, pursuant to Rule 12b-15 under the Securities Exchange Act of 1934.

Because no financial statements have been included in this Amendment and this Amendment does not contain or amend any disclosure with respect to Items 307 and 308 of Regulation S-K, paragraphs 3, 4 and 5 of the certifications have been omitted. We are not including the certifications under Section 906 of the Sarbanes-Oxley Act of 2002 as no financial statements are being filed with this Amendment.

Except as described above, this Amendment does not modify or update disclosure in, or exhibits to, the 2022 Annual Report. Furthermore, this Amendment does not change any previously reported financial results, nor does it reflect events occurring after the date of the 2022 Annual Report. Information not affected by this Amendment remains unchanged and reflects the disclosures made at the time the 2022 Annual Report was filed. Accordingly, this Amendment should be read in conjunction with the 2022 Annual Report and our other filings with the SEC.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Amendment contains statements that discuss future events or expectations, projections of results of operations or financial condition, trends in our business, business prospects and strategies and other "forward-looking" information. In some cases, you can identify "forward-looking statements" by words like "may," "will," "should," "expects," "plans," "anticipates," "believes," "estimates," "predicts," "intends," "potential" or "continue" or the negative of those words and other comparable words. These forward-looking statements are not guarantees of future performance or development and involve known and unknown risks, uncertainties and other factors that are in some cases beyond our control. These forward-looking statements may relate to, among other things, our expectations regarding the scope, progress, expansion, and costs of researching, developing and commercializing our product candidates; our opportunity to benefit from various regulatory incentives; expectations for our financial results, revenue, operating expenses and other financial measures in future periods; and the adequacy of our sources of liquidity to satisfy our working capital needs, capital expenditures, and other liquidity requirements. These are only some of the factors that may affect the forward-looking statements contained in the 2022 Annual Report. For a discussion identifying additional important factors that could cause actual results to vary materially from those anticipated in the forward-looking statements, see "Management's Discussion and Analysis of Financial Condition and Results of Operations" and "Risk Factors" in the 2022 Annual Report. You should review these risk factors for a more complete understanding of the risks associated with an investment in our securities. However, we operate in a competitive and rapidly changing environment and new risks and uncertainties emerge, are identified or become apparent from time to time. It is not possible for us to predict all risks and uncertainties that could have an impact on the forward-looking statements contained in the 2022 Annual Report. You should be aware that the forward-looking statements contained in the 2022 Annual Report are based on our current views and assumptions. We undertake no obligation to revise or update any forward-looking statements made in the 2022 Annual Report to reflect events or circumstances after the date hereof or to reflect new information or the occurrence of unanticipated events, except as required by law.

Unless the context indicates otherwise, the terms "AcelRx," "AcelRx Pharmaceuticals," "we," "us" and "our" refer to AcelRx Pharmaceuticals, Inc., and its consolidated subsidiaries. "Niyad" is a trademark, and "ACELRX," "DSUVIA", "DZUVEO" and "Zalviso" are registered trademarks, all owned by AcelRx Pharmaceuticals, Inc. This report also contains trademarks and trade names that are the property of their respective owners.

ACELRX PHARMACEUTICALS, INC.

2022 ANNUAL REPORT ON FORM 10-K

AMENDMENT NO. 1

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PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS, AND CORPORATE GOVERNANCE

Our executive officers and directors as of April 24, 2023 are as follows:

Name	Age	Title
Executive Officers		
Vincent J. Angotti	55	Director and Chief Executive Officer
Raffi Asadorian	53	Chief Financial Officer
Pamela P. Palmer, M.D., Ph.D.	60	Director, Chief Medical Officer and Co-Founder
Badri Dasu	60	Chief Engineering Officer
Directors		
Adrian Adams (2)(3)	72	Chairman and Director
Richard Afable, M.D. (2)	69	Director
Marina Bozilenko (1)	57	Director
Jill Broadfoot (1)	62	Director
Stephen J. Hoffman, M.D. Ph.D. (3)	69	Director
Howard B. Rosen (1)	65	Director
Mark Wan (2)(3)	57	Director

(1) Member of the Audit Committee
(2) Member of the Compensation Committee
(3) Member of the Nominating and Corporate Governance Committee

Vincent J. Angotti has served as our director and Chief Executive Officer since March 2017. From 2015 to 2016, Mr. Angotti was Chief Executive Officer and Director of XenoPort, Inc., a biopharmaceutical company that was acquired by Arbor Pharmaceuticals, LLC in 2016. Prior to that, from 2008 to 2015, Mr. Angotti held various roles at Xenoport, including Executive VP and Chief Operating Officer from 2012 to 2015, and Senior Vice President and Chief Commercialization Officer from 2008 to 2012. Prior to joining XenoPort, from 2001 to 2008, Mr. Angotti held several senior sales and marketing positions at Reliant Pharmaceuticals, Inc., a pharmaceutical company that was acquired by GlaxoSmithKline in 2007, the most recent of which was senior vice president of sales and marketing. Mr. Angotti began his career in the life sciences industry at Novartis Pharmaceuticals Corp., where he worked from 1991 until 2001 in sales and operations positions, most recently as executive director, field operations. He holds a B.S. with a concentration in Business Management from Cornell University and an M.B.A. with honors from Columbia University. Mr. Angotti's role as our Chief Executive Officer, his business expertise and his prior leadership roles in pharmaceutical companies provides him with the qualifications and skills to serve as a director.

Raffi Asadorian has served as our Chief Financial Officer since August 2017. Previously, Mr. Asadorian served as the Chief Financial Officer of Amyris, Inc., a publicly traded commercial-stage biotechnology company, from January 2015 to January 2017. Prior to Amyris, he served as the Chief Financial Officer of Unilabs, a private equity-owned medical diagnostics company, from August 2009 to October 2014. Mr. Asadorian started his career at PricewaterhouseCoopers (PwC) where he was a partner in its Transaction Services (M&A advisory) group. While at PwC, Mr. Asadorian advised Barr Pharmaceuticals, a publicly traded specialty pharmaceutical company, on its acquisition of PLIVA, a publicly traded pharmaceutical company, and, after its acquisition, Mr. Asadorian joined Barr as Senior Vice President and Chief Financial Officer of its PLIVA business from 2007 to 2009. In that role, Mr. Asadorian oversaw a global finance team and was responsible for Barr's ex-US financial operations, until its acquisition by Teva Pharmaceuticals.

Pamela P. Palmer, M.D., Ph.D. has served as our director and Chief Medical Officer since she co-founded the company in July 2005. Dr. Palmer was Director of UCSF PainCARE-Center for Advanced Research and Education from 2005 to 2009, and was Medical Director of the UCSF Pain Management Center from 1999 to 2005. Dr. Palmer has previously been a consultant to Omeros Corporation, a biopharmaceutical company she co-founded in 1994. Dr. Palmer holds an M.D. from Stanford University and a Ph.D. from the Stanford Department of Neuroscience. Dr. Palmer's extensive clinical and scientific experience in the treatment of acute and chronic pain as well as historical knowledge of our company provides her with the qualifications and skills to serve as a director.

Badri Dasu has served as our Chief Engineering Officer since September 2007. From December 2005 until September 2007, Mr. Dasu served as Vice President of Medical Device Engineering at Anesiva, Inc., a biopharmaceutical company. From March 2002 until December 2005, Mr. Dasu served as Vice President for Manufacturing and Device Development at AlgoRx Pharmaceuticals, Inc., an emerging pain management company, which merged with Corgentech Inc., a biotechnology company, in December 2005. From January 2000 until March 2002, Mr. Dasu served as Vice President of Manufacturing and Process Development at PowderJect Pharmaceuticals, a vaccine, drug and diagnostics delivery company that was acquired by Chiron Corporation in 2003 and later acquired by Novartis AG, a global healthcare and pharmaceutical company, in 2006. Previously, Mr. Dasu served in various capacities in process development at Metrika, Inc., a company focused on the manufacture and marketing of disposable diabetes monitoring products that was acquired by Bayer HealthCare, LLC in 2006, and at Cygnus, Inc., a drug delivery and specialty pharmaceuticals company. Mr. Dasu holds a B.E. in Chemical Engineering from the University of Mangalore, India and a M.S. in Chemical Engineering from the University of Tulsa.

Adrian Adams has served as our Chairman since February 2013. Since January 2020, Mr. Adams has also served as Chairman of the board of directors of Impel Pharmaceuticals, Inc., a publicly traded specialty pharmaceutical company, and in May 2020 he took on the additional role of Chief Executive Officer. In addition, Mr. Adams has served as Chairman of the board of directors of Akebia Therapeutics, Inc., a specialty publicly traded pharmaceutical company, since December 2018. Previously, Mr. Adams served as Chief Executive Officer of Aralez Pharmaceuticals, Inc., a specialty pharmaceutical company, after the merger between Pozen, Inc. and Tribute Pharmaceuticals Canada, Inc. in February 2016 to January 2019 and served as a member of the board of directors from February 2016 to April 2019. Prior to that, from May 2015 to January 2016, Mr. Adams served as Chief Executive Officer and a member of the board of directors of Pozen, Inc. Mr. Adams served as Chief Executive Officer and President of Auxilium Pharmaceuticals Inc., a specialty biopharmaceutical company, from December 2011 until January 2015, when it was acquired by Endo International plc. Prior to joining Auxilium, from September 2011 until November 2011, Mr. Adams served as Chairman and Chief Executive Officer of Neurologix, a company focused on development of multiple innovative gene therapy development programs. Before Neurologix, Mr. Adams served as President and Chief Executive Officer of Inspire Pharmaceuticals, Inc., where he oversaw the commercialization and development of prescription pharmaceutical products and led the company through a strategic acquisition by global pharmaceutical leader Merck & Co., Inc. in May 2011. Prior to Inspire, Mr. Adams served as President and Chief Executive Officer of Sepracor Inc. from December 2006 until February 2010, when it was acquired by Dainippon Sumitomo Pharma Co. Prior to joining Sepracor, Mr. Adams was President and Chief Executive Officer of Kos Pharmaceuticals, Inc. from 2002 until the acquisition of the company by Abbott Laboratories in December 2006. Mr. Adams graduated from the Royal Institute of Chemistry at Salford University in the U.K. Mr. Adams has extensive national and international experience and has been instrumental in launching major global brands in addition to driving successful corporate development activities encapsulating financing, product and company acquisitions, in-licensing and company M&A activities, all of which provide him with the qualifications and skills to serve as a director.

Richard Afable, M.D. has served as our director since December 2013. Dr. Afable has served as trustee of Chapman University since March 2017, of Providence St. Joseph Health since January 2018, and he is the immediate past chair of the California Hospital Association. From July 2016 through December 2017, Dr. Afable has served as Executive Vice President and Chief Executive, Southern California, for Providence St. Joseph Health. From February 2013 to July 2016, Dr. Afable served as the Chief Executive Officer of Covenant Health Network, based in Irvine, California, a non-profit healthcare delivery system formed through the affiliation of Hoag Memorial Hospital Presbyterian and St. Joseph Health System. Prior to Covenant Health Network, Dr. Afable served as the President and Chief Executive of Hoag Memorial Hospital Presbyterian from 2005 to 2013. Prior to Hoag Memorial Hospital Presbyterian, Dr. Afable served as the Chief Medical Officer of Catholic Health East from 1999 to 2005. He earned a B.S. in Biology and an M.D. from Loyola University of Chicago, and a Master's in Public Health from the University of Illinois at Chicago. Dr. Afable's scientific, financial and business expertise, including his experience as an executive officer in the health care industry, provides him with the qualifications and skills to serve as a director.

Jill Broadfoot has served as our director since November 2021. Ms. Broadfoot currently serves as the Chief Financial Officer of aTyr Pharma, Inc., a position she has held since July 2018. From January 2017 to July 2018, Ms. Broadfoot served as Chief Financial Officer of Emerald Health Pharmaceuticals Inc. and Emerald Health Bioceuticals Inc., where she was responsible for establishing operations for the U.S.-based pharmaceutical and bioceutical entities as well as the establishment of operations, corporate governance, finance and accounting and investor relations functions, among others. Prior to Emerald Health, Ms. Broadfoot served as Vice President, U.S. Corporate Controller at GW Pharmaceuticals, from May 2016 to January 2017. While at GW Pharmaceuticals, her responsibilities included establishing U.S. commercial operations and implementing U.S. public company financial and accounting standards in connection with the transfer of corporate operations from the U.K. to the U.S. Prior to joining GW Pharmaceuticals, Ms. Broadfoot served as Chief Financial Officer of Vical Inc., from October 2004 to March 2013, where she had oversight of finance, investor relations, manufacturing, information technology, human resources, and business development. Prior to that, Ms. Broadfoot held various positions at DJO Global, Inc., most recently as Vice President of Finance, and served as an audit manager at Ernst & Young LLP. Ms. Broadfoot is a member of the board of directors of Otonomy, Inc., a publicly traded biopharmaceutical company. Ms. Broadfoot holds a B.S. in Business Administration and Accounting from San Diego State University and is a Certified Public Accountant (Inactive). Ms. Broadfoot's financial and business expertise, including her diversified background in finance, operations and business development, provides her with the qualifications and skills to serve as a director.

Marina Bozilenko has served as our director since March 2021. Since June 2021, Ms. Bozilenko has served as President, Chief Executive Officer and a member of the board of directors at Biothea Pharma, Inc., a private biotechnology company, and since February 2021, she has served as a Strategic Advisor to William Blair & Company, L.L.C., a financial services company she joined in January 2010 as Managing Director/Partner and Head of Biotechnology and Pharma. Ms. Bozilenko also currently serves as a member of the board of directors at SynAct Pharma AB, a publicly traded biotechnology company listed on the Spotlight Stock Market, a role she has held since April 2021. Prior to her position at William Blair, Ms. Bozilenko was a Principal at Kidd & Company, LLC, an investment firm, between August 2008 and January 2010. Prior to Kidd & Company, Ms. Bozilenko was Senior Managing Director at Bear, Stearns & Co. Inc., an investment bank, from April 2003 to January 2008, Managing Director at Banc of America Securities, LLC, an investment bank, between March 2000 and April 2003, Managing Director and Head of West Coast Healthcare Investment Banking at Prudential Vector Health Care Group, a brokerage firm, between July 1999 and March 2000, and held multiple positions of increasing responsibility including Managing Director and Head of West Coast at Vector Securities International, Inc., a brokerage firm, between March 1988 and July 1999. Between January 2010 and March 2020, Ms. Bozilenko served on the board of directors of Olema Pharmaceuticals, Inc., a clinical-stage biopharmaceutical company. Ms. Bozilenko received her B.A. in Molecular Biology and Biochemistry and M.A. in Economic History from the University of Chicago. Ms. Bozilenko's financial and business expertise, including her diversified background in finance and business development, provides her with the qualifications and skills to serve as a director.

Stephen J. Hoffman, M.D., Ph.D. has served as our director since February 2010. Dr. Hoffman served as Chief Executive Officer and Director of Aerpio Pharmaceuticals, Inc., from December 2017 to October 2019. Prior to that, Dr. Hoffman had been a Senior Advisor to PDL BioPharma, Inc. beginning in February 2014. Prior to that, he served as a managing director at Skyline Ventures, a venture capital firm, from May 2007 until February 2014. From January 2003 to March 2007, Dr. Hoffman was a general partner at TVM Capital, a venture capital firm. From 1994 to 2012, Dr. Hoffman served as President, Chief Executive Officer and a director of Allos Therapeutics, a biopharmaceutical company; and served as chairman of the board of directors from 2002 until its acquisition by Spectrum Pharmaceuticals in 2012. Dr. Hoffman currently serves on the board of directors of Dicerna Pharmaceuticals, Inc. and Palleon Pharmaceuticals, Inc. Dr. Hoffman holds a Ph.D. in Chemistry from Northwestern University and an M.D. from the University of Colorado, School of Medicine. Dr. Hoffman's scientific, financial and business expertise, including his diversified background as an executive officer and investor in public pharmaceutical companies, provides him with the qualifications and skills to serve as a director.

Howard B. Rosen served as our Chief Executive Officer from April 1, 2016 until March 5, 2017, as our interim Chief Executive Officer from April 1, 2015 until March 31, 2016, and has served as our director since 2008. Since 2008, Mr. Rosen has served as a consultant to several companies in the biotechnology industry. He has also served as a lecturer at Stanford University in Chemical Engineering since 2008 and in Management since 2011. Mr. Rosen served as interim President and Chief Executive Officer of Pearl Therapeutics, Inc., a company focused on developing treatments for chronic respiratory diseases, from June 2010 to March 2011. From 2004 to 2008, Mr. Rosen was Vice President of Commercial Strategy at Gilead Sciences, Inc., a biopharmaceutical company. Mr. Rosen was President of ALZA Corporation, a pharmaceutical and medical systems company that merged with Johnson & Johnson, a global healthcare company, in 2001, from 2003 until 2004. Prior to that, from 1994 until 2003, Mr. Rosen held various positions at ALZA Corporation. Mr. Rosen is also currently a member of the board of directors of Kala Pharmaceuticals, Inc., a publicly traded biotechnology company, Aria Pharmaceuticals, Inc., Hopewell Therapeutics, Inc. and FireCyte Therapeutics, Inc., all of which are private biotechnology companies, Entrega, Inc., a private technology company, and Hammerton, Inc., a decorative lighting company. In addition, Mr. Rosen is a trustee of the National Academy of Engineering Foundation. Mr. Rosen previously served as chairman of the board of directors of Alcobra, Ltd., a public pharmaceutical company, from 2014 through 2017. Mr. Rosen holds a B.S. in Chemical Engineering from Stanford University, an M.S. in Chemical Engineering from the Massachusetts Institute of Technology and an M.B.A. from the Stanford Graduate School of Business. Mr. Rosen's experience in the biopharmaceutical industry, including his specific experience with commercialization of pharmaceutical products, provides him with the qualifications and skills to serve as a director.

Mark Wan has served as our director since August 2006. Mr. Wan is a founding managing director of Causeway Media Partners, a private investment firm, which was founded in 2013. Prior to Causeway, he was a founding general partner of Three Arch Partners, a venture capital firm. Prior to co-founding Three Arch Partners in 1993, Mr. Wan was a general partner at Brentwood Associates, a private equity firm from 1987 until 1993. Mr. Wan currently serves on the board of directors of Athlon Acquisition Corp., a blank check company. Between July 2013 and December 2020, Mr. Wan served on the board of directors of QT Vascular Ltd., a public Singapore-based medical device company. Mr. Wan holds a B.S. in Engineering from Yale University and an M.B.A. from the Stanford Graduate School of Business. Mr. Wan's financial experience and extensive knowledge of our company provides him with the qualifications and skills to serve as a director.

Process for Stockholder Nominations

There have been no material changes to the procedures by which stockholders may recommend nominees to our Board since we last provided disclosure of such procedures.

Audit Committee

The Audit Committee was established by the Board in accordance with Section 3(a)(58)(A) of the Exchange Act to oversee our corporate accounting and financial reporting processes and audits of its financial statements. For this purpose, the Audit Committee performs several functions. In 2022, the Audit Committee was comprised of Messrs. Edwards and Rosen, Mses. Broadfoot and Bozilenko, and Dr. Hoffman, each of whom was a non-employee member of our Board. Mr. Edwards resigned from our Board effective March 31, 2022 and Ms. Broadfoot became Chair of the Audit Committee, effective April 1, 2022. Dr. Hoffman resigned from the Audit Committee effective April 30, 2022 and Ms. Bozilenko was appointed as a member of the Audit Committee effective immediately upon Dr. Hoffman's resignation.

The Board reviews the Nasdaq listing standards definition of independence for Audit Committee members on an annual basis and has determined that all members of our Audit Committee are independent (as independence is currently defined in Rule 5605(c)(2)(A)(i) and (ii) of the Nasdaq listing standards).

In addition, our Board has determined that each of the directors serving on our Audit Committee meets the requirements for financial literacy under applicable rules and regulations of the SEC and Nasdaq. Our Board has also determined that each of Mr. Edwards and Mses. Broadfoot and Bozilenko qualifies as an "audit committee financial expert" within the meaning of SEC regulations. In making this determination, our Board considered the overall knowledge, experience and familiarity of each of Mr. Edwards and Mses. Broadfoot and Bozilenko with accounting matters, in analyzing and evaluating financial statements and in managing private equity investments. Mr. Edwards served as Chair of the Audit Committee until March 31, 2022 and Ms. Broadfoot became Chair of the Audit Committee, effective April 1, 2022. The composition of the Audit Committee satisfies the independence and other requirements of Nasdaq and the SEC.

Code of Business Conduct and Ethics

We have adopted the AcelRx Pharmaceuticals, Inc. Code of Business Conduct and Ethics that applies to all officers, directors and employees, including our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions. All new employee and director hires are trained on the Code of Business Conduct and Ethics and the Company's Whistleblower Policy as part of their on-hire training, and all employees and directors are provided with copies of both policies on an annual basis. The Code of Business Conduct and Ethics is available on our website at www.acelrx.com. Stockholders may request a free copy of the Code of Business Conduct and Ethics by submitting a written request to: AcelRx Pharmaceuticals, Inc., Attention: Investor Relations, 25821 Industrial Boulevard, Suite 400, Hayward, CA 94545. If we make any substantive amendments to the Code of Business Conduct and Ethics or grant any waiver from a provision of the Code of Business Conduct and Ethics to any executive officer or director, we will promptly disclose the nature of the amendment or waiver on our website.

ITEM 11. EXECUTIVE COMPENSATION

Our "named executive officers" for the year ended December 31, 2022, consisting of our chief executive officer and the two other most highly compensated executive officers serving as of December 31, 2022, were:

- Vincent J. Angotti, Chief Executive Officer
- Raffi Asadorian, Chief Financial Officer
- Pamela P. Palmer, M.D., Ph.D., Chief Medical Officer and Co-Founder

Summary Compensation Table

The following table sets forth certain summary information for the year indicated with respect to our named executive officers as of December 31, 2022.

Name and Principal Position	Year	Salary	Stock Awards(1)	Option Awards(2)	Non-Equity Incentive Plan Compensation(3)	All Other Compensation(4)	Total
Vincent J. Angotti	2022	$ 636,540	$ 156,585	$ 233,892	$ 257,799	$ 12,200	$ 1,297,016
Chief Executive Officer	2021	636,540	376,000	1,156,667	267,347	11,400	2,447,954
Raffi Asadorian	2022	474,435	47,176	70,463	150,870	12,200	755,144
Chief Financial Officer	2021	460,616	129,250	272,262	151,082	11,400	1,024,610
Pamela P. Palmer, M.D., Ph.D.	2022	526,458	49,184	73,462	161,096	12,200	822,400
Chief Medical Officer	2021	511,124	129,250	272,262	159,471	11,400	1,083,507

(1) The dollar amounts in this column represent the aggregate grant date fair value of the RSUs granted during the year, as computed in accordance with ASC 718, not including any estimates of forfeitures. For a discussion of valuation assumptions, see Notes 1 and 15 to our consolidated financial statements included in our Annual Report on Form 10-K filed with the SEC on March 31, 2023. These amounts do not necessarily correspond to the actual economic value that may be received by the named executive officers.

(2) The dollar amounts in this column represent the aggregate grant date fair value of all option awards granted during the indicated year. These amounts have been calculated in accordance with ASC 718, using the Black-Scholes option-pricing model and excluding the effect of estimated forfeitures. For a discussion of valuation assumptions, see Notes 1 and 15 to our consolidated financial statements included in our Annual Report on Form 10-K filed with the SEC on March 31, 2023. These amounts do not necessarily correspond to the actual value that may be recognized from the option awards by the named executive officers.

(3) The dollar amounts in 2022 reflect the incentive bonuses awarded to the named executive officers under our 2022 Cash Bonus Plan and which were paid in the first quarter of 2023.

(4) Reflects matching contributions made by AcelRx under its 401(k) Plan on behalf of each named executive officer.

Outstanding Equity Awards at December 31, 2022

The following table presents information regarding outstanding equity awards held by our named executive officers as of December 31, 2022.

		Option Awards(1)				Stock Awards(2)	
Name	Vesting Commencement Date	Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable	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
Vincent J. Angotti	2/11/2022					19,500	$ 44,070
	2/11/2022		38,999	$ 8.03	2/11/2032		
	3/3/2021					6,667	15,067
	3/3/2021		49,998	37.60	3/3/2031		
	2/6/2020					3,334	7,535
	2/6/2020	14,166	5,833	34.40	2/6/2030		
	2/11/2019	19,166	833	50.20	2/11/2029		
		9,625		44.50	4/9/2028		
		17,499		40.00	1/22/2028		
		39,999		66.00	3/6/2027		
Raffi Asadorian	2/11/2022					5,875	13,278
	2/11/2022		11,749	8.03	2/11/2032		
	3/3/2021					2,292	5,180
	3/3/2021	3,007	3,868	37.60	3/3/2031		
	3/3/2021		3,435	37.60	3/3/2031		
	2/6/2020					1,146	2,590
	2/6/2020	4,869	2,005	34.40	2/6/2030		
	2/11/2019	6,587	287	50.20	2/11/2029		
		4,056		44.50	4/9/2028		
		7,374		40.00	1/22/2028		
		10,999		60.00	8/16/2027		
Pamela P. Palmer, M.D., Ph.D.	2/11/2022					6,125	13,843
	2/11/2022		12,249	8.03	2/11/2032		
	3/3/2021					2,292	5,180
	3/3/2021	3,007	3,868	37.60	3/3/2031		
	3/3/2021		3,435	37.60	3/3/2031		
	2/6/2020					1,146	2,590
	2/6/2020	4,869	2,005	34.40	2/6/2030		
	2/11/2019	6,587	287	50.20	2/11/2029		
		4,757		44.50	4/9/2028		
		8,649		40.00	1/22/2028		
		6,624		60.00	2/7/2027		
		5,524		68.00	2/10/2026		
		5,499		132.00	12/2/2024		
		4,999		206.80	2/4/2024		
		19,406		106.23	2/5/2023		

(1) With the exception of the performance-based stock options granted on April 9, 2018, and the share price performance-based vesting options granted on March 3, 2021, all stock options vest over 4 years, with 25% of the shares vesting on the one-year anniversary of the vesting commencement date, and 1/48th of the shares vesting monthly thereafter, subject to continuous service. Vesting commencement dates are included for stock options that were not fully vested as of December 31, 2022. The performance-based stock options granted to our named executive officers on April 9, 2018 were exercisable as follows: 50% of the stock option award became vested and exercisable upon our achievement of commercial approval by the FDA of its NDA for DSUVIA on or before February 15, 2019, which FDA approval was received on November 2, 2018; and the remaining 50% of the award vested on the one-year anniversary of the date of such FDA approval, or November 2, 2019, subject to continuous service.

(2) The RSUs granted to our named executive officers vest in three equal consecutive annual installments on the first three anniversaries of the vesting commencement date.

Employment Arrangements

Vincent J. Angotti

In February 2017, we entered into an offer letter agreement with Mr. Angotti, which provided for an initial annual base salary of $600,000 with an annual cash bonus targeted at 55% of Mr. Angotti's base salary. As of the date of this proxy statement, Mr. Angotti's annual base salary is $655,636 and Mr. Angotti is eligible for an annual target bonus of up to 60% of his annual base salary.

Raffi Asadorian

In July 2017, we entered into an offer letter agreement with Mr. Asadorian, which provided for an initial annual base salary of $400,000 with an annual cash bonus targeted at 30% of Mr. Asadorian's base salary. As of the date of this proxy statement, Mr. Asadorian's annual base salary is $488,668 and Mr. Asadorian is eligible for an annual target bonus of up to 40% of his annual base salary.

Pamela P. Palmer, M.D., Ph.D.

In December 2010, we entered into an offer letter agreement with Dr. Palmer, which provided for an initial annual base salary of $375,000. As of the date of this proxy statement, Dr. Palmer's annual base salary is $542,252 and Dr. Palmer is eligible for an annual target bonus of up to 40% of her annual base salary.

Benefits Upon Termination or Change in Control

Vincent J. Angotti

Under our offer letter agreement with Mr. Angotti, in the event that Mr. Angotti's employment is terminated by us without cause (and not due to his death or disability) or he resigns for good reason, referred to as an involuntary termination, then he will be entitled to the following severance benefits:

- a lump sum cash severance payment in an amount equal to twelve months of his then-current base salary, plus 100% of his target annual bonus for the year of termination;
- reimbursement of COBRA premiums for up to twelve months; and
- twelve months' worth of accelerated vesting of his equity awards, and (iv) extended exercisability of vested options for up to twelve months following his termination date. In addition, if Mr. Angotti experiences an involuntary termination within three months prior to or eighteen months following a change in control of AcelRx, then his severance benefits will be increased as follows: (w) the lump sum cash severance payment will instead be an amount equal to twenty-four months of his then-current base salary, plus 200% of his target annual bonus; (x) he will be entitled to payment of any bonus earned but not yet paid for the prior year; (y) the COBRA premium reimbursement period will be for up to twenty-four months; and (z) 100% of all then-unvested equity awards will accelerate as of his termination date. In order to receive any severance benefits, Mr. Angotti must sign a waiver and release of claims in favor of AcelRx.

Severance Benefit Plan. In February 2017, our Board adopted an Amended and Restated Severance Benefit Plan, or the Severance Plan, to create two tiers of severance benefits payable to participating executive officers upon an involuntary termination in connection with a change in control, depending on the executive officer's position with AcelRx as of the change in control transaction. The Severance Plan is subject to the Employee Retirement Income Security Act of 1974 and is and intended to maintain the competitiveness and effectiveness of our total compensation packages. The Severance Plan replaces the prior change of control and severance arrangements contained in the offer letter agreements with Dr. Palmer.

The Severance Plan provides that if an executive officer's employment with us is terminated by us without cause (and not due to death or disability) or the executive officer resigns for good reason (as such terms are defined in the Severance Plan), referred to below as an involuntary termination, the executive officer will receive (i) a lump sum severance payment equal to 6 months of the monthly base salary the executive officer was receiving immediately prior to such termination date; and (ii) up to 6 months of reimbursement for premiums paid for COBRA coverage for the executive officer and his or her eligible dependents. In addition, the Severance Plan provides for the following enhanced severance benefits if an executive officer's involuntary termination occurs within 3 months prior to or within 18 months after a change in control (as such term is defined in the Severance Plan) of AcelRx:

Severance Benefit	**C-level officers ***	**VP, SVP or EVP**
Base Salary:	12 months	6 months
Target Bonus:	100% of target bonus opportunity	Greater of 50% of target bonus opportunity, or a prorated amount of target bonus opportunity through termination date
Reimbursement of COBRA Premiums:	Up to 12 months	Up to 6 months
Vesting Acceleration:	100% vesting and exercisability of all outstanding unvested equity awards subject to time-based vesting	Same as for C-level executive officers
Extended exercisability of stock options:	Until 6 months after termination date (or earlier expiration date of the award)	Same as for C-level executive officers

* Executive officer must elect to participate in the Severance Plan in lieu of any separate benefits in their employment offer letters

The Severance Plan also provides that in the event that an outstanding unvested time-based vesting equity award does not become an assumed award in connection with a change in control, each such outstanding equity award will become 100% vested and exercisable immediately prior to the effective date of the change in control. All severance benefits payable under the Severance Plan are subject to the execution of a waiver and release of claims in favor of AcelRx.

Mr. Angotti's offer letter and the Severance Plan also contain a "better after-tax" provision, which provides that if any of the payments to the executive constitutes a parachute payment under Section 280G of the Code, the payments will either be (i) reduced or (ii) provided in full to the executive, whichever results in the executive receiving the greater amount after taking into consideration the payment of all taxes, including the excise tax under Section 4999 of the Code, in each case based upon the highest marginal rate for the applicable tax.

Non-Employee Director Compensation

Compensation for our non-employee directors consists of cash, restricted stock unit awards, or RSUs and stock options. The Compensation Committee periodically reviews the compensation paid to non-employee directors for their service on the Board and its committees and recommends any changes considered appropriate to the full Board for its approval.

Cash Compensation Arrangements for 2022

Our non-employee director cash compensation is aligned with the 50th percentile of our peer group. Each member of our Board who is not our employee receives an annual retainer of $40,000. In addition, our non-employee directors receive the following cash compensation for Board services, as applicable:

- the Board Chair receives an additional annual retainer of $30,000;
- the Audit Committee Chair receives an additional annual retainer of $20,000;
- the FAST Committee Chair receives an additional annual retainer of $20,000;
- the Compensation Committee Chair receives an additional annual retainer of $15,000;
- the Nominating and Corporate Governance Committee Chair receives an additional annual retainer of $10,000;
- an Audit Committee member receives an additional annual retainer of $10,000;
- a FAST Committee member receives an additional annual retainer of $10,000;
- a Compensation Committee member receives an additional annual retainer of $7,500; and
- a Nominating and Corporate Governance Committee member receives an additional retainer of $5,000.

All Board and committee retainers accrue and are payable on a quarterly basis at the end of each calendar quarter of service. We reimburse our non-employee directors for travel, lodging and other reasonable expenses incurred in connection with their attendance at Board or committee meetings.

Equity Compensation Arrangements for 2022

Equity compensation for our non-employee directors consists of a mix of stock options and RSUs. In 2022, the equity grant value was split approximately equally between stock options and RSUs, with the number of RSUs being equal to 50% of the number of stock options. In February 2022, the Board approved the recommendations of the Compensation Committee to better align our non-employee director equity compensation closer to the 50th percentile of our peer group. Beginning in February 2022, upon election or appointment to our Board, a new non-employee director will be granted an initial stock option to purchase 2,325 shares of our common stock, which will vest as to 1/3rd of the shares subject to the option on the one-year anniversary of the date of grant and as to the remaining shares subject to the option on an equal monthly basis over the following two-year period, and 1,162 RSUs, which will vest as to 1/3rd of the RSUs on each anniversary of the date of grant over a three-year period. Each non-employee director who is then serving as a director or who is elected to our Board on the date of an annual meeting will be granted a stock option to purchase 1,550 shares of our common stock, which will vest in full on the one-year anniversary of the date of grant, and 775 RSUs, which will vest in full on the one-year anniversary of the date of grant.

Each of the stock options will be granted with an exercise price equal to the fair market value of our common stock on the date of grant. All stock options and RSUs awarded to our non-employee directors are entitled to full vesting acceleration as of immediately prior to the effective date of certain change of control transactions involving us, such as our liquidation or a dissolution of or an event that results in a material change in the ownership of AcelRx.

2022 Director Compensation

The following table sets forth certain summary information for the year ended December 31, 2022 with respect to the compensation of our non-employee directors. Neither Mr. Angotti nor Dr. Palmer, who are executive officers, received or receives any additional compensation for serving on our Board. Mr. Edwards resigned from the Board effective March 31, 2022.

Name	Fees Earned or Paid in Cash	Stock Awards (1)(3)	Option Awards (2)(3)	Total
Adrian Adams	$ 102,500	$ 3,581	$ 5,416	$ 111,497
Richard Afable, M.D.	55,000	3,581	5,416	63,997
Marina Bozilenko	57,500	3,581	5,416	66,497
Jill Broadfoot	57,500	3,581	5,416	66,497
Mark G. Edwards	15,000	—	—	15,000
Stephen J. Hoffman, M.D., Ph.D.	47,500	3,581	5,416	56,497
Howard B. Rosen	50,000	3,581	5,416	58,997
Mark Wan	67,500	3,581	5,416	76,497

(1) The dollar amount in this column represents the grant date fair value of the RSUs granted to our non-employee directors during 2022, as computed in accordance with ASC Topic 718, not including any estimates of forfeitures. For a discussion of valuation assumptions, see Note 1 to our consolidated financial statements and the discussion under "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations—Critical Accounting Estimates—Stock-Based Compensation" included in our Annual Report on Form 10-K filed with the SEC on March 31, 2023. This amount does not correspond to the actual economic value that may be received from the RSUs. As of December 31, 2022, our non-employee directors had the following outstanding RSUs: Mr. Adams – 775; Dr. Afable – 775; Ms. Bozilenko – 1,276; Ms. Broadfoot – 1,276; Mr. Edwards – 0; Dr. Hoffman – 775; Mr. Rosen – 775; and Mr. Wan – 775.

(2) The dollar amount in this column represents the grant date fair value of the stock options granted to our non-employee directors during 2022. This amount has been calculated in accordance with ASC 718 using the Black-Scholes option-pricing model and excluding the effect of estimated forfeitures. For a discussion of valuation assumptions, see Notes 1 and 15 to our consolidated financial statements included in our Annual Report on Form 10-K filed with the SEC on March 31, 2023. This amount does not necessarily correspond to the actual economic value that may be recognized from the options. As of December 31, 2022, our non-employee directors had the following number of outstanding options: Mr. Adams – 8,925; Dr. Afable – 8,175; Ms. Bozilenko – 4,050; Ms. Broadfoot – 3,050; Mr. Edwards – 0; Dr. Hoffman – 8,175; Mr. Rosen – 76,973; and Mr. Wan – 8,175.

(3) On July 15, 2022, the date of our 2022 annual meeting of stockholders, each of the non-employee directors was granted 775 RSUs and an option to purchase 1,550 shares of our common stock with an exercise price of $4.62 per share. The shares subject to these stock options and RSUs vest on the first anniversary of the date of grant.

Non-Employee Director Compensation Changes for 2023

In February 2023, the Board approved the recommendations of the Compensation Committee to better align our non-employee director equity compensation closer to the 50th percentile of our peer group and in order to maximize the benefit of the 2023 equity award component to our directors to the greatest extent possible under the remaining equity share pool available under the 2020 Equity Incentive Plan. Beginning in February 2023, the equity grant value was split between stock options (75%) and RSUs (25%), with the number of RSUs being equal to 50% of the number of stock options. Beginning in February 2023, each non-employee director who is then serving as a director or who is elected to our Board on the date of an annual meeting will be granted a stock option to purchase 3,487 shares of our common stock, which will vest in full on the one-year anniversary of the date of grant, and 581 RSUs, which will vest in full on the one-year anniversary of the date of grant.

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 regarding the ownership of our common stock as of April 24, 2023 by:

- all those known by us to be beneficial owners of more than 5% of our common stock;
- each director and nominee for director;
- each named executive officer; and
- all of our current executive officers and directors as a group.

	Beneficial Ownership[1]	
Name of Beneficial Owner	**Number of Shares**	**% of Total**
Stockholders Owning Greater than 5%:		
Armistice Capital, LLC(2)	864,328	7.9%
Directors and Named Executive Officers:		
Adrian Adams(3)	16,437	*
Richard Afable, M.D. (4)	7,737	*
Vincent J. Angotti(5)	144,788	1.3%
Marina Bozilenko(6)	3,082	*
Jill Broadfoot(7)	1,040	*
Stephen J. Hoffman, M.D., Ph.D.(8)	7,687	*
Pamela P. Palmer, M.D., Ph.D.(9)	88,563	*
Howard B. Rosen(10)	79,360	*
Mark Wan(11)	7,687	*
Raffi Asadorian(12)	53,956	*
All current executive officers and directors as a group (11 persons)(13)	458,257	4.1%

* Less than 1%.

(1) This table is based upon information supplied by officers, directors and principal stockholders. Unless otherwise indicated in the footnotes to this table and subject to community property laws where applicable, we believe that each of the stockholders named in this table has sole voting and investment power with respect to the shares indicated as beneficially owned. Applicable percentages are based on 10,924,294 shares outstanding on April 24, 2023, adjusted as required by rules promulgated by the SEC. The number of shares beneficially owned includes shares of common stock issuable pursuant to the exercise of stock options that are exercisable within 60 days of April 24, 2023. Shares issuable pursuant to the exercise of stock options that are exercisable stock options and restricted stock units vesting within 60 days of April 24, 2023, are deemed to be outstanding and beneficially owned by the person to whom such shares are issuable for the purpose of computing the percentage ownership of that person, but they are not treated as outstanding for the purpose of computing the percentage ownership of any other person.

(2) Based on information disclosed in a Schedule 13G/A filed with the SEC on February 14, 2023, by Armistice Capital, LLC ("Armistice Capital") reporting ownership as of December 31, 2022. Includes 864,328 shares reported as beneficially owned by Armistice Capital, of which Armistice Capital reports sole voting power and sole dispositive power with respect to zero shares, and shared voting power and shared dispositive power with respect to 864,328 shares, and 864,328 shares reported as beneficially owned by Steven Boyd ("Mr. Boyd"), of which Mr. Boyd reports sole voting power and sole dispositive power with respect to zero shares, and shared voting power and shared dispositive power with respect to 864,328 shares. Armistice Capital is the investment manager of Armistice Capital Master Fund Ltd. (the "Master Fund"), the direct holder of the reported shares, and pursuant to an Investment Management Agreement, Armistice Capital exercises voting and investment power over these shares held by the Master Fund and thus may be deemed to beneficially own these shares held by the Master Fund. Mr. Boyd, as the managing member of Armistice Capital, may be deemed to beneficially own these shares held by the Master Fund. The Master Fund specifically disclaims beneficial ownership of these shares directly held by it by virtue of its inability to vote or dispose of such securities as a result of its Investment Management Agreement with Armistice Capital. Despite such shared beneficial ownership, the reporting persons disclaim that they constitute a statutory group within the meaning of Rule 13d-5(b)(1) of the Securities Exchange Act of 1934. The address for Armistice Capital and Mr. Boyd is 510 Madison Avenue, 7th Floor, New York, New York 10022.

(3) Includes 6,625 shares issuable pursuant to stock options exercisable within 60 days of April 24, 2023.

(4) Includes 6,625 shares issuable pursuant to stock options exercisable within 60 days of April 24, 2023.

(5) Includes 116,787 shares issuable pursuant to stock options exercisable within 60 days of April 24, 2023.

(6) Includes 2,083 shares issuable pursuant to stock options exercisable within 60 days of April 24, 2023.

(7) Includes 791 shares issuable pursuant to stock options exercisable within 60 days of April 24, 2023.

(8) Includes 6,625 shares issuable pursuant to stock options exercisable within 60 days of April 24, 2023.

(9) Includes 56,603 shares issuable pursuant to stock options exercisable within 60 days of April 24, 2023.

(10) Includes 75,423 shares issuable pursuant to stock options exercisable within 60 days of April 24, 2023.

(11) Includes 6,625 shares issuable pursuant to stock options exercisable within 60 days of April 24, 2023.

(12) Includes 42,813 shares issuable pursuant to stock options exercisable within 60 days of April 24, 2023.

(13) Includes 359,109 shares issuable pursuant to stock options exercisable within 60 days of April 24, 2023.

Equity Compensation Plan Information

The following table provides certain information with respect to our equity compensation plans in effect as of December 31, 2022.

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants and rights(1) (A)	Weighted-average exercise price of outstanding options, warrants and rights(2) (B)	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column A)(3) (C)
Equity compensation plans approved by security holders	808,401	$ 52.98	554,703
Equity compensation plans not approved by security holders	—	—	—
Total	808,401	$ 52.98	554,703

(1) Consists of the: (i) 2011 Equity Incentive Plan, as amended, (ii) Amended and Restated 2020 Equity Incentive Plan, and (iii) Amended and Restated 2011 Employee Stock Purchase Plan, or the ESPP. Number of securities includes: (i) 725,623 options with a weighted-average remaining life of 5.3 years and (ii) 82,778 shares of common stock to be issued following the vesting of RSUs for which no exercise price will be paid. Under the ESPP, participants are permitted to purchase our common stock at a discount on certain dates through payroll deductions within a pre-determined purchase period. Accordingly, the number of shares to be issued upon exercise of outstanding rights under the ESPP as of December 31, 2022 is not determinable.

(2) The calculation of weighted average exercise price includes only outstanding stock options.

(3) As of December 31, 2022, (i) 342,827 shares of common stock were available for issuance under the 2020 Equity Incentive Plan and (ii) 211,876 shares of common stock were available for issuance under the ESPP. On February 28, 2023, 26,016 shares were purchased under the ESPP and as of May 24, 2023, up to a maximum of 20,000 shares may be purchased in the current purchase period.

Item 13. Certain Relationships and Related Transactions and Director Independence

Certain Relationships and Related Transactions

There has not been since January 1, 2021, nor is there currently proposed, any transaction or series of similar transactions to which we were or are to be a party in which the amount involved exceeds $120,000 and in which any current director, executive officer, holder of more than 5% of our common stock or any immediate family member of any of the foregoing persons had or will have a direct or indirect material interest other than compensation arrangements, described under the sections titled “Executive Compensation” and “Director Compensation,” and indemnification agreements described below.

Indemnification Agreements

We have entered into indemnification agreements with each of our current directors and officers. These agreements provide for the indemnification of such persons for all reasonable expenses and liabilities incurred in connection with any action or proceeding brought against them by reason of the fact that they are or were serving in such capacity. We believe that these indemnification agreements are necessary to attract and retain qualified persons as directors and officers. Furthermore, we have obtained director and officer liability insurance to cover liabilities our directors and officers may incur in connection with their services to us.

Independence of the Board of Directors

Under the rules of The Nasdaq Stock Market, LLC, or Nasdaq, “independent” directors must comprise a majority of a listed company’s board of directors. In addition, applicable Nasdaq rules require that, subject to specified exceptions, each member of a listed company’s audit, compensation and nominating committees be independent within the meaning of applicable Nasdaq rules. Audit Committee members must also satisfy the independence criteria set forth in Rule 10A-3 under the Exchange Act.

Our Board undertook a review of the independence of each director and considered whether any director has a material relationship with us that could compromise his or her ability to exercise independent judgment in carrying out his or her responsibilities. As a result of this review, our Board determined that all of our directors, other than Mr. Angotti, our Chief Executive Officer, and Dr. Palmer, our Chief Medical Officer, qualify as “independent” directors within the meaning of the Nasdaq rules. Accordingly, a majority of our directors are independent, as required under applicable Nasdaq rules. Our non-employee directors have been meeting, and we anticipate that they will continue to meet, in regularly scheduled executive sessions at which only non-employee directors are present.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

Change in Independent Registered Public Accounting Firm

On July 15, 2021, we were formally notified that OUM & Co. LLP, OUM, combined its practice with Withum and, as a result of such transaction, OUM effectively resigned as our independent registered public accounting firm on such date. Pursuant to certain terms of the transaction, OUM combined its operations with Withum operations and certain professional staff and partners of OUM joined Withum as employees or partners.

On July 16, 2021, with the approval of our Audit Committee, Withum was engaged as our independent registered public accounting firm for the quarterly periods ending June 30, 2021 and September 30, 2021, and for the year ending December 31, 2021.

During the years ended December 31, 2020 and 2019, and during the interim period from December 31, 2020 through July 15, 2021, the date of resignation, there were no disagreements with OUM on any matter of accounting principles or practices, financial statement disclosure or auditing scope or procedures, which disagreements, if not resolved to the satisfaction of OUM, would have caused it to make reference to such disagreement in its reports.

The report of OUM regarding our consolidated financial statements for the year ended December 31, 2020 did not contain any adverse opinion or disclaimer of opinion and were not qualified or modified as to uncertainty, audit scope or accounting principles.

Prior to engaging Withum, neither we nor anyone on our behalf consulted with Withum regarding (i) the application of accounting principles to a specified transaction, either completed or proposed, or on the type of audit opinion that might be rendered by Withum on our consolidated financial statements, or (ii) any matter that was either the subject of a disagreement (as defined in Item 304(a)(1)(iv) of Regulation S-K and the related instructions) or a reportable event (as described in Item 304(a)(1)(v) of Regulation S-K), and Withum did not provide any written report or oral advice that was an important factor considered by us in reaching a decision as to any such accounting, auditing or financial reporting issue.

We previously provided OUM with a copy of the disclosures regarding this change in independent registered public accounting firm reproduced in this Proxy Statement and we received a letter from OUM addressed to the SEC stating that they agree with the above statements. A copy of this letter was filed as an exhibit to our Current Report on Form 8-K filed with the SEC on July 29, 2021.

Fees Billed By Independent Registered Public Accounting Firm in 2022 and 2021

As described above, on July 15, 2021, OUM combined its operations with the operations of Withum and certain professional staff and partners of OUM joined Withum as employees or partners. The following tables present the aggregate fees billed by OUM and Withum to us for the years ended December 31, 2022 and 2021.

OUM & Co. LLP (San Francisco, CA PCAOB ID Number 252)

	Year Ended December 31,	
	2022	2021
Audit Fees(1)	$ —	$ 87,075
Audit-Related Fees	—	—
Tax Fees	—	—
All Other Fees	—	—
Total Fees	$ —	$ 87,075

(1) *Audit Fees.* Consists of fees for professional services rendered for the review of our condensed consolidated financial statements for the first interim period of 2021. Fees also consist of review of interim condensed consolidated financial statements and fees for assistance with registration statements filed with the SEC, comfort letters and services that are normally provided in connection with statutory and regulatory filings or engagements for 2021.

WithumSmith+Brown, PC (San Francisco, CA PCAOB ID Number 100)

	Year Ended December 31,	
	2022	2021
Audit Fees(1)	$ 568,900	$ 508,000
Audit-Related Fees	—	—
Tax Fees	—	—
All Other Fees	—	—
Total Fees	$ 568,900	$ 508,000

(1) *Audit Fees.* Consists of fees for professional services rendered for the audit of our consolidated financial statements, review of interim condensed consolidated financial statements and fees for assistance with registration statements filed with the SEC, comfort letters and services that are normally provided by Withum in connection with statutory and regulatory filings or engagements for 2022 and 2021.

Pre-Approval Policies and Procedures

Our Audit Committee pre-approves all audit and permissible non-audit services provided by our independent registered public accounting firm. These services may include audit services, audit-related services, tax services and other services. Pre-approval may be given as part of the Audit Committee's approval of the scope of the engagement of the independent registered public accounting firm or on an individual explicit case-by-case basis.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(a) The following documents are filed as part of the 2022 Annual Report filed with the SEC on March 31, 2023:

1.Financial Statements:

See Index to Financial Statements in Item 8 of the 2022 Annual Report.

2. Financial Statement Schedules:

Reference is made to the financial statement schedules included under Item 8 of Part II in the 2022 Annual Report. All other schedules are omitted because they are not applicable, not required or the information is shown in the financial statements or the notes thereto.

(b) Exhibits

Exhibit Number	Exhibit Description	Incorporation By Reference			
		Form	SEC File No.	Exhibit	Filing Date
2.1§	Agreement and Plan of Merger, dated as of November 14, 2021, by and among the Registrant, Lowell, Merger Sub 1, Merger Sub 2 and the Stockholder Representative.	10-Q	001-35068	2.1	11/15/2021
3.1	Amended and Restated Certificate of Incorporation of the Registrant.	8-K	001-35068	3.1	2/18/2011
3.2	Certificate of Amendment of Amended and Restated Certificate of Incorporation of the Registrant.	8-K	001-35068	3.1	6/25/2019
3.3	Certificate of Amendment of Amended and Restated Certificate of Incorporation of the Registrant.	8-K	001-35068	3.1	10/25/2022
3.4	Certificate of Designation of Preferences, Rights and Limitations of Series A Convertible Preferred Stock of the Registrant.	8-K	001-35068	3.1	08/04/2022
3.5	Certificate of Elimination of Series A Convertible Preferred Stock of the Registrant.	8-K	001-35068	3.2	10/25/2022
3.6	Amended and Restated Bylaws of the Registrant.	8-K	001-35068	3.1	08/12/2022
4.1	Description of Capital Stock.	10-K	001-35068	4.1	3/15/2021
4.2	Reference is made to Exhibits 3.1 through 3.3.				
4.3	Specimen Common Stock Certificate of the Registrant.	S-1	333-170594	4.2	1/31/2011
4.4	Form of Warrant to Purchase Common Stock of the Registrant, dated as of May 30, 2019.	8-K	001-35068	4.1	6/3/2019

4.5	Form of Warrant to Purchase Common Stock of the Registrant, dated as of November 15, 2021.	8-K	001-35068	4.1	11/15/2021
4.6	Warrant to Purchase Common Stock of the Registrant, dated as of August 3, 2022.	8-K	001-35068	4.1	08/04/2022
4.7^	Form of Common Warrant, as amended (April 2023).				
4.8	Form of Pre-Funded Warrant (December 2022).	8-K	001-35068	4.2	12/28/2022
4.9	Form of Common Warrant, as amended (November 2022).	8-K	001-35068	4.3	12/28/2022
10.1+	Form of Indemnification Agreement between the Registrant and each of its directors and executive officers.	S-1	333-170594	10.1	1/7/2011
10.2+	2011 Equity Incentive Plan.	S-8	333-172409	99.3	2/24/2011
10.3+	Forms of Stock Option Grant Notice, Notice of Exercise and Option Agreement under 2011 Equity Incentive Plan.	10-K	001-35068	10.5	3/30/2011
10.4+	Forms of Restricted Stock Unit Grant Notice and Restricted Stock Unit Agreement under 2011 Equity Incentive Plan.	10-K	001-35068	10.6	3/30/2011
10.5+	Amended and Restated 2020 Equity Incentive Plan.	8-K	001-350683	10.1	6/17/2021
10.6+	Forms of Stock Option Grant Notice, Stock Option Agreement and Notice of Exercise under the Amended and Restated 2020 Equity Incentive Plan.	S-8	333-239213	99.2	6/16/2020
10.7+	Forms of RSU Award Grant Notice and Award Agreement (RSU Award) under the Amended and Restated 2020 Equity Incentive Plan.	S-8	333-239213	99.3	6/16/2020
10.8+	Amended and Restated 2011 Employee Stock Purchase Plan.	S-8	333-239213	99.4	6/16/2020
10.9+	Amended and Restated Offer Letter between the Registrant and Badri (Anil) Dasu, dated December 30, 2010.	S-1	333-170594	10.15	1/7/2011
10.10+	Amended and Restated Offer Letter between the Registrant and Pamela Palmer, dated December 29, 2010.	S-1	333-170594	10.16	1/7/2011
10.11+	Offer Letter between the Registrant and Vincent J. Angotti, effective as of March 6, 2017.	10-Q	001-35068	10.4	5/8/2017
10.12+	Offer Letter between the Registrant and Raffi Asadorian, dated July 18, 2017.	8-K	001-35068	10.1	7/19/2017
10.13+	Non-Employee Director Compensation Policy.	10-K	001-35068	10.13	3/10/2022
10.14+	Amended and Restated Severance Benefit Plan effective as of February 7, 2017.	8-K	001-35068	10.2	2/9/2017

10.15§	Sublease for a Single Sublessee, dated March 26, 2021, by and between the Registrant and Weichert Workforce Mobility Inc., as successor in interest to The MI Group, Inc.	10-Q	001-35068	10.3	5/17/2021
10.16§#	License and Commercialization Agreement (DZUVEO), dated July 14, 2021, between the Registrant and Laboratoire Aguettant.	10-Q	001-35068	10.1	11/15/2021
10.17§#	License and Commercialization Agreement (PFS), dated July 14, 2021, between the Registrant and Laboratoire Aguettant.	10-Q	001-35068	10.2	11/15/2021
10.18	Contingent Value Rights Agreement, dated as of January 7, 2022, by and among AcelRx Pharmaceuticals, Inc., James Wilkie, solely in his capacity as the representative of the Lowell stockholders and option holders, and Computershare Inc., and its wholly-owned subsidiary, Computershare Trust Company, N.A., a federally chartered trust company, collectively as Rights Agent	8-K	001-35068	10.1	1/12/2022
10.19§#	Commercial Supply Agreement, effective March 31, 2021 by and between the Registrant and Catalent Pharma Solutions, LLC.	10-Q	001-35068	10.1	8/16/2021
10.20^#	Manufacturing Services Agreement between Registrant and Patheon Pharmaceuticals, Inc., dated as of January 18, 2013.				
10.21^#	Amended and Restated Capital Expenditure Agreement between Registrant and Patheon Pharmaceuticals, Inc., effective as of December 12, 2012.				
10.22	Second Amendment to Amended and Restated Capital Expenditure and Equipment Agreement, between the Registrant and Patheon Pharmaceuticals, Inc. effective as of January 30, 2014.	10-Q	001-35068	10.4	5/8/2014
10.23^#	Amendment #1 to Manufacturing Services Agreement between the Registrant and Patheon Pharmaceuticals, Inc., effective as of December 12, 2012.				
10.24#	Amendment #2 to Manufacturing Services Agreement between the Registrant and Patheon Pharmaceuticals, Inc., effective as of August 4, 2017.	10-Q	001-35068	10.1	11/9/2017
10.25#	Purchase and Sale Agreement between Registrant and ARPI LLC, dated as of September 18, 2015.	10-Q	001-35068	10.6	11/3/2015
10.26#	Subsequent Purchase and Sale Agreement between ARPI LLC (a wholly owned subsidiary of the Registrant) and SWK Funding, LLC (assigned of PDL BioPharma, Inc.), dated as of September 18, 2015.	10-Q	001-35068	10.7	11/3/2015
10.27	Controlled Equity Offering℠ Sales Agreement between the Registrant and Cantor Fitzgerald & Co., dated as of June 21, 2016.	8-K	001-35068	10.1	6/21/2016
10.28	Amendment No. 1 to the Controlled Equity Offering℠ Sales Agreement between the Registrant and Cantor Fitzgerald & Co., dated as of August 29, 2020.	S-3	333-239156	1.3	6/12/2020
10.29	Loan and Security Agreement between the Registrant and Oxford Finance, LLC, dated as of May 30, 2019.	8-K	001-35068	10.1	6/3/2019
10.30	First Amendment to Loan and Security Agreement between the Registrant and Oxford Finance, LLC, dated as of May 5, 2021.	10-Q	001-35068	10.4	11/15/2021

10.31	Second Amendment to Loan and Security Agreement between the Registrant and Oxford Finance, LLC, dated as of November 14, 2021.	10-K	001-35068	10.31	3/10/2022
10.32#	Agreement between the Registrant and SpecGX, LLC, dated June 16, 2017.	10-Q	001-35068	10.1	11/7/2019
10.33	Amendment to Agreement between the Registrant and SpecGX, LLC, dated September 23, 2019.	10-Q	001-35068	10.2	11/7/2019
10.34	Securities Purchase Agreement, between the Registrant and Lincoln Park Capital Fund, LLC, dated as of August 3, 2022.	8-K	001-35068	10.1	08/04/2022
10.35	Registration Rights Agreement, between the Registrant and Lincoln Park Capital Fund, LLC, dated as of August 3, 2022.	8-K	001-35068	10.2	08/04/2022
23.1	Consent of Withum Smith & Brown, LLP, Independent Registered Public Accounting Firm.	10-K	001-35068	23.1	03/31/2023
24.1	Power of Attorney (included in signature page).	10-K	001-35068	24.1	03/31/2023
31.1^	Certification of Principal Executive Officer pursuant to Rules 13a-14(a) and 15d-14(a) promulgated under the Securities Exchange Act of 1934, as amended.				
31.2^	Certification of Principal Financial Officer pursuant to Rules 13a-14(a) and 15d-14(a) promulgated under the Securities Exchange Act of 1934, as amended.				
32.1	Certifications of Chief Executive Officer and Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.	10-K	001-35068	32.1	03/31/2023
101.INS	XBRL Instance Document- the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.	10-K	001-35068	101.INS	03/31/2023
101.SCH	Inline XBRL Taxonomy Schema Document	10-K	001-35068	101.SCH	03/31/2023
101.CAL	Inline XBRL Taxonomy Calculation Linkbase Document	10-K	001-35068	101.CAL	03/31/2023
101.DEF	Inline XBRL Taxonomy Definition Linkbase Document	10-K	001-35068	101.DEF	03/31/2023
101.LAB	Inline XBRL Taxonomy Label Linkbase Document	10-K	001-35068	101.LAB	03/31/2023
101.PRE	Inline XBRL Taxonomy Presentation Linkbase Document	10-K	001-35068	101.PRE	03/31/2023
104	Cover Page Interactive Data File (formatted as inline XBRL with applicable taxonomy extension information contained in Exhibits 101.INS, 101.SCH, 101.CAL, 101.DEF, 101.LAB, and 101.PRE).	10-K	001-35068	104	03/31/2023

^ Filed herewith.

§ Schedules omitted pursuant to Item 601(a)(5) of Regulation S-K. The Registrant agrees to furnish supplementally a copy of any omitted schedule upon request by the SEC.

+ Indicates management contract or compensatory plan.

Material in the exhibit marked with an "[*]" has been omitted because it is confidential, not material, and would be competitively harmful if publicly disclosed.

The certifications attached as Exhibit 32.1 accompany this Annual Report on Form 10-K pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, and shall not be deemed "filed" by the Registrant for purposes of Section 18 of the Securities Exchange Act of 1934, as amended.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Act of 1934, the registrant has duly caused this Amendment No. 1 to its Annual Report on Form 10-K/A to be signed on its behalf by the undersigned, thereunto duly authorized.

Date: May 1, 2023

AcelRx Pharmaceuticals, Inc.
(Registrant)

/s/ Vincent J. Angotti

Vincent J. Angotti
Chief Executive Officer and Director
(Principal Executive Officer)

/s/ Raffi Asadorian

Raffi Asadorian
Chief Financial Officer
(Principal Financial and Accounting Officer)

AMENDED AND RESTATED

COMMON STOCK PURCHASE WARRANT

ACELRX PHARMACEUTICALS, INC.

Warrant Shares: 4,227,052

Original Issuance Date: December 29, 2022
Amendment Date: April 25, 2023

THIS AMENDED AND RESTATED COMMON STOCK PURCHASE WARRANT (the "Warrant") certifies that, for value received, Armistice Capital Master Fund Ltd. or its assigns (the "Holder") is entitled, upon the terms and subject to the limitations on exercise and the conditions hereinafter set forth, at any time after the six month anniversary of the Original Issuance Date (the "Initial Exercise Date") and on or prior to 5:00 p.m. (New York City time) on December 29, 2028 (the "Termination Date") but not thereafter, to subscribe for and purchase from AcelRx Pharmaceuticals, Inc., a Delaware corporation (the "Company"), up to 4,227,052 shares of Common Stock (as subject to adjustment hereunder, the "Warrant Shares"). The purchase price of one share of Common Stock under this Warrant shall be equal to the Exercise Price, as defined in Section 2(b).

Section 1. Definitions. In addition to the terms defined elsewhere in this Warrant, the following terms have the meanings indicated in this Section 1:

"Affiliate" means any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 405 under the Securities Act.

"Bid Price" means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock then listed or quoted on a Trading Market, the bid price of the Common Stock for the time in question (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. ("Bloomberg") (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported on the Pink Open Market (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined by an independent appraiser selected in good faith by the Holders of a majority in interest of the Warrants then outstanding and reasonably acceptable to the Company, the fees and expenses of which shall be paid by the Company.

"Board of Directors" means the board of directors of the Company.

"Business Day" means any day other than Saturday, Sunday or other day on which commercial banks in The City of New York are authorized or required by law to remain closed; provided, however, for clarification, commercial banks shall not be deemed to be authorized or required by law to remain closed due to "stay at home", "shelter-in-place", "non-essential employee" or any other similar orders or restrictions or the closure of any physical branch locations at the direction of any governmental authority so long as the electronic funds transfer systems (including for wire transfers) of commercial banks in The City of New York generally are open for use by customers on such day.

"Commission" means the United States Securities and Exchange Commission.

"Common Stock" means the shares of Common Stock of the Company, par value $0.001 per share, and any other class of securities into which such securities may hereafter be reclassified or changed.

"Common Stock Equivalents" means any securities of the Company or the Subsidiaries which would entitle the holder thereof to acquire at any time shares of Common Stock, including, without limitation, any debt, preferred shares, right, option, warrant or other instrument that is at any time convertible into or exercisable or exchangeable for, or otherwise entitles the holder thereof to receive, shares of Common Stock.

"Exchange Act" means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

"Exempt Issuance" means the issuance of (a) shares of Common Stock or options to employees, officers or directors of the Company pursuant to any stock or option plan duly adopted for such purpose, by a majority of the non-employee members of the Board of Directors or a majority of the members of a committee of non-employee directors established for such purpose for services rendered to the Company, (b) securities upon the exercise or exchange of or conversion of any securities issued pursuant to the Registration Statement, and/or other securities exercisable or exchangeable for or convertible into shares of Common Stock issued and outstanding on the date of this Warrant, provided that such securities have not been amended since the date of this Warrant to increase the number of such securities or to decrease the exercise price, exchange price or conversion price of such securities (other than in connection with stock splits or combinations) or to extend the term of such securities, and warrants to the placement agent in connection with the transactions pursuant to the Registration Statement and any securities upon exercise of warrants to the placement agent, and (c) securities issued pursuant to acquisitions or strategic transactions approved by a majority of the disinterested directors of the Company, provided that such securities are issued as "restricted securities" (as defined in Rule 144) and carry no registration rights that require or permit the filing of any registration statement in connection therewith until fifty (50) days after the Initial Exercise Date, and provided that any such issuance shall only be to a Person (or to the equityholders of a Person) which is, itself or through its subsidiaries, an operating company or an owner of an asset in a business synergistic with the business of the Company and shall provide to the Company additional benefits in addition to the investment of funds, but shall not include a transaction in which the Company is issuing securities primarily for the purpose of raising capital or to an entity whose primary business is investing in securities.

"Person" means an individual or corporation, partnership, trust, incorporated or unincorporated association, joint venture, limited liability company, joint stock company, government (or an agency or subdivision thereof) or other entity of any kind.

"Purchase Agreement" means the securities purchase agreement, dated as of December 27, 2022, among the Company and the purchasers signatory thereto, as amended, modified or supplemented from time to time in accordance with its terms.

"Registration Statement" means the Company's registration statement on Form S-3 (File No. 333-239156).

"Securities Act" means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

"Subsidiary" means any subsidiary of the Company and shall, where applicable, also include any direct or indirect subsidiary of the Company formed or acquired after the date hereof.

"Trading Day" means a day on which the Common Stock is traded on a Trading Market.

"Trading Market" means any of the following markets or exchanges on which the Common Stock is listed or quoted for trading on the date in question: the NYSE American, the Nasdaq Capital Market, the Nasdaq Global Market, the Nasdaq Global Select Market, or the New York Stock Exchange (or any successors to any of the foregoing).

"Transfer Agent" means Computershare, Inc., the current transfer agent of the Company, with a mailing address of 250 Royall Street, Canton, Massachusetts 02021, and any successor transfer agent of the Company.

"VWAP" means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the daily volume weighted average price of the Common Stock for such date (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock is then reported on the Pink Open Market (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined by an independent appraiser selected in good faith by the holders of a majority in interest of the Warrants then outstanding and reasonably acceptable to the Company, the fees and expenses of which shall be paid by the Company.

"Warrants" means this Warrant as issued by the Company pursuant to the Registration Statement.

Section 2. Exercise.

a) Exercise of Warrant. Exercise of the purchase rights represented by this Warrant may be made, in whole or in part, at any time or times on or after the Initial Exercise Date and on or before the Termination Date by delivery to the Company of a duly executed PDF copy submitted by e-mail (or e-mail attachment) of the Notice of Exercise in the form annexed hereto (the "Notice of Exercise"). Within the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period (as defined in Section 2(d)(i) herein) following the date of exercise as aforesaid, the Holder shall deliver the aggregate Exercise Price for the shares specified in the applicable Notice of Exercise by wire transfer or cashier's check drawn on a United States bank unless the cashless exercise procedure specified in Section 2(c) below is specified in the applicable Notice of Exercise. No ink-original Notice of Exercise shall be required, nor shall any medallion guarantee (or other type of guarantee or notarization) of any Notice of Exercise be required. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender this Warrant to the Company until the Holder has purchased all of the Warrant Shares available hereunder and the Warrant has been exercised in full, in which case, the Holder shall surrender this Warrant to the Company for cancellation within three (3) Trading Days of the date on which the final Notice of Exercise is delivered to the Company. Partial exercises of this Warrant resulting in purchases of a portion of the total number of Warrant Shares available hereunder shall have the effect of lowering the outstanding number of Warrant Shares purchasable hereunder in an amount equal to the applicable number of Warrant Shares purchased. The Holder and the Company shall maintain records showing the number of Warrant Shares purchased and the date of such purchases. The Company shall deliver any objection to any Notice of Exercise within one (1) Business Day of receipt of such notice. **The Holder and any assignee, by acceptance of this Warrant, acknowledge and agree that, by reason of the provisions of this paragraph, following the purchase of a portion of the Warrant Shares hereunder, the number of Warrant Shares available for purchase hereunder at any given time may be less than the amount stated on the face hereof.**

b Exercise Price. The exercise price per share of Common Stock under this Warrant shall be $2.07, subject to adjustment hereunder (the "Exercise Price").

c) Cashless Exercise. If at the time of exercise hereof there is no effective registration statement registering, or the prospectus contained therein is not available for the issuance of the Warrant Shares to the Holder, then this Warrant may only be exercised, in whole or in part, at such time by means of a "cashless exercise" in which the Holder shall be entitled to receive a number of Warrant Shares equal to the quotient obtained by dividing [(A-B) (X)] by (A), where:

(A) = as applicable: (i) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise if such Notice of Exercise is (1) both executed and delivered pursuant to Section 2(a) hereof on a day that is not a Trading Day or (2) both executed and delivered pursuant to Section 2(a) hereof on a Trading Day prior to the opening of "regular trading hours" (as defined in Rule 600(b) of Regulation NMS promulgated under the federal securities laws) on such Trading Day, (ii) at the option of the Holder, either (y) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise or (z) the Bid Price of the Common Stock on the principal Trading Market as reported by Bloomberg as of the time of the Holder's execution of the applicable Notice of Exercise if such Notice of Exercise is executed during "regular trading hours" on a Trading Day and is delivered within two (2) hours thereafter (including until two (2) hours after the close of "regular trading hours" on a Trading Day) pursuant to Section 2(a) hereof or (iii) the VWAP on the date of the applicable Notice of Exercise if the date of such Notice of Exercise is a Trading Day and such Notice of Exercise is both executed and delivered pursuant to Section 2(a) hereof after the close of "regular trading hours" on such Trading Day;

(B) = the Exercise Price of this Warrant, as adjusted hereunder; and

(X) = the number of Warrant Shares that would be issuable upon exercise of this Warrant in accordance with the terms of this Warrant if such exercise were by means of a cash exercise rather than a cashless exercise.

If Warrant Shares are issued in such a cashless exercise, the parties acknowledge and agree that in accordance with Section 3(a)(9) of the Securities Act, the Warrant Shares shall take on the registered characteristics of the Warrants being exercised. The Company agrees not to take any position contrary to this Section 2(c).

Notwithstanding anything herein to the contrary, on the Termination Date, this Warrant shall be automatically exercised via cashless exercise pursuant to this Section 2(c).

d) Mechanics of Exercise.

i. Delivery of Warrant Shares Upon Exercise. The Company shall cause the Warrant Shares purchased hereunder to be transmitted by the Transfer Agent to the Holder by crediting the account of the Holder's or its designee's balance account with The Depository Trust Company through its Deposit or Withdrawal at Custodian system ("DWAC") if the Company is then a participant in such system and either (A) there is an effective registration statement permitting the issuance of the Warrant Shares to or resale of the Warrant Shares by the Holder or (B) this Warrant is being exercised via cashless exercise, and otherwise by physical delivery of a certificate, registered in the Company's share register in the name of the Holder or its designee, for the number of Warrant Shares to which the Holder is entitled pursuant to such exercise to the address specified by the Holder in the Notice of Exercise by the date that is the earliest of (i) two (2) Trading Days after the delivery to the Company of the Notice of Exercise, (ii) one (1) Trading Day after delivery of the aggregate Exercise Price to the Company and (iii) the number of Trading Days comprising the Standard Settlement Period after the delivery to the Company of the Notice of Exercise (such date, the "Warrant Share Delivery Date"). Upon delivery of the Notice of Exercise, the Holder shall be deemed for all corporate purposes to have become the holder of record of the Warrant Shares with respect to which this Warrant has been exercised, irrespective of the date of delivery of the Warrant Shares, provided that payment of the aggregate Exercise Price (other than in the case of a cashless exercise) is received within the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period following delivery of the Notice of Exercise. If the Company fails for any reason to deliver to the Holder the Warrant Shares subject to a Notice of Exercise by the Warrant Share Delivery Date, the Company shall pay to the Holder, in cash, as liquidated damages and not as a penalty, for each $1,000 of Warrant Shares subject to such exercise (based on the VWAP of the Common Stock on the date of the applicable Notice of Exercise), $10 per Trading Day (increasing to $20 per Trading Day on the third Trading Day after the Warrant Share Delivery Date) for each Trading Day after such Warrant Share Delivery Date until such Warrant Shares are delivered or Holder rescinds such exercise. The Company agrees to maintain a transfer agent that is a participant in the FAST program so long as this Warrant remains outstanding and exercisable. As used herein, "Standard Settlement Period" means the standard settlement period, expressed in a number of Trading Days, on the Company's primary Trading Market with respect to the Common Stock as in effect on the date of delivery of the Notice of Exercise.

ii. Delivery of New Warrants Upon Exercise. If this Warrant shall have been exercised in part, the Company shall, at the request of a Holder and upon surrender of this Warrant certificate, at the time of delivery of the Warrant Shares, deliver to the Holder a new Warrant evidencing the rights of the Holder to purchase the unpurchased Warrant Shares called for by this Warrant, which new Warrant shall in all other respects be identical with this Warrant.

iii. Rescission Rights. If the Company fails to cause the Transfer Agent to transmit to the Holder the Warrant Shares pursuant to Section 2(d)(i) by the Warrant Share Delivery Date, then the Holder will have the right to rescind such exercise.

iv. Compensation for Buy-In on Failure to Timely Deliver Warrant Shares Upon Exercise. In addition to any other rights available to the Holder, if the Company fails to cause the Transfer Agent to transmit to the Holder the Warrant Shares in accordance with the provisions of Section 2(d)(i) above pursuant to an exercise on or before the Warrant Share Delivery Date, and if after such date the Holder is required by its broker to purchase (in an open market transaction or otherwise) or the Holder's brokerage firm otherwise purchases, shares of Common Stock to deliver in satisfaction of a sale by the Holder of the Warrant Shares which the Holder anticipated receiving upon such exercise (a "Buy-In"), then the Company shall (A) pay in cash to the Holder the amount, if any, by which (x) the Holder's total purchase price (including brokerage commissions, if any) for the shares of Common Stock so purchased exceeds (y) the amount obtained by multiplying (1) the number of Warrant Shares that the Company was required to deliver to the Holder in connection with the exercise at issue times (2) the price at which the sell order giving rise to such purchase obligation was executed, and (B) at the option of the Holder, either reinstate the portion of the Warrant and equivalent number of Warrant Shares for which such exercise was not honored (in which case such exercise shall be deemed rescinded) or deliver to the Holder the number of shares of Common Stock that would have been issued had the Company timely complied with its exercise and delivery obligations hereunder. For example, if the Holder purchases Common Stock having a total purchase price of $11,000 to cover a Buy-In with respect to an attempted exercise of shares of Common Stock with an aggregate sale price giving rise to such purchase obligation of $10,000, under clause (A) of the immediately preceding sentence the Company shall be required to pay the Holder $1,000. The Holder shall provide the Company written notice indicating the amounts payable to the Holder in respect of the Buy-In and, upon request of the Company, evidence of the amount of such loss. Nothing herein shall limit a Holder's right to pursue any other remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Company's failure to timely deliver shares of Common Stock upon exercise of the Warrant as required pursuant to the terms hereof.

v. No Fractional Shares or Scrip. No fractional shares or scrip representing fractional shares shall be issued upon the exercise of this Warrant. As to any fraction of a share which the Holder would otherwise be entitled to purchase upon such exercise, the Company shall, at its election, either pay a cash adjustment in respect of such final fraction in an amount equal to such fraction multiplied by the Exercise Price or round up to the next whole share.

vi. Charges, Taxes and Expenses. Issuance of Warrant Shares shall be made without charge to the Holder for any issue or transfer tax or other incidental expense in respect of the issuance of such Warrant Shares, all of which taxes and expenses shall be paid by the Company, and such Warrant Shares shall be issued in the name of the Holder or in such name or names as may be directed by the Holder; provided, however, that, in the event that Warrant Shares are to be issued in a name other than the name of the Holder, this Warrant when surrendered for exercise shall be accompanied by the Assignment Form attached hereto duly executed by the Holder and the Company may require, as a condition thereto, the payment of a sum sufficient to reimburse it for any transfer tax incidental thereto. The Company shall pay all Transfer Agent fees required for same-day processing of any Notice of Exercise and all fees to the Depository Trust Company (or another established clearing corporation performing similar functions) required for same-day electronic delivery of the Warrant Shares.

vii. Closing of Books. The Company will not close its stockholder books or records in any manner which prevents the timely exercise of this Warrant, pursuant to the terms hereof.

e) Holder's Exercise Limitations. The Company shall not effect any exercise of this Warrant, and a Holder shall not have the right to exercise any portion of this Warrant, pursuant to Section 2 or otherwise, to the extent that after giving effect to such issuance after exercise as set forth on the applicable Notice of Exercise, the Holder (together with the Holder's Affiliates, and any other Persons acting as a group together with the Holder or any of the Holder's Affiliates (such Persons, "Attribution Parties")), would beneficially own in excess of the Beneficial Ownership Limitation (as defined below). For purposes of the foregoing sentence, the number of shares of Common Stock beneficially owned by the Holder and its Affiliates and Attribution Parties shall include the number of shares of Common Stock issuable upon exercise of this Warrant with respect to which such determination is being made, but shall exclude the number of shares of Common Stock which would be issuable upon (i) exercise of the remaining, nonexercised portion of this Warrant beneficially owned by the Holder or any of its Affiliates or Attribution Parties and (ii) exercise or conversion of the unexercised or nonconverted portion of any other securities of the Company (including, without limitation, any other Common Stock Equivalents) subject to a limitation on conversion or exercise analogous to the limitation contained herein beneficially owned by the Holder or any of its Affiliates or Attribution Parties. Except as set forth in the preceding sentence, for purposes of this Section 2(e), beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder, it being acknowledged by the Holder that the Company is not representing to the Holder that such calculation is in compliance with Section 13(d) of the Exchange Act and the Holder is solely responsible for any schedules required to be filed in accordance therewith. To the extent that the limitation contained in this Section 2(e) applies, the determination of whether this Warrant is exercisable (in relation to other securities owned by the Holder together with any Affiliates and Attribution Parties) and of which portion of this Warrant is exercisable shall be in the sole discretion of the Holder, and the submission of a Notice of Exercise shall be deemed to be the Holder's determination of whether this Warrant is exercisable (in relation to other securities owned by the Holder together with any Affiliates and Attribution Parties) and of which portion of this Warrant is exercisable, in each case subject to the Beneficial Ownership Limitation, and the Company shall have no obligation to verify or confirm the accuracy of such determination. In addition, a determination as to any group status as contemplated above shall be determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. For purposes of this Section 2(e), in determining the number of outstanding shares of Common Stock, a Holder may rely on the number of outstanding shares of Common Stock as reflected in (A) the Company's most recent periodic or annual report filed with the Commission, as the case may be, (B) a more recent public announcement by the Company or (C) a more recent written notice by the Company or the Transfer Agent setting forth the number of shares of Common Stock outstanding. Upon the written or oral request of a Holder, the Company shall within one Trading Day confirm orally and in writing to the Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to the conversion or exercise of securities of the Company, including this Warrant, by the Holder or its Affiliates or Attribution Parties since the date as of which such number of outstanding shares of Common Stock was reported. The "Beneficial Ownership Limitation" shall be 4.99% (or, upon election by a Holder prior to the issuance of any Warrants, 9.99%) of the number of shares of Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock issuable upon exercise of this Warrant. The Holder, upon notice to the Company, may increase or decrease the Beneficial Ownership Limitation provisions of this Section 2(e), provided that the Beneficial Ownership Limitation in no event exceeds 9.99% of the number of Common Shares outstanding immediately after giving effect to the issuance of Common Shares upon exercise of this Warrant held by the Holder and the provisions of this Section 2(e) shall continue to apply. Any increase in the Beneficial Ownership Limitation will not be effective until the 61st day after such notice is delivered to the Company. The provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 2(e) to correct this paragraph (or any portion hereof) which may be defective or inconsistent with the intended Beneficial Ownership Limitation herein contained or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitations contained in this paragraph shall apply to a successor holder of this Warrant.

Section 3. Certain Adjustments.

a) Stock Dividends and Splits. If the Company, at any time while this Warrant is outstanding: (i) pays a stock dividend or otherwise makes a distribution or distributions on shares of its Common Stock or any other equity or equity equivalent securities payable in shares of Common Stock (which, for avoidance of doubt, shall not include any shares of Common Stock issued by the Company upon exercise of this Warrant), (ii) subdivides outstanding shares of Common Stock into a larger number of shares, (iii) combines (including by way of reverse stock split) outstanding shares of Common Stock into a smaller number of shares, or (iv) issues by reclassification of shares of the Common Stock any shares of capital stock of the Company, then in each case the Exercise Price shall be multiplied by a fraction of which the numerator shall be the number of shares of Common Stock (excluding treasury shares, if any) outstanding immediately before such event and of which the denominator shall be the number of shares of Common Stock outstanding immediately after such event, and the number of shares issuable upon exercise of this Warrant shall be proportionately adjusted such that the aggregate Exercise Price of this Warrant shall remain unchanged. Any adjustment made pursuant to this Section 3(a) shall become effective immediately after the record date for the determination of stockholders entitled to receive such dividend or distribution and shall become effective immediately after the effective date in the case of a subdivision, combination or reclassification.

b) [Reserved].

c) Subsequent Rights Offerings. In addition to any adjustments pursuant to Section 3(a) above, if at any time the Company grants, issues or sells any Common Stock Equivalents or rights to purchase stock, warrants, securities or other property pro rata to the record holders of any class of shares of Common Stock (the "Purchase Rights"), then the Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the Holder could have acquired if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the grant, issue or sale of such Purchase Rights (provided, however, that, to the extent that the Holder's right to participate in any such Purchase Right would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Purchase Right to such extent (or beneficial ownership of such shares of Common Stock as a result of such Purchase Right to such extent) and such Purchase Right to such extent shall be held in abeyance for the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation).

d) Pro Rata Distributions. During such time as this Warrant is outstanding, if the Company shall declare or make any dividend or other distribution of its assets (or rights to acquire its assets) to holders of shares of Common Stock, by way of return of capital or otherwise (including, without limitation, any distribution of cash, stock or other securities, property or options by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (a "Distribution"), at any time after the issuance of this Warrant, then, in each such case, the Holder shall be entitled to participate in such Distribution to the same extent that the Holder would have participated therein if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date of which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the participation in such Distribution (provided, however, that, to the extent that the Holder's right to participate in any such Distribution would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Distribution to such extent (or in the beneficial ownership of any shares of Common Stock as a result of such Distribution to such extent) and the portion of such Distribution shall be held in abeyance for the benefit of the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation).

e) Fundamental Transaction. If, at any time while this Warrant is outstanding, (i) the Company, directly or indirectly, in one or more related transactions effects any merger or consolidation of the Company with or into another Person, (ii) the Company or any Subsidiary, directly or indirectly, effects any sale, lease, license, assignment, transfer, conveyance or other disposition of all or substantially all of its assets in one or a series of related transactions, (iii) any, direct or indirect, purchase offer, tender offer or exchange offer (whether by the Company or another Person) is completed pursuant to which holders of Common Stock are permitted to sell, tender or exchange their shares for other securities, cash or property and has been accepted by the holders of 50% or more of the outstanding shares of Common Stock or 50% or more of the voting power of the common equity of the Company, (iv) the Company, directly or indirectly, in one or more related transactions effects any reclassification, reorganization or recapitalization of the Common Stock or any compulsory share exchange pursuant to which the Common Stock is effectively converted into or exchanged for other securities, cash or property, or (v) the Company, directly or indirectly, in one or more related transactions consummates a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off, merger or scheme of arrangement) with another Person or group of Persons whereby such other Person or group acquires 50% or more of the outstanding shares of Common Stock or 50% or more of the voting power of the common equity of the Company (each a "Fundamental Transaction"), then, upon any subsequent exercise of this Warrant, the Holder shall have the right to receive, for each Warrant Share that would have been issuable upon such exercise immediately prior to the occurrence of such Fundamental Transaction, at the option of the Holder (without regard to any limitation in Section 2(e) on the exercise of this Warrant), the number of shares of Common Stock of the successor or acquiring corporation or of the Company, if it is the surviving corporation, and any additional consideration (the "Alternate Consideration") receivable as a result of such Fundamental Transaction by a holder of the number of shares of Common Stock for which this Warrant is exercisable immediately prior to such Fundamental Transaction (without regard to any limitation in Section 2(e) on the exercise of this Warrant). For purposes of any such exercise, the determination of the Exercise Price shall be appropriately adjusted to apply to such Alternate Consideration based on the amount of Alternate Consideration issuable in respect of one share of Common Stock in such Fundamental Transaction, and the Company shall apportion the Exercise Price among the Alternate Consideration in a reasonable manner reflecting the relative value of any different components of the Alternate Consideration. If holders of Common Stock are given any choice as to the securities, cash or property to be received in a Fundamental Transaction, then the Holder shall be given the same choice as to the Alternate Consideration it receives upon any exercise of this Warrant following such Fundamental Transaction. Notwithstanding anything to the contrary, in the event of a Fundamental Transaction, the Company or any Successor Entity (as defined below) shall, at the Holder's option, exercisable at any time concurrently with, or within 30 days after, the consummation of the Fundamental Transaction (or, if later, the date of the public announcement of the applicable Fundamental Transaction), purchase this Warrant from the Holder by paying to the Holder an amount of cash equal to the Black Scholes Value of the remaining unexercised portion of this Warrant on the date of the consummation of such Fundamental Transaction. "Black Scholes Value" means the value of this Warrant based on the Black-Scholes Option Pricing Model obtained from the "OV" function on Bloomberg determined as of the day of consummation of the applicable contemplated Fundamental Transaction for pricing purposes and reflecting (A) a risk-free interest rate corresponding to the U.S. Treasury rate for a period equal to the time between the date of the public announcement of the applicable contemplated Fundamental Transaction and the Termination Date, (B) an expected volatility equal to the greater of 100% and the 100 day volatility obtained from the HVT function on Bloomberg (determined utilizing a 365 day annualization factor) as of the Trading Day immediately following the public announcement of the applicable contemplated Fundamental Transaction, (C) the underlying price per share used in such calculation shall be the greater of (i) the sum of the price per share being offered in cash, if any, plus the value of any non-cash consideration, if any, being offered in such Fundamental Transaction and (ii) the highest VWAP during the period beginning on the Trading Day immediately preceding the public announcement of the applicable contemplated Fundamental Transaction (or the consummation of the applicable Fundamental Transaction, if earlier) and ending on the Trading Day of the Holder's request pursuant to this Section 3(e) and (D) a remaining option time equal to the time between the date of the public announcement of the applicable contemplated Fundamental Transaction and the Termination Date and (E) a zero cost of borrow. The payment of the Black Scholes Value will be made by wire transfer of immediately available funds (or such other consideration) within the later of (i) five Business Days of the Holder's election and (ii) the date of consummation of the Fundamental Transaction. The Company shall cause any successor entity in a Fundamental Transaction in which the Company is not the survivor (the "Successor Entity") to assume in writing all of the obligations of the Company under this Warrant and the other Transaction Documents in accordance with the provisions of this Section 3(e) pursuant to written agreements in form and substance reasonably satisfactory to the Holder and approved by the Holder (without unreasonable delay) prior to such Fundamental Transaction and shall, at the option of the Holder, deliver to the Holder in exchange for this Warrant a security of the Successor Entity evidenced by a written instrument substantially similar in form and substance to this Warrant which is exercisable for a corresponding number of shares of capital stock of such Successor Entity (or its parent entity) equivalent to the shares of Common Stock acquirable and receivable upon exercise of this Warrant (without regard to any limitations on the exercise of this Warrant) prior to such Fundamental Transaction, and with an exercise price which applies the exercise price hereunder to such shares of capital stock (but taking into account the relative value of the shares of Common Stock pursuant to such Fundamental Transaction and the value of such shares of capital stock, such number of shares of capital stock and such exercise price being for the purpose of protecting the economic value of this Warrant immediately prior to the consummation of such Fundamental Transaction), and which is reasonably satisfactory in form and substance to the Holder. Upon the occurrence of any such Fundamental Transaction, the Successor Entity shall be added to the term "Company" under this Warrant (so that from and after the occurrence or consummation of such Fundamental Transaction, each and every provision of this Warrant and the other Transaction Documents referring to the "Company" shall refer instead to each of the Company and the Successor Entity or Successor Entities, jointly and severally), and the Successor Entity or Successor Entities, jointly and severally with the Company, may exercise every right and power of the Company prior thereto and the Successor Entity or Successor Entities shall assume all of the obligations of the Company prior thereto under this Warrant and the other Transaction Documents with the same effect as if the Company and such Successor Entity or Successor Entities, jointly and severally, had been named as the Company herein.

f) Calculations. All calculations under this Section 3 shall be made to the nearest cent or the nearest 1/100th of a share, as the case may be. For purposes of this Section 3, the number of shares of Common Stock deemed to be issued and outstanding as of a given date shall be the sum of the number of shares of Common Stock (excluding treasury shares, if any) issued and outstanding.

g) Notice to Holder.

i. Adjustment to Exercise Price. Whenever the Exercise Price is adjusted pursuant to any provision of this Section 3, the Company shall promptly deliver to the Holder by email a notice setting forth the Exercise Price after such adjustment and any resulting adjustment to the number of Warrant Shares and setting forth a brief statement of the facts requiring such adjustment.

ii. Notice to Allow Exercise by Holder. If (A) the Company shall declare a dividend (or any other distribution in whatever form) on the Common Stock, (B) the Company shall declare a special nonrecurring cash dividend on or a redemption of the Common Stock, (C) the Company shall authorize the granting to all holders of the Common Stock rights or warrants to subscribe for or purchase any shares of capital stock of any class or of any rights, (D) the approval of any stockholders of the Company shall be required in connection with any reclassification of the Common Stock, any consolidation or merger to which the Company (or any of its Subsidiaries) is a party, any sale or transfer of all or substantially all of its assets, or any compulsory share exchange whereby the Common Stock is converted into other securities, cash or property, or (E) the Company shall authorize the voluntary or involuntary dissolution, liquidation or winding up of the affairs of the Company, then, in each case, the Company shall cause to be delivered by email to the Holder at its last email address as it shall appear upon the Warrant Register of the Company, at least 20 calendar days prior to the applicable record or effective date hereinafter specified, a notice stating (x) the date on which a record is to be taken for the purpose of such dividend, distribution, redemption, rights or warrants, or if a record is not to be taken, the date as of which the holders of the Common Stock of record to be entitled to such dividend, distributions, redemption, rights or warrants are to be determined or (y) the date on which such reclassification, consolidation, merger, sale, transfer or share exchange is expected to become effective or close, and the date as of which it is expected that holders of the Common Stock of record shall be entitled to exchange their shares of the Common Stock for securities, cash or other property deliverable upon such reclassification, consolidation, merger, sale, transfer or share exchange; provided that the failure to deliver such notice or any defect therein or in the delivery thereof shall not affect the validity of the corporate action required to be specified in such notice. To the extent that any notice provided in this Warrant constitutes, or contains, material, non-public information regarding the Company or any of the Subsidiaries, the Company shall simultaneously file such notice with the Commission pursuant to a Current Report on Form 8-K. The Holder shall remain entitled to exercise this Warrant during the period commencing on the date of such notice to the effective date of the event triggering such notice except as may otherwise be expressly set forth herein.

Section 4. Transfer of Warrant.

a) Transferability. This Warrant and all rights hereunder (including, without limitation, any registration rights) are transferable, in whole or in part, upon surrender of this Warrant at the principal office of the Company or its designated agent, together with a written assignment of this Warrant substantially in the form attached hereto duly executed by the Holder or its agent or attorney and funds sufficient to pay any transfer taxes payable upon the making of such transfer. Upon such surrender and, if required, such payment, the Company shall execute and deliver a new Warrant or Warrants in the name of the assignee or assignees, as applicable, and in the denomination or denominations specified in such instrument of assignment, and shall issue to the assignor a new Warrant evidencing the portion of this Warrant not so assigned, and this Warrant shall promptly be cancelled. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender this Warrant to the Company unless the Holder has assigned this Warrant in full, in which case, the Holder shall surrender this Warrant to the Company within three (3) Trading Days of the date on which the Holder delivers an assignment form to the Company assigning this Warrant in full. The Warrant, if properly assigned in accordance herewith, may be exercised by a new holder for the purchase of Warrant Shares without having a new Warrant issued.

b) New Warrants. This Warrant may be divided or combined with other Warrants upon presentation hereof at the aforesaid office of the Company, together with a written notice specifying the names and denominations in which new Warrants are to be issued, signed by the Holder or its agent or attorney. Subject to compliance with Section 4(a), as to any transfer which may be involved in such division or combination, the Company shall execute and deliver a new Warrant or Warrants in exchange for the Warrant or Warrants to be divided or combined in accordance with such notice. All Warrants issued on transfers or exchanges shall be dated the initial issuance date of this Warrant and shall be identical with this Warrant except as to the number of Warrant Shares issuable pursuant thereto.

c) Warrant Register. The Company shall register this Warrant, upon records to be maintained by the Company for that purpose (the "Warrant Register"), in the name of the record Holder hereof from time to time. The Company may deem and treat the registered Holder of this Warrant as the absolute owner hereof for the purpose of any exercise hereof or any distribution to the Holder, and for all other purposes, absent actual notice to the contrary. Upon execution and delivery of this Warrant, as amended and restated, the original Warrant shall be cancelled, and such cancellation shall be reflected upon the Warrant Register. The parties acknowledge and agree, that the amendment and restatement of this Warrant is solely to conform the terms of this Warrant to the rules and regulations of the Nasdaq Global Market.

Section 5. Miscellaneous.

a) No Rights as Stockholder Until Exercise; No Settlement in Cash. This Warrant does not entitle the Holder to any voting rights, dividends or other rights as a stockholder of the Company prior to the exercise hereof as set forth in Section 2(d)(i), except as expressly set forth in Section 3. Without limiting any rights of a Holder to receive Warrant Shares on a "cashless exercise" pursuant to Section 2(c) or to receive cash payments pursuant to Section 2(d)(i) and Section 2(d)(iv) herein, in no event shall the Company be required to net cash settle an exercise of this Warrant.

b) Loss, Theft, Destruction or Mutilation of Warrant. The Company covenants that upon receipt by the Company of evidence reasonably satisfactory to it of the loss, theft, destruction or mutilation of this Warrant or any stock certificate relating to the Warrant Shares, and in case of loss, theft or destruction, of indemnity or security reasonably satisfactory to it (which, in the case of the Warrant, shall not include the posting of any bond), and upon surrender and cancellation of such Warrant or stock certificate, if mutilated, the Company will make and deliver a new Warrant or stock certificate of like tenor and dated as of such cancellation, in lieu of such Warrant or stock certificate.

c) Saturdays, Sundays, Holidays, etc. If the last or appointed day for the taking of any action or the expiration of any right required or granted herein shall not be a Business Day, then such action may be taken or such right may be exercised on the next succeeding Business Day.

d) Authorized Shares.

The Company covenants that, during the period the Warrant is outstanding, it will reserve from its authorized and unissued Common Stock a sufficient number of shares to provide for the issuance of the Warrant Shares upon the exercise of any purchase rights under this Warrant. The Company further covenants that its issuance of this Warrant shall constitute full authority to its officers who are charged with the duty of issuing the necessary Warrant Shares upon the exercise of the purchase rights under this Warrant. The Company will take all such reasonable action as may be necessary to assure that such Warrant Shares may be issued as provided herein without violation of any applicable law or regulation, or of any requirements of the Trading Market upon which the Common Stock may be listed. The Company covenants that all Warrant Shares which may be issued upon the exercise of the purchase rights represented by this Warrant will, upon exercise of the purchase rights represented by this Warrant and payment for such Warrant Shares in accordance herewith, be duly authorized, validly issued, fully paid and nonassessable and free from all taxes, liens and charges created by the Company in respect of the issue thereof (other than taxes in respect of any transfer occurring contemporaneously with such issue).

Except and to the extent as waived or consented to by the Holder, the Company shall not by any action, including, without limitation, amending its certificate of incorporation or through any reorganization, transfer of assets, consolidation, merger, dissolution, issue or sale of securities or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms of this Warrant, but will at all times in good faith assist in the carrying out of all such terms and in the taking of all such actions as may be necessary or appropriate to protect the rights of Holder as set forth in this Warrant against impairment. Without limiting the generality of the foregoing, the Company will (i) not increase the par value of any Warrant Shares above the amount payable therefor upon such exercise immediately prior to such increase in par value, (ii) take all such action as may be necessary or appropriate in order that the Company may validly and legally issue fully paid and nonassessable Warrant Shares upon the exercise of this Warrant and (iii) use commercially reasonable efforts to obtain all such authorizations, exemptions or consents from any public regulatory body having jurisdiction thereof, as may be, necessary to enable the Company to perform its obligations under this Warrant.

Before taking any action which would result in an adjustment in the number of Warrant Shares for which this Warrant is exercisable or in the Exercise Price, the Company shall obtain all such authorizations or exemptions thereof, or consents thereto, as may be necessary from any public regulatory body or bodies having jurisdiction thereof.

e) Governing Law. All questions concerning the construction, validity, enforcement and interpretation of this Warrant shall be governed by and construed and enforced in accordance with the internal laws of the State of New York, without regard to the principles of conflicts of law thereof. Each party agrees that all legal proceedings concerning the interpretations, enforcement and defense of the transactions contemplated by this Warrant (whether brought against a party hereto or their respective affiliates, directors, officers, stockholders, partners, members, employees or agents) shall be commenced exclusively in the state and federal courts sitting in the City of New York. Each party hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in the City of New York, Borough of Manhattan for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is improper or is an inconvenient venue for such proceeding. Each party hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof via registered or certified mail or overnight delivery (with evidence of delivery) to such party at the address in effect for notices to it under this Warrant and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any other manner permitted by law. If either party shall commence an action, suit or proceeding to enforce any provisions of this Warrant, the prevailing party in such action, suit or proceeding shall be reimbursed by the other party for their reasonable attorneys' fees and other costs and expenses incurred with the investigation, preparation and prosecution of such action or proceeding.

f) Restrictions. The Holder acknowledges that the Warrant Shares acquired upon the exercise of this Warrant, if not registered, and the Holder does not utilize cashless exercise, will have restrictions upon resale imposed by state and federal securities laws.

g) Nonwaiver and Expenses. No course of dealing or any delay or failure to exercise any right hereunder on the part of Holder shall operate as a waiver of such right or otherwise prejudice the Holder's rights, powers or remedies. Without limiting any other provision of this Warrant, if the Company willfully and knowingly fails to comply with any provision of this Warrant, which results in any material damages to the Holder, the Company shall pay to the Holder such amounts as shall be sufficient to cover any costs and expenses including, but not limited to, reasonable attorneys' fees, including those of appellate proceedings, incurred by the Holder in collecting any amounts due pursuant hereto or in otherwise enforcing any of its rights, powers or remedies hereunder.

h) Notices. Any and all notices or other communications or deliveries to be provided by the Holders hereunder including, without limitation, any Notice of Exercise, shall be in writing and delivered personally, by e-mail, or sent by a nationally recognized overnight courier service, addressed to the Company, at 25821 Industrial Boulevard, Suite 400, Hayward, CA 94545, Attention: Chief Financial Officer, or such other email address or address as the Company may specify for such purposes by notice to the Holders. Any and all notices or other communications or deliveries to be provided by the Company hereunder shall be in writing and delivered personally, by e-mail, or sent by a nationally recognized overnight courier service addressed to each Holder at the e-mail address or address of such Holder appearing on the books of the Company. Any notice or other communication or deliveries hereunder shall be deemed given and effective on the earliest of (i) the time of transmission, if such notice or communication is delivered via e-mail at the e-mail address set forth in this Section prior to 5:30 p.m. (New York City time) on any date, (ii) the next Trading Day after the time of transmission, if such notice or communication is delivered via e-mail at the e-mail address set forth in this Section on a day that is not a Trading Day or later than 5:30 p.m. (New York City time) on any Trading Day, (iii) the second Trading Day following the date of mailing, if sent by U.S. nationally recognized overnight courier service, or (iv) upon actual receipt by the party to whom such notice is required to be given. To the extent that any notice provided hereunder constitutes, or contains, material, non-public information regarding the Company or any Subsidiaries, the Company shall simultaneously file such notice with the Commission pursuant to a Current Report on Form 8-K.

i) Limitation of Liability. No provision hereof, in the absence of any affirmative action by the Holder to exercise this Warrant to purchase Warrant Shares, and no enumeration herein of the rights or privileges of the Holder, shall give rise to any liability of the Holder for the purchase price of any Common Stock or as a stockholder of the Company, whether such liability is asserted by the Company or by creditors of the Company.

j) Remedies. The Holder, in addition to being entitled to exercise all rights granted by law, including recovery of damages, will be entitled to specific performance of its rights under this Warrant. The Company agrees that monetary damages would not be adequate compensation for any loss incurred by reason of a breach by it of the provisions of this Warrant and hereby agrees to waive and not to assert the defense in any action for specific performance that a remedy at law would be adequate.

k) Successors and Assigns. Subject to applicable securities laws, this Warrant and the rights and obligations evidenced hereby shall inure to the benefit of and be binding upon the successors and permitted assigns of the Company and the successors and permitted assigns of Holder. The provisions of this Warrant are intended to be for the benefit of any Holder from time to time of this Warrant and shall be enforceable by the Holder or holder of Warrant Shares.

l) Amendment. This Warrant may be modified or amended or the provisions hereof waived with the written consent of the Company, on the one hand, and the Holder, on the other hand.

m) Severability. Wherever possible, each provision of this Warrant shall be interpreted in such manner as to be effective and valid under applicable law, rule or regulation (including those of the Nasdaq Global Market), but if any provision of this Warrant shall be prohibited by or invalid under applicable law, rule or regulation, such provision shall be ineffective to the extent of such prohibition or invalidity, without invalidating the remainder of such provisions or the remaining provisions of this Warrant and the Company shall use commercially reasonable efforts to take such actions so as to bring such provision into compliance with such law, rule or regulation.

n) Headings. The headings used in this Warrant are for the convenience of reference only and shall not, for any purpose, be deemed a part of this Warrant.

****

(Signature Page Follows)

IN WITNESS WHEREOF, the Company has caused this Warrant to be executed by its officer thereunto duly authorized as of the date first above indicated.

ACELRX PHARMACEUTICALS, INC.

By: /s/ Vincent J. Angotti
Name: Vincent J. Angotti
Title: Chief Executive Officer

Acknowledged and Agreed:

ARMISTICE CAPITAL MASTER FUND LTD.

By: /s/ Kenneth Seiler

Name: Kenneth Seiler

Title: Chief Compliance Officer & Counsel of Armistice Capital, LLC, its investment manager

[Signature Page to Amended and Restated Common Stock Purchase Agreement]

NOTICE OF EXERCISE

TO: ACELRX PHARMACEUTICALS, INC.

(1) The undersigned hereby elects to purchase _____ Warrant Shares of the Company pursuant to the terms of the attached Warrant (only if exercised in full), and tenders herewith payment of the exercise price in full, together with all applicable transfer taxes, if any.

(2) Payment shall take the form of (check applicable box):

[ ] in lawful money of the United States; or

[ ] if permitted the cancellation of such number of Warrant Shares as is necessary, in accordance with the formula set forth in subsection 2(c), to exercise this Warrant with respect to the maximum number of Warrant Shares purchasable pursuant to the cashless exercise procedure set forth in subsection 2(c).

(3) Please issue said Warrant Shares in the name of the undersigned or in such other name as is specified below:

_____

The Warrant Shares shall be delivered to the following DWAC Account Number:

_____

_____

_____

[SIGNATURE OF HOLDER]

Name of Investing Entity: _____
Signature of Authorized Signatory of Investing Entity: _____
Name of Authorized Signatory: _____
Title of Authorized Signatory: _____
Date: _____

ASSIGNMENT FORM

(To assign the foregoing Warrant, execute this form and supply required information. Do not use this form to purchase shares.)

FOR VALUE RECEIVED, the foregoing Warrant and all rights evidenced thereby are hereby assigned to

Name: _____
(Please Print)

Address: _____
(Please Print)

Phone Number: _____

Email Address: _____

Dated: _____ __, _____

Holder's Signature: _____

Holder's Address: _____

[*] = CERTAIN CONFIDENTIAL INFORMATION CONTAINED IN THIS DOCUMENT, MARKED BY BRACKETS, HAS BEEN OMITTED BECAUSE IT IS BOTH (I) NOT MATERIAL AND (II) IS OF THE TYPE THAT WOULD LIKELY CAUSE COMPETITIVE HARM IF PUBLICLY DISCLOSED.

Exhibit 10.20

Manufacturing Services Agreement for ARX-01

December 12, 2012

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MANUFACTURING SERVICES AGREEMENT

THIS MANUFACTURING SERVICES AGREEMENT (the "**Agreement**") is made as of December 12, 2012 (the "**Effective Date**")

B E T W E E N:

PATHEON PHARMACEUTICALS INC.,
a corporation existing under the laws of the State of Delaware
("**Patheon**"),

- and -

ACELRX PHARMACEUTICALS, INC.,
a corporation existing under the laws of the State of Delaware
("**Client**").

THIS AGREEMENT WITNESSES THAT in consideration of the rights conferred and the obligations assumed herein, and for other good and valuable consideration (the receipt and sufficiency of which are acknowledged by each party), and intending to be legally bound the parties agree as follows:

ARTICLE 1

INTERPRETATION

1.1 Definitions.

The following terms will, unless the context otherwise requires, have the respective meanings set out below and grammatical variations of these terms will have corresponding meanings:

"Active Materials", "**Active Pharmaceutical Ingredient**" or "**API**" means the material listed on Schedule D;

"Active Materials Credit Value" means the value of the Active Materials for certain purposes of this Agreement, as set forth on Schedule D;

"Actual Annual Yield" or "**AAY**" has the meaning specified in Section 2.2(a);

"Affiliate" means:

(a) a business entity which owns, directly or indirectly, a controlling interest in a party to this Agreement, by stock ownership or otherwise; or

(b) a business entity which is controlled by a party to this Agreement, either directly or indirectly, by stock ownership or otherwise; or

(c) a business entity, the controlling interest of which is directly or indirectly common to the majority ownership of a party to this Agreement;

For this definition, "control" means the ownership of shares carrying at least a majority of the votes for the election of the directors of a corporation.

"Annual Product Review Report" means the annual product review report prepared by Patheon as described in Title 21 of the United States Code of Federal Regulations, Section 211.180(e);

"Annual Report" means the annual report to the FDA prepared by Client regarding the Product as described in Title 21 of the United States Code of Federal Regulations, Section 314.81(b)(2);

"Annual Volume" means the estimated volume of Product to be manufactured in any Year of this Agreement as set forth in Schedule B;

"Applicable Laws" means all applicable Laws, including the Laws of State of Ohio, being the jurisdiction where the Manufacturing Site is located, cGMPs, the United States Federal Food, Drug and Cosmetic Act, as amended, and the Laws of all jurisdictions in the Territory;

"Application for Marketing Authorization" means, with respect to Product, (a) in the United States, a New Drug Application filed with the FDA pursuant to 21 U.S.C. Section 357 and 21 C.F.R. Section 314 ("**NDA**"), and (b) in any country other than the United States, an application or set of applications for marketing approval comparable to an NDA necessary to market and sell Product commercially in such country.

"Authority" means any governmental or regulatory authority, department, body or agency or any court, tribunal, bureau, commission or other similar body, whether federal, state, provincial, county or municipal;

"Bill Back Items" means the expenses for all third party supplier fees for the purchase or use of columns, standards, tooling, pallets, PAPR or PPE suits (where applicable), RFID tags and supporting equipment, and other project specific items necessary for Patheon to perform the Manufacturing Services, and which are not included as Components;

"Breach Notice" will have the meaning specified in Section 8.2(a);

"Business Day" means a day other than a Saturday, Sunday or a day that is a statutory holiday in the States of Ohio or California;

"Bulk Tablet Packaging" means, as the context requires, either the packaging activities related to bulk sufentanil tablets or the packaging components which hold bulk sufentanil tablets following manufacture.

"cGMPs" means current good manufacturing practices as described in Parts 210 and 211 of Title 21 of the United States' Code of Federal Regulations together with the latest FDA guidance documents pertaining to manufacturing and quality control practice, all as updated, amended and revised from time to time;

"Capital Agreement" means the Amended and Restated Capital Expenditure and Equipment Agreement entered into by the parties effective December 12, 2012 and attached here to as Schedule K;

"Client Intellectual Property" means Intellectual Property made, invented, generated or derived by Client before entering into this Agreement, or by Patheon while performing any Manufacturing Services or otherwise generated or derived by Patheon in its business which Intellectual Property is specific to, or dependent upon, Client's Active Materials or Product, including Product Intellectual Property;

"Client Property" will have the meaning specified in Section 8.4(f);

"Client-Supplied Components" means those Components to be supplied by Client or that have been supplied by Client;

"CMC" has the meaning specified in Section 7.8(c);

"Commercially Reasonable Efforts" means, with respect to the activities conducted pursuant to this Agreement, the carrying out of obligations or tasks in a sustained manner consistent with the commercially reasonable efforts used by a reputable pharmaceutical contract manufacturing organization for drug substances of similar nature, complexity, and developmental stage. Commercially Reasonable Efforts requires that Patheon: (a) promptly assign responsibility for such obligations to specific employee(s) who are held accountable for progress and monitor such progress on an on-going basis, (b) set and consistently seek to achieve specific and meaningful objectives for carrying out such obligations, and (c) consistently makes and implements decisions and allocates resources designed to advance progress with respect to such objectives.

"Components" means, collectively, all packaging components, raw materials, and ingredients (including labels, product inserts and other labelling for the Product) but excluding pallets, required to manufacture the Product in accordance with the Specifications, other than the Active Materials;

"Confidentiality Agreement" means the agreement about the non-disclosure of confidential information between Patheon and Client dated December 22, 2010;

"Confidential Information" means all confidential or proprietary information of a party that is disclosed to the other party under this Agreement, including, without limitation, research, development, manufacturing, marketing, financial, personnel, and other business and technical information, compositions, inventions, discoveries, processes, methods, formulae, procedures, protocols, techniques, data, specifications, and plans, whether disclosed in oral, written, graphic, or other electronic form. In addition, all confidential information disclosed by a party under the Confidentiality Agreement will be such party's Confidential Information for purposes of this Agreement. Notwithstanding the foregoing, all information and data that are developed or generated by or on behalf of Patheon as a result of performing the Manufacturing Services hereunder and that relate to Product including, without limitation, master production and control records, batch production and control records, Client Intellectual Property, Inventions, quality control tests and results thereof, in each case will be deemed to be Client Confidential Information and Patheon will be deemed to be the Receiving Party of such Confidential Information, regardless of whether Patheon generated and/or disclosed such information, data, Inventions, or other documents to Client.

"Dedicated Equipment" will have the meaning ascribed to it in the Capital Agreement related to this MSA;

"Deficiency" has the meaning specified in Section 7.8(d);

"Deficiency Notice" has the meaning specified in Section 6.1(a);

"Delivery Date" means the date scheduled for shipment of Product under a Firm Order as set forth in Section 5.1(e);

"Development Agreement" has the meaning specified in Section 13.11;

"FDA" means the United States Food and Drug Administration;

"Finished Product Packaging" means, as the context requires, either (a) drug product in the primary packaging comprised of sufentanil drug tablets in a cartridge inside of an aluminum based pouch with an oxygen scavenger, and secondary packaging which is to be determined, or (b) the packaging activities related to such drug product in its primary and secondary packaging.

"Firm Order" has the meaning specified in Section 5.1(c);

"First Firm Order" has the meaning specified in Section 5.1(b);

"Force Majeure Event" has the meaning specified in Section 13.7;

"Initial Manufacturing Month" has the meaning specified in Section 5.1(b);

"Initial Manufacturing Period" has the meaning specified in Section 5.1(b);

"Initial Term" has the meaning specified in Section 8.1;

"Intellectual Property" includes, without limitation, rights in patents, patent applications, formulae, trade-marks, trade-mark applications, trade-names, Inventions, copyrights, industrial designs, trade secrets, and know-how;

"Invention" means any innovation, improvement, development, discovery, computer program, device, trade secret, method, know-how, process, technique or the like, whether or not written or otherwise fixed in any form or medium, regardless of the media on which it is contained and whether or not patentable or copyrightable;

"Inventory" means all inventories of Components and work-in-process produced or held by Patheon for the manufacture of the Products but, for greater certainty, does not include the Active Materials;

"Late Delivery" has the meaning specified in Section 5.5(b);

"Laws" means all laws, statutes, ordinances, regulations, rules, by-laws, judgments, decrees or orders of any Authority;

"Manufacturing Requirements" means performing the Manufacturing Services in conformance with the Specifications, cGMPs, the Quality Agreement, the Capital Agreement and Applicable Laws;

"Manufacturing Services" means the manufacturing, quality control, quality assurance, stability testing, Bulk Tablet Packaging and Finished Product Packaging (if applicable) and related services, set forth in this Agreement, required to manufacture Product from Active Materials and Components;

"Manufacturing Site" means the facility owned and operated by Patheon that is located at 2110 East Galbraith Road, Cincinnati, OH 45237-1625;

"Materials" means all Components, Bill Back Items, and other materials used to manufacture the Product other than Active Materials;

"Maximum Credit Value" means the maximum value of Active Materials that may be credited by Patheon under this Agreement, as set forth on Schedule D;

"Minimum Run Quantity" means the minimum number of batches of a Product to be produced during the same cycle of manufacturing as set forth in Schedule B, with preferably three lots per manufacturing cycle and no more than five lots per manufacturing cycle;

"Patheon Competitor" means a company that is in the primary business of providing contract pharmaceutical development services or commercial manufacturing services to the pharmaceutical industry in exchange for compensation.

"Patheon Intellectual Property" means Intellectual Property generated or derived by Patheon before performing any Manufacturing Services, Intellectual Property developed by Patheon while performing the Manufacturing Services, or otherwise generated or derived by Patheon in its business, in each case which Intellectual Property is not specific to, or dependent upon, Client's Active Materials or Products including, without limitation, Inventions and Intellectual Property which may apply to manufacturing processes or the formulation or development of drug Product, drug product dosage forms or drug delivery systems unrelated to the specific requirements of the Product(s);

"Price" means the price measured in US Dollars to be charged by Patheon for performing the Manufacturing Services, and includes the cost of Components, certain cost items as set forth in Schedule B, and annual stability testing costs as set forth in Schedule C;

"Product(s)" means the product(s) listed on Schedule A;

"Product Intellectual Property" has the meaning specified in Section 13.1(b);

"Quality Agreement" means the agreement (the form of which is set forth in Schedule F) between the parties setting out the quality assurance standards for the Manufacturing Services to be performed by Patheon for Client;

"Recall" has the meaning specified in Section 6.2(a);

"Regulatory Authority" means the FDA and any other foreign regulatory agencies competent to grant marketing approvals for pharmaceutical products, including the Product, in the Territory;

"RFID" means Radio Frequency Identification Devices which (at present or in the future) may be affixed to Product or Materials to assist in inventory control, tracking, and identification;

"Remediation Period" has the meaning specified in Section 8.2(a);

"Shortfall" has the meaning specified in Section 2.2(b);

"Specifications" means the file for the Product, which is given by Client to Patheon in accordance with the procedures listed in Schedule A and which contains documents relating to the Product, including, without limitation:

(a) specifications for Active Materials and Components;

(b) manufacturing specifications, directions, and processes;

(c) storage requirements;

(d) all known environmental, health and safety information for Products including material safety data sheets; and

(e) the finished Product specifications, Bulk Tablet Packaging specifications, and shipping requirements for each Product;

all as updated, amended and revised from time to time by Client in accordance with the terms of this Agreement;

"Target Yield" has the meaning specified in Section 2.2(a);

"Target Yield Determination Batches" has the meaning specified in Section 2.2(a);

"Technical Dispute" has the meaning specified in Section 12.2;

"Territory" means the geographic area of the United States of America, Canada and Mexico, and their respective territories, and any other geographic areas that may be added to the Territory upon agreement by the parties in accordance with Section 4.5;

"Third Party Rights" means the Intellectual Property of any third party;

"Year" means in the first year of this Agreement the period from the Effective Date up to and including December 121 of the same calendar year, and thereafter will mean a calendar year.

1.2 Currency.

Unless otherwise indicated, all monetary amounts are expressed in this Agreement in the lawful currency of the United States of America.

1.3 Sections and Headings.

The division of this Agreement into Articles, Sections, Subsections, and Schedules and the insertion of headings are for convenience of reference only and will not affect the interpretation of this Agreement. Unless otherwise indicated, any reference in this Agreement to a Section or Schedule refers to the specified Section or Schedule to this Agreement. In this Agreement, the terms "**this Agreement**", "**hereof**", "**herein**", "**hereunder**" and similar expressions refer to this Agreement and not to any particular part, Section or Schedule of this Agreement.

1.4 Singular Terms.

Except as otherwise expressly stated or unless the context otherwise requires, all references to the singular will include the plural and vice versa.

1.5 Schedules.

The following Schedules are attached to, incorporated in, and form part of this Agreement:

Schedule A	-	Product List and Specifications
Schedule B	-	Minimum Run Quantity, Annual Volume, and Price
Schedule C	-	Annual Stability Testing
Schedule D	-	Active Materials, Active Materials Credit Value, and Maximum Credit Value
Schedule E	-	Technical Dispute Resolution
Schedule F	-	Commercial Quality Agreement
Schedule G	-	(Reserved)
Schedule H	-	Quarterly Active Materials Inventory Report
Schedule I	-	Report of Annual Active Materials Inventory Reconciliation and Calculation of Actual Annual Yield
Schedule J	-	(Reserved)
Schedule K	-	Capital Agreement

ARTICLE 2

PATHEON'S MANUFACTURING SERVICES

2.1 Manufacturing Services.

Patheon will perform the Manufacturing Services and supply to Client Product intended for marketing and sale in the Territory for the fees specified in Schedules B and C. The parties acknowledge that they intend to negotiate an amendment to this Agreement to add ARX-01 in Finished Product Packaging as a Product. If the parties enter into this amendment, Client will still have the right to purchase Product in Bulk Tablet Packaging from Patheon and have a third party package the Product into Finished Product Packaging for distribution or sale outside of the Territory. Schedule B sets forth a list of cost items that are included in the Price for Product; all cost items required for the manufacture of Product that are not included in this list are excluded from the Price and are subject to reasonable additional fees to be paid by the Client. All Manufacturing Services will be performed by Patheon at the Manufacturing Site. Patheon may change the Manufacturing Site for the Product only with the prior written consent of Client, this consent not to be unreasonably withheld. During the period commencing on the Effective Date up through the Initial Term, Patheon will supply 100% of the Client's requirements for Product offered for sale by Client in the Territory so long as Patheon is in material compliance with its obligations to Client under this Agreement. But if (a) Patheon fails to meet its supply obligations to Client for three consecutive Firm Orders, (b) in any consecutive six month period, 30% or more of the aggregate quantities of Product to be delivered by Patheon pursuant to Firm Orders during such six month period are not delivered by the due dates specified in the applicable Firm Orders, or (c) Patheon does not fulfill a Firm Order within 90 days after the Delivery Date specified therein then, in each case, Client may obtain up to 20% of its requirements for Product offered for sale in the Territory from an alternate supplier, regardless of whether any such occurrence is attributable to a Force Majeure Event. After the Initial Term, Client will only be required to obtain 80% of its requirements for Product offered for sale in the Territory from Patheon.

In performing the Manufacturing Services, Patheon and Client agree that:

(a) Conversion of Active Materials and Components. Patheon will convert Active Materials and Components into Product in Bulk Tablet Packaging.

(b) Quality Control and Quality Assurance. Patheon will perform the quality control and quality assurance testing specified in the Quality Agreement. Batch review and release to Client will be the responsibility of Patheon's quality assurance group. Patheon will perform its batch review and release responsibilities in accordance with Patheon's standard operating procedures and in compliance with all Applicable Laws. Each time Patheon ships Product to Client, it will give Client a certificate of analysis and certificate of compliance that includes a statement that the Product in such shipment have been manufactured and tested in accordance with Specifications and cGMPs and conform to the Specifications, and sets out the quality control and quality assurance test results for such Product. Client will have sole responsibility for the release of Product to the market. The form and style of batch documents, including, but not limited to, batch production records, lot packaging records, equipment set up control, operating parameters, and data printouts, raw material data, and laboratory notebooks are the exclusive property of Patheon. Specific Product related information contained in those batch documents is Client's property and Client's Confidential Information.

(c) Components. Patheon will purchase and test all Components (with the exception of Client-Supplied Components) at Patheon's expense and as required by the Specifications.

(d) Stability Testing. Patheon will conduct stability testing on the Product in accordance with the protocols set out in the Specifications for the separate fees and during the time periods set out in Schedule C, subject to mutual written agreement of Patheon and Client. Patheon will not make any changes to these testing protocols without prior written approval from Client. If a confirmed stability test failure occurs, Patheon will notify Client within one Business Day, after which Patheon and Client will jointly determine the proceedings and methods to be undertaken to investigate the cause of the failure, including which party will bear the cost of the investigation. Patheon will not be liable for these costs unless it has failed to perform the Manufacturing Services in accordance with the Manufacturing Requirements. Patheon will give Client all stability test data and results at Client's request.

(e) Packaging. Patheon will complete Bulk Tablet Packaging as set out in the Specifications. Client will be responsible for the cost of artwork development. Patheon will determine and imprint the batch numbers and expiration dates for each Product shipped. The batch numbers and expiration dates will be affixed on the Product and on the shipping carton of Product as outlined in the Specifications and as required by cGMPs. Client may, in its sole discretion, make changes to labels, product inserts, and other packaging for the Product. Those changes will be submitted by Client to all applicable governmental agencies and other third parties responsible for the approval of the Product. Client will be responsible for the cost of labelling obsolescence when changes occur, as contemplated in Section 4.4. Patheon's name will not appear on the label or anywhere else on the Product unless: (i) required by any Laws; or (ii) Patheon consents in writing to the use of its name.

(f) Active Materials and Client Supplied Components Importing. At least 45 days before the scheduled production date, Client will deliver that quantity of Active Materials to the Manufacturing Site DDP (Incoterms 2010) sufficient for Patheon to manufacture the desired quantities of Product and to ship Product on the Delivery Date. If these Active Materials are not received 45 days before the scheduled production date, Patheon may delay the shipment of Product by the same number of days as the delay in receipt of the Active Materials. But if Patheon is unable to manufacture Product to meet this new shipment date due to prior third party production commitments, Patheon may delay the shipment until a later date as reasonably agreed to by the parties. All shipments of Active Materials will be accompanied by certificate(s) of analysis from the Active Materials manufacturer and the Client, confirming the identity and purity of the Active Materials and its compliance with the Active Materials specifications.

(g) Patheon Supplied Components Importing. At least 15 days before the scheduled production date, Patheon will have all Components at the Manufacturing Site and will be prepared to manufacture the desired quantities of Product and to ship Product on the Delivery Date. If all Components are not ready for production at least 15 days before the scheduled production date, Patheon will provide written notification of the delay to Client and will use Commercially Reasonable Efforts to obtain such Components as soon as practicable.

(h) Bill Back Items. Bill Back Items will be charged to Client at Patheon's cost plus a 10% handling fee.

(i) Product Rejection for Finished Product Specification Failure. If Patheon manufactures Product in accordance with the agreed upon Specifications and the Manufacturing Requirements and a batch or portion of a batch of Product does not meet the Specifications for Bulk Tablet Packaging, Client will pay Patheon the applicable Price per unit for the non-conforming Product. The API in the non-conforming Product will be included in the "**Quantity Converted**" for purposes of calculating the "**Actual Annual Yield**" under Section 2.2(a).

2.2 Active Materials Yield.

(a) Reporting. Patheon will give Client a quarterly inventory report of the Active Materials held by Patheon using the inventory report form set out in Schedule H, which will contain the following information for the quarter:

Quantity Received: The total quantity of Active Materials that complies with the Specifications and is received at the Manufacturing Site during the applicable period.

Quantity Dispensed: The total quantity of Active Materials dispensed at the Manufacturing Site during the applicable period. The Quantity Dispensed is calculated by adding the Quantity Received to the inventory of Active Materials that complies with the Specifications held at the beginning of the applicable period, less the inventory of Active Materials that complies with the Specifications held at the end of the period. The Quantity Dispensed will only include Active Materials received for commercial manufacturing of Product and, for certainty, will not include any (i) Active Materials that must be retained by Patheon as samples, (ii) Active Materials contained in Product that must be retained as samples, (iii) Active Materials used in testing (if applicable), and (iv) Active Materials received or dispensed in technical transfer activities or development activities during the applicable period, including without limitation, any regulatory, stability or test batches manufactured during the applicable period. For clarity, Quantity Dispensed includes all amounts of Active Materials that are lost, stolen, damaged, destroyed, or rendered unusable because of a failure to handle the Active Materials in accordance with cGMPs or other Applicable Laws, as well as Active Materials that are consumed in batches that are not released to Client because they do not comply with the Specifications.

Quantity Converted: The total amount of Active Materials contained in the Products manufactured with the Quantity Dispensed (including any additional Products produced in accordance with Section 6.1 or 6.2), delivered by Patheon, and not rejected, recalled or returned in accordance with Section 6.1 or 6.2 because of Patheon's failure to perform the Manufacturing Services in accordance with Specifications, cGMPs, and Applicable Laws.

Within 60 days after the end of each Year, Patheon will prepare an annual reconciliation of Active Materials on the reconciliation report form set forth in Schedule I including the calculation of the "**Actual Annual Yield**" or "**AAY**" for the Products at the Manufacturing Site during the Year. AAY is the percentage of the Quantity Dispensed that was converted to Product and is calculated as follows:

$$\frac{\text{Quantity Converted during the Year}}{\text{Quantity Dispensed during the Year}} \times 100\%$$

Once the parties mutually agree that Patheon has produced three successful commercial production batches (including validation batches and samples) of Products at the Manufacturing Site (collectively, the "**Target Yield Determination Batches**"), the Parties will mutually agree on the target yield for the Products at the Manufacturing Site (each, a "**Target Yield**"). The Target Yield will be revised annually to reflect the actual manufacturing experience as reasonably agreed to by the parties. For clarity, the initial Target Yield, once established, will be applied retroactively for the purposes of determining the Actual Annual Yield for the first Year of the Agreement.

For [*] scale: If the Target Yield is not greater than or equal to [*], the Parties mutually agree to re-evaluate the production process.

For [*] scale: If the Target Yield is not greater than or equal to [*], the Parties mutually agree to re-evaluate the production process.

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

If during any calendar quarter more than 1 gram of Active Materials is lost, stolen, damaged, destroyed, or rendered unusable because of Patheon's failure to comply with cGMPs or other Applicable Laws, Patheon will report the occurrence to Client in writing within ten days of its discovery thereof.

(b) Shortfall Calculation. If the Actual Annual Yield falls more than 3.5% below the respective Target Yield in a Year, then the shortfall for the Year (the "**Shortfall**") will be calculated as follows:

Shortfall = [(Target Yield – 3.5%) – AAY] * Active Materials Credit Value * Quantity Dispensed

(c) Credit for Shortfall. If there is a Shortfall in a Year, then Patheon will credit Client's account for the amount of the Shortfall not later than 60 days after the end of the Year.

Each credit under this Section 2.2(c) will be summarized on the reconciliation report form set forth in Schedule I. Not later than 45 days after the expiration or termination of this Agreement, any remaining credit owing under this Section 2.2(c) will be paid to Client. The Shortfall for each Year, if any, will be disclosed by Patheon on the reconciliation report form.

(d) Maximum Credit. Patheon's liability for Active Materials calculated in accordance with this Section 2.2 in a Year will not exceed, in the aggregate, the Maximum Credit Value set forth in Schedule D.

(e) Material Breach. Patheon agrees to use Commercially Reasonable Efforts to deliver 100% of all quantities of Products specified in each Firm Order that meet the Manufacturing Requirements, at the times and on the Delivery Dates specified. If Patheon uses Commercially Reasonable Efforts but fails to deliver the quantity of Product ordered in a Firm Order, it will not be a material breach of this Agreement if:

(i) No more than three batches of Product delivered by Patheon under the applicable Firm Order fail to contain at least 90% of the Target Yield set forth in Section 2.2(a); or

(ii) No batches of Products are delivered more than 90 days after the Delivery Date specified in the applicable Firm Order.

For clarity, if one or both of the situations set forth in clauses (i) or (ii) occur, Patheon will be in material breach of this Agreement. In addition, rejection of five or more shipments of Product in any one Year due to Patheon's failure to perform the Manufacturing Services in accordance with the Manufacturing Requirements will be a material breach of this Agreement.

Patheon will also comply with all of the terms and conditions of the Quality Agreement.

ARTICLE 3

CLIENT'S OBLIGATIONS

3.1 Payment.

Client will pay Patheon for performing the Manufacturing Services according to the Prices specified in Schedules B and C. These prices may be subject to adjustment under other parts of this Agreement. Client will also pay Patheon for any Bill Back Items.

3.2 Active Materials and Client-Supplied Components.

Client will at its sole cost and expense, use commercially reasonable efforts to deliver those quantities of Active Materials and Client-Supplied Components to Patheon (in accordance with Section 2.1(f)) sufficient for Patheon to manufacture the desired quantities of Products and to ship Products on the Delivery Date. If applicable, Patheon and the Client will reasonably cooperate to permit the import of the Active Materials into the United States. Client's obligation will include obtaining the proper release of the Active Materials from U.S. Customs and the FDA. Client or Client's designated broker will be the "**Importer of Record**" for Active Materials imported into the United States. The Active Materials and Client-Supplied Components will be held by Patheon on behalf of Client as set forth in this Agreement. Title to the Active Materials and Client-Supplied Components will at all times remain the property of Client. Any Active Materials and Client-Supplied Components received by Patheon will only be used by Patheon to perform the Manufacturing Services and will not be transferred to any third parties without Client's prior written consent. Patheon will store and handle Active Materials in accordance with cGMPs and requirements applicable to a DEA Schedule II controlled substance. Patheon will store and handle Client-Supplied Components in accordance with Applicable Laws. If any of the Client-Supplied Components are lost, damaged, stolen, destroyed, or otherwise rendered unusable for their intended purpose because they were not stored or handled in accordance with the storage conditions specified by Client in writing and in accordance with Applicable Laws while in Patheon's custody or control, Patheon will promptly pay to Client the actual replacement cost for these Client-Supplied Components.

ARTICLE 4

CONVERSION FEES AND COMPONENT COSTS

4.1 First Year Pricing.

The tiered Price and annual stability Price for the Product for the first Year are listed in Schedules B and C and are subject to the adjustments set forth in Sections 4.2 and 4.3.

4.2 Price Adjustments – Subsequent Years' Pricing.

After the first Year of the Agreement, Patheon may, upon at least 60 days' written notice to Client, adjust the Price effective January 1st of each Year as follows:

(a) Manufacturing and Stability Testing Costs. Patheon may adjust the Price for inflation, based upon the preliminary number for any increase in the Producer Price Index pcu325412325412 for Pharmaceutical Preparation Manufacturing ("**PPI**") published by the United States Department of Labor, Bureau of Labor Statistics in August of the preceding Year compared to the final number for the same month of the Year prior to that, unless the parties otherwise agree in writing. On or about November 1st of each Year, Patheon will give Client a statement setting forth the calculation for the inflation adjustment to be applied in calculating the Price for the next Year.

(b) Component Costs. If Patheon incurs an increase in Component costs during the Year, it may increase the Price for the next Year to pass through the additional Component costs. On or about November 1st of each Year, Patheon will give Client information about the increase in Component costs which will be applied to the calculation of the Price for the next Year to reasonably demonstrate that the Price increase is justified. But Patheon will not be required to give information to Client that is subject to obligations of confidentiality between Patheon and its suppliers.

(c) Pricing Basis. Client acknowledges that the Price in any Year is quoted based upon the Minimum Run Quantity and the Annual Volume specified in Schedule B for Phase 1 ([*]) equipment, and Phase 2 ([*]) equipment, respectively, together with price adjustments for manufacturing and the combination of Phase 1 and Phase 2 equipment, respectively. The Price is subject to change if the specified Minimum Run Quantity changes or if the Annual Volume is not ordered in a Year. For greater certainty, if Patheon and Client agree that the Minimum Run Quantity will be reduced or the Annual Volume will not be ordered in a Year, whether as a result of a decrease in estimated Annual Volume or otherwise, and, as a result of the reduction, Patheon demonstrates to Client that its costs to perform the Manufacturing Services or to acquire the Materials for the Product will increase on a per unit basis (including the amount of the increase), then Patheon may increase the Price by an amount that reflects Patheon's documented increased costs. On or about November 1st of each Year, Patheon will give Client a statement setting forth the information to be applied in calculating those cost increases for the next Year. But Patheon will not be required to give information to Client that is subject to obligations of confidentiality between Patheon and its suppliers.

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

(d) Tier Pricing. The pricing in Schedule B is set forth in Annual Volume tiers based upon the Client's volume forecasts under Section 5.1. The Client will be invoiced during the Year for the unit price set forth in the Annual Volume tier based on the 18 month forecast provided in September of the previous Year. Within 30 days of the end of each Year or of the termination of the Agreement, Patheon will send Client a reconciliation of the actual volume of Product ordered by the Client during the Year with the pricing tiers. If Client has overpaid during the Year, Patheon will issue a credit to the Client for the amount of the overpayment within 45 days of the end of the Year or, if the Agreement is terminated before the full amount of such credit is applied against amounts due by Client hereunder, Patheon will issue payment to the Client for the overpayment within 45 days of the termination of the Agreement. If Client has underpaid during the Year, Patheon will issue an invoice to the Client under Section 5.6 for the amount of the underpayment within 45 days of the end of the Year or termination of the Agreement. If Client disagrees with the reconciliation, the parties will work in good faith to resolve the disagreement amicably. If the parties are unable to resolve the disagreement within 30 days, the matter will be handled under Section 12.1.

For all Price adjustments under this Section 4.2, Patheon will deliver to Client on or about November 1st of each Year a revised Schedule B to be effective for Product delivered on or after the first day of the next Year.

4.3 Price Adjustments – Current Year Pricing.

During any Year of this Agreement, the Price set out in Schedule B will be adjusted as follows:

Extraordinary Increases in Component Costs. If, at any time, market conditions result in Patheon's cost of Components being materially greater than normal forecasted increases, then Patheon will be entitled to an adjustment to the Price for any affected Product to compensate it for the increased Component costs. Changes materially greater than normal forecasted increases will have occurred if: (i) the cost of a Component increases by 10% of the cost for that Component upon which the most recent fee quote was based; or (ii) the aggregate cost for all Components required to manufacture a Product increases by 5% of the total Component costs for the Product upon which the most recent fee quote was based. If Component costs have been previously adjusted to reflect an increase in the cost of one or more Components, the adjustments set out in (i) and (ii) above will operate based on the last cost adjustment for the Components.

For a Price adjustment under this Section 4.3, Patheon will deliver to Client a revised Schedule B and budgetary pricing information, adjusted Component costs or other documents reasonably sufficient to demonstrate that a Price adjustment is justified. Patheon will have no obligation to deliver any supporting documents that are subject to obligations of confidentiality between Patheon and its suppliers. The revised Price will be effective for any Product delivered on or after the first day of the month following Client's receipt of the revised Schedule B.

4.4 Adjustments Due to Technical Changes.

Amendments to the Specifications or the Quality Agreement requested by Client will only be implemented following a technical and cost review by Patheon and are subject to Client and Patheon reaching agreement on Price changes required because of the amendment through good faith negotiations. Amendments to the Specifications required by the FDA or any other Regulatory Authority will be implemented by Patheon, and the parties will subsequently negotiate any change in the Price that is required because of such amendments. Amendments to the Specifications, the Quality Agreement, or the Manufacturing Site requested by Patheon will only be implemented following the written approval of Client, the approval not to be unreasonably withheld. If Client accepts a proposed Price change relating to a proposed Specifications change, the proposed change in the Specifications will be implemented, and the Price change will become effective, only for those orders of Product that are manufactured under the revised Specifications. In addition, Client agrees to purchase, at Patheon's cost (including all reasonable costs incurred by Patheon for the purchase and handling of the Inventory), all Inventory used under the "**old**" Specifications and purchased or maintained by Patheon in order to fill Firm Orders or under Section 5.2, if the Inventory can no longer be used under the revised Specifications. Open purchase orders for Components no longer required under any revised Specifications that were placed by Patheon with suppliers in order to fill Firm Orders or under Section 5.2 will be cancelled where possible, and if the orders may not be cancelled without penalty, will be assigned to and satisfied by Client.

4.5 Multi-Country Packaging Requirements (if applicable).

If Client decides to have Patheon perform Manufacturing Services for the Product for countries outside the Territory, then Client will inform Patheon of the packaging requirements for each new country and Patheon will prepare a quotation for consideration by Client of any additional Component costs and the change over fees for the Product destined for each new country. The agreed additional packaging requirements and related packaging costs and change over fees will be set out in a written amendment to this Agreement.

ARTICLE 5

ORDERS, SHIPMENT, INVOICING, PAYMENT

5.1 Orders and Forecasts.

(a) Rolling 18 Month Forecast. When this Agreement is executed, Client will give Patheon a non-binding 18 month forecast of the volume of Product that Client expects to order in the first 18 months of commercial manufacture of the Product. This forecast will then be updated by Client: (i) every 6 months until an Application for Marketing Authorization for the Product is filed with the FDA; (ii) quarterly following Application for Marketing Authorization filing, and prior to the start of commercial manufacturing; and (iii) monthly after the start of commercial manufacturing, on or before the 10th day of the relevant month on a rolling forward basis. Client will update the forecast forthwith if it determines that the volumes estimated in the most recent forecast have changed by more than 20%. The most recent 18 month forecast will prevail.

(b) Firm Orders for Initial Manufacturing Month. At least three months before the start of commercial manufacture of the Product, Client will update the rolling forecast for the first three months of manufacture of the Product (the "**Initial Manufacturing Period**"). The first month of this updated forecast ("**Initial Manufacturing Month**") will constitute a firm written order in the form of a purchase order or otherwise ("**First Firm Order**") by Client to purchase and, when accepted by Patheon, for Patheon to manufacture the quantity of the Product set forth in the Firm Order. If manufacturing has not started, Client may cancel any batches from the First Firm Order at no cost if notice of cancellation is received by Patheon 60 days or more before the scheduled Delivery Date under the First Firm Order. If manufacturing has not started, Client may cancel any batches from the First Firm Order if notice of cancellation is received by Patheon more than 30 days but fewer than 60 days before the scheduled Delivery Date under the First Firm Order, but Client will pay Patheon $[*] for each cancelled batch. The parties agree that this payment will be considered liquidated damages for Patheon's loss of manufacturing capacity due to the Client's cancellation of manufacturing and will not be considered a penalty. If the First Firm Order is changed or adjusted as described above then the initial rolling 18 month forecast will also be adjusted as necessary.

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

(c) Firm Orders Thereafter. Before and during the Initial Manufacturing Period, and thereafter on a rolling basis during the term of this Agreement, Client will issue an updated 18 month forecast on or before the 10th day of each month. The first four months of each updated forecast will constitute firm orders by Client to purchase and for Patheon to manufacture and supply the quantity of the Product set forth in such portion of the updated forecast. Concurrent with the 18 month forecast, Client will issue a firm written order in the form of a purchase order or otherwise ("**Firm Order**") by Client to purchase and, when accepted by Patheon, for Patheon to manufacture and deliver the agreed quantity of the Product on a date not less than three months from the first day of the month immediately following the date that the Firm Order is submitted. Firm Orders submitted to Patheon will specify Client's Manufacturing Services purchase order number, quantities by Product type, monthly delivery schedule, and any other elements necessary to ensure the timely manufacture and shipment of the Product. The quantities of Product ordered in those written orders will be firm and binding on Client and may not be reduced by Client.

(d) Three Year Forecast. On or before the 10th day of June of each Year, Client will give Patheon a written non-binding three-year forecast, broken down by quarters for the second and third years of the forecast, of the volume of each Product Client then anticipates will be required to be manufactured and delivered to Client during the three-year period.

(e) Acceptance of Firm Order. Patheon will accept Firm Orders by sending an acknowledgement to Client within ten Business Days of its receipt of the Firm Order. The acknowledgement will include, subject to confirmation from the Client, the Delivery Date for the Product ordered. The Delivery Date may be amended by agreement of the Parties or as set forth in Sections 2.1(f) or 5.1(b). For clarity, Patheon will be required to accept Firm Orders provided that such Firm Orders comply with the requirements set forth in Section 5.1(b) or 5.1(c), as applicable, and are consistent with the binding portion of the most recent forecast provided by Client.

5.2 Reliance by Patheon.

(a) Client understands and acknowledges that Patheon will rely on the Firm Orders and rolling forecasts submitted under Sections 5.1(a), (b), and (c) in ordering the Components required to meet the Firm Orders. In addition, Client understands that to ensure an orderly supply of the Components, Patheon may want to purchase the Components in sufficient volumes to meet the production requirements for Product during part or all of the forecasted periods referred to in Section 5.1(a) or to meet the production requirements of any longer period agreed to by Patheon and Client. Accordingly, Client authorizes Patheon to purchase Components to satisfy the Manufacturing Services requirements for Product for the first six months contemplated in the most recent forecast given by Client under Section 5.1(a). Patheon may make other purchases of Components to meet Manufacturing Services requirements for longer periods if agreed to in writing by the parties. The Client will give Patheon written authorization to order Components for any launch quantities of Product requested by Client, which will be considered a Firm Order when accepted by Patheon. If Components ordered by Patheon under Firm Orders or this Section 5.2 are not included in finished Product manufactured for Client within six months after the forecasted month for which the purchases have been made (or for a longer period as the parties may agree) or if the Components have expired during the period, then Client will pay to Patheon its costs therefor (including all reasonable costs incurred by Patheon for the purchase and handling of the Components). But if these Components are used in Product subsequently manufactured for Client or in third party product manufactured by Patheon, Client will receive credit for any costs of those Components previously paid to Patheon by Client.

(b) If Client fails to take possession or arrange for the destruction of Components within 12 months of purchase or, in the case of finished Product, within three months of manufacture, Client will pay Patheon [*] thereafter for storing the Components or finished Product. Storage fees for Components or Product which contain controlled substances or require refrigeration will be charged at [*]. Storage fees are subject to a one pallet minimum charge per month. Patheon may ship finished Product held by it longer than three months to the Client at Client's expense on 14 days written notice to the Client.

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

5.3 Minimum Orders.

Client may only order Manufacturing Services for batches of Product in multiples of the Minimum Run Quantities as set out in Schedule B.

5.4 Shipments.

Shipments of Product will be made EXW (INCOTERMS 2010) Patheon's shipping point unless otherwise mutually agreed. Risk of loss or of damage to Product will remain with Patheon until Patheon loads the Product onto the carrier's vehicle for shipment at the shipping point, at which time risk of loss or damage will transfer to Client. Patheon will package each shipment of Product in a commercially reasonable manner and in accordance with Client's instructions. Patheon will, in accordance with Client's instructions and as agent for Client, (i) arrange for shipping to be paid by Client and (ii) at Client's risk and expense, obtain any export licence or other official authorization necessary to export the Product. Client will arrange for insurance and will select the freight carrier used by Patheon to ship Product and may monitor Patheon's shipping and freight practices as they pertain to this Agreement. Product will be transported in accordance with the Specifications.

5.5 On Time Delivery.

(a) Patheon and the Client understand that there may be uncertainties and necessary adjustments in production schedules during the Initial Manufacturing Period. The parties agree that they will work together closely to expedite deliveries and manage the scheduling of the initial Product launch.

(b) If, after the Initial Manufacturing Period, Patheon is unable to deliver the quantity of Product ordered under a Firm Order within five days of the Delivery Date due to an act or omission by Patheon (a "**Late Delivery**"), Client will receive a credit from Patheon for the Late Delivery that will be applied against the purchase price under the next Firm Order. The credit will be 5% of the Price of the quantities of Product not delivered by Patheon under the Firm Order (i.e., Client Credit = [Quantity Ordered in the Firm Order – Actual Delivery Quantities of Product] * Price * 5%). The parties agree that the credits provided for under this Section 5.5(b) are considered liquidated damages for the shortage of supply of Product for commercial sale and will not be considered a penalty.

(c) A Late Delivery will not be a material breach of this Agreement by Patheon for the purposes of Section 8.2 except as set forth in Section 2.2(e). If Patheon has two consecutive Late Deliveries in a calendar quarter, the parties will meet as necessary to amicably resolve the reasons for the Late Deliveries. The parties will agree on a delivery improvement plan within five Business Days. If, after the delivery improvement plan is in place, Patheon has two further consecutive Late Deliveries in any calendar quarter, Client may exercise its right to terminate this Agreement for cause under Section 8.2(a) without a further opportunity to cure.

(d) For clarity, a Late Delivery will not include any delay in shipment of Product caused by events outside of Patheon's reasonable control, such as a Force Majeure Event, a delay in delivery of API or Materials (provided that Patheon ordered Materials with sufficient lead time for such Materials to be delivered on a timely basis), a delay in Product release approval from Client, inaccurate Client forecasts, or receipt of non-conforming API or Client-Supplied Components.

5.6 Invoices and Payment.

Invoices will be sent on the date issued by fax or email to the fax number or email address given by Client to Patheon in writing. Invoices will be sent when the Product is manufactured and released by Patheon to the Client. Patheon will also submit to Client, with each shipment of Product, a duplicate copy of the invoice covering the shipment. Patheon will also give Client an invoice covering any Inventory or Components which are to be purchased by Client under Section 5.2 of this Agreement. Each invoice will, to the extent applicable, identify Client's Manufacturing Services purchase order number, Product numbers, names and quantities, unit price, freight charges, and the total amount to be paid by Client. Client will pay all invoices within 30 days of the date of invoice. The unpaid portion of accounts that are past due by more than 30 days will accrue interest at 1.5% per month which is equal to an annual rate of 18%. The Late Delivery credits set forth in Section 5.5(b) are only available to Client if all outstanding undisputed invoices have been paid in full or are not more than 45 days outstanding at the time the Late Delivery arose. Notwithstanding the foregoing, Client will have no obligation to pay invoices for that portion of a shipment of Product that has been rejected by Client in accordance with Section 6.1(a) unless and until an independent third party determines that the applicable Products should have been accepted by Client as set forth in Section 6.1(b).

ARTICLE 6

PRODUCT CLAIMS AND RECALLS

6.1 Product Claims.

(a) Product Claims. Client has the right to reject any portion of any shipment of Product that deviates from the Manufacturing Requirements without invalidating any remainder of the shipment. Client will visually inspect the Product manufactured by Patheon upon receipt and will give Patheon written notice (a "**Deficiency Notice**") of all claims for Product that deviate from the Manufacturing Requirements or for shortages in Product delivered within 30 days after Client's receipt thereof (or, in the case of any defects not reasonably susceptible to discovery upon receipt and visual inspection of the Product, within 30 days after discovery by Client, but not after the expiration date of the Product). Should Client fail to give Patheon the Deficiency Notice within the applicable 30 day period, then the delivery will be deemed to have been accepted by Client on the 30th day after delivery or discovery, as applicable. Except as set out in Section 6.3 and Section 10.3, Patheon will have no liability for any deviations for which it has not received notice within the applicable 30 day period.

(b) Determination of Deficiency. Upon receipt of a Deficiency Notice, Patheon will have ten days to advise Client by notice in writing that it disagrees with the contents of the Deficiency Notice. If Client and Patheon fail to agree within ten days after Patheon's notice to Client as to whether any Products identified in the Deficiency Notice deviate from the Manufacturing Requirements, then the parties will mutually select an independent third party to evaluate if the Products deviate from the Manufacturing Requirements. This evaluation will be binding on the parties. If the independent third party determines that any Products deviate from the Manufacturing Requirements, Client's rejection of those Products in the manner contemplated in Section 6.1(a) will be binding and Patheon will be responsible for the cost of the evaluation. If the independent third party does not find that any of the Products deviate from the Manufacturing Requirements, then Client will be deemed to have accepted delivery of the Products on the date on which the independent third party issues its findings, but this date will be no longer than 60 days after the delivery date, and Client will be responsible for the cost of the evaluation.

(c) Shortages or Production Deficiencies. Claims for shortages in the amount of Product shipped by Patheon that are the subject of a Deficiency Notice will be dealt with by Patheon either remedying the shortage by supplying additional Product as soon as practicable but in no event later than within 45 days of its receipt of the Deficiency Notice, contingent upon the receipt from Client of all Active Materials and Client-Supplied Components required for the manufacture of the replacement Product. A shortage of greater than 25% or Late Delivery of three consecutive Product shipments will be considered a material risk that Patheon will not be able to meet Client forecasts consistent with Section 2.1.

6.2 Product Recalls and Returns.

(a) Records and Notice. Patheon and Client will each maintain records necessary to permit a Recall of any Product delivered to Client or customers of Client. Each party will promptly notify the other by telephone (to be confirmed in writing) of any information which might affect the marketability, safety or effectiveness of the Product or which might result in the Recall or seizure of the Product. Upon receiving this notice or upon this discovery, each party will stop making any further shipments of any Product in its possession or control until a decision has been made whether a Recall or some other corrective action is necessary. The decision to initiate a Recall or to take some other corrective action, if any, will be made and implemented by Client. "**Recall**" will mean any action (i) by Client to recover title to or possession of quantities of the Product sold or shipped to third parties (including, without limitation, the voluntary withdrawal of Product from the market); or (ii) by any Regulatory Authorities to detain or destroy any of the Product. Recall will also include any action by either party to refrain from selling or shipping quantities of the Product to third parties which would have been subject to a Recall if sold or shipped.

(b) Recalls. If (i) any governmental or regulatory authority issues a directive, order or, following the issuance of a safety warning or alert about a Product, a written request that any Product be Recalled, (ii) a court of competent jurisdiction orders a Recall, or (iii) Client determines that any Product should be Recalled or that a "**Dear Doctor**" letter is required relating to the restrictions on the use of any Product, Patheon will co-operate as reasonably required by Client, having regard to all applicable laws and regulations.

(c) Product Returns. Client will have the responsibility for handling customer returns of the Product. Patheon will give Client any assistance that Client may reasonably require to handle the returns.

6.3 Patheon's Responsibility for Defective and Recalled Product.

(a) Defective Product. If Client rejects Product under Section 6.1 and the deviation is determined to have arisen from Patheon's failure to provide the Manufacturing Services in accordance with the Manufacturing Requirements, Patheon will credit Client's account for Patheon's invoice price for the defective Product. If Client previously paid for the defective Product, Patheon will promptly, at Client's election, either: (i) refund the invoice price for the defective Product; (ii) offset the amount paid against other amounts due to Patheon hereunder; or (iii) replace the Product with conforming Product without Client being liable for payment therefor under Section 3.1, contingent upon the receipt from Client of all Active Materials required for the manufacture of the replacement Product. For greater certainty, Patheon's responsibility for any loss of Active Materials in defective Product will be captured and calculated in the Active Materials Yield under Section 2.2.

(b) Recalled Product. If a Recall or return results from, or arises out of, a failure by Patheon to perform the Manufacturing Services in accordance with the Manufacturing Requirements, Patheon will be responsible for the documented out-of-pocket expenses of the Recall or return and will promptly, at Client's election, either: (i) refund the invoice price for the Recalled or returned Product, (ii) offset the amount paid by Client for the Recalled or returned Product against other amounts due to Patheon hereunder; or (iii) replace the Recalled or returned Product with new Product without Client being liable for payment therefore under Section 3.1, contingent upon the receipt from Client of all Active Materials required for the manufacture of the replacement Product. For greater certainty, Patheon's responsibility for any loss of Active Materials in Recalled Product will be captured and calculated in the yield calculations under Section 2.2. In all other circumstances, Recalls, returns, or other corrective actions will be made at Client's cost and expense.

(c) Except as set forth in Sections 6.3(a) and (b) above and in Section 10.3, Patheon will not be liable to Client nor have any responsibility to Client for any deficiencies in, or other liabilities associated with, any Product manufactured by it (collectively, "**Product Claims**"). For greater certainty, Patheon will have no obligation for any Product Claims to the extent the Product Claim (i) is caused by deficiencies in the Specifications, the safety, efficacy, or marketability of the Product or any distribution thereof, (ii) results from a defect in a Component that is not reasonably discoverable by Patheon using the test methods set forth in the Specifications, (iii) results from a defect in the Active Materials or Client-Supplied Components that is not reasonably discoverable by Patheon using the test methods set forth in the Specifications, (iv) is caused by actions of third parties occurring after the Product is shipped by Patheon under Section 5.4, (v) is due to packaging design or labelling defects or omissions for which Patheon has no responsibility, (vi) is due to any unascertainable reason despite Patheon having performed the Manufacturing Services in accordance with the Manufacturing Requirements, or (vii) is due to any other breach by Client of its obligations under this Agreement.

6.4 Disposition of Defective or Recalled Products.

Client will not dispose of any damaged, defective, returned, or Recalled Product for which it intends to assert a claim against Patheon without Patheon's prior written authorization to do so. Alternatively, Patheon may instruct Client to return the Product to Patheon. Patheon will bear the cost of disposition for any damaged, defective, returned or Recalled Product for which it bears responsibility under Section 6.3. In all other circumstances, Client will bear the cost of disposition for any damaged, defective, returned, or Recalled Product.

6.5 Healthcare Provider or Patient Questions and Complaints.

Client will have the sole responsibility for responding to questions and complaints from its customers. Questions or complaints received by Patheon from Client's customers, healthcare providers or patients will be promptly referred to Client. Patheon will co-operate as reasonably required to allow Client to determine the cause of and resolve any questions and complaints. This assistance will include follow-up investigations, including testing. In addition, Patheon will give Client all mutually agreed upon information that will enable Client to respond properly to questions or complaints about the Product as set forth in the Quality Agreement. Unless it is determined that the cause of the complaint resulted from a failure by Patheon to perform the Manufacturing Services in accordance with the Manufacturing Requirements, all costs incurred under this Section 6.5 will be borne by Client.

6.6 Sole Remedy.

Except for the indemnity set forth in Section 10.3, monetary remedies that are expressly provided for in this Agreement, and subject to the limitations set forth in Sections 10.1 and 10.2, the remedies described in this Article 6 and Section 2.2, as well as Client's right to terminate the Agreement in accordance with Section 8.2, will be Client's sole remedies for any failure by Patheon to provide the Manufacturing Services in accordance with the Manufacturing Requirements.

ARTICLE 7

CO-OPERATION

7.1 Supply Team.

Each party will forthwith upon execution of this Agreement establish a Supply Team, with each party appointing two of its employees to be members of the Supply Team. The members from each party collectively will have one (1) vote. Each party may replace any or all of its representatives on the Supply Team at any time upon written notice to the other party.

(a) Responsibilities. The Supply Team will perform the following functions:

(i) discuss and supervise all issues relating to the Manufacturing Services and supply of Product hereunder;

(ii) oversee and monitor the supply of Active Materials and Materials to meet forecasted delivery requirements;

(iii) establish written key performance indicators for the parties' activities with respect to Manufacturing hereunder, which key performance indicators may include, without limitation, timely delivery of Active Materials, on time product deliveries, percentage of lots accepted, Target Yield and Actual Annual Yield, and measure and monitor the parties' performance against such key performance indicators; and

(iv) oversee the handling of Product complaints, adverse events, Product recalls, and Product return processes in accordance with the applicable procedures specified in this Agreement and the Quality Agreement.

(b) Meetings. During the term of this Agreement, Supply Team meetings will be held quarterly, either in person or by means of telecommunication or video conference, and may be called by either party with not less than 30 days' notice to the other, unless such notice is waived. In addition to the quarterly meetings, the Supply Team may be convened, polled, or consulted with from time to time on an ad hoc basis by means of telecommunication, video conferences, electronic mail, or correspondence, as deemed necessary or appropriate to perform the responsibilities assigned to it under this Agreement. The Supply Team will hold its first meeting within 60 days after the Effective Date. Representatives of each party who are not members of the Supply Team may attend meetings of the Supply Team as required to further the activities of the parties with respect to the Manufacturing Services. All material decisions made by the Supply Team will be recorded in writing. For the avoidance of doubt, the Supply Team will not have the authority to amend or modify any term or condition of this Agreement, including, without limitation, any financial terms or obligations. These amendments or modifications may only be made in accordance with Section 13.11.

(c) Decision Making. The Supply Team will operate by consensus (e.g., all decisions and approvals will require a unanimous vote of both parties' members). If the Supply Team fails to reach a consensus on any matter within its jurisdiction within 30 days of first consideration of such matter, either party may refer such matter for resolution in accordance with the provisions of Article 12.

7.2 Governmental Agencies.

Subject to Section 7.8, each party may communicate with any governmental agency, including but not limited to governmental agencies responsible for granting regulatory approval for the Product, regarding the Product if, in the opinion of that party's counsel, the communication is necessary to comply with the terms of this Agreement or the requirements of any law, governmental order or regulation; provided, however, in the event such requirement applies to Patheon, Patheon will notify Client in writing of the requirement and such communication. Unless, in the reasonable opinion of its counsel, there is a legal prohibition against doing so, Patheon will permit Client to accompany and take part in any communications with the agency, and to receive copies of all communications from the agency within one Business Day of receipt thereof. Unless, in the reasonable opinion of its counsel, there is a legal prohibition against doing so, Client will notify Patheon of any communications it has with any governmental agency, including but not limited to governmental agencies responsible for granting regulatory approval for the Products, that directly relate to Patheon's performance of the Manufacturing Services under this Agreement. To the extent practicable, Client will permit Patheon to take part in these communications with the agency, and will provide copies of all such written communications from the agency within one Business Day of receipt thereof.

7.3 Records and Accounting by Patheon.

Patheon will keep records of the manufacture, testing, and shipping of the Product, and retain samples of the Product as are necessary to comply with manufacturing regulatory requirements applicable to Patheon, as well as to assist with resolving Product complaints and other similar investigations. Copies of the records and samples will be retained for one year following the date of Product expiry, or longer if required by law or the Quality Agreement, at which time Client will be contacted concerning the delivery and destruction of the documents and/or samples of Product. Client is responsible for retaining samples of the Product necessary to comply with the legal/regulatory requirements applicable to Client.

7.4 Inspection.

Client may inspect Patheon reports and records relating to this Agreement during normal business hours, and with reasonable advance notice, but a Patheon representative must be present during the inspection.

7.5 Access.

Patheon will give Client reasonable access at mutually agreeable times to its records relating to the Manufacturing Services and to the areas of the Manufacturing Site in which the Product is manufactured, stored, handled, or shipped to permit Client to verify that the Manufacturing Services are being performed in accordance with the Manufacturing Requirements. But, with the exception of "**for-cause**" audits (including follow-up audits conducted to ensure that deficiencies noted by Client or a Regulatory Authority have been remedied), Client will be limited each Year to one cGMP-type audit, lasting no more than two days and involving no more than two auditors. Client may request additional cGMP-type audits, subject to payment to Patheon of a fee of $5,000 for each additional audit day and $1,000 per audit day for each additional auditor. The right of access set forth in this Section 7.5 will not include a right to access or inspect Patheon's financial records.

7.6 Notification of Regulatory Inspections.

Patheon will notify Client within one Business Day of any inspections by any governmental agency specifically involving the Product. Patheon will also notify Client of receipt of any form 483's, warning letters or any other regulatory action or notice that questions Patheon's compliance with cGMPs relating to operations at the Manufacturing Facility that could have an adverse impact on the Product, including the regulatory status of the Product.

7.7 Reports.

Patheon will supply on an annual basis all Product data in its control, including release test results, complaint test results, and all investigations (in manufacturing, testing, and storage), that Client reasonably requires in order to complete any filing under any applicable regulatory regime, including any Annual Report that Client is required to file with the FDA. At the Client's request, Patheon will provide a copy of the Annual Product Review Report to the Client at no additional cost. Any additional report requested by Client beyond the scope of cGMPs and customary FDA requirements will be subject to an additional fee to be agreed upon between Patheon and the Client.

7.8 FDA Filings.

(a) Regulatory Authority. Client will have the sole responsibility for filing all documents with all Regulatory Authorities and taking any other actions that may be required for the receipt and/or maintenance of Regulatory Authority approval for the commercial manufacture of the Product. Patheon will assist Client, to the extent consistent with Patheon's obligations under this Agreement, to obtain Regulatory Authority approval for the commercial manufacture of the Product as quickly as reasonably possible.

(b) Verification of Data. At least 21 days prior to filing any documents with any Regulatory Authority that incorporate data generated by Patheon, Client will give Patheon a copy of the documents incorporating this data to give Patheon the opportunity to verify the accuracy and regulatory validity of those documents as they relate to Patheon generated data.

(c) Verification of CMC. At least 21 days prior to filing with any Regulatory Authority any documentation which is or is equivalent to the FDA's Chemistry and Manufacturing Controls ("**CMC**") section related to any Application for Marketing Authorization, Client will give Patheon a copy of the CMC as well as all supporting documents which have been relied upon to prepare the CMC. This disclosure will permit Patheon to verify that the CMC accurately describes the work that Patheon has performed and the manufacturing processes that Patheon will perform under this Agreement. Client will give Patheon copies of all FDA filings at the time of submission which contain CMC information regarding the Product.

(d) Deficiencies. If, in Patheon's sole discretion, acting reasonably, Patheon determines that any of the information given by Client under clauses (b) and (c) above is inaccurate or deficient in any manner whatsoever (the "**Deficiencies**"), Patheon will notify Client in writing of the Deficiencies. The parties will work together to have the Deficiencies resolved prior to any pre-approval inspection by a Regulatory Authority.

(e) Client Responsibility. For clarity, the parties agree that in reviewing the documents referred to in clause (b) above, Patheon's role will be limited to verifying the accuracy of the description of the work undertaken or to be undertaken by Patheon. Subject to the foregoing, Patheon will not assume any responsibility for the accuracy of any Application for Marketing Authorization. The Client is solely responsibility for the preparation and filing of the Application for Marketing Authorization, and any relevant costs will be borne by the Client.

(f) Inspection by Regulatory Authorities. If Client does not give Patheon the documents requested under clause (b) above within the time specified and if Patheon reasonably believes that Patheon's standing with a Regulatory Authority may be jeopardized, Patheon may, in its sole discretion, delay or postpone any inspection by the Regulatory Authority until Patheon has reviewed the requested documents and is satisfied with their contents.

ARTICLE 8

TERM AND TERMINATION

8.1 Term.

This Agreement will become effective as of the Effective Date and will continue in effect thereafter until December 121, 2017 (the "**Initial Term**"), unless terminated earlier by one of the parties in accordance herewith. This Agreement will automatically continue after the Initial Term for successive terms of two years each. Either party may terminate this Agreement at will upon 18 months written notice given to the other party, provided that the earliest date on which any such notice of termination at will under this Section 8.1 may be given is June 30, 2016, and the earliest such termination at will may be effective is December 121, 2017.

8.2 Termination for Cause.

(a) Either party at its sole option may terminate this Agreement upon written notice where the other party has failed to remedy a material breach of any of its representations, warranties, or other obligations under this Agreement within 60 days following receipt of a written notice (the "**Remediation Period**") of the breach that expressly states that it is a notice under this Section 8.2(a) (a "**Breach Notice**"). Notwithstanding the foregoing, a Remediation Period will not be required for any of the material breaches by Patheon expressly identified in Section 2.2(e) or in Section 5.5(c), and Client will be permitted to terminate this Agreement upon written notice to Patheon for any such material breaches. If Client terminates this Agreement under this Section 8.2(a), Patheon will, within 30 days after the date of termination, refund to Client (i) the cost of all Facility Modifications funded by Client under the Capital Agreement, (ii) the cost of all facility modifications funded by Client under the Phase II Capital Agreement (as such term is defined in Schedule B), and (iii) the amount of all Facility Fees paid by Client under this Agreement that have not been reimbursed by Patheon prior to termination of this Agreement. Either party at its sole option may immediately terminate this Agreement upon written notice, but without prior advance notice, to the other party if: (i) the other party is declared insolvent or bankrupt by a court of competent jurisdiction; (ii) a voluntary petition of bankruptcy is filed in any court of competent jurisdiction by the other party; or (iii) this Agreement is assigned by the other party for the benefit of creditors.

(b) Client may terminate this Agreement upon 30 days' prior written notice if any Regulatory Authority takes any action, or raises any objection, that prevents the importation, exportation, purchase, use, marketing, or sale of the Product. But if this occurs, Client will still fulfill all of its obligations under Section 8.4 below.

(c) Patheon may terminate this Agreement upon six months' prior written notice if Client assigns under Section 13.6 any of its rights under this Agreement to an assignee that, in the opinion of Patheon acting reasonably, is a Patheon Competitor. Should Patheon decide to terminate in accordance with this Section 8.2(d), Patheon will continue to supply the assignee with Product until the earlier of (i) qualification and approval of another site to manufacture Product, and (ii) 12 months from the date of termination.

8.3 Product Discontinuation.

Client will give at least three months' advance notice if it intends to no longer order Manufacturing Services for Product due to Product's discontinuance in the market.

8.4 Obligations on Termination.

If this Agreement is completed, expires, or is terminated for any reason, then:

(a) Client will take delivery of and pay for all undelivered Product that was manufactured under a Firm Order and in accordance with the Manufacturing Requirements, at the price in effect at the time the Firm Order was placed;

(b) Client will purchase, at Patheon's cost (including all costs incurred by Patheon for the purchase and handling of the Inventory), the Inventory applicable to the Product which was purchased, produced or maintained by Patheon in contemplation of filling Firm Orders in accordance with Section 5.2 prior to notice of termination being given;

(c) Client will satisfy the purchase price payable under Patheon's orders with suppliers of Components, if the orders were made by Patheon in reliance on Firm Orders in accordance with Section 5.2, and Patheon will transfer to Client all Components covered by such Firm Orders (with shipping and related expenses, if any, to be borne by Client);

(d) Patheon will return to Client all unused Active Materials (with shipping and related expenses, if any, to be borne by Client);

(e) Client acknowledges that no Patheon Competitor will be permitted access to the Manufacturing Site; and

(f) Client will make commercially reasonable efforts, at its own expense, to remove from Patheon site(s), within five Business Days, all of Client's Components, Inventory and Materials (whether current or obsolete), supplies, undelivered Product, chattels, Dedicated Equipment or other moveable property owned by Client, related to the Agreement and located at a Patheon site or that is otherwise under Patheon's care and control ("**Client Property**"). If Client fails to remove the Client Property within five Business Days following the completion, termination, or expiration of the Agreement, Client will pay Patheon $100.00 per pallet, per month, one pallet minimum ($200 per pallet, per month, one pallet minimum, for any of the Client Property that contains controlled substances or requires refrigeration) thereafter for storing the Client Property and will assume any third party storage charges invoiced to Patheon regarding the Client Property. Patheon will invoice Client for the storage charges as set forth in Section 5.6 of this Agreement.

Any termination or expiration of this Agreement will not affect any outstanding obligations or payments due hereunder prior to the termination or expiration, nor will it prejudice any other remedies that the parties may have under this Agreement. For greater certainty, termination or expiration of this Agreement for any reason will not affect the obligations and responsibilities of the parties under Articles 6, 10, 11 and 12 and Sections 2.2(c), 3.2, 4.2(d), 5.4, 5.5(b), 5.6, 7.3, 7.4, 7.6, 7.7, 8.2, 8.4, 13.1, 13.2, 13.3, 13.5, 13.9, 13.10, 13.11, 13.15 and 13.16, all of which survive any termination or expiration.

ARTICLE 9

REPRESENTATIONS, WARRANTIES AND COVENANTS

9.1 Authority.

Each party covenants, represents, and warrants that it has the full right and authority to enter into this Agreement and that it is not aware of any impediment that would inhibit its ability to perform its obligations hereunder.

9.2 Client Warranties.

Client covenants, represents, and warrants that:

(a) Non-Infringement.

(i) the Specifications for the Product are its or its Affiliate's property and that Client may lawfully disclose the Specifications to Patheon;

(ii) any Client Intellectual Property used by Patheon in performing the Manufacturing Services according to the Specifications is Client's or its Affiliate's unencumbered property, and, to Client's knowledge, may be lawfully used as directed by Client;

(iii) to Client's knowledge, there are no actions or other legal proceedings concerning the infringement of Third Party Rights related to any of the Specifications, or any of the Active Materials and the Components, or the sale, use, or other disposition of Product made in accordance with the Specifications;

(b) Quality and Compliance.

(i) the Specifications for Product conform to all applicable cGMPs and Applicable Laws;

(ii) the Product, if labelled and manufactured in accordance with the Specifications and in compliance with applicable cGMPs and Applicable Laws (i) may be lawfully sold and distributed in every jurisdiction in which Client markets the Product, and (ii) will comply with the requirements of all applicable marketing approvals for the Product;

(iii) on the date of shipment, the API will conform to the specifications for the API that Client has given to Patheon and will be adequately contained, packaged, and labelled and will conform to the affirmations of fact on the container.

9.3 Patheon Warranties.

Patheon covenants, represents, and warrants that:

(a) it will perform the Manufacturing Services in accordance with the Manufacturing Requirements;

(b) any Patheon Intellectual Property used by Patheon to perform the Manufacturing Services (i) is Patheon's or its Affiliate's unencumbered property, (ii) may be lawfully used by Patheon, and (iii) does not infringe and will not infringe any Third Party Rights; and

(c) the Product will, on delivery, conform to the Specifications, have been manufactured in accordance with the Manufacturing Requirements, and not be adulterated.

(d) neither it nor any of its Affiliates, personnel or contractors performing any Manufacturing Services will make any payments or gifts to foreign governments or related persons for the purpose of obtaining or retaining business for or with, or directing business to, any person in connection with the performance of Manufacturing Services. Accordingly, Patheon agrees that no portion of monies paid or payable in connection with this Agreement, nor any other item of value, will, directly or indirectly, be paid, received, transferred, loaned, offered, promised or furnished to, or for the use of, any officer or employee of any foreign government department, agency, instrumentality or corporation thereof, or any political party or any official of such party or candidate for office, or any person acting for or on behalf of any of the foregoing, for the purpose of (i) inducing the recipient to misuse his or her official position to direct business wrongfully to Client, Patheon, or any other person, (ii) influencing any act or decision of an official in his or her official capacity, including to obtain regulatory approvals for Product, (iii) inducing an official to do or omit to do any act in violation of his or her lawful duty, (iv) obtaining any improper advantage, or (v) inducing a foreign official to use his or her influence improperly to affect or influence any act or decision.

9.4 Debarred Persons.

Patheon covenants that it will not in the performance of its obligations under this Agreement use the services of any person or entity debarred or suspended under 21 U.S.C. §335(a) or (b). Patheon represents that it does not currently have, and covenants that it will not hire, as an officer or an employee any person who has been convicted of a felony under the laws of the United States for conduct relating to the regulation of any drug product under the Federal Food, Drug, and Cosmetic Act (United States).

9.5 Permits.

Client will be solely responsible for obtaining or maintaining, on a timely basis, any permits or other regulatory approvals for the Product or the Specifications, including, without limitation, all marketing and post-marketing approvals.

Patheon will maintain at all relevant times, at its sole expense, all governmental permits, licenses, approval, and authorities required to enable it to lawfully and properly perform the Manufacturing Services.

9.6 No Warranty.

NEITHER PARTY MAKES ANY WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, BY FACT OR LAW, OTHER THAN THOSE EXPRESSLY SET FORTH IN THIS AGREEMENT. NEITHER PARTY MAKES ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS WITH RESPECT TO THE PRODUCT.

ARTICLE 10

REMEDIES AND INDEMNITIES

10.1 Consequential Damages.

Except for a breach of Article 11, and without limiting the party's indemnification obligations under this Article 10, under no circumstances whatsoever will either party be liable to the other in contract, tort, negligence, breach of statutory duty, or otherwise for (i) any (direct or indirect) loss of profits, of production, of anticipated savings, of business, or goodwill or (ii) for any other liability, damage, costs, or expense of any kind incurred by the other party of an indirect or consequential nature, regardless of any notice of the possibility of these damages. For clarity, the foregoing does not apply to limit a party's liability for monetary remedies that are expressly provided for in this Agreement, such as payments required under Section 6.3(b), regardless of whether such monetary remedies may be characterized as consequential damages.

10.2 Limitation of Liability.

(a) Active Materials. Except as expressly set forth in Section 2.2, under no circumstances will Patheon be responsible for any loss or damage to the Active Materials. Patheon's maximum responsibility for loss or damage to the Active Materials will not exceed the Maximum Credit Value set forth in Schedule D.

(b) Maximum Liability. Except for a breach of its obligations under Article 11 or liability arising under Section 10.3, Patheon's maximum liability to Client under this Agreement for any reason whatsoever, including, without limitation, any liability arising under Article 6 hereof or resulting from any and all breaches of its representations, warranties, or any other obligations under this Agreement will not exceed [*].

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

10.3 Patheon.

Patheon agrees to defend, indemnify, and hold Client and Client's officers, employees, and agents harmless against any and all losses, damages, costs (including reasonable attorneys' fees and costs), claims, demands, judgments and liabilities to, from and in favour of third parties (other than Affiliates) resulting from, or relating to (a) any claim of personal injury or property damage to the extent that the injury or damage is the result of a failure by Patheon to perform the Manufacturing Services in accordance with the Manufacturing Requirements, (b) any claim resulting from or relating to a breach by Patheon of its obligations, representations or warranties under this Agreement, or (c) any claim resulting from or relating to the negligence or wrongful act(s) of Patheon or Patheon's officers, employees, agents or Affiliates, except in each case to the extent that the losses, damages, costs, claims, demands, judgments, and liabilities are due to the negligence or wrongful act(s) of Client or its officers, employees, agents, or Affiliates.

If a claim occurs, Client will: (a) promptly notify Patheon of the claim; (b) use commercially reasonable efforts to mitigate the effects of the claim; (c) reasonably cooperate with Patheon in the defense of the claim; and (d) permit Patheon to control the defense and settlement of the claim, all at Patheon's cost and expense.

10.4 Client.

Client agrees to defend, indemnify, and hold Patheon and Patheon's officers, employees, and agents harmless against any and all losses, damages, costs (including reasonable attorneys' fees and costs), claims, demands, judgments and liability to, from and in favour of third parties (other than Affiliates) resulting from, or relating to any claim of infringement or alleged infringement of any Third Party Rights in the Product, or any portion thereof, or any claim of personal injury or property damage to the extent that the injury or damage is the result of a breach of this Agreement by Client, including, without limitation, any representation or warranty contained herein, except to the extent that the losses, damages, costs, claims, demands, judgments, and liabilities are due to (a) the negligence or wrongful act(s) of Patheon or Patheon's officers, employees, or agents, (b) Patheon's breach of this Agreement including, without limitation, any representation or warranty contained herein, or (c) infringement of any Third Party Rights in the Product, or any portion thereof, based on Patheon's use or incorporation of any processes or methods to perform the Manufacturing Services other than those specified by Client in the Specifications.

If a claim occurs, Patheon will: (a) promptly notify Client of the claim; (b) use commercially reasonable efforts to mitigate the effects of the claim; (c) reasonably cooperate with Client in the defense of the claim; and (d) permit Client to control the defense and settlement of the claim, all at Client's cost and expense.

10.5 Reasonable Allocation of Risk.

This Agreement (including, without limitation, this Article 10) is reasonable and creates a reasonable allocation of risk for the relative profits the parties each expect to derive from the Product. Patheon assumes only a limited degree of risk arising from the manufacture, distribution, and use of the Product because Client has developed and will hold the marketing approval for the Product, Client requires Patheon to manufacture and label the Product strictly in accordance with the Specifications, and Client, not Patheon, is best positioned to inform and advise potential users about the circumstances and manner of use of the Product.

ARTICLE 11

CONFIDENTIALITY

11.1 Confidentiality.

For purposes of this Agreement, each party will be deemed to be the "**Disclosing Party**" with respect to its own Confidential Information, and a "**Receiving Party**" with respect to the Confidential Information of the other party. The Receiving Party will: (a) use the Disclosing Party's Confidential Information solely for the purposes contemplated by this Agreement and for no other purpose without the prior written consent of the Disclosing Party; (b) not disclose the Disclosing Party's Confidential Information to any third party without first obtaining the written consent of the Disclosing Party; and (c) protect the confidentiality of the Disclosing Party's Confidential Information with at least the same degree of care used to protect its own confidential and/or proprietary information from unauthorized use or disclosure, but in no event with less than reasonable care. The Receiving Party will be permitted to furnish and otherwise disclose the other party's Confidential Information to those of its Affiliates, officers, employees, and subcontractors who need to know such Confidential Information, provided that such personnel are bound by obligations of confidentiality with respect to such Confidential Information that are at least as restrictive as those set forth in this Article 11. Client may also disclose Patheon's Confidential Information to its corporate partners, bona fide investors, potential acquirers, distributors, licensors and sublicensees as necessary so long as they are bound by obligations of confidentiality with respect to such Confidential Information. If the Receiving Party discloses the Disclosing Party's Confidential Information to a Third Party with the Disclosing Party's permission as permitted herein, the Receiving Party will ensure that all Confidential Information disclosed to such Third Party is identified as confidential at the time of disclosure.

11.2 Exceptions to Confidential Information.

The obligations of confidentiality in Section 11.1 will not apply to that part of the Disclosing Party's Confidential Information which the Receiving Party is able to demonstrate by competent documentary evidence:

(a) was already known to the Receiving Party, other than under an obligation of confidentiality, at the time of disclosure by the Disclosing Party;

(b) was generally available to the public or otherwise part of the public domain at the time of its disclosure to the Receiving Party;

(c) later became part of the public domain through no act or omission of the Receiving Party;

(d) was disclosed to the Receiving Party, other than under an obligation of confidentiality to a Third Party, by a Third Party who had no obligation to the Disclosing Party not to disclose such information to others; or

(e) was independently developed by employees or contractors of either party outside of such party's activities under this Agreement.

11.3 Disclosure Required by Law.

The Receiving Party may disclose the Disclosing Party's Confidential Information without violating the obligations of this Agreement to the extent that such disclosure is (a) required by a valid order of a court or other governmental body having jurisdiction, (b) required by applicable law or regulation, or (c) necessary for filings with Authorities including, without limitation, the U.S. Securities & Exchange Commission, in each case provided that the Receiving Party provides the Disclosing Party with reasonable prior written notice of such disclosure (to the extent permitted by applicable law to do so) and makes a reasonable effort to obtain, or to reasonably assist the Disclosing Party in obtaining, a protective order or other appropriate remedy preventing or limiting the disclosure and/or requiring that the Disclosing Party's Confidential Information so disclosed be used only for the purposes for which the law or regulation requires, for which the order was issued, or for the applicable regulatory or governmental filing.

11.4 Destruction of Confidential Information.

At the Disclosing Party's request, the Receiving Party will destroy all or such parts of the Disclosing Party's Confidential Information as the Disclosing Party will direct, including any copies thereof made by the Receiving Party, except that the Receiving Party will not be required to destroy any computer files created during automatic system back up which are subsequently stored securely by the Receiving Party. Notwithstanding the foregoing, the Receiving Party may retain one copy of the Disclosing Party's Confidential Information for archival purposes, subject to the ongoing obligation to maintain the confidentiality of such information.

11.5 Remedy.

Each party acknowledges that disclosure or distribution of the other's Confidential Information or use of the information contrary to the terms of this Agreement may cause irreparable harm for which damages at law may not be an adequate remedy. Accordingly, the Disclosing Party hereunder may seek to enforce the provisions of this Agreement prohibiting disclosure or distribution of its Confidential Information or use thereof contrary to the provisions hereof in a court of competent jurisdiction, in addition to any and all other remedies available at law or in equity.

ARTICLE 12

DISPUTE RESOLUTION

12.1 Commercial Dispute Resolution.

If any dispute arises out of this Agreement (other than a dispute under Section 6.1(b) or a Technical Dispute, as defined in Section 12.2), the parties will first try to resolve it amicably. In that regard, any party may send a notice of dispute to the other, and each party will appoint, within ten Business Days from receipt of the notice of dispute, a single representative having full power and authority to resolve the dispute. The representatives will meet as necessary in order to resolve the dispute. If the representatives fail to resolve the matter within one month from their appointment, or if a party fails to appoint a representative within the ten Business Day period set forth above, the dispute will immediately be referred to the Chief Operating Officer of Patheon (or another officer as appropriate) and the Chief Development Officer of Client (or another officer as appropriate) who will meet and discuss as necessary to try to resolve the dispute amicably. Should the parties fail to reach a resolution under this Section 12.1, the dispute will be submitted to final and binding arbitration in the City of Chicago, Illinois in accordance with the rules and procedures of the American Arbitration Association, and judgment upon the award may be entered in any court having jurisdiction thereof. In any arbitration proceeding, the unsuccessful party will pay the successful party all costs and expenses, including reasonable attorneys' fees, incurred by the successful party in connection with the arbitration proceeding and will pay all other costs and expenses of the arbitration, including the arbitrators' fees.

Each party agrees to abide by the award rendered in any arbitration conducted pursuant to this Section 12.1 and agrees that the courts may award full faith and credit to such judgment in order to enforce such award.

12.2 Technical Dispute Resolution.

If a dispute arises (other than disputes under Sections 6.1(b)) between the parties that is exclusively related to technical aspects of the manufacturing, packaging, labelling, quality control testing, handling, storage, or other activities under this Agreement (a "**Technical Dispute**"), the parties will make all reasonable efforts to resolve the dispute by amicable negotiations. In that regard, senior representatives of each party will, as soon as practicable and in any event no later than ten Business Days after a written request from either party to the other, meet in good faith to resolve any Technical Dispute. If, despite this meeting, the parties are unable to resolve a Technical Dispute within a reasonable time, and in any event within 30 Business Days of the written request, the Technical Dispute will, at the request of either party, be referred for determination to an expert in accordance with Schedule E. If the parties cannot agree that a dispute is a Technical Dispute, Section 12.1 will prevail. For greater certainty, the parties agree that the release of the Product for sale or distribution under the applicable marketing approval for the Product will not by itself indicate compliance by Patheon with its obligations for the Manufacturing Services and further that nothing in this Agreement (including Schedule E) will remove or limit the authority of the relevant qualified person (as specified by the Quality Agreement) to determine whether the Product is to be released for sale or distribution.

ARTICLE 13

MISCELLANEOUS

13.1 Inventions.

(a) For the term of this Agreement, Client hereby grants to Patheon a non-exclusive, paid-up, royalty-free, non-transferable license of Client Intellectual Property which Patheon must use in order to perform the Manufacturing Services solely for the purposes of performing the Manufacturing Services.

(b) All Intellectual Property generated or derived by Patheon or its contractors or Affiliates while performing the Manufacturing Services, to the extent it is specific to the development, manufacture, use, dosage, formulation, or composition of matter of Product ("**Product Intellectual Property**"), will be the exclusive property of Client. Patheon hereby assigns to Client all of its right, title, and interest in and to the Product Intellectual Property, and agrees to take, at Client's expense, all further acts reasonably required to evidence such assignment and transfer to Client and to assist Client with applying for, securing, and maintaining patent or other proprietary protection for Product Intellectual Property. Patheon will ensure that each employee or contractor of Patheon or its Affiliates that performs any activities under this Agreement has a contractual obligation to assign all rights in the Product Intellectual Property to Patheon such that Patheon may assign and transfer such rights to Client in accordance with this Section 13.1(b).

(c) All Patheon Intellectual Property will be the exclusive property of Patheon. Patheon hereby grants to Client a perpetual, irrevocable, non-exclusive, worldwide, paid-up, royalty-free, sublicensable, transferable license to use the Patheon Intellectual Property used by Patheon to perform the Manufacturing Services to enable Client to manufacture or have manufactured the Product(s).

(d) Each party will be solely responsible for the costs of filing, prosecution, and maintenance of patents and patent applications on its own Inventions.

(e) Patheon will give Client written notice, as promptly as practicable, of all Inventions which can reasonably be deemed to constitute Product Intellectual Property, or improvements or other modifications of the Product or processes or technology owned or otherwise controlled by Client.

13.2 Intellectual Property.

Subject to Section 13.1, all Client Intellectual Property will be owned by Client and all Patheon Intellectual Property will be owned by Patheon. Neither party has, nor will it acquire, any interest in any of the other party's Intellectual Property unless otherwise expressly agreed to in writing. Neither party will use any Intellectual Property of the other party, except as specifically authorized by the other party or as required for the performance of its obligations under this Agreement.

13.3 Insurance.

Each party will maintain commercial general liability insurance, including blanket contractual liability insurance covering the obligations of that party under this Agreement through the term of this Agreement and for a period of three years thereafter. This insurance will have policy limits of not less than (i) $3,000,000 for each occurrence for personal injury or property damage liability; and (ii) $3,000,000 in the aggregate per annum for product and completed operations liability. If requested each party will give the other a certificate of insurance evidencing the above and showing the name of the issuing company, the policy number, the effective date, the expiration date, and the limits of liability. Each party will provide a minimum of 30 days' written notice to the other party of any cancellation of the insurance. If a party is unable to maintain the insurance policies required under this Agreement through no fault of its own, then the party will forthwith notify the other party in writing and the parties will in good faith negotiate appropriate amendments to the insurance provision of this Agreement in order to provide adequate assurances.

13.4 Independent Contractors.

The parties are independent contractors and this Agreement will not be construed to create between Patheon and Client any other relationship such as, by way of example only, that of employer-employee, principal agent, joint-venturer, co-partners, or any similar relationship, the existence of which is expressly denied by the parties.

13.5 No Waiver.

Either party's failure to require the other party to comply with any provision of this Agreement will not be deemed a waiver of the provision or any other provision of this Agreement, with the exception of Section 6.1.

13.6 Assignment.

(a) Patheon may not assign this Agreement or any of its rights or obligations hereunder to a competitor of Client, or otherwise without the written consent of Client, this consent not to be unreasonably withheld. But Patheon may arrange for subcontractors to perform specific testing services arising under this Agreement without the consent of Client. Patheon agrees that it will remain solely and fully liable for the performance of its subcontractors and their compliance with the terms of this Agreement.

(b) Subject to Section 8.2(d), Client may assign this Agreement or any of its rights or obligations hereunder without approval from Patheon. But Client will give Patheon prior written notice of any assignment, any assignee will covenant in writing with Patheon to be bound by the terms of this Agreement. Client agrees that it will remain fully liable for the performance of its assignee under this Agreement, including all payment obligations.

(c) Despite the foregoing provisions of this Section 13.6, either party may assign this Agreement to any of its Affiliates or to a successor to or purchaser of all or substantially all of its business, but the assignee must execute an agreement with the non-assigning party whereby it agrees to be bound hereunder.

13.7 Force Majeure.

Neither party will be liable for the failure to perform its obligations under this Agreement if the failure is caused by an event beyond that party's reasonable control, including, but not limited to, strikes or other labor disturbances, lockouts, riots, quarantines, communicable disease outbreaks, wars, acts of terrorism, fires, floods, storms, interruption of or delay in transportation, defective equipment, lack of or inability to obtain fuel, power or components, or compliance with any order or regulation of any government entity acting within colour of right (a "**Force Majeure Event**"). A party claiming a right to excused performance under this Section 13.7 will immediately notify the other party in writing of the extent of its inability to perform, which notice will specify the event beyond its reasonable control that prevents the performance. Neither party will be entitled to rely on a Force Majeure Event to relieve it from an obligation to pay money (including any interest for delayed payment) which would otherwise be due and payable under this Agreement.

13.8 Additional Products.

Additional Products may be added to this Agreement and each additional Product will be governed by the general conditions hereof with any special terms (including, without limitation, price) governed by amendments to Schedules A, B, C, and D as applicable.

13.9 Notices.

Any notice, approval, instruction or other written communication required or permitted hereunder will be sufficient if made or given to the other party by personal delivery, by express courier service, facsimile communication, or confirmed receipt email or by sending the same by first class mail, postage prepaid, return receipt requested, to the respective addresses, facsimile numbers or electronic mail addresses set forth below:

If to Client:

AcelRx Pharmaceuticals, Inc.
351 Galveston Drive
Redwood City, CA 94063
Attention: Chief Development Officer
Fax No.: (650) 216-6500
Email address: lhamel@acelrx.com

If to Patheon:

Patheon Pharmaceuticals Inc.
2110 East Galbraith Road
Cincinnati, OH 45237-1625
Attention: Director of Legal Services
Fax No.: 513-948-6927
Email address: Frank.McCune@patheon.com

With a copy to:

Patheon Inc.
4721 Emperor Boulevard
Research Triangle Park,
NC 27703
Attention: General Counsel
Fax No.: 919-474-2269
Email address: Michael.Lytton@Patheon.com

or to any other addresses, facsimile numbers or electronic mail addresses given to the other party in accordance with the terms of this Section 13.9. Notices or written communications made or given by personal delivery, express courier service, facsimile, or electronic mail will be deemed to have been sufficiently made or given when received.

13.10 Severability.

If any provision of this Agreement is determined by a court of competent jurisdiction to be invalid, illegal, or unenforceable in any respect, that determination will not impair or affect the validity, legality, or enforceability of the remaining provisions hereof, because each provision is separate, severable, and distinct.

13.11 Entire Agreement.

This Agreement, together with the Quality Agreement and the Capital Agreement, constitutes the full, complete, final and integrated agreement between the parties relating to the subject matter hereof and supersedes all previous written or oral negotiations, commitments, agreements, transactions, or understandings concerning the subject matter hereof, including the Confidentiality Agreement. But this Agreement is not intended to, and does not, supersede the Master Agreement for Pharmaceutical Development Services entered into between the parties effective August 7, 2009 (the "**Development Agreement**"), as amended, pursuant to which Patheon is manufacturing clinical supplies of Product for Client. Any modification, amendment, or supplement to this Agreement must be in writing and signed by authorized representatives of both parties. In case of conflict, the prevailing order of documents will be this Agreement, the Quality Agreement, and the Capital Agreement.

13.12 Other Terms.

No terms, provisions or conditions of any purchase order or other business form or written authorization used by Client or Patheon will have any effect on the rights, duties, or obligations of the parties under or otherwise modify this Agreement, regardless of any failure of Client or Patheon to object to the terms, provisions, or conditions unless the document specifically refers to this Agreement and is signed by both parties.

13.13 No Third Party Benefit or Right.

For greater certainty, nothing in this Agreement will confer or be construed as conferring on any third party any benefit or the right to enforce any express or implied term of this Agreement.

13.14 Execution in Counterparts.

This Agreement may be executed in two or more counterparts, by original or facsimile signature, each of which will be deemed an original, but all of which together will constitute one and the same instrument.

13.15 Use of Client Name.

Patheon will not make any use of Client's name, trademarks or logo or any variations thereof, alone or with any other word or words, without the prior written consent of Client, which consent will not be unreasonably withheld. Despite this, Client agrees that Patheon may include Client's name and logo in customer lists or related marketing and promotional material for the purpose of identifying users of Patheon's Manufacturing Services.

13.16 Governing Law.

This Agreement will be construed and enforced in accordance with the laws of the State of Delaware and the laws of the United States of America applicable therein. The UN Convention on Contracts for the International Sale of Goods will not apply to this Agreement.

[Signature page follows]

IN WITNESS WHEREOF, the duly authorized representatives of the parties have executed this Agreement as of the date first written above.

PATHEON PHARMACEUTICALS INC.

By: /s/ Stuart Grant
Name: Stuart Grant
Title: Chief Financial Officer

ACELRX PHARMACEUTICALS, INC.

By: /s/ James Welch
Name: James Welch
Title: Chief Financial Officer

SCHEDULE A

PRODUCT LIST AND SPECIFICATIONS

Product List

ARX-01 in Bulk Tablet Packaging

Specifications

Prior to the start of commercial manufacturing of Product under this Agreement, Client will give Patheon the originally executed copies of the Specifications that will be submitted by Client to the FDA for approval. If the Specifications received are subsequently amended, then Client will give Patheon the revised and originally executed copies of the revised Specifications. Upon acceptance of the revised Specifications, Patheon will give Client a signed and dated receipt indicating Patheon's acceptance of the revised Specifications.

SCHEDULE B

MINIMUM RUN QUANTITY, ANNUAL VOLUME, AND PRICE

Annual Volume Forecasts

Client has provided an estimated annual tablet volume forecast for Product as outlined below for informational purposes only. These estimates are subject to change.

Product	2012 Volume	2014 Volume	2015 Volume	2016 Volume
Tablets	[*]	[*]	[*]	[*]

Product	2017 Volume	2018 Volume	2019 Volume
Tablets	[*]	[*]	[*]

Manufacturing and Bulk Packaging Prices

Pricing includes the cost of labour, overhead, raw materials, bulk packaging Components and QC testing. Pricing for 2 batch sizes is being presented, [*] and [*]. The [*] batch size is proposed for the initial start-up volumes but is not economically viable for long-term commercial production. Based on the forecast provided, a long-term commercial batch size of [*] is being presented.

Bulk Pricing – [*] Batch

Product	Annual Quantity (1,000's)	(1,000's)	Price per 1,000 Tablets		
ARX-01 Sufentanil 15mcg Tablets	[*]	[*]	$[*]	$[*]	
ARX-01 Sufentanil 15mcg Tablets	[*]	[*]			
ARX-01 Sufentanil 15mcg Tablets	[*]	[*]	$[*]	$[*]	
ARX-01 Sufentanil 15mcg Tablets	[*]	[*]	$[*]	$[*]	$[*]
ARX-01 Sufentanil 15mcg Tablets	[*]	[*]	$[*]	$[*]	
ARX-01 Sufentanil 15mcg Tablets	[*]	[*]	$[*]	$[*]	$[*]

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

[*]

Bulk Pricing – [*] Batch

Product	Annual Quantity (1,000's)		(1,000's)	Price per 1,000 Tablets		
ARX-01 Sufentanil 15mcg Tablets	[*]		[*]	$[*]	$[*]	
ARX-01 Sufentanil 15mcg Tablets	[*]		[*]			
ARX-01 Sufentanil 15mcg Tablets	[*]		[*]	$[*]	$[*]	
ARX-01 Sufentanil 15mcg Tablets	[*]		[*]	$[*]	$[*]	$[*]
ARX-01 Sufentanil 15mcg Tablets	[*]		[*]	$[*]	$[*]	
ARX-01 Sufentanil 15mcg Tablets	[*]		[*]	$[*]	$[*]	$[*]

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

The following cost items are included in the Price for the Product:

- Product manufactured and packaged in Bulk Tablet Packaging under the Agreement
- Standard certificate of analysis ("**COA**")
- Standard certificate of compliance ("**COC**")
- GMP required retention samples
- Copies of deviation reports
- Batch Production Records ("**BPR**")/Lot Packaging Records ("**LPR**") copies for validation batches, first ten commercial batches, and one commercial batch per Year thereafter
- One label copy change per Year
- BPR/LPR changes [one change per Year]
- Common HPLC/GC columns, reagents, and lab supplies
- Copy of the Annual Product Review Report
- Product Approval Inspection ("**PAI**") and copy of FDA Report
- Simple, routine statistical review
- Storage of Production Test Record ("**PTR**") batches and other experimental batches for three months
- Storage of registration batches and other experimental batches for two years or until Product approval, whichever comes first
- Routine sampling and analysis as part of Product manufacture and release
- Warehousing of equipment, raw materials, API, and finished goods for normal commercial supply
- Testing of raw materials
- Testing of final product in Bulk Tablet Packaging

SCHEDULE C

ANNUAL STABILITY TESTING

$

STABILITY – COMMERCIAL SUFENTANIL TABLETS

	ACTIVITY								***PRICE***
	Number of Lots 1								
	Total Samples 12								
								Subtotal $[*]	
	Protocol Generation								
Pullpoint Month	T = 0	T = 1	T = 3	T = 6	T = 9	T = 12	T = 18	T = 24	T = 36
25ºC / 60% RH	X	X	X	X	X	X	X	X	X
40ºC / 75% RH	X	X	X						
Samples per pullpoint	**1**	**2**	**2**	**2**	**1**	**1**	**1**	**1**	**1**
Microbiology	X	*				***X****			
Cost per pullpoint (Milestone Price)	$[*]	[*]	$[*]	$[*]	$[*]	$[*]	$[*]	$[*]	**$[*]**

Note: For all required testing intervals pull two 40-count cartridges per pull point. Do not test T=0 unless lot from clearance testing is within 30 days of T initial (T=0).

* Note Microbiological testing: Pull fifty-one 40 -count cartridges (approximately 15 grams).

Total **$[*]**

STABILITY - COMMERCIAL SUFENTANIL TABLETS 30ºC / 65% RH*

								USD	
	ACTIVITY								***PRICE***
	Number of Lots 1								
	Total Samples 12								
								Subtotal $[*]	
	Protocol Generation								
Pullpoint Month	T = 0	T = 1	T = 3	T = 6	T = 9	T = 12	T = 18	T = 24	T = 36
30ºC / 65% RH		**X**	**X**	**X**	**X**	**X**			
Samples per pullpoint		**1**	**1**	**1**	**1**	**1**			
Cost per pullpoint (Milestone Price)	$[*]	[*]	$[*]	$[*]	$[*]	$[*]	$[*]	$[*]	**$[*]**

* Contingency testing interval - pull and/or test samples only at written request of AcelRx..

Total **$[*]**

Stability Testing Requirements:

[*]

Product used for stability testing will be invoiced at current commercial pricing rates.

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

SCHEDULE D

ACTIVE MATERIALS

Active Materials	Supplier
Sufentanil [*]	[*]

ACTIVE MATERIALS CREDIT VALUE

The Active Materials Credit Value will be as follows:

PRODUCT	ACTIVE MATERIALS	ACTIVE MATERIALS CREDIT VALUE
ARX-01	Sufentanil [*]	Client's actual cost for Active Materials not to exceed $[*] per gram.

MAXIMUM CREDIT VALUE

Patheon's liability for Active Materials calculated in accordance with Section 2.2 of the Agreement in a Year will not exceed[*].

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

SCHEDULE E

TECHNICAL DISPUTE RESOLUTION

Technical Disputes which cannot be resolved by negotiation as provided in Section 12.2 will be resolved in the following manner:

1. **Appointment of Expert**. Within ten Business Days after a party requests under Section 12.2 that an expert be appointed to resolve a Technical Dispute, the parties will jointly appoint a mutually acceptable expert with experience and expertise in the subject matter of the dispute. If the parties are unable to so agree within the ten Business Day period, or in the event of disclosure of a conflict by an expert under Paragraph 2 hereof which results in the parties not confirming the appointment of the expert, then an expert (willing to act in that capacity hereunder) will be appointed by an experienced arbitrator on the roster of the American Arbitration Association.

2. **Conflicts of Interest**. Any person appointed as an expert will be entitled to act and continue to act as an expert even if at the time of his appointment or at any time before he gives his determination, he has or may have some interest or duty which conflicts or may conflict with his appointment if before accepting the appointment (or as soon as practicable after he becomes aware of the conflict or potential conflict) he fully discloses the interest or duty and the parties will, after the disclosure, have confirmed his appointment.

3. **Not Arbitrator**. No expert will be deemed to be an arbitrator and the provisions of the American Arbitration Act or of any other applicable statute (foreign or domestic) and the law relating to arbitration will not apply to the expert or the expert's determination or the procedure by which the expert reaches his determination under this Schedule E.

4. **Procedure**. Where an expert is appointed:

(a) (a) **Timing**. The expert will be so appointed on condition that (i) he promptly fixes a reasonable time and place for receiving representations, submissions or information from the parties and that he issues the authorizations to the parties and any relevant third party for the proper conduct of his determination and any hearing and (ii) he renders his decision (with full reasons) within 15 Business Days (or another other date as the parties and the expert may agree) after receipt of all information requested by him under Paragraph 4(b) hereof.

(b) (b) **Disclosure of Evidence**. The parties undertake one to the other to give to any expert all the evidence and information within their respective possession or control as the expert may reasonably consider necessary for determining the matter before him which they will disclose promptly and in any event within five Business Days of a written request from the relevant expert to do so.

(c) (c) **Advisors**. Each party may appoint any counsel, consultants and advisors as it feels appropriate to assist the expert in his determination and so as to present their respective cases so that at all times the parties will co-operate and seek to narrow and limit the issues to be determined.

(d) (d) **Appointment of New Expert**. If within the time specified in Paragraph 4(a) above the expert will not have rendered a decision in accordance with his appointment, a new expert may (at the request of either party) be appointed and the appointment of the existing expert will thereupon cease for the purposes of determining the matter at issue between the parties save this if the existing expert renders his decision with full reasons prior to the appointment of the new expert, then this decision will have effect and the proposed appointment of the new expert will be withdrawn.

(e) (e) **Final and Binding**. The determination of the expert will, except for fraud or manifest error, be final and binding upon the parties.

(f) (f) **Costs**. Each party will bear its own costs for any matter referred to an expert hereunder and, in the absence of express provision in the Agreement to the contrary, the costs and expenses of the expert will be shared equally by the parties.

For greater certainty, the release of the Product for sale or distribution under the applicable marketing approval for the Product will not by itself indicate compliance by Patheon with its obligations for the Manufacturing Services and further that nothing in this Agreement (including this Schedule E) will remove or limit the authority of the relevant qualified person (as specified by the Quality Agreement) to determine whether the Product is to be released for sale or distribution.

SCHEDULE F

COMMERCIAL QUALITY AGREEMENT

SCHEDULE G (Reserved)

SCHEDULE H

QUARTERLY ACTIVE MATERIALS INVENTORY REPORT

TO: ACELRX PHARMACEUTICALS, INC.

FROM: PATHEON PHARMACEUTICALS INC.

RE: Active Materials quarterly inventory report under Section 2.2(a) of the Manufacturing Services Agreement dated December 12, 2012 (the "**Agreement**")

Reporting quarter:			
Active Materials on hand at beginning of quarter:	_____	kg	(A)
Active Materials on hand at end of quarter:	_____	kg	(B)
Quantity Received during quarter:	_____	kg	(C)
Quantity Dispensed[1] during quarter: (A + C – B)	_____	kg	
Quantity Converted during quarter: (total Active Materials in Product produced and not rejected, recalled or returned)	_____	kg	

Capitalized terms used in this report have the meanings given to the terms in the Agreement.

PATHEON PHARMACEUTICALS INC. DATE: _____

Per: _____
Name: _____
Title: _____

[1] Excludes any (i) Active Materials that must be retained by Patheon as samples, (ii) Active Materials contained in Product that must be retained as samples, (iii) Active Materials used in testing (if applicable), and (iv) Active Materials received or consumed in technical transfer activities or development activities, including, without limitation, any regulatory, stability or test batches manufactured during the month.

SCHEDULE I

REPORT OF ANNUAL ACTIVE MATERIALS INVENTORY RECONCILIATION AND CALCULATION OF ACTUAL ANNUAL YIELD

TO: ACELRX PHARMACEUTICALS, INC.

FROM: PATHEON PHARMACEUTICALS INC.

RE: Active Materials annual inventory reconciliation report and calculation of Actual Annual Yield under Section 2.2(a) of the Manufacturing Services Agreement dated December 12, 2012 (the "**Agreement**")

Reporting Year ending:			
Active Materials on hand at beginning of Year:		kg	(A)
Active Materials on hand at end of Year:		kg	(B)
Quantity Received during Year:		kg	(C)
Quantity Dispensed[1] during Year: (A + C – B)		kg	(D)
Quantity Converted during Year: (total Active Materials in Product produced and not rejected, recalled or returned)		kg	(E)
Active Materials Credit Value:	$	/ kg	(F)
Target Yield:		%	(G)
Actual Annual Yield: ((E/D) * 100)		%	(H)
Shortfall: (((G – 3.5) - H)/100) * F * D	$ (if a negative number, insert zero)		(I)

1 Excludes any (i) Active Materials that must be retained by Patheon as samples, (ii) Active Materials contained in Product that must be retained as samples, (iii) Active Materials used in testing (if applicable), and (iv) Active Materials received or consumed in technical transfer activities or development activities, including, without limitation, any regulatory, stability or test batches manufactured during the Year.

Based on the foregoing reimbursement calculation Patheon will reimburse Client the amount of $.

Capitalized terms used in this report have the meanings given to the terms in the Agreement.

DATE:

PATHEON PHARMACEUTICALS INC.

Per:
Name:
Title:

SCHEDULE J (Reserved)

[*] = CERTAIN CONFIDENTIAL INFORMATION CONTAINED IN THIS DOCUMENT, MARKED BY BRACKETS, HAS BEEN OMITTED BECAUSE IT IS BOTH (I) NOT MATERIAL AND (II) IS OF THE TYPE THAT WOULD LIKELY CAUSE COMPETITIVE HARM IF PUBLICLY DISCLOSED.

Exhibit 10.21

AMENDED AND RESTATED CAPITAL EXPENDITURE AND EQUIPMENT AGREEMENT

THIS AMENDED AND RESTATED CAPITAL EXPENDITURE AND EQUIPMENT AGREEMENT (this "Agreement") is made as of December 12, 2012 (the "Effective Date") between

ACELRX PHARMACEUTICALS, INC.,
a corporation existing under the laws of the State of Delaware, located at
575Chesapeake Drive, Redwood City, California 94063 ("AcelRx")**PATHEON**

- and -

PHARMACEUTICALS INC.,
a corporation existing under the laws of the State of Delaware, located at
2110 East Galbraith Road, Cincinnati, Ohio 45237-1625 ("Patheon")

BACKGROUND

AcelRx and Patheon entered into a Manufacturing Services Agreement effective December 12, 2012 (the "MSA") under which Patheon will perform certain commercial supply manufacturing services (the "Services") related to AcelRx's ARX-01 Tablets (the "Product"), which Product will be incorporated into products intended for commercial sale. For clarity, Patheon and AcelRx are parties to a Master Agreement for Pharmaceutical Development Services effective August 7, 2009, as amended (the "Patheon MA"), and Patheon's corporate affiliate, Patheon Inc. ("Patheon Canada") and AcelRx are parties to a Master Agreement for Pharmaceutical Development Services effective October 28, 2009, as amended (the "Patheon Canada MA"), and Patheon and Patheon Canada have and/or are performing clinical trial manufacturing services related to the Product for AcelRx under these existing agreements. In order for Patheon to perform the Services, certain capital expenditures will be required for the purchase and installation of capital equipment and facility modifications at Patheon's facility located at 2110 East Galbraith Road, Cincinnati, Ohio 45237-1625 (the "Facility"). Other capital equipment owned by AcelRx and located at Patheon Canada's manufacturing facilities in Ontario will need to be transferred to the Facility. The parties entered into a Capital Expenditure and Equipment Agreement dated May 25, 2011, that set out the parties' understanding regarding the capital expenditures (the "Capital Agreement"). The parties intend that this Agreement will supersede the Capital Agreement and restate the parties' agreement and undertakings regarding these capital expenditures.

AGREEMENT

NOW, THEREFORE, in consideration of the rights conferred and the obligations assumed herein, and intending to be legally bound, the parties hereby agree as follows:

1. Definitions

"Dedicated Equipment" means the equipment listed in Schedule A, which equipment is to be used by Patheon solely to perform manufacturing services for AcelRx under the Patheon MA, the Patheon Canada MA, or the MSA, and for no other purpose.

"Facility Modifications" means the modifications to the Facility and all related engineering and Facility qualification costs that are listed in Schedule B.

"Project" means the activities to be performed under this Agreement with respect to the purchase, modification, transfer, testing, and qualification of Dedicated Equipment and the performance of Facility Modifications.

2. Performance of the Project

Patheon will perform the Project in compliance with the terms and conditions of this Agreement, AcelRx's instructions, and all applicable laws and regulations. Patheon will perform the Project in accordance with the timeline that will be established by the combined Patheon-AcelRx Project team. This timeline may be modified by mutual agreement of the parties.

With respect to the Dedicated Equipment that will be transferred from Patheon Canada's facilities to the Facility, AcelRx will be responsible for the packaging and transport of the Dedicated Equipment to the Facility. Patheon Canada will allow and support access to the Dedicated Equipment by the AcelRx packaging/transport contractor(s). AcelRx will bear the risk of loss of or damage to the Dedicated Equipment during transit to the Facility, and will obtain insurance covering such risk of loss or damage while in transit. AcelRx will be responsible for obtaining appropriate import and related documentation for the transport of the Dedicated Equipment. Once delivered to the Facility, Patheon will be responsible for the installation of the Dedicated Equipment and for any risk of damage thereof.

3. Expenditures and Payment

(a) The estimated cost for the purchase and, as applicable, transfer of the Dedicated Equipment for use to perform the Services is set forth in Schedule A. AcelRx will agree on the specific Dedicated Equipment to be purchased by Patheon and will agree on the actual purchase price for such equipment prior to Patheon purchasing such equipment. Notwithstanding any other provisions of this Agreement, and provided that AcelRx agrees on the purchase price for the applicable Dedicated Equipment, the individual amount of each item on Schedule A may be increased or decreased to reflect Patheon's actual cost, but the aggregate amount contributed by AcelRx for the Dedicated Equipment will not exceed $[*] (the "Dedicated Equipment Cap") unless there are further modifications or changes in the processes or requirements for the Services or if the assumptions underlying the estimated costs change. If this occurs, the parties will agree on revised cost estimates and a revised maximum aggregate amount to be contributed by AcelRx. At AcelRx's option, AcelRx may purchase some or all of the Dedicated Equipment directly and arrange to have it delivered to the Facility rather than have Patheon purchase the Dedicated Equipment on AcelRx's behalf, in which case the applicable amounts specified in Schedule A for the purchase of such Dedicated Equipment will be deducted from the Dedicated Equipment Cap and will not be payable to Patheon. Upon completion of the project, Patheon will give AcelRx a final Schedule A with the actual costs for each item.

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

(b) The estimated cost for making the Facility Modifications (including related engineering and Facility qualification costs) is set forth in Schedule B. Notwithstanding any other provisions of this Agreement, the individual amount of each item on Schedule B may be increased or decreased to reflect Patheon's actual cost, but the aggregate amount contributed by AcelRx for the Phase I and Phase II Facility Modifications will not exceed $[*] unless there are further modifications or changes in the processes or requirements for the Services or if the assumptions underlying the estimated costs change. If this occurs, the parties will agree on revised cost estimates and a revised maximum aggregate amount to be contributed by AcelRx. Upon completion of the project, Patheon will give AcelRx a final Schedule B with the actual costs for each item. Any reimbursement to AcelRx for the cost of Facility Modifications will be discussed by the parties and, if agreed to, will be addressed in the MSA. For clarity, except as set forth in Section 8(d), nothing in this Agreement obliges Patheon to agree to reimburse AcelRx for the cost of the Facility Modifications.

(c) Subject to the limitations set forth in this Section 3, AcelRx hereby directs Patheon to incur, on its behalf, pre-approved direct out-of-pocket costs for the Dedicated Equipment and the Facility Modifications as set forth in Schedule A and Schedule B, respectively. Patheon will give AcelRx copies of third party invoices for these items (where applicable) within 30 days after Patheon's receipt thereof and will issue its invoice to AcelRx. AcelRx will pay all amounts owing to Patheon within 30 days of the date of the Patheon invoice to enable Patheon to pay all amounts owed under the third party invoices

4. Patheon Use of Facility Modifications and Dedicated Equipment

(a) Patheon may use the Facility Modifications to manufacture third party products but AcelRx Product will have priority over any third party product. Patheon will not use the Facility Modifications to manufacture OEL Category 4 drugs and will follow its internal SOPs to prevent cross-contamination and to ensure proper cleaning of the Facility Modifications after use on third party products. Patheon will pay the following fees to AcelRx for third party use of the Facilities Modifications during the term of this Agreement:

- $[*] for commercial product manufactured
- $[*] for Development work

The use fees will include all development and commercial batches manufactured by Patheon, will be calculated by Patheon as of December 121 of each Year, and will be paid to AcelRx by February 15 of the following Year. The total use fees paid during the term of the Agreement will not exceed the total investment paid by AcelRx for the Facilities Modifications ($[*]).

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

(b) Patheon may only use the Dedicated Equipment to manufacture the Product for AcelRx and not for the manufacture of any other products. Patheon will operate and use the Dedicated Equipment in accordance with its SOPs and the instructions set forth in the applicable equipment operation manual, if any, provided by the manufacturer of the Dedicated Equipment and delivered to Patheon.

(c) In no event shall AcelRx be liable for any use of the Facility Modifications by Patheon. Patheon agrees to indemnify and hold AcelRx and its affiliates, officers, directors, employees and agents harmless from and against all costs (including reasonable attorneys' fees), losses, liabilities, damages, and expenses of any kind arising from (i) the Modified Facility, or (ii) the negligence or misconduct of Patheon, Patheon's affiliates, or their respective personnel with respect to their use of the Dedicated Equipment.

5. Maintenance of Dedicated Equipment and Facility Modifications

(a) Patheon will at its expense perform routine repairs, preventive maintenance, and calibration on the Dedicated Equipment owned by AcelRx. Patheon will have an annual aggregate limit on these costs of $[*] but this limit will not apply if Patheon has been negligent in performing the repairs, maintenance and calibration. Repair, maintenance, and calibration costs, including the cost of spare part purchases or equipment upgrades requested by AcelRx that exceed this annual aggregate limit (other than the costs that result from Patheon's negligence, which costs will be borne by Patheon) will be invoiced to AcelRx at Patheon's actual cost.

(b) Patheon will, at its expense, perform routine repairs, preventive maintenance, calibration and air monitoring per Patheon's SOPs with respect to the Facility Modifications.

(c) Upon prior mutual agreement between the parties on a suitable date for an inspection, Patheon will give AcelRx reasonable access during normal working hours for the inspection of the Dedicated Equipment owned by AcelRx.

(d) Patheon will (i) keep the Dedicated Equipment free from encumbrances, liens, and interests of third parties, (ii) take all necessary care to prevent any damage, loss or theft to the Dedicated Equipment, and (iii) clearly identify all Dedicated Equipment in the Modified Facilities (e.g., by labelling such equipment) and in its books as belonging to AcelRx.

(e) Patheon will promptly notify AcelRx if any accident, loss of or damage occurs to the Dedicated Equipment and Facility Modifications but the notification will be no later than two business days after the occurrence.

6. Title and Risk of Loss of the Equipment and Facility Improvements

The Dedicated Equipment will be owned by AcelRx, which will be the sole legal and beneficial owner thereof. The Facility Modifications will be owned by Patheon, which will be the sole legal and beneficial owner thereof. Patheon will at all times keep the Dedicated Equipment and the Facility Modifications insured against loss, damage or destruction at the replacement cost with inflation adjustment, and Patheon will replace any of these items that are lost, damaged or destroyed. Patheon will name AcelRx as an additional insured on any insurance policy or endorsement that covers the Dedicated Equipment owned by AcelRx, and will provide proof of such insurance to AcelRx upon request.

7. Fees

OVERHEAD FEE

Due to the uniqueness of AcelRx's process and package, significant dedicated space is necessary at the Facility and a minimum return on this space is required. Commencing in 2013 and, in each Year thereafter during the term of the MSA, an annual "Overhead Fee" will be charged to AcelRx. The Overhead Fee will be $200,000 per Year, but will be prorated based on the aggregate revenues recorded by Patheon from AcelRx under both the Development Agreement and the MSA for all services performed by Patheon for any and all AcelRx products (such as the products referred to as ARX-02, ARX-03, and ARX-04, as well as any other future products that AcelRx may develop), including the Product (collectively, "Patheon Revenues") in the prior Year, such that if Patheon recorded at least $[*] in Patheon Revenues in the prior Year, no Overhead Fee will be payable for such Year, but if Patheon recorded less than $[*] in Patheon Revenues in the prior Year, the Overhead Fee payable in such Year shall be pro-rated such that the actual Overhead Fee payable by AcelRx will be equal to $200,000 multiplied by a percentage equal to the percentage that the amount of Patheon Revenues recorded in the prior Year represents of $[*]. For example, if the Patheon Revenues recorded are greater than $[*] in 2012, no Overhead Fee will be due for the Year 2013. If Patheon Revenues recorded in 2012 are equal to $[*], then the Overhead Fee payable by AcelRx for 2013 will be equal to [*]of $200,000, or $[*].

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

If an Overhead Fee is payable for a particular Year, it will be divided into four equal installments, with each installment paid on the last day of each calendar quarter. For example, if the Overhead Fee for 2013 is equal to $[*], AcelRx will pay the first installment of $[*] to Patheon by March 31, 2013, and each subsequent $[*] installment by June 30, September 30, and December 121, 2013, respectively. There will be no Overhead Fee payable for any Year where the total Patheon Revenues recorded in the prior Year exceed $[*]. Patheon acknowledges and agrees that the Overhead Fee is intended to, and does, cover all dedicated space at the Facility for the Product included in the scopes of Phase I and Phase II Manufacturing as outlined on Schedule B. If Patheon is selected to perform Finished Product Packaging, an additional Overhead Fee will be considered by the parties if this packaging cannot be accomplished within the dedicated space covered above.

FACILITY FEES

A. Phase I Facility Fee

AcelRx will pay to Patheon a "Phase I Facility Fee" in the amount of $480,000 to offset taxes incurred and paid by Patheon for Facility Modifications made to the Facility pursuant to this Agreement shown as Phase I on Schedule B in the amount of $1,098,537. Upon execution of this Agreement, AcelRx will pay to Patheon $[*] of the Phase I Facility Fee. The remaining $[*] of the Phase I Facility Fee will be made in five equal quarterly installments of $[*] each, with the first installment payable on October 1, 2012 and the last installment payable on October 1, 2013.

Patheon will reimburse AcelRx for the Phase I Facility Fee paid by AcelRx hereunder over a three-year period, commencing in the Year in which the Application for Marketing Authorization is approved by the FDA. The Phase I Facility Fee reimbursement will be made by Patheon in [*] equal quarterly installments of $[*], with the first installment payable on the first day of the calendar quarter following the date of FDA approval of the Application for Marketing Authorization. For example, if the Application for Marketing Authorization is approved by the FDA on September 15, 2015, Patheon will pay to AcelRx $[*] on October 1, 2015 and an additional $[*] on the first day of each subsequent calendar quarter thereafter until the entire amount of the Phase I Facility Fee has been reimbursed to AcelRx.

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

B. Phase II Facility Fee

The parties are currently in discussions regarding additional facility modifications that will be required to support Phase II Manufacturing. Once the parties have reached agreement regarding the scope and cost of these additional facility modifications, Schedule B and Section 3(b) of this Agreement will be modified to reflect the new capital amounts. The parties have agreed that AcelRx will pay to Patheon a "Phase II Facility Fee" to offset taxes owed by Patheon for these additional facility modifications. The Phase II Facility Fee will be equal to the cost of the facility modifications for Phase II multiplied by Patheon's effective tax rate, but will be prorated based on cumulative Patheon Revenues starting in 2013 as described herein, and will only be payable by AcelRx until such time as the cumulative Patheon Revenues recorded starting in 2013 have reached $[*]. The Phase II Facility Fee will be divided into eight equal quarterly installments and will be paid in arrears so that no installment of the Phase II Facility Fee will be paid until the first day of the calendar quarter commencing after the date on which all facility modifications required under the Phase II capital expenditure have been completed. For example, if all facility modifications required under the Phase II capital expenditure are completed during May 2014, AcelRx will make its first installment payment of the Phase II Facility Fee on July 1, 2014, and would make seven additional quarterly payments with the final payment due July 1, 2016, assuming that Patheon Revenues from AcelRx have not reached the $[*] threshold.

As noted above, the Phase II Facility Fee will be prorated based on cumulative Patheon Revenues of $[*] starting from January 1, 2013. The actual installment amount of the Phase II Facility Fee due for each calendar quarter will be determined based on the cumulative Patheon Revenues recorded from January 1, 2013 as a percentage of $[*]. For clarification, if the cumulative Patheon Revenues recorded up through the first Phase II Facility Fee installment payment are equal to or greater than $[*], no installment payment will be due by AcelRx. If the cumulative Patheon Revenues recorded up through the first Phase II Facility Fee installment payment are less than $[*], the first installment payment of the Phase II Facility Fee due by AcelRx will be equal to one eighth of the Phase II facility fee multiplied by the Patheon Revenues recorded after January 1, 2013 as a percentage of the $[*] per calendar quarter target.

The parties agree that Patheon will reimburse AcelRx for the full amount of the Phase II Facility Fee paid by AcelRx once the cumulative Patheon Revenues recorded on or after January 1, 2013 have reached $[*], regardless of whether at least $[*] of Patheon Revenues were recorded in each calendar quarter. Patheon will, within 30 days after the first day of the applicable calendar quarter, reimburse AcelRx for any installment amounts of the Phase II Facility Fee that have been paid by AcelRx in prior calendar quarters based on a quarterly true-up of the installment amounts of the Phase II Facility Fee paid by AcelRx to date and the total cumulative Patheon Revenues recorded on or after January 1, 2013. Patheon will reimburse to AcelRx all Phase II Facility Fee amounts paid by AcelRx that have not been previously reimbursed by Patheon within 30 days after the cumulative Patheon Revenues recorded on or after January 1, 2013 have reached $[*], even if this cumulative amount is not recorded until after December 121, 2014.

Example of Phase II Facility Fee payment calculations

Example 1:

If the Phase II Facility Fee is equal to $[*], then the portion of the Phase II Facility Fee that could be payable by AcelRx for each calendar quarter is $[*]. If all Facility Modifications required under the Phase II capital expenditure are completed by February 1, 2013, then the first installment of the Phase II Facility Fee is payable on April 1, 2013. If Patheon has recorded $[*] in Patheon Revenues for the first calendar quarter of 2013, AcelRx will owe Patheon [*] of the $[*] installment for the first calendar quarter (i.e., $[*] is [*]% of $[*], so AcelRx owes [*] of the $[*] installment for a total payment of $[*]). If the cumulative Patheon Revenues recorded for 2013 are $[*] at the end of the second calendar quarter of 2013 (i.e., $[*] in Q1 2013 and $[*] in Q2 2013), AcelRx will not owe an installment of the Phase II Facility Fee on July 1, 2013, and instead, Patheon will reimburse to AcelRx the full amount of the first calendar quarter installment ($[*]) no later than 30 days after the first day of the second calendar quarter of 2013.

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

For further clarification, in this example if the cumulative Patheon Revenues recorded as of December 121, 2014 total $[*], AcelRx will have paid Patheon [*] of the Phase II Facility Fee (i.e., $[*] is [*] of $[*], so AcelRx will have paid [*] of $[*], for a total of $[*]) by January 1, 2015. AcelRx will not owe Patheon any further installments of the Phase II Facility Fee and, once Patheon has recorded additional Patheon Revenues of $[*] for a cumulative total of $[*], Patheon will reimburse to AcelRx the $[*] of the Phase II Facility Fee previously paid by AcelRx within 30 days after the date on which the cumulative Patheon Revenues recorded reach at least $[*].

Example 2:

Assuming the Phase II Facility Modifications are completed in May 2014 at a cost of $[*], Patheon's effective tax rate is [*], and as of June 30, 2014 Patheon Revenues from AcelRx are $[*] (starting from January 1, 2013), AcelRx would pay Patheon a Facility Fee installment of $[*] ($[*] *[*] tax rate = $[*]). If in the following quarter, Patheon recognized $[*] in revenue, no installment payment would be due, and Patheon would Reimburse AcelRx for the first $[*] installment payment subject to the previous section.

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

For further clarification, assuming the Phase II Facility Modifications are completed in May 2014 and Patheon Revenues are $[*] as of June 30, 2014 (starting from January 1, 2013), AcelRx would never make a Facility Fee payment, as the $[*] threshold for Patheon Revenues has been met prior to the completion of the Phase II facility.

8. Term; Termination; Effect of Termination on Future Funding

(a) Term; Termination. This Agreement will commence on the Effective Date and, unless earlier terminated as set forth in this Section 8, will continue in effect until the expiration or termination of the MSA, including any extensions thereof. Either party at its sole option may terminate this Agreement upon written notice where the other party has failed to remedy a material breach of any of its obligations under this Agreement within 60 days following receipt of a written notice of the breach that expressly states in reasonable detail the nature of the breach. This Agreement will terminate automatically if the parties have not executed the MSA by December 121, 2012 unless this date is extended by written agreement of the parties. AcelRx will have the right, upon written notice to Patheon, to terminate the portion of the Project applicable to Dedicated Equipment at any time upon written notice to Patheon, in which event the Project will no longer cover the transfer or purchase of Dedicated Equipment and the provisions of Section 8(c) below will apply.

(b) Effect of Termination on Future Funding. If this Agreement or the MSA is terminated, AcelRx's obligation to further fund expenditures under this Agreement will cease upon Patheon's receipt of the notice of termination of this Agreement or the MSA, except for the cost of non-cancelable commitments that are made by Patheon prior to receiving written notice of the termination, and for which AcelRx is responsible under Section 3 of this Agreement If this Agreement terminates automatically due to failure of the parties to enter into the MSA as set forth above in Section 8(a), AcelRx's obligation to fund expenditures under this Agreement will cease as of the automatic termination date except for the cost of non-cancellable commitments that are made by Patheon under this Agreement prior to the automatic termination date. If this Agreement terminates, Patheon will use reasonable efforts to cancel or otherwise reduce the amount of non-cancellable commitments that have been made by Patheon under this Agreement prior to the termination date and for which AcelRx is responsible under Section 3 of this Agreement.

(c) Return of Equipment; Option to Purchase Equipment. If this Agreement expires or is terminated for any reason, or if AcelRx elects to terminate the portion of the Project applicable to the purchase and transfer of Dedicated Equipment in accordance with Section 8(a), AcelRx will remove, or arrange to remove, from the Facility at its expense all Dedicated Equipment that is not purchased by Patheon as provided in this Section 8(c), and will repair or arrange to repair, at its reasonable expense, any damage to the Facility resulting from this removal. AcelRx may, at its sole option, offer to Patheon the option to purchase some or all of the Dedicated Equipment at its depreciated value under a five year straight line depreciation schedule from the date of the original Capital Agreement or 10% of the original purchase price, whichever is greater. If Patheon elects to purchase some or all of the Dedicated Equipment, it will pay AcelRx for the agreed upon purchase price of this equipment within 30 days of electing to purchase the equipment and, as of the date of AcelRx's receipt of the payment, all right, title and interest in and to the purchased equipment will be vested in Patheon.

(d) Refund of Facility Payments for Patheon Material Breach. If AcelRx terminates this Agreement for Patheon's uncured material breach under Section 8(a), Patheon will refund to AcelRx, within 30 days after the date of such termination, the amounts paid by AcelRx to Patheon under this Agreement as set forth below. If AcelRx terminates this Agreement due to Patheon's uncured material breach at any time, Patheon will reimburse AcelRx for 100% of all outstanding amounts paid by AcelRx for Facility Fees. Further, Patheon will reimburse AcelRx for the then current value of all Facility Modifications. The current value of Facility Modifications shall be calculated based on the total cost of the Facility Modification prorated on a monthly basis over a ten year life from the time of completion. For example, if AcelRx terminates this agreement due to Patheon's uncured breach five years (60 months) after the September, 2011 completion date of the Phase I Facility Modifications and three years (36 months) after completion of the Phase II Facility Modifications, then Patheon would reimburse AcelRx for 50.0% of total Phase I cost [(120 - 60) / 120 = .500] and 70% of total Phase II cost [(120 - 36) / 120 = .700].

(e) Survival. Sections 4(a), 4(c), 8(b), 8(c), 8(d), 8(e), 9(b), 9(i) and 98(j) will survive the expiration or termination of this Agreement for any reason.

9. General

(a) All monetary amounts are expressed in the lawful currency of the United States of America.

(b) This Agreement will be construed and enforced in accordance with the laws of the State of Delaware (without regard to principles of conflicts of law).

(c) This Agreement contains the entire understanding of the parties about the subject matter herein and supersedes all previous agreements (oral and written), negotiations and discussions. For clarity, this Agreement is a supplement to, and does not supersede, the Patheon MA. The Confidentiality Agreement between Patheon and AcelRx effective December 22, 2010 (the "CDA") will govern with respect to all disclosures of Information (as such term is defined in the CDA) made by the parties hereunder. The parties agree that the Information exchanged by the parties hereunder may be used as necessary for conducting the activities under this Agreement in addition to use for the Purpose (as such term is defined in the CDA).

(d) The parties may modify or amend the provisions hereof only by an instrument in writing duly executed by both of the parties.

(e) Patheon may not assign or otherwise transfer its rights or obligations hereunder without the prior written consent of AcelRx, this consent not to be unreasonably withheld. AcelRx may assign or otherwise transfer its rights or obligations hereunder without approval from Patheon. But AcelRx will give Patheon prior written notice of any assignment, any assignee will covenant in writing with Patheon to be bound by the terms of this Agreement, and AcelRx will remain liable hereunder.

(f) This Agreement may be signed by facsimile or in two counterparts, each of which when executed and delivered or transmitted, will be considered an original and both of which together will constitute one and the same instrument.

(g) The “Background” section of this document is expressly incorporated into the Agreement.

(h) The parties hereto are independent contractors, and nothing contained in this Agreement is intended, and will not be construed, to place the parties in the relationship of partners, principal and agent, employer/employee or joint venturer. Neither party will have any right, power or authority to bind or obligate the other, nor will either hold itself out as having such right, power or authority.

(i) If any one or more provisions of this Agreement will be found to be illegal or unenforceable in any respect, the validity, legality and enforceability of the remaining provisions will not in any way be affected or impaired thereby, provided the surviving agreement materially comports with the parties’ original intent. The parties will make a good faith effort to replace any such provision with a valid and enforceable one such that the objectives contemplated by the parties when entering this Agreement may be realized.

(j) Waiver or forbearance by either party hereto of any of its rights under this Agreement or applicable law in any one or more instances must be in writing and signed by the waiving party and will not be deemed to constitute a waiver or forbearance of any other right or a further or continuing waiver of such rights.

[Signature page to follow]

IN WITNESS WHEREOF the duly authorized representatives of the parties have executed this Agreement.

AcelRx Pharmaceuticals, Inc.	**Patheon Pharmaceuticals Inc.**
By: /s/ James Welch	By: /s/ Stuart Grant
Name: James Welch	Name: Stuart Grant
Title: Chief Financial Officer	Title: Chief Financial Officer

SCHEDULE A

Dedicated Equipment		Investment	AcelRx Provided
[*]		—	X
[*]		—	X
[*]		—	X
[*]		—	X
[*]		—	X
[*]		—	X
[*]		—	X
Modifications to existing equipment and [*]	$	[*]	
[*]	$	[*]	
In process testing equipment	$	[*]	
Equipment Containment Level Verification IH Study	$	[*]	
Equipment Qualification Cost. This cost will be charged on a time and materials basis, and is estimated to be equal to [*]of the cost of all manufacturing equipment listed in this Schedule A, including equipment provided by AcelRx.	$	[*]	
[*] Design and Qualification Support (Excluding travel expenses to be billed separately)	$	[*]	
Total Dedicated Equipment	$	[*]	

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

SCHEDULE B

Renovated space for process room and corridor with white zone finishes, Cat3B gowning, material airlock, CII Security	$[*]
Utility modifications: existing unit HVAC once thru air, THP monitoring, Compressed air piping, piped Chilled water, piped Purified water, piped city water, Portable Cat3b central vacuum, portable CAT3b dust collection, Misting shower, 230V and 110V power, bottled nitrogen	$[*]
Engineering Cost. This cost will be charged on a time and materials basis, and is estimated to be equal to [*] of the total cost of the first two line items in this table.	$[*]
Facility Qualification Cost. This cost will be charged on a time and materials basis, and is estimated to be equal to [*]of the total cost for the first two line items in this table.	$[*]
Contingency. This cost covers charges for items that have not yet been determined, and is estimated to be equal to [*] of the total cost for the first two line items in this table.	$[*]
[*] line Facility Support	$[*]
Total Phase I	$[*]
Phase II (estimated)	$[*]
[*] Facility Modifications	
Mfg facility - 5-2 Phase 2	
One additional process room, equipment wash, clean equipment room, Airlock modifications and security	$[*]
Utility modifications	
HVAC unit, THP, Utilities (CA, Purified water, CQ, CV, dust collection, elec, and N2)	$[*]
Engineering Cost ([*])	$[*]
Qualification Cost ([*])	$[*]
Contingency ([*])	$[*]
Total Phase II	$[*]
Total Facility Modifications	$[*]

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

[*] = CERTAIN CONFIDENTIAL INFORMATION CONTAINED IN THIS DOCUMENT, MARKED BY BRACKETS, HAS BEEN OMITTED BECAUSE IT IS BOTH (I) NOT MATERIAL AND (II) IS OF THE TYPE THAT WOULD LIKELY CAUSE COMPETITIVE HARM IF PUBLICLY DISCLOSED.

Exhibit 10.23

AMENDMENT #1 TO MANUFACTURING SERVICES AGREEMENT BETWEEN PATHEON PHARMACEUTICALS, INC. AND ACELRX PHARMACEUTICALS, INC.

WHEREAS Patheon Pharmaceuticals Inc. ("Patheon") and AcelRx Pharmaceuticals, Inc. ("AcelRx"), have entered into a Manufacturing Services Agreement effective December 12, 2012 (the "Agreement"). Patheon and AcelRx are each a "Party" and are collectively the "Parties."

AND WHEREAS the Parties wish to amend the Agreement.

NOW THEREFORE, in consideration of the premises hereof and the mutual covenants and conditions hereinafter set forth and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereto, intending to be legally bound, hereby agree as follows:

1. **Section 1.1 (Definitions) of the Agreement is amended as follows:**

   - **"EMA**" means the European Medicines Agency;

   - **"TGA**" means Therapeutic Goods Administration;
   - **"Regulatory Authority**" means the FDA, EMA, TGA and any other foreign regulatory agencies competent to grant marketing approvals for pharmaceutical products, including the Product, in the Territory;
   - **"Territory**" means the geographic area of the United States of America, Canada and Mexico, and their respective territories, the European Union, Switzerland, Liechtenstein, Norway, Iceland, Australia and any other geographic areas that may be added to the Territory upon agreement by the parties in accordance with Section 4.5;

2. **Section 2.1(e)** is amended by adding "and Finished Tablets" after "Bulk Tablets" in the first line.

3. **The language "(if applicable)" is deleted from the header of Section 4.5.**

4. **Section 7.2 (Governmental Agencies) is deleted in its entirely and is replaced with the following:**

   7.2 <u>Governmental Agencies.</u>

   Subject to Section 7.8 and excepting issues of public safety or as mandated by law or regulation, Client shall be solely responsible for communicating, with any governmental agency, including but not limited to governmental agencies responsible for granting regulatory approval for the Product, regarding the Product. But Client will inform Patheon of any communication or activities that directly affect Patheon or Patheon's obligations under this Agreement. If a regulatory authority or any other third party contacts Patheon regarding the Product and unless, in the reasonable opinion of each party's counsel, there is a legal prohibition against doing so, Patheon will permit Client to take part in any communications with the agency or third party, and to receive copies of all communications from the agency or third party within one Business Day of receipt thereof. Unless, in the reasonable opinion of each party's counsel, there is a legal prohibition against doing so, Client will notify Patheon of any communications it has with any governmental agency, including but not limited to governmental agencies responsible for granting regulatory approval for the Products, that directly relate to Patheon's performance of the Manufacturing Services under this Agreement. To the extent practicable, Client will permit Patheon to take part in these communications with the agency, and will provide copies of all such written communications from the agency within one Business Day of receipt thereof.

5. Section 7.7 (Reports) is deleted in its entirely and is replaced with the following:

Section 7.7 <u>Reports.</u>

Patheon will supply on an annual basis all Product data in its control, including release test results, complaint test results, and all investigations (in manufacturing, testing, and storage), that Client reasonably requires in order to complete any filing under any applicable regulatory regime, including any Annual Report that Client is required to file with the FDA or any other Regulatory Authority within the Territory. At the Client's request, Patheon will provide a copy of the Annual Product Review Report to the Client at no additional cost. Any additional report requested by Client beyond the scope of cGMPs and customary FDA or other Regulatory Authority requirements within the Territory will be subject to an additional fee to be agreed upon between Patheon and the Client

6. The header of Section 7.8 (FDA Filings) will now read "<u>FDA and Other Regulatory Filings In the Territory</u>."

7. Schedules A, B and C are deleted in their entirety and replaced with the revised Schedules A, B and C attached.

8. Conflicts, Use of Terms. If there is a conflict between the terms and conditions of the Agreement and the terms and conditions of this Amendment #1, the terms and conditions of this Amendment #1 will control.

No Other Modifications. Except as provided above, the terms and conditions of the Agreement remain unchanged.

IN WITNESS WHEREOF, the Parties have caused this Amendment #1 to be duly executed, effective as of January 19, 2016. The Parties agree that this Amendment #1 may be signed in counterparts.

ACCEPTED AND ACKNOWLEDGED

AcelRx Pharmaceuticals, Inc.		**Patheon Pharmaceuticals Inc.**	
By:	/s/ Howard B. Rosen	By:	/s/ Francis P. McCone
Name:	Howard B. Rosen	Name:	Francis P. McCone
Title:	Interim CEO	Title:	Secretary
Date:	3/9/16	Date:	January 19, 2016

SCHEDULE A

PRODUCT LIST AND SPECIFICATIONS

[*]

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

SCHEDULE B

MINIMUM RUN QUANTITY, ANNUAL VOLUME, AND PRICE

[*]

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

SCHEDULE C

[*]

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

Exhibit 31.1

CERTIFICATIONS

I, Vincent J. Angotti, certify that:

1. I have reviewed this Amendment No. 1 to Form 10-K of AcelRx Pharmaceuticals, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

Date: May 1, 2023

/s/ Vincent J. Angotti

Vincent J. Angotti
Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATIONS

I, Raffi Asadorian, certify that:

1. I have reviewed this Amendment No. 1 to Form 10-K of AcelRx Pharmaceuticals, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

Date: May 1, 2023

/s/ Raffi Asadorian

Raffi Asadorian
Chief Financial Officer
(Principal Financial Officer)