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

FORM 8-K

CURRENT REPORT
Pursuant to Section 13 or 15(d)
of the Securities Exchange Act of 1934

Date of Report (Date of earliest event reported): March 11, 2019

X4 Pharmaceuticals, Inc.
(Exact name of registrant as specified in its charter)

Delaware	**001-38295**	**27-3181608**
(State or other jurisdiction of incorporation)	**(Commission File Number)**	**(IRS Employer Identification No.)**

955 Massachusetts Avenue, 4th Floor **Cambridge, Massachusetts** **(Address of principal executive offices)**	**02139** **(Zip Code)**

Registrant's telephone number, including area code: (857) 529-8300

Arsanis, Inc.
950 Winter Street, Suite 4500
Waltham, Massachusetts 02451
(Former name or former address, if changed since last report)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions (see General Instruction A.2. below):

☐ Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)

☐ Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)

☐ Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))

☐ Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§240.12b-2 of this chapter).

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. ☒

Item 2.01. Completion of Acquisition or Disposition of Assets.

On March 13, 2019, X4 Pharmaceuticals, Inc., formerly Arsanis, Inc. (the "***Company***"), completed its business combination with X4 Therapeutics, Inc., formerly X4 Pharmaceuticals, Inc. ("***X4***"), in accordance with the terms of the Agreement and Plan of Merger, dated as of November 26, 2018, as amended on December 20, 2018 and March 8, 2019 (the "***Merger Agreement***"), by and among the Company, X4 and Artemis AC Corp., a Delaware corporation and a wholly owned subsidiary of the Company ("***Merger Sub***"), pursuant to which, among other matters, Merger Sub merged with and into X4, with X4 continuing as a wholly owned subsidiary of the Company and the surviving corporation of the merger (the "***Merger***"). Effective at 5:00 p.m. EST on March 13, 2019, the Company effected a 1-for-6 reverse stock split of its common stock (the "***Reverse Stock Split***") and changed its name to "X4 Pharmaceuticals, Inc." Following the completion of the Merger, the business conducted by the Company became primarily the business conducted by X4, which is a clinical-stage biopharmaceutical company focused on the discovery, development and commercialization of novel therapeutics for the treatment of rare diseases. Unless noted otherwise, all references to share and per share amounts in this Current Report on Form 8-K reflect the Reverse Stock Split.

Under the terms of the Merger Agreement, at the closing of the Merger, the Company issued an aggregate of approximately 25.7 million shares of its common stock to X4 stockholders, based on a common stock exchange ratio of 0.5702 shares of the Company's common stock for each share of X4 common stock outstanding immediately prior to the Merger and a preferred stock exchange ratio of 0.5702 shares of the Company's common stock for each share of X4 preferred stock outstanding prior to the Merger, in each case before taking into account of the Reverse Stock Split. The exchange ratios were determined through arm's-length negotiations between the Company and X4. The Company also assumed all of the outstanding and unexercised stock options and warrants to purchase shares of X4 capital stock, with the number of shares subject to such options or warrants representing the right to purchase a number of shares of the Company's common stock equal to 0.5702 multiplied by the number of shares of X4 capital stock previously represented by such options or warrants, before taking into account the Reverse Stock Split. The exercise prices of such options and warrants were also appropriately adjusted to reflect the exchange ratio of 0.5702, before taking into account the Reverse Stock Split. As a result of the Reverse Stock Split, the number of shares subject to such options and warrants and the exercise prices of such options and warrants were further adjusted by decreasing the number of shares subject to such options and warrants and increasing the exercise price of such options and warrants on a 1-for-6 Reverse Stock Split basis. The assumed options continue to be governed by the terms of the X4 2015 Employee, Director and Consultant Equity Incentive Plan, as amended, under which the options were originally granted (the "***X4 Plan***"). Upon the closing of the Merger, the Company also assumed the X4 Plan.

Immediately following the Merger and the Reverse Stock Split, there were approximately 6.7 million shares of the Company's common stock outstanding, and the former X4 stockholders owned approximately 4.3 million shares, or 63.7% of the Company's common stock outstanding. In addition, immediately following the Merger and the Reverse Stock Split, the former X4 optionholders held options to purchase approximately 0.8 million shares of the Company's common stock and the former X4 warrantholders held warrants to purchase approximately 0.5 million shares of the Company's common stock. Approximately 24.3% of the Company's common stock outstanding immediately after the Merger is held by stockholders subject to lock-up restrictions, pursuant to which such stockholders have agreed, except in limited circumstances, not to sell or transfer, or engage in swap or similar transactions with respect to, shares of the Company's common stock, including, as applicable, shares received in the Merger and issuable upon exercise of certain warrants and options, for a period of 180 days following the closing of the Merger.

The shares of the Company's common stock issued to the former stockholders of X4 were registered with the U.S. Securities and Exchange Commission (the "***SEC***") on the Company's Registration Statement on Form S-4, as amended (File No. 333-228929) (the "***Registration Statement***").

The shares of the Company's common stock listed on The Nasdaq Global Market, previously trading through the close of business on Wednesday, March 13, 2019 under the ticker symbol "ASNS," will commence trading on The Nasdaq Capital Market, on a post-Reverse Stock Split adjusted basis, under the ticker symbol "XFOR," on Thursday, March 14, 2019. The Company's common stock is represented by a new CUSIP number, 98420X103.

The foregoing description of the Merger Agreement contained herein does not purport to be complete and is qualified in its entirety by reference to the Merger Agreement, including the amendments thereto, which are attached hereto as Exhibits 2.1, 2.2 and 2.3 and are incorporated herein by reference.

Item 2.03. Creation of a Direct Financial Obligation or an Obligation under an Off-Balance Sheet Arrangement of a Registrant.

In October 2018, X4 entered into a loan and security agreement (the "***Hercules Loan Agreement***") with Hercules Capital, Inc. ("***Hercules***"), which provided for aggregate maximum borrowings of up to $13.0 million, consisting of (i) a term loan of up to $8.0 million, which was available upon entering into the agreement, (ii) subject to specified financing conditions, an additional term loan of up to $2.0 million, available for borrowing from January 1, 2019 to March 31, 2019, and (iii) subject to specified financing conditions and the receipt of the second tranche $2.0 million term loan described above, an additional term loan of up to $3.0 million, available for borrowing until March 31, 2019. In October 2018, X4 borrowed $8.0 million under the Hercules Loan Agreement. Borrowings under the Hercules Loan Agreement bear interest at variable rates, with the first tranche bearing interest at a variable rate equal to the greater of (i) 9.5% or (ii) 9.5% plus *the Wall Street Journal* prime rate minus 5.25%, the second tranche bearing interest at a variable rate, subject to completion of specified financing conditions, equal to either (A) the greater of (i) 9.5% or (ii) 9.5% plus *the Wall Street Journal* prime rate minus 5.25% or (B) the greater of (i) 8.75% or (ii) 8.75% plus *the Wall Street Journal* prime rate minus 5.25%, and the third tranche bearing interest at a variable rate equal to the greater of (i) 8.75% or (ii) 8.75% plus *the Wall Street Journal* prime rate minus 5.25%. In an event of default, as defined in the Hercules Loan Agreement, and until such event is no longer continuing, the interest rate applicable to borrowings under the Hercules Loan Agreement would be increased by 4.0%.

Borrowings under the Hercules Loan Agreement are repayable in monthly interest-only payments through August 2019, or a later date upon achievement of specified conditions, and in equal monthly payments of principal and accrued interest from September 2019 until the maturity date of the loan, which is either (i) November 2021 if the second tranche is not borrowed, or (ii) May 2022 if the second tranche is borrowed. At X4's option, X4 may prepay all, but not less than all, of the outstanding borrowings, subject to a prepayment premium of up to 2.0% of the principal amount outstanding as of the date of repayment. In addition, the Hercules Loan Agreement provides for a final payment, payable upon maturity or the repayment in full of all obligations under the agreement, of up to $1.0 million.

Borrowings under the Hercules Loan Agreement are collateralized by substantially all of X4's personal property and other assets, including its intellectual property, until a specified financing condition is met. Under the Hercules Loan Agreement, X4 has agreed to affirmative and negative covenants to which X4 will remain subject until maturity or repayment of the loan in full. The covenants include (a) maintaining a minimum liquidity amount of the lesser of (i) 125% of outstanding borrowings under the Hercules Loan Agreement and (ii) 100% of X4's cash and cash equivalents in an account in which Hercules has a first priority security interest, as well as (b) restrictions on X4's ability to incur additional indebtedness, pay dividends, encumber its intellectual property, or engage in certain fundamental business transactions, such as mergers or acquisitions of other businesses. X4's obligations under the Hercules Loan Agreement are subject to acceleration upon occurrence of specified events of default, including payment default, insolvency and a material adverse change in X4's business, operations or financial or other condition.

In October 2018, in connection with entering into the Hercules Loan Agreement, X4 issued to the lender warrants for the purchase of 210,638 shares of X4 Series B preferred stock at an exercise price of $1.88 per share, which as a result of the Merger and the Reverse Stock Split, became warrants to purchase approximately 20,017 shares of the Company's common stock at an exercise price of $19.80 per share. The warrants were immediately exercisable and expire in October 2028.

In December 2018, X4 entered into the First Amendment to the Hercules Loan Agreement (the "***First Amendment***"), which amended the available borrowing dates of the second tranche from between January 1, 2019 and March 31, 2019 to between December 11, 2018 and December 14, 2018 and amended the term loan maturity date to November 1, 2021. In December 2018, X4 borrowed the additional $2.0 million provided under the First Amendment. In connection with entering into the First Amendment, X4 agreed to issue to the lender warrants to purchase a specified number of shares of X4 preferred stock at an aggregate exercise price of $99,000 at the earliest of

(a) June 30, 2019, (b) the earlier to occur of (i) the date X4 prepays the outstanding borrowings or (ii) the date the outstanding borrowings become due and payable, or (c) on or before the fifth business day following the closing of or the announcement of the termination of the Merger.

The Company intends to issue a warrant to purchase 5,000 shares of the Company's common stock with an exercise price of $19.80 per share (the "***2019 Hercules Warrant***") to Hercules pursuant to the Hercules Loan Agreement as a result of closing of the Merger. The Company expects that the 2019 Hercules Warrant will be exercisable for a period of 10 years from the date of issuance. The issuance of the 2019 Hercules Warrant is expected to be exempt from registration under Section 4(a)(2) of the Securities Act of 1933, as amended (the "***Securities Act***"), relating to sales by an issuer not involving any public offering.

The foregoing description of the Hercules Loan Agreement and the First Amendment contained herein does not purport to be complete and is qualified in its entirety by reference to the Hercules Loan Agreement and the First Amendment, which are attached hereto as Exhibits 10.9 and 10.10, respectively, and are incorporated herein by reference.

Item 3.03. Material Modification to Rights of Security Holders.

As disclosed below under Item 5.07, at the special meeting of the Company's stockholders held on March 11, 2019 (the "***Special Meeting***"), the Company's stockholders approved an amendment to the restated certificate of incorporation of the Company (the "***Stock Split Amendment***") to effect the Reverse Stock Split of the Company's common stock, and approved an amendment to the restated certificate of incorporation of the Company (the "***Name Change Amendment***") to change the Company's name from "Arsanis, Inc." to "X4 Pharmaceuticals, Inc." (the "***Name Change***").

On March 13, 2019, immediately following the closing of the Merger, the Company filed the Stock Split Amendment with the Secretary of State of the State of Delaware to effect the Reverse Stock Split and the Company filed the Name Change Amendment with the Secretary of State of the State of Delaware to effect the Name Change. As a result of the Reverse Stock Split, the number of issued and outstanding shares of the Company's common stock immediately prior to the Reverse Stock Split was reduced to a smaller number of shares, such that every six shares of the Company's common stock held by a stockholder immediately prior to the Reverse Stock Split, including shares of the Company's common stock issued to former X4 stockholders in connection with the Merger, were combined and reclassified into one share of the Company's common stock. Immediately following the Reverse Stock Split, there were approximately 6.7 million shares of the Company's common stock outstanding.

No fractional shares were issued in connection with the Reverse Stock Split. Any fractional shares resulting from the Reverse Stock Split were rounded down to the nearest whole number, and each stockholder who would otherwise be entitled to a fraction of a share of common stock upon the Reverse Stock Split (after aggregating all fractions of a share to which such stockholder would otherwise be entitled) is, in lieu thereof, entitled to receive a cash payment determined by multiplying the average closing price per share of Common Stock on the Nasdaq Global Market on the 10 consecutive trading days prior to March 13, 2019, by the fraction of a share of Common Stock to which each stockholder would otherwise be entitled.

The foregoing descriptions of the Stock Split Amendment and the Name Change Amendment are not complete and are subject to and qualified in their entirety by reference to the Stock Split Amendment and the Name Change Amendment, copies of which are attached hereto as Exhibit 3.1 and Exhibit 3.2, respectively, and are incorporated herein by reference.

Item 5.01. Changes in Control of Registrant.

The information set forth in Item 2.01 of this Current Report on Form 8-K regarding the Merger and the information set forth in Item 5.02 of this Current Report on Form 8-K regarding the Company's board of directors and executive officers following the Merger are incorporated by reference into this Item 5.01.

Item 5.02. Departure of Directors or Certain Officers; Election of Directors; Appointment of Certain Officers; Compensatory Arrangements of Certain Officers.

Directors

In accordance with the Merger Agreement, on March 13, 2019, immediately prior to and effective upon the closing of the Merger, Michael P. Gray, William Clark, M.B.A, Tillman U. Gerngross, Ph.D., Carl Gordon, Ph.D., C.F.A., Terrance McGuire, Claudio Nessi, Ph.D., M.B.A., Michael Ross, Ph.D. and Amy Schulman, J.D. resigned from the Company's board of directors and committees of the board of directors on which they respectively served, which resignations were not the result of any disagreements with the Company relating to the Company's operations, policies or practices.

The Merger Agreement provides that at or immediately after the closing of the Merger, the size of the Company's board of directors will be fixed at seven members consisting of two members designated by the Company, who are David McGirr, M.B.A. and René Russo, Pharm.D., BCPS, and five members designated by X4. In accordance with the Merger Agreement, at the closing of the Merger on March 13, 2019, the board of directors and its committees were reconstituted, with David McGirr, Paula Ragan, Ph.D. and Michael S. Wyzga appointed as Class I directors of the Company whose terms expire at the Company's 2021 annual meeting of stockholders (with Mr. Wyzga to serve as chairman of the board of directors), René Russo and Isaac Blech appointed as Class II directors of the Company whose terms expire at the Company's 2019 annual meeting of stockholders, and Gary J. Bridger, Ph.D. appointed as Class III director of the Company whose term expires at the Company's 2020 annual meeting of stockholders, and with one additional person to be appointed to the Company's board of directors as a Class III director. In addition, David McGirr, Isaac Blech and Michael S. Wyzga were appointed to the Company's Audit Committee (with Mr. McGirr continuing to serve as chair of the committee); Isaac Blech and Gary J. Bridger, Ph.D. were appointed to the Company's Compensation Committee (with Mr. Blech serving as chair of the committee); and Gary J. Bridger, Ph.D., David McGirr and Michael S. Wyzga were appointed to the Company's Nominating and Corporate Governance Committee (with Dr. Bridger serving as chair of the committee). Each of Drs. Bridger, Ragan and Russo and Messrs. Blech, McGirr and Wyzga entered into an indemnification agreement with the Company on March 13, 2019, immediately following the Merger.

Previously, on November 14, 2017, X4 entered into an independent contractor agreement with Gary J. Bridger, Ph.D., pursuant to which Dr. Bridger agreed to provide X4 with strategic advice in support of X4's research and development programs in oncology and WHIM syndrome. The agreement provided for an initial term of six months, which was renewed in accordance with its terms for an additional six months and expired in November 2018. The independent contractor agreement included standard assignment of invention, confidentiality and indemnification provisions. In consideration for the provision of consulting services pursuant to the agreement, Dr. Bridger was paid approximately $105,000. On October 4, 2018, X4 entered into a letter agreement with Dr. Bridger, pursuant to which Dr. Bridger agreed to serve as a member of the X4 board of directors. This letter agreement superseded the independent contractor agreement described above. Pursuant to the letter agreement, X4 granted Dr. Bridger an option to purchase 226,983 shares of its common stock to vest pursuant to the terms of the X4 Plan and a separate non-qualified stock option agreement to be entered into by and between X4 and Dr. Bridger. The letter agreement also specified that Dr. Bridger would be entitled to receive an annual grant of an option to purchase shares of X4 common stock at the level set for independent directors by the X4 board of directors, if any. X4 also agreed to reimburse Dr. Bridger for expenses for which he received prior approval from X4. Either X4 or Dr. Bridger may terminate the letter agreement at any time, for any reason, by giving the other 30 days' prior written notice.

Executive Officers

On March 13, 2019, effective immediately after the closing of the Merger, the Company's board of directors appointed Paula Ragan, Ph.D. as the Company's President, Chief Executive Officer and Secretary and Adam S. Mostafa as the Company's Chief Financial Officer, Treasurer and Assistant Secretary. Each of Dr. Ragan and Mr. Mostafa entered into an indemnification agreement with the Company on March 13, 2019, immediately following the Merger. There are no family relationships among any of the Company's directors and executive officers.

These executive officers received the following Company securities in connection with the closing of the Merger:

- Dr. Ragan received 181,366 shares of the Company's common stock in exchange of her shares of X4 common stock and preferred stock and her options to purchase shares of X4 common stock became options to purchase an aggregate of 246,319 shares of the Company's common stock; and
- Mr. Mostafa's options to purchase shares of X4 common stock became options to purchase an aggregate of 62,633 shares of the Company's common stock.

Paula Ragan, Ph.D. Dr. Ragan, age 48, has been X4's President and Chief Executive Officer and a member of the X4 board of directors since July 2014. She has more than 18 years of experience building companies in the biotechnology industry. From August 2012 to September 2014, Dr. Ragan consulted as Chief Business Officer at Lysosomal Therapeutics Inc., a private biopharmaceutical company, where she led the company's business development activities. Prior to that, from January 2007 to August 2012, Dr. Ragan held leadership roles in corporate development and operations at Genzyme Corporation, a Sanofi company, where she led strategic partnering efforts for Genzyme's Rare Disease business and headed the supply chain planning for Genzyme's flagship commercial products. Other professional roles include business roles at Hydra Biosciences, Oscient Corporation and Celera Corporation. Dr. Ragan received her B.S. from Tufts University and her Ph.D. from Massachusetts Institute of Technology and completed post-doctoral studies at Harvard Medical School. The Company believes that Dr. Ragan's perspective and experience as X4's President and Chief Executive Officer, which provides the board with historic knowledge, operational expertise and continuity, provides her with the qualifications and skills to serve on the Company's board of directors.

On March 13, 2019, in connection with the closing of the Merger, X4 entered into an amended and restated executive employment agreement (the "***CEO Agreement***") with Paula Ragan, Ph.D., pursuant to which Dr. Ragan agreed to continue serving as X4's Chief Executive Officer. Pursuant to the CEO Agreement, Dr. Ragan's compensation consists of base salary at an annual rate approved by the board of directors or an appropriate committee thereof, an annual bonus as determined by the board of directors, but not less than 25% of Dr. Ragan's base salary, fringe benefits, vacation, reimbursement of ordinary and reasonable out-of-pocket expenses and coverage under X4's Directors' and Officers' ("***D&O***") insurance policies, subject to the terms and conditions of such policies. Dr. Ragan's base salary is currently equal to $520,000, with an annual target bonus set at 50% of base salary, subject to review and adjustment each year by the board of directors.

If Dr. Ragan's employment is terminated for any reason, Dr. Ragan will be entitled to receive her accrued but unpaid salary, accrued but unused vacation days, the amount of any properly incurred expenses prior to termination not yet reimbursed and other benefits. In addition to the foregoing, if Dr. Ragan's employment is terminated by X4 without cause or if Dr. Ragan resigns for good reason, each term as defined in the CEO Agreement, Dr. Ragan will be entitled to the following: (a) a continuation of base salary for 12 months, (b) a pro-rata portion of Dr. Ragan's at-target annual bonus for the calendar year in which the termination occurs based on the period worked by Dr. Ragan during such calendar year prior to termination, (c) so long as Dr. Ragan is eligible for coverage under X4's health insurance plan, elects coverage, was covered prior to termination, and elects to exercise her rights under COBRA to continue participation in such plan, X4 will pay the normal share of costs under such plan until the earlier of 12 months from the date of Dr. Ragan's termination, or the date Dr. Ragan is eligible to receive health benefits through another employer, and (d) Dr. Ragan will become vested in the additional number of outstanding time-based equity awards granted to Dr. Ragan by X4 that would have otherwise vested had Dr. Ragan remained employed for an additional 12 months after her termination date. In addition, if Dr. Ragan's employment is terminated without cause or if Dr. Ragan resigns for good reason within the one year period following a change of control, as that term is defined in the CEO Agreement, Dr. Ragan will be entitled to automatic vesting in all outstanding time-based equity awards granted to Dr. Ragan by X4, subject to the terms and conditions of the CEO Agreement. Dr. Ragan agrees to continue to abide by the terms of her non-competition, non-solicitation, non-disclosure and intellectual property agreement.

The foregoing description of the CEO Agreement contained herein does not purport to be complete and is qualified in its entirety by reference to the CEO Agreement, which is attached hereto as Exhibit 10.3 and is incorporated herein by reference.

Adam S. Mostafa. Adam S. Mostafa, age 39, has served as X4's Chief Financial Officer since September 2018. Prior to joining X4, Mr. Mostafa served as chief financial officer of Abpro Corporation, a biotechnology company focused on antibody therapeutics, from June 2016 to August 2018. Prior to that, Mr. Mostafa was a managing director in the healthcare investment banking group at Cantor Fitzgerald from January 2015 to May 2016, and from June 2011 to January 2015, Mr. Mostafa was a senior banker in the healthcare investment banking group at Needham & Company. Prior to that, Mr. Mostafa was a vice president in the investment banking group at CRT Capital Group from March 2007 to May 2011, and from September 2003 to March 2007, Mr. Mostafa was a portfolio management associate in the global stock selection group at AQR Capital. Mr. Mostafa began his career as an analyst in the healthcare investment banking group at Salomon Smith Barney. Mr. Mostafa earned an A.B. in Economics from Brown University.

On March 13, 2019, in connection with the closing of the Merger, X4 entered into an amended and restated executive employment agreement (the "***CFO Agreement***") with Adam S. Mostafa, pursuant to which Mr. Mostafa agreed to continue serving as X4's Chief Financial Officer. Pursuant to the CFO Agreement, Mr. Mostafa's compensation consists of base salary at an annual rate approved by the board if directors or an appropriate committee thereof, an annual bonus as determined by the board of directors but not less than 25% of Mr. Mostafa's base salary, fringe benefits, vacation, reimbursement of ordinary and reasonable out-of-pocket expenses and coverage under X4's D&O insurance policies, subject to the terms and conditions of such policies. Mr. Mostafa's base salary is currently equal to $380,000, with an annual target bonus set at 40% of base salary, subject to review and adjustment each year by the board of directors.

If Mr. Mostafa's employment is terminated for any reason, Mr. Mostafa is entitled to receive his accrued but unpaid salary, accrued but unused vacation days, the amount of any properly incurred expenses prior to termination not yet reimbursed and other benefits. In addition to the foregoing, if Mr. Mostafa's employment is terminated by X4 without cause or if Mr. Mostafa resigns for good reason, each term as defined in the CFO Agreement, Mr. Mostafa will be entitled to the following: (a) a continuation of base salary for six months, (b) a pro-rata portion of Mr. Mostafa's at-target annual bonus for the calendar year in which the termination occurs based on the period worked by Mr. Mostafa during such calendar year prior to termination, (c) so long as Mr. Mostafa is eligible for coverage under X4's health insurance plan, elects coverage, was covered prior to termination, and elects to exercise his rights under COBRA to continue participation in such plan, X4 will pay the normal share of costs under such plan until the earlier of six months from the date of Mr. Mostafa's termination or the date Mr. Mostafa is eligible to receive health benefits through another employer, and (d) Mr. Mostafa will become vested in the additional number of outstanding time-based equity awards granted to Mr. Mostafa by X4 that would have otherwise vested had Mr. Mostafa remained employed for an additional six months after his termination date. In addition, if Mr. Mostafa's employment is terminated without cause or if Mr. Mostafa resigns for good reason within the one year period following a change of control, as that term is defined in the CFO Agreement, Mr. Mostafa will be entitled to automatic vesting in all outstanding time-based equity awards granted to Mr. Mostafa by X4, subject to the terms and conditions of the CFO Agreement. Mr. Mostafa agrees to continue to abide by the terms of his non-competition, non-solicitation, non-disclosure and intellectual property agreement.

The foregoing description of the CFO Agreement contained herein does not purport to be complete and is qualified in its entirety by reference to the CFO Agreement, which is attached hereto as Exhibit 10.4 and is incorporated herein by reference.

Director Compensation Policy

On March 13, 2019, the Company adopted a director compensation policy based on Arsanis's existing director compensation program. Pursuant to the policy, the annual retainer for non-employee directors is $35,000 and the annual retainer for the chair of the board of directors is $75,000. Annual retainers for committee membership are as follows:

Audit committee chairperson	$15,000
Audit committee member	$ 7,500
Compensation committee chairperson	$10,000
Compensation committee member	$ 5,000
Nominating and corporate governance committee chairperson	$ 8,000
Nominating and corporate governance committee member	$ 4,000

These fees are payable in arrears in four equal quarterly installments on the last day of each quarter, provided that the amount of such payment will be prorated for any portion of such quarter that a director is not serving on the Company's board of directors, on such committee or in such position. Non-employee directors are also reimbursed for reasonable out-of-pocket business expenses incurred in connection with attending meetings of the board of directors and any committee of the board of directors on which they serve and in connection with other business related to the board of directors. Directors may also be reimbursed for reasonable out-of-pocket business expenses authorized by the board of directors or a committee that are incurred in connection with attending conferences or meetings with management in accordance with a travel policy, as may be in effect from time to time.

In addition to the above fees, the board of directors may determine that additional committee fees are appropriate and should be payable for any newly created committee of the board of directors.

In addition, the Company grants to new non-employee directors upon their initial election to the board of directors, an option to purchase 6,854 shares of the Company's common stock at an exercise price equal to the closing price of the Company's common stock on the date of grant. Each of these options has a term of 10 years from the date of the award and vests as to 33.3333% of the shares of common stock underlying such option on the first anniversary of the date of grant, with the remainder vesting in equal monthly installments of 2.7777% of the shares of common stock underlying such option until the 36-month anniversary of the date of grant, subject to the non-employee director's continued service as a director. This vesting accelerates as to 100% of the shares upon a change in control of the Company.

Further, on the dates of each of the Company's annual meetings of stockholders, each non-employee director that has served on the Company's board of directors for at least six months automatically receives an option to purchase 3,427 shares of the Company's common stock at an exercise price equal to the closing price of the Company's common stock on the date of the grant. Each of these options has a term of 10 years from the date of the award and vests in equal monthly installments of 8.333% of the shares of the Company's common stock underlying such option until the 12-month anniversary of the date of grant (or, if earlier, the date of the Company's next annual meeting of stockholders following the date of grant) unless otherwise provided at the time of grant, subject to the non-employee director's continued service as a director, with 100% acceleration of vesting upon a change in control of the Company.

The foregoing description of the director compensation policy is not complete and is subject to and qualified in its entirety by reference to the director compensation policy, a copy of which is attached hereto as Exhibit 10.2 and is incorporated herein by reference.

X4 2015 Employee, Director and Consultant Equity Incentive Plan

The X4 Plan has been assumed by the Company such that stock options and other equity-based awards are available for future grant with respect to 180,996 shares of the Company's common stock (which reflects the 1,904,561 shares of X4 common stock available for grant thereunder as of immediately prior to the effective time of the Merger, as adjusted for the common stock exchange ratio and the Reverse Stock Split).

Resignation of Named Executive Officer

On March 13, 2019, immediately prior to and effective upon the closing of the Merger, Michael P. Gray, the Company's President, Chief Executive Officer and Chief Financial Officer, resigned as an officer of the Company. In connection with the resignation of his employment, Mr. Gray is entitled to certain severance payments and benefits and certain of his outstanding options and restricted stock will automatically vest in full, and the period during which he can exercise certain options will be automatically extended, in each case as described in Mr. Gray's amended and restated employment agreement. For additional information regarding these payments and benefits, please refer to "The Merger - Interests of the Arsanis Directors and Executive Officers in the Merger - Merger-Related Compensation of Executive Officers" on pages 174-178 of the Registration Statement.

Item 5.03. Amendments to Articles of Incorporation or Bylaws; Change in Fiscal Year.

To the extent required by Item 5.03 of Form 8-K, the information contained in Item 2.01 and Item 3.03 of this Current Report on Form 8-K is incorporated by reference herein.

Item 5.07 Submission of Matters to a Vote of Security Holders.

The Company convened and adjourned its special meeting of stockholders on March 11, 2019 (the "***Special Meeting***"). At the Special Meeting, 12,635,982 shares of common stock prior to the Reverse Stock Split, or approximately 86.7% of the shares of the Company's common stock outstanding and entitled to vote at the Special Meeting, were present in person or represented by proxy. At the Special Meeting, the stockholders of the Company voted as set forth below on Proposals No. 1 through 5, each of which is described in detail in the Registration Statement.

The final voting results for each matter submitted to a vote of the Company's stockholders, which share amounts do not reflect the Reverse Stock Split, are as follows:

Proposal No. 1. Approval of the Merger Agreement.

Proposal to approve the Merger Agreement, by and among the Company, X4 and Merger Sub, and the transactions contemplated thereby, including the merger and the issuance of shares of Company common stock to X4's stockholders pursuant to the terms of the Merger Agreement:

Votes For	Votes Against	Abstentions	Broker Non-Votes
10,529,713	47,435	5,068	2,053,766

Proposal No. 2. Approval of the Amendment to the Restated Certificate of Incorporation of the Company to Effect the Reverse Stock Split.

Proposal to approve an amendment to the Company's restated certificate of incorporation effecting a reverse stock split of Company common stock at a ratio mutually agreed to between the Company and X4 in the range of one new share for every four (4) to eight (8) shares outstanding (or any number in between):

Votes For	Votes Against	Abstentions
12,371,924	203,752	60,306

Proposal No. 3. Approval of the Amendment to the Restated Certificate of Incorporation of the Company to Effect the Name Change.

Proposal to approve an amendment to the Company's restated certificate of incorporation changing the Company's corporate name from "Arsanis, Inc." to "X4 Pharmaceuticals, Inc.":

Votes For	Votes Against	Abstentions
12,563,014	58,610	14,358

Proposal No. 4. Approval of the Potential Financing.

Proposal to approve, for purposes of Nasdaq Listing Rules 5635(a), (b) and (d), the sale of up to 45.0 million shares of the Company's common stock, and/or securities convertible into or exercisable for shares of the Company's common stock, in the aggregate (subject to adjustment for any stock split, recapitalization or reverse stock split (including the Reverse Stock Split) effected prior to the offerings), for gross proceeds of up to $60.0 million with a maximum 30.0% effective discount to the market price of the Company's common stock at the time of entering into binding agreement(s) for the issuance:

Votes For	Votes Against	Abstentions	Broker Non-Votes
10,388,559	172,226	21,431	2,053,766

Proposal No. 5. Approval of Possible Adjournment of the Special Meeting.

Proposal to consider and vote upon an adjournment of the Special Meeting, if necessary, to solicit additional proxies if there are not sufficient votes in favor of Proposal Nos. 1, 2, 3 or 4:

Votes For	Votes Against	Abstentions
12,374,132	241,697	20,153

Item 8.01. Other Events.

On March 13, 2019, the Company issued a press release announcing the completion of the Merger, the Reverse Stock Split and the Name Change. A copy of the press release is attached as Exhibit 99.1 to this Current Report on Form 8-K.

Item 9.01. Financial Statements and Exhibits.

(a) Financial Statements of Businesses Acquired.

The Company intends to file the financial statements of X4 required by Item 9.01(a) as part of an amendment to this Current Report on Form 8-K not later than 71 calendar days after the date this Current Report on Form 8-K is required to be filed.

(b) Pro Forma Financial Information.

The Company intends to file the pro forma financial information required by Item 9.01(b) as part of an amendment to this Current Report on Form 8-K not later than 71 calendar days after the date this Current Report on Form 8-K is required to be filed.

(d) Exhibits

Exhibit No.	Description
2.1*±	Agreement and Plan of Merger, dated November 26, 2018, by and among the Company, Artemis AC Corp. and X4 Therapeutics, Inc. (formerly X4 Pharmaceuticals, Inc.) (incorporated by reference from Exhibit 2.1 to the Current Report on Form 8-K filed with the SEC on November 27, 2018, File No. 001-38295).
2.2*	First Amendment to Agreement and Plan of Merger, dated December 20, 2018, by and among the Company, Artemis AC Corp. and X4 Therapeutics, Inc. (formerly X4 Pharmaceuticals, Inc.) (incorporated by reference from Exhibit 2.1 to the Current Report on Form 8-K, as filed with the Securities and Exchange Commission on December 20, 2018, File No. 001-38295).
2.3*	Second Amendment to Agreement and Plan of Merger, dated March 8, 2019, by and among the Company, Artemis AC Corp. and X4 Therapeutics, Inc. (formerly X4 Pharmaceutical, Inc.) (incorporated by reference from Exhibit 2.1 to the Current Report on Form 8-K, as filed with the Securities and Exchange Commission on March 8, 2019, File No. 001-38295).

3.1	Certificate of Amendment (Reverse Stock Split) to the Restated Certificate of Incorporation of the Company.
3.2	Certificate of Amendment (Name Change) to the Restated Certificate of Incorporation of the Company.
4.1	Form of Common Stock Certificate.
4.2	Form of Warrant to Purchase Series A Preferred Stock of X4 Therapeutics, Inc. (formerly X4 Pharmaceuticals, Inc.) issued to Silicon Valley Bank and Life Science Loans, LLC.
4.3	Form of Warrant to Purchase Series A Preferred Stock of X4 Therapeutics, Inc. (formerly X4 Pharmaceuticals, Inc.) issued to Maxim Partners LLC.
4.4	Form of Warrant to Purchase Series B Preferred Stock of X4 Therapeutics, Inc. (formerly X4 Pharmaceuticals, Inc.).
4.5	Form of Warrant to Purchase Series B Preferred Stock of X4 Therapeutics, Inc. (formerly X4 Pharmaceuticals, Inc.) issued to Hercules Capital, Inc.
4.6	Warrant Modification Agreement, dated as of December 11, 2018, by and among X4 Therapeutics, Inc. (formerly X4 Pharmaceuticals, Inc.) and Hercules Capital, Inc.
10.1.1@	2015 Employee, Director and Consultant Equity Incentive Plan, as amended.
10.1.2@	Form of Stock Option Agreement under the 2015 Employee, Director and Consultant Equity Incentive Plan, as amended.
10.2@	Director Compensation Policy.
10.3@	Amended and Restated Executive Employment Agreement, dated as of March 13, 2019, by and between the Company and Paula Ragan, Ph.D.
10.4@	Amended and Restated Executive Employment Agreement, dated as of March 13, 2019, by and between the Company and Adam S. Mostafa.
10.5#	License Agreement, dated as of July 10, 2014, by and between X4 Therapeutics, Inc. (formerly X4 Pharmaceuticals, LLC) and Genzyme Corp., a Sanofi company.
10.6#	Amendment No. 1 to License Agreement, dated as of October 23, 2014, by and between X4 Therapeutics, Inc. (formerly X4 Pharmaceuticals, Inc.) and Genzyme Corporation, a Sanofi company.
10.7#	License Agreement, dated as of December 13, 2016, by and between X4 Therapeutics, Inc. (formerly X4 Pharmaceuticals, Inc.) and Georgetown University.
10.8#	Exclusive License Agreement, dated as of December 23, 2016, by and between X4 Therapeutics, Inc. (formerly X4 Pharmaceuticals, Inc.) and Beth Israel Deaconess Medical Center.
10.9	Loan and Security Agreement, dated as of October 19, 2018, by and between X4 Therapeutics, Inc. (formerly X4 Pharmaceuticals, Inc.) and Hercules Capital, Inc.
10.10	Amendment No. 1 to Loan and Security Agreement, dated as of December 11, 2018, by and between X4 Therapeutics, Inc. (formerly X4 Pharmaceuticals, Inc.) and Hercules Capital, Inc.
10.11	Lease, dated as of January 20, 2017, by and between X4 Therapeutics, Inc. (formerly X4 Pharmaceuticals, Inc.) and Brickman 955 Massachusetts LLC.
99.1	Press Release dated March 13, 2019.

± All schedules (or similar attachments) have been omitted from this filing pursuant to Item 601(b)(2) of Regulation S-K. X4 Pharmaceuticals, Inc. will furnish copies of any schedules to the U.S. Securities and Exchange Commission upon request.

* Previously filed.

@ Management contract or compensatory plans or arrangements.

Confidential treatment is being requested for portions of this exhibit. These portions have been omitted from this report and are being filed separately with the U.S. Securities and Exchange Commission.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

X4 PHARMACEUTICALS, INC.

Date: March 13, 2019

By: /s/ Paula Ragan, Ph.D.
Paula Ragan, Ph.D.
President and Chief Executive Officer

CERTIFICATE OF AMENDMENT OF THE RESTATED CERTIFICATE OF INCORPORATION OF ARSANIS, INC.

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

Arsanis, Inc. (the "Corporation"), a corporation organized and existing under and by virtue of the provisions of the General Corporation Law of the State of Delaware (the "General Corporation Law"),

DOES HEREBY CERTIFY:

1. A resolution was duly adopted by the Board of Directors of the Corporation pursuant to Section 242 of the General Corporation Law proposing this Amendment of the Corporation's Restated Certificate of Incorporation and declaring the advisability of this Amendment of the Restated Certificate of Incorporation and authorizing the appropriate officers of the Corporation to solicit the consent of the stockholders therefor, which resolution setting forth the proposed amendment is as follows:

RESOLVED, that the first paragraph of Article FOURTH of the Restated Certificate of Incorporation of the Corporation, as amended, be and hereby is deleted in its entirety and the following paragraphs are inserted in lieu thereof:

"FOURTH. Effective as of 5:00 p.m. on March 13, 2019 (the "Effective Time"), a one-for-six reverse stock split of the Corporation's common stock, par value $0.001 per share (the "Common Stock"), shall become effective, pursuant to which each six shares of Common Stock outstanding and held of record by each stockholder of the Corporation (including treasury shares) immediately prior to the Effective Time shall be reclassified and combined into one validly issued, fully paid and nonassessable share of Common Stock automatically and without any action by the holder thereof upon the Effective Time and shall represent one share of Common Stock from and after the Effective Time (such reclassification and combination of shares, the "Reverse Stock Split"). The par value of the Common Stock following the Reverse Stock Split shall remain at $0.001 per share. No fractional shares of Common Stock shall be issued as a result of the Reverse Stock Split and, in lieu thereof, upon surrender after the Effective Time of a certificate which formerly represented shares of Common Stock that were issued and outstanding immediately prior to the Effective Time, any person who would otherwise be entitled to a fractional share of Common Stock as a result of the Reverse Stock Split, following the Effective Time, shall be entitled to receive a cash payment equal to the fraction of a share of Common Stock to which such holder would otherwise be entitled multiplied by the fair value per share of the Common Stock immediately prior to the Effective Time as determined by the Board of Directors of the Corporation.

Each stock certificate that, immediately prior to the Effective Time, represented shares of Common Stock that were issued and outstanding immediately prior to the Effective Time shall, from and after the Effective Time, automatically and without the necessity of presenting the same for exchange, represent that number of whole shares of Common Stock after the Effective Time into which the shares formerly represented by such certificate have been reclassified (as well as the right to receive cash in lieu of fractional shares of Common Stock after the Effective Time); provided, however, that each person of record holding a certificate that represented shares of Common Stock that were issued and outstanding immediately prior to the Effective Time shall receive, upon surrender of such certificate, a new certificate evidencing and representing the number of whole shares of Common Stock after the Effective Time into which the shares of Common Stock formerly represented by such certificate shall have been reclassified.

The total number of shares of all classes of stock which the Corporation shall have authority to issue is 43,333,333 shares, consisting of (i) 33,333,333 shares of Common Stock, $0.001 par value per

share (“Common Stock”), and (ii) 10,000,000 shares of Preferred Stock, $0.001 par value per share (“Preferred Stock”).”

2. This Certificate of Amendment of the Restated Certificate of Incorporation has been duly adopted by the stockholders of the Corporation in accordance with the provisions of Section 242 of the General Corporation Law.

[Remainder of page intentionally blank]

IN WITNESS WHEREOF, this Corporation has caused this Certificate of Amendment of the Restated Certificate of Incorporation to be signed by its President and Chief Executive Officer this 13th day of March, 2019.

/s/ Paula Ragan, Ph.D.
Paula Ragan, Ph.D.
President and Chief Executive Officer

Exhibit 3.2

CERTIFICATE OF AMENDMENT OF THE RESTATED CERTIFICATE OF INCORPORATION OF ARSANIS, INC.

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

Arsanis, Inc. (the "Corporation"), a corporation organized and existing under and by virtue of the provisions of the General Corporation Law of the State of Delaware (the "General Corporation Law"),

DOES HEREBY CERTIFY:

1. A resolution was duly adopted by the Board of Directors of the Corporation pursuant to Section 242 of the General Corporation Law proposing this Amendment of the Corporation's Restated Certificate of Incorporation and declaring the advisability of this Amendment of the Restated Certificate of Incorporation and authorizing the appropriate officers of the Corporation to solicit the consent of the stockholders therefor, which resolution setting forth the proposed amendment is as follows:

RESOLVED, that Article FIRST of the Restated Certificate of Incorporation of the Corporation, as amended, be and hereby is deleted in its entirety and the following is inserted in lieu thereof:

"FIRST: Effective immediately upon the filing of this Certificate of Amendment of the Restated Certificate of Incorporation with the Secretary of State of the State of Delaware, the name of the Corporation is X4 Pharmaceuticals, Inc."

2. This Certificate of Amendment of the Restated Certificate of Incorporation has been duly adopted by the stockholders of the Corporation in accordance with the provisions of Section 242 of the General Corporation Law.

[Remainder of page intentionally blank]

IN WITNESS WHEREOF, this Corporation has caused this Certificate of Amendment of the Restated Certificate of Incorporation to be signed by its President and Chief Executive Officer this 13th day of March, 2019.

/s/ Paula Ragan, Ph.D.
Paula Ragan, Ph.D.
President and Chief Executive Officer

ZQ|CERT#|COY|CLS|RGSTRY|ACCT#|TRANSTYPE|RUN#|TRANS#

COMMON STOCK

PAR VALUE $0.001

COMMON STOCK

Certificate Number

ZQ00000000

Shares

X4 PHARMACEUTICALS

X4 PHARMACEUTICALS, INC.

INCORPORATED UNDER THE LAWS OF THE STATE OF DELAWARE

THIS CERTIFIES THAT

MR. SAMPLE & MRS. SAMPLE &
MR. SAMPLE & MRS. SAMPLE

SEE REVERSE FOR CERTAIN DEFINITIONS

CUSIP 98420X 10 3

is the owner of

***ZERO HUNDRED THOUSAND
ZERO HUNDRED AND ZERO***

THIS CERTIFICATE IS TRANSFERABLE IN CITIES DESIGNATED BY THE TRANSFER AGENT, AVAILABLE ONLINE AT www.computershare.com

FULLY-PAID AND NON-ASSESSABLE SHARES OF COMMON STOCK OF

X4 Pharmaceuticals, Inc. (hereinafter called the "Company"), transferable on the books of the Company in person or by duly authorized attorney, upon surrender of this Certificate properly endorsed. This Certificate and the shares represented hereby, are issued and shall be held subject to all of the provisions of the Certificate of Incorporation, as amended, and the By-Laws, as amended, of the Company (copies of which are on file with the Company and with the Transfer Agent), to all of which each holder, by acceptance hereof, assents. This Certificate is not valid unless countersigned and registered by the Transfer Agent and Registrar.

Witness the facsimile seal of the Company and the facsimile signatures of its duly authorized officers.

DATED DD-MMM-YYYY

President

Treasurer

X4 PHARMACEUTICALS, INC. CORPORATE SEAL August 2, 2010 DELAWARE

COUNTERSIGNED AND REGISTERED:
COMPUTERSHARE TRUST COMPANY, N.A.
TRANSFER AGENT AND REGISTRAR,

By _____
AUTHORIZED SIGNATURE

SECURITY INSTRUCTIONS ON REVERSE

1234567

X4 PHARMACEUTICALS
935 Massachusetts Avenue, 4th Floor, Cambridge, MA 02139

MR A SAMPLE
DESIGNATION (IF ANY)
ADD 1
ADD 2
ADD 3
ADD 4

CUSIP/IDENTIFIER	98420X 10 3
Holder ID	XXXXXXXXXX
Insurance Value	1,000,000.00
Number of Shares	123456
DTC	12345678 12345678901234

Certificate Numbers	Num	No. Denom.	Total
12345678901234567890	1	1	1
12345678901234567890	2	2	2
12345678901234567890	3	3	3
12345678901234567890	4	4	4
12345678901234567890	5	5	5
12345678901234567890	6	6	6
Total Transaction			7

X4 PHARMACEUTICALS, INC.

THE COMPANY WILL FURNISH WITHOUT CHARGE TO EACH SHAREHOLDER WHO SO REQUESTS, A SUMMARY OF THE POWERS, DESIGNATIONS, PREFERENCES AND RELATIVE, PARTICIPATING, OPTIONAL OR OTHER SPECIAL RIGHTS OF EACH CLASS OF STOCK OF THE COMPANY AND THE QUALIFICATIONS, LIMITATIONS OR RESTRICTIONS OF SUCH PREFERENCES AND RIGHTS, AND THE VARIATIONS IN RIGHTS, PREFERENCES AND LIMITATIONS DETERMINED FOR EACH SERIES, WHICH ARE FIXED BY THE CERTIFICATE OF INCORPORATION OF THE COMPANY, AS AMENDED, AND THE RESOLUTIONS OF THE BOARD OF DIRECTORS OF THE COMPANY, AND THE AUTHORITY OF THE BOARD OF DIRECTORS TO DETERMINE VARIATIONS FOR FUTURE SERIES. SUCH REQUEST MAY BE MADE TO THE OFFICE OF THE SECRETARY OF THE COMPANY OR TO THE TRANSFER AGENT. THE BOARD OF DIRECTORS MAY REQUIRE THE OWNER OF A LOST OR DESTROYED STOCK CERTIFICATE, OR HIS LEGAL REPRESENTATIVES, TO GIVE THE COMPANY A BOND TO INDEMNIFY IT AND ITS TRANSFER AGENTS AND REGISTRARS AGAINST ANY CLAIM THAT MAY BE MADE AGAINST THEM ON ACCOUNT OF THE ALLEGED LOSS OR DESTRUCTION OF ANY SUCH CERTIFICATE.

The following abbreviations, when used in the inscription on the face of this certificate, shall be construed as though they were written out in full according to applicable laws or regulations:

TEN COM	- as tenants in common	UNIF GIFT MIN ACT	-.....(Cust).....Custodian.....(Minor).....
TEN ENT	- as tenants by the entireties		under Uniform Gifts to Minors Act.....(State).....
JT TEN	- as joint tenants with right of survivorship and not as tenants in common	UNIF TRF MIN ACT	-.....(Cust).....Custodian (until age.....)
			.....(Minor).....under Uniform Transfers to Minors Act.....(State).....

Additional abbreviations may also be used though not in the above list.

For value received, _____ hereby sell, assign and transfer unto

PLEASE INSERT SOCIAL SECURITY OR OTHER IDENTIFYING NUMBER OF ASSIGNEE

_____

(PLEASE PRINT OR TYPEWRITE NAME AND ADDRESS, INCLUDING POSTAL ZIP CODE, OF ASSIGNEE)

_____

_____

_____ Shares

of the common stock represented by the within Certificate, and do hereby irrevocably constitute and appoint

_____ Attorney

to transfer the said stock on the books of the within-named Incorporation with full power of substitution in the premises.

Dated: _____ 20____

Signature: _____

Signature: _____

Notice: The signature to this assignment must correspond with the name as written upon the face of the certificate, in every particular, without alteration or enlargement, or any change whatever.

Signature(s) Guaranteed: Medallion Guarantee Stamp

THE SIGNATURE(S) SHOULD BE GUARANTEED BY AN ELIGIBLE GUARANTOR INSTITUTION (Banks, Stockbrokers, Savings and Loan Associations and Credit Unions) WITH MEMBERSHIP IN AN APPROVED SIGNATURE GUARANTEE MEDALLION PROGRAM, PURSUANT TO S.E.C. RULE 17Ad-15.

SECURITY INSTRUCTIONS

THIS IS WATERMARKED PAPER. DO NOT ACCEPT WITHOUT NOTING WATERMARK. HOLD TO LIGHT TO VERIFY WATERMARK.

The IRS requires that the named transfer agent ("we") report the cost basis of certain shares or units acquired after January 1, 2011. If your shares or units are covered by the legislation, and you requested to sell or transfer the shares or units using a specific cost basis calculation method, then we have processed as you requested. If you did not specify a cost basis calculation method, then we have defaulted to the first in, first out (FIFO) method. Please consult your tax advisor if you need additional information about cost basis.

If you do not keep in contact with the issuer or do not have any activity in your account for the time period specified by state law, your property may become subject to state unclaimed property laws and transferred to the appropriate state.

153427

THIS WARRANT AND THE SHARES ISSUABLE HEREUNDER HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "**ACT**"), OR THE SECURITIES LAWS OF ANY STATE AND, EXCEPT AS SET FORTH IN SECTIONS 5.3 AND 5.4 BELOW, MAY NOT BE OFFERED, SOLD, PLEDGED OR OTHERWISE TRANSFERRED UNLESS AND UNTIL REGISTERED UNDER SAID ACT AND LAWS OR, IN THE OPINION OF LEGAL COUNSEL IN FORM AND SUBSTANCE SATISFACTORY TO THE ISSUER, SUCH OFFER, SALE, PLEDGE OR OTHER TRANSFER IS EXEMPT FROM SUCH REGISTRATION.

WARRANT TO PURCHASE STOCK

Company: X4 Pharmaceuticals, Inc., a Delaware corporation
Number of Shares: As set forth in Paragraph A below
Type/Series of Stock: Series A Preferred Stock, $0.001 par value per share
Warrant Price: $1.88 per Share, subject to adjustment as set forth herein
Issue Date: October 25, 2016
Expiration Date: October 24, 2026 **See also Section 5.1(b).**
Credit Facility: This Warrant to Purchase Stock ("**Warrant**") is issued in connection with that certain Mezzanine Loan and Security Agreement of even date herewith between Silicon Valley Bank and the Company (as amended and/or modified and in effect from time to time, the "**Loan Agreement**") [and the participation therein of Life Science Loans, LLC pursuant to an agreement between Silicon Valley Bank and Life Science Loans, LLC].

THIS WARRANT CERTIFIES THAT, for good and valuable consideration, [SILICON VALLEY BANK / LIFE SCIENCE LOANS, LLC] (together with any successor or permitted assignee or transferee of this Warrant or of any shares issued upon exercise hereof, "**Holder**") is entitled to purchase up to such number of fully paid and non-assessable shares of the above-stated Type/Series of Stock (the "**Class**") of the above-named company (the "**Company**") as determined pursuant to Paragraph A below, at the above-stated Warrant Price, all as set forth above and as adjusted pursuant to Section 2 of this Warrant, subject to the provisions and upon the terms and conditions set forth in this Warrant. [Reference is made to Section 5.4 of this Warrant whereby Silicon Valley Bank shall transfer this Warrant to its parent company, SVB Financial Group.]

A. Number of Shares. This Warrant shall be exercisable for the Initial Shares, plus the Additional Shares, if any (collectively, and as may be adjusted from time to time in accordance with the provisions of this Warrant, the "**Shares**").

(1) Initial Shares. As used herein "**Initial Shares**" means 27,128 shares of the Class, subject to adjustment from time to time in accordance with the provisions of this Warrant.

(2) Additional Shares. Upon the making, if any, of the Term B Loan Advance (as defined in the Loan Agreement) to the Company in any amount, this Warrant automatically shall become exercisable for an additional 18,085 shares of the Class, as such number may be adjusted from time to time in accordance with the provisions of this Warrant (the "**Additional Shares**"), including, without limitation, adjustments in respect of events occurring prior to the

date, if any, on which this Warrant becomes exercisable for the Additional Shares as if they constituted "Shares" hereunder at all times from and after the Issue Date.

SECTION 1. EXERCISE.

1.1 Method of Exercise. Holder may at any time and from time to time exercise this Warrant, in whole or in part, by delivering to the Company the original of this Warrant together with a duly executed Notice of Exercise in substantially the form attached hereto as Appendix 1 and, unless Holder is exercising this Warrant pursuant to a cashless exercise set forth in Section 1.2, a check, wire transfer of same-day funds (to an account designated by the Company), or other form of payment acceptable to the Company for the aggregate Warrant Price for the Shares being purchased.

1.2 Cashless Exercise. On any exercise of this Warrant, in lieu of payment of the aggregate Warrant Price in the manner as specified in Section 1.1 above, but otherwise in accordance with the requirements of Section 1.1, Holder may elect to receive Shares equal to the value of this Warrant, or portion hereof as to which this Warrant is being exercised. Thereupon, the Company shall issue to the Holder such number of fully paid and non-assessable Shares as are computed using the following formula:

$$X = Y(A-B)/A$$

where:

X = the number of Shares to be issued to the Holder;

Y = the number of Shares with respect to which this Warrant is being exercised (inclusive of the Shares surrendered to the Company in payment of the aggregate Warrant Price);

A = the Fair Market Value (as determined pursuant to Section 1.3 below) of one Share; and

B = the Warrant Price.

1.3 Fair Market Value. If the Company's common stock is then traded or quoted on a nationally recognized securities exchange, inter-dealer quotation system or over-the-counter market (a "**Trading Market**") and the Class is common stock, the fair market value of a Share shall be the closing price or last sale price of a share of common stock reported for the Business Day immediately before the date on which Holder delivers this Warrant together with its Notice of Exercise to the Company. If the Company's common stock is then traded in a Trading Market and the Class is a series of the Company's convertible preferred stock, the fair market value of a Share shall be the closing price or last sale price of a share of the Company's common stock reported for the Business Day immediately before the date on which Holder delivers this Warrant together with its Notice of Exercise to the Company multiplied by the number of shares of the Company's common stock into which a Share is then convertible. If the Company's common stock is not traded in a Trading Market, the Board of Directors of the Company shall determine the fair market value of a Share in its reasonable good faith judgment.

1.4 Delivery of Certificate and New Warrant. Within a reasonable time after Holder exercises this Warrant in the manner set forth in Section 1.1 or 1.2 above, the Company shall deliver to Holder a certificate representing the Shares issued to Holder upon such exercise and, if this Warrant has not been fully exercised and has not expired, a new warrant of like tenor representing the Shares not so acquired.

1.5 Replacement of Warrant. On receipt of evidence reasonably satisfactory to the Company of the loss, theft, destruction or mutilation of this Warrant and, in the case of loss, theft or destruction, on delivery of an indemnity agreement reasonably satisfactory in form, substance and amount to the Company or, in the case of mutilation, on surrender of this Warrant to the Company for cancellation, the Company shall, within a reasonable time, execute and deliver to Holder, in lieu of this Warrant, a new warrant of like tenor and amount.

1.6 Treatment of Warrant Upon Acquisition of Company.

(a) Acquisition. For the purpose of this Warrant, "**Acquisition**" means any transaction or series of related transactions involving: (i) the sale, lease, exclusive license, or other disposition of all or substantially all of the assets of the Company; (ii) any merger or consolidation of the Company into or with another person or entity (other than a merger or consolidation effected exclusively to change the Company's domicile), or any other corporate reorganization, in which the stockholders of the Company in their capacity as such immediately prior to such merger, consolidation or reorganization, own less than a majority of the Company's (or the surviving or successor entity's) outstanding voting power immediately after such merger, consolidation or reorganization (or, if such Company stockholders beneficially own a majority of the outstanding voting power of the surviving or successor entity as of immediately after such merger, consolidation or reorganization, such surviving or successor entity is not the Company); or (iii) any sale or other transfer by the stockholders of the Company of shares representing at least a majority of the Company's then-total outstanding combined voting power.

(b) Treatment of Warrant at Acquisition. In the event of an Acquisition in which the consideration to be received by the Company's stockholders consists solely of cash, solely of Marketable Securities or a combination of cash and Marketable Securities (a "**Cash/Public Acquisition**"), and the fair market value of one Share as determined in accordance with Section 1.3 above would be greater than the Warrant Price in effect on such date immediately prior to such Cash/Public Acquisition, and Holder has not exercised this Warrant pursuant to Section 1.1 above as to all Shares, then this Warrant shall automatically be deemed to be Cashless Exercised pursuant to Section 1.2 above as to all Shares effective immediately prior to and contingent upon the consummation of a Cash/Public Acquisition. In connection with such Cashless Exercise, Holder shall be deemed to have restated each of the representations and warranties in Section 4 of the Warrant as of the date thereof and the Company shall promptly notify the Holder of the number of Shares (or such other securities) issued upon exercise. In the event of a Cash/Public Acquisition where the fair market value of one Share as determined in accordance with Section 1.3 above would be less than the Warrant Price in effect immediately prior to such Cash/Public Acquisition, then this Warrant will expire immediately prior to the consummation of such Cash/Public Acquisition.

(c) Upon the closing of any Acquisition other than a Cash/Public Acquisition, the acquiring, surviving or successor entity shall assume the obligations of this Warrant, and this Warrant shall thereafter be exercisable for the same securities and/or other property as would have been paid for the Shares issuable upon exercise of the unexercised portion of this Warrant as if such Shares were outstanding on and as of the closing of such Acquisition, subject to further adjustment from time to time in accordance with the provisions of this Warrant.

(d) As used in this Warrant "**Marketable Securities**" means securities meeting all of the following requirements: (i) the issuer thereof is then subject to the reporting requirements of Section 13 or Section 15(d) of the Securities Exchange Act of 1934, as amended (the "**Exchange Act**"), and is then current in its filing of all required reports and other information under the Act and the Exchange Act; (ii) the class and series of shares or other security of the issuer that would be received by Holder in connection with the Acquisition were Holder to exercise this Warrant on or prior to the closing thereof is then traded in a Trading Market, and (iii) following the closing of such Acquisition, Holder would not be restricted from publicly re-selling all of the issuer's shares and/or other securities that would be received by Holder in such Acquisition were Holder to exercise this Warrant in full on or prior to the closing of such Acquisition, except to the extent that any such restriction (x) arises solely under federal or state securities laws, rules or regulations, and (y) does not extend beyond six (6) months from the closing of such Acquisition.

1.7 Voting Agreement. Upon any exercise of this Warrant, Holder shall, if the Company so requests in writing, become a party to, by execution and delivery to the Company of a counterpart signature page, joinder agreement, instrument of accession or similar instrument, that certain Amended and Restated Voting Agreement, dated August 15, 2015 by and among the Company and the other parties thereto and the other parties thereto, as amended and/or restated and in effect from time to time (the "**Voting Agreement**"), solely with respect to the Shares issued upon such exercise (and the shares of common stock, if any, issued upon conversion of such Shares), solely to the extent that all holders of outstanding shares of the Class are then parties thereto, and solely to the extent that such agreement is then by its terms in force and effect.

SECTION 2. ADJUSTMENTS TO THE SHARES AND WARRANT PRICE.

2.1 Stock Dividends, Splits, Etc. If the Company declares or pays a dividend or distribution on the outstanding shares of the Class payable in common stock or other securities or property (other than cash), then upon exercise of this Warrant, for each Share acquired, Holder shall receive, without additional cost to Holder, the total number and kind of securities and property which Holder would have received had Holder owned the Shares of record as of the date the dividend or distribution occurred. If the Company subdivides the outstanding shares of the Class by reclassification or otherwise into a greater number of shares, the number of Shares purchasable hereunder shall be proportionately increased and the Warrant Price shall be proportionately decreased. If the outstanding shares of the Class are combined or consolidated, by reclassification or otherwise, into a lesser number of shares, the Warrant Price shall be proportionately increased and the number of Shares shall be proportionately decreased.

2.2 Reclassification, Exchange Combinations or Substitution. Upon any event whereby all of the outstanding shares of the Class are reclassified, exchanged, combined, substituted, or replaced for, into, with or by Company securities of a different class and/or series,

then from and after the consummation of such event, this Warrant will be exercisable for the number, class and series of Company securities that Holder would have received had the Shares been outstanding on and as of the consummation of such event, and subject to further adjustment thereafter from time to time in accordance with the provisions of this Warrant. The provisions of this Section 2.2 shall similarly apply to successive reclassifications, exchanges, combinations, substitutions, replacements or other similar events.

2.3 Conversion of Preferred Stock. If the Class is a class and series of the Company's convertible preferred stock, in the event that all outstanding shares of the Class are converted, automatically or by action of the holders thereof, into common stock pursuant to the provisions of the Company's Certificate of Incorporation, including, without limitation, in connection with the Company's initial, underwritten public offering and sale of its common stock pursuant to an effective registration statement under the Act (the "**IPO**") then from and after the date on which all outstanding shares of the Class have been so converted, this Warrant shall be exercisable for such number of shares of common stock into which the Shares would have been converted had the Shares been outstanding on the date of such conversion, and the Warrant Price shall equal the Warrant Price in effect as of immediately prior to such conversion divided by the number of shares of common stock into which one Share would have been converted, all subject to further adjustment thereafter from time to time in accordance with the provisions of this Warrant.

2.4 Adjustments for Diluting Issuances. Without duplication of any adjustment otherwise provided for in this Section 2, the number of shares of common stock issuable upon conversion of the Shares shall be subject to anti-dilution adjustment from time to time in the manner set forth in the Company's Certificate of Incorporation as if the Shares were issued and outstanding on and as of the date of any such required adjustment.

2.5 No Fractional Share. No fractional Share shall be issuable upon exercise of this Warrant and the number of Shares to be issued shall be rounded down to the nearest whole Share. If a fractional Share interest arises upon any exercise of the Warrant, the Company shall eliminate such fractional Share interest by paying Holder in cash the amount computed by multiplying the fractional interest by (i) the fair market value (as determined in accordance with Section 1.3 above) of a full Share, less (ii) the then-effective Warrant Price.

2.6 Notice/Certificate as to Adjustments. Upon each adjustment of the Warrant Price, Class and/or number of Shares, the Company, at the Company's expense, shall notify Holder in writing within a reasonable time setting forth the adjustments to the Warrant Price, Class and/or number of Shares and facts upon which such adjustment is based. The Company shall, upon written request from Holder, furnish Holder with a certificate of its Chief Financial Officer, including computations of such adjustment and the Warrant Price, Class and number of Shares in effect upon the date of such adjustment.

SECTION 3. REPRESENTATIONS AND COVENANTS OF THE COMPANY.

3.1 Representations and Warranties. The Company represents and warrants to, and agrees with, the Holder as follows:

(a) The initial Warrant Price referenced on the first page of this Warrant is not greater than the price per share at which shares of the Class were last sold and issued prior to the Issue Date hereof in an arms-length transaction in which at least $500,000 of such shares were sold.

(b) All Shares which may be issued upon the exercise of this Warrant, and all securities, if any, issuable upon conversion of the Shares, shall, upon issuance in accordance with the terms of this Warrant (and, in the case of any such conversion securities, the terms of the Company's Certificate of Incorporation), be duly authorized, validly issued, fully paid and non-assessable, and free of any liens and encumbrances except for restrictions on transfer provided for herein, under applicable federal and state securities laws or under the Voting Agreement (to the extent Holder is then a party thereto or is required by the terms of Section 1.7 above to become a party). The Company covenants that it shall at all times cause to be reserved and kept available out of its authorized and unissued capital stock such number of shares of the Class, common stock and other securities as will be sufficient to permit the exercise in full of this Warrant and the conversion of the Shares into common stock or such other securities.

(c) The Company's capitalization table attached hereto as Schedule 1 is true and complete, in all material respects, as of the Issue Date.

3.2 Notice of Certain Events. If the Company proposes at any time to:

(a) declare any dividend or distribution upon the outstanding shares of the Class or common stock, whether in cash, property, stock, or other securities and whether or not a regular cash dividend;

(b) offer for subscription or sale pro rata to the holders of the outstanding shares of the Class any additional shares of any class or series of the Company's stock (other than pursuant to contractual pre-emptive rights);

(c) effect any reclassification, exchange, combination, substitution, reorganization or recapitalization of the outstanding shares of the Class;

(d) effect an Acquisition or to liquidate, dissolve or wind up; or

(e) effect an IPO;

then, in connection with each such event, the Company shall give Holder:

(1) in the case of the matters referred to in (a) and (b) above, at least seven (7) Business Days prior written notice of the earlier to occur of the effective date thereof or the date on which a record will be taken for such dividend, distribution, or subscription rights (and specifying the date on which the holders of outstanding shares of the Class will be entitled thereto) or for determining rights to vote, if any;

(2) in the case of the matters referred to in (c) and (d) above at least seven (7) Business Days prior written notice of the date when the same will take

place (and specifying the date on which the holders of outstanding shares of the Class will be entitled to exchange their shares for the securities or other property deliverable upon the occurrence of such event and such reasonable information as Holder may reasonably require regarding the treatment of this Warrant in connection with such event giving rise to the notice); and

(3) with respect to the IPO, at least seven (7) Business Days prior written notice of the date on which the Company proposes to file its registration statement in connection therewith.

The Company will also provide information requested by Holder that is reasonably necessary to enable Holder to comply with Holder's accounting or reporting requirements.

SECTION 4. REPRESENTATIONS AND WARRANTIES OF THE HOLDER.

The Holder represents and warrants to the Company as follows:

4.1 Purchase for Own Account. This Warrant and the securities to be acquired upon exercise of this Warrant by Holder are being acquired for investment for Holder's account, not as a nominee or agent, and not with a view to the public resale or distribution within the meaning of the Act. Holder also represents that it has not been formed for the specific purpose of acquiring this Warrant or the Shares.

4.2 Disclosure of Information. Holder is aware of the Company's business affairs and financial condition and has received or has had full access to all the information it considers necessary or appropriate to make an informed investment decision with respect to the acquisition of this Warrant and its underlying securities. Holder further has had an opportunity to ask questions and receive answers from the Company regarding the terms and conditions of the offering of this Warrant and its underlying securities and to obtain additional information (to the extent the Company possessed such information or could acquire it without unreasonable effort or expense) necessary to verify any information furnished to Holder or to which Holder has access.

4.3 Investment Experience. Holder understands that the purchase of this Warrant and its underlying securities involves substantial risk. Holder has experience as an investor in securities of companies in the development stage and acknowledges that Holder can bear the economic risk of such Holder's investment in this Warrant and its underlying securities and has such knowledge and experience in financial or business matters that Holder is capable of evaluating the merits and risks of its investment in this Warrant and its underlying securities and/or has a preexisting personal or business relationship with the Company and certain of its officers, directors or controlling persons of a nature and duration that enables Holder to be aware of the character, business acumen and financial circumstances of such persons.

4.4 Accredited Investor Status. Holder is an "accredited investor" within the meaning of Regulation D promulgated under the Act.

4.5 The Act. Holder understands that this Warrant and the Shares issuable upon exercise hereof have not been registered under the Act in reliance upon a specific exemption therefrom, which exemption depends upon, among other things, the bona fide nature of the

Holder's investment intent as expressed herein. Holder understands that this Warrant and the Shares issued upon any exercise hereof must be held indefinitely unless subsequently registered under the Act and qualified under applicable state securities laws, or unless exemption from such registration and qualification are otherwise available. Holder is aware of the provisions of Rule 144 promulgated under the Act.

4.6 Market Stand-off Agreement. The Holder agrees that the Shares shall be subject to the Market Standoff provisions in Section 2.11 of the Company's Investor Rights Agreement, as amended and in effect from time to time.

4.7 No Voting Rights. Holder, as a Holder of this Warrant, will not have any voting rights until the exercise of this Warrant.

SECTION 5. MISCELLANEOUS.

5.1 Term; Automatic Cashless Exercise Upon Expiration.

(a) Term. Subject to the provisions of Section 1.6 above, this Warrant is exercisable in whole or in part at any time and from time to time on or before 6:00 PM, Pacific time, on the Expiration Date and shall be void thereafter.

(b) Automatic Cashless Exercise upon Expiration. In the event that, upon the Expiration Date, the fair market value of one Share (or other security issuable upon the exercise hereof) as determined in accordance with Section 1.3 above is greater than the Warrant Price in effect on such date, then this Warrant shall automatically be deemed on and as of such date to be exercised pursuant to Section 1.2 above as to all Shares (or such other securities) for which it shall not previously have been exercised, and the Company shall, within a reasonable time, deliver a certificate representing the Shares (or such other securities) issued upon such exercise to Holder.

5.2 Legends. Each certificate evidencing Shares (and each certificate evidencing securities issued upon conversion of any Shares, if any) shall be imprinted with a legend in substantially the following form:

THE SHARES EVIDENCED BY THIS CERTIFICATE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "**ACT**") OR THE SECURITIES LAWS OF ANY STATE AND, EXCEPT AS SET FORTH IN THAT CERTAIN WARRANT TO PURCHASE STOCK ISSUED BY THE ISSUER TO [SILICON VALLEY BANK / LIFE SCIENCE LOANS, LLC] DATED OCTOBER 25, 2016, MAY NOT BE OFFERED, SOLD, PLEDGED OR OTHERWISE TRANSFERRED UNLESS AND UNTIL REGISTERED UNDER SAID ACT AND LAWS OR, IN THE OPINION OF LEGAL COUNSEL IN FORM AND SUBSTANCE SATISFACTORY TO THE ISSUER, SUCH OFFER, SALE, PLEDGE OR OTHER TRANSFER IS EXEMPT FROM SUCH REGISTRATION.

5.3 Compliance with Securities Laws on Transfer. This Warrant and the Shares issued upon exercise of this Warrant (and the securities issuable, directly or indirectly, upon conversion of the Shares, if any) may not be transferred or assigned in whole or in part except in compliance

with applicable federal and state securities laws by the transferor and the transferee (including, without limitation, the delivery of investment representation letters and legal opinions reasonably satisfactory to the Company, as reasonably requested by the Company). The Company shall not require Holder to provide an opinion of counsel if the transfer is to [SVB Financial Group (Silicon Valley Bank's parent company) or any other] [an] affiliate of Holder, provided that [any] such [transferee / affiliate] is an "accredited investor" as defined in Regulation D promulgated under the Act. Additionally, the Company shall also not require an opinion of counsel if there is no material question as to the availability of Rule 144 promulgated under the Act.

5.4 Transfer Procedure. [After receipt by Silicon Valley Bank of the executed Warrant, Silicon Valley Bank will transfer all of this Warrant to its parent company, SVB Financial Group. By its acceptance of this Warrant, SVB Financial Group hereby makes to the Company each of the representations and warranties set forth in Section 4 hereof and agrees to be bound by all of the terms and conditions of this Warrant as if the original Holder hereof.] Subject to the provisions of Section 5.3 and upon providing the Company with written notice, [SVB Financial Group and any subsequent] Holder may transfer all or part of this Warrant or the Shares issued upon exercise of this Warrant (or the securities issued upon conversion of the Shares, if any) to any transferee, provided, however, in connection with any such transfer, [SVB Financial Group or any subsequent] Holder will give the Company notice of the portion of the Warrant and/or Shares (and/or securities issued upon conversion of the Shares, if any) being transferred with the name, address and taxpayer identification number of the transferee and Holder will surrender this Warrant to the Company for reissuance to the transferee(s) (and Holder if applicable); and provided further, that any subsequent transferee [other than SVB Financial Group] shall agree in writing with the Company to be bound by all of the terms and conditions of this Warrant. Notwithstanding any contrary provision herein, at all times prior to the IPO, Holder may not, without the Company's prior written consent, transfer this Warrant or any portion hereof, or any Shares issued upon any exercise hereof, or any shares or other securities issued upon any conversion of any Shares issued upon any exercise hereof, to any person or entity who directly competes with the Company, except in connection with an Acquisition of the Company by such a direct competitor.

5.5 Notices. All notices and other communications hereunder from the Company to the Holder, or vice versa, shall be deemed delivered and effective (i) when given personally, (ii) on the third (3rd) Business Day after being mailed by first-class registered or certified mail, postage prepaid, (iii) upon actual receipt if given by facsimile or electronic mail and such receipt is confirmed in writing by the recipient, or (iv) on the first Business Day following delivery to a reliable overnight courier service, courier fee prepaid, in any case at such address as may have been furnished to the Company or Holder, as the case may be, in writing by the Company or such Holder from time to time in accordance with the provisions of this Section 5.5. All notices to Holder shall be addressed as follows until the Company receives notice of a change of address in connection with a transfer or otherwise:

[___]
Attn: [___]
[___]
[___]
Telephone: [___]
Facsimile: [___]

Email address: [___]

Notice to the Company shall be addressed as follows until Holder receives notice of a change in address:

X4 Pharmaceuticals, Inc.
Attn: Chief Financial Officer
784 Memorial Drive, Suite 140
Cambridge, MA 02139
Telephone:
Facsimile:
Email:

With a copy (which shall not constitute notice) to:

Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.
Attn: Meryl J. Epstein, Esq.
One Financial Center, Boston, MA 02111
Telephone: (617) 348-1635
Facsimile: (617) 542-2241
Email: mjepstein@mintz.com

5.6 Waiver. This Warrant and any term hereof may be changed, waived, discharged or terminated (either generally or in a particular instance and either retroactively or prospectively) only by an instrument in writing signed by the party against which enforcement of such change, waiver, discharge or termination is sought.

5.7 Attorneys' Fees. In the event of any dispute between the parties concerning the terms and provisions of this Warrant, the party prevailing in such dispute shall be entitled to collect from the other party all costs incurred in such dispute, including reasonable attorneys' fees.

5.8 Counterparts; Facsimile/Electronic Signatures. This Warrant may be executed in counterparts, all of which together shall constitute one and the same agreement. Any signature page delivered electronically or by facsimile shall be binding to the same extent as an original signature page with regards to any agreement subject to the terms hereof or any amendment thereto.

5.9 Governing Law. This Warrant shall be governed by and construed in accordance with the laws of the State of California, without giving effect to its principles regarding conflicts of law.

5.10 Headings. The headings in this Warrant are for purposes of reference only and shall not limit or otherwise affect the meaning of any provision of this Warrant.

5.11 Business Days. "**Business Day**" is any day that is not a Saturday, Sunday or a day on which [Silicon Valley Bank is] [banks in Washington are] closed.

[Remainder of page left blank intentionally]

[Signature page follows]

IN WITNESS WHEREOF, the parties have caused this Warrant to Purchase Stock to be executed by their duly authorized representatives effective as of the Issue Date written above.

"COMPANY"

X4 PHARMACEUTICALS, INC.

By: _____
Name: _____
(Print)
Title: _____

"HOLDER"

[SILICON VALLEY BANK / LIFE SCIENCE LOANS, LLC]

By: _____
Name: _____
(Print)
Title: _____

APPENDIX 1

NOTICE OF EXERCISE

1. The undersigned Holder hereby exercises its right to purchase _____ shares of the Common/Series _____ Preferred [circle one] Stock of _____ (the "**Company**") in accordance with the attached Warrant To Purchase Stock, and tenders payment of the aggregate Warrant Price for such shares as follows:

[ ] check in the amount of $_____ payable to order of the Company enclosed herewith

[ ] Wire transfer of immediately available funds to the Company's account

[ ] Cashless Exercise pursuant to Section 1.2 of the Warrant

[ ] Other [Describe] _____

2. Please issue a certificate or certificates representing the Shares in the name specified below:

_____

Holder's Name

_____

_____

(Address)

3. By its execution below and for the benefit of the Company, Holder hereby restates each of the representations and warranties in Section 4 of the Warrant to Purchase Stock as of the date hereof.

HOLDER:

_____

By: _____

Name: _____

Title: _____

(Date): _____

Form of Maxim Warrant

THIS WARRANT AND THE UNDERLYING SECURITIES ISSUABLE UPON THE EXERCISE THEREOF HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT"). NO SALE OR DISPOSITION MAY BE EFFECTED EXCEPT IN COMPLIANCE WITH RULE 144 UNDER SAID ACT OR AN EFFECTIVE REGISTRATION STATEMENT RELATED THERETO OR AN OPINION OF COUNSEL FOR THE HOLDER SATISFACTORY TO THE COMPANY THAT SUCH REGISTRATION IS NOT REQUIRED UNDER THE ACT.

X4 PHARMACEUTICALS, INC.

WARRANT TO PURCHASE PREFERRED STOCK

No. 2015-__ **_____, 2015**

VOID AFTER _____, 2020

THIS CERTIFIES THAT, for value received, **Maxim Partners, LLC**, with its principal office at 405 Lexington Ave., New York, NY 10174, or assigns (the "***Holder***"), is entitled to subscribe for and purchase from **X4 PHARMACEUTICALS, INC**, a Delaware corporation, with its principal office at 784 Memorial Drive, Suite #140, Cambridge, MA 02139 (the "***Company***"), the Exercise Shares at the Exercise Price (each subject to adjustment as provided herein). Unless indicated otherwise, the aggregate number of Exercise Shares that Holder may purchase by exercising this Warrant is equal to [____] Exercise Shares, subject to adjustment pursuant to the terms hereof, including but not limited to adjustments pursuant to Sections 5 and 7 below.

1. DEFINITIONS. Capitalized terms used but not defined herein shall have the meanings set forth in the Agreement. As used herein, the following terms shall have the following respective meanings:

(a) "***Equity Securities***" shall mean shares of the Company's shares of Series A Preferred Stock, par value U.S. $0.001 per share.

(b) "***Exercise Period***" shall mean the period commencing on the date hereof and ending five (5) years later, unless sooner terminated as provided below

(c) "***Exercise Price***" shall mean $2.07; provided, that, the Exercise Price shall be subject to adjustment pursuant to Sections 5 and 7 below.

(d) "***Exercise Shares***" shall mean the Equity Securities issuable upon exercise of this Warrant and any Conversion Securities (as defined below).

2. EXERCISE OF WARRANT. The rights represented by this Warrant may be exercised in whole or in part at any time during the Exercise Period, by delivery of the following to the Company at its address set forth above (or at such other address as it may designate by notice in writing to the Holder):

(a) an executed Notice of Exercise in the form attached hereto;

(b) payment of the Exercise Price either (i) in cash or by check, (ii) by wire transfer or (iii) pursuant to Section 2.1 below; and

(c) this Warrant.

Upon the exercise of the rights represented by this Warrant, a certificate or certificates for the Exercise Shares so purchased, registered in the name of the Holder shall be issued and delivered to the Holder within a reasonable time after the rights represented by this Warrant shall have been so exercised. In the event that this Warrant is being exercised for less than all of the then-current number of Exercise Shares purchasable hereunder, the Company shall, concurrently with the issuance by the Company of the number of Exercise Shares for which this Warrant is then being exercised, issue a new Warrant exercisable for the remaining number of Exercise Shares purchasable hereunder.

The person in whose name any certificate or certificates for Exercise Shares are to be issued upon exercise of this Warrant shall be deemed to have become the holder of record of such shares on the date on which this Warrant was surrendered and payment of the Exercise Price was made, irrespective of the date of delivery of such certificate or certificates, except that, if the date of such surrender and payment is a date when the stock transfer books of the Company are closed, such person shall be deemed to have become the holder of such shares at the close of business on the next succeeding date on which the stock transfer books are open.

2.1 Net Exercise. Notwithstanding any provisions herein to the contrary, if the fair market value of one Exercise Share is greater than the Exercise Price (at the date of calculation as set forth below), in lieu of exercising this Warrant by payment of cash, the Holder may elect to receive shares equal to the value (as determined below) of this Warrant (or the portion thereof being canceled) by surrender of this Warrant at the principal office of the Company together with the properly endorsed Notice of Exercise in which event the Company shall issue to the Holder a number of Exercise Shares computed using the following formula:

$$X = \frac{Y\,(A-B)}{A}$$

Where X = the number of Exercise Shares to be issued to the Holder

Y = the number of Exercise Shares purchasable under the Warrant or, if only a portion of the Warrant is being exercised, that portion of the Warrant being canceled (at the date of such calculation)

A = the fair market value of one Exercise Share (at the date of such calculation)

B = Exercise Price (as adjusted to the date of such calculation)

For purposes of the above calculation, the fair market value of one Exercise Share shall be determined by the Company's Board of Directors in good faith; provided, however, that in the event that this Warrant is exercised pursuant to this Section 2.1 in connection with the Company's initial public offering of its Common Stock, the fair market value per share shall be the product of (i) the per share offering price to the public of the Company's initial public offering, and (ii) the number of shares of Common Stock into which each Exercise Share is convertible at the time of such exercise.

3. COVENANTS OF THE COMPANY.

3.1 Covenants as to Exercise Shares. Except as provided in the last sentence of this Section 3.1, the Company covenants and agrees that all Exercise Shares that may be issued upon the exercise of the rights represented by this Warrant will, upon issuance, be validly issued and outstanding, fully paid and nonassessable, and free from all taxes, liens and charges with respect to the issuance thereof. The Company further covenants and agrees that the Company will at all times during the Exercise Period, have authorized and reserved, free from preemptive rights, a sufficient number of shares of the series of equity securities comprising the Exercise Shares to provide for the exercise of the rights represented by this Warrant. If at any time during the Exercise Period the number of authorized but unissued shares of such series of the Company's equity securities shall not be sufficient to permit exercise of this Warrant, the Company will take such corporate action as may, in the opinion of its counsel, be necessary to increase its authorized but unissued shares of such series of the Company's equity securities to such number of shares as shall be sufficient for such purposes.

3.2 Notices of Record Date. In the event of any taking by the Company of a record of the holders of any class of securities for the purpose of determining the holders thereof who are entitled to receive any dividend or other distribution, the Company shall mail to the Holder, at least ten (10) days prior to the date specified herein, a notice specifying the date on which any such record is to be taken for the purpose of such dividend or distribution.

4. REPRESENTATIONS OF HOLDER.

4.1 Acquisition of Warrant for Personal Account. The Holder represents and warrants that it is acquiring the Warrant and the Exercise Shares solely for its account for investment and not with a view to or for sale or distribution of said Warrant or Exercise Shares or any part thereof. The Holder also represents that the entire legal and beneficial interests of the Warrant and Exercise Shares the Holder is acquiring is being acquired for, and will be held for, its account only.

4.2 Securities Are Not Registered.

(a) The Holder understands that the Warrant and the Exercise Shares have not been registered under the Securities Act of 1933, as amended (the "***Act***") on the basis that no distribution or public offering of the stock of the Company is to be effected. The Holder realizes that the basis for the exemption may not be present if, notwithstanding its representations, the Holder has a present intention of acquiring the securities for a fixed or determinable period in the future, selling (in connection with a distribution or otherwise), granting any participation in, or otherwise distributing the securities. The Holder has no such present intention.

(b) The Holder recognizes that the Warrant and the Exercise Shares must be held indefinitely unless they are subsequently registered under the Act or an exemption from such registration is available. The Holder recognizes that the Company has no obligation to register the Warrant or the Exercise Shares of the Company, or to comply with any exemption from such registration.

(c) The Holder is aware that neither the Warrant nor the Exercise Shares may be sold pursuant to Rule 144 adopted under the Act unless certain conditions are met, including, among other things, the existence of a public market for the shares, the availability of certain current public information about the Company, the resale following the required holding period under Rule 144 and the number of shares being sold during any three month period not exceeding specified limitations. Holder is aware that the conditions for resale set forth in Rule 144 have not been satisfied and that the Company presently has no plans to satisfy these conditions in the foreseeable future.

4.3 Disposition of Warrant and Exercise Shares.

(a) The Holder further agrees not to make any disposition of all or any part of the Warrant or Exercise Shares in any event unless and until:

(i) the Company shall have received a letter secured by the Holder from the Securities and Exchange Commission stating that no action will be recommended to the Commission with respect to the proposed disposition;

(ii) there is then in effect a registration statement under the Act covering such proposed disposition and such disposition is made in accordance with said registration statement; or

(iii) the Holder shall have notified the Company of the proposed disposition and shall have furnished the Company with a detailed statement of the circumstances surrounding the proposed disposition, and if reasonably requested by the Company, the Holder shall have furnished the Company with an opinion of counsel, reasonably satisfactory to the Company, for the Holder to the effect that such disposition will not require registration of such Warrant or Exercise Shares under the Act or any applicable state securities laws.

(b) The Holder understands and agrees that all certificates evidencing the shares to be issued to the Holder may bear the following legend:

> THESE SECURITIES HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "***ACT***"). THEY MAY NOT BE SOLD, OFFERED FOR SALE, PLEDGED OR HYPOTHECATED IN THE ABSENCE OF AN EFFECTIVE REGISTRATION STATEMENT AS TO THE SECURITIES UNDER THE ACT OR AN OPINION OF COUNSEL SATISFACTORY TO THE COMPANY THAT SUCH REGISTRATION IS NOT REQUIRED.

4.4 Accredited Investor Status. The Holder is an "accredited investor" as defined in Regulation D promulgated under the Act.

5. ADJUSTMENT OF EXERCISE PRICE AND NUMBER OF EXERCISE SHARES.

5.1 Changes in Securities. In the event of changes in the series of equity securities of the Company comprising the Exercise Shares by reason of stock dividends, splits, recapitalizations, reclassifications, combinations or exchanges of shares, separations, reorganizations, liquidations, or the like, the number and class of Exercise Shares available under the Warrant in the aggregate and the Exercise Price shall be correspondingly adjusted to give the Holder of the Warrant, on exercise for the same aggregate Exercise Price, the total number, class, and kind of shares as the Holder would have owned had the Warrant been exercised prior to the event and had the Holder continued to hold such shares until after the event requiring adjustment. For purposes of this Section 5 and Section 7, the "***Aggregate Exercise Price***" shall mean the aggregate Exercise Price payable in connection with the exercise in full of this Warrant. The form of this Warrant need not be changed because of any adjustment in the number of Exercise Shares subject to this Warrant.

5.2 Conversion. Upon the conversion of all outstanding shares of the series of equity securities comprising the Exercise Shares, this Warrant shall become exercisable for that class, series, kind, and number of shares of equity securities (the "***Conversion Securities***") into which the Exercise Shares would then be convertible and the Exercise Price shall be correspondingly adjusted to give the Holder of the Warrant, on exercise for the same aggregate Exercise Price, the total number, class, series, and kind of shares as the Holder would have owned if this Warrant had been exercised prior to such event and such Exercise Shares had been acquired. In such case, all references to "Exercise Shares" shall mean the Conversion Securities. Conversion Securities shall be subject to further and successive adjustments pursuant to this Section 5.

6. FRACTIONAL SHARES. No fractional shares shall be issued upon the exercise of this Warrant as a consequence of any adjustment pursuant hereto. All Exercise Shares (including fractions) to be issued upon exercise of this Warrant shall be aggregated for purposes of determining whether the exercise would result in the issuance of any fractional share. If, after aggregation, the exercise would result in the issuance of a fractional share, the Company shall, in lieu of issuance of any fractional share, pay the Holder otherwise entitled to such fraction a sum in cash equal to the product resulting from multiplying the then current fair market value of one Exercise Share by such fraction.

7. EARLY TERMINATION. In the event of, at any time during the Exercise Period, an initial public offering of securities of the Company registered under the Act, or a **[Deemed Liquidation Event]** (as defined in the Company's Certificate of Incorporation), the Company shall provide to the Holder ten (10) days advance written notice of the estimated closing date of such public offering or Deemed Liquidation Event, and, unless the Holder exercises this Warrant pursuant to the terms of Section 2 within five (5) days of the receipt of such advance written notice, this Warrant shall be deemed exercised pursuant to Section 2.1 immediately prior to the date such public offering is closed or the closing of such Deemed Liquidation Event.

8. MARKET STAND-OFF AGREEMENT. The Holder hereby agrees that it will not, without the prior written consent of the managing underwriter, during the period beginning on and including the date that the Company's Common Stock is first quoted on a national exchange and continuing through the close of trading on the date that is 180 days thereafter , or such other period as may be requested by the Company or an underwriter to comply with regulatory restrictions on (1) the publication or other distribution of research reports and (2) analyst recommendations and options, including, but not limited to, the restrictions contained in FINRA Rule 2711(f)(4) or NYSE Rule 472(f)(4), or any successor provisions or amendments thereto), (i) lend; offer; pledge; sell; contract to sell; sell any option or contract to purchase; purchase any option or contract to sell; grant any option, right, or warrant to purchase; or otherwise transfer or dispose of, directly or indirectly, any shares of Common Stock or any securities convertible into or exercisable or exchangeable (directly or indirectly) for Common Stock (whether such shares or any such securities are then owned by the Holder or are thereafter acquired) or (ii) enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of such securities, whether any such transaction described in clause (i) or (ii) above is to be settled by delivery of Common Stock or other securities, in cash, or otherwise. The foregoing provisions of this Section shall apply only to an initial public offering, shall not apply to the sale of any shares to an underwriter pursuant to an underwriting agreement, or the transfer of any shares to any trust for the direct or indirect benefit of the Holder or the immediate family of the Holder, provided that the trustee of the trust agrees to be bound in writing by the restrictions set forth herein, and provided further that any such transfer shall not involve a disposition for value (an "***Estate Planning Transfer***"), and shall be applicable to the Holder only if all officers and directors are subject to the same restrictions and the Company uses commercially reasonable efforts to obtain a similar agreement from all stockholders individually owning more than one percent (1%) of the Company's outstanding Common Stock (after giving effect to conversion into Common Stock of all outstanding Preferred Stock). The underwriters in connection with such registration are intended third-party beneficiaries of this Section and shall have the right, power, and authority to enforce the provisions hereof as though they were a party hereto. Each Holder further agrees to execute such agreements as may be reasonably requested by the underwriters in connection with such registration that are consistent with this Section or that are necessary to give further effect thereto. Any discretionary waiver or termination of the restrictions of any or all of such agreements by the Company or the underwriters shall apply pro rata to all Holders subject to such agreements, based on the number of shares subject to such agreements. Holder agrees that any transferee of the Warrant (or other securities) of the Company held by Holder shall be bound by this Section 8.

9. Rights and Restrictions of the Holder. As contemplated by that certain Series A Preferred Stock Purchase Agreement by and among the Company and the purchasers named therein dated as of August 14, 2015 (the "***Purchase Agreement***"), the Equity Securities shall be deemed to have been issued under the Purchase Agreement and accordingly the Equity Securities and the Exercise Shares issuable upon the conversion of such Equity Securities shall be entitled to the rights, benefits and restrictions accorded to the Equity Securities, and the Equity Shares issuable upon conversion thereof, issued pursuant to the Purchase Agreement, including the rights, benefits and restrictions set forth in the Purchase Agreement and the related Investor Rights Agreement, in each case as amended, and the applicable provisions of the Company's Amended and Restated Certificate of Incorporation, the Purchase Agreement and the related Investor Rights Agreement and Right of First Refusal and Co-Sale Agreement are hereby incorporated herein by reference and made a part hereof as if set forth herein in their entirety.

10. NO STOCKHOLDER RIGHTS. This Warrant in and of itself shall not entitle the Holder to any voting rights or other rights as a stockholder of the Company.

11. TRANSFER OF WARRANT. Without the prior written consent of the Company, this Warrant shall not be assigned, pledged or hypothecated in any way (whether by operation of law or otherwise) and shall not be subject to execution, attachment or similar process, provided, however, that the Holder may assign this Warrant to its affiliate(s) without such prior written consent of the Company. Any attempted transfer, assignment, pledge, hypothecation or other disposition of this Warrant or of any rights granted hereunder contrary to the provisions of this Section 11, or the levy of any attachment or similar process upon this Warrant or such rights, shall be null and void.

12. LOST, STOLEN, MUTILATED OR DESTROYED WARRANT. If this Warrant is lost, stolen, mutilated or destroyed, the Company may, on such terms as to indemnity or otherwise as it may reasonably impose (which shall, in the case of a mutilated Warrant, include the surrender thereof), issue a new Warrant of like denomination and tenor as the Warrant so lost, stolen, mutilated or destroyed. Any such new Warrant shall constitute an original contractual obligation of the Company, whether or not the allegedly lost, stolen, mutilated or destroyed Warrant shall be at any time enforceable by anyone.

13. AMENDMENT. Any term of this Warrant may be amended or waived with the written consent of the Company and Holders of at least a majority in interest of the outstanding Warrants provided that all Warrants are similarly affected. Upon the effectuation of such amendment or waiver in conformance with this Section 13, the Company shall promptly give written notice thereof to the record holders of the Warrants who have not previously consented thereto in writing.

14. NOTICES, ETC. All notices required or permitted hereunder shall be in writing and shall be deemed effectively given: (a) upon personal delivery to the party to be notified, (b) when sent by confirmed telex or facsimile if sent during normal business hours of the recipient, if not, then on the next business day, (c) five (5) days after having been sent by registered or certified mail, return receipt requested, postage prepaid, or (d) one (1) day after deposit with a nationally recognized overnight courier, specifying next day delivery, with written verification of receipt. All communications shall be sent to the Company at the address listed on the signature page and to the Holder at 405 Lexington Ave., New York, NY 10174, or at such other address as the Company or Holder may designate by ten (10) days advance written notice to the other parties hereto.

15. ACCEPTANCE. Receipt of this Warrant by the Holder shall constitute acceptance of and agreement to all of the terms and conditions contained herein.

16. GOVERNING LAW. This Warrant and all rights, obligations and liabilities hereunder shall be governed by and construed under the laws of the Commonwealth of Massachusetts as applied to agreements among Massachusetts residents, made and to be performed entirely within the Commonwealth of Massachusetts without giving effect to conflicts of laws principles.

IN WITNESS WHEREOF, the Company has caused this Warrant to be executed by its duly authorized officer as of [●], 2015.

X4 PHARMACEUTICALS, INC

By: _____
Name: Paula Ragan
Title: Chief Executive Officer
Address: 784 Memorial Drive, Suite #140,
Cambridge, MA 02139

NOTICE OF EXERCISE

TO: X4 PHARMACEUTICALS, INC

(1) ☐ The undersigned hereby elects to purchase _____ shares of _____ (the "***Exercise Shares***") of **X4 PHARMACEUTICALS, INC.** (the "***Company***") pursuant to the terms of the attached Warrant, and tenders herewith payment of the exercise price in full, together with all applicable transfer taxes, if any.

☐ The undersigned hereby elects to purchase _____ shares of _____ (the "***Exercise Shares***") of **X4 PHARMACEUTICALS, INC** (the "***Company***") pursuant to the terms of the net exercise provisions set forth in Section 2.1 of the attached Warrant, and shall tender payment of all applicable transfer taxes, if any.

(2) Please issue a certificate or certificates representing said Exercise Shares in the name of the undersigned or in such other name as is specified below:

_____
(Name)

_____

_____
(Address)

(3) The undersigned represents that (i) the aforesaid Exercise Shares are being acquired for the account of the undersigned for investment and not with a view to, or for resale in connection with, the distribution thereof and that the undersigned has no present intention of distributing or reselling such shares; (ii) the undersigned is aware of the Company's business affairs and financial condition and has acquired sufficient information about the Company to reach an informed and knowledgeable decision regarding its investment in the Company; (iii) the undersigned is experienced in making investments of this type and has such knowledge and background in financial and business matters that the undersigned is capable of evaluating the merits and risks of this investment and protecting the undersigned's own interests; (iv) the undersigned understands that Exercise Shares issuable upon exercise of this Warrant have not been registered under the Securities Act of 1933, as amended (the "***Securities Act***"), by reason of a specific exemption from the registration provisions of the Securities Act, which exemption depends upon, among other things, the bona fide nature of the investment intent as expressed herein, and, because such securities have not been registered under the Securities Act, they must be held indefinitely unless subsequently registered under the Securities Act or an exemption from such registration is available; (v) the undersigned is aware that the aforesaid Exercise Shares may not be sold pursuant to Rule 144 adopted under the Securities Act unless certain conditions are met and until the undersigned has held the shares for the number of years prescribed by Rule 144, that among the conditions for use of the Rule is the availability of current information to the public about the Company and the Company has not made such information available and has no present plans to do so; and (vi) the undersigned agrees not to make any disposition of all or any part of the aforesaid shares of Exercise Shares unless and until there is then in effect a registration statement under the Securities Act covering such proposed disposition and such disposition is made in accordance with said registration statement, or, if reasonably requested by the Company, the undersigned has provided the Company with an opinion of counsel satisfactory to the Company, stating that such registration is not required.

(4) By execution and delivery of this notice, the undersigned hereby agrees to become a party to (i) that certain Amended and Restated Investors' Rights Agreement dated as of August 14, 2015 (the "***Investors' Rights Agreement***") by and among the Company and the Investors (as defined in the Investors' Rights Agreement), (ii) that certain Amended and Restated Voting Agreement dated as of August 14, 2015 (the "***Voting Agreement***") by and among the Company and the Investors (as defined in the Voting Agreement) and (iii) that certain Amended and Restated Right of First Refusal and Co-Sale Agreement, dated as of August 14, 2015 (the "***ROFR Agreement***") by and among the Company and the Investors and Key Holders (as defined in the ROFR Agreement) and the undersigned is entitled to all of the benefits under and subject to all of the obligations, restrictions and limitations set forth in the Investors' Rights Agreement, Voting Agreement and ROFR Agreement that are applicable to the Investors. This notice shall take effect and shall become a part of said Investors' Rights Agreement, Voting Agreement and ROFR Agreement immediately upon execution.

(Date)

(Signature)

(Print name)

Exhibit 4.4

THIS WARRANT AND THE SECURITIES ISSUABLE UPON THE EXERCISE HEREOF HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED. THEY MAY NOT BE SOLD, OFFERED FOR SALE, PLEDGED, HYPOTHECATED, OR OTHERWISE TRANSFERRED EXCEPT PURSUANT TO AN EFFECTIVE REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933, AS AMENDED OR AN OPINION OF COUNSEL SATISFACTORY TO THE COMPANY THAT REGISTRATION IS NOT REQUIRED.

X4 PHARMACEUTICALS, INC.

WARRANT TO PURCHASE SERIES B PREFERRED STOCK

No. BW-_____
Issue Date: _____, 2017

For the Purchase
of _____ shares of
Series B Preferred Stock

Void after _____, 2020

THIS WARRANT TO PURCHASE SERIES B PREFERRED STOCK (this "**Warrant**") is issued to [_____] (the "**Holder**") by X4 Pharmaceuticals, Inc. (the "**Company**"), as of November 1, 2017 pursuant to the terms of the Series B Preferred Stock Purchase Agreement, dated November 1, 2017 by and among the Company and the Investors therewith (the "**Purchase Agreement**").

1. Purchase of Exercise Shares. Subject to the terms and conditions hereinafter set forth, the Holder is entitled, upon surrender of this Warrant at the principal office of the Company (or at such other place as the Company shall notify the holder hereof in writing), to purchase from the Company the Exercise Shares at the Exercise Price (each subject to adjustment as provided herein) at any time or from time to time at or before the earlier of 5:00 p.m. eastern time on the Expiration Date (as defined below). This Warrant shall be exercisable, in whole or in part, prior to the Expiration Date.

2. Definitions.

(a) "***Conversion Shares***" shall mean the shares of Common Stock issuable upon conversion of the Exercise Shares.

(b) "***Exercise Price***" shall mean $1.88 per Exercise Share, subject to adjustment pursuant to Section 7 below.

(c) "***Exercise Shares***" shall mean [_____] shares[1] of the Company's Series B Preferred Stock issuable upon exercise of this Warrant, subject to adjustment pursuant to Section 7 below. The Exercise Shares shall have the rights and preferences associated with them as set forth in the Restated Certificate.

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1 10% of the Series B stock purchased.

(d) "***Expiration Date***" shall mean November 1, 2020.

(e) "***Majority of the Conversion Shares***" shall mean a majority of the Conversion Shares issuable upon exercise and conversion of all the Warrants issued pursuant to the Purchase Agreement.

(f) "***Series B Preferred Stock***" shall mean the Company's Series B Preferred Stock, par value $0.001 per share.

(g) "***Shares***" shall mean the Exercise Shares and Conversion Shares.

(h) "***Restated Certificate***" shall mean the Third Amended and Restated Certificate of Incorporation of the Company, as amended and/or amended and restated from time to time.

3. Exercise of Warrant. While this Warrant remains outstanding and exercisable, the Holder may exercise, in whole or in part, the purchase rights evidenced hereby. Such exercise shall be effected by: (a) the surrender of the Warrant, together with a notice of exercise to the Secretary of the Company at its principal offices; and (b) the payment to the Company of an amount equal to the aggregate Exercise Price for the number of Exercise Shares being purchased. Payment of the purchase price shall be in cash or by certified or official bank check payable to the order of the Company

4. Net Exercise. Notwithstanding any provisions herein to the contrary, in lieu of exercising this Warrant by delivering payment of the purchase price to the Company as provided in Section 3(b), the Holder may elect to receive shares equal to the value of this Warrant (or the portion thereof being canceled) by surrender of this Warrant at the principal office of the Company together with notice of such election at any time or from time to time prior to the Expiration Date, in which event the Company shall issue to the holder hereof a number of Exercise Shares computed using the following formula:

$$X = \frac{Y\,(A - B)}{A}$$

Where

X — the number of Exercise Shares to be issued to the Holder.

Y — The number of Exercise Shares purchasable under this Warrant.

A — The fair market value of one Exercise Share as of the date of exercise.

B — The Exercise Price (as adjusted to the date of such calculations).

For purposes of the above calculation, the fair market value of one Exercise Share as of a particular date (the "***Determination Date***") shall mean:

(A) In the event that all of the Company's shares of Preferred Stock shall prior to exercise or exchange of this Warrant have been converted into shares of the Common Stock of the Company, $0.0001 par value per share (the "***Common Stock***"), as a result of the conversion of all of the issued and outstanding shares of Preferred Stock in connection with the closing of a firm commitment underwritten public offering (as such term is described in the Restated Certificate), then the fair market value per share of each Exercise Share shall be determined by taking the product of "x" and "y," with "x" equal to the number of shares of Common Stock into which one share of the Series B Preferred Stock, could be converted on the Determination Date, and "y" equal to the fair market value of Common Stock on the Determination Date. For purposes of making this calculation, the fair market value of the Company's Common Stock shall be determined as follows:

(1) If the Common Stock is traded on an exchange or is quoted on the NASDAQ Stock Market ("NASDAQ"), then the closing price on the day before the Determination Date;

(2) If Common Stock is not traded on an exchange or on the NASDAQ but is traded in the over-the-counter market, then the closing price on the day before the Determination Date; or

(3) If the Determination Date is the date on which the Common Stock is first sold to the public by the Company in a firm commitment public offering under the Securities Act of 1933, as amended (the "***1933 Act***"), then the initial public offering price (before deducting commissions, discounts or expenses) at which the Common Stock is sold in such offering;

(B) In the event that the Determination Date is the date of a liquidation, dissolution or winding up, or any Deemed Liquidation Event (as defined in the Restated Certificate), then the fair market value per share of each Exercise Share shall be determined by aggregating all amounts to be payable per share to holders of the Exercise Shares in the event of such liquidation, dissolution or winding up or Deemed Liquidation Event, plus all other amounts to be payable per share in respect of the Exercise Shares in liquidation, assuming for the purposes of this subsection that all of the Exercise Shares issuable upon exercise of all of the Warrants are outstanding at the Determination Date; or

(C) In all other cases, the fair market value per share of the Exercise Shares shall be determined in good faith by the unanimous approval of Company's Board of Directors upon review of relevant factors.

5. Certificates for Shares. Upon the exercise of the purchase rights evidenced by this Warrant, one or more certificates for the number of Exercise Shares (or Conversation Shares, as the case may required) so purchased shall be issued as soon as practicable thereafter, and in any event within thirty (30) days of the delivery of the Notice of Exercise.

6. Issuance of Shares. The Company covenants that the Exercise Shares, when issued pursuant to the exercise of this Warrant, and the Conversion Shares, when issued pursuant to the conversion of the Exercise Shares and the terms and conditions of the Restated Certificate will be duly and validly issued, fully paid and nonassessable and free from all taxes, liens, and charges with respect to the issuance thereof.

7. Adjustment of Exercise Price and Number of Shares. The number of and kind of Exercise Shares purchasable upon exercise of this Warrant and the Exercise Price shall be subject to adjustment from time to time as follows (it being agreed that similar adjustments with respect to the number and kind of Conversion Shares receivable upon conversion of the Exercise Shares and the conversion price of the Conversion Shares shall be subject to adjustment from time to time as provided for in the Restated Certificate):

(a) Subdivisions, Combinations and Other Issuances. If the Company shall at any time prior to the expiration of this Warrant subdivide the Exercise Shares, by split-up or otherwise, or combine its Exercise Shares, or issue additional shares of Exercise Shares as a dividend, the number of Exercise Shares issuable on the exercise of this Warrant shall forthwith be proportionately increased in the case of a subdivision or stock dividend, or proportionately decreased in the case of a combination. Appropriate adjustments shall also be made to the purchase price payable per share, but the aggregate purchase price payable for the total number of Exercise Shares purchasable under this Warrant (as adjusted) shall remain the same. Any adjustment under this Section 7(a) shall become effective at the close of business on the date the subdivision or combination becomes effective, or as of the record date of such dividend, or in the event that no record date is fixed, upon the making of such dividend.

(b) Reclassification, Reorganization and Consolidation. In the event of changes in the series or class of equity securities of the Company comprising the Exercise Shares by reason of stock dividends, splits, recapitalizations, reclassifications, combinations or exchanges of shares, separations, reorganizations, liquidations, or the like, the number and series or class of Exercise Shares available under the Warrant in the aggregate and the Exercise Price shall be correspondingly adjusted to give the Holder of the Warrant, on exercise for the same Aggregate Exercise Price, the total number, class, and kind of shares as the Holder would have owned had the Warrant been exercised prior to the event and had the Holder continued to hold such shares until after the event requiring adjustment; *provided*, *however*, that such adjustment shall not be made with respect to, and this Warrant shall terminate if not exercised prior to, the events set forth in Section 7 below. For purposes of this Section 7, the "***Aggregate Exercise Price***" shall mean the aggregate Exercise Price payable in connection with the exercise in full of this Warrant.

(c) Merger, Consolidation or Sale of Assets. If there shall be a merger or consolidation of the Company with or into another corporation (other than a merger or reorganization involving only a change in the state of incorporation of the Company or the acquisition by the Company of other businesses where the Company survives as a going concern), or the sale of all or substantially all of the Company's capital stock or assets to any

other person, then as a part of such transaction, provision shall be made so that the Holder shall thereafter be entitled to receive the number of shares of stock or other securities or property (including cash) of the Company, or of the successor corporation resulting from the merger, consolidation or sale, to which the Holder would have been entitled if the Holder had exercised its rights pursuant to this Warrant immediately prior thereto. In any such case, appropriate adjustment shall be made in the application of the provisions of this Section 7(c) to the end that the provisions of this Section 7(c) shall be applicable after that event in as nearly equivalent a manner as may be practicable

(d) Notice of Adjustment; Expiration. When any adjustment is required to be made in the number or kind of shares purchasable upon exercise of the Warrant or conversion of the Exercise Shares or in the Exercise Price, the Company shall promptly notify the holder of such event and of the number of Exercise Shares, Conversion Shares or other securities or property thereafter purchasable upon exercise of this Warrant, as applicable.

(e) Adjustment Pursuant to Restated Certificate. If the Series B Preferred Stock shall be adjusted pursuant to the Restated Certificate in a manner not set forth above in clauses (a) through (d) of this Section 7, the Exercise Shares shall be adjusted in the same manner as the Series B Preferred Stock in accordance with the Restated Certificate.

8. No Fractional Shares or Scrip. No fractional shares or scrip representing fractional shares shall be issued upon the exercise of this Warrant, but in lieu of such fractional shares the Company shall make a cash payment therefor on the basis of the Exercise Price then in effect.

9. Representations of the Company. The Company represents that all corporate actions on the part of the Company, its officers, directors and stockholders necessary for the sale and issuance of this Warrant, the Exercise Shares and the Conversion Shares have been taken.

10. Restrictive Legend.

The Shares (unless registered under the 1933 Act) shall be stamped or imprinted with a legend in substantially the following form:

THE SECURITIES REPRESENTED HEREBY HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AND HAVE BEEN ACQUIRED FOR INVESTMENT AND NOT WITH A VIEW TO, OR IN CONNECTION WITH, THE SALE OR DISTRIBUTION THEREOF. NO SUCH TRANSFER MAY BE EFFECTED WITHOUT AN EFFECTIVE REGISTRATION STATEMENT RELATED THERETO OR AN OPINION OF COUNSEL IN A FORM SATISFACTORY TO THE COMPANY THAT SUCH REGISTRATION IS NOT REQUIRED UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

11. Warrants Transferable. With respect to any offer, sale or other disposition of this Warrant, Holder will give written notice to the Company prior thereto, describing briefly the manner thereof, together with a written opinion of Holder's counsel, or other evidence if reasonably satisfactory to the Company, to the effect that such offer, sale or other distribution

may be effected without registration or qualification (under any federal or state law then in effect). Upon receiving such written notice and reasonably satisfactory opinion, if so requested, or other evidence, the Company, as promptly as practicable, shall notify Holder that Holder may sell or otherwise dispose of this Warrant in accordance with the terms of the notice delivered to the Company. If a determination has been made pursuant to this Section 11 that the opinion of counsel for Holder, or other evidence, is not reasonably satisfactory to the Company, the Company shall so notify Holder promptly after such determination has been made. Each Warrant thus transferred shall bear a legend as to the applicable restrictions on transferability in order to ensure compliance with the 1933 Act, unless in the opinion of counsel for the Company such legend is not required in order to ensure compliance with the 1933 Act. The Company may issue stop transfer instructions to its transfer agent in connection with such restrictions. Subject to the foregoing transfers of this Warrant shall be registered upon registration books maintained for such purpose by or on behalf of the Company.

12. Early Termination. In the event of, at any time prior to the Expiration Date: (a) the consummation of an initial public offering of securities of the Company registered under the 1933 Act, (b) the automatic conversion of the Series B Preferred Stock pursuant to Section 5 of the Restated Certificate or (c) a Deemed Liquidation Event, the Company shall provide to the Holder fifteen (15) days advance written notice of the estimated closing date of such public offering, the effective date of such automatic conversion of the Series B Preferred Stock or the closing of such Deemed Liquidation Event. Unless the Holder exercises this Warrant pursuant to the terms of Section 3 within five (5) days of the receipt of such advance written notice, immediately prior to the date such public offering is closed, the effective date of such automatic conversion of the Series B Preferred Stock or the closing of such Deemed Liquidation Event, this Warrant shall (i) be automatically deemed exercised in full pursuant to Section 4 if the fair market value of each Exercise Share is greater than the Exercise Price or (ii) be automatically terminated if the fair market value each Exercise Share is equal to or less than the Exercise Price.

13. Market Stand-Off Agreement. The Holder hereby agrees that it will not, without the prior written consent of the managing underwriter, during the period beginning on and including the date that the Company's Common Stock is first quoted on a national exchange and continuing through the close of trading on the date that is 180 days thereafter, or such other period as may be requested by the Company or an underwriter to comply with regulatory restrictions on (1) the publication or other distribution of research reports and (2) analyst recommendations and options, including, but not limited to, the restrictions contained in FINRA Rule 2711(f)(4) or NYSE Rule 472(f)(4), or any successor provisions or amendments thereto), (i) lend; offer; pledge; sell; contract to sell; sell any option or contract to purchase; purchase any option or contract to sell; grant any option, right, or warrant to purchase; or otherwise transfer or dispose of, directly or indirectly, any shares of Common Stock or any securities convertible into or exercisable or exchangeable (directly or indirectly) for Common Stock (whether such shares or any such securities are then owned by the Holder or are thereafter acquired) or (ii) enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of such securities, whether any such transaction described in clause (i) or (ii) above is to be settled by delivery of Common Stock or other securities, in cash, or otherwise. The foregoing provisions of this Section shall apply only to an initial public offering, shall not apply to the sale of any shares to an underwriter pursuant to an underwriting agreement, or the transfer of any shares to any trust for the direct or indirect benefit of the Holder or the

immediate family of the Holder, provided that the trustee of the trust agrees to be bound in writing by the restrictions set forth herein, and provided further that any such transfer shall not involve a disposition for value (an "Estate Planning Transfer"), and shall be applicable to the Holder only if all officers and directors are subject to the same restrictions and the Company uses commercially reasonable efforts to obtain a similar agreement from all stockholders individually owning more than one percent (1%) of the Company's outstanding Common Stock (after giving effect to conversion into Common Stock of all outstanding Preferred Stock). The underwriters in connection with such registration are intended third party beneficiaries of this Section and shall have the right, power, and authority to enforce the provisions hereof as though they were a party hereto. Each Holder further agrees to execute such agreements as may be reasonably requested by the underwriters in connection with such registration that are consistent with this Section or that are necessary to give further effect thereto. Any discretionary waiver or termination of the restrictions of any or all of such agreements by the Company or the underwriters shall apply pro rata to all Holders subject to such agreements, based on the number of shares subject to such agreements. Holder agrees that any transferee of the Warrant (or other securities) of the Company held by Holder shall be bound by this Section 13.

14. Rights of Stockholders. The Holder shall not be entitled, as a Warrant holder, to vote or receive dividends or be deemed the holder of the Exercise Shares or any other securities of the Company which may at any time be issuable on the exercise hereof for any purpose, nor shall anything contained herein be construed to confer upon the Holder, as such, any of the rights of a stockholder of the Company or any right to vote for the election of directors or upon any matter submitted to stockholders at any meeting thereof, or to give or withhold consent to any corporate action (whether upon any recapitalization, issuance of stock, reclassification of stock, change of par value, consolidation, merger, conveyance, or otherwise) or to receive notice of meetings, or to receive dividends or subscription rights or otherwise until the Warrant shall have been exercised and the Exercise Shares purchasable upon the exercise hereof shall have become deliverable, as provided herein.

15. Taxes. The issuance of the Exercise Shares upon the exercise of this Warrant, and the delivery of certificates or other instruments representing such Exercise Shares, shall be made without charge to the Holder for any tax or other charge of whatever nature in respect of such issuance and the Company shall bear any such taxes in respect of such issuance.

16. Lost Warrant, etc. Upon receipt by the Company of evidence reasonably satisfactory to the Company of the loss, theft, destruction or mutilation of this Warrant, and, in the case of loss, theft or destruction, of any indemnification undertaking by the Holder to the Company in customary form and, in the case of mutilation, upon surrender and cancellation of this Warrant, the Company shall execute and deliver to the Holder a new Warrant representing the right to purchase the Exercise Shares then underlying this Warrant. Whenever the Company is required to issue a new Warrant pursuant to the terms of this Warrant, such new Warrant (i) shall be of like tenor with this Warrant, (ii) shall represent, as indicated on the face of such new Warrant, the right to purchase the Exercise Shares then underlying this Warrant (or in the case of a new Warrant being issued pursuant to Section 11, the Exercise Shares designated by the Holder which, when added to the number of Exercise Shares underlying the other new Warrants issued in connection with such issuance, does not exceed the number of Exercise Shares then underlying this Warrant), (iii) shall have an issuance date, as indicated on the face of such new Warrant, which is the same as the issuance date of this Warrant, and (iv) shall have the same rights and conditions as this Warrant.

17. Notices. All notices and other communications given or made pursuant to this Agreement shall be in writing and shall be deemed effectively given upon the earlier of actual receipt, or (a) personal delivery to the party to be notified, (b) when sent, if sent by electronic mail or facsimile during normal business hours of the recipient, and if not sent during normal business hours, then on the recipient's next business day, (c) five (5) days after having been sent by registered or certified mail, return receipt requested, postage prepaid, or (d) one (1) business day after deposit with a nationally recognized overnight courier, freight prepaid, specifying next business day delivery, with written verification of receipt, and shall be addressed (i) if to the Holder, at the Holder's address as set forth on the Schedule of Investors to the Purchase Agreement, and (ii) if to the Company, at 955 Massachusetts Avenue, Cambridge, Massachusetts, 02139, or at such other address as a party may designate by ten days advance written notice to the other party pursuant to the provisions above.

18. Waiver and Amendment. Any term of this Warrant may be amended or waived with the written consent of the Company and Holders of at least a Majority of the Conversion Shares, provided that all Warrants are similarly affected. Upon the effectuation of such amendment or waiver in conformance with this Section 16, the Company shall promptly give written notice thereof to the record holders of the Warrants who have not previously consented thereto in writing.

19. Governing Law. This Warrant and all actions arising out of or in connection with this Agreement shall be governed by and construed in accordance with the laws of the State of Delaware, without regard to the conflicts of law provisions of the State of Delaware or of any other state.

20. Rights and Obligations Survive Exercise of Warrant. Unless otherwise provided herein, the rights and obligations of the Company, of the Holder and of the holder of the Exercise Shares issued upon exercise of this Warrant, shall survive the exercise of this Warrant.

21. Severability. If one or more provisions of this Warrant are held to be unenforceable under applicable law, such provision(s) shall be excluded from this Warrant and the balance of this Warrant shall be interpreted as if such provision(s) were so excluded and shall be enforceable in accordance with its terms.

[Signature Page Follows]

The Company has caused this Warrant to be issued as of the date first written above.

X4 PHARMACEUTICALS, INC.

By: _____

Paula Ragan, Ph.D., President and
Chief Executive Officer

EXHIBIT A

NOTICE OF EXERCISE

TO: X4 PHARMACEUTICALS, INC.
Attention: Chief Executive Officer

1. The undersigned hereby elects to purchase _____ shares of _____ pursuant to the terms of the attached Warrant (the "Shares").

2. Method of Exercise (Please initial the applicable blank):

— The undersigned elects to exercise the attached Warrant by means of a cash payment, and tenders herewith payment in full for the purchase price of the shares being purchased.

— The undersigned elects to exercise the attached Warrant by means of the net exercise provisions of Section 4 of the Warrant.

3. Please issue a certificate or certificates representing said Shares in the name of the undersigned or in such other name as is specified below:

_____
(Name)

_____

_____
(Address)

4. The undersigned hereby represents and warrants that the aforesaid Shares are being acquired for the account of the undersigned for investment and not with a view to, or for resale, in connection with the distribution thereof, and that the undersigned has no present intention of distributing or reselling such shares and all representations and warranties of the undersigned set forth in Sections 3 of the Purchase Agreement (as defined in the Warrant) are true and correct as of the date hereof.

_____
(Signature)

_____
(Name)

_____ _____
(Date) (Title)

EXHIBIT B

FORM OF TRANSFER
(To be signed only upon transfer of Warrant)

FOR VALUE RECEIVED, the undersigned hereby sells, assigns and transfers unto _____ the right represented by the attached Warrant to purchase _____ shares of _____ of X4 Pharmaceuticals, Inc. to which the attached Warrant relates, and appoints _____ Attorney to transfer such right on the books of _____, with full power of substitution in the premises.

Dated: _____

_____
(Signature must conform in all respects to name of Holder as specified on the face of the Warrant)

Address: _____

_____

_____

Signed in the presence of:

_____

THIS WARRANT, AND THE SECURITIES ISSUABLE UPON THE EXERCISE OF THIS WARRANT, HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT"), OR ANY STATE SECURITIES LAWS. THEY MAY NOT BE SOLD, OFFERED FOR SALE, PLEDGED, OR HYPOTHECATED IN THE ABSENCE OF AN EFFECTIVE REGISTRATION STATEMENT RELATED THERETO OR AN OPINION OF COUNSEL (WHICH MAY BE COMPANY COUNSEL) REASONABLY SATISFACTORY TO THE COMPANY THAT SUCH REGISTRATION IS NOT REQUIRED UNDER THE ACT, OR ANY APPLICABLE STATE SECURITIES LAWS.

WARRANT AGREEMENT

To Purchase Shares of Preferred Stock of

X4 PHARMACEUTICALS, INC.

Dated as of October 19, 2018 (the "Effective Date")

WHEREAS, X4 Pharmaceuticals, Inc., a Delaware corporation, has entered into a Loan and Security Agreement of even date herewith (the "Loan Agreement") with Hercules Capital, Inc., a Maryland corporation, in its capacity as administrative and collateral agent, and Hercules Capital, Inc. (the "Warrantholder") and the other lender parties thereto;

WHEREAS, the Company (as defined below) desires to grant to the Warrantholder, in consideration for, among other things, the financial accommodations provided for in the Loan Agreement, the right to purchase shares of Preferred Stock (as defined below) pursuant to this Warrant Agreement (the "Agreement");

NOW, THEREFORE, in consideration of the Warrantholder executing and delivering the Loan Agreement and providing the financial accommodations contemplated therein, and in consideration of the mutual covenants and agreements contained herein, the Company and the Warrantholder agree as follows:

SECTION 1. GRANT OF THE RIGHT TO PURCHASE PREFERRED STOCK.

For value received, the Company hereby grants to the Warrantholder, and the Warrantholder is entitled, upon the terms and subject to the conditions hereinafter set forth, to subscribe for and purchase, from the Company, an aggregate number of fully paid and non-assessable shares of the Preferred Stock equal to the quotient derived by dividing (a) the Warrant Coverage (as defined below) by (b) the Exercise Price (defined below). The Exercise Price of such shares is subject to adjustment as provided in Section 8. As used herein, the following terms shall have the following meanings:

"Act" means the Securities Act of 1933, as amended.

"Charter" means the Company's Articles of Incorporation, Certificate of Incorporation or other constitutional document, as may be amended from time to time.

"Common Stock" means the Company's common stock, $0.001 par value per share;

"Company" means X4 Pharmaceuticals, Inc., a Delaware corporation, and any successor or surviving entity that assumes the obligations of the Company under this Agreement pursuant to Section 8(a).

"Equity Round" means any non-public offering of equity securities by the Company, after the Effective Date but prior to the consummation of an Initial Public Offering that results in the conversion of all preferred stock of the Company into Common Stock, in a transaction or series of related transactions principally for equity financing purposes in which the cash is received by the Company and/or debt of the Company is cancelled or converted in exchange for equity securities of the Company; provided that Equity Round shall not include additional closings of the Company's Series B Preferred Stock round of financing.

"Exercise Price" means (a) if Preferred Stock means Series B Preferred Stock, $1.88 per share, or (b) if Preferred Stock means Next Round Stock, the lowest price per share of Next Round Stock paid by investors in the Next Round, in either case subject to adjustment pursuant to Section 8;

"Initial Public Offering" means the initial underwritten public offering of the Company's Common Stock pursuant to a registration statement under the Act, which public offering has been declared effective by the Securities and Exchange Commission ("SEC");

"Merger Event" means (i) any sale, lease, exclusive license or other transfer of all or substantially all assets of the Company or any merger or consolidation involving the Company in which the Company is not the surviving entity, or in which the outstanding shares of the Company's capital stock are otherwise converted into or exchanged for shares of preferred stock, other securities or property of another entity; or (ii) any Deemed Liquidation Event as such term is defined in the Charter;

"Next Round" means the next Equity Round in which the Company issues and sells shares of its preferred stock and any options, warrants, rights or other securities that are exercisable, convertible or exchangeable into, or otherwise provide the right to purchase or acquire shares of such preferred stock for aggregate gross cash proceeds of at least $25,000,000;

"Preferred Stock" means, at the election of the Warrantholder, (A) the Series B Preferred Stock of the Company or (B) upon the closing of the Next Round, the class and series of the preferred stock of the Company and any options, warrants, rights or other securities that are exercisable, convertible or exchangeable into, or otherwise provide the right to purchase or acquire shares of preferred stock (such preferred stock, the "Next Round Stock"), and, to the extent provided in Sections 8(a) and (b), any other stock into or for which such Preferred Stock may be converted or exchanged, provided, that notwithstanding anything to the contrary contained in this Warrant, if all of the preferred stock of the Company is converted into Common Stock (automatically upon an Initial Public Offering or otherwise), "Preferred Stock": shall thereafter refer to Common Stock, with the appropriate adjustment to the number of such shares of Common Stock issuable upon exercise of this Warrant;

"Purchase Price" means, with respect to any exercise of this Agreement, an amount equal to the Exercise Price as of the relevant time multiplied by the number of shares of Preferred Stock requested to be exercised under this Agreement pursuant to such exercise; and

"Warrant Coverage" means $396,000.

SECTION 2. TERM OF THE AGREEMENT.

Except as otherwise provided for herein, the term of this Agreement and the right to purchase Preferred Stock as granted herein (the "Warrant) shall commence on the Effective Date and shall be exercisable for a period ending upon the earlier to occur of (i) ten (10) years from the Effective Date.

SECTION 3. EXERCISE OF THE PURCHASE RIGHTS.

(a) Exercise. The purchase rights set forth in this Agreement are exercisable by the Warrantholder, in whole or in part, at any time, or from time to time, prior to the expiration of the term set forth in Section 2, by tendering to the Company at its principal office a notice of exercise in the form attached hereto as Exhibit I (the "Notice of Exercise"), duly completed and executed. Promptly upon receipt of the Notice of Exercise and the payment of the Purchase Price in accordance with the terms set forth below, and in no event later than three (3) days thereafter, the Company shall issue to the Warrantholder a certificate for the number of shares of Preferred Stock purchased and shall execute the acknowledgment of exercise in the form attached hereto as Exhibit II (the "Acknowledgment of Exercise") indicating the number of shares which remain subject to future purchases, if any.

The Purchase Price may be paid at the Warrantholder's election either (i) by cash or check, or (ii) by surrender of all or a portion of the Warrant for shares of Preferred Stock to be exercised under this Agreement and, if applicable, an amended Agreement representing the remaining number of shares purchasable hereunder, as determined below ("Net Issuance"). If the Warrantholder elects the Net Issuance method, the Company will issue Preferred Stock in accordance with the following formula:

$$X = \frac{Y(A-B)}{A}$$

Where: X = the number of shares of Preferred Stock to be issued to the Warrantholder.

Y = the number of shares of Preferred Stock requested to be exercised under this Agreement.

A = the fair market value of one (1) share of Preferred Stock at the time of issuance of such shares of Preferred Stock.

B = the Exercise Price.

For purposes of the above calculation, current fair market value of Preferred Stock shall mean with respect to each share of Preferred Stock:

(i) if the exercise is in connection with an Initial Public Offering, and if the Company's Registration Statement relating to such Initial Public Offering has been declared effective by the SEC, then the fair market value per share shall be the initial "Price to Public" of the Common Stock specified in the final prospectus with respect to the offering;

(ii) if the exercise is after, and not in connection with an Initial Public Offering, and:

(A) if the Common Stock is traded on a securities exchange, the fair market value shall be deemed to be the prior day closing price before the day the current fair market value of the securities is being determined; or

(B) if the Common Stock is traded over-the-counter, the fair market value shall be deemed to be the prior day closing bid and asked price quoted on the NASDAQ system (or similar system) before the day the current fair market value of the securities is being determined;

(iii) if at any time the Common Stock is not listed on any securities exchange or quoted in the NASDAQ National Market or the over-the-counter market, the current fair market value of Preferred Stock shall be the highest price per share which the Company could obtain from a willing buyer (not a current employee or director) for shares of Common Stock sold by the Company, from authorized but unissued shares, as determined in good faith by its Board of Directors, unless the Company shall become subject to a Merger Event, in which case the fair market value of Preferred Stock shall be deemed to be the per share value received by the holders of the Company's Preferred Stock on a common equivalent basis pursuant to such Merger Event.

Upon partial exercise by either cash or Net Issuance, the Company shall promptly issue an amended Agreement representing the remaining number of shares purchasable hereunder. All other terms and conditions of such amended Agreement shall be identical to those contained herein, including, but not limited to the Effective Date hereof.

(b) Exercise Prior to Expiration. To the extent this Agreement is not previously exercised as to all shares of Preferred Stock subject hereto, and if the fair market value of one share of the Preferred Stock is greater than the Exercise Price then in effect, this Agreement shall be deemed automatically exercised pursuant to Section 3(a) (even if not surrendered) immediately before its expiration. For purposes of such automatic exercise, the fair market value of one share of the Preferred Stock upon such expiration shall be determined pursuant to Section 3(a). To the extent this Agreement or any portion thereof is deemed automatically exercised pursuant to this Section 3(b), the Company agrees to promptly notify the Warrantholder of the number of shares of Preferred Stock, if any, the Warrantholder is to receive by reason of such automatic exercise.

SECTION 4. RESERVATION OF SHARES.

During the term of this Agreement, the Company will at all times have authorized and reserved a sufficient number of shares of its Preferred Stock to provide for the exercise of the rights to purchase Preferred Stock as provided for herein, and shall have authorized and reserved a sufficient number of shares of its Common Stock to provide for the conversion of the shares of Preferred Stock issuable hereunder.

SECTION 5. NO FRACTIONAL SHARES OR SCRIP.

No fractional shares or scrip representing fractional shares shall be issued upon the exercise of this Agreement, but in lieu of such fractional shares the Company shall make a cash payment therefor upon the basis of the then fair market value of one share of Preferred Stock.

SECTION 6. NO RIGHTS AS SHAREHOLDER/STOCKHOLDER.

This Agreement does not entitle the Warrantholder to any voting rights or other rights as a shareholder/stockholder of the Company prior to the exercise of this Agreement.

SECTION 7. WARRANTHOLDER REGISTRY.

The Company shall maintain a registry showing the name and address of the registered holder of this Agreement. The Warrantholder's initial address, for purposes of such registry, is set forth below the Warrantholder's signature on this Agreement. The Warrantholder may change such address by giving written notice of such changed address to the Company.

SECTION 8. ADJUSTMENT RIGHTS.

The Exercise Price and the number of shares of Preferred Stock purchasable hereunder are subject to adjustment, as follows:

(a) Merger Event. If at any time there shall be Merger Event, this Warrant shall, on and after the closing thereof, automatically and without further action on the part of any party or other person, represent the right to receive the consideration (including, without limitation, cash, securities or other property (collectively, "Reference Property")) payable on or in respect of all shares of Preferred Stock that are issuable hereunder as of immediately prior to the closing of such Merger Event less the Purchase Price for all such shares of Preferred Stock, and such Merger Event consideration shall be paid to Warrantholder as and when it is paid to the holders of the outstanding shares of Preferred Stock and this Warrant shall thereupon automatically terminate. Appropriate adjustment (as determined in good faith by the Company's Board of Directors and reasonably acceptable to the Warrantholder) shall be made in the application of the provisions of this Agreement with respect to the rights and interests of the Warrantholder after the Merger Event to the end that the provisions of this Agreement (including adjustments of the Exercise Price, the ability of the Warrantholder to elect the class and series of Preferred Stock as set forth in the definition thereof, and adjustments to ensure that the provisions of this Section 8 shall thereafter be applicable, as nearly as possible, to the purchase rights under this Agreement in relation to any Reference Property thereafter acquirable upon exercise of such purchase rights) shall continue to be applicable in their entirety, and to the greatest extent possible. To the extent this Warrant or any portion thereof is deemed automatically exercised pursuant to this Section 8(a), the Company agrees to promptly notify the Warrantholder of the Reference Property, if any, the Warrantholder is to receive by reason of such automatic exercise. Notwithstanding anything to the contrary in this Warrant, if the aggregate fair market value of the Reference Property payable under this Section 8(a) is less than the aggregate Exercise Price of this Warrant, then this Warrant shall automatically terminate immediately prior to the closing of such Merger Event without and Reference Property or other consideration being paid to the Warrantholder.

(b) Reclassification of Shares. Except for Merger Events subject to Sections 8(a) and 8(e), if the Company at any time shall, by combination, reclassification, exchange or subdivision of securities or otherwise, change any of the securities as to which purchase rights under this Agreement exist into the same or a different number of securities of any other class or classes, this Agreement shall thereafter represent the right to acquire such number and kind of securities as would have been issuable as the result of such change with respect to the securities which were subject to the purchase rights under this Agreement immediately prior to such combination, reclassification, exchange, subdivision or other change; provided to the extent the Warrantholder has the right to elect to receive upon exercise either Series B Preferred Stock or Next Round Stock, the adjustment under this clause (b) shall apply solely to the class and series of preferred stock that has been so combined, reclassified, exchanged or subdivided and shall not impair the Warrantholder's right to elect to exercise the purchase rights for any other class or series of preferred stock. The provisions of this Section 8(b) shall similarly apply to any successive combination, reclassification, exchange, subdivision or other change.

(c) Subdivision or Combination of Shares. If the Company at any time shall combine or subdivide its Preferred Stock, (i) in the case of a subdivision, the Exercise Price shall be proportionately decreased and the number of shares of Preferred Stock issuable hereunder shall be proportionately increased, or (ii) in the case of a combination, the Exercise Price shall be proportionately increased and the number of shares of Preferred Stock issuable hereunder shall be proportionately decreased.

(d) Dividends. If the Company at any time while this Agreement is outstanding and unexpired shall:

(i) pay a dividend with respect to the Preferred Stock payable in Preferred Stock, then the Exercise Price shall be adjusted, from and after the date of determination of stockholders entitled to receive such dividend or distribution, to that price determined by multiplying the Exercise Price in effect immediately prior to such date of determination by a fraction (A) the numerator of which shall be the total number of shares of Preferred Stock outstanding immediately prior to such dividend or distribution, and (B) the denominator of which shall be the total number of shares of Preferred Stock outstanding immediately after such dividend or distribution; or

(ii) make any other dividend or distribution with respect to Preferred Stock (or stock into which the Preferred Stock is convertible), except any dividend or distribution specifically provided for in any other clause of this Section 8, then, in each such case, provision shall be made by the Company such that the Warrantholder shall receive upon exercise or conversion of this Warrant a proportionate share of any such dividend or distribution as though it were the holder of the Preferred Stock (or other stock for which the Preferred Stock is convertible) as of the record date fixed for the determination of the stockholders of the Company entitled to receive such dividend or distribution.

(e) Antidilution Rights. Additional antidilution rights applicable to the Preferred Stock purchasable hereunder are as set forth in the Charter and shall be applicable with respect to the Preferred Stock issuable hereunder. The Company shall promptly provide the Warrantholder with any restatement, amendment, modification or waiver of the Charter; provided, that no such amendment, modification or waiver shall impair or reduce the antidilution rights applicable to the Preferred Stock as of the date hereof unless such amendment, modification or waiver affects the rights of the Warrantholder with respect to the Preferred Stock in the same manner as it affects all other holders of Preferred Stock. The Company shall provide the Warrantholder with prior written notice of any issuance of its stock or other equity security to occur after the Effective Date of this Agreement, which notice shall include (a) the price at which such stock or security is to be sold, (b) the number of shares to be issued, and (c) such other information as necessary for the Warrantholder to determine if a dilutive event has occurred. For the avoidance of doubt, there shall be no duplicate anti-dilution adjustment pursuant to this subsection (e), the forgoing subsection (d) and the Charter.

(f) Notice of Adjustments. If: (i) the Company shall declare any dividend or distribution upon its stock, whether in stock, cash, property or other securities; (ii) there shall be any Merger Event; (iii) there shall be an Initial Public Offering; or (iv) there shall be any voluntary dissolution, liquidation or winding up of the Company; then, in connection with each such event, the Company shall send to the Warrantholder: (A) at least thirty (30) days' prior written notice of the date on which the books of the Company shall close or a record shall be taken for such dividend, distribution, subscription rights (specifying the date on which the holders of Preferred Stock shall be entitled thereto) or for determining rights to vote in respect of such Merger Event, dissolution, liquidation or winding up; (B) in the case of any such Merger Event, dissolution, liquidation or winding up, at least thirty (30) days' prior written notice of the date when the same shall take place (and specifying the date on which the holders of Preferred Stock shall be entitled to exchange their Preferred Stock for securities or other property deliverable upon such Merger Event, dissolution, liquidation or winding up); and (C) in the case of an Initial Public Offering, the Company shall give the Warrantholder at least thirty (30) days' written notice prior to the effective date thereof.

Each such written notice shall set forth, in reasonable detail, (i) the event requiring the notice, and (ii) if any adjustment is required to be made, (A) the amount of such adjustment, (B) the method by which such adjustment was calculated, (C) the adjusted Exercise Price (if the Exercise Price has been adjusted), and (D) the number of shares subject to purchase hereunder after giving effect to such adjustment, and shall be given in accordance with Section 12(g) below.

(g) Timely Notice. Failure to timely provide such notice required by Section 8(f) above shall entitle the Warrantholder to retain the benefit of the applicable notice period notwithstanding anything to the contrary contained in any insufficient notice received by the Warrantholder. For purposes of this Section 8(g), and notwithstanding anything to the contrary in Section 12(g), the notice period shall begin on the date the Warrantholder actually receives a written notice containing all the information required to be provided in such Section 12(g).

SECTION 9. REPRESENTATIONS, WARRANTIES AND COVENANTS OF THE COMPANY.

(a) Reservation of Preferred Stock. The Preferred Stock issuable upon exercise of the Warrantholder's rights has been or, in the case of Preferred Stock issuable in the Next Round, will be duly and validly reserved and, when issued in accordance with the provisions of this Agreement, will be validly issued, fully paid and non-assessable, and will be free of any taxes, liens, charges or encumbrances of any nature whatsoever; provided, that the Preferred Stock issuable pursuant to this Agreement may be subject to restrictions on transfer under state and/or federal securities laws. The Company has made available to the Warrantholder true, correct and complete copies of its Charter and current bylaws. The issuance of certificates for shares of Preferred Stock upon exercise of this Agreement shall be made without charge to the Warrantholder for any issuance tax in respect thereof, or other cost incurred by the Company in connection with such exercise and the related issuance of shares of Preferred Stock; provided, that the Company shall not be required to pay any tax which may be payable in respect of any transfer and the issuance and delivery of any certificate in a name other than that of the Warrantholder.

(b) Due Authority. The execution and delivery by the Company of this Agreement and the performance of all obligations of the Company hereunder, including the issuance to the Warrantholder of the right to acquire the shares of Preferred Stock and the Common Stock into which it may be converted, have been duly authorized by all necessary corporate action on the part of the Company. This Agreement: (i) does not violate the Charter or the Company's current bylaws; (ii) does not contravene any law or governmental rule, regulation or order applicable to the Company; and (iii) does not and will not contravene any provision of, or constitute a default under, any indenture, mortgage, contract or other instrument to which the Company is a party or by which it is bound. This Agreement constitutes a legal, valid and binding agreement of the Company, enforceable in accordance with its terms.

(c) Consents and Approvals. No consent or approval of, giving of notice to, registration with, or taking of any other action in respect of any state, federal or other governmental authority or agency is required with respect to the execution, delivery and performance by the Company of its obligations under this Agreement, except for the filing of notices pursuant to Regulation D under the Act and any filing required by applicable state securities law, which filings will be effective by the time required thereby.

(d) Issued Securities. All issued and outstanding shares of Common Stock, Preferred Stock or any other securities of the Company have been duly authorized and validly issued and are fully paid and nonassessable. All outstanding shares of Common Stock, Preferred Stock and any other securities were issued in full compliance with all federal and state securities laws. In addition, as of the date immediately preceding the date of this Agreement:

(i) The authorized capital of the Company consists of (A) 116,500,000 shares of Common Stock, of which 4,830,406 shares are issued and outstanding, (B) 2,313,523 shares of Series Seed Preferred Stock, of which 1,516,136 shares are issued and outstanding and are convertible into an aggregate of 1,516,136 shares of Common Stock, (C) 22,000,000 shares of Series A Preferred Stock, of which 19,946,842 shares are issued and outstanding and are convertible into an aggregate of 19,946,842 shares of Common Stock, and (B) 25,100,000 shares of Series B Preferred Stock, of which 18,616,569 shares are issued and outstanding and are convertible into an aggregate of 18,616,569 shares of Common Stock.

(ii) The Company has reserved 10,200,000 shares of Common Stock for issuance under its Stock Option Plan(s), under which 7,572,819 options are outstanding. The Company has warrants presently outstanding to purchase 1,646,494 shares of Series A Preferred Stock and warrants presently outstanding to purchase 3,294,268 shares of Series B Preferred Stock. There are no other options, warrants, conversion privileges or other rights presently outstanding to purchase or otherwise acquire any authorized but unissued shares of the Company's capital stock or other securities of the Company.

(iii) In accordance with the Company's Charter, no stockholder of the Company has preemptive rights to purchase new issuances of the Company's capital stock.

(e) Registration Rights. The Company agrees that the shares of Common Stock issued and issuable upon conversion of the shares of Preferred Stock issued and issuable upon exercise of this Warrant, and, at all times (if any) when the Preferred Stock shall be Common Stock, the shares of Preferred Stock issued and issuable upon exercise of this Warrant, shall have the "Piggyback," and S-3 registration rights pursuant to and as set forth in the Company's investor rights agreement or similar agreement (the "Investor Rights Agreement") on a pari passu basis with the holders of outstanding shares of Preferred Stock who are parties thereto. The provisions set forth in the Company's Investor Rights Agreement or similar agreement relating to such registration rights in effect as of the Effective Date may not be amended, modified or waived without the prior written consent of the Warrantholder unless such amendment, modification or waiver affects the rights associated with the shares of Preferred Stock issued and issuable upon exercise hereof in the same manner as such amendment, modification, or waiver affects the rights associated with all outstanding shares of Preferred Stock whose holders are parties thereto.

(f) Other Commitments to Register Securities. Except as set forth in this Agreement, the Company is not, pursuant to the terms of any other agreement currently in existence, under any obligation to register under the Act any of its presently outstanding securities or any of its securities which may hereafter be issued.

(g) Exempt Transaction. Subject to the accuracy of the Warrantholder's representations in Section 10, the issuance of the Preferred Stock upon exercise of this Agreement, and the issuance of the Common Stock upon conversion of the Preferred Stock, will each constitute a transaction exempt from (i) the registration requirements of Section 5 of the Act, in reliance upon Section 4(2) thereof, and (ii) the qualification requirements of the applicable state securities laws.

(h) Compliance with Rule 144. If the Warrantholder proposes to sell Preferred Stock issuable upon the exercise of this Agreement, or the Common Stock into which it is convertible, in compliance with Rule 144 promulgated by the SEC, then, upon the Warrantholder's written request to the Company, the Company shall furnish to the Warrantholder, within ten days after receipt of such request, a written statement confirming the Company's compliance with the filing requirements of the SEC as set forth in such Rule, as such Rule may be amended from time to time.

(i) Information Rights. During the term of this Warrant, in order to establish the valuation of the Warrant, the Warrantholder shall be entitled to the information rights contained in Sections 7.1(b) and 7.1(c) of the Loan Agreement, and Sections 7.1(b) and 7.1(c) of the Loan Agreement are hereby incorporated into this Agreement by this reference as though fully set forth herein, provided, however, that the Company shall not be required to deliver a Compliance Certificate once all Indebtedness (as defined in the Loan Agreement) owed by the Company to the Warrantholder has been repaid. The information rights set forth in this Section 9(i) are subject to the Warrantholder having confidentiality obligations with respect thereto reasonably acceptable to the Company.

SECTION 10. REPRESENTATIONS AND COVENANTS OF THE WARRANTHOLDER.

This Agreement has been entered into by the Company in reliance upon the following representations and covenants of the Warrantholder:

(a) Investment Purpose. The right to acquire Preferred Stock is being acquired for investment and not with a view to the sale or distribution of any part thereof, and the Warrantholder has no present intention of selling or engaging in any public distribution of such rights or the Preferred Stock except pursuant to an effective registration statement or an exemption from the registration requirements of the Act.

(b) Private Issue. The Warrantholder understands (i) that the Preferred Stock issuable upon exercise of this Agreement is not registered under the Act or qualified under applicable state securities laws on the ground that the issuance contemplated by this Agreement will be exempt from the registration and qualifications requirements thereof, and (ii) that the Company's reliance on such exemption is predicated on the representations set forth in this Section 10.

(c) Financial Risk. The Warrantholder has such knowledge and experience in financial and business matters as to be capable of evaluating the merits and risks of its investment, and has the ability to bear the economic risks of its investment.

(d) Risk of No Registration. The Warrantholder understands that if the Company does not register with the SEC pursuant to Section 12 of the Securities Exchange Act of 1934 (the "1934 Act"), or file reports pursuant to Section 15(d) of the 1934 Act, or if a registration statement covering the securities under the Act is not in effect when it desires to sell (i) the rights to purchase Preferred Stock pursuant to this Agreement or (ii) the Preferred Stock issuable upon exercise of the right to purchase, it may be required to hold such securities for an indefinite period. The Warrantholder also understands that any sale of (A) its rights hereunder to purchase Preferred Stock or (B) Preferred Stock issued or issuable hereunder which might be made by it in reliance upon Rule 144 under the Act may be made only in accordance with the terms and conditions of that Rule.

(e) Accredited Investor. The Warrantholder is an "accredited investor" within the meaning of the Securities and Exchange Rule 501 of Regulation D, as presently in effect.

SECTION 11. TRANSFERS.

Subject to compliance with applicable federal and state securities laws, this Agreement and all rights hereunder are transferable, in whole or in part, without charge to the holder hereof (except for transfer taxes) upon surrender of this Agreement properly endorsed. Each taker and holder of this Agreement, by taking or holding the same, consents and agrees that this Agreement, when endorsed in blank, shall be deemed negotiable, and that the holder hereof, when this Agreement shall have been so endorsed and its transfer recorded on the Company's books, shall be treated by the Company and all other persons dealing with this Agreement as the absolute owner hereof for any purpose and as the person entitled to exercise the rights represented by this Agreement. The transfer of this Agreement shall be recorded on the books of the Company upon receipt by the Company of a notice of transfer in the form attached hereto as Exhibit III (the "Transfer Notice"), at its principal offices and the payment to the Company of all transfer taxes and other governmental charges imposed on such transfer. Until the Company receives such Transfer Notice, the Company may treat the registered owner hereof as the owner for all purposes.

SECTION 12. MISCELLANEOUS.

(a) Effective Date. The provisions of this Agreement shall be construed and shall be given effect in all respects as if it had been executed and delivered by the Company on the date hereof. This Agreement shall be binding upon any successors or assigns of the Company.

(b) Remedies. In the event of any default hereunder, the non-defaulting party may proceed to protect and enforce its rights either by suit in equity and/or by action at law, including but not limited to an action for damages as a result of any such default, and/or an action for specific performance for any default where the Warrantholder will not have an adequate remedy at law and where damages will not be readily ascertainable. The Company expressly agrees that it shall not oppose an application by the Warrantholder or any other person entitled to the benefit of this Agreement requiring specific performance of any or all provisions hereof or enjoining the Company from continuing to commit any such breach of this Agreement.

(c) No Impairment of Rights. The Company will not, by amendment of its Charter or through any other means, avoid or seek to avoid the observance or performance of any of the terms of this Agreement, 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 in order to protect the rights of the Warrantholder against impairment.

(d) Additional Documents. The Company, upon execution of this Agreement, shall provide the Warrantholder with certified resolutions with respect to the representations, warranties and covenants set forth in Sections 9(a) through 9(d), 9(f) and 9(g). The Company shall also supply documentation reasonably necessary to evaluate whether to exercise this Warrant, including without limitation, (i) any merger/purchase/asset sale agreement and related documents and estimated payout allocations to each of the respective shareholders, warrant and option holders in connection with a Merger Event, (ii) the most recent capitalization tables, and (iii) the most recent Charter, in the case of information provided pursuant to clauses (i) and (ii) above, subject to the Warrantholder having confidentiality obligations with respect thereto reasonably acceptable to the Company.

(e) Attorney's Fees. In any litigation, arbitration or court proceeding between the Company and the Warrantholder relating hereto, the prevailing party shall be entitled to attorneys' fees and expenses and all costs of proceedings incurred in enforcing this Agreement. For the purposes of this Section 12(e), attorneys' fees shall include without limitation fees incurred in connection with the following: (i) contempt proceedings; (ii) discovery; (iii) any motion, proceeding or other activity of any kind in connection with an insolvency proceeding; (iv) garnishment, levy, and debtor and third party examinations; and (v) post-judgment motions and proceedings of any kind, including without limitation any activity taken to collect or enforce any judgment.

(f) Severability. In the event any one or more of the provisions of this Agreement shall for any reason be held invalid, illegal or unenforceable, the remaining provisions of this Agreement shall be unimpaired, and the invalid, illegal or unenforceable provision shall be replaced by a mutually acceptable valid, legal and enforceable provision, which comes closest to the intention of the parties underlying the invalid, illegal or unenforceable provision.

(g) Notices. Except as otherwise provided herein, any notice, demand, request, consent, approval, declaration, service of process or other communication that is required, contemplated, or permitted under this Agreement or with respect to the subject matter hereof shall be in writing, and shall be deemed to have been validly served, given, delivered, and received upon the earlier of: (i) the day of transmission by facsimile or hand delivery if transmission or delivery occurs on a business day at or before 5:00 pm in the time zone of the recipient, or, if transmission or delivery occurs on a non-business day or after such time, the first business day thereafter, or the first business day after deposit with an overnight express service or overnight mail delivery service; or (ii) the third (3rd) calendar day after deposit in the United States mails, with proper first class postage prepaid, and shall be addressed to the party to be notified as follows:

If to the Warrantholder:

HERCULES CAPITAL, INC.
Legal Department
Attention: Chief Legal Officer and Bryan Jadot
400 Hamilton Avenue, Suite 310
Palo Alto, CA 94301
Email:
Telephone:

(i) If to the Company:

X4 Pharmaceuticals, Inc.
Attention: Adam Mostafa and Brian Bowersox
955 Massachusetts Avenue, 4th Floor
Boston, MA 02139
Email:
Telephone:

or to such other address as each party may designate for itself by like notice.

(h) Entire Agreement; Amendments. This Agreement constitutes the entire agreement and understanding of the parties hereto in respect of the subject matter hereof, and supersedes and replaces in their entirety any prior proposals, term sheets, letters, negotiations or other documents or agreements, whether written or oral, with respect to the subject matter hereof (including the Warrantholder's proposal letter dated September 13, 2018). None of the terms of this Agreement may be amended except by an instrument executed by each of the parties hereto.

(i) Headings. The various headings in this Agreement are inserted for convenience only and shall not affect the meaning or interpretation of this Agreement or any provisions hereof.

(j) No Strict Construction. The parties hereto have participated jointly in the negotiation and drafting of this Agreement. In the event an ambiguity or question of intent or interpretation arises, this Agreement shall be construed as if drafted jointly by the parties hereto and no presumption or burden of proof shall arise favoring or disfavoring any party by virtue of the authorship of any provisions of this Agreement.

(k) No Waiver. No omission or delay by the Warrantholder at any time to enforce any right or remedy reserved to it, or to require performance of any of the terms, covenants or provisions hereof by the Company at any time designated, shall be a waiver of any such right or remedy to which the Warrantholder is entitled, nor shall it in any way affect the right of the Warrantholder to enforce such provisions thereafter.

(l) Survival. All agreements, representations and warranties contained in this Agreement or in any document delivered pursuant hereto shall be for the benefit of the Warrantholder and shall survive the execution and delivery of this Agreement and the expiration or other termination of this Agreement.

(m) Governing Law. This Agreement has been negotiated and delivered to Warrantholder in the State of California, and shall have been accepted by the Warrantholder in the State of California. Delivery of Preferred Stock to the Warrantholder by the Company under this Agreement is due in the State of California. This Agreement shall be governed by, and construed and enforced in accordance with, the laws of the State of Delaware, excluding conflict of laws principles that would cause the application of laws of any other jurisdiction.

(n) Consent to Jurisdiction and Venue. All judicial proceedings arising in or under or related to this Agreement may be brought in any state or federal court of competent jurisdiction located in the State of California. By execution and delivery of this Agreement, each party hereto generally and unconditionally: (i) consents to personal jurisdiction in Santa Clara County, State of California; (ii) waives any objection as to jurisdiction or venue in Santa Clara County, State of California; (c) agrees not to assert any defense based on lack of jurisdiction or venue in the aforesaid courts; and (iii) irrevocably agrees to be bound by any judgment rendered thereby in connection with this Agreement. Service of process on any party hereto in any action arising out of or relating to this Agreement shall be effective if given in accordance with the requirements for notice set forth in Section 12(g), and shall be deemed effective and received as set forth in Section 12(g). Nothing herein shall affect the right to serve process in any other manner permitted by law or shall limit the right of either party to bring proceedings in the courts of any other jurisdiction.

(o) Mutual Waiver of Jury Trial. Because disputes arising in connection with complex financial transactions are most quickly and economically resolved by an experienced and expert person and the parties wish applicable state and federal laws to apply (rather than arbitration rules), the parties desire that their disputes be resolved by a judge applying such applicable laws. EACH OF THE COMPANY AND THE WARRANTHOLDER SPECIFICALLY WAIVES ANY RIGHT IT MAY HAVE TO TRIAL BY JURY OF ANY CAUSE OF ACTION, CLAIM, CROSS-CLAIM, COUNTERCLAIM, THIRD PARTY CLAIM OR ANY OTHER CLAIM (COLLECTIVELY, “CLAIMS”) ASSERTED BY THE COMPANY AGAINST THE WARRANTHOLDER OR ITS ASSIGNEE OR BY THE WARRANTHOLDER OR ITS ASSIGNEE AGAINST THE COMPANY. This waiver extends to all such Claims, including Claims that involve Persons other than the Company and the Warrantholder; Claims that arise out of or are in any way connected to the relationship between the Company and the Warrantholder; and any Claims for damages, breach of contract, specific performance, or any equitable or legal relief of any kind, arising out of this Agreement.

(p) Judicial Reference. If the waiver of jury trial set forth above is ineffective or unenforceable, the parties agree that all Claims shall be resolved by reference to a private judge sitting without a jury, pursuant to Code of Civil Procedure Section 638, before a mutually acceptable referee or, if the parties cannot agree, a referee selected by the Presiding Judge of Santa Clara County, California. Such proceeding shall be conducted in Santa Clara County, California, with Delaware rules of evidence and discovery applicable to such proceeding.

(q) Prejudgment Relief. In the event Claims are to be resolved by arbitration, either party may seek from a court of competent jurisdiction identified in Section 12(n), any prejudgment order, writ or other relief and have such prejudgment order, writ or other relief enforced to the fullest extent permitted by law notwithstanding that all Claims are otherwise subject to resolution by judicial reference.

(r) Counterparts. This Agreement and any amendments, waivers, consents or supplements hereto may be executed in any number of counterparts, and by different parties hereto in separate counterparts, each of which when so delivered shall be deemed an original, but all of which counterparts shall constitute but one and the same instrument.

[Remainder of Page Intentionally Left Blank]

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by its officers thereunto duly authorized as of the Effective Date.

COMPANY:

X4 PHARMACEUTICALS, INC.

By: _____
Name: Adam Mostafa
Title: Chief Financial Officer

WARRANTHOLDER:

HERCULES CAPITAL, INC.

By: _____
Name: Jennifer Choe
Title: Assistant General Counsel

EXHIBIT I

NOTICE OF EXERCISE

To: X4 PHARMACEUTICALS, INC.

(1) The undersigned Warrantholder hereby elects to purchase [_____] shares of the Series [__] Preferred Stock of [_____], pursuant to the terms of the Warrant Agreement dated the 19th day of October, 2018 (the "Agreement") between [_____] and the Warrantholder, and [CASH PAYMENT: tenders herewith payment of the Purchase Price in full, together with all applicable transfer taxes, if any.] [NET ISSUANCE: elects pursuant to Section 3(a) of the Agreement to effect a Net Issuance.]

(2) Please issue a certificate or certificates representing said shares of Series [__] Preferred Stock in the name of the undersigned or in such other name as is specified below.

_____
(Name)

_____
(Address)

WARRANTHOLDER:

HERCULES CAPITAL, INC.

By: _____
Name: _____
Title: _____
Date: _____

EXHIBIT II

ACKNOWLEDGMENT OF EXERCISE

The undersigned [_____], hereby acknowledges receipt of the "Notice of Exercise" from Hercules Capital, Inc., to purchase [____] shares of the Series [__] Preferred Stock of [_____], pursuant to the terms of the Warrant Agreement by and between X4 Pharmaceuticals, Inc. and Hercules Capital, Inc. dated September [__], 2018 (the "Agreement"), and further acknowledges that [_____] shares remain subject to purchase under the terms of the Agreement.

COMPANY:

X4 PHARMACEUTICALS, INC.

By: _____
Title: _____
Date: _____

EXHIBIT III

TRANSFER NOTICE

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

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

_____

(Please Print)

whose address is _____

_____

Dated: _____

Holder's Signature: _____

Holder's Address: _____

_____

Signature Guaranteed: _____

NOTE: The signature to this Transfer Notice must correspond with the name as it appears on the face of the Agreement, without alteration or enlargement or any change whatever. Officers of corporations and those acting in a fiduciary or other representative capacity should file proper evidence of authority to assign the foregoing Agreement.

Exhibit 4.6

WARRANT MODIFICATION AGREEMENT

This Warrant Modification Agreement is entered into as of December 11, 2018 between Hercules Capital, Inc. (the "Warrantholder") and X4 Pharmaceuticals, Inc. (the "Company").

Recitals

A. On October 19, 2018, the Company issued to Warrantholder a warrant (the "Warrant") to purchase shares of its Series B Preferred Stock or Next Round Stock on such terms as set forth therein. Any terms not specifically defined herein shall have the meanings set forth in the Warrant.

B. In connection with an amendment to the Loan Agreement of even date herewith, the Company and the Warrantholder now desire to modify the Warrant.

Now, therefore, for good and valuable consideration, the receipt of which is hereby acknowledged, the Company and Warrantholder agree as follows:

1. Notwithstanding Section 8(a) of the Warrant, the Merger (as defined below) shall not be deemed as "Merger Event" under the Warrant, and the Warrant shall continue in full force and effect following the closing of the Merger, and thereafter the Warrant shall be exercisable for shares of Arsanis Common Stock (as defined below) with the Exercise Price under the Warrant being equal to $1.88 per share, subject to appropriate adjustment for the Preferred Stock Exchange Ratio (as defined in the Merger Agreement (as defined below)) following the Merger. For purposes hereof, the "Merger Agreement" shall mean that certain Agreement and Plan of Merger, dated November 26, 2018, as may be amended from time to time, by and among Arsanis, Inc., a Delaware corporation ("Arsanis"), Artemis AC Corp., a Delaware corporation and a wholly owned subsidiary of Arsanis ("Merger Sub") and the Company, pursuant to which, among other things and subject to the terms and conditions of the Merger Agreement, Merger Sub will merge with and into the Company, with the Company continuing as a wholly owned subsidiary of Arsanis and the surviving corporation of the merger (the "Merger"), pursuant to which each share of the Company's Series B Preferred Stock will be cancelled and exchanged for a number of shares of Arsanis' common stock, par value $0.001 per share (the "Arsanis Common Stock"), equal to the Preferred Stock Exchange Ratio.

2. The Company shall not sign or enter into any agreement that will modify, alter or change the rights of Warrantholder under the Warrant without the written consent of the Warrantholder.

3. Except as specifically set forth in this Warrant Modification Agreement, the Warrant remains unmodified and in full force and effect.

4. This Warrant Modification Agreement may be executed in any number of counterparts, and by different parties hereto in separate counterparts, each of which when so delivered shall be deemed an original, but all of which counterparts shall constitute but one and the same instrument.

***

IN WITNESS WHEREOF, the parties hereto have caused this Warrant Modification to be executed by its officers thereunto duly authorized as of the date set forth above.

COMPANY: X4 PHARMACEUTICALS, INC.

By: /s/ Adam Mostafa
Name: Adam Mostafa
Title: Chief Financial Officer

WARRANTHOLDER: HERCULES CAPITAL, INC. a Maryland corporation

By: /s/ Jennifer Choe
Name: Jennifer Choe
Title: Assistant General Counsel

[signature page]

X4 PHARMACEUTICALS, INC.

2015 EMPLOYEE, DIRECTOR AND CONSULTANT EQUITY INCENTIVE PLAN

1. DEFINITIONS.

Unless otherwise specified or unless the context otherwise requires, the following terms, as used in this X4 Pharmaceuticals, Inc. 2015 Employee, Director and Consultant Equity Incentive Plan, have the following meanings:

Administrator means the Board of Directors, unless it has delegated power to act on its behalf to the Committee, in which case the Administrator means the Committee.

Affiliate means a corporation which, for purposes of Section 424 of the Code, is a parent or subsidiary of the Company, direct or indirect.

Agreement means an agreement between the Company and a Participant delivered pursuant to the Plan and pertaining to a Stock Right, in such form as the Administrator shall approve.

Board of Directors means the Board of Directors of the Company.

Cause means, with respect to a Participant (a) dishonesty with respect to the Company or any Affiliate, (b) insubordination, substantial malfeasance or non-feasance of duty, (c) unauthorized disclosure of confidential information, (d) breach by a Participant of any provision of any employment, consulting, advisory, nondisclosure, non-competition or similar agreement between the Participant and the Company or any Affiliate, and (e) conduct substantially prejudicial to the business of the Company or any Affiliate; provided, however, that any provision in an agreement between a Participant and the Company or an Affiliate, which contains a conflicting definition of Cause for termination and which is in effect at the time of such termination, shall supersede this definition with respect to that Participant. The determination of the Administrator as to the existence of Cause will be conclusive on the Participant and the Company.

Code means the United States Internal Revenue Code of 1986, as amended including any successor statute, regulation and guidance thereto.

Committee means the committee of the Board of Directors to which the Board of Directors has delegated power to act under or pursuant to the provisions of the Plan.

Common Stock means shares of the Company's common stock, $.001 par value per share.

Company means X4 Pharmaceuticals, Inc., a Delaware corporation.

Consultant means any natural person who is an advisor or consultant that provides bona fide services to the Company or its Affiliates, provided that such services are not in connection with the offer or sale of securities in a capital raising transaction, and do not directly or indirectly promote or maintain a market for the Company's or its Affiliates' securities.

Disability or Disabled means permanent and total disability as defined in Section 22(e)(3) of the Code.

Employee means any employee of the Company or of an Affiliate (including, without limitation, an employee who is also serving as an officer or director of the Company or of an Affiliate), designated by the Administrator to be eligible to be granted one or more Stock Rights under the Plan.

Exchange Act means the Securities Exchange Act of 1934, as amended.

Fair Market Value of a Share of Common Stock means:

(1) If the Common Stock is listed on a national securities exchange or traded in the over-the-counter market and sales prices are regularly reported for the Common Stock, the closing or, if not applicable, the last price of the Common Stock on the composite tape or other comparable reporting system for the trading day on the applicable date and if such applicable date is not a trading day, the last market trading day prior to such date;

(2) If the Common Stock is not traded on a national securities exchange but is traded on the over-the-counter market, if sales prices are not regularly reported for the Common Stock for the trading day referred to in clause (1), and if bid and asked prices for the Common Stock are regularly reported, the mean between the bid and the asked price for the Common Stock at the close of trading in the over-the-counter market for the trading day on which Common Stock was traded on the applicable date and if such applicable date is not a trading day, the last market trading day prior to such date; and

(3) If the Common Stock is neither listed on a national securities exchange nor traded in the over-the-counter market, such value as the Administrator, in good faith, shall determine.

ISO means an option intended to qualify as an incentive stock option under Section 422 of the Code.

Non-Qualified Option means an option which is not intended to qualify as an ISO.

Option means an ISO or Non-Qualified Option granted under the Plan.

Participant means an Employee, director or Consultant of the Company or an Affiliate to whom one or more Stock Rights are granted under the Plan. As used herein, "Participant" shall include "Participant's Survivors" where the context requires.

Plan means this X4 Pharmaceuticals, Inc. 2015 Employee, Director and Consultant Equity Incentive Plan.

Securities Act means the Securities Act of 1933, as amended.

Shares means shares of the Common Stock as to which Stock Rights have been or may be granted under the Plan or any shares of capital stock into which the Shares are changed or for which they are exchanged within the provisions of Paragraph 3 of the Plan. The Shares issued under the Plan may be authorized and unissued shares or shares held by the Company in its treasury, or both.

Stock-Based Award means a grant by the Company under the Plan of an equity award or an equity based award which is not an Option or a Stock Grant.

Stock Grant means a grant by the Company of Shares under the Plan.

Stock Right means a right to Shares or the value of Shares of the Company granted pursuant to the Plan — an ISO, a Non-Qualified Option, a Stock Grant or a Stock-Based Award.

Survivor means a deceased Participant's legal representatives and/or any person or persons who acquired the Participant's rights to a Stock Right by will or by the laws of descent and distribution.

2. PURPOSES OF THE PLAN.

The Plan is intended to encourage ownership of Shares by Employees and directors of and certain Consultants to the Company and its Affiliates in order to attract and retain such people, to induce them to work for the benefit of the Company or of an Affiliate and to provide additional incentive for them to promote the success of the Company or of an Affiliate. The Plan provides for the granting of ISOs, Non-Qualified Options, Stock Grants and Stock-Based Awards.

3. SHARES SUBJECT TO THE PLAN.

(a) The number of Shares which may be issued from time to time pursuant to this Plan shall be 625,000, or the equivalent of such number of Shares after the Administrator, in its sole discretion, has interpreted the effect of any stock split, stock dividend, combination, recapitalization or similar transaction in accordance with Paragraph 24 of the Plan.

(b) If an Option ceases to be "outstanding", in whole or in part (other than by exercise), or if the Company shall reacquire (at not more than its original issuance price) any Shares issued pursuant to a Stock Grant or Stock-Based Award, or if any Stock Right expires or is forfeited, cancelled, or otherwise terminated or results in any Shares not being issued, the unissued or reacquired Shares which were subject to such Stock Right shall again be available for issuance from time to time pursuant to this Plan. Notwithstanding the foregoing, if a Stock Right is

exercised, in whole or in part, by tender of Shares or if the Company or an Affiliate's tax withholding obligation is satisfied by withholding Shares, the number of Shares deemed to have been issued under the Plan for purposes of the limitation set forth in Paragraph 3(a) above shall be the number of Shares that were subject to the Stock Right or portion thereof, and not the net number of Shares actually issued. However, in the case of ISOs, the foregoing provisions shall be subject to any limitations under the Code.

4. ADMINISTRATION OF THE PLAN.

The Administrator of the Plan will be the Board of Directors, except to the extent the Board of Directors delegates its authority to the Committee, in which case the Committee shall be the Administrator. Subject to the provisions of the Plan, the Administrator is authorized to:

(a) Interpret the provisions of the Plan and all Stock Rights and to make all rules and determinations which it deems necessary or advisable for the administration of the Plan;

(b) Determine which Employees, directors and Consultants shall be granted Stock Rights;

(c) Determine the number of Shares for which a Stock Right or Stock Rights shall be granted;

(d) Specify the terms and conditions upon which a Stock Right or Stock Rights may be granted;

(e) Amend any term or condition of any outstanding Stock Right, including, without limitation, to reduce or increase the exercise price or purchase price, accelerate the vesting schedule or extend the expiration date, provided that (i) such term or condition as amended is permitted by the Plan; (ii) any such amendment shall not impair the rights of a Participant under any Stock Right previously granted without such Participant's consent or in the event of death of the Participant the Participant's Survivors; and (iii) any such amendment shall be made only after the Administrator determines whether such amendment would cause any adverse tax consequences to the Participant, including, but not limited to, the annual vesting limitation contained in Section 422(d) of the Code and described in Paragraph 6(b)(iv) below with respect to ISOs and pursuant to Section 409A of the Code;

(f) Buy out for a payment in cash or Shares, a Stock Right previously granted and/or cancel any such Stock Right and grant in substitution therefor other Stock Rights, covering the same or a different number of Shares and having an exercise price or purchase price per share which may be lower or higher than the exercise price or purchase price of the cancelled Stock Right, based on such terms and conditions as the Administrator shall establish and the Participant shall accept; and

(g) Adopt any sub-plans applicable to residents of any specified jurisdiction as it deems necessary or appropriate in order to comply with or take advantage of any tax or other laws applicable to the Company, any Affiliate or to Participants or to otherwise facilitate the administration of the Plan, which sub-plans may include additional restrictions or conditions applicable to Stock Rights or Shares issuable pursuant to a Stock Right;

provided, however, that all such interpretations, rules, determinations, terms and conditions shall be made and prescribed in the context of not causing any adverse tax consequences under Section 409A of the Code and preserving the tax status under Section 422 of the Code of those Options which are designated as ISOs. Subject to the foregoing, the interpretation and construction by the Administrator of any provisions of the Plan or of any Stock Right granted under it shall be final, unless otherwise determined by the Board of Directors, if the Administrator is the Committee. In addition, if the Administrator is the Committee, the Board of Directors may take any action under the Plan that would otherwise be the responsibility of the Committee.

To the extent permitted under applicable law, the Board of Directors or the Committee may allocate all or any portion of its responsibilities and powers to any one or more of its members and may delegate all or any portion of its responsibilities and powers to any other person selected by it. The Board of Directors or the Committee may revoke any such allocation or delegation at any time.

5. ELIGIBILITY FOR PARTICIPATION.

The Administrator will, in its sole discretion, name the Participants in the Plan; provided, however, that each Participant must be an Employee, director or Consultant of the Company or of an Affiliate at the time a Stock Right is granted. Notwithstanding the foregoing, the Administrator may authorize the grant of a Stock Right to a person not then an Employee, director or Consultant of the Company or of an Affiliate; provided, however, that the actual grant of such Stock Right shall be conditioned upon such person becoming eligible to become a Participant at or prior to the time of the execution of the Agreement evidencing such Stock Right. ISOs may be granted only to Employees who are deemed to be residents of the United States for tax purposes. Non-Qualified Options, Stock Grants and Stock-Based Awards may be granted to any Employee, director or Consultant of the Company or an Affiliate. The granting of any Stock Right to any individual shall neither entitle that individual to, nor disqualify him or her from, participation in any other grant of Stock Rights or any grant under any other benefit plan established by the Company or any Affiliate for Employees, directors or Consultants.

6. TERMS AND CONDITIONS OF OPTIONS.

Each Option shall be set forth in writing in an Option Agreement, duly executed by the Company and, to the extent required by law or requested by the Company, by the Participant. The Administrator may provide that Options be granted subject to such terms and conditions, consistent with the terms and conditions specifically required under this Plan, as the Administrator may deem appropriate including, without limitation, subsequent approval by the shareholders of the Company of this Plan or any amendments thereto. The Option Agreements shall be subject to at least the following terms and conditions:

(a) Non-Qualified Options: Each Option intended to be a Non-Qualified Option shall be subject to the terms and conditions which the Administrator determines to be appropriate and in the best interest of the Company, subject to the following minimum standards for any such Non-Qualified Option:

(i) Exercise Price: Each Option Agreement shall state the exercise price (per share) of the Shares covered by each Option, which exercise price shall be determined by the Administrator and shall be at least equal to the Fair Market Value per share of Common Stock on the date of grant of the Option; provided, that if the exercise price is less than Fair Market Value, the terms of such Option must comply with the requirements of Section 409A of the Code unless granted to a Consultant to whom Section 409A of the Code does not apply.

(ii) Number of Shares: Each Option Agreement shall state the number of Shares to which it pertains.

(iii) Option Periods: Each Option Agreement shall state the date or dates on which it first is exercisable and the date after which it may no longer be exercised, and may provide that the Option rights accrue or become exercisable in installments over a period of months or years, or upon the occurrence of certain conditions or the attainment of stated goals or events.

(iv) Option Conditions: Exercise of any Option may be conditioned upon the Participant's execution of a Share purchase agreement in form satisfactory to the Administrator providing for certain protections for the Company and its other shareholders, including requirements that:

A. The Participant's or the Participant's Survivors' right to sell or transfer the Shares may be restricted; and

B. The Participant or the Participant's Survivors may be required to execute letters of investment intent and must also acknowledge that the Shares will bear legends noting any applicable restrictions.

(v) Term of Option: Each Option shall terminate not more than ten years from the date of the grant or at such earlier time as the Option Agreement may provide.

(b) ISOs: Each Option intended to be an ISO shall be issued only to an Employee who is deemed to be a resident of the United States for tax purposes, and shall be subject to the following terms and conditions, with such additional restrictions or changes as the Administrator determines are appropriate but not in conflict with Section 422 of the Code and relevant regulations and rulings of the Internal Revenue Service:

(i) Minimum standards: The ISO shall meet the minimum standards required of Non-Qualified Options, as described in Paragraph 6(a) above, except clause (i) thereunder.

(ii) Exercise Price: Immediately before the ISO is granted, if the Participant owns, directly or by reason of the applicable attribution rules in Section 424(d) of the Code:

A. 10% or less of the total combined voting power of all classes of stock of the Company or an Affiliate, the exercise price per share of the Shares covered by each ISO shall not be less than 100% of the Fair Market Value per share of the Common Stock on the date of grant of the Option; or

B. More than 10% of the total combined voting power of all classes of stock of the Company or an Affiliate, the exercise price per share of the Shares covered by each ISO shall not be less than 110% of the Fair Market Value per share of the Common Stock on the date of grant of the Option.

(iii) Term of Option: For Participants who own:

A. 10% or less of the total combined voting power of all classes of stock of the Company or an Affiliate, each ISO shall terminate not more than ten years from the date of the grant or at such earlier time as the Option Agreement may provide; or

B. More than 10% of the total combined voting power of all classes of stock of the Company or an Affiliate, each ISO shall terminate not more than five years from the date of the grant or at such earlier time as the Option Agreement may provide.

(iv) Limitation on Yearly Exercise: The Option Agreements shall restrict the amount of ISOs which may become exercisable in any calendar year (under this or any other ISO plan of the Company or an Affiliate) so that the aggregate Fair Market Value (determined on the date each ISO is granted) of the stock with respect to which ISOs are exercisable for the first time by the Participant in any calendar year does not exceed $100,000.

7. TERMS AND CONDITIONS OF STOCK GRANTS.

Each Stock Grant to a Participant shall state the principal terms in an Agreement duly executed by the Company and, to the extent required by law or requested by the Company, by the Participant. The Agreement shall be in a form approved by the Administrator and shall contain terms and conditions which the Administrator determines to be appropriate and in the best interest of the Company, subject to the following minimum standards:

(a) Each Agreement shall state the purchase price per share, if any, of the Shares covered by each Stock Grant, which purchase price shall be determined by the Administrator but shall not be less than the minimum consideration required by the Delaware General Corporation Law, if any, on the date of the grant of the Stock Grant;

(b) Each Agreement shall state the number of Shares to which the Stock Grant pertains; and

(c) Each Agreement shall include the terms of any right of the Company to restrict or reacquire the Shares subject to the Stock Grant, including the time and events upon which such rights shall accrue and the purchase price therefor, if any.

8. TERMS AND CONDITIONS OF OTHER STOCK-BASED AWARDS.

The Administrator shall have the right to grant other Stock-Based Awards based upon the Common Stock having such terms and conditions as the Administrator may determine, including, without limitation, the grant of Shares based upon certain conditions, the grant of securities convertible into Shares and the grant of stock appreciation rights, phantom stock awards or stock units. The principal terms of each Stock-Based Award shall be set forth in an Agreement, duly executed by the Company and, to the extent required by law or requested by the Company, by the Participant. The Agreement shall be in a form approved by the Administrator and shall contain terms and conditions which the Administrator determines to be appropriate and in the best interest of the Company.

The Company intends that the Plan and any Stock-Based Awards granted hereunder be exempt from the application of Section 409A of the Code or meet the requirements of paragraphs (2), (3) and (4) of subsection (a) of Section 409A of the Code, to the extent applicable, and be operated in accordance with Section 409A so that any compensation deferred under any Stock-Based Award (and applicable investment earnings) shall not be included in income under Section 409A of the Code. Any ambiguities in the Plan shall be construed to effect the intent as described in this Paragraph 8.

9. EXERCISE OF OPTIONS AND ISSUE OF SHARES.

An Option (or any part or installment thereof) shall be exercised by giving written notice to the Company or its designee (in a form acceptable to the Administrator, which may include electronic notice), together with provision for payment of the aggregate exercise price in accordance with this Paragraph for the Shares as to which the Option is being exercised, and upon compliance with any other condition(s) set forth in the Option Agreement. Such notice shall be signed by the person exercising the Option (which signature may be provided electronically in a form acceptable to the Administrator), shall state the number of Shares with respect to which the Option is being exercised and shall contain any representation required by the Plan or the Option Agreement. Payment of the exercise price for the Shares as to which such Option is being exercised shall be made (a) in United States dollars in cash or by check, or (b) at the discretion of the Administrator, through delivery of shares of Common Stock held for at least six months (if required to avoid negative accounting treatment) having a Fair Market Value equal as of the date of the exercise to the aggregate cash exercise price for the number of Shares as to which the Option is being exercised, or (c) at the discretion of the Administrator, by having the Company retain from the Shares otherwise issuable upon exercise of the Option, a number of Shares having a Fair Market Value equal as of the date of exercise to the aggregate exercise price for the number of Shares as to which the Option is being exercised, or (d) at the discretion of the Administrator (after consideration of applicable securities, tax and accounting implications), by delivery of the grantee’s personal recourse note bearing interest payable not less than annually at no less than 100% of the applicable Federal rate, as defined in Section 1274(d) of the Code, or (e) at the discretion of the Administrator, in accordance with a cashless exercise program established with a

securities brokerage firm, and approved by the Administrator, or (f) at the discretion of the Administrator, by any combination of (a), (b), (c), (d) and (e) above or (g) at the discretion of the Administrator, by payment of such other lawful consideration as the Administrator may determine. Notwithstanding the foregoing, the Administrator shall accept only such payment on exercise of an ISO as is permitted by Section 422 of the Code.

The Company shall then reasonably promptly deliver the Shares as to which such Option was exercised to the Participant (or to the Participant's Survivors, as the case may be). In determining what constitutes "reasonably promptly," it is expressly understood that the issuance and delivery of the Shares may be delayed by the Company in order to comply with any law or regulation (including, without limitation, state securities or "blue sky" laws) which requires the Company to take any action with respect to the Shares prior to their issuance. The Shares shall, upon delivery, be fully paid, non-assessable Shares.

10. PAYMENT IN CONNECTION WITH THE ISSUANCE OF STOCK GRANTS AND STOCK-BASED AWARDS AND ISSUE OF SHARES.

Any Stock Grant or Stock-Based Award requiring payment of a purchase price for the Shares as to which such Stock Grant or Stock-Based Award is being granted shall be made (a) in United States dollars in cash or by check, or (b) at the discretion of the Administrator, through delivery of shares of Common Stock held for at least six months (if required to avoid negative accounting treatment) and having a Fair Market Value equal as of the date of payment to the purchase price of the Stock Grant or Stock-Based Award, or (c) at the discretion of the Administrator (after consideration of applicable securities, tax and accounting implications), by delivery of the grantee's personal recourse note bearing interest payable not less than annually at no less than 100% of the applicable Federal rate, as defined in Section 1274(d) of the Code, or (d) at the discretion of the Administrator, by any combination of (a), (b) and (c) above; or (e) at the discretion of the Administrator, by payment of such other lawful consideration as the Administrator may determine.

The Company shall when required by the applicable Agreement, reasonably promptly deliver the Shares as to which such Stock Grant or Stock-Based Award was made to the Participant (or to the Participant's Survivors, as the case may be), subject to any escrow provision set forth in the applicable Agreement. In determining what constitutes "reasonably promptly," it is expressly understood that the issuance and delivery of the Shares may be delayed by the Company in order to comply with any law or regulation (including, without limitation, state securities or "blue sky" laws) which requires the Company to take any action with respect to the Shares prior to their issuance.

11. RIGHTS AS A SHAREHOLDER.

No Participant to whom a Stock Right has been granted shall have rights as a shareholder with respect to any Shares covered by such Stock Right except after due exercise of an Option or issuance of Shares as set forth in any Agreement, tender of the aggregate exercise or purchase price, if any, for the Shares being purchased and registration of the Shares in the Company's share register in the name of the Participant.

12. ASSIGNABILITY AND TRANSFERABILITY OF STOCK RIGHTS.

By its terms, a Stock Right granted to a Participant shall not be transferable by the Participant other than (i) by will or by the laws of descent and distribution, or (ii) as approved by the Administrator in its discretion and set forth in the applicable Agreement provided that no Stock Right may be transferred by a Participant for value. Notwithstanding the foregoing, an ISO transferred except in compliance with clause (i) above shall no longer qualify as an ISO. The designation of a beneficiary of a Stock Right by a Participant, with the prior approval of the Administrator and in such form as the Administrator shall prescribe, shall not be deemed a transfer prohibited by this Paragraph. Except as provided above during the Participant's lifetime a Stock Right shall only be exercisable by or issued to such Participant (or his or her legal representative) and shall not be assigned, pledged or hypothecated in any way (whether by operation of law or otherwise) and shall not be subject to execution, attachment or similar process. Any attempted transfer, assignment, pledge, hypothecation or other disposition of any Stock Right or of any rights granted thereunder contrary to the provisions of this Plan, or the levy of any attachment or similar process upon a Stock Right, shall be null and void.

13. EFFECT ON OPTIONS OF TERMINATION OF SERVICE OTHER THAN FOR CAUSE OR DEATH OR DISABILITY.

Except as otherwise provided in a Participant's Option Agreement, in the event of a termination of service (whether as an Employee, director or Consultant) with the Company or an Affiliate before the Participant has exercised an Option, the following rules apply:

(a) A Participant who ceases to be an Employee, director or Consultant of the Company or of an Affiliate (for any reason other than termination for Cause, Disability, or death for which events there are special rules in Paragraphs 14, 15, and 16, respectively), may exercise any Option granted to him or her to the extent that the Option is exercisable on the date of such termination of service, but only within such term as the Administrator has designated in a Participant's Option Agreement.

(b) Except as provided in Subparagraph (c) below, or Paragraph 15 or 16, in no event may an Option intended to be an ISO, be exercised later than three months after the Participant's termination of employment.

(c) The provisions of this Paragraph, and not the provisions of Paragraph 15 or 16, shall apply to a Participant who subsequently becomes Disabled or dies after the termination of employment, director status or consultancy; provided, however, in the case of a Participant's Disability or death within three months after the termination of employment, director status or consultancy, the Participant or the Participant's Survivors may exercise the Option within one year after the date of the Participant's termination of service, but in no event after the date of expiration of the term of the Option.

(d) Notwithstanding anything herein to the contrary, if subsequent to a Participant's termination of employment, termination of director status or termination of consultancy, but prior to the exercise of an Option, the Administrator determines that, either prior or subsequent to the Participant's termination, the Participant engaged in conduct which would constitute Cause, then such Participant shall forthwith cease to have any right to exercise any Option.

(e) A Participant to whom an Option has been granted under the Plan who is absent from the Company or an Affiliate because of temporary disability (any disability other than a Disability as defined in Paragraph 1 hereof), or who is on leave of absence for any purpose, shall not, during the period of any such absence, be deemed, by virtue of such absence alone, to have terminated such Participant's employment, director status or consultancy with the Company or with an Affiliate, except as the Administrator may otherwise expressly provide; provided, however, that, for ISOs, any leave of absence granted by the Administrator of greater than ninety days, unless pursuant to a contract or statute that guarantees the right to reemployment, shall cause such ISO to become a Non-Qualified Option on the 181st day following such leave of absence.

(f) Except as required by law or as set forth in a Participant's Option Agreement, Options granted under the Plan shall not be affected by any change of a Participant's status within or among the Company and any Affiliates, so long as the Participant continues to be an Employee, director or Consultant of the Company or any Affiliate.

14. EFFECT ON OPTIONS OF TERMINATION OF SERVICE FOR CAUSE.

Except as otherwise provided in a Participant's Option Agreement, the following rules apply if the Participant's service (whether as an Employee, director or Consultant) with the Company or an Affiliate is terminated for Cause prior to the time that all his or her outstanding Options have been exercised:

(a) All outstanding and unexercised Options as of the time the Participant is notified his or her service is terminated for Cause will immediately be forfeited.

(b) Cause is not limited to events which have occurred prior to a Participant's termination of service, nor is it necessary that the Administrator's finding of Cause occur prior to termination. If the Administrator determines, subsequent to a Participant's termination of service but prior to the exercise of an Option, that either prior or subsequent to the Participant's termination the Participant engaged in conduct which would constitute Cause, then the right to exercise any Option is forfeited.

15. EFFECT ON OPTIONS OF TERMINATION OF SERVICE FOR DISABILITY.

Except as otherwise provided in a Participant's Option Agreement:

(a) A Participant who ceases to be an Employee, director or Consultant of the Company or of an Affiliate by reason of Disability may exercise any Option granted to such Participant:

(i) To the extent that the Option has become exercisable but has not been exercised on the date of the Participant's termination of service due to Disability; and

(ii) In the event rights to exercise the Option accrue periodically, to the extent of a pro rata portion through the date of the Participant's termination of service due to Disability of any additional vesting rights that would have accrued on the next vesting date had the Participant not become Disabled. The proration shall be based upon the number of days accrued in the current vesting period prior to the date of the Participant's termination of service due to Disability.

(b) A Disabled Participant may exercise the Option only within the period ending one year after the date of the Participant's termination of service due to Disability, notwithstanding that the Participant might have been able to exercise the Option as to some or all of the Shares on a later date if the Participant had not been terminated due to Disability and had continued to be an Employee, director or Consultant or, if earlier, within the originally prescribed term of the Option.

(c) The Administrator shall make the determination both of whether Disability has occurred and the date of its occurrence (unless a procedure for such determination is set forth in another agreement between the Company and such Participant, in which case such procedure shall be used for such determination). If requested, the Participant shall be examined by a physician selected or approved by the Administrator, the cost of which examination shall be paid for by the Company.

16. EFFECT ON OPTIONS OF DEATH WHILE AN EMPLOYEE, DIRECTOR OR CONSULTANT.

Except as otherwise provided in a Participant's Option Agreement:

(a) In the event of the death of a Participant while the Participant is an Employee, director or Consultant of the Company or of an Affiliate, such Option may be exercised by the Participant's Survivors:

(i) To the extent that the Option has become exercisable but has not been exercised on the date of death; and

(ii) In the event rights to exercise the Option accrue periodically, to the extent of a pro rata portion through the date of death of any additional vesting rights that would have accrued on the next vesting date had the Participant not died. The proration shall be based upon the number of days accrued in the current vesting period prior to the Participant's date of death.

(b) If the Participant's Survivors wish to exercise the Option, they must take all necessary steps to exercise the Option within one year after the date of death of such Participant, notwithstanding that the decedent might have been able to exercise the Option as to some or all of the Shares on a later date if he or she had not died and had continued to be an Employee, director or Consultant or, if earlier, within the originally prescribed term of the Option.

17. EFFECT OF TERMINATION OF SERVICE ON STOCK GRANTS AND STOCK-BASED AWARDS.

In the event of a termination of service (whether as an Employee, director or Consultant) with the Company or an Affiliate for any reason before the Participant has accepted a Stock Grant or a Stock-Based Award and paid the purchase price, if required, such grant shall terminate.

For purposes of this Paragraph 17 and Paragraph 18 below, a Participant to whom a Stock Grant or a Stock-Based Award has been issued under the Plan who is absent from work with the Company or with an Affiliate because of temporary disability (any disability other than a Disability as defined in Paragraph 1 hereof), or who is on leave of absence for any purpose, shall not, during the period of any such absence, be deemed, by virtue of such absence alone, to have terminated such Participant's employment, director status or consultancy with the Company or with an Affiliate, except as the Administrator may otherwise expressly provide.

In addition, for purposes of this Paragraph 17 and Paragraph 18 below, any change of employment or other service within or among the Company and any Affiliates shall not be treated as a termination of employment, director status or consultancy so long as the Participant continues to be an Employee, director or Consultant of the Company or any Affiliate.

18. EFFECT ON STOCK GRANTS OF TERMINATION OF SERVICE OTHER THAN FOR CAUSE OR DEATH OR DISABILITY.

Except as otherwise provided in a Participant's Stock Grant Agreement, in the event of a termination of service (whether as an Employee, director or Consultant), other than termination for Cause, Disability, or death for which events there are special rules in Paragraphs 19, 20, and 21, respectively, before all forfeiture provisions or Company rights of repurchase shall have lapsed, then the Company shall have the right to cancel or repurchase that number of Shares subject to a Stock Grant as to which the Company's forfeiture or repurchase rights have not lapsed.

19. EFFECT ON STOCK GRANTS OF TERMINATION OF SERVICE FOR CAUSE.

Except as otherwise provided in a Participant's Stock Grant Agreement, the following rules apply if the Participant's service (whether as an Employee, director or Consultant) with the Company or an Affiliate is terminated for Cause:

(a) All Shares subject to any Stock Grant that remain subject to forfeiture provisions or as to which the Company shall have a repurchase right shall be immediately forfeited to the Company.

(b) Cause is not limited to events which have occurred prior to a Participant's termination of service, nor is it necessary that the Administrator's finding of Cause occur prior to termination. If the Administrator determines, subsequent to a Participant's termination of service, that either prior or subsequent to the Participant's termination the Participant engaged in conduct which would constitute Cause, then all Shares subject to any Stock Grant that remained subject to forfeiture provisions or as to which the Company had a repurchase right on the date of termination shall be immediately forfeited to the Company.

20. EFFECT ON STOCK GRANTS OF TERMINATION OF SERVICE FOR DISABILITY.

Except as otherwise provided in a Participant's Stock Grant Agreement, the following rules apply if a Participant ceases to be an Employee, director or Consultant of the Company or of an Affiliate by reason of Disability: to the extent the forfeiture provisions or the Company's rights of repurchase have not lapsed on the date of Disability, they shall be exercisable; provided, however, that in the event such forfeiture provisions or rights of repurchase lapse periodically, such provisions or rights shall lapse to the extent of a pro rata portion of the Shares subject to such Stock Grant through the date of Disability as would have lapsed had the Participant not become Disabled. The proration shall be based upon the number of days accrued prior to the date of Disability.

The Administrator shall make the determination both as to whether Disability has occurred and the date of its occurrence (unless a procedure for such determination is set forth in another agreement between the Company and such Participant, in which case such procedure shall be used for such determination). If requested, the Participant shall be examined by a physician selected or approved by the Administrator, the cost of which examination shall be paid for by the Company.

21. EFFECT ON STOCK GRANTS OF DEATH WHILE AN EMPLOYEE, DIRECTOR OR CONSULTANT.

Except as otherwise provided in a Participant's Stock Grant Agreement, the following rules apply in the event of the death of a Participant while the Participant is an Employee, director or Consultant of the Company or of an Affiliate: to the extent the forfeiture provisions or the Company's rights of repurchase have not lapsed on the date of death, they shall be exercisable; provided, however, that in the event such forfeiture provisions or rights of repurchase lapse periodically, such provisions or rights shall lapse to the extent of a pro rata portion of the Shares subject to such Stock Grant through the date of death as would have lapsed had the Participant not died. The proration shall be based upon the number of days accrued prior to the Participant's date of death.

22. PURCHASE FOR INVESTMENT.

Unless the offering and sale of the Shares shall have been effectively registered under the Securities Act, the Company shall be under no obligation to issue Shares under the Plan unless and until the following conditions have been fulfilled:

(a) The person who receives a Stock Right shall warrant to the Company, prior to the receipt of Shares, that such person is acquiring such Shares for his or her own account, for investment, and not with a view to, or for sale in connection with, the distribution of any such Shares, in which event the person acquiring such Shares shall be bound by the provisions of the following legend (or a legend in substantially similar form) which shall be endorsed upon the certificate evidencing the Shares issued pursuant to such exercise or such grant:

> "The shares represented by this certificate have been taken for investment and they may not be sold or otherwise transferred by any person, including a pledgee, unless (1) either (a) a Registration Statement with respect to such shares shall be effective under the Securities Act of 1933, as amended, or (b) the Company shall have received an opinion of counsel satisfactory to it that an exemption from registration under such Act is then available, and (2) there shall have been compliance with all applicable state securities laws."

(b) At the discretion of the Administrator, the Company shall have received an opinion of its counsel that the Shares may be issued in compliance with the Securities Act without registration thereunder.

23. DISSOLUTION OR LIQUIDATION OF THE COMPANY.

Upon the dissolution or liquidation of the Company, all Options granted under this Plan which as of such date shall not have been exercised and all Stock Grants and Stock-Based Awards which have not been accepted, to the extent required under the applicable Agreement, will terminate and become null and void; provided, however, that if the rights of a Participant or a Participant's Survivors have not otherwise terminated and expired, the Participant or the Participant's Survivors will have the right immediately prior to such dissolution or liquidation to exercise or accept any Stock Right to the extent that the Stock Right is exercisable or subject to acceptance as of the date immediately prior to such dissolution or liquidation. Upon the dissolution or liquidation of the Company, any outstanding Stock-Based Awards shall immediately terminate unless otherwise determined by the Administrator or specifically provided in the applicable Agreement.

24. ADJUSTMENTS.

Upon the occurrence of any of the following events, a Participant's rights with respect to any Stock Right granted to him or her hereunder shall be adjusted as hereinafter provided, unless otherwise specifically provided in a Participant's Agreement:

(a) Stock Dividends and Stock Splits. If (i) the shares of Common Stock shall be subdivided or combined into a greater or smaller number of shares or if the Company shall issue any shares of Common Stock as a stock dividend on its outstanding Common Stock, or (ii) additional shares or new or different shares or other securities of the Company or other non-cash assets are distributed with respect to such shares of Common Stock, each Stock Right and the number of shares of Common Stock deliverable thereunder shall be appropriately increased or decreased proportionately, and appropriate adjustments shall be made including, in the exercise or purchase price per share, to reflect such events. The number of Shares subject to the limitations in Paragraph 3(a) shall also be proportionately adjusted upon the occurrence of such events.

(b) Corporate Transactions. If the Company is to be consolidated with or acquired by another entity in a merger, consolidation, or sale of all or substantially all of the Company's assets other than a transaction to merely change the state of incorporation (a "Corporate Transaction"), the Administrator or the board of directors of any entity assuming the obligations of the Company hereunder (the "Successor Board"), shall, as to outstanding Options, either (i) make appropriate provision for the continuation of such Options by substituting on an equitable basis for the Shares then subject to such Options either the consideration payable with respect to the outstanding shares of Common Stock in connection with the Corporate Transaction or securities of any successor or

acquiring entity; or (ii) upon written notice to the Participants, provide that such Options must be exercised (either (A) to the extent then exercisable or, (B) at the discretion of the Administrator, any such Options being made partially or fully exercisable for purposes of this Subparagraph), within a specified number of days of the date of such notice, at the end of which period such Options which have not been exercised shall terminate; or (iii) terminate such Options in exchange for payment of an amount equal to the consideration payable upon consummation of such Corporate Transaction to a holder of the number of shares of Common Stock into which such Option would have been exercisable (either (A) to the extent then exercisable or, (B) at the discretion of the Administrator, any such Options being made partially or fully exercisable for purposes of this Subparagraph) less the aggregate exercise price thereof. For purposes of determining the payments to be made pursuant to Subclause (iii) above, in the case of a Corporate Transaction the consideration for which, in whole or in part, is other than cash, the consideration other than cash shall be valued at the fair value thereof as determined in good faith by the Board of Directors.

With respect to outstanding Stock Grants, the Administrator or the Successor Board, shall make appropriate provision for the continuation of such Stock Grants on the same terms and conditions by substituting on an equitable basis for the Shares then subject to such Stock Grants either the consideration payable with respect to the outstanding Shares of Common Stock in connection with the Corporate Transaction or securities of any successor or acquiring entity. In lieu of the foregoing, in connection with any Corporate Transaction, the Administrator may provide that, upon consummation of the Corporate Transaction, each outstanding Stock Grant shall be terminated in exchange for payment of an amount equal to the consideration payable upon consummation of such Corporate Transaction to a holder of the number of shares of Common Stock comprising such Stock Grant (to the extent such Stock Grant is no longer subject to any forfeiture or repurchase rights then in effect or, at the discretion of the Administrator, all forfeiture and repurchase rights being waived upon such Corporate Transaction).

In taking any of the actions permitted under this Paragraph 24(b), the Administrator shall not be obligated by the Plan to treat all Stock Rights, all Stock Rights held by a Participant, or all Stock Rights of the same type, identically.

(c) Recapitalization or Reorganization. In the event of a recapitalization or reorganization of the Company other than a Corporate Transaction pursuant to which securities of the Company or of another corporation are issued with respect to the outstanding shares of Common Stock, a Participant upon exercising an Option or accepting a Stock Grant after the recapitalization or reorganization shall be entitled to receive for the price paid upon such exercise or acceptance if any, the number of replacement securities which would have been received if such Option had been exercised or Stock Grant accepted prior to such recapitalization or reorganization.

(d) Adjustments to Stock-Based Awards. Upon the happening of any of the events described in Subparagraphs (a), (b) or (c) above, any outstanding Stock-Based Award shall be appropriately adjusted to reflect the events described in such Subparagraphs. The Administrator or the Successor Board shall determine the specific adjustments to be made under this Paragraph 24, including, but not limited to the effect of any Corporate Transaction and, subject to Paragraph 4, its determination shall be conclusive.

(e) Modification of Options. Notwithstanding the foregoing, any adjustments made pursuant to Subparagraph (a), (b) or (c) above with respect to Options shall be made only after the Administrator determines whether such adjustments would (i) constitute a "modification" of any ISOs (as that term is defined in Section 424(h) of the Code) or (ii) cause any adverse tax consequences for the holders of Options, including, but not limited to, pursuant to Section 409A of the Code. If the Administrator determines that such adjustments made with respect to Options would constitute a modification or other adverse tax consequence, it may refrain from making such adjustments, unless the holder of an Option specifically agrees in writing that such adjustment be made and such writing indicates that the holder has full knowledge of the consequences of such "modification" on his or her income tax treatment with respect to the Option. This paragraph shall not apply to the acceleration of the vesting of any ISO that would cause any portion of the ISO to violate the annual vesting limitation contained in Section 422(d) of the Code, as described in Paragraph 6(b)(iv).

25. ISSUANCES OF SECURITIES.

Except as expressly provided herein, no issuance by the Company of shares of stock of any class, or securities convertible into shares of stock of any class, shall affect, and no adjustment by reason thereof shall be made with respect to, the number or price of shares subject to Stock Rights. Except as expressly provided herein, no adjustments shall be made for dividends paid in cash or in property (including without limitation, securities) of the Company prior to any issuance of Shares pursuant to a Stock Right.

26. FRACTIONAL SHARES.

No fractional shares shall be issued under the Plan and the person exercising a Stock Right shall receive from the Company cash in lieu of such fractional shares equal to the Fair Market Value thereof.

27. CONVERSION OF ISOs INTO NON-QUALIFIED OPTIONS; TERMINATION OF ISOs.

The Administrator, at the written request of any Participant, may in its discretion take such actions as may be necessary to convert such Participant's ISOs (or any portions thereof) that have not been exercised on the date of conversion into Non-Qualified Options at any time prior to the expiration of such ISOs, regardless of whether the Participant is an Employee of the Company or an Affiliate at the time of such conversion. At the time of such conversion, the Administrator (with the consent of the Participant) may impose such conditions on the exercise of the resulting Non-Qualified Options as the Administrator in its discretion may determine, provided that such conditions shall not be inconsistent with this Plan. Nothing in the Plan shall be deemed to give any Participant the right to have such Participant's ISOs converted into Non-Qualified Options, and no such conversion shall occur until and unless the Administrator takes appropriate action. The Administrator, with the consent of the Participant, may also terminate any portion of any ISO that has not been exercised at the time of such conversion.

28. WITHHOLDING.

In the event that any federal, state, or local income taxes, employment taxes, Federal Insurance Contributions Act ("F.I.C.A.") withholdings or other amounts are required by applicable law or governmental regulation to be withheld from the Participant's salary, wages or other remuneration in connection with the issuance of a Stock Right or Shares under the Plan or for any other reason required by law, the Company may withhold from the Participant's compensation, if any, or may require that the Participant advance in cash to the Company, or to any Affiliate of the Company which employs or employed the Participant, the statutory minimum amount of such withholdings unless a different withholding arrangement, including the use of shares of the Company's Common Stock or a promissory note, is authorized by the Administrator (and permitted by law). For purposes hereof, the fair market value of the shares withheld for purposes of payroll withholding shall be determined in the manner set forth under the definition of Fair Market Value provided in Paragraph 1 above, as of the most recent practicable date prior to the date of exercise. If the Fair Market Value of the shares withheld is less than the amount of payroll withholdings required, the Participant may be required to advance the difference in cash to the Company or the Affiliate employer. The Administrator in its discretion may condition the exercise of an Option for less than the then Fair Market Value on the Participant's payment of such additional withholding.

29. NOTICE TO COMPANY OF DISQUALIFYING DISPOSITION.

Each Employee who receives an ISO must agree to notify the Company in writing immediately after the Employee makes a Disqualifying Disposition of any Shares acquired pursuant to the exercise of an ISO. A Disqualifying Disposition is defined in Section 424(c) of the Code and includes any disposition (including any sale or gift) of such Shares before the later of (a) two years after the date the Employee was granted the ISO, or (b) one year after the date the Employee acquired Shares by exercising the ISO, except as otherwise provided in Section 424(c) of the Code. If the Employee has died before such Shares are sold, these holding period requirements do not apply and no Disqualifying Disposition can occur thereafter.

30. TERMINATION OF THE PLAN.

The Plan will terminate on January 15, 2025, the date which is ten years from the earlier of the date of its adoption by the Board of Directors and the date of its approval by the shareholders of the Company. The Plan may be terminated at an earlier date by vote of the shareholders or the Board of Directors of the Company; provided, however, that any such earlier termination shall not affect any Agreements executed prior to the effective date of such termination. Termination of the Plan shall not affect any Stock Rights theretofore granted.

31. AMENDMENT OF THE PLAN AND AGREEMENTS.

The Plan may be amended by the shareholders of the Company. The Plan may also be amended by the Administrator, including, without limitation, to the extent necessary to qualify any or all outstanding Stock Rights granted under the Plan or Stock Rights to be granted under the Plan for favorable federal income tax treatment as may be afforded incentive stock options under Section 422 of the Code (including deferral of taxation upon exercise), and to the extent necessary

to qualify the Shares issuable under the Plan for listing on any national securities exchange or quotation in any national automated quotation system of securities dealers. Any amendment approved by the Administrator which the Administrator determines is of a scope that requires shareholder approval shall be subject to obtaining such shareholder approval. Any modification or amendment of the Plan shall not, without the consent of a Participant, adversely affect his or her rights under a Stock Right previously granted to him or her. With the consent of the Participant affected, the Administrator may amend outstanding Agreements in a manner which may be adverse to the Participant but which is not inconsistent with the Plan. In the discretion of the Administrator, outstanding Agreements may be amended by the Administrator in a manner which is not adverse to the Participant.

32. EMPLOYMENT OR OTHER RELATIONSHIP.

Nothing in this Plan or any Agreement shall be deemed to prevent the Company or an Affiliate from terminating the employment, consultancy or director status of a Participant, nor to prevent a Participant from terminating his or her own employment, consultancy or director status or to give any Participant a right to be retained in employment or other service by the Company or any Affiliate for any period of time.

33. GOVERNING LAW.

This Plan shall be construed and enforced in accordance with the law of the State of Delaware.

X4 PHARMACEUTICALS, INC.

STOCK OPTION AGREEMENT - INCORPORATED TERMS AND CONDITIONS

AGREEMENT made as of the date of grant set forth in the Stock Option Grant Notice by and between X4 Pharmaceuticals, Inc. (the "Company"), a Delaware corporation, and the individual whose name appears on the Stock Option Grant Notice (the "Participant").

WHEREAS, the Company desires to grant to the Participant an Option to purchase shares of its common stock, $0.001 par value per share (the "Shares"), under and for the purposes set forth in the Company's 2015 Employee, Director and Consultant Equity Incentive Plan (the "Plan");

WHEREAS, the Company and the Participant understand and agree that any terms used and not defined herein have the same meanings as in the Plan; and

WHEREAS, the Company and the Participant each intend that the Option granted herein shall be of the type set forth in the Stock Option Grant Notice.

NOW, THEREFORE, in consideration of the mutual covenants hereinafter set forth and for other good and valuable consideration, the parties hereto agree as follows:

1. GRANT OF OPTION.

The Company hereby grants to the Participant the right and option to purchase all or any part of an aggregate of the number of Shares set forth in the Stock Option Grant Notice, on the terms and conditions and subject to all the limitations set forth herein, under United States securities and tax laws, and in the Plan, which is incorporated herein by reference. The Participant acknowledges receipt of a copy of the Plan.

2. EXERCISE PRICE.

The exercise price of the Shares covered by the Option shall be the amount per Share set forth in the Stock Option Grant Notice, subject to adjustment, as provided in the Plan, in the event of a stock split, reverse stock split or other events affecting the holders of Shares after the date hereof (the "Exercise Price"). Payment shall be made in accordance with Paragraph 9 of the Plan.

3. EXERCISABILITY OF OPTION.

Subject to the terms and conditions set forth in this Agreement and the Plan, the Option granted hereby shall become vested and exercisable as set forth in the Stock Option Grant Notice and is subject to the other terms and conditions of this Agreement and the Plan.

4. TERM OF OPTION.

This Option shall terminate on the Option Expiration Date as specified in the Stock Option Grant Notice and, if this Option is designated in the Stock Option Grant Notice as an ISO and the Participant owns as of the date hereof more than 10% of the total combined voting power of all classes of capital stock of the Company or an Affiliate, such date may not be more than five years from the date of this Agreement, but shall be subject to earlier termination as provided herein or in the Plan.

If the Participant ceases to be an Employee, director or Consultant of the Company or of an Affiliate for any reason other than the death or Disability of the Participant, or termination of the Participant for Cause (the "Termination Date"), the Option to the extent then vested and exercisable pursuant to Section 3 hereof as of the Termination Date, and not previously terminated in accordance with this Agreement, may be exercised within three months after the Termination Date, or on or prior to the Option Expiration Date as specified in the Stock Option Grant Notice, whichever is earlier, but may not be exercised thereafter except as set forth below. In such event, the unvested portion of the Option shall not be exercisable and shall expire and be cancelled on the Termination Date.

If this Option is designated in the Stock Option Grant Notice as an ISO and the Participant ceases to be an Employee of the Company or of an Affiliate but continues after termination of employment to provide service to the Company or an Affiliate as a director or Consultant, this Option shall continue to vest in accordance with Section 3 above as if this Option had not terminated until the Participant is no longer providing services to the Company. In such case, this Option shall automatically convert and be deemed a Non-Qualified Option as of the date that is three months from termination of the Participant's employment and this Option shall continue on the same terms and conditions set forth herein until such Participant is no longer providing service to the Company or an Affiliate.

Notwithstanding the foregoing, in the event of the Participant's Disability or death within three months after the Termination Date, the Participant or the Participant's Survivors may exercise the Option within one year after the Termination Date, but in no event after the Option Expiration Date as specified in the Stock Option Grant Notice.

In the event the Participant's service is terminated by the Company or an Affiliate for Cause, the Participant's right to exercise any unexercised portion of this Option even if vested shall cease immediately as of the time the Participant is notified his or her service is terminated for Cause, and this Option shall thereupon terminate. Notwithstanding anything herein to the contrary, if subsequent to the Participant's termination, but prior to the exercise of the Option, the Administrator determines that, either prior or subsequent to the Participant's termination, the Participant engaged in conduct which would constitute Cause, then the Participant shall immediately cease to have any right to exercise the Option and this Option shall thereupon terminate.

In the event of the Disability of the Participant, as determined in accordance with the Plan, the Option shall be exercisable within one year after the Participant's termination of service due to Disability or, if earlier, on or prior to the Option Expiration Date as specified in the Stock Option Grant Notice. In such event, the Option shall be exercisable:

(a) to the extent that the Option has become exercisable but has not been exercised as of the date of the Participant's termination of service due to Disability; and

(b) in the event rights to exercise the Option accrue periodically, to the extent of a pro rata portion through the date of the Participant's termination of service due to Disability of any additional vesting rights that would have accrued on the next vesting date had the Participant not become Disabled. The proration shall be based upon the number of days accrued in the current vesting period prior to the date of the Participant's termination of service due to Disability.

In the event of the death of the Participant while an Employee, director or Consultant of the Company or of an Affiliate, the Option shall be exercisable by the Participant's Survivors within one year after the date of death of the Participant or, if earlier, on or prior to the Option Expiration Date as specified in the Stock Option Grant Notice. In such event, the Option shall be exercisable:

(x) to the extent that the Option has become exercisable but has not been exercised as of the date of death; and

(y) in the event rights to exercise the Option accrue periodically, to the extent of a pro rata portion through the date of death of any additional vesting rights that would have accrued on the next vesting date had the Participant not died. The proration shall be based upon the number of days accrued in the current vesting period prior to the Participant's date of death.

5. METHOD OF EXERCISING OPTION.

Subject to the terms and conditions of this Agreement, the Option may be exercised by written notice to the Company or its designee, in substantially the form of Exhibit A attached hereto (or in such other form acceptable to the Company, which may include electronic notice). Such notice shall state the number of Shares with respect to which the Option is being exercised and shall be signed by the person exercising the Option (which signature may be provided electronically in a form acceptable to the Company). Payment of the Exercise Price for such Shares shall be made in accordance with Paragraph 9 of the Plan. The Company shall deliver such Shares as soon as practicable after the notice shall be received, provided, however, that the Company may delay issuance of such Shares until completion of any action or obtaining of any consent, which the Company deems necessary under any applicable law (including, without limitation, state securities or "blue sky" laws). The Shares as to which the Option shall have been so exercised shall be registered in the Company's share register in the name of the person so exercising the Option (or, if the Option shall be exercised by the Participant and if the Participant shall so request in the notice exercising the Option, shall be registered in the Company's share register in the name of the Participant and another person jointly, with right of survivorship) and shall be delivered as provided above to or upon the written order of the person exercising the Option. In the event the Option shall be exercised, pursuant to Section 4 hereof, by any person other than the Participant, such notice shall be accompanied by appropriate proof of the right of such person to exercise the Option. All Shares that shall be purchased upon the exercise of the Option as provided herein shall be fully paid and nonassessable.

6. PARTIAL EXERCISE.

Exercise of this Option to the extent above stated may be made in part at any time and from time to time within the above limits, except that no fractional share shall be issued pursuant to this Option.

7. NON-ASSIGNABILITY.

The Option shall not be transferable by the Participant otherwise than by will or by the laws of descent and distribution. If this Option is a Non-Qualified Option then it may also be transferred pursuant to a qualified domestic relations order as defined by the Code or Title I of the Employee Retirement Income Security Act or the rules thereunder. Except as provided above in this paragraph, the Option shall be exercisable, during the Participant's lifetime, only by the Participant (or, in the event of legal incapacity or incompetency, by the Participant's guardian or representative) and shall not be assigned, pledged or hypothecated in any way (whether by operation of law or otherwise) and shall not be subject to execution, attachment or similar process. Any attempted transfer, assignment, pledge, hypothecation or other disposition of the Option or of any rights granted hereunder contrary to the provisions of this Section 7, or the levy of any attachment or similar process upon the Option shall be null and void.

8. NO RIGHTS AS STOCKHOLDER UNTIL EXERCISE.

The Participant shall have no rights as a stockholder with respect to Shares subject to this Agreement until registration of the Shares in the Company's share register in the name of the Participant. Except as is expressly provided in the Plan with respect to certain changes in the capitalization of the Company, no adjustment shall be made for dividends or similar rights for which the record date is prior to the date of such registration.

9. ADJUSTMENTS.

The Plan contains provisions covering the treatment of Options in a number of contingencies such as stock splits and mergers. Provisions in the Plan for adjustment with respect to stock subject to Options and the related provisions with respect to successors to the business of the Company are hereby made applicable hereunder and are incorporated herein by reference.

10. TAXES.

The Participant acknowledges and agrees that (i) any income or other taxes due from the Participant with respect to this Option or the Shares issuable upon exercise of this Option shall be the Participant's responsibility; (ii) the Participant was free to use professional advisors of his or her choice in connection with this Agreement, has received advice from his or her professional advisors in connection with this Agreement, understands its meaning and import, and is entering into this Agreement freely and without coercion or duress; (iii) the Participant has not received and is not relying upon any advice, representations or assurances made by or on behalf of the Company or any Affiliate or any employee of or counsel to the Company or any Affiliate regarding any tax or other effects or implications of the Option, the Shares or other matters contemplated by this Agreement and (iv) neither the Administrator, the Company, its Affiliates, nor any of its officers or directors, shall be held liable for any applicable costs, taxes, or penalties associated with the Option if, in fact, the Internal Revenue Service were to determine that the Option constitutes deferred compensation under Section 409A of the Code.

If this Option is designated in the Stock Option Grant Notice as a Non-Qualified Option or if the Option is converted into a Non-Qualified Option and such Non-Qualified Option is exercised, the Participant agrees that the Company may withhold from the Participant's remuneration, if any, the minimum statutory amount of federal, state and local withholding taxes attributable to such amount that is considered compensation includable in such person's gross income. At the Company's discretion, the amount required to be withheld may be withheld in cash from such remuneration, or in kind from the Shares otherwise deliverable to the Participant on exercise of the Option. The Participant further agrees that, if the Company does not withhold an amount from the Participant's remuneration sufficient to satisfy the Company's income tax withholding obligation, the Participant will reimburse the Company on demand, in cash, for the amount under-withheld.

11. PURCHASE FOR INVESTMENT.

Unless the offering and sale of the Shares to be issued upon the particular exercise of the Option shall have been effectively registered under the Securities Act of 1933, as now in force or hereafter amended (the "1933 Act"), the Company shall be under no obligation to issue the Shares covered by such exercise unless the Company has determined that such exercise and issuance would be exempt from the registration requirements of the 1933 Act and until the following conditions have been fulfilled:

(a) The person(s) who exercise the Option shall warrant to the Company, at the time of such exercise, that such person(s) are acquiring such Shares for their own respective accounts, for investment, and not with a view to, or for sale in connection with, the distribution of any such Shares, in which event the person(s) acquiring such Shares shall be bound by the provisions of the following legend which shall be endorsed upon any certificate(s) evidencing the Shares issued pursuant to such exercise:

"The shares represented by this certificate have been taken for investment and they may not be sold or otherwise transferred by any person, including a pledgee, unless (1) either (a) a Registration Statement with respect to such shares shall be effective under the Securities Act of 1933, as amended, or (b) the Company shall have received an opinion of counsel satisfactory to it that an exemption from registration under such Act is then available, and (2) there shall have been compliance with all applicable state securities laws;" and

(b) If the Company so requires, the Company shall have received an opinion of its counsel that the Shares may be issued upon such particular exercise in compliance with the 1933 Act without registration thereunder. Without limiting the generality of the foregoing, the Company may delay issuance of the Shares until completion of any action or obtaining of any consent, which the Company deems necessary under any applicable law (including without limitation state securities or "blue sky" laws).

12. RESTRICTIONS ON TRANSFER OF SHARES.

12.1 The Shares acquired by the Participant pursuant to the exercise of the Option granted hereby shall not be transferred by the Participant except as permitted herein.

12.2 In the event of the Participant's termination of service for any reason, the Company shall have the option, but not the obligation, to repurchase all or any part of the Shares issued pursuant to this Agreement (including, without limitation, Shares purchased after termination of service, Disability or death in accordance with Section 4 hereof). In the event the Company does not, upon the termination of service of the Participant (as described above), exercise its option pursuant to this Section 12.2, the restrictions set forth in the balance of this Agreement shall not thereby lapse, and the Participant for himself or herself, his or her heirs, legatees, executors, administrators and other successors in interest, agrees that the Shares shall remain subject to such restrictions. The following provisions shall apply to a repurchase under this Section 12.2:

(i) The per share repurchase price of the Shares to be sold to the Company upon exercise of its option under this Section 12.2 shall be equal to the Fair Market Value of each such Share determined in accordance with the Plan as of the date of repurchase provided, however, in the event of a termination by the Company for Cause, the per share repurchase price of the Shares to be sold to the Company upon exercise of its option under this Section 12.2 shall be equal to the lesser of the Exercise Price and the Fair Market Value on the date of the repurchase.

(ii) The Company's option to repurchase the Participant's Shares in the event of termination of service shall be valid for a period of 12 months commencing with the date of such termination of service.

(iii) In the event the Company shall be entitled to and shall elect to exercise its option to repurchase the Participant's Shares under this Section 12.2, the Company shall notify the Participant, or in case of death, his or her Survivor, in writing of its intent to repurchase the Shares. Such written notice may be mailed by the Company up to and including the last day of the time period provided for in Section 12.2(ii) for exercise of the Company's option to repurchase.

(iv) The written notice to the Participant shall specify the address at, and the time and date on, which payment of the repurchase price is to be made (the "Closing"). The date specified shall not be less than ten days nor more than 60 days from the date of the mailing of the notice, and the Participant or his or her successor in interest with respect to the Shares shall have no further rights as the owner thereof from and after the date specified in the notice. At the Closing, the repurchase price shall be delivered to the Participant or his or her successor in interest and the Shares being purchased, duly endorsed for transfer, shall, to the extent that they are not then in the possession of the Company, be delivered to the Company by the Participant or his or her successor in interest.

12.3 It shall be a condition precedent to the validity of any sale or other transfer of any Shares by the Participant that the following restrictions be complied with (except as otherwise provided in this Section 12):

(i) No Shares owned by the Participant may be sold, pledged or otherwise transferred (including by gift or devise) to any person or entity, voluntarily, or by operation of law, except in accordance with the terms and conditions hereinafter set forth.

(ii) Before selling or otherwise transferring all or part of the Shares, the Participant shall give written notice of such intention to the Company, which notice shall include the name of the proposed transferee, the proposed purchase price per share, the terms of payment of such purchase price and all other matters relating to such sale or transfer and shall be accompanied by a copy of the binding written agreement of the proposed transferee to purchase the Shares of the Participant. Such notice shall constitute a binding offer by the Participant to sell to the Company such number of the Shares then held by the Participant as are proposed to be sold in the notice at the monetary price per share designated in such notice, payable on the terms offered to the Participant by the proposed transferee (provided, however, that the Company shall not be required to meet any non-monetary terms of the proposed transfer, including, without limitation, delivery of other securities in exchange for the Shares proposed to be sold). The Company shall give written notice to the Participant as to whether such offer has been accepted in whole by the Company within 60 days after its receipt of written notice from the Participant. The Company may only accept such offer in whole and may not accept such offer in part. Such acceptance notice shall fix a time, location and date for the Closing on such purchase ("Closing Date") which shall not be less than ten nor more than sixty days after the giving of the acceptance notice, provided, however, if any of the Shares to be sold pursuant to this Section 12.3 have been held by the Participant for less than six months, then the Closing Date may be extended by the Company until no more than ten days after such Shares have been held by the Participant for six months if required under applicable accounting rules in effect at the time. The place for such Closing shall be at the Company's principal office. At such Closing, the Participant shall accept payment as set forth herein and shall deliver to the Company in exchange therefor certificates for the number of Shares stated in the notice accompanied by duly executed instruments of transfer.

(iii) If the Company shall fail to accept any such offer, the Participant shall be free to sell all, but not less than all, of the Shares set forth in his or her notice to the designated transferee at the price and terms designated in the Participant's notice, provided that (i) such sale is consummated within six months after the giving of notice by the Participant to the Company as aforesaid, and (ii) the transferee first agrees in writing to be bound by the provisions of this Section 12 so that such transferee (and all subsequent transferees) shall thereafter only be permitted to sell or transfer the Shares in accordance with the terms hereof. After the expiration of such six months, the provisions of this Section 12.3 shall again apply with respect to any proposed voluntary transfer of the Participant's Shares.

(iv) The provisions of this Section 12.3 may be waived by the Company. Any such waiver may be unconditional or based upon such conditions as the Company may impose.

12.4 In the event that the Participant or his or her successor in interest fails to deliver the Shares to be repurchased by the Company under this Agreement, the Company may elect (a) to establish a segregated account in the amount of the repurchase price, such account to be turned over to the Participant or his or her successor in interest upon delivery of such Shares, and (b) immediately to take such action as is appropriate to transfer record title of such Shares from the Participant to the Company and to treat the Participant and such Shares in all respects as if delivery of such Shares had been made as required by this Agreement. The Participant hereby irrevocably grants the Company a power of attorney which shall be coupled with an interest for the purpose of effectuating the preceding sentence.

12.5 If the Company shall pay a stock dividend or declare a stock split on or with respect to any of its Common Stock, or otherwise distribute securities of the Company to the holders of its Common Stock, the number of shares of stock or other securities of the Company issued with respect to the shares then subject to the restrictions contained in this Agreement shall be added to the Shares subject to the Company's rights to repurchase pursuant to this Agreement. If the Company shall distribute to its stockholders shares of stock of another corporation, the shares of stock of such other corporation, distributed with respect to the Shares then subject to the restrictions contained in this Agreement, shall be added to the Shares subject to the Company's rights to repurchase pursuant to this Agreement.

12.6 If the outstanding shares of Common Stock of the Company shall be subdivided into a greater number of shares or combined into a smaller number of shares, or in the event of a reclassification of the outstanding shares of Common Stock of the Company, or if the Company shall be a party to a merger, consolidation or capital reorganization, there shall be substituted for the Shares then subject to the restrictions contained in this Agreement such amount and kind of securities as are issued in such subdivision, combination, reclassification, merger, consolidation or capital reorganization in respect of the Shares subject immediately prior thereto to the Company's rights to repurchase pursuant to this Agreement.

12.7 The Company shall not be required to transfer any Shares on its books which shall have been sold, assigned or otherwise transferred in violation of this Agreement, or to treat as owner of such Shares, or to accord the right to vote as such owner or to pay dividends to, any person or organization to which any such Shares shall have been so sold, assigned or otherwise transferred, in violation of this Agreement.

12.8 The provisions of Sections 12.1, 12.2 and 12.3 shall terminate upon the effective date of the registration of the Shares pursuant to the Securities Exchange Act of 1934.

12.9 The Participant agrees that in the event the Company proposes to offer for sale to the public any of its equity securities and such Participant is requested by the Company and any underwriter engaged by the Company in connection with such offering to sign an agreement restricting the sale or other transfer of Shares, then it will promptly sign such agreement and will not transfer, whether in privately negotiated transactions or to the public in open market transactions or otherwise, any Shares or other securities of the Company held by him or her during such period as is determined by the Company and the underwriters, not to exceed 180 days following the closing of the offering, plus such additional period of time as may be required to comply with NASD Rule 2711 or similar rules thereto (such period, the "Lock-Up Period"). Such agreement shall be in writing and in form and substance reasonably satisfactory to the Company and such underwriter and pursuant to customary and prevailing terms and conditions. Notwithstanding whether the Participant has signed such an agreement, the Company may impose stop-transfer instructions with respect to the Shares or other securities of the Company subject to the foregoing restrictions until the end of the Lock-Up Period.

12.10 The Participant acknowledges and agrees that neither the Company, its shareholders nor its directors and officers, has any duty or obligation to disclose to the Participant any material information regarding the business of the Company or affecting the value of the Shares before, at the time of, or following a termination of the service of the Participant by the Company, including, without limitation, any information concerning plans for the Company to make a public offering of its securities or to be acquired by or merged with or into another firm or entity.

12.11 All certificates representing the Shares to be issued to the Participant pursuant to this Agreement shall have endorsed thereon a legend substantially as follows: "The shares represented by this certificate are subject to restrictions set forth in a Stock Option Agreement dated _____, 201__ with this Company, a copy of which Agreement is available for inspection at the offices of the Company or will be made available upon request."

13. NO OBLIGATION TO MAINTAIN RELATIONSHIP.

The Participant acknowledges that: (i) the Company is not by the Plan or this Option obligated to continue the Participant as an employee, director or Consultant of the Company or an Affiliate; (ii) the Plan is discretionary in nature and may be suspended or terminated by the Company at any time; (iii) the grant of the Option is a one-time benefit which does not create any contractual or other right to receive future grants of options, or benefits in lieu of options; (iv) all determinations with respect to any such future grants, including, but not limited to, the times when options shall be granted, the number of shares subject to each option, the option price, and the time or times when each option shall be exercisable, will be at the sole discretion of the Company; (v) the Participant's participation in the Plan is voluntary; (vi) the value of the Option is an extraordinary item of compensation which is outside the scope of the Participant's employment or consulting contract, if any; and (vii) the Option is not part of normal or expected compensation for purposes of calculating any severance, resignation, redundancy, end of service payments, bonuses, long-service awards, pension or retirement benefits or similar payments.

14. IF OPTION IS INTENDED TO BE AN ISO.

If this Option is designated in the Stock Option Grant Notice as an ISO so that the Participant (or the Participant's Survivors) may qualify for the favorable tax treatment provided to holders of Options that meet the standards of Section 422 of the Code then any provision of this Agreement or the Plan which conflicts with the Code so that this Option would not be deemed an ISO is null and void and any ambiguities shall be resolved so that the Option qualifies as an ISO. The Participant should consult with the Participant's own tax advisors regarding the tax effects of the Option and the requirements necessary to obtain favorable tax treatment under Section 422 of the Code, including, but not limited to, holding period requirements.

Notwithstanding the foregoing, to the extent that the Option is designated in the Stock Option Grant Notice as an ISO and is not deemed to be an ISO pursuant to Section 422(d) of the Code because the aggregate Fair Market Value (determined as of the Date of Option Grant) of any of the Shares with respect to which this ISO is granted becomes exercisable for the first time during any calendar year in excess of $100,000, the portion of the Option representing such excess value shall be treated as a Non-Qualified Option and the Participant shall be deemed to have taxable income measured by the difference between the then Fair Market Value of the Shares received upon exercise and the price paid for such Shares pursuant to this Agreement.

Neither the Company nor any Affiliate shall have any liability to the Participant, or any other party, if the Option (or any part thereof) that is intended to be an ISO is not an ISO or for any action taken by the Administrator, including without limitation the conversion of an ISO to a Non-Qualified Option.

15. NOTICE TO COMPANY OF DISQUALIFYING DISPOSITION OF AN ISO.

If this Option is designated in the Stock Option Grant Notice as an ISO then the Participant agrees to notify the Company in writing immediately after the Participant makes a Disqualifying Disposition of any of the Shares acquired pursuant to the exercise of the ISO. A Disqualifying Disposition is defined in Section 424(c) of the Code and includes any disposition (including any sale) of such Shares before the later of (a) two years after the date the Participant was granted the ISO or (b) one year after the date the Participant acquired Shares by exercising the ISO, except as otherwise provided in Section 424(c) of the Code. If the Participant has died before the Shares are sold, these holding period requirements do not apply and no Disqualifying Disposition can occur thereafter.

16. NOTICES.

Any notices required or permitted by the terms of this Agreement or the Plan shall be given by recognized courier service, facsimile, registered or certified mail, return receipt requested, addressed as follows:

If to the Company:

X4 Pharmaceuticals, Inc.
One Broadway, 14th Floor
Cambridge, MA 02142
Attention: President

If to the Participant at the address set forth on the Stock Option Grant Notice or to such other address or addresses of which notice in the same manner has previously been given. Any such notice shall be deemed to have been given upon the earlier of receipt, one business day following delivery to a recognized courier service or three business days following mailing by registered or certified mail.

17. GOVERNING LAW.

This Agreement shall be governed by and construed in accordance with the laws of the State of Delaware, without giving effect to the conflict of law principles thereof. For the purpose of litigating any dispute that arises under this Agreement, the parties hereby consent to exclusive jurisdiction in Massachusetts and agree that such litigation shall be conducted in the state courts of Middlesex County, Massachusetts or the federal courts of the United States for the District of Massachusetts.

18. BENEFIT OF AGREEMENT.

Subject to the provisions of the Plan and the other provisions hereof, this Agreement shall be for the benefit of and shall be binding upon the heirs, executors, administrators, successors and assigns of the parties hereto.

19. ENTIRE AGREEMENT.

This Agreement, together with the Plan, embodies the entire agreement and understanding between the parties hereto with respect to the subject matter hereof and supersedes all prior oral or written agreements and understandings relating to the subject matter hereof. No statement, representation, warranty, covenant or agreement not expressly set forth in this Agreement shall affect or be used to interpret, change or restrict, the express terms and provisions of this Agreement, provided, however, in any event, this Agreement shall be subject to and governed by the Plan.

20. MODIFICATIONS AND AMENDMENTS.

The terms and provisions of this Agreement may be modified or amended as provided in the Plan.

21. WAIVERS AND CONSENTS.

Except as provided in the Plan, the terms and provisions of this Agreement may be waived, or consent for the departure therefrom granted, only by written document executed by the party entitled to the benefits of such terms or provisions. No such waiver or consent shall be deemed to be or shall constitute a waiver or consent with respect to any other terms or provisions of this Agreement, whether or not similar. Each such waiver or consent shall be effective only in the specific instance and for the purpose for which it was given, and shall not constitute a continuing waiver or consent.

22. DATA PRIVACY.

By entering into this Agreement, the Participant: (i) authorizes the Company and each Affiliate, and any agent of the Company or any Affiliate administering the Plan or providing Plan recordkeeping services, to disclose to the Company or any of its Affiliates such information and data as the Company or any such Affiliate shall request in order to facilitate the grant of options and the administration of the Plan; (ii) waives any data privacy rights he or she may have with respect to such information; and (iii) authorizes the Company and each Affiliate to store and transmit such information in electronic form.

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Exhibit A

NOTICE OF EXERCISE OF STOCK OPTION

[Form for Unregistered Shares]

To: X4 Pharmaceuticals, Inc.

Ladies and Gentlemen:

I hereby exercise my Stock Option to purchase _____ shares (the "Shares") of the common stock, $0.001 par value, of X4 Pharmaceuticals, Inc. (the "Company"), at the exercise price of $_____ per share, pursuant to and subject to the terms of that certain Stock Option Agreement between the undersigned and the Company dated _____, 201_.

I am aware that the Shares have not been registered under the Securities Act of 1933, as amended (the "1933 Act"), or any state securities laws. I understand that the reliance by the Company on exemptions under the 1933 Act is predicated in part upon the truth and accuracy of the statements by me in this Notice of Exercise.

I hereby represent and warrant that (1) I have been furnished with all information which I deem necessary to evaluate the merits and risks of the purchase of the Shares; (2) I have had the opportunity to ask questions concerning the Shares and the Company and all questions posed have been answered to my satisfaction; (3) I have been given the opportunity to obtain any additional information I deem necessary to verify the accuracy of any information obtained concerning the Shares and the Company; and (4) I have such knowledge and experience in financial and business matters that I am able to evaluate the merits and risks of purchasing the Shares and to make an informed investment decision relating thereto.

I hereby represent and warrant that I am purchasing the Shares for my own personal account for investment and not with a view to the sale or distribution of all or any part of the Shares.

I understand that because the Shares have not been registered under the 1933 Act, I must continue to bear the economic risk of the investment for an indefinite time and the Shares cannot be sold unless the Shares are subsequently registered under applicable federal and state securities laws or an exemption from such registration requirements is available.

I agree that I will in no event sell or distribute or otherwise dispose of all or any part of the Shares unless (1) there is an effective registration statement under the 1933 Act and applicable state securities laws covering any such transaction involving the Shares or (2) the Company receives an opinion of my legal counsel (concurred in by legal counsel for the Company) stating that such transaction is exempt from registration or the Company otherwise satisfies itself that such transaction is exempt from registration.

I consent to the placing of a legend on my certificate for the Shares stating that the Shares have not been registered and setting forth the restriction on transfer contemplated hereby and to the placing of a stop transfer order on the books of the Company and with any transfer agents against the Shares until the Shares may be legally resold or distributed without restriction.

I understand that at the present time Rule 144 of the Securities and Exchange Commission (the "SEC") may not be relied on for the resale or distribution of the Shares by me. I understand that the Company has no obligation to me to register the sale of the Shares with the SEC and has not represented to me that it will register the sale of the Shares.

I understand the terms and restrictions on the right to dispose of the Shares set forth in the 2015 Employee, Director and Consultant Equity Incentive Plan and the Stock Option Agreement, both of which I have carefully reviewed. I consent to the placing of a legend on my certificate for the Shares referring to such restriction and the placing of stop transfer orders until the Shares may be transferred in accordance with the terms of such restrictions.

I have considered the Federal, state and local income tax implications of the exercise of my Option and the purchase and subsequent sale of the Shares.

I am paying the option exercise price for the Shares as follows:

_____

Please issue the Shares (check one):

☐ to me; or

☐ to me and _____, as joint tenants with right of survivorship

and mail the certificate to me at the following address:

_____

_____

_____

My mailing address for shareholder communications, if different from the address listed above is:

_____

_____

_____

Very truly yours,

Participant (signature)

Print Name

Date

Social Security Number

X4 PHARMACEUTICALS, INC.

DIRECTOR COMPENSATION POLICY
(Last modified: March 13, 2019)

The Board of Directors (the "Board") of X4 Pharmaceuticals, Inc. (the "Company"), has approved the following Director Compensation Policy under which the Company's non-employee directors shall receive the following compensation for their service as members of the Board of Directors.

Director Compensation

Our goal is to provide compensation for our non-employee directors in a manner that enables us to attract and retain outstanding director candidates and reflects the substantial time commitment necessary to oversee the Company's affairs. We also seek to align the interests of our directors and our stockholders and we have chosen to do so by compensating our non-employee directors with a mix of cash and equity-based compensation.

Cash Compensation

The fees that will be paid to our non-employee directors for service on the Board, and for service on each committee of the Board on which the director is then a member, and the fees that will be paid to the chairperson of the Board, if one is then appointed, and the chairperson of each committee of the Board will be as follows:

	Annual Retainer Amount for Chair	Annual Retainer Amount for Member
Board of Directors	$ 75,000	$ 35,000
Audit Committee	$ 15,000	$ 7,500
Compensation Committee	$ 10,000	$ 5,000
Nominating and Corporate Governance Committee	$ 8,000	$ 4,000

The foregoing fees will be payable in arrears in four equal quarterly installments on the last day of each quarter, provided that the amount of such payment will be prorated for any portion of such quarter that the director is not serving on our Board, on such committee or in such position, and no fee shall be payable in respect of any period prior to the completion of our initial public offering.

Equity Compensation

Initial Grants. Upon initial election to our Board, such non-employee director will be granted, automatically and without the need for any further action by the Board, an initial equity award of an option to purchase 6,854 shares of our common stock. The initial award shall have a term of ten years from the date of the award, and shall vest and become exercisable as to 33.3333% of the shares underlying such award on the 12-month anniversary of the date of the award, with the remainder vesting in equal monthly installments of 2.7777% of the shares underlying the initial award until the 36-month anniversary of the date of the award, subject the director's continued service as a director, employee or consultant through each applicable vesting date. The vesting shall accelerate as to 100% of the shares upon a change in control of the Company. The exercise price shall be the closing price of our common stock on the date of grant.

Annual Grants. Each non-employee director who has served as a member of our Board for at least six months prior to the date of our annual meeting of stockholders for a particular year will be granted, automatically and without the need for any further action by the Board, an equity award on the date of our annual meeting of stockholders for such year of an option to purchase 3,427 shares of our common stock. The annual award shall have a term of ten years from the date of the award, and shall vest and become exercisable as to 8.3333% of the shares underlying such award on the one-month anniversary of the date of the award, with the remainder vesting in equal monthly installments of 8.3333% of the shares underlying the annual award until the twelve-month anniversary of the date of the award (or, if earlier, the date of the next annual meeting of stockholders following the date of grant of the option), subject to the director's continued service as a director, employee or consultant through each applicable vesting date. The vesting shall accelerate as to 100% of the shares upon a change in control of the Company. The exercise price shall be the closing price of our common stock on the date of grant.

The foregoing share amounts shall be automatically adjusted in the event of any stock split, reverse stock split, stock dividend, recapitalization, combination of shares, reclassification of shares, spin-off or other similar change in capitalization or event effecting our common stock, or any distribution to holders of our common stock other than an ordinary cash dividend.

The initial awards and the annual awards shall be subject to the terms and conditions of our 2017 Stock Incentive Plan, or any successor plan, and the terms of the option agreements entered into with each director in connection with such awards.

Expenses

Upon presentation of documentation of such expenses reasonably satisfactory to the Company, each non-employee director shall be reimbursed for his or her reasonable out-of-pocket business expenses incurred in connection with attending meetings of the Board and committees thereof or in connection with other business related to the Board, and each non-employee director shall also be reimbursed for his or her reasonable out-of-pocket business expenses authorized by the Board or a committee of the Board that are incurred in connection with attendance at various conferences or meetings with management of the Company, in accordance with the Company's travel policy, as it may be in effect from time to time.

AMENDED AND RESTATED EXECUTIVE EMPLOYMENT AGREEMENT

This Amended and Restated Executive Employment Agreement (the "Agreement"), by and between X4 Pharmaceuticals, Inc. ("Company") and Paula Ragan, Ph.D ("Executive"), is made and entered into as of the date the Agreement is approved by the Company's Board of Directors or an appropriate committee thereof (the "Effective Date").

WHEREAS, Company entered into that certain Agreement and Plan of Merger, dated as of November 26, 2018 (as amended, the "Merger Agreement"), with Arsanis, Inc. ("Arsanis") and Artemis AC Corp. ("Merger Sub") whereby Merger Sub shall merge with and into Company and Company shall become a wholly-owned subsidiary of Arsanis (the "Arsanis Merger");

WHEREAS, Company wishes to continue employing Executive to serve as its Chief Executive Officer contingent on the successful consummation of the Arsanis Merger;

WHEREAS, Executive represents that Executive possesses the necessary skills to perform the duties of this position and that Executive has no obligation to any other person or entity which would prevent, limit or interfere with Executive's ability to do so; and

WHEREAS, Executive and Company desire to enter into this Amended and Restated Executive Employment Agreement to assure the harmonious performance of the affairs of Company.

NOW, THEREFORE, in consideration of the mutual promises, terms, provisions, and conditions contained herein, the parties agree as follows:

1. Title and Duties. Contingent on the successful consummation of the Arsanis Merger, and subject to the terms and conditions of this Agreement, Executive's position with Company shall be Chief Executive Officer ("CEO"), reporting to Company's Board of Directors (the "Board"). Executive accepts such employment upon the terms and conditions set forth herein, and agrees to perform to the best of Executive's ability the duties normally associated with such position and as reasonably determined by the Board in its sole discretion. While serving as CEO hereunder, Executive shall devote all of Executive's business time and energies to the business and affairs of Company, provided that nothing contained in this Section 1 shall prevent or limit: (a) Executive's right to manage Executive's personal investments on Executive's own personal time, including, without limitation the right to make passive investments in the securities of (i) any entity which Executive does not control, directly or indirectly, and which does not compete with Company, or (ii) any publicly held entity, so long as Executive's aggregate direct and indirect interest does not exceed two percent (2%) of the issued and outstanding securities of any class of securities of such publicly held entity; and (b) Executive's participation in civic and charitable activities, including as a member of a board of a civic or charitable organization, so long as such activities do not interfere with Executive's performance of Executive's duties hereunder.

2. Term; Termination.

(a) Term. Subject to the terms hereof and contingent on the successful consummation of the Arsanis Merger, Executive's employment hereunder shall become effective on March 13, 2019 (the "Commencement Date") and shall continue until terminated hereunder by either party (such term of employment shall be referred to herein as the "Term").

(b) Termination by Company. Notwithstanding anything else contained in this Agreement, Company may terminate Executive's employment hereunder as follows:

(i) For Cause. Company may terminate Executive's employment for Cause (as defined below) by written notice by Company to Executive that Executive's employment is being terminated for Cause, which termination shall be effective on the date of such notice or such later date as specified in writing by Company, provided that if Executive has cured the circumstances giving rise to Cause (as such cure right may be applicable pursuant to the terms and conditions set forth below) then such termination shall not be effective.

(ii) Without Cause. Company may terminate Executive's employment without Cause, by written notice by Company to Executive that Executive's employment is being terminated without Cause, which termination shall be effective ninety (90) days after the date of such notice or such later date as specified in writing by Company.

For the purposes of this Agreement, "Cause" shall mean: (A) fraud, embezzlement, or illegal misconduct in connection with Executive's duties under this Agreement; (B) conviction of a felony involving fraud, dishonesty or breach of trust; (C) willful misconduct or gross negligence in the performance of the duties delegated to Executive; (D) material breach of this Agreement; or (E) material breach of any non-competition, non-solicitation, non-disclosure, and intellectual property assignment agreement between Executive and Company; provided that "Cause" shall not be deemed to have occurred pursuant to subsections (C) or (D) hereof unless Executive has first received written notice specifying in reasonable detail the particulars of such ground and that Company intends to terminate Executive's employment hereunder for such ground, and if such ground is curable, Executive has failed to cure such ground within a period of thirty (30) days from the date of her receipt of such notice.

(c) Termination by Executive. Notwithstanding anything else contained in this Agreement, Executive may terminate Executive's employment hereunder as follows:

(i) For Good Reason. Executive may terminate Executive's employment for Good Reason (as defined below) by written notice by Executive to Company that Executive is terminating Executive's employment for Good Reason, which termination shall be effective thirty (30) days after the date of such notice; provided that if Company has cured the circumstances giving rise to Good Reason then such termination shall not be effective; or

(ii) Without Good Reason. Executive may terminate Executive's employment without Good Reason by written notice by Executive to Company that Executive is terminating Executive's employment, which termination shall be effective ninety (90) days after the date of such notice.

For the purposes of this Agreement, “Good Reason” shall mean: (A) a material reduction in Executive’s then-current Base Salary; (B) a material diminution in Executive’s authority, duties, or responsibilities; (C) a material change in the geographic location at which the Executive provides services to the Company outside of a fifty (50) mile radius from the then-current location; or (D) any action or inaction by Company that constitutes a material breach of this Agreement; provided that “Good Reason” shall not be deemed to have occurred unless: (1) Executive provides Company with written notice that Executive intends to terminate Executive’s employment hereunder for one of the grounds set forth above within thirty (30) days of such ground first occurring, (2) if such ground is capable of being cured, Company has failed to cure such ground within a period of thirty (30) days from the date of such written notice, and (3) Executive terminates Executive’s employment within seventy five (75) days from the date that Good Reason first occurs. For purposes of clarification, the above-listed conditions shall apply separately to each occurrence of Good Reason and failure to adhere to such conditions in the event of Good Reason shall not disqualify Executive from asserting Good Reason for any subsequent occurrence of Good Reason.

(d) Termination Due to Disability. Notwithstanding anything else contained in this Agreement, Company may terminate Executive’s employment due to Executive’s Disability (as defined below) by written notice to Executive that Executive’s employment is being terminated as a result of Executive’s Disability, which termination shall be effective on the date of such notice or such later date as specified in writing by Company. For the purposes of this Agreement, “Disability” shall mean Executive’s incapacity or inability to perform Executive’s duties and responsibilities as contemplated herein for one hundred twenty (120) days or more within any one (1) year period (cumulative or consecutive), because Executive’s physical or mental health has become so impaired as to make it impossible or impractical for Executive to perform the duties and responsibilities contemplated hereunder. Determination of Executive’s physical or mental health shall be determined by the Board after consultation with a medical expert appointed by mutual agreement between Company and Executive who has examined Executive. Executive hereby consents to such examination and consultation regarding Executive’s health and ability to perform as aforesaid.

3. Compensation.

(a) Base Salary. While Executive is employed hereunder, Executive shall earn a base salary at the annual rate approved by the Board or an appropriate committee thereof (as may be changed from time-to-time, the “Base Salary”). The Base Salary shall be payable in substantially equal periodic installments, at least on a monthly basis, in accordance with Company’s payroll practices as in effect from time to time. Company shall deduct from each such installment all amounts required to be deducted or withheld under applicable law or under any employee benefit plan in which Executive participates.

(b) Annual Bonus. Executive shall be eligible to receive an annual performance bonus (the "Annual Bonus") for all years in which Executive is employed by Company hereunder. The Annual Bonus potential shall be in an amount approved by the Board or an appropriate committee thereof, but under no circumstances shall the Annual Bonus potential be less than twenty-five percent (25%) of Executive's then Base Salary (provided that, as stated below, the amount of any Annual Bonus remains in the Board's discretion). The amount of the Annual Bonus shall be based on factors such as Executive's work performance, Company's financial performance, Company's business forecasts, Company's determination of Executive's achievement of milestones for the applicable year, and economic conditions generally. The actual amount of the Annual Bonus shall be determined by the Board in its sole discretion. The Annual Bonus shall be paid to Executive in no event later than March 15th of the calendar year immediately following the calendar year to which it pertains. Executive must be employed by Company at the time that the Annual Bonus is paid in order to be eligible for, and to be deemed as having earned, such Annual Bonus. Company shall deduct from the Annual Bonus all amounts required to be deducted or withheld under applicable law or under any employee benefit plan in which Executive participates.

(c) Fringe Benefits. Executive shall be entitled to participate in all benefit/welfare plans and fringe benefits provided to employees at the same level as Executive. Executive understands that, except when prohibited by applicable law, Company's benefit plans and fringe benefits may be amended by Company from time to time in its sole discretion.

(d) Vacation. Consistent with Company's current policy and given Executive's tenure with Company, Executive shall be eligible to accrue up to twenty (20) days of vacation per year, to be scheduled to minimize disruption to Company's operations. Executive's vacation use, accrual and carryover shall be subject to the terms and conditions of Company's vacation policy in effect from time to time.

(e) Reimbursement of Expenses. Company shall reimburse Executive for all ordinary and reasonable out-of-pocket business expenses incurred by Executive in furtherance of Company's business in accordance with Company's policies with respect thereto as in effect from time to time. Executive must submit any request for reimbursement no later than ninety (90) days following the date that such business expense is incurred. All reimbursements provided under this Agreement shall be made or provided in accordance with the requirements of Section 409A ("Section 409A") of the Code and the rules and regulations thereunder, including, where applicable, the requirement that (i) any reimbursement is for expenses incurred during Executive's lifetime (or during a shorter period of time specified in this Agreement); (ii) the amount of expenses eligible for reimbursement during a calendar year may not affect the expenses eligible for reimbursement in any other calendar year; (iii) the reimbursement of an eligible expense shall be made no later than the last day of the calendar year following the year in which the expense is incurred; and (iv) the right to reimbursement or in kind benefits is not subject to liquidation or exchange for another benefit.

(f) Indemnification. Executive shall be eligible for coverage under Company Directors' and Officers' ("D&O") insurance policies to the same extent and in the same manner to which Company's similarly situated executives are entitled to coverage under Company D&O insurance policies, subject to the terms and conditions of any such Company D&O insurance policies.

4. Termination Payments; Severance Benefit.

(a) Payment of Accrued Obligations. Regardless of the reason for any employment termination hereunder, Company shall pay to Executive: (i) the portion of Executive's Base Salary that has accrued prior to any termination of Executive's employment and has not yet been paid; (ii) the portion of Executive's vacation days that have accrued prior to any termination of Executive's employment and has not yet been used; and (iii) the amount of any expenses properly incurred by Executive on behalf of Company prior to any such termination and has not yet been reimbursed (together, the "Accrued Obligations") promptly following the effective date of termination, and otherwise within any timeframe required by law. Executive's entitlement to other compensation or benefits under any Company plan or policy shall be governed by and determined in accordance with the terms of such plan or policy, except as otherwise specified in this Agreement. In the event of Company's termination of Executive's employment for Cause or Executive's termination of Executive's employment without Good Reason, Executive shall be eligible for the Accrued Obligations and shall not be eligible for any severance or severance-type payments, other than as expressly set forth herein.

(b) Severance in the Event of Termination Without Cause or Resignation for Good Reason. Subject to the terms and conditions of Section 4(d), in the event that Executive's employment hereunder is terminated by Company without Cause or terminated by Executive for Good Reason, then, in addition to the Accrued Obligations:

(i) Company shall pay Executive an amount equal to continuation of Executive's monthly Base Salary for a twelve (12) month period, with such payments to be made in accordance with Company's normal payroll practices and schedules, less all customary and required taxes and employment-related deductions.

(ii) Company shall pay Executive a pro-rata portion of Executive's at-target Annual Bonus for the calendar year in which the termination occurs based on the period worked by Executive during such calendar year prior to termination, with such payment to be made in on one lump sum in accordance with Company's normal payroll practices and schedules, less all customary and required taxes and employment-related deductions.

(iii) In the event that Executive is eligible for coverage under a Company health insurance plan and Executive has elected to have coverage thereunder and was covered thereunder prior to termination, and in the event that Executive chooses to exercise Executive's right under the Consolidated Omnibus Budget Reconciliation Act of 1985 ("COBRA") to continue Executive's participation in such plan, Company shall pay its normal share of the costs for such coverage for a period of up to twelve (12) months from termination, to the same extent that such insurance is provided to persons then currently employed by Company. Company shall deduct from each of the installments due under Section 4(b)(i) the portion of the monthly premium due from Executive in accordance with the terms of such coverage. Notwithstanding any other provision of this Agreement, this obligation shall cease on the date Executive becomes eligible to receive health insurance benefits through any other employer, and Executive agrees to provide Company with written notice immediately upon becoming eligible for such benefits. Executive's acceptance of any payment on Executive's behalf or coverage provided hereunder shall be an express representation to Company that Executive has no such eligibility.

(iv) Executive shall become vested in the additional number of outstanding time-based equity awards granted to Executive by Company that would have otherwise vested had Executive remained in employment for an additional twelve (12) months after the termination date.

Subsections (i), (ii), (iii) and (iv) are referred to as the Severance Benefit. The Severance Benefit is expressly subject to the conditions described above and in Section 4(d) below. Any payment or benefit made as part of such Severance Benefit shall be paid less all customary and required taxes and employment-related deductions.

(c) Accelerated Vesting in Event of Termination without Cause or Resignation for Good Reason Following Change of Control. Subject to the terms and conditions of Section 4(d), in the event that a Change of Control (as defined below) occurs and within a period of one (1) year following the Change of Control the Company terminates Executive's employment without Cause or Executive resigns for Good Reason, then Executive automatically shall become vested in one hundred percent (100%) of outstanding time-based equity awards granted to Executive by Company. The above-described vesting is expressly subject to the conditions described in Section 4(d), and shall be provided less all customary and required taxes and employment-related deductions. For purposes of this section, a "Change of Control" shall mean the occurrence of any of the following events: (i) Ownership. Any "Person" (as such term is used in Sections 13(d) and 14(d) of the Securities Exchange Act of 1934, as amended) becomes the "Beneficial Owner" (as defined in Rule 13d-3 under said Act), directly or indirectly, of securities of Company representing fifty percent (50%) or more of the total voting power represented by Company's then outstanding voting securities (excluding for this purpose any such voting securities held by Company, or any affiliate, parent or subsidiary of Company, or by any employee benefit plan of Company) pursuant to a transaction or a series of related transactions which the Board does not approve; or (ii) Merger/Sale of Assets. (A) A merger or consolidation of Company whether or not approved by the Board, other than a merger or consolidation which would result in the voting securities of Company outstanding immediately prior thereto continuing to represent (either by remaining outstanding or by being converted into voting securities of the surviving entity or the parent of such corporation) at least fifty percent (50%) of the total voting power represented by the voting securities of Company or such surviving entity or parent of such corporation, as the case may be, outstanding immediately after such merger or consolidation; or (B) the sale or disposition by Company of all or substantially all of Company's assets.

(d) Conditions. Company shall not be obligated to provide Executive any payment, benefit and/or vesting described in Section 4(b) or Section 4(c) unless and until Executive has executed without revocation a separation agreement in a form acceptable to Company, which must be signed by Executive, returned to Company and be enforceable and irrevocable no later than sixty (60) days following Executive's separation from service (the "Review Period"), and which shall include, at a minimum, the provision of separation pay and benefits due from Company to Executive as applicable, a complete general release of claims against Company and its affiliated entities and each of their officers, directors and employees, and terms relating to non-disparagement, non-competition, confidentiality, cooperation and the like similar in scope, duration and substance to those terms set forth in the agreement described in Section 5 below. If

Executive executes and does not revoke such agreement within the Review Period, then provision of payments, benefits and/or vesting shall commence on the first (1st) day following the Review Period, provided that if the last day of the Review Period occurs in the calendar year following the year of termination, then the payment shall not commence until January 2 of such subsequent calendar year, and further provided that, as applied to Section 4(b)(i), (ii) and (iii) as applicable, the first payments/benefits shall include in a lump sum all amounts that were otherwise payable to Executive from the date of Executive's separation from service occurred through such first payment.

(e) COBRA. If the payment of any COBRA or health insurance premiums by Company on behalf of Executive as described herein would otherwise violate any applicable nondiscrimination rules or cause the reimbursement of claims to be taxable under the Patient Protection and Affordable Care Act of 2010, together with the Health Care and Education Reconciliation Act of 2010 (collectively, the "Act") or Section 105(h) of the Code, the COBRA premiums paid by Company shall be treated as taxable payments (subject to customary and required taxes and employment-related deductions) and be subject to imputed income tax treatment to the extent necessary to eliminate any discriminatory treatment or taxation under the Act or Section 105(h) of the Code. If Company determines in its sole discretion that it cannot provide the COBRA benefits described herein under Company's health insurance plan without potentially violating applicable law (including, without limitation, Section 2716 of the Public Health Service Act), Company shall in lieu thereof provide to Executive a taxable lump-sum payment in an amount equal to the sum of the monthly (or then remaining) COBRA premiums that Executive would be required to pay to maintain Executive's group health insurance coverage in effect on the separation date for the remaining portion of the period for which Executive shall receive the payments described in Sections 4(b) or 4(c) above.

(f) No Other Payments or Benefits Owing. The payments and benefits set forth in this Section 4 shall be the sole amounts owing to Executive upon termination of Executive's employment for the reasons set forth above and Executive shall not be eligible for any other payments or other forms of compensation or benefits. The payments and benefits set forth in this Section shall be the sole remedy, if any, available to Executive in the event that Executive brings any claim against Company relating to the termination of Executive's employment under this Agreement.

(g) No Mitigation of Damages Offset. Except as otherwise may be expressly provided herein, Executive shall not be required to mitigate any amounts due or provided her under this Agreement by seeking other employment or otherwise. Any payments made by Company to Executive after the termination of employment shall not be reduced by any compensation Executive receives from any subsequent employment or source.

5. Non-Competition, Non-Solicitation, Non-Disclosure Agreement. Executive has signed and agrees to continue to abide by Company's Non-Competition, Non-Solicitation, Non-Disclosure, and Intellectual Property Agreement.

6. Code Sections 409A and 280G.

(a) In the event that the payments or benefits set forth in Section 4 constitute "non-qualified deferred compensation" subject to Section 409A, then the following conditions apply to such payments or benefits:

(i) Any termination of Executive's employment triggering payment of benefits under Section 4 must constitute a "separation from service" under Section 409A(a)(2)(A)(i) of the Code and Treas. Reg. §1.409A-1(h) before distribution of such benefits can commence. To the extent that the termination of Executive's employment does not constitute a separation of service under Section 409A(a)(2)(A)(i) of the Code and Treas. Reg. §1.409A-1(h) (as the result of further services that are reasonably anticipated to be provided by Executive to Company at the time Executive's employment terminates), any such payments under Section 4 that constitute deferred compensation under Section 409A shall be delayed until after the date of a subsequent event constituting a separation of service under Section 409A(a)(2)(A)(i) of the Code and Treas. Reg. §1.409A-1(h). For purposes of clarification, this Section 6(a) shall not cause any forfeiture of benefits on Executive's part, but shall only act as a delay until such time as a "separation from service" occurs.

(ii) Notwithstanding any other provision with respect to the timing of payments under Section 4 if, at the time of Executive's termination, Executive is deemed to be a "specified employee" of Company (within the meaning of Section 409A(a)(2)(B)(i) of the Code), then limited only to the extent necessary to comply with the requirements of Section 409A, any payments to which Executive may become entitled under Section 4 which are subject to Section 409A (and not otherwise exempt from its application) shall be withheld until the first (1st) business day of the seventh (7th) month following the termination of Executive's employment, at which time Executive shall be paid an aggregate amount equal to the accumulated, but unpaid, payments otherwise due to Executive under the terms of Section 4.

(b) It is intended that each installment of the payments and benefits provided under Section 4 shall be treated as a separate "payment" for purposes of Section 409A. Neither Company nor Executive shall have the right to accelerate or defer the delivery of any such payments or benefits except to the extent specifically permitted or required by Section 409A.

(c) Notwithstanding any other provision of this Agreement to the contrary, this Agreement shall be interpreted and at all times administered in a manner that avoids the inclusion of compensation in income under Section 409A, or the payment of increased taxes, excise taxes or other penalties under Section 409A. The parties intend this Agreement to be in compliance with Section 409A. Executive acknowledges and agrees that Company does not guarantee the tax treatment or tax consequences associated with any payment or benefit arising under this Agreement, including but not limited to consequences related to Section 409A.

(d) If any payment or benefit Executive would receive under this Agreement, when combined with any other payment or benefit Executive receives pursuant to a Change of Control (for purposes of this section, a "Payment") would: (i) constitute a "parachute payment" within the meaning of Section 280G the Code; and (ii) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "Excise Tax"), then such Payment shall be either: (A) the full amount of such Payment; or (B) such lesser amount (with cash payments being reduced

before stock option compensation) as would result in no portion of the Payment being subject to the Excise Tax, whichever of the foregoing amounts, taking into account the applicable federal, state and local employments taxes, income taxes, and the Excise Tax, results in Executive's receipt, on an after-tax basis, of the greater amount of the Payment notwithstanding that all or some portion of the Payment may be subject to the Excise Tax.

7. General.

(a) Notices. Except as otherwise specifically provided herein, any notice required or permitted by this Agreement shall be in writing and shall be delivered as follows with notice deemed given as indicated: (i) by personal delivery when delivered personally; (ii) by overnight courier upon written verification of receipt; (iii) by facsimile transmission upon acknowledgment of receipt of electronic transmission; or (iv) by certified or registered mail, return receipt requested, upon verification of receipt.

Notices to Executive shall be sent to the last known address in Company's records or such other address as Executive may specify in writing.

Notices to Company shall be sent to:

X4 Pharmaceuticals, Inc.
955 Massachusetts Ave., 4th Floor
Cambridge, MA 02139
Attention: Chair, Board of Directors

with a copy to:

Mintz, Levin, Cohn, Ferris, Glovsky & Popeo, P.C.
One Financial Center
Boston, MA, 02111
Attn: John J. Cheney, Esq.

(b) Modifications and Amendments. The terms and provisions of this Agreement may be modified or amended only by written agreement executed by the parties hereto.

(c) Waivers and Consents. The terms and provisions of this Agreement may be waived, or consent for the departure therefrom granted, only by written document executed by the party entitled to the benefits of such terms or provisions. No such waiver or consent shall be deemed to be or shall constitute a waiver or consent with respect to any other terms or provisions of this Agreement, whether or not similar. Each such waiver or consent shall be effective only in the specific instance and for the purpose for which it was given, and shall not constitute a continuing waiver or consent.

(d) Assignment. Company may assign its rights and obligations hereunder to any person or entity that succeeds to all or substantially all of Company's business or that aspect of Company's business in which Executive is principally involved. Executive may not assign Executive's rights and obligations under this Agreement without the prior written consent of Company.

(e) Governing Law; Jury Waiver. This Agreement and the rights and obligations of the parties hereunder shall be construed in accordance with and governed by the law of Massachusetts without giving effect to the conflict of law principles thereof. Any legal action or proceeding with respect to this Agreement shall be brought in the courts of the Commonwealth of Massachusetts or the United States of America for the District of Massachusetts. By execution and delivery of this Agreement, each of the parties hereto accepts for itself and in respect of its property, generally and unconditionally, the exclusive jurisdiction of the aforesaid courts. ANY ACTION, DEMAND, CLAIM OR COUNTERCLAIM ARISING UNDER OR RELATING TO THIS AGREEMENT SHALL BE RESOLVED BY A JUDGE ALONE AND EACH OF COMPANY AND EXECUTIVE WAIVES ANY RIGHT TO A JURY TRIAL THEREOF.

(f) Headings and Captions. The headings and captions of the various subdivisions of this Agreement are for convenience of reference only and shall in no way modify or affect the meaning or construction of any of the terms or provisions hereof.

(g) Entire Agreement. This Agreement, together with the other agreements specifically referenced herein, embodies the entire agreement and understanding between the parties hereto with respect to the subject matter hereof and supersedes all prior oral or written agreements and understandings relating to the subject matter hereof. No statement, representation, warranty, covenant or agreement of any kind not expressly set forth in this Agreement shall affect, or be used to interpret, change or restrict, the express terms and provisions of this Agreement.

(h) Counterparts. This Agreement may be executed in two or more counterparts, and by different parties hereto on separate counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. For all purposes a signature by fax shall be treated as an original.

[Signature Page to Follow]

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

PAULA RAGAN, Ph.D.

/s/ Paula M. Ragan, Ph.D.

Name: Paula M. Ragan, Ph.D.

Address:

X4 PHARMACEUTICALS, INC.

/s/ Michael S. Wyzga

Name: Michael S. Wyzga
Title: Chairman, Board of Directors

AMENDED AND RESTATED EXECUTIVE EMPLOYMENT AGREEMENT

This Amended and Restated Executive Employment Agreement (the "Agreement"), by and between X4 Pharmaceuticals, Inc. ("Company") and Adam S. Mostafa ("Executive"), is made and entered into as of the date the Agreement is approved by the Company's Board of Directors (the "Board") or an appropriate committee thereof (the "Effective Date").

WHEREAS, Company entered into that certain Agreement and Plan of Merger, dated as of November 26, 2018 (as amended, the "Merger Agreement"), with Arsanis, Inc. ("Arsanis") and Artemis AC Corp. ("Merger Sub") whereby Merger Sub shall merge with and into Company and Company shall become a wholly-owned subsidiary of Arsanis (the "Arsanis Merger");

WHEREAS, Company wishes to continue employing Executive to serve as its Chief Financial Officer contingent on the successful consummation of the Arsanis Merger;

WHEREAS, Executive represents that Executive possesses the necessary skills to perform the duties of this position and that Executive has no obligation to any other person or entity which would prevent, limit or interfere with Executive's ability to do so; and

WHEREAS, Executive and Company desire to enter into this Amended and Restated Executive Employment Agreement to assure the harmonious performance of the affairs of Company.

NOW, THEREFORE, in consideration of the mutual promises, terms, provisions, and conditions contained herein, the parties agree as follows:

1. Title and Duties. Contingent on the successful consummation of the Arsanis Merger, and subject to the terms and conditions of this Agreement, Executive's position with Company shall be Chief Financial Officer ("CFO"), reporting to Company's Chief Executive Officer ("CEO") or the CEO's designee. Executive accepts such employment upon the terms and conditions set forth herein, and agrees to perform to the best of Executive's ability the duties normally associated with such position and as reasonably determined by Company in its sole discretion. While serving as CFO hereunder, Executive shall devote all of Executive's business time and energies to the business and affairs of Company, provided that nothing contained in this Section 1 shall prevent or limit: (a) Executive's right to manage Executive's personal investments on Executive's own personal time, including, without limitation the right to make passive investments in the securities of (i) any entity which Executive does not control, directly or indirectly, and which does not compete with Company, or (ii) any publicly held entity, so long as Executive's aggregate direct and indirect interest does not exceed two percent (2%) of the issued and outstanding securities of any class of securities of such publicly held entity; (b) Executive's participation in civic and charitable activities, including as a member of a board of a civic or charitable organization, so long as such activities do not interfere with Executive's performance of Executive's duties hereunder; and (c) Executive's performance of consulting services for the entities listed on Exhibit A hereto, provided that such services are limited to 2 hours per month for each listed entity via phone or email (i.e., not in person), and are performed outside of business hours and otherwise in a manner that does not interfere with Executive's performance of Executive's duties hereunder.

2. Term; Termination.

(a) Term. Subject to the terms hereof and contingent on the successful consummation of the Arsanis Merger, Executive's employment hereunder shall become effective on March 13, 2019 (the "Commencement Date") and shall continue until terminated hereunder by either party (such term of employment shall be referred to herein as the "Term").

(b) Termination by Company. Notwithstanding anything else contained in this Agreement, Company may terminate Executive's employment hereunder as follows:

(i) For Cause. Company may terminate Executive's employment for Cause (as defined below) by written notice by Company to Executive that Executive's employment is being terminated for Cause, which termination shall be effective on the date of such notice or such later date as specified in writing by Company, provided that if Executive has cured the circumstances giving rise to Cause (as such cure right may be applicable pursuant to the terms and conditions set forth below) then such termination shall not be effective.

(ii) Without Cause. Company may terminate Executive's employment without Cause, by written notice by Company to Executive that Executive's employment is being terminated without Cause, which termination shall be effective ninety (90) days after the date of such notice or such later date as specified in writing by Company.

For the purposes of this Agreement, "Cause" shall mean: (A) fraud, embezzlement, or illegal misconduct in connection with Executive's duties under this Agreement; (B) conviction of a felony involving fraud, dishonesty or breach of trust; (C) willful misconduct or gross negligence in the performance of the duties delegated to Executive; (D) material breach of this Agreement; or (E) material breach of any non-competition, non-solicitation, non-disclosure, and intellectual property assignment agreement between Executive and Company; provided that "Cause" shall not be deemed to have occurred pursuant to subsections (C) or (D) hereof unless Executive has first received written notice specifying in reasonable detail the particulars of such ground and that Company intends to terminate Executive's employment hereunder for such ground, and if such ground is curable, Executive has failed to cure such ground within a period of thirty (30) days from the date of his receipt of such notice.

(c) Termination by Executive. Notwithstanding anything else contained in this Agreement, Executive may terminate Executive's employment hereunder as follows:

(i) For Good Reason. Executive may terminate Executive's employment for Good Reason (as defined below) by written notice by Executive to Company that Executive is terminating Executive's employment for Good Reason, which termination shall be effective thirty (30) days after the date of such notice; provided that if Company has cured the circumstances giving rise to Good Reason then such termination shall not be effective; or

(ii) Without Good Reason. Executive may terminate Executive's employment without Good Reason by written notice by Executive to Company that Executive is terminating Executive's employment, which termination shall be effective ninety (90) days after the date of such notice.

For the purposes of this Agreement, "Good Reason" shall mean: (A) a material reduction in Executive's then-current Base Salary; (B) a material diminution in Executive's authority, duties, or responsibilities; (C) a material change in the geographic location at which the Executive provides services to the Company outside of a fifty (50) mile radius from the then-current location; or (D) any action or inaction by Company that constitutes a material breach of this Agreement; provided that "Good Reason" shall not be deemed to have occurred unless: (1) Executive provides Company with written notice that Executive intends to terminate Executive's employment hereunder for one of the grounds set forth above within thirty (30) days of such ground first occurring, (2) if such ground is capable of being cured, Company has failed to cure such ground within a period of thirty (30) days from the date of such written notice, and (3) Executive terminates Executive's employment within seventy five (75) days from the date that Good Reason first occurs. For purposes of clarification, the above-listed conditions shall apply separately to each occurrence of Good Reason and failure to adhere to such conditions in the event of Good Reason shall not disqualify Executive from asserting Good Reason for any subsequent occurrence of Good Reason.

(d) Termination Due to Disability. Notwithstanding anything else contained in this Agreement, Company may terminate Executive's employment due to Executive's Disability (as defined below) by written notice to Executive that Executive's employment is being terminated as a result of Executive's Disability, which termination shall be effective on the date of such notice or such later date as specified in writing by Company. For the purposes of this Agreement, "Disability" shall mean Executive's incapacity or inability to perform Executive's duties and responsibilities as contemplated herein for one hundred twenty (120) days or more within any one (1) year period (cumulative or consecutive), because Executive's physical or mental health has become so impaired as to make it impossible or impractical for Executive to perform the duties and responsibilities contemplated hereunder. Determination of Executive's physical or mental health shall be determined by the Board after consultation with a medical expert appointed by mutual agreement between Company and Executive who has examined Executive. Executive hereby consents to such examination and consultation regarding Executive's health and ability to perform as aforesaid.

3. Compensation.

(a) Base Salary. While Executive is employed hereunder, Executive shall earn a base salary at the annual rate approved by the Board or an appropriate committee thereof (as may be changed from time-to-time, the "Base Salary"). The Base Salary shall be payable in substantially equal periodic installments, at least on a monthly basis, in accordance with Company's payroll practices as in effect from time to time. Company shall deduct from each such installment all amounts required to be deducted or withheld under applicable law or under any employee benefit plan in which Executive participates.

(b) Annual Bonus. Executive shall be eligible to receive an annual performance bonus (the "Annual Bonus") for all years in which Executive is employed by Company hereunder. The Annual Bonus potential shall be in an amount approved by the Board or an appropriate committee thereof, but under no circumstances shall the Annual Bonus potential be less than twenty-five percent (25%) of Executive's then Base Salary (provided that, as stated below, the amount of any Annual Bonus remains in the Board's discretion). The amount of the Annual Bonus shall be based on factors such as Executive's work performance, Company's financial performance, Company's business forecasts, Company's determination of Executive's achievement of milestones for the applicable year, and economic conditions generally. The actual amount of the Annual Bonus shall be determined by the Board in its sole discretion. The Annual Bonus shall be paid to Executive in no event later than March 15th of the calendar year immediately following the calendar year to which it pertains. Executive must be employed by Company at the time that the Annual Bonus is paid in order to be eligible for, and to be deemed as having earned, such Annual Bonus. Company shall deduct from the Annual Bonus all amounts required to be deducted or withheld under applicable law or under any employee benefit plan in which Executive participates.

(c) Fringe Benefits. Executive shall be entitled to participate in all benefit/welfare plans and fringe benefits provided to employees at the same level as Executive. Executive understands that, except when prohibited by applicable law, Company's benefit plans and fringe benefits may be amended by Company from time to time in its sole discretion.

(d) Vacation. Consistent with Company's current policy and given Executive's tenure with Company, Executive shall be eligible to accrue up to fifteen (15) days of vacation per year, to be scheduled to minimize disruption to Company's operations. Executive's vacation use, accrual and carryover shall be subject to the terms and conditions of Company's vacation policy in effect from time to time.

(e) Reimbursement of Expenses. Company shall reimburse Executive for all ordinary and reasonable out-of-pocket business expenses incurred by Executive in furtherance of Company's business in accordance with Company's policies with respect thereto as in effect from time to time. Executive must submit any request for reimbursement no later than ninety (90) days following the date that such business expense is incurred. All reimbursements provided under this Agreement shall be made or provided in accordance with the requirements of Section 409A ("Section 409A") of the Code and the rules and regulations thereunder, including, where applicable, the requirement that (i) any reimbursement is for expenses incurred during Executive's lifetime (or during a shorter period of time specified in this Agreement); (ii) the amount of expenses eligible for reimbursement during a calendar year may not affect the expenses eligible for reimbursement in any other calendar year; (iii) the reimbursement of an eligible expense shall be made no later than the last day of the calendar year following the year in which the expense is incurred; and (iv) the right to reimbursement or in kind benefits is not subject to liquidation or exchange for another benefit.

(f) Indemnification. Executive shall be eligible for coverage under Company Directors' and Officers' ("D&O") insurance policies to the same extent and in the same manner to which Company's similarly situated executives are entitled to coverage under Company D&O insurance policies, subject to the terms and conditions of any such Company D&O insurance policies.

4. Termination Payments; Severance Benefit.

(a) Payment of Accrued Obligations. Regardless of the reason for any employment termination hereunder, Company shall pay to Executive: (i) the portion of Executive's Base Salary that has accrued prior to any termination of Executive's employment and has not yet been paid; (ii) the portion of Executive's vacation days that have accrued prior to any termination of Executive's employment and has not yet been used; and (iii) the amount of any expenses properly incurred by Executive on behalf of Company prior to any such termination and has not yet been reimbursed (together, the "Accrued Obligations") promptly following the effective date of termination, and otherwise within any timeframe required by law. Executive's entitlement to other compensation or benefits under any Company plan or policy shall be governed by and determined in accordance with the terms of such plan or policy, except as otherwise specified in this Agreement. In the event of Company's termination of Executive's employment for Cause or Executive's termination of Executive's employment without Good Reason, Executive shall be eligible for the Accrued Obligations and shall not be eligible for any severance or severance-type payments, other than as expressly set forth herein.

(b) Severance in the Event of Termination Without Cause or Resignation for Good Reason. Subject to the terms and conditions of Section 4(d), in the event that Executive's employment hereunder is terminated by Company without Cause or terminated by Executive for Good Reason, then, in addition to the Accrued Obligations:

(i) Company shall pay Executive an amount equal to continuation of Executive's monthly Base Salary for a six (6) month period, with such payments to be made in accordance with Company's normal payroll practices and schedules, less all customary and required taxes and employment-related deductions.

(ii) Company shall pay Executive a pro-rata portion of Executive's at-target Annual Bonus for the calendar year in which the termination occurs based on the period worked by Executive during such calendar year prior to termination, with such payment to be made in on one lump sum in accordance with Company's normal payroll practices and schedules, less all customary and required taxes and employment-related deductions.

(iii) In the event that Executive is eligible for coverage under a Company health insurance plan and Executive has elected to have coverage thereunder and was covered thereunder prior to termination, and in the event that Executive chooses to exercise Executive's right under the Consolidated Omnibus Budget Reconciliation Act of 1985 ("COBRA") to continue Executive's participation in such plan, Company shall pay its normal share of the costs for such coverage for a period of up to six (6) months from termination, to the same extent that such insurance is provided to persons then currently employed by Company. Company shall deduct from each of the installments due under Section 4(b)(i) the portion of the monthly premium due from Executive in accordance with the terms of such coverage. Notwithstanding any other provision of this Agreement, this obligation shall cease on the date Executive becomes eligible to receive health insurance benefits through any other employer, and Executive agrees to provide Company with written notice immediately upon becoming eligible for such benefits. Executive's acceptance of any payment on Executive's behalf or coverage provided hereunder shall be an express representation to Company that Executive has no such eligibility.

(iv) Executive shall become vested in the additional number of outstanding time-based equity awards granted to Executive by Company that would have otherwise vested had Executive remained in employment for an additional six (6) months after the termination date.

Subsections (i), (ii), (iii) and (iv) are referred to as the Severance Benefit. The Severance Benefit is expressly subject to the conditions described above and in Section 4(d) below. Any payment or benefit made as part of such Severance Benefit shall be paid less all customary and required taxes and employment-related deductions.

(c) Accelerated Vesting in Event of Termination without Cause or Resignation for Good Reason Following Change of Control. Subject to the terms and conditions of Section 4(d), in the event that a Change of Control (as defined below) occurs and within a period of one (1) year following the Change of Control the Company terminates Executive's employment without Cause or Executive resigns for Good Reason, then Executive automatically shall become vested in one hundred percent (100%) of outstanding time-based equity awards granted to Executive by Company. The above-described vesting is expressly subject to the conditions described in Section 4(d), and shall be provided less all customary and required taxes and employment-related deductions. For purposes of this section, a "Change of Control" shall mean the occurrence of any of the following events: (i) Ownership. Any "Person" (as such term is used in Sections 13(d) and 14(d) of the Securities Exchange Act of 1934, as amended) becomes the "Beneficial Owner" (as defined in Rule 13d-3 under said Act), directly or indirectly, of securities of Company representing fifty percent (50%) or more of the total voting power represented by Company's then outstanding voting securities (excluding for this purpose any such voting securities held by Company, or any affiliate, parent or subsidiary of Company, or by any employee benefit plan of Company) pursuant to a transaction or a series of related transactions which the Board does not approve; or (ii) Merger/Sale of Assets. (A) A merger or consolidation of Company whether or not approved by the Board, other than a merger or consolidation which would result in the voting securities of Company outstanding immediately prior thereto continuing to represent (either by remaining outstanding or by being converted into voting securities of the surviving entity or the parent of such corporation) at least fifty percent (50%) of the total voting power represented by the voting securities of Company or such surviving entity or parent of such corporation, as the case may be, outstanding immediately after such merger or consolidation; or (B) the sale or disposition by Company of all or substantially all of Company's assets.

(d) Conditions. Company shall not be obligated to provide Executive any payment, benefit and/or vesting described in Section 4(b) or Section 4(c) unless and until Executive has executed without revocation a separation agreement in a form acceptable to Company, which must be signed by Executive, returned to Company and be enforceable and irrevocable no later than sixty (60) days following Executive's separation from service (the "Review Period"), and which shall include, at a minimum, the provision of separation pay and benefits due from Company to Executive as applicable, a complete general release of claims against Company and its affiliated entities and each of their officers, directors and employees, and terms relating to non-disparagement, non-competition, confidentiality, cooperation and the like similar in scope, duration and substance to those terms set forth in the agreement described in Section 5 below. If

Executive executes and does not revoke such agreement within the Review Period, then provision of payments, benefits and/or vesting shall commence on the first (1st) day following the Review Period, provided that if the last day of the Review Period occurs in the calendar year following the year of termination, then the payment shall not commence until January 2 of such subsequent calendar year, and further provided that, as applied to Section 4(b)(i), (ii) and (iii) as applicable, the first payments/benefits shall include in a lump sum all amounts that were otherwise payable to Executive from the date of Executive's separation from service occurred through such first payment.

(e) COBRA. If the payment of any COBRA or health insurance premiums by Company on behalf of Executive as described herein would otherwise violate any applicable nondiscrimination rules or cause the reimbursement of claims to be taxable under the Patient Protection and Affordable Care Act of 2010, together with the Health Care and Education Reconciliation Act of 2010 (collectively, the "Act") or Section 105(h) of the Code, the COBRA premiums paid by Company shall be treated as taxable payments (subject to customary and required taxes and employment-related deductions) and be subject to imputed income tax treatment to the extent necessary to eliminate any discriminatory treatment or taxation under the Act or Section 105(h) of the Code. If Company determines in its sole discretion that it cannot provide the COBRA benefits described herein under Company's health insurance plan without potentially violating applicable law (including, without limitation, Section 2716 of the Public Health Service Act), Company shall in lieu thereof provide to Executive a taxable lump-sum payment in an amount equal to the sum of the monthly (or then remaining) COBRA premiums that Executive would be required to pay to maintain Executive's group health insurance coverage in effect on the separation date for the remaining portion of the period for which Executive shall receive the payments described in Sections 4(b) or 4(c) above.

(f) No Other Payments or Benefits Owing. The payments and benefits set forth in this Section 4 shall be the sole amounts owing to Executive upon termination of Executive's employment for the reasons set forth above and Executive shall not be eligible for any other payments or other forms of compensation or benefits. The payments and benefits set forth in this Section shall be the sole remedy, if any, available to Executive in the event that Executive brings any claim against Company relating to the termination of Executive's employment under this Agreement.

(g) No Mitigation of Damages Offset. Except as otherwise may be expressly provided herein, Executive shall not be required to mitigate any amounts due or provided him under this Agreement by seeking other employment or otherwise. Any payments made by Company to Executive after the termination of employment shall not be reduced by any compensation Executive receives from any subsequent employment or source.

5. Non-Competition, Non-Solicitation, Non-Disclosure Agreement. Executive has signed and agrees to continue to abide by Company's Non-Competition, Non-Solicitation, Non-Disclosure, and Intellectual Property Agreement.

6. Code Sections 409A and 280G.

(a) In the event that the payments or benefits set forth in Section 4 constitute "non-qualified deferred compensation" subject to Section 409A, then the following conditions apply to such payments or benefits:

(i) Any termination of Executive's employment triggering payment of benefits under Section 4 must constitute a "separation from service" under Section 409A(a)(2)(A)(i) of the Code and Treas. Reg. §1.409A-1(h) before distribution of such benefits can commence. To the extent that the termination of Executive's employment does not constitute a separation of service under Section 409A(a)(2)(A)(i) of the Code and Treas. Reg. §1.409A-1(h) (as the result of further services that are reasonably anticipated to be provided by Executive to Company at the time Executive's employment terminates), any such payments under Section 4 that constitute deferred compensation under Section 409A shall be delayed until after the date of a subsequent event constituting a separation of service under Section 409A(a)(2)(A)(i) of the Code and Treas. Reg. §1.409A-1(h). For purposes of clarification, this Section 6(a) shall not cause any forfeiture of benefits on Executive's part, but shall only act as a delay until such time as a "separation from service" occurs.

(ii) Notwithstanding any other provision with respect to the timing of payments under Section 4 if, at the time of Executive's termination, Executive is deemed to be a "specified employee" of Company (within the meaning of Section 409A(a)(2)(B)(i) of the Code), then limited only to the extent necessary to comply with the requirements of Section 409A, any payments to which Executive may become entitled under Section 4 which are subject to Section 409A (and not otherwise exempt from its application) shall be withheld until the first (1st) business day of the seventh (7th) month following the termination of Executive's employment, at which time Executive shall be paid an aggregate amount equal to the accumulated, but unpaid, payments otherwise due to Executive under the terms of Section 4.

(b) It is intended that each installment of the payments and benefits provided under Section 4 shall be treated as a separate "payment" for purposes of Section 409A. Neither Company nor Executive shall have the right to accelerate or defer the delivery of any such payments or benefits except to the extent specifically permitted or required by Section 409A.

(c) Notwithstanding any other provision of this Agreement to the contrary, this Agreement shall be interpreted and at all times administered in a manner that avoids the inclusion of compensation in income under Section 409A, or the payment of increased taxes, excise taxes or other penalties under Section 409A. The parties intend this Agreement to be in compliance with Section 409A. Executive acknowledges and agrees that Company does not guarantee the tax treatment or tax consequences associated with any payment or benefit arising under this Agreement, including but not limited to consequences related to Section 409A.

(d) If any payment or benefit Executive would receive under this Agreement, when combined with any other payment or benefit Executive receives pursuant to a Change of Control (for purposes of this section, a "Payment") would: (i) constitute a "parachute payment" within the meaning of Section 280G the Code; and (ii) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "Excise Tax"), then such Payment shall be either: (A) the full amount of such Payment; or (B) such lesser amount (with cash payments being reduced before stock option compensation) as would result in no portion of the Payment being subject to the Excise Tax, whichever of the foregoing amounts, taking into account the applicable federal, state and local employments taxes, income taxes, and the Excise Tax, results in Executive's receipt, on an after-tax basis, of the greater amount of the Payment notwithstanding that all or some portion of the Payment may be subject to the Excise Tax.

7. General.

(a) Notices. Except as otherwise specifically provided herein, any notice required or permitted by this Agreement shall be in writing and shall be delivered as follows with notice deemed given as indicated: (i) by personal delivery when delivered personally; (ii) by overnight courier upon written verification of receipt; (iii) by facsimile transmission upon acknowledgment of receipt of electronic transmission; or (iv) by certified or registered mail, return receipt requested, upon verification of receipt.

Notices to Executive shall be sent to the last known address in Company's records or such other address as Executive may specify in writing.

Notices to Company shall be sent to:

X4 Pharmaceuticals, Inc.
955 Massachusetts Ave., 4th Floor
Cambridge, MA 02139
Attention: Chair, Board of Directors

with a copy to:

Mintz, Levin, Cohn, Ferris, Glovsky & Popeo, P.C.
One Financial Center
Boston, MA, 02111
Attn: John J. Cheney, Esq.

(b) Modifications and Amendments. The terms and provisions of this Agreement may be modified or amended only by written agreement executed by the parties hereto.

(c) Waivers and Consents. The terms and provisions of this Agreement may be waived, or consent for the departure therefrom granted, only by written document executed by the party entitled to the benefits of such terms or provisions. No such waiver or consent shall be deemed to be or shall constitute a waiver or consent with respect to any other terms or provisions of this Agreement, whether or not similar. Each such waiver or consent shall be effective only in the specific instance and for the purpose for which it was given, and shall not constitute a continuing waiver or consent.

(d) Assignment. Company may assign its rights and obligations hereunder to any person or entity that succeeds to all or substantially all of Company's business or that aspect of Company's business in which Executive is principally involved. Executive may not assign Executive's rights and obligations under this Agreement without the prior written consent of Company.

(e) Governing Law; Jury Waiver. This Agreement and the rights and obligations of the parties hereunder shall be construed in accordance with and governed by the law of Massachusetts without giving effect to the conflict of law principles thereof. Any legal action or proceeding with respect to this Agreement shall be brought in the courts of the Commonwealth of Massachusetts or the United States of America for the District of Massachusetts. By execution and delivery of this Agreement, each of the parties hereto accepts for itself and in respect of its property, generally and unconditionally, the exclusive jurisdiction of the aforesaid courts. ANY ACTION, DEMAND, CLAIM OR COUNTERCLAIM ARISING UNDER OR RELATING TO THIS AGREEMENT SHALL BE RESOLVED BY A JUDGE ALONE AND EACH OF COMPANY AND EXECUTIVE WAIVES ANY RIGHT TO A JURY TRIAL THEREOF.

(f) Headings and Captions. The headings and captions of the various subdivisions of this Agreement are for convenience of reference only and shall in no way modify or affect the meaning or construction of any of the terms or provisions hereof.

(g) Entire Agreement. This Agreement, together with the other agreements specifically referenced herein, embodies the entire agreement and understanding between the parties hereto with respect to the subject matter hereof and supersedes all prior oral or written agreements and understandings relating to the subject matter hereof. No statement, representation, warranty, covenant or agreement of any kind not expressly set forth in this Agreement shall affect, or be used to interpret, change or restrict, the express terms and provisions of this Agreement.

(h) Counterparts. This Agreement may be executed in two or more counterparts, and by different parties hereto on separate counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. For all purposes a signature by fax shall be treated as an original.

[Signature Page to Follow]

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

ADAM S. MOSTAFA

/s/ Adam S. Mostafa
Name: Adam S. Mostafa

Address:

X4 PHARMACEUTICALS, INC.

/s/ Paula M. Ragan, Ph.D.
Name: Paula M. Ragan, Ph.D.
Title: CEO

Address: 955 Massachusetts Avenue
Cambridge, MA 02139

EXHIBIT A
PERMITTED CONSULTING ENGAGEMENTS

- Cumberland Pharmaceuticals
- Abmed

LICENSE AGREEMENT

This License Agreement (this "**Agreement**") is executed as of July 10, 2014 (the "**Effective Date**") by and between **Genzyme Corp.**, a corporation having an address at 500 Kendall Street, Cambridge, MA 02142 ("**Genzyme**" or "**Licensor**") and **X4 Pharmaceuticals, LLC**, a Massachusetts limited liability company having an address at 281 School Street, Belmont, MA 02478, United States ("**X4**"). Genzyme and X4 are sometimes referred to herein individually as a "**Party**" and collectively as the "**Parties**."

RECITALS

WHEREAS, Genzyme controls certain intellectual property rights in the Territory (as defined herein) with respect to the Licensed Compounds (as defined herein) and Licensed Products (as defined herein); and

WHEREAS, Genzyme wishes to grant to X4, and X4 wishes to receive, an exclusive license under such intellectual property rights to Develop (as defined herein) and Commercialize (as defined herein) Licensed Products in the Territory, in each case in accordance with the terms and conditions set forth below.

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

ARTICLE 1
DEFINITIONS

Unless otherwise specifically provided herein, the following terms shall have the following meanings:

1.1 "**Acceptance**" shall mean [***].

1.2 "**Accountant**" has the meaning set forth in Section 6.12.

1.3 "**Adverse Event**" means (a) the development of an undesirable medical condition or the deterioration of a pre-existing medical condition in a patient or clinical investigation subject during or following exposure to or use of a Licensed Product, whether or not considered causally related to such Licensed Product, (b) the exacerbation in a patient or clinical investigation subject of any pre-existing condition occurring during or following exposure to or use of a Licensed Product, or (c) any other adverse experience or adverse drug experience (as described in the FDA's Investigational New Drug safety reporting and NDA post-marketing reporting regulations, 21 C.F.R. §§312.32 and 314.80, respectively, and any applicable corresponding regulations outside the United States, in each case as may be amended from time to time), of a patient or clinical investigation subject occurring during or following exposure to or

Portions of this Exhibit, indicated by the mark "[***]," were omitted and have been filed separately with the Securities and Exchange Commission pursuant to the Registrant's application requesting confidential treatment pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

use of a Licensed Product. For purposes of this Agreement, "undesirable medical condition" includes symptoms (e.g., nausea, chest pain), signs (e.g., tachycardia, enlarged liver) or the abnormal results of an investigation (e.g., laboratory findings, electrocardiogram), including unfavorable side effects, toxicity, injury, overdose or sensitivity reactions.

1.4 "**Agreement**" has the meaning set forth in the preamble hereto.

1.5 "**Affiliate**" means, with respect to a Party, any Person that, directly or indirectly, through one or more intermediaries, controls, is controlled by or is under common control with such Party. For purposes of this definition, "control" and, with correlative meanings, the terms "controlled by" and "under common control with" means (a) the possession, directly or indirectly, of the power to direct the management or policies of a business entity, whether through the ownership of voting securities, by contract relating to voting rights or corporate governance, or otherwise, or (b) the ownership, directly or indirectly, of more than 50% of the voting securities or other ownership interest of a business entity (or, with respect to a limited partnership or other similar entity, status as a general partner).

1.6 "**Allo-HSCT Treatment**" means allogeneic hematopoietic stem cell transplantation (i.e. where the donor is a different person than the recipient).

1.7 "**Annual Net Sales**" means Net Sales of all Licensed Products in the Territory (excluding Net Sales of each Licensed Product in any country in the Territory for which the Royalty Term for such Licensed Product and country has expired) in a particular Calendar Year.

1.8 "**Applicable Law**" means applicable laws, rules and regulations, including any rules, regulations, guidelines or other requirements of the Regulatory Authorities that may be in effect from time to time and applicable to a particular activity hereunder in the Territory.

1.9 "**Auto-HSCT Treatments**" means autologous hematopoietic stem cell transplantation, (i.e. where the donor and the recipient are one and a same person).

1.10 "**Breaching Party**" has the meaning set forth in Section 12.3.

1.11 "**Business Day**" means a day other than a Saturday or Sunday and any other day on which banking institutions in New York, New York, United States are not closed.

1.12 "**Calendar Quarter**" means, with respect to the first such Calendar Quarter, the period beginning on the Execution Date and ending on the last day of the calendar quarter within which the Execution Date falls and thereafter each successive period of three calendar months commencing on January 1, April 1, July 1 and October 1.

1.13 "**Calendar Year**" means, with respect to the first such Calendar Year, the period beginning on the Execution Date and ending on December 31 of the calendar year within which the Execution Date falls and thereafter each successive period of twelve (12) calendar months commencing on January 1 and ending on December 31.

1.14 "**Change of Control**" means the purchase (direct or indirect, either through merger or otherwise) by a Third Party of (i) fifty per cent (50%) or more of the existing Units in X4 or (ii) the whole or a substantial part of the business of X4 to which this Agreement relates. For clarity, the Parties agree that (a) any Licensed Product shall constitute a substantial part of the business of X4 for purposes of this definition and (b) an investment transaction by venture capital or other financial investors not engaged in the pharmaceutical or biotechnology business and not otherwise affiliated with a pharmaceutical or biotechnology company, the sole purpose of which is to raise capital for X4 shall not be deemed to be a Change of Control for purposes of this Agreement.

1.15 "**Clinical Data**" means all data, reports and results with respect to the Licensed Compound and the Licensed Products made, collected or otherwise generated under or in connection with the conduct of Clinical Studies.

1.16 "**Clinical Studies**" means human clinical trials for a Licensed Product and any other tests and studies for a Licensed Product in human subjects, in any case, conducted by or on behalf of X4 pursuant to this Agreement.

1.17 "**Combination Product**" means a single product that consists of or contains a Licensed Compound as an active ingredient together with one or more other therapeutically active ingredients and is sold either as a fixed dose or as separate doses in a single package.

1.18 "**Commercialization**" means, with respect to a Licensed Product, any and all activities (whether before or after Regulatory Approval) directed to the marketing, promotion and sale of such Licensed Product in the Field in the Territory, including pre-launch and post-launch marketing, promoting, marketing research, distributing, offering to commercially sell and commercially selling such Licensed Product, importing, exporting or transporting such Licensed Product for commercial sale, medical education activities with respect to such Licensed Product, conducting Clinical Studies that are not required to obtain or maintain Regulatory Approval for such Licensed Product for an indication, which may include epidemiological studies, modeling and pharmacoeconomic studies, post-marketing surveillance studies, investigator sponsored studies and health economics studies and regulatory affairs (including interacting with Regulatory Authorities) with respect to the foregoing. When used as a verb, "**Commercializing**" means to engage in Commercialization and "**Commercialize**" and "**Commercialized**" shall have corresponding meanings.

1.19 "**Commercially Reasonable Efforts**" means [***].

1.20 "**Complaining Party**" has the meaning set forth in Section 12.3.

1.21 "**Confidential Information**" has the meaning set forth in Section 9.1.

1.22 "**Control**" means, with respect to any Information, Regulatory Documentation, Patent, or other intellectual property right, possession of the right, whether directly or indirectly, and whether by ownership, license or otherwise (other than by operation of the license and other grants in Section 2.1), to assign or grant a license, sublicense or other right to or under such Information, Regulatory Documentation, Patent, or other intellectual property right as provided for herein without violating the terms of any agreement or other arrangement with any Third Party. "**Controlled**" has a corresponding meaning.

1.23 "**Controlling Party**" has the meaning set forth in Section 7.4.1.

1.24 "**CREATE Act**" has the meaning set forth in Section 7.2.4.

1.25 "**Cumulative Net Sales**" means total Net Sales of a Licensed Product in the Territory since the First Commercial Sale of such Licensed Product in the Territory (excluding Net Sales of each Licensed Product in any country in the Territory for which the Royalty Term for any Licensed Product and country has expired). For purposes of clarity, Net Sales of any Sublicensee of X4 shall be included as part of Net Sales solely for purposes of determining Cumulative Net Sales.

1.26 "**Current Good Manufacturing Practices**" or "**cGMP**" means current good manufacturing practices and standards, as provided for (and as amended from time to time) in the Current Good Manufacturing Practice regulations promulgated by the FDA under the United States Food, Drug and Cosmetic Act (21 C.F.R. Part 210 et seq.) and in the European Community Directive 2003/94/EC (Principles and guidelines of good manufacturing practice for medicinal products), as well as applicable documents developed by the International Conference on Harmonization (ICH) harmonized Tripartite Guideline, Good Manufacturing Practice Guide for Active Pharmaceutical Ingredients, Q7a.

1.27 "**Development**" means, with respect to a Licensed Product, all activities related to research, preclinical and other non-clinical testing, test method development and stability testing, toxicology, formulation, the conduct of Manufacture Process Development, the conduct of Clinical Studies, including Manufacturing in support thereof (but excluding any commercial Manufacturing), the conduct of statistical analysis and report writing, the preparation and submission of Drug Approval Applications for such Licensed Product, regulatory affairs with respect to the foregoing and all other activities necessary or reasonably useful or otherwise requested or required by a Regulatory Authority as a condition or in support of obtaining or maintaining a Regulatory Approval for such Licensed Product. When used as a verb, "**Develop**" means to engage in Development.

1.28 "**Development Plan**" means the plan for the Development of the Licensed Products as described in Section 3.1.1, as updated from time to time pursuant to Section 3.1.1.

1.29 "**Disclosing Party**" has the meaning set forth in Section 9.1.

1.30 "**Dollars**" or "**$**" means United States Dollars.

1.31 "**Drug Approval Application**" means a New Drug Application (an "**NDA**") as defined in the FFDCA and the regulations promulgated thereunder (including all additions, supplements, extensions and modifications thereto), or any corresponding foreign application in the Territory, including, with respect to the European Union, a Marketing Authorization Application (an "**MAA**") filed with the EMA pursuant to the centralized approval procedure or with the applicable Regulatory Authority of a country in Europe with respect to the mutual recognition or any other national approval procedure (including all additions, supplements, extensions and modifications thereto).

1.32 "**Effective Date**" has the meaning set forth in the preamble hereto.

1.33 "**EMA**" means the European Medicines Agency and any successor agency thereto.

1.34 "**European Union**" means the economic, scientific and political organization of member states as it may be constituted from time to time, which as of the Effective Date consists of Austria, Belgium, Bulgaria, Czech Republic, Croatia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, The Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom of Great Britain and Northern Ireland and that certain portion of Cyprus included in such organization.

1.35 "**Executive Officers**" means the **Chief Executive Officer** of X4 and the Head of Strategy & Business Development of Genzyme (or his/her designee).

1.36 "**Exploit**" means, with respect to a Licensed Product, to make, have made, import, have imported, use, sell or offer for sale, research, Develop, Commercialize, register, Manufacture, have Manufactured, hold or keep (whether for disposal or otherwise), have used, export, have exported, transport, distribute, have distributed, promote, have promoted, market or have sold or otherwise dispose of such Licensed Product and "**Exploitation**" means the act of Exploiting a Licensed Product.

1.37 "**FDA**" means the United States Food and Drug Administration and any successor agency thereto.

1.38 "**FFDCA**" means the United States Food, Drug, and Cosmetic Act, as amended from time to time.

1.39 "**Field**" means all therapeutic, prophylactic and diagnostic uses in humans for all indications, excluding (a) the Mozobil Indications, and (b) any use for Auto-HSCT Treatments and Allo-HSCT Treatments.

1.40 "**Financial Commitment**" means a private placement of capital or debt ownership interests or securities of X4 (including rights or options to acquire ownership interests) which results in aggregate proceeds to X4 of at least [***].

1.41 "**First Commercial Sale**" means, with respect to a Licensed Product in a country in the Territory, the first sale to a Third Party for monetary value for use or consumption by the general public of such Licensed Product in such country after the applicable Regulatory Authority has approved the Drug Approval Application for such Licensed Product in such country. Sales prior to the approval of the applicable Drug Approval Application, such as so-called "treatment IND sales", "named patient sales" and "compassionate use sales", shall not constitute a First Commercial Sale.

1.42 "**Force Majeure Event**" has the meaning set forth in Section 13.1.

1.43 "**Genzyme**" has the meaning set forth in the preamble hereto.

1.44 "**Genzyme Indemnitees**" has the meaning set forth in Section 11.1.

1.45 "**Genzyme Knowledge**" has the meaning set forth in Section 10.3.

1.46 "**IFRS**" means International Financial Reporting Standards adopted by the International Accounting Standards Board or applicable generally accepted accounting principles, in each case consistently applied.

1.47 "**IND**" means an investigational new drug application filed with the FDA for authorization to commence Clinical Studies in the United States (including all additions, supplements, extensions and modifications thereto), or any corresponding foreign application in any country or region in the Territory (including all additions, supplements, extensions and modifications thereto).

1.48 "**Indemnification Claim Notice**" has the meaning set forth in Section 11.3.

1.49 "**Indemnified Party**" has the meaning set forth in Section 11.3.

1.50 "**Indemnifying Party**" means the Party from whom indemnification is sought pursuant to Section 11.1 or Section 11.2.

1.51 "**Information**" means all technical, scientific and other know-how and information, trade secrets, knowledge, technology, means, methods, processes, practices, formulas, instructions, skills, techniques, procedures, experiences, technical assistance, designs, drawings, assembly procedures, computer programs, specifications, data, results and other material, including Regulatory Documentation, pre-clinical trial results and Clinical Study results, Manufacturing procedures, test procedures, and purification and isolation techniques (whether or not confidential, proprietary, patented or patentable) in written, electronic or any other form now known or hereafter developed, and all other discoveries, developments, inventions (whether or not confidential, proprietary, patented or patentable), and tangible embodiments of any of the foregoing.

1.52 "**Infringement**" has the meaning set forth in Section 7.3.1.

1.53 "**Infringement Notice**" has the meaning set forth in Section 7.3.1.

1.54 "**Invoiced Sales**" has the meaning set forth in the definition of "Net Sales".

1.55 "**LIBOR**" means the London Interbank Offered Rate for deposits in Euros having a maturity of one month published by the British Bankers' Association, as adjusted from time to time on the first London business day of each month.

1.56 "**Licensed Compound**" means (a) any of the compounds listed on **Schedule 1.56** and (b) any other compound that is otherwise covered by a Valid Claim of a Licensed Patent. Notwithstanding the foregoing, for the avoidance of doubt, plerixafor (also known as AMD3100 and 1,1'-[1,4-phenylene-bis(methylene)]-bis-1,4,8,11- tetraazacyclotetradecane, and by the trade name Mozobil®) is not a Licensed Compound.

1.57 "**Licensed Know-How**" means the Information Controlled by Genzyme or its Affiliates during the Term that is related to, and necessary or useful for the Development and/or Commercialization of, the Licensed Compounds and/or Licensed Products but excluding any Information to the extent claimed or covered by published Licensed Patents. For purposes of clarity, Licensed Know-How is listed on Schedule 1.57 attached hereto.

1.58 "**Licensed Patents**" means (a) the national, regional and international patents and patent applications, including provisional patent applications set forth on Schedule 1.58, (b) all patent applications Controlled by Genzyme or its Affiliates during the Term that claim priority to any patents or patent applications in clause (a), including divisionals, continuations, continuations-in-part, converted provisionals, and continued prosecution applications, as well as any substitute applications with respect to any patent applications in clause (a), (c) any and all patents that have issued or in the future may issue from any of foregoing patent applications in clause (a) or clause (b), to the extent Controlled by Genzyme or its Affiliates during the Term, including utility patents, utility models, petty patents and design patents and certificates of invention, and (d) any and all re-issues re-examinations renewals, revalidations, restorations or extensions (including any supplementary protection certificates and the like) of any of the foregoing patents or patent applications in clause (a), clause (b), or clause (c) to the extent Controlled by Genzyme or its Affiliates during the Term.

1.59 "**Licensed Product**" means any pharmaceutical product containing a Licensed Compound, alone or in combination with one or more other active ingredients.

1.60 "**Licensed Product Agreement**" means, with respect to a Licensed Product, any agreement entered into by and between X4 or any of its Sublicensees or its or their respective Affiliates, on the one hand, and one or more Third Parties, on the other hand, that relates to the Exploitation of such Licensed Product in the Field in the Territory, including (a) any agreement pursuant to which X4, its Sublicensees or its or their respective Affiliates receives any license or other rights to Exploit such Licensed Product, (b) supply agreements pursuant to which X4, its Sublicensees or its or their respective Affiliates obtain or will obtain quantities of such Licensed Product, (c) clinical trial agreements with respect to the conduct of clinical trials for such Licensed Product, (d) contract research organization agreements with respect to the conduct of services for such Licensed Product and (e) service agreements with respect to the conduct of services for such Licensed Product.

1.61 "**Losses**" has the meaning set forth in Section 11.1.

1.62 "**MAA**" has the meaning set forth in the definition of "Drug Approval Application."

1.63 "**Major Markets**" means each of the United States, the United Kingdom, Spain, Italy, France, Germany, Japan, Brazil, Russia, India and China.

1.64 "**Manufacture**" and "**Manufacturing**" means, with respect to a Licensed Product, all activities related to the production, manufacture, processing, filling, finishing, packaging, labeling, release, shipping, holding, conduct of Manufacture Process Development, stability testing, quality assurance or quality control of such Licensed Product or any intermediate thereof.

1.65 "**Manufacture Process Development**" means the process development, process qualification and validation and scale-up of the process to manufacture a Licensed Product and analytic development and product characterization with respect thereto.

1.66 "**Markings**" has the meaning set forth in Section 4.6.

1.67 "**Material Safety Issue**" has the meaning set forth in Section 12.4.2.

1.68 "**Milestone Event**" means each of the events identified as a milestone event in Section 6.4.1.

1.69 "**Monetization**" means the monetization of all or a portion of Genzyme's rights to receive payments under this Agreement, including by means of a direct sale (through an auction process or otherwise) or a financing (through a borrowing of loans, an offering of securities or otherwise).

1.70 "**Mozobil Indications**" means mobilization of hematopoietic stem cells to the peripheral blood for collection with or without use of G-CSF and subsequent autologous transplantation in human patients with a) lymphoma or b) multiple myeloma.

1.71 "**NDA**" has the meaning set forth in the definition of "Drug Approval Application."

1.72 "**Net Sales**" means, for any period, the gross amount invoiced by X4 or any of its Affiliates (or, for the sole purpose of calculating Cumulative Net Sales hereunder, by X4's Sublicensees and their Affiliates) for the sale of a Licensed Product, as applicable (the "**Invoiced Sales**"), less deductions for: [***]. Any of the deductions listed above that involves a payment by X4 or any of its Affiliates (or, for the sole purpose of calculating

Cumulative Net Sales hereunder, by X4's Sublicensees and their Affiliates) shall be taken as a deduction in the Calendar Quarter in which the payment is accrued by such entity. For purposes of determining Net Sales, a Licensed Product shall be deemed to be sold when invoiced and a "sale" shall not include transfers or dispositions of such Licensed Product for pre-clinical or clinical purposes or as samples, in each case, without charge. In the case of pharmacy incentive programs, hospital performance incentive programs, chargebacks, disease management programs, similar programs or discounts on portfolio product offerings, all rebates, discounts and other forms of reimbursements shall be allocated among products on the basis on which such rebates, discounts and other forms of reimbursements were actually granted or, if such basis cannot be determined, in accordance with X4's or its Affiliates' (or, for the sole purpose of calculating Cumulative Net Sales hereunder, with X4's Sublicensees' and their Affiliates') existing allocation method; provided, that, any such allocation shall be done in accordance with Applicable Law, including any price reporting laws, rules and regulations. X4's or any of its Affiliates' transfer of any Licensed Product to an Affiliate or Sublicensee shall not result in any Net Sales. In the event a Licensed Product is sold which is or comprises a Combination Product, then Net Sales with respect to such Combination Product shall be calculated by multiplying the Net Sales (as described above) of the applicable Combination Product by the fraction A over A+B, in which A is the average sales price in such country in the applicable Calendar Quarter of Licensed Products containing as therapeutically active ingredients only the Licensed Compound (in the same doses and dosage form), and B is the average sales price in such country in the applicable Calendar Quarter of products that do not contain the Licensed Compound and which contain as therapeutically active ingredients all of (and only) the other therapeutically active ingredients that are contained in such Combination Product (in the same doses and dosage form). In the event there are no such separate sales of the Licensed Product used to determine A or the other product used to determine B for a given Combination Product in such country during the applicable Calendar Quarter, Net Sales with respect to such Combination Product shall be determined by the Parties in good faith, based upon commercially reasonable standards and available market information, using values of A and B where A is equal to the relative value, to the end-user, of the Licensed Compound contained in the applicable Combination Product, and B is equal to the relative value, to the end-user, of all the other therapeutically active ingredients included in the applicable Combination Product without the Licensed Compound.

1.73 "**Non-Controlling Party**" has the meaning set forth in Section 7.4.1.

1.74 "**Party**" and "**Parties**" each has the meaning set forth in the preamble hereto.

1.75 "**Patents**" means (a) all national, regional and international patent applications, including provisional patent applications and PCT applications, continuations, continuations in part, divisionals, and registration confirmations, and (b) all national or regional patents, including utility patents, utility models, petty patents, certificates of invention and design patents including any and all reissues, re-examinations, renewals, revalidations, restorations or extensions (including any supplementary protection certificates and the like).

1.76 "**Payments**" has the meaning set forth in Section 6.8.

1.77 "**Person**" means an individual, sole proprietorship, partnership, limited partnership, limited liability partnership, corporation, limited liability company, business trust, joint stock company, trust, unincorporated association, joint venture or other similar entity or organization, including a government or political subdivision, department or agency of a government.

1.78 "**Phase II Clinical Trial**" means a Clinical Study, the principal purpose of which is a determination of safety and efficacy of a Licensed Product in the target patient population or a similar Clinical Study prescribed by the Regulatory Authorities, from time to time, pursuant to Applicable Law or otherwise as more fully defined in 21 C.F.R. §312.21(b), as amended.

1.79 "**Phase III Clinical Trial**" means a Clinical Study on a sufficient number of subjects that is designed to establish that a Licensed Product is safe and efficacious for its intended use and to determine warnings, precautions and adverse reactions that are associated with such Licensed Product in the dosage range to be prescribed, as more fully defined in 21 C.F.R. §312.21(c), as amended, which Clinical Study is intended to support Regulatory Approval of such Licensed Product, including all tests and studies that are required by the FDA from time to time, pursuant to Applicable Law or otherwise.

1.80 "**Product Labeling**" means, with respect to a Licensed Product in a country in the Territory, (a) the Regulatory Authority-approved full prescribing information for such Licensed Product for such country, including any required patient information and (b) all labels and other written, printed or graphic matter upon any container, wrapper or any package insert utilized with or for such Licensed Product in such country.

1.81 "**Product Trademarks**" means the Trademark(s) to be used by X4, or its Affiliates or Sublicensees for the Commercialization of the Licensed Products in the Field in the Territory and any registrations thereof or any pending applications relating thereto in the Territory (excluding, in any event, any Trademarks that include any corporate name or logo of Genzyme or its Affiliates).

1.82 "**Prosecution and Maintenance**" has the meaning set forth in Section 7.2.1.

1.83 "**Receiving Party**" has the meaning set forth in Section 9.1.

1.84 "**Regulatory Approval**" means, with respect to a Licensed Product in a country in the Territory, any and all approvals (including Drug Approval Applications), licenses, registrations or authorizations of any Regulatory Authority necessary to commercially distribute, sell or market such Licensed Product in such country, including, where applicable, (a) pricing or reimbursement approval in such country**,** (b) pre- and post-approval marketing authorizations (including any prerequisite Manufacturing approval or authorization related thereto) and (c) labeling approval.

1.85 "**Regulatory Authority**" means any applicable supra-national, federal, national, regional, state, provincial or local regulatory agencies, departments, bureaus, commissions, councils or other government entities regulating or otherwise exercising authority with respect to the Exploitation of a Licensed Compound or a Licensed Product in the Territory.

1.86 "**Regulatory Documentation**" means all (a) applications (including all INDs and Drug Approval Applications), registrations, licenses, authorizations and approvals (including all Regulatory Approvals), (b) correspondence and reports submitted to or received from Regulatory Authorities (including minutes and official contact reports relating to any communications with any Regulatory Authority) and all supporting documents with respect thereto, including all regulatory drug lists, advertising and promotion documents, Adverse Event files and complaint files and (c) Clinical Data and any other data contained in any of the foregoing, in each case ((a), (b) and (c)), relating to the Licensed Product.

1.87 "**Regulatory Exclusivity**" means the period of data, market or other regulatory exclusivity under the FFDCA, European Parliament and Council Regulations (EC) Nos. 726/2004, 141/2000 and 1901/2006, or national implementations of Article 10 of Directive 2001/83/EC, and all equivalents (including in the United States and the European Union) of any of the foregoing.

1.88 "**Royalty Term**" means, with respect to each Licensed Product and each country in the Territory, the period beginning on the date of the First Commercial Sale of such Licensed Product in such country, and ending on the latest to occur of (a) the expiration of the last-to-expire Valid Claim within the Licensed Patents in such country that would be infringed by the sale of such Licensed Product in such country; (b) the expiration of Regulatory Exclusivity in such country for such Licensed Product and (c) the tenth (10^{th}) anniversary of the First Commercial Sale of such Licensed Product in such country.

1.89 "**Sublicense**" means an exclusive sublicense to Commercialize a Licensed Product granted by X4 pursuant to Section 2.3.2 to a Sublicensee. For clarity, any subcontracting agreement meeting the requirements of Section 3.5 or Section 4.8 pursuant to which X4 subcontracts the exercise of its rights and/or the performance of its obligations under this Agreement shall not constitute a Sublicense.

1.90 "**Sublicensee**" means a Person, other than an Affiliate, that is granted a Sublicense by X4.

1.91 "**Sublicense Percentage**" means (a) with respect to a Sublicense granted with respect to a Licensed Product prior to the dosing of the first patient in the first Phase II Clinical Trial conducted for such Licensed Product, [***]; (b) with respect to a Sublicense granted with respect to a Licensed Product on or after the dosing of the first patient in the first Phase II Clinical Trial for such Licensed Product and prior to the dosing of the first patient in the first Phase III Clinical Trial conducted for such Licensed Product, [***]; and (c) with respect to a Sublicense granted with respect to a Licensed Product on or after the dosing of the first patient in the first Phase III Clinical Trial conducted for such Licensed Product, [***].

1.92 "**Sublicense Revenue**" means cash payments received by X4 or its Affiliate from their respective Sublicensees pursuant to a Sublicense in consideration for the grant of a Sublicense, including any upfront payments, license maintenance fees, development or regulatory or sales milestone payments [***]. Notwithstanding the foregoing, Sublicense Revenue will not include [***].

1.93 "**Term**" has the meaning set forth in Section 12.2.

1.94 "**Termination Notice Period**" has the meaning set forth in Section 12.3.

1.95 "**Territory**" means worldwide.

1.96 "**Third Party**" means any Person other than Genzyme, X4 and their respective Affiliates.

1.97 "**Third Party Claims**" has the meaning set forth in Section 11.1.

1.98 "**Trademark**" means any word, name, symbol, color, designation or device or any combination thereof that functions as a source identifier, including any trademark, trade dress, brand mark, service mark, trade name, brand name, logo or business symbol, whether or not registered.

1.99 "**Trigger Notice**" has the meaning set forth in Section 4.7.

1.100 "**United States**" means the United States of America, including all possessions and territories thereof.

1.101 "**Valid Claim**" means a pending or issued claim of a patent or patent application which: (a) has not been held unpatentable, invalid or unenforceable by a court or other government agency of competent jurisdiction in a decision from which no appeal can or has been taken; and (b) which has not been admitted to be invalid or unenforceable through reissue, re-examination, disclaimer or otherwise. Notwithstanding the foregoing, in case of pending patent applications, it is understood and agreed that if the corresponding claim in the patent applications: (i) has been limited or cancelled because of patentability requirements such that the corresponding claim does not cover the applicable Licensed Product; (ii) has lapsed; (iii) has been finally rejected (and the rejection has been affirmed on appeal or the time for appeal or petition has lapsed); (iv) has been finally revoked (and the revocation has been affirmed on appeal or the time for appeal or petition has lapsed); or (v) [***], then such corresponding claim in such corresponding patent application pending in any country will not be deemed to be a Valid Claim.

1.102 "**X4**" has the meaning set forth in the preamble hereto.

1.103 "**X4 First Financing**" means the closing by X4, in a single transaction or a series of transaction, of a financing round in which X4 receives from one or more Third Parties funding in an aggregate amount of not less than [***] in exchange for debt or equity ownership interests or securities of X4.

1.104 "**X4 Indemnitees**" has the meaning set forth in Section 11.2.

1.105 "**X4 Know-How**" means any Information Controlled by X4 or its Affiliates as of the effective date of termination of this Agreement by Genzyme pursuant to Section 12.3 and/or 12.5 that is not generally known and is necessary or useful for the Exploitation of a Licensed Product in the Field in the Territory, but excluding any Information to the extent covered or claimed by published X4 Patents.

1.106 "**X4 Patents**" means any Patents Controlled by X4 or its Affiliates as of the effective date of termination of this Agreement by Genzyme pursuant to Section 12.3 and/or 12.5 that are necessary or useful (or, with respect to patent applications, would be necessary or useful if such patent applications were to issue as patents) for the Exploitation of a Licensed Product in the Field in the Territory.

ARTICLE 2
GRANT OF RIGHTS AND RELATED TRANSFER OBLIGATIONS

2.1 Grants to X4. Subject to Section 2.2, Section 2.3, Section 4.7 and the other terms and conditions of this Agreement, Genzyme hereby grants to X4:

2.1.1 an exclusive (including with regard to Genzyme and its Affiliates, excepting only the retained rights of Genzyme described in Section 2.2) license during the Term, with the right to grant sublicenses in accordance with Section 2.3, under the Licensed Patents and the Licensed Know-How to Exploit the Licensed Compounds and Licensed Products in the Field in the Territory.

2.1.2 a non-exclusive license during the Term, with the right to grant sublicenses in accordance with Section 2.3, to use any Trademark and/or logo of Genzyme or its Affiliates solely as necessary for X4 to perform its obligations under Section 4.6 and for no other purpose.

2.2 Retention of Rights and Negative Covenant by Genzyme.

2.2.1 Notwithstanding anything to the contrary in this Agreement, Genzyme retains, on behalf of itself and its Affiliates, the exclusive right in and to the Licensed Patents and the Licensed Know-How to Exploit Licensed Compounds and Licensed Products in the Territory outside of the Field and solely for use in Mozobil Indications, Allo-HSCT Treatments and Auto-HSCT Treatments; provided, that, the retained right of Genzyme to Exploit the Licensed Compounds and Licensed Products outside of the Field shall be subject, in each such case, to Section 2.2.2 and to the prior written consent of X4, which consent shall not be unreasonably withheld, delayed or conditioned.

2.2.2 Notwithstanding anything to the contrary in this Agreement, Genzyme retains, on behalf of itself and its Affiliates, the non-exclusive right in and to the Licensed Patents and the Licensed Know-How to conduct preclinical research, and testing with respect to the Licensed Compounds in the Field in the Territory, and to Manufacture the Licensed Compounds solely for use in the performance of such preclinical research and testing, subject to the remainder of this Section 2.2.2. For clarity, the foregoing rights shall exclude any clinical development or Commercialization of the Licensed Compounds of any kind in the Field and/or manufacture of the Licensed Compounds for such purpose. Genzyme further covenants that it will not, during the Term, engage in any clinical Development or Commercialization of any of the Licensed Compounds listed on **Schedule 1.56** outside the Field (including in the Mozobil Indications, for Allo-HSCT Treatments and for Auto-HSCT Treatments) and/or manufacture of the Licensed Compounds listed on Schedule 1.56 for any such purpose. Any proposed publication by Genzyme or its Affiliates of research results relating to the Licensed Compounds that are obtained in the performance of the research activities described in this Section 2.2.2 shall be subject to the restrictions of Section 9.5 hereof.

2.3 Sublicenses.

2.3.1 The rights and licenses granted to X4 under Section 2.1 shall include the right to grant sublicenses, which shall not be further sublicensable, to its Affiliates, and to academic collaborators and Third Party contractors to Develop the Licensed Compounds and Licensed Products in the Field in the Territory; provided, that, X4 shall require each such Sublicensee to agree in writing to be bound by the applicable terms and conditions of this Agreement, including Section 4.7, Section 12.7, ARTICLE 7 and ARTICLE 9. No such sublicense shall relieve X4 of any of its obligations hereunder and X4 shall use its Commercially Reasonable Efforts to enforce compliance by each such Sublicensee to the extent such enforcement is required to allow X4 to comply with its obligations hereunder. X4 shall promptly inform Genzyme in writing of any material breach by a Sublicensee of its sublicense agreement to the extent such material breach would reasonably be expected to affect Genzyme's rights under this Agreement, and any failure by X4 to promptly take reasonable steps in accordance with the terms of the sublicense to have Sublicensee remedy such material breach shall constitute a material breach of this Agreement.

2.3.2 Subject to X4's compliance with its obligations under Section 4.7, and subject to X4 having secured the X4 First Financing as required under Section 12.1, the rights and licenses granted to X4 under Section 2.1 shall include the right to grant sublicenses to its Affiliates and Third Parties to Develop and/or Commercialize the Licensed Compound and Licensed Products in the Field in the Territory. X4 shall (a) require each Sublicensee to agree in writing to be bound by the applicable terms and conditions of this Agreement, including Section 4.7, Section 12.7, ARTICLE 7 and ARTICLE 9, and (b) provide Genzyme with a written notice of the execution of such sublicense (which written notice shall include a copy of any such sublicense)., which copy may be redacted by X4 with respect to obligations that are not relevant to X4's obligations under this Agreement, the terms of which shall be Confidential Information of X4 and subject to Article 9. No such Sublicensee shall relieve X4 of any of its obligations hereunder and X4 shall use its Commercially Reasonable Efforts to enforce compliance by each such Sublicensee to the extent such enforcement is required to allow X4 to comply with its obligations hereunder. X4 shall promptly inform Genzyme in writing of any material breach by a Sublicensee of its

sublicense agreement to the extent such material breach would reasonably be expected to affect Genzyme's rights under this Agreement, and any failure by X4 to promptly take reasonable steps in accordance with the terms of the sublicense to have Sublicensee remedy such material breach shall constitute a material breach of this Agreement.

2.4 Paid-Up License. Upon the expiration of the Royalty Term with respect to a Licensed Product in a country, the licenses granted to X4 under Section 2.1 shall become fully paid-up, irrevocable and perpetual for such Licensed Product in that country.

2.5 Genzyme Trademarks. With respect to any Trademark and/or logo of Genzyme or its Affiliates licensed to X4 under Section 2.1.2, X4 agrees to conform to the guidelines of Genzyme in effect from time to time (as notified in writing to X4) with respect to manner of use and to maintain the quality standards of Genzyme for goods sold and services provided in connection with any such Trademark and/or logo of Genzyme or its Affiliates. X4 and its Affiliates shall, and shall include in each Sublicense agreement an obligation of each Sublicensee to, use diligent efforts not to do any act that endangers, destroys or similarly affects the value of the goodwill pertaining to the any Trademark and/or logo of Genzyme or its Affiliates. X4 and its Affiliates shall, and shall include in each Sublicense agreement an obligation of each Sublicensee to, execute any documents required in the reasonable opinion of Genzyme to be entered as a "registered user" or recorded licensee of the any Trademark and/or logo of Genzyme or its Affiliates or to be removed as registered user or licensee thereof.

2.6 No Implied Rights. For the avoidance of doubt, X4, its Sublicensees and its and their respective Affiliates shall have no right, express or implied, with respect to the Licensed Patents, the Licensed Know-How or any Trademark and/or logo of Genzyme or its Affiliates, except as expressly provided in Section 2.1.

2.7 Disclosure. Genzyme shall use commercially reasonable efforts to deliver the Licensed Know-How to X4, at Genzyme's sole cost and expense, within [***] after the Effective Date. Genzyme shall also provide to X4, where available, copies of any raw data from Clinical Studies, case report forms, protocols and amendments, trial master files and investigator brochures related to the Licensed Compound and the Licensed Products.

2.8 Initial Material Transfer. Within [***] after the Effective Date, Genzyme shall, at Genzyme's sole cost and expense, deliver to X4 approximately the quantity of Licensed Compound in powder form as shown on Schedule 1.56 (the "**Initial Materials**"), and a "Certificate of Analysis" with respect to the Initial Materials and will transfer ownership to X4 of any Initial Materials (or work in-process of Initial Materials) currently housed at Aptuit (Genzyme's contract manufacturer of AMD11070). X4 shall reimburse Genzyme for the reasonable out-of-pocket expenses incurred by Genzyme in delivering the Initial Materials to X4 pursuant to this Section 2.8. THE INITIAL MATERIALS SUPPLIED BY GENZYME UNDER THIS SECTION 2.8 ARE SUPPLIED "AS IS" AND GENZYME MAKES NO REPRESENTATIONS AND EXTENDS NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR

PURPOSE, OR THAT THE USE OF THE INITIAL MATERIALS DOES NOT INFRINGE ANY PATENT, COPYRIGHT, TRADEMARK, OR OTHER PROPRIETARY RIGHTS OF A THIRD PARTY. X4 assumes all liability for damages which may arise from its use, storage or disposal of the Initial Materials. Genzyme will not be liable to X4 for any loss, claim or demand made by X4, or made against X4 by any Third Party, due to or arising from the use of the Initial Materials except, to the extent permitted by applicable Laws, to the extent caused by the negligence or willful misconduct of Genzyme.

ARTICLE 3

DEVELOPMENT AND REGULATORY

3.1 Development.

3.1.1 Development Plans. The initial Development Plan, which covers the period from the Effective Date through the first Calendar Quarter of 2015, is attached to this Agreement as **Schedule 3.1.2**. [***], X4 shall prepare and submit an updated Development Plan to Genzyme. Each such update to the Development Plan shall set forth for the applicable Calendar Year the Development objectives, the planned Clinical Studies and other Development activities and the contemplated timelines for the foregoing. X4 shall manage the preparation of each such update so that it is submitted to Genzyme [***]. X4 shall consider in good faith any comments Genzyme may provide with respect to any such updates to the Development Plan.

3.1.2 Diligence. X4 shall use Commercially Reasonable Efforts to Develop, at is sole cost and expense, and obtain and maintain Regulatory Approvals for at least one Licensed Product for use in the Field in at least the USA and one of the other Major Markets.

3.2 Regulatory Matters.

3.2.1 Regulatory Responsibilities.

(a) X4 shall have the sole right and responsibility for preparing, obtaining and maintaining Drug Approval Applications and any other Regulatory Approvals and other submissions, and for conducting communications with the Regulatory Authorities, for Licensed Products in the Field in the Territory. As between the Parties, all Drug Approval Applications and Regulatory Approvals relating to Licensed Products in the Field with respect to the Territory shall be owned by, and shall be the sole property and held in the name of, X4 or its designated Affiliate or Sublicensee.

(b) Genzyme hereby assigns to X4 all of Genzyme's right, title and interest in and to the Drug Approval Applications and Regulatory Approvals with respect to the Licensed Compound Controlled by Genzyme on the Effective Date (the "**Assigned Regulatory Documentation**"), a list of which Assigned Regulatory Documentation is set forth on **Schedule 3.2.1**. Promptly following the completion of X4 First Financing, Genzyme shall take such steps as may be reasonably necessary to promptly complete the transfer to X4 of its ownership of the Assigned Regulatory Documentation. All such Assigned Regulatory Documentation will be owned by and held in the name of X4.

(c) Schedule 3.2.1(c) sets forth all Regulatory Documentation, other than the Assigned Regulatory Documentation, that is Controlled by Genzyme as of the Execution Date. Genzyme hereby grants to X4 the exclusive right, and right of reference, under Genzyme's right, title, and interest in and to all such Regulatory Documentation not assigned to X4 pursuant to Section 3.2.1(b), to use such Regulatory Documentation for the purposes of seeking Regulatory Approvals to Commercialize Licensed Products in the Field in the Territory in accordance with this Agreement. X4 may sublicense such rights in connection with any sublicense granted in accordance with Section 2.3.

(d) Genzyme shall, upon the written request of X4, notify the applicable Regulatory Authorities in writing that it is transferring responsibility for Regulatory Documentation, including the Assigned Regulatory Documentation, to X4, and X4 shall notify the applicable Regulatory Authorities in writing that it is accepting all regulatory responsibilities associated with such Regulatory Documentation (including the responsibility for reporting Adverse Events).

3.3 Reports. At least [***] commencing on the last day of the first full Calendar Year following the Effective Date and [***], X4 shall provide Genzyme with a detailed report describing (a) the Development activities it has performed, or caused to be performed, since the preceding report (including any filings, submissions, communications or meetings with any Regulatory Authorities) and (b) its Development activities in process (including any Clinical Data and Patent filings) and (c) safety findings related to the Licensed Compounds and Licensed Products. All information disclosed by X4 to Genzyme pursuant to this Section 3.3 shall be the Confidential Information of X4.

3.4 Records. X4 shall maintain, or cause to be maintained, all Regulatory Documentation Controlled by X4 and final supporting records and documentation therefor (but not draft records or documentation therefor except as otherwise required by Applicable Law), in sufficient detail and in compliance with Applicable Law. Such records and documentation shall be complete and accurate and shall fully and properly reflect all work done and results achieved in the performance of the applicable Development activities in a manner appropriate for any regulatory purpose and, when applicable, for use in connection with Patent filings, prosecution and maintenance. Such records and documentation shall be retained by X4 for [***].

3.5 Subcontracting. X4 may subcontract the exercise of its rights and the performance of its obligations under this ARTICLE 3; provided, that, (a) X4 shall oversee the performance by its subcontractors of the subcontracted activities in a manner that would be reasonably expected to result in their timely and successful completion and (b) any agreement pursuant to which X4 engages a subcontractor pursuant to this Section 3.5 must (i) be consistent with this Agreement and (ii) contain terms obligating such subcontractor to: (A) comply with confidentiality provisions that are consistent with those set forth in ARTICLE 9; and (B) provide Genzyme with substantially the same rights with respect to any Information, Patents and other intellectual property arising from the performance of the subcontracted obligation as Genzyme would have under this Agreement if such Information, Patents or other intellectual property had arisen from the performance of such obligation by X4.

3.6 Compliance. X4 shall perform or cause to be performed any and all of its Development activities under this Agreement in a good scientific manner and in compliance with all Applicable Law.

3.7 Regulatory Audits. During the period commencing on the Effective Date and continuing until the first to occur of the expiration of the Term, the termination of this Agreement or the consummation of a Transaction, Genzyme shall have the right, during normal business hours and upon reasonable notice, to inspect any regulatory records and correspondence kept by X4, its Affiliates or Sublicensees in accordance with this Article 3. Any such audit may not be conducted more than [***]. The cost of any audit shall be borne by Genzyme. Notwithstanding the foregoing, to the extent that X4 does not have the right to grant Genzyme the right to audit the records of any of its Sublicensees hereunder, X4 shall obtain for itself such right and, at Genzyme's request, X4 shall, subject to the limitations set forth in this Section 3.7, exercise such audit right with respect to such Sublicensees and shall provide the results of such audit to Genzyme.

ARTICLE 4
COMMERCIALIZATION

4.1 Commercialization. Subject to Section 4.7, X4 shall have the sole right, at is sole cost and expense, to control the Commercialization of Licensed Products in the Field in the Territory.

4.2 Commercial Diligence. X4 shall use Commercially Reasonable Efforts to Commercialize at least one Licensed Product in the Field in accordance with Applicable Law in each of the USA and at least one of the other Major Markets.

4.3 Compliance with Applicable Law. X4 and its Affiliates shall, and X4 shall include in each Sublicense agreement an obligation of each Sublicensee to, comply with all Applicable Law with respect to the Commercialization of the Licensed Products.

4.4 Sales and Distribution. X4 shall be solely responsible for invoicing and booking sales, establishing all terms of sale (including pricing and discounts) and warehousing and distributing the Licensed Products in the Field in the Territory and shall perform such activities in accordance with the terms and conditions of this Agreement. X4 shall be solely responsible for handling all returns, recalls and withdrawals, order processing, invoicing and collection, distribution and inventory and receivables with respect to the Licensed Product in the Field in the Territory.

4.5 Product Trademarks. X4 shall have the right to determine and own the Product Trademarks to be used with respect to the Exploitation of the Licensed Products in the Field in the Territory.

4.6 Markings. To the extent required by Applicable Law in a country in the Territory, the promotional materials, packaging and Product Labeling for the Licensed Product used by X4, its Sublicensees or its or their respective Affiliates in connection with the Licensed Product in such country shall contain (a) the Genzyme Corporate Name and (b) the logo and corporate name of the manufacturer (collectively, the "**Markings**"). The manner in which the Markings are to be presented on promotional materials, packaging and Product Labeling for the Licensed Product shall be subject to Section 2.5 and Section 7.1.2.

4.7 Genzyme Right of First Negotiation. Genzyme shall have a right of first negotiation, as described in this Section 4.7, to negotiate with X4 for an agreement providing rights for the grant to Genzyme or its Affiliates of the right to Exploit Licensed Products in the Field in the Territory (the "**Right of First Negotiation**"). If at any time during the Term, X4 determines, in its sole discretion, that it wishes to seek to grant a sublicense (an "**Out-License**") under the Licensed Patents and/or Licensed Know-How to a Third Party for the Development and/or Commercialization of any Licensed Product, then X4 will notify Genzyme in writing and provide a non-confidential summary of the Licensed Product that is the subject of the proposed Out-License, as well as the intended scope (i.e., field and territory) of the Out-License (a "**Trigger Notice**"). If Genzyme desires to evaluate such Out-License, Genzyme will provide X4 with a written notice of same [***] that provides the process and time lines for internal diligence and stage gate committee meetings that are required to advance into license negotiations (a "**Negotiation Notice**"). Promptly after X4's receipt of a Negotiation Notice, X4 will provide Genzyme with a confidential summary of the Licensed Product (each, a "**Data Package**"), including material Clinical Data and preclinical data Controlled by X4 (as well as such other information in X4's Control that Genzyme may reasonably request), which Data Package shall be Confidential Information of X4 under this Agreement. During the period commencing on the date of receipt by X4 of the Negotiation Notice [***] (the "**Diligence Period**"), Genzyme will complete its diligence and comply with the time lines set in the Negotiation Notice and Genzyme and X4 shall have weekly meetings (either in person or by phone) to discuss Genzyme's progress and to answer any questions related to diligence. During the period commencing on the last day of the Diligence Period [***] (the "**Exclusivity Period**"), Genzyme will have an exclusive right to negotiate with X4 for an exclusive, royalty-bearing license to such Licensed Product in the field and territory specified in the Trigger Notice. If (a) Genzyme (i) does not deliver a Negotiation Notice to X4 within the [***], (ii) does not deliver a binding written proposal to X4 for the terms of an Out-License to X4 during the Exclusivity Period, or (iii) declines in writing an Out-License to the Licensed Product after review of the Data Package, or (b) Genzyme and X4 do not mutually agree on the terms of an Out-License within the Exclusivity Period, Genzyme shall have no further rights under this Agreement with respect to such Licensed Product and X4 will be free to negotiate an Out-License for such Licensed Product with any Third Party, subject to the terms of Section 2.2 (Sublicenses).

4.8 Subcontracting. Subject to Section 4.7, X4 may subcontract the Commercialization of the Licensed Products in the Field in the Territory; provided, that, (a) X4 shall use its Commercially Reasonable Efforts to oversee the performance by its subcontractors of the subcontracted activities in a manner that would be reasonably expected to result in their timely and successful completion of such activities and (b) any agreement

pursuant to which X4 engages a subcontractor must (i) be consistent in all material respects with this Agreement and (ii) contain terms obligating such subcontractor to comply with confidentiality provisions that are at least as restrictive as those set forth in ARTICLE 9. For clarity, the foregoing shall not limit X4's right to grant Sublicenses pursuant to Section 2.3 and, subject to the requirements of Section 2.3, X4 shall have the right to exercise its rights and fulfill its obligations through one or more Affiliates or Sublicensees.

ARTICLE 5
MANUFACTURE AND SUPPLY

5.1 In General. X4 shall (a) be responsible for the Manufacture of Licensed Compounds and each Licensed Product in sufficient quantities to enable X4 to pursue the Exploitation of such Licensed Product in the Field in the Territory in accordance with its obligations under Section 4.12, and (b) use Commercially Reasonable Efforts to assure an efficient and reliable supply of Licensed Compounds and each Licensed Product conforming to the applicable specifications with respect thereto as necessary to Exploit and maintain Regulatory Approvals for such Licensed Product in the Field in the Territory in accordance with its obligations under Section 4.2 and Section 3.32, including developing commercially reasonable arrangements and strategies for back-up sources of supply of such Licensed Compounds and Licensed Product that appropriately and reasonably minimize the risk of supply shortfalls and that take into account expected inventory levels and demand.

5.2 Subcontracting of Manufacturing Rights. In furtherance of the obligations set forth in Section 5.1, X4 shall either itself Manufacture and supply, or may enter into one or more definitive Manufacturing and supply agreements with Genzyme or Third Parties to Manufacture and supply, clinical and commercial supplies of Licensed Compounds and each Licensed Product. X4 shall, shall cause its Affiliates to, and shall include in any agreement with any Third Party that Manufactures and supplies clinical or commercial supplies of Licensed Compounds and any Licensed Product an obligation of such Third Party to, comply with all Applicable Law with respect to the Manufacture of Licensed Compound and Licensed Products.

ARTICLE 6
PAYMENTS

6.1 Signature Fee. No later than ten (10) days after the Execution Date, X4 shall pay Genzyme an upfront amount equal to [***]. Such payment shall be nonrefundable (including in the case that this Agreement would not enter into force as per Section 12.1) and non-creditable against any other payments due hereunder.

6.2 X4 First Financing Fee. No later than thirty (30) days after the closing of the X4 First Financing, X4 shall pay Genzyme an upfront amount equal to Three Hundred Thousand Dollars ($300,000). Such payment shall be nonrefundable and non-creditable against any other payments due hereunder.

6.3 Equity Consideration.

6.3.1 Unit Issuance.

(a) Initial Grant. [***] after the closing of the X4 First Financing, X4 shall issue to Genzyme or to Genzyme's designated Affiliate a number of units of ownership interests of X4 ("Units") that represents, on an as-converted basis, ten per cent (10%) of the outstanding Units of X4 immediately following the closing of the X4 First Financing (the "**Initial Units**").

(b) Anti-Dilution Grant. If at any time prior to the date of [***], X4 issues Units (including any options, warrants or rights to purchase or acquire Units from X4) that would cause Genzyme's percentage ownership in X4 to drop below ten percent (10%), X4 shall issue additional Units to Genzyme to restore Genzyme's percentage ownership in X4 to ten percent (10%) (the "**Anti-Dilution Units**"). The obligation of X4 to issue Anti-Dilution Units shall terminate on the date of Financial Commitment.

(c) Execution of Documents. Concurrently with such issuance of the Initial Units and/or the issuance of the Anti-Dilution Shares, Genzyme shall or shall cause its designated Affiliate to execute and deliver to X4 and the Third Party investors in X4 customary documents (such as, without limitation, a restricted unit purchase agreement, an investor rights agreement and a voting agreement).

6.3.2 Put Option.

(a) Put Option. At any time during the Term, Genzyme or its Affiliate, as the holder of Units of X4, will have the one time right to request in writing that X4 purchase all (but not less than all) of the Units of X4 then held by Genzyme or such Affiliate (the "**Subject Units**"). Upon X4's receipt of such written notice, X4 shall purchase such Subject Units from Genzyme or such Affiliate, for a purchase price equal to [***] (the "**Purchase Price**").

(b) Put Closing.

(i) The closing of the purchase and sale of any Subject Units (each a "**Put Closing**") shall take place on, and payment therefor shall be made in full on, the date that is [***] after the notice from Genzyme pursuant to Section 6.3.2(a) exercising the right to require X4 to purchase Subject Units (the "**Put Closing Date**"). The Put Closing shall take place at 10:00 a.m. on the Put Closing Date.

(ii) The Purchase Price shall be paid in full by X4 at the Put Closing, by wire transfer of immediately available federal funds or by bank cashier's or certified check , and Genzyme shall deliver the Subject Units to be sold to X4 at Closing duly endorsed for transfer to X4, which Subject Units shall be, and upon the request of X4, Genzyme shall provide to X4 a certificate to the effect that, the Subject Units being sold are free and clear of all liens and encumbrances of any kind, nature and description other than applicable restrictions under federal and state securities laws.

6.4 Milestones.

6.4.1 Regulatory Milestone Payments. X4 shall pay Genzyme the following one-time, non-refundable, non-creditable milestone payments [***] after the first achievement of the corresponding Milestone Event by X4, its Sublicensees or their respective Affiliates:

Milestone Event	Milestone Payment
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]

6.4.2 Sales Milestone Payment. X4 shall pay Genzyme the following one-time, non-refundable, non-creditable milestone payments [***] after the first achievement of the corresponding Milestone Event by X4, its Sublicensees and their respective Affiliates:

Milestone Event	Milestone Payment
[***]	[***]
[***]	[***]
[***]	[***]

6.4.3 Milestone Payment upon Change of Control. X4 shall pay to Genzyme a one-time, non-refundable, non-creditable milestone payment upon the closing during the Term of any transaction that constitutes a Change of Control (the "**Transaction**"), in an amount equal to five and half of one percent (5.5%) of the Net Consideration paid or payable to all X4's equity holders (including Genzyme) less the amount of Net Consideration that Genzyme (and its Affiliates, assignees and/or transferees) is entitled to receive in connection with the Transaction by reason of the ownership by any of them of shares of ownership interests of X4 (including securities, warrants, stock appreciation rights, options or similar rights, whether or not vested, that are convertible into ownership interests of X4). The milestone payment described in this Section 6.4.3 shall become due and payable as from the date on which X4's equity holders actually receive

the consideration owed to them under the Transaction and, for clarity, no payment under this Section 6.4.3 will be due by X4 to Genzyme with respect to any consideration resulting from a deferred payment under the Transaction until such deferred payment is made to X4's equity holders. For the purpose of this Section 6.4.3, "**Net Consideration**" shall mean [***]. If Genzyme reasonably disagrees with the calculation of the Net Consideration provided by X4 it shall provide X4 with written notice [***] of its receipt of the calculation provided by X4. To the extent that parties are unable to resolve the disagreement [***], the matter shall be resolved in accordance with Section 6.12.

6.4.4 Determination that Milestone Events Have Occurred. X4 shall notify Genzyme promptly of the achievement of each Milestone Event. In the event that, notwithstanding the fact that X4 has not provided Genzyme such a notice, Genzyme believes that any such Milestone Event has been achieved, it shall so notify X4 in writing and the Parties shall promptly meet and discuss in good faith whether such Milestone Event has been achieved. Any dispute under this Section 6.4.3 regarding whether or not a Milestone Event has been achieved shall be subject to resolution in accordance with Section 13.5.

6.4.5 No Multiple Payments. For purposes of clarity, in the event that any milestone event set forth in Section 6.4.1 and/or Section 6.4.2 is achieved by a Sublicensee, X4 shall be obligated to pay to Genzyme the applicable milestone payment contemplated by Section 6.4.1 or Section 6.4.2, as the case may be, but shall not be obligated to pay Genzyme the Sublicense Percentage of any such milestone payment received by X4 from such Sublicensee.

6.5 Royalties.

6.5.1 Royalty Rates. X4 shall pay Genzyme a royalty on Net Sales of all Licensed Products in the Territory (excluding Net Sales of each Licensed Product in any country in the Territory for which the Royalty Term for such Licensed Product and country has expired) in each Calendar Year (or partial Calendar Year) at the tiered rates set forth in the table below:

Annual Net Sales of all Licensed Products in the Territory	Royalty Rate
[***]	[***]
[***]	[***]
[***]	[***]

6.5.2 Blended Royalty. X4 acknowledges that (a) the Licensed Know-How and the Information included in the Regulatory Documentation licensed by Genzyme to X4 are proprietary and valuable and that without the Licensed Know-How and such Information, X4 may not be able to obtain and maintain Regulatory Approvals with respect to the Licensed Products, (b) such Regulatory Documentation may allow X4 to obtain and maintain Regulatory Exclusivity

with respect to the Licensed Products in the Field in the Territory, and (c) the milestone payments and royalties set forth in Section 6.4 and this Section 6.5, respectively, are, in part, intended to compensate Genzyme for the value of such exclusivity. The Parties agree that the royalty rates set forth in this Section 6.5 reflect an efficient and reasonable blended allocation of the value provided by Genzyme to X4.

6.5.3 Royalty Reduction.

(a) If X4 or any of its Affiliates, is required to pay a Third Party amounts with respect to a Licensed Product in any country under a written agreement under which X4 or its Affiliate obtains a license under or acquires a Patent Controlled by such Third Party that contains a Valid Claim that covers such Licensed Product in such country, X4 may provide written notice to Genzyme setting forth in reasonable detail the identity of such Third Party and such Third Party Patent (which written notice shall include a copy of any such license or acquisition agreement entered into by X4 or its Affiliate as applicable, including its financial terms) and, thereafter, X4 may deduct [***]. Notwithstanding the foregoing, [***].

(b) In the event a Licensed Product is sold in a country and is not covered by a Valid Claim in that country, the tiered royalty rates payable by X4 to Genzyme under Section 6.5.1 shall be reduced by [***] during the applicable Royalty Term with respect to that country.

(c) Generic Products. In the event that one or more Third Parties sell a Generic Product (as defined below) in any country in which a Licensed Product is then being sold by X4, then, (a) during any Calendar Quarter in which sales of the Generic Product by such Third Parties are equal to or greater than [***] (as measured by prescriptions or other similar information available from a Third Party data provider reasonably acceptable to the Parties and applicable to such country) the applicable royalties in effect with respect to such Licensed Product in such country as specified in Section 6.5.1 shall be reduced [***] and (b) during any Calendar Quarter in which sales of the Generic Product by such Third Parties are [***] (as measured by prescriptions or other similar information available from a Third Party data provider reasonably acceptable to the Parties and applicable to such country) the applicable royalties in effect with respect to such Licensed Product in such country as specified in Section 6.5.1 shall be reduced [***]. For purposes of this Section 6.5.3(c), a "Generic Product" means [***].

6.5.4 Payment Dates and Reports. Royalty payments shall be made by X4 [***] after the end of each Calendar Quarter commencing with the Calendar Quarter in which the first day of the first Royalty Term for the first Licensed Product occurs. X4 shall also provide to Genzyme, at the same time each such payment is made, a report showing: (a) the Invoiced Sales of Licensed Products by country (in the local currency) in the Territory and the Net Sales of Licensed Products by country (in Dollars); (b) the basis for any deductions from Invoiced Sales to determine Net Sales; (c) the applicable royalty rates for the Licensed Products; (d) the exchange rates used in calculating any of the foregoing; and (e) a calculation of the amount of royalty due to Genzyme.

6.6 Sublicense Revenue. X4 shall pay to Genzyme the applicable Sublicense Percentage of any Sublicense Revenue paid to X4 or any of its Affiliates in connection with any Sublicense.

6.7 Mode of Payment; Currency Conversion.

(a) All payments to Genzyme under this Agreement shall be made by electronic funds transfer of Dollars in the requisite amount to such bank account as Genzyme may from time to time designate by written notice to X4.

(b) If any currency conversion shall be required in connection with any payment hereunder, such conversion shall be made by using the arithmetic mean of the exchange rates for the purchase of Dollars as published in *The Wall Street Journal*, Eastern Edition, on the last Business Day of each month in the Calendar Quarter to which such payments relate.

6.8 Taxes. Genzyme alone shall be responsible for paying any and all income taxes (other than withholding taxes required by Applicable Law to be paid by X4) levied on account of, or measured in whole or in part by reference to, any milestones and other amounts payable by X4 to Genzyme pursuant to this Agreement ("**Payments**") it receives. X4 shall deduct or withhold from the Payments any taxes that it is required by Applicable Law to deduct or withhold. Notwithstanding the foregoing, if Genzyme or any of its Affiliates is entitled under any applicable tax treaty to a reduction of rate of, or the elimination of, applicable withholding tax, it may deliver to X4 or the appropriate governmental authority (with the assistance of X4) the prescribed forms (including the US Tax Residency Form 6166 or IRS Form W-8BEN-E) necessary to reduce the applicable rate of withholding or to relieve X4 of its obligation to withhold tax, and X4 shall apply the reduced rate of withholding, or dispense with withholding, as the case may be; provided that X4 has received from Genzyme delivery of all applicable forms (and, if necessary, its receipt of appropriate governmental authorization) at least fifteen (15) days prior to the time that the Payments are due. X4 shall notify Genzyme if X4 intends to withhold at least thirty (30) days prior to the time the Payments are due. If, in accordance with the foregoing, X4 withholds any amount, it shall pay to Genzyme the balance when due, make timely payment to the proper taxing authority of the withheld amount and send to Genzyme proof of such payment within fifteen (15) days following such payment.

6.9 Interest on Late Payments. If any Payment due to Genzyme under this Agreement is not paid in when due, then X4 shall pay interest on the unpaid amount and on any unpaid accrued interest (before and after any judgment) at an annual rate (but with interest accruing on a daily basis) of [***], or the maximum rate permitted by Applicable Laws, whichever is less, such interest to run from the date upon which payment of such amount became due until payment thereof in full together with such accrued interest.

6.10 Financial Records. X4 and its Affiliates shall, and X4 shall include in each of its Sublicense agreements an obligation of such Sublicensees to, keep complete and accurate books and records that are necessary to verify the milestone and royalty payments owed under Section 6.4 and Section 6.5, including books and records of Invoiced Sales

(including any deductions therefrom) and Net Sales of Licensed Products in the Territory. X4 and its Affiliates shall, and X4 shall include in each of its Sublicense agreements an obligation of such Sublicensee to, retain such books and records, until the later of [***], or for such longer period as may be required by Applicable Law.

6.11 Audit. At the request of Genzyme, X4 and its Affiliates shall, and X4 shall include in each of its Sublicense agreements an obligation of such Sublicensee to, permit an independent certified public accountant retained by Genzyme, at reasonable times and upon reasonable notice, to audit the books and records maintained pursuant to Section 6.10. In no event shall such independent certified public accountant disclose to Genzyme any information other than its findings regarding the accuracy of the reports and payments made by X4 under this Article 6. Such audits may not (a) be conducted for any Calendar Quarter [***], (b) be conducted [***] (unless a previous audit during such [***] revealed an underpayment with respect to such period or X4 restates or revises such books and records for such [***]) or (c) be repeated for any Calendar Quarter. Except as provided below, the cost of any audit shall be borne by Genzyme, unless the audit reveals [***], in which case X4 shall bear the cost of the audit. Unless disputed pursuant to Section 6.12, (a) if such audit concludes that additional payments were due and payable by X4, X4 shall pay the additional amounts, with interest from the date originally due as provided in Section 6.9 within thirty (30) days after the date on which such audit is completed and the conclusions thereof are notified to the Parties and (b) if such audit concludes that X4 overpaid Genzyme, [***]. Notwithstanding the foregoing, to the extent that X4 does not have the right to grant Genzyme the right to audit the records of any of its Sublicensees hereunder, X4 shall obtain for itself such right and, at Genzyme's request in accordance with the third sentence of this Section 6.11, X4 shall exercise such audit right with respect to such Sublicensees, using an independent certified public account reasonably acceptable to Genzyme, and shall provide the results of such audit to Genzyme.

6.12 Audit Dispute. In the event of a dispute over the results of any audit conducted pursuant to Section 6.11, Genzyme and X4 shall work in good faith to resolve such dispute. If the Parties are unable to reach a mutually acceptable resolution of any such dispute [***], the dispute shall be submitted for arbitration to a certified public accounting firm selected by each Party's certified public accountants or to such other Person as the Parties shall mutually agree (the "**Accountant**") or failing such agreement, as the Chairman of the International Chamber of Commerce (or such other body as the Parties may mutually agree), may nominate. The decision of the Accountant shall be final and the costs of such arbitration as well as the initial audit shall be borne between the Parties in such manner as the Accountant shall determine.

6.13 Confidentiality. Genzyme shall treat all information subject to review under this ARTICLE 6 in accordance with the confidentiality provisions of ARTICLE 9 and Genzyme shall cause the independent public accountant retained by Genzyme pursuant to Section 6.11 or the Accountant, as applicable, to enter into a reasonably acceptable confidentiality agreement that includes an obligation to retain all such financial information in confidence and to disclose to Genzyme solely its findings regarding the accuracy of the reports and payments made by X4 hereunder, and not any other such financial information.

ARTICLE 7
INTELLECTUAL PROPERTY

7.1 Ownership of Intellectual Property.

7.1.1 Ownership of Technology. Subject to the licenses granted under Section 2.1, as between the Parties, each Party shall own and retain all right, title and interest in and to any and all: (a) Information that is conceived, discovered, developed or otherwise made by or on behalf of such Party, its (sub)licensees or its and their respective Affiliates under or in connection with this Agreement, whether or not patented or patentable, and any and all Patents and other intellectual property rights with respect thereto and (b) other Information, Patents and other intellectual property rights that are owned or otherwise Controlled (other than pursuant to the license grants set forth in Section 2.1) by such Party, its (sub)licensees or its and their respective Affiliates. The determination of authorship, inventorship or ownership of any Information that is conceived, discovered, developed or otherwise made under or in connection with this Agreement shall be made under United States Applicable Law, irrespective of where such Information is actually conceived, discovered, developed or otherwise made.

7.1.2 Ownership of any Trademark and/or logo of Genzyme or its Affiliates. As between the Parties, Genzyme shall retain all right, title and interest in and to the any Trademark and/or logo of Genzyme or its Affiliates.

7.2 Patent Prosecution.

7.2.1 Filing, Prosecution and Maintenance. [***], X4 shall control and use Commercially Reasonable Efforts in conducting the preparation, filing, prosecution and maintenance (including with respect to any related interference, re-issuance, re-examination, post-grant review and opposition proceedings) ("**Prosecution and Maintenance**") of the Licensed Patents in the Territory at its sole cost and expense using counsel reasonably acceptable to Genzyme; provided that (a) [***] and (b) if X4 plans to abandon any Licensed Patent in a country or region, then X4 shall notify Genzyme in writing [***], the term "Licensed Patents" automatically shall be modified to exclude the patent or patent application excluded in Licensed Patents in such country or territory as of the date X4 provides such written request to Genzyme., and Genzyme shall have the option, but not the obligation, to assume the Prosecution and Maintenance of such Patent in the specific country or territory at its sole cost and expense.

7.2.2 Cooperation. Each Party shall assist the other Party at the reasonable request of the other Party from time to time in connection with its activities set forth in Section 7.1.1 or Section 7.2.1, as applicable. X4 shall keep Genzyme reasonably informed, not less often that once per Calendar Year, of key steps to be taken in the Prosecution and Maintenance of all the Licensed Patents, including all applications filed by it pursuant to Section 7.2.1. Upon Genzyme's written request, X4 shall furnish Genzyme with copies of such applications for Licensed Patents, amendments thereto and other related correspondence to and from patent offices, and, to the extent reasonably practicable, permit Genzyme an opportunity to offer its comments thereon before making a submission to a patent office, and X4 shall consider in good faith Genzyme's comments.

7.2.3 Patent Term Extensions. X4 shall have the right to control decisions regarding patent term extensions, including supplementary protection certificates and any other extensions that are now or become available in the future, wherever applicable, for the Licensed Patents in any country in the Territory. X4 shall have the right and shall use Commercially Reasonable Efforts to pursue such extensions in accordance with such decisions. Genzyme shall use commercially reasonable efforts to provide prompt and reasonable assistance, as reasonably requested by X4, including by taking such action as Licensed Patent holder as is required under any Applicable Law to obtain any such extension.

7.2.4 CREATE Act. Notwithstanding anything to the contrary in this Section 7.2, neither Party shall have the right to make an election under the Cooperative Research and Technology Enhancement Act of 2004, 35 U.S.C. 103(c)(2)-(c)(3) (the "**CREATE Act**") when exercising its rights under this Section 7.2 without the prior written consent of the other Party. With respect to any such permitted election, the Parties shall use reasonable efforts to cooperate and coordinate their activities with respect to any submissions, filings or other activities in support thereof. The Parties acknowledge and agree that this Agreement is a "joint research agreement" as defined in the CREATE Act.

7.3 Enforcement of Patents.

7.3.1 Notice. In the event either Party becomes aware of (a) any suspected infringement of any Licensed Patents or (b) any certification filed under the Hatch-Waxman Act claiming that any Licensed Patents are invalid or unenforceable or claiming that any Licensed Patents would not be infringed by the making, use, offer for sale, sale or import of a product for which an application under the Hatch-Waxman Act is filed, or any equivalent or similar certification or notice in any other jurisdiction in the Territory (each of clauses (a) and (b), an "**Infringement**"), such Party shall promptly notify the other Party and provide it with all details of such Infringement of which it is aware (each, an "**Infringement Notice**"); provided that each Party shall give the other Party an Infringement Notice [***].

7.3.2 Control of Enforcement. X4 shall have the first right, but not the obligation, through counsel of its choosing, to initiate an infringement action with respect to any Infringement of any Licensed Patents at its sole cost and expense or, subject to Section 2.3, to grant the infringing Third Party adequate rights and licenses necessary for continuing such activities. If X4 does not initiate such an infringement action [***] of learning of such Infringement, or earlier notifies Genzyme in writing of its intent not to so initiate an action, and X4 has not granted such infringing Third Party rights and licenses to continue its otherwise infringing activities, then Genzyme shall have the right, but not the obligation, to bring such an action; provided that, except with respect to any Infringement described in clause (b) of the definition thereof, if [***].

7.3.3 Settlement. The Party that controls the prosecution of a given Infringement claim pursuant to Section 7.3.2 shall also have the right to control settlement of such claim; provided that no settlement shall be entered into without the prior consent of the other Party if such settlement would adversely affect or diminish the rights and benefits of the other Party under this Agreement, or impose any new obligations or adversely affect any obligations of the other Party under this Agreement.

7.3.4 Cooperation. In the event a Party is entitled to and brings an infringement action in accordance with this Section 7.3, the other Party shall cooperate fully, including being joined as a party plaintiff in such action, providing access to relevant documents and other evidence and making its employees available at reasonable business hours, at the expense of the Party bringing the infringement action. If a Party pursues an action against such alleged Infringement, it shall consider in good faith any comments from the other Party and shall keep the other Party reasonably informed of any steps taken to preclude such infringement.

7.3.5 Costs and Recovery. The costs and expenses relating to any Infringement action commenced pursuant to this Section 7.3 shall be the responsibility of the Party controlling the prosecution thereof. Any damages or other amounts collected shall be [***].

7.4 Infringement Claims by Third Parties.

7.4.1 Defense of Third Party Claims. If a Third Party asserts that a Patent or other intellectual property right owned or otherwise controlled by it is infringed by the Exploitation of the Licensed Products in the Field in the Territory, the Party first made aware of such a claim shall promptly provide the other Party written notice of such claim along with the related facts in reasonable detail. X4 shall have the first right, but not the obligation, to control the defense of such claim. If X4 fails to assume control of the defense of such claim [***], then Genzyme shall have the right, but not the obligation, to defend against such claim. Notwithstanding the foregoing, the Party controlling such defense (the "**Controlling Party**") shall not be entitled to assert a claim or counterclaim against such Third Party based on the Patents or other intellectual property rights owned or otherwise controlled by the other Party (the "**Non-Controlling Party**") without the prior written consent of the Non-Controlling Party, such consent not to be unreasonably conditioned, withheld or delayed. The Non-Controlling Party shall cooperate with the Controlling Party, at the Controlling Party's reasonable request and expense, in any such defense and shall have the right, at its own expense, to be represented separately by counsel of its own choice in any such proceeding.

7.4.2 Settlement of Third Party Claims. The Controlling Party with respect to a particular claim pursuant to Section 7.4.1 also shall have the right to control settlement of such claim; provided that [***].

7.4.3 Allocation of Costs. All costs and expenses relating to any defense, settlement and judgments in an action commenced pursuant to this Section 7.4 shall be borne by the Controlling Party with respect to such action.

7.5 Invalidity or Unenforceability Defenses or Actions.

7.5.1 Third Party Defense or Counterclaim.

(a) If a Third Party asserts, as a defense or as a counterclaim in any infringement action under Section 7.3 or claim or counterclaim asserted under Section 7.4, or in a

declaratory judgment action or similar action or claim filed by such Third Party, that any Licensed Patent is invalid or unenforceable, then the Party pursuing such infringement action, or the Party first obtaining knowledge of such declaratory judgment action, as the case may be, shall promptly give written notice to the other Party.

(b) X4 shall have the first right, but not the obligation, through counsel of its choosing, at its sole cost and expense, to defend against such action or claim. If X4 [***], Genzyme shall have the right, through counsel of its choosing, at its sole cost and expense, to defend against such action or claim.

7.5.2 Assistance. Each Party shall assist and cooperate with the other Party as such other Party may reasonably request from time to time in connection with its activities set forth in Section 7.5.1, including by providing access to relevant documents and other evidence and making its employees available at reasonable business hours; provided that neither Party shall be required to disclose legally privileged information unless and until procedures reasonably acceptable to such Party are in place to protect such privilege. In connection with any such defense or claim or counterclaim, the controlling Party shall consider in good faith any comments from the other Party and shall keep the other Party reasonably informed of any steps taken, and shall provide copies of all documents filed, in connection with such defense, claim or counterclaim. In connection with the activities set forth in Section 7.5.1, each Party shall consult with the other as to the strategy for the defense of the Licensed Patents.

7.6 Third Party Licenses. If, in the reasonable opinion of counsel to X4, the Exploitation of the Licensed Product in the Field in the Territory by X4, its Sublicensees or its or their respective Affiliates infringes or misappropriates any Patent or any intellectual property right of a Third Party in any country or countries in the Territory, [***], then X4 shall have the first right, but not the obligation, to negotiate the terms of a license from such Third Party in the applicable country or, countries in the Territory. X4 shall keep Genzyme regularly informed in writing of any such decision to enter into negotiation, and of the outcome thereof. [***].

7.7 Product Trademarks.

7.7.1 Maintenance and Prosecution of Product Trademarks. X4 shall own all right, title, and interest to the Product Trademarks in the Territory, and shall be responsible for the registration, prosecution, and maintenance thereof. All costs and expenses of registering, prosecuting, and maintaining the Product Trademarks shall be borne solely by X4.

7.7.2 Enforcement of Product Trademarks. X4 shall have the right and responsibility for taking such action as X4 deems necessary against a Third Party based on any alleged, threatened, or actual infringement, dilution, misappropriation, or other violation of, or unfair trade practices or any other like offense relating to, the Product Trademarks by a Third Party in the Territory. X4 shall bear the costs and expenses relating to any enforcement action commenced pursuant to this Section 7.7.2 and any settlements and judgments with respect thereto, and shall retain any damages or other amounts collected in connection therewith.

7.7.3 Third Party Claims. X4 shall have the right and responsibility for defending against any alleged, threatened, or actual claim by a Third Party that the use or registration of the Product Trademarks in the Territory infringes, dilutes, misappropriates, or otherwise violates any Trademark or other right of such Third Party or constitutes unfair trade practices or any other like offense, or any other claims as may be brought by a Third Party against a Party in connection with the use of the Product Trademarks with respect to a Licensed Product in the Territory. X4 shall bear the costs and expenses relating to any defense commenced pursuant to this Section 7.7.3 and any settlements and judgments with respect thereto, and shall retain any damages or other amounts collected in connection therewith.

7.7.4 Notice and Cooperation. Each Party shall provide to the other Party prompt written notice of any actual or threatened infringement of the Product Trademarks in the Territory and of any actual or threatened claim that the use of the Product Trademarks in the Territory violates the rights of any Third Party. Each Party shall cooperate fully with the other Party with respect to any enforcement action or defense commenced pursuant to this Section 7.7; provided that X4 shall bear the reasonable and documented out-of-pocket costs and expenses incurred by Genzyme in connection with such cooperation.

ARTICLE 8
PHARMACOVIGILANCE AND SAFETY

8.1 Global Safety Database. X4 shall set up, hold, and maintain (at X4's sole cost and expense) the global safety database for the Licensed Products in the Territory.

8.2 Clinical Trial Register. Notwithstanding anything in this Agreement to the contrary, including ARTICLE 9, X4 shall have the right to disclose on publicly-accessible clinical trial registries the results or summaries of the results of all Clinical Studies for the Licensed Compound or Licensed Products conducted by or under authority of X4 in the Territory or as otherwise required by Applicable Law.

ARTICLE 9
CONFIDENTIALITY AND NON-DISCLOSURE

9.1 Confidentiality Obligations. At all times during the Term [***], each Party shall, and shall cause its Affiliates and, in the case of X4 as the Receiving Party, shall include in each Sublicense agreement an obligation of its Sublicensees to and its and their respective officers, directors, employees and agents to, keep completely confidential and not publish or otherwise disclose and not use, directly or indirectly, for any purpose, any Confidential Information furnished or otherwise made known to it, directly or indirectly, by the other Party, except to the extent such disclosure or use is expressly permitted by the terms of this Agreement or such use is reasonably necessary for the performance of its obligations or the exercise of its rights under this Agreement. "**Confidential Information**" means any information provided by one Party (the "**Disclosing Party**") to the other Party (the "**Receiving Part**y") under or in connection with this Agreement, including the terms of this Agreement or any information relating to the Licensed Products (including the Regulatory Documentation and Regulatory Approvals and any information or data contained therein), any Exploitation of the Licensed Products in the Territory or the scientific, regulatory or business affairs or other activities of either Party. Notwithstanding the foregoing, Confidential Information shall not include any information that:

9.1.1 is or hereafter becomes part of the public domain through no wrongful act, fault or negligence on the part of the Receiving Party;

9.1.2 can be demonstrated by documentation or other competent proof to have been in the Receiving Party's possession prior to disclosure by the Disclosing Party without any obligation of confidentiality with respect to such information;

9.1.3 is subsequently received by the Receiving Party, without confidentiality restrictions, from a Third Party who is not bound by any obligation of confidentiality with respect to such information; or

9.1.4 can be demonstrated by documentation or other competent evidence to have been independently developed by or for the Receiving Party without use of or reference to the Disclosing Party's Confidential Information.

Specific aspects or details of Confidential Information shall not be deemed to be within the public domain or in the possession of the Receiving Party merely because the Confidential Information is embraced by more general information in the public domain or in the possession of the Receiving Party. Further, any combination of Confidential Information shall not be considered in the public domain or in the possession of the Receiving Party merely because individual elements of such Confidential Information are in the public domain or in the possession of the Receiving Party unless the combination and its principles are in the public domain or in the possession of the Receiving Party.

9.2 Permitted Disclosures. Each Receiving Party may disclose Confidential Information disclosed to it by the Disclosing Party to the extent that such disclosure by the Receiving Party is:

9.2.1 made in response to a valid order of a court of competent jurisdiction or other supra-national, federal, national, regional, state, provincial and local governmental or regulatory body of competent jurisdiction or, if in the reasonable opinion of the Receiving Party's legal counsel, such disclosure is otherwise required by Applicable Law or the requirements of a national securities exchange or other similar regulatory body; provided that the Receiving Party shall first have given notice, to the extent legally permitted, to the Disclosing Party and given the Disclosing Party a reasonable opportunity to quash such order and to obtain a protective order requiring that the Confidential Information and documents that are the subject of such order be held in confidence by such court or agency or, if disclosed, be used only for the purposes for which the order was issued; and provided further that if a disclosure order is not quashed or a protective order is not obtained, the Confidential Information disclosed in response to such court or governmental order shall be limited to the information that is legally required to be disclosed in response to such court or governmental order;

9.2.2 made by the Receiving Party to a Regulatory Authority as required in connection with any filing, application or request for Regulatory Approval; provided that reasonable measures shall be taken to obtain confidential treatment of such information;

9.2.3 made by the Receiving Party as necessary to file or prosecute Patent applications pursuant to Section 7.1.1 or Section 7.2.1, as applicable, prosecute or defend litigation or otherwise establish rights or enforce obligations under this Agreement; provided that reasonable measures shall be taken to obtain confidential treatment of such information; or

9.2.4 made by the Receiving Party to advisors, actual or prospective acquirers, merger candidates, actual or prospective investors or funding sources or actual or prospective Sublicensees (with respect to X4 as the Receiving Party), or, with respect to Genzyme as the Receiving Party, investors in connection with a Monetization (and to its and their respective Affiliates, representatives and financing sources); provided that (a) each such Third Party signs an agreement that contains obligations that are substantially similar to the Receiving Party's obligations hereunder except that the obligations under such agreement may terminate five years after disclosure of the relevant information, and (b) each such Third Party to whom information is disclosed shall (i) be subject to reasonable obligations of confidentiality, (ii) be informed of the confidential nature of the Confidential Information so disclosed, and (iii) agree to hold such Confidential Information subject to the terms thereof.

9.3 Use of Names. Except as expressly provided in this Agreement, neither Party shall mention or otherwise use the name, insignia, symbol, Trademark of the other Party (or any abbreviation or adaptation thereof) in any publication, press release, marketing and promotional material or other form of publicity without the prior written approval of such other Party in each instance, such approval not be unreasonably conditioned, withheld or delayed. The restrictions imposed by this Section 9.3 shall not prohibit either Party from making any disclosure (a) identifying the other Party as a counterparty to this Agreement to its investors, (b) that is required by Applicable Law or the requirements of a national securities exchange or another similar regulatory body or (c) with respect to which written consent has previously been obtained. Further, the restrictions imposed on each Party under this Section 9.3 are not intended, and shall not be construed, to prohibit a Party from identifying the other Party in its internal business communications, provided that any Confidential Information in such communications remains subject to this Article 9.

9.4 Press Releases. Neither Party shall issue any press release or other similar public communication relating to this Agreement, its subject matter or the transactions covered by it, or the activities of the Parties under or in connection with this Agreement, without the prior written approval of the other Party, except (a) for communications required by Applicable Law as reasonably advised by the issuing Party's counsel (provided that the other Party is given a reasonable opportunity to review and comment on any such press release or public communication in advance thereof to the extent legally permitted and the issuing Party shall act in good faith to incorporate any reasonable comments provided by the other Party on such press release or public communication), (b) for information that has been previously disclosed publicly or (c) as otherwise set forth in this Agreement. The Parties agree that X4 may issue a press release to announce the execution of this Agreement, a draft of which shall be provided to and approved by Genzyme.

Portions of this Exhibit, indicated by the mark "[***]," were omitted and have been filed separately with the Securities and Exchange Commission pursuant to the Registrant's application requesting confidential treatment pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

9.5 Publications. Each Party acknowledges that the other Party's personnel may desire to publish in scientific journals or present at scientific conferences scientific, pre-clinical or clinical data derived from research and development related to the Licensed Compounds and Licensed Products conducted in accordance with the terms of this Agreement. Accordingly, no such publication will be submitted and no such presentation shall be made unless a written copy of such proposed publication or presentation is submitted by the Party wishing to publish ("**Publishing Party**") to the other Party ("**Consulted Party**") [***] before submission for publication or presentation. The Consulted Party shall notify the Publishing Party in writing [***] whether such draft contains (a) information of the Consulted Party which it considers to be Confidential Information, (b) information that if published would have an adverse effect on a patent application covering the subject matter of this Agreement, or (c) information that such Consulted Party reasonably believes would be likely to have a material adverse impact on the Development, Manufacture or Commercialization of a Licensed Product, or the Exploitation of rights retained under Section 2.2.2. In the case of item (a) above, the Publishing Party may not publish Confidential Information of the Consulted Party without its written consent. In the case of item (b) above, the Consulted Party may request a delay and the Publishing Party shall delay such publication or presentation, [***], to permit the timely preparation and filing of a patent application or an application for a certificate of invention covering the information at issue. In the case of item (c) above, if the Publishing Party disagrees with the Consulted Party's assessment of the impact of the publication or presentation, then the issue shall be resolved pursuant to Section 13.5. X4 and Genzyme will each comply with standard academic practice regarding authorship of scientific publications and recognition of contribution of other parties in any publication.

9.6 Destruction of Confidential Information. Within [***] after the earlier of (a) the expiration of the Term, (b) the termination of this Agreement, or (c) the written request of the Disclosing Party, the Receiving Party shall promptly destroy all documentary, electronic or other tangible embodiments of the Disclosing Party's Confidential Information to which the Receiving Party does not retain rights hereunder and any and all copies thereof, and destroy those portions of any documents that incorporate or are derived from the Disclosing Party's Confidential Information to which the Receiving Party does not retain rights hereunder, and provide a written certification of such destruction, except that the Receiving Party may retain one copy thereof, to the extent that the Receiving Party requires such Confidential Information for the purpose of performing any obligations or exercising any rights under this Agreement that may survive such expiration or termination, or for archival purposes. Notwithstanding the foregoing, the Receiving Party also shall be permitted to retain such additional copies of or any computer records or files containing the Disclosing Party's Confidential Information that have been created solely by the Receiving Party's automatic archiving and back-up procedures, to the extent created and retained in a manner consistent with the Receiving Party's standard archiving and back-up procedures, but not for any other use or purpose.

ARTICLE 10
REPRESENTATIONS AND WARRANTIES; COVENANTS

10.1 Mutual Representations and Warranties. Each Party hereby represents and warrants to the other Party as of the Effective Date as follows:

10.1.1 Corporate Authority. Such Party (a) has the power and authority and the legal right to enter into this Agreement and perform its obligations hereunder and (b) has taken all necessary action on its part required to authorize the execution and delivery of this Agreement and the performance of its obligations hereunder. This Agreement has been duly executed and delivered by such Party and constitutes a legal, valid and binding obligation of such Party and is enforceable against it in accordance with its terms subject to the effects of bankruptcy, insolvency or other laws of general application affecting the enforcement of creditor rights and judicial principles affecting the availability of specific performance and general principles of equity, whether enforceability is considered in a proceeding at law or equity.

10.1.2 Consents and Approvals. All necessary consents, approvals and authorizations of all Regulatory Authorities and other Persons required to be obtained by such Party in connection with the execution and delivery of this Agreement have been obtained.

10.1.3 Conflicts. The execution and delivery of this Agreement and the performance of such Party's obligations hereunder (a) do not conflict with or violate any requirement of Applicable Law or any provision of the articles of incorporation or bylaws of such Party in any material way and (b) do not conflict with, violate or breach or constitute a default or require any consent under, any contractual obligation or court or administrative order by which such Party is bound.

10.2 Representations, Warranties and Covenants of X4. Neither X4 nor any of its Affiliates has been debarred or is subject to debarment and neither X4 nor any of its Affiliates will use in any capacity, in connection with the activities to be performed under this Agreement, any Person who, to X4's knowledge after due inquiry, has been debarred pursuant to Section 306 of the FFDCA or who is the subject of a conviction described in such section. X4 shall inform Genzyme in writing immediately if it or any Person who is performing activities hereunder is debarred or is the subject of a conviction described in Section 306 or if any action, suit, claim, investigation or legal or administrative proceeding is pending or, to the best of X4's knowledge, is threatened, relating to the debarment or conviction of X4 or any Person performing activities hereunder.

10.3 Representations and Warranties of Genzyme. Genzyme hereby represents and warrants to X4 that as of the Effective Date:

10.3.1 Genzyme or its Affiliate owns all right, title and interest in and to the Licensed Patents listed on Schedule 1.58, and, to Genzyme's Knowledge, the Licensed Patents listed in Exhibit 1.58 are the only Patents Controlled by Genzyme that claim (specifically or generically) the composition, method of manufacture or method of use of any Licensed Compound;

10.3.2 Genzyme has not granted to any Affiliate or Third Party any rights in the Licensed Know-How or Licensed Patents that are inconsistent with the rights granted to X4 under this Agreement;

10.3.3 No Third Party has made or threatened in writing a claim of infringement or misappropriation with respect to the Licensed Compounds;

10.3.4 To Genzyme's Knowledge, there is no infringement or misappropriation of any Licensed Patent or any Licensed Know-How by any Third Party;

10.3.5 All Licensed Patent Rights listed on Schedule 1.58 are existing and, to Genzyme's Knowledge, no issued Patents which are part of Licensed Patent Rights listed on Schedule 1.58 are invalid or unenforceable;

10.3.6 There are no claims, judgment or settlements against Genzyme pending, or to Genzyme's Knowledge, threatened, that invalidate or seek to invalidate the Licensed Patents;

10.3.7 Genzyme is not a party to any agreement with the U.S. Federal government or an agency thereof pursuant to which the U.S. Federal government or such agency provided funding for the development of a Licensed Compound;

For purposes of this Section 10.3, "**Genzyme's Knowledge**" means the actual knowledge (without enquiry or investigation) of Genzyme.

10.4 DISCLAIMER OF WARRANTY. EXCEPT FOR THE EXPRESS WARRANTIES SET FORTH IN SECTION 10.1 AND SECTION 10.2, NEITHER PARTY MAKES ANY REPRESENTATIONS OR GRANTS ANY WARRANTY, EXPRESS OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, BY STATUTE OR OTHERWISE, AND EACH PARTY SPECIFICALLY DISCLAIMS ANY OTHER WARRANTIES, WHETHER WRITTEN OR ORAL, OR EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF QUALITY, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE OR ANY WARRANTY AS TO THE VALIDITY OF ANY PATENTS OR THE NON-INFRINGEMENT OF ANY INTELLECTUAL PROPERTY RIGHTS OF THIRD PARTIES.

10.5 ADDITIONAL WAIVER. X4 AGREES THAT: (A) EXCEPT AS SPECIFICALLY PROVIDED IN SECTION 10.3, THE LICENSED PATENTS AND LICENSED KNOW-HOW ARE LICENSED "AS IS", "WITH ALL FAULTS" AND "WITH ALL DEFECTS", AND X4 EXPRESSLY WAIVES ALL RIGHTS TO MAKE ANY CLAIM WHATSOEVER AGAINST GENZYME FOR MISREPRESENTATION OR FOR BREACH OF PROMISE, GUARANTEE OR WARRANTY OF ANY KIND RELATING TO THE LICENSED PATENTS OR LICENSED KNOW-HOW; (B) GENZYME WILL HAVE NO LIABILITY TO X4 FOR ANY ACT OR OMISSION PRIOR TO THE EFFECTIVE DATE IN THE PREPARATION, FILING, PROSECUTION, MAINTENANCE, ENFORCEMENT, DEFENCE OR OTHER HANDLING OF THE LICENSED PATENTS; AND (C) X4 IS SOLELY RESPONSIBLE FOR DETERMINING WHETHER THE LICENSED PATENTS AND LICENSED KNOW-HOW HAVE APPLICABILITY OR UTILITY IN X4'S CONTEMPLATED EXPLOITATION OF THE LICENSED PRODUCT, AND X4 ASSUMES ALL RISK AND LIABILITY IN CONNECTION WITH SUCH DETERMINATION.

ARTICLE 11
INDEMNITY

11.1 Indemnification of Genzyme. X4 shall indemnify Genzyme, its Affiliates and its and their respective directors, officers, employees and agents (collectively, "**Genzyme Indemnitees**"), and defend and save each of them harmless, from and against any and all losses, damages, liabilities, costs and expenses (including reasonable attorneys' fees and expenses) (collectively, "**Losses**") in connection with any and all suits, investigations, claims or demands of Third Parties (collectively, "**Third Party Claims**") arising from or occurring as a result of: (a) the breach by X4 of any representation, warranty, covenant, obligation or agreement made or undertaken by X4 under this Agreement, (b) the gross negligence or willful misconduct on the part of any X4 Indemnitee or (c) the Exploitation of any Licensed Compounds or Licensed Products in the Field by or on behalf of X4, its Sublicensees or any of its or their respective Affiliates; provided that, with respect to any Third Party Claim for which X4 has an obligation to any Genzyme Indemnitee pursuant to this Section 11.1 and Genzyme has an obligation to any X4 Indemnitee pursuant to Section 11.2, each Party shall indemnify each of the Genzyme Indemnitees or the X4 Indemnitees, as applicable, for its Losses to the extent of its responsibility, relative to the other Party. The foregoing indemnification obligation shall not apply to the extent that the Genzyme Indemnitees fail to comply with the indemnification procedures set forth in Sections 11.3 and 11.4 and X4's defense of the relevant Claims is prejudiced by such failure.

11.2 Indemnification of X4. Genzyme shall indemnify X4, its Affiliates and its and their respective directors, officers, employees and agents (collectively, "**X4 Indemnitees**"), and defend and save each of them harmless, from and against any and all Losses in connection with any and all Third Party Claims arising from or occurring as a result of: (a) the breach by Genzyme of any representation, warranty, covenant, obligation or agreement made or undertaken by Genzyme under this Agreement or (b) the gross negligence or willful misconduct on the part of any Genzyme Indemnitee; provided that, with respect to any Third Party Claim for which Genzyme has an obligation to any X4 Indemnitee pursuant to this Section 11.2 and X4 has an obligation to any Genzyme Indemnitee pursuant to Section 11.1, each Party shall indemnify each of the Genzyme Indemnitees or the X4 Indemnitees, as applicable, for its Losses to the extent of its responsibility, relative to the other Party. The foregoing indemnification obligation shall not apply to the extent that the X4 Indemnitees fail to comply with the indemnification procedures set forth in Sections 11.3 and 11.4 and Genzyme's defense of the relevant Claims is prejudiced by such failure.

11.3 Notice of Claim. All indemnification claims in respect of a Genzyme Indemnitee or a X4 Indemnitee shall be made solely by Genzyme or X4, as applicable (each of Genzyme or X4 in such capacity, the "**Indemnified Party**"). The Indemnified Party shall give the Indemnifying Party prompt written notice (an "**Indemnification Claim Notice**") of any Losses or discovery of fact upon which such Indemnified Party intends to base a request

for indemnification under Section 11.1 or Section 11.2, but in no event shall the Indemnifying Party be liable for any Losses that result from any delay in providing such notice. Each Indemnification Claim Notice must contain a description of the claim and the nature and amount of such Loss (to the extent that the nature and amount of such Loss is known at such time). The Indemnified Party shall furnish promptly to the Indemnifying Party copies of all papers and official documents received in respect of any Losses and Third Party Claims.

11.4 Control of Defense.

11.4.1 Control of Defense. At its option, the Indemnifying Party may assume the defense of any Third Party Claim by giving written notice to the Indemnified Party [***]. The assumption of the defense of a Third Party Claim by the Indemnifying Party shall not be construed as an acknowledgment that the Indemnifying Party is liable to indemnify any Genzyme Indemnitee or X4 Indemnitee, as applicable, in respect of the Third Party Claim, nor shall it constitute a waiver by the Indemnifying Party of any defenses it may assert against a Genzyme Indemnitee's or a X4 Indemnitee's, as applicable, claim for indemnification. Upon assuming the defense of a Third Party Claim, the Indemnifying Party may appoint as lead counsel in the defense of the Third Party Claim any legal counsel selected by the Indemnifying Party. In the event the Indemnifying Party assumes the defense of a Third Party Claim, the Indemnified Party shall immediately deliver to the Indemnifying Party all original notices and documents (including court papers) received by any Genzyme Indemnitee or X4 Indemnitee, as applicable, in connection with the Third Party Claim. If the Indemnifying Party assumes the defense of a Third Party Claim, except as provided in Section 11.4.2, the Indemnifying Party shall not be liable to the Indemnified Party for any legal expenses subsequently incurred by such Indemnified Party or any Genzyme Indemnitee or X4 Indemnitee, as applicable, in connection with the analysis, defense or settlement of such Third Party Claim. In the event that it is ultimately determined that the Indemnifying Party is not obligated to indemnify, defend or hold harmless a Genzyme Indemnitee or X4 Indemnitee, as applicable, from and against a Third Party Claim, the Indemnified Party shall reimburse the Indemnifying Party for any and all costs and expenses (including attorneys' fees and costs of suit) incurred by the Indemnifying Party in its defense of such Third Party Claim.

11.4.2 Right to Participate in Defense. Without limiting Section 11.4.1, any Indemnified Party shall be entitled to participate in, but not control, the defense of a Third Party Claim and to employ counsel of its choice for such purpose; provided that such employment shall be at the Indemnified Party's own expense unless (a) the employment thereof has been specifically authorized by the Indemnifying Party in writing, (b) the Indemnifying Party has failed to assume the defense and employ counsel in accordance with Section 11.4.1 (in which case the Indemnified Party shall control the defense) or (c) the interests of the Indemnified Party and any Genzyme Indemnitee or X4 Indemnitee, as applicable, on the one hand, and the Indemnifying Party, on the other hand, with respect to such Third Party Claim are sufficiently adverse to prohibit the representation by the same counsel of all such Persons under Applicable Law, ethical rules or equitable principles.

11.4.3 Settlement. With respect to any Third Party Claims relating solely to the payment of money damages in connection with a Third Party Claim that shall not result in any

Genzyme Indemnitee or X4 Indemnitee, as applicable, becoming subject to injunctive or other relief or otherwise adversely affecting the business, rights, or interests of any Genzyme Indemnitee or X4 Indemnitee, as applicable, in any manner and as to which the Indemnifying Party shall have acknowledged in writing the obligation to indemnify such Genzyme Indemnitee or X4 Indemnitee, as applicable, hereunder, the Indemnifying Party shall have the sole right to consent to the entry of any judgment, enter into any settlement or otherwise dispose of such Third Party Claim, on such terms as the Indemnifying Party, in its sole discretion, shall deem appropriate. With respect to all other Third Party Claims, where the Indemnifying Party has assumed the defense of the Third Party Claim in accordance with Section 11.4.1, the Indemnifying Party shall have authority to consent to the entry of any judgment, enter into any settlement or otherwise dispose of such Third Party Claim, provided that it obtains the prior written consent of the Indemnified Party (such consent not to be unreasonably conditioned, withheld or delayed). The Indemnifying Party shall not be liable for any settlement or other disposition of a Third Party Claim by a Genzyme Indemnitee or a X4 Indemnitee that is reached without the prior written consent of the Indemnifying Party. So long as the Indemnifying Party is actively defending or prosecuting any Third Party Claim, the Indemnified Party shall not, and the Indemnified Party shall ensure that each Genzyme Indemnitee or X4 Indemnitee, as applicable, does not, admit any liability with respect to or settle, compromise or discharge, such Third Party Claim without the prior written consent of the Indemnifying Party, such consent not to be unreasonably conditioned, withheld or delayed. If the Indemnifying Party does not assume and conduct the defense of a Third Party Claim [***], the Indemnified Party may consent to the entry of any judgment or enter into any settlement with respect to such Third Party Claim in any manner the Indemnified Party may deem reasonably appropriate. For clarity, the assumption of the defense of any Third Party Claim by the Indemnified Party in accordance with the preceding sentence shall in no event relieve the Indemnifying Party from its obligations to indemnify and hold harmless the Indemnified Party from all Losses arising from such Third Party Claim.

11.4.4 Cooperation. Regardless of whether the Indemnifying Party chooses to defend or prosecute any Third Party Claim, the Indemnified Party shall, and shall cause each Genzyme Indemnitee or X4 Indemnitee, as applicable, to, cooperate in the defense or prosecution thereof and shall furnish such records, information and testimony, provide such witnesses and attend such conferences, discovery proceedings, hearings, trials and appeals as may be reasonably requested in connection therewith. Such cooperation shall include access during normal business hours afforded to the Indemnifying Party to, and reasonable retention by the Indemnified Party and any Genzyme Indemnitee or X4 Indemnitee, as applicable, of, records and information that are reasonably relevant to such Third Party Claim, and making all Genzyme Indemnitees or X4 Indemnitees, as applicable, and other employees and agents available on a mutually convenient basis to provide additional information and explanation of any material provided hereunder; provided that neither Party shall be required to disclose legally privileged information unless and until procedures reasonably acceptable to such Party are in place to protect such privilege, and the Indemnifying Party shall reimburse the Indemnified Party for all its reasonable costs and expenses in connection therewith.

11.4.5 Expenses. Except as provided above, the costs and expenses, including fees and disbursements of counsel, incurred by the Indemnified Party in connection with any Third Party Claim shall be reimbursed on a Calendar Quarter basis by the Indemnifying Party, without

prejudice to the Indemnifying Party's right to contest any Genzyme Indemnitee's or X4 Indemnitee's, as applicable, right to indemnification and subject to refund in the event the Indemnifying Party is ultimately held not to be obligated to indemnify a Genzyme Indemnitee or X4 Indemnitee, as applicable.

11.5 Limitation on Damages and Liability. [***], NEITHER PARTY NOR ANY OF THEIR RESPECTIVE AFFILIATES SHALL BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, OR FOR LOST PROFITS, WHETHER IN CONTRACT, WARRANTY, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE, ARISING OUT OF (a) THE DEVELOPMENT, MANUFACTURE, USE OR SALE OF THE LICENSED PRODUCTS UNDER THIS AGREEMENT, (b) THE USE OF OR REFERENCE TO THE LICENSED PATENTS, LICENSED KNOW-HOW OR REGULATORY DOCUMENTATION OR (c) ANY BREACH OF OR FAILURE TO PERFORM ANY OF THE PROVISIONS OF THIS AGREEMENT.

11.6 Insurance. X4 shall, and shall cause its Sublicensees and its and their respective Affiliates to maintain (a) no later than thirty days prior to the anticipated date of First Commercial Sale of a Licensed Product, (i) commercial general liability insurance covering bodily injury and property damage of not less than [***] per occurrence and in the aggregate, and (ii) clinical trials liability insurance coverage with minimum indemnity limits of [***] per occurrence and in the aggregate, and (b) following the First Commercial Sale of a Licensed Product, and thereafter during any period in which X4 has indemnification obligations to Genzyme, (i) commercial general liability insurance covering bodily injury and property damage of not less than [***] per occurrence and in the aggregate, and (ii) products liability/completed operations and clinical trials liability insurance coverage with minimum indemnity limits of [***] per occurrence and in the aggregate. Such policies shall be provided by insurance carrier(s) reasonably acceptable to Genzyme. [***]. If such policies are written on a claims made basis, they shall remain in effect for a minimum period of [***] and shall not be cancelled or subject to a reduction of coverage without the prior written authorization of Genzyme. Upon Genzyme's written request, X4 shall provide Genzyme with certificate(s) of insurance or certified copies of X4's insurance policies to evidence the purchase and/or maintenance of such policies. Maintenance of such insurance coverage shall not relieve X4 of any responsibility under this Agreement for damages in excess of insurance limits or otherwise.

ARTICLE 12
TERM AND TERMINATION

12.1 Termination upon Failure to Close the X4 First Financing. [***]. In the event that X4 does not consummate [***], then the Financing Exclusivity Period shall automatically be extended by [***]. In the event that X4 does not [***], as so extended, and the Parties have not otherwise agreed in writing to further extend such period, this Agreement shall immediately terminate and Genzyme shall have no further obligations to X4 with respect to the Licensed Patent and Licensed Know-How and shall be free to negotiate and enter into any agreement with a Third Party concerning the Licensed Patents or the Licensed Know How.

12.2 Term. This Agreement shall commence on the Effective Date and shall, unless earlier terminated in accordance with this ARTICLE 12, continue (a) with respect to each Licensed Product in each country in the Territory, until the expiration of the Royalty Term for such Licensed Product in such country and (b) with respect to this Agreement in its entirety, until the expiration of the last-to-expire Royalty Term for any Licensed Product in the Territory (such period, the "**Term**").

12.3 Termination of this Agreement for Material Breach. In the event that either Party materially breaches this Agreement (such Party, the "**Breaching Party**"), in addition to any other right and remedy the other Party (the "**Complaining Party**") may have, the Complaining Party may terminate this Agreement, in its entirety upon ninety (90) days' prior written notice (the "**Termination Notice Period**") to the Breaching Party, specifying the material breach and its claim of right to terminate, provided that the termination shall not become effective at the end of the Termination Notice Period if the Breaching Party cures the material breach complained of during the Termination Notice Period The Breaching Party may dispute any alleged breach by written notice to the Complaining Party within such ninety-(90) day period, in which case the Complaining Party shall not have the right to terminate this Agreement pursuant to this Section 12.3 unless and until it has been mutually agreed pursuant to Section 13.5 or determined in accordance with Section 13.5 below that this Agreement was materially breached by the Breaching Party, and the Breaching Party fails to comply with its obligations hereunder within ninety (90) days after such mutual agreement or determination, as applicable. Notwithstanding the foregoing, it is understood and agreed that termination of this Agreement pursuant to this Section 12.3 shall in no way limit either Party's right to seek all remedies available by law and in equity.

12.4 Unilateral Termination Rights.

12.4.1 In the event that X4 or any of its Affiliates anywhere in the Territory, institutes, prosecutes or otherwise participates in (or in any way aids any Third Party in instituting, prosecuting or participating in), at law or in equity or before any administrative or regulatory body, including the U.S. Patent and Trademark Office or its foreign counterparts, any claim, demand, action or cause of action for declaratory relief, damages or any other remedy or for an enjoinment, injunction or any other equitable remedy, including any interference, reexamination, post grant review, opposition or any similar proceeding, alleging that any claim in a Licensed Patent is invalid, unenforceable or otherwise not patentable (a "**Patent Challenge**") (except as required under a court order or subpoena), Genzyme may terminate this Agreement immediately upon written notice to X4. In the event that a Sublicensee of X4 or an Affiliate thereof anywhere in the Territory institutes, prosecutes or otherwise participates in (or in any way aids any Third Party in instituting, prosecuting or participating in) a Patent Challenge (except as required under a court order or subpoena), then Genzyme may send a written demand to X4 to terminate such sublicense in the event such Sublicensee fails to withdraw such Patent Challenge or such Patent Challenge is otherwise not dismissed [***]. If such Sublicensee fails to withdraw such Patent Challenge or such Patent Challenge is not dismissed [***], and thereafter, X4 shall terminate such Sublicense [***]. Notwithstanding the foregoing, Genzyme shall not have any termination rights pursuant to

this Section 12.4.1 on account of any Patent Challenge that is either (i) a legal or administrative challenge asserted as a counterclaim in an action initiated by or under the authority of Genzyme against X4, its Sublicensees or their respective Affiliates, or (ii) a declaratory action proceeding brought against Genzyme with respect to the validity, patentability or enforceability of any Licensed Patent as a result of Genzyme threatening to bring any action against X4, its Sublicensees, or their respective Affiliates.

12.4.2 X4 may terminate this Agreement in its entirety immediately upon notice to Genzyme for a Material Safety Issue. "**Material Safety Issue**" shall mean the reasonable belief of X4 or any of its Affiliates' or Sublicensees' based upon additional information that becomes available or an analysis of the existing information at any time, that the medical risk/benefit profile of the Licensed Compound or a Licensed Product is so unfavorable that it would be incompatible with the welfare of patients to Develop or Commercialize such Licensed Compound or Licensed Product or to continue to Develop or Commercialize it. In the event of a dispute as to whether a Material Safety Issue exists, the Parties shall resolve the dispute in accordance with Section 13.5, unless the Data Safety Monitoring Board or any institutional Review Board or any Regulatory Authority has recommended to X4 or Genzyme, or their Sublicensees or Affiliates, to terminate an ongoing Clinical Study of the Licensed Compound or Licensed Product or has halted or placed any such ongoing Clinical Study on hold, or a Regulatory Authority has withdrawn or requested that X4 withdraw any applicable Regulatory Approval for a Licensed Product, all of which foregoing circumstances shall be deemed conclusive evidence of the existence of a Material Safety Issue giving rise to X4's right to terminate under this Section 12.4.2.

12.5 Termination Upon Insolvency. Either Party may terminate this Agreement if, at any time, the other Party (a) files in any court or agency pursuant to any statute or regulation of any state, country or jurisdiction, a petition in bankruptcy or insolvency or for reorganization or for an arrangement or for the appointment of a receiver or trustee of such other Party or of its assets, (b) is declared insolvent or bankrupt by a court of competent jurisdiction, (c) is served with an involuntary petition against it, filed in any insolvency proceeding that is not dismissed within ninety (90) days after the filing thereof, (d) proposes or is placed in a process of complete liquidation, or (e) makes an assignment of substantially all of its assets for the benefit of its creditors.

12.6 Rights in Bankruptcy. All rights and licenses granted under or pursuant to this Agreement by X4 or Genzyme are, and shall otherwise be deemed to be, for purposes of Section 365(n) of the U.S. Bankruptcy Code, licenses of right to "intellectual property" as defined under Section 101 of the U.S. Bankruptcy Code. The Parties agree that the Parties, as licensees of such rights under this Agreement, shall retain and may fully exercise all of their rights and elections under the U.S. Bankruptcy Code.

12.7 Consequences of Termination.

12.7.1 In the event of a termination of this Agreement for any reason, any Sublicense agreement entered into by X4 as of the effective date of termination shall remain in full force and effect; provided, that, (a) the applicable Sublicensee is not then in breach of its Sublicense agreement with X4 and agrees to be bound to Genzyme as a direct licensee under the terms and conditions of the Sublicense agreement and (b) the Sublicensee promptly enters into appropriate agreements or amendments to the Sublicense agreement to substitute Genzyme for X4 as the licensor thereunder.

12.7.2 In the event of a termination of this Agreement for any reason other than as provided in Section 12.7.4, all rights and licenses granted by Genzyme hereunder shall immediately terminate; provided, that, if such termination occurs after the First Commercial Sale of a Licensed Product hereunder, X4 and its Sublicensees and Affiliates shall have the right to continue selling any or all Licensed Product remaining in their inventory for [***], provided that the sale of such remaining inventory will be subject to the royalty obligations set forth in Section 6.5.

12.7.3 Upon termination of this Agreement by Genzyme pursuant to Section 12.3 or 12.4.1, X4 shall promptly, to the extent requested by Genzyme:

(a) where permitted by Applicable Law, assign to Genzyme all of its right, title and interest in and to, and transfer possession to Genzyme of, all Regulatory Documentation (including, for clarity, Regulatory Approvals) then in its name applicable to any Licensed Product in the Territory;

(b) notify the applicable Regulatory Authorities and take any other action reasonably necessary to effect the transfer set forth in clause (a) above;

(c) grant Genzyme [***], under all Regulatory Documentation (including any Regulatory Approvals) then owned or Controlled by X4 then in its name that are not assigned to Genzyme pursuant to clause (a) above that are necessary or useful for Genzyme or any of its Affiliates to Exploit any Licensed Compound or Licensed Product in the Field in the Territory and any improvement to any of the foregoing, as such Regulatory Documentation exists as of the effective date of such termination of this Agreement and X4 shall continue to maintain such Regulatory Documentation (including any Regulatory Approvals) unless and until Genzyme notifies X4 that such maintenance is no longer required;

(d) to the extent requested in writing by Genzyme, grant Genzyme [***], under the X4 Know-How and the X4 Patents, to Exploit Licensed Products in the Field and, following any such termination, the provisions of ARTICLE 7 that apply to Licensed Patents shall survive with respect to such X4 Patents with Genzyme having, with respect to such X4 Patents, the rights and obligations that X4 has with respect to the Licensed Patents; provided, that, the survival of the licenses granted to Genzyme pursuant to this Section 12.7.3(d) shall be subject to [***]. For purposes of this Section 12.7.3(d), the term "X4 Licensed Product" shall mean any Licensed Product that is covered by a Valid Claim of any X4 Patents and for uses or incorporates any X4 Know-How and "Applicable Post-Termination Percentage" means, with respect to each X4 Licensed Product described in this Section 12.7.3(d), (1) if the effective date of termination is [***] with respect to any such X4 Licensed Product in any country in the Territory, [***], (2) if the effective date of termination is [***] with respect to any such X4 Licensed Product in any country in the Territory but [***] with respect to such X4 Licensed Product in any country in the Territory, [***], (3) if the effective date of termination is on or after [***] with respect to any such X4 Licensed Product in any country in the Territory but prior to [***] with respect to any such X4 Licensed Product in any country in the Territory, [***], and (z) if the effective date of termination is [***] with respect to any such X4 Licensed Product in any country in the Territory, [***].

(e) unless expressly prohibited by any Regulatory Authority, transfer control to Genzyme of all Clinical Studies of each Licensed Product being conducted as of the effective date of termination and continue to conduct such Clinical Studies, at Genzyme's cost and expense, [***] to enable such transfer to be completed without interruption of any such Clinical Study; provided, that, Genzyme shall not have any obligation to continue any Clinical Study unless required by Applicable Law and (ii) with respect to each Clinical Study for which such transfer is expressly prohibited by the applicable Regulatory Authority, X4 shall continue to conduct such Clinical Study [***] at Genzyme's reasonable cost and expense.

(f) assign (or cause its Affiliates to assign) to Genzyme all Licensed Product Agreements, unless, with respect to any such Licensed Product Agreement, such Licensed Product Agreement expressly prohibits such assignment or relates to products in addition to the Licensed Product, in which case X4 shall cooperate with Genzyme in all reasonable respects to secure the consent of the applicable Third Party to such assignment and if any such consent cannot be obtained with respect to a Licensed Product Agreement, X4 shall use Commercially Reasonable Efforts at Genzyme's cost and expense to try to obtain for Genzyme substantially all of the practical benefit and burden under such Licensed Product Agreement, including by (i) pursuing appropriate and reasonable alternative arrangements (such as splitting Licensed Product Agreements non exclusively related to Licensed Products) on terms mutually agreeable to Genzyme and X4 and (ii) subject to the consent and control of Genzyme, pursuing the enforcement, at Genzyme's cost and expense and for the account of Genzyme, of any and all rights of X4 against the other party thereto arising out of the breach or cancellation thereof by such other party or otherwise; [***];

(g) provide Genzyme with copies of all reports and data generated or obtained by X4 or any of its Affiliates that relate to any Licensed Product that have not previously been provided to Genzyme;

(h) where permitted by Applicable Laws, assign to Genzyme all right, title, and interest of X4 in each Product Trademark; and

(i) sell to Genzyme some or all of the inventory of Licensed Compound and/or Licensed Product in possession of X4 and Affiliates as of the termination date, at a price equal to [***].

Except in the event of termination of this Agreement by Genzyme pursuant to Section 12.3, Genzyme shall reimburse X4 for all reasonable, documented out-of-pocket expenses incurred by X4 in performing its obligations under Section 12.7.3(a) to (h).

12.7.4 Upon termination by X4 pursuant to Section 12.3 or 12.5, then: (a) the licenses granted by Genzyme to X4 pursuant to Section 2.1 hereof shall survive on a country-by-country and Licensed Product-by-Licensed Product basis until the expiration of the Royalty Term

for each such Licensed Product in each such country, subject to [***]; and (b) each Party shall promptly return or destroy all Confidential Information of the other Party; provided, further that, each Party may retain, subject to ARTICLE 7 hereof, (i) one (1) copy of the Confidential Information of the other Party in its archives for the purpose of establishing the contents thereof and ensuring compliance with its obligations hereunder and (ii) any Confidential Information of the other Party contained in its laboratory notebooks or databases; and X4 may retain and use Genzyme's Confidential Information solely in connection with the exercise of its rights set forth in clause (a) of this Section 12.7.4.

12.7.5 Without limiting Genzyme's rights under other provisions of this ARTICLE 12, in the event of any termination by Genzyme pursuant to Section 12.3 or by X4 pursuant to 12.4.2, X4 shall, at the request and expense of Genzyme, use Commercially Reasonable Efforts to provide Genzyme with such assistance, [***], as is reasonably necessary to effectuate a smooth and orderly transition of any Development, Manufacture and Commercialization activities to Genzyme or its designee so as to minimize any disruption of such activities. Further, upon Genzyme's request and expense, in the event of any termination by Genzyme pursuant to Section 12.3 or by X4 pursuant to 12.4.2 after the First Commercial Sale of a Licensed Product hereunder, X4 shall provide such technical assistance, [***], as may reasonably be requested to transfer all Manufacturing technology that is or had been used by or on behalf of X4 and its Affiliates in connection with the Manufacture of any Licensed Compound or Licensed Product.

12.8 Accrued Rights; Surviving Obligations.

12.8.1 Accrued Rights. Termination or expiration of this Agreement for any reason shall be without prejudice to any rights that shall have accrued to the benefit of a Party prior to such termination or expiration. Such termination or expiration shall not relieve a Party from obligations that are expressly indicated to survive the termination or expiration of this Agreement.

12.8.2 Survival. Without limiting the foregoing, Article 1, Section 2.6, Section 3.4 (last sentence), Article 6 (with respect to any payment accrued but not paid prior to termination or expiration), Section 6.4.3 (with respect to deferred payments under a Transaction), Section 6.10 (for the length of time specified therein), Section 7.1, Sections 7.3 through 7.5 (with respect to any action or proceeding initiated prior to termination or expiration), Section 7.7 (with respect to any action or proceeding initiated prior to termination or expiration), Article 8, Article 9 (for the length of time specified in Section 9.1), Sections 10.4 and 10.5, Article 11, Sections 12.6 through 12.8 and Article 13 shall survive the termination or expiration of this Agreement for any reason. In addition, upon the expiration, but not an earlier termination, of this Agreement, Section 2.4 shall also survive.

ARTICLE 13
MISCELLANEOUS

13.1 Force Majeure. Neither Party shall be held liable or responsible to the other Party or be deemed to have defaulted under or breached this Agreement for failure or delay in fulfilling or performing any term of this Agreement (other than an obligation to make payments) when such failure or delay is caused by or results from events beyond the

reasonable control of the non-performing Party, including fires, floods, earthquakes, embargoes, shortages, epidemics, quarantines, war, acts of war (whether war be declared or not), terrorist acts, insurrections, riots, civil commotion, strikes, lockouts or other labor disturbances (whether involving the workforce of the non-performing Party or of any other Person), acts of God or acts, omissions or delays in acting by any governmental authority (each, a "**Force Majeure Event**"). The non-performing Party shall notify the other Party of a Force Majeure Event [***] by giving written notice to the other Party stating the nature of such Force Majeure Event, its anticipated duration, and any action being taken to avoid or minimize its effect. The suspension of performance shall be of no greater scope and no longer duration than is necessary and the non-performing Party shall use commercially reasonable efforts to remedy its inability to perform. In the event that such suspension of performance [***] and in the absence of such Force Majeure Event such suspension of performance would be a material breach of this Agreement, such other Party shall have the right to terminate this Agreement pursuant to Section 12.3.

13.2 Export Control. This Agreement is made subject to any restrictions concerning the export of products or technical information from the United States or other countries that may be imposed on or related to the Parties from time to time. Each Party agrees that it will not export, directly or indirectly, any technical information acquired from the other Party under this Agreement or any products using such technical information to a location or in a manner that at the time of export requires an export license or other governmental approval, without first obtaining the written consent to do so from the appropriate agency or other governmental entity in accordance with Applicable Law.

13.3 Assignment. Neither Party shall sell, transfer, assign, delegate, pledge or otherwise dispose of, whether voluntarily, involuntarily, by operation of law or otherwise, this Agreement or any of its rights or duties hereunder without the prior written consent of the other Party; provided that (a) Genzyme may, without such consent, assign this Agreement and its rights and obligations hereunder to an Affiliate, to the purchaser of the Licensed Patents or Licensed Know-How or to its successor entity or acquirer in the event of a merger, consolidation or change in control of Genzyme and (b) X4 may without such consent, [***], assign this Agreement and its rights and obligations hereunder in connection with a Change of Control; provided, further, that in either case ((a) or (b)), the assignee or transferee shall assume all obligations of its assignor or transferor under this Agreement and such assignor or transferor shall remain responsible to the other Party for the performance by such assignee or transferee of the rights and obligations of the assigning Party hereunder. Any attempted assignment or delegation in violation of the preceding sentence shall be void and of no effect. All validly assigned and delegated rights and obligations of the Parties hereunder shall be binding upon and inure to the benefit of and be enforceable by and against the successors and permitted assigns of Genzyme or X4, as the case may be. [***].

13.4 Severability. To the fullest extent permitted by Applicable Law, the Parties waive any provision of law that would render any provision in this Agreement invalid, illegal, or unenforceable in any respect. If any provision of this Agreement is held to be invalid, illegal, or unenforceable, in any respect, then such provision will be given no effect by the Parties and shall not form part of this Agreement. To the fullest extent permitted by

Applicable Law and if the rights or obligations of either Party will not be materially and adversely affected, all other provisions of this Agreement shall remain in full force and effect, and the Parties shall use their best efforts to negotiate a provision in replacement of the provision held invalid, illegal, or unenforceable that is consistent with Applicable Law and achieves, as nearly as possible, the original intention of the Parties.

13.5 Dispute Resolution. If a dispute arises between the Parties in connection with the interpretation, validity or performance of this Agreement or any document or instrument delivered in connection herewith, then either Party shall have the right to refer such dispute to the Executive Officers for attempted resolution by good faith negotiations during a period of [***]. Any final decision mutually agreed to by the Executive Officers shall be conclusive and binding on the Parties. If such Executive Officers are unable to resolve such dispute within such [***] period, either Party shall be free to institute litigation in accordance with Section 13.6 and seek such remedies as may be available. Notwithstanding anything in this Agreement to the contrary, either Party shall be entitled to institute litigation in accordance with Section 13.6 immediately if litigation is necessary to prevent irreparable harm to that Party.

13.6 Governing Law, Jurisdiction, Venue and Service.

13.6.1 Governing Law. This Agreement shall be governed by and construed in accordance with the laws of [***], excluding any conflicts or choice of law rule or principle that might otherwise refer construction or interpretation of this Agreement to the substantive law of another jurisdiction. The Parties agree to exclude the application to this Agreement of the United Nations Convention on Contracts for the International Sale of Goods.

13.6.2 Jurisdiction. Subject to Section 13.5 and Section 13.10, the Parties hereby irrevocably and unconditionally consent to the exclusive jurisdiction of the courts of [***] for any action, suit or proceeding (other than appeals therefrom) arising out of or relating to this Agreement, and agree not to commence any action, suit or proceeding (other than appeals therefrom) related thereto except in such courts. The Parties irrevocably and unconditionally waive their right to a jury trial.

13.6.3 Venue. The Parties further hereby irrevocably and unconditionally waive any objection to the laying of venue of any action, suit or proceeding (other than appeals therefrom) arising out of or relating to this Agreement in the courts of [***], and hereby further irrevocably and unconditionally waive and agree not to plead or claim in any such court that any such action, suit or proceeding brought in any such court has been brought in an inconvenient forum.

13.6.4 Service. Each Party further agrees that service of any process, summons, notice or document by registered mail to its address set forth in Section 13.7.2 shall be effective service of process for any action, suit or proceeding brought against it under this Agreement in any such court.

13.7 Notices.

13.7.1 Notice Requirements. Any notice, request, demand, waiver, consent, approval or other communication permitted or required under this Agreement shall be in writing, shall refer specifically to this Agreement and shall be deemed given only if delivered by hand or sent by facsimile transmission (with transmission confirmed) or by internationally recognized delivery service that maintains records of delivery, addressed to the Parties at their respective addresses specified in Section 13.7.2 or to such other address as the Party to whom notice is to be given may have provided to the other Party in accordance with this Section 13.7. Such notice shall be deemed to have been given as of the date delivered by hand or transmitted by facsimile (with transmission confirmed) or on the third Business Day (at the place of delivery) after deposit with an internationally recognized delivery service. Any notice delivered by facsimile shall be confirmed by a hard copy delivered as soon as practicable thereafter. This Section 13.7 is not intended to govern the day-to-day business communications necessary between the Parties in performing their obligations under the terms of this Agreement.

13.7.2 Address for Notice.

If to X4, to:

X4 Pharmaceuticals, LLC
281 School Street,
Belmont, MA 02478
Attention: **CEO**
Facsimile: +001 801 285 7570
E-Mail: pmragan@gmail.com

with a copy to (which shall not constitute notice):

Mintz Levin
One Financial Center
Boston, MA 02111
Attention: John Cheney
Facsimile: (617) 542-2241
E-Mail: jjcheney@mintz.com

If to Genzyme, to:

Genzyme Corp.
500 Kendall Street,
Cambridge, MA 02142
Attention: General Counsel
Facsimile: + 1 617 768 6938
E-Mail: tracey.quarles@genzyme.com

Portions of this Exhibit, indicated by the mark "[***]," were omitted and have been filed separately with the Securities and Exchange Commission pursuant to the Registrant's application requesting confidential treatment pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

with a copy to (which shall not constitute notice):

Sanofi – Legal Operations
54 rue la Boétie
75008 Paris
France
Attention: Vice President, Legal Operations
Facsimile: +33 (0) 1 5377 4048
E-Mail: jose.ferrer@sanofi.com

13.8 Entire Agreement; Amendments. This Agreement, together with the Schedules attached hereto, sets forth and constitutes the entire agreement and understanding between the Parties with respect to the subject matter hereof and all prior agreements, understandings, promises and representations, whether written or oral, with respect thereto are superseded hereby, including that certain Material Transfer Agreement dated 11 February 2014 between X4 and Sanofi, an Affiliate of Genzyme. Each Party confirms that it is not relying on any representations or warranties of the other Party except as specifically set forth herein. No amendment, modification, release or discharge shall be binding upon the Parties unless in writing and duly executed by authorized representatives of both Parties.

13.9 English Language. This Agreement shall be written and executed in, and all other communications under or in connection with this Agreement shall be in, the English language. Any translation into any other language shall not be an official version thereof, and in the event of any conflict in interpretation between the English version and such translation, the English version shall control.

13.10 Equitable Relief. The Parties acknowledge and agree that the restrictions set forth in ARTICLE 9 are reasonable and necessary to protect the legitimate interests of the other Party and that such other Party would not have entered into this Agreement in the absence of such restrictions, and that any breach or threatened breach of any provision of ARTICLE 9 may result in irreparable injury to such other Party for which there will be no adequate remedy at law. In the event of a breach or threatened breach of any provision of ARTICLE 9, the non-breaching Party shall be entitled to seek to obtain from any court of competent jurisdiction injunctive relief, whether preliminary or permanent, specific performance and an equitable accounting of all earnings, profits and other benefits arising from such breach, which rights shall be cumulative and in addition to any other rights or remedies to which such non-breaching Party may be entitled in law or equity. Nothing in this Section 13.10 is intended, or should be construed, to limit either Party's right to equitable relief or any other remedy for a breach of any other provision of this Agreement.

13.11 Waiver and Non-Exclusion of Remedies. Any term or condition of this Agreement may be waived at any time by the Party that is entitled to the benefit thereof, but no such waiver shall be effective unless set forth in a written instrument duly executed by or on behalf of the Party waiving such term or condition. The waiver by either Party of any right hereunder or of the failure to perform or of a breach by the other Party shall not be deemed a waiver of any other right hereunder or of any other breach or failure by the other Party whether of a similar nature or otherwise.

Portions of this Exhibit, indicated by the mark "[***]," were omitted and have been filed separately with the Securities and Exchange Commission pursuant to the Registrant's application requesting confidential treatment pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

13.12 No Benefit to Third Parties. The representations, warranties, covenants and agreements set forth in this Agreement are for the sole benefit of the Parties and their successors and permitted assigns, and they shall not be construed as conferring any rights on any other Persons.

13.13 Further Assurance. Each Party shall duly execute and deliver, or cause to be duly executed and delivered, such further instruments and do and cause to be done such further acts and things, including the filing of such assignments, agreements, documents and instruments, as may be necessary or as the other Party may reasonably request in connection with this Agreement or to carry out more effectively the provisions and purposes hereof, or to better assure and confirm unto such other Party its rights and remedies under this Agreement.

13.14 Relationship of the Parties. It is expressly agreed that Genzyme, on the one hand, and X4, on the other hand, shall be independent contractors and that the relationship between the two Parties shall not constitute a partnership, joint venture or agency. Neither Genzyme, on the one hand, nor X4, on the other hand, shall have the authority to make any statements, representations or commitments of any kind, or to take any action, which shall be binding on the other Party, without the prior written consent of the other Party to do so, such consent not to be unreasonably conditioned, withheld or delayed. All persons employed by a Party shall be employees of such Party and not of the other Party and all costs and obligations incurred by reason of any such employment shall be for the account and expense of such Party.

13.15 Counterparts. This Agreement may be executed in any number of counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. This Agreement may be executed by facsimile or other electronic signatures and such signatures shall be deemed to bind each Party as if they were original signatures.

13.16 References. Unless otherwise specified, (a) references in this Agreement to any Article, Section or Schedule means references to such Article, Section or Schedule of this Agreement, (b) references in any section to any clause are references to such clause of such section and (c) references to any agreement, instrument or other document in this Agreement refer to such agreement, instrument or other document as originally executed or, if subsequently varied, replaced or supplemented from time to time, as so varied, replaced or supplemented and in effect at the relevant time of reference thereto.

13.17 Construction. Except where the context otherwise requires, wherever used, the singular shall include the plural, the plural the singular, the use of any gender shall be applicable to all genders and the word “or” is used in the inclusive sense (and/or). The captions of this Agreement are for convenience of reference only and in no way define, describe, extend or limit the scope or intent of this Agreement or the intent of any provision contained in this Agreement. The term “including” as used herein means including, without limiting the generality of any description preceding such term. The language of this Agreement shall be deemed to be the language mutually chosen by the Parties and no rule of strict construction shall be applied against either Party.

[*SIGNATURE PAGE FOLLOWS*.]

THIS AGREEMENT IS EXECUTED by the authorized representatives of the Parties as of the date first written above.

GENZYME CORP

By: /s/ Constantine Chinoporos
Name: Constantine Chinoporos
Title: Vice President

X4 PHARMACEUTICALS, LLC.

By: /s/ Paula Ragan, PhD
Name: Paula Ragan, PhD
Title: Managing Partner

Portions of this Exhibit, indicated by the mark "[***]," were omitted and have been filed separately with the Securities and Exchange Commission pursuant to the Registrant's application requesting confidential treatment pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

Schedule 1.57
Licensed Know-How

[Attached]

[***]

Portions of this Exhibit, indicated by the mark "[***]," were omitted and have been filed separately with the Securities and Exchange Commission pursuant to the Registrant's application requesting confidential treatment pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

Schedule 1.58
Licensed Patents

[Attached]

[***]

Portions of this Exhibit, indicated by the mark "[***]," were omitted and have been filed separately with the Securities and Exchange Commission pursuant to the Registrant's application requesting confidential treatment pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

Schedule 1.56
Licensed Compound

Licensed Compound Designation	[***]
AMD11070 (ph1)	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]

Portions of this Exhibit, indicated by the mark "[***]," were omitted and have been filed separately with the Securities and Exchange Commission pursuant to the Registrant's application requesting confidential treatment pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

Schedule 3.1.2
Development Plan

[***]

Portions of this Exhibit, indicated by the mark "[***]," were omitted and have been filed separately with the Securities and Exchange Commission pursuant to the Registrant's application requesting confidential treatment pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

Schedule 3.2.1
Regulatory Documents Assigned by Genzyme to X4

[***]

Portions of this Exhibit, indicated by the mark "[***]," were omitted and have been filed separately with the Securities and Exchange Commission pursuant to the Registrant's application requesting confidential treatment pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

Exhibit 10.6

Execution Copy

AMENDMENT NO. 1 TO LICENSE AGREEMENT

This Amendment No. 1 to License Agreement (this "**Amendment**") is dated as of October 23, 2014 (the "**Amendment Effective Date**") by and between **Genzyme Corp**., a corporation having an address at 500 Kendall Street, Cambridge, MA 02142 ("**Genzyme**" or "**Licensor**") and X**4 Pharmaceuticals, INC**., a Delaware corporation having an address at 281 School Street, Belmont, MA 02478, United States ("**X4**"). Each of Genzyme and X4 may be referred to herein as a "**Party**" and together as the "**Parties**". Capitalized terms used but not otherwise defined herein shall have the meanings ascribed to such terms in the License Agreement by and between the Parties effective as of July 10, 2014 (the "**Agreement**").

WHEREAS, the Parties hereto desire to amend the Agreement as set forth herein to, among other things, include the right of X4 to extend a certain milestone date and to reflect the conversion of X4 from a limited liability company to a corporation; and

WHEREAS, pursuant to Section 13.8 of the Agreement, the Agreement may be amended by a written instrument duly executed by authorized representatives of both Parties.

NOW, THEREFORE, in consideration of the mutual covenants contained herein, and for other good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, the Parties hereto, intending to be legally bound, hereby agree as follows:

1. Amendments to Agreement.

(a) The reference in the first recital to "**X4 Pharmaceuticals, LLC**, a Massachusetts limited liability company" is hereby deleted and "**X4 Pharmaceuticals, INC**., a Delaware corporation" is hereby inserted in lieu thereof

(b) All references in the Agreement to "X4 Pharmaceuticals, LLC" are hereby deleted and "X4 Pharmaceuticals, INC." is hereby inserted in lieu thereof.

(c) Section 6.2 of the Agreement is hereby deleted in its entirety and the following is hereby inserted in lieu thereof:

"6.2 X4 First Financing Fee.

6.2.1 No later than [***] after the closing of the X4 First Financing, X4 shall pay Genzyme an upfront amount equal to Three Hundred Thousand Dollars ($300,000) (the "**First Financing Fee**"). The payment of the First Financing Fee shall be [***].

6.2.2 X4 shall have the right in its sole discretion to extend the Financing Exclusivity Period (as defined in Section 12.1.1 below) during the term thereof by providing written notice to Genzyme (the "**Financing Exclusivity Extension Notice**")

(d) Section 6.3.1(a) of the Agreement is hereby deleted in its entirety and the following is hereby inserted in lieu thereof:

"(a) Initial Grant. No later than [***] after the closing of the X4 First Financing, X4 shall issue to Genzyme or to Genzyme's designated Affiliate a number of shares of the Common Stock, $.001 par value per share, of X4 ("**Shares**") that represents, on an as-converted basis, ten percent (10%) of the outstanding Shares of X4 immediately following the closing of the X4 First Financing (the "**Initial Shares"**)."

(e) All references in the Agreement to "Units" and "Anti-Dilution Units" are hereby deleted and "Shares" and "Anti-Dilution Shares" is hereby inserted in lieu thereof.

(f) All references in the Agreement to "Subject Units" are hereby deleted and "Subject Shares" is hereby inserted in lieu thereof.

(g) Section 12.1 of the Agreement is hereby deleted in its entirety and the following is hereby inserted in lieu thereof:

"12.1 Termination upon Failure to Close the X4 First Financing.

12.1.1 Financing Exclusivity Period. X4 will use its Commercially Reasonable Efforts to **consummate** the X4 First Financing [***] (such period, as extended pursuant to this Section 12.1, the "Financing Exclusivity Period").

12.1.2 Extension of Financing Exclusivity Period.

(a) Extension Due to Payment of Financing Exclusivity Extension Payment. Upon the delivery by X4 of the Financing Exclusivity Extension Notice, the Financing Exclusivity Period shall automatically be extended [***].

(b) Extension Due to Signed Term Sheet. In the event that X4 does not consummate the X4 First Financing on or before the expiration of the Financing Exclusivity Period (whether or not extended according to 12.1.2(a) above) and [***], then the Financing Exclusivity Period shall automatically be extended by [***].

12.1.3 **Right to Terminate**. In the event that X4 does not consummate the X4 First Financing on or before the expiration of the Financing Exclusivity Period and the Parties have not otherwise agreed in writing to further extend the Financing Exclusivity Period, this Agreement shall immediately terminate and Genzyme shall have no further obligations to X4 with respect to the Licensed Patent and Licensed Know-How and shall be free to negotiate and enter into any agreement with a Third Party concerning the Licensed Patents or the Licensed Know How.

(h) All references in the Agreement to the "Execution Date" are hereby deleted and "Effective Date" is hereby inserted in lieu thereof.

(i) Schedule 1.58 to the Agreement is hereby deleted and replaced by the attached revised Schedule 1.58.

2. Miscellaneous. The Parties hereby confirm and agree that, except as amended hereby, the Agreement remains in full force and effect and is a binding obligation of the Parties hereto. This Amendment may be executed in counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

This Amendment is executed by the authorized representatives of the Parties as of the date first written above.

GENZYME CORP

By: /s/ Constantine Chinoporos
Name: Constantine Chinoporos
Title: Vice President

X4 PHARMACEUTICALS, INC.

By: /s/ Paula Ragan
Name: Paula Ragan
Title: CEO

Schedule 1.58

[***]

Portions of this Exhibit, indicated by the mark "[***]," were omitted and have been filed separately with the Securities and Exchange Commission pursuant to the Registrant's application requesting confidential treatment pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

EXCLUSIVE LICENSE AGREEMENT

BETWEEN

GEORGETOWN UNIVERSITY

AND

X4 PHARMACEUTICALS, INC.

This Exclusive License Agreement (hereinafter "Agreement") is entered into and effective as of the 13th day of December, 2016 (hereinafter "Effective Date"), by and between GEORGETOWN UNIVERSITY, a Congressionally-chartered academic institution of higher education organized under the laws of the District of Columbia, having its principal place of business located at 37th and O Streets, N.W., Washington, D.C. 20057 (hereinafter "GEORGETOWN" or "LICENSOR"), and X4 Pharmaceuticals, Inc., a corporation organized under the laws of the state of Delaware with offices located at 784 Memorial Drive, Suite 140, Cambridge, MA 02139 (hereinafter "LICENSEE").

WHEREAS, GEORGETOWN AND LICENSEE are joint owners of certain Licensed Patents (as later defined herein) relating to Methods for Treating Cancer;

WHEREAS, Dr. Michael Atkins of GEORGETOWN is a co-inventor of the Licensed Patents;

WHEREAS, GEORGETOWN desires to have the Licensed Patents developed and commercialized to benefit the public and is willing to grant a license to LICENSEE hereunder;

WHEREAS, LICENSEE has represented to GEORGETOWN, to induce it to enter into this Agreement, that LICENSEE shall commit itself to a diligent program of exploiting the Licensed Patents so that public utilization shall result therefrom; and

WHEREAS, LICENSEE desires to obtain an exclusive license to GEORGETOWN's joint ownership rights under the Licensed Patents upon the terms and conditions hereinafter set forth.

NOW, THEREFORE, the Parties agree as follows:

ARTICLE 1
Definitions

1.1 Terms in this Agreement (other than names of parties and Article headings) that are set forth with a capitalized first letter have the meanings established for such

terms in this Article 1 unless otherwise expressly defined in this Agreement (such definitions shall be equally applicable to both the singular and plural forms of the defined terms). The words “hereof,” “herein” and “hereunder” and words of like import when used in this Agreement shall refer to this Agreement as a whole and not to any particular provision of this Agreement, and Section references are to this Agreement unless otherwise specified.

1.2 “Affiliate” shall mean any corporation or other entity that directly or indirectly controls, is controlled by or is under common control with a Party to this Agreement. A corporation or other entity shall be regarded as in control of another corporation or entity if it owns or directly or indirectly controls more than fifty percent (50%) of the voting stock or other ownership interest of the other corporation or entity, or if it possesses, directly or indirectly, the power to direct or cause the direction of the management and policies of the corporation or other entity or the power to elect or appoint fifty percent (50%) or more of the members of the governing body of the corporation or other entity.

1.3 “Commercially Reasonable Efforts” shall mean, [***].

1.4 “Effective Date” shall mean the date first written above.

1.5 “End User” shall mean a Person who acquires a Licensed Product directly or indirectly from Licensee, for use and not for resale following First Commercial Sale.

1.6 “Field” means all therapeutic, prophylactic and diagnostic uses in all disease indications in humans and animals.

1.7 “First Commercial Sale” means the initial transfer by or on behalf of LICENSEE or its Sublicensees of Licensed Products to a Third Party in exchange for cash or some equivalent to which value can be assigned for the purpose of determining Net Sales. For avoidance of doubt, First Commercial Sale excludes transfers or dispositions of a Licensed Product between LICENSEE and its Affiliates and Sublicensees or for charitable, promotional (including samples), pre-clinical, clinical or regulatory purposes.

1.8 “Licensed Method” means any method that is covered in whole or in part by a Valid Claim contained in the Licensed Patents.

1.9 “Licensed Patents” means [***].

1.10 “Licensed Product” means any product that (a) either is covered by a Valid Claim in the Licensed Patents, or whose manufacture, use, import, offer for Sale or Sale would constitute, but for the license granted to the LICENSEE pursuant to this

Agreement and LICENSEE's joint ownership of the Licensed Patents, an infringement of any Valid Claim within the Licensed Patents, or (b) is developed, made, Sold, registered or practiced using the Licensed Methods or which is authorized to be used to practice the Licensed Methods, in whole or in part.

1.11 "Net Sales" means the gross amount invoiced by LICENSEE and its Sublicensees billings to unrelated Third Parties for the Sale of Licensed Products, less the sum of the following items, to the extent included in the gross amounts invoiced for such Licensed Products or otherwise directly paid, incurred, allowed, accrued or specifically allocated by LICENSEE or its Sublicensees with respect to the Sale of such Licensed Products:

(a) discounts given and actually taken in amounts customary in the trade for quantity/volume purchases, cash payments, prompt payments, wholesalers and distributors;

(b) rebates and chargebacks allowed, given or accrued (including cash, governmental and managed care rebates, hospital or other buying group chargebacks, cash and non-cash coupons, and governmental taxes in the nature of a rebate based on usage levels or Sales of such Licensed Products);

(c) sales, value added, import, export, excise and other taxes directly imposed and with reference to particular Sales;

(d) outbound transportation, customs charges, and insurance charges prepaid or allowed; and

(e) amounts allowed or credited on returns or rejections.

No other deductions shall be made for commissions paid to individuals whether they are with independent sales agencies or regularly employed by Licensee and on its payroll, or for the cost of collections. Licensed Products shall be considered "sold" [***] after billing or invoicing, or upon receipt of payment, whichever comes first, provided, however, that Licensed Products are actually shipped to unrelated Third Party customers. If a Licensed Product is distributed or invoiced for a discounted price substantially lower than customary in the trade, Net Sales shall be based on the customary amount billed for such Licensed Products. Without limiting the generality of the foregoing, transfers or dispositions of a Licensed Product for charitable, promotional (including samples), pre-clinical, clinical, or regulatory purposes will be excluded from Net Sales.

1.12 "Party" means each of LICENSOR and LICENSEE, and "Parties" means both LICENSOR and LICENSEE.

1.13 "Person" means any legal person or entity, including without limitation any individual, corporation, partnership, joint venture, association, joint stock company, trust, unincorporated association, limited liability corporation, governmental entity, or other person or entity of similar nature.

1.14 To "Sell" a product means to sell, transfer, lease or otherwise dispose of or commercialize a product. "Sale" and "Sold" have the corollary meanings ascribed thereto.

1.15 "Sublicense" means present, future, or contingent transfer of any license, right, option, first right to negotiate or other right granted under the Licensed Patents, in whole or in part. "Sublicense" includes, without limitation, strategic partnerships, marketing collaborations, and distribution agreements.

1.16 "Sublicensee" means any Third Party to whom LICENSEE has granted a license to make, have made, use and/or Sell the Licensed Product or practice the Licensed Method under the Licensed Patents, provided said Third Party has agreed in writing with LICENSEE to accept any applicable conditions and restrictions agreed to by LICENSEE in this Agreement.

1.17 "Territory" means worldwide.

1.18 "Third Party" means any Person other than the Parties and their respective Affiliates.

1.19 "Valid Claim" means either:

(a) a claim of an issued and unexpired patent that has not been held permanently revoked, unenforceable or invalid by a decision of a court or other governmental agency of competent jurisdiction, unappealable or unappealed within the time allowed for appeal, and that has not been admitted to be invalid or unenforceable through reissue or disclaimer or otherwise; or

(b) a claim of a pending patent application that was filed in good faith and has not been abandoned or finally disallowed without the possibility of appeal or refiling of said application.

ARTICLE 2
Grant

2.1 Subject to the terms and conditions herein, LICENSOR hereby grants to LICENSEE, in the Field and Territory, an exclusive license under LICENSOR's interest in the Licensed Patents to practice the Licensed Methods and to make, have made, use, offer to Sell, Sell and import Licensed Products during the Term. The license includes the right, but not the obligation, to grant one or more Sublicenses in accordance with the terms of Article 3.

2.2 LICENSEE acknowledges and agrees that no license is granted or implied under the Licensed Patent outside the Field and Territory and will not practice under the Licensed Patent outside the Field and Territory.

2.3 This Agreement confers no license, ownership interest in or other rights by implication, estoppel or otherwise upon LICENSEE in any technology, know how, patents, pending patent applications, or products of LICENSOR except as explicitly set forth in this Agreement, regardless of whether such technology or patent rights shall be dominant or subordinate to any Licensed Patents.

ARTICLE 3
Sublicensing

3.1 LICENSEE shall assure itself of the integrity and financial responsibility of each Person to whom a Sublicense is granted.

3.2 Each Sublicensee shall agree to be bound by all of the obligations, terms and conditions that obligate, bind or affect LICENSEE under this License Agreement to the extent that such obligations, terms and conditions are relevant given the nature of the rights granted by LICENSEE to any given Sublicensee.

3.3 LICENSEE shall be and remain responsible for the performance by each Sublicensee of all of such Sublicensee's obligations provided herein.

3.4 LICENSEE shall agree to ascertain, compute and audit and shall faithfully ascertain, compute and audit all Net Sales by each Sublicensee hereunder.

3.5 LICENSEE shall not grant any rights under the Licensed Patents to Sublicensee that are inconsistent with this Agreement or that would be a breach of this Agreement if performed by a Sublicensee.

3.6 LICENSEE shall contractually require that each Sublicensee (excluding Third Party Contractors) shall not at any time, directly or indirectly, in any legal or administrative proceeding oppose the grant of, dispute the validity of, or cooperate in any suit against any patent or claim included in the Licensed Patents (except as required under a court order or subpoena).

3.7 Within [***] after entering into any Sublicense (excluding Sublicenses granted to Third Parties that are clinical research organizations, contract manufacturers, contract laboratory organizations, and other similar Third Parties that support the development and commercialization of Licensed Products on a fee-for-service basis ("Third Party Contractors") or any amendment to any such Sublicense, LICENSEE shall notify LICENSOR of the identity of the Sublicensee and shall provide to LICENSOR a copy of the Sublicense or amendment, which copy may be redacted to omit proprietary and other sensitive information to the extent that such redaction does not impact LICENSOR's ability to confirm LICENSEE's compliance with this Agreement.

3.8 LICENSEE shall provide to LICENSOR notice of any termination of the Sublicenses described in Section 3.7 within [***] after such event.

3.9 Any Sublicense entered into by LICENSEE in violation of the requirements of this Article 3 shall be null and void and without effect.

ARTICLE 4
Reservation of Rights

4.1 LICENSOR expressly reserves all rights not granted herein. LICENSOR reserves all right to disseminate and publish scientific findings from research conducted by LICENSOR on its own behalf (and not, for clarity, on behalf of LICENSEE) related to the Licensed Patents and Licensed Method, subject to Article 12. LICENSEE reserves all right to disseminate and publish scientific findings from research conducted by or on behalf of LICENSEE related to the Licensed Patents and Licensed Method.

ARTICLE 5
Licensee Diligence Obligations

5.1 LICENSEE shall use Commercially Reasonable Efforts, or shall cause its Sublicensees to use Commercially Reasonable Efforts, to develop Licensed Product and to introduce Licensed Product into the commercial market; thereafter, LICENSEE or its Sublicensees shall use Commercially Reasonable Efforts to make Licensed Product reasonably available to the public.

5.2 LICENSEE shall use its Commercially Reasonable Efforts to obtain required government regulatory approval to manufacture, market and Sell the Licensed Product in the Field in those countries of the Territory where it is commercially reasonable, in LICENSEE's judgment, to seek such approvals, and shall use its Commercially Reasonable Efforts to market the Licensed Product in quantities sufficient to meet the market demands for such Licensed Product.

ARTICLE 6
License Issue Fee and Milestone Payments

6.1 License Issue Fee. LICENSEE shall pay to LICENSOR within [***] of the Effective Date of this Agreement, a license issue fee of fifty thousand dollars ($50,000). The payment is nonrefundable and is not creditable against any other fee or payment.

6.2 Milestone Payments. In addition to the License Issue Fee, LICENSEE shall, upon the achievement of the events set forth below, make the following payments to LICENSOR for each Licensed Product Sold by LICENSEE, its Affiliates and its Sublicensees:

(a) [***] dollars ($[***]) upon First Commercial Sale of a Licensed Product.

(b) [***] dollars ($[***]) upon achieving the first [***] dollars ($[***]) in Net Sales from the Sale of Licensed Product.
(c) [***] dollars ($[***]) upon achieving the first [***] dollars ($[***]) in Net Sales from the Sale of Licensed Product.

LICENSEE shall notify LICENSOR within [***] of LICENSEE's determination of the occurrence of each such event and shall remit payment due under this Section within [***] of providing such notice to LICENSOR. Payments made pursuant to this Section 6.2 shall be nonrefundable and shall not be creditable against any other fee or payment. For purposes of this Section 6.2, [***]. For purposes of example and without limitation, [***]. Similarly, if, instead of [***]. In addition, [***] for purposes of this Section 6.2.

6.3 Sales or transfers to LICENSEE's Affiliates or Sublicensees shall not be included in the calculation of Net Sales until the actual Sale and shipment by such Affiliate or Sublicensee to a Third Party, except if such Affiliate or Sublicensee is an End User of the Licensed Product. Under such circumstances where an Affiliate or Sublicensee of LICENSEE is an End User, Net Sales shall be based on the lowest Sales price of Licensed Product charged to Third Parties for the calendar quarter in which the Licensed Product is shipped to such Affiliate or Sublicensee and which calendar quarter shall be deemed the calendar quarter of payment, taking into account volumes of purchases.

6.4 The LICENSEE agrees to pay all bank transfer charges, and all taxes, fees and other governmental charges imposed on the payments to the LICENSOR pursuant to the terms and conditions of this Agreement (excluding any income tax or similar tax imposed on LICENSOR as a result of its receipt of payments hereunder).

6.5 All payments under this Agreement should be made payable to "Georgetown University" and sent to the address identified in Section 17.1 herein. Each payment should reference this Agreement and identify the obligation under this Agreement that the payment satisfies.

6.6 All payments due under this Agreement shall be drawn on a United States bank and shall be payable in United States dollars. Conversion of foreign currency to U.S. dollars for purposes of calculating Net Sales shall be made in accordance with LICENSEE's then customary and usual currency conversion procedures, consistently applied, which shall be consistent with LICENSEE's usual and customary generally accepted accounting principles consistently applied and which procedures shall be disclosed to LICENSOR. Such payments shall be without deduction of exchange, collection, or other charges, and, specifically, without deduction of withholding or similar taxes or other government imposed fees or taxes, except as permitted in the definition of Net Sales.

6.7 Any payments by LICENSEE that are not paid on or before the date such payments are due under this Agreement shall bear interest, to the extent permitted by law, at an annual rate equal to one percentage point above the U.S. prime rate of interest as reported in the Wall Street Journal on the date payment is due, with interest accruing on a daily basis.

ARTICLE 7
Reports and Records of Licensee

7.1 Frequency of Reports.

(a) Before First Commercial Sale. Prior to First Commercial Sale of any Licensed Product, LICENSEE shall deliver progress reports to LICENSOR annually, within [***] after the end of each calendar year. Such progress reports shall describe for each Licensed Product the LICENSEE's work related to the development and testing of the Licensed Product and its efforts in obtaining any required government approvals for marketing the Licensed Product. Each report will include information sufficient to enable the LICENSOR to determine the LICENSEE's progress in commercially developing the Licensed Product, including a summary of any material work completed by LICENSEE during such calendar year and any material work planned to be conducted by LICENSEE during the subsequent calendar year, with respect to the Licensed Product. In the event LICENSOR, in good faith, does not reasonably deem the information set forth in the report sufficient for determining progress in commercially developing the Licensed Product, LICENSEE shall modify the report accordingly.

(b) Upon First Commercial Sale of a Licensed Product. LICENSEE shall report to LICENSOR the date of First Commercial Sale of a Licensed Product within [***] of its determination of the occurrence thereof.

(c) After First Commercial Sale. After the First Commercial Sale of a Licensed Product and until the payment of all of the milestone payments in Section 6.2 for such Licensed Product, LICENSEE shall deliver a report to LICENSOR within [***] days after December 31 of each year of Net Sales from the Sale of such Licensed Product during the immediately preceding [***] period containing the information concerning the immediately preceding [***] period, as further described in Section 7.2(b).

7.2 Reports and Payments.

(a) LICENSEE shall keep full, true and accurate books and records which shall contain all information that may be reasonably necessary for the purpose of showing LICENSEE's compliance with this Agreement, including without limitation, the amounts payable to LICENSOR hereunder. Said books of account shall be kept at LICENSEE's principal place of business. Said books and the supporting data shall be open to inspection on behalf of LICENSOR upon no less than [***] days written notice during reasonable business hours to the extent necessary for the purpose of verifying LICENSEE's statement of Net Sales provided under Section 7.2(b) or compliance in other respects with this Agreement. Such inspection shall be made not more often than once each calendar year at the expense of LICENSOR by an independent Certified Public Accountant appointed by LICENSOR and to whom LICENSEE has no reasonable objection. LICENSEE shall not be required to retain such records for more than [***] after the date such records have been created. Notwithstanding the foregoing, in the event that the payment due date for any milestone payment herein is determined by the independent Certified Public Accountant to have been due at a date more than [***] earlier than determined by LICENSEE, then unless LICENSEE disputes such determination (pursuant to the process set forth in Section 7.2(a)(i) below), LICENSEE shall, within [***] of such Certified Public Accountant's determination, remit the milestone payment due (if not previously paid) and reimburse LICENSOR for the reasonable, out-of-pocket costs of the audit incurred by LICENSOR. If LICENSEE disputes the Certified Public Accountant's determination and such dispute is resolved against LICENSEE, then Licensee shall, within [***] of the conclusion of such dispute resolution, remit the milestone payment due (if not previously paid) and reimburse LICENSOR for the reasonable, out-of-pocket costs of the audit incurred by LICENSOR.

(i) LICENSEE may dispute a determination made by LICENSOR's Certified Public Accountant pursuant to this Section 7.2(a) by providing written notice to LICENSOR of such dispute within [***] of LICENSEE's receipt of such Certified Public Accountant's determination. If LICENSEE commences such dispute, the disputed determination shall be decided by an independent expert having at least ten (10) years

professional experience in the calculation of net sales of pharmaceutical products. The Parties shall reasonably cooperate with the expert's investigation of the dispute. The decision of the expert shall be final and binding. If the expert rules in favor of LICENSEE, then the costs and expenses of the expert shall be paid by LICENSOR, and if the expert rules in favor of LICENSOR, then the costs and expenses of the expert shall be paid by LICENSEE.

(b) LICENSEE shall, within [***] days after December 31 of each year, to the extent required under Section 7.1(c), deliver to LICENSOR a full and detailed report for the preceding [***] period setting forth the Net Sales of each of LICENSEE and Affiliate, and each Sublicensee of LICENSEE , including at least the following information:

(i) Total amount invoiced for Licensed Product Sold; and
(ii) Deductions applicable as provided in the definition of Net Sales.

ARTICLE 8
Patents and Intellectual Property Rights

8.1 Patent Prosecution. LICENSEE shall have the first right, but not the obligation, to prepare, file, prosecute (including to seek extensions of), maintain and defend all pending patent applications and patents comprising Licensed Patents (including any *inter partes* and opposition proceedings relative to Licensed Patents). LICENSOR shall reasonably cooperate with LICENSEE in the filing, prosecution, maintenance and defense of the Licensed Patents. Such cooperation includes promptly executing all documents, or requiring inventors, subcontractors, employees and consultants and agents of LICENSOR and its Affiliates to execute all documents, and joining as a party in any proceedings, as reasonable and appropriate so as to enable the filing, prosecution, maintenance and defense of any Licensed Patents in any country. If LICENSEE elects not to file, prosecute, maintain and defend any of the Licensed Patents, LICENSOR may (but shall not be obligated to), upon notice to LICENSEE, undertake such filing, prosecution, maintenance and defense of such Licensed Patents at LICENSOR's sole cost and expense, subject to LICENSEE's prior written consent, not to be unreasonably withheld. LICENSEE may prepare, file, prosecute, maintain and defend all Licensed Patents using counsel of its choice. In the event that LICENSEE changes counsel for any reason, LICENSEE shall replace such counsel with new counsel of its choice that is reasonably acceptable to LICENSOR, provided, however, that if LICENSOR rejects the choice of new counsel by LICENSEE [***], then LICENSEE shall be free, in its sole discretion,

to choose an attorney of its choice. LICENSEE shall instruct counsel to promptly provide LICENSOR with copies of all relevant documentation so that LICENSOR may be currently and promptly informed and appraised of the prosecution of Licensed Patents, but in no case [***] in advance of any deadline for filing a response, and so that LICENSOR may comment upon such documentation sufficiently in advance of any final deadline for filing a response, provided, however, that if LICENSOR has not commented upon such documentation [***] to the final deadline for filing a response, LICENSEE shall be free to respond appropriately without waiting for LICENSOR's comments, if any. LICENSEE shall, in good faith, consider all reasonable comments provided by LICENSOR. LICENSEE shall not finally and irrevocably cancel all Valid Claims in a Licensed Patent without LICENSOR's prior written consent, not to be unreasonably withheld, it being understood that abandonment of a Licensed Patent shall not be deemed a cancellation of all Valid Claims in such Licensed Patent if a continuation or similar application claiming priority (directly or indirectly) to such Licensed Patent is filed and which continuation or other application includes one or more Valid Claims of the abandoned Licensed Patent. Both parties hereto shall keep this documentation in confidence in accordance with the provisions of Article 12 herein.

8.2 Costs. Except as provided in Section 8.1, all costs, including without limitation attorneys' fees, incurred by LICENSEE for preparing, filing, prosecuting, copying LICENSOR, and maintaining and defending the Licensed Patents, whether incurred prior to or after the Effective Date, shall be borne by LICENSEE. The costs of all oppositions initiated or defended by LICENSEE shall be considered prosecution expenses and also shall be borne by LICENSEE.

8.3 Duration of Obligation. LICENSEE's obligation to pay costs as set forth in this Article 8 shall continue until [***] after receipt by either Party of a Notice of Termination or expiration of this Agreement.

8.4 Communication between Parties. Each Party shall promptly inform the other as to all matters that come to its attention that reasonably could be expected to materially adversely affect the prosecution, maintenance or defense of the Licensed Patents.

ARTICLE 9
Patent Marking

Patent Marking. LICENSEE shall mark the Licensed Products with a patent notice referring to the Licensed Patents in accordance with 35 U.S.C. §287.

ARTICLE 10
Enforcement of the Licensor's Intellectual Property

10.1 Third Party Infringement. Each Party shall inform the other Party promptly in writing of any alleged infringement of the Licensed Patents by a Third Party and of any available evidence thereof.

10.2 During the term of this Agreement, LICENSEE shall have the initial right, but not the obligation, to prosecute at its own expense any infringement of the Licensed Patents. If LICENSEE prosecutes any infringement, LICENSOR agrees that LICENSEE may include LICENSOR as a co-plaintiff in any such suit, and LICENSOR agrees to join in any such suit, without any expense to LICENSOR. The total cost of any infringement action commenced or defended by LICENSEE shall be borne by LICENSEE and LICENSEE shall keep all recovery or damages derived therefrom.

10.3 If after [***] of having been notified of any alleged infringement of the Licensed Patents or such shorter time proscribed by law, LICENSEE:

(a) has been unsuccessful in persuading the alleged infringer to desist, or

(b) has not brought and has not been diligently prosecuting an infringement action, or

(c) if LICENSEE notifies LICENSOR at any time prior thereto of its intention not to bring suit against any alleged infringer, then, and in those events only, and subject to the rights of other co-owners of the Licensed Patents, LICENSOR shall have the right, but not the obligation, to prosecute at its own expense any infringement of the Licensed Patents, and LICENSOR may, for such purposes, require joinder of LICENSEE as involuntary parties to the litigation, provided, however, that such right to bring an infringement action remains in effect only for so long as the license granted herein remains exclusive. No settlement, consent judgment or other voluntary final disposition of the suit may be entered into without the consent of LICENSEE which consent shall not unreasonably be withheld, conditioned or delayed. LICENSOR shall indemnify LICENSEE against any order for costs that may be made against LICENSEE in such proceedings or any action arising there from, including without limitation, abuse of process and malicious prosecution. The total cost of any infringement action commenced or defended by LICENSOR shall be borne by LICENSOR and, subject to the rights of other co-owners of the Licensed Patents, LICENSOR shall keep all recovery or damages for past infringement derived therefrom.

10.4 In any infringement suit as either Party may institute to enforce the Licensed Patents pursuant to this Agreement, the other Party hereto shall, at the request and expense of the Party initiating such suit, cooperate in all respects and, to the extent possible, have its employees testify when requested and make available relevant records, papers, information, samples, specimens, and the like.

ARTICLE 11
Indemnification and Insurance

11.1 LICENSOR's Right to Indemnification. LICENSEE shall indemnify, defend and hold harmless LICENSOR, its directors, trustees, officers, faculty, employees, students, and agents and their respective successors, heirs and assignees (the "Indemnitees"), against any and all claims, suits, losses, liabilities, damages, costs, fees and expenses, including reasonable attorneys' fees and expenses, incurred by or imposed upon any of the Indemnitees in connection with any claims, suits, actions or demands of Third Parties ("Claims") asserted against them to the extent arising out of any theory of liability (including without limitation actions in the form of tort, product liability, negligence, warranty, strict liability, violation of government regulation, infringement of patent or other proprietary rights, breach of any representations or warranties by LICENSEE, failure by LICENSEE to perform any of its obligations under this Agreement, trademark or trade dress infringement arising out of the use of any trademark or trade dress by LICENSEE in connection with the Sale of Licensed Product, copyright infringement arising out of any material published by LICENSEE, and regardless of whether such action has any factual basis) concerning any Licensed Product that is made, used, Sold, distributed, supplied or provided, or any Licensed Method performed, pursuant to any right or license granted under this Agreement or any Sublicense, except to the extent that any Claims shall have arisen from the gross negligence or willful misconduct of any LICENSOR Indemnitee or the breach of this Agreement by any LICENSOR Indemnitee.

LICENSOR Indemnitee shall promptly notify LICENSEE of any Claim with respect to which such LICENSOR Indemnitee is seeking indemnification hereunder, upon becoming aware thereof, and permit LICENSEE at LICENSEE's cost to defend against such Claim and shall cooperate in the defense thereof. Neither such LICENSOR Indemnitee nor LICENSEE shall enter into, or permit, any settlement of any such Claim without the express written consent of the other Party, which shall not unreasonably be withheld, conditioned or delayed. Such LICENSOR Indemnitee may, at its option and expense, have its own counsel participate in any proceeding which is under direction of LICENSEE and will cooperate with LICENSEE and its insurer in the disposition of any such matter; provided, however, that if LICENSEE shall not defend such Claim, such LICENSOR Indemnitee shall have the right to defend such Claim itself and recover from LICENSEE all reasonable attorneys' fees and expenses incurred by it during the course of such defense.

11.2 Failure to Defend. With respect to any Claim which pursuant to Section 11.1, LICENSEE shall fail to defend, LICENSEE shall not thereafter question the liability of LICENSEE hereunder to the Indemnitee for any loss (including reasonable counsel fees and other reasonable expenses of defense) arising from such Claim.

11.3 Claims Period. Notwithstanding the foregoing, the indemnification provisions of Section 11.1 hereof shall survive termination or expiration of this Agreement, but only with respect to claims which arose from acts or circumstances which occurred prior to termination.

11.4 Insurance. LICENSEE shall obtain and carry in full force and effect, or shall provide through self-insurance, commercial general liability insurance, including product liability and errors and omissions insurance, which shall protect LICENSEE and Indemnitees with respect to events covered by Section 11.1 above. Such insurance (i) shall list LICENSOR as an additional insured thereunder, (ii) shall be endorsed to include product liability coverage, and (iii) shall require [***] written notice to be given to LICENSOR prior to any cancellation or material change thereof. The limits of such insurance shall be consistent with limits as are customary in the U.S. pharmaceutical industry for the activities to be conducted by LICENSEE under this Agreement. LICENSEE shall provide LICENSOR with Certificates of Insurance evidencing compliance with this Section. LICENSEE shall continue to maintain such insurance or self-insurance after the expiration or termination of this Agreement during any period in which LICENSEE or any SUBLICENSEE continues to make, use, or Sell a product that was a Licensed Product under this Agreement, and thereafter for a period of [***].

ARTICLE 12
Confidentiality Provisions

12.1 Confidential Information. All information disclosed by one Party to another Party hereunder ("Confidential Information") shall be maintained in confidence by the receiving Party and shall not be disclosed to any Third Party or used for any purpose other than performance of its obligations and exercise of its rights under this Agreement ("Permitted Purpose") without the prior written consent of the disclosing Party for the term of this Agreement and a period of [***] thereafter, except to the extent that such information is:

(i) now in the public domain or subsequently enters into the public domain through no fault of the receiving Party;

(ii) known by the receiving Party at the time of its receipt and not through a prior disclosure by the disclosing Party on a confidential basis as documented by the receiving Party's written records;

(iii) developed by or for the receiving Party independently of Confidential Information received from the disclosing Party as documented by the receiving Party's written records;

(iv) subsequently disclosed to the receiving Party by a Third Party who may lawfully do so and is not under an obligation of confidentiality to the disclosing Party;

(v) disclosed to governmental or other regulatory agencies in order to obtain patents or to gain or maintain approval to conduct clinical trials or to market and Sell Licensed Products or perform Licensed Methods, but such disclosure may be only to the extent reasonably necessary to obtain patents or authorizations; and/or

(vi) deemed necessary by LICENSEE to be disclosed to Sublicensees, agents, consultants, and/or other Third Parties for the development and/or commercialization of Licensed Products and/or in connection with a licensing transaction and/or a permitted assignment under this Agreement, and/or loan, financing, or investment and/or acquisition, merger, consolidation, or similar transaction (or for such entities to determine their interest in performing such activities) in each case on the condition that any third parties to whom such disclosures are made agree to be bound by confidentiality and non-use obligations substantially similar to those contained in this Agreement.

Confidential Information pertaining to the Licensed Patents shall be deemed Confidential Information of both Parties.

12.2 Each Party shall keep in confidence and shall each use its Commercially Reasonable Efforts to cause its respective officers, directors, employees, professors, researchers, students, trustees, regents, agents, consultants, clinical research associates and clinical investigators to whom it is permitted to disclose information pursuant to the terms of this Agreement to retain in confidence all Confidential Information of the disclosing Party and not use such Confidential Information for any purpose other than the Permitted Purpose. Without limiting the foregoing, each Party shall exercise the same degree of diligence and care with respect to the Confidential Information of the disclosing Party as it exercises with respect to its own confidential and proprietary information.

12.3 If a Party is required by judicial or administrative process to disclose Confidential Information that is subject to the non-disclosure provisions of this Article 12, such Party shall promptly inform the other Party of the disclosure that is being sought in order to provide the other Party an opportunity to challenge or limit the disclosure obligations. Confidential Information that is disclosed by judicial or administrative process shall remain otherwise subject to the confidentiality and non-use provisions hereof, and the disclosing Party, pursuant to law or court order, shall take all steps reasonably necessary, including without limitation obtaining an order of confidentiality, to ensure the continued confidential treatment of such Confidential Information.

12.4 Either Party may disclose the terms of this Agreement to the extent required, in the reasonable opinion of such Party's legal counsel, to comply with applicable laws, including without limitation the rules and regulations promulgated by the United States Securities And Exchange Commission. Notwithstanding the foregoing, prior to such disclosure, the Parties will consult with one another on the terms of this Agreement that are to be redacted in making any such disclosure. If a Party discloses this Agreement or any of the terms hereof in accordance with this Section, such Party agrees, at its own expense, to seek confidential treatment of portions of this Agreement or such terms as may be reasonably requested by the other Party.

12.5 Publicity. No Party will make any media release or other public announcement relating to or referring to this Agreement without the prior written consent of the other Party.

ARTICLE 13
Representation or Warranties; Disclaimer

13.1 Warranties. LICENSOR represents and warrants to Licensee that:

(a) LICENSOR has full right and authority to enter into this Agreement and to grant the licenses and other rights to LICENSEE as herein described;

(b) to the best of LICENSOR's knowledge after reasonably due inquiry, the execution, delivery and performance of this Agreement does not conflict with any other agreement, contract, instrument or understanding, oral or written, to which LICENSOR is a party, or by which it is bound; and

(c) none of LICENSOR or any of its Affiliates has entered into any agreement or otherwise licensed, granted, assigned, transferred, conveyed or otherwise encumbered or disposed of any right, title or interest in or to any of the Licensed Patents that would conflict with or impair the scope of any rights or licenses granted hereunder.

13.2 Except as may otherwise be expressly set forth in this Agreement, LICENSOR makes no representation and extends no warranties of any kind concerning the Licensed Patents, express or implied, including without limitation warranties of merchantability, fitness for a particular purpose, noninfringement, validity of Licensed Patents claims, whether issued or pending, and the absence of latent or other defects, whether or not discoverable. Specifically, and not to limit the foregoing, LICENSOR makes no warranty or representation (i) regarding the validity or scope of the Licensed Patents, (ii) that the exploitation of the Licensed Patents or any Licensed Product or Licensed Method will not infringe any patents or other intellectual property rights of LICENSOR or of a Third Party and (iii) that the Licensed Products will be safe or non-hazardous.

13.3 In no event shall LICENSOR, its trustees, directors, officers, employees and Affiliates, under any circumstances, be liable or obligated in any manner for any special, incidental, consequential or exemplary damages arising out of or related to this Agreement or the transactions contemplated hereunder, even if LICENSOR is informed in advance of the possibility of such damages occurring. This limitation is separate and independent of any other remedy limitations and shall not fail if such other limitation on remedy fails.

13.4 LICENSEE hereby represents and warrants to LICENSOR that LICENSEE has the right, power and authority to enter in to this Agreement and to fully perform all of its obligations hereunder; and entering into this Agreement does not violate any agreement or obligation existing between LICENSEE and any Third Party.

ARTICLE 14
Assignment

LICENSEE may not assign, voluntarily, by operation of law, or otherwise, this Agreement without LICENSOR's prior written consent, and any attempt to do so without such consent will be void and of no effect, except that LICENSEE may assign its rights and obligations under this Agreement without LICENSOR's consent to an Affiliate of LICENSEE or to a successor of LICENSEE in connection with the merger, consolidation, or sale of all or substantially all of LICENSEE's assets or equity or that portion of its business to which this Agreement relates, which assignment shall be disclosed to LICENSOR by written notice as soon as possible, but in no event no longer than [***] after the assignment is effective.

ARTICLE 15
Compliance with the Law

15.1 LICENSEE shall use Commercially Reasonable Efforts to comply with all commercially material local, state, federal, and international laws and regulations relating to the development, manufacture, use and Sale of Licensed Products.

15.2 LICENSEE acknowledges that it is subject to the United States laws and regulations controlling the export of technical data, computer software, laboratory prototypes and other commodities. The transfer of such items may require a license from the cognizant agency of the United States Government and written assurances by LICENSEE that LICENSEE shall not export data or commodities to certain foreign countries without prior approval of such agency. LICENSOR neither represents that a license shall not be required nor that, if required, it shall be issued.

ARTICLE 16
Term and Termination

16.1 Term of License. Unless sooner terminated pursuant to another provision of this Agreement, this Agreement shall continue in full force and effect and shall have a term expiring upon the last expiration or last final invalidation of the Licensed Patents, including any extension or reissues thereof.

16.2 Voluntary Termination by LICENSEE. LICENSEE shall have the right to terminate this Agreement, for any reason upon at least sixty (60) days' prior written notice to LICENSOR, such notice to state the date, at least sixty (60) days in the future, upon which termination is to be effective.

16.3 Termination for Default. LICENSOR may terminate this Agreement and the license granted hereunder or render this license non-exclusive, effective upon written notice from LICENSOR to LICENSEE, for any of the following:

(a) If LICENSEE does not make a payment due hereunder and fails to cure such nonpayment (including the payment of interest) within thirty (30) days after the date of notice of such nonpayment by LICENSOR;

(b) If LICENSEE defaults in its obligations to procure and maintain insurance in accordance with Section 11.4 and does not cure such failure within forty-five (45) days after the date of notice of such failure by LICENSOR; or

(c) If LICENSEE shall become insolvent, shall make an assignment for the benefit of creditors, or shall have a petition in bankruptcy filed for or against it that is not dismissed within sixty (60) days of filing or if a receiver, trustee, or any similar officer is appointed to take possession, custody, or control of all or substantially all of LICENSEE's assets or property or if LICENSEE adopts any resolution of its Board of Directors or stockholders for the purpose of effecting any of the foregoing.

16.4 Except as provided for in Section 16.3(a) through 16.3(c) above, if LICENSEE materially defaults in the performance of any material obligations under this Agreement (including its obligations under Article 5) and the default has not been cured within [***] after the date of written notice of such default by LICENSOR, LICENSOR may terminate this Agreement and the license granted hereunder or render this license non-exclusive. Such termination rights shall be in addition to and not in substitution for any other remedies that may be available to LICENSOR. Termination pursuant to this Section 16.4 shall not relieve the LICENSEE from liability and damages to LICENSOR for breach of this Agreement.

16.5 If LICENSEE in good faith disagrees as to whether there has been a default under Section 16.3 or Section 16.4, (a) LICENSEE shall provide written notice to LICENSOR that it disputes such claim of default within [***] of receipt of the written notice of default from LICENSOR, (b) LICENSEE may contest the allegation of default in a court of competent jurisdiction, (c) from the date of receipt of such notice by LICENSOR until such time as the dispute has become finally settled, the running of the time periods as to which LICENSEE must cure such alleged default shall be suspended, and (d) LICENSOR shall not have the right to terminate this Agreement unless and until the existence of such default has been determined. It is understood and acknowledged that during the pendency of such a dispute, all of the terms and conditions of this Agreement shall remain in effect and the Parties shall continue to perform all of their respective obligations hereunder.

16.6 Waiver by either Party of a single default or a succession of defaults shall not deprive such Party of any right to terminate this Agreement arising by reason of any subsequent default.

16.7 Patent Challenge on Sublicensed Patents. LICENSEE shall include provisions in all agreements granting Sublicenses of LICENSEE's rights hereunder (excluding Sublicenses with Third Party Contractors) providing that if the Sublicensee undertakes a challenge in a legal or administrative proceeding to the validity, patentability or enforceability of any of the Licensed Patents or otherwise opposing in a legal or administrative proceeding any of the Licensed Patents (each a "Patent Challenge") with respect to which the Sublicensee is Sublicensed, LICENSEE shall be permitted to terminate such Sublicense. If a Sublicensee of LICENSEE undertakes a Patent Challenge of any such Licensed Patent under which such Sublicensee is Sublicensed, then LICENSEE within [***] after receipt of notice from LICENSOR of such Patent Challenge demanding termination of the Sublicense shall terminate the applicable Sublicense agreement. If LICENSEE fails to so terminate such Sublicense agreement, LICENSOR may terminate this Agreement.

16.8 Effect of Termination.

(a) Termination of Licensee's Rights. Upon termination of this Agreement, the license granted hereunder shall terminate and all of the Parties' rights granted under this Agreement shall immediately terminate. Any such termination shall not relieve either Party from any obligations accrued prior to the date of such termination. For clarity, termination of LICENSEE's rights under this Agreement shall not affect LICENSEE's rights as a co-owner of the Licensed Patents or rights obtained from other co-owners of the Licensed Patents.

(b) Upon termination, each Party shall promptly return to the other Party, or destroy, all Confidential Information of the other Party provided to it under this Agreement, regardless of medium, including without limitation, magnetically recorded writings or legible and readable copies thereof, which are in its possession, custody, or control, provided, however, a Party shall not be obligated to return or destroy Confidential Information of the other Party which such Party can show that it independently developed or which is Confidential Information of both LICENSOR and LICENSEE. Notwithstanding the foregoing, each Party may retain one copy of the Confidential Information of the other Party in its confidential legal files for the purpose of establishing the extent of the disclosure and its obligations hereunder.

(c) The provisions under which this Agreement may be terminated will be in addition to any and all other legal remedies which either Party may have for the enforcement of any and all terms hereof, and do not in any way limit any other legal remedy such Party may have.

(d) The following provisions of this Agreement shall survive termination: Articles 1, 11, 12, 16.8, and 17 will survive the termination of this Agreement.

ARTICLE 17
Miscellaneous

17.1 Notice. Any notices required or permitted under this Agreement shall be in writing, shall specifically refer to this Agreement, and shall be sent by hand, recognized national overnight courier, confirmed facsimile transmission, confirmed electronic mail, or registered or certified mail, postage prepaid, return receipt requested, to the following addresses or facsimile numbers of the Parties:

If to GEORGETOWN:

By courier:

Vice President
Office of Technology Commercialization
Georgetown University
Harris Building, Suite 1500
3300 Whitehaven Street, N.W.
Washington, DC 20007
Fax: 202-687-3111

By United States Postal Service:

Vice President
Office of Technology Commercialization
Georgetown University
Box 571408
Washington, DC 20057-1408

If to X4: Attn: John Celebi
Chief Operating Officer
X4 Pharmaceuticals, Inc.
784 Massachusetts Avenue, Suite 140
Cambridge MA 02139

All notices under this Agreement shall be deemed effective upon receipt. A Party may change its contact information immediately upon written notice to the other Parties in the manner provided in this Section.

17.2 Governing Law. This Agreement and all disputes arising out of or related to this Agreement (whether in contract, tort or otherwise), and the validity, performance, interpretation, enforcement, breach or termination hereof, and any remedies relating thereto, shall be governed by and construed in all respects under, the laws of the State of New York without giving effect to its conflicts of law principles.

17.3 Force Majeure. No Party shall be liable or responsible hereunder by reason of any failure or delay in the performance of its obligations hereunder on account of strikes, shortages, riots, insurrection, fires, flood, storm, explosions, acts of God, war, governmental action, labor conditions, earthquakes, or any other cause which is beyond the reasonable control of such Party.

17.4 Further Assurances. Each Party agrees to cooperate fully with the other Parties and to execute such further instruments, documents and agreements and to give such further written assurances, as may be reasonably requested by the other Party, to better evidence and reflect the transactions contemplated hereby, and to carry into effect the intent and purposes of this Agreement.

17.5 Amendment and Waiver. This Agreement may be amended, supplemented, or otherwise modified only by a writing that refers explicitly to this Agreement and that is signed on behalf of all Parties. No term or provision hereof will be considered waived by a Party, and no breach excused by a Party, unless such waiver or consent is in writing signed on behalf of the Party against whom the waiver is asserted. No consent by either Party to, or waiver of, a breach by either Party, whether express or implied, will constitute a consent to, waiver of, or excuse of any other different or subsequent breach by a Party.

17.6 Binding Effect. This Agreement shall be binding upon and inure to the benefit of the Parties and their respective permitted successors and assigns.

17.7 Non-Use of LICENSOR Name. LICENSEE and Sublicensees shall not use the name of "Georgetown University," or any variation, adaptation, or abbreviation thereof, or of any of its trustees, officers, faculty, students, employees, or agents, or any trademark, service mark, seal, mascots, crests or logo owned by GEORGETOWN or any of its personnel, or any adaptation of them, or any terms of this Agreement in any promotional, advertising or sales literature or, except as permitted by Section 12.4, other public announcement or disclosure without the prior written consent of Georgetown. The foregoing notwithstanding, without the consent of GEORGETOWN, LICENSEE may state that it is licensed by LICENSOR under one or more of its patents and/or patent applications comprising the Licensed Patents.

17.8 Equitable Relief. Each Party agrees that certain breaches of this Agreement by the other Party may result in irreparable harm to the other Party, the extent of which would be difficult and/or impracticable to assess, and that money damages would not be an adequate remedy for such breach. Accordingly, the other Party shall be entitled to seek immediate equitable and other provisional relief, including without limitation specific performance of this Agreement and a temporary restraining order and/or preliminary and/or permanent injunction, as a remedy for such breach in addition to any and all other remedies available to a Party at law or in equity and without prejudice to any such other remedies.

17.9 Relationship of Parties. Each Party's relationship with the other is that of an independent contractor, and nothing in this Agreement is intended to, or should be construed to, create a partnership, agency, joint venture or employment relationship. No Party is authorized to make any representation, contract or commitment on behalf of the other.

17.10 Severability. In the event that any provision of this Agreement shall be unenforceable or invalid under any applicable law or be so held by applicable court decision, such unenforceability or invalidity shall not render this Agreement unenforceable or invalid as a whole, and, in such event, such provisions shall be changed and interpreted so as to best accomplish the objectives of such unenforceable or invalid provision within the limits of applicable law or applicable court decisions.

17.11 Headings. The paragraph headings appearing in this Agreement are inserted only as a matter of convenience and in no way define, limit, construe or describe the scope or extent of such paragraph or in any way affect such paragraph.

17.12 Counterparts. This Agreement may be signed in two or counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. If this Agreement is executed in counterparts, no

signatory hereto shall be bound until all of the Parties named below have duly executed or caused to be duly executed a counterpart of this Agreement. A signature on a copy of this Agreement received by either Party by facsimile or PDF e-mail is binding upon the other Party as an original. The Parties agree that a photocopy of such facsimile or PDF e-mail may also be treated by the Parties as a duplicate original.

17.13 Entire Agreement. This Agreement constitutes the entire agreement between the Parties with respect to its subject matter and supersedes all prior agreements or understandings between the Parties relating to its subject matter.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their duly authorized representatives.

GEORGETOWN UNIVERSITY:		X4 PHARMACEUTICALS, INC.:	
By:	/s/ Claudia Cherney Stewart	By:	/s/ John Celebi
Name:	Claudia Cherney Stewart, Ph.D.	Name:	John Celebi
Title:	Vice President, Office of Technology Commercialization	Title:	Chief Operating Officer
Date:	12/13/2016	Date:	12/13/2016

Portions of this Exhibit, indicated by the mark "[***]," were omitted and have been filed separately with the Securities and Exchange Commission pursuant to the Registrant's application requesting confidential treatment pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

Exhibit 10.8

BIDMC Agreement No: A9456
BIDMC Case No: 1952

BETH ISRAEL DEACONESS MEDICAL CENTER
EXCLUSIVE LICENSE AGREEMENT

This License Agreement ("Agreement") is made as of the date immediately above the signatures of the Parties below ("Effective Date") between **Beth Israel Deaconess Medical Center**, a not-for-profit Massachusetts corporation, with a principal place of operation at 330 Brookline Avenue, Boston, Massachusetts 02215 ("BIDMC"), and **X4 Pharmaceuticals, Inc.** a corporation, having a principal place of business at 784 Massachusetts Avenue, Suite 140, Cambridge MA 02139 ("Licensee"), each referred to individually as a "Party" and collectively as the "Parties".

RECITALS

BIDMC, as a center for patient care, research and education, owns certain Patent Rights (defined below) through assignment and desires to benefit the public by disseminating the results of its research through the grant of a license of those Patent Rights to Licensee for the commercial development, manufacture, distribution and use of Products and Processes (defined below).

Licensee has the capability to commercially develop, manufacture, distribute and use Products and Processes for public use and benefit and desires to receive a license to such Patent Rights.

For good and valuable consideration, the sufficiency of which the Parties acknowledge, the Parties agree as follows:

1. DEFINITIONS

The following terms have the following meanings:

1.1 "Affiliate" with respect to either Party, means any corporation or other legal entity other than that Party, in whatever country organized, that directly or indirectly controls, is controlled by or is under common control with that Party. For the purposes of this definition, the term "control" means (a) for Licensee, (i) beneficial ownership of at least fifty percent (50%) of the voting securities of a corporation or other business organization with voting securities or (ii) a fifty percent (50%) or greater interest in the net assets or profits of a partnership or other business organization without voting securities; and (b) for BIDMC, the power, direct or indirect, to elect or appoint fifty percent (50%) or more of the directors or trustees, or to cause direction of management and policies, whether through the ownership of voting securities, by contract or otherwise.

1.2 "Claim" means any pending or issued claim of any Patent Right that has not been permanently revoked, nor held unenforceable or invalid by a decision of a court or other governmental agency of competent jurisdiction that is unappealable or unappealed in the time allowed for appeal.

1.3 "Distributor" means any entity to whom Licensee, a Licensee Affiliate or a Sublicensee has granted, express or implied, the right to Sell and/or distribute any Product or Process on behalf of Licensee, such Licensee Affiliate or such Sublicensee, without granting such entity the right to make, have made, use or have used. A Distributor shall not be considered a Sublicensee under this Agreement.

1.4 "Field" means all fields of use.

1.5 "Patent Costs" means all costs and expenses of any kind, including attorneys' fees, associated with the preparation, filing, prosecution and maintenance of all Patent Rights.

1.6 "Patent Challenge" means a challenge in a legal or administrative proceeding to the validity, patentability or enforceability of any of the Patent Rights or otherwise opposing in a legal or administrative proceeding any of the Patent Rights.

1.7 "Patent Rights" means the United States and international patents, patent applications and provisional applications listed on Appendix A, and the patents resulting from any of the foregoing applications; and any divisions, continuations, and continuations-in-part (but only to the extent the claims are directed to subject matter specifically described in the patent applications listed in Appendix A), including foreign patent applications or patents that are equivalent to the foregoing; and any reissues, reexaminations or extensions of any of the foregoing; and any and all patents and patent applications claiming priority benefit from or to any of the foregoing, and all patents and patent applications from which any of the foregoing claim priority benefit from or to.

1.8 "Process" means any process, method or service the use or performance of which, in whole or in part, is (a) covered by any Claim in the Patent Rights; or (b) which, absent the license granted hereunder, would infringe one or more Claims of the Patent Rights.

1.9 "Product" means

(a) any product (including any apparatus or kit) that in whole or through a component part thereof, the manufacture, use, practice or Sale of which is covered by one or more Claims of the Patent Rights or, in the absence of a license from BIDMC, would infringe one or more Claims of the Patent Rights; or

(b) any product (including any apparatus or kit) that is developed, produced or manufactured with, or used pursuant to, a Process as defined in Section 1.9.

1.10 "Related Information" means any research data, designs, formulae, process information and other information pertaining to any invention claimed in the Patent Rights owned by BIDMC, for which there is no obligation to any third party, and (i) is known as of the Effective Date and disclosed to the BIDMC Technology Ventures Office by Dr. Mier; and (ii) is in addition to the disclosures in the patent application for the Patent Rights. Licensee shall maintain all such Related Information as the Confidential Information of BIDMC.

1.11 "Sale" (and "Sell" and "Sold" as the case may be) shall mean to sell or have sold, to lease or have leased, to import or have imported or otherwise to transfer or have transferred a Product or Process for consideration (in the form of cash or otherwise), and further in the case of a Process to use or perform such Process in exchange for consideration for the benefit of a third party.

1.12 "Sublicensee" means any sublicensee of the rights granted to Licensee pursuant to Section 2.1(a). Sublicensee shall not include Distributors.

1.13 "Term" means the term of this Agreement, which shall commence on the Effective Date and shall remain in effect until the date on which all issued patents and filed patent applications within the Patent Rights have expired or been permanently abandoned, unless this Agreement is terminated earlier as provided herein.

1.14 "Territory" means worldwide.

2. LICENSE

2.1 Grant of License.

(a) Subject to the terms of this Agreement and BIDMC's rights in the Patent Rights, BIDMC hereby grants to Licensee and its Affiliates in the Field in the Territory for the Term, an exclusive, royalty-free, fully paid-up (upon payment of the License Issue Fee pursuant to Section 3.1) license under BIDMC's rights in the Patent Rights to make, have made, use, have used, Sell and have Sold Products and Processes.

(b) Subject to the terms of this Agreement and specifically Section 2.2, BIDMC grants Licensee the right to grant sublicenses under the rights granted in Section 2.1(a) and Section 2.1(c), provided that in each case Licensee shall be responsible for the performance of any obligations of Sublicensees relevant to this Agreement as if such performance were carried out by Licensee itself, which right to grant sublicenses will be exclusive with respect to the rights granted in Section 2.1(a) and will be non-exclusive with respect to the rights granted in Section 2.1(c).

(c) Subject to the terms of this Agreement, BIDMC hereby grants to Licensee and its Affiliates (subject to Section 2.1(e)) in the Field in the Territory for the

Term, a nonexclusive royalty-free, fully paid-up (upon payment of the License Issue Fee pursuant to Section 3.1) right to use Related Information disclosed by BIDMC to Licensee to develop, make, have made, use, have used, Sell and have Sold and otherwise commercialize the Products and Processes.

(d) The licenses granted in Sections 2.1(a) and 2.1(c) above include:

(i) the right to grant to the purchaser, user or consumer of Products the right to use such purchased Products in a method coming within the scope of Patent Rights, and such purchasers, users and consumers will not be considered Sublicensees hereunder; and

(ii) the right to grant a Distributor the right to Sell (but not to make, have made, use or have used) such Products and/or Processes for or on behalf of Licensee, Licensee Affiliates and Sublicensees in a manner consistent with this Agreement.

(e) The foregoing license grants to Licensee Affiliates are subject to each such

Affiliate assuming the same obligations as those of Licensee and becoming subject to the same terms and conditions under this Agreement; and further provided that Licensee shall be responsible for the performance of all of such obligations and for compliance with all of such terms and conditions by Affiliate.

2.2 Sublicenses. Each sublicense granted hereunder shall be consistent with and comply with all terms of this Agreement, and shall incorporate terms and conditions sufficient to enable Licensee to comply with this Agreement. Licensee shall provide to BIDMC a fully signed copy of all sublicense agreements and amendments thereto, including all exhibits, attachments and related documents, within [***] of executing the same, excluding sublicenses granted to third parties that are clinical research organizations, contract manufacturers, contract laboratory organizations, and other similar third parties that support the development and commercialization of Products and/or Processes on a fee-for-service basis as Sublicensees hereunder ("Third Party Contractors"). Licensee will be permitted to redact from such fully signed copies proprietary and other sensitive information to the extent that such redaction does not impact BIDMC's ability to confirm Licensee's compliance with this Agreement. Notwithstanding the foregoing, Licensee will disclose to BIDMC the identity of the Sublicensee (excluding, for avoidance of doubt, Third Party Contractors). Any sublicense which is not in accordance with the forgoing provisions shall be null and void. Any Sublicensee and Distributor agreement under this Agreement shall provide for termination of any sublicense granted hereunder upon termination of this Agreement for any reason. Upon termination of this Agreement for any reason, any Sublicensee and Distributor not then in default under its agreement shall have the right to seek a license from BIDMC. BIDMC agrees to negotiate such licenses in good faith under reasonable terms and conditions consistent with this Agreement.

Upon Licensee's request during the term of this Agreement, BIDMC agrees to provide, on a timely basis, a letter to an existing or potential Sublicensee specifically named by Licensee stating that, in the event of termination of this Agreement, BIDMC will grant a license to Sublicensee under terms and conditions to be no less favorable as a whole than those granted to Sublicensee by Licensee, provided that Sublicensee is not in default of its sublicense agreement with Licensee at the time such license is to be granted by BIDMC and provided that BIDMC shall not assume any obligation of Licensee to Sublicensee under such agreement, except for the license granted. Licensee's right to request and Sublicensee's right to acquire such letter are specifically conditioned on BIDMC's review of the final, executed sublicense agreement between Sublicensee and Licensee and on BIDMC's conclusion, at its reasonable discretion, that such sublicense agreement is reasonable and in the best interests of the commercialization of the Patent Rights.

2.3 Retained Rights; Requirements. Any and all licenses granted hereunder are subject to:

(a) the royalty-free right of BIDMC and BIDMC's Affiliates and of academic, government and not-for-profit institutions to make, use and/or practice the technology or method described and/or claimed in the Patent Rights solely for non-commercial research purposes; and

(b) for Patent Rights supported by federal funding, the rights, conditions and limitations imposed by U.S. law (see 35 U.S.C. § 202 et seq. and regulations pertaining thereto), including without limitation:

(i) the royalty-free non-exclusive license granted to the U.S. government; and

(ii) to the extent required by the National Institutes of Health (as the federal funding agency), the requirement that any Products (if they qualify as "subject inventions" under 35 U.S.C. § 204) used or sold in the United States shall be manufactured substantially in the United States.

If Licensee or any of its Affiliates or Sublicensees wishes to obtain a waiver of the requirement under Section 2.3(b)(ii), BIDMC agrees to reasonably cooperate with Licensee or such Affiliates or Sublicensees in obtaining such waiver, including by directly filing for such waiver if required by applicable law and regulations.

2.4 No Additional Rights. Nothing in this Agreement shall be construed to grant Licensee an express or implied license under any patent, technology or intellectual property right owned solely or jointly by BIDMC, other than the Patent Rights and Related Information expressly licensed hereunder.

3. PAYMENTS

3.1 License Issue Fee. Licensee shall pay BIDMC a non-refundable, non-creditable license issue fee in the sum of twenty thousand dollars ($20,000) ("License Issue Fee") within twenty (20) business days of the Effective Date of this Agreement. For avoidance of doubt, upon payment of the License Issue Fee, the licenses and rights granted to Licensee under Section 2.1 shall be fully paid-up and royalty-free.

3.2 Form of Payment. All payments due under this Agreement shall be drawn on a United States bank and shall be payable in United States dollars. Each payment shall reference this Agreement and identify the obligation under this Agreement that the payment satisfies. Conversion of foreign currency to U.S. dollars shall be made at the conversion rate existing in the United States, as reported in The Wall Street Journal, on the last working day of the applicable Reporting Period. Such payments shall be without deduction of exchange, collection or other charges, and, specifically, without deduction of withholding or similar taxes or other government imposed fees or taxes. Checks for all payments due to BIDMC under this Agreement shall be made payable to BIDMC and addressed as set forth in Section 12.2. Payments via wire transfer should be made as follows:

[***]

3.3 Overdue Payments. The payments due under this Agreement shall, if overdue, bear interest at two percentage Points above the Prime Rate of interest as reported in the Wall Street Journal on the date payment is due until payment thereof, not to exceed the maximum permitted by law. Any such overdue payments when made shall be accompanied by all interest so accrued. Payment and acceptance, in whole or in part, of interest and the overdue payment shall not preclude BIDMC from exercising any other rights it may have as a consequence of the lateness of any payment.

3.4 Consequences of a Patent Challenge. In the event that (i) Licensee, any of its Affiliates, or any Sublicensee brings a Patent Challenge against BIDMC, or (ii) Licensee, any of its Affiliates, or any Sublicensee assists another party in bringing a Patent Challenge against BIDMC (except as required under a court order or subpoena), and (iii) BIDMC does not choose to exercise its rights to terminate this Agreement pursuant to Section 9.4, then if such a Patent Challenge is successful, Licensee will have no right to recoup any monies paid during the period of challenge.

4. PATENT PROSECUTION AND MAINTENANCE

4.1 Prosecution. Provided that Licensee seeks and maintains the strongest and broadest patent claims reasonably practicable and uses patent attorneys acceptable to BIDMC, such acceptance not to be unreasonably withheld, BIDMC appoints Licensee as its exclusive agent to prepare, file, prosecute (including to seek extensions of), maintain and defend (including inter partes and opposition proceedings) all of the Patent Rights

during the Term. Licensee shall copy BIDMC on all patent prosecution documents and give BIDMC reasonable opportunities to advise Licensee on such filing, prosecution, maintenance and defense. BIDMC shall reasonably cooperate with Licensee in the filing, prosecution, maintenance and defense of the Patent Rights. Such cooperation includes promptly executing all documents, or requiring inventors, subcontractors, employees and consultants and agents of BIDMC and its Affiliates to execute all documents, and joining as a party in any proceedings, as reasonable and appropriate so as to enable the filing, prosecution, maintenance and defense of any Patent Right in any country. In the event Licensee desires to abandon the prosecution, maintenance or defense of any patent, patent application, or any Claims within the Patent Rights where such Claims are not included in a continuation, divisional or other patent or patent application, Licensee shall provide BIDMC with [***] prior written notice of such intended abandonment or decline of responsibility and, as to Claims, shall reasonably consider BIDMC's judgment in whether or not to abandon or not defend such Claim, and, as to such patent or patent application, such abandonment or election not to defend shall only be with prior notice to BIDMC on a patent by patent and country by country basis. If BIDMC desires to prosecute, maintain or defend any such Patent Rights proposed to be abandoned by Licensee under this Agreement, the right to prepare, file, prosecute, maintain and defend the relevant Patent Rights shall revert, as between Licensor and Licensee, to BIDMC, at BIDMC's expense, subject to any third party rights. In such event, such BIDMC paid-for rights shall be removed from the definition of Patent Rights under this Agreement, the licenses granted to Licensee and its Affiliates as to such Patent Rights shall terminate, and BIDMC shall have the right to abandon or maintain and license such Patent Rights in its discretion.

4.2 Confidentiality of Prosecution and Maintenance Information. Each Party agrees to treat all information related to prosecution and maintenance of Patent Rights as Confidential Information in accordance with the provisions of Appendix B.

5. REPORTS

5.1 Progress Reports. Within [***] after the end of each calendar year, Licensee shall report in writing to BIDMC on progress during such preceding [***] period in developing and/or commercializing Products and/or Processes, including, without limitation, progress on research and development, status of applications for regulatory approvals, manufacturing, sales, sublicensing and the number of sublicenses (excluding Third Party Contractors) entered into and marketing.

6. THIRD PARTY INFRINGEMENT AND LEGAL ACTIONS

6.1 Licensee Right to Prosecute. Licensee shall have the first right, but not the obligation, to initiate legal proceedings to protect the Patent Rights from infringement, with respect to a Claim of a Patent Right in the Field in the Territory, and prosecute infringers at Licensee's expense. Before commencing such action, Licensee and, as applicable, any Affiliate, shall consult with BIDMC, concerning the advisability of bringing suit, the selection of counsel and the jurisdiction for such action (provided

Licensee must have BIDMC's prior written consent (not to be unreasonably withheld) with respect to selection of jurisdiction for any action in which BIDMC may be joined as a party-plaintiff) and shall use reasonable efforts to accommodate the views of BIDMC regarding the proposed action, especially but without limitation with respect to potential effects on the public interest. Licensee shall be responsible to BIDMC for all costs, expenses and liabilities arising out or and in connection with any such action and shall indemnify and hold BIDMC harmless therefrom, regardless of whether BIDMC is a party-plaintiff, except for the expense of any independent counsel retained by BIDMC in accordance with Section 6.2 below. Licensee shall keep BIDMC informed of the progress of such proceedings and shall make its counsel reasonably available to BIDMC for discussion of such proceedings. BIDMC shall also be entitled to independent counsel in such proceedings but at its own expense, said expense to be offset against any damages received by the Licensee bringing suit in accordance with Section 6.4

6.2 BIDMC Right to Prosecute and/or Join as a Party-Plaintiff.

(a) In the event that Licensee elects not to take action pursuant to this Section 6.1, Licensee shall so notify BIDMC promptly in writing of its intention in good time to enable BIDMC to meet any deadlines by which an action must be taken to establish or preserve any enforcement rights and BIDMC shall have the right to take steps to protect the Patent Rights from infringement, with respect to a Claim of a Patent Right in the Field in the Territory, and prosecute infringers at BIDMC's expense and subject to any third party rights. If BIDMC notifies Licensee that it intends to so prosecute, subject to any third party rights, BIDMC shall use reasonable efforts, within [***] of its notice to Licensee, to (i) cause such infringement to terminate; (ii) reach a settlement with infringers; or (iii) initiate legal proceedings against the infringer. Nothing in this Section 6.2 shall be construed to prevent Licensee from initiating legal proceedings, in accordance with its independent judgement of the merits of an infringement action, as provided in Section 6.1.

(b) If Licensee elects to commence an action as described in Section 6.1 above, BIDMC shall have, in its sole discretion and at its own expense, the option to voluntarily join such action as a party-plaintiff. If required by law for the purposes of Licensee bringing an action against an alleged infringer, BIDMC agrees that it shall allow Licensee to join BIDMC in such action as a party-plaintiff

6.3 Notice of Actions; Settlement. Licensee shall promptly inform BIDMC of any action or suit relating to Patent Rights and shall not enter into any settlement, consent judgment or other voluntary final disposition of any action relating to Patent Rights, including but not limited to appeals, that would adversely affect the validity, patentability or enforceability of the Patent Rights without the prior written consent of BIDMC, which shall not be unreasonably withheld or delayed.

6.4 Recovery. Subject to any third party rights, any award paid by third parties as the result of such proceedings (whether by way of settlement or otherwise) shall first be applied to reimbursement of any legal fees and expenses incurred by both Parties, in proportion to their expenditures, and then the remainder, if any, shall be distributed between the Parties as follows:

(a) Licensee shall receive an amount equal to its lost profits or a reasonable royalty on the infringing sales, or whichever measure of damages the court shall have applied; and

(b) the balance, if any, remaining after Licensee and BIDMC have been compensated under Section 6.4(a) shall be shared equally by the Parties.

7. INDEMNIFICATION AND INSURANCE

7.1 Indemnification.

(a) Licensee shall indemnify, defend and hold harmless BIDMC and its Affiliates and their respective trustees, directors, officers, medical and professional staff, employees, and agents and their respective successors, heirs and assigns (the "Indemnitees"), against any liability, damage, loss or expense (including reasonable attorney's fees and expenses of litigation) incurred by or imposed upon the Indemnitees or any one of them in connection with any claims, suits, actions, demands or judgments commenced or obtained by a third party arising out of any theory of liability, including without limitation, any theory of product liability (including, but not limited to, actions in the form of contract, tort, warranty, or strict liability) concerning any Product or Process made, used or sold pursuant to any right or license granted under this Agreement. BIDMC shall promptly provide written notice to Licensee of any claim to which indemnification applies under this Section 7.1(a).

(b) Licensee agrees, at its own expense, to, defend against and resolve, and will have the right to assume and control the defense and resolution of, any actions or claims brought or filed against any party indemnified hereunder with respect to the subject of indemnity contained herein, whether or not such actions are rightfully brought; provided, however, that any Indemnitee shall have the right to retain its own counsel, at the expense of Licensee, if representation of such Indemnitee by counsel retained by Licensee would be inappropriate because of actual or potential conflicts of interests of such Indemnitee and any other party represented by such counsel. Licensee agrees to keep BIDMC informed of the progress in the defense and disposition of such claim and to consult with BIDMC prior to any proposed settlement. The party indemnified hereunder will reasonably cooperate with Licensee at Licensee's expense and will make available to Licensee relevant information under the control of such indemnified party.

(b) This Section 7.1 shall survive expiration or termination of this Agreement.

7.2 Insurance.

(a) Beginning at such time as any Product or Process licensed under this Agreement is being commercially distributed, sold, leased or otherwise transferred, or performed or used (other than for the purpose of obtaining regulatory approvals), by Licensee, Licensee shall, at its sole cost and expense, procure and maintain commercial general liability insurance in amounts not less than $[***] per incident and $[***] annual aggregate and naming the Indemnitees as additional insureds. Such commercial general liability insurance shall provide (i) product liability coverage and (ii) broad form contractual liability coverage for the indemnification obligations under Section 7.1 of this Agreement. If Licensee or its Affiliates or Sublicensees elects to self-insure all or part of the limits described above (including deductibles or retentions which are in excess of $[***] annual aggregate), such self-insurance program must be reasonably acceptable to the Licensor, provided that if a Sublicensee elects to self-insure and such Sublicensee has a market capitalization of at least [***] dollars ($[***]), then such Sublicensee's self-insurance program shall automatically be deemed reasonably acceptable to Licensor and not subject to Licensor's review. The minimum amounts of insurance coverage required under this Section 7.2 shall not be construed to create a limit of liability with respect to the indemnification obligations under Section 7.1 of this Agreement.

(b) Licensee shall provide BIDMC with written evidence of such insurance upon request of BIDMC. Licensee shall provide BIDMC with written notice at least [***] prior to the cancellation, non-renewal or material change in such insurance; if Licensee does not obtain replacement insurance providing comparable coverage prior to the expiration of such [***] period, BIDMC shall have the right to terminate this Agreement pursuant to Section 9.3 (and subject to the cure right therein).

(c) Licensee shall maintain such commercial general liability insurance beyond the expiration or termination of this Agreement during (i) the period that any such Product or Process, is being commercially distributed, sold, leased or otherwise transferred, or performed or used (other than for the purpose of obtaining regulatory approvals), by Licensee or by a licensee, affiliate or agent of Licensee and (ii) a reasonable period after the period referred to in (c) (i) above which in no event shall be less than [***].

(d) This Section 7.2 shall survive expiration of termination of this Agreement.

7.3 Affiliates and Sublicensees. Licensee shall require all its Affiliates and Sublicensees (other than Third Party Contractors) to comply with the provisions and obligations under this Section 7 as if such entity were the Licensee.

8. REPRESENTATION; DISCLAIMER OF WARRANTIES; LIMITATION OF LIABILITY

8.1 Representation. To the best knowledge of BIDMC's Technology Ventures Office, BIDMC represents that:

(a) No approval, authorization, consent or other order or action of or filing with any court, administrative agency or other governmental authority is required for the execution and delivery by it of this Agreement or the consummation by it of the transactions contemplated hereby;

(b) it has full right and authority to enter into this Agreement and to grant the licenses and other rights to Licensee as herein described;

(c) the execution, delivery and performance of this Agreement does not conflict with any other agreement, contract, instrument or understanding, oral or written, to which BIDMC is a party, or by which it is bound; and

(d) none of BIDMC nor any of its Affiliates has entered into any agreement or otherwise licensed, granted, assigned, transferred, conveyed or otherwise encumbered or disposed of any right, title or interest in or to any of the Patent Rights that would conflict with or impair the scope of any rights or licenses granted hereunder.

8.2 No Warranties. BIDMC HEREBY DISCLAIMS AND MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, CONCERNING THE PATENT RIGHTS AND ANY OF THE RIGHTS GRANTED HEREUNDER, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT, VALIDITY OF PATENT RIGHTS CLAIMS, WHETHER ISSUED OR PENDING, AND THE ABSENCE OF LATENT OR OTHER DEFECTS, WHETHER OR NOT DISCOVERABLE. SPECIFICALLY, AND NOT TO LIMIT THE FOREGOING, BIDMC MAKES NO WARRANTY OR REPRESENTATION (i) REGARDING THE VALIDITY OR SCOPE OF ANY OF THE CLAIM(S), WHETHER ISSUED OR PENDING, OF ANY OF THE PATENT RIGHTS, AND (ii) THAT THE EXPLOITATION OF THE PATENT RIGHTS OR ANY PRODUCT OR PROCESS WILL NOT INFRINGE ANY PATENTS OR OTHER INTELLECTUAL PROPERTY RIGHTS OF BIDMC OR OF ANY THIRD PARTY.

8.3 Limitation of Liability. IN NO EVENT SHALL BIDMC OR ANY OF ITS AFFILIATES OR ANY OF THEIR RESPECTIVE TRUSTEES, DIRECTORS, OFFICERS, MEDICAL AND PROFESSIONAL STAFF, EMPLOYEES AND AGENTS BE LIABLE TO LICENSEE OR ANY OF ITS AFFILIATES, SUBLICENSEES OR DISTRIBUTORS FOR INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND ARISING IN ANY WAY OUT OF THIS AGREEMENT

OR THE LICENSE RIGHTS GRANTED HEREUNDER, HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, INCLUDING WITHOUT LIMITATION ECONOMIC DAMAGES OR INJURY TO PROPERTY OR LOST PROFITS, REGARDLESS OF WHETHER BIDMC SHALL BE ADVISED, SHALL HAVE OTHER REASON TO KNOW, OR IN FACT SHALL KNOW OF THE POSSIBILITY OF THE FOREGOING.

9. TERMINATION

9.1 Termination for Failure to Pay. If Licensee fails to make any payment due hereunder, BIDMC shall have the right to terminate this Agreement upon fifteen (15) business days written notice, unless Licensee makes such payments plus any interest due, as set forth in Section 3.3, within said fifteen (15) day notice period. If payments are not made, BIDMC may immediately terminate this Agreement at the end of said fifteen (15) business day period.

9.2 Termination for Insolvency. BIDMC may terminate this Agreement immediately upon written notice with no further notice obligation or opportunity to cure if Licensee shall become insolvent, shall make an assignment for the benefit of creditors, or shall have a petition in bankruptcy filed for or against it that is not dismissed within sixty (60) days of filing.

9.3 Termination for Non-Financial Default. If Licensee or any of its Affiliates shall materially default in the performance of any of its material obligations under this Agreement (including any such obligations undertaken by Sublicensees) (excluding as provided for in Sections 9.1 and 9.2) and if such material default has not been cured within sixty (60) days after notice by BIDMC in writing of such material default, then at the end of such cure period, BIDMC may, at its option, in its sole discretion, either (i) immediately terminate any licenses granted hereunder with respect to the country or countries in which such material default has occurred, or (ii) terminate the Agreement in its entirety. BIDMC shall have the foregoing termination rights immediately, upon written notice, if any such same material default occurs more than three times, even if cured within such sixty (60) day periods.

9.4 Patent Challenge. During the Term, if a Sublicensee (excluding a Third Party Contractor) brings a Patent Challenge or assists another party in bringing a Patent Challenge (except as required under a court order or subpoena or except as raised as a defense against a claim, action or proceeding asserted by BIDMC or its Affiliates against such Sublicensee), then BIDMC may send a written demand to Licensee to terminate such sublicense. If Licensee fails to so terminate such sublicense within sixty (60) days after BIDMC' s demand, BIDMC may immediately terminate this Agreement and/or any licenses granted hereunder.

9.5 Termination by Licensee. Licensee shall have the right to terminate this Agreement for any reason by giving ninety (90) days advance written notice to BIDMC.

9.6 Effects of Termination of Agreement.

(a) General. Upon termination of this Agreement or any of the licenses hereunder for any reason, final reports in accordance with Section 5.1 shall be submitted to BIDMC and all payments, including without limitation any unreimbursed Patent Costs, accrued or due to BIDMC as of the termination date shall become immediately payable. The termination or expiration of this Agreement or any licenses granted hereunder shall not relieve any Party or its Affiliates of obligations arising before such termination or expiration. For the avoidance of doubt, termination of this Agreement shall not affect the right of Licensee, its Affiliates, Sublicensees and Distributors to continue operating under Licensee's rights as joint owner and co-applicant of the Patent Rights.

(b) Survival. The following provisions shall survive the expiration or termination of this Agreement: Sections 1, 2.2 (last two sentences of the first paragraph), 3, 7, 8, 11 and 9.6 and Appendix B.

10. COMPLIANCE WITH LAW

10.1 Compliance. Licensee shall have the sole responsibility for compliance with all government statutes and regulations that relate to Products and Processes, including, but not limited to, those of the Food and Drug Administration and the Export Administration, and any applicable laws and regulations of any other country in the Territory. Licensee agrees that it shall be solely responsible for obtaining any necessary licenses to export, re¬export, or import Products or Processes covered by Patent Rights and/or Confidential Information and that it will indemnify, defend, and hold BIDMC harmless (in accordance with Section 8.1) for the consequences of any violation by Licensee, its Affiliates, Sublicensees or Distributors of any such laws or regulations.

10.2 Patent Numbers. Licensee shall cause all Products sold in the United States to be marked with all applicable U.S. Patent Numbers, to the full extent required by United States law. Licensee shall similarly cause all Products shipped to or sold in any other country to be marked in such a manner as to conform with the patent laws and practices of such country.

11. ASSIGNMENT

11.1 Assignment. This Agreement is personal to Licensee and no rights or obligations may be assigned by Licensee without the prior written consent of BIDMC, except that Licensee may assign its rights and obligations under this Agreement to an Affiliate or to a successor in connection with the merger, consolidation, or sale of all or substantially all of its assets or equity or that portion of its business to which this Agreement relates ("Assignment"); provided, however, that Licensee shall provide notification to BIDMC within [***] of such Assignment

12. MISCELLANEOUS

12.1 Entire Agreement. This Agreement and the Sponsored Research Agreement (BIDMC Agreement No. A8755) and its Amendment No. 1 (BIDMC Agreement No. A8755) between the Parties, dated January 1, 2015 and February 2, 2016 respectively with continuing obligations, non-disclosure agreement constitutes the entire understanding between the Parties with respect to the subject matter hereof.

12.2 Notices. Any notice, communication or payment required or permitted to be given or made hereunder shall be in writing and, except as otherwise expressly provided in this Agreement, shall be deemed given or made and effective (i) when delivered personally; or (ii) when delivered by telex or telecopy (if not a payment); or (iii) when received if sent by overnight express or mailed by certified, registered or regular mail, postage prepaid, addressed to parties at their address stated below, or to such other address as such party may designate by written notice in accordance with the provisions of this Section 10.2.

BIDMC: Attn: [***]
Beth Israel Deaconess Medical Center
330 Brookline Avenue, BR2
Boston, MA 02215
Phone: 617 667-9490
Fax: 617-667-4445
Email: [***]

With a copy to: General Counsel
Legal Department
Beth Israel Deaconess Medical Center
330 Brookline Avenue, Suite 300
Boston, MA 02215

LICENSEE: Attn: John Celebi
Chief Operating Officer
X4 Pharmaceuticals, Inc.
784 Massachusetts Avenue, Suite 140
Cambridge MA 02139

12.3 Amendment; Waiver. This Agreement may be amended and any of its terms or conditions may be waived only by a written instrument executed by an authorized signatory of the Parties or, in the case of a waiver, by the Party waiving compliance. The failure of either Party at any time or rimes to require performance of any provision hereof shall in no manner affect its rights at a later time to enforce the same. No waiver by either Party of any condition or term shall be deemed as a further or continuing waiver of such condition or term or of any other condition or term.

Portions of this Exhibit, indicated by the mark "[***]," were omitted and have been filed separately with the Securities and Exchange Commission pursuant to the Registrant's application requesting confidential treatment pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

12.4 Binding Effect. This Agreement shall be binding upon and inure to the benefit of and be enforceable by the Parties hereto and their respective permitted successors and assigns.

12.5 Force Majeure. Neither Party shall be responsible for delays resulting from fire, explosion, flood, war, sabotage, strike or riot, or similar causes beyond the reasonable control of such Party, provided that the nonperforming Party uses commercially reasonable efforts to avoid or remove such causes of nonperformance and continues performance under this Agreement with reasonable dispatch whenever such causes are removed.

12.6 Use of Name. Neither Party shall use the name of the other Party or of any trustee, director, officer, staff member, employee, student or agent of the other Party or any adaptation thereof in any advertising, promotional or sales literature, publicity or in any document employed to obtain funds or financing without the prior written approval of the Party or individual whose name is to be used.

12.7 Governing Law. This Agreement shall be governed by and construed and interpreted in accordance with the laws of the Commonwealth of Massachusetts, excluding with respect to conflict of laws, except that questions affecting the construction and effect of any patent shall be determined by the law of the country in which the patent shall have been granted. Each Party agrees to submit to the exclusive jurisdiction of the Superior Court for Suffolk County, Massachusetts, and the United States District Court for the District of Massachusetts with respect to any claim, suit or action in law or equity arising in any way out of this Agreement or the subject matter hereof.

12.8 BIDMC Policies. Licensee acknowledges that BIDMC's employees and medical and professional staff members and the employees and staff members of BIDMC's Affiliates are subject to the applicable policies of BIDMC and such Affiliates, including, without limitation, policies regarding conflicts of interest, intellectual property and other matters. Licensee shall provide BIDMC with any agreement it proposes to enter into with any employee or staff member of BIDMC or any of BIDMC's Affiliates for BIDMC's prior review and shall not enter into any oral or written agreement with such employee or staff member which it knows conflicts with any such policy. BIDMC shall provide Licensee, at Licensee's request, with copies of any such policies applicable to any such employee or staff member.

12.9 Severability. If any provision(s) of this Agreement are or become invalid, are ruled illegal by any court of competent jurisdiction or are deemed unenforceable under then current applicable law from time to time in effect during the term hereof; it is the intention of the parties that the remainder of this agreement shall not be effected thereby. It is further the intention of the parties that in lieu of each such provision which is invalid, illegal or unenforceable, there be substituted or added as part of this Agreement a provision which shall be as similar as possible in economic and business objectives as intended by the parties to such invalid, illegal or enforceable provision, but shall be valid, legal and enforceable.

12.10 Interpretation. The parties hereto are sophisticated, have had the opportunity to consult legal counsel with respect to this transaction and hereby waive any presumptions of any statutory or common law rule relating to the interpretation of contracts against the drafter.

12.11 Headings. All headings are for convenience only and shall not affect the meaning of any provision of this Agreement.

[Remainder of page intentionally left blank]

Portions of this Exhibit, indicated by the mark "[***]," were omitted and have been filed separately with the Securities and Exchange Commission pursuant to the Registrant's application requesting confidential treatment pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their duly authorized representatives as of the date first written above.

The Effective Date of this License Agreement is December 23, 2016.

X4 PHARMACEUTICALS, INC.	**BETH ISRAEL DEACONESS MEDICAL CENTER**
BY: /s/ John Celebi	BY: /s/ Vikas Sukhatme, M.D., Sc. D.
Name: John Celebi	Name: Vikas Sukhatme, M.D., Sc. D.
TITLE: Chief Operating Officer	TITLE: Chief Academic Officer
DATE: 12/29/2016	DATE: 12/27/2016

Portions of this Exhibit, indicated by the mark "[***]," were omitted and have been filed separately with the Securities and Exchange Commission pursuant to the Registrant's application requesting confidential treatment pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

Appendix A

[***]

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Portions of this Exhibit, indicated by the mark "[***]," were omitted and have been filed separately with the Securities and Exchange Commission pursuant to the Registrant's application requesting confidential treatment pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

Appendix B

CONFIDENTIALITY TERMS AND CONDITIONS

1. Definition of Confidential Information. "Confidential Information" shall mean any information, including but not limited to data, techniques, protocols or results, or business, financial, commercial or technical information, disclosed by one Party (each a "Discloser" as applicable) to the other Party (each a "Recipient" as applicable) in connection with the terms of that certain Exclusive License Agreement dated December , 2016 (the "License Agreement") and identified as confidential at the time of disclosure. Capitalized terms used in this Appendix that are not otherwise defined herein have the meanings ascribed in the License Agreement to which this Appendix is attached and made a part thereof.

2. Exclusions. "Confidential Information" under this Agreement shall not include any information that (i) is or becomes publicly available through no wrongful act of Recipient; (ii) was known by Recipient prior to disclosure by Discloser, as evidenced by tangible records; (iii) becomes known to Recipient after disclosure from a third party having an apparent bona fide right to disclose it without any confidentiality obligation; (iv) is independently developed or discovered by Recipient without use of Discloser's Confidential Information, as evidenced by tangible records; or (v) is disclosed to another party by Discloser without restriction on further disclosure. The obligations of confidentiality and non-use set forth in this Agreement shall not apply with respect to any information that Recipient is required to disclose or produce pursuant to applicable law, court order or other valid legal process provided that Recipient promptly notifies Discloser prior to such required disclosure, discloses such information only to the extent so required and cooperates reasonably with Discloser's efforts to contest or limit the scope of such disclosure.

3. Permitted Purpose. Recipient shall have the right to, and agrees that it will, use Discloser's Confidential Information solely for the performance of its obligations and exercise of its rights under the License Agreement (the "Purpose"), except as may be otherwise specified in a separate definitive written agreement negotiated and executed between the parties.

4. Restrictions. For the term of the License Agreement and a period of [***] thereafter (and indefinitely with respect to any individually identifiable health information disclosed by BIDMC to Licensee, if any), each Recipient agrees that: (i) it will not use such Confidential Information for any purpose other than as specified herein; and (ii) it will use reasonable efforts (but no less than the efforts used to protect its own confidential and/or proprietary information of a similar nature) not to disclose such Confidential Information to any other person or entity except as expressly permitted hereunder or the License Agreement. Recipient may, however, disclose Discloser's Confidential Information only on a need-to-know basis to its and its Affiliates employees, staff members and agents ("Receiving Individuals") who are directly participating in the Purpose and who are informed of the confidential nature of such information, provided Recipient shall be responsible for compliance by Receiving Individuals with the terms of this Agreement and any breach thereof Each party further agrees not to use the name of the other party or any of its Affiliates or any of their respective trustees, directors, officers, staff members,

employees, students or agents in any advertising, promotional or sales literature, publicity or in any document employed to obtain funds or financing without the prior written approval of the party or individual whose name is to be used, in the case of BIDMC such approval to be given by the Public Affairs Department. This Section 4 shall survive termination or expiration of this Agreement.

5. Right to Disclose. Discloser represents that to the best of its knowledge it has the right to disclose to each Recipient all of Discloser's Confidential Information that will be disclosed hereunder.

6. Ownership. All Confidential Information disclosed pursuant to this Agreement, including without limitation all written and tangible forms thereof, shall be and remain the property of the Discloser. Upon termination of this Agreement, if requested by Discloser, Recipient shall return or destroy at Discloser's discretion all of Discloser's Confidential Information, provided that Recipient shall be entitled to keep one copy of such Confidential Information in a secure location solely for the purpose of determining Recipient's legal obligations hereunder.

7. No License. Nothing in this Agreement shall be construed as granting or conferring, expressly or impliedly, any rights by license or otherwise, under any patent, copyright, or other intellectual property rights owned or controlled by Discloser relating to Confidential Information, except as specifically set forth in the License Agreement.

8. Remedies. Each party acknowledges that any breach of this Agreement by it may cause irreparable harm to the other party and that each party is entitled to seek injunctive relief and any other remedy available at law or in equity.

9. Export Restrictions. The Confidential Information is subject to the export and customs laws and regulations of the United States and any other applicable country and neither party will export, re-export or transship, directly or indirectly, such information to any country without first obtaining proper governmental approval, as necessary. Licensee will not disclose any export controlled information to BIDMC without the express prior written consent of BIDMC Technology Ventures Office. Licensee will indemnify BIDMC for any and all claims, actions, damages or liabilities of any kind related to Company's failure to comply with this section.

10. General. These Confidentiality Terms and Conditions, along with the License Agreement, contain the entire understanding of the parties with respect to the subject matter hereof, and supersede any prior oral or written understandings between the parties relating to confidential treatment of information. Sections 1, 2, 4, 7, 10 and 11 of these Confidentiality Terms and Conditions shall survive any expiration or termination of the License Agreement.

LOAN AND SECURITY AGREEMENT

THIS LOAN AND SECURITY AGREEMENT is made and dated as of October 19, 2018 and is entered into by and between X4 PHARMACEUTICALS, INC. a Delaware corporation, and each of its Qualified Subsidiaries (hereinafter collectively referred to as the "Borrower"), the several banks and other financial institutions or entities from time to time parties to this Agreement (collectively, referred to as "Lender") and HERCULES CAPITAL, INC., a Maryland corporation, in its capacity as administrative agent and collateral agent for itself and the Lender (in such capacity, the "Agent").

RECITALS

A. Borrower has requested Lender to make available to Borrower a loan in an aggregate principal amount of up to Thirteen Million ($13,000,000.00) (the "Term Loan"); and

B.Lender is willing to make the Term Loan on the terms and conditions set forth in this Agreement.

AGREEMENT

NOW, THEREFORE, Borrower, Agent and Lender agree as follows:

SECTION 1 DEFINITIONS AND RULES OF CONSTRUCTION

1.1 Unless otherwise defined herein, the following capitalized terms shall have the following meanings:

"Account Control Agreement(s)" means any agreement entered into by and among the Agent, Borrower and a third party Bank or other institution (including a Securities Intermediary) in which Borrower maintains a Deposit Account or an account holding Investment Property and which perfects Agent's first priority security interest in the subject account or accounts.

"ACH Authorization" means the ACH Debit Authorization Agreement in substantially the form of Exhibit H, which account numbers shall be redacted for security purposes if and when filed publicly by the Borrower.

"Advance(s)" means a Term Loan Advance.

"Advance Date" means the funding date of any Advance.

"Advance Request" means a request for an Advance submitted by Borrower to Agent in substantially the form of Exhibit A, which account numbers shall be redacted for security purposes if and when filed publicly by the Borrower.

"Affiliate" means, with respect to any person, (a) any Person that directly or indirectly controls, is controlled by, or is under common control with the Person in question, (b) any Person directly or indirectly owning, controlling or holding with power to vote ten percent (10%) or more of the outstanding voting securities of such Person, or (c) any Person ten percent (10%) or more of whose outstanding voting securities are directly or indirectly owned, controlled or held by such Person with power to vote such securities. As used in the definition of "Affiliate," the term "control" means the possession, directly or indirectly, of the power to direct or cause the direction of the management and policies of a Person, whether through ownership of voting securities, by contract or otherwise.

"Agent" has the meaning given to it in the preamble to this Agreement.

"Agreement" means this Loan and Security Agreement, as amended from time to time.

"Amortization Date" means September 1, 2019; provided however, if Interest Only Extension Conditions A are achieved, then March 1, 2020; and if Interest Only Extension Conditions B are achieved, then December 1, 2020.

"Anti-Corruption Laws" shall mean all laws, rules, and regulations of any jurisdiction applicable to Borrower or any of its Affiliates from time to time concerning or relating to bribery or corruption, including without limitation the United States Foreign Corrupt Practices Act of 1977, as amended, the UK Bribery Act 2010 and other similar legislation in any other jurisdictions.

"Anti-Terrorism Laws" means any laws, rules, regulations or orders relating to terrorism or money laundering, including without limitation Executive Order No. 13224 (effective September 24, 2001), the USA PATRIOT Act, the laws comprising or implementing the Bank Secrecy Act, and the laws administered by OFAC.

"Assignee" has the meaning given to it in Section 11.13.

"Blocked Person" means any Person: (a) listed in the annex to, or is otherwise subject to the provisions of, Executive Order No. 13224, (b) a Person owned or controlled by, or acting for or on behalf of, any Person that is listed in the annex to, or is otherwise subject to the provisions of, Executive Order No. 13224, (c) a Person with which any Lender is prohibited from dealing or otherwise engaging in any transaction by any Anti-Terrorism Law, (d) a Person that commits, threatens or conspires to commit or supports "terrorism" as defined in Executive Order No. 13224, or (e) a Person that is named a "specially designated national" or "blocked person" on the most current list published by OFAC or other similar list.

"Borrower Products" means all products, software, service offerings, technical data or technology currently being designed, manufactured or sold by Borrower or which Borrower intends to sell, license, or distribute in the future including any products or service offerings under development, collectively, together with all products, software, service offerings, technical data or technology that have been sold, licensed or distributed by Borrower since its incorporation.

"Business Day" means any day other than Saturday, Sunday and any other day on which banking institutions in the State of California or the Commonwealth of Massachusetts are closed for business.

"Cash" means all cash, cash equivalents and liquid funds.

"Change in Control" means any reorganization, recapitalization, consolidation or merger (or similar transaction or series of related transactions) of Borrower, sale or exchange of outstanding shares (or similar transaction or series of related transactions) of Borrower in which the holders of Borrower's outstanding shares immediately before consummation of such transaction or series of related transactions do not, immediately after consummation of such transaction or series of related transactions, retain shares representing more than fifty percent (50%) of the voting power of the surviving entity of such transaction or series of related transactions (or the parent of such surviving entity if such surviving entity is wholly owned by such parent), in each case without regard to whether Borrower is the surviving entity. Notwithstanding the foregoing, an Initial Public Offering and any financing transaction related to Performance Milestone I or Performance Milestone II is not a Change of Control.

"Charter" means Borrower's Certificate of Incorporation, as amended from time to time.

"Claims" has the meaning given to it in Section 11.10.

"Closing Date" means the date of this Agreement.

"Collateral" means the property described in Section 3.

"Common Stock" means the Common Stock, $0.001 par value per share, of the Borrower.

"Confidential Information" has the meaning given to it in Section 11.12.

"Contingent Obligation" means, as applied to any Person, any direct or indirect liability, contingent or otherwise, of that Person with respect to (i) any Indebtedness, dividend, letter of credit or other obligation of another, including any such obligation directly or indirectly guaranteed, endorsed, co-made or discounted or sold with recourse by that Person, or in respect of which that Person is otherwise directly or indirectly liable; (ii) any obligations with respect to undrawn letters of credit, corporate credit cards or merchant services issued for the account of that Person; and (iii) all obligations arising under any interest rate, currency or commodity swap agreement, interest rate cap agreement, interest rate collar agreement, or other agreement or arrangement designated to protect a Person against fluctuation in interest rates, currency exchange rates or commodity prices; provided, however, that the term "Contingent Obligation" shall not include endorsements for collection or deposit in the ordinary course of business or guaranties of leases that do not constitute Indebtedness. The amount of any Contingent Obligation shall be deemed to be an amount equal to the stated or determined amount of the primary obligation in respect of which such Contingent Obligation is made or, if not stated or determinable, the maximum reasonably anticipated liability in respect thereof as determined by such Person in good faith; provided, however, that such amount shall not in any event exceed the maximum amount of the obligations under the guarantee or other support arrangement.

"Copyright License" means any written agreement granting any right to use any Copyright or Copyright registration, now owned or hereafter acquired by Borrower or in which Borrower now holds or hereafter acquires any interest.

"Copyrights" means all copyrights, whether registered or unregistered, held pursuant to the laws of the United States of America, any State thereof, or of any other country.

"Deposit Accounts" means any "deposit accounts," as such term is defined in the UCC, and includes any checking account, savings account, or certificate of deposit.

"Domestic Subsidiary" means any Subsidiary that is not a Foreign Subsidiary.

"Due Diligence Fee" means $25,000, which fee has been paid to Lender prior to the Closing Date, and shall be deemed fully earned on such date regardless of the early termination of this Agreement.

"Eligible Foreign Subsidiary" means any Foreign Subsidiary whose execution of a Joinder Agreement could not result in a material adverse tax consequence to Borrower.

"Equity Interests" means, with respect to any Person, the capital stock, partnership or limited liability company interest, or other equity securities or equity ownership interests of such Person.

"ERISA" means the Employee Retirement Income Security Act of 1974, as amended, and the regulations promulgated thereunder.

"Event of Default" has the meaning given to it in Section 9.

"Excluded Account" means any "zero balance" deposit account or securities account used exclusively for payroll, employee benefits or employee taxes, the funds of which shall not exceed the amount required to pay the next payroll or other relevant cycle, and identified to the Agent in writing by the Borrower as such.

"Facility Charge" means $65,000.

"Financial Statements" has the meaning given to it in Section 7.1.

"Foreign Subsidiary" means any Subsidiary other than a Subsidiary organized under the laws of any state within the United States of America.

"GAAP" means generally accepted accounting principles in the United States of America, as in effect from time to time.

"Indebtedness" means indebtedness of any kind, including (a) all indebtedness for borrowed money or the deferred purchase price of property or services (excluding trade credit entered into in the ordinary course of business due within ninety (90) days), including reimbursement and other obligations with respect to surety bonds and letters of credit, (b) all obligations evidenced by notes, bonds, debentures or similar instruments, (c) all capital lease obligations within the meaning of GAAP as in effect on the Closing Date, and (d) all Contingent Obligations; provided that Indebtedness shall not include endorsements of checks or drafts arising in the ordinary course of business.

"Initial Public Offering" means the initial firm commitment underwritten offering of Borrower's Common Stock pursuant to a registration statement under the Securities Act of 1933 filed with and declared effective by the Securities and Exchange Commission.

"Insolvency Proceeding" is any proceeding by or against any Person under the United States Bankruptcy Code, or any other bankruptcy or insolvency law, including assignments for the benefit of creditors, compositions, extensions generally with its creditors, or proceedings seeking reorganization, arrangement, or other similar relief.

"Intellectual Property" means all of Borrower's Copyrights; Trademarks; Patents; Licenses; trade secrets and inventions; mask works; Borrower's applications therefor and reissues, extensions, or renewals thereof; and Borrower's goodwill associated with any of the foregoing, together with Borrower's rights to sue for past, present and future infringement of Intellectual Property and the goodwill associated therewith.

"Interest Only Extension Conditions A" means satisfaction of each of the following events: (a) no default or Event of Default shall have occurred and remains continuing; and (b) Borrower shall have received a Tranche 3 Term Loan Advance.

"Interest Only Extension Conditions B" means satisfaction of each of the following events: (a) no default or Event of Default shall have occurred and remains continuing; (b) Borrower shall have received a Tranche 3 Term Loan Advance; and (c) Borrower shall have achieved Performance Milestone II.

"Inventory" means "inventory" as defined in Article 9 of the UCC.

"Investment" means any beneficial ownership (including stock, partnership or limited liability company interests) of or in any Person, or any loan, advance or capital contribution to any Person or the acquisition of any asset of another Person.

"IP Security Agreement" means that certain Intellectual Property Security Agreement, executed and delivered by Borrower to Agent and dated as of the Closing Date.

"Joinder Agreements" means for each Qualified Subsidiary, a completed and executed Joinder Agreement in substantially the form attached hereto as Exhibit G.

"Lender" has the meaning given to it in the preamble to this Agreement.

"License" means any Copyright License, Patent License, Trademark License or other license of rights or interests.

"Lien" means any mortgage, deed of trust, pledge, hypothecation, assignment for security, security interest, encumbrance, levy, lien or charge of any kind, whether voluntarily incurred or arising by operation of law or otherwise, against any property, any conditional sale or other title retention agreement, and any lease in the nature of a security interest.

"Loan" means the Advances made under this Agreement.

"Loan Documents" means this Agreement, the Notes (if any), the ACH Authorization, the Account Control Agreements, the Joinder Agreements, all UCC Financing Statements, the Warrant, the IP Security Agreement, the Pledge Agreement and any other documents executed in connection with the Secured Obligations or the transactions contemplated hereby, as the same may from time to time be amended, modified, supplemented or restated.

"Material Adverse Effect" means a material adverse effect upon: (i) the business, operations, properties, assets or financial condition of Borrower and its Subsidiaries taken as a whole; or (ii) the ability of Borrower to perform or pay the Secured Obligations in accordance with the terms of the Loan Documents, or the ability of Agent or Lender to enforce any of its rights or remedies with respect to the Secured Obligations; or (iii) the Collateral or Agent's Liens on the Collateral or the priority of such Liens.

"Maximum Term Loan Amount" means Thirteen Million and No/100 Dollars ($13,000,000.00).

"Maximum Rate" shall have the meaning assigned to such term in Section 2.3.

"Non-Disclosure Agreement" means that certain Confidential Disclosure Agreement by and between X4 Pharmaceuticals, Inc. and Hercules Capital, Inc. dated as of August 14, 2018.

"Note(s)" means a Term Note.

"OFAC" is the U.S. Department of Treasury Office of Foreign Assets Control.

"OFAC Lists" are, collectively, the Specially Designated Nationals and Blocked Persons List maintained by OFAC pursuant to Executive Order No. 13224, 66 Fed. Reg. 49079 (Sept. 25, 2001) and/or any other list of terrorists or other restricted Persons maintained pursuant to any of the rules and regulations of OFAC or pursuant to any other applicable Executive Orders.

"Patent License" means any written agreement granting any right with respect to any invention on which a Patent is in existence or a Patent application is pending, in which agreement Borrower now holds or hereafter acquires any interest.

"Patents" means all letters patent of, or rights corresponding thereto, in the United States of America or in any other country, all registrations and recordings thereof, and all applications for letters patent of, or rights corresponding thereto, in the United States of America or any other country.

"Performance Milestone I" means Borrower shall have: (a) obtained a minimum of $45,000,000 in unrestricted (including, not subject to any redemption, clawback, escrow or similar restriction) gross cash proceeds from an equity financing (or a series of equity financings),

including through private financings led by an institutional investor reasonably acceptable to Lender and/or public offerings, during the period commencing on the Closing Date through March 31, 2019, including an amount of up to $7,500,000 of investor funded indebtedness converted into equity in such financing(s), subject to verification by Agent (including supporting documentation requested by Agent); and (b) achieved the "First Patient In" Phase 3 portion of a Phase 2/3 clinical evaluation of X4P-001 in patients with WHIM.

"Performance Milestone II" means Borrower shall have: (a) achieved Performance Milestone I, and (b) obtained a minimum of $80,000,000 (inclusive of amounts raised to achieve Performance Milestone I) in unrestricted (including, not subject to any redemption, clawback, escrow or similar restriction) gross cash proceeds from an equity financing (or a series of equity financings), including through private financings and/or public offerings, during the period commencing on the Closing Date through December 31, 2019, including an amount of up to $7,500,000 of investor funded indebtedness converted into equity in such financings to the extent not previously converted in connection with Performance Milestone I, subject to verification by Agent (including supporting documentation requested by Agent).

"Permitted Indebtedness" means: (i) Indebtedness of Borrower in favor of Lender or Agent arising under this Agreement or any other Loan Document; (ii) Indebtedness existing on the Closing Date which is disclosed in Schedule 1A; (iii) Indebtedness of up to $500,000 outstanding at any time secured by a Lien described in clause (vii) of the defined term "Permitted Liens," provided such Indebtedness does not exceed the cost of the Equipment financed with such Indebtedness; (iv) Indebtedness to trade creditors incurred in the ordinary course of business, and Indebtedness incurred in the ordinary course of business with corporate credit cards; (v) Indebtedness that also constitutes a Permitted Investment; (vi) Subordinated Indebtedness; (vii) reimbursement obligations in connection with letters of credit that are secured by Cash and issued on behalf of the Borrower or a Subsidiary thereof in an amount not to exceed $200,000 at any time outstanding, (viii) other unsecured Indebtedness in a principal amount not to exceed $200,000 at any time outstanding, (ix) intercompany Indebtedness as long as either (A) each of the Subsidiary obligor and the Subsidiary obligee under such Indebtedness is a Qualified Subsidiary that has executed a Joinder Agreement and (x) extensions, amendments, restatements, refinancings and renewals of any items of Permitted Indebtedness, provided that the principal amount is not increased or the terms modified to impose materially more burdensome terms upon Borrower or its Subsidiary, as the case may be.

"Permitted Investment" means: (i) Investments existing on the Closing Date which are disclosed in Schedule 1B; (ii) (a) marketable direct obligations issued or unconditionally guaranteed by the United States of America or any agency or any State thereof maturing within one year from the date of acquisition thereof currently having a rating of at least A-2 or P-2 from either Standard & Poor's Corporation or Moody's Investors Services, (b) commercial paper maturing no more than one year from the date of creation thereof and currently having a rating of at least A-2 or P-2 from either Standard & Poor's Corporation or Moody's Investors Service, (c) certificates of deposit issued by any bank with assets of at least $500,000,000 maturing no more than one year from the date of investment therein, and (d) money market accounts; (iii) repurchases of stock from current or former employees, directors, or consultants of Borrower under the terms of applicable repurchase agreements at the original issuance price of such securities in an aggregate amount not to exceed $250,000 in any fiscal year, provided that no Event of Default has occurred

and is continuing or would immediately result after giving effect to the repurchases; (iv) Investments consisting of the endorsement of negotiable instruments for deposit or collection or similar transactions in the ordinary course of business; (v) Investments accepted in connection with Permitted Transfers; (vi) Investments (including debt obligations) received in connection with the bankruptcy or reorganization of customers or suppliers and in settlement of delinquent obligations of, and other disputes with, customers or suppliers arising in the ordinary course of Borrower's business; (vii) Investments consisting of notes receivable of, or prepaid royalties and other credit extensions, to customers and suppliers who are not Affiliates, in the ordinary course of business, provided that this subparagraph (vii) shall not apply to Investments of Borrower in any Subsidiary; (viii) Investments consisting of loans not involving the net transfer on a substantially contemporaneous basis of cash proceeds to employees, officers or directors relating to the purchase of capital stock of Borrower pursuant to employee stock purchase plans or other similar agreements approved by Borrower's Board of Directors; (ix) Investments consisting of travel advances, employee relocation loans, and other employee loans and advances in the ordinary course of business in an aggregate amount not to exceed $250,000 in any fiscal year or $500,000 during the term hereof; (x) Investments in newly-formed Domestic Subsidiaries, provided that each such Domestic Subsidiary other than one (1) Security Corporation enters into a Joinder Agreement promptly after its formation by Borrower and execute such other documents as shall be reasonably requested by Agent; (xi) Investments in Foreign Subsidiaries approved in advance in writing by Agent; (xii) joint ventures or strategic alliances in the ordinary course of Borrower's business consisting of the licensing of technology, the development of technology or the providing of technical support, provided that any cash Investments by Borrower do not exceed $500,000 in the aggregate in any fiscal year; (xiii) Investments in one (1) Subsidiary qualifying as a "security corporation" under Massachusetts law (a "Security Corporation"); and (xiv) additional Investments that do not exceed $250,000 in the aggregate.

"Permitted Liens" means any and all of the following: (i) Liens in favor of Agent or Lender; (ii) Liens existing on the Closing Date which are disclosed in Schedule 1C; (iii) Liens for taxes, fees, assessments or other governmental charges or levies, either not delinquent or being contested in good faith by appropriate proceedings; provided, that Borrower maintains adequate reserves therefor in accordance with GAAP (to the extent required hereby); (iv) Liens securing claims or demands of materialmen, artisans, mechanics, carriers, warehousemen, landlords and other like Persons arising in the ordinary course of Borrower's business and imposed without action of such parties; provided, that the payment thereof is not yet required; (v) Liens arising from judgments, decrees or attachments in circumstances which do not constitute an Event of Default hereunder; (vi) deposits to secure the performance of obligations not to exceed $100,000 in the aggregate, and the following deposits, to the extent made in the ordinary course of business: deposits under worker's compensation, unemployment insurance, social security and other similar laws, or to secure the performance of bids, tenders or contracts (other than for the repayment of borrowed money) or to secure indemnity, performance or other similar bonds for the performance of bids, tenders or contracts (other than for the repayment of borrowed money) or to secure statutory obligations (other than Liens arising under ERISA or environmental Liens) or surety or appeal bonds, or to secure indemnity, performance or other similar bonds; (vii) Liens on Equipment or software or other intellectual property constituting purchase money Liens and Liens in connection with capital leases securing Indebtedness permitted in clause (iii) of "Permitted Indebtedness"; (viii) Liens incurred in connection with Subordinated Indebtedness; (ix) leasehold interests in leases or subleases and licenses or sublicenses granted in the ordinary course of

business and not interfering in any material respect with the business of the lessor licensor, as applicable; (x) Liens in favor of customs and revenue authorities arising as a matter of law to secure payment of custom duties that are promptly paid on or before the date they become due; (xi) Liens on insurance proceeds securing the payment of financed insurance premiums that are promptly paid on or before the date they become due (provided that such Liens extend only to such insurance proceeds and not to any other property or assets); (xii) statutory and common law rights of set-off and other similar rights as to deposits of cash and securities in favor of banks, other depository institutions and brokerage firms; (xiii) easements, zoning restrictions, rights-of-way and similar encumbrances on real property imposed by law or arising in the ordinary course of business so long as they do not materially impair the value or marketability of the related property; (xiv) (A) Liens on Cash securing obligations permitted under clause (vii) of the definition of Permitted Indebtedness and (B) security deposits in connection with real property leases, the combination of (A) and (B) in an aggregate amount not to exceed $200,000 at any time; (xv) Liens incurred in connection with the extension, renewal or refinancing of the Indebtedness secured by Liens of the type described in clauses (i) through (xi) above; provided, that any extension, renewal or replacement Lien shall be limited to the property encumbered by the existing Lien and the principal amount of the Indebtedness being extended, renewed, refinanced, modified, amended, restated or amended and restated (as may have been reduced by any payment thereon) does not increase; and (xvi) other Liens securing obligations not to exceed the principal amount of $250,000 outstanding at any time.

"Permitted Transfers" means (i) sales of Inventory in the ordinary course of business, (ii) non-exclusive outbound licenses and similar arrangements for the use of Intellectual Property in the ordinary course of business, (iii) exclusive licenses for the use of the Intellectual Property of Borrower or Borrower Products in the field of Immuno-Oncology entered into the ordinary course of business provided that each such license constitutes an arms-length transaction, that could not result in a legal transfer of title of the licensed property, and so long as after giving effect to each such non-exclusive or exclusive license, Borrower and its Subsidiaries retain sufficient rights to use or benefit from the subject Intellectual Property as to enable them to conduct their business in the ordinary course, (iv) dispositions of worn-out, obsolete or surplus Equipment at fair market value in the ordinary course of business, (v) transfers consisting of Permitted Investments or Permitted Liens, (vi) transfers of Cash in the ordinary course of business to the extent not otherwise inconsistent with the terms and conditions of this Agreement, and (vii) other Transfers of assets having a fair market value of not more than $250,000 in the aggregate in any fiscal year.

"Person" means any individual, sole proprietorship, partnership, joint venture, trust, unincorporated organization, association, corporation, limited liability company, institution, other entity or government.

"Pledge Agreement" means the Pledge Agreement dated as of the Closing Date between Borrower and Agent, as the same may from time to time be amended, restated, modified or otherwise supplemented.

"Preferred Stock" means at any given time any equity security issued by Borrower that has any rights, preferences or privileges senior to Borrower's Common Stock.

"Prepayment Charge" shall have the meaning assigned to such term in Section 2.5.

"Qualified Subsidiary" means any direct or indirect Domestic Subsidiary (other than one (1) Security Corporation) or Eligible Foreign Subsidiary.

"Receivables" means (i) all of Borrower's Accounts, Instruments, Documents, Chattel Paper, Supporting Obligations, letters of credit, proceeds of any letter of credit, and Letter of Credit Rights, and (ii) all customer lists, software, and business records related thereto.

"Required Lenders" means at any time, the holders of more than 50% of the aggregate unpaid principal amount of the Term Loans then outstanding.

"Sanctioned Country" shall mean, at any time, a country or territory which is the subject or target of any Sanctions.

"Sanctioned Person" shall mean, at any time, (a) any Person listed in any Sanctions-related list of designated Persons maintained by the Office of Foreign Assets Control of the U.S. Department of the Treasury or the U.S. Department of State, or by the United Nations Security Council, the European Union or any EU member state, (b) any Person operating, organized or resident in a Sanctioned Country or (c) any Person controlled by any such Person.

"Sanctions" shall mean economic or financial sanctions or trade embargoes imposed, administered or enforced from time to time by (a) the U.S. government, including those administered by the Office of Foreign Assets Control of the U.S. Department of the Treasury or the U.S. Department of State, or (b) the United Nations Security Council, the European Union or Her Majesty's Treasury of the United Kingdom.

"SBA" shall have the meaning assigned to such term in Section 7.16.

"SBIC" shall have the meaning assigned to such term in Section 7.16.

"SBIC Act" shall have the meaning assigned to such term in Section 7.16.

"SEC" means the Securities and Exchange Commission, or any successor thereto.

"Secured Obligations" means Borrower's obligations under this Agreement and any Loan Document (other than the Warrant), including any obligation to pay any amount now owing or later arising.

"Subordinated Indebtedness" means Indebtedness subordinated to the Secured Obligations in amounts and on terms and conditions satisfactory to Agent in its sole discretion and subject to a written subordination agreement in form and substance satisfactory to Agent in its sole discretion.

"Subsequent Financing" means the closing of any Borrower institutional financing which becomes effective after the Closing Date, but specifically excluding Borrower's Series B Preferred financing round, and Borrower's Initial Public Offering.

"Subsidiary" means an entity, whether corporate, partnership, limited liability company, joint venture or otherwise, in which Borrower owns or controls 50% or more of the outstanding voting securities, including each entity listed on Schedule 1 hereto.

"Term Commitment" means as to any Lender, the obligation of such Lender, if any, to make a Term Loan Advance to the Borrower in a principal amount not to exceed the amount set forth under the heading "Term Commitment" opposite such Lender's name on Schedule 1.1.

"Term Loan Advance" means any Term Loan funds advanced under this Agreement.

"Term Loan Maturity Date" means November 1, 2021, provided however, if Borrower receives a Tranche 2 Term Loan Advance, and no default or Event of Default shall have occurred and be continuing, then May 1, 2022.

"Term Note" means a Promissory Note in substantially the form of Exhibit B.

"Trademark License" means any written agreement granting any right to use any Trademark or Trademark registration, now owned or hereafter acquired by Borrower or in which Borrower now holds or hereafter acquires any interest.

"Trademarks" means all trademarks (registered, common law or otherwise) and any applications in connection therewith, including registrations, recordings and applications in the United States Patent and Trademark Office or in any similar office or agency of the United States of America, any State thereof or any other country or any political subdivision thereof.

"Tranche 1 Term Loan Advance" shall mean a Term Loan Advance with the meaning assigned to such term in Section 2.2(a)(i).

"Tranche 1 Warrant" means that certain Warrant to purchase a number of shares of Borrower's Preferred Stock at an aggregate exercise price equal to $396,000 issued by Borrower to Lender on the Closing Date in connection with the extension of the Tranche 1 Term Loan Advance.

"Tranche 1 Term Loan Interest Rate" means for any day a per annum rate of interest equal to the greater of either (i) 9.50% plus the prime rate as reported in The Wall Street Journal minus 5.25%, and (ii) 9.50%.

"Tranche 2 Term Loan Advance" shall mean a Term Loan Advance with the meaning assigned to such term in Section 2.2(a)(ii).

"Tranche 2 Warrant" means that certain Warrant issued by Borrower to Lender on the date Borrower draws the Tranche 2 Term Loan Advance in connection with the extension of the Tranche 2 Term Loan Advance; if the Tranche 2 Term Loan Advance is drawn before Borrower achieves Performance Milestone I, the aggregate exercise price shall be $99,000, but if the Tranche 2 Term Loan Advance is drawn after Borrower achieves Performance Milestone I, then the aggregate exercise price shall be $40,000.

"Tranche 3 Term Loan Advance" shall mean a Term Loan Advance with the meaning assigned to such term in Section 2.2(a)(iii).

"Tranche 3 Term Loan Interest Rate" means for any day a per annum rate of interest equal to the greater of either (i) 8.75% plus the prime rate as reported in The Wall Street Journal minus 5.25%, and (ii) 8.75%.

"Tranche 3 Warrant" means that certain Warrant to purchase a number of shares of Borrower's Preferred Stock at an aggregate exercise price equal to $60,000 issued by Borrower to Lender on the date Borrower draws the Tranche 3 Term Loan Advance in connection with the extension of the Tranche 3 Term Loan Advance.

"UCC" means the Uniform Commercial Code as the same is, from time to time, in effect in the State of California; provided, that in the event that, by reason of mandatory provisions of law, any or all of the attachment, perfection or priority of, or remedies with respect to, Agent's Lien on any Collateral is governed by the Uniform Commercial Code as the same is, from time to time, in effect in a jurisdiction other than the State of California, then the term "UCC" shall mean the Uniform Commercial Code as in effect, from time to time, in such other jurisdiction solely for purposes of the provisions thereof relating to such attachment, perfection, priority or remedies and for purposes of definitions related to such provisions.

"Warrant" means any warrant, including the Tranche 1 Warrant, the Tranche 2 Warrant and the Tranche 3 Warrant, entered into in connection with the Loan, as may be amended, restated or modified from time to time.

Unless otherwise specified, all references in this Agreement or any Annex or Schedule hereto to a "Section," "subsection," "Exhibit," "Annex," or "Schedule" shall refer to the corresponding Section, subsection, Exhibit, Annex, or Schedule in or to this Agreement. Unless otherwise specifically provided herein, any accounting term used in this Agreement or the other Loan Documents shall have the meaning customarily given such term in accordance with GAAP, and all financial computations hereunder shall be computed in accordance with GAAP, consistently applied. Unless otherwise defined herein or in the other Loan Documents, terms that are used herein or in the other Loan Documents and defined in the UCC shall have the meanings given to them in the UCC.

SECTION 2 THE LOAN

2.1 [Intentionally omitted.]

2.2 Term Loan.

(a) Advances.

(i) Tranche 1 Term Loan Advances. Subject to the terms and conditions of this Agreement, Lender will severally (and not jointly) make in an amount not to exceed its respective Term Commitment, and Borrower agrees to draw, a Term Loan Advance of $8,000,000 (a "Tranche 1 Term Loan Advance") on the Closing Date.

(ii) Tranche 2 Term Loan Advance. Subject to the terms and conditions of this Agreement, beginning on January 1, 2019 and continuing through March 31, 2019, and subject to Borrower's satisfactory progress towards the achievement of Performance Milestone I in Lender's sole discretion, Borrower may request and Lender will make a Term Loan Advance of $2,000,000 (the "Tranche 2 Term Loan Advance").

(iii) Tranche 3 Term Loan Advance. Subject to the terms and conditions of this Agreement and Borrower's prior receipt of the Tranche 2 Term Loan Advance, beginning on the date Borrower achieves Performance Milestone I and continuing through March 31, 2019, Borrower may request and Lender will make a Term Loan Advance of $3,000,000 (the "Tranche 3 Term Loan Advance").

Subject to the terms above, the aggregate outstanding Term Loan Advances may be up to the Maximum Term Loan Amount.

(b) Advance Request. To obtain a Term Loan Advance, Borrower shall complete, sign and deliver an Advance Request (at least three (3) Business Days before the Advance Date other than with respect to the Tranche 1 Term Loan Advance, which shall be at least one (1) Business Day) to Agent. Lender shall fund the Term Loan Advance in the manner requested by the Advance Request provided that each of the conditions precedent to such Term Loan Advance is satisfied as of the requested Advance Date.

(c) Term Loan Interest Rate.

(i) Tranche 1 Term Loan Advance. The principal balance of the Tranche 1 Term Loan Advance shall bear interest thereon from such Advance Date at the Tranche 1 Term Loan Interest Rate based on a year consisting of 360 days, with interest computed daily based on the actual number of days elapsed.

(ii) Tranche 2 Term Loan Advance. If the Tranche 2 Term Loan Advance is drawn before Borrower achieves Performance Milestone I, the principal balance of the Tranche 2 Term Loan Advance shall bear interest thereon from such Advance Date at the Tranche 1 Term Loan Interest Rate based on a year consisting of 360 days, with interest computed daily based on the actual number of days elapsed. If the Tranche 2 Term Loan Advance is drawn after Borrower achieves Performance Milestone I, the principal balance of the Tranche 2 Term Loan Advance shall bear interest thereon from such Advance Date at the Tranche 3 Term Loan Interest Rate based on a year consisting of 360 days, with interest computed daily based on the actual number of days elapsed.

(iii) Tranche 3 Term Loan Advance. The principal balance of the Tranche 3 Term Loan Advance shall bear interest thereon from the applicable Advance Date at the Tranche 3 Term Loan Interest Rate based on a year consisting of 360 days, with interest computed daily based on the actual number of days elapsed.

The Tranche 1 Term Loan Interest Rate and the Tranche 3 Term Loan Interest Rate will float and change on the day the prime rate changes from time to time.

(d) Payment. Borrower will pay interest on each Term Loan Advance on the first Business Day of each month, beginning the month after the corresponding Advance Date. Borrower shall repay the aggregate Term Loan principal balance that is outstanding on the day immediately preceding the Amortization Date, in equal monthly installments of principal and interest (mortgage style) beginning on the Amortization Date and continuing on the first Business Day of each month thereafter until the Secured Obligations (other than inchoate indemnity obligations and other obligations that are stated to survive termination of this Agreement) are repaid. The entire Term Loan principal balance and all accrued but unpaid interest hereunder, shall be due and payable on Term Loan Maturity Date. Borrower shall make all payments under this Agreement without setoff, recoupment or deduction and regardless of any counterclaim or defense. Lender will initiate debit entries to the Borrower's account as authorized on the ACH Authorization (i) on each payment date of all periodic obligations payable to Lender under each Term Advance and (ii) reasonable and documented out-of-pocket legal fees and costs incurred by Agent or Lender in connection with Section 11.11 of this Agreement; provided that, with respect to clause (i) above, in the event that Lender or Agent informs Borrower that Lender will not initiate a debit entry to Borrower's account for a certain amount of the periodic obligations due on a specific payment date, Borrower shall pay to Lender such amount of periodic obligations in full in immediately available funds on such payment date; provided, further, that, with respect to clause (i) above, if Lender or Agent informs Borrower that Lender will not initiate a debit entry as described above later than the date that is three (3) Business Days prior to such payment date, Borrower shall pay to Lender such amount of periodic obligations in full in immediately available funds on the date that is three (3) Business Days after the date on which Lender or Agent notifies Borrower of such; provided, further, that, with respect to clause (ii) above, in the event that Lender or Agent informs Borrower that Lender will not initiate a debit entry to Borrower's account for certain amount of such out-of-pocket legal fees and costs incurred by Agent or Lender, Borrower shall pay to Lender such amount in full in immediately available funds within three (3) Business Days.

2.3 Maximum Interest. Notwithstanding any provision in this Agreement or any other Loan Document, it is the parties' intent not to contract for, charge or receive interest at a rate that is greater than the maximum rate permissible by law that a court of competent jurisdiction shall deem applicable hereto (which under the laws of the State of California shall be deemed to be the laws relating to permissible rates of interest on commercial loans) (the "Maximum Rate"). If a court of competent jurisdiction shall

finally determine that Borrower has actually paid to Lender an amount of interest in excess of the amount that would have been payable if all of the Secured Obligations had at all times borne interest at the Maximum Rate, then such excess interest actually paid by Borrower shall be applied as follows: first, to the payment of the Secured Obligations consisting of the outstanding principal; second, after all principal is repaid, to the payment of Lender's accrued interest, costs, expenses, professional fees and any other Secured Obligations permitted under this Agreement; and third, after all Secured Obligations are repaid, the excess (if any) shall be refunded to Borrower.

2.4 Default Interest. In the event any payment is not paid on the scheduled payment date, an amount equal to four percent (4%) of the past due amount shall be payable on demand. In addition, upon the occurrence and during the continuation of an Event of Default hereunder, all unpaid Secured Obligations, including principal, interest, compounded interest, and professional fees, shall bear interest at a rate per annum equal to the rate set forth in 2.2(c), plus four percent (4%) per annum. In the event any interest is not paid when due hereunder, delinquent interest shall be added to principal and shall bear interest on interest, compounded at the rate set forth in 2.2(c) or Section 2.4, as applicable.

2.5 Prepayment. At its option upon at least seven (7) Business Days prior written notice to Agent (or such shorter notice period as agreed by Agent in its discretion), Borrower may prepay all, but not less than all, of the outstanding Advances by paying the entire principal balance, all accrued and unpaid interest thereon, together with a prepayment charge equal to the following percentage of the Advance amount being prepaid: if such prepayment is made (a) during any of the first twelve (12) months following the Closing Date, 2.0%; (b) after twelve (12) months but prior to twenty four (24) months following the Closing Date, 1.0%; and (c) after twenty four (24) months following the Closing Date, but prior to the Term Loan Maturity Date, 0.5% (each, a "Prepayment Charge"). Borrower agrees that the Prepayment Charge is a reasonable calculation of Lender's lost profits in view of the difficulties and impracticality of determining actual damages resulting from an early repayment of the Advances. Borrower shall prepay the outstanding amount of all principal and accrued interest through the prepayment date and the Prepayment Charge upon the occurrence of a Change in Control. Notwithstanding the foregoing, Agent and Lender agree to waive the Prepayment Charge if Agent and Lender (in its sole and absolute discretion) agree in writing to refinance the Advances prior to the Term Loan Maturity Date.

2.6 End of Term Charges.

(a) On the earliest to occur of (i) the Term Loan Maturity Date, (ii) the date that Borrower prepays the outstanding Secured Obligations (other than any inchoate indemnity obligations and any other obligations which, by their terms, are to survive the termination of this Agreement) in full, or (iii) the date that the Secured Obligations become due and payable, Borrower shall pay Lender a charge of $636,000 in connection with the Tranche 1 Term Loan Advance. Notwithstanding the required payment date of such charge, it shall be deemed earned by Lender as of the Closing Date.

(b) On the earliest to occur of (i) the Term Loan Maturity Date, (ii) the date that Borrower prepays the outstanding Secured Obligations (other than any inchoate indemnity obligations and any other obligations which, by their terms, are to survive the termination of this Agreement) in full, or (iii) the date that the Secured Obligations become due and payable, Borrower shall pay Lender a charge of $159,000 in connection with the Tranche 2 Term Loan Advance if the Term 2 Term Loan Advance is drawn before Borrower achieves Performance Milestone I, but if the Tranche 2 Term Loan Advance is drawn after Borrower achieves Performance Milestone I, then Borrower shall instead pay Lender a charge of $105,000. Notwithstanding the required payment date of such charge, it shall be deemed earned by Lender as of the Closing Date, to the extent Borrower draws the Tranche 2 Term Loan Advance.

(c) On the earliest to occur of (i) the Term Loan Maturity Date, (ii) the date that Borrower prepays the outstanding Secured Obligations (other than any inchoate indemnity obligations and any other obligations which, by their terms, are to survive the termination of this Agreement) in full, or (iii) the date that the Secured Obligations become due and payable, Borrower shall pay Lender a charge of $157,500 in connection with the Tranche 3 Term Loan Advance. Notwithstanding the required payment date of such charge, it shall be deemed earned by Lender as of the Closing Date, to the extent Borrower draws the Tranche 3 Term Loan Advance.

2.7 Notes. If so requested by Lender by written notice to Borrower, then Borrower shall execute and deliver to Lender (and/or, if applicable and if so specified in such notice, to any Person who is an assignee of Lender pursuant to Section 11.13) (promptly after the Borrower's receipt of such notice) a Note or Notes to evidence Lender's Loans.

2.8 Pro Rata Treatment. Each payment (including prepayment) on account of any fee and any reduction of the Term Loans shall be made pro rata according to the Term Commitments of the relevant Lender.

SECTION 3 SECURITY INTEREST

3.1 As security for the prompt and complete payment when due (whether on the payment dates or otherwise) of all the Secured Obligations, Borrower grants to Agent a security interest in all of Borrower's right, title, and interest in, to and under all of Borrower's personal property and other assets including without limitation the following (except as set forth herein) whether now owned or hereafter acquired (collectively, the "Collateral"): (a) Receivables; (b) Equipment; (c) Fixtures; (d) General Intangibles; (e) Inventory; (f) Investment Property; (g) Deposit Accounts; (h) Cash; (i) Goods; and all other tangible and intangible personal property of Borrower whether now or hereafter owned or existing, leased, consigned by or to, or acquired by, Borrower and wherever located, and any of Borrower's property in the possession or under the control of Agent; and, to the extent not otherwise included, all Proceeds of each of the foregoing and all accessions to, substitutions and replacements for, and rents, profits and products of each of the foregoing. Notwithstanding the above, upon Borrower's achievement of Performance Milestone I, Agent shall promptly release its lien on Intellectual Property,

provided, however, that from and after such release, the Collateral shall include all Accounts and General Intangibles that consist of rights to payment and proceeds from the sale, licensing or disposition of all or any part, or rights in, the Intellectual Property (the "Rights to Payment"). Notwithstanding the foregoing, if a judicial authority (including a U.S. Bankruptcy Court) holds that a security interest in the underlying Intellectual Property is necessary to have a security interest in the Rights to Payment, then the Collateral shall automatically, and effective as of the date of this Agreement, include the Intellectual Property to the extent necessary to permit perfection of Agent's security interest in the Rights to Payment.

3.2 Notwithstanding the broad grant of the security interest set forth in Section 3.1 above, the Collateral shall not include (a) more than 65% of the presently existing and hereafter arising issued and outstanding shares of capital stock owned by Borrower of any Foreign Subsidiary (other than an Eligible Foreign Subsidiary) which shares entitle the holder thereof to vote for directors or any other matter, (b) any "intent to use" trademarks at all times prior to the first use thereof, whether by the actual use thereof in commerce, the recording of a statement of use with the United States Patent and Trademark Office or otherwise, provided, that upon submission and acceptance by the United States Patent and Trademark Office of an amendment to allege use of an intent-to-use trademark application pursuant to 15 U.S.C. Section 1060(a) (or any successor provision) such intent-to-use application shall constitute Collateral, (c) nonassignable licenses or contracts, which by their terms require the consent of the licensor thereof or another party (but only to the extent such prohibition on transfer is enforceable under applicable law, including, without limitation, Sections 9406, 9407 and 9408 of the UCC), and (d) any leasehold real property interest, license, lease or other contract or agreement or any property subject to a purchase money security interest or similar arrangement to the extent that a grant of a security interest therein would violate or invalidate such lease, license, contract or agreement or purchase money arrangement or create a right of termination in favor of any other party thereto (but only to the extent such prohibition on transfer or grant of a security interest is enforceable under applicable law, including, without limitation, Sections 9406, 9407 and 9408 of the UCC), (e) any property to the extent that, and for as long as, such grant of a security interest is prohibited by any applicable law, rule or regulation; provided that the foregoing exclusion in this clause (e) shall in no way be construed (i) to apply to the extent that any described prohibition is unenforceable under Section 9406, 9407 or 9408 of the UCC or other applicable law or (ii) to apply to the extent that any consent or waiver has been obtained, or is hereafter obtained, that would permit the Agent's security interest or Lien notwithstanding the prohibition on the grant of a security interest in such property (f) Excluded Accounts, (g) motor vehicles or other assets in which a security interest may be perfected only though compliance with a certificate of title statute, (h) any property subject to the Sanofi Agreement as disclosed on Schedule 3.2 hereto, and (i) any Cash securing reimbursement obligations permitted under this Agreement.

SECTION 4 CONDITIONS PRECEDENT TO LOAN

The obligations of Lender to make the Loan hereunder are subject to the satisfaction by Borrower of the following conditions:

4.1 Initial Advance. On or prior to the Closing Date, Borrower shall have delivered to Agent the following:

(a) executed copies of the Loan Documents (other than the Tranche 1 Warrant, which shall be an original), Account Control Agreements, and all other documents and instruments reasonably required by Agent to effectuate the transactions contemplated hereby or to create and perfect the Liens of Agent with respect to all Collateral, in all cases in form and substance reasonably acceptable to Agent;

(b) certified copy of resolutions of Borrower's board of directors evidencing approval of (i) the Loan and other transactions evidenced by the Loan Documents; and (ii) the Warrant and transactions evidenced thereby;

(c) certified copies of the Certificate of Incorporation and the Bylaws, as amended through the Closing Date, of Borrower;

(d) a certificate of good standing for Borrower from its state of incorporation and similar certificates from all other jurisdictions in which it does business and where the failure to be qualified could have a Material Adverse Effect;

(e) payment of the Facility Charge and reimbursement of Agent's and Lender's reasonable and documented expenses reimbursable pursuant to this Agreement, which amounts may be deducted from the initial Advance;

(f) all certificates of insurance with respect to insurance required hereunder; and

(g) such other documents as Agent may reasonably request.

4.2 All Advances. On each Advance Date:

(a) Agent shall have received (i) an Advance Request for the relevant Advance as required by 2.2(b), each duly executed by Borrower's Chief Executive Officer or Chief Financial Officer, (ii) the Tranche 2 Warrant or Tranche 3 Warrant, as applicable, and (iii) any other documents Agent may reasonably request.

(b) The representations and warranties set forth in this Agreement shall be true and correct in all material respects on and as of the Advance Date with the same effect as though made on and as of such date, except to the extent such representations and warranties expressly relate to an earlier date, and representations and warranties that may be updated pursuant to this Agreement shall be true and correct in all material respects as of the date made, provided that such updated representations and warranties shall not apply to an earlier date and shall not cure any default arising from any false or incorrect representations and warranties previously made.

(c) Borrower shall be in compliance with all the terms and provisions set forth herein and in each other Loan Document on its part to be observed or performed, and at the time of and immediately after such Advance no Event of Default shall have occurred and be continuing.

(d) Each Advance Request shall be deemed to constitute a representation and warranty by Borrower on the relevant Advance Date as to the matters specified in paragraphs (b) and (c) of this Section 4.2 and as to the matters set forth in the Advance Request.

4.3 No Default. As of the Closing Date and each Advance Date, (i) no fact or condition exists that could reasonably (or could reasonably, with the passage of time, the giving of notice, or both) constitute an Event of Default and (ii) no event that has had or could reasonably be expected to have a Material Adverse Effect has occurred and is continuing.

SECTION 5 REPRESENTATIONS AND WARRANTIES OF BORROWER

Borrower represents and warrants that:

5.1 Corporate Status. Borrower is a corporation duly organized, legally existing and in good standing under the laws of the State of Delaware, and is duly qualified as a foreign corporation in all jurisdictions in which the nature of its business or location of its properties require such qualifications and where the failure to be qualified could reasonably be expected to have a Material Adverse Effect. Borrower's present name, former names (if any), locations, place of formation, tax identification number, organizational identification number and other information are correctly set forth in Exhibit C, as may be updated by Borrower in a written notice (including any Compliance Certificate) provided to Agent after the Closing Date.

5.2 Collateral. Borrower owns the Collateral, including, as applicable, the Intellectual Property, free of all Liens, except for Permitted Liens. Borrower has the power and authority to grant to Agent a Lien in the Collateral as security for the Secured Obligations.

5.3 Consents. Borrower's execution, delivery and performance of this Agreement and all other Loan Documents, and Borrower's execution of the Warrant, (i) have been duly authorized by all necessary corporate action of Borrower, (ii) will not result in the creation or imposition of any Lien upon the Collateral, other than Permitted Liens and the Liens created by this Agreement and the other Loan Documents, (iii) do not violate any provisions of Borrower's Certificate or Articles of Incorporation (as applicable), bylaws, or any, law, regulation, order, injunction, judgment, decree or writ to which Borrower is subject and (iv) except as described on Schedule 5.3, do not violate any material contract or agreement or require the consent or approval of any other Person which has not already been obtained. The individual or individuals executing the Loan Documents and the Warrant are duly authorized to do so.

5.4 Material Adverse Effect. No event that has had or could reasonably be expected to have a Material Adverse Effect has occurred and is continuing. Borrower is not aware of any event likely to occur that is reasonably expected to result in a Material Adverse Effect.

5.5 Actions Before Governmental Authorities. There are no actions, suits or proceedings at law or in equity or by or before any governmental authority now pending or, to the knowledge of Borrower, threatened in writing against Borrower or its property, that is reasonably expected to result in a Material Adverse Effect.

5.6 Laws. Neither Borrower nor any of its Subsidiaries is in violation of any law, rule or regulation, or in default with respect to any judgment, writ, injunction or decree of any governmental authority, where such violation or default is reasonably expected to result in a Material Adverse Effect. Borrower is not in default in any manner under any provision of any agreement or instrument evidencing material Indebtedness, or any other material agreement to which it is a party or by which it is bound.

Neither Borrower nor any of its Subsidiaries is an "investment company" or a company "controlled" by an "investment company" under the Investment Company Act of 1940, as amended. Neither Borrower nor any of its Subsidiaries is engaged as one of its important activities in extending credit for margin stock (under Regulations X, T and U of the Federal Reserve Board of Governors). Borrower and each of its Subsidiaries has complied in all material respects with the Federal Fair Labor Standards Act. Neither Borrower nor any of its Subsidiaries is a "holding company" or an "affiliate" of a "holding company" or a "subsidiary company" of a "holding company" as each term is defined and used in the Public Utility Holding Company Act of 2005. Neither Borrower's nor any of its Subsidiaries' properties or assets has been used by Borrower or such Subsidiary or, to Borrower's Knowledge, by previous Persons, in disposing, producing, storing, treating, or transporting any hazardous substance other than in material compliance with applicable laws. Borrower and each of its Subsidiaries has obtained all consents, approvals and authorizations of, made all declarations or filings with, and given all notices to, all Governmental Authorities that are necessary to continue their respective businesses as currently conducted.

None of Borrower, any of its Subsidiaries, or any of Borrower's or its Subsidiaries' Affiliates or any of their respective agents acting or benefiting in any capacity in connection with the transactions contemplated by this Agreement is (i) in violation of any Anti-Terrorism Law, (ii) engaging in or conspiring to engage in any transaction that evades or avoids, or has the purpose of evading or avoiding or attempts to violate, any of the prohibitions set forth in any Anti-Terrorism Law, or (iii) is a Blocked Person. None of Borrower, any of its Subsidiaries, or to the knowledge of Borrower and any of their Affiliates or agents, acting or benefiting in any capacity in connection with the transactions contemplated by this Agreement, (x) conducts any business or engages in making or receiving any contribution of funds, goods or services to or for the benefit of any Blocked Person, or (y) deals in, or otherwise engages in any transaction relating to, any property or interest in property blocked pursuant to Executive Order No. 13224, any similar executive order or other Anti-Terrorism Law. None of the funds to be provided under this Agreement will be used, directly or indirectly, (a) for any activities in violation of any applicable anti-money laundering, economic sanctions and anti-bribery laws and

regulations laws and regulations or (b) for any payment to any governmental official or employee, political party, official of a political party, candidate for political office, or anyone else acting in an official capacity, in order to obtain, retain or direct business or obtain any improper advantage, in violation of the United States Foreign Corrupt Practices Act of 1977, as amended.

5.7 Information Correct and Current. No information, report, Advance Request, financial statement, exhibit or schedule furnished, by or on behalf of Borrower to Agent in connection with any Loan Document or included therein or delivered pursuant thereto contained, or, when taken as a whole, contains or will contain any material misstatement of fact or, when taken together with all other such information or documents, omitted, omits or will omit to state any material fact necessary to make the statements therein, in the light of the circumstances under which they were, are or will be made, not materially misleading at the time such statement was made or deemed made. Additionally, any and all financial or business projections provided by Borrower to Agent, whether prior to or after the Closing Date, shall be (i) provided in good faith and based on the most current data and information available to Borrower, and (ii) the most current of such projections provided to Borrower's Board of Directors (it being understood that such projections are subject to significant uncertainties and contingencies, many of which are beyond the control of Borrower, that no assurance is given that any particular projections will be realized, and that actual results may differ).

5.8 Tax Matters. Except as described on Schedule 5.8 and except those being contested in good faith with adequate reserves under GAAP, (a) Borrower has filed all material federal, state and local tax returns that it is required to file, (b) Borrower has duly paid or fully reserved for all taxes or installments thereof (including any interest or penalties) as and when due, which have or may become due pursuant to such returns, and (c) Borrower has paid or fully reserved for any tax assessment received by Borrower for the three (3) years preceding the Closing Date, if any (including any taxes being contested in good faith and by appropriate proceedings), in each case, other than with respect to taxes that do not exceed, individually or in the aggregate, $25,000.

5.9 Intellectual Property Claims. Borrower is the sole owner of, or otherwise has the right to use, the Intellectual Property material to Borrower's business. Except as described on Schedule 5.9, (i) each of the material Copyrights, Trademarks and Patents is valid and enforceable, (ii) no material part of the Intellectual Property has been judged invalid or unenforceable, in whole or in part, and (iii) no claim has been made to Borrower that any material part of the Intellectual Property violates the rights of any third party. Exhibit D is a true, correct and complete list of each of Borrower's Patents, registered Trademarks, registered Copyrights, and material agreements under which Borrower licenses Intellectual Property from third parties (other than shrink-wrap software licenses), together with application or registration numbers, as applicable, owned by Borrower or any Subsidiary, in each case as of the Closing Date. Borrower is not in material breach of, nor has Borrower failed to perform any material obligations under, any of the foregoing contracts, licenses or agreements and, to Borrower's knowledge, no third party to any such contract, license or agreement is in material breach thereof or has failed to perform any material obligations thereunder.

5.10 Intellectual Property. Except as described on Schedule 5.10, Borrower has all material rights with respect to Intellectual Property that it uses in, and that is necessary or material in the operation or conduct of Borrower's business as currently conducted and proposed to be conducted by Borrower. Without limiting the generality of the foregoing, and in the case of Licenses, except for restrictions that are unenforceable under Division 9 of the UCC, Borrower has the right, to the extent required to operate Borrower's business, to freely transfer, license or assign Intellectual Property necessary or material in the operation or conduct of Borrower's business as currently conducted by Borrower, without condition, restriction or payment of any kind (other than license payments in the ordinary course of business) to any third party, and Borrower owns or has the right to use, pursuant to valid licenses, all software development tools, library functions, compilers and all other third-party software and other items that are material to Borrower's business and used in the design, development, promotion, sale, license, manufacture, import, export, use or distribution of Borrower Products that are material to Borrower's business except customary covenants in inbound license agreements and equipment leases where Borrower is the licensee or lessee.

5.11 Borrower Products. Except as described on Schedule 5.11, which may be updated by Borrower in a written notice provided after the Closing Date, no Intellectual Property owned by Borrower or Borrower Product has been or is subject to any actual or, to the knowledge of Borrower, threatened in writing litigation, proceeding (including any proceeding in the United States Patent and Trademark Office or any corresponding foreign office or agency) or outstanding decree, order, judgment, settlement agreement or stipulation that restricts in any manner Borrower's use, transfer or licensing thereof or that may affect the validity, use or enforceability thereof, in such case, which could reasonably be expected to have a Material Adverse Effect. There is no decree, order, judgment, agreement, stipulation, arbitral award or other provision entered into in connection with any litigation or proceeding that obligates Borrower to grant licenses or ownership interest in any future Intellectual Property related to the operation or conduct of the business of Borrower or Borrower Products. Except as set forth on Schedule 5.11, Borrower has not received any written notice or claim, challenging or questioning Borrower's ownership in any Intellectual Property material to Borrower's business (or written notice of any claim challenging or questioning the ownership in any licensed Intellectual Property of the owner thereof) or suggesting that any third party has any claim of legal or beneficial ownership with respect thereto nor, to Borrower's knowledge, is there a reasonable basis for any such claim. Neither Borrower's use of its Intellectual Property material to Borrower's business nor the production and sale of Borrower Products material to Borrower's business infringes the Intellectual Property or other rights of others.

5.12 Financial Accounts. Exhibit E, as may be updated by the Borrower in a written notice provided to Agent after the Closing Date, is a true, correct and complete list of (a) all banks and other financial institutions at which Borrower or any Subsidiary maintains Deposit Accounts and (b) all institutions at which Borrower or any Subsidiary maintains an account holding Investment Property, and such exhibit correctly identifies the name, address and telephone number of each bank or other institution, the name in which the account is held, a description of the purpose of the account, and the complete account number therefor.

5.13 Employee Loans. Except as described on Schedule 5.13, which may be updated by Borrower in a written notice provided after the Closing Date, Borrower has no outstanding loans to any employee, officer or director of the Borrower nor has Borrower guaranteed the payment of any loan made to an employee, officer or director of the Borrower by a third party.

5.14 Capitalization and Subsidiaries. Borrower's capitalization as of the Closing Date is set forth on Schedule 5.14 annexed hereto. Borrower does not own any stock, partnership interest or other securities of any Person, except for Permitted Investments. Attached as Schedule 5.14, as may be updated by Borrower in a written notice provided after the Closing Date, is a true, correct and complete list of each Subsidiary.

5.15 Foreign Subsidiary Voting Rights. No decision or action in any governing document of any Foreign Subsidiary (other than an Eligible Foreign Subsidiary) requires a vote of greater than 50.1% of the Equity Interests or voting rights of such Foreign Subsidiary.

SECTION 6 INSURANCE; INDEMNIFICATION

6.1 Coverage. Borrower shall cause to be carried and maintained commercial general liability insurance, on an occurrence form, against risks customarily insured against in Borrower's line of business. Such risks shall include the risks of bodily injury, including death, property damage, personal injury, advertising injury, and contractual liability per the terms of the indemnification agreement found in Section 6.3. Borrower must maintain a minimum of $2,000,000 of commercial general liability insurance for each occurrence. Borrower has and agrees to maintain a minimum of $2,000,000 of directors' and officers' insurance for each occurrence and $5,000,000 in the aggregate. So long as there are any Secured Obligations outstanding (other than inchoate indemnity obligations and other obligations which are expressly stated to survive termination of this Agreement), Borrower shall also cause to be carried and maintained insurance upon the Collateral, insuring against all risks of physical loss or damage howsoever caused, in an amount not less than the full replacement cost of the Collateral, provided that such insurance may be subject to standard exceptions and deductibles.

6.2 Certificates. Borrower shall deliver to Agent certificates of insurance that evidence Borrower's compliance with its insurance obligations in Section 6.1 and the obligations contained in this Section 6.2. Borrower's insurance certificate shall state Agent (shown as "Hercules Capital, Inc.", as Agent") is an additional insured for commercial general liability, a loss payee for all risk property damage insurance, subject to the insurer's approval, and a loss payee for property insurance and additional insured for liability insurance for any future insurance that Borrower may acquire from such insurer. Attached to the certificates of insurance will be additional insured endorsements for liability and lender's loss payable endorsements for all risk property damage

insurance. All certificates of insurance will provide for a minimum of thirty (30) days advance written notice to Agent of cancellation (other than cancellation for non-payment of premiums, for which ten (10) days' advance written notice shall be sufficient) or any other change adverse to Agent's interests. Any failure of Agent to scrutinize such insurance certificates for compliance is not a waiver of any of Agent's rights, all of which are reserved. Borrower shall provide Agent with copies of each insurance policy within thirty (30) days of the Closing Date, and upon entering or amending any insurance policy required hereunder, Borrower shall provide Agent with copies of such policies and shall promptly deliver to Agent updated insurance certificates with respect to such policies.

6.3 Indemnity. Borrower agrees to indemnify and hold Agent, Lender and their officers, directors, employees, agents, in-house attorneys, representatives and shareholders (each, an "Indemnified Person") harmless from and against any and all claims, costs, expenses, damages and liabilities (including such claims, costs, expenses, damages and liabilities based on liability in tort, including strict liability in tort), including reasonable attorneys' fees and disbursements and other costs of investigation or defense (including those incurred upon any appeal) (collectively, "Liabilities"), that may be instituted or asserted against or incurred by such Indemnified Person as the result of credit having been extended, suspended or terminated under this Agreement and the other Loan Documents or the administration of such credit, or in connection with or arising out of the transactions contemplated hereunder and thereunder, or any actions or failures to act in connection therewith, or arising out of the disposition or utilization of the Collateral, excluding in all cases Liabilities to the extent resulting solely from any Indemnified Person's gross negligence or willful misconduct. Borrower agrees to pay, and to save Agent and Lender harmless from, any and all liabilities with respect to, or resulting from any delay in paying, any and all excise, sales or other similar taxes (excluding taxes imposed on or measured by the net income of Agent or Lender) that may be payable or determined to be payable with respect to any of the Collateral or this Agreement. In no event shall any Indemnified Person be liable on any theory of liability for any special, indirect, consequential or punitive damages (including any loss of profits, business or anticipated savings). This Section 6.3 shall survive the repayment of indebtedness under, and otherwise shall survive the expiration or other termination of, the Loan Agreement.

SECTION 7 COVENANTS OF BORROWER

Borrower agrees as follows:

7.1 Financial Reports. Borrower shall furnish to Agent the financial statements and reports listed hereinafter (the "Financial Statements"):

(a) as soon as practicable (and in any event within 30 days) after the end of each month, unaudited interim and year-to-date financial statements as of the end of such month (prepared on a consolidated and consolidating basis, if applicable), including balance sheet and related statements of income and cash flows accompanied by a report detailing any material contingencies (including the commencement of any material litigation by or against Borrower) or any other occurrence that could reasonably be

expected to have a Material Adverse Effect, prepared in accordance with GAAP, except (i) for the absence of footnotes, (ii) that they are subject to normal year end adjustments, and (iii) they do not contain certain non-cash items that are customarily included in quarterly and annual financial statements;

(b) as soon as practicable (and in any event within 45 days) after the end of each calendar quarter, unaudited interim and year-to-date financial statements as of the end of such calendar quarter (prepared on a consolidated and consolidating basis, if applicable), including balance sheet and related statements of income and cash flows accompanied by a report detailing any material contingencies (including the commencement of any material litigation by or against Borrower) or any other occurrence that could reasonably be expected to have a Material Adverse Effect, certified by Borrower's Chief Executive Officer or Chief Financial Officer to the effect that they have been prepared in accordance with GAAP, except (i) for the absence of footnotes, and (ii) that they are subject to normal year end adjustments; as well as the most recent capitalization table for Borrower, including the weighted average exercise price of employee stock options;

(c) as soon as practicable (and in any event within one hundred eighty (180) days) after the end of each fiscal year, unqualified audited financial statements as of the end of such year (prepared on a consolidated and consolidating basis, if applicable), including balance sheet and related statements of income and cash flows, and setting forth in comparative form the corresponding figures for the preceding fiscal year, certified by a firm of independent certified public accountants selected by Borrower and reasonably acceptable to Agent, accompanied by any management report from such accountants (Agent hereby acknowledges that PwC is an acceptable firm of independent public accounts);

(d) as soon as practicable (and in any event within 30 days) after the end of each month, a Compliance Certificate in the form of Exhibit F;

(e) as soon as practicable (and in any event within 30 days) after the end of each month, a report showing agings of accounts receivable and accounts payable;

(f) promptly and in any event within 5 days after the sending or filing thereof, as the case may be, copies of any proxy statements, financial statements or reports that Borrower has made generally available to holders of its Preferred Stock and copies of any regular, periodic and special reports or registration statements that Borrower files with the Securities and Exchange Commission or any governmental authority that may be substituted therefor, or any national securities exchange;

(g) at the same time and in the same manner as it gives to its Board of Directors, copies of all board packages that Borrower provides to its directors in connection with meetings of the Board of Directors, and within 30 days after each such meeting, minutes of such meeting, provided that in all cases Borrower may exclude confidential compensation information, information presenting a conflict of interest with Agent or Lender and information covered by attorney-client privilege;

(h) any budget and any forecast of Borrower promptly following its approval by Borrower's Board of Directors, and in any event, not less than once annually, no later than 60 days following the end of the fiscal year;

(i) such other financial information reasonably requested by Agent; and

(j) immediate notice if Borrower or any Subsidiary has knowledge that Borrower, or any Subsidiary or Affiliate of Borrower, is listed on the OFAC Lists or (a) is convicted on, (b) pleads nolo contendere to, (c) is indicted on, or (d) is arraigned and held over on charges involving money laundering or predicate crimes to money laundering.

Borrower shall not (without the consent of Agent, such consent not to be unreasonably withheld or delayed), make any change in its (a) accounting policies or reporting practices, except as required by GAAP or (b) fiscal years or fiscal quarters. As of the Closing Date, the fiscal year of Borrower ends on December 31.

The executed Compliance Certificate may be sent via email to Agent at legal@herculestech.com. All Financial Statements required to be delivered pursuant to clauses (a), (b) and (c) shall be sent via e-mail to financialstatements@herculestech.com with a copy to legal@herculestech.com provided, that if e-mail is not available or sending such Financial Statements via e-mail is not possible, they shall be faxed to Agent at: (650) 473-9194, attention Account Manager: X4 Pharmaceuticals, Inc.

Notwithstanding the foregoing, documents required to be delivered pursuant to the terms hereof (to the extent any such documents are included in materials otherwise filed with the SEC) may be delivered electronically and if so delivered, shall be deemed to have been delivered on the date on which Borrower emails a link thereto to Agent.

7.2 Management Rights. Borrower shall permit any representative that Agent or Lender authorizes, including its attorneys and accountants, to inspect the Collateral and examine and make copies and abstracts of the books of account and records of Borrower at reasonable times and upon reasonable notice during normal business hours; provided, however, that so long as no Event of Default has occurred and is continuing, such examinations shall be limited to no more often than twice per fiscal year. In addition, any such representative shall have the right to meet with management and officers of Borrower to discuss such books of account and records at reasonable times and upon reasonable notice during normal business hours. In addition, Agent or Lender shall be entitled at reasonable times and intervals to consult with and advise the management and officers of Borrower concerning significant business issues affecting Borrower; provided that management and officers of Borrower shall not be bound to accept such advisement. Such consultations shall not unreasonably interfere with Borrower's business operations. The parties intend that the rights granted Agent and Lender shall constitute "management rights" within the meaning of 29 C.F.R. Section 2510.3-101(d)(3)(ii), but that any advice, recommendations or participation by Agent or Lender with respect to any business issues shall not be deemed to give Agent or Lender, nor be deemed an exercise by Agent or Lender of, control over Borrower's management or policies.

7.3 Further Assurances. Borrower shall from time to time following Agent's request execute, deliver and file, alone or with Agent, any financing statements, security agreements, collateral assignments, notices, control agreements, or other documents to perfect or give the highest priority to Agent's Lien on the Collateral. Borrower shall from time to time procure any instruments or documents as may be reasonably requested by Agent, and take all further action that may be necessary, or that Agent may reasonably request, to perfect and protect the Liens granted hereby and thereby. In addition, and for such purposes only, Borrower hereby authorizes Agent to execute and deliver on behalf of Borrower and to file such financing statements (including an indication that the financing statement covers "all assets or all personal property" of Borrower in accordance with Section 9-504 of the UCC), collateral assignments, notices, control agreements, security agreements and other documents without the signature of Borrower either in Agent's name or in the name of Agent as agent and attorney-in-fact for Borrower. Borrower shall protect and defend Borrower's title to the Collateral and Agent's Lien thereon against all Persons claiming any interest adverse to Borrower or Agent other than Permitted Liens.

7.4 Indebtedness. Borrower shall not create, incur, assume, guarantee or be or remain liable with respect to any Indebtedness, or permit any Subsidiary so to do, other than Permitted Indebtedness, or prepay any Indebtedness or take any actions which impose on Borrower an obligation to prepay any Indebtedness, except for (a) the conversion of Indebtedness into equity securities and the payment of cash in lieu of fractional shares in connection with such conversion, (b) purchase money Indebtedness pursuant to its then applicable payment schedule, (c) prepayment by any Subsidiary of (i) inter-company Indebtedness owed by such Subsidiary to any Borrower, or (ii) if such Subsidiary is not a Borrower, intercompany Indebtedness owed by such Subsidiary to another Subsidiary that is not a Borrower or (d) as otherwise permitted hereunder or approved in writing by Agent.

7.5 Collateral. Borrower shall at all times keep the Collateral, the Intellectual Property and all other property and assets used in Borrower's business or in which Borrower now or hereafter holds any interest free and clear from any legal process or Liens whatsoever (except for Permitted Liens), and shall give Agent prompt written notice of any legal process affecting the Collateral, the Intellectual Property, such other property and assets, or any Liens thereon, provided however, that the Collateral and such other property and assets may be subject to Permitted Liens except that there shall be no Liens whatsoever on Intellectual Property other than (i) customary restrictions on assignment, sublicense or transfer that may exist in any license agreement where Borrower or a Subsidiary is the licensee (and not the licensor) and (ii) licenses of Intellectual Property that constitute Permitted Transfers. Borrower shall not agree with any Person other than Agent or Lender not to encumber its property other than pursuant to customary restrictions in leases, licenses and agreements in respect of Permitted Indebtedness. Borrower shall not enter into or suffer to exist or become effective any agreement that prohibits or limits the ability of any Borrower to create, incur, assume or suffer to exist any Lien upon any of its Intellectual Property, whether now owned or hereafter acquired, to secure its obligations under the Loan Documents to which it is a party other than (a) this Agreement and the other Loan Documents, (b) any agreements

governing any purchase money Liens or capital lease obligations otherwise permitted hereby (in which case, any prohibition or limitation shall only be effective against the assets financed thereby) and (c) customary restrictions on the assignment of leases, licenses and other agreements. Borrower shall cause its Subsidiaries to protect and defend such Subsidiary's title to its assets from and against all Persons claiming any interest adverse to such Subsidiary, and Borrower shall cause its Subsidiaries at all times to keep such Subsidiary's property and assets free and clear from any legal process or Liens whatsoever (except for Permitted Liens, provided however, that there shall be no Liens whatsoever on Intellectual Property other than (i) customary restrictions on assignment, sublicense or transfer that may exist in any license agreement where Borrower or a Subsidiary is the licensee (and not the licensor) and (ii) licenses of Intellectual Property that constitute Permitted Transfers), and shall give Agent prompt written notice of any legal process affecting such Subsidiary's assets.

7.6 Investments. Borrower shall not directly or indirectly acquire or own, or make any Investment in or to any Person, or permit any of its Subsidiaries so to do, other than Permitted Investments.

7.7 Distributions. Borrower shall not, and shall not allow any Subsidiary to, (a) repurchase or redeem any class of stock or other Equity Interest other than pursuant to employee, director or consultant repurchase plans or other similar agreements, provided, however, in each case the repurchase or redemption price does not exceed the original consideration paid for such stock or Equity Interest, or (b) declare or pay any cash dividend or make a cash distribution on any class of stock or other Equity Interest, except that a Subsidiary may pay dividends or make distributions to Borrower, or (c) lend money to any employees, officers or directors (except for Permitted Investments) or guarantee the payment of any such loans granted by a third party in excess of $100,000 in the aggregate or (d) waive, release or forgive any Indebtedness owed by any employees, officers or directors in excess of $100,000 in the aggregate.

7.8 Transfers. Except for Permitted Transfers, Borrower shall not, and shall not allow any Subsidiary to, voluntarily or involuntarily transfer, sell, lease, license, lend or in any other manner convey any equitable, beneficial or legal interest in any material portion of its assets.

7.9 Mergers or Acquisitions. Borrower shall not merge or consolidate, or permit any of its Subsidiaries to merge or consolidate, with or into any other business organization (other than mergers or consolidations of (a) a Subsidiary which is not a Borrower into another Subsidiary or into Borrower or (b) a Borrower into another Borrower), or acquire, or permit any of its Subsidiaries to acquire, all or substantially all of the capital stock or property of another Person.

7.10 Taxes. Borrower and its Subsidiaries shall pay when due all material taxes, fees or other charges of any nature whatsoever (together with any related interest or penalties) now or hereafter imposed or assessed against Borrower, Agent, Lender or the Collateral or upon Borrower's ownership, possession, use, operation or disposition thereof or upon Borrower's rents, receipts or earnings arising therefrom. Borrower shall file on or before the due date therefor all personal property tax returns in respect of the Collateral. Notwithstanding the foregoing, Borrower may contest, in good faith and by appropriate proceedings, taxes for which Borrower maintains adequate reserves therefor in accordance with GAAP.

7.11 Corporate Changes. Neither Borrower nor any Subsidiary shall change its corporate name, legal form or jurisdiction of formation without twenty (20) days' prior written notice to Agent. Neither Borrower nor any Subsidiary shall suffer a Change in Control. Neither Borrower nor any Subsidiary shall relocate its chief executive office or its principal place of business unless: (i) it has provided prior written notice to Agent; and (ii) such relocation shall be within the continental United States of America. Neither Borrower nor any Qualified Subsidiary shall relocate any item of Collateral (other than (x) sales of Inventory in the ordinary course of business, (y) relocations of Equipment having an aggregate value of up to $150,000 in any fiscal year, and (z) relocations of Collateral from a location described on Exhibit C to another location described on Exhibit C) unless (i) it has provided prompt written notice to Agent, (ii) such relocation is within the continental United States of America and, (iii) if such relocation is to a third party bailee, it has delivered a bailee agreement in form and substance reasonably acceptable to Agent.

7.12 Deposit Accounts. Neither Borrower nor any Qualified Subsidiary shall maintain any Deposit Accounts, or accounts holding Investment Property, except (i) for Excluded Accounts, or (ii) with respect to which Agent has an Account Control Agreement.

7.13 Borrower shall notify Agent of each Subsidiary formed subsequent to the Closing Date and, within 15 days of formation, shall cause any such Qualified Subsidiary to execute and deliver to Agent a Joinder Agreement.

7.14 [Reserved.]

7.15 Notification of Event of Default. Borrower shall notify Agent immediately of the occurrence of any Event of Default.

7.16 Agent and Lender have received a license from the U.S. Small Business Administration ("SBA") to extend loans as a small business investment company ("SBIC") pursuant to the Small Business Investment Act of 1958, as amended, and the associated regulations (collectively, the "SBIC Act"). Portions of the loan to Borrower will be made under the SBA license and the SBIC Act. Addendum 1 to this Agreement outlines various responsibilities of Agent, Lender and Borrower associated with an SBA loan, and such Addendum 1 is hereby incorporated in this Agreement.

7.17 Use of Proceeds. Borrower agrees that the proceeds of the Loans shall be used solely to refinance existing indebtedness, to pay related fees and expenses in connection with this Agreement and for working capital and general corporate purposes. The proceeds of the Loans will not be used in violation of Anti-Corruption Laws or applicable Sanctions.

7.18 Foreign Subsidiary Voting Rights. Borrower shall not, and shall not permit any Subsidiary, to amend or modify any governing document of any Foreign Subsidiary of Borrower (other than an Eligible Foreign Subsidiary) the effect of which is to require a vote of greater than 50.1% of the Equity Interests or voting rights of such entity for any decision or action of such entity.

7.19 Compliance with Laws.

Borrower shall maintain, and shall cause its Subsidiaries to maintain, compliance in all material respect with all applicable laws, rules or regulations (including any law, rule or regulation with respect to the making or brokering of loans or financial accommodations), and shall, or cause its Subsidiaries to, obtain and maintain all required governmental authorizations, approvals, licenses, franchises, permits or registrations reasonably necessary in connection with the conduct of Borrower's business.

Neither Borrower nor any of its Subsidiaries shall, nor shall Borrower or any of its Subsidiaries permit any Affiliate controlled by Borrower or any Subsidiary to, directly or indirectly, knowingly enter into any documents, instruments, agreements or contracts with any Person listed on the OFAC Lists. Neither Borrower nor any of its Subsidiaries shall, nor shall Borrower or any of its Subsidiaries, permit any Affiliate controlled by Borrower or any Subsidiary to, directly or indirectly, (i) conduct any business or engage in any transaction or dealing with any Blocked Person, including, without limitation, the making or receiving of any contribution of funds, goods or services to or for the benefit of any Blocked Person, (ii) deal in, or otherwise engage in any transaction relating to, any property or interests in property blocked pursuant to Executive Order No. 13224 or any similar executive order or other Anti-Terrorism Law, or (iii) engage in or conspire to engage in any transaction that evades or avoids, or has the purpose of evading or avoiding, or attempts to violate, any of the prohibitions set forth in Executive Order No. 13224 or other Anti-Terrorism Law.

Borrower and its Subsidiaries and their respective officers and employees and to the knowledge of Borrower, its directors and agents, are in compliance with Anti-Corruption Laws and applicable Sanctions in all material respects.

None of Borrower, any of its Subsidiaries or any of their respective directors, officers or employees, or to the knowledge of Borrower, any agent for Borrower or its Subsidiaries that will act in any capacity in connection with or benefit from the credit facility established hereby, is a Sanctioned Person. No Loan, use of proceeds or other transaction contemplated by this Agreement will violate Anti-Corruption Laws or applicable Sanctions.

7.20 Intellectual Property. Each Borrower shall protect, defend and maintain the validity and enforceability of its Intellectual Property material to its business; (ii) promptly advise Agent in writing of material infringements of its Intellectual Property; and (iii) not allow any Intellectual Property material to Borrowers' business to be abandoned, forfeited or dedicated to the public without Agent's written consent. If a Borrower (i) obtains any Patent, registered Trademark, registered Copyright, registered mask work, or any pending application for any of the foregoing, whether as owner, licensee or otherwise, or (ii) applies for any Patent or the registration of any Trademark,

then such Borrower shall promptly, and in any event, within thirty (30) days thereof, provide written notice thereof to Agent and shall execute such intellectual property security agreements and other documents and take such other actions as Agent may request in its good faith business judgment to perfect and maintain a first priority perfected security interest in favor of Agent in such property. If a Borrower decides to register any Copyrights or mask works in the United States Copyright Office, such Borrower shall: (x) provide Agent with at least fifteen (15) days prior written notice of such Borrower's intent to register such Copyrights or mask works together with a copy of the application it intends to file with the United States Copyright Office (excluding exhibits thereto); (y) execute an intellectual property security agreement and such other documents and take such other actions as Agent may request in its good faith business judgment to perfect and maintain a first priority perfected security interest in favor of Agent in the Copyrights or mask works intended to be registered with the United States Copyright Office; and (z) record such intellectual property security agreement with the United States Copyright Office contemporaneously with filing the Copyright or mask work application(s) with the United States Copyright Office. Borrowers shall promptly provide to Agent copies of all applications that it files for Patents or for the registration of Trademarks, Copyrights or mask works, together with evidence of the recording of the intellectual property security agreement required for Agent to perfect and maintain a first priority perfected security interest in such property.

7.21 Transactions with Affiliates. Borrower shall not and shall not permit any Subsidiary to, directly or indirectly, enter into or permit to exist any transaction of any kind with any Affiliate of Borrower or such Subsidiary on terms that are less favorable to Borrower or such Subsidiary, as the case may be, than those that might be obtained in an arm's length transaction from a Person who is not an Affiliate of Borrower or such Subsidiary.

7.22 Minimum Cash. Borrower at all times shall maintain Cash in an account or accounts of X4 Pharmaceuticals, Inc. subject to an Account Control Agreement, in an aggregate amount greater than or equal to the lesser of: (i) 125% of the aggregate Term Loan Advances outstanding under this Agreement; and (ii) 100% of Borrower's Cash reserves.

7.23 Post-Closing Items. On or before the corresponding dates set forth on Schedule 7.23, Borrower shall use its commercially reasonable efforts to deliver or cause to be delivered or completed the items listed on Schedule 7.23.

SECTION 8 RIGHT TO INVEST

8.1 Lender or its assignee or nominee shall have the right, in its discretion, to participate, in a cumulative amount of up to $1,000,000, in one or more Subsequent Financings, on the same terms, conditions and pricing afforded to others participating in any such Subsequent Financing, provided, however, Lender may not participate in any "Exempted Issuances," as such term is defined in the Charter. This Section 8.1, and all rights and obligations hereunder, shall survive the repayment of indebtedness under, and otherwise shall survive the expiration or other termination of, the Loan Agreement, but shall terminate upon the earliest to occur of: (a) the Initial Public Offering, (b) the date Borrower becomes subject to the reporting obligations of the Securities and Exchange Act of 1934, and (c) a "Deemed Liquidation Event," as such term is defined in the Charter.

SECTION 9 EVENTS OF DEFAULT

The occurrence of any one or more of the following events shall be an Event of Default:

9.1 Payments. Borrower fails to pay any amount due under this Agreement or any of the other Loan Documents on the due date; provided, however, that an Event of Default shall not occur on account of a failure to pay due solely to an administrative or operational error of Agent or Lender or Borrower's bank if Borrower had the funds to make the payment when due and makes the payment within three (3) Business Days following Borrower's knowledge of such failure to pay; or

9.2 Covenants. Borrower breaches or defaults in the performance of any covenant or Secured Obligation under this Agreement, or any of the other Loan Documents or any other agreement among Borrower, Agent and Lender, and (a) with respect to a default under any covenant under this Agreement (other than under Sections 6, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9, 7.15, 7.16, 7.17, 7.18, 7.19, 7.20 and 7.22) any other Loan Document or any other agreement among Borrower, Agent and Lender, such default continues for more than ten (10) Business Days after the earlier of the date on which (i) Agent or Lender has given notice of such default to Borrower and (ii) Borrower has actual knowledge of such default or (b) with respect to a default under any of Sections 6, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9, 7.15, 7.16, 7.17, 7.18, 7.19, 7.20 and 7.22, the occurrence of such default; or

9.3 Material Adverse Effect. A circumstance has occurred that could reasonably be expected to have a Material Adverse Effect; or

9.4 Representations. Any representation or warranty made by Borrower in any Loan Document or in the Warrant shall have been false or misleading in any material respect when made or when deemed made; or

9.5 Insolvency. Borrower (A) (i) shall make an assignment for the benefit of creditors; or (ii) shall be unable to pay its debts as they become due, or be unable to pay or perform under the Loan Documents, or shall become insolvent; or (iii) shall file a voluntary petition in bankruptcy; or (iv) shall file any petition, answer, or document seeking for itself any reorganization, arrangement, composition, readjustment, liquidation, dissolution or similar relief under any present or future statute, law or regulation pertinent to such circumstances; or (v) shall seek or consent to or acquiesce in the appointment of any trustee, receiver, or liquidator of Borrower or of all or any substantial part (i.e., 33¬1/3% or more) of the assets or property of Borrower; or (vi) shall cease operations of its business as its business has normally been conducted, or terminate substantially all of its employees; or (vii) Borrower or its directors or majority shareholders shall take any action initiating any of the foregoing actions described in

clauses (i) through (vi); or (B) either (i) forty-five (45) days shall have expired after the commencement of an involuntary action against Borrower seeking reorganization, arrangement, composition, readjustment, liquidation, dissolution or similar relief under any present or future statute, law or regulation, without such action being dismissed or all orders or proceedings thereunder affecting the operations or the business of Borrower being stayed; or (ii) a stay of any such order or proceedings shall thereafter be set aside and the action setting it aside shall not be timely appealed; or (iii) Borrower shall file any answer admitting or not contesting the material allegations of a petition filed against Borrower in any such proceedings; or (iv) the court in which such proceedings are pending shall enter a decree or order granting the relief sought in any such proceedings; or (v) forty-five (45) days shall have expired after the appointment, without the consent or acquiescence of Borrower, of any trustee, receiver or liquidator of Borrower or of all or any substantial part of the properties of Borrower without such appointment being vacated; or

9.6 Attachments; Judgments. Any portion of Borrower's assets is attached or seized, or a levy is filed against any such assets, or a judgment or judgments is/are entered for the payment of money (not covered by independent third party insurance as to which liability has not been rejected by such insurance carrier), individually or in the aggregate, of at least $250,000, or Borrower is enjoined or in any way prevented by court order from conducting any part of its business and such attachment, seizure, levy, judgment or enjoinment is not, within thirty (30) days after the occurrence thereof, discharged or stayed (whether through the posting of a bond or otherwise); or

9.7 Other Obligations. The occurrence of any "event of default" under any agreement or obligation of Borrower involving any Indebtedness in excess of $250,000 after giving effect to any applicable grace period thereunder which results in a right by such third party to accelerate the maturity of such Indebtedness.

SECTION 10 REMEDIES

10.1 General. Upon and during the continuance of any one or more Events of Default, (i) Agent may, and at the direction of the Required Lenders shall, accelerate and demand payment of all or any part of the Secured Obligations together with a Prepayment Charge and declare them to be immediately due and payable (provided, that upon the occurrence of an Event of Default of the type described in Section 9.5, all of the Secured Obligations shall automatically be accelerated and made due and payable, in each case without any further notice or act), (ii) Agent may, at its option, sign and file in Borrower's name any and all collateral assignments, notices, control agreements, security agreements and other documents it deems necessary or appropriate to perfect or protect the repayment of the Secured Obligations, and in furtherance thereof, Borrower hereby grants Agent an irrevocable power of attorney coupled with an interest during the continuance of such Event of Default, and (iii) Agent may notify any of Borrower's account debtors to make payment directly to Agent, compromise the amount of any such account on Borrower's behalf and endorse Agent's name without recourse on any such payment for deposit directly to Agent's account. Agent may, and at the direction of the Required Lenders shall, exercise all rights and remedies with respect to the Collateral

under the Loan Documents or otherwise available to it under the UCC and other applicable law, including the right to release, hold, sell, lease, liquidate, collect, realize upon, or otherwise dispose of all or any part of the Collateral and the right to occupy, utilize, process and commingle the Collateral. All Agent's rights and remedies shall be cumulative and not exclusive.

10.2 Collection; Foreclosure. Upon the occurrence and during the continuance of any Event of Default, Agent may, and at the direction of the Required Lenders shall, at any time or from time to time, apply, collect, liquidate, sell in one or more sales, lease or otherwise dispose of, any or all of the Collateral, in its then condition or following any commercially reasonable preparation or processing, in such order as Agent may elect. Any such sale may be made either at public or private sale at its place of business or elsewhere. Borrower agrees that any such public or private sale may occur upon ten (10) calendar days' prior written notice to Borrower. Agent may require Borrower to assemble the Collateral and make it available to Agent at a place designated by Agent that is reasonably convenient to Agent and Borrower. The proceeds of any sale, disposition or other realization upon all or any part of the Collateral shall be applied by Agent in the following order of priorities:

First, to Agent and Lender in an amount sufficient to pay in full Agent's and Lender's reasonable costs and professionals' and advisors' fees and expenses as described in Section 11.11;

Second, to Lender in an amount equal to the then unpaid amount of the Secured Obligations (including principal, interest, and the Default Rate interest), in such order and priority as Agent may choose in its sole discretion; and

Finally, after the full and final payment in Cash of all of the Secured Obligations (other than inchoate obligations), to any creditor holding a junior Lien on the Collateral, or to Borrower or its representatives or as a court of competent jurisdiction may direct.

Agent shall be deemed to have acted reasonably in the custody, preservation and disposition of any of the Collateral if it complies with the obligations of a secured party under the UCC.

10.3 No Waiver. Agent shall be under no obligation to marshal any of the Collateral for the benefit of Borrower or any other Person, and Borrower expressly waives all rights, if any, to require Agent to marshal any Collateral.

10.4 Cumulative Remedies. The rights, powers and remedies of Agent hereunder shall be in addition to all rights, powers and remedies given by statute or rule of law and are cumulative. The exercise of any one or more of the rights, powers and remedies provided herein shall not be construed as a waiver of or election of remedies with respect to any other rights, powers and remedies of Agent.

SECTION 11 MISCELLANEOUS

11.1 Severability. Whenever possible, each provision of this Agreement shall be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Agreement shall be prohibited by or invalid under such law, such provision shall be ineffective only to the extent and duration of such prohibition or invalidity, without invalidating the remainder of such provision or the remaining provisions of this Agreement.

11.2 Notice. Except as otherwise provided herein, any notice, demand, request, consent, approval, declaration, service of process or other communication (including the delivery of Financial Statements) that is required, contemplated, or permitted under the Loan Documents or with respect to the subject matter hereof shall be in writing, and shall be deemed to have been validly served, given, delivered, and received upon the earlier of: (i) the day of transmission by electronic mail or hand delivery or delivery by an overnight express service or overnight mail delivery service; or (ii) the third calendar day after deposit in the United States of America mails, with proper first class postage prepaid, in each case addressed to the party to be notified as follows:

(a) If to Agent:

HERCULES CAPITAL, INC.
Legal Department
Attention: Chief Legal Officer and Bryan Jadot
400 Hamilton Avenue, Suite 310
Palo Alto, CA 94301
email: legal@herculestech.com
Telephone: 650-289-3060

(b) If to Lender:

HERCULES CAPITAL, INC.
Legal Department
Attention: Chief Legal Officer and Bryan Jadot
400 Hamilton Avenue, Suite 310
Palo Alto, CA 94301
email:
Telephone:

(c) If to Borrower:

X4 PHARMACEUTICALS, INC.

Attention: Adam Mostafa and Brian Bowersox
955 Massachusetts Avenue, 4th Floor
Boston, MA 02139
email:
Telephone:

Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.
One Financial Center
Boston, MA 02111
Attention: John Cheney
email: jcheney@mintz.com
Telephone: 617-542-6000

or to such other address as each party may designate for itself by like notice.

11.3 Entire Agreement; Amendments.

(a) This Agreement and the other Loan Documents constitute the entire agreement and understanding of the parties hereto in respect of the subject matter hereof and thereof, and supersede and replace in their entirety any prior proposals, term sheets, non-disclosure or confidentiality agreements, letters, negotiations or other documents or agreements, whether written or oral, with respect to the subject matter hereof or thereof (including Agent's revised proposal letter dated September 13, 2018 and the Non-Disclosure Agreement).

(b) Neither this Agreement, any other Loan Document, nor any terms hereof or thereof may be amended, supplemented or modified except in accordance with the provisions of this Section 11.3(b). The Required Lenders and Borrower party to the relevant Loan Document may, or, with the written consent of the Required Lenders, the Agent and the Borrower party to the relevant Loan Document may, from time to time, (i) enter into written amendments, supplements or modifications hereto and to the other Loan Documents for the purpose of adding any provisions to this Agreement or the other Loan Documents or changing in any manner the rights of the Lenders or of the Borrower hereunder or thereunder or (ii) waive, on such terms and conditions as the Required Lenders or the Agent, as the case may be, may specify in such instrument, any of the requirements of this Agreement or the other Loan Documents or any default or Event of Default and its consequences; provided, however, that no such waiver and no such amendment, supplement or modification shall (A) forgive the principal amount, extend the final scheduled date of maturity of any Loan, extend the scheduled date of any amortization payment in respect of any Term Loan, or reduce the stated rate of any interest or fee payable hereunder, in each case without the written consent of each Lender directly affected thereby; (B) eliminate or reduce the voting rights of any Lender under this Section 11.3(b) without the written consent of such Lender; (C) reduce any percentage specified in the definition of Required Lenders, consent to the assignment or transfer by the Borrower of any of its rights and obligations under this Agreement and the other Loan Documents, release all or substantially all of the Collateral or release a Borrower from its obligations under the Loan Documents, in each case without the written consent of all Lenders; or (D) amend, modify or waive any provision of Section 11.17 without the written consent of the Agent. Any such waiver and any such amendment, supplement or modification shall apply equally to each Lender and shall be binding upon Borrower, the Lender, the Agent and all future holders of the Loans.

11.4 No Strict Construction. The parties hereto have participated jointly in the negotiation and drafting of this Agreement. In the event an ambiguity or question of intent or interpretation arises, this Agreement shall be construed as if drafted jointly by the parties hereto and no presumption or burden of proof shall arise favoring or disfavoring any party by virtue of the authorship of any provisions of this Agreement.

11.5 No Waiver. The powers conferred upon Agent and Lender by this Agreement are solely to protect its rights hereunder and under the other Loan Documents and its interest in the Collateral and shall not impose any duty upon Agent or Lender to exercise any such powers. No omission or delay by Agent or Lender at any time to enforce any right or remedy reserved to it, or to require performance of any of the terms, covenants or provisions hereof by Borrower at any time designated, shall be a waiver of any such right or remedy to which Agent or Lender is entitled, nor shall it in any way affect the right of Agent or Lender to enforce such provisions thereafter.

11.6 Survival. All agreements, representations and warranties contained in this Agreement and the other Loan Documents or in any document delivered pursuant hereto or thereto shall be for the benefit of Agent and Lender and shall survive the execution and delivery of this Agreement. Sections 6.3 and 8.1 shall survive the termination of this Agreement.

11.7 Successors and Assigns. The provisions of this Agreement and the other Loan Documents shall inure to the benefit of and be binding on Borrower and its permitted assigns (if any). Borrower shall not assign its obligations under this Agreement or any of the other Loan Documents without Agent's express prior written consent, and any such attempted assignment shall be void and of no effect. Agent and Lender may assign, transfer, or endorse its rights hereunder and under the other Loan Documents without prior notice to Borrower, and all of such rights shall inure to the benefit of Agent's and Lender's successors and assigns; provided that as long as no Event of Default has occurred and is continuing, neither Agent nor any Lender may assign, transfer or endorse its rights hereunder or under the Loan Documents to any party that is a direct competitor of Borrower (as reasonably determined by Agent), it being acknowledged that in all cases, any transfer to an Affiliate of any Lender or Agent shall be allowed.

11.8 Governing Law. This Agreement and the other Loan Documents have been negotiated and delivered to Agent and Lender in the State of California, and shall have been accepted by Agent and Lender in the State of California. Payment to Agent and Lender by Borrower of the Secured Obligations is due in the State of California. This Agreement and the other Loan Documents shall be governed by, and construed and enforced in accordance with, the laws of the State of California, excluding conflict of laws principles that would cause the application of laws of any other jurisdiction.

11.9 Consent to Jurisdiction and Venue. All judicial proceedings (to the extent that the reference requirement of Section 11.10 is not applicable) arising in or under or related to this Agreement or any of the other Loan Documents may be brought in any state or federal court located in the State of California. By execution and delivery of this

Agreement, each party hereto generally and unconditionally: (a) consents to nonexclusive personal jurisdiction in Santa Clara County, State of California; (b) waives any objection as to jurisdiction or venue in Santa Clara County, State of California; (c) agrees not to assert any defense based on lack of jurisdiction or venue in the aforesaid courts; and (d) irrevocably agrees to be bound by any judgment rendered thereby in connection with this Agreement or the other Loan Documents. Service of process on any party hereto in any action arising out of or relating to this Agreement shall be effective if given in accordance with the requirements for notice set forth in Section 11.2, and shall be deemed effective and received as set forth in Section 11.2. Nothing herein shall affect the right to serve process in any other manner permitted by law or shall limit the right of either party to bring proceedings in the courts of any other jurisdiction.

11.10 Mutual Waiver of Jury Trial / Judicial Reference.

(a) Because disputes arising in connection with complex financial transactions are most quickly and economically resolved by an experienced and expert Person and the parties wish applicable state and federal laws to apply (rather than arbitration rules), the parties desire that their disputes be resolved by a judge applying such applicable laws. EACH OF BORROWER, AGENT AND LENDER SPECIFICALLY WAIVES ANY RIGHT IT MAY HAVE TO TRIAL BY JURY OF ANY CAUSE OF ACTION, CLAIM, CROSS-CLAIM, COUNTERCLAIM, THIRD PARTY CLAIM OR ANY OTHER CLAIM (COLLECTIVELY, “CLAIMS”) ASSERTED BY BORROWER AGAINST AGENT, LENDER OR THEIR RESPECTIVE ASSIGNEE OR BY AGENT, LENDER OR THEIR RESPECTIVE ASSIGNEE AGAINST BORROWER. This waiver extends to all such Claims, including Claims that involve Persons other than Agent, Borrower and Lender; Claims that arise out of or are in any way connected to the relationship among Borrower, Agent and Lender; and any Claims for damages, breach of contract, tort, specific performance, or any equitable or legal relief of any kind, arising out of this Agreement, any other Loan Document.

(b) If the waiver of jury trial set forth in Section 11.10(a) is ineffective or unenforceable, the parties agree that all Claims shall be resolved by reference to a private judge sitting without a jury, pursuant to Code of Civil Procedure Section 638, before a mutually acceptable referee or, if the parties cannot agree, a referee selected by the Presiding Judge of the Santa Clara County, California. Such proceeding shall be conducted in Santa Clara County, California, with California rules of evidence and discovery applicable to such proceeding.

(c) In the event Claims are to be resolved by judicial reference, either party may seek from a court identified in Section 11.9, any prejudgment order, writ or other relief and have such prejudgment order, writ or other relief enforced to the fullest extent permitted by law notwithstanding that all Claims are otherwise subject to resolution by judicial reference.

11.11 Professional Fees. Borrower promises to pay Agent's and Lender's reasonable and documented fees and expenses necessary to finalize the loan documentation, including but not limited to reasonable and documented attorneys' fees, UCC searches, filing costs, and other miscellaneous expenses. In addition, Borrower promises to pay any and all reasonable and documented attorneys' and other professionals' fees and expenses incurred by Agent and Lender after the Closing Date in connection with or related to: (a) the Loan; (b) the administration, collection, or enforcement of the Loan; (c) the amendment or modification of the Loan Documents; (d) any waiver, consent, release, or termination under the Loan Documents; (e) the protection, preservation, audit, field exam, sale, lease, liquidation, or disposition of Collateral or the exercise of remedies with respect to the Collateral; (f) any legal, litigation, administrative, arbitration, or out of court proceeding in connection with or related to Borrower or the Collateral, and any appeal or review thereof; and (g) any bankruptcy, restructuring, reorganization, assignment for the benefit of creditors, workout, foreclosure, or other action related to Borrower, the Collateral, the Loan Documents, including representing Agent or Lender in any adversary proceeding or contested matter commenced or continued by or on behalf of Borrower's estate, and any appeal or review thereof.

11.12 Confidentiality. Agent and Lender acknowledge that certain items of Collateral and information provided to Agent and Lender, including items provided in connection with the Non-Disclosure Agreement, by Borrower are confidential and proprietary information of Borrower, if and to the extent such information either (x) is marked as confidential by Borrower at the time of disclosure, or (y) should reasonably be understood to be confidential (the "Confidential Information"). Accordingly, Agent and Lender agree that any Confidential Information it may obtain during the term of this Agreement shall not be disclosed to any other Person or entity in any manner whatsoever, in whole or in part, without the prior written consent of Borrower, except that Agent and Lender may disclose any such information: (a) to its own directors, officers, employees, accountants, counsel and other professional advisors and to its Affiliates if Agent or Lender in its sole discretion determines that any such party should have access to such information in connection with such party's responsibilities in connection with the Loan or this Agreement and, provided that such recipient of such Confidential Information either (i) agrees to be bound by the confidentiality provisions of this paragraph or (ii) is otherwise subject to confidentiality restrictions that reasonably protect against the disclosure of Confidential Information; (b) if such information is generally available to the public through no fault of Agent or Lender; (c) if required or appropriate in any report, statement or testimony submitted to any governmental authority having or claiming to have jurisdiction over Agent or Lender; (d) if required or appropriate in response to any summons or subpoena or in connection with any litigation, to the extent permitted or deemed advisable by Agent's or Lender's counsel; (e) to comply with any legal requirement or law applicable to Agent or Lender; (f) to the extent reasonably necessary in connection with the exercise of any right or remedy under any Loan Document, including Agent's sale, lease, or other disposition of Collateral after an Event of Default; (g) to any participant or assignee of Agent or Lender or any prospective participant or assignee; provided, that such participant or assignee or prospective participant or assignee agrees in writing to be bound by this Section prior to disclosure; or (h) otherwise with the prior consent of Borrower; provided, that any disclosure made in violation of this Agreement shall not affect the obligations of Borrower or any of its Affiliates or any guarantor under this Agreement or the other Loan Documents. Agent's and Lender's obligations under this Section 11.12 shall supersede all of their respective obligations under the Non-Disclosure Agreement.

11.13 Assignment of Rights. Borrower acknowledges and understands that Agent or Lender may, subject to Section 11.7, sell and assign all or part of its interest hereunder and under the Loan Documents to any Person or entity (an "Assignee"). After such assignment the term "Agent" or "Lender" as used in the Loan Documents shall mean and include such Assignee, and such Assignee shall be vested with all rights, powers and remedies of Agent and Lender hereunder with respect to the interest so assigned; but with respect to any such interest not so transferred, Agent and Lender shall retain all rights, powers and remedies hereby given. No such assignment by Agent or Lender shall relieve Borrower of any of its obligations hereunder. Lender agrees that in the event of any transfer by it of the Note(s)(if any), it will endorse thereon a notation as to the portion of the principal of the Note(s), which shall have been paid at the time of such transfer and as to the date to which interest shall have been last paid thereon.

11.14 Revival of Secured Obligations. This Agreement and the Loan Documents shall remain in full force and effect and continue to be effective if any petition is filed by or against Borrower for liquidation or reorganization, if Borrower becomes insolvent or makes an assignment for the benefit of creditors, if a receiver or trustee is appointed for all or any significant part of Borrower's assets, or if any payment or transfer of Collateral is recovered from Agent or Lender. The Loan Documents and the Secured Obligations and Collateral security shall continue to be effective, or shall be revived or reinstated, as the case may be, if at any time payment and performance of the Secured Obligations or any transfer of Collateral to Agent, or any part thereof is rescinded, avoided or avoidable, reduced in amount, or must otherwise be restored or returned by, or is recovered from, Agent, Lender or by any obligee of the Secured Obligations, whether as a "voidable preference," "fraudulent conveyance," or otherwise, all as though such payment, performance, or transfer of Collateral had not been made. In the event that any payment, or any part thereof, is rescinded, reduced, avoided, avoidable, restored, returned, or recovered, the Loan Documents and the Secured Obligations shall be deemed, without any further action or documentation, to have been revived and reinstated except to the extent of the full, final, and indefeasible payment to Agent or Lender in Cash.

11.15 Counterparts. This Agreement and any amendments, waivers, consents or supplements hereto may be executed in any number of counterparts, and by different parties hereto in separate counterparts, each of which when so delivered shall be deemed an original, but all of which counterparts shall constitute but one and the same instrument.

11.16 No Third Party Beneficiaries. No provisions of the Loan Documents are intended, nor will be interpreted, to provide or create any third-party beneficiary rights or any other rights of any kind in any Person other than Agent, Lender and Borrower unless specifically provided otherwise herein, and, except as otherwise so provided, all provisions of the Loan Documents will be personal and solely among Agent, the Lender and the Borrower.

11.17 Agency.

(a) Lender hereby irrevocably appoints Hercules Capital, Inc. to act on its behalf as the Agent hereunder and under the other Loan Documents and authorizes the Agent to take such actions on its behalf and to exercise such powers as are delegated to the Agent by the terms hereof or thereof, together with such actions and powers as are reasonably incidental thereto.

(b) Lender agrees to indemnify the Agent in its capacity as such (to the extent not reimbursed by Borrower and without limiting the obligation of Borrower to do so), according to its respective Term Commitment percentages (based upon the total outstanding Term Loan Commitments) in effect on the date on which indemnification is sought under this Section 11.17, from and against any and all liabilities, obligations, losses, damages, penalties, actions, judgments, suits, costs, expenses or disbursements of any kind whatsoever that may at any time be imposed on, incurred by or asserted against the Agent in any way relating to or arising out of, this Agreement, any of the other Loan Documents or any documents contemplated by or referred to herein or therein or the transactions contemplated hereby or thereby or any action taken or omitted by the Agent under or in connection with any of the foregoing; The agreements in this Section shall survive the payment of the Loans and all other amounts payable hereunder.

(c) Agent in Its Individual Capacity. The Person serving as the Agent hereunder shall have the same rights and powers in its capacity as a Lender as any other Lender and may exercise the same as though it were not the Agent and the term "Lender" shall, unless otherwise expressly indicated or unless the context otherwise requires, include each such Person serving as Agent hereunder in its individual capacity.

(d) Exculpatory Provisions. The Agent shall have no duties or obligations except those expressly set forth herein and in the other Loan Documents. Without limiting the generality of the foregoing, the Agent shall not:

(i) be subject to any fiduciary or other implied duties, regardless of whether any default or any Event of Default has occurred and is continuing;

(ii) have any duty to take any discretionary action or exercise any discretionary powers, except discretionary rights and powers expressly contemplated hereby or by the other Loan Documents that the Agent is required to exercise as directed in writing by the Lender, provided that the Agent shall not be required to take any action that, in its opinion or the opinion of its counsel, may expose the Agent to liability or that is contrary to any Loan Document or applicable law; and

(iii) except as expressly set forth herein and in the other Loan Documents, have any duty to disclose, and the Agent shall not be liable for the failure to disclose, any information relating to the Borrower or any of its Affiliates that is communicated to or obtained by any Person serving as the Agent or any of its Affiliates in any capacity.

(e) The Agent shall not be liable for any action taken or not taken by it (i) with the consent or at the request of the Lender or as the Agent shall believe in good faith shall be necessary, under the circumstances or (ii) in the absence of its own gross negligence or willful misconduct.

(f) The Agent shall not be responsible for or have any duty to ascertain or inquire into (i) any statement, warranty or representation made in or in connection with this Agreement or any other Loan Document, (ii) the contents of any certificate, report or other document delivered hereunder or thereunder or in connection herewith or therewith, (iii) the performance or observance of any of the covenants, agreements or other terms or conditions set forth herein or therein or the occurrence of any default or Event of Default, (iv) the validity, enforceability, effectiveness or genuineness of this Agreement, any other Loan Document or any other agreement, instrument or document or (v) the satisfaction of any condition set forth in Section 4 or elsewhere herein, other than to confirm receipt of items expressly required to be delivered to the Agent.

(g) Reliance by Agent. Agent may rely, and shall be fully protected in acting, or refraining to act, upon, any resolution, statement, certificate, instrument, opinion, report, notice, request, consent, order, bond or other paper or document that it has no reason to believe to be other than genuine and to have been signed or presented by the proper party or parties or, in the case of cables, telecopies and telexes, to have been sent by the proper party or parties. In the absence of its gross negligence or willful misconduct, Agent may conclusively rely, as to the truth of the statements and the correctness of the opinions expressed therein, upon any certificates or opinions furnished to Agent and conforming to the requirements of the Loan Agreement or any of the other Loan Documents. Agent may consult with counsel, and any opinion or legal advice of such counsel shall be full and complete authorization and protection in respect of any action taken, not taken or suffered by Agent hereunder or under any Loan Documents in accordance therewith. Agent shall have the right at any time to seek instructions concerning the administration of the Collateral from any court of competent jurisdiction. Agent shall not be under any obligation to exercise any of the rights or powers granted to Agent by this Agreement, the Loan Agreement and the other Loan Documents at the request or direction of Lenders unless Agent shall have been provided by Lender with adequate security and indemnity against the costs, expenses and liabilities that may be incurred by it in compliance with such request or direction.

11.18 Publicity. None of the parties hereto nor any of its respective member businesses and Affiliates shall, without the other parties' prior written consent (which shall not be unreasonably withheld or delayed), publicize or use (a) the other party's name (including a brief description of the relationship among the parties hereto), logo or hyperlink to such other parties' web site, separately or together, in written and oral presentations, advertising, promotional and marketing materials, client lists, public relations materials or on its web site (together, the " Publicity Materials"); (b) the names

of officers of such other parties in the Publicity Materials; and (c) such other parties' name, trademarks, servicemarks in any news or press release concerning such party; provided however, notwithstanding anything to the contrary herein, no such consent shall be required (i) to the extent necessary to comply with the requests of any regulators, legal requirements or laws applicable to such party, pursuant to any listing agreement with any national securities exchange (so long as such party provides prior notice to the other party hereto to the extent reasonably practicable) and (ii) to comply with Section 11.12.

(SIGNATURES TO FOLLOW)

IN WITNESS WHEREOF, Borrower, Agent and Lender have duly executed and delivered this Loan and Security Agreement as of the day and year first above written.

BORROWER:

X4 PHARMACEUTICALS, INC.

Signature: /s/ Adam Mostafa

Print Name: Adam Mostafa

Title: Chief Financial Officer

Accepted in Palo Alto, California:

AGENT:

HERCULES CAPITAL, INC.

Signature: /s/ Jennifer Choe

Print Name: Jennifer Choe

Title: Associate General Counsel

LENDER:

HERCULES CAPITAL, INC.

Signature: /s/ Jennifer Choe

Print Name: Jennifer Choe

Title: Associate General Counsel

Table of Exhibits and Schedules

ADDENDUM 1 to LOAN AND SECURITY AGREEMENT

(a) *Borrower's Business*. For purposes of this Addendum 1, Borrower shall be deemed to include its "affiliates" as defined in Title 13 Code of Federal Regulations Section 121.103. Borrower represents and warrants to Agent and Lender as of the Closing Date and covenants to Agent and Lender for a period of one year after the Closing Date with respect to subsections 2, 3, 4, 5, 6 and 7 below, as follows:

1. Size Status. Borrower's primary NAICS code is 541714 and has fewer than 1,000 employees in the aggregate;

2. No Relender. Borrower's primary business activity does not involve, directly or indirectly, providing funds to others, purchasing debt obligations, factoring, or long-term leasing of equipment with no provision for maintenance or repair;

3. No Passive Business. Borrower is engaged in a regular and continuous business operation (excluding the mere receipt of payments such as dividends, rents, lease payments, or royalties). Borrower's employees are carrying on the majority of day to day operations. Borrower will not pass through substantially all of the proceeds of the Loan to another entity;

4. No Real Estate Business. Borrower is not classified under Major Group 65 (Real Estate) or Industry No. 1531 (Operative Builders) of the SIC Manual. The proceeds of the Loan will not be used to acquire or refinance real property unless Borrower (x) is acquiring an existing property and will use at least 51 percent of the usable square footage for its business purposes; (y) is building or renovating a building and will use at least 67 percent of the usable square footage for its business purposes; or (z) occupies the subject property and uses at least 67 percent of the usable square footage for its business purposes.

5. No Project Finance. Borrower's assets are not intended to be reduced or consumed, generally without replacement, as the life of its business progresses, and the nature of Borrower's business does not require that a stream of cash payments be made to the business's financing sources, on a basis associated with the continuing sale of assets (e.g., real estate development projects and oil and gas wells). The primary purpose of the Loan is not to fund production of a single item or defined limited number of items, generally over a defined production period, where such production will constitute the majority of the activities of Borrower (e.g., motion pictures and electric generating plants).

6. No Farm Land Purchases. Borrower will not use the proceeds of the Loan to acquire farm land which is or is intended to be used for agricultural or forestry purposes, such as the production of food, fiber, or wood, or is so taxed or zoned.

7. No Foreign Investment. The proceeds of the Loan will not be used substantially for a foreign operation. At the time of the Loan, Borrower will not have more than 49 percent of its employees or tangible assets located outside the United States of America. The representation in this subsection (7) is made only as of the date hereof and shall not continue for one year as contemplated in the first sentence of this Section 1.

(b) *Small Business Administration Documentation*. Agent and Lender acknowledge that Borrower completed, executed and delivered to Agent SBA Forms 480, 652 and 1031 (Parts A and B) together with a business plan showing Borrower's financial projections (including balance sheets and income and cash flows statements) for the period described therein and a written statement (whether included in the purchase agreement or pursuant to a separate statement) from Agent regarding its intended use of proceeds from the sale of securities to Lender (the "Use of Proceeds Statement"). Borrower represents and warrants to Agent and Lender that the information regarding Borrower and its affiliates set forth in the SBA Form 480, Form 652 and Form 1031 and the Use of Proceeds Statement delivered as of the Closing Date is accurate and complete.

(c) *Inspection*. The following covenants contained in this Section (c) are intended to supplement and not to restrict the related provisions of the Loan Documents. Subject to the preceding sentence, Borrower will permit, for so long as Lender holds any debt or equity securities of Borrower, Agent, Lender or their representative, at Agent's or Lender' expense, and examiners of the SBA to visit and inspect the properties and assets of Borrower, to examine its books of account and records, and to discuss Borrower's affairs, finances and accounts with Borrower's officers, senior management and accountants, all at such reasonable times as may be requested by Agent or Lender or the SBA.

(d) *Annual Assessment*. Promptly after the end of each calendar year (but in any event prior to February 28 of each year) and at such other times as may be reasonably requested by Agent or Lender, Borrower will deliver to Agent a written assessment of the economic impact of Lender's investment in Borrower, specifying the full-time equivalent jobs created or retained in connection with the investment, the impact of the investment on the businesses of Borrower in terms of expanded revenue and taxes, other economic benefits resulting from the investment (such as technology development or commercialization, minority business development, or expansion of exports) and such other information as may be required regarding Borrower in connection with the filing of Lender's SBA Form 468. Lender will assist Borrower with preparing such assessment. In addition to any other rights granted hereunder, Borrower will grant Agent and Lender and the SBA access to Borrower's books and records for the purpose of verifying the use of such proceeds. Borrower also will furnish or cause to be furnished to Agent and Lender such other information regarding the business, affairs and condition of Borrower as Agent or Lender may from time to time reasonably request.

(e) *Use of Proceeds*. Borrower will use the proceeds from the Loan only for purposes set forth in Section 7.17. Borrower will deliver to Agent from time to time promptly following Agent's request, a written report, certified as correct by Borrower's Chief Financial Officer, verifying the purposes and amounts for which proceeds from the Loan have been disbursed. Borrower will supply to Agent such additional information and documents as Agent reasonably requests with respect to its use of proceeds and will permit Agent and Lender and the SBA to have access to any and all Borrower records and information and personnel as Agent deems necessary to verify how such proceeds have been or are being used, and to assure that the proceeds have been used for the purposes specified in Section 7.17.

(f) *Activities and Proceeds*. Neither Borrower nor any of its affiliates (if any) will engage in any activities or use directly or indirectly the proceeds from the Loan for any purpose for which a small business investment company is prohibited from providing funds by the SBIC Act, including 13 C.F.R. §107.720. Without obtaining the prior written approval of Agent, Borrower will not change within 1 year of the date hereof, Borrower's current business activity to a business activity which a licensee under the SBIC Act is prohibited from providing funds by the SBIC Act.

(g) *Redemption Provisions*. Notwithstanding any provision to the contrary contained in the Certificate of Incorporation of Borrower, as amended from time to time (the "Charter"), if, pursuant to the redemption provisions contained in the Charter, Lender is entitled to a redemption of its Warrant, such redemption (in the case of Lender) will be at a price equal to the redemption price set forth in the Charter (the "Existing Redemption Price"). If, however, Lender delivers written notice to Borrower that the then current regulations promulgated under the SBIC Act prohibit payment of the Existing Redemption Price in the case of an SBIC (or, if applied, the Existing Redemption Price would cause the Series B Preferred Stock, or next round, to the extent applicable, to lose its classification as an "equity security" and Lender has determined that such classification is unadvisable), the amount Lender will be entitled to receive shall be the greater of (i) fair market value of the securities being redeemed taking into account the rights and preferences of such securities plus any costs and expenses of the Lender incurred in making or maintaining the Warrant, and (ii) the Existing Redemption Price where the amount of accrued but unpaid dividends payable to the Lender is limited to Borrower's earnings plus any costs and expenses of the Lender incurred in making or maintaining the Warrant; provided, however, the amount calculated in subsections (i) or (ii) above shall not exceed the Existing Redemption Price.

(h) *Compliance and Resolution*. Borrower agrees that a failure to comply with Borrower's obligations under this Addendum, or any other set of facts or circumstances where it has been asserted by any governmental regulatory agency (or Agent or Lender believes that there is a substantial risk of such assertion) that Agent, Lender and their affiliates are not entitled to hold, or exercise any significant right with respect to, any securities issued to Lender by Borrower, will constitute a breach of the obligations of Borrower under the financing agreements among Borrower, Agent and Lender. In the event of (i) a failure to comply with Borrower's obligations under this Addendum; or (ii) an assertion by any governmental regulatory agency (or Agent or Lender believes that there is a substantial risk of such assertion) of a failure to comply with Borrower's obligations under this Addendum, then (i) Agent, Lender and Borrower will meet and resolve any such issue in good faith to the satisfaction of Borrower, Agent, Lender, and any governmental regulatory agency, and (ii) upon request of Lender or Agent, Borrower will cooperate and assist with any assignment of the financing agreements among Hercules Technology III, L.P., Hercules Technology IV, L.P. and Hercules Capital, Inc.

EXHIBIT A

ADVANCE REQUEST

To: Agent:
Hercules Capital, Inc. (the "Agent")
400 Hamilton Avenue, Suite 310
Palo Alto, CA 94301
email: legal@herculestech.com
Attn:

Date: _____, 2018

X4 Pharmaceuticals, Inc. ("Borrower") hereby requests from Hercules Capital, Inc. ("Lender") an Advance in the amount of _____ Dollars ($_____) on _____, _____ (the "Advance Date") pursuant to the Loan and Security Agreement among Borrower, Agent and Lender (the "Agreement"). Capitalized words and other terms used but not otherwise defined herein are used with the same meanings as defined in the Agreement.

Please:

(a) Issue a check payable to Borrower

or

(b) Wire Funds to Borrower's account

Bank: _____
Address: _____
_____
ABA Number: _____
Account Number: _____
Account Name: _____
Contact Person: _____
Phone Number
To Verify Wire Info: _____
Email address: _____

Borrower represents that the conditions precedent to the Advance set forth in the Agreement are satisfied and shall be satisfied upon the making of such Advance, including but not limited to: (i) that no event that has had or could reasonably be expected to have a Material Adverse Effect has occurred and is continuing; (ii) that the representations and warranties set forth in the Agreement and in the Warrant are and shall be true and correct in all material respects on and as of the Advance Date with the same effect as though made on and as of such date, except to the extent such representations and warranties expressly relate to an earlier date; (iii) that Borrower is in compliance with all the terms and provisions set forth in each Loan Document on its part to be observed or performed; and (iv) that as of the Advance Date, no fact or condition exists that could (or could, with the passage of time, the giving of notice, or both) constitute an Event of Default under the Loan Documents. Borrower understands and acknowledges that Agent has the right to review the financial information supporting this representation and, based upon such review in its sole discretion, Lender may decline to fund the requested Advance.

Borrower hereby represents that Borrower's corporate status and locations have not changed since the date of the Agreement or, if the Attachment to this Advance Request is completed, are as set forth in the Attachment to this Advance Request.

Borrower agrees to notify Agent promptly before the funding of the Loan if any of the matters which have been represented above shall not be true and correct on the Borrowing Date and if Agent has received no such notice before the Advance Date then the statements set forth above shall be deemed to have been made and shall be deemed to be true and correct as of the Advance Date.

Executed as of [ ], 20[ ].

BORROWER: X4 PHARMACEUTICALS, INC.

SIGNATURE: _____
TITLE: _____
PRINT NAME: _____

ATTACHMENT TO ADVANCE REQUEST

Dated: _____

Borrower hereby represents and warrants to Agent that Borrower's current name and organizational status is as follows:

Name:	X4 Pharmaceuticals, Inc.
Type of organization:	Corporation
State of organization:	Delaware
Organization file number:	5568691

Borrower hereby represents and warrants to Agent that the street addresses, cities, states and postal codes of its current locations are as follows:

EXHIBIT B

SECURED TERM PROMISSORY NOTE

$[ ],000,000 Advance Date: ___ __, 20[ ]

Maturity Date: _____ ___, 20[ ]

FOR VALUE RECEIVED, X4 PHARMACEUTICALS, INC., a Delaware corporation, for itself and each of its Qualified Subsidiaries (the "Borrower") hereby promises to pay to the order of Hercules Capital, Inc., a Maryland corporation, or the holder of this Note (the "Lender") at 400 Hamilton Avenue, Suite 310, Palo Alto, CA 94301 or such other place of payment as the holder of this Secured Term Promissory Note (this "Promissory Note") may specify from time to time in writing, in lawful money of the United States of America, the principal amount of [ ] Million Dollars ($[ ],000,000) or such other principal amount as Lender has advanced to Borrower, together with interest at a rate as set forth in Section 2.2(c) of the Loan Agreement based upon a year consisting of 360 days, with interest computed daily based on the actual number of days in each month.

This Promissory Note is the Note referred to in, and is executed and delivered in connection with, that certain Loan and Security Agreement dated October 19, 2018, by and among Borrower, Hercules Capital, Inc., a Maryland corporation (the "Agent") and the several banks and other financial institutions or entities from time to time party thereto as lender (as the same may from time to time be amended, modified or supplemented in accordance with its terms, the "Loan Agreement"), and is entitled to the benefit and security of the Loan Agreement and the other Loan Documents (as defined in the Loan Agreement), to which reference is made for a statement of all of the terms and conditions thereof. All payments shall be made in accordance with the Loan Agreement. All terms defined in the Loan Agreement shall have the same definitions when used herein, unless otherwise defined herein. An Event of Default under the Loan Agreement shall constitute a default under this Promissory Note.

Borrower waives presentment and demand for payment, notice of dishonor, protest and notice of protest under the UCC or any applicable law. Borrower agrees to make all payments under this Promissory Note without setoff, recoupment or deduction and regardless of any counterclaim or defense. This Promissory Note has been negotiated and delivered to Lender and is payable in the State of California. This Promissory Note shall be governed by and construed and enforced in accordance with, the laws of the State of California, excluding any conflicts of law rules or principles that would cause the application of the laws of any other jurisdiction.

BORROWER FOR ITSELF AND
ON BEHALF OF ITS QUALIFIED SUBSIDIARIES: X4 PHARMACEUTICALS, INC.

By: _____

Title: _____

EXHIBIT C

NAME, LOCATIONS, AND OTHER INFORMATION FOR BORROWER

1. Borrower represents and warrants to Agent that Borrower's current name and organizational status as of the Closing Date is as follows:

Name:	X4 Pharmaceuticals, Inc.
Type of organization:	Corporation
State of organization:	Delaware
Organization file number:	5568691

2. Borrower represents and warrants to Agent that for five (5) years prior to the Closing Date, Borrower did not do business under any other name or organization or form except the following:

Name:
Used during dates of:
Type of Organization:
State of organization:
Organization file Number:
Borrower's fiscal year ends on _____
Borrower's federal employer tax identification number is:

3. Borrower represents and warrants to Agent that its chief executive office is located at _____.

EXHIBIT F

COMPLIANCE CERTIFICATE

Hercules Capital, Inc. (as "Agent")
400 Hamilton Avenue, Suite 310
Palo Alto, CA 94301

Reference is made to that certain Loan and Security Agreement dated October 19, 2018 and the Loan Documents (as defined therein) entered into in connection with such Loan and Security Agreement all as may be amended from time to time (hereinafter referred to collectively as the "Loan Agreement") by and among Hercules Capital, Inc. (the "Agent"), the several banks and other financial institutions or entities from time to time party thereto (collectively, the "Lender") and Hercules Capital, Inc., as agent for the Lender (the "Agent") and X4 Pharmaceuticals, Inc. (the "Company") as Borrower. All capitalized terms not defined herein shall have the same meaning as defined in the Loan Agreement.

The undersigned is an Officer of the Company, knowledgeable of all Company financial matters, and is authorized to provide certification of information regarding the Company; hereby certifies, in such capacity, that in accordance with the terms and conditions of the Loan

Agreement, the Company is in compliance for the period ending of all covenants, conditions and terms and hereby reaffirms that all representations and warranties contained therein are true and correct on and as of the date of this Compliance Certificate with the same effect as though made on and as of such date, except to the extent such representations and warranties expressly relate to an earlier date, after giving effect in all cases to any standard(s) of materiality contained in the Loan Agreement as to such representations and warranties. Attached are the required documents supporting the above certification. The undersigned further certifies that these are prepared in accordance with GAAP (except for the absence of footnotes with respect to unaudited financial statement and subject to normal year end adjustments) and are consistent from one period to the next except as explained below.

REPORTING REQUIREMENT	REQUIRED	CHECK IF ATTACHED
Interim Financial Statements	Monthly within 30 days	
Interim Financial Statements	Quarterly within 45 Days	
Audited Financial Statements	FYE within 180 days	
Budget and forecast	At least annually within 60 days following FYE	

7.22 MINIMUM CASH

(A) Are all Cash balances held by Borrower held in accounts subject to an Account Control Agreement? ____ Yes ____ No

(B) If Yes,

(i) Balance of Cash Reserves $_____

(ii) Aggregate Term Loan Advances outstanding $_____

(iii) Cash balances held in accounts subject to an Account Control Agreement $_____

Is item (iii) above equal to or greater than the lesser (i) and (ii)? ____ Yes ____ No

Current statements showing balances held in all accounts subject to an Account Control Agreement are attached. ____ Yes ____ No

The undersigned hereby also confirms the below disclosed accounts represent all depository accounts and securities accounts presently open in the name of each Borrower or Borrower Subsidiary/Affiliate, as applicable.

	Depository AC #	Financial Institution	Account Type (Depository / Securities)	Last Month Ending Account Balance	Purpose of Account
BORROWER Name/Address:					
1					
2					
3					
4					
5					
6					
7					

BORROWER SUBSIDIARY / AFFILIATE COMPANY Name/Address
1
2
3
4
5
6
7

Very Truly Yours,

X4 PHARMACEUTICALS, INC.

By: _____

Name: _____

Its: _____

EXHIBIT G

FORM OF JOINDER AGREEMENT

This Joinder Agreement (the "Joinder Agreement") is made and dated as of [ ], 20[ ], and is entered into by and between _____., a _____ corporation ("Subsidiary"), and HERCULES CAPITAL, INC., a Maryland corporation (as "Agent").

RECITALS

A. Subsidiary's Affiliate, X4 Pharmaceuticals, Inc. ("Company") has entered into that certain Loan and Security Agreement dated October 19, 2018, with the several banks and other financial institutions or entities from time to time party thereto as lender (collectively, the "Lender") and the Agent, as such agreement may be amended (the "Loan Agreement"), together with the other agreements executed and delivered in connection therewith, including but not limited to the IP Security Agreement;

B. Subsidiary acknowledges and agrees that it will benefit both directly and indirectly from Company's execution of the Loan Agreement and the other agreements executed and delivered in connection therewith;

AGREEMENT

NOW THEREFORE, Subsidiary and Agent agree as follows:

1. The recitals set forth above are incorporated into and made part of this Joinder Agreement. Capitalized terms not defined herein shall have the meaning provided in the Loan Agreement.

2. By signing this Joinder Agreement, Subsidiary shall be bound by the terms and conditions of the Loan Agreement the same as if it were the Borrower (as defined in the Loan Agreement) under the Loan Agreement, mutatis mutandis, provided however, that (a) with respect to (i) Section 5.1 of the Loan Agreement, Subsidiary represents that it is an entity duly organized, legally existing and in good standing under the laws of [ ], (b) neither Agent nor Lender shall have any duties, responsibilities or obligations to Subsidiary arising under or related to the Loan Agreement or the other Loan Documents, (c) that if Subsidiary is covered by Company's insurance, Subsidiary shall not be required to maintain separate insurance or comply with the provisions of Sections 6.1 and 6.2 of the Loan Agreement, and (d) that as long as Company satisfies the requirements of Section 7.1 of the Loan Agreement, Subsidiary shall not have to provide Agent separate Financial Statements. To the extent that Agent or Lender has any duties, responsibilities or obligations arising under or related to the Loan Agreement or the other Loan Documents, those duties, responsibilities or obligations shall flow only to Company and not to Subsidiary or any other Person or entity. By way of example (and not an exclusive list): (i) Agent's providing notice to Company in accordance with the Loan Agreement or as otherwise agreed among Company, Agent and Lender shall be deemed provided to Subsidiary; (ii) a Lender's providing an Advance to Company shall be deemed an Advance to Subsidiary; and (iii) Subsidiary shall have no right to request an Advance or make any other demand on Lender.

3. Subsidiary agrees not to certificate its equity securities without Agent's prior written consent, which consent may be conditioned on the delivery of such equity securities to Agent in order to perfect Agent's security interest in such equity securities.

4. Subsidiary acknowledges that it benefits, both directly and indirectly, from the Loan Agreement, and hereby waives, for itself and on behalf on any and all successors in interest (including without limitation any assignee for the benefit of creditors, receiver, bankruptcy trustee or itself as debtor-in-possession under any bankruptcy proceeding) to the fullest extent provided by law, any and all claims, rights or defenses to the enforcement of this Joinder Agreement on the basis that (a) it failed to receive adequate consideration for the execution and delivery of this Joinder Agreement or (b) its obligations under this Joinder Agreement are avoidable as a fraudulent conveyance.

5. As security for the prompt, complete payment when due (whether on the payment dates or otherwise) of all the Secured Obligations, Subsidiary grants to Agent a security interest in all of Subsidiary's right, title, and interest in and to the Collateral.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

SUBSIDIARY:

_____

By:
Name:
Title:

Address:

Telephone: _____
email: _____

AGENT:

HERCULES CAPITAL, INC.

By: _____
Name: _____
Title: _____

Address:
400 Hamilton Ave., Suite 310
Palo Alto, CA 94301
email: legal@herculestech.com
Telephone: 650-289-3060

EXHIBIT H

ACH DEBIT AUTHORIZATION AGREEMENT

Hercules Capital, Inc.
400 Hamilton Avenue, Suite 310
Palo Alto, CA 94301

Re: Loan and Security Agreement dated October 19, 2018 (the "Agreement") by and among X4 Pharmaceuticals, Inc. ("Borrower") and Hercules Capital, Inc., as agent ("Company") and the lenders party thereto (collectively, the "Lender")

In connection with the above referenced Agreement, the Borrower hereby authorizes the Company to initiate debit entries for (i) the periodic payments due under the Agreement and (ii) out-of-pocket legal fees and costs incurred by Agent or Lender pursuant to Section 11.11 of the Agreement to the Borrower's account indicated below. The Borrower authorizes the depository institution named below to debit to such account.

DEPOSITORY NAME	BRANCH
CITY	STATE AND ZIP CODE
TRANSIT/ABA NUMBER	ACCOUNT NUMBER

This authority will remain in full force and effect so long as any amounts are due under the Agreement.

X4 PHARMACEUTICALS, INC.

By: _____

Date: _____

AMENDMENT NO. 1
TO
LOAN AND SECURITY AGREEMENT

THIS AMENDMENT NO. 1 TO LOAN AND SECURITY AGREEMENT (the "First Amendment") is dated as of December 11, 2018 (the "First Amendment Date") and is entered into by and among X4 PHARMACEUTICALS, INC., a Delaware corporation, the several banks and other financial institutions or entities from time to time parties hereto (collectively, referred to as "Lender") and HERCULES CAPITAL, INC., a Maryland corporation, in its capacity as administrative agent for itself and the Lender (in such capacity, the "Agent"). Capitalized terms used herein without definition shall have the same meanings given them in the Loan Agreement (as defined below).

RECITALS

A. Borrower, Agent and Lender have entered into that certain Loan and Security Agreement dated as of October 19, 2018 (as may be amended, restated, or otherwise modified, the "Loan Agreement"), pursuant to which Lender has agreed to extend and make available to Borrower certain advances of money.

B. Borrower has requested and Agent and Lender have agreed to modify certain provisions of the Loan Agreement, subject to the terms and conditions set forth herein.

C. Borrower, Agent and Lender have agreed to amend the Loan Agreement upon the terms and conditions more fully set forth herein.

AGREEMENT

NOW, THEREFORE, in consideration of the foregoing Recitals and intending to be legally bound, the parties hereto agree as follows:

1. AMENDMENTS.

1.1 Definitions.

(a) New Definitions. The following definitions are hereby inserted alphabetically into Section 1.1 of the Loan Agreement:

"Merger Agreement" means that certain Agreement and Plan of Merger, dated November 26, 2018, as may be amended from time to time, by and among Arsanis, Inc., a Delaware corporation ("Arsanis"), Artemis AC Corp., a Delaware corporation and a wholly owned subsidiary of Arsanis ("Merger Sub"), and the Borrower, pursuant to which, among other things and subject to the terms and conditions of the Merger Agreement, Merger Sub will merge with and into Borrower, with Borrower continuing as a wholly owned subsidiary of Arsanis and the surviving corporation of the merger (the "Merger").

(b) Amended Definitions. The following definitions in Section 1.1 of the Loan Agreement are hereby amended and restated in their entirety as follows:

"Term Loan Maturity Date" means November 1, 2021.

"Tranche 2 Warrant" means that certain Warrant to purchase a number of shares of Borrower's Preferred Stock, or, if issued following the Merger (as defined in the definition of Merger Agreement above), then the common stock of Arsanis, par value $0.001 per share ("Arsanis Common Stock"), at an aggregate exercise price equal to $99,000 in connection with the extension of the Tranche 2 Term Loan Advance; notwithstanding the above, such Warrant shall be earned as of the date of the Tranche 2 Term Loan Advance, but shall be issued upon the earliest of (a) June 30, 2019, (b) the earlier to occur of (i) the date that Borrower prepays the outstanding Secured Obligations (other than any inchoate indemnity obligations and any other obligations which, by their terms, are to survive the termination of this Agreement) in full, or (ii) the date that the Secured Obligations become due and payable, (c) on or before the fifth (5th) Business Day following the closing of the Merger (as defined in the definition of Merger Agreement above), or (d) on or before the fifth (5th) Business Day following the public announcement of a termination of the Merger (as defined in the definition of Merger Agreement above).

"Warrant" means any warrant, including the Tranche 1 Warrant, the Tranche 2 Warrant and the Tranche 3 Warrant, entered into in connection with the Loan, as may be amended, restated or modified from time to time, provided, however, that notwithstanding anything set forth to the contrary in such Warrants, each Warrant shall continue in full force and effect following the closing of the Merger (as defined in the definition of Merger Agreement above), and thereafter each such Warrant shall be exercisable for shares of Arsanis Common Stock (as defined in the definition of Tranche 2 Warrant) with the Exercise Price under the Warrant being equal to $1.88 per share, subject to appropriate adjustment for the Preferred Stock Exchange Ratio (as defined in the Merger Agreement) following the Merger (as defined in the definition of Merger Agreement above).

(c) The defined term "Change in Control" in Section 1.1 of the Loan Agreement is amended by amending and restating the last sentence thereof to read as follows:

Notwithstanding the foregoing, an Initial Public Offering, any financing transaction related to Performance Milestone I or Performance Milestone II and the Merger (as defined in the definition of Merger Agreement above) is not a Change in Control.

1.2 Amendments.

(a) Section 2.2(a)(ii) of the Loan Agreement is hereby amended and restated in its entirety as follows:

2.2(a)(ii) Tranche 2 Term Loan Advance. Subject to the terms and conditions of this Agreement, beginning on December 11, 2018 and continuing through December 14, 2018, and subject to Borrower's satisfactory progress towards the achievement of Performance Milestone I in Lender's sole discretion, Borrower may request and Lender will make a Term Loan Advance of $2,000,000 (the "Tranche 2 Term Loan Advance").

(b) Section 7.9 of the Loan Agreement is hereby amended and restated in its entirety as follows:

7.9 Mergers or Acquisitions. Borrower shall not merger or consolidate, or permit any of its Subsidiaries to merger or consolidate, with or into any other business organization (other than mergers or consolidations of (a) a Subsidiary which is not a Borrower into another Subsidiary or into Borrower or (b) a Borrower into another Borrower, or the Merger (as defined in the definition of Merger Agreement above)), or acquire, or permit any of its Subsidiaries to acquire, all or substantially all of the capital stock or property of another Person.

2. BORROWER'S REPRESENTATIONS AND WARRANTIES. Borrower represents and warrants that:

2.1 Immediately upon giving effect to this First Amendment (i) the representations and warranties contained in the Loan Documents are true, accurate and complete in all material respects as of the date hereof (except to the extent such representations and warranties relate to an earlier date, in which case they are true and correct as of such date), and (ii) no Event of Default has occurred and is continuing with respect to which Borrower has not been notified in writing by Agent.

2.2 Borrower has the corporate power and authority to execute and deliver this First Amendment and to perform its obligations under the Loan Agreement, as amended by this First Amendment.

2.3 The certificate of incorporation, bylaws and other organizational documents of Borrower delivered to Agent and Lender on the Closing Date remain true, accurate and complete and have not been amended, supplemented or restated and are and continue to be in full force and effect.

2.4 The execution and delivery by Borrower of this First Amendment and the performance by Borrower of its obligations under the Loan Agreement, as amended by this First Amendment, have been duly authorized by all necessary corporate action on the part of Borrower.

2.5 This First Amendment has been duly executed and delivered by Borrower and is the binding obligation of Borrower, enforceable against it in accordance with its terms, except as such enforceability may be limited by bankruptcy, insolvency, reorganization, liquidation, moratorium or other similar laws of general application and equitable principles relating to or affecting creditors' rights; and

2.6 As of the date hereof, it has no defenses against the obligations to pay any amounts under the Secured Obligations. Borrower acknowledges that Agent and Lender have acted in good faith and have conducted in a commercially reasonable manner their relationships with Borrower in connection with this First Amendment and in connection with the Loan Documents.

Borrower understands and acknowledges that Agent and Lender are entering into this First Amendment in reliance upon, and in partial consideration for, the above representations and warranties, and agrees that such reliance is reasonable and appropriate.

3. LIMITATION. The amendments set forth in this First Amendment shall be limited precisely as written and shall not be deemed (a) to be a waiver or modification of any other term or condition of the Loan Agreement or of any other instrument or agreement referred to therein or to prejudice any right or remedy which Agent or Lender may now have or may have in the future under or in connection with the Loan Agreement (as amended hereby) or any instrument or agreement referred to therein; or (b) to be a consent to any future amendment or modification or waiver to any instrument or agreement the execution and delivery of which is consented to hereby, or to any waiver of any of the provisions thereof. Except as expressly amended hereby, the Loan Agreement shall continue in full force and effect.

4. EFFECTIVENESS. This First Amendment shall become effective upon the satisfaction of all the following conditions:

4.1 Amendments. Borrower, Agent and Lender shall have duly executed and delivered this First Amendment and the Warrant Modification Agreement, to Agent.

4.2 Payment of Agent and Lender Expenses. Borrower shall have paid all of Agent's and Lender's fees and expenses (including all reasonable attorneys' fees and reasonable expenses) incurred through the First Amendment Date.

5. COUNTERPARTS. This First Amendment may be signed in any number of counterparts, and by different parties hereto in separate counterparts, with the same effect as if the signatures to each such counterpart were upon a single instrument. All counterparts shall be deemed an original of this First Amendment. This First Amendment may be executed by facsimile, portable document format (.pdf) or similar technology signature, and such signature shall constitute an original for all purposes.

6. INCORPORATION BY REFERENCE. The provisions of Section 11 of the Loan Agreement shall be deemed incorporated herein by reference, *mutatis mutandis*.

7. LOAN DOCUMENTS. This First Amendment shall constitute a Loan Document.

[*Signatures on following page*]

IN WITNESS WHEREOF, the parties have duly authorized and caused this First Amendment to be executed as of the date first written above.

BORROWER:

X4 PHARMACEUTICALS, INC.

Signature: /s/ Adam Mostafa

Print Name: Adam Mostafa

Title: CFO

Accepted in Palo Alto, California:

AGENT:

HERCULES CAPITAL, INC.

Signature: /s/ Jennifer Choe
Jennifer Choe, Assistant
General Counsel

LENDER:

HERCULES CAPITAL, INC.

Signature: /s/ Jennifer Choe
Jennifer Choe, Assistant
General Counsel

Exhibit 10.11

LEASE

BETWEEN

X4 PHARMACEUTICALS, INC., AS TENANT

AND

BRICKMAN 955 MASSACHUSETTS LLC, AS LANDLORD

955 MASSACHUSETTS AVENUE, CAMBRIDGE, MASSACHUSETTS

The submission of an unsigned copy of this document to Tenant for Tenant's consideration does not constitute an offer to lease the Premises or an option to or for the Premises. This document shall become effective and binding only upon the execution and delivery of this Lease by both Landlord and Tenant.

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LEASE

THIS LEASE is dated as of January 20, 2017 between the Landlord and the Tenant named below, and is of space in the Building described below.

ARTICLE 1

BASIC DATA; DEFINITIONS

1.1 Basic Data. Each reference in this Lease to any of the following terms shall be construed to incorporate the data for that term set forth in this Section:

Landlord: BRICKMAN 955 MASSACHUSETTS LLC, a Delaware limited liability company

Landlord's Notice Address: 712 Fifth Avenue, 6th Floor
New York, NY 10019
Attention: Asset Manager, 955 Massachusetts Avenue,
Cambridge, MA

Tenant: X4 PHARMACEUTICALS, INC., a Delaware corporation

Tenant's Notice Address: 784 Memorial Drive, Suite 140, Cambridge, MA 02139

Property: The land located in Cambridge, Massachusetts, together with the Building and other improvements thereon, as more fully described in **Exhibit B-1** attached hereto.

Building: The building located on the Property and commonly known and numbered as 955 Massachusetts Avenue, Cambridge, MA

Building Rentable Area: Agreed to be 90,311 square feet.

Premises: The fourth (4th) floor of the Building shown on the location plan attached hereto as **Exhibit A**.

Premises Rentable Area: Agreed to be 12,577 rentable square feet. Basic Rent: The Basic Rent for the Initial Term is as follows:

RENTAL PERIOD	ANNUAL BASIC RENT	MONTHLY PAYMENT	PER RSF
8/1/17 - 7/31/18	$ 792,351.00	$66,029.25	$ 63.00
8/1/18 - 7/31/19	$ 804,928.00	$67,077.33	$ 64.00
8/1/19 - 7/31/20	$ 817,505.00	$68,125.42	$ 65.00
8/1/20 - 7/31/21	$ 830,082.00	$69,173.50	$ 66.00
8/1/21 - 7/31/22	$ 842,659.00	$70,221.58	$ 67.00

Base Operating Expenses: Actual Operating Expenses for calendar year 2017. Base Taxes: Actual Taxes for the twelve month period ending June 30, 2017.

Commencement Date: Three (3) Business Days following the execution of this Lease by Tenant and Landlord. Promptly upon the occurrence of the Commencement Date, Landlord and Tenant shall execute and deliver a letter designating the Commencement Date substantially in the form attached hereto as **Exhibit D** but the failure by either party to execute and deliver such a letter shall have no effect on the Commencement Date, as hereinabove determined.

Rent Commencement Date: August 1, 2017.

Expiration Date: July 31, 2022.

Tenant's Proportionate Share: Thirteen and 93/100 percent (13.93%) (which is based on the ratio of (a) Premises Rentable Area to (b) Building Rentable Area).

Basic Rent for Extension Term: As set forth in **Section 2.3** hereof.

Letter of Credit: $264,117.00, to be held and disposed of as provided in **Section 14.8**.

Initial Term: The period commencing on the Commencement Date and expiring at the close of the day immediately preceding the fifth (5^{th}) anniversary of the Rent Commencement Date, except that if the Rent Commencement Date is other than the first day of a calendar month, the expiration of the Initial Term shall be at the close of the last day of the calendar month in which such anniversary falls. The "Term" shall include the Initial Term and any extension thereof that is expressly provided for by this Lease and that is exercised and effected strictly in accordance with this Lease; if no extension of the Term is expressly provided for by this Lease, no right to extend the Term shall be implied by this provision.

Extension Term: One period of five (5) years as more fully set forth in **Section 2.3** hereof.

Initial General Liability Insurance: $3,000,000 per occurrence/$5,000,000 aggregate (combined single limit) for property damage, bodily injury or death.

Permitted Uses: General office use in accordance with all applicable Laws and consistent with the character of a first class office building, but specifically excluding governmental or quasi-governmental offices, medical or dental offices, offices for a call center, employment agencies or any other offices which solicit or accept "off the street" clients or customers to the Premises.

Landlord's Contribution: As set forth in **Exhibit C** hereto.

Parking Spaces: Tenant shall (a) lease sixteen (16) parking spaces for the entire Term at the Landlord's then current market rate for all office tenants of the Building from time to time applicable and (b) have the option to lease up to an additional four (4) parking spaces on a month to month basis (each terminable by either party on one month's notice) and at the Landlord's then current market rate for all office tenants of the Building from time to time applicable. Landlord shall have the right exercisable from time to time (monthly, if necessary, depending on availability) to allocate the number of indoor and outdoor parking spaces available to Tenant as determined by Landlord. The Landlord's current market rate is $290.00 per month for indoor spaces and $250.00 per month for outdoor spaces.

Right of First Offer: As set forth in Section 2.4 hereof

1.2 Additional Definitions. When used in Lease, the capitalized terms set forth below shall bear the meanings set forth below.

Adequate Assurance: As defined in **Section 14.1**.

Adequate Assurance of Future Performance: As defined in **Section 14.1**.

Additional Rent: All charges and sums payable by Tenant as set forth in this Lease, other than and in addition to Basic Rent.

Alterations: As defined in **Section 5.2**.

Bankruptcy Code: As defined in Section **14.1**.

Base Building: Shall mean all of the Structural Elements (as hereinafter defined) of the Building, the roof, the common building and core facilities of the Building, and the Base Building Systems serving the Building, but shall not include any Improvements relating to the Premises (whether existing or constructed by Landlord or Tenant), Alterations, the distribution portions of Base Building Systems which exclusively serve the Premises (whether located in the Premises or other areas of the Building), or other fixtures or personal property installed by or on behalf of Tenant or any party claiming by, through or under Tenant.

Base Building Systems: Shall mean the mechanical, gas, electrical, sanitary, heating, air conditioning, ventilating, elevator, plumbing, fire control and suppression, sprinkler/life safety and security systems (to the extent installed by Landlord) and other common service systems of the Building.

Bathroom Upgrade: As defined in **Section 4.1**.

Brokers: CBRE-New England.

Business Day: All days except Saturdays, Sundays, New Year's Day, Martin Luther King Day, Memorial Day, Patriot's Day, Presidents Day, Independence Day, Labor Day, Columbus Day, Veteran's Day, Thanksgiving Day, Christmas Day (and the following day when any such day occurs on Sunday and the prior day when such day occurs on a Saturday).

Common Facilities: As defined in **Section 2.2**.

Default Interest Rate: As defined in **Section 3.1(a)**.

Environmental Condition: Any disposal, release or threat of release of Hazardous Materials on, under, from or about the Building or the Property or storage of Hazardous Materials on, from or about the Building or the Property.

Environmental Laws: Any federal, state and/or local statute, ordinance, bylaw, code, rule and/or regulation now or hereafter enacted, pertaining to any aspect of the environment or human health, including, without limitation, Chapter 21C, Chapter 21D, and Chapter 21E of the General Laws of Massachusetts and the regulations promulgated by the Massachusetts Department of Environmental Protection, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. § 9601 *et seq.*, the Resource Conservation and Recovery Act of 1976, 42 U.S.C. § 6901 *et seq.*, the Toxic Substances Control Act, 15 U.S.C. §2061 *et seq.*, the Federal Clean Water Act, 33 U.S.C. §1251, and the Federal Clean Air Act, 42 U.S.C. §7401 *et seq.*

Escalation Charges: The Additional Rent arising pursuant to **Article 8** and **Article 9** of this Lease.

Event of Bankruptcy: As defined in **Section 14.1**.

Event of Default: As defined in **Section 14.1**.

Force Majeure: Collectively and individually, strikes, lockouts or other labor trouble, fire or other casualty, acts of God, governmental preemption of priorities or other controls in connection with a national or other public emergency or shortages of fuel, supplies or labor resulting therefrom, unusually adverse weather conditions, fire or other casualty, acts of terrorism or bioterrorism, civil commotion, or any other cause, whether similar or dissimilar, beyond the reasonable control of the party required to perform an obligation.

Holder: As defined in **Section 13.1**.

Hazardous Materials: Shall mean chemicals, contaminants, pollutants, flammables, explosives, materials, wastes or other substances defined, determined or identified as hazardous or toxic under or otherwise controlled pursuant to any Environmental Laws, including, without limitation, any “oil,” “hazardous material,” “hazardous waste,” “hazardous substance” or “chemical substance or mixture”, as the foregoing terms (in quotations) are defined in any Environmental Laws.

Improvements: As defined in **Section 10.2**.

Land: The land that constitutes a portion of the Property.

Landlord’s Restoration Work: As defined in **Section 11.2**.

Laws: All present and future statutes, laws, codes, regulations, ordinances, orders, rules, bylaws, administrative guidelines, requirements, directives and actions of any federal, state or local governmental or quasi-governmental authority, and other legal requirements of whatever kind or nature that are applicable to the Property, including, without limitation, all Environmental Laws and the Americans With Disabilities Act of 1990 (including the Americans With Disabilities Act Accessibility Guidelines for Buildings and Facilities), and any amendments, modifications or changes to any of the foregoing.

Mortgage: As defined in **Section 13.1**.

Operating Expenses: As defined in **Section 9.1**.

Operating Year: As defined in **Section 9.1**.

Plans: As defined in **Exhibit C**.

Recapture Date: As defined in **Section 6.4**.

Rules and Regulations: As defined in **Section 2.2**.

Specified Restoration Work: As defined in **Section 11.2**.

Structural Elements: Shall mean the structural (i.e., load bearing) components of the Building's footings, foundations, exterior structural walls, interior structural columns and other load-bearing elements of the Building.

Successor: As defined in **Section 13.1**.

Tangible Net Worth: Shall mean total assets minus intangible assets (including, without limitation, goodwill, patents and copyrights) and total liabilities, all as calculated in accordance with generally accepted accounting principles.

Taxes: As defined in **Section 8.1**.

Tax Year: As defined in **Section 8.1.**

Tenant's Work: As defined in **Exhibit C**.

T**enant's Removable Property**: As defined in **Section 5.2**.

T**enant's Restoration Work**: As defined in **Section 11.2**.

1.3 Enumeration of Exhibits. The following Exhibits are a part of this Lease, are incorporated herein by reference attached hereto, and are to be treated as a part of this Lease for all purposes. Undertakings contained in such Exhibits are agreements on the part of Landlord and Tenant, as the case may be, to perform the obligations stated therein.

Exhibit A	Location Plan of the Premises
Exhibit B	Legal Description
Exhibit C	Work Letter
Exhibit D	Commencement Date Letter
Exhibit E	Operating Expenses
Exhibit F	Rules and Regulations
Exhibit G	List of Work Stations
Exhibit H	Estoppel Certificate
Exhibit I	ROFO SPACE I
Exhibit J	ROFO SPACE II

ARTICLE 2
PREMISES AND APPURTENANT RIGHTS

2.1 Lease of Premises. Landlord hereby leases to Tenant and Tenant hereby leases from Landlord the Premises for the Term and upon the terms and conditions hereinafter set forth.

2.2 Appurtenant Rights and Reservations.

(a) Tenant shall have, as appurtenant to the Premises, the non-exclusive right to use, and permit its invitees to use in common with Landlord and others, (i) public or common lobbies, hallways, stairways, elevators and common walkways necessary for access to the Building and the Premises, and if the portion of the Premises on any floor includes less than the entire floor, the common toilets, corridors and elevator lobby of such floor; and (ii) the loading areas, pedestrian sidewalks, landscaped areas, trash enclosures, and other areas or facilities, if any, which are located in or on the Property and designated by Landlord from time to time for the non-exclusive use of tenants and other occupants of the Building (the "**Common Facilities**"); but such rights shall always be subject to reasonable rules and regulations from time to time established by Landlord pursuant to **Section 15.6** (the "**Rules and Regulations**") and to the right of Landlord to designate and change from time to time such areas and facilities so to be used.

(b) Excepted and excluded from the Premises and the Common Facilities are the floor slab, demising walls and perimeter walls and exterior windows (except the inner surfaces of each thereof), and any space in the Premises used for shafts, stacks, pipes, conduits, fan rooms, ducts, electric or other utilities, sinks or other Building facilities, but the entry doors (and related glass and finish work) to the Premises are a part thereof. Landlord shall have the right to place in the Premises (but in such manner as to reduce to a minimum interference with Tenant's use of the Premises) interior storm windows, sun control devices, utility lines, equipment, stacks, pipes, conduits, ducts and the like. In the event that Tenant shall install any hung ceilings or walls in the Premises, Tenant shall install and maintain, as Landlord may require, proper access panels therein to afford access to any facilities above the ceiling or within or behind the walls. Tenant shall be entitled to install any such ceilings or walls only in compliance with the other terms and conditions of this Lease. Tenant shall have no right to access and use the fan rooms, janitorial, electrical, telephone and telecommunications closets, conduits, risers, plenum spaces and other service areas of the Building without the prior written consent of Landlord.

(c) Tenant may install signs or lettering on the entry doors to the Premises provided such signs conform to sign standards for the Building adopted by Landlord in its sole discretion and Tenant has submitted to Landlord a plan or sketch in reasonable detail (showing, without limitation, size, color, location, materials and method of affixation) of the sign to be placed on such entry doors. Except for the foregoing signage, Tenant will not place on the exterior of the Premises (including both interior and exterior surfaces of doors and interior surfaces of windows) or on any part of the Building outside the Premises, any sign, symbol, advertisement or the like visible to public view outside of the Premises. If and only so long as Landlord maintains a tenant directory in the main lobby of the Building, Landlord shall cause Tenant's name to be listed on such tenant directory; provided, however, that any changes or replacements of such lobby listing after the initial installation shall be at Tenant's expense.

2.3 Option to Extend.

(a) Provided that, at the time of such exercise, (i) this Lease is in full force and effect, and (ii) no Event of Default shall have occurred and be continuing (either at the time of exercise or at the commencement of the Extended Term), and (iii) the originally-named Tenant shall be in occupancy of at least eighty percent (80%) of the Premises for the conduct of its business and shall not have assigned this Lease or sublet more than twenty percent (20%) of the Premises (other than to any entity to which assignment or subletting by the originally named Tenant shall have been permitted under **Article 6** without Landlord's Consent) (any of which conditions described in clauses (i), (ii), and (iii) may be waived by Landlord at any time in Landlord's sole discretion), Tenant shall have the right and option to extend the Term of this Lease for one extended term (the "**Extended Term**") of five (5) years by giving written notice to Landlord not later than nine (9) months and not sooner than twelve (12) months prior to the expiration date of the Initial Term. Without limiting the foregoing, all of the rights created by this Section 2.3 shall be personal to the originally named Tenant under this Lease and shall not apply in favor of or be exercisable by any assignee of this Lease (other than an assignee to which assignment by the originally named Tenant shall have been permitted under **Article 6** without. Landlord's consent) or other successor to Tenant's rights under the Lease nor any sublessee of all or any portion of the Premises. The effective giving of such notice of extension by Tenant shall automatically extend the Term of this Lease for the Extended Term, and no instrument of renewal or extension need be executed. In the event that Tenant fails timely to give such notice to Landlord, this Lease shall automatically terminate at the end of the Initial Term and Tenant shall have no further option to extend the Term of this Lease. The Extended Term shall commence on the day immediately succeeding the expiration date of the Initial Term and shall end on the day immediately preceding the fifth (5^{th}) anniversary of the first day of the Extended Term. The Extended Term shall be on all the terms and conditions of this Lease, except: (x) Tenant shall have no further option to extend the Term, (y) the Basic Rent for the Extended Term shall be the Fair Market Rental Value of the Premises as of the commencement of the Extended Term, taking into account all relevant factors, determined pursuant to **Section 2.3(b)** below, and (z) Landlord shall not be required to furnish any materials or perform any work to prepare the Premises for Tenant's occupancy during the Extended Term and Landlord shall not be required to provide any work allowance or reimburse Tenant for any alterations made or to be made by Tenant, or to grant Tenant any rent concession. Notwithstanding anything contained herein to the contrary, it is understood and agreed by the parties that in no event shall the annual Basic Rent for the Extended Term (whether determined by agreement, by arbitration or otherwise) be less than the annual Basic Rent payable by Tenant immediately prior to the commencement of the Extended Term.

(b) Promptly after receiving Tenant's notice extending the Term of this Lease pursuant to **Section 2.3(a)** above, Landlord shall provide Tenant with Landlord's good faith estimate of the Fair Market Rental Value (as defined in **Section 2.3(c)** below) of the Premises for the upcoming Extended Term, but in no event shall Landlord be required to deliver such estimate sooner than eight (8) months prior to the expiration of the Term then in effect. If Tenant is unwilling to accept Landlord's estimate of the Fair Market Rental Value as set forth in Landlord's notice referred to above, and the parties are unable to reach agreement thereon within thirty (30) days after the delivery of such notice by Landlord, then either party may submit the determination of the Fair Market Rental Value of the Premises to arbitration by giving notice to the other party naming the initiating party's arbitrator within ten (10) days after the expiration of such thirty (30)-day period. Within fifteen (15) days after receiving a notice of initiation of arbitration, the responding party shall appoint its own arbitrator by notifying the initiating party of the responding party's arbitrator. If the second arbitrator shall not have been so appointed within such fifteen (15) day period, the Fair Market Rental Value of the Premises shall be determined by the initiating party's arbitrator. If the second arbitrator shall have been so appointed, the two arbitrators thus appointed shall, within fifteen (15) days after the responding party's notice of appointment of the second arbitrator, appoint a third arbitrator. If the two initial arbitrators are unable timely to agree on the third arbitrator, then either may, on behalf of both, request such appointment by the Boston office of JAMS, Inc., or its successor, or, on its failure, refusal or inability to act, by a court of competent jurisdiction. The Fair Market Rental Value of the Premises for the Extended Term shall be determined by the method commonly known as Baseball Arbitration, whereby Landlord's selected arbitrator and Tenant's selected arbitrator shall each set forth its respective determination of the Fair Market Rental Value of the Premises, and the third arbitrator must select one or the other (it being understood that the third arbitrator shall be expressly prohibited from selecting a compromise figure). Landlord's selected arbitrator and Tenant's selected arbitrator shall deliver their determinations of the Fair Market Rental Value of the Premises to the third arbitrator within five (5) Business Days of the appointment of the third arbitrator and the third arbitrator shall render his or her decision within ten (10) days after receipt of both of the other two determinations of the Fair Market Rental Value of the Premises. The third arbitrator's decision shall be binding on both Landlord and Tenant. The third arbitrator shall be a commercial real estate broker who is independent from the parties and who has not worked for either party or their affiliates in the prior five (5) years and who has at least ten (10) years' experience in comparable buildings in the financial district of Boston. Each party shall pay the fees of its own arbitrator, and the fees of the third arbitrator shall be shared equally by the parties. In the event Tenant initiates the aforesaid arbitration process and as of the commencement of the Extended Term the amount of the Basic Rent for the Extended Term has not been determined, Tenant shall pay the amount determined by Landlord for the Premises and when the determination has actually been made, an appropriate retroactive adjustment shall be made as of the commencement of the Extended Term if necessary. In the event that such determination shall result in an overpayment by Tenant of any Basic Rent, such overpayment shall be paid by Landlord to Tenant promptly after such determination has been made, and if such determination shall result in an underpayment by Tenant of any Basic Rent, Tenant shall pay any such amounts to Landlord promptly following such determination.

(c) For purposes of this **Section 2.3**, the determination of "**Fair Market Rental Value**" shall mean the then fair market rental value of the Premises taking into account all then relevant factors, whether favorable to Landlord or Tenant, and based upon rental rates agreed to in comparable transactions executed within six (6) months prior to such determination with new tenants for comparable space in the Building or, if comparable transactions do not exist in the Building, then an amount that landlords of first class multi-tenanted commercial office buildings in the same market area of the City of Cambridge, Massachusetts have agreed to accept with tenants of comparable creditworthiness for comparable space (in terms of condition and floor location) of a comparable size, for a comparable use, for a nonrenewal term equal to the Extended Term and commencing as of the first day of the Extended Term and taking into account all other relevant factors.

2.4 Right of First Offer.

(a) Subject to the terms and conditions of this **Section 2.4**, before Landlord leases any Available Space (as defined below) to any unrelated third party during the Term, Landlord will first offer such Available Space to Tenant for lease by written notice to Tenant ("**Landlord's Offer Notice**") and Tenant will have the right to lease the offered Available Space. As used in this **Section 2.4**, "Available Space" shall mean and refer to either (i) that office space in the Building, containing approximately 5,136 rentable square feet and located on the second (2nd) floor and shown on the plan attached hereto as **Exhibit I** ("**ROFO SPACE I**") or (i) that office space in the Building, containing approximately 6, 313 rentable square feet located on the third (3rd) floor and shown on the plan attached hereto as **Exhibit J** ("**ROFO SPACE II**") that, in such case, respectively, Landlord reasonably determines will be vacant and free of any possessory right now or hereafter existing in favor of any third party during the Term. Anything to the contrary contained herein notwithstanding, Tenant's right of first offer hereunder is subordinate to (i) any right of offer, right of first refusal, renewal right or similar right or option in favor of any third party existing as of the date of this Lease and (ii) Landlord's right to renew or extend the term of any lease to another tenant in occupancy of the Available Space, whether or not pursuant to an option or right set forth in such other tenant's lease.

(b) Landlord's Offer Notice shall specify the location and size of the Available Space, the Basic Rent for the Available Space, the date that Landlord estimates the Available Space will be delivered to Tenant, the term of the Lease with respect to the Available Space, the Base Year for Taxes and Base Year for Operating Expenses, tenant improvement allowances (if any), and all other material terms and conditions which will apply to the Available Space. Tenant will notify Landlord within ten (10) days of Landlord's Offer Notice that (i) Tenant elects to lease the Available Space on the terms set forth in Landlord's Offer Notice, or (ii) Tenant rejects Landlord's offer. If Tenant elects to lease the Available Space, Landlord and Tenant agree to enter into an amendment to the Lease memorializing the addition of the Available Space to this Lease, but failure of the parties to execute such an amendment shall have no effect on the effectiveness of the expansion of the Premises to include the Available Space, and the economic terms associated therewith, as set forth above. If Tenant rejects Landlord's offer, or fails to notify Landlord within said ten (10) day period that Tenant intends to lease such Available Space, Landlord shall be entitled to lease the Available Space that was offered to Tenant at any time to any third party on terms acceptable to Landlord in its sole discretion and Tenant shall have no further right to lease such Available Space pursuant to this Lease.

(c) Notwithstanding any contrary provision of this **Section 2.4** or any other provision of the Lease, any exercise by Tenant of its right to lease Available Space shall be void and of no effect unless on the date Tenant notifies Landlord that it elects to lease Available Space and on the commencement date of the amendment for the Available Space (i) the Lease is in full force and effect, and (ii) no Event of Default shall have occurred and be continuing, and (iii) the originally-named Tenant shall be in occupancy of at least eighty percent (80%) of the Premises for the conduct of its business and shall not have assigned this Lease or sublet more than twenty percent (20%) of the Premises (which conditions under clauses (i), (ii) and (ii) above Landlord may waive by written notice to Tenant at any time). Without limiting the foregoing, all of the rights created by this **Section 2.4** shall be personal to the originally named Tenant under this Lease and shall not apply in favor of or be exercisable by any assignee of this Lease or other successor to Tenant's rights under the Lease nor any sublessee of all or any portion of the Premises.

ARTICLE 3
BASIC RENT

3.1 Payment.

(a) Tenant agrees to pay Additional Rent to Landlord, or as directed by Landlord, commencing on the Commencement Date and Basic Rent to Landlord, or as directed by Landlord, commencing on the Rent Commencement Date and, without offset, abatement (except as provided in **Section 11.3**), deduction or demand, except that the first full monthly installment of Basic Rent shall be paid upon execution and delivery of this Lease by Tenant. Basic Rent shall be payable in equal monthly installments, in advance, on the first day of each and every calendar month during the Term of this Lease, to Landlord at such place as Landlord shall from time to time designate by notice, in lawful money of the United States. In the event that any installment of Basic Rent or any payment of Additional Rent is not paid when due, Tenant shall pay, in addition to any charges under **Section 14.4**, at Landlord's request an administrative fee equal to 5% of the overdue payment. In addition to the foregoing, if payment of Rent or other charges due under this Lease are not paid within ten (10) days after the date due, such past due amount shall bear interest from the date due until paid at a rate equal to the lesser of (1) a rate equal to 3% plus the prime rate published from time to time in The Wall Street Journal or its successor publication or (2) the highest rate permitted to be charged by applicable Law (the "**Default Interest Rate**"). Landlord and Tenant agree that all amounts due from Tenant under or in respect of this Lease, whether labeled Basic Rent, Escalation Charges, Additional Rent or otherwise, shall be considered as rental reserved under this Lease for all purposes, including without limitation regulations promulgated pursuant to the Bankruptcy Code, and including further without limitation Section 502(b) thereof.

(b) Basic Rent for any partial month shall be pro-rated on a daily basis, and if the first day on which Tenant must pay Basic Rent shall be other than the first day of a calendar month, the first payment which Tenant shall make to Landlord shall be equal to a proportionate part of the monthly installment of Basic Rent for the partial month from the first day on which Tenant must pay Basic Rent to the last day of the month in which such day occurs, plus the installment of Basic Rent for the succeeding calendar month.

ARTICLE 4
CONDITION OF PREMISES

4.1 Condition of Premises; Initial Improvements. The Premises are being leased in their present condition, AS IS, WITHOUT REPRESENTATION OR WARRANTY by Landlord, except that the Premises shall be delivered with the Building Systems serving the Premises in good repair and working order, and at the time of delivery the Premises shall be free of other occupants and free of furniture, equipment and other personal property other than the Workstations (defined below) or other personal property consented to by Tenant. Landlord shall have no obligation to perform any alterations or to make any improvements to the Premises to prepare them for Tenant's occupancy. Tenant acknowledges that Tenant has inspected the Premises and Common Facilities and has found the same satisfactory.

Landlord agrees to perform cosmetic upgrades to the bathrooms within the Premises using building standard materials and colors at Landlord's cost and expense, including new lighting, new paint on stalls, new vanities, new toilets and new ceiling tiles (the "**Bathroom Upgrade**"). Landlord shall consult with Tenant as to layout, color selection, choice of building standard materials and the like, and the parties agree to cooperate to arrive at a mutually acceptable plan for such upgrade. Landlord shall use commercially reasonable efforts to complete the Bathroom Upgrade by August 1, 2017. Landlord shall endeavor not to unreasonably interfere with or disturb Tenant's use and occupancy of the remainder of the Premises during the course of such work, but shall not be required to perform such work during times other than normal business hours or to incur any overtime charges.

The workstations (excluding chairs, but including associated rolling files) listed on **Exhibit G** hereto (the "**Workstations**") shall remain at the Premises when the Premises are delivered to Tenant. Tenant at its cost and expense shall maintain the Workstations in substantially the same condition, repair and appearance as provided by Landlord and protect same from deterioration other than normal wear and tear. Landlord shall retain title to the Workstations during the Term. Upon the expiration of the Term, the Workstations shall, without the necessity of further action by the parties, become the property of Tenant in their "as-is" "where is" condition at such time, without representation or warranty by Landlord and Tenant shall remove the Workstations from the Premises at Tenant's expense and shall repair any damage to the Premises or the Building caused by such removal. Notwithstanding the foregoing, in the event that the Term shall be terminated due to a default by Tenant under this Lease, at Landlord's option the Workstations shall upon such termination either (i) become the property of Tenant in their "as-is" "where is" condition at such time, without representation or warranty by Landlord, in which event Tenant shall remove the Workstations from the Premises at Tenant's expense and shall repair any damage to the Premises or the Building caused by such removal, or (ii) shall remain the property of Landlord and shall not be removed from the Premises by Tenant.

ARTICLE 5
USE OF PREMISES

5.1 Permitted Use. Tenant agrees that the Premises shall be used and occupied by Tenant only for Permitted Use and for no other use without Landlord's express written consent. Tenant shall not perform any act or carry on any practice which may injure the Premises, or any other part of the Building, or cause any offensive odors or loud noise or constitute a nuisance or a menace to any other tenant or tenants or other persons in the Building.

5.2 Installations and Alterations by Tenant.

(a) Tenant shall make no alterations, additions (including, for the purposes hereof, wall to wall carpeting), or improvements (collectively, "**Alterations**") in or to the Premises (including Tenant's Work and any other Alterations necessary for Tenant's initial occupancy of the Premises) or any Base Building Systems serving the Premises without Landlord's prior written consent, which consent shall not be unreasonably withheld or delayed with respect to non-structural Alterations that do not affect or involve any portion of the Base Building or the Base Building Systems. Any Alterations shall be in accordance with Landlord's Rules and Regulations from time to time in effect and with plans and specifications meeting the requirements set forth in such Rules and Regulations and approved in advance by Landlord. All Alterations shall (i) be performed in a good and workmanlike manner using only new and only quality materials and in compliance with all applicable Laws; (ii) be made at Tenant's sole cost and expense; (iii) become part of the Premises and the property of Landlord upon the expiration or earlier termination of the Term of this Lease unless Landlord otherwise notifies Tenant such Alteration must be removed as provided in **Section 5.2(e)** below; (iv) be made by contractors and subcontractors approved in advance by Landlord; and (v) be coordinated with any work being performed by Landlord in such a manner as not to damage the Building or interfere with the management, maintenance or operation of the Building. At Landlord's request, Tenant shall, before its work is started, secure assurances satisfactory to Landlord in its reasonable discretion protecting Landlord against claims arising out of the furnishing of labor and materials for the Alterations. If any Alterations shall involve the removal of fixtures, equipment or other property in the Premises which are not Tenant's Removable Property, such fixtures, equipment or property shall be promptly replaced by Tenant at its expense with new fixtures, equipment or property of like utility and of at least equal quality. Tenant shall promptly reimburse Landlord for all reasonable costs, including attorneys', architects', engineers', and consultants' fees, incurred by Landlord in connection with any request from Tenant pursuant to this **Section 5.2**. Tenant acknowledges and agrees that any review or approval by Landlord of any plans and/or specifications with respect to any Alterations is solely for Landlord's benefit, and without any representation or warranty whatsoever to Tenant with respect to the adequacy, correctness or efficiency thereof or otherwise. Landlord shall have the right to require that Tenant use Landlord's designated structural contractor and architect for the Building for the design and performance of any Alterations affecting the Structural Elements and/or that Tenant use Landlord's designated fire and life safety contractor and engineer for the Building to perform Tenant's connection to the Building's fire alarm system or any Alterations that affect the fire alarm or fire/life safety systems in the Building.

Notwithstanding the foregoing, Tenant may, without Landlord's prior consent but upon notice (which shall reasonably describe the Alterations) to Landlord perform Alterations within the Premises provided (a) the cost of such Alteration does not exceed $25,000 in each instance, (b) such work does not affect the structure of the Building or the Building Systems, and (c) such work does not require a building permit (such Alterations are referred to herein as "**Cosmetic Alterations**").

(b) All articles of personal property and all business and trade fixtures, furniture, moveable partitions, freestanding cabinet work, machinery and equipment owned or installed by Tenant or any party claiming by, through or under Tenant solely at its expense in the Premises ("**Tenant's Removable Property**") shall remain the property of Tenant and may be removed by Tenant at any time prior to the expiration or earlier termination of the Term, provided that Tenant, at its expense, shall repair any damage to the Building caused by such removal. Any provision of this Lease to the contrary notwithstanding, Tenant shall be solely responsible for the ordering, delivery and installation of any telephone, telephone switching, telephone and data cabling, and Tenant's Removable Property to be installed by or on behalf of Tenant in the Premises and for the removal of all telephone and data cabling and all other lines installed in the Building by or on behalf of Tenant or anyone claiming by, through or under Tenant at the expiration or earlier termination of the Term of this Lease.

(c) Notice is hereby given that Landlord shall not be liable for any labor or materials furnished or to be furnished to Tenant upon credit, and that no mechanic's or other lien for any such labor or materials shall attach to or affect the reversion or other estate or interest of Landlord in and to the Premises, the Building or the Property. To the maximum extent permitted by law, before such time as any contractor commences to perform work on behalf of Tenant, such contractor (and any subcontractors) shall furnish a written statement acknowledging the provisions set forth in the prior clause. Tenant agrees to pay promptly when due the entire cost of any work done on behalf of Tenant, its agents, employees or independent contractors, and not to cause or permit any liens for labor or materials performed or furnished in connection therewith to attach to all or any part of the Property and immediately to discharge any such liens which may so attach. If, notwithstanding the foregoing, any lien is filed against all or any part of the Property for work claimed to have been done for, or materials claimed to have been furnished to, Tenant or its agents, employees or independent contractors, Tenant, at its sole cost and expense, shall cause such lien to be dissolved promptly after receipt of notice that such lien has been filed, by the payment thereof or by the filing of a bond sufficient to accomplish the foregoing. If Tenant shall fail to discharge any such lien, Landlord may, at its option, discharge such lien and treat the cost thereof (including attorneys' fees incurred in connection therewith) as Additional Rent payable upon demand, it being expressly agreed that such discharge by Landlord shall not be deemed to waive or release the Event of Default in not discharging such lien. Tenant shall indemnify and hold Landlord harmless from and against any and all expenses, liens, claims, liabilities and damages based on or arising, directly or indirectly, by reason of the making of any alterations, additions or improvements by or on behalf of Tenant to the Premises under this Section, which obligation shall survive the expiration or termination of this Lease.

(d) In the course of any work being performed by Tenant (including, without limitation, the installation or removal of any Tenant's Removable Property), Tenant agrees to use labor compatible with that being employed by Landlord for work in the Building or on the Property or other buildings owned by Landlord or its affiliates (which term, for purposes hereof, shall include, without limitation, entities which control or are under common control with or are controlled by Landlord or, if Landlord is a partnership or limited liability company, by any partner or member of Landlord) and not to employ or permit the use of any labor or otherwise take any action which might result in a labor dispute or disharmony involving personnel providing services in the Building or on the Property pursuant to arrangements made by Landlord.

(e) Landlord may, by written notice to Tenant prior to the expiration or earlier termination of the Term of this Lease, require Tenant, at Tenant's expense, to remove any Alterations in the Premises at the expiration or earlier termination of the Term, to repair any damage to the Premises and Building caused by such removal and return the affected portion of the Premises to a Building standard tenant improved condition as determined by Landlord. If Tenant expressly requests at the time it seeks Landlord's consent to the installation of Alterations that Landlord notify Tenant whether it will require removal of the same at the expiration or earlier termination of this Lease, Landlord agrees to make and notify Tenant of such determination in writing at the time of its consent to the installation of such Alterations and such written determination shall be binding upon Landlord and its successors. If Tenant fails to complete such removal and/or to repair any damage caused by the removal of any Alterations in the Premises, and return the affected portion of the Premises to a Building standard tenant improved condition as determined by Landlord, then, without limiting Landlord's other rights and remedies, at Landlord's option, either (a) Tenant shall be deemed to be holding over in the Premises and Rent shall continue to accrue in accordance with the terms of **Article 12**, below, until such work shall be completed, or (b) Landlord may do so and may charge the cost thereof to Tenant.

5.3 Extra Hazardous Use. Tenant covenants and agrees that Tenant will not do or permit anything to be done in or upon the Premises, or bring in anything or keep anything therein, which shall increase the rate of property or liability insurance on the Premises or the Property above the standard rate applicable to Premises being occupied for the Permitted Use. If the premium or rates payable with respect to any policy or policies of insurance carried by or on behalf of Landlord with respect to the Property increases as a result of any act or activity on or use of the Premises during the Term or payment by the insurer of any claim arising from any act or neglect of Tenant, its employees, agents, contractors or invitees, Tenant shall pay such increase, from time to time, within fifteen (15) days after demand therefor by Landlord, as Additional Rent.

5.4 Hazardous Materials.

(a) Tenant may use materials such as adhesives, lubricants, ink, solvents and cleaning fluids of the kind and in amounts and in the manner customarily found and used in business offices in order to conduct its business at the Premises and to maintain and operate the business machines located in the Premises provided that such materials are used, stored and disposed of by Tenant strictly in accordance with all applicable Laws. Except for the foregoing, Tenant shall not use, store, handle, treat, transport, release or dispose of any other Hazardous Materials on or about the Premises or the Property without Landlord's prior written consent, which Landlord may withhold or condition in Landlord's sole discretion.

(b) Any handling, treatment, transportation, storage, disposal or use of Hazardous Materials by Tenant in or about the Premises or the Property and Tenant's use of the Premises shall comply with all applicable Environmental Laws. Tenant shall, within ten (10) Business Days of Landlord's written request therefor, disclose in writing all Hazardous Materials that are being used by Tenant in the Premises, the nature of such use and the manner of storage and disposal. Without Landlord's prior written consent, Tenant shall not conduct any sampling or investigation of soil or groundwater on the Property to determine the presence of any constituents therein.

(c) Tenant shall indemnify, defend upon demand with counsel reasonably acceptable to Landlord, and hold Landlord and the Landlord Parties (as hereinafter defined) harmless from and against, any liabilities, losses claims, damages, interest, penalties, fines, attorneys' fees, experts' fees, court costs, remediation costs, and other expenses which result from the use, storage, handling, treatment, transportation, release, threat of release or disposal of Hazardous Materials in or about the Premises or the Property by Tenant or Tenant's agents, employees, contractors or invitees. The provisions of this **paragraph (c)** shall survive the expiration or earlier termination of this Lease.

(d) Tenant shall give written notice to Landlord as soon as reasonably practicable of (i) any communication received by Tenant from any governmental authority concerning Hazardous Materials which relates to the Premises or the Property, and (ii) any Environmental Condition of which Tenant is aware.

ARTICLE 6
ASSIGNMENT AND SUBLETTING

6.1 Prohibition.

(a) Tenant covenants and agrees that neither this Lease nor the term and estate hereby granted, nor any interest herein or therein, will be assigned, mortgaged, pledged, encumbered or otherwise transferred, whether voluntarily, involuntarily, by operation of law or otherwise, and that neither the Premises nor any part thereof will be encumbered in any manner by reason of any act or omission on the part of Tenant, or used or occupied or permitted to be used or occupied, by anyone other than Tenant, or for any use or purpose other than a Permitted Use, or be sublet (which term, without limitation, shall include granting of concessions, licenses and the like) in whole or in part, or be offered or advertised for assignment or subletting by Tenant or any person acting on behalf of Tenant, without, in each case, the prior written consent of Landlord (all of the foregoing are hereinafter sometimes referred to collectively as "**Transfers**" and any person to whom any Transfer is made or sought to be made is hereinafter sometimes referred to as a "**Transferee**"). Without limiting the foregoing, any agreement pursuant to which: (x) Tenant is relieved from the obligation to pay, or a third party agrees to pay on Tenant's behalf, all or any portion of the Basic Rent or Additional Rent under this Lease; and/or (y) a third party undertakes or is granted by or on behalf of Tenant the right to assign or attempt to assign this Lease or sublet or attempt to sublet all or any portion of the Premises, shall for all purposes hereof be deemed to be a Transfer of this Lease and subject to the provisions of this **Article 6**. A Transfer under this **Article 6** shall also include a sale or other transfer (by one or more transfers) of any of the following: the voting stock, partnership interests, membership or other equity interests in Tenant (or any other mechanism such as the issuance of additional stock or the creation of additional partnership or membership interests) which results in a change of control of Tenant or a sale or other transfer (in one or more transfers) of fifty percent (50%) or

more of the assets of Tenant, as if such transfer were an assignment of this Lease. Notwithstanding the foregoing, if equity interests in Tenant at any time are or become traded on a national securities exchange (as defined in the Securities Exchange Act of 1934), the transfer of equity interests in Tenant on a national securities exchange shall not be deemed an assignment within the meaning of this Article; provided, however, that if Tenant is a corporation the outstanding stock of which is listed on a national securities exchange, then any private purchase or buyout of stock shall be deemed a Transfer under this **Article 6**.

(b) Notwithstanding the foregoing, Landlord's consent shall not be required under **Section 6.1(a)** and **Section 6.4** and **Section 6.5** shall not apply to either (x) transactions with an entity into or with which Tenant is merged or consolidated, or to which all or substantially all of Tenant's assets are transferred, or (y) transactions with any entity which controls or is controlled by Tenant or is under common control with Tenant; provided and only on condition that in any such event:

(i) the successor to Tenant has a net worth, computed in accordance with generally accepted accounting principles consistently applied, at least equal to the greater of (a) the Tangible Net Worth of Tenant immediately prior to such merger, consolidation or transfer, or (b) the Tangible Net Worth of Tenant herein named on the date of this Lease,

(ii) proof satisfactory to Landlord of the Tangible Net Worth of both the transferee and Tenant shall have been delivered to Landlord at least ten (10) days prior to the effective date of any such transaction,

(iii) the transfer is for a valid business purpose of Tenant and is not a subterfuge for the provisions of this **Article 6**, and

(iv) the transferee agrees directly with Landlord, by written instrument in form satisfactory to Landlord in its reasonable discretion, to be bound by all the obligations of Tenant hereunder, including, without limitation, the covenant against further assignment and subletting.

6.2 Landlord's Consent.

(a) If Tenant desires Landlord's consent to any Transfer, Tenant shall notify Landlord in writing, which notice (the "**Transfer Notice**") shall include (i) the proposed effective date of the Transfer, which shall not be less than thirty (30) days nor more than one hundred eighty (180) days after the date of delivery of the Transfer Notice, (ii) a description of the portion of the Premises to be transferred, (iii) all of the terms of the proposed Transfer and the consideration therefor, including the name and address of the proposed Transferee, and an executed copy of all documentation effectuating the proposed Transfer, including all operative documents to evidence such Transfer and all agreements incidental or related to such Transfer, (iv) current financial statements of the proposed Transferee certified by an officer, partner or owner thereof, business credit and personal references and history of the proposed Transferee and any other information required by Landlord which will enable Landlord to determine the financial responsibility, character, and reputation of the proposed Transferee, nature of such Transferee's business and proposed use of the Premises.

(b) In the event Landlord does not exercise its options pursuant to **Section 6.4** below to recapture the Premises or terminate this Lease in whole or in part, Landlord's consent to a proposed Transfer shall not be unreasonably withheld, conditioned or delayed, provided and upon condition that:

(i) There shall not be an Event of Default that remains uncured;

(ii) In Landlord's reasonable judgment the proposed Transferee is engaged in a business which is in keeping with the then standards of the Building and Property and the proposed use is limited to the Permitted Use;

(iii) The proposed Transferee is a reputable entity and has sufficient financial worth and stability in light of the responsibilities to be undertaken, based on evidence provided by Tenant (and others) to Landlord, as determined by Landlord in its reasonable discretion;

(iv) Neither (A) the proposed Transferee nor (B) any person or entity which, directly or indirectly, controls, is controlled by, or is under common control with, the proposed Transferee, is then an occupant of any part of the Property;

(v) The proposed Transferee is not a person or entity with whom Landlord is then, or during the preceding six (6) months has been, actively negotiating to lease space at the Property;

(vi) The proposed Transfer shall be in form reasonably satisfactory to Landlord and shall comply with the applicable provisions of this **Article 6**;

(vii) Tenant shall not have advertised or publicized in any way the availability of the Premises at rental rate less than the base rent and additional rent at which Landlord is then offering to lease other space located in the Building without prior notice to and approval by Landlord, which approval shall not be unreasonably withheld, conditioned or delayed;

(viii) With respect to a proposed sublease, the proposed sublease involves, in Landlord's reasonable judgment, a portion of the Premises which is independently leasable space;

(ix) With respect to and after taking into account a proposed sublease, there will not be more than two (2) different entities (including Tenant) occupying the Premises;

(x) The character of the business to be conducted or the proposed use of the Premises by the proposed Transferee or the identity of the proposed Transferee will not create or increase the likelihood of any labor disputes, disharmony, strikes or any other form of protests occurring at the Property;

(xi) The proposed Transfer shall not have (or potentially have) any adverse effect on any real estate investment trust qualification requirements of Landlord or any of its affiliates or otherwise cause Landlord or any of its affiliates to be in violation of any Laws to which Landlord or such affiliate is subject, including, without limitation, the Employment Retirement Security Act of 1974;

(xii) The holder of any Superior Mortgage and/or Superior Lease, as applicable, consents to such Transfer; and

(xiii) Neither the identity nor business of the proposed Transferee would cause Landlord to be in violation of any covenant or restriction contained in another lease at the Property.

6.3 Acceptance of Rent. If this Lease is assigned, or if the Premises or any part thereof is sublet or occupied by anyone other than Tenant, whether or not in violation of the terms and conditions of the Lease, Landlord may, at any time and from time to time, collect rent and other charges from the Transferee, and apply the net amount collected to the rent and other charges herein reserved, but no such Transfer, collection or modification of any provisions of this Lease shall be deemed a waiver of this covenant, or the acceptance of the Transferee as a tenant or a release of Tenant from the further performance of covenants on the part of Tenant to be performed hereunder. Any consent by Landlord to a particular Transfer or other act for which Landlord's consent is required under **paragraph (a)** of **Section 6.1** shall not in any way diminish the prohibition stated in **paragraph (a)** of **Section 6.1** as to any further such Transfer or other act or the continuing liability of the original named Tenant. No Transfer hereunder shall relieve Tenant from its obligations hereunder, and Tenant shall remain fully and primarily liable therefor. Landlord may revoke any consent by Landlord to a particular Transfer if the Transfer does not provide that the Transferee agrees to be independently bound by and upon all of the covenants, agreements, terms, provisions and conditions set forth in this Lease on the part of Tenant to be kept and performed.

6.4 Excess Payments. If Tenant assigns this Lease or sublets the Premises or any portion thereof, Tenant shall pay to Landlord as Additional Rent fifty percent (50%) of the amount, if any, by which (a) any and all compensation received by Tenant as a result of such Transfer, net only of reasonable expenses actually incurred by Tenant in connection with such Transfer for brokerage commissions, improvement expenses and allowances (prorated over the term of the Transfer), exceeds (b) in the case of an assignment, the Basic Rent and Additional Rent under this Lease, and in the case of a subletting, the portion of the Basic Rent and Additional Rent allocable to the portion of the Premises subject to such subletting. Such payments shall be made on the date the corresponding payments under this Lease are due. Notwithstanding the foregoing, the provisions of this Section shall impose no obligation on Landlord to consent to an assignment of this Lease or a subletting of all or a portion of the Premises.

6.5 Landlord's Recapture Right. Notwithstanding anything herein to the contrary, in addition to withholding or granting consent with respect to any proposed Transfer, Landlord shall have the right, to be exercised in writing within thirty (30) days after receipt of a Transfer Notice, to terminate this Lease (in the event of a proposed assignment) or recapture that portion of the Premises to be subleased (in the event of a proposed sublease). In the case of a proposed assignment, this Lease shall terminate as of the date (the "**Recapture Date**") which is the later of (i) sixty (60) days after the date of Landlord's election, and (ii) the proposed effective date of such Transfer, as if such date were the last day of the Term of this Lease. If Landlord exercises the rights under this Section 6.5 in connection with a proposed sublease, this Lease shall be deemed amended to eliminate the proposed sublease premises from the Premises as of the Recapture Date, and thereafter all Basic Rent and Escalation Charges shall be appropriately prorated to reflect the reduction of the Premises as of the Recapture Date provided, however, that in the case of a proposed sublease of less than thirty percent (30%) of the Premises, Tenant shall have five (5) days following such exercise by Landlord of its rights under this **Section 6.5** to give notice to Landlord rescinding its Transfer Notice, and if Tenant rescinds its Transfer Notice in a timely manner, Landlord's recapture of the proposed sublease premises shall be deemed to have been rescinded as to the Transfer Notice in question (but not as to any subsequent Transfer Notice).

6.6 Further Requirements. Tenant shall reimburse Landlord on demand, as Additional Rent, for any out-of-pocket costs (including reasonable attorneys' fees and expenses) incurred by Landlord in connection with any actual or proposed assignment or sublease or other act described in **paragraph (a)** of **Section 6.1**, whether or not consummated, including the costs of making investigations as to the acceptability of the proposed assignee or subtenant. Any sublease to which Landlord gives its consent shall not be valid unless and until Tenant and the sublessee execute a consent agreement in form and substance satisfactory to Landlord in its reasonable discretion and a fully executed counterpart of such sublease has been delivered to Landlord. Any sublease shall provide that: (i) the term of the sublease ends no later than one day before the last day of the Term of this Lease; (ii) such sublease is subject and subordinate to this Lease; (iii) Landlord may enforce the provisions of the sublease, including collection of rents; and (iv) in the event of termination of this Lease or reentry or repossession of the Premises by Landlord, Landlord may, at its sole discretion and option, take over all of the right, title and interest of Tenant, as sublessor, under such sublease, and such subtenant shall, at Landlord's option, attorn to Landlord, but nevertheless Landlord shall not (A) be liable for any previous act or omission of Tenant under such sublease; (B) be subject to any defense or offset previously accrued in favor of the subtenant against Tenant; or (C) be bound by any previous modification of such sublease made without Landlord's written consent or by any previous prepayment of more than one month's rent.

ARTICLE 7
RESPONSIBILITY FOR REPAIRS AND CONDITION OF PREMISES; SERVICES TO BE FURNISHED BY LANDLORD

7.1 Landlord Repairs.

(a) Except as otherwise provided in this Lease, Landlord agrees to keep in good order, condition and repair the roof, the Base Building and Base Building Systems (but specifically excluding any supplemental heating, ventilation or air conditioning equipment or systems exclusively serving the Premises installed at Tenant's request or as a result of Tenant's requirements in excess of Building standard design criteria), all insofar as they affect the Premises, except that Landlord shall in no event be responsible to Tenant for the repair of glass in the Premises, the doors (or related glass and finish work) leading to the Premises, or any condition in the Premises or the Building caused by any act or neglect of Tenant, its invitees or contractors. Landlord shall also keep and maintain all Common Facilities in a good and clean order, condition and repair, free of snow and accumulation of dirt and rubbish and with reasonable treatment of ice on driveways and pedestrian walkways, and shall keep and maintain all landscaped areas on the Property in a neat and orderly condition. Landlord shall not be responsible to make any improvements or repairs to the Building other than as expressly in this **Section 7.1** provided, unless expressly provided otherwise in this Lease.

(b) Landlord shall never be liable for any failure to make repairs which Landlord has undertaken to make under the provisions of this **Section 7.1** or elsewhere in this Lease; unless Tenant has given notice to Landlord of the need to make such repairs, and Landlord has failed to commence to make such repairs within a reasonable time after receipt of such notice, or fails to proceed with reasonable diligence to complete such repairs.

7.2 Tenant Repairs; Compliance with Laws.

(a) Tenant shall keep and maintain the Premises and the Improvements, fixtures and appurtenances therein or thereon (including, without limitation, electrical and mechanical systems not considered part of the Base Building Systems or any portion of such systems that have been installed for the exclusive use and benefit of Tenant such as additional HVAC equipment, hot water heaters, electronic, data, phone, and other telecommunications cabling and related equipment, and security or telephone systems for the Premises), neat and clean and in good order, condition and repair, excepting only those repairs for which Landlord is responsible under the terms of this Lease, reasonable wear and tear of the Premises, and damage by fire or other casualty or as a consequence of the exercise of the power of eminent domain; and Tenant shall surrender the Premises, at the end of the Term, in such condition. Subject to **Section 10.4** regarding waiver of subrogation, Tenant shall be responsible for the cost of repairs which may be made necessary by reason of damage to the Building caused by any act or neglect of Tenant, or its employees, contractors or invitees (including any damage by fire or other casualty arising therefrom).

(b) Tenant shall comply with all Laws from time to time in effect and all directions, rules and regulations of governmental agencies having jurisdiction, and the standards recommended by the local Board of Fire Underwriters applicable to the Premises and Tenant's use and occupancy thereof and its business and operations therein, and shall, at Tenant's expense, obtain all permits, licenses and the like required thereby. Notwithstanding the foregoing, Tenant shall not be obligated to make structural repairs or alterations to the Premises in order to comply with any Laws unless the need for such repairs or alterations arises from (i) the specific manner and nature of Tenant's use or occupancy of the Premises, as distinguished from mere general office use, (ii) the manner of conduct of Tenant's business or operation of its installations, equipment or other property therein, (iii) any cause or condition created by or at the instance of the Tenant, including, without limitation, the performance of any other Alterations

made by Tenant, or (iv) a breach by Tenant of any provisions of this Lease. Any of the foregoing conditions caused by any employee, agent, contractor, or subtenant of Tenant or any other party claiming by, through, or under Tenant shall be attributable to Tenant for purposes of this Lease. Tenant shall also be responsible for the cost of compliance with all present and future Laws in respect of the Building to the extent arising from any of the causes set forth in **clauses (i)** through **(iv)** above of this **Section 7.2(b)**, in which event Tenant shall be responsible to perform, at Tenant's sole cost and expense, such repairs or alterations, whether or not such compliance requires work which is structural or non-structural, ordinary or extraordinary, foreseen or unforeseen.

(c) If repairs are required to be made by Tenant pursuant to the terms hereof, and Tenant fails to make the repairs, upon not less than ten (10) days' prior written notice (except that no notice shall be required in the event of an emergency), Landlord may make or cause such repairs to be made (but shall not be required to do so), and the provisions of **Section 14.4** shall be applicable to the costs thereof. Landlord shall not be responsible to Tenant for any loss or damage whatsoever that may accrue to Tenant's stock or business by reason of Landlord's making such repairs.

7.3 Floor Load - Heavy Machinery.

(a) Tenant shall not place a load upon any floor in the Premises exceeding the floor load that such floor was designed to carry, or such lower limit as may be proscribed by applicable Law. Landlord reserves the right to prescribe the weight and position of all business machines and mechanical equipment, including safes, which shall be placed so as to distribute the weight. Business machines and mechanical equipment shall be placed and maintained by Tenant at Tenant's expense in settings sufficient, in Landlord's judgment, to absorb and prevent vibration, noise and annoyance. Tenant shall not move any safe, heavy machinery, heavy equipment, freight, bulky matter or fixtures into or out of the Building without Landlord's prior consent, which consent may include a requirement to provide insurance, naming Landlord as an insured, in such amounts as Landlord may deem reasonable.

(b) If any such safe, machinery, equipment, freight, bulky matter or fixtures requires special handling, Tenant agrees to employ only persons holding a Master Rigger's license to do such work, and that all work in connection therewith shall comply with applicable Laws. Any such moving shall be at the sole risk and hazard of Tenant, and Tenant will exonerate, indemnify and save Landlord harmless against and from any liability, loss, injury, claim or suit resulting directly or indirectly from such moving.

7.4 Utility Services.

(a) Landlord shall, on all Business Days from 8:00 a.m. to 6:00 p.m. except Saturday, which shall be from 8:00 a.m. to 1:00 p.m., furnish heating and cooling as normal seasonal changes may require to provide reasonably comfortable space temperature and ventilation for occupants of the Premises under normal business operation at an occupancy of not more than one person per 140 square feet of usable area and an electrical load not exceeding 2.5 watts per usable square foot. If Tenant shall require air conditioning, heating or ventilation outside the hours and days above specified, Landlord may furnish such service and Tenant shall

pay therefor such charges as may from time to time be in effect for the Building upon demand as Additional Rent. In the event Tenant introduces into the Premises personnel or equipment which overloads the capacity of the Building system or in any other way interferes with the system's ability to perform adequately its proper functions, supplementary systems may, if and as needed, at Landlord's option, be provided by Landlord, and the cost of such supplementary systems shall be payable by Tenant to Landlord upon demand as Additional Rent.

(b) Landlord shall supply electricity to the Premises for lighting and normal office machines at base building standard receptacles for standard single phase 120 volt alternating current, and Tenant agrees in its use of the Premises (i) not to exceed such requirements, and (ii) that its total connected lighting load it will not exceed the maximum from time to time permitted under applicable governmental regulations. If, without in any way derogating from the foregoing limitation, Tenant shall require electricity in excess of the requirements set forth above, Tenant shall notify Landlord and Landlord may (without being obligated to do so) supply such additional service or equipment at Tenant's sole cost and expense. Landlord shall purchase and install, at Tenant's expense, all lamps, tubes, bulbs, starters and ballasts. If there is a separate electrical meter in the Premises for the purpose of measuring Tenant's use and consumption of electricity in the Premises, Tenant shall make direct payment to the utility provider for any electricity used or consumed in the Premises. If there is no separate electrical meter or submeter in the Premises for the purpose of measuring Tenant's use and consumption of electricity in the Premises, Landlord shall compute the cost of the electricity used by Tenant on the basis of the rate paid by Landlord to the utility company (with no mark-up) and shall bill the amount to Tenant. Upon request of Tenant, Landlord shall provide to Tenant copies of any such electric bills. Tenant shall permit Landlord's existing wires, pipes, risers, conduits and other electrical equipment of Landlord to be used for the purpose of providing electrical service to the Premises.

(c) In order to assure that the foregoing requirements are not exceeded and to avert possible adverse effect on the Building's electric system, Tenant shall not, without Landlord's prior consent, connect any fixtures, appliances or equipment to the Building's electric distribution system drawing more than 15 amps at 120/208 volts. If Tenant has special equipment (such as computers, servers and reproduction equipment) that uses either 3 phase electric power or a voltage other than 120 volts, or any other electrical usage in excess of 3.0 watts per usable square foot of the Premises, Landlord may, at its option, require such usage to be separately metered or check metered, at Tenant's sole cost and expense, and invoiced or billed separately to Tenant by Landlord or the applicable utility provider, as applicable. All charges to Tenant under this paragraph shall be due and payable as Additional Rent within thirty (30) days after receiving Landlord's invoice therefor.

(d) In the event any governmental entity promulgates or revises any Law, or issues mandatory controls relating to the use or conservation of energy, water, gas, light or electricity, or the provision of any other utility or service furnished by Landlord in the Building, Landlord may take any appropriate action to comply with such provision of Law or mandatory controls, including the making of alterations to the Building, subject, however, to the terms and conditions of this Lease. Neither Landlord's actions nor its failure to act shall entitle Tenant to any damages, abate or suspend Tenant's obligation to pay Basic Rent, Escalation Charges and Additional Rent or constitute or be construed as a constructive or other eviction of Tenant except as otherwise specifically set forth herein.

7.5 Other Services.

Landlord shall also provide:

(a) Passenger elevator service from the existing passenger elevator system in common with Landlord and others entitled thereto.

(b) Warm water for lavatory purposes and cold water (at temperatures supplied by the city in which the Property is located) for drinking, lavatory and toilet purposes. Such water shall be made available from the main connection point for such service on the floor on which the Premises is located and the distribution of water within the Premises shall be provided by Tenant. If Tenant uses water for any purpose other than for ordinary lavatory and drinking purposes, Landlord may assess a reasonable charge for the additional water so used, or install a water meter and thereby measure Tenant's water consumption for all purposes. In the latter event, Tenant shall pay the cost of the meter and the cost of installation thereof as Additional Rent upon demand and shall keep such meter and installation equipment in good working order and repair. Tenant agrees to pay for water consumed, as shown on such meter, together with the sewer charge based on such meter charges, as and when bills are rendered, and in the event Tenant fails timely to make any such payment, Landlord may pay such charges and collect the same from Tenant upon demand as Additional Rent.

(c) Cleaning and janitorial services to the Premises, provided the same are kept in order by Tenant, substantially in accordance with the cleaning standards from time to time in effect for the Building.

(d) Access to the Premises at all times, subject to security and safety precautions from time to time in effect, if any, and subject always to restrictions based on emergency conditions.

Landlord may from time to time, but shall not be obligated to, provide one or more attendants in or about the lobby of the Building, and the costs of such services shall constitute Operating Expenses in accordance with the provisions of **Article 9** hereof. Tenant expressly acknowledges and agrees that, if provided: (i) such attendants shall not serve as police officers, and will be unarmed, and will not be trained in situations involving potentially physical confrontation; and (ii) such attendants will be solely an amenity to tenants of the Building for purposes such as assisting visitors and invitees of tenants and others in the Building, monitoring fire control and alarm equipment, and summoning emergency services to the Building as and when needed, and not for the purpose of securing any individual tenant premises or guaranteeing the physical safety of Tenant's Premises or of Tenant's employees, agents, contractors or invitees. If and to the extent that Tenant desires to provide security for the Premises or for such persons or their property, Tenant shall be responsible for so doing, after having first consulted with Landlord and after obtaining Landlord's consent, which shall not be unreasonably withheld. Landlord expressly disclaims any and all responsibility and/or liability for the physical safety of Tenant's property, and for that of Tenant's employees, agents, contractors and invitees, and, without in

any way limiting the operation of **Article 10** hereof, Tenant, for itself and its agents, contractors, invitees and employees, hereby expressly waives any claim, action, cause of action or other right which may accrue or arise as a result of any damage or injury to the person or property of Tenant or any such agent, invitee, contractor or employee. Tenant agrees that, as between Landlord and Tenant, it is Tenant's responsibility to advise its employees, agents, contractors and invitees as to necessary and appropriate safety precautions.

7.6 Interruption of Service. Landlord reserves the right to curtail, suspend, interrupt and/or stop the supply of water, sewage, electrical current, cleaning, and other services, and to curtail, suspend, interrupt and/or stop use of entrances and/or lobbies serving access to the Building, or other portions of the Property, without thereby incurring any liability to Tenant, when necessary by reason of accident or emergency, or for repairs, alterations, replacements or improvements in the judgment of Landlord reasonably exercised desirable or necessary, or when prevented from supplying such services or use due to any act or neglect of Tenant or Tenant's agents employees, contractors or invitees or any person claiming by, through or under Tenant or by Force Majeure, including, but not limited to, strikes, lockouts, difficulty in obtaining materials, accidents, laws or orders, or inability, by exercise of reasonable diligence, to obtain electricity, water, gas, steam, coal, oil or other suitable fuel or power. No diminution or abatement of rent or other compensation, nor any direct, indirect or consequential damages shall or will be claimed by Tenant as a result of, nor shall this Lease or any of the obligations of Tenant be affected or reduced by reason of, any such interruption, curtailment, suspension or stoppage in the furnishing of the foregoing services or use, irrespective of the cause thereof. Failure or omission on the part of Landlord to furnish any of the foregoing services or use as provided in this paragraph shall not be construed as an eviction of Tenant, actual or constructive, nor entitle Tenant to an abatement of rent, nor to render the Landlord liable in damages, nor release Tenant from prompt fulfillment of any of its covenants under this Lease.

Notwithstanding the foregoing, if (i) Landlord ceases to furnish any utility service to be provided by Landlord hereunder that is necessary for use of the Premises for a period in excess of fifteen (15) consecutive days after Tenant notifies Landlord of such cessation (the "**Interruption Notice**"); (ii) such cessation is caused by the negligence or willful misconduct of Landlord, its agents, employees or contractors; (iii) such cessation is not caused by a fire or other casualty (in which case Section 11 shall control); and (iv) as a result of such cessation, the Premises or a material portion thereof, is rendered untenantable and Tenant in fact ceases to use the Premises, or material portion thereof, then Tenant, as its sole remedy, shall be entitled to receive a proportionate abatement of Base Rent payable hereunder during the period beginning on the sixthteenth (16^{th}) consecutive day following Landlord's receipt of the Interruption Notice and ending on the day when the service in question has been restored. In the event the entire Premises has not been rendered untenantable by the cessation in service, the amount of abatement that Tenant is entitled to receive shall be prorated based upon the percentage of the Premises so rendered untenantable and not used by Tenant.

ARTICLE 8
REAL ESTATE TAXES

8.1 Payments on Account of Real Estate Taxes.

(a) "**Tax Year**" shall mean a twelve-month period commencing on July 1 and falling wholly or partially within the Term, and "**Taxes**" shall mean (i) all taxes, assessments (special or otherwise), levies, fees and all other government levies, exactions and charges of every kind and nature, general and special, ordinary and extraordinary, foreseen and unforeseen, which are, at any time prior to or during the Term, imposed or levied upon or assessed against the Property or any portion thereof, or against any Basic Rent, Additional Rent or other rent of any kind or nature payable to Landlord by anyone on account of the ownership, leasing or operation of the Property, or which arise on account of or in respect of the ownership, development, leasing, operation or use of the Property or any portion thereof; (ii) all gross receipts taxes or similar taxes imposed or levied upon, assessed against or measured by any Basic Rent, Additional Rent or other rent of any kind or nature or other sum payable to Landlord by anyone on account of the ownership, development, leasing, operation, or use of the Property or any portion thereof; (iii) all value added, use and similar taxes at any time levied, assessed or payable on account of the ownership, development, leasing, operation, or use of the Property or any portion thereof; and (iv) reasonable expenses of any proceeding for abatement of any of the foregoing items included in Taxes; but the amount of special taxes or special assessments included in Taxes shall be limited to the amount of the installment (plus any interest, other than penalty interest, payable thereon) of such special tax or special assessment required to be paid during the year in respect of which such Taxes are being determined. There shall be excluded from Taxes all income, estate, succession, inheritance and transfer taxes of Landlord; provided, however, that if at any time during the Term the present system of ad valorem taxation of real property shall be changed so that a capital levy, franchise, income, profits, sales, rental, use and occupancy, or other new or additional tax or charge shall in whole or in part be substituted for, or added to, such ad valorem tax and levied against, or be payable by, Landlord with respect to the Property or any portion thereof, such tax or charge shall be included in the term "**Taxes**" for the purposes of this Article.

(b) In the event that Taxes during any Tax Year shall exceed Base Taxes, Tenant shall pay to. Landlord, as an Escalation Charge, an amount equal to (i) such excess Taxes multiplied by (ii) Tenant's Proportionate Share, such amount to be apportioned for any portion of a Tax Year in which the Commencement Date falls or the Term expires. If and to the extent the Building is part of a larger project or development and Taxes are not separately allocated by the taxing authority among the various buildings in such project or development, Landlord shall, in accordance with its good faith business judgment, allocate to the Building for each Tax Year or portion thereof during the Term an equitable portion of such Taxes.

(c) Estimated payments by Tenant on account of Taxes shall be made on the first day of each and every calendar month during the Term of this Lease, in the fashion herein provided for the payment of Basic Rent. The monthly amount so to be paid to Landlord shall be sufficient to provide Landlord by the time real estate tax payments are due with a sum equal to Tenant's required payment, as reasonably estimated by Landlord from time to time, on account of Taxes for the then current Tax Year. Promptly after receipt by Landlord of bills for such Taxes, Landlord shall advise Tenant of the amount thereof and the computation of Tenant's payment on account thereof. If estimated payments theretofore made by Tenant for the Tax Year covered by such bills exceed the required payment on account thereof for such Tax Year,

Landlord shall credit the amount of overpayment against subsequent obligations of Tenant on account of Taxes (or promptly refund such overpayment if the Term of this Lease has ended and Tenant has no further obligation to Landlord); but if the required payments on account thereof for such Tax Year are greater than estimated payments theretofore made on account thereof for such Tax Year, Tenant shall pay the difference to Landlord within thirty (30) days after being so advised by Landlord, and the obligation to make such payment for any period within the Term shall survive expiration of the Term.

8.2 Abatement. If Landlord shall receive any tax refund or reimbursement of Taxes or sum in lieu thereof with respect to any Tax Year all or any portion of which falls within the Term, then out of any balance remaining thereof after deducting Landlord's expenses in obtaining such refund, Landlord shall, provided there does not then exist an Event of Default, credit an amount equal to such refund or reimbursement or sum in lieu thereof (exclusive of any interest, and apportioned if such refund is for a Tax Year a portion of which falls outside the Term,) multiplied by Tenant's Proportionate Share against the monthly installments of Escalation Charges next due under this Lease (or refund such amount lo Tenant if the Term has ended and Tenant has no further obligations to Landlord); provided, that in no event shall Tenant be entitled to a credit in excess of the payments made by Tenant on account of Taxes for such Tax Year pursuant to **paragraph (b)** of **Section 8.1** or to receive any payments or abatement of Basic Rent if Taxes for any year are less than Base Taxes or if Base Taxes are abated. If the Taxes comprising Base Taxes are reduced as a result of an appropriate proceeding or otherwise, the Taxes as so reduced shall for all purposes be deemed to be the Base Taxes and Landlord shall give notice to Tenant of the corrected amount of Base Taxes and the amount of any additional payments due from Tenant under this **Article 8**.

ARTICLE 9
OPERATING EXPENSES

9.1 Definitions. "**Operating Year**" shall mean each calendar year all or any part of which falls within the Term, and "**Operating Expenses**" shall mean the aggregate costs and expenses incurred by Landlord with respect to the operation, administration, cleaning, insuring, repair, maintenance and management of the Property, including, without limitation, the costs and expenses set forth in **Exhibit E** attached hereto, provided that if during any portion of the Operating Year for which Operating Expenses are being computed, less than all of the Building was occupied by tenants or Landlord was not supplying all tenants with the services being supplied under this Lease, actual Operating Expenses incurred shall be extrapolated reasonably by Landlord on an item by item basis to the estimated Operating Expenses that would have been incurred if the Building were fully occupied for such Operating Year and such services were being supplied to all tenants, and such extrapolated amount shall, for the purposes hereof, be deemed to be the Operating Expenses for such Operating Year.

9.2 Tenant's Payment of Operating Expenses.

(a) In the event that for any Operating Year Operating Expenses shall exceed Base Operating Expenses, Tenant shall pay to Landlord, as an Escalation Charge, an amount equal to (i) such excess Operating Expenses multiplied by (ii) Tenant's Proportionate Share, such amount to be apportioned for any portion of an Operating Year in which the Commencement Date falls or the Term of this Lease ends.

(b) Estimated payments by Tenant on account of Operating Expenses shall be made on the first day of each and every calendar month during the Term of this Lease, in the fashion herein provided for the payment of Basic Rent. The monthly amount so to be paid to Landlord shall be sufficient to provide Landlord by the end of each Operating Year a sum equal to Tenant's required payment, as reasonably estimated by Landlord from time to time during each Operating Year, on account of Operating Expenses for such Operating Year. After the end of each Operating Year, Landlord shall submit to Tenant a reasonably detailed accounting of Operating Expenses for such Operating Year, and Landlord shall certify to the accuracy thereof. If estimated payments theretofore made for such Operating Year by Tenant exceed Tenant's required payment on account thereof for such Operating Year according to such statement, Landlord shall credit the amount of overpayment against subsequent obligations of Tenant with respect to Operating Expenses (or promptly refund such overpayment if the Term of this Lease has ended and Tenant has no further obligation to Landlord); but if the required payments on account thereof for such Operating Year are greater than the estimated payments (if any) theretofore made on account thereof for such Operating Year, Tenant shall make payment to Landlord within thirty (30) days after being so advised by Landlord, and the obligation to make such payment for any period within the Term shall survive expiration of the Term.

(c) Any such accounting by Landlord shall be binding and conclusive upon Tenant unless within sixty (60) days after the giving by Landlord of such accounting Tenant shall notify Landlord that Tenant disputes the correctness of such accounting, specifying the particular respects in which the accounting is claimed to be incorrect. If Tenant timely sends a notice to Landlord disputing the accounting received from Landlord, Tenant may, at Tenant's sole cost and expense, undertake an audit of such of Landlord's books as are directly relevant to the Operating Expense accounting for the Operating Year in question, provided and on condition that (i) there is then no uncured Event of Default under this Lease, (ii) Tenant has made all payments of Escalation Charges billed or invoiced by Landlord as of the date of the audit, (iii) the audit is performed only by Tenant's employees, internal accounting department or an independent certified public accounting firm reasonably approved by Landlord and whose fee or other compensation is fixed by contract and is in no manner computed or determined based upon the results of the audit, (iv) both Tenant and its examiners execute and deliver to Landlord a confidentiality agreement in form and substance reasonably acceptable to Landlord whereby such parties expressly agree to maintain the results of such audit in strict confidence, and (v) such audit is commenced and completed and the results thereof delivered to Landlord within sixty (60) days following the date Landlord makes its books available to Tenant. If Tenant fails to timely deliver a dispute notice to Landlord, or fails to complete its audit and deliver the results thereof to Landlord within the applicable sixty (60) day period, then, in either of such events, Landlord's accounting shall be binding and conclusive upon Tenant for all purposes of this Lease. If it is finally agreed by the parties that Landlord has overstated Tenant's share of excess Operating Expenses, Landlord shall credit the amount of such overstatement against the monthly installments of Escalation Charges next due under this Lease (or refund such amount to Tenant if the Term has ended and Tenant has no further obligations to Landlord under this Lease). If the audit demonstrates that Landlord has not overstated Escalation Charges, then Landlord may invoice Tenant for any amount by which Tenant's Escalation Charges under this Section 9.2 was understated, which invoice shall be payable by Tenant within thirty (30) days after receipt.

ARTICLE 10
INDEMNITY AND PUBLIC LIABILITY INSURANCE

10.1 Tenant's Indemnity. Except to the extent arising from the gross negligence or willful misconduct of Landlord or its agents or employees, Tenant shall defend with counsel first approved by Landlord, save harmless, and indemnify Landlord and Landlord's managing agent, beneficiaries, partners, members, shareholders, subsidiaries, officers, directors, agents, trustees and employees ("**Landlord Parties**") from and against all claims, losses, cost, damages, any liability or expense of whatever nature arising from injury, loss, accident or damage to any person or property, arising from or claimed to have arisen (a) from any accident, injury or damage whatsoever to any person, or to the property of any person, occurring in or about the Premises; (b) from the omission, fault, willful act, negligence or other misconduct of Tenant or Tenant's agents, employees, contractors, licensees or invitees, (c) in connection with Tenant's use of the Premises or any business conducted therein or any work done or condition created in the Premises by Tenant, its agent, employees or contractors, or anyone claiming by, through or under Tenant, or (d) the failure of Tenant to perform and discharge its covenants and obligations under this Lease and, in any case, occurring after the Commencement Date (or such earlier date as of which Tenant takes possession of the Premises) until the expiration of the Term of this Lease and thereafter so long as Tenant is in occupancy of any part of the Premises. This indemnity and hold harmless agreement shall include indemnity against all losses, costs, damages, expenses and liabilities incurred in or in connection with any such claim or any proceeding brought thereon, and the defense thereof, including, without limitation, reasonable attorneys' fees and costs at both the trial and appellate levels. The provisions of this **Section 10.1** shall survive the expiration or earlier termination of this Lease,

10.2 Tenant Insurance. Tenant agrees to maintain, at Tenant's expense, in full force from the date upon which Tenant first enters the Premises for any reason, throughout the Term of this Lease, and thereafter so long as Tenant is in occupancy of any part of the Premises, (a) a policy of commercial general liability and property damage insurance (including broad form contractual liability, independent contractor's hazard and completed operations coverage) in at least the amounts of the Initial General Liability Insurance specified in **Section 1.1** or such greater amounts as Landlord in its reasonable discretion shall from time to time request, under which Tenant is named as an insured and Landlord, and, at Landlord's request, Landlord's property manager, any Superior Mortgagee and Superior Lessor, and such other persons as Landlord reasonably may request are named as additional insureds, (b) special form (formerly known as "all risk") property insurance on a "replacement cost" basis, insuring Tenant's Removable Property and any alterations, additions and improvements located from time to time in the Premises, whether made by Tenant pursuant to **Article 5** or **Exhibit C**, made by Landlord in connection with the Bathroom Upgrades or otherwise existing in the Premises as of the Commencement Date (such alterations, additions and improvements collectively the "**Improvements**"), (c) workers' compensation insurance with statutory limits, (d) employer's liability insurance with the following limits: bodily injury by disease per person $1,000,000.00; bodily injury by accident policy limit $1,000,000.00; bodily injury by disease policy limit $1,000,000.00, (e) business automobile liability insurance including owned, hired and non-

owned automobiles, in an amount not less than One Million Dollars ($1,000,000) combined single limit per occurrence, with such commercially reasonable increases as Landlord may require from time to time, and (f) business interruption insurance insuring interruption or stoppage of Tenant's business at the Premises for a period of not less than twelve (12) months. Tenant may satisfy such insurance requirements by including the Premises in a so-called "blanket" and/or "umbrella" insurance policy, provided that the amount of coverage allocated to the Premises is pursuant to a "per location" endorsement shall fulfill the requirements set forth herein. Tenant's insurance shall be primary to, and not contributory with any insurance carried by Landlord, whose insurance shall be considered excess only. Each policy required hereunder shall be non-cancelable and non-amendable with respect to Landlord and Landlord's said designees without thirty (30) days' prior notice. The policies of insurance required to be maintained by Tenant hereunder shall be issued by companies domiciled in the United States and qualified and licensed to conduct business in the state in which the Property is located, and shall be rated A:X or better in the most current issue of Best's Key Rating Guide (or any successor thereto). At all times during the Term, such insurance shall be maintained, and Tenant shall cause a current and valid certificate of such policies to be deposited with Landlord. If Tenant fails to have a current and valid certificate of such policies on deposit with Landlord at all times during the Term and such failure is not cured within three (3) Business Days following Tenant's receipt of notice thereof from Landlord, Landlord shall have the right, but not the obligation, to obtain such an insurance policy, and Tenant shall be obligated to pay Landlord the amount of the premiums applicable to such insurance within ten (10) days after Tenant's receipt of Landlord's request for payment thereof Tenant's insurance policies shall not include deductibles in excess of Five Thousand Dollars ($5,000.00).

10.3 Tenant's Risk. Tenant agrees to use and occupy the Premises and to use such other portions of the Property as Tenant is herein given the right to use at Tenant's own risk. Landlord shall not be liable to Tenant, its employees, agents, invitees or contractors for any damage, injury, loss, compensation, or claim (including, but not limited to, claims for the interruption of or loss to Tenant's business) based on, arising out of or resulting from any cause whatsoever, including, but not limited to, repairs to any portion of the Premises or the Property, any fire, robbery, theft, mysterious disappearance and/or any other crime or casualty, the actions of any other tenants of the Building or of any other person or persons, or any leakage in any part or portion of the Premises or the Building, or from water, rain or snow that may leak into, or flow from any part of the Premises or the Building, or from drains, pipes or plumbing fixtures in the Building, unless due to the gross negligence or willful misconduct of Landlord or Landlord's agents, contractors or employees. Any goods, property or personal effects stored or placed in or about the Premises shall be at the sole risk of Tenant, and neither Landlord nor Landlord's insurers shall in any manner be held responsible therefor. Landlord shall not be responsible or liable to Tenant, or to those claiming by, through or under Tenant, for any loss or damage that may be occasioned by or through the acts or omissions of persons occupying adjoining premises or any part of the premises adjacent to or connecting with the Premises or any part of the Property or otherwise. Notwithstanding the foregoing, Landlord shall not be released from liability for any injury, loss, damages or liability to the extent arising from any gross negligence or willful misconduct of Landlord, its servants, employees or agents acting within the scope of their authority on or about the Premises; provided, however, that in no event shall Landlord, its servants, employees or agents have any liability to Tenant based on any loss with respect to or interruption in the operation of Tenant's business. The provisions of this **Section 10.3** shall be applicable from and after the execution of this Lease and until the end of the Term of this Lease, and during any additional period as Tenant may use or be in occupancy of any part of the Premises or of the Building.

10.4 Landlord's Insurance. Landlord shall maintain, as a part of Operating Expenses, special form property insurance on the Building in such amounts and subject to such deductibles as Landlord may reasonably determine. Such insurance shall be maintained with an insurance company selected by Landlord or a Superior Mortgagee, and payment for losses thereunder shall be made solely to Landlord subject to the rights of the Superior Mortgagee from time to time. Additionally Landlord may maintain such additional insurance, including, without limitation, earthquake insurance, terrorism insurance, flood insurance, liability insurance and/or rent insurance, as Landlord may in its sole discretion elect. The cost of all such additional insurance shall also be part of the Operating Expenses. Any or all of Landlord's insurance may be provided by blanket coverage maintained by Landlord or any affiliate of Landlord under its insurance program for its portfolio of properties or by Landlord's or any affiliate of Landlord's program of self-insurance, and in such event Operating Expenses shall include the portion of the reasonable cost of blanket insurance or self-insurance that is allocated to the Building.

10.5 Waiver of Subrogation. Notwithstanding anything herein to the contrary, Landlord and Tenant each hereby waives any and all rights of recovery, claim, action, or cause of action against the other, its agents, employees, licensees, or invitees for any loss or damage to or at the Premises or the Property or any personal property of such party therein or thereon by reason of fire, the elements, or any other cause which is covered, or would have been covered, by the insurance coverages required to be maintained by Landlord and Tenant, respectively, under this Lease, regardless of cause or origin, including omission of the other party hereto, its agents, employees, licensees, or invitees. Landlord and Tenant covenant that no insurer shall hold any right of subrogation against either of such parties with respect thereto. The parties hereto agree that any and all such insurance policies required to be carried by either shall be endorsed with a subrogation clause that shall provide that such party's insurer waives any right of recovery against the other party in connection with any such loss or damage.

ARTICLE 11
FIRE, EMINENT DOMAIN, ETC.

11.1 Landlord's Right of Termination. If the Premises or the Building are substantially damaged (the term "substantially damaged" meaning damage of such a character that the same cannot, in the ordinary course, reasonably be expected to be repaired within sixty (60) days from the time that repair work would commence) by fire or other casualty (each, a "Casualty"), then Landlord shall have the right to terminate this Lease by giving notice of Landlord's election so to do within ninety (90) days after the occurrence of such Casualty, whereupon this Lease shall terminate thirty (30) days after the date of such notice with the same force and effect as if such date were the date originally established as the expiration date hereof. In no event shall Landlord have any liability for damages to Tenant for inconvenience, annoyance or interruption of business arising from any Casualty.

11.2 Restoration; Tenant's Right of Termination.

(a) If the Building or the Premises shall be partially or totally damaged or destroyed by a Casualty and if this Lease is not terminated as provided in this **Article 11**, then (i) Landlord shall repair and restore the Building and the Premises (but excluding Tenant's Removable Property and the Improvements ("**Landlord's Restoration Work**") with reasonable dispatch (but Landlord shall not be required to perform the same on an overtime or premium pay basis) after notice to Landlord of the Casualty and the collection of the insurance proceeds attributable to such Casualty, and (ii) Tenant shall repair and restore in accordance with **Section 5.2** all of Tenant's Removable Property and the Improvements ("**Tenant's Restoration Work**") with reasonable dispatch after the Casualty. Notwithstanding anything to the contrary contained herein, if in Landlord's sole discretion it would be appropriate for safety reasons, health reasons or the efficient operation or restoration of the Building or the Premises for Landlord to perform all or a portion of Tenant's Restoration Work on behalf of Tenant, then (x) Landlord shall give Tenant a written notice specifying the portion of Tenant's Restoration Work to be performed by Landlord (the "**Specified Restoration Work**"), (y) Landlord shall perform the Specified Restoration Work, and (z) Tenant shall pay to Landlord within ten (10) days following the giving of Landlord's written demand therefor (or Landlord shall retain from the insurance proceeds paid to Landlord in accordance with the last sentence of this **Section 11.2(a)**) the cost of such Specified Restoration Work. The proceeds of insurance covering Tenant's Removable Property and the Improvements shall be paid to Landlord, and, unless Landlord restores Tenant's Removable Property and the Improvements as part of the Specified Restoration Work, upon the completion of the repair and restoration of Tenant's Removable Property and the Improvements and the reoccupancy of the Premises by Tenant, Landlord shall disburse to Tenant the proceeds of insurance maintained by Tenant covering Tenant's Removable Property and the Improvements up to the amount so expended by Tenant.

(b) If all or part of the Premises is damaged or destroyed by a Casualty, and neither party elects to exercise its termination right under this **Article 11** (or if no such termination rights are triggered), Landlord may, by written notice to Tenant given within thirty (30) days after the date of such Casualty, relocate Tenant to available space in the Building which is comparable to the Premises (the "**Interim Space**") during the restoration of the Premises, provided (i) Landlord shall pay the reasonable and actual costs to move Tenant's moveable fixtures, furniture and equipment into the Interim Space, and back into the Premises after restoration, to the extent not covered by Tenant's insurance, (ii) the square footage of the Interim Space shall not be less than ninety percent (90%) of the Premises Rentable Area, (iii) the Interim Space shall be reasonably suitable for the conduct and operation of Tenant's business, and (iv) upon occupancy of the Interim Space, Tenant shall pay Landlord Rent for the Interim Space at the same per square foot rental rate as is then applicable under this Lease, adjusted to reflect the actual square footage of the Interim Space (but which Rent shall not exceed the Rent for the Premises). If Landlord exercises the foregoing option, Tenant shall relocate from the Premises to the Interim Space within thirty (30) days after receipt of Landlord's notice; and Tenant shall relocate from the Interim Space to the restored Premises within thirty (30) days after Landlord notifies Tenant that the restoration of the Premises has been substantially completed.

(c) Landlord shall not carry any insurance on Tenant's Removable Property or on the Improvements (including without limitation the Bathroom Upgrade performed in connection with this Lease) that constitute part of Tenant's Restoration Work and shall not be obligated to repair or replace Tenant's Removable Property or such Improvements (whether or

not installed by or at the expense of Landlord). Tenant shall look solely to its insurance for recovery of any damage to or loss of Tenant's Removable Property and any Improvements. Tenant shall notify Landlord promptly of any casualty in the Premises. In the event of a partial or total destruction of the Premises, Tenant shall as soon as practicable (but no later than five (5) Business Days after receiving a notice from Landlord) remove any and all of Tenant's Removable Property from the Premises or the portion thereof destroyed, as the case may be, and if Tenant does not promptly so remove Tenant's Removable Property, Landlord, at Tenant's expense, may discard the same or may remove Tenant's Removable Property to a public warehouse for deposit or retain the same in its own possession and at its discretion may sell the same at either public auction or private sale, the proceeds of which shall be applied first to the expenses of removal, storage and sale, second to any sums owed by Tenant to Landlord, with any balance remaining to the paid to Tenant; if the expenses of such removal, storage and sale shall exceed the proceeds of any sale, Tenant shall pay such excess to Landlord upon demand. Tenant shall be solely responsible for arranging for any visits to the Premises by Tenant's insurance adjuster that may be desired by Tenant prior to the removal of Tenant's Removable Property by Tenant or Landlord, as provided in this **Section 11.2(c)**, or the performance by Landlord of Landlord's Restoration Work or the Specified Restoration Work and Landlord shall be under no obligation to delay the performance of same, nor shall Landlord have any liability to Tenant in the event that Tenant fails to do so. Tenant shall promptly permit Landlord access to the Premises for the purpose of performing Landlord's Restoration Work and, if applicable, the Specified Restoration Work.

(d) Within ninety (90) days after the occurrence of any Casualty affecting the Premises, Landlord shall deliver to Tenant a written estimate from a reputable contractor, architect or engineer designated by Landlord as to the probable length of time that will be necessary to substantially complete Landlord's Restoration Work. If such time estimate exceeds twelve (12) months from the date that repair work would commence, Tenant shall have the right to terminate this Lease by giving notice to Landlord thereof within thirty (30) days after receipt of such estimate (time being of the essence with respect to the giving of such notice by Tenant). If Tenant is entitled pursuant to the terms of this **Section 11.2(d)** to terminate this Lease and Tenant fails to deliver a termination notice to Landlord within the thirty (30) day period set forth herein, Tenant will be deemed to have waived Tenant's rights under this **Section 11.2(d)** to terminate the Lease on account of such Casualty. The provisions of this Section are in lieu of any statutory termination provisions allowable in the event of a Casualty.

(e) If this Lease is terminated under any of the provisions of this **Article 11** as a result of a Casualty, Landlord shall be entitled to retain for its benefit the proceeds of insurance maintained by Tenant on the Improvements. This **Section 11.2** shall be deemed an express agreement governing any damage or destruction of the Premises by fire or other casualty, and any law providing for a contingency in the absence of an express agreement, now or hereafter in force, shall have no application.

11.3 Abatement of Rent. If the Premises is damaged by a Casualty, Basic Rent and Escalation Charges payable by Tenant shall abate proportionately for the period from the date of such fire or other casualty until the earlier of (a) the date that Landlord substantially completes Landlord's Restoration Work (i.e. the date that Landlord completes Landlord's Restoration Work except for (i) items of work (and, if applicable, adjustment of equipment and fixtures) which can

be completed after occupancy has been taken without causing undue interference with Tenant's use of the Premises (i.e. so called "punch list" items) and (ii) items which, in accordance with good construction practice, should be performed after the performance of Tenant's Restoration Work) provided that if Landlord would have completed Landlord's Restoration Work at an earlier date but for Tenant having failed to cooperate with Landlord in effecting such Work or collecting insurance proceeds, then the Premises shall be deemed to have been repaired and restored on such earlier date and the abatement shall cease, or (b) the date Tenant or other occupant reoccupies any portion of the Premises (in which case the Basic Rent and Escalation Charges allocable to such reoccupied portion shall be payable by Tenant from the date of such occupancy). Notwithstanding any provision contained in this Lease to the contrary, (i) there shall be no abatement with respect to any portion of the Premises which has not been rendered untenantable by reason of fire or other casualty and which is accessible, whether or not other portions of the Premises are untenantable, and (ii) any abatement of Basic Rent or Escalation Charges applicable to any portion of the Premises which was rendered untenantable by reason of a casualty shall cease on the earliest of the dates referred to in clauses (a) or (b) of the preceding sentence provided such portion is accessible, whether or not other portions of the Premises remain untenantable. Landlord's determination of the date Landlord's Restoration Work to the Premises shall have been substantially completed shall be controlling unless Tenant disputes same by notice to Landlord given within ten (10) days after such determination by Landlord, and pending resolution of such dispute, Tenant shall pay Basic Rent and Escalation Charges in accordance with Landlord's determination. Notwithstanding the foregoing, if by reason of any act or omission by Tenant, any subtenant or any of their respective partners, directors, officers, servants, employees, agents or contractors, Landlord, any Mortgagee shall be unable to collect all of the insurance proceeds (including, without limitation, rent insurance proceeds) applicable to the casualty, then, without prejudice to any other remedies which may be available against Tenant, there shall be no abatement of Basic Rent or of Escalation Charges.

11.4 Eminent Domain.

(a) If the Premises shall be affected by any exercise of the power of eminent domain, Basic Rent and Escalation Charges payable by Tenant shall be justly and equitably abated and reduced according to the nature and extent of the loss of use thereof suffered by Tenant. In no event shall Landlord have any liability for damages to Tenant for inconvenience, annoyance or interruption of business arising from such exercise of the power of eminent domain.

(b) If any part of the Building is taken by any exercise of the right of eminent domain, then Landlord shall have the right to terminate this Lease (even if Landlord's entire interest in the Premises may have been divested) by giving notice of Landlord's election so to do within ninety (90) days after the occurrence of the effective date of such taking, whereupon this Lease shall terminate thirty (30) days after the date of such notice with the same force and effect as if such date were the date originally established for the expiration of the Term of this Lease.

(c) If this Lease shall not be terminated pursuant to **Section 11.4(b)**, Landlord shall thereafter use due diligence to restore the Premises (excluding any Alterations made by Tenant pursuant to **Section 5.2**) to proper condition for Tenant's use and occupation, provided that Landlord's obligation shall be limited to the amount of compensation recoverable by

Landlord from the taking authority. If, for any reason, such restoration shall not be substantially completed within six (6) months after the expiration of the ninety (90) day period referred to in **Section 11.4(b)** (which six month period may be extended for such periods of time as Landlord is prevented from proceeding with or completing such restoration for any cause beyond Landlord's reasonable control, but in no event for more than an additional three (3) months), Tenant shall have the right to terminate this Lease by giving notice to Landlord thereof within thirty (30) days after the expiration of such period (as so extended). Upon the giving of such notice, this Lease shall cease and come to an end thirty (30) days after the giving of such notice, without further liability or obligation on the part of either party unless, within such thirty (30) day period, Landlord substantially completes such restoration. Such right of termination shall be Tenant's sole and exclusive remedy at law or in equity for Landlord's failure so to complete such restoration.

(d) Landlord shall have and hereby reserves and excepts, and Tenant hereby grants and assigns to Landlord, all rights to recover for damages to the Property and the leasehold interest hereby created, and to compensation accrued or hereafter to accrue by reason of such taking, and by way of confirming the foregoing, Tenant hereby grants and assigns, and covenants with Landlord to grant and assign to Landlord, all rights to such damages or compensation, and covenants to deliver such further assignments and assurances thereof as Landlord may from time to time request, and Tenant hereby irrevocably appoints Landlord its attorney in fact to execute and deliver in Tenant's name all such assignments and assurances. Nothing contained herein shall be construed to prevent Tenant from prosecuting in any condemnation proceedings a claim for the value of any of Tenant's Removable Property installed in the Premises by Tenant at Tenant's expense and for relocation expenses, provided that such action shall not affect the amount of compensation otherwise recoverable by Landlord from the taking authority.

ARTICLE 12
HOLDING OVER; SURRENDER

12.1 Holding Over. If Tenant or anyone claiming by, through or under Tenant shall remain in possession of all or any part of the Premises (which shall include a failure by Tenant to remove any Tenant's Removable Property or Alterations which Landlord notified Tenant were to be removed at the expiration or earlier termination of the Term) after the expiration or earlier termination of the Term of this Lease, such holding over shall be treated as a daily tenancy at sufferance at a Basic Rent equal to one hundred fifty percent (150%) of the Basic Rent in effect for the last rental period of the Term plus Escalation Charges and other Additional Rent herein provided (prorated on a daily basis). In addition to any other liabilities to Landlord accruing therefrom, Tenant shall protect, defend, indemnify and hold Landlord harmless from all loss, costs and damages, direct and/or indirect, sustained by reason of any such holding over, including, without limitation, claims made by and loss of any succeeding tenant arising out of such failure to timely surrender possession in the condition required under this Lease. In all other respects, such holding over shall be on the terms and conditions set forth in this Lease as far as applicable (and excluding any extension, expansion or rights of first offer of tenant) in the Lease. Nothing contained in this **Article 12** shall be construed as a consent by Landlord to any holding over by Tenant, and Landlord shall have the right to immediately terminate such holding over pursuant to applicable Law. The provisions of this **Article 12** shall not be deemed to limit or constitute a waiver of any other rights or remedies of Landlord provided herein or at law.

12.2 Surrender of Premises. Upon the expiration or earlier termination of the Term of this Lease, Tenant shall promptly and peaceably quit and surrender to Landlord the Premises in neat and clean condition and in good order, condition and repair, together with all Alterations which may have been made or installed in, on or to the Premises prior to or during the Term of this Lease (except as otherwise required by Landlord pursuant to **Section 5.2(e)** above), excepting only ordinary wear and use and damage by fire or other casualty for which, under other provisions of this Lease, Tenant has no responsibility to repair or restore. Tenant shall remove all of Tenant's Removable Property, all signs installed by or on behalf of Tenant in or on the Premises and the Building, all lines and other wiring and cabling installed by Tenant prior to or during the Term. Tenant shall repair any damage to the Premises or the Building caused by such removal and restore the affected area to its condition prior to the installation thereof Any Tenant's Removable Property which shall remain in the Building or on the Premises after the expiration or termination of the Term of this Lease shall be deemed conclusively to have been abandoned, and either may be retained by Landlord as its property or may be disposed of in such manner as Landlord may see fit, at Tenant's sole cost and expense.

ARTICLE 13
RIGHTS OF MORTGAGEES; TRANSFER OF TITLE

13.1 Rights of Mortgagees.

(a) This Lease, and all rights of Tenant hereunder, are and shall be subject and subordinate to any ground or underlying leases of the Property and to all renewals, extensions, modifications and replacements thereof, and to all mortgages, deeds of trust or similar encumbrances which may now or hereafter affect the Property, whether or not such mortgages or other encumbrances shall also cover other lands and/or buildings, and to each and every advance made or hereafter to be made under such mortgages and other encumbrances, and to all renewals, modifications, replacements, extensions and consolidations of such mortgages and other encumbrances. This Section shall be self-operative and no further instrument of subordination shall be required. In confirmation of such subordination, Tenant shall promptly execute, acknowledge and deliver any instrument that Landlord, the lessor under any such lease or the holder of any such mortgage or other encumbrance or any of their respective successors in interest may reasonably request to evidence such subordination. Any lease to which this Lease is, at the time referred to, subject and subordinate is herein called "**Superior Lease**" and the lessor of a Superior Lease or its successor in interest at the time referred to, is herein called "**Superior Lessor**"; and any mortgage or other encumbrance to which this Lease is, at the time referred to, subject and subordinate, is herein called "**Superior Mortgage**" and the holder of a Superior Mortgage, or its successor in interest at the time referred to, is herein called "**Superior Mortgagee**." If any Superior Mortgagee, shall so elect, this Lease and the rights of Tenant hereunder, shall be superior in right to the rights of such holder, with the same force and effect as if this Lease had been executed, delivered and recorded, or a statutory notice hereof recorded, prior to the execution, delivery and recording of any such Superior Mortgage. The election of any such Superior Mortgagee shall become effective upon either notice from such Superior Mortgagee to Tenant in the same fashion as notices from Landlord to Tenant are to be given hereunder or by the recording in the appropriate registry or recorder's office of an instrument in which the Superior Mortgagee subordinates its rights under such Superior Mortgage to this Lease.

(b) If any Superior Lessor or Superior Mortgagee or the nominee or designee of any Superior Lessor or Superior Mortgagee shall succeed to the rights of Landlord under this Lease, whether through possession or foreclosure action or delivery of a new lease or deed, or otherwise, then at the request of such party so succeeding to Landlord's rights (herein called "**Successor Landlord**") Tenant shall attorn to and recognize such Successor Landlord as Tenant's landlord under this Lease and shall promptly execute and deliver any instrument that such Successor Landlord may reasonably request to evidence such attornment. Tenant waives the provisions of any law or regulation, now or hereafter in effect, which terminates or may give or purport to give Tenant any right to terminate or otherwise affect this Lease or the obligations of Tenant hereunder in the event that any such foreclosure, termination or other proceeding is filed, prosecuted or completed. Upon such attornment, this Lease shall continue in full force and effect as a direct lease between the Successor Landlord and Tenant upon all of the terms, conditions and covenants as are set forth in this Lease, except that the Successor Landlord shall not be (i) liable in any way to Tenant for any act or omission, neglect or default on the part of Landlord under this Lease, (ii) responsible for any monies owing by or on deposit with Landlord to the credit of Tenant, (iii) subject to any counterclaim or setoff which theretofore accrued to Tenant against Landlord, (iv) bound by any modification of this Lease subsequent to such Superior Lease or Superior Mortgage, or by any previous prepayment of fixed rent for more than one (1) month, which was not approved in writing by the Superior Lessor or the Superior Mortgagee thereto, (v) liable to the Tenant beyond the Successor Landlord's interest in the Property and the rents, income, receipts, revenues, issues and profits issuing from such Property, (vi) responsible for the performance of any work to be done by the Landlord under this Lease to render the Premises ready for occupancy by the Tenant, (vii) liable for the payment of any improvement allowance or similar amount owing to Tenant on account of the performance of any alterations or leasehold improvements to the Premises or the Building, or (viii) required to remove any person occupying the Premises or any part thereof, except if such person claims by, through or under the Successor Landlord.

13.2 Assignment of Rents and Transfer of Title.

(a) With reference to any assignment by Landlord of Landlord's interest in this Lease, or the rents payable hereunder, conditional in nature or otherwise, which assignment is made to a Superior Mortgagee on property which includes the Premises, Tenant agrees that the execution thereof by Landlord, and the acceptance thereof by the Superior Mortgagee shall never be treated as an assumption by the Superior Mortgagee of any of the obligations of Landlord hereunder unless the Superior Mortgagee shall, by notice sent to Tenant, specifically otherwise elect and, except as aforesaid, the Superior Mortgagee shall be treated as having assumed Landlord's obligations hereunder only upon foreclosure of the Superior Mortgage and the taking of possession of the Premises.

(b) In no event shall the acquisition of Landlord's interest in the Property by a purchaser which, simultaneously therewith, leases Landlord's entire interest in the Property back to the seller thereof be treated as an assumption by operation of law or otherwise, of Landlord's obligations hereunder, but Tenant shall look solely to such seller lessee, and its successors from time to time in title, for performance of Landlord's obligations hereunder. In any such event, this Lease shall be subject and subordinate to the lease to such purchaser. For all purposes, such seller lessee, and its successors in title, shall be the Landlord hereunder unless and until Landlord's position shall have been assumed by such purchaser lessor.

(c) Except as provided in **paragraph (b)** of this Section, in the event of any transfer of title to the Property by Landlord, Landlord shall thereafter be entirely freed and relieved from the performance and observance of all covenants and obligations hereunder.

13.3 Notice to Mortgagee. Tenant shall not seek to enforce any remedy it may have for any default on the part of Landlord without first giving any Superior Mortgagee and Superior Lessor, as applicable, written notice by certified mail, return receipt requested, specifying the default in reasonable detail, and affording such Superior Mortgagee and Superior Lessor, as applicable, (i) a reasonable opportunity to perform Landlord's obligations hereunder (but not less than thirty (30) days), if such default can be cured without such Superior Mortgagee or Superior Lessor, as applicable, taking possession of the mortgaged or leased estate, or (ii) time to obtain possession of the mortgaged or leased estate and then to cure such default of Landlord, if such default cannot be cured without such Superior Mortgagee or Superior Lessor or taking possession of the mortgaged or leased estate. The curing of any of Landlord's defaults by a Superior Mortgagee or Superior Lessor shall be treated as performance by Landlord.

ARTICLE 14
DEFAULT; REMEDIES

14.1 Tenant's Default. If at any time subsequent to the date of this Lease any one or more of the following events (herein referred to as an "**Event of Default**") shall occur:

(a) Tenant shall fail to pay the Basic Rent, Escalation Charges or any other Additional Rent hereunder when due and such failure shall continue for three (3) Business Days after notice to Tenant from Landlord (except that such written notice shall only be required twice in any twelve (12) month period, with any subsequent failure to pay such sums constituting an Event of Default unless paid within three (3) Business Days after the date due without need for an additional written notice); or

(b) Tenant shall neglect or fail to perform or observe any other covenant herein contained on Tenant's part to be performed or observed and Tenant shall fail to remedy the same within thirty (30) days after notice to Tenant (or such shorter period for completing a cure for such default as may be required by applicable Laws or by virtue of an emergency situation) specifying such neglect or failure, or if such failure is of such a nature that Tenant cannot reasonably remedy the same within such thirty (30) day period, Tenant shall fail to commence promptly (and in any event within such thirty (30) day period) to remedy the same and thereafter to diligently prosecute such remedy to completion with diligence and continuity (and in any event, within ninety (90) days after the notice described in this **subparagraph (ii)**), provided that (x) in no event shall Tenant have such additional period of time that would (A) subject Landlord or any Superior Lessor or any Superior Mortgagee to prosecution for a crime or any other fine or charge, (B) subject the Property, or any part thereof, to any lien or encumbrance

which is not removed or bonded within the time period required under this Lease, or (C) result in a default under any Superior Lease or under any Superior Mortgage and (y) such written notice shall only be required twice in any twelve (12) month period, with any subsequent similar performance default constituting an Event of Default unless cured within the period required under this Lease without need for an additional written notice); or

(c) Tenant's leasehold interest in the Premises shall be taken on execution or by other process of law directed against Tenant; or

(d) If Tenant or any guarantor of this Lease shall (i) make an assignment for the benefit of creditors, (ii) acquiesce in a petition in any court in any bankruptcy, reorganization, composition, extension or insolvency proceedings, (iii) seek, consent to or acquiesce in the appointment of any trustee, receiver or liquidator of Tenant or of any guarantor of this Lease or of all or any part of Tenant's or such guarantor's property, (iv) file a petition seeking an order for relief under the Title 11 of the United States Code, as now or hereafter amended or supplemented (the "**Bankruptcy Code**"), or by filing any petition under any other present or future federal, state or other statute or law for the same or similar relief, or (v) fail to win the dismissal, discontinuation or vacating of any involuntary bankruptcy proceeding filed under the Bankruptcy Code, or under any other present or future federal, state or other statute or law for the same or similar relief, within sixty (60) days after such proceeding is initiated; or

(e) Any lien has been filed against the Property, or any portion thereof, as a result of Tenant's acts, omissions or breach of this Lease, and Tenant fails, within 30 days after the lien is filed, either (1) to cause said lien to be removed from the Property, or (2) to furnish a bond sufficient to remove the lien or cause a title insurance endorsement to be issued with respect to such lien, which endorsement shall be satisfactory, in form and substance to Landlord, in Landlord's sole and absolute discretion; then in any such case Landlord may exercise any of Landlord's rights or remedies available under this Lease, at law or in equity.

14.2 <u>Landlord's Remedies</u>.

(a) Upon the occurrence of an Event of Default, Landlord shall have the following remedies, in addition to any and all other rights and remedies available at Law or in equity or otherwise provided in this Lease, any one or more of which Landlord may resort to cumulatively, consecutively, or in the alternative:

Landlord may continue this Lease in full force and effect, and collect Rent and other charges as and when due, without prejudice to Landlord's right to subsequently elect to terminate this Lease on account of such Event of Default;

(i) Landlord may terminate this Lease upon written notice to Tenant to such effect, in which event this Lease (and all of Tenant's rights hereunder) shall immediately terminate, but such termination shall not affect those obligations of Tenant which are intended by their terms to survive the expiration or termination of this Lease, and Tenant shall remain liable for damages as hereinafter set forth in this **Section 14.2**. This Lease may also be terminated by a judgment specifically providing for termination;

(ii) Landlord may terminate Tenant's right of possession without terminating this Lease upon written notice to Tenant to such effect, in which event Tenant's right of possession of the Premises shall immediately terminate, but this Lease shall continue subject to the effect of this **Section 14.2**;

(iii) Landlord may, but shall not be obligated to, perform any defaulted obligation of Tenant, and to recover from Tenant, as Additional Rent, the costs incurred by Landlord in performing such obligation. Notwithstanding the foregoing, or any other notice and cure period set forth herein, Landlord may exercise its rights under this **Section 14.2(a)(iv)** without prior notice or upon shorter notice than otherwise required hereunder (and as may be reasonable under the circumstances) in the event of any one or more of the following circumstances is present: (i) there exists a reasonable risk of prosecution of Landlord unless such obligation is performed sooner than the stated cure period; (ii) there exists an emergency arising out of the defaulted obligation; or (iii) the Tenant has failed to obtain insurance required by this Lease, or such insurance has been canceled by the insurer without being timely replaced by Tenant, as required herein; and

(iv) Landlord shall have the right to recover damages from Tenant, as set forth in this **Section 14.2**.

(b) Upon any termination of this Lease or of Tenant's right of possession, Landlord, at its sole election, may (i) re-enter the Premises, either by summary proceedings, ejectment or otherwise, and remove and dispossess Tenant and all other persons and any and all property from the same, as if this Lease had not been made, (ii) remove all property from the Premises and store the same in a public warehouse or elsewhere at Tenant's expense, and/or (iii) deem such property to be abandoned, and, in such event, Landlord may dispose of such property at Tenant's expense, free from any claim by Tenant or anyone claiming by, through or under Tenant. It shall not constitute a constructive or other termination of this Lease or Tenant's right to possession if Landlord (a) exercises its right to repair or maintain the Premises, (b) performs any unperformed obligations of Tenant, (c) stores or removes Tenant's property from the Premises after Tenant's dispossession, (d) attempts to relet, or, in fact, does relet, the Premises or (e) seeks the appointment of a receiver on Landlord's initiative to protect Landlord's interest under this Lease.

(c) If this Lease shall have been terminated as provided in this Article, Tenant shall pay the Basic Rent, Escalation Charges, Additional Rent and other sums payable hereunder up to the time of such termination, and thereafter Tenant, until the end of what would have been the Term of this Lease in the absence of such termination, and whether or not the Premises shall have been relet, shall be liable to Landlord for, and shall pay to Landlord, as liquidated current damages: (x) the Basic Rent, Escalation Charges, Additional Rent and other sums that would be payable hereunder if such termination had not occurred, less the net proceeds, if any, of any reletting of the Premises, after deducting all expenses incurred by Landlord in connection with such reletting, including, without limitation, all repossession costs, brokerage commissions, legal expenses, attorneys' fees, advertising, expenses of employees, alteration costs and expenses of preparation for such reletting; and (y) if, in accordance with **Section 3.1(a)**, Tenant commenced payment of the full amount of Basic Rent on any day other than the Commencement Date, the

amount of Basic Rent that would have been payable during the period beginning on the Commencement Date and ending on the day Tenant commenced payment of the full amount of Basic Rent under such **Section 3.1(a)**. Tenant shall pay the portion of such current damages referred to in clause (x) above to Landlord monthly on the days which the Basic Rent would have been payable hereunder if this Lease had not been terminated, and Tenant shall pay the portion of such current damages referred to in clause (y) above to Landlord upon such termination.

(d) At any time after termination of this Lease as provided in this Article, whether or not Landlord shall have collected any such current damages, as liquidated final damages and in lieu of all such current damages beyond the date of such demand, at Landlord's election Tenant shall pay to Landlord an amount equal to the excess, if any, of the Basic Rent, Escalation Charges, Additional Rent and other sums as hereinbefore provided which would be payable hereunder from the date of such demand assuming that, for the purposes of this paragraph, annual payments by Tenant on account of Taxes and Operating Expenses would be the same as the payments required for the immediately preceding Operating or Tax Year plus a three percent (3%) annual increase per year for what would be the then unexpired Term of this Lease if the same remained in effect, over the then fair net rental value of the Premises for the same period.

(e) In case of any Event of Default, re-entry, expiration and dispossession by summary proceedings or otherwise, Landlord may (i) relet the Premises or any part or parts thereof, either in the name of Landlord or otherwise, for a term or terms which may at Landlord's option be equal to or less than or exceed the period which would otherwise have constituted the balance of the Term of this Lease and may grant concessions or free rent to the extent that Landlord considers advisable and necessary to re let the same and (ii) make such alterations, repairs and decorations in the Premises as Landlord considers advisable and necessary for the purpose of reletting the Premises; and the making of such alterations, repairs and decorations shall not operate or be construed to release Tenant from liability hereunder as aforesaid. Tenant, for itself and any and all persons claiming through or under Tenant, including its creditors, upon the termination of this Lease and of the term of this Lease in accordance with the terms hereof, or in the event of entry of judgment for the recovery of the possession of the Premises in any action or proceeding, or if Landlord shall enter the Premises by process of law or otherwise, hereby waives any right of redemption provided or permitted by any statute, law or decision now or hereafter in force, and does hereby waive, surrender and give up all rights or privileges which it or they may or might have under and by reason of any present or future law or decision, to redeem the Premises or for a continuation of this Lease for the term of this Lease hereby demised after having been dispossessed or ejected therefrom by process of law, or otherwise.

(f) In addition to any other remedies under this **Article 14**, Tenant shall immediately become liable to Landlord for all damages proximately caused by Tenant's breach of its obligations under this Lease, including all costs Landlord incurs in reletting (or attempting to relet) the Premises or any part thereof, including, without limitation, brokers' commissions, expenses of cleaning, altering and preparing the Premises for new tenants, legal fees and all other like expenses properly chargeable against the Premises and the rental received therefrom and like costs, provided that nothing set forth in this **Section 14.2(f)** shall be construed to impose upon

Landlord any obligation to relet the Premises or to mitigate its damages hereunder, except to the extent expressly required under applicable Law. If Landlord does elect to relet the Premises (or any portion thereof), such reletting may be for a period shorter or longer than the remaining Term, and upon such terms and conditions as Landlord deems appropriate, in its sole and absolute discretion, and Tenant shall have no interest in any sums collected by Landlord in connection with such reletting except to the extent expressly set forth herein. If the Premises or any part thereof shall be relet in combination with any other space, then proper apportionment on a per-square foot basis shall be made of the rent received from such reletting and of the expenses of such reletting. If Landlord shall succeed in reletting the Premises during the period in which Tenant is paying monthly rent damages as described in **Section 14.2(c)**, Landlord shall credit Tenant with the net rents collected by Landlord from such reletting, after first deducting from the gross rents, as and when collected by Landlord, (A) all expenses incurred or paid by Landlord in collecting such rents, and (B) any theretofore unrecovered costs associated with the termination of this Lease or Landlord's reentry into the Premises, including any theretofore unrecovered expenses of reletting or other damages payable hereunder. If the Premises or any portion thereof be relet by Landlord for the unexpired portion of the Term before presentation of proof of such damages to any court, commission or tribunal, the amount of rent reserved upon such reletting shall, prima facie, constitute the fair and reasonable rental value for the Premises, or part thereof, so relet for the term of the reletting. Landlord shall not be liable in any way whatsoever for its failure or refusal to relet the Premises or, if the Premises or any part are relet, for its failure to collect the rent under such reletting, and no such refusal or failure to relet or failure to collect rent shall release or affect Tenant's liability for damages or otherwise under this Lease.

(g) If the trustee or the debtor in possession assumes the Lease under applicable bankruptcy law, it may assume and assign its interest in this Lease only if the proposed assignee first provides Landlord with (1) notice of such proposed assignment, setting forth (i) the name and address of the proposed assignee, its proposed use of the Premises, reasonably detailed character and financial references for such person (including its most recent balance sheet and income statements certified by its chief financial officer or, if available, a certified public accountant) and any other information reasonably requested by Landlord, and (ii) all of the terms and conditions of such offer, shall be given to Landlord by Tenant or such trustee no later than twenty (20) days after receipt by Tenant or such trustee of such offer, but in any event no later than ten (10) days prior to the date that Tenant or such trustee shall make application to a court of competent jurisdiction for authority and approval to assume this Lease and enter into such assignment; (2) Adequate Assurance of Future Performance (as hereinafter defined) of all of Tenant's obligations under this Lease, and (3) Landlord determines, in the exercise of its reasonable business judgment, that the assignment of this Lease will not breach any other lease, or any mortgage, financing agreement, or other agreement relating to the Property by which Landlord or the Property is then bound (and Landlord shall not be required to obtain consents or waivers from any third party required under any lease, mortgage, financing agreement, or other such agreement by which Landlord is then bound). Landlord shall have the option, to be exercised by notice to Tenant or such trustee given at any time prior to the date the application is filed for court approval of the assumption and assignment of this Lease to the proposed assignee, to accept an assignment of this Lease upon the same terms and conditions and for the same consideration, if any, as the bona fide offer made by such proposed assignee, less any brokerage commissions which may be payable out of the consideration to be paid by such person for the assignment of this Lease.

(h) For purposes only of **paragraph (g)** above, and in addition to any other requirements under the Bankruptcy Code, any future federal bankruptcy law and applicable case law, "Adequate Assurance of Future Performance" means at least the satisfaction of the following conditions, which Landlord and Tenant acknowledge to be commercially reasonable:

(i) the proposed assignee submitting a current financial statement, audited by a certified public accountant, that allows a net worth and working capital in amounts determined in the reasonable business judgment of Landlord to be sufficient to assure the future performance by the assignee of Tenant's obligation under this Lease; and

(ii) if requested by Landlord in the exercise of its reasonable business judgment, the proposed assignee obtaining a guarantee (in form and substance satisfactory to Landlord) from one or more persons who satisfy Landlord's standards of creditworthiness; and

(iii) the proposed assignee is of a character and financial worth such as is in keeping with the standards of Landlord in those respects for the Property, the assignee's tenancy is of the same quality as other tenants at the Property, and the purposes for which the proposed assignee intends to use the Premises are uses expressly permitted by and not prohibited by this Lease or prohibited by any other lease at the Property.

14.3 Additional Rent. If Tenant shall fail to pay when due any sums under this Lease designated as an Escalation Charge or other Additional Rent, Landlord shall have the same rights and remedies as Landlord has hereunder for failure to pay Basic Rent.

14.4 Remedying Defaults. Landlord shall have the right, but shall not be required, to pay such sums or do any act which requires the expenditure of monies which may be necessary or appropriate by reason of the failure or neglect of Tenant to perform any of the provisions of this Lease, and in the event of the exercise of such right by Landlord, Tenant agrees to pay to Landlord forthwith upon demand all such sums, together with interest thereon at the Default Interest Rate, as Additional Rent.

14.5 Remedies Cumulative. The specified remedies to which Landlord may resort hereunder are not intended to be exclusive of any remedies or means of redress to which Landlord may at any time be entitled lawfully, and Landlord may invoke any remedy (including the remedy of specific performance) allowed at law or in equity as if specific remedies were not herein provided for.

14.6 Enforcement Costs. Tenant shall pay all reasonable costs and expenses (including, without limitation, attorneys' fees and expenses at both the trial and appellate levels) incurred by or on behalf of Landlord in connection with the successful enforcement of any rights of Landlord or obligations of Tenant hereunder, whether or not occasioned by an Event of Default.

14.7 Waiver.

(a) Failure on the part of Landlord or Tenant to complain of any action or non-action on the part of the other, no matter how long the same may continue, shall never be a waiver by Tenant or Landlord, respectively, of any of the other's rights hereunder. Further, no waiver at any time of any of the provisions hereof by Landlord or Tenant shall be construed as a waiver of any of the other provisions hereof, and a waiver at any time of any of the provisions hereof shall not be construed as a waiver at any subsequent time of the same provisions. The consent or approval of Landlord or Tenant to or of any action by the other requiring such consent or approval shall not be construed to waive or render unnecessary Landlord's or Tenant's consent or approval to or of any subsequent similar act by the other.

(b) Any waiver by Landlord of any provisions of this Lease must be in a writing signed by Landlord. In addition, Landlord's acceptance of any payment from Tenant after a termination of this Lease due to an Event of Default by Tenant shall not have the effect of reinstating this Lease, nor estop Landlord from exercising any of the rights and remedies granted to Landlord hereunder arising out of such Event of Default. No payment by Tenant or acceptance by Landlord of a lesser amount than the Basic Rent, Escalation Charges, Additional Rent and other sums due hereunder shall be deemed to be other than on account of the total amount due from Tenant to Landlord, to be applied in such order as Landlord deems appropriate. In no event shall any endorsement or statement on any check or accompanying any check or payment be deemed an accord and satisfaction; and Landlord may accept such check or payment without prejudice to Landlord's right to recover the balance of such Basic Rent, Escalation Charges, Additional Rent or other sum and to pursue any other remedy provided in this Lease.

14.8 Security Deposit. Simultaneously with the execution of this Lease by Tenant, Tenant shall deliver to Landlord, and Tenant shall maintain in effect at all times during the Term (including any extension or renewal terms), as collateral for the full and faithful performance and observance by Tenant of Tenant's covenants and obligations under this Lease, an unconditional, irrevocable, absolutely "clean" letter of credit (each such letter of credit and such extensions or replacements thereof, as the case may be, is hereinafter referred to as a "**Letter of Credit**") in the amount shown in **Section 1.1** (the "**Required Amount**"), in form reasonably satisfactory to Landlord. The Letter of Credit shall be issued by and drawable upon a commercial bank, trust company, national banking association or other banking institution reasonably satisfactory to Landlord and having a credit rating with respect to certificates of deposit, short term deposits or commercial paper of at least P-1 (or equivalent) by Moody's Investor Service, Inc., or at least A/A-1 (or equivalent) by Standard & Poors Corporation (and is not on credit-watch or similar credit review with negative implication), have combined capital, surplus and undivided profits of not less than $500,000,000 and have offices for banking and drawing purposes in the city or county in which the Premises are located, or shall permit the Letter of Credit to be drawn by Landlord upon facsimile presentation. Landlord hereby approves SILICON VALLEY BANK as the issuer of the Letter of Credit. Any Letter of Credit shall name Landlord as the beneficiary (or, at Landlord's request, shall name any Superior Mortgagee as beneficiary or co-beneficiary thereof), have an expiration date no earlier than the first anniversary of the date of issuance thereof and shall be automatically renewed from year to year through the date that is ninety (90) days after expiration of the Term unless terminated by the issuer thereof by notice to Landlord given not less than forty-five (45) days prior to the expiration thereof, be fully transferable by

Landlord without payment of any fees or charges, permit partial draws and be payable at sight upon presentment of a simple sight draft signed by Landlord or its property manager Tenant shall, throughout the Term of this Lease, deliver to Landlord, in the event of the termination of any such Letter of Credit, a replacement Letter of Credit in lieu thereof no later than thirty (30) days prior to the expiration date of the preceding Letter of Credit and complying with all of the requirements of this **Section 14.8**. If Tenant shall fail to obtain any replacement of or amendment to a Letter of Credit within any of the applicable time limits set forth in this **Section 14.8**, such failure shall constitute an immediate Event of Default under this Lease without any additional notice or cure period applicable thereto, and Landlord shall have the right (but not the obligation), at its option, to draw down the full amount of the existing Letter of Credit and use, apply and retain the same as security hereunder, and notwithstanding such draw by Landlord, Landlord shall retain all other rights and remedies that are available to Landlord under this Lease at Law or in equity with respect to such Event of Default.

If Tenant defaults in respect of the full and prompt payment and performance of any of the terms, provisions, covenants and conditions of this Lease beyond notice (the delivery of which shall not be required for purposes of this **Section 14.8** if Landlord is prevented or prohibited from delivering the same under applicable Law, including, but not limited to, all applicable bankruptcy and insolvency laws) and the expiration of any applicable cure periods (except that no notice and cure period shall be required for purposes of this **Section 14.8** with respect to any default by Tenant hereunder if, at the time of such default, any of the events set forth in **Section 14.1** shall have occurred with or without the acquiescence of Tenant), including, but not limited to, the payment of Basic Rent and Additional Rent, Landlord may, at its election, (but shall not be obligated to) draw down the entire Letter of Credit or any portion thereof and use or apply the whole or any part of the security represented by the Letter of Credit to the extent required for the payment of: (i) Basic Rent, Additional Rent or any other sum as to which Tenant is in default, (ii) any sum which Landlord may expend or may be required to expend by reason of Tenant's default in respect of any of the terms, provisions, covenants, and conditions of this Lease, including but not limited to, any reasonably anticipated reletting costs or expenses (including, without limitation, any free rent, tenant improvement allowance, leasing commissions, attorneys' fees, costs and expenses, and other fees, costs and expenses relating to the reletting of all or any portion of the Premises), (iii) any reasonably anticipated damages or deficiency in the reletting of the Premises, whether such damages or deficiency accrued before or after summary proceedings or other re-entry by Landlord, or (iv) any reasonably anticipated damages awarded to Landlord in accordance with the terms and conditions of **Article 14** hereof, it being understood that any use of the whole or any part of the security represented by the Letter of Credit shall not constitute a bar or defense to any of Landlord's other remedies under this Lease or any Law, including but not limited to Landlord's right to assert a claim against Tenant under 11 U.S.C. §502(b)(6) or any other provision of Title 11 of the United States Code. To insure that Landlord may utilize the security represented by the Letter of Credit in the manner, for the purpose, and to the extent provided in this **Section 14.8**, each Letter of Credit shall provide that the full amount or any portion thereof may be drawn down by Landlord upon the presentation to the issuing bank (or the advising bank, if applicable) of Landlord's draft drawn on the issuing bank with accompanying memoranda or statement of beneficiary. In no event shall the Letter of Credit require Landlord to submit evidence to the issuing (or advising) bank of the truth or accuracy of any such written statement and in no event shall the issuing bank have the right to dispute the truth or accuracy of any such statement nor shall the issuing (or advising)

bank have the right to review the applicable provisions of the Lease. In no event and under no circumstance shall the draw down on or use of any amounts under the Letter of Credit constitute a basis or defense to the exercise of any other of Landlord's rights and remedies under this Lease or under any Law, including, but not limited to, Landlord's right to assert a claim against Tenant under 11 U.S.C. §502(b)(6) or any other provision of Title 11 of the United States Code.

If Landlord utilizes all or any part of the security represented by the Letter of Credit but does not terminate this Lease as provided in **Article 14** hereof, Landlord may, in addition to exercising its rights as provided in **Section 14.8(b)** above, retain the unapplied and unused balance of the portion of the Letter of Credit drawn down by Landlord (herein called the "**Cash Security**") as security for the faithful performance and observance by Tenant thereafter of the terms, provisions, and conditions of this Lease, and may use, apply, or retain the whole or any part of said Cash Security to the extent required for payment of any of the amounts specified in clauses (i) through (iv) of **Section 14.8(b)** above. In the event Landlord uses, applies or retains any portion or all of the security represented by the Letter of Credit, Tenant shall forthwith restore the amount so used, applied or retained (at Landlord's option, either by the deposit with Landlord of cash or the provision of a replacement Letter of Credit) so that at all times the amount of the security represented by the Letter of Credit and the Cash Security (if any) shall be not less than the Required Amount, failing which Tenant shall be in default of its obligations under this **Section 14.8** and Landlord shall have the same rights and remedies as for the non-payment of Basic Rent beyond the applicable grace period.

In addition to and without limitation of Landlord's other rights under this **Section 14.8**, if the credit rating of the issuer of the Letter of Credit is reduced below P-1 (or equivalent) by Moody's Investor Service, Inc., or below AJA-1 (or equivalent) by Standard & Poors Corporation, or if the financial condition of such issuer changes in any other materially adverse way, by being placed into receivership or conservatorship by the Federal Deposit Insurance Corporation, or any successor or similar entity, or by being placed on "CreditWatch" or similar status by Standard & Poors or Moody's, then Landlord may immediately draw upon the Letter of Credit as provided in **Section 14.8** and use, apply and retain the same as Cash Security hereunder and Landlord shall have the right, by giving Tenant written notice of such requirement, to require that Tenant obtain from a new issuer a replacement Letter of Credit, which issuer and replacement Letter of Credit both comply in all respects with the requirements of this **Section 14.8**. In the event that Tenant shall not have delivered to Landlord a replacement Letter of Credit complying with all of the requirements of this **Section 14.8** within fifteen (15) Business Days after Tenant's receipt of such notice, Landlord shall have the right (but not the obligation), at its option, to give written notice to Tenant stating that such failure constitutes a continuing and immediate Event of Default by Tenant under the Lease without any additional notice or cure period applicable thereto, and Landlord shall have the right to exercise all rights and remedies available to Landlord under this Lease at Law and in equity with respect to such Event of Default.

If Tenant shall have fully paid and performed all of Tenant's obligations under this Lease, the Letter of Credit and the Cash Security (if any) then held by Landlord shall be returned to Tenant after the date fixed as the end of this Lease and after delivery to Landlord of entire possession of the Premises in the condition required under this Lease; provided, however, that if Tenant is in breach of this Lease as of the expiration of this Lease, then such 30-day period shall not commence until such breach is fully cured and in no event shall any such return be construed as an admission by Landlord that Tenant has performed all of its obligations hereunder.

In the event of any sale, transfer or leasing of Landlord's interest in the Building whether or not in connection with a sale, transfer or leasing of the Land to a vendee, transferee or lessee, Landlord shall have the right to transfer the Letter of Credit and the Cash Security (if any) to the vendee, transferee or lessee or, in the alternative, to require Tenant to deliver a replacement Letter of Credit naming the new landlord as beneficiary, and, upon such delivery by Tenant of such replacement Letter of Credit, Landlord shall return the existing Letter of Credit to Tenant. Upon such transfer or return of the Letter of Credit and the Cash Security (if any), Landlord shall thereupon be released by Tenant from all liability for the return thereof, and Tenant shall look solely to the new landlord for the return of the same. The provisions of the preceding sentence shall apply to every subsequent sale, transfer or leasing of the Building, and any successor of Landlord may, upon a sale, transfer, leasing or other cessation of the interest of such successors in the Building, whether in whole or in part, transfer the Letter of Credit and the Cash Security (if any) to any vendee, transferee or lessee of the Building (or require Tenant to deliver a replacement Letter of Credit as hereinabove set forth) and shall thereupon be relieved of all liability with respect thereto. If Tenant shall fail to deliver such replacement Letter of Credit to Landlord within fifteen (15) Business Days following receipt of Landlord's written notice, such failure shall constitute an immediate Event of Default under this Lease and Landlord shall have the right (but not the obligation), at its option, to draw down the existing Letter of Credit and retain the proceeds as Cash Security hereunder until a replacement Letter of Credit is delivered, and notwithstanding such draw by Landlord, Landlord shall retain all other rights and remedies that are available to Landlord under this Lease, at law or in equity with respect to such Event of Default. Landlord and Tenant hereby agree that, in connection with the transfer by Landlord or its successors or assigns hereunder of Landlord's interest in the Letter of Credit, Tenant shall be solely liable to pay any transfer commission and other costs charged by the issuing bank in connection with any such transfer of the Letter of Credit, as Additional Rent, upon Landlord's demand therefor. Tenant shall not assign or encumber or attempt to assign or encumber the security represented by the Letter of Credit, and neither Landlord nor its successors or assigns shall be bound by any such assignment, encumbrance, attempted assignment or attempted encumbrance. In any event, in the absence of evidence satisfactory to Landlord of an assignment of the right to receive the security represented by the Letter of Credit, Landlord may return the Letter of Credit to the original Tenant regardless of one or more assignments of this Lease.

Neither the Letter of Credit, any proceeds therefrom or the Cash Security, if any, shall be deemed an advance rent deposit or an advance payment of any other kind, or a measure or limitation of Landlord's damages or constitute a bar or defense to any of the Landlord's other remedies under this Lease or at law or in equity upon Tenant's default. The holder of a mortgage shall not be responsible to Tenant for the return or application of any such deposit, whether or not it succeeds to the position of Landlord hereunder, unless such deposit shall have been received in hand by such holder.

Notwithstanding anything to the contrary contained herein, provided and on condition that, as of the date set forth herein, Tenant is not then in default hereunder, the amount of the Letter of Credit shall be reduced on the second anniversary of the Rent Commencement Date to an amount equal to One Hundred Fifty Thousand Dollars ($150,000.00). Said reduction shall be effected by an amendment to the Letter of Credit or by the delivery of a new Letter of Credit in the reduced amount in the form required above. If Tenant believes that it has satisfied all the conditions precedent to a reduction in the amount of the Letter of Credit, then it shall request such reduction in writing to Landlord, which request shall certify to Landlord that all such conditions have been satisfied. If Landlord determines that all of the aforesaid conditions are met, the Security Deposit shall be so reduced in accordance with this provision.

14.9 Landlord's Default. Landlord shall in no event be in default under this Lease unless Landlord shall neglect or fail to perform any of its obligations hereunder and shall fail to remedy the same within thirty (30) days after notice to Landlord specifying such neglect or failure, or if such failure is of such a nature that Landlord cannot reasonably remedy the same within such thirty (30) day period, Landlord shall fail to commence promptly (and in any event within such thirty (30) day period) to remedy the same and to prosecute such remedy to completion with diligence and continuity.

14.10 Independent Covenants. Tenant hereby acknowledges and agrees that the obligations of Tenant hereunder shall be separate and independent covenants and agreements, that the obligations of Tenant hereunder, including, without limitation the obligation to pay Basic Rent, Escalation Charges, Additional Rent and other sums due hereunder, shall continue unaffected, unless the requirement to pay or perform the same shall have been terminated or abated pursuant to an express provision of this Lease. Such waiver and acknowledgements by Tenant are a material inducement to Landlord entering into this Lease. To the extent of any conflicts or inconsistencies between the terms and provisions of this **Section 14.10** and the terms and provisions of the remainder of this Lease, the terms and provisions of this **Section 14.10** shall control.

ARTICLE 15
MISCELLANEOUS PROVISIONS

15.1 Landlord's Rights of Access. Landlord and its agents, representatives, contractors and employees shall have the right to enter the Premises upon prior reasonable notice (except in an emergency, in which event Landlord shall endeavor to give such notice as is reasonably practicable under the circumstances and in all events notice under this **Article 15** may be by telephone notwithstanding anything to the contrary in this Lease) for the purpose of doing maintenance, making such repairs, alterations or improvements as Landlord shall reasonably require or shall have the right to make by the provisions of this Lease or otherwise in exercising Landlord's rights or fulfilling Landlord's obligations under this Lease. Landlord and its agents, representatives, contractors and employees shall have the right to enter the Premises without notice to Tenant for the purpose of performing janitorial and other services which Landlord is obligated to provide under this Lease or for exercising any of Landlord's rights under **Article 14** of this Lease. Landlord and its invitees shall also have the right on reasonable prior notice to enter the Premises, for the purpose of inspecting them or exhibiting them to prospective purchasers, prospective or actual Superior Lessors or Superior Mortgagees of the Building and,

during the final twenty four (24) months of the Term, to prospective tenants. For each of the above purposes, Landlord shall at all times have a key with which to unlock all the doors in the Premises, excluding Tenant's vaults, safes and special security areas designated in advance by Tenant to Landlord. In an emergency, Landlord shall have the right to use any means that Landlord may deem proper to open the doors in and to the Premises. Any entry into the Premises by Landlord in the manner hereinbefore described shall not be deemed to be a forcible or unlawful entry into, or a detainer of, the Premises, or an actual or constructive eviction of Tenant from any portion of the Premises. No provision of this Lease shall be construed as obligating Landlord to perform any repairs, alterations or decorations except as otherwise expressly agreed to be performed by Landlord in this Lease.

15.2 Covenant of Quiet Enjoyment. Subject to the terms and conditions of this Lease, on payment of the Basic Rent and Escalation Charges and other Additional Rent and observing, keeping and performing all of the other terms and conditions of this Lease on Tenant's part to be observed, kept and performed, Tenant shall lawfully, peaceably and quietly enjoy the Premises during the term hereof, without hindrance or ejection by any persons lawfully claiming under Landlord to have title to the Premises superior to Tenant. The foregoing covenant of quiet enjoyment is in lieu of any other covenant, express or implied.

15.3 Landlord's Liability.

(a) Tenant agrees to look solely to Landlord's then equity interest in the Property at the time of recovery for recovery of any judgment against Landlord, and agrees that neither Landlord nor any successor of Landlord nor any beneficiary, trustee, member, manager, partner, director, officer, employee or shareholder of Landlord or such successor shall ever be personally liable for any such judgment, or for the payment of any monetary obligation to Tenant. The provision contained in the foregoing sentence is not intended to, and shall not, limit any right that Tenant might otherwise have to obtain injunctive relief against Landlord or any successor of Landlord, or to take any action not involving the personal liability of Landlord or any successor of Landlord to respond in monetary damages from Landlord's assets other than Landlord's equity interest in the Property.

(b) In no event shall Landlord ever be liable to Tenant for any loss of business or any other indirect or consequential damages suffered by Tenant from whatever cause.

(c) Where provision is made in this Lease for Landlord's consent, and Tenant shall request such consent, and Landlord shall fail or refuse to give such consent, Tenant shall not be entitled to any damages for any withholding by Landlord of its consent, it being intended that Tenant's sole remedy shall be an action for specific performance or injunction, and that such remedy shall be available only in those cases where Landlord has expressly agreed in writing not to unreasonably withhold its consent. Furthermore, whenever Tenant requests Landlord's consent or approval (whether or not provided for herein), Tenant shall pay to Landlord, on demand, as Additional Rent, any reasonable expenses incurred by Landlord (including without limitation reasonable attorneys' fees and costs, if any) in connection therewith.

(d) Any repairs or restoration required or permitted to be made by Landlord under this Lease may be made during normal business hours, and Landlord shall have no liability for damages to Tenant for inconvenience, annoyance or interruption of business arising therefrom.

15.4 Estoppel Certificate. Tenant shall, without charge, at any time and from time to time, within ten (10) Business Days after written request by Landlord duly execute an Estoppel Certificate in the form attached hereto as **Exhibit H** or such other commercially reasonable form as shall be requested by Landlord and deliver said Estoppel Certificate to Landlord, or to any mortgagee or proposed mortgagee, or any purchaser or proposed purchaser, or to any other entity reasonably specified by Landlord: If Tenant fails to so execute and deliver such estoppel certificate within such ten (10) Business Day period, then Landlord shall be entitled to send Tenant a second notice requesting such execution and delivery of such estoppel certificate ("Second Notice"), and if Tenant fails to execute and deliver such estoppel certificate within three (3) Business Days after the Second Notice, such failure shall, at Landlord's option, be a "Default of Tenant" without the benefit of any further notice or cure period.

15.5 Brokerage. Tenant warrants and represents that Tenant has dealt with no broker in connection with the consummation of this Lease other than Broker, and, in the event of any brokerage claims against Landlord predicated upon prior dealings with Tenant, Tenant agrees to defend the same and indemnify Landlord against any such claim (except any claim by Broker).

15.6 Rules and Regulations. Tenant, its employees, representatives, agents, subtenants, licensees, contractors, and invitees shall abide by the Rules and Regulations from time to time established by Landlord, it being agreed that Landlord shall have the right from time to time during the Term to make reasonable changes in and additions to the Rules and Regulations as Landlord deems necessary for the management, safety, care, cleanliness, conservation and sustainability of the Building and the Property and for the preservation of good order therein. Changes and additions to the Rules and Regulations shall become binding upon Tenant upon communication of such change or addition to Tenant in writing. The Rules and Regulations shall be generally applicable to all tenants of the Building of similar nature to the Tenant named herein. Landlord agrees that any such Rules and Regulations will be uniformly enforced, provided, however, Landlord may waive any one or more of the Rules and Regulations for the benefit of any particular tenant if Landlord reasonably deems such waiver appropriate, but no such waiver shall be construed as a waiver of such Rules and Regulations in favor of any other tenant, nor prevent Landlord from enforcing such Rules and Regulations against any or all tenants of the Building. Landlord shall not have any obligation to enforce the Rules and Regulations or the terms of any other lease against any other tenant and Landlord shall not be liable to Tenant for violation thereof by any other tenant, its employees, representatives, agents, contractors, visitors, subtenants, licensees or invitees. In the event that there shall be a conflict between such Rules and Regulations and the provisions of this Lease, the provisions of this Lease shall control. The Rules and Regulations currently in effect are set forth in **Exhibit F** attached hereto and made a part hereof.

15.7 Financial Statements. Tenant shall deliver to Landlord, within ten (10) days after Landlord's reasonable request for the same, Tenant's most recently completed financial statements (audited if available) prepared and certified by an independent certified public accountant and certified by an officer of Tenant as being true and correct in all material respects. Landlord and its affiliates and investors shall keep such financial statements confidential,

provided that Landlord shall be permitted to deliver such financial statements to a lender, purchaser or lessor or a prospective lender, purchaser or lessor in connection with (i) a sale or financing of the Building or the Property or any interest in any deed of trust encumbering the Building or the Property, or (ii) a sale of all or substantially all of the interests in Landlord or(iii) any other recapitalization of the equity interests in Landlord, so long as Landlord first advises the recipient of the confidential nature of such statements. Notwithstanding the foregoing, if and only so long as Tenant's stock is publicly traded on a national exchange (or publicly listed in an equivalent manner, such as on NASDAQ) that requires its financial statements to be publicly disclosed, Tenant shall have no obligation to deliver any financial statements to Landlord. Any such financial statements may be relied upon by any actual or potential lessor, purchaser, or mortgagee of the Property.

15.8 Intentionally Omitted.

15.9 Confidentiality. Tenant agrees that this Lease and the terms contained herein will be treated as strictly confidential and except as required by Law (or except with the written consent of Landlord) Tenant shall not disclose the same to any third party except for Tenant's partners, lenders, accountants and attorneys who have been advised of the confidentiality provisions contained herein and agree to be bound by the same, In the event Tenant is required by Law to provide this Lease or disclose any of its terms, Tenant shall give Landlord prompt notice of such requirement prior to making disclosure so that Landlord may seek an appropriate protective order. If failing the entry of a protective order Tenant is compelled to make disclosure, Tenant shall only disclose portions of the Lease which Tenant is required to disclose and will exercise reasonable efforts to obtain assurance that confidential treatment will be accorded to the information so disclosed.

15.10 Invalidity of Particular Provisions. If any term or provision of this Lease, or the application thereof to any person or circumstance shall, to any extent, be invalid or unenforceable, the remainder of this Lease, or the application of such term or provision to persons or circumstances other than those as to which it is held invalid or unenforceable, shall not be affected thereby, and each term and provision of this Lease shall be valid and be enforced to the fullest extent permitted by law.

15.11 Provisions Binding, Etc. Except as herein otherwise provided, the terms hereof shall be binding upon and shall inure to the benefit of the successors and assigns, respectively, of Landlord and Tenant (except in the case of Tenant, only such successors and assigns as may be permitted hereunder) and, if Tenant shall be an individual, upon and to his heirs, executors, administrators, successors and permitted assigns. Each term and each provision of this Lease to be performed by Tenant shall be construed to be both a covenant and a condition. Any reference in this Lease to successors and assigns of Tenant shall not be construed to constitute a consent to assignment by Tenant.

15.12 Recording. Tenant agrees not to record this Lease, but, if the Term of this Lease (including any extended term) is seven (7) years or longer, each party hereto agrees, on the request of the other, to execute a notice of lease/short form memorandum of lease in recordable form and complying with applicable Law and shall contain no information other than what is statutorily required to record a notice of lease/short form memorandum of lease. In no event

shall such document set forth the rent or other charges payable by Tenant under this Lease; and any such document shall expressly state that it is executed pursuant to the provisions contained in this Lease, and is not intended to vary the terms and conditions of this Lease. At any time following Landlord's request, Tenant shall execute and deliver to Landlord within ten (10) days after such request a release of any document recorded in the real property records for the location of the Property evidencing this Lease or notice of termination of this Lease in recordable form, which shall be held in escrow by Landlord until the expiration or earlier termination of the Term. The obligations of Tenant under this Section shall survive the expiration or any earlier termination of the Term.

15.13 Notice. Whenever, by the terms of this Lease, notice shall or may be given either to Landlord or to Tenant (excluding notices pursuant to **Section 15.1**), such notice shall be in writing and shall be sent by hand, registered or certified mail, or overnight or other commercial courier, postage or delivery charges, as the case may be, prepaid as follows:

If intended for Landlord, addressed to Landlord at the address set forth in **Article 1** of this Lease (or to such other address or addresses as may from time to time hereafter be designated by Landlord by like notice).

If intended for Tenant, addressed to Tenant at the address set forth in **Article I** of this Lease except that from and after the Commencement Date the address of Tenant shall be the Premises (or to such other address or addresses as may from time to time hereafter be designated by Tenant by like notice).

Except as otherwise provided herein, all such notices shall be effective when received; provided, that (i) if receipt is refused, notice shall be effective upon the first occasion that such receipt is refused, (ii) if the notice is unable to be delivered due to a change of address of which no notice was given, notice shall be effective upon the date such delivery was attempted, (iii) if the notice address is a post office box number, notice shall be effective the day after such notice is sent as provided hereinabove or (iv) if the notice is to a foreign address, notice shall be effective two (2) days after such notice is sent as provided hereinabove.

Any notice given by an attorney on behalf of Landlord or by Landlord's managing agent shall be considered as given by Landlord and shall be fully effective.

15.14 When Lease Becomes Binding; Entire Agreement; Modification. The submission of this document for examination and negotiation does not constitute an offer to lease, or a reservation of, or option for, the Premises, and this document shall become effective and binding only upon the execution and delivery hereof by both Landlord and Tenant. This Lease is the entire agreement between Landlord and Tenant, and this Lease expressly supersedes any negotiations, considerations, representations and understandings and proposals or other written documents relating hereto. This Lease may be modified or altered only by written agreement between Landlord and Tenant, and no act or omission of any employee or agent of Landlord shall alter, change or modify any of the provisions hereof.

15.15 Authority. Tenant hereby represents and warrants to Landlord that (i) Tenant is duly organized and validly existing in good standing under the laws of Delaware, is registered to do business as a foreign corporation with the Secretary of the Commonwealth of Massachusetts and possesses all licenses and authorizations necessary to carry on its business, (ii) Tenant has full power and authority to carry on its business, enter into this Lease and consummate the transaction contemplated by this Lease, (iii) the individual executing and delivering this Lease on Tenant's behalf has been duly authorized to do so, (iv) this Lease has been duly executed and delivered by Tenant, (v) this Lease constitutes a valid, legal, binding and enforceable obligation of Tenant (subject to bankruptcy, insolvency or creditor rights laws generally, and principles of equity generally), (vi) the execution, delivery and performance of this Lease by Tenant will not cause or constitute a default under, or conflict with, the organizational documents of Tenant or any agreement to which Tenant is a party, (vii) the execution, delivery and performance of this Lease by Tenant will not violate any applicable Law, and (vii) all consents, approvals, authorizations, orders or filings of or with any court or governmental agency or body, if any, required on the part of Tenant for the execution, delivery and performance of this Lease have been obtained or made.

15.16 Paragraph Headings and Interpretation of Sections. The paragraph headings throughout this instrument are for convenience and reference only, and the words contained therein shall in no way be held to explain, modify, amplify or aid in the interpretation, construction or meaning of the provisions of this Lease. The provisions of this Lease shall be construed as a whole, according to their common meaning (except where a precise legal interpretation is clearly evidenced), and not for or against either party. Use in this Lease of the words "including," "such as" or words of similar import, when followed by any general term, statement or matter, shall not be construed to limit such term, statement or matter to the specified item(s), whether or not language of non-limitation, such as "without limitation" or "including, but not limited to," or words of similar import, are used with reference thereto, but rather shall be deemed to refer to all other terms or matters that could fall within a reasonably broad scope of such term, statement or matter.

15.17 Joint and Several Liability; Successors and Assigns. If there shall be more than person or entity which constitute the "Tenant" hereunder, the obligations of Tenant hereunder shall be joint and several for all such persons and entities, The covenants and conditions herein contained, subject to the provisions as to assignment, shall inure to and bind the heirs, successors, executors, administrators and assigns of the parties hereto.

15.18 Waiver of Jury Trial. IN ANY ACTION OR PROCEEDING ARISING HEREFROM, LANDLORD AND TENANT HEREBY CONSENT TO (I) THE JURISDICTION OF ANY COMPETENT COURT WITHIN THE STATE WHERE THE BUILDING IS LOCATED, (II) SERVICE OF PROCESS BY ANY MEANS AUTHORIZED BY THE LAW OF THE STATE WHERE THE BUILDING IS LOCATED, AND (III) IN THE INTEREST OF SAVING TIME AND EXPENSE, TRIAL WITHOUT A JURY IN ANY ACTION, PROCEEDING OR COUNTERCLAIM BROUGHT BY EITHER OF THE PARTIES HERETO AGAINST THE OTHER OR THEIR SUCCESSORS IN RESPECT OF ANY MATTER ARISING OUT OF OR IN CONNECTION WITH THIS LEASE, THE RELATIONSHIP OF LANDLORD AND TENANT, TENANT'S USE OR OCCUPANCY OF THE PREMISES, AND/OR ANY CLAIM FOR INJURY OR DAMAGE, OR ANY EMERGENCY OR STATUTORY REMEDY. IN THE EVENT LANDLORD COMMENCES ANY SUMMARY PROCEEDINGS OR ACTION FOR NONPAYMENT OF BASE RENT OR

ADDITIONAL RENT, TENANT SHALL NOT INTERPOSE ANY COUNTERCLAIM OF ANY NATURE OR DESCRIPTION (UNLESS SUCH COUNTERCLAIM SHALL BE MANDATORY) IN ANY SUCH PROCEEDING OR ACTION, BUT SHALL BE RELEGATED TO AN INDEPENDENT ACTION AT LAW.

15.19 Reservation. Nothing set forth in this Lease shall be deemed or construed to restrict Landlord from making any repairs, renovations, replacements, improvements and modifications to, or to reconfigure, any of the parking or Common Facilities serving the Property, and Landlord expressly reserves the right to make any such repairs, renovations, replacements, improvements and modifications or reconfigurations to such areas and other facilities of the Building and Common Facilities as Landlord may deem appropriate, including the addition or deletion of temporary or permanent improvements therein, or the conversion of areas now dedicated for the non- exclusive common use of tenants (including Tenant) to the exclusive use of one or more tenants or licensees within the Building. In connection with the foregoing, Landlord may temporarily close or cover entrances, doors, windows, corridors, or other facilities without liability to Tenant; however, in doing so, Landlord shall use commercially reasonable efforts to not unreasonably interfere with or disturb Tenant's use and occupancy of the Premises.

15.20 Prohibited Persons and Transactions. Tenant represents and warrants that neither Tenant nor any of its affiliates, nor any of their respective partners, members, shareholders or other equity owners, and none of their respective employees, officers, directors, representatives or agents is, nor will they become, a person or entity with whom U.S. persons or entities are restricted from doing business under regulations of the Office of Foreign Asset Control ("**OFAC**") of the Department of the Treasury (including those named on OFAC's Specially Designated and Blocked Persons List) or under any statute, executive order (including the September 24, 2001, Executive Order Blocking Property and Prohibiting Transactions with Persons Who Commit, Threaten to Commit, or Support Terrorism), or other governmental action and is not and will not Transfer this Lease to, contract with or otherwise engage in any dealings or transactions or be otherwise associated with such persons or entities.

15.21 Time Is of the Essence. Time is of the essence of each provision of this Lease.

15.22 Multiple Counterparts; Entire Agreement. This Lease may be executed in multiple counterparts, each of which shall be deemed an original and all of which together shall constitute one and the same document. This Lease constitutes the entire agreement between the parties hereto, Landlord's managing agent and their respective affiliates with respect to the subject matter hereof and thereof and supersedes all prior dealings between them with respect to such subject matter, and there are no verbal or collateral understandings, agreements, representations or warranties not expressly set forth in this Lease. No subsequent alteration, amendment, change or addition to this Lease shall be binding upon Landlord or Tenant, unless reduced to writing and signed by the party or parties to be charged therewith.

15.23 Governing Law. This Lease shall be governed by the laws of the state in which the Property is located, without regard to application of any conflict of law principles.

IN WITNESS WHEREOF, Landlord and Tenant have caused this Lease to be duly executed, under seal, by persons hereunto duly authorized, as of the date first set forth above.

LANDLORD:

BRICKMAN 955 MASSACHUSETTS LLC, a Delaware limited liability company

By: */s/ Michael Esquor*

Name: Michael Esquor

Title: Treasurer

TENANT:

X4 PHARMACEUTICALS, INC., a Delaware corporation

By: */s/ Paula Ragan*

Name: Paula Ragan

Title: CEO

Tenant's Federal Taxpayer Identification Number:

EXHIBIT A
Location Plan of Premises

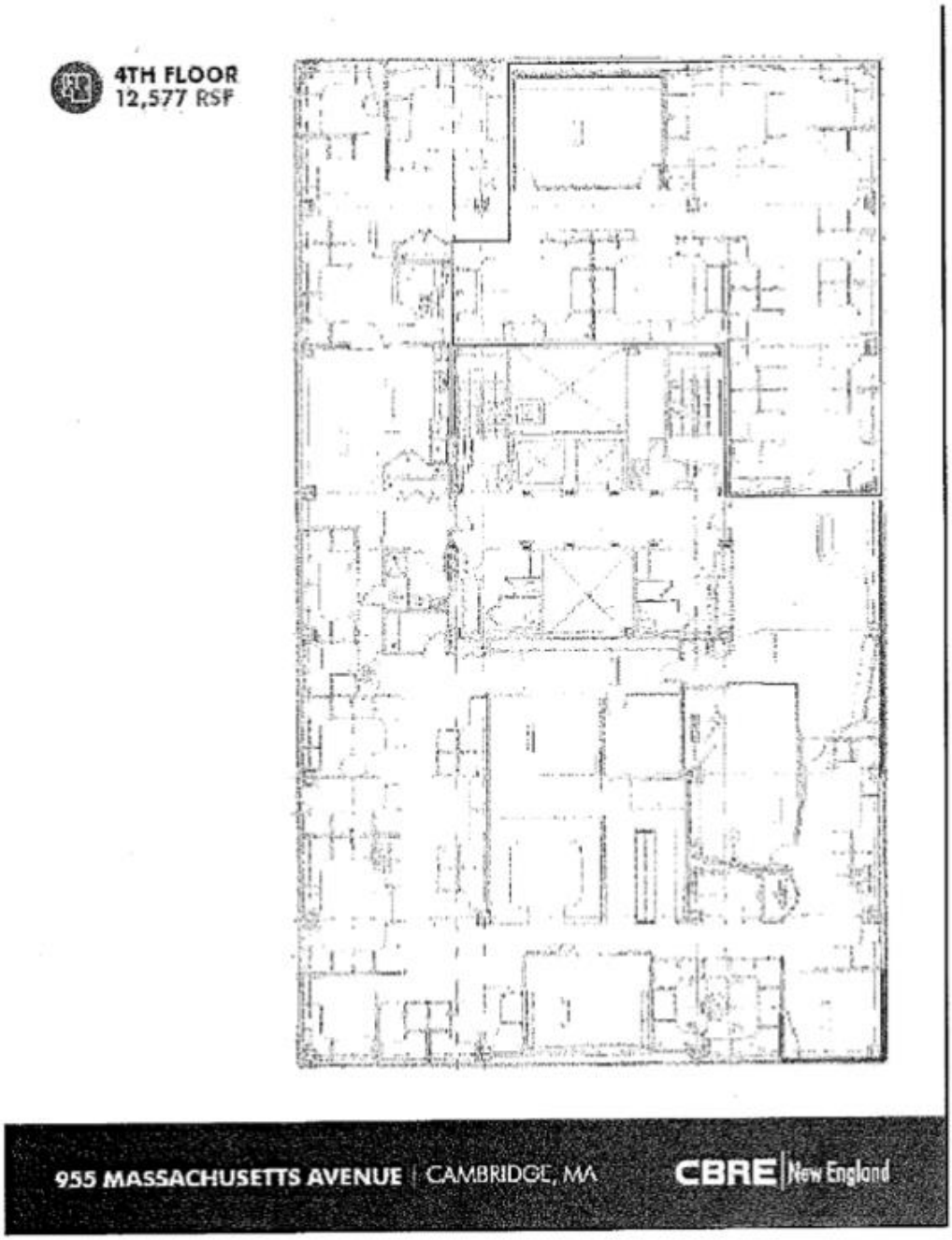

EXHIBIT B

Legal Description

A certain parcel of land in Cambridge, Middlesex County, Massachusetts at and known as 955 Massachusetts Avenue containing approximately 29,400 square feet of land as shown on a plan of land dated April 9, 1970 by John F. Hennessy and /toothed with the Middlesex South District Registry of Deeds in Book 11825, Page 454, as Plan Number 379 of 1970, bounded and described as shown on said plan as follows:

SOUTHWESTERLY	by Massachusetts Avenue, 200 feet;
NORTHWESTERLY	by land of Mary A. Bunyan et al, and by land of Joseph C. Pallotta et ux, 143.58 feet;
NORTHEASTERLY	by land of George and Joseph D. Gordon, Trustees, 200 feet; and
SOUTHEASTERLY	by land of Socony Mobil Oil Co., Inc, 150.50 feet.

EXHIBIT C

Tenant's Work

1. Preparation of Plans. Tenant shall prepare at its sole cost and expense, plans and specifications for the improvements Tenant desires to make in connection with Tenant's occupancy of the Premises (the "**Plans**"). The Plans shall be submitted to Landlord for Landlord's approval (such approval not to be unreasonably withheld or delayed) no later than thirty (30) days from the date hereof, and Landlord shall approve or disapprove of the Plans within ten (10) Business Days after receiving them. Any disapproval by Landlord of the Plans shall be accompanied by a reasonably specific statement of reasons therefor. Tenant shall cause the Plans to be revised in a manner sufficient to remedy Landlord's objections and/or respond to Landlord's concerns and shall resubmit the revised the Plans to Landlord, and Landlord shall either approve or disapprove of the revised Plans within five (5) Business Days following the date of resubmission. If Landlord shall again disapprove of the Plans, Tenant shall again revise such plans and resubmit them to Landlord pursuant to the foregoing procedures until the Plans have been approved by Landlord. The Plans shall be stamped by a Massachusetts-registered architect and engineer, such architect and engineer being subject to Landlord's approval in Landlord's reasonable discretion, and shall comply with all applicable laws, ordinances and regulations (including, without limitation, the applicable requirements of the Americans with Disabilities Act of 1990 and the Massachusetts Architectural Access Board, as amended from time to time, and the regulations promulgated thereunder) and the requirements of the Rules and Regulations and shall be in a form satisfactory to appropriate governmental authorities responsible for issuing permits, approvals and licenses required for construction. Landlord reserves the right to require Tenant to use Landlord's engineer to prepare all engineering plans and drawings for the structural, mechanical, electrical, plumbing, HVAC, life safety, and sprinkler portions of Tenant's Work. Landlord will not approve any alterations or additions that require unusual expense to readapt the Premises to normal office use on expiration or termination of this Lease or increase the cost of insurance on the Building, unless Tenant first gives assurances acceptable to Landlord that such re-adaptation will be made prior to such expiration or termination without expense to Landlord and for payment of any such increased cost. Tenant acknowledges and agrees that any review or approval by Landlord of any plans and/or specifications with respect to Tenant's Work is solely for Landlord's benefit, and without any representation or warranty whatsoever to Tenant with respect to the adequacy, correctness or efficiency thereof or otherwise.

2. Performance of Tenant's Work. Promptly after the Commencement Date, Landlord's approval of the Plans (the "**Approved Plans**") and receipt by Tenant of all required permits and approvals, Tenant shall commence and exercise all reasonable efforts to complete the work specified therein ("**Tenant's Work**"). Subject to and upon all of the terms, provisions, agreements, covenants and conditions contained in this Lease, Tenant shall be entitled to access the Premises beginning on the Commencement Date for the purpose of performing Tenant's Work as provided for in this Lease, installation and testing of telecommunications/data wiring, equipment, furniture, and fixtures and for moving purposes, such access by Tenant prior to the Rent Commencement Date to be subject to all of the terms and conditions of this Lease other than the payment of Basic Rent, and Landlord shall not be responsible for any injury to persons or damage to property resulting from such early access by Tenant.

3. All of Tenant's Work shall be completed in accordance with the Approved Plans and the requirements for alterations and improvements made by or on behalf of Tenant set forth in this Lease and in the Rules and Regulations. Tenant's Work shall be performed by a general contractor approved by Landlord, which approval shall not be unreasonably withheld or delayed, under a written construction contract. The approval by Landlord of Tenant's general contractor shall not impose upon Landlord any responsibility or liability whatsoever to Tenant as a result of, or arising out of, the defaults or other acts or omissions of the general contractor. Prior to commencing Tenant's Work, Tenant shall obtain and provide Landlord with copies of, all state, local and other necessary permits and shall carry such insurance (naming Landlord, Landlord's property manager, any Superior Mortgagee, any Superior Lessor and any other parties reasonably designated by Landlord as additional insureds). In addition, Landlord may monitor the progress of Tenant's Work, including, without limitation, attend any weekly or other periodic job meetings. Tenant shall reimburse Landlord for all actual out of pocket costs incurred by Landlord (and its designees) in connection with reviewing Tenant's Plans and monitoring Tenant's Work (including, without limitation actual reasonable payments made to Landlord's Property Manager) up to an amount equal to two percent (2%) of Landlord's Contribution, which amount may be deducted directly from Landlord's Contribution at Landlord's option. Any review and monitoring of Tenant's Work by Landlord shall not impose upon Landlord any responsibility or liability whatsoever to Tenant as a result of, or arising out of, Tenant's Work. Within forty-five (45) days after completion of any Tenant's Work, Tenant shall provide to Landlord "as-built" plans of the Tenant's Work. Tenant shall provide Landlord with copies of the certificate of occupancy for any Tenant's Work that requires a certificate of occupancy reasonably promptly after completion of such Tenant's Work. Nothing herein shall be construed as permitting Tenant to occupy all or any portion of the Premises for which Tenant has not obtained a certificate of occupancy or otherwise failed to comply with applicable legal requirements.

4. Landlord's Contribution. Landlord shall reimburse Tenant for the hard costs and costs of architectural and engineering services incurred by Tenant with respect to the performance of Tenant's Work (the "**Cost of Tenant's Work**") up to a maximum of $314,425.00 ("**Landlord's Contribution**") provided that a requisition is submitted by Tenant in accordance with the provisions of this Exhibit C on or before the date that is twelve (12) months after the Commencement Date. The Costs of Tenant's Work shall not include costs arising from an Event of Default or from any facts or circumstances that could become an Event of Default, such as legal fees or bonding costs arising in connection with a mechanic's lien placed on the Premises or Tenant's interest therein. Tenant shall be entirely responsible for any excess. Landlord's Contribution shall be payable by Landlord to Tenant (or, at Landlord's election, directly to Tenant's contractor) upon written requisition to Landlord in monthly installments, as provided below, according to reasonable construction disbursement procedures and as Tenant's Work progresses. In any case, prior to payment of any such installment Tenant shall deliver to Landlord a written request, which request shall be given no more frequently than once every thirty (30) days, for such disbursement, which shall be accompanied by: (i) invoices for Tenant's Work covered such requisition; (ii) copies of partial lien waivers or final lien waivers (in the case of a final installment); (iii) a certificate signed by the Tenant's architect certifying that Tenant's Work represented by the aforementioned invoices has been completed substantially in accordance with the Approved Plans; (iv) a certificate of substantial completion and as-built plans for Tenant's Work (in the case of a final installment); and (v) all other information and materials reasonably requested by Landlord. Landlord shall pay each required installment within thirty (30) days of

receiving the materials enumerated in the previous sentence. Each installment by Landlord will be in the amount of Landlord's pro-rata share based on the ratio of Landlord's Contribution to the total Cost of Tenant's Work (as evidenced by reasonably detailed documentation delivered to Landlord with the requisition first submitted by Tenant), less a retainage equal to the greater of the retainage set forth in the construction contract or five percent (5%) of amount due under the construction contract, but in no event shall Landlord be required to pay more than Landlord's Contribution. Landlord shall not be obligated to disburse funds for materials stored off-site. In the event that any amount of Landlord's Contribution remains after reimbursement for the total Costs of Tenant's Work, Tenant may apply up to $62,885.00 from such remaining amount of Landlord's Contribution against the first due amounts of Basic Rent due hereunder.

EXHIBIT D
Commencement Date Letter

_____, 20__

[Name of Contact]
[Name of Tenant]
[Address of Tenant]

RE: [*Name of Tenant]*
[Premises Rentable Area and Floor]
[Address of Building]

Dear *[Name of Contact]*:

Reference is made to that certain Lease, dated as of _____, 20__, between *[Landlord]*, as Landlord and *[Tenant]* as Tenant, with respect to Premises on the ____ floor of the above-referenced building. In accordance with Exhibit C of the Lease, this is to confirm that the Commencement Date of the Term of the Lease occurred on _____, and that the Term of the Lease shall expire on _____.

If the foregoing is in accordance with your understanding, kindly execute the enclosed duplicate of this letter, and return the same to us.

Very truly yours,

[Landlord]

By: _____
Name: _____
Title: _____

Accepted and Agreed:

[Tenant]

By: _____
Name: _____
Title: _____
Date: _____

EXHIBIT E
Operating Expenses

Operating Expenses shall include the following, without limitation:

1. All expenses incurred by Landlord or Landlord's agents which shall be directly related to employment of personnel, including amounts incurred for wages, salaries and other compensation for services, payroll, social security, unemployment and similar taxes, workmen's compensation insurance, disability benefits, pensions, hospitalization, retirement plans and group insurance, uniforms and working clothes and the cleaning thereof, and expenses imposed on Landlord or Landlord's agents pursuant to any collective bargaining agreement for the services of employees of Landlord or Landlord's agents in connection with the operation, repair, maintenance, cleaning, management and protection of the Property, including, without limitation, day and night supervisors, manager, accountants, bookkeepers, janitors, carpenters, engineers, mechanics, electricians and plumbers and personnel engaged in supervision of any of the persons mentioned above; provided that, if any such employee is also employed on other property of Landlord, such compensation shall be suitably prorated among the Property and such other properties.

2. The cost of services, utilities, materials and supplies furnished or used in the operation, repair, maintenance, cleaning, management and protection of the Property.

3. The cost of replacements for tools and other similar equipment used in the repair, maintenance, cleaning and protection of the Property, provided that, in the case of any such equipment used jointly on other property of Landlord, such costs shall be suitably prorated among the Property and such other properties.

4. Where the Property is managed by Landlord or an affiliate of Landlord, management fees at reasonable rates for self-managed buildings consistent with the class of building and the services rendered, which management fees shall not exceed four percent (4%) of gross annual income, whether or not actually paid, or where managed by other than Landlord or an affiliate thereof, the amounts accrued for management, together with, in either case, amounts accrued for legal and other professional fees relating to the Property, but excluding such fees and commissions paid in connection with services rendered for securing or renewing leases and for matters not related to the normal administration and operation of the Property.

5. Premiums for insurance against damage or loss to the Property from such hazards as Landlord shall determine, including, but not by way of limitation, insurance covering loss of rent attributable to any such hazards, and public liability insurance.

6. If, during the Term of this Lease, Landlord shall make a capital expenditure, the total cost of which is not properly includable in Operating Expenses for the Operating Year in which it was made, there shall nevertheless be included in such Operating Expenses for the Operating Year in which it was made and in Operating Expenses for each succeeding Operating Year the annual charge-off of such capital expenditure. Annual charge-off shall be determined by dividing the original capital expenditure plus an interest factor, reasonably determined by Landlord, as being the interest rate then being charged for long-term mortgages by institutional lenders on like properties within the locality in which the Property is located, by the number of years of useful life of the capital expenditure; and the useful life shall be determined reasonably by Landlord in accordance with generally accepted accounting principles and practices in effect at the time of making such expenditure.

7. Costs for electricity, water and sewer use charges, gas and other utilities supplied to the Property and not paid for directly by tenants.

8. Betterment assessments, provided the same are apportioned equally over the longest period permitted by law, and to the extent, if any, not included in Taxes.

9. Amounts paid to independent contractors for services, materials and supplies furnished for the operation, repair, maintenance, cleaning and protection of the Property.

10. Costs for snow removal, planting, landscaping, grounds and parking operation, maintenance and repair expenses.

Notwithstanding anything to the contrary set forth in the Lease, Operating Expenses shall not include the following:

Any cost or expense to the extent to which Landlord is paid or reimbursed (other than as a payment for Operating Expenses), including work or services performed for any tenant (including Tenant) at such tenant's cost or the cost of any item for which Landlord has been paid or reimbursed by insurance, warranties, service contracts, condemnation proceeds or otherwise;

(i) The cost of any work or services performed for any other property other than the Building;

(ii) Marketing costs, including leasing commissions, attorneys' fees, space planning costs, and other costs and expenses incurred in connection with lease, sublease and/or assignment negotiations and transactions with present or prospective tenants or other occupants of the Building;

(iii) Costs associated with the operation of the business of the entity which constitutes Landlord as the same are distinguished from the costs of operation of the Building;

(iv) Taxes;

(v) Costs (including permit, license, and inspection fees) incurred in renovating, improving, decorating, painting or redecorating vacant leasable space or space for tenants;

(vi) Depreciation and amortization on the Building, except as expressly permitted elsewhere in the Lease;

(vii) Overhead and profit paid to subsidiaries or affiliates of Landlord for management or other services on or to the Property or for supplies or other materials, to the extent that the costs of the service, supplies or materials exceed the competitive costs of the services, supplies or materials were they not provided by a subsidiary or affiliate;

(viii) Interest on debt or amortization payments on mortgages or deeds of trust or any other debt for borrowed money;

(ix) Items and services which Tenant is not entitled to receive under this Lease but which a Landlord provides selectively to one or more tenants of the Building other than Tenant or for which Landlord is separately reimbursed;

(x) Costs incurred, in excess of the deductible, in connection with repairs or other work needed to the Building because of fire, windstorm, or other casualty or cause insured against by Landlord; and

(xi) Any costs, fines or penalties incurred because Landlord violated any governmental rule or authority.

EXHIBIT F
Rules and Regulations of Building

The following regulations are generally applicable:

1. The public sidewalks, entrances, passages, courts, elevators, vestibules, stairways, corridors or halls shall not be obstructed or encumbered by Tenant (except as necessary for deliveries) or used for any purpose other than ingress and egress to and from the Premises.

2. No awnings, curtains, blinds, shades, screens or other projections shall be attached to or hung in, or used in connection with, any window of the Premises or any outside wall of the Building. Such awnings, curtains, blinds, shades, screens or other projections must be of a quality, type, design and color, and attached in the manner, approved by Landlord.

3. No show cases or other articles shall be put in front of or affixed to any part of the exterior of the Building, nor, if the Building is occupied by more than one tenant, displayed through interior windows into the atrium of the Building, nor placed in the halls, corridors or vestibules, provided that show cases or articles may be displayed through interior windows into the atrium of the Building (if any) with Landlord's prior written approval, such approval not to be unreasonably withheld or delayed so long as such display does not adversely affect the aesthetic integrity of the Building.

4. The water and wash closets and other plumbing fixtures shall not be used for any purposes other than those for which they were designed and constructed, and no sweepings, rubbish, rags, acids or like substances shall be deposited therein. All damages resulting from any misuse of the fixtures shall be borne by the Tenant.

5. Tenant shall not use the Premises or any part thereof or permit the Premises or any part thereof to be used as a public employment bureau or for the sale of property of any kind at auction, except in connection with Tenant's business.

6. Tenant must, upon the termination of its tenancy, return to the Landlord all locks, cylinders and keys to offices and toilet rooms of the Premises.

7. Landlord reserves the right to exclude from the Building after business hours and at all hours on days other than Business Days all persons connected with or calling upon the Tenant who do not present a pass to the Building signed by the Tenant or who are not escorted in the Building by an employee of Tenant. Tenant shall be responsible for all persons for whom it issues any such pass and shall be liable to the Landlord for all wrongful acts of such persons.

8. The requirements of Tenant will be attended to only upon application at the Building Management Office. Employees of Landlord shall not perform any work or do anything outside of their regular duties, unless under special instructions from the office of the Landlord.

9. There shall not be used in any space in the Building, or in the public halls of the Building, either by Tenant or by jobbers or others, in the delivery or receipt of merchandise, any hand trucks, except those equipped with rubber tires and side guards.

10. No bicycles, vehicles or animals (other than service animals for the disabled) of any kind shall be brought into or kept in or about the Premises.

11. No tenant shall make, or permit to be made, any unseemly or disturbing noises or disturb or interfere with occupants of this or any neighboring building or premises or those having business with them whether by use of any musical instrument, radio, talking machine, unmusical noise, whistling, singing, or in any other way. No tenant shall throw anything out of the doors, windows or skylights or down the passageways.

12. The Premises shall not be used for lodging or sleeping or for any immoral or illegal purpose.

13. No smoking shall be permitted in the Premises or the Building. Smoking shall only be permitted in smoking areas outside of the Building which have been designated by the Landlord.

14. Landlord shall have the right, exercisable without notice and without liability to any tenant, to change the name and street address of the Building.

15. Tenant shall not use the name of the Building for any purpose other than Tenant's business address; Tenant shall not use the name of the Building for Tenant's business address after Tenant vacates the Premises; nor shall Tenant use any picture or likeness of the Building in any circulars, notices, advertisements or correspondence.

16. No article which is explosive or inherently dangerous is allowed in the Building.

17. Tenant shall not represent itself as being associated with any company or corporation by which the Building may be known.

18. Room-to-room canvasses to solicit business from other tenants of the Building are not permitted; Tenant shall not advertise the business, profession or activities of Tenant conducted in the Building in any manner which violates any code of ethics by any recognized association or organization pertaining to such business, profession or activities.

19. Tenant shall not waste electricity, water or air-conditioning and shall cooperate fully with Landlord to assure the most effective and efficient operation of the Building's heating and air-conditioning systems.

20. No locks or similar devices shall be attached to any door except by Landlord and Landlord shall have the right to retain a key to all such locks. Tenant may not install any locks without Landlord's prior approval, which approval shall not be unreasonably withheld.

21. Except with the prior approval of Landlord, all cleaning, repairing, janitorial, decorating, painting or other services and work in and about the Premises shall be done only by authorized Building personnel.

22. To the extent permitted by law, Tenant shall not cause or permit picketing or other activity which would interfere with the business of Landlord or any other tenant or occupant of the Building, or distribution of written materials involving its employees in or about the Building, except in those locations and subject to time and other limitations as to which Landlord may give prior written consent.

23. Tenant shall not cook, otherwise prepare or sell any food or beverages in or from the Premises or use the Premises for housing accommodations or lodging or sleeping purposes except that Tenant may install and maintain vending machines, coffee/beverage stations and food warming equipment and eating facilities for the benefit of its employees or guests, provide the same are maintained in compliance with applicable laws and regulations and do not disturb other tenants in the Building with odor, refuse or pests.

24. Tenant shall not permit the use of any apparatus for sound production or transmission in such manner that the sound so transmitted or produced shall be audible or vibrations therefrom shall be detectable beyond the Premises; nor permit objectionable odors or vapors to emanate from the Premises.

25. No floor covering shall be affixed to any floor in the Premises by means of glue or other adhesive without Landlord's prior written consent not to be unreasonably withheld.

26. Tenant shall only use the freight elevator for mail carts, dollies and other similar devices for delivering material between floors that Tenant may occupy.

27. The rules and regulations set forth in Attachment I to this Exhibit, which is by this reference made a part hereof, are applicable to any Alterations being undertaken by or for Tenant in the Premises pursuant to Section 5.2 of the Lease.

28. Tenants hosting social and/or business functions, events, meetings and the like with outside guests or invitees shall not overload the Premises with more people than allowed by applicable laws. All attendees shall be supervised inside the Premises.

    If the Tenant is serving alcoholic beverages, Tenant shall be required to comply with all applicable legal requirements with respect to such service, including, without limitation, ensuring that any person served is of legal age for consumption. In addition, Tenant shall maintain the broadest available liquor law liability insurance (sometimes also known as "dram shop" insurance) policy or policies with a responsible and qualified insurance company approved by the

Landlord, and with minimum combined limits of at least the minimum limits of liability insurance specified in the lease, plus minimum limits of coverage of at least $3,000,000 under an umbrella policy covering excess “liquor law” liability. Such policies shall name Landlord, Landlord’s managing agent, and any mortgagee as additional insured.

Tenants will be required to provide a Certificate of insurance evidencing sufficient liquor liability coverage to Landlord at least 24 hours in advance of the event:

Should Tenant fail to provide evidence of liquor liability insurance, Landlord may revoke or suspend Tenant’s rights to serve alcoholic beverages in the Premises until such default is cured and may withhold floor access to Tenant’s guests or invitees during the function, event, meeting, etc.

Landlord reserves the right to exclude or expel from the Building any person who, in Landlord’s judgment, is intoxicated, under the influence of liquor or drugs or in violation of any of these Rules and Regulations.

29. Landlord reserves the right to establish, modify, and enforce parking and traffic rules and regulations.

Attachment I to Exhibit F
Rules and Regulations for Tenant Alterations

A. General

1. All Alterations made by Tenant in, to or about the Premises shall be made in accordance with the requirements of this Exhibit and by contractors or mechanics approved by Landlord.

2. Tenant shall, prior to the commencement of any work, submit for Landlord's written approval, complete plans for the Alterations, with full details and specifications for all of the Alterations, in compliance with Section D below.

3. Alterations must comply with the Building Code applicable to the Property and the requirements, rules and regulations and any other governmental agencies having jurisdiction.

4. No work shall be permitted to commence before Tenant obtains and furnishes to Landlord copies of all necessary licenses and permits from all governmental authorities having jurisdiction.

5. All demolition, removals or other categories of work that may inconvenience other tenants or disturb Building operations, must be scheduled and performed before or after normal business hours, and Tenant shall provide Landlord with at least 24 hours' notice prior to proceeding with such work.

6. All inquiries, submissions, approvals and all other matters shall be processed through Landlord's property manager.

7. All work, if performed by a contractor or subcontractor, shall be subject to reasonable supervision and inspection by Landlord's representative. Such supervision and inspection shall be at Tenant's sole expense and Tenant shall pay Landlord's reasonable charges for such supervision and inspection as Additional Rent within thirty (30) days after receiving Landlord's invoice therefor.

B. Prior to Commencement of Work

1. Tenant shall submit to the Building manager a request to perform the work. The request shall include the following enclosures:

(i) A list of Tenant's contractors and/or subcontractors for Landlord's approval.

(ii) Four complete sets of plans and specifications properly stamped by a registered architect or professional engineer.

(iii) A properly executed building permit application form.

(iv) Four executed copies of the Insurance Requirements Agreement in the form attached to this Exhibit as Attachment II and made a part hereof from Tenant's contractor and, if requested by Landlord, from the contractor's subcontractors.

(v) Contractor's and subcontractor's insurance certificates, including an indemnity in accordance with the Insurance Requirements Agreement.

2. Landlord will return the following to Tenant:

(i) Two sets of plans approved or a disapproved with specific comments as to the reasons therefor (such approval or comments shall not constitute a waiver of approval of governmental authorities).

(ii) Two fully executed copies of the Insurance Requirements Agreement.

3. Landlord's approval of the plans, drawings, specifications or other submissions in respect of any Alterations shall create no liability or responsibility on the part of Landlord for their completeness, design sufficiency or compliance with requirements of any applicable laws, rules or regulations of any governmental or quasi-governmental agency, board or authority.

4. Tenant shall obtain a building permit from the Building Department and necessary permits from other governmental agencies. Tenant shall be responsible for keeping current all permits. Tenant shall submit copies of all approved plans and permits to Landlord and shall post the original permit on the Premises prior to the commencement of any work.

C. Requirements and Procedures

1. All structural and floor loading requirements shall be subject to the prior approval of Landlord's structural engineer.

2. All mechanical (HVAC, plumbing and sprinkler) and electrical requirements shall be subject to the approval of Landlord's mechanical and electrical engineers and all mechanical and electrical work shall be performed by contractors who are engaged by Landlord in constructing, operating or maintaining the Building. When necessary, Landlord will require engineering and shop drawings, which drawings must be approved by Landlord before work is started. Drawings are to be prepared by Tenant and all approvals shall be obtained by Tenant.

3. Elevator service for construction work shall be charged to Tenant at standard Building rates. Prior arrangements for elevator use shall be made with Building manager by Tenant. No material or equipment shall be carried under or on top of elevators. If an operating engineer is required by any union regulations, such engineer shall be paid for by Tenant.

4. If shutdown of risers and mains for electrical, HVAC, sprinkler and plumbing work is required, such work shall be supervised by Landlord's representative. No work will be performed in Building mechanical equipment rooms without Landlord's approval and under Landlord's supervision.

5. Tenant's contractor shall:

(i) have a superintendent or foreman on the Premises at all times;

(ii) police the job at all times, continually keeping the Premises orderly;

(iii) maintain cleanliness and protection of all areas, including elevators and lobbies.

(iv) protect the front and top of all peripheral HVAC units and thoroughly clean them at the completion of work;

(v) block off supply and return grills, diffusers and ducts to keep dust from entering into the Building air conditioning system; and

(vi) avoid the disturbance of other tenants.

6. If Tenant's contractor is negligent in any of its responsibilities, Tenant shall be charged for corrective work.

7. All equipment and installations must be equal to the standards generally in effect with respect to the remainder of the Building. Any deviation from such standards will be permitted only if indicated or specified on the plans and specifications and approved by Landlord.

8. A properly executed air balancing report signed by a professional engineer shall be submitted to Landlord upon the completion of all HVAC work.

9. Upon completion of the Alterations, Tenant shall submit to Landlord a permanent certificate of occupancy and final approval by the other governmental agencies having jurisdiction.

10. Tenant shall submit to Landlord a formal "as-built" set of drawings showing all items of the Alterations in full detail.

11. Additional and differing provisions in the Lease, if any, will be applicable and will take precedence.

D. Standards for Plans and Specifications

Whenever Tenant shall be required by the terms of the Lease (including this Exhibit) to submit plans to Landlord in connection with any Alterations, such plans shall include at least the following:

1. Floor plan indicating location of partitions and doors (details required of partition and door types).

2. Location of standard electrical convenience outlets and telephone outlets.

3. Location and details of special electrical outlets; e.g., photocopiers, etc.

4. Reflected ceiling plan showing layout of standard ceiling and lighting fixtures. Partitions to be shown lightly with switches located indicating fixtures to be controlled.

5. Locations and details of special ceiling conditions, lighting fixtures, speakers, etc.

6. Location and specifications of floor covering, paint or paneling with paint colors referenced to standard color system.

7. Finish schedule plan indicating wall covering, paint, or paneling with paint colors referenced to standard color system.

8. Details and specifications of special millwork, glass partitions, rolling doors and grilles, blackboards, shelves, etc.

9. Hardware schedule indicating door number keyed to plan, size, hardware required including butts, latchsets or locksets, closures, stops, and any special items such as thresholds, soundproofing, etc. Keying schedule is required.

10. Verified dimensions of all built-in equipment (file cabinets, lockers, plan files, etc.)

11. Location and weights of storage files.

12. Location of any special soundproofing requirements.

13. Location and details of special floor areas exceeding 50 pounds of live load per square foot.

14. All structural, mechanical, plumbing and electrical drawings, to be prepared by the base building consulting engineers, necessary to complete the Premises in accordance with Tenant’s Plans.

15. All drawings to be uniform size (30” x 46”) and shall incorporate the standard project electrical and plumbing symbols and be at a scale of 1/8” = l’ or larger.

16. All drawings shall be stamped by an architect (or, where applicable, an engineer) licensed in the jurisdiction in which the Property is located and without limiting the foregoing, shall be sufficient in all respects for submission to applicable authorization in connection with a building permit application.

Attachment II to Exhibit F
Contractor's Insurance Requirements

Building:

Landlord:

Tenant:

Premises:

The undersigned contractor or subcontractor ("**Contractor**") has been hired by the tenant named above (hereinafter called "**Tenant**") of the Building named above (or by Tenant's contractor) to perform certain work ("**Work**") for Tenant in the Premises identified above. Contractor and Tenant have requested the landlord named above ("**Landlord**") to grant Contractor access to the Building and its facilities in connection with the performance of the Work, and Landlord agrees to grant such access to Contractor upon and subject to the following terms and conditions:

1. Contractor agrees to indemnify and save harmless Landlord and its respective officers, employees and agents and their affiliates, subsidiaries and partners, and each of them, from and with respect to any claims, demands, suits, liabilities, losses and expenses, including reasonable attorneys' fees, arising out of or in connection with the Work (and/or imposed by law upon any or all of them) because of personal injuries, bodily injury (including death at any time resulting therefrom) and loss of or damage to property, including consequential damages, whether such injuries to person or property are claimed to be due to negligence of the Contractor, Tenant, Landlord or any other party entitled to be indemnified as aforesaid except to the extent specifically prohibited by law (and any such prohibition shall not void this Agreement but shall be applied only to the minimum extent required by law).

2. Contractor shall provide and maintain at its own expense, until completion of the Work, the following insurance:

(a) "Builder's All Risk" insurance in an amount at least equal to 100% of the replacement value of such Alterations.

(b) Workmen's Compensation and Employers Liability Insurance covering each and every workman employed in, about or upon the Work, as provided for in and in the amounts required by each and every statute applicable to Workmen's Compensation and Employers' Liability Insurance.

(c) Commercial General Liability Insurance including coverages for Protective and Contractual Liability (to specifically include coverage for the indemnification clause of this Agreement) for not less than the following limits:

Personal Injury:	$5,000,000 per person $10,000,000 per occurrence
Property Damage:	$3,000,000 per occurrence $3,000,000 general aggregate

(d) Commercial Automobile Liability Insurance (covering all owned, non-owned and/or hired motor vehicles to be used in connection with the Work) for not less than the following limits•

Bodily Injury:	$3,000,000 per person $5,000,000 per occurrence
Property Damage:	$1,000,000 per occurrence $3,000,000 general aggregate

Contractor shall furnish a certificate from its insurance carrier or carriers to the Building office before commencing the Work, showing that it has complied with the above requirements regarding insurance and providing that the insurer will give Landlord ten (10) days' prior written notice of the cancellation of any of the foregoing policies.

3. Contractor shall require all of its subcontractors engaged in the Work to provide the following insurance:

(a) Workmen's Compensation and Employers Liability Insurance covering each and every workman employed in, about or upon the Work, as provided for in and in the amounts required by each and every statute applicable to Workmen's Compensation and Employers' Liability Insurance.

(b) Commercial General Liability Insurance including Protective and Contractual Liability coverages with limits of liability at least equal to the limits stated in paragraph 2(c).

(c) Commercial Automobile Liability Insurance (covering all owned, non owned and/or hired motor vehicles to be used in connection with the Work) with limits of liability at least equal to the limits stated in paragraph 2(d).

Upon the request of Landlord, Contractor shall require all of its subcontractors engaged in the Work to execute an Insurance Requirements agreement in the same form as this Agreement.

Agreed to and executed this day of , 20 .

Contractor:

By: _____

By: _____

By: _____

EXHIBIT G

List of Workstations

66 workstations
65 rolling shelf seats with fabric
65 rolling shelf seats without fabric
1 microwave
1 dishwasher
1 refrigerator
2 standalone server cages (in server room)
1 projector in conference room

EXHIBIT H

FORM ESTOPPEL CERTIFICATE

TENANT: _____
DATE OF LEASE: _____
AMENDED: _____
PREMISES: _____

To: _____

The undersigned hereby certifies as follows:

1. The undersigned is the "Tenant" under the above-referenced Lease, as the same may have been amended, modified or supplemented ("**Lease**") covering the above-referenced Premises ("**Premises**").

2. The Lease constitutes the entire agreement between landlord under the Lease ("Landlord") and Tenant with respect to the Premises and the Lease has not been modified or amended in any respect except as set forth above. A true and accurate copy of the Lease (including all addenda, riders, amendments, modifications and supplements thereto) is attached hereto.

3. The term of the Lease commenced on _____, ____ and, including any presently exercised option or renewal term, will expire on _____, ____. If applicable, the Rent Commencement Date is _____. Tenant has not sublet or assigned its leasehold interest except _____. All improvements to be constructed on the Premises by Landlord have been completed and accepted by Tenant and any tenant improvement allowances have been paid in full except _____.

4. As of this date, there exists no default, beyond applicable notice and cure periods on the part of either Tenant or Landlord.

Tenant is currently obligated to pay annual rental in monthly installments of $_____ per month and monthly installments of annual rental have been paid through _____, ____. The rent payable pursuant to the Lease on account of increases in real estate taxes, insurance, common area maintenance expenses and operating expenses in the amount of $_____ per month has been paid through and including _____. No rent has been paid more than thirty (30) days in advance. Tenant has no claim or defense against Landlord under the Lease and is asserting no offsets or credits against either the rent or Landlord except _____. Tenant has no claim against Landlord for any security or other deposits except $_____ which was paid pursuant to the Lease.

5. Tenant has no charge, lien, claim of set-off or defense against rents or other charges due or to become due under the Lease or otherwise under any of the terms, conditions or covenants contained therein except $_____. Tenant is not entitled to any free rent period or other concessions under the Lease after the date hereof, except as follows:

6. Tenant has no option or preferential right to lease or occupy additional space within the property of which the Premises are a part except $_____. Tenant has no option or preferential right to purchase all or any part of the Premises. Tenant has no option to terminate the Term of the Lease prior to its expiration date except: _____. Tenant has no right to renew or extend the terms of the Lease except _____.

7. Tenant has made no agreements with Landlord or its agent or employees concerning free rent, partial rent, rebate of rental payments or any other type of rental or other concession except as expressly set forth in the Lease.

8. There has not been filed by or against Tenant a petition in bankruptcy, voluntary or otherwise, any assignment for the benefit of creditors, any petition seeking reorganization or arrangement under the bankruptcy laws of the United States, or any state thereof, or any other action brought under said bankruptcy laws with respect to Tenant.

9. Tenant's address for notices is as follows:

_____

_____

_____

This Certificate is made to _____ in connection with the prospective purchase by _____ or its nominee, successors or assigns of the property of which the Premises are a part. This Certificate may be relied on by _____, any other party who acquires an interest in the property of which the Premises are a part in connection with such purchase, and any lender providing financing in connection with the acquisition of the property of which the Premises are a part.

Dated this ____ day of _____, 20__.

[TENANT]

By: _____
Its: _____

EXHIBIT I

ROFO SPACE I

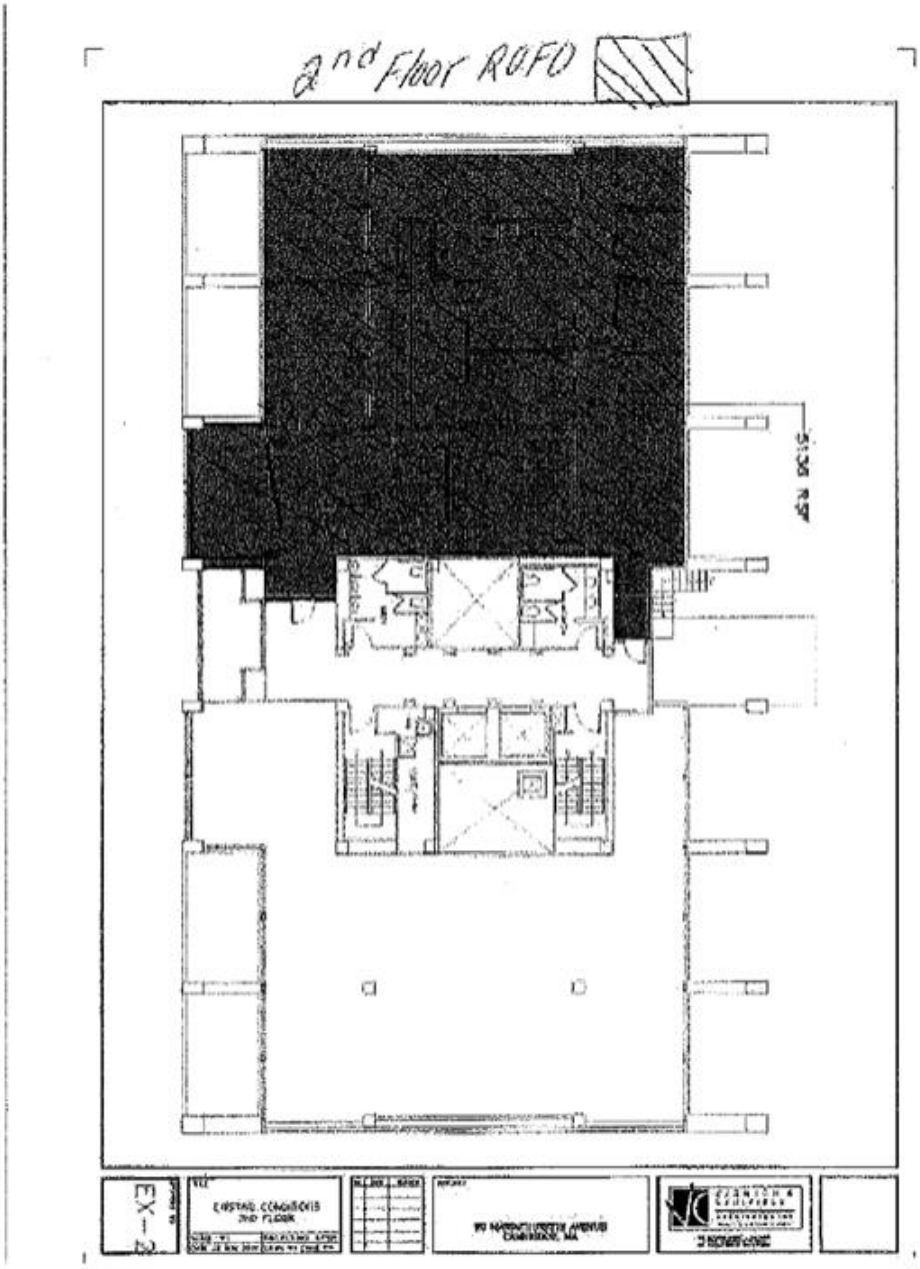

EXHIBIT J

ROFO SPACE II

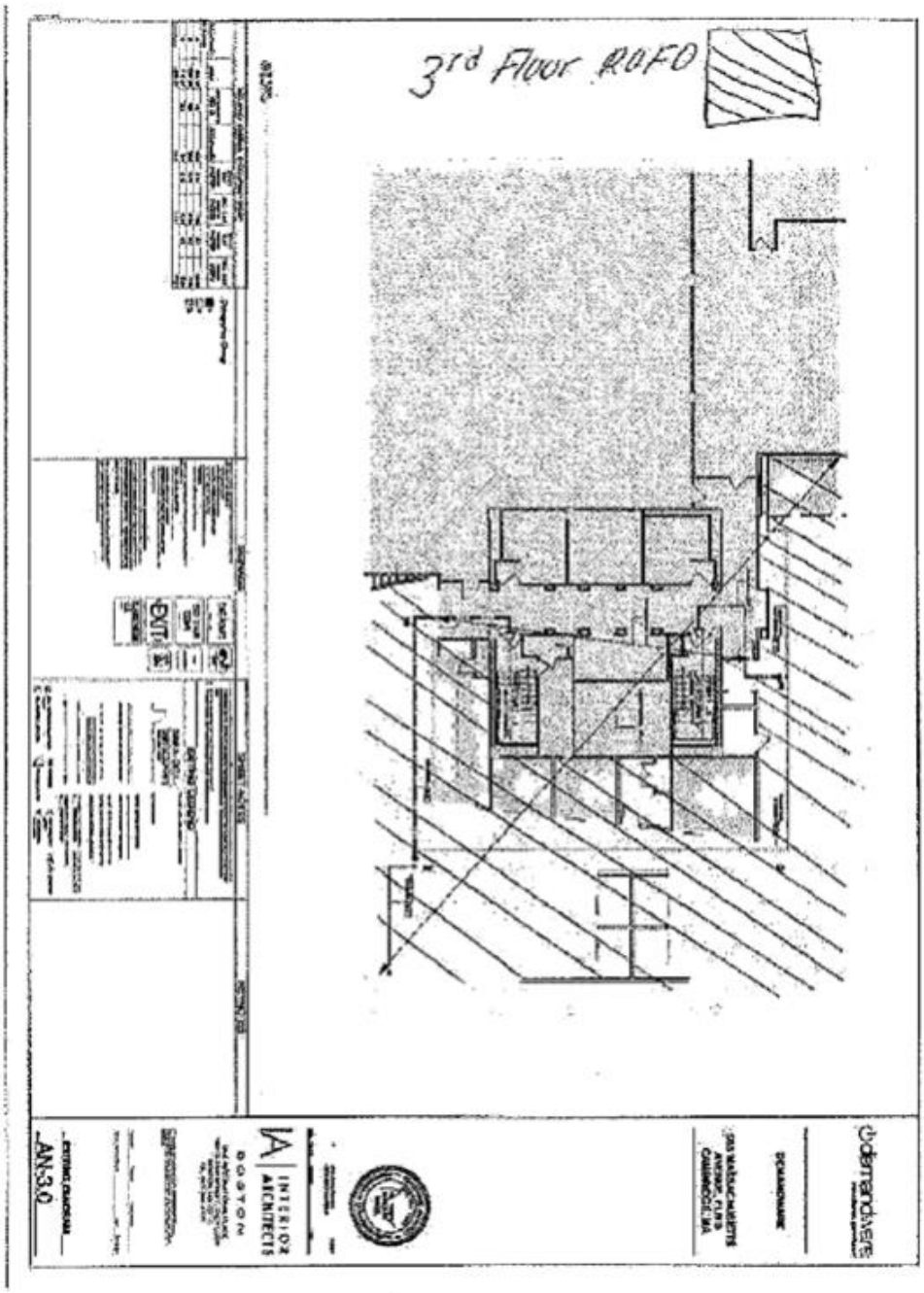

Exhibit 99.1

X4 Pharmaceuticals Completes Merger with Arsanis

- Newly Nasdaq-listed XFOR focused on the development of novel therapeutics for the treatment of rare diseases –

Cambridge, MA – March 13, 2019 – X4 Pharmaceuticals, Inc. (Nasdaq: XFOR, as of March 14, 2019), a clinical-stage biopharmaceutical company focused on the development of novel therapeutics for the treatment of rare diseases, today announced the completion of its merger with Arsanis, Inc. (Nasdaq: ASNS, through March 13, 2019), effective as of March 13, 2019.

“We are very pleased to complete this transformative event that enables us to achieve the next level of corporate growth as we seek to usher in a new generation of therapies for patients with rare genetic diseases and rare cancers. The merger enables us to accelerate our lead program with X4P-001 in WHIM syndrome towards Phase 3 as we evolve into a pre-commercial global corporation,” said Paula Ragan, Ph.D., President and Chief Executive Officer of X4 Pharmaceuticals. “With the acquisition of synergistic R&D capabilities, X4 intends to establish a globally-recognized Center of Research Excellence to build upon our core science and technology, and to create long-term growth for a sustainable global rare disease business.”

The holders of shares of X4 capital stock outstanding immediately prior to the merger received 0.5702 shares of Arsanis common stock in exchange for each share of X4 capital stock in the merger. On March 13, 2019, Arsanis is effecting a six-for-one reverse stock split. As a result of the reverse stock split, every six shares of Arsanis common stock outstanding following the merger, including the shares issued to the holders of shares of X4 capital stock in the merger, will be combined and reclassified into one share of Arsanis common stock. No fractional shares will be issued in connection with the reverse stock split. Instead, cash, based on the average closing price per share of Arsanis common stock on the Nasdaq Global Market on the 10 consecutive trading days prior to March 13, 2019, will be paid in lieu of fractions of shares.

Following the merger and the reverse stock split, the combined organization is expected to have approximately 6.7 million shares outstanding.

In connection with the merger, Arsanis will change its name to X4 Pharmaceuticals, Inc. The combined organization will commence trading on March 14, 2019 on the Nasdaq Capital Market under the symbol “XFOR”.

The combined organization will operate under the leadership of X4’s management team prior to the merger, including Paula Ragan, Ph.D., President and Chief Executive Officer, and Adam S. Mostafa, Chief Financial Officer. The board of directors of the combined organization is comprised of six directors: four directors from the former X4 board, Michael S. Wyzga, Isaac Blech, Gary J. Bridger, Ph.D. and Dr. Ragan, and two directors from the former Arsanis board, David McGirr and René Russo, Pharm.D., BCPS. Mr. Wyzga is the new chairman of the board. The corporate headquarters of the combined organization is located in Cambridge, Massachusetts.

About WHIM Syndrome

WHIM syndrome is a primary immunodeficiency disease caused by genetic mutations in the CXCR4 receptor gene resulting in susceptibility to certain types of infections. WHIM is an abbreviation for the characteristic clinical symptoms of the syndrome: Warts, Hypogammaglobulinemia, Infections, and Myelokathexis. There is no approved therapy for the treatment of WHIM syndrome.

About X4 Pharmaceuticals

X4 Pharmaceuticals is developing novel therapeutics designed to improve immune cell trafficking to treat rare diseases, including primary immunodeficiencies and cancer. X4’s oral small molecule drug candidates antagonize the CXCR4 pathway, which plays a central role in immune surveillance. X4’s most advanced product candidate, X4P-001, is in a Phase 2 clinical trial in patients with WHIM syndrome, a rare genetic, primary immunodeficiency disease, and is currently also under investigation in multiple clinical trials in oncology. X4 expects to begin a Phase 3 trial of X4P-001 in WHIM syndrome in the first half of 2019. X4 was founded and is led by a team with deep product development and commercialization expertise, including several former members of the Genzyme leadership team, and is located in Cambridge, Massachusetts. For more information, visit www.x4pharma.com.

Forward-Looking Statements

This press release contains forward-looking statements that involve substantial risks and uncertainties. All statements, other than statement of historical facts, included in this press release regarding our strategy, future operations, and plans are forward-looking statements. Examples of such statements include, but are not limited to, statements relating to the development, potential benefits and uses of and markets for X4's product candidates, including X4P-001 and anticipated clinical trials, including timing and potential results, the potential benefits of the merger, our evolution into a pre-commercial global corporation, and our intention to establish a Center of Research Excellence and its potential benefits. Actual results or events could differ materially from the plans, intentions, expectations and projections disclosed in the forward-looking statements. Various important factors could cause actual results or events to differ materially from the forward-looking statements that X4 makes, including, but not limited to, the risk that trials and studies may be delayed and may not have satisfactory outcomes, potential adverse effects arising from the testing or use of X4P-001 or other product candidates, the risk that costs required to develop X4P-001 or other product candidates or to expand our operations will be higher than anticipated and other risks described in the "Risk Factors" section of the Registration Statement on Form S-4 filed by Arsanis with the SEC and declared effective by the SEC on February 14, 2019. X4 does not assume any obligation to update any forward-looking statements, except as required by law.

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