UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, DC 20549

FORM 10-Q /A

Amendment No. 1

(Mark One)

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

For the quarterly period ended March 31, 2016

OR

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

For the transition period from_____ to_____

Commission File Number: 001-35966

bluebird bio, Inc.

(Exact Name of Registrant as Specified in Its Charter)

Delaware	**13-3680878**
(State or Other Jurisdiction of Incorporation or Organization)	**(IRS Employer Identification No.)**
150 Second Street **Cambridge, Massachusetts** **(Address of Principal Executive Offices)**	**02141** **(Zip Code)**

(339) 499-9300
(Registrant's Telephone Number, Including Area Code)

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

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes ☒ No ☐

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

Large accelerated filer	☒	Accelerated filer	☐
Non-accelerated filer	☐ (Do not check if a smaller reporting company)	Smaller reporting company	☐

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

As of April 30, 2016, there were 36,943,048 shares of the registrant's Common Stock, par value $0.01 per share, outstanding.

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EXPLANATORY NOTE

This Form 10-Q/A constitutes Amendment No. 1 to the Quarterly Report on Form 10-Q of bluebird bio, Inc. for the period ended March 31, 2016, originally filed with the Securities and Exchange Commission ("SEC") on May 4, 2016 (the "Original Filing"). We are filing this Amendment No. 1 to our Quarterly Report on Form 10-Q solely to provide a revised copy of Exhibits 10.16, 10.17 and 10.18 that was included with the Original Filing in response to SEC comments in connection with our confidential treatment request. This Amendment No. 1 does not change any other portion of the Original Filing. This Amendment No. 1 speaks as of the original filing date of the Original Filing and does not reflect events occurring after the filing date of the Original Filing, or modify or update the disclosures therein in any way other than as required to reflect the amendment described above.

SIGNATURES

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

bluebird bio, Inc.

Date: November 2, 2016

By: /s/ Nick Leschly
Nick Leschly
President, Chief Executive Officer and Director (Principal Executive Officer and Duly Authorized Officer)

Date: November 2, 2016

By: /s/ Jeffrey Walsh
Jeffrey Walsh
Chief Financial and Strategy Officer (Principal Financial Officer and Duly Authorized Officer)

Exhibit Index

Exhibit Number	Exhibit Title	Incorporated by Reference			
		Form	File no.	Exhibit	Filing Date
10.16†	Amended and Restated License Agreement by and between the Registrant and Celgene Corporation, dated February 16, 2016	10Q/A	001-35966	10.16	Filed herewith
10.17†	License Agreement by and between the Registrant and Biogen Idec MA Inc., dated August 13, 2014	10Q/A	001-35966	10.17	Filed herewith
10.18†	Exclusive Patent License Agreement by and between the Registrant and the National Institutes of Health, dated August 31, 2015	10Q/A	001-35966	10.18	Filed herewith
31.1	Certification of Principal Executive Officer pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.	—	—	—	Filed herewith
31.2	Certification of Principal Financial Officer pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.	—	—	—	Filed herewith

† Portions of this exhibit (indicated by asterisks) have been omitted pursuant to a request for confidential treatment and this exhibit has been submitted separately to the SEC.

Execution Copy

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT PURSUANT TO RULE 24B-2 PROMULGATED UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED.

Exhibit 10.16

Amended and Restated License Agreement

by and between

bluebird bio, Inc.

and

Celgene Corporation

and

Celgene European Investment Company LLC

February 16, 2016

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List of Appendices

Amended and Restated License Agreement

This Amended and Restated License Agreement (this "License Agreement"), dated as of February 16, 2016 (the "License Agreement Effective Date"), is made by and between bluebird bio, Inc., a Delaware corporation ("Bluebird"), and Celgene Corporation, a Delaware Corporation ("Celgene Corp"), with respect to all rights and obligations under this License Agreement in the United States (subject to Section 11.18), and Celgene European Investment Company LLC, a Delaware limited liability company, with respect to all rights and obligations under this License Agreement outside of the United States (subject to Section 11.18) ("Celgene Europe" and together with Celgene Corp, "Celgene"). Each of Bluebird and Celgene may be referred to herein as a "Party" or together as the "Parties."

WHEREAS, Bluebird has developed and owns or has rights to certain Patents and technology relating to developing innovative gene therapies for genetic disorders;

WHEREAS, Celgene is a biopharmaceutical company focused on acquiring, Developing and Commercializing innovative anti-cancer agents; and

WHEREAS, Bluebird and Celgene are parties to that certain Master Collaboration Agreement, dated as of March 19, 2013, pursuant to which the Parties entered into a global strategic collaboration to research, develop and commercialize therapeutic products in the Field (the "Original MCA");

WHEREAS, the Parties entered into an Amended and Restated Collaboration Agreement, dated as of June 3, 2015 (the "Master Collaboration Agreement"), pursuant to which the Parties amended and restated the Original MCA in order to continue the research and development of the Product Candidates pursuant to the terms set forth therein;

WHEREAS, pursuant to the terms of the Master Collaboration Agreement, Celgene has exercised its option to select a Product Candidate to be an Optioned Candidate by delivering to Bluebird a Celgene Option Notice and payment of the applicable Initial Option Fee and Additional Option Fee (such Optioned Candidate, as defined more fully in Appendix A, the "Elected Candidate"); and

WHEREAS, the Parties now wish to enter into an exclusive licensing arrangement whereby Celgene will have exclusive rights to Develop Elected Candidate and Commercialize Licensed Product, all on the terms and conditions set forth here.

NOW, THEREFORE, in consideration of the mutual covenants contained herein, and for other good and valuable consideration, the amount and sufficiency of which are hereby acknowledged, the Parties hereby agree as follows:

1. **Definitions.**

The following terms and their correlatives will have the meanings set forth below. Capitalized terms used, but not defined, herein will have the meanings ascribed to such terms in the Master Collaboration Agreement.

1.1 "Applicable Bluebird In-Licenses" means the Applicable Pre-Existing In-Licenses and the Applicable New In-Licenses.

1.2 "Applicable New In-Licenses" means all New In-Licenses of Bluebird or its Affiliates necessary or useful for the research, Development and/or Commercialization of Elected Candidate and Licensed Product that Celgene has elected to list on Appendix B as of the License Agreement Effective Date, plus any other New In-License of Bluebird or its Affiliates that Celgene has elected to include as an Applicable New In-License pursuant to Section 3.2(b).

1.3 "Applicable Pre-Existing In-Licenses" means all Pre-Existing In-Licenses necessary or useful for the research, Development and/or Commercialization of Elected Candidate and Licensed Product, and any extensions or expansions of the scope of such Pre-Existing In-Licenses, including those listed on Appendix C.

1.4 "Biosimilar Product" means, with respect to a Licensed Product in any country, any biosimilar product sold by a Third Party not authorized by or on behalf of Celgene, its Affiliates or Sublicensees, (a) that is a biosimilar biological product, as defined in 21 USC 379j-51 (or any successor or replacement thereof), a similar biological medicinal product, as defined in Annex I to Directive 2001/83/EC (or any successor or replacement thereof), or any similar biosimilar or generic product under the Laws of any country or jurisdiction, or (b) regarding which Regulatory Approval is obtained by referencing Regulatory Data of such Licensed Product.

1.5 "Bluebird In-Licensed IP" means all Patents, Materials and Know-How in-licensed by Bluebird pursuant to Applicable Bluebird In-Licenses, including any extensions or expansions of the scope thereof.

1.6 "Bluebird Technology" means all Bluebird Solely Owned IP and all of Bluebird's right, title and interest in and to Joint IP.

1.7 "Celgene Development & Commercialization Program" means a Development and Commercialization program for Licensed Product in the Field worldwide.

1.8 "Celgene Licensed Product In-License" means any Applicable Celgene In-License or other agreement between Celgene or any of its Affiliates and a Third Party entered into under Section 4.3(d) pursuant to which Celgene or any of its Affiliates in-licenses any Know-How, Materials or Patents that directly relate to or Cover the Elected Candidate and/or Licensed Product or its Manufacture or use.

1.9 "Celgene Licensed Product In-Licensed IP" means any Patents, Materials and Know-How Controlled at any time during the License Agreement Term by Celgene or any of its Affiliates pursuant to a Celgene Licensed Product In-License or Celgene Other In-License that directly relate to or Cover the Elected Candidate and/or Licensed Product or its Manufacture or use.

1.10 "Celgene Licensed Product IP" means (a) Celgene Technology, (b) Collaboration IP solely owned by Celgene and Celgene's interest in jointly owned Collaboration IP, and (c) Patents, Materials or Know-How (to the extent not included in subsection (a) or (b)) owned by Celgene or its Affiliates that are Controlled at any time during the License Agreement Term by Celgene or any of its Affiliates, in each case that directly relate to or Cover the Elected Candidate and/or Licensed Product or its Manufacture or use.

1.11 "Celgene Other In-License" means any agreement between Celgene or any of its Affiliates and a Third Party, other than Applicable Celgene In-Licenses and any agreement between Celgene or any of its Affiliates and a Third Party entered into under Section 4.3(d), pursuant to which Celgene or any of its Affiliates in-licenses any Know-How, Materials or Patents that directly relate to or Cover the Elected Candidate and/or Licensed Product or its Manufacture or use.

1.12 "Celgene Regulatory Rights" means all Regulatory Data, Regulatory Filings and Regulatory Approvals for Elected Candidate and Licensed Product worldwide Controlled by Celgene or any of its Affiliates.

1.13 "Celgene Technology" means all Celgene Solely Owned IP and all of Celgene's right, title and interest in and to Joint IP.

1.14 "Clinical Study" means any human clinical trial of a Product Candidate.

1.15 "Commercialization" means any and all activities directed to the Manufacturing, marketing, detailing, promotion and securing of reimbursement of a product after Regulatory Approval has been obtained (including making, having made, using, importing, selling and offering for sale such product), and will include post-approval clinical studies, post-launch marketing, promoting, detailing, marketing research, distributing, customer service, administering and commercially selling such product, importing, exporting or transporting such product for commercial sale, and all regulatory compliance with respect to the foregoing.

1.16 "Commercially Reasonable Efforts" means, with respect to the Development or Commercialization of Licensed Product by a Party, that level of efforts and resources that such Party would normally devote to the Development or Commercialization, as the case may be, of a product owned by it or to which it has rights of the type it has hereunder, which is of a similar commercial potential at a similar stage in its lifecycle, in each case taking into account issues of safety and efficacy, product profile, the proprietary position, the then current competitive environment for such product and the likely timing of such product's entry into the market, the pricing and launching strategy for the respective product, the regulatory environment and status of such product, and other relevant scientific, technical and commercial factors.

1.17 "Control" or "Controlled" means, with respect to any Know-How, Material, Patent, Regulatory Data, Regulatory Filings and Regulatory Approvals, the possession (whether by ownership or license, other than by a license or sublicense granted pursuant to this License Agreement) by a Party or its Affiliates of the ability to grant to the other Party a license or access as provided herein to such item, without violating the terms of any agreement or other arrangement with any Third Party or, other than under Applicable Bluebird In-Licenses, being obligated to pay any royalties or other consideration therefor ("Additional Payments"). For clarity, Other In-Licenses are not "Controlled" for purposes of this License Agreement, unless and only after such Other In-License is converted into an Applicable New In-License pursuant to Section 3.2(b). Notwithstanding the foregoing, as provided in Section 3.2(a), if on or after the License Agreement Effective Date and for such time as the other Party agrees to pay and does in fact pay all Additional Payments with respect to such Party's access or license to any Know-How, Material, Patent, Regulatory Data, Regulatory Filings and Regulatory Approvals (other than that in-licensed by

Bluebird pursuant to an Other In-License), such Know-How, Material, Patent, Regulatory Data, Regulatory Filings and Regulatory Approvals will be deemed to be included in the definition of "Control".

1.18 "Covers", with reference to (a) a Patent, means that the making, using, selling, offering for sale or importing of a product or practice of a method would infringe a Valid Claim of such Patent in the country in which such activity occurs, and (b) Materials or Know-How, means that the Manufacture, Development or Commercialization of a product incorporates, embodies or otherwise makes use of such Materials or Know-How.

1.19 "EU" means the organization of member states of the European Union as it may be constituted from time to time.

1.20 "EU Regulatory Event" means, with respect to a Licensed Product, the earlier to occur of [***].

1.21 "Field" means the targeting of the Target Antigen by the use of (a) T-cells expressing a CAR (with or without other engineering to enhance functionality and/or safety), including virus specific genetically modified T-cells expressing a synthetic CAR, and (b) T-cells expressing native antigen receptors or engineered antigen receptors in which the T-cells are genetically modified to enhance their performance, persistence or safety, in each case under (a) and (b) for the treatment, modulation, palliation or prevention of cancer in humans.

1.22 "First Commercial Sale" means the first sale for use or consumption of any Licensed Product in a country after all required Regulatory Approvals for commercial sale of such Licensed Product have been obtained in such country.

1.23 "First Indication" means the first disease condition for which a particular Licensed Product has been approved by a Regulatory Authority.

1.24 "GAAP" means U.S. generally accepted accounting principles or International Financial Reporting Standards, consistently applied, as designated and used by the applicable Party.

1.25 "Gene Editing" means homing endonuclease (HE) and megaTAL gene editing technologies, including HE/megaTAL-mediated homology directed recombination and Bluebird's proprietary DARIC cell signaling technology.

1.26 "In-License Payments" means any amounts paid or payable under any Applicable Bluebird In-License that are incurred by Bluebird solely and directly as a result of the grant of a sublicense thereunder under this License Agreement to Celgene, any of Celgene's contract Third Parties under Section 3.5, or any further Sublicensees of Celgene (including of Celgene's Affiliates that are granted sublicenses) under this License Agreement. Any such payments will include [***] but excluding [***].

1.27 "Licensed IP" means all (a) Patents, Materials and Know-How Controlled at any time during the term of this License Agreement by Bluebird or any of its Affiliates (including any applicable Collaboration IP and Bluebird Technology), other than pursuant to an Applicable

Bluebird In-License, and (b) Bluebird In-Licensed IP, in each case to the extent necessary or useful to Develop Elected Candidate and Develop and Commercialize Licensed Product. [***]

1.28 "Licensed Product" means any product that constitutes or incorporates an Elected Candidate (including all modified and improved versions thereof), in all forms, presentations, and formulations (including manner of delivery and dosage). A modified or improved version of an Elected Candidate constituted or incorporated in a product will be deemed a "Modified Licensed Product" for purposes of Section 4.2 if it is Covered by patentable technology Controlled by Bluebird that (a) is first discovered, created, conceived, developed or reduced to practice after the later of (i) the License Agreement Effective Date and (ii) the end of the Collaboration Program Term, (b) requires the submission of a new BLA with respect to such modified or improved Elected Candidate, and (c) materially contributes to the Elected Candidate being approved for a new indication or new patient population. For clarity, "Modified Licensed Products" are Licensed Products hereunder for all purposes other than Section 4.2.

1.29 "Manufacturing" means the production, manufacture, processing, filling, finishing, packaging, labeling, shipping and holding of product or any intermediate thereof, including process development, process qualification and validation, scale-up, commercial manufacture and analytic development, product characterization, stability testing, quality assurance and quality control. With reference to Elected Candidate and Licensed Product, Manufacturing includes Vector and associated Payload supply.

1.30 "Net Sales" means [***].

1.31 "Pivotal Study" means (a) a Phase 3 Study that is intended by Celgene to be submitted (together with any other registration trials that are prospectively planned when such Phase 3 Study is initiated) for Regulatory Approval in the U.S. or the EU, or (b) any other clinical study that is designed to establish that a pharmaceutical product is safe and efficacious for its intended use, and to determine warnings, precautions, and adverse reactions that are associated with such pharmaceutical product in the dosage range to be prescribed, which clinical study is a registration trial intended to be sufficient for filing an application for a Regulatory Approval for the Licensed Product in the U.S. or another country or some or all of an extra-national territory, solely as evidenced by the acceptance for filing for a Regulatory Approval for such product after completion of such study.

1.32 "Regulatory Exclusivity Period" means with respect to a Licensed Product in a country, the period of time during which (a) Celgene or any of its Affiliates or Sublicensees has been granted the exclusive legal right by a Regulatory Authority (or is otherwise entitled to the exclusive legal right by operation of Law) in such country to market and sell the Licensed Product, or (b) the data and information submitted by Celgene or any of its Affiliates or Sublicensees to the relevant Regulatory Authority in such country for purposes of obtaining Regulatory Approval may not be disclosed, referenced or relied upon in any way by such Regulatory Authority (including by relying upon the Regulatory Authority's previous findings regarding the safety or effectiveness of the Licensed Product) to support the Regulatory Approval or marketing of any product by a Third Party in such country.

1.33 "Second Indication" means [***].

1.34 "Selling Party" means Celgene and its Sublicensees (including Celgene's Affiliates that are granted sublicenses pursuant to Section 3.3).

1.35 "Sublicensee" means any person or entity (including Affiliates of Celgene) that is granted a sublicense as permitted by Section 3.3 (or an option to take such a sublicense), either directly by Celgene or indirectly by any other Sublicensee hereunder.

1.36 "Target Antigen" means the antigen designated as B-cell maturation antigen (BCMA)as further set forth on Appendix D, and naturally occurring variants thereof.

1.37 "Valid Claim" means, with respect to a particular country, (a) any claim of an issued and unexpired Patent in such country that (i) has not been held revoked, unenforceable or invalid by a decision of a court or governmental agency of competent jurisdiction, which decision is unappealable or unappealed within the time allowed for appeal and (ii) has not been abandoned, disclaimed, denied or admitted to be invalid or unenforceable through reissue or disclaimer or otherwise in such country, or (b) a claim of a pending Patent application that has not been finally abandoned or finally rejected or expired and which has been pending [***] from the date of filing of the earliest priority Patent application to which such pending Patent application is entitled to claim benefit.

1.38 "Vector Supplies" means supplies of Vectors and associated Payloads Manufactured for incorporation into Elected Candidate and Licensed Product for Development or Commercialization thereof.

Definitions for each of the following terms are found in the body of this License Agreement or the Appendices hereto as indicated below:

Defined Terms	***Location***
Additional IP	Section 3.2(a)
Additional Payments	Section 1.17
Applicable Bluebird In-License	Section 1.1
Applicable New In-License	Section 1.2
Applicable Pre-Existing In-License	Section 1.3
Bankruptcy Code	Section 3.7
Biosimilar Application	Section 7.2(f)
Biosilimar Product	Section 1.4
Biosimilar Product Competition	Section 4.3(e)
Bluebird	Preamble
Bluebird In-Licensed IP	Section 1.5
Bluebird Indemnitees	Section 9.6(a)
Bluebird Technology	Section 1.6
Business Acquisition	Section 3.4(b)
Business Party	Section 3.4(b)
Business Program	Section 3.4(b)
Celgene	Preamble
Celgene Corp	Preamble

Defined Terms	***Location***
Celgene Development & Commercialization Program	Section 1.7
Celgene Europe	Preamble
Celgene Indemnitees	Section 9.6(b)
Celgene Licensed Product In-License	Section 1.8
Celgene Licensed Product In-Licensed IP	Section 1.9
Celgene Licensed Product IP	Section 1.10
Celgene Other In-License	Section 1.11
Celgene Regulatory Rights	Section 1.12
Celgene Technology	Section 1.13
Clinical Study	Section 1.14
Combination Product	Section 1.30
Commercialization	Section 1.15
Commercially Reasonable Efforts	Section 1.16
Competitive Infringement	Section 7.1
Control	Section 1.17
Covers	Section 1.18
Elected Candidate	Appendix A
EU	Section 1.19
EU Regulatory Event	Section 1.20
Field	Section 1.21
First Commercial Sale	Section 1.22
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Fully Burdened Manufacturing Cost	Appendix H
GAAP	Section 1.24
Gene Editing	Section 1.25
In-License Payment	Section 1.26
Indemnification Claim Notice	Section 9.6(c)
Indemnified Party	Section 9.6(c)
Joint IP	Section 5.2
License Agreement	Preamble
License Agreement Effective Date	Preamble
License Agreement Term	Section 10.1
Licensed IP	Section 1.27
Licensed Product	Section 1.28
Litigation Conditions	Section 9.6(d)(i)
Losses	Section 9.6(a)
Major EU Countries	Section 1.20
Manufacturing	Section 1.29
Manufacturing and Supply Agreement	Section 2.4(c)(ii)
Master Collaboration Agreement	Preamble

Defined Terms	***Location***
Milestone Event	Section 4.2
Milestone Payment	Section 4.2
Modified Licensed Product	Section 1.28
Net Sales	Section 1.30
Original MCA	Preamble
Party(ies)	Preamble
Patent Challenge	Section 10.2(b)
PHSA	Section 7.2(f)
Pivotal Study	Section 1.31
Regulatory Exclusivity Period	Section 1.32
Second Indication	Section 1.33
Selling Party	Section 1.34
Solely Owned IP	Section 5.1
Specific Patent	Section 6.3
Sublicensee	Section 1.35
Third Party Claims	Section 9.6(a)
Valid Claim	Section 1.37
Vector Supplies	Section 1.38

2. **Development and Commercialization.**

2.1 Development. As of and after the License Agreement Effective Date, Celgene will assume sole responsibility for, and control of, Developing Elected Candidate and Licensed Product in the Field worldwide, and will establish a Celgene Development & Commercialization Program for that purpose. As of and after the License Agreement Effective Date, Celgene will have sole responsibility for all costs and expenses arising from the Development and Commercialization of Elected Candidate and Licensed Product in the Field worldwide. Notwithstanding the foregoing, if the initial Phase 1 Study with respect to Optioned Candidate has not been completed as of the License Agreement Effective Date, Bluebird will continue to be responsible for the performance of such initial Phase 1 Study under the oversight of the JSC under the Master Collaboration Agreement until completion of such initial Phase 1 Study. In the event Bluebird continues to be responsible for the performance of such initial Phase 1 Study, Bluebird will be responsible for the costs of performing such initial Phase 1 Study on the terms set forth in the Master Collaboration Agreement.

2.2 Regulatory. Subject to the last sentence of Section 2.1, (a) as of and after the License Agreement Effective Date, Celgene will lead and have sole control of all efforts with Regulatory Authorities regarding the Development and Commercialization of Elected Candidate and Licensed Product in the Field worldwide, including taking full responsibility for preparing and filing the relevant Regulatory Filings and seeking Regulatory Approval and (b) promptly following the License Agreement Effective Date, Bluebird will, at Celgene's expense, assign to Celgene all Regulatory Filings with respect to Elected Candidate and Licensed Product. For clarity, in the event Bluebird continues to be responsible for the performance of an initial Phase 1 Study

following the License Agreement Effective Date in accordance with Section 2.1, Bluebird will retain ownership of any Regulatory Filings (including the IND) for Optioned Candidate until completion of such initial Phase 1 Study. In the event of failure to assign such Regulatory Filings to Celgene, Bluebird hereby consents and grants to Celgene the right to access and reference (without any further action required on the part of Bluebird, whose authorization to file this consent with any Regulatory Authority is hereby granted) any such Regulatory Filing.

2.3 Technical Assistance. During the Collaboration Program Term, Bluebird will reasonably cooperate with Celgene to provide all technical assistance, and to transfer to Celgene any additional Know-How licensed to Celgene under Section 3.1, requested by Celgene to facilitate the transfer of Development efforts related to Elected Candidate and Licensed Product. Such cooperation will include providing Celgene with reasonable access by teleconference or in-person at Bluebird's facilities to Bluebird personnel involved in the research and Development of Elected Candidate to provide Celgene with a reasonable level of technical assistance and consultation in connection with the transfer of such Know-How. Following the Collaboration Program Term, Bluebird will reasonably cooperate with Celgene to provide reasonable amounts of technical assistance, including to transfer to Celgene any additional Know-How licensed to Celgene under Section 3.1, with respect to Elected Candidate or Licensed Product as reasonably requested by Celgene with reasonable advance notice to Bluebird. Any dispute with respect to the amount and completeness of the technical assistance and cooperation to be provided by Bluebird under this Section 2.3 will be referred to and finally resolved by binding arbitration by a mutually agreeable, disinterested, conflict-of-interest-free individual not affiliated or consulting with either Party. Any such arbitration will be conducted under the then-current rules of the American Arbitration Association.

2.4 Manufacture and Supply.

(a) *Manufacturing*. Subject to Section (b), Celgene will be solely responsible for, and will bear all the costs and expenses of, Manufacturing and supplying all Elected Candidate and Licensed Product for Development and Commercialization in the Field worldwide and, subject to Section 2.4(c), Celgene will purchase Vector Supply from Bluebird or its designee for such purpose.

(b) *Vector Supply*. Bluebird will have the sole right to Manufacture or have Manufactured Vector Supply, and Celgene will have no rights with respect thereto except as provided in Section 2.4(c)(iv). Except as provided in Section 2.4(c)(iv) or in the Manufacturing and Supply Agreement, neither Celgene nor any Affiliate of Celgene (nor any others on behalf of or under license or sublicense from Celgene or any of its Affiliates) will Manufacture (i) any Vector and associated Payload for Licensed Product or (ii) Licensed Product, except for the Manufacture of Licensed Product using Vector Supply supplied by or on behalf of Bluebird. Except as provided in Section 2.4(c)(iv) or in the Manufacturing and Supply Agreement, Celgene and its Affiliates and Sublicensees will purchase all Vector Supply exclusively from Bluebird or its designee.

(c) *Vector Supply Terms*.

(i) Except as provided otherwise in this Section 2.4(c) or in the Manufacturing and Supply Agreement, Bluebird and its Affiliates will Manufacture, or cause a Third Party to Manufacture, all Vector Supply for all Elected Candidate and Licensed Product required for clinical Development and Commercialization in the Field worldwide, and will have the right to make all necessary decisions regarding arrangements with Third Party manufacturers, provided that Bluebird will reasonably consult with Celgene with respect to all such arrangements and obtain Celgene's prior written consent, which will not be unreasonably withheld, conditioned or delayed. [***]

(ii) The Parties will enter into a "Manufacturing and Supply Agreement," between each other or among the Parties and an Affiliate or a Third Party, covering Vector Supply as soon as reasonably practicable after the License Agreement Effective Date, which agreement will be consistent with and supersede the terms of this Section 2.4(c) and will otherwise be subject in all respects to the terms and conditions of this License Agreement.

(iii) The cost to Celgene of Vector Supply will equal [***] of Bluebird's Fully Burdened Manufacturing Cost for such Manufacture, plus [***], unless otherwise agreed by the Parties in writing.

(iv) The Manufacturing and Supply Agreement will include the terms set forth in Appendix I, including terms permitting Celgene to establish "back-up" and/or "second source" rights for Vector Supply and license grants from Celgene to Bluebird under the Celgene Licensed Product IP and Celgene Licensed Product In-Licensed IP to the extent necessary or useful for Bluebird to Manufacture Vector Supply. [***] Any such arbitration will be conducted under the then-current rules of the American Arbitration Association. Each Party will prepare and submit a written summary of such Party's position with respect to the disputes issues and any relevant evidence in support thereof to the arbitrator within [***] days of selection of the arbitrator. Upon receipt of such summaries from both Parties, the arbitrator(s) will provide copies of the same to the other Party. The arbitrator will be authorized to solicit briefing or other submissions on particular questions. Within [***] days of the delivery of such summaries by the arbitrator, each Party will submit a written rebuttal of the other Party's summary and may also amend and re-submit its original summary. Oral presentations will not be permitted unless otherwise requested by the arbitrator. The arbitrator will make a final decision with respect to the disputed issues within [***] days following receipt of the last of such rebuttal statements submitted by the Parties and [***]. Immediately following such arbitration decision, the Parties will enter into the Manufacturing and Supply Agreement which includes the terms and conditions agreed to by the Parties and such other terms and conditions decided by such arbitrator with respect to the disputed issues.

(v) At Celgene's request, Bluebird will cooperate with Celgene's reasonable requests, at Celgene's cost and expense, to engage in a technology transfer to allow Celgene, in accordance with Section 2.4(c)(iv), to Manufacture Vector Supply (through the first commercial batch of Vector Supply) itself or by through its designated Third Party manufacturer, by transferring all Know-How, Materials, technology and trade secrets Controlled by Bluebird or its

Affiliates that are necessary to Manufacture Vector Supply, thereby enabling Celgene (or such Third Party) to Manufacture the Vector Supply.

(vi) Any purchase of Vector Supply from Bluebird or its designee will expressly not include any license rights to any Know-How or Patents, but instead all licenses (implied, by exhaustion or otherwise) will arise under Section 3.1, if and as applicable.

(vii) For the purpose of this License Agreement, certain words and phrases (and their correlatives) relating to Manufacturing will have the meanings set forth on Appendix I.

2.5 Celgene Diligence. Celgene, directly or through one or more of its Sublicensees, will use Commercially Reasonable Efforts: (a) to Develop Licensed Product in the Field and to obtain Regulatory Approvals therefor; and (b) to Commercialize Licensed Product in the Field after obtaining such Regulatory Approval, in each country worldwide where Commercializing Licensed Product would be warranted by using Commercially Reasonable Efforts.

2.6 Annual Update Meetings. At least once during each consecutive twelve (12)-month period from the License Agreement Effective Date until the earlier of first approval of a BLA for Licensed Product by the FDA or first approval of an MAA for Licensed Product by the EMA, within thirty (30) days of Bluebird's written request, the Parties will meet in person at a U.S. site of Celgene for Celgene to provide Bluebird with an update on the Development of Licensed Product by Celgene and its Sublicensees. During such meeting, Celgene will disclose to Bluebird all material information regarding such Development.

2.7 Reports by Celgene. Celgene will prepare and maintain, and will cause its Sublicensees to prepare and maintain, reasonably complete and accurate records regarding the Development of Elected Candidate and Licensed Product, and Commercialization of Licensed Product worldwide after Regulatory Approval therefor. Celgene will provide to Bluebird a reasonably detailed report regarding such efforts at least once every twelve (12)-month period from the License Agreement Effective Date. Such report will contain sufficient detail to enable Bluebird to assess Celgene's compliance with its Development and Commercialization obligations in Section 2.5, including information with respect to the following: (a) the design, status and results of any animal studies and clinical trials for Licensed Product; (b) any regulatory milestones, and any Regulatory Approvals achieved, for Licensed Product; and (c) activities with respect to selling, promoting, supporting, detailing and marketing of Licensed Product. In addition to the foregoing, Celgene will provide Bluebird with such additional information regarding any such activities as Bluebird may reasonably request from time to time.

2.8 Applicable Bluebird In-Licenses and Other IP.

(a) *Maintenance of Applicable Bluebird In-Licenses*. Bluebird (i) will duly perform and observe all of its obligations under the Applicable Bluebird In-Licenses in all material respects and maintain in full force and effect the Applicable Bluebird In-Licenses, and (ii) will not, without Celgene's prior written consent (such consent not to be unreasonably withheld, conditioned or delayed), (A) amend, modify, restate, cancel, supplement or waive any provision of any Applicable Bluebird In-License, or grant any consent thereunder, or agree to do any of the foregoing, or (B) exercise any right to terminate any Applicable Bluebird In-License in each case ((A) and (B)) that

would reasonably be expected to adversely affect in any respect the rights of Celgene under this License Agreement, provided that Bluebird will provide prior written notice to Celgene of all of the foregoing notwithstanding whether or not any of the foregoing would reasonably be expected to adversely affect in any respect the rights of Celgene under this License Agreement. Bluebird will provide Celgene with written notice as promptly as practicable (and in any event within five (5) business days) after becoming aware of any of the following: (I) any material breach or default by Bluebird or any of its Affiliates of any covenant, agreement or other provision of any Applicable Bluebird In-License, (II) any notice or claim from the counterparty to any Applicable Bluebird In-License terminating or providing notice of termination of any Applicable Bluebird In-License, (III) any notice or claim alleging any breach of default under any Applicable Bluebird In-License, or (IV) the existence of any facts, circumstances or events which alone or together with other facts, circumstances or events could reasonably be expected (with or without the giving of notice or passage of time or both) to give rise to a breach of or default under or right to terminate any Applicable Bluebird In-License. If Bluebird fails to pay any amounts due under any Applicable Bluebird In-License and if such nonpayment would permit the counterparty to such Applicable Bluebird In-License to terminate or suspend the same or any rights thereunder, Celgene will have the right, but not the obligation, in its sole discretion, to pay such amounts on Bluebird's behalf, and any amounts so paid by Celgene may be taken by Celgene as a credit against any amounts payable to Bluebird under this License Agreement.

(b) *Maintenance of Celgene Licensed Product In-Licenses*. Celgene (i) will duly perform and observe all of its obligations under the Celgene Licensed Product In-Licenses in all material respects and maintain in full force and effect the Celgene Licensed Product In-Licenses, and (ii) will not, without Bluebird's prior written consent (such consent not to be unreasonably withheld, conditioned or delayed), [***]. Celgene will provide Bluebird with written notice as promptly as practicable (and in any event within [***]) after becoming aware of any of the following: [***] If Celgene fails to pay any amounts due under any Celgene Licensed Product In-License [***] Bluebird will have the right, but not the obligation, in its sole discretion, to [***]

(c) *Applicable Bluebird In-License Requirements*. Celgene will abide, and will cause all its Affiliates and applicable Sublicensees to abide, by all requirements of each Applicable Bluebird In-License in all material respects (and in any case in all respects in the case that failure to so abide would result in a breach under the Applicable Bluebird In-License), to the extent applicable to Sublicensees thereunder and to the extent disclosed by Bluebird to Celgene, with the understanding that disclosure by Bluebird of any Applicable Bluebird In-License to Celgene will be deemed disclosure of such requirements of such Applicable Bluebird In-License to Celgene. In the event of a termination of any Applicable Bluebird In-License, Bluebird agrees, to the extent requested by Celgene, to reasonably assist Celgene in securing a direct license from the applicable licensor under any Patents, Materials and Know-How that was licensed to Bluebird and sublicensed to Celgene hereunder prior to such termination. In addition, Bluebird agrees, if requested by Celgene, to reasonably assist Celgene in securing a standby license from the applicable licensor under any Patents, Materials and Know-How that are licensed to Bluebird and sublicensed to Celgene.

3. **License Grants.**

3.1 License by Bluebird. Subject to the terms and conditions of this License Agreement, Bluebird hereby grants to Celgene a worldwide, exclusive (even as to Bluebird) license, with the right to sublicense only as permitted by Section 3.4, under Licensed IP, to Develop Elected Candidate and to Develop and Commercialize Licensed Product. Further, (a) the license to Commercialize granted in this Section 3.1 will cover only the sale and offer for sale of Licensed Product in finished form and not the sale or offer for sale of Vectors (other than as and to the extent incorporated in the Licensed Product), and (b) rights to Manufacture Vectors and associated Payloads are included within the scope of the license granted to Celgene under this Section 3.1, which rights are subject to the terms and conditions of Section 2.4(c).

3.2 Additional IP; Other In-Licenses.

(a) *Additional IP*. Except as set forth in Section 3.2(b), Celgene may, on or after the License Agreement Effective Date, elect to include within the scope of the Licensed IP any Know-How, Material, Patent, Regulatory Data, Regulatory Filings or Regulatory Approvals ("Additional IP"), that would be Controlled by Bluebird but for required payments of Additional Payments to a Third Party, by (i) providing notice to Bluebird of same and (ii) agreeing to pay and in fact paying all Additional Payments with respect to Celgene's access or license to such Additional IP. Following Bluebird's receipt of such notice and subject to Celgene's performance of its obligations to pay any Additional Payments with respect to Celgene's access or license to such Additional IP, such Additional IP will be deemed Licensed IP hereunder. For avoidance of doubt, this Section 3.2(a) does not apply to Know-How, Materials, Patents, Regulatory Data, Regulatory Filings or Regulatory Approvals licensed to Bluebird under the Applicable Bluebird In-Licenses, all of which are deemed Controlled by Bluebird notwithstanding this Section 3.2(a).

(b) *Other In-Licenses*. Celgene may, on or after the License Agreement Effective Date, elect to convert any Other In-License to an Applicable New In-License by providing notice to Bluebird of same. Upon Bluebird's receipt of such notice, such Other In-License will be an Applicable New In-License hereunder, Appendix B will automatically be updated to include such New In-License and the provisions of this License Agreement applicable to New In-Licenses, including Section 4.1(b), will apply with respect to such New In-License.

3.3 Sublicensing Rights.

(a) *Transfer*. The licenses granted in Sections 3.1 are transferable only upon a permitted assignment of this License Agreement in accordance with Section 11.12.

(b) *Celgene Sublicenses*. The license granted in Section 3.1 may be sublicensed, in full or in part, by Celgene by a written agreement to its Affiliates and Third Parties (with the right to sublicense through multiple tiers), provided, that as a condition precedent to and requirement of any such sublicense:

(i) Celgene will provide Bluebird with a copy of any sublicense agreement with a non-Affiliated Sublicensee within thirty (30) days of execution thereof, and to the extent permitted under any Applicable Bluebird In-License, such sublicense agreement may be redacted as necessary to protect commercially sensitive information;

(ii) Celgene will be responsible for any and all obligations of such Sublicensee as if such Sublicensee were "Celgene" hereunder; and

(iii) Any such Sublicensee will agree in writing to be bound by substantially identical obligations as Celgene hereunder with respect to the activities of such Sublicensee hereunder (and not with respect to the activities of any other), including Know-How disclosure obligations Celgene has to Bluebird hereunder with respect to the activities of such Sublicensee hereunder (but excluding payment obligations).

3.4 Exclusivity.

(a) During the License Agreement Term, neither Party nor its Affiliates (nor any others on behalf of or with, or under license (including a covenant not to sue) or sublicense from, such Party or any its Affiliates) will research, Develop, Manufacture or Commercialize any actual or potential products (including Vectors and associated Payloads) to be used in the Field (which, for the purposes of this Section 3.4, will include all indications and will not be limited to cancer) that specifically target the Target Antigen, other than pursuant to this License Agreement (which includes, for avoidance of doubt, research, Development, Manufacture and Commercialization of improved and modified versions of the Licensed Product by Celgene) or any other Development & Commercialization Agreement (which includes, for avoidance of doubt, research, Development, Manufacture and Commercialization of improved and modified versions of the Licensed Product by Celgene).

(b) Notwithstanding Section 3.4(a), if (i) a Business Combination occurs with respect to either Party with a Third Party or (ii) a Party acquires a Third Party (including by a merger or consolidation) so that such Third Party becomes an Affiliate over which the acquiring Party has control (as defined in the definition of Affiliate), or (iii) a Party acquires all or substantially all of the assets of a Third Party (including any subsidiaries or divisions thereof) (each of (i), (ii) and (iii), a "Business Acquisition"; such Party, the "Business Party"), and, in each case, the Third Party (or any of such Third Party's Affiliates or any successors or assigns of such Third Party or such Third Party's Affiliates, other than the Business Party and its Affiliates as of the Business Acquisition) (A) already has, or the acquired assets contain, as applicable, a program that existed prior to, or was planned prior to and is demonstrably to be implemented shortly after, the Business Acquisition or (B) initiates and pursues a new program following such Business Acquisition, in each case that would otherwise violate Section 3.4(a) (a "Business Program"), then such Third Party (or any of such Third Party's Affiliates or any successors or assigns of such Third Party or such Third Party's Affiliates, other than the Business Party and its Affiliates as of the Business Acquisition), as applicable, will be permitted to initiate, pursue and continue such Business Program after such Business Acquisition and such initiation, pursuit and continuation will not constitute a violation of Section 3.4(a); provided however that (I) none of the Licensed IP, or other Patents, Materials or Know-How Controlled by the other Party and, in each case, licensed to the Business Party will be used in the Business Program, and (II) the research or Development activities required under this License Agreement will be conducted separately from any research or Development activities directed to such Business Program, including the maintenance of separate lab notebooks and records (password-protected to the extent kept on a computer network)

and separate personnel working on each of the activities under this License Agreement and the activities covered under such Business Program.

[***]

3.5 Contract Manufacturers. Subject to the terms and conditions of this License Agreement, either Party will have the right to appoint by a written agreement "contract manufacturers", meaning any Third Party or Affiliate of such Party that manufactures Licensed Product (or components therefor, including for Bluebird, Vectors and associated Payloads) for re-sale, but who itself is not a "Sublicensee" hereunder and thereby exercises "have made" rights granted by the other Party hereunder, as well as "contract research organizations" and other providers performing services on Celgene's behalf, none of which will be deemed a "Sublicensee" hereunder. Each Party will be responsible for any such contract manufacturer, contract research organization or service provider hereunder, and further will require any such contract manufacturer, contract research organization or service provider to agree in writing to comply with Sections 3.6 and 8.

3.6 No Implied Rights. No license, sublicense or other right is or will be created or granted hereunder by implication, estoppel or otherwise. Any licenses, sublicenses or rights will be granted only as expressly provided in this License Agreement. Celgene will not practice or otherwise use any Licensed IP other than in accordance with the licenses granted in Section 3.1.

3.7 Section 365(n) of the Bankruptcy Code. All rights and licenses granted pursuant to any section of this License Agreement are, and will be deemed to be, rights and licenses to "intellectual property" (as defined in Section 101(35A) of title 11 of the United States Code and of any similar provisions of applicable Laws under any other jurisdiction (the "Bankruptcy Code")). Bluebird agrees that Celgene, as a licensee of rights and licenses under this License Agreement, will retain and may fully exercise all of its rights and elections under the Bankruptcy Code. The Parties further agree that, in the event of the commencement of a bankruptcy proceeding by or against Bluebird under the Bankruptcy Code or analogous provisions of applicable Law outside the United States, Celgene will be entitled to a complete duplicate of (or complete access to, as appropriate) any intellectual property licensed to Celgene and all embodiments of such intellectual property, which, if not already in Celgene's possession, will be promptly delivered to it (a) upon any such commencement of a bankruptcy proceeding upon Celgene's written request therefor, unless Bluebird elects to continue to perform all of its obligations under this License Agreement or (b) if not delivered under clause (a), following the rejection of this License Agreement by Bluebird in the bankruptcy proceeding upon written request therefor by Celgene.

4. **Payments and Royalties.**

4.1 Applicable Bluebird In-Licenses and Celgene Licensed Product In-Licenses.

(a) *Applicable Pre-Existing In-Licenses*. If any In-License Payment becomes due under any Applicable Pre-Existing In-License during the License Agreement Term, Bluebird will pay same, provided that Celgene will reimburse Bluebird for any such In-License Payment within thirty (30) days of Celgene's receipt of Bluebird's written invoice therefor, which In-License Payment (other than payments that are royalties) will not exceed [***], and subject to Section 6.1.

Any such reimbursement by Celgene to Bluebird (i) is in addition to and not in lieu of the other payments required by this Section 4 and (ii) will not be subject to Section 4.3(d).

(b) *Applicable New In-Licenses*. Celgene may elect to take a sublicense under any New In-License of Bluebird and its Affiliates and upon such election, such New In-License will be an Applicable New In-License hereunder for all purposes. For the purposes of determining the Parties' respective payment obligations, all Applicable New In-Licenses as of and following the License Agreement Effective Date will be listed on Appendix B. If any In-License Payment becomes due under any Applicable New In-License during the License Agreement Term, Bluebird will pay same and, subject to Section 6.1, Celgene will reimburse Bluebird for (i) [***] of such payment that are royalties, which royalties will be subject to Section 4.3(d), and (ii) [***] of such payment that are not royalties, in each case ((i) and (ii)) within thirty (30) days of receipt of Bluebird's written invoice therefor. If Celgene elects to convert an Other In-License to an Applicable New In-License pursuant to Section 3.2(b), Celgene will reimburse Bluebird for [***] of any In-License Payments that became due under such Applicable New In-License during the License Agreement Term to the same extent as if such Applicable New In-License was designated as such as of the License Agreement Effective Date, including with respect to applicable Patent Costs in accordance with Section 6.1, provided that Bluebird provides Celgene with a reasonable accounting of same. If any In-License Payments are royalties due under any Applicable New In-License during the License Agreement Term, such royalties will be subject to Section 4.3(d). To the extent that any grant of a sublicense by Celgene or any Sublicensees under an Applicable New In-License triggers a payment obligation under such Applicable New In-License, Bluebird will pay same and Celgene will reimburse Bluebird for [***] of such payment within thirty (30) days of receipt of Bluebird's written invoice therefor.

(c) *Celgene Licensed Product In-Licenses*. If any payments become due under any Celgene Licensed Product In-License with respect to the Licensed Product, Bluebird will be responsible for [***] of such payments as provided in Section 4.1(e) of the Master Collaboration Agreement, provided that if any such payments are royalties, such royalties will be subject to Section 4.3(d).

4.2 Milestone Payments. Celgene will make milestone payments (each, a "Milestone Payment") to Bluebird upon the occurrence of each of the milestones events (each, a "Milestone Event") as set forth below in this Section 4.2. Each of the Milestone Payments will be payable to Bluebird by Celgene within forty-five (45) days of the achievement of the specified Milestone Event, and such payments when owed or paid will be non-refundable and non-creditable, and not subject to set-off, except as otherwise set forth in Sections 2.8(a), 10.3(c) and 10.6 hereof, and Sections 4.1(e), 4.3 and 10.6 of the Master Collaboration Agreement. Except with respect to Modified Licensed Products, each of the Milestone Payments are payable only once in total under this License Agreement, whether achieved by one or more Licensed Products. Notwithstanding the foregoing, Bluebird will be entitled to receive [***] of the Milestone Payments below, other than the Milestone Payment for the first Milestone Event (*i.e.*, [***].

Milestone Event	***Milestone Payment***
[***]	[***]

Milestone Event	***Milestone Payment***
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]

[***]

4.3 Royalties.

(a) *Rates*. Subject to the remainder of this Section 4.3, Celgene will pay to Bluebird running royalties, on a Licensed Product-by-Licensed Product basis, based on the total aggregate annual Net Sales worldwide by Selling Parties of such Licensed Product in a given calendar year at the following royalty rates:

Annual Worldwide Net Sales of each Licensed Product	***Royalty Rate***
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]

By way of example, in a given calendar year, if the aggregate annual worldwide Net Sales for a Licensed Product is [***], the following royalty payment would be payable for those Net Sales under this Section 4.3(a): [***].

(b) *Royalty Term*. Royalties under Section 4.3(a) will be payable, on a Licensed Product-by-Licensed Product and country-by-country basis, on the Net Sales of any Licensed Product if at least one of the following two (2) conditions apply:

(i) if one or more Valid Claims within any of Patents included within the Licensed IP (including, for clarity, Joint IP) Covers such Licensed Product in such country; or

(ii) on a country-by-country basis, for [***] years from the First Commercial Sale of such Licensed Product in such country, provided that, for the purposes of this Section 4.3(b)(ii), Licensed Products that have achieved Regulatory Approval under different BLAs will be deemed to be separate Licensed Products hereunder, and thus subject to separate [***] year periods on a country-by-country basis.

(c) *Royalty Reduction*. If Licensed Product is royalty-bearing only on account of Section 4.3(b)(ii), then the royalty rates set forth in Section 4.3(a) with respect to Net Sales attributable to Licensed Product will be reduced by [***].

(d) *Third Party Royalty Payments*. If Celgene or its Sublicensee, in its reasonable judgment, is required to obtain a license from any Third Party under any Patent Covering Licensed Product in order to Develop or Commercialize such Licensed Product, and if Celgene (or its

Sublicensee) is required to pay to such Third Party under such license any royalties, and the infringement of such Patent cannot reasonably be avoided by Celgene (or its Sublicensee), or if Celgene (or its Sublicensee) is required by a court of competent jurisdiction to pay royalties or lost profits to such a Third Party (and the infringement of such Patent cannot reasonably be avoided), then the amount of Celgene's royalty obligations under this Section 4.3 will be reduced by [***] of the amount of such royalties paid to such Third Party, provided however, that the royalties payable under Section 4.3(a) will not be reduced in any such event below [***] of the amounts set forth in Section 4.3(a) (but as may be further reduced pursuant to Section 4.3(c) or Section 4.3(e)) for each royalty tier. Any royalties payable under any Applicable Pre-Existing In-Licenses may not be deducted under this Section 4.3(d) from royalties owed to Bluebird. Any royalties payable under any Applicable New In-Licenses and Celgene Licensed Product In-Licenses may be deducted under this Section 4.3(d) from royalties owed to Bluebird. Celgene (or its Sublicensee) will use its commercially reasonable efforts to minimize the amount of any of the foregoing payments owed to Third Parties. Prior to Celgene or its Sublicensee exercising its reasonable judgment under this Section 4.3(d), Celgene will provide Bluebird with written notice of a potential need to obtain any license from Third Parties. The Parties will discuss the best course of action to resolve such potential license requirement(s).

(e) [***]

(f) *Additional Royalty Provisions*. The royalties payable under Section 4.3(a) will be subject to the following:

(i) only one (1) royalty will be payable hereunder with respect to each Licensed Product unit;

(ii) royalties when owed or paid hereunder will, except as provided in Section 4.3(d), be non-refundable and non-creditable and not subject to set-off (except as otherwise provided in Sections 2.8(a), 10.3(c) and 10.6 hereof, Section 17.6 of any Co-Development, Co-Promote and Profit Share Agreement, and Sections 4.1(e), 4.3 and 10.6 of the Master Collaboration Agreement); and

(iii) except as expressly set forth in Sections 4.3(c), 4.3(d) and 4.3(e), no other royalty deductions are permitted hereunder.

4.4 Payment Terms.

(a) *Manner of Payment*. All payments to be made by Celgene hereunder will be made in U.S. dollars by wire transfer to such bank account as Bluebird may designate.

(b) *Reports and Royalty Payments*. For as long as royalties or other payments are due under this Section 4, Celgene will furnish to Bluebird a written report, after the end of each calendar quarter, showing the amount of Net Sales and royalty due under Section 4.3, and any other payments accrued during such calendar quarter, which report will be furnished within [***] of the end of the quarter for Net Sales generated by Celgene and its Affiliates, and within [***] of the end of the quarter for Net Sales generated by Sublicensees. [***]. The reports will include, at a minimum, the following information for the applicable calendar quarter, each listed by country of sale and use: [***].

(c) *Records and Audits*. Celgene will keep, and will cause each of the other Selling Parties, as applicable, to keep, and Bluebird will keep, adequate books and records of accounting for the purpose of calculating all royalties and other amounts payable by either Party to the other Party hereunder and ensuring each Party's compliance hereunder. For the [***] following the end of the calendar year to which each will pertain, such books and records of accounting (including those of the other Selling Parties, as applicable) will be kept at each of their principal place of business. At the request of either Party, the other Party will, and, with respect to Celgene, Celgene will cause each of the other Selling Parties to, permit the requesting Party and its representatives (including an independent auditor), at reasonable times and upon reasonable notice, to examine the books and records maintained pursuant to this Section 4.4(c). Such examinations may not [***]. Except as provided below, the cost of this examination will be borne by [***]. Unless disputed as described below, if such audit concludes that additional payments were owed or that excess payments were made during such period, [***]. In the event of a dispute regarding such books and records, [***] Bluebird and Celgene will work in good faith to resolve the disagreement. If the Parties are unable to reach a mutually acceptable resolution of any such dispute within [***] such dispute will be resolved in accordance with [***].

(d) *Currency Exchange*. With respect to Net Sales invoiced in U.S. dollars, the Net Sales and the amounts due to Bluebird hereunder will be expressed in U.S. dollars. With respect to Net Sales invoiced in a currency other than U.S. dollars, payments will be calculated based on [***].

(e) [***]

(f) *Blocked Payments*. In the event that, by reason of applicable Law in any country, it becomes impossible or illegal for Celgene (or any other Selling Party) to transfer, or have transferred on its behalf, payments owed Bluebird hereunder, Celgene will [***].

(g) *Interest Due*. If any payment due to either Party under this License Agreement is overdue (and is not subject to a good faith dispute), then such paying Party will pay interest thereon (before and after any judgment) at an annual rate (but with interest accruing on a daily basis) of [***].

(h) *Mutual Convenience of the Parties*. The royalty and other payment obligations set forth hereunder have been agreed to by the Parties for the purpose of reflecting and advancing their mutual convenience, including the ease of calculating and paying royalties and other amounts to Bluebird.

5. **Ownership and Inventorship of IP.**

5.1 Solely-Owned IP. Subject to Section 5.2, as between the Parties, each Party will own and retain all right, title and interest in and to any and all Know-How and Patents arising therefrom that are discovered, created, conceived, developed or reduced to practice solely by or on behalf of such Party under or in connection with this License Agreement, including as part the Celgene Development & Commercialization Program ("Solely Owned IP"). Subject to the licenses hereunder and the other terms and conditions of this License Agreement, each Party will be solely

responsible for the Prosecution and Maintenance, and the enforcement and defense, of any Patents within its Solely Owned IP, and the other Party will have no rights with respect thereto.

5.2 Joint IP. The Parties will jointly own any and all Know-How and Patents arising therefrom that are discovered, created, conceived, developed or reduced to practice jointly by or on behalf of the Parties, under or in connection with this License Agreement, including as part of the Celgene Development & Commercialization Program ("Joint IP"). Each Party will have an undivided one-half interest in and to Joint IP. Each Party will exercise its ownership rights in and to such Joint IP, including the right to license and sublicense or otherwise to exploit, transfer or encumber its ownership interest, without an accounting or obligation to, or consent required from, the other Party, but subject to the licenses hereunder and the other terms and conditions of this License Agreement, including Section 3.4. At the reasonable written request of a Party, the other Party will in writing grant such consents and confirm that no such accounting is required to effect the foregoing regarding Joint IP. Each Party, for itself and on behalf of its Affiliates, licensees and Sublicensees, and employees, subcontractors, consultants and agents of any of the foregoing, hereby assigns (and to the extent such assignment can only be made in the future hereby agrees to assign), to the other Party a joint and undivided interest in and to all Joint IP. The Prosecution and Maintenance, and the enforcement and defense, of any Patents within Joint IP will be jointly managed by the Parties on mutually agreeable terms to be entered into by the Parties at the time any such Patents are first filed, provided that (a) all recoveries and Patent Costs arising from the enforcement or defense of any Patents within Joint IP, absent further agreement, will be shared by the Parties in accordance with Section 7.2(e) (provided that sufficient advance written notice of any such Patent Costs is given to the Party not incurring same) and (b) Patent Costs incurred in connection with the Prosecution and Maintenance of Patents within Joint IP will be apportioned as set forth in Sections 6.1 and 6.3, provided that in each case ((a) and (b)), if either Party elects not to pay any such Patent Costs for any such Patent, the Parties will meet and agree upon an equitable way to treat such Patent.

5.3 Inventorship. Inventorship determination for all Patents worldwide arising from any Know-How created, conceived or developed by or on behalf of the Parties under or in connection with this License Agreement and thus the ownership thereof will be made in accordance with applicable United States patent Laws.

5.4 Allocation. Notwithstanding Sections 5.1 – 5.3, the Patent Committee may allocate ownership of a particular item of intellectual property to improve the prospects of obtaining patent protection with respect to such item of intellectual property, even if such allocation is not in accordance with the terms of Sections 5.1 – 5.3, so long as the Parties mutually agree to such allocation.

6. **Patent Prosecution and Maintenance.**

6.1 Generally. Subject to Sections 6.2 and 6.3, Bluebird will have the sole right to Prosecute and Maintain Patents within the Licensed IP. Bluebird will use commercially reasonable efforts to, where applicable and upon Celgene's reasonable request, separate parent Patent applications within the Licensed IP into one or more separate Patent applications for Specific Patents, to the extent permitted under applicable Law, where doing so would not reasonably be

expected to materially harm any Patent within the Licensed IP or other Patents owned by Bluebird or its Affiliates, provided that the foregoing limitation will not apply to Licensed IP that is Collaboration IP. Bluebird will be responsible for [***]. Celgene will be responsible for [***] Except for costs associated with [***] during the License Agreement Term Celgene will be responsible for [***].

6.2 Celgene Input. Bluebird will regularly provide Celgene with copies of all applications for Patents within the Licensed IP, and all other material submissions and correspondence with any patent authorities regarding such Patents, in sufficient time to allow for review and comment by Celgene. In addition, Bluebird will provide Celgene and its counsel with an opportunity to consult with Bluebird and its counsel regarding Prosecution and Maintenance of any such Patents in the Field, and Bluebird will consider in good faith all comments timely made by Celgene and its counsel. In the event of any disagreement between any of Bluebird or Celgene, Bluebird will have the final decision-making authority with respect to the matter involved as long as Bluebird acts in good faith.

6.3 Specific Patents. For any Patent within the Licensed IP [***] (each "Specific Patent"), the following will apply: upon Celgene's written request, and provided that Bluebird reasonably agrees with Celgene that the following Prosecution and Maintenance activities would not materially harm any other Patent within the Licensed IP or other Patents owned by Bluebird or its Affiliates (other than Collaboration IP), Celgene will control the Prosecution and Maintenance of the Specific Patents, and notwithstanding anything in Section 6.1 to the contrary, Celgene will be solely responsible for the payment of all related Patent Costs. In addition, Celgene will provide Bluebird and its counsel with an opportunity to consult with Celgene and its counsel regarding Prosecution and Maintenance of any such Specific Patents, and Celgene will include or reflect all reasonable comments timely made by Bluebird and its counsel. Celgene acknowledges and agrees that Bluebird may grant similar rights to other exclusive Third Party licensees under any Patent within the Licensed IP that has claims Covering only a product that is not a Licensed Product (or its manufacture or use) and no other product (or its manufacture or use), other than Specific Patents. If the Parties cannot agree whether or not any Patent within the Licensed IP is a Specific Patent, or if Bluebird claims that the foregoing Prosecution and Maintenance activities would materially harm any other Patent within the Licensed IP or other Patents owned by Bluebird or any of its Affiliates, either of the Parties may refer such dispute to a mutually agreeable, disinterested, conflict-of-interest-free individual not affiliated or consulting with either Party and who has at least fifteen (15) years of patent prosecution experience in the pharmaceutical field. Any such arbitration will be conducted under the then-current rules of the American Arbitration Association, and the decision of the arbitrator will be final.

6.4 Election Not to Prosecute or Maintain or Pay Patent Costs. If Bluebird elects not (a) to Prosecute or Maintain any Patents within the Licensed IP in any particular country before the applicable filing deadline or continue such activities once filed in a particular country, or (b) to pay the Patent Costs associated with Prosecution or Maintenance of any Patents within the Licensed IP, then in each such case Bluebird will so notify Celgene, promptly in writing and in good time to enable Bluebird to meet any deadlines by which an action must be taken to preserve such Patent in such country, if Celgene so requests. Upon receipt of each such notice by Bluebird,

Celgene will have the right, but not the obligation, to notify Bluebird in writing on a timely basis that Celgene will assume control of the Prosecution or Maintenance of such Patent, and bear the Patent Costs thereafter incurred by Celgene with respect thereto. In addition, Celgene will provide Bluebird and its counsel with an opportunity to consult with Celgene and its counsel regarding Prosecution and Maintenance of any such Patents, and Celgene will include or reflect all reasonable comments timely made by Bluebird and its counsel. If after making such election, Celgene elects not to pay the Patent Costs associated with Prosecution or Maintenance of any such Patent, then in each such case Celgene will so notify Bluebird and on the ninetieth (90th) day after Bluebird's receipt of such notice such Patent will no longer be licensed to Celgene hereunder and will no longer be included within the "Licensed IP" hereunder.

6.5 Third Party Rights. To the extent that a Third Party licensor of Bluebird has retained any right to Prosecute or Maintain any Patent within the Licensed IP licensed to Celgene hereunder (including pursuant to an Applicable Bluebird In-License), or otherwise be involved in such activities, Bluebird will use commercially reasonable efforts to cause such Third Party licensor to take the actions specified by this Section 6 (including Sections 6.6 and 6.7) in a manner consistent with the in-license applicable thereto, but Bluebird will not be deemed to be in breach of its obligations under this Section 6 if, after using such commercially reasonable efforts, it is unable to comply with such obligations because of actions taken or not taken by such Third Party licensor.

6.6 Patent Extensions. Subject to the remainder of this Section 6.6, if any election for patent term restoration or extension, supplemental protection certificate or any of their equivalents may be made with respect to any Patent within the Licensed IP, after consultation with Celgene, the Parties will discuss and seek to reach mutual agreement whether or not to take such action. If the Parties are not able to reach mutual agreement, (a) Celgene will have the sole right to make the final decision whether or not to seek such patent term restoration or extension, supplemental protection certificate or any of their equivalents with respect to Specific Patents and Patents within the Collaboration IP licensed to Celgene hereunder and (b) Bluebird will have the sole right to make the final decision whether or not to seek such patent term restoration or extension, supplemental protection certificate or any of their equivalents with respect to all other Patents within the Licensed IP.

6.7 Regulatory Exclusivity Periods. With respect to any Patent listings required for any Regulatory Exclusivity Periods for Product, the Parties will mutually agree on which Patents within the Licensed IP to list, provided that if the Parties are not able to agree, Celgene will have the right to make the final decision, and provided further that the exercise of such right by Celgene will not increase or otherwise change the rights or obligations of the Parties hereunder.

6.8 Cooperation. Each Party will reasonably cooperate with the other Party in the Prosecution and Maintenance of Patents within the Licensed IP. Such cooperation includes promptly executing all documents, or requiring inventors, subcontractors, employees and consultants and agents of Celgene and Bluebird and their respective Affiliates and Sublicensees to execute all documents, as reasonable and appropriate so as to enable the Prosecution and Maintenance of any such Patents in any country.

6.9 Patent Marking. Celgene will mark, and will cause all other Selling Parties to mark, Product with all Patents within the Licensed IP in accordance with applicable Law, which marking obligation will continue for as long as (and only for as long as) required under applicable Law.

6.10 Common Interest Disclosures. With regard to any information or opinions disclosed pursuant to this License Agreement by one Party to the other Party regarding Prosecution and Maintenance of Patent within the Licensed IP, or enforcement of intellectual property and/or technology by or against Third Parties, Bluebird and Celgene agree that they have a common legal interest in determining the ownership, scope, validity and/or enforcement of the Licensed IP, and whether, and to what extent, Third Party intellectual property rights may affect the conduct of the Development and Commercialization of any Licensed Product, and have a further common legal interest in defending against any actual or prospective Third Party claims based on allegations of misuse or infringement of intellectual property rights relating to the Development or Commercialization of any Licensed Product. Accordingly, the Parties agree that all such information and materials obtained by the Parties from each other will be used solely for purposes of the Parties' common legal interests with respect to the conduct of the Agreement. All such information and materials will be treated as protected by the attorney-client privilege, the work product privilege, and any other privilege or immunity that may otherwise be applicable. By sharing any such information and materials, neither Party intends to waive or limit any privilege or immunity that may apply to the shared information and materials. Neither Party will have the authority to waive any privilege or immunity on behalf of the other Party without such other Party's prior written consent, nor will the waiver of privilege or immunity resulting from the conduct of one Party be deemed to apply against any other Party. This Section 6.10 will be subject to any right granted by either Party to any Third Party, provided that the grant of such right to such Third Party does not conflict with the other Party's rights or the first Party's obligations under this License Agreement.

7. **Patent Enforcement and Defense.**

7.1 Notice. Each Party will promptly notify, in writing, the other Party upon learning of any actual or suspected Competitive Infringement of any Patents within the Licensed IP by a Third Party, or of any claim of invalidity, unenforceability, or non-infringement of any Patents within the Licensed IP, and will, along with such notice, supply the other Party with any evidence in its possession pertaining thereto. For purposes of this License Agreement, "Competitive Infringement" means any allegedly infringing activity in the Field (which, for the purposes of this definition, will include all indications and will not be limited to cancer) with respect to a Patent within the Licensed IP, which activity (a) falls within the scope then in effect of the licenses granted by Bluebird to Celgene as set forth in Sections 3.1, (b) is subject to Section 7.2(f), or (c) would be competitive with a Licensed Product and targets the same Target Antigen as such Licensed Product.

7.2 Enforcement and Defense.

(a) *Patents within the Licensed IP and Competitive Infringement.*

(i) As between the Parties, [***] will have the first right, but not the obligation, to seek to abate any Competitive Infringement of the Patents within the Licensed IP by a Third Party,

or to file suit against any such Third Party for such Competitive Infringement. If [***] does not take steps to abate such Competitive Infringement, or file suit to enforce the Patents within the Licensed IP against such Third Party with respect to such Competitive Infringement, within a commercially reasonably time, [***] will have the right (but not the obligation) to take action to enforce the Patents within the Licensed IP against such Third Party for such Competitive Infringement. [***] will pay all its Patent Costs incurred for such enforcement.

(ii) Neither Party will exercise any of its enforcement rights under this Section 7.2(a) without first consulting with the other Party, provided that this consultation requirement will not limit either Party's rights under this Section 7.2(a).

(b) *Defense*. As between the Parties, [***] will have the first right, but not the obligation, to defend against a declaratory judgment action or other action challenging any Patents within the Licensed IP, other than with respect to [***]. If [***] does not take steps to defend within a commercially reasonably time, or elects not to continue any such defense (in which case it will promptly provide notice thereof to [***]), then [***] will have the right (but not the obligation) to defend any such Patent.

(c) *Withdrawal, Cooperation and Participation*. With respect to any infringement or defensive action identified above in this Section 7.2:

[***]

(d) [***]

(e) *Damages*. Unless otherwise agreed by the Parties, all monies recovered upon the final judgment or settlement of any action described in Section 7.2(a) or any action described in Section 7.2(b) will be used first to [***] with the balance of any such recovery to be divided as follows:

(i) To the extent such recovery reflects [***]

(ii) To the extent such recovery reflects [***]

(iii) For the remainder of any such recovery [***]

(f) *Biosimilar Applications.* If either Party receives a copy of an application submitted to the FDA under subsection (k) of Section 351 of the Public Health Service Act ("PHSA") (a "Biosimilar Application") naming Licensed Product as a reference product or otherwise becomes aware that such a Biosimilar Application has been filed (such as in an instance described in Section 351(1)(9)(C) of the PHSA), such Party will, [***].

7.3 Third Party Rights. To the extent that a Third Party licensor of Bluebird has retained any right to (a) defend against a declaratory judgment action or other action challenging any Patents within the Licensed IP, (b) seek to abate any Competitive Infringement of the Patents within the Licensed IP by a Third Party, or (c) take any other actions described in Section 7.2(f) for any Patent within the Licensed IP licensed to Celgene hereunder (including pursuant to an Applicable Bluebird In-License), or otherwise be involved in such activities, Bluebird will use commercially reasonable efforts to cause such Third Party licensor to take the actions specified by

this Section 7.3 in a manner consistent with the in-license applicable thereto, but Bluebird will not be deemed to be in breach of its obligations under this Section 7.3 if, after using such commercially reasonable efforts, it is unable to comply with such obligations because of actions taken or not taken by such Third Party licensor.

8. **Confidentiality.**

The Parties acknowledge and agree that terms of this License Agreement and all Materials, ideas and information of any kind, whether in written, oral, graphical, machine-readable or other form, whether or not marked as confidential or proprietary, which are transferred, disclosed or made available by a Party or at the request of a Party, including any of the foregoing of Third Parties, will be subject to the provisions of Section 10 of the Master Collaboration Agreement. The Parties agree to issue the joint press release on Appendix E promptly following the License Agreement Effective Date. A redacted version of this License Agreement will be agreed to by the Parties and shall be consistent with the corresponding redacted version of this License Agreement in such manner as is provided in Section 8.3 of the Master Collaboration Agreement.

9. **Warranties; Limitations of Liability; Indemnification.**

9.1 Representations and Warranties. Each Party represents and warrants to the other as of the License Agreement Effective Date that it has the legal right and power to enter into this License Agreement, to extend the rights and licenses granted or to be granted to the other in this License Agreement, and to fully perform its obligations hereunder.

9.2 Additional Representations and Warranties of Bluebird. Except as set forth in Schedule 9.2, Bluebird represents and warrants to Celgene that, as of the License Agreement Effective Date:

(a) *Licensed IP*. Appendix F sets forth a complete and accurate list of all Patents included in the Licensed IP, indicating the owner, licensor and/or co-owner(s), if applicable, and, for any Elected Candidate and Licensed Product-relevant subject matter or Materials, if no Patent is specifically licensed, a list of all subject matter or Materials that are included in the Licensed IP, including those licensed under a materials use license or equivalent. Bluebird Controls the Patents listed on Appendix F and the Know-How within the Licensed IP, and is entitled to grant the licenses specified herein. Bluebird has not granted to any Third Party any rights or licenses under such Patents or Know-How within the Licensed IP that would conflict with the licenses granted to Celgene hereunder.

(b) *Third Party Agreements*. The Applicable Bluebird In-Licenses are valid and binding obligations of Bluebird and, to the Knowledge of Bluebird, the applicable licensor, enforceable against Bluebird and, to the Knowledge of Bluebird, the applicable licensor, in accordance with their terms, except as may be limited by general principles of equity (regardless of whether considered in a proceeding at law or in equity) and by applicable bankruptcy, insolvency, moratorium and other similar Laws of general application relating to or affecting creditors' rights generally. Neither Bluebird nor any of its Affiliates has received any notice of any counterparty's intention to terminate any Applicable Bluebird In-License in whole or in part or any notice requesting any amendment, alteration or modification of such Applicable Bluebird In-License or any sublicense or assignment thereunder. There is no breach or default, or event

which upon notice or the passage of time, or both, could give rise to any breach or default, in the performance of any Applicable Bluebird In-License by Bluebird or any of its Affiliates or, to the Knowledge of Bluebird, the counterparty thereto, and Bluebird has not received any notice of any such breach, default or event. Except for the Applicable Bluebird In-Licenses, neither Bluebird nor any of its Affiliates is a party to any license, sublicense or other agreement pursuant to which Bluebird or such Affiliate has received a license or other rights relating to the Elected Candidate or Licensed Product. All Patents and Know-How licensed to Bluebird under the Applicable Bluebird In-Licenses are Controlled by Bluebird for purposes of the licenses granted to Celgene under this License Agreement.

(c) *Patents*. To Bluebird's Knowledge, the Patents listed on Appendix F have been procured or are being procured from the respective patent offices in accordance with applicable Law. None of the Patents included in the Licensed IP is or has been involved in any opposition, cancellation, interference, reissue or reexamination proceeding, and no Licensed IP is the subject of any judicial, administrative or arbitral order, award, decree, injunction, lawsuit, proceeding or stipulation. Neither Bluebird nor any of its Affiliates has received any notice alleging that the Patents in the Licensed IP are invalid or unenforceable, or challenging Bluebird's ownership of or right to use any such rights.

(d) *No Conflicts*. The execution, delivery and performance by Bluebird of this License Agreement and the consummation of the transactions contemplated hereby will not result in any violation of, conflict with, result in a breach of or constitute a default under any understanding, contract or agreement to which Bluebird is a party or by which it is bound. Neither Bluebird 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 its assets, including any intellectual property rights, that would in any way conflict with or impair the scope of any rights or licenses granted to Celgene hereunder.

(e) *Outlicenses.* Appendix G sets forth a complete and accurate list of all agreements relating to the licensing, sublicensing or other granting of rights by Bluebird to any Person with respect to the Licensed IP and the Target Antigen, and Bluebird has provided complete and accurate copies of all such agreements to Celgene. Except for the Applicable Bluebird In-Licenses, Bluebird and its Affiliates are not subject to any payment obligations to Third Parties as a result of the execution or performance of this License Agreement. Neither Bluebird nor any of its Affiliates has granted any liens or security interests on the Licensed IP and the Licensed IP is free and clear of any mortgage, pledge, claim, security interest, covenant, easement, encumbrance, lien or charge of any kind.

(f) *No Proceedings*. There is no action, suit, proceeding or investigation pending or, to the Knowledge of Bluebird, currently threatened in writing against or affecting Bluebird that questions the validity of this License Agreement or the right of Bluebird to enter into this License Agreement or consummate the transactions contemplated hereby.

(g) *No Infringement.* Neither Bluebird nor any of its Affiliates has received any notice of any claim that any Patent, Know-How or other intellectual property Controlled by a Third Party would be infringed or misappropriated by the production, use, research, Development,

Manufacture or Commercialization of the Elected Candidate or Licensed Product pursuant to this License Agreement, and, to the Knowledge of Bluebird, there are no Patents, Know-How or other intellectual property owned by a Third Party and not included in the Licensed IP or In-Licensed IP that are necessary for the production, use, research, Development, Manufacture or Commercialization of Elected Candidate or Licensed Product.

9.3 Disclaimers. Without limiting the respective rights and obligations of the Parties expressly set forth herein, each Party specifically disclaims any guarantee that any Licensed Product will be successful, in whole or in part. EXCEPT AS OTHERWISE EXPRESSLY PROVIDED IN THIS LICENSE AGREEMENT, THE PARTIES MAKE NO REPRESENTATIONS AND EXTEND NO WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO ANY PATENTS, KNOW-HOW, ELECTED CANDIDATE OR LICENSED PRODUCT, INCLUDING WARRANTIES OF VALIDITY OR ENFORCEABILITY OF ANY PATENT RIGHTS, TITLE, QUALITY, MERCHANTABILITY, FITNESS FOR A PARTICULAR USE OR PURPOSE, PERFORMANCE, AND NONINFRINGEMENT OF ANY THIRD PARTY PATENTS OR OTHER INTELLECTUAL PROPERTY RIGHTS.

9.4 [***]

9.5 Performance by Others. The Parties recognize that each Party may perform some or all of its obligations under this License Agreement through Affiliates and permitted subcontractors provided, however, that each Party will remain responsible and liable for the performance by its Affiliates and permitted subcontractors and will cause its Affiliates and permitted subcontractors to comply with the provisions of this License Agreement in connection therewith.

9.6 Indemnification.

(a) *Indemnification by Celgene*. Celgene will indemnify Bluebird, its Affiliates and their respective directors, officers, employees, Third Party licensors and agents, and their respective successors, heirs and assigns (collectively, "Bluebird 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") against the Bluebird Indemnitees arising from or occurring as a result of: (i) the material breach by Celgene of any term of this License Agreement; (ii) any gross negligence or willful misconduct on the part of Celgene in performing its obligations under this License Agreement; or (iii) the Development or Commercialization by or on behalf of Celgene or any of its Affiliates or Sublicensees of Elected Candidate or Licensed Product, except in each case for those Losses for which Bluebird has an obligation to indemnify Celgene pursuant to Section 9.6(b), as to which Losses each Party will indemnify the other to the extent of their respective liability; provided, however, that Celgene will not be obligated to indemnify Bluebird Indemnitees for any Losses to the extent that such Losses arise as a result of gross negligence or willful misconduct on the part of an Bluebird Indemnitee.

(b) *Indemnification by Bluebird*. Bluebird will indemnify Celgene, its Affiliates and their respective directors, officers, employees and agents, and their respective successors, heirs

and assigns (collectively, "Celgene 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 against Celgene Indemnitees arising from or occurring as a result of: (i) the material breach by Bluebird of any term of this License Agreement; (ii) any gross negligence or willful misconduct on the part of Bluebird in performing its obligations under this License Agreement; or (iii) the Development by or on behalf of Bluebird or any of its Affiliates or Sublicensees of Elected Candidate or Licensed Product, except in each case for those Losses for which Celgene has an obligation to indemnify Bluebird pursuant to Section 9.6(a), as to which Losses each Party will indemnify the other to the extent of their respective liability for the Losses; provided, however, that Bluebird will not be obligated to indemnify Celgene Indemnitees for any Losses to the extent that such Losses arise as a result of gross negligence or willful misconduct on the part of a Celgene Indemnitee.

(c) *Notice of Claim*. All indemnification claims provided for in Sections 9.6(a) and 9.6(b) will be made solely by such Party to this License Agreement (the "Indemnified Party"). The Indemnified Party will promptly notify the indemnifying Party (an "Indemnification Claim Notice") of any Losses or the discovery of any fact upon which the Indemnified Party intends to base a request for indemnification under Sections 9.6(a) and 9.6(b), but in no event will 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 estimated amount of such Loss (to the extent that the nature and amount of such Loss is known at such time). The Indemnified Party will furnish promptly to the indemnifying Party copies of all papers and official documents received in respect of any Losses and Third Party Claims.

(d) *Defense, Settlement, Cooperation and Expenses*.

(i) *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 within thirty (30) days after the indemnifying Party's receipt of an Indemnification Claim Notice, provided however that (A) the Third Party Claim solely seeks monetary damages and (B) the indemnifying Party expressly agrees in writing that as between the indemnifying Party and the Indemnified Party, the indemnifying Party will be solely obligated to satisfy and discharge the Third Party Claim in full and is able to reasonably demonstrate that it has sufficient financial resources (the matters described in (A) and (B), the "Litigation Conditions"). The assumption of the defense of a Third Party Claim by the indemnifying Party will not be construed as an acknowledgment that the indemnifying Party is liable to indemnify the Indemnified Party in respect of the Third Party Claim, nor will it constitute a waiver by the indemnifying Party of any defenses it may assert against the Indemnified Party's 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 (the indemnifying Party will consult with the Indemnified Party with respect to a possible conflict of interest of such counsel retained by the indemnifying Party). In the event the indemnifying Party assumes the defense of a Third Party Claim, the Indemnified Party will immediately deliver to the indemnifying Party all original notices and documents (including court papers) received by the Indemnified Party in connection with the Third Party Claim. Should the indemnifying Party assume the defense of a Third Party Claim, except as provided in Section 9.6(d)(ii), the indemnifying Party will not be liable to the

Indemnified Party for any legal costs or expenses subsequently incurred by such Indemnified Party in connection with the analysis, defense or settlement of the Third Party Claim. The Indemnified Party may, at any time, assume the defense of a Third Party Claim if at any time the Litigation Conditions are not satisfied with respect to such Claim. In the event that it is ultimately determined that the indemnifying Party is not obligated to indemnify, defend or hold harmless the Indemnified Party from and against the Third Party Claim, the Indemnified Party will reimburse the indemnifying Party for any and all costs and expenses (including attorneys' fees and costs of suit) and any Third Party Claims incurred by the indemnifying Party in its defense of the Third Party Claim.

(ii) *Right to Participate in Defense*. Without limiting Section 9.6(d)(i), any Indemnified Party will be entitled to participate in, but not control, the defense of such Third Party Claim and to employ counsel of its choice for such purpose; provided, however, that such employment will be at the Indemnified Party's own cost and 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 9.6(d)(i) (in which case the Indemnified Party will control the defense), (C) the interests of the Indemnified Party and the indemnifying Party with respect to such Third Party Claim are sufficiently adverse to prohibit the representation by the same counsel of both Parties under applicable Law, ethical rules or equitable principles, or (D) the indemnifying Party no longer satisfies the Litigation Conditions, in which case the indemnifying Party will assume [***] percent ([***]) of any such costs and expenses of counsel for the Indemnified Party.

(iii) *Settlement*. With respect to any Third Party Claims that relate solely to the payment of money damages in connection with a Third Party Claim and that will not result in the Indemnified Party's becoming subject to injunctive or other relief or otherwise adversely affecting the business of the Indemnified Party in any manner, and as to which the indemnifying Party will have acknowledged in writing the obligation to indemnify the Indemnified Party hereunder, and subject to the Litigation Conditions being satisfied, the indemnifying Party will have the sole right to agree to the entry of any judgment, enter into any settlement or otherwise dispose of such Loss, on such terms as the indemnifying Party, in its sole discretion, will deem appropriate. With respect to all other Losses in connection with Third Party Claims, where the indemnifying Party has assumed the defense of the Third Party Claim in accordance with Section 9.6(d)(i), the indemnifying Party will have authority to agree to the entry of any judgment, enter into any settlement or otherwise dispose of such Loss provided it obtains the prior written consent of the Indemnified Party (such consent not to be unreasonably withheld, delayed or conditioned). The indemnifying Party will not be liable for any settlement or other disposition of a Loss by an Indemnified Party that is reached without the prior written consent of the indemnifying Party. Regardless of whether the indemnifying Party chooses to defend or prosecute any Third Party Claim, no Indemnified Party will admit any liability with respect to or settle, compromise or discharge, any Third Party Claim without the prior written consent of the indemnifying Party, such consent not to be unreasonably withheld, delayed or conditioned.

(iv) *Cooperation*. If the indemnifying Party chooses to defend or prosecute any Third Party Claim, the Indemnified Party will, and will cause each other Indemnified Party to,

cooperate in the defense or prosecution thereof and will 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 will include access during normal business hours afforded to indemnifying Party to, and reasonable retention by the Indemnified Party of, records and information that are reasonably relevant to such Third Party Claim, and making Indemnified Parties and other employees and agents available on a mutually convenient basis to provide additional information and explanation of any material provided hereunder, and the indemnifying Party will reimburse the Indemnified Party for all its reasonable out-of-pocket costs and expenses in connection therewith.

(v) *Costs and Expenses*. Except as provided above in this Section 9.6(d), the costs and expenses, including attorneys' fees and expenses, incurred by the Indemnified Party in connection with any claim will be reimbursed on a calendar quarter basis by the indemnifying Party, without prejudice to the indemnifying Party's right to contest the Indemnified Party's right to indemnification and subject to refund in the event the indemnifying Party is ultimately held not to be obligated to indemnify the Indemnified Party.

9.7 Insurance. Each Party will maintain at its sole cost and expense, an adequate liability insurance or self-insurance program (including product liability insurance) to protect against potential liabilities and risk arising out of activities to be performed under this License Agreement, and any agreement related hereto and upon such terms (including coverages, deductible limits and self-insured retentions) as are customary in the U.S. pharmaceutical industry for the activities to be conducted by such Party under this License Agreement. Subject to the preceding sentence, such liability insurance or self-insurance program will insure against all types of liability, including personal injury, physical injury or property damage arising out of the manufacture, sale, use, distribution or marketing of Licensed Product. The coverage limits set forth herein will not create any limitation on a Party's liability to the other under this License Agreement.

10. **Term and Termination.**

10.1 Term. This License Agreement will commence as of the License Agreement Effective Date and, unless sooner terminated in accordance with the terms hereof or by mutual written consent, will continue on a country-by-country basis, until there are no more payments owed Bluebird on Licensed Product in such country (the longest such period of time for any Licensed Product hereunder, the "License Agreement Term"). Upon there being no more such payments hereunder for any such Licensed Product in such country, the licenses contained in Section 3.1 for such Licensed Product will become fully paid up and will remain exclusive with respect to such Licensed Product in such country.

10.2 Termination by Bluebird.

(a) *Breach*. Bluebird will have the right to terminate this License Agreement in full upon delivery of written notice to Celgene in the event of any material breach by Celgene of any terms and conditions of this License Agreement in a manner that fundamentally frustrates the transactions contemplated by this License Agreement, provided that such termination will not be effective if such breach, has been cured within [***] after written notice thereof is given by Bluebird to Celgene specifying the nature of the alleged breach (or, if such default cannot be cured

within such [***] period, within [***] after such notice if Celgene commences actions to cure such default within such [***] period and thereafter diligently continues such actions, but fails to cure the default by the end of such [***]); provided, however, that to the extent such material breach involves the failure to make a payment when due, such breach must be cured within [***] after written notice thereof is given by Bluebird to Celgene.

(b) *Termination for IP Challenge*. Bluebird will have the right to terminate this License Agreement in full upon written notice to Celgene in the event that Celgene or any of its Affiliates or Sublicensees directly or indirectly challenges in a legal or administrative proceeding the patentability, enforceability or validity of any Patents within the Licensed IP (except as a defense against a claim, action or proceeding asserted by Bluebird against Celgene or its Affiliates or Sublicensees) (a "Patent Challenge"); provided that with respect to any such Patent Challenge by any Sublicensee of Celgene, (i) Bluebird will not have the right to terminate this License Agreement under this Section 10.2(b) if Celgene (A) causes such Patent Challenge to be terminated or dismissed or (B) terminates such Sublicensee's sublicense to the Patents being challenged by the Sublicensee, in each case ((A) and (B)) within [***] Bluebird's notice to Celgene under this Section 10.2(b), and (ii) Bluebird may terminate this License Agreement only with respect to the country or countries in which such Sublicensee has commenced a Patent Challenge unless such country or countries are the United States, France, Germany, Italy, Spain and/or the United Kingdom, in which case Bluebird may terminate this entire License Agreement. In the event Celgene intends to assert a Patent Challenge in any forum, not less than [***] prior to making any such assertion, Celgene will provide to Bluebird a complete written disclosure of each basis known to Celgene for such assertion. Notwithstanding the foregoing, Bluebird's termination right under this Section 10.2(b) will not apply to any Affiliate of Celgene that first becomes an Affiliate of Celgene after the Effective Date of this License Agreement in connection with a Business Combination, where such Affiliate of Celgene was undertaking activities in connection with a Patent Challenge prior to such Business Combination; provided however that Celgene causes such Patent Challenge to terminate within forty-five (45) days after such Business Combination.

10.3 Termination by Celgene.

(a) *Breach*. Celgene will have the right to terminate this License Agreement in full upon delivery of written notice to Bluebird in the event of any material breach by Bluebird of any terms and conditions of this License Agreement in a manner that fundamentally frustrates the transactions contemplated by this License Agreement, provided that such termination will not be effective if such breach has been cured within [***] after written notice thereof is given by Celgene to Bluebird specifying the nature of the alleged breach (or, if such default cannot be cured within such [***] period, within [***] after such notice if Bluebird commences actions to cure such default within such [***] period and thereafter diligently continues such actions, but fails to cure the default by the end of such [***].

(b) *Discretionary Termination*. Beginning with the [***], Celgene will have the right to terminate this License Agreement in full at its discretion for any reason by delivering written notice to Bluebird, such termination to be effective [***] following the date of such notice.

(c) *Alternative to Termination Under Section* 10.3(a). If Celgene has the right to terminate this License Agreement under Section 10.3(a) (including expiration of all applicable cure periods thereunder), in lieu of exercising such termination right, Celgene may elect once by written notice to Bluebird before the end of such applicable cure period to have this License Agreement continue in full force and effect and instead have, starting immediately after the end of such applicable cure period, any future Milestone Payments set forth in Section 4.2 and the royalty rates set forth in the table set forth in Section 4.3(a) be reduced by [***], provided that such reduction will not apply if such future Milestone Payments and royalty rates have already been reduced pursuant to Section 11.4(c) of the Master Collaboration Agreement.

10.4 Effects of Termination. Upon termination (but not expiration pursuant to Section 10.1) of this License Agreement for any reason:

(a) *Wind Down*. Celgene will responsibly wind-down, in accordance with accepted pharmaceutical industry norms and ethical practices, any on-going clinical studies for which it has responsibility hereunder in which patient dosing has commenced or, if reasonably practicable and requested by Bluebird, allow Celgene, its Affiliates or its Sublicensees to complete such trials. Celgene will be responsible for any costs associated with such wind-down. Bluebird will pay all costs incurred by either Party to complete such studies should Bluebird request that such studies be completed.

(b) *Sublicenses*. A termination of this License Agreement will not automatically terminate any sublicense granted by Celgene pursuant to Section 3.3 for Commercialization rights with respect to a non-Affiliated Sublicensee, provided that (i) such Sublicensee is not then (A) in material breach of any provision of this License Agreement or (B) in material breach of the applicable sublicense agreement or otherwise in breach of such sublicense agreement in a manner that would give rise to a right of termination on the part of Celgene, (ii) if Bluebird terminates this License Agreement pursuant to Section 10.2(a) for Celgene's failure to fulfill its payment obligations hereunder, such Sublicensee agrees to and does pay to Bluebird all outstanding amounts that accrued as a result of such Sublicensee's activities under the sublicense, (iii) Bluebird will have the right to step into the role of Celgene as sublicensor under any such sublicense executed after the License Agreement Effective Date, with all the rights that Celgene had under such sublicense, solely with respect to the Licensed IP, prior to termination of this License Agreement (including the right to receive any payments to Celgene by such Sublicensee that accrue from and after the date of the termination of this License Agreement solely with respect to the Licensed IP), (iv) such Sublicensee will pay to Bluebird all amounts that Celgene would have been obligated to pay to Bluebird hereunder with respect to such Sublicensee's activities had this License Agreement not terminated (less any amounts received by Bluebird in clause (iii) above) and (v) the survival of such sublicense will not result in an imposition of any additional obligations on the part of Bluebird that are not included within the scope of this License Agreement. Celgene will include in any sublicense agreement executed after the License Agreement Effective Date that relates solely to the Licensed IP a provision in which said Sublicensee acknowledges its obligations to Bluebird under this Section 10.4(b).

(c) *Cessation of Rights*. Except as otherwise expressly provided in Section 10.4(b), all rights and licenses granted by Bluebird to Celgene in Section 3 will terminate, and Celgene and its Affiliates and Sublicensees will cease all use of Licensed IP and all Development, Manufacture and Commercialization of Elected Candidate and Licensed Product.

(d) *Regulatory Approvals*. To the extent permitted by applicable Law, and subject to Bluebird paying commercially reasonable compensation to Celgene for the assets to be transferred pursuant to this Section 10.4(d) (such compensation to either be mutually agreed to or determined through arbitration as provided in Section 10.4(g) below, and such compensation to be reduced by [***] from what would be commercially reasonable compensation if this License Agreement is terminated by Bluebird pursuant to Section 10.2(a)), all Regulatory Approvals and other regulatory filings and communications owned (in whole or in part) or otherwise Controlled by Celgene and its Affiliates and Sublicensees solely relating to the Elected Candidate and/or Licensed Product, and all other documents solely relating to and necessary to further Develop and Commercialize Elected Candidate and Licensed Product, as such items exist as of the effective date of such termination (including all solely related completed and ongoing clinical studies) will be assigned to Bluebird, and Celgene will provide to Bluebird one (1) copy of the foregoing and all documents contained in or referenced in any such items, together with the raw and summarized data for any clinical studies (and where reasonably available, electronic copies thereof). In the event of failure to obtain assignment, subject to the Parties agreeing on commercially reasonable compensation for the right to access and reference, Celgene hereby consents and grants to Bluebird the right to access and reference (without any further action required on the part of Celgene, whose authorization to file this consent with any Regulatory Authority is hereby granted) any such item.

(e) *Licenses*. Subject to Bluebird paying (i) commercially reasonable compensation to Celgene for the licenses to be granted pursuant to subsection (A) of this Section 10.4(e) (such compensation to either be mutually agreed to or determined through arbitration as provided in Section 10.4(g) below, and such compensation to be reduced by [***] from what would be commercially reasonable compensation if this License Agreement is terminated by Bluebird pursuant to Section 10.2(a)), and (ii) amounts payable to Celgene's applicable licensors as set forth below, Celgene will grant to Bluebird and its Affiliates (A) a worldwide, perpetual and irrevocable, nontransferable (except in connection with a permitted assignment of this License Agreement in accordance with Section 11.12), exclusive license, with the right to grant sublicenses through multiple tiers (subject to Section 3.3(b), *mutatis mutandis*), under the Celgene Licensed Product IP, and (B) an exclusive sublicense under the Celgene Licensed Product In-Licensed IP, in each case ((A) and (B)) to the extent such Celgene Licensed Product IP and Celgene Licensed Product In-Licensed IP are used in or Cover the Licensed Product as of the effective date of termination and to the extent such Celgene Licensed Product IP and Celgene Licensed Product In-Licensed IP exist as of the effective date of such termination (including in each case any additions, divisions, continuations, continuations-in-part, invention certificates, substitutions, reissues, reexaminations, extensions, registrations, supplementary protection certificates and renewals of such Celgene Licensed Product IP and Celgene Licensed Product In-Licensed IP) solely to the extent necessary to research, Develop, Manufacture and Commercialize the Elected Candidate and Licensed Product. With respect to grants of a sublicense under subsection (B) above, Bluebird will be

responsible for all amounts payable to the applicable licensor, excluding maintenance fee payments, payments that are trigged by the grant of a sublicense (but including payments triggered by further grants of sublicenses by Bluebird or its sublicensees) and Patent Costs, that are attributable to Bluebird as a sublicensee thereunder under this License Agreement and Celgene will pay same and Bluebird will reimburse Celgene for [***] of such payments within thirty (30) days of receipt of Celgene's written invoice therefor. Celgene will provide Bluebird with copies of all applicable Celgene Licensed Product In-Licenses promptly following the effective date of the termination of this License Agreement. The Prosecution and Maintenance and enforcement and defense rights and obligations of the Parties with respect to any Patents licensed or sublicensed to Bluebird pursuant to this Section 10.4(e) will be discussed and agreed to by the Parties, with the understanding that such Prosecution and Maintenance and enforcement and defense rights and obligations will be substantially similar to those set forth in Section 6, with the roles of Bluebird and Celgene reversed (and such other changes as are appropriate from the context, and taking into account any rights retained by a Third Party licensor of Celgene to Prosecute and Maintain or enforce and defend any Patent sublicensed to Bluebird under this Section 10.4(e)). Bluebird will abide, and will cause all its Affiliates and applicable sublicensees to abide, by all requirements of each Celgene Licensed Product In-License under which Bluebird is sublicensed under this Section 10.4(e) in all material respects (and in any case in all respects in the case that failure to so abide would result in a breach under the Celgene Licensed Product In-License), to the extent applicable to sublicensees thereunder and to the extent disclosed by Celgene to Bluebird, with the understanding that disclosure by Celgene of any Celgene Licensed Product In-License to Bluebird will be deemed disclosure of such requirements of such Celgene Licensed Product In-License to Bluebird.

(f) *Trademarks*. Subject to Bluebird paying commercially reasonable compensation to Celgene for the license to be granted pursuant to this Section 10.4(f) (such compensation to either be mutually agreed to or determined through arbitration as provided in Section 10.4(g) below, and such compensation to be reduced by [***] from what would be commercially reasonable compensation if this License Agreement is terminated by Bluebird pursuant to Section 10.2(a)), Celgene will exclusively license to Bluebird any registered or unregistered trademarks or internet domain names that are specific to and solely used for the Licensed Product worldwide (it being understood that the foregoing will not include any trademarks or internet domain names that contain the corporate or business name(s) of Celgene).

(g) *Commercially Reasonable Compensation.* If the Parties are unable to agree on the amount of commercially reasonable compensation payable by Bluebird to Celgene pursuant to Sections 10.4(d), 10.4(e) or 10.4(f) within ten (10) days of the effective date of termination of this License Agreement, [***].

(h) *Country Termination*. If this License Agreement is terminated only with respect to a specific country pursuant to Section 10.2(b), the provisions of this Section 10.4 will apply only with respect to such terminated country.

10.5 Survival. In addition to the termination consequences set forth in Section 10.4, the following provisions will survive termination or expiration of this License Agreement: Sections 1,

3.3 (mutatis mutandis with respect to licenses granted to Bluebird under Section 10.4), 3.6, 3.7, 4.4, 5, 8, 9.3, 9.4, 9.6, 9.7, 10.4, 10.5 and 11. Termination or expiration of this License Agreement will not relieve the Parties of any liability or obligation which accrued hereunder prior to the effective date of such termination or expiration nor preclude either Party from pursuing all rights and remedies it may have hereunder or at law or in equity with respect to any breach of this License Agreement nor prejudice either Party's right to obtain performance of any obligation. All other rights and obligations will terminate upon expiration of this License Agreement.

10.6 Right to Set-off. Notwithstanding anything to the contrary in this License Agreement, each Party has the right at all times to retain and set off against all amounts due and owing to the other Party as determined in a final judgment any damages recovered by such Party for any Losses incurred by such Party.

11. **General Provisions.**

11.1 Cumulative Remedies and Irreparable Harm. All rights and remedies of the Parties hereunder will be cumulative and in addition to all other rights and remedies provided hereunder or available by agreement, at law or otherwise. Each Party acknowledges and agrees that breach of any of the terms or conditions of this License Agreement would cause irreparable harm and damage to the other and that such damage may not be ascertainable in money damages and that as a result thereof the non-breaching Party would be entitled to seek from a court equitable or injunctive relief restraining any breach or future violation of the terms contained herein by the breaching Party without the necessity of proving actual damages or posting bond. Such right to equitable relief is in addition to whatever remedies either Party may be entitled to as a matter of law or equity, including money damages.

11.2 Business Combination and IP.

(a) *Bluebird Business Combination*. Notwithstanding anything to the contrary herein, for purposes of this License Agreement, no Know-How, Materials, Patents, Regulatory Data, Regulatory Filings or Regulatory Approvals not Controlled by Bluebird or any of its Affiliates prior to a Business Combination of Bluebird will be Controlled for purposes of this License Agreement after such Business Combination of Bluebird, other than (i) Applicable Bluebird In-Licenses to the extent in effect immediately prior to such Business Combination of Bluebird, (ii) Collaboration IP, and (iii) any Patent that claims priority, directly or indirectly, to any other Patent first Controlled before such Business Combination of Bluebird will be Controlled thereafter no matter when such Patent is filed or issued.

(b) *Celgene Business Combination*. Notwithstanding anything to the contrary herein, for purposes of this License Agreement, no Know-How, Materials, Patents Regulatory Data, Regulatory Filings or Regulatory Approvals not Controlled by Celgene or any of its Affiliates prior to a Business Combination of Celgene will be Controlled for purposes of this License Agreement after such Business Combination of Celgene, other than Collaboration IP, and except that any Patent that claims priority, directly or indirectly, to any other Patent first Controlled before such Business Combination of Celgene will be Controlled thereafter no matter when such Patent is filed or issued.

11.3 Relationship of Parties. Nothing in this License Agreement is intended or will be deemed to constitute a partnership, agency, employer-employee or joint venture relationship between the Parties. No Party will incur any debts or make any commitments for the other, except to the extent, if at all, specifically provided therein. There are no express or implied third party beneficiaries hereunder (except for Bluebird Indemnitees and Celgene Indemnitees for purposes of Section 9.6).

11.4 Compliance with Law. Each Party will perform or cause to be performed any and all of its obligations or the exercise of any and all of its rights hereunder in good scientific manner and in compliance with all applicable Law. Without limiting the foregoing, Bluebird will comply with comply with all applicable Laws and regulations (including U.S. Foreign Corrupt Practices Act and any other applicable anti-bribery or anti-kickback laws or regulations).

11.5 Force Majeure. Neither Party will be liable to the other for failure of or delay in performing obligations set forth in this License Agreement (other than any obligation to pay monies when due), and neither will be deemed in breach of such obligations, if such failure or delay is due to natural disasters or any causes reasonably beyond the control of such Party; provided that the Party affected will promptly notify the other of the force majeure condition and will exert reasonable efforts to eliminate, cure or overcome any such causes and to resume performance of its obligations as soon as possible.

11.6 Governing Law. This License Agreement will be governed by and construed in accordance with the Laws of the State of New York, without respect to its conflict of laws rules, provided that any dispute relating to the scope, validity, enforceability or infringement of any Patents or Know-How will be governed by, and construed and enforced in accordance with, the substantive Laws of the jurisdiction in which such Patents or Know-How apply.

11.7 Counterparts; Facsimiles. This License Agreement may be executed in one or more counterparts, each of which will be deemed an original, and all of which together will be deemed to be one and the same instrument. Facsimile or PDF execution and delivery of this License Agreement by either Party will constitute a legal, valid and binding execution and delivery of this License Agreement by such Party

11.8 Headings. All headings in this License Agreement are for convenience only and will not affect the meaning of any provision hereof.

11.9 Waiver of Rule of Construction. Each Party has had the opportunity to consult with counsel in connection with the review, drafting and negotiation of this License Agreement. Accordingly, the rule of construction that any ambiguity in this License Agreement will be construed against the drafting party will not apply.

11.10 Interpretation. Whenever any provision of this License Agreement uses the term "including" (or "includes"), such term will be deemed to mean "including without limitation" (or "includes without limitations"). "Herein," "hereby," "hereunder," "hereof" and other equivalent words refer to this License Agreement as an entirety and not solely to the particular portion of this License Agreement in which any such word is used. All definitions set forth herein will be deemed applicable whether the words defined are used herein in the singular or the plural. Unless

otherwise provided, all references to Sections and Appendices in this License Agreement are to Sections and Appendices of this License Agreement. References to any Sections include Sections and subsections that are part of the related Section (e.g., a section numbered "Section 2.1" would be part of "Section 2", and references to "Section 2.1" would also refer to material contained in the subsection described as "Section 2.1(a)").

11.11 Binding Effect. This License Agreement will inure to the benefit of and be binding upon the Parties, their Affiliates, and their respective lawful successors and assigns.

11.12 Assignment. This License Agreement may not be assigned by either Party, nor may either Party delegate its obligations or otherwise transfer licenses or other rights created by this License Agreement, except as expressly permitted hereunder or otherwise without the prior written consent of the other Party, which consent will not be unreasonably withheld, delayed or conditioned; provided that without consent (a) Celgene may assign this License Agreement to (i) an Affiliate or (ii) its successor in connection with the merger, consolidation, or sale of all or substantially all of its assets, and (a) Bluebird may assign this License Agreement to (i) an Affiliate or (ii) its successor in connection with the merger, consolidation, or sale of all or substantially all of its assets or that portion of its business pertaining to the subject matter of this License Agreement; provided further that, except in the case where a Party is involved in a merger or consolidation where it is the surviving entity and no assets of such Party that are subject to this License Agreement have been transferred as a result of such merger or consolidation, (A) such assigning Party provides the other Party to this License Agreement with at least thirty (30) business days advance written notice of such assignment(s) and the assigning Party agrees in a written agreement delivered prior to such assignment(s) to the non-assigning Party (and upon which such non-assigning Party may rely) to remain fully liable for the performance of its obligations under this License Agreement by its assignee(s), (B) the assignee(s) agree in a written agreement delivered prior to such assignment(s) to the non-assigning Party (and upon which such non-assigning Party may rely) to assume performance of all such assigned obligations, (C) in the case of any assignment by Bluebird, all Licensed IP licensed to Celgene under this License Agreement will be transferred to such assignee(s) effective as of such assignment(s), (D) all of the matters referred to in clauses (A), (B) and (C), as applicable, will be set forth in documentation reasonably acceptable to the non-assigning Party prior to any such assignment(s) (and with such reasonable acceptance not to be unreasonably withheld, conditioned or delayed) and in all cases will provide the non-assigning Party with the full benefits of its rights under this License Agreement (after taking into account all risks involving applicable counter-party performance and bankruptcy and insolvency risks, including those involving contractual rejection under 11 USC §365) as if no such assignment(s) had occurred, and (E) in the case of any assignment, the assigning Party will reimburse the non-assigning Party for all of the legal fees and expenses incurred by such non-assigning Party in connection with the matters set forth in clause (D) of this sentence in an aggregate amount not to exceed [***], and provided, further, that if Bluebird wishes to assign any Licensed IP to its Affiliates, it will be permitted to do so conditioned on each such Affiliate becoming a party to this License Agreement, in the form of an amendment to this License Agreement executed by Celgene, Bluebird and such Affiliate, pursuant to which such Affiliate would agree to assume all obligations hereunder, and grant to Celgene all rights hereunder, with

respect to the Licensed IP. The terms of this License Agreement will be binding upon and will inure to the benefit of the successors, heirs, administrators and permitted assigns of the Parties. Any purported assignment in violation of this Section 11.12 will be null and void *ab initio*.

11.13 Notices. All notices, requests, demands and other communications required or permitted to be given pursuant to this License Agreement will be in writing and will be deemed to have been duly given upon the date of receipt if delivered by hand, recognized international overnight courier, confirmed facsimile transmission, or registered or certified mail, return receipt requested, postage prepaid to the applicable address or facsimile number set forth in Section 13.14 of the Master Collaboration Agreement. Either Party may change its designated address and facsimile number by notice to the other Party in the manner provided in this Section 11.13.

11.14 Amendment and Waiver. This License Agreement may be amended, supplemented, or otherwise modified only by means of a written instrument signed by both Parties; provided that any unilateral undertaking or waiver made by one Party in favor of the other will be enforceable if undertaken in a writing signed by the Party to be charged with the undertaking or waiver. Any waiver of any rights or failure to act in a specific instance will relate only to such instance and will not be construed as an agreement to waive any rights or fail to act in any other instance, whether or not similar.

11.15 Severability. In the event that any provision of this License Agreement will, for any reason, be held to be invalid or unenforceable in any respect, such invalidity or unenforceability will not affect any other provision hereof, and the Parties will negotiate in good faith to modify this License Agreement to preserve (to the extent possible) their original intent.

11.16 Entire Agreement. This License Agreement, together with the Master Collaboration Agreement, is the sole agreement with respect to the subject matter and supersedes all other agreements and understandings between the Parties with respect to same (including Confidential Agreement). In the event of any conflict between the terms of this License Agreement and the terms of the Master Collaboration Agreement, the terms of this License Agreement will control.

11.17 Force Majeure. Neither Celgene nor Bluebird will be liable for failure of or delay in performing obligations set forth in this License Agreement (other than any obligation to pay monies when due), and neither will be deemed in breach of such obligations, if such failure or delay is due to natural disasters or any causes reasonably beyond the control of Celgene or Bluebird and without the fault or negligence of the Party so failing or delaying; provided that the Party affected will promptly notify the other of the force majeure condition and will exert reasonable efforts to eliminate, cure or overcome any such causes and to resume performance of its obligations as soon as possible.

11.18 **Celgene Parties.** The Parties hereby acknowledge and agree that (a) Celgene Corp is the party to this License Agreement with respect to all rights and obligations under this License Agreement in the United States, provided that with respect to payment obligations under this License Agreement, Celgene Corp is the responsible party with respect to all such payment obligations; (b) Celgene Europe is the party to this License Agreement with respect to all rights and obligations under this License Agreement outside of the United States, provided that with respect to payment obligations under this License Agreement, Celgene Europe is not a responsible

party with respect to any such payment obligations; and (c) as between Bluebird, on the one hand, and Celgene Corp and Celgene Europe, on the other, Celgene Corp shall undertake all actions permitted or required to be taken by Celgene Corp and/or Celgene Europe.

[*Remainder of this Page Intentionally Left Blank*]

IN WITNESS WHEREOF, the Parties have caused this License Agreement to be executed by their respective duly authorized officers as of the License Agreement Effective Date.

bluebird bio, Inc.

By: /s/ Jason F. Cole
(Signature)

Name: Jason F. Cole

Title: SVP, and General Counsel

Date:

Celgene Corporation

By: /s/ Peter N. Kellogg
(Signature)

Name: Peter N. Kellogg

Title: EVP and CFO

Date: 2/8/2016

Celgene European Investment Company LLC (CEICO)

By: Celgene International Sarl, the sole member of CEICO

By:____/s/ Jonathan Biller_____

Print: __Jonathan Biller_____

and

By:_____/s/ Jürg Oehen_____

Print: ____Jürg Oehen, Director_____

Appendix A

Additional Defined Terms

"Elected Candidate" means the following Optioned Candidate selected by Celgene under the Master Collaboration Agreement that specifically targets the Target Antigen: bb2121.

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT PURSUANT TO RULE 24B-2 PROMULGATED UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED.

Appendix B

Applicable New In-Licenses

[***]

Appendix C

Applicable Pre-Existing In-Licenses

[***]

Appendix D

Target Antigen

B cell maturation antigen (BCMA, gene name TNFRSF17)

Approved symbol
TNFRSF17

Approved name
Tumor necrosis factor receptor superfamily, member 17

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT PURSUANT TO RULE 24B-2 PROMULGATED UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED.

Appendix E

Press Release

bluebird bio Announces First Patient Treated with bb2121 in CRB-401 Phase 1 Study in Patients with Relapsed/Refractory Multiple Myeloma

Celgene has agreed to exercise its option to exclusively license bb2121 under global strategic collaboration

bluebird bio to receive $10 million option exercise payment from Celgene

Cambridge, MA, February 17, 2016 – bluebird bio, Inc. (Nasdaq: BLUE), a clinical- stage company committed to developing potentially transformative gene therapies for severe genetic diseases and T cell-based immunotherapies for cancer, announced treatment of the first patient in a Phase 1 study of its product candidate bb2121 in patients with relapsed/refractory multiple myeloma. bb2121 is a chimeric antigen receptor T cell (CAR T) therapy targeting B cell maturation antigen (BCMA), and bluebird bio is developing bb2121 in collaboration with Celgene Corporation. bluebird bio also announced today that Celgene has exercised its option to exclusively license bb2121, under the terms of the collaboration agreement between the two companies.

"bb2121 is bluebird bio's first oncology program to enter the clinic, and the treatment of this first patient marks an important milestone for us as we build a broad, fully integrated T cell immunotherapy franchise," said Nick Leschly, chief bluebird. "We are pleased that Celgene has exercised their option to license bb2121. We believe our combined manufacturing, development and commercial expertise will enable us to rapidly advance bb2121 through clinical trials."

"Despite many recent advances in the field, multiple myeloma remains incurable, with almost all patients becoming refractory to therapy eventually," said James N. Kochenderfer, M.D., National Cancer Institute, an investigator for the CRB-401 study. "BCMA is one of the most exciting targets in multiple myeloma, and we are eager to explore the potential of bb2121 to become an important new treatment option for patients living with multiple myeloma."

bluebird bio and Celgene amended and restated their collaboration agreement in June 2015 to focus on developing product candidates targeting BCMA during a three-year collaboration term. By exercising its exclusive option under the terms of the agreement, Celgene will be responsible for worldwide development and commercialization of bb2121 after Phase 1. bluebird bio is responsible for the development of bb2121 through the completion of the CRB-401 Phase 1 study and has an option to share in the development, promotion and profits in the United States. bluebird bio will receive a $10 million option exercise payment from Celgene, and bluebird bio is also eligible to receive specified development, regulatory and commercial milestone payments and royalty payments on net sales.

About the CRB-401 Study

The primary objective of the CRB-401 study is to evaluate the maximum tolerated dose of bb2121 and determine the recommended Phase 2 dose. The secondary objective is patient response, measured using the International Myeloma Working Group (IMWG) Response Criteria for Multiple Myeloma. The first portion of the study includes a dose- escalation phase in which cohorts of patients will receive ascending doses of bb2121 to determine the maximum tolerated dose and establish a recommended Phase 2 dose. The second portion of the study is a dose expansion phase where patients will receive bb2121 to further evaluate the safety, tolerability and clinical activity at the recommended Phase 2 dose.

About bluebird bio, Inc.

With its lentiviral-based gene therapies, T cell immunotherapy expertise and gene editing capabilities, bluebird bio has built an integrated product platform with broad potential application to severe genetic diseases and cancer. bluebird bio's gene therapy clinical programs include its Lenti-D™ product candidate, currently in a Phase 2/3 study, called the Starbeam Study, for the treatment of cerebral adrenoleukodystrophy, and its LentiGlobin® BB305 product candidate, currently in three clinical studies for the treatment of transfusion-dependent ß-thalassemia, also known as ß-thalassemia major, and severe sickle cell disease. bluebird bio's oncology pipeline is built upon the company's leadership in lentiviral gene delivery and T cell engineering, with a focus on developing novel T cell-based immunotherapies, including chimeric antigen receptor (CAR T) and T cell receptor (TCR) therapies. bluebird bio's lead oncology program, bb2121, is an anti-BCMA CAR T program partnered with Celgene. bb2121 is currently being studied in a Phase 1 trial for the treatment of relapsed/refractory multiple myeloma. bluebird bio also has discovery research programs utilizing megaTALs/homing endonuclease gene editing technologies with the potential for use across the company's pipeline.

bluebird bio has operations in Cambridge, Massachusetts, Seattle, Washington, and Paris, France.

LentiGlobin and Lenti-D are trademarks of bluebird bio, Inc.

Forward-Looking Statements

This release contains "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995, including statements regarding the clinical and market potential of the Company's anti-BCMA oncology program, including its bb2121 product candidate. Any forward-looking statements are based on management's current expectations of future events and are subject to a number of risks and uncertainties that could cause actual results to differ materially and adversely from those set forth in or

implied by such forward-looking statements. These risks and uncertainties include, but are not limited to, the risk that the preclinical efficacy and safety data for our bb2121 product candidate will not be observed in the CRB-401 clinical study, the risk of cessation or delay of any of the ongoing or planned clinical studies and/or our development of our product candidates, the risk of a delay in the enrollment of patients in our clinical studies, the risk that our collaboration with Celgene Corporation will not continue or will not be successful, and the risk that any one or more of our product candidates will not be successfully developed and commercialized. For a discussion of other risks and uncertainties, and other important factors, any of which could cause our actual results to differ from those contained in the forward-looking statements, see the section entitled "Risk Factors" in our most recent quarterly report on Form 10-Q, as well as discussions of potential risks, uncertainties, and other important factors in our subsequent filings with the Securities and Exchange Commission. All information in this press release is as of the date of the release, and bluebird bio undertakes no duty to update this information unless required by law.

Contact:

bluebird bio, Inc.

Manisha Pai, 617-245-2107
mpai@bluebirdbio.com

or

Pure Communications, Inc. Dan Budwick,
973-271-6085

Appendix F

Certain Patents within the Licensed IP Controlled by Bluebird as of the License Agreement Effective Date

[***]

Appendix G

Bluebird Agreements

None.

Appendix H

Certain Manufacturing Definitions

"Fully Burdened Manufacturing Costs" means costs to supply applicable therapeutic ingredients, finished products, related inputs and services (a) supplied by an unaffiliated Third Party or (b) manufactured directly by Bluebird; it being understood and agreed that (i) in the case of costs referred to in clause (a) of this sentence where an unaffiliated Third Party is the manufacturer, Fully Burdened Manufacturing Costs will equal [***], and (ii) in the case of costs referred to in clause (b) of this sentence where Bluebird is the manufacturer, Fully Burdened Manufacturing Costs will equal [***]

Appendix I

Manufacturing and Supply Agreement Terms

1. ***Supply*:**

- Vector Supply will be governed by the Manufacturing and Supply Agreement. The terms of the Manufacturing and Supply Agreement will be consistent with the terms of Section 2.4 and will include, but will not be limited to, the following:

  [***]

- Quality of the Vector Supplies supplied will be governed by a separate Quality Service Agreement, to be agreed between the Parties.

2. ***Forecasts*:**

- The Supply Agreement will define the conditions for non-binding and binding forecasts.

  [***]

3. ***Minimum Supply Quantities*:**

  [***]

4. ***Manufacture*:**

- As indicated in Section 2.4(c)(i) of the License Agreement, Bluebird will Manufacture Vector Supply in-house or utilize Third Party contract manufacturers. Bluebird will have the right to make all necessary decisions regarding arrangements with Third Party manufacturers, provided that Bluebird will reasonably consult with Celgene with respect to all such arrangements and obtain Celgene's prior written consent, which will not be unreasonably withheld, conditioned or delayed.

  [***]

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT PURSUANT TO RULE 24B-2 PROMULGATED UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED.

Schedule 9.2

Exceptions to Bluebird's Representations and Warranties in Section 9.2

Execution Version

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT PURSUANT TO RULE 24B-2 PROMULGATED UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED.

EXHIBIT 10.17

LICENSE AGREEMENT

THIS LICENSE AGREEMENT (this "**Agreement**") is made effective as of the 13 day of August, 2014 (the "**Effective Date**"), by and between bluebird bio, Inc., a Delaware corporation having its principal place of business at 150 Second Street, Third Floor, Cambridge, MA 02141 ("**Bluebird**"), and Biogen Idec MA Inc., a Massachusetts corporation having its principal place of business at 225 Binney Street, Cambridge, MA 02142 ("**Biogen**"). Bluebird and Biogen may, from time-to-time, be individually referred to as a "**Party**" and collectively referred to as the "**Parties**".

RECITALS

\S, Biogen Controls the Licensed Patent Rights (hereinafter defined); and

\S, Bluebird wishes to obtain, and Biogen wishes to grant, certain licenses under the Licensed Patent Rights on the terms and conditions set forth herein.

IEREFORE, the Parties, intending to be legally bound hereby, agree as follows:

1. DEFINITIONS

1.1. "**Affiliate**" means, with respect to a Party, any Person that controls, is controlled by, or is under common control with that Party. For the purpose of this definition, "control" shall refer to: (a) the possession, directly or indirectly, of the power to direct the management or policies of an entity, whether through the ownership of voting securities, by contract or otherwise; or (b) the ownership, directly or indirectly, of fifty percent (50%) or more of the voting securities of such entity.

1.2. "**Applicable Laws**" means all applicable laws, statutes, rules, regulations and guidelines, including all good manufacturing practices and all applicable standards or guidelines promulgated by the appropriate Regulatory Authority.

1.3. "**BCMA**" means B-Cell Maturation Antigen.

1.4. "**Business Day**" means any day other than a Saturday, a Sunday or a day on which commercial banks located in New York, New York are authorized or required by law to remain closed.

1.5. "**Calendar Quarter**" means the respective periods of three (3) consecutive calendar months ending on March 31, June 30, September 30 and December 31.

1.6. "**Calendar Year**" means any twelve (12) month period commencing on January 1.

1.7. "**COM IP**" means (a) the patents and patent applications listed on **Schedule A** attached hereto; and (b) (i) all continuations, divisionals, renewals and continuations-in-part (to the extent the claims thereof are entirely supported by one or more of the patents and patent applications listed on **Schedule A** to which it claims priority) claiming priority to the patents and patent applications described in clause (a), (ii) any other subsequent filings in any country worldwide claiming priority to the patents and patent applications described in clause (a) (to the extent the claims thereof are entirely supported by one or more of the patents and patent applications listed on **Schedule A** to which it claims priority); and (iii) all letters of patent granted with respect to any of the foregoing and patents of addition, restorations, extensions, supplementary protection certificates, registration or confirmation patents, reissues and re-examinations of any of the foregoing described in clauses (b)(i) and (b)(ii), each of the foregoing (b)(i) through (b)(iii), to the extent (x) Biogen or its Affiliates Controls such patents and patent applications and (y) such patents and patent applications have claims Covering Licensed Products then in Development or Commercialization within the Field.

1.8. "**Commercialize**" or "**Commercialization**" means to manufacture for sale, market, promote, otherwise offer for sale, distribute, and sell.

1.9. "**Commercially Reasonable Efforts**" means [***].

1.10. "**Control**" or "**Controlled**" means, with respect to any Intellectual Property Rights, the legal authority or right (whether by ownership, license or otherwise other than pursuant to this Agreement) of a Party or any of its Affiliates to grant a license or a sublicense of or under such Intellectual Property Rights to the other Party without breaching the terms of any agreement with a Third Party. For clarity, if a Party or any of its Affiliates only can grant a license or sublicense to Intellectual Property Rights, or provide access to a material or document, of a limited scope due to an encumbrance imposed by a Third Party, "**Control**" or "**Controlled**" shall be construed to so limit the license or sublicense to such Intellectual Property Rights or the provision of, or provision of access to, such materials or documents (as applicable).

1.11. "**Cover**", "**Covering**" or "**Covered**" means, with respect to a given Licensed Product in a given country in the Territory, that, in the absence of ownership of or a license granted under a Valid Claim, the research, Development, manufacture, Commercialization, use, import, offer for sale or sale of such Licensed Product in such country would infringe such Valid Claim (or, in the case of a claim that has not yet issued, would infringe such claim if it were to issue without modification).

1.12. "**Develop**" or "**Development**" means to conduct research and development activities (including related manufacturing activities) under conditions designed to yield data suitable for inclusion in, or otherwise necessary to support, an application

for Regulatory Approval of a Licensed Product by a Regulatory Authority within the Territory.

1.13. "**Distributor**" means a Third Party, other than a Third Party to which any sublicense hereunder is granted, that (a) purchases any Licensed Products in finished form from Bluebird or any of its Affiliates or sublicensees with the intent or purpose of reselling such Licensed Products; and (b) has the right to Commercialize such Licensed Products in one or more regions.

1.14. "**EMA**" means the European Medicines Agency, or any successor agency thereto.

1.15. "**EU**" means the European Union member states as of the applicable time during the Term.

1.16. "**FDA**" means the United States Food and Drug Administration, or a successor federal agency thereto.

1.17. "**Field**" means all human diagnostic, therapeutic and prophylactic uses in [***].

1.18. "**First Clinical Trial**" means the first human clinical trial of a Licensed Product.

1.19. "**First Commercial Sale**" means with respect to a Licensed Product, the first sale for use or consumption of the Licensed Product following receipt of Regulatory Approval for such Licensed Product in a country in the Territory.

1.20. "**GAAP**" means the generally accepted accounting principles in the United States, consistently applied.

1.21. "**IND**" means: (a) an investigational new drug application filed with the FDA for authorization for the investigation of a Licensed Product; or (b) any foreign equivalents as filed with the applicable Regulatory Authorities in other countries or regulatory jurisdictions in the Territory, as applicable.

1.22. "**Intellectual Property Rights**" means all trade secrets, copyrights, Patent Rights, Trademarks, moral rights, know-how and any and all other intellectual property or proprietary rights now known or hereafter recognized in any jurisdiction.

1.23. "**Licensed Patent Rights**" means collectively, the COM IP and MOT IP.

1.24. "**Licensed Product**" means [***].

1.25. "**MAA**" means (a) a Marketing Authorization Application for a Licensed Product filed with (i) the EMA under the centralized European procedure (including amendments and supplements thereto) or (ii) a Regulatory Authority in any country in the EU if the centralized European procedure is not used to obtain Regulatory

Approval of such Licensed Product; or (b) any other equivalent or related Regulatory Filing, such as a Type II variation, to gain Regulatory Approval of a Licensed Product in any country in the EU.

1.26. "**MOT IP**" means (a) the patents and patent applications listed on **Schedule B** attached hereto; and (b) (i) all continuations, divisionals, renewals and continuations-in-part (to the extent the claims thereof are entirely supported by one or more of the patents and patent applications listed on **Schedule B** to which it claims priority) claiming priority to the patents and patent applications described in clause (a), (ii) any other subsequent filings in any country worldwide claiming priority to the patents and patent applications described in clause (a) (to the extent the claims thereof are entirely supported by one or more of the patents and patent applications listed on **Schedule B** to which it claims priority); and (iii) all letters of patent granted with respect to any of the foregoing and patents of addition, restorations, extensions, supplementary protection certificates, registration or confirmation patents, reissues and re-examinations of any of the foregoing described in clauses (b)(i) and (b)(ii), each of the foregoing (b)(i) through (b)(iii), to the extent (x) Biogen or its Affiliates Controls such patents and patent applications and (y) such patents and patent applications have claims Covering Licensed Products then in Development or Commercialization within the Field.

1.27. "**NDA**" means: (a) a new drug application filed with the FDA for authorization for marketing the Licensed Product; or (b) any of its foreign equivalents as filed with the applicable Regulatory Authorities in other countries or regulatory jurisdictions in the Territory, as applicable.

1.28. "**Net Sales**" means [***]

1.29. "**Patent Rights**" means the rights and interests in and to issued patents and pending patent applications in any country, jurisdiction or region (including inventor's certificates and utility models), including all provisionals, non-provisionals, substitutions, continuations, continuations-in-part, divisionals, renewals and all patents granted thereon, and all reissues, reexaminations, extensions, confirmations, revalidations, registrations and patents of addition thereof, including supplementary protection certificates, PCTs, pediatric exclusivity periods and any foreign equivalents to any of the foregoing.

1.30. "**Person**" means an individual, corporation, partnership, limited liability company, trust, business trust, association, joint stock company, joint venture, pool, syndicate, sole proprietorship, unincorporated organization, governmental authority or any other form of entity not specifically listed herein.

1.31. "**Phase III Clinical Trial**" means a human clinical trial of a Licensed Product which is intended to be a pivotal trial for obtaining Regulatory Approval, or

otherwise is designed and conducted according to 21 C.F.R. §312.21(c), as amended, o r its equivalent, as appropriate, in foreign jurisdictions.

1.32. "**Regulatory Approval**" means, with respect to a Licensed Product in any country or regulatory jurisdiction, any approval registration, license or authorization that is required by the applicable Regulatory Authority to market and sell such Licensed Product in such country or regulatory jurisdiction.

1.33. "**Regulatory Authority**" means any governmental agency or authority responsible for granting Regulatory Approvals for a Licensed Product in the Territory.

1.34. **"Regulatory Exclusivity"** means any rights or protections which are recognized, afforded or granted by any Regulatory Authority in any country or region of the Territory in association with the Regulatory Approval of a Licensed Product in the Field, providing such Licensed Product: (i) a period of marketing exclusivity during which a Regulatory Authority that recognizes, affords or grants such marketing exclusivity shall refrain from either reviewing or approving a marketing authorization application or similar regulatory submission submitted by a Third Party seeking to market a product containing the same active pharmaceutical ingredient as such Licensed Product; or (ii) a period of data exclusivity during which a Third Party seeking to market a product containing the same active pharmaceutical ingredient as such Licensed Product is precluded from either referencing or relying upon, without an express right of reference from the dossier holder, such Licensed Product's clinical dossier or relying on previous Regulatory Authority findings of safety or effectiveness with respect to such Licensed Product to support the submission, review or approval of a marketing authorization application or similar regulatory submission before the applicable Regulatory Authority.

1.35. "**Regulatory Filings**" means, with respect to a Licensed Product, any submission to a Regulatory Authority of any appropriate regulatory application, including, without limitation, any IND, any NDA, any submission to a regulatory advisory board, any marketing authorization application (including any MAA), any BLA (biologics license application) and any supplement or amendment thereto.

1.36. "**Related Party**" means any of a Party's Affiliates and permitted sublicensees.

1.37. "**ROFO Field**" means [***].

1.38. "**Royalty Term**" means, on a Licensed Product-by-Licensed Product and country-by country basis, the period commencing on the First Commercial Sale of such Licensed Product in such country and expiring upon the later of: (a) ten (10) years following the date of First Commercial Sale of such Licensed Product in such country; (b) the expiration of Regulatory Exclusivity for such Licensed Product or

(c) the expiration or abandonment of the last Valid Claim included in the Licensed Patent Rights that Covers the Licensed Product in such country.

1.39. **"T-Cell**" means any of the lymphocytes that mature in the thymus and have the ability to recognize specific peptide antigens presented by major histocompatibility complex antigens through the receptors on their cell surface.

1.40. "**Territory**" means worldwide.

1.41. "**Third Party**" means any Person other than a Party or an Affiliate of a Party.

1.42. "**Trademarks**" means all registered and unregistered trademarks, service marks, trade dress, trade names, logos, insignias, domain names, symbols, designs, and combinations thereof.

1.43. "**Valid Claim**" means either: (a) a claim of an issued and unexpired patent included within the Licensed Patent Rights, which has not been permanently revoked or declared unenforceable or invalid by an unreversed and unappealable or unreversed and unappealed decision of a court or other appropriate body of competent jurisdiction and which has not been abandoned, disclaimed, denied or admitted to be invalid or unenforceable through reissue, re-examination, disclaimer or otherwise; or (b) a claim of a pending patent application included within the Licensed Patent Rights, which claim was filed in good faith and has not been cancelled, withdrawn, abandoned or finally disallowed without the possibility of appeal or refiling of such application.

1.44. **Additional Definitions**. Each of the following definitions is set forth in the Section indicated below:

Definition	Section
Agreement	Preamble
Annual 5-Year Forecast	5.1.6(b)
Bankruptcy Code	13.4
Bankruptcy Event	13.4
Biogen	Preamble
Biogen Indemnitees	11.1
Bluebird	Preamble
Bluebird Indemnitees	11.2
Bluebird Withholding Tax Action	5.3.2
Cap	12.2
CDA	17.11
Change in Control	17.1
Claims	11.1

Definition	Section
Confidential Information	9.1
Combination Product	1.28
Deductions	1.28
Defense Action	8.1
Developed IP	7.2
Effective Date	Preamble
Fees	6.1.1
Force Majeure Event	17.4
government	10.3
Government Official	10.3
Gross Sales	1.28
Indemnified Party	11.3
Indemnifying Party	11.3
Milestone Event	5.1.2
Milestone Payment	5.1.2
Party(ies)	Preamble
Recipients	9.2
Relevant Records	6.1.1
Restricted Information	14.2
ROFO Exercise Notice	4.1
ROFO Exercise Period	4.1
ROFO Notice	4.1
Term	13.1
Third Party Infringement	8.1

2. LICENSE GRANT, EXCLUSIVITY

2.1. **License Grant**. Subject to the terms and conditions of this Agreement, Biogen hereby grants to Bluebird a co-exclusive (with Biogen), sublicensable (subject to Section 2.2), royalty-bearing right and license under the Licensed Patent Rights to research, Develop, manufacture, Commercialize, use, import, offer for sale and sell the Licensed Products in the Field in the Territory.

2.2. **Bluebird Sublicense Rights**. Bluebird may sublicense the rights granted to it by Biogen under this Agreement (a) to any of its Affiliates or Celgene Corporation or any of its Affiliates, in each case without Biogen's prior approval, or (b) to any other Third Party upon Biogen's prior written approval, which approval shall not be unreasonably withheld or delayed. Any and all sublicenses shall be subject to the following requirements:

2.2.1. All sublicenses shall be subject to and consistent with the terms and conditions of this Agreement and shall: (a) preclude the assignment of such

sublicense without the prior written approval of Biogen, (b) include Biogen as an intended third party beneficiary under the sublicense with the right to enforce the terms of such sublicense, and (c) preclude the granting of further sublicenses in contravention with the terms and conditions of this Agreement. In no event shall any sublicense relieve Bluebird of any of its obligations under this Agreement.

2.2.2. Except for any sublicenses to an Affiliate of Bluebird or Celgene Corporation, prior to the execution of any sublicense agreement (including any further sublicense by an existing sublicensee), Bluebird shall provide to Biogen a draft of the proposed sublicense agreement and Biogen shall approve, disapprove or require modifications to such proposed sublicense agreement, which approval, disapproval or required modifications shall be communicated to Bluebird within [***] by Biogen, or, if Biogen does not provide any such communication within such [***] period, such proposed sublicense agreement shall be deemed to have been approved by Biogen.

2.2.3. Bluebird shall furnish to Biogen a true and complete copy of each sublicense agreement and each amendment thereto, within [***] after the sublicense or amendment has been executed.

2.3. **Retained Rights**. Bluebird acknowledges and agrees that Biogen retains, on behalf of itself and its Affiliates, all rights in the Licensed Patent Rights other than those specifically granted to Bluebird in Section 2.1, including, subject to Section 2.5, the right to practice the Licensed Patents in the Field in the Territory. As between Biogen and Bluebird, Biogen will exclusively own the results of any use of the Licensed Patent Rights by Biogen not in violation of this Agreement and, subject to Section 4, will have no obligation under this Agreement to disclose or license to Bluebird any developments or Intellectual Property Rights that may arise with respect to such uses.

2.4. **No Additional Rights**. Nothing in this Agreement shall be construed to confer any rights upon Bluebird by implication, estoppel, or otherwise as to any active pharmaceutical ingredients, compounds, products, technology or Intellectual Property Rights of Biogen or its Affiliates other than the rights under the Licensed Patent Rights expressly granted herein.

2.5. **Exclusivity**. During the Term, Biogen shall not grant any rights under the Licensed Patent Rights to a Third Party to Develop or Commercialize Licensed Products in the Field in the Territory, except that Biogen may grant any such rights to any Third Party acting on behalf of Biogen in such Development or Commercialization, including contract research organizations, contract manufacturing organizations and distributors.

3. DEVELOPMENT, MANUFACTURING, REGULATORY AND COMMERCIALIZATION

3.1. **Development**. Bluebird shall itself, or through its Affiliates or sublicensees, use Commercially Reasonable Efforts to Develop Licensed Products in the Field in the Territory, and Bluebird shall undertake all Development activities at its sole expense. Without limiting the foregoing, in connection with its efforts to Develop Licensed Products, Bluebird shall bear all responsibility and expense for filing Regulatory Filings in Bluebird's name and obtaining Regulatory Approval for Licensed Products in the Field in the Territory.

3.2. **Commercialization**.

3.2.1. Bluebird shall itself, or through its Affiliates, sublicensees or Distributors, use Commercially Reasonable Efforts to Commercialize the Licensed Products in the Field throughout the Territory in those countries in which Regulatory Approval has been obtained for the marketing of the Licensed Products, it being understood that Bluebird, in the exercise of such Commercially Reasonable Efforts, may determine to not seek Regulatory Approval for and Commercialize the Licensed Product in certain countries in the Territory. Bluebird shall undertake such activities at its sole expense and shall have sole decision-making authority with respect to such activities.

3.2.2. **Prohibition on Sales Outside of the Field**. To the extent permitted by Applicable Laws in each country in the Territory, Bluebird shall not, and shall ensure that its Related Parties agree not to, Commercialize any Licensed Product outside of the Field in the Territory or provide or sell Licensed Product for or to any Third Party if Bluebird or its Related Party knows or has reason to believe that such Third Party, either directly or indirectly, will provide or sell such Licensed Product for use outside of the Field in the Territory. Biogen shall be a third party beneficiary of any agreements between or among Bluebird and its Related Parties with respect to such restriction, with the right to enforce such agreements. Bluebird shall provide Biogen with a copy of the relevant sections of each such agreement promptly after the execution thereof.

3.3. **Reporting.** [***]

3.4. **Manufacturing**. Subject to Section 2.2, Bluebird shall have the sole right to manufacture, or have manufactured, Licensed Products for use in the Field in the Territory, and it shall be entitled to use, and to sublicense the manufacturing rights under the Licensed Patent Rights, for such purposes. Bluebird shall be responsible for all aspects of manufacturing of Licensed Products.

4. RIGHT OF FIRST OFFER

4.1. If at any time during the Term and [***], Biogen seeks to grant rights to a Third Party under the Licensed Patent Rights to Develop or Commercialize one or more Licensed Products for the ROFO Field in any country in the Territory, then before granting such rights, Biogen shall provide Bluebird with written notice thereof (such notice, the "**ROFO Notice**"). In the event that Bluebird wishes to exercise its right of first offer with respect to the ROFO Field for all of the countries in the Territory, it shall do so in writing (the "**ROFO Exercise Notice**") no later than [***] after Bluebird's receipt of the ROFO Notice (the "**ROFO Exercise Period**").

4.2. Upon Biogen's receipt of the ROFO Exercise Notice, this Agreement shall be amended promptly as follows:

(a) the definition of "Field" shall be amended to include the ROFO Field;

(b) as a result of updating the definition of "Field" pursuant to the foregoing clause (a), Net Sales of Licensed Products in the ROFO Field in the Territory shall be included in the aggregate annual Net Sales of Licensed Products for royalty calculation purposes pursuant to Sections 5.1.3(a) and 5.1.3(b);

(c) a new provision shall be added pursuant to which Bluebird shall pay to Biogen an upfront payment of [***] with respect to the ROFO Exercise Notice for the ROFO Field within [***] after the effective date of the amendment;

(d) [***]; and

(e) any additional terms as may be agreed by the Parties with respect to the addition of the ROFO Field shall be included in this Agreement.

4.3. If Bluebird notifies Biogen that it elects not to exercise such right or fails to respond during the ROFO Exercise Period, Biogen shall thereafter have no further obligation to Bluebird with respect to the ROFO Field and may enter into a definitive agreement granting a Third Party, a license or other right under the Licensed Patent Rights to Develop or Commercialize one or more Licensed Products in the ROFO Field.

5. PAYMENT TERMS

5.1. Payment Terms.

5.1.1. **Upfront Payment.** In partial consideration of the licenses and rights granted to Bluebird hereunder, Bluebird shall pay to Biogen [***] within ten (10) days after the Effective Date. Such payment shall be non-refundable and non-creditable.

5.1.2. **Milestone Payments**. Bluebird shall notify Biogen as soon as practicable upon (and in any event within ten (10) days after) achievement of each of the following events by Bluebird or its Affiliates or sublicensees (each such event, a "**Milestone Event**"). In further consideration of the licenses and rights granted to Bluebird, within [***] after achievement of each Milestone Event set forth below, Bluebird shall pay to Biogen the corresponding non-creditable and non-refundable milestone payment (each, a "**Milestone Payment**"). If any Milestone Payment has not been paid by the time that the subsequent (based on the row numbers in the table below) Milestone Event is achieved, then all unpaid earlier Milestone Payments will be due and payable on the due date for payment of the Milestone Payment for such subsequent Milestone Event, and Bluebird shall pay to Biogen all such unpaid earlier Milestone Payments in addition to the Milestone Payment for such subsequent Milestone Event on such due date.

(a) Development Milestone Events.

Row	Milestone Event	Milestone Payment
[***]	[***]	[***]
[***]	[***]	[***]
[***]	[***]	[***]
[***]	[***]	[***]

(b) For the avoidance of doubt and except as set forth in Section 4.2(d): (i) each Milestone Payment shall be payable only once upon the first achievement of the applicable Milestone Event for a Licensed Product in the Field [***]; and (ii) satisfaction of a Milestone Event by a sublicensee or assignee of, or Third Party retained by, Bluebird or its Affiliates shall be deemed to have been satisfied by Bluebird for purposes of this Section 5.1.2.

5.1.3. **Calculation of Royalties.** In consideration of the licenses and rights granted to Bluebird hereunder, Bluebird shall pay to Biogen in accordance with Section 5.1.4(b) the royalties set forth in Sections 5.1.3(a) and 5.1.3(b),

as applicable, with respect to aggregate annual Net Sales of Licensed Products in the Field in the Territory during the applicable Royalty Term.

(a) **Royalty in countries of the Territory where there is no Valid Claim that Covers the Licensed Product.** Bluebird shall pay Biogen a royalty of [***] of aggregate annual Net Sales of Licensed Products in the Field in countries of the Territory where there is no Valid Claim included in the Licensed Patent Rights in such countries that Covers such Licensed Products.

(b) **Royalty in countries of the Territory where there is a Valid Claim that Covers the Licensed Product.** Bluebird shall pay Biogen a royalty on Net Sales of Licensed Products in the Field in countries of the Territory where there is a Valid Claim included in the Licensed Patent Rights in such countries that covers such Licensed Products calculated as the percentages of the applicable portion of annual Net Sales of Licensed Products in the Field in the Territory set forth in the table below.

Annual Net Sales of Licensed Products in the Field in the Territory	Royalty Rate to be applied to Net Sales from countries where there is a Valid Claim
[***]	[***]
[***]	[***]
[***]	[***]

For example, if (a) annual Net Sales of Licensed Products in the Field in countries **without** a Valid Claim are $700 million and (b) annual Net Sales of Licensed Products in the Field in countries **with** a Valid Claim are $1.2 billion, the royalties under Sections 5.1.3(a) and 5.1.3(b) would be calculated as follows:

[***]

5.1.4. **Royalty Reports and Payments.** Commencing with the beginning of the first Royalty Term and thereafter during the Term, on a Calendar Year-by-Calendar Year basis and with respect to each Calendar Quarter of such Calendar Year, within [***] after the end of the applicable Calendar Quarter, Bluebird shall:

(a) provide to Biogen a report of gross sales (including any foreign exchange rates used) and Net Sales of Licensed Products (detailing all Deductions) in the Field in the Territory for such Calendar Year broken down by Calendar Quarter on an aggregate and country-by-country basis, which Net Sales shall include Net Sales for such Calendar Quarter and Net Sales for each of the previous Calendar Quarters in such Calendar Year, as applicable, and including lists of countries that fall under each of Sections 5.1.3(a) and 5.1.3(b), with calculations of aggregate annual Net Sales under each of Sections 5.1.3(a) and 5.1.3(b); and

(b) pay to Biogen the royalties due under Section 5.1.3(a) and Section 5.1.3(b) with respect to such Net Sales for such Calendar Quarter.

5.1.5. Payment Reduction in the event of [***].

5.1.6. [***]

(a) In order to enable Biogen [***] within [***] of each Calendar Quarter [***] Bluebird shall deliver to Biogen [***] provided that Biogen acknowledges [***].

(b) Within [***] after Bluebird submits an application for Regulatory Approval of the first Licensed Product in any country in the Territory [***].

5.1.7. Late Payments. Any late payments shall bear interest [***].

5.2. Payment Method.

5.2.1. Currency. With respect to Net Sales invoiced in U.S. dollars, the Net Sales and the amounts due for royalties under Section 5.1.3 will be expressed in U.S. dollars. With respect to Net Sales invoiced in a currency other than U.S. dollars, payments will be calculated based on amounts converted to U.S. dollars using currency exchange rates for the Calendar Quarter for which remittance is made for such royalties. [***]

5.2.2. Method of Payment. All payments from Bluebird to Biogen shall be made by wire transfer in U.S. Dollars to the credit of such bank account as may be designated by Biogen in writing to Bluebird. Any payment which falls due on a date which is not a Business Day may be made on the next succeeding Business Day.

5.3. Taxes.

5.3.1. **VAT.** It is understood and agreed between the Parties that any payments made under this Agreement are [***] (VAT), which shall be added thereon as applicable.

5.3.2. **Withholding Taxes.** If Bluebird is required to make a payment to Biogen subject to a deduction of tax or withholding tax, then [***].

5.3.3. **Tax Cooperation** [***] Each Party shall provide the other Party with reasonable assistance to enable the recovery, as permitted by Applicable Laws, of [***].

5.3.4. **Tax Forms.** The Parties agree to cooperate and produce on a timely basis any tax forms or reports reasonably requested by the other Party in connection with [***].

6. RECORDS; AUDIT RIGHTS

6.1. Relevant Records.

6.1.1. **Relevant Records**. Bluebird shall keep, and will cause each of its Affiliates or sublicensees, as applicable, to keep, accurate books and records of accounting for the purpose of calculating all payments due to Biogen under Section 5.1 (such payments, collectively the "**Fees**" and such books and records, collectively the "**Relevant Records**"). For the [***] following the end of the Calendar Year to which each will pertain, such Relevant Records will be kept by Bluebird or such Affiliate or sublicensee at each of their principal place of business.

6.1.2. **Audit Request**. At the request of Biogen, Bluebird shall, and, shall cause each of its Affiliates or sublicensees to, permit Biogen and its representatives (including an independent auditor), at reasonable times and upon reasonable notice, to examine the Relevant Records. Such examinations may not (a) be conducted for any Calendar Year more than [***] after the end of such Calendar Year; (b) be conducted more than once in any [***] period; or (c) be repeated for any Calendar Year. Such audit shall be requested in writing at least [***] in advance, and shall be conducted during Bluebird's normal business hours and otherwise in manner that minimizes any interference to Bluebird's business operations.

6.1.3. **Audit Fees and Expenses**. Biogen shall bear any and all fees and expenses incurred by it in connection with any such audit of the Relevant Records; ***provided***, ***however***, in the event an audit reveals an underpayment by Bluebird of more than [***] as to the period subject to the audit, Bluebird

shall reimburse Biogen for any reasonable and documented out-of-pocket costs and expenses of the audit within [***] after receiving invoices thereof.

7. INTELLECTUAL PROPERTY RIGHTS

7.1. **Pre-existing IP**. Subject only to the rights expressly granted to the other Party under this Agreement, each Party shall retain all rights, title and interests in and to any Intellectual Property Rights that are owned, licensed or sublicensed by such Party prior to or independent of this Agreement.

7.2. **Developed IP**. Bluebird shall own all rights, title and interests in and to any Intellectual Property Rights that are conceived solely by Bluebird, its Affiliates or sublicensees following the Effective Date (collectively, "**Developed IP**").

7.3. **Patent Prosecution and Maintenance of Licensed Patent Rights.**

7.3.1. **Prosecution and Maintenance of MOT IP.**

(a) Subject to the rights of any Third Party with respect to the MOT IP, Biogen shall, at its expense and discretion, be responsible for prosecuting (including in connection with any reexaminations, oppositions and the like) and maintaining the MOT IP in the Territory. If Biogen files patent applications claiming priority to the patent listed in **Schedule B** subsequent to the Effective Date, Biogen shall make a determination in good faith as to whether such applications have claims that constitute MOT IP. If Biogen determines that such applications have claims that constitute MOT IP, then Biogen shall provide Bluebird drafts of any material filings or responses to be made to relevant patent offices which are related to such MOT IP, within a reasonable amount of time in advance of submitting such filings or responses to permit Bluebird an opportunity to review and comment thereon. Biogen shall consider in good faith the reasonable comments made by Bluebird with respect to the MOT IP, ***provided that*** Biogen does not reasonably determine such comments to be detrimental to the prosecution or enforcement of any Patent Rights owned or Controlled by Biogen or the rights of any Third Party with respect to the MOT IP.

(b) If Biogen elects to abandon the prosecution or maintenance of the MOT IP in any country in the Territory or as a PCT application (and does not elect to file one or more new patent applications claiming priority to such MOT IP), then unless Biogen has a good faith reasonable basis for determining that such prosecution or

maintenance not be continued by either Party, Biogen will promptly (but not less than thirty (30) days before any action is required) provide Bluebird with written notice, and will permit Bluebird, at Bluebird's sole discretion and expense, to continue prosecution or maintenance of any such MOT IP in the applicable country of the Territory, subject to the rights of any Third Party with respect to such MOT IP and ***provided that*** Bluebird shall consult with Biogen with respect to the prosecution or maintenance of such Patent Rights by Bluebird, including: (i) allowing Biogen a reasonable opportunity and reasonable time to review and comment regarding such drafts before any applicable filings are submitted to any relevant patent office or governmental authority, (ii) reflecting any reasonable comments offered by Biogen in any filings submitted by Bluebird to any relevant patent office or governmental authority and (iii) not taking any position with respect to such Patent Rights that would be reasonably likely to adversely affect the scope, validity or enforceability of any other Patent Rights being prosecuted or maintained by Biogen without the prior written consent of Biogen, which consent shall not be unreasonably withheld, delayed or conditioned.

7.3.2. Prosecution and Maintenance of COM IP.

(a) Biogen shall be responsible for prosecuting (including in connection with any reexaminations, oppositions and the like) and maintaining the COM IP in the Territory, and subject to Section 5.1.5, the Parties shall share equally the costs and expenses in connection with such prosecution and maintenance. Biogen shall provide Bluebird drafts of any material filings or responses related thereto to be made to relevant patent offices, within a reasonable amount of time in advance of submitting such filings or responses to permit Bluebird an opportunity to review and comment thereon. Biogen shall reflect any such reasonable comments with respect to COM IP, ***provided that*** in each case Biogen does not reasonably determine such comments to be detrimental to the prosecution or enforcement of any Patent Rights owned or Controlled by Biogen.

(b) If Biogen elects to abandon the prosecution or maintenance of any COM IP in any country in the Territory or as a PCT application (and does not elect to file one or more new patent applications claiming priority to such COM IP), then unless Biogen has a good faith reasonable basis for determining that such prosecution or maintenance not be continued by either Party, Biogen will promptly (but not less than thirty (30) days before any action is

required) provide Bluebird with written notice, and will permit Bluebird, at Bluebird's sole discretion and expense, to continue prosecution or maintenance of such COM IP in the applicable country of the Territory; ***provided that*** Bluebird shall consult with Biogen with respect to the preparation, filing, prosecution and maintenance of such Patent Rights by Bluebird, including: (i) allowing Biogen a reasonable opportunity and reasonable time to review and comment regarding such drafts before any applicable filings are submitted to any relevant patent office or governmental authority, (ii) reflecting any reasonable comments offered by Biogen in any filings submitted by Bluebird to any relevant patent office or governmental authority and (iii) not taking any position with respect to such Patent Rights that would be reasonably likely to adversely affect the scope, validity or enforceability of any other Patent Rights being prosecuted and maintained by Biogen without the prior written consent of Biogen, which consent shall not be unreasonably withheld, delayed or conditioned.

8. ACTUAL OR THREATENED INFRINGEMENT, DISCLOSURE OR MISAPPROPRIATION.

8.1. **Notification**. Each Party shall promptly notify the other Party in writing of its becoming aware of (a) any actual or threatened infringement, misappropriation or other violation or challenge to the validity, scope or enforceability by a Third Party of any Licensed Patent Rights in the Field ("**Third Party Infringement**"); or (b) initiation by a Third Party of an opposition proceeding against any Licensed Patent Rights in the Field, or initiation by Bluebird of an opposition against a Third Party related to the Licensed Patent Rights in the Field or any allegation by a Third Party that Intellectual Property Rights owned by it are infringed, misappropriated or violated by the Development, Commercialization or research, develop, make, have made, use, sell, offer for sale, market, distribute, import, export or otherwise exploit any Licensed Product in the Field ("**Defense Action**").

8.2. **Third Party Infringements**.

8.2.1. **Enforcement of MOT IP**. Subject to the rights of any Third Party with respect to MOT IP, [***] shall have the sole right (but not the obligation), at its own expense, to control enforcement of the MOT IP against any Third Party Infringement [***].

8.2.2. **Enforcement of COM IP**.

(a) Unless [***] shall have the [***] right (but not the obligation), [***] to control enforcement of the COM IP against any Third Party Infringement.

(b) [***] shall have the right (but not the obligation) to control enforcement of the COM IP against any Third Party Infringement if (i) [***] or (ii) [***] ***provided that***, in the case of clause (ii), [***].

8.2.3. **Cooperation**. Each Party shall provide to the Party enforcing any such rights under this Section 8.2 reasonable assistance in such enforcement, [***].

8.2.4. **Recoveries**. Any and all recoveries resulting from a suit, action or proceeding relating to a claim of Third Party Infringement shall first be [***]. Thereafter, any remaining recoveries shall be [***].

8.3. **Defense Actions**. [***] shall be [***] responsible for the costs of any Defense Action and shall have all authority with respect to any such Defense Action, including [***] ***provided that*** [***] shall keep [***] timely informed of the proceedings and filings, and provide [***] with copies of all material communications, pertaining to each Defense Action [***] shall not settle, stipulate to any facts or make any admission with respect to any Defense Action without [***] prior written consent (not to be unreasonably withheld or delayed) if such settlement, stipulation or admission would (a) [***] (b) [***] (c) [***].

9. CONFIDENTIALITY

9.1. **Definition**. "**Confidential Information**" means the terms and provisions of this Agreement and other proprietary information and data of a financial, commercial or technical nature that the disclosing Party or any of its Affiliates has supplied or otherwise made available to the other Party or its Affiliates, which are disclosed in writing or orally, including with respect to Bluebird as the disclosing Party, Restricted Information and any Bluebird proprietary information or data in proposed publications or presentations submitted to Biogen pursuant to Section 14.1.3 or reports submitted pursuant to Section 3.3.

9.2. **Obligations**. During the Term and for five (5) years thereafter, the receiving Party will (a) protect all Confidential Information of the disclosing Party against unauthorized disclosure to Third Parties and (b) not use or disclose the Confidential Information of the disclosing Party, except as permitted by or in furtherance of exercising rights or carrying out obligations hereunder or for internal legal, accounting or finance purposes, for the avoidance of doubt, Biogen may not use Restricted Information in connection with its own research, Development,

manufacture, Commercialization, use, import, or sale of products covered by the Licensed Patents in the Field in the Territory. The receiving Party shall treat all Confidential Information provided by the disclosing Party with the same degree of care as the receiving Party uses for its own similar information, but in no event less than a reasonable degree of care. The receiving Party may disclose the Confidential Information to its Affiliates, and their respective directors, officers, employees, subcontractors, sublicensees, consultants, attorneys, accountants, banks and investors (collectively, "**Recipients**") who have a need-to-know such information for purposes related to this Agreement, ***provided that*** the receiving Party shall hold such Recipients to written obligations of confidentiality with terms and conditions at least as restrictive as those set forth in this Agreement.

9.3. Exceptions to Confidentiality. The obligations under this Section 9 shall not apply to any information to the extent the receiving Party can demonstrate by competent evidence that such information:

(a) is (at the time of disclosure) or becomes (after the time of disclosure) known to the public or part of the public domain through no breach of this Agreement by the receiving Party or any Recipients to whom it disclosed such information;

(b) was known to, or was otherwise in the possession of, the receiving Party prior to the time of disclosure by the disclosing Party;

(c) is disclosed to the receiving Party on a non-confidential basis by a Third Party who is entitled to disclose it without breaching any confidentiality obligation to the disclosing Party; or

(d) is independently developed by or on behalf of the receiving Party or any of its Affiliates, as evidenced by its written records, without use or access to the Confidential Information.

9.4. Permitted Disclosures.

9.4.1. Compliance with Law. The restrictions set forth in this Section 9 shall not apply to any Confidential Information that the receiving Party is required to disclose under Applicable Laws or a court order or other governmental order or to enforce any Licensed Patent Right under Section 8, ***provided that*** the receiving Party: (a) provides the disclosing Party with prompt notice of such disclosure requirement if legally permitted; (b) affords the disclosing Party an opportunity to oppose or limit, or secure confidential treatment for such required disclosure; and (c) if the disclosing Party is unsuccessful in its efforts pursuant to Section 9.4.1(b), discloses only that

portion of the Confidential Information that the receiving Party is legally required to disclose as advised by the receiving Party's legal counsel.

9.4.2. **Biogen Permitted Disclosures**. Notwithstanding the restrictions set forth in this Section 9, in the event that Biogen wishes to assign, pledge or otherwise transfer its rights to receive some or all of the Fees payable hereunder, Biogen may disclose to a Third Party Confidential Information of Bluebird in connection with any such proposed assignment, ***provided that*** Biogen shall hold such Third Parties to written obligations of confidentiality with terms and conditions at least as restrictive as those set forth in this Agreement.

9.4.3. **Bluebird Permitted Disclosures**. Notwithstanding the restrictions set forth in this Section 9, in the event that Bluebird wishes to enter into a sublicense in accordance with Section 2.2, Bluebird may disclose to a Third Party Confidential Information of Biogen relating to the Licensed Products in the Field in connection with any such proposed sublicense, ***provided that*** Bluebird shall hold such Third Parties to written obligations of confidentiality with terms and conditions at least as restrictive as those set forth in this Agreement.

9.4.4. **Disclosure of Agreement Terms**. Notwithstanding the restrictions set forth in this Section 9, a Party may, without the prior consent of the other Party, disclose the terms and provisions of this Agreement to any Third Party that is (a) performing diligence in connection with any permitted Change of Control or similar transaction or (b) a permitted sublicensee under this Agreement or a permitted assignee of this Agreement, ***provided that*** such Party shall hold such Third Party to written obligations of confidentiality with terms and conditions at least as restrictive as those set forth in this Agreement.

9.5. **Right to Injunctive Relief**. Each Party agrees that breaches of this Section 9 may cause irreparable harm to the other Party and shall entitle such other Party, in addition to any other remedies available to it (subject to the terms of this Agreement), the right to seek injunctive relief enjoining such action.

9.6. **Ongoing Obligation for Confidentiality**. Upon expiration or termination of this Agreement, the receiving Party shall, and shall cause its Recipients to, destroy, delete or return (as requested by the disclosing Party) any Confidential Information of the disclosing Party, except for one copy which may be retained in the confidential files of its legal department for archival purposes only.

10. REPRESENTATIONS, WARRANTIES AND COVENANTS

10.1. Representations and Warranties by Each Party. Each Party represents and warrants to the other Party as of the Effective Date that:

(a) it is a corporation duly organized, validly existing, and in good standing under the laws of its jurisdiction of formation;

(b) it has full corporate power and authority to execute, deliver, and perform under this Agreement, and has taken all corporate action required by Applicable Laws and its organizational documents to authorize the execution and delivery of this Agreement and the consummation of the transactions contemplated by this Agreement;

(c) this Agreement constitutes a valid and binding agreement enforceable against it in accordance with its terms;

(d) all consents, approvals and authorizations from all governmental authorities or other Third Parties required to be obtained by such Party in connection with this Agreement have been obtained; and

(e) the execution and delivery of this Agreement and all other instruments and documents required to be executed pursuant to this Agreement, and the consummation of the transactions contemplated hereby do not and shall not: (i) conflict with or result in a breach of any provision of its organizational documents; (ii) result in a breach of any agreement to which it is a party that would impair the performance of its obligations hereunder; or (iii) violate any Applicable Laws.

10.2. Representations and Warranties by Biogen.

Biogen represents and warrants to Bluebird as of the Effective Date that:

(a) Biogen Controls the Licensed Patent Rights, and is entitled to grant the licenses specified herein; and

(b) Biogen has not granted to any Third Party any rights or licenses under any of the Licensed Patent Rights that would conflict with the licenses granted to Bluebird hereunder.

10.3. Covenants and Representations and Warranties by Bluebird.

Bluebird represents and warrants as of the Effective Date and covenants thereafter to Biogen that:

(a) it shall, and shall ensure all Third Parties that it engages, comply with all Applicable Laws with respect to the performance of its obligations hereunder;

(b) without limiting the generality of Section 10.3(a), Bluebird shall comply with the U.S. Foreign Corrupt Practices Act of 1977 (as modified or amended);

(c) it has not and will not directly or indirectly offer or pay, or authorize such offer or payment of, any money, or transfer anything of value, to improperly seek to influence any Government Official; and

(d) if Bluebird is itself a Government Official, Bluebird represents warrants and covenants that it has not accepted, and will not accept in the future, such a payment or transfer.

As used in this Section 10.3, "**Government Official**" means: (i) any elected or appointed government official (e.g., a member of a ministry of health); (ii) any employee or person acting for or on behalf of a government official, agency, or enterprise performing a governmental function; (iii) any political party officer, employee, or person acting for or on behalf of a political party or candidate for public office; (iv) an employee or person acting for or on behalf of a public international organization; or (v) any person otherwise categorized as a government official under local law. For the purposes of the definition of "**Government Official**", the terms "**government**" and the correlative term "**governmental**" are meant to include all levels and subdivisions of non-U.S. governments (i.e., local, regional, or national and administrative, legislative, or executive).

10.4. No Other Warranties. EXCEPT AS EXPRESSLY STATED IN THIS SECTION 10, NEITHER PARTY MAKES ANY REPRESENTATIONS OR EXTENDS ANY WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, INCLUDING BUT NOT LIMITED TO WARRANTIES OF TITLE, NON-INFRINGEMENT, VALIDITY, ENFORCEABILITY, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. ANY INFORMATION PROVIDED BY BIOGEN OR ITS AFFILIATES IS MADE AVAILABLE ON AN "AS IS" BASIS WITHOUT WARRANTY WITH RESPECT TO COMPLETENESS, COMPLIANCE WITH REGULATORY STANDARDS OR REGULATIONS OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER KIND OF WARRANTY WHETHER EXPRESS OR IMPLIED.

11. INDEMNIFICATION

11.1. **Indemnification by Bluebird**. Bluebird agrees to indemnify, hold harmless and defend Biogen and its Affiliates, and their respective officers, directors and employees (collectively, "**Biogen Indemnitees**"), from and against any Claims arising or resulting from: (a) the Development of a Licensed Product by, on behalf of or under grant of rights from Bluebird, its Affiliates, subcontractors or sublicensees; (b) the Commercialization of a Licensed Product by, on behalf of or under grant of rights from Bluebird, its Affiliates, subcontractors or sublicensees; (c) any gross negligence or wrongful intentional acts or omissions of Bluebird, its Affiliates, subcontractors or sublicensees in connection with this Agreement; (d) breach by Bluebird of any representation, warranty, obligation or covenant as set forth in this Agreement; or (e) breach by Bluebird of the scope of the license set forth in Section 2.1. As used herein, "**Claims**" means collectively, any and all Third Party demands, claims, actions and proceedings (whether criminal or civil, in contract, tort or otherwise) for losses, damages, liabilities, costs and expenses (including reasonable attorneys' fees).

11.2. **Indemnification by Biogen**. Biogen agrees to indemnify, hold harmless and defend Bluebird and its Affiliates and their respective officers, directors and employees (collectively, "**Bluebird Indemnitees**"), from and against any Claims arising or resulting from: (a) any gross negligence or wrongful intentional acts or omissions of Biogen, its Affiliates, or subcontractors in connection with this Agreement; or (b) breach by Biogen of any representation, warranty, obligation or covenant as set forth in this Agreement.

11.3. **Indemnification Procedure**. In connection with any Claim for which a Party (the "**Indemnified Party**") seeks indemnification from the other Party (the "**Indemnifying Party**") pursuant to this Agreement, the Indemnified Party shall: (a) give the Indemnifying Party prompt written notice of the Claim; ***provided, however,*** that failure to provide such notice shall not relieve the Indemnifying Party from its liability or obligation hereunder, except to the extent of any material prejudice as a direct result of such failure; (b) cooperate with the Indemnifying Party, at the Indemnifying Party's expense, in connection with the defense and settlement of the Claim; and (c) permit the Indemnifying Party to control the defense and settlement of the Claim; ***provided, however,*** that the Indemnifying Party may not settle the Claim without the Indemnified Party's prior written consent, which shall not be unreasonably withheld or delayed, in the event such settlement materially adversely impacts the Indemnified Party's rights or obligations. Further, the Indemnified Party shall have the right to participate (but not control) and be represented in any suit or action by advisory counsel of its selection and at its own expense.

12. LIMITATION OF LIABILITY

[***]

13. TERM; TERMINATION

13.1. **Term**. The term of this Agreement (the "**Term**") shall commence as of the Effective Date and, unless earlier terminated as expressly provided herein, shall expire upon the last-to-expire Royalty Term.

13.2. **Termination for Cause**. Each Party shall have the right, without prejudice to any other remedies available to it at law or in equity, to terminate this Agreement in the event the other Party breaches any of its material obligations hereunder and fails to cure such breach within [***] of receiving notice thereof; ***provided***, ***however***, that if such breach is capable of being cured, but cannot be cured within such [***] period, and the breaching Party initiates actions to cure such breach within such period and thereafter diligently pursues such actions, the breaching Party shall have such additional period as is reasonable to cure such breach, but in no event will such additional period exceed [***]. Any termination by a Party under this Section 13.2 shall be without prejudice to any damages or other legal or equitable remedies to which it may be entitled from the other Party. For the avoidance of doubt, Bluebird's failure to use Commercially Reasonable Efforts to Develop and Commercialize the Licensed Product shall constitute a material breach by Bluebird under this Agreement.

13.3. **Termination by Bluebird**. Bluebird may terminate this Agreement at will in its sole discretion, on not less than [***] prior written notice to Biogen.

13.4. **Termination for a Bankruptcy Event**. Each Party shall have the right to terminate this Agreement in the event of a Bankruptcy Event with respect to the other Party. "**Bankruptcy Event**" means the occurrence of any of the following: (a) the institution of any bankruptcy, receivership, insolvency, reorganization or other similar proceedings by or against a Party under any bankruptcy, insolvency, or other similar law now or hereinafter in effect, including any section or chapter of the United States Bankruptcy Code, as amended or under any similar laws or statutes of the United States or any state thereof (the "**Bankruptcy Code**"), where in the case of involuntary proceedings such proceedings have not been dismissed or discharged within [***] after they are instituted; (b) the insolvency or making of an assignment for the benefit of creditors or the admittance by a Party of any involuntary debts as they mature; (c) the institution of any reorganization, arrangement or other readjustment of debt plan of a Party not involving the Bankruptcy Code; (d) the appointment of a receiver for all or substantially all of a Party's assets; or (e) any corporate action taken by the board of directors of a Party in furtherance of any of the foregoing actions.

13.5. Effect of Termination or Expiration.

13.5.1. Upon termination or expiration of this Agreement, (a) Bluebird shall pay to Biogen [***] Biogen as of the effective date of termination or expiration within [***] following the effective date of termination or expiration and (b) all licenses under Section 2.1 from Biogen to Bluebird shall terminate.

13.5.2. Upon termination of this Agreement, Bluebird shall have the right to sell its remaining inventory of Licensed Products for a period of up to [***] following the termination of this Agreement so long as Bluebird has fully paid, and continues to fully pay when due, any and all Fees owed to Biogen, and Bluebird otherwise is not in material breach of this Agreement.

13.5.3. A termination of this Agreement will not automatically terminate any sublicense granted by Bluebird pursuant to Section 2.2 with respect to a Third Party, ***provided that*** (a) such sublicensee is not then in breach of any provision of this Agreement or the applicable sublicense agreement; (b) Biogen will have the right to step into the role of Bluebird as sublicensor, with all the rights that Bluebird had under such sublicense prior to termination of this Agreement (including the right to receive any payments to Bluebird by such sublicensee that accrue from and after the date of the termination of this Agreement); and (c) Biogen will only have those obligations to such sublicensee as Biogen had to Bluebird hereunder. Bluebird shall include in any sublicense agreement a provision in which said sublicensee acknowledges its obligations to Biogen hereunder and the rights of Biogen to terminate this Agreement with respect to any sublicensee for material breaches of this Agreement by such sublicensee.

13.6. Survival. Expiration or termination of this Agreement shall not relieve the Parties of any obligation accruing hereunder prior to such expiration or termination. Without limiting the foregoing, the provisions of Sections 5.1.7 (Late Payments), 5.2 (Payment Method), 5.3 (Taxes), 6 (Records; Audit Rights), 7.1 (Pre-Existing IP), 7.2 (Developed IP), 9 (Confidentiality), 11 (Indemnification), 12 (Limitation of Liability), 13.5 (Effect of Termination or Expiration), 14.1.2 (Public Statements), 15 (Bluebird Insurance), 16 (Dispute Resolution), 17.3 (Governing Law) and 17.8 (Notices) shall survive expiration or termination of this Agreement.

14. PUBLICITY, PUBLICATIONS AND RESTRICTED ACCESS

14.1. Publicity and Publications.

14.1.1. Use of Trademarks. Neither Party (nor any of its Affiliates or agents) shall use the Trademarks of the other Party or its Affiliates in any press release,

publication or other form of promotional disclosure without the prior written consent of the other Party in each instance.

14.1.2. **Public Statements**. Except as expressly set forth herein, each Party agrees not to issue any press release or other public statement or any information relating to this Agreement, whether written, electronic, oral or otherwise, disclosing the existence of this Agreement or the terms hereof without the prior written consent of the other Party; ***provided, however***, that neither Party will be prevented from complying with any duty of disclosure it may have pursuant to Applicable Laws or the rules of any recognized stock exchange, including disclosure of the terms of this Agreement, so long as the disclosing Party provides the other Party at least [***] prior written notice to the extent practicable and only discloses information to the extent required by Applicable Laws or the rules of any recognized stock exchange.

14.1.3. **Publications**. Biogen acknowledges that Bluebird personnel may desire to publish or present data that is derived from the research, Development or Commercialization of the Licensed Products in the Field or related to the Licensed Patent Rights. No such publication by Bluebird will be submitted and no such presentation shall be made unless a written copy of such proposed publication or presentation is submitted to Biogen no later than [***] before submission for publication or presentation. Biogen shall provide its comments with respect to such publications and presentations within [***] after its receipt of such written copy from Bluebird. Bluebird shall consider in good faith all comments made by Biogen, including limitations on disclosure of Bluebird confidential information requested by Biogen consistent with what Bluebird would consider normal procedure for its own development products. Bluebird will comply with standard academic practice regarding authorship of scientific publications and recognition of contribution of other parties in any such publication.

14.2. **Restricted Disclosure and Internal Access.** At any time after [***], Bluebird's obligation to submit details of Bluebird's research and Development activities with respect to the Licensed Products, including specific vector sequences used in the Licensed Products pursuant to clause (a) or (b) of Section 3.3 or proposed manuscripts pursuant to Section 14.1.3 (such information, the "**Restricted Information**") shall be limited to submitting such information solely to Biogen's intellectual property group, and Biogen shall restrict the access of any such Restricted Information to Biogen's intellectual property group; ***provided that***, notwithstanding the foregoing, (i) Biogen's intellectual property group may disclose to other employees and consultants of Biogen information derived from Restricted Information concerning whether or not Bluebird has complied with its payment obligations under Section 5.1.2 and Section 5.1.3 and (ii) the restrictions

contained in this Section 14.2 shall not apply in the event of any dispute under this Agreement.

15. BLUEBIRD INSURANCE

15.1. Insurance Requirements. Bluebird shall maintain during the Term and until the later of: (a) [***] after termination or expiration of this Agreement, or (b) the date that all statutes of limitation covering claims or suits that may be instituted for personal injury based on the sale or use of the Licensed Products have expired, commercial general liability insurance from a minimum "A-" AM Bests rated insurance company or insurer reasonably acceptable to Biogen, including contractual liability and product liability or clinical trials, if applicable, with coverage limits of not less than [***]. Bluebird has the right to provide the total limits required by any combination of primary and umbrella/excess coverage. The minimum level of insurance set forth herein shall not be construed to create a limit on Bluebird's liability hereunder. Such policies shall name Biogen and its Affiliates as additional insured and provide a waiver of subrogation in favor of Biogen and its Affiliates. Such insurance policies shall be primary and non-contributing with respect to any other similar insurance policies available to Biogen or its Affiliates. Any deductibles for such insurance shall be assumed by Bluebird.

15.2. Policy Notification. Bluebird shall provide Biogen with original certificates of insurance (which may be done through the submission of an electronic copy of such certificate) evidencing such insurance: (a) promptly following execution by both Parties of this Agreement; and (b) prior to expiration of any one coverage. Biogen shall be given at least thirty (30) days written notice prior to cancellation, termination or any change to restrict the coverage or reduce the limits afforded.

16. DISPUTE RESOLUTION

16.1. General. Promptly after the written request of either Party, each of the Parties shall appoint a designated representative to meet in person or by telephone to attempt in good faith to resolve any dispute that arises under this Agreement. If the designated representatives do not resolve the dispute within [***] of such request, then a senior executive of each Party shall meet in person or by telephone to review and attempt to resolve the dispute in good faith. The senior executives shall have [***] days to attempt to resolve the dispute. If the senior executives cannot resolve such dispute within such period of time, then the Parties shall each be free to pursue any avenue available to them under law or equity to resolve the dispute. If a Party's legal rights would be adversely affected as a result of the passage of time that would occur by participating in the dispute resolution mechanism set forth above, including the effect of applicable statutes of limitations or time-based defenses (such as estoppels or laches), such Party may commence legal proceedings prior to or during the course of such dispute resolution mechanism.

16.2. **Injunctive Relief**. Notwithstanding the foregoing, in the event of an actual or threatened breach hereunder, the aggrieved Party may seek equitable relief (including restraining orders, specific performance or other injunctive relief) in any court or other forum, without first submitting to the dispute resolution procedures set forth in Section 16.1.

17. GENERAL PROVISIONS

17.1. **Assignment**. [***]

17.2. **Severability**. Should one or more of the provisions of this Agreement become void or unenforceable as a matter of law, then such provision will be ineffective only to the extent of such prohibition or invalidity, without invalidating the remainder of this Agreement, and the Parties agree to substitute a valid and enforceable provision therefor which, as nearly as possible, achieves the desired economic effect and mutual understanding of the Parties under this Agreement.

17.3. **Governing Law.** This Agreement shall be governed by and construed under the laws in effect in the Commonwealth of Massachusetts, U.S., without giving effect to any conflicts of laws provision thereof or of any other jurisdiction that would produce a contrary result.

17.4. **Force Majeure**. Except with respect to delays or nonperformance caused by the negligent or intentional act or omission of a Party, any delay or nonperformance by such Party (other than payment obligations under this Agreement) will not be considered a breach of this Agreement to the extent such delay or nonperformance is caused by acts of God, natural disasters, acts of the government or civil or military authority, fire, floods, epidemics, quarantine, energy crises, war or riots or other similar cause outside of the reasonable control of such Party (each, a "**Force Majeure Event**"), ***provided that*** the Party affected by such Force Majeure Event will promptly begin or resume performance as soon as reasonably practicable after the event has abated. If the Force Majeure Event prevents a Party from performing any of its obligations under this Agreement for [***] or more, then the other Party may terminate this Agreement immediately upon written notice to the non-performing Party.

17.5. **Waivers and Amendments**. The failure of any Party to assert a right hereunder or to insist upon compliance with any term or condition of this Agreement shall not constitute a waiver of that right or excuse a similar subsequent failure to perform any such term or condition by the other Party. No waiver shall be effective unless it has been given in writing and signed by the Party giving such waiver. No provision of this Agreement may be amended or modified other than by a written document signed by authorized representatives of each Party.

17.6. **Relationship of the Parties**. Nothing contained in this Agreement shall be deemed to constitute a partnership, joint venture, or legal entity of any type between Biogen and Bluebird, or to constitute one Party as the agent of the other. Moreover, each Party agrees not to construe this Agreement, or any of the transactions contemplated hereby, as a partnership for any tax purposes. Each Party shall act solely as an independent contractor, and nothing in this Agreement shall be construed to give any Party the power or authority to act for, bind, or commit the other Party.

17.7. **Successors and Assigns**. This Agreement shall be binding upon and inure to the benefit of the Parties hereto and their respective successors and permitted assigns.

17.8. **Notices**. All notices, consents, waivers, and other communications under this Agreement must be in writing and will be deemed to have been duly given when: (a) delivered by hand (with written confirmation of receipt); (b) sent by fax (with written confirmation of receipt), ***provided that*** a copy is sent by an internationally recognized overnight delivery service (receipt requested); or (c) when received by the addressee, if sent by an internationally recognized overnight delivery service (receipt requested), in each case to the appropriate addresses and fax numbers set forth below (or to such other addresses and fax numbers as a Party may designate by written notice):

If to Biogen:

Biogen Idec
225 Binney Street
Cambridge, MA 02142
Attn: Executive Vice President and General Counsel
Facsimile: (866) 546-2758

with a copy to:

Ropes & Gray LLP
Prudential Tower, 800 Boylston Street
Boston, MA 02199-3600 U.S.A.
Attn: Marc A. Rubenstein, Esq.
Facsimile: (617) 235-0706

If to Bluebird:

bluebird bio, Inc.
150 2nd Street
Cambridge, MA 02141
Attn: General Counsel

with a copy to:

Goodwin Procter LLP
53 State Street
Boston, MA 02109-2802
Attn: Michael Bison

17.9. Further Assurances. Bluebird and Biogen hereby covenant and agree without the necessity of any further consideration, to execute, acknowledge and deliver any and all such other documents and take any such other action as may be reasonably necessary or appropriate to carry out the intent and purposes of this Agreement.

17.10. No Third Party Beneficiary Rights. Except as expressly provided in this Agreement, this Agreement is not intended to and shall not be construed to give any Third Party any interest or rights (including, without limitation, any Third Party beneficiary rights) with respect to or in connection with any agreement or provision contained herein or contemplated hereby, except in the case of Section 11, Biogen Indemnitees and Bluebird Indemnitees, as applicable.

17.11. Entire Agreement; Confidentiality Agreement. This Agreement, together with its Schedules, sets forth the entire agreement and understanding of the Parties as to the subject matter hereof and supersedes all proposals, oral or written, and all other prior communications between the Parties with respect to such subject matter, including, without limitation, that certain mutual confidentiality agreement by and between Bluebird and Biogen Idec Inc., dated February 14, 2014 (the "**CDA**"). The Parties acknowledge and agree that, as of the Effective Date, all Confidential Information (as defined in the CDA) disclosed by Biogen or its Affiliates pursuant to the CDA shall be considered Biogen's Confidential Information and subject to the terms set forth in this Agreement. In the event of any conflict between a material provision of this Agreement and any Schedule hereto, this Agreement shall control.

17.12. Counterparts. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. An executed signature page of this Agreement delivered by electronic or facsimile transmission shall be as effective as an original executed signature page.

17.13. Cumulative Remedies. No remedy referred to in this Agreement is intended to be exclusive, but each shall be cumulative and in addition to any other remedy referred to in this Agreement or otherwise available under law.

17.14. Waiver of Rule of Construction. Each Party has had the opportunity to consult with counsel in connection with the review, drafting and negotiation of this

Agreement. Accordingly, any rule of construction that any ambiguity in this Agreement shall be construed against the drafting Party shall not apply.

17.15. Headings. The captions to the several sections hereof are not a part of this Agreement, but are included merely for convenience of reference only and shall not affect its meaning or interpretation.

17.16. Construction. Except where the context otherwise requires, the use of any gender herein shall be deemed to be or include the other genders, the use of the singular shall be deemed to include the plural (and vice versa) and the word "or" is used in the inclusive sense commonly associated with the term "and/or". The words "include", "includes" and "including" shall be deemed to be followed by the phrase "without limitation." The word "will" shall be construed to have the same meaning and effect as the word "shall." Unless the context requires otherwise, (a) any definition of or reference to any agreement, instrument or other document herein shall be construed as referring to such agreement, instrument or other document as from time to time amended, supplemented or otherwise modified (subject to any restrictions on such amendments, supplements or modifications set forth herein), (b) any reference herein to any Person shall be construed to include the Person's successors and assigns, (c) the words "herein", "herewith", "hereof" and "hereunder", and words of similar import, shall, unless otherwise stated, be construed to refer to this Agreement in its entirety and not to any particular provision hereof and (d) all references to "Section" and "Schedule", unless otherwise specified, are intended to refer to a Section or Schedule of or to this Agreement.

[*Signatures on next page*]

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT PURSUANT TO RULE 24B-2 PROMULGATED UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED.

IESS WHEREOF, the Parties intending to be bound have caused this Agreement to be executed by their duly authorized representatives as of the Effective Date.

Biogen Idec MA Inc.	**bluebird bio, Inc.**
By: /s/ Steven Holtzmann	By: /s/ Jason F. Cole
Name: Steven Holtzmann	Name: Jason F. Cole
Title: EVP, Corporate Development	Title: SVP, General Counsel

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SCHEDULE A

COM IP

[***]

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SCHEDULE B

MOT IP

[***]

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT PURSUANT TO RULE 24B-2 PROMULGATED UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED.

EXHIBIT 10.18

THE NATIONAL INSTITUTES OF HEALTH

PATENT LICENSE AGREEMENT – *EXCLUSIVE*

COVER PAGE

For the **NIH** internal use only:

License Number: L-224-2015/0

License Application Number: A-107-2014

Serial Number(s) of Licensed Patent(s) or Patent Application(s):

[***]

Licensed bio, Inc.

Cooperative Research and Development Agreement (CRADA) Number (if a subject invention): None

Additional Remarks:

Public Benefit(s):

Autologous cell therapy has shown the potential to result in a significant and durable clinical benefit to patients with advanced tumors; the newest iteration of this approach uses engineered chimeric antigen receptors (CAR) to activate T cell response to the tumor. B cell maturation antigen (BCMA) is an attractive target for application of CAR technology due to its expression in different tumor types (especially hematological cancers) and lack of expression in non-transformed tissues; therefore, development of BCMA CAR products by the **Licensee**, in partnership with the **NIH**, has the potential to generate new, efficacious, and safe therapies for patients that have not responded to all other therapies.

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT PURSUANT TO RULE 24B-2 PROMULGATED UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED.

This Patent License Agreement, hereinafter referred to as the "**Agreement**", consists of this Cover Page, an attached **Agreement**, a Signature Page, Appendix A (List of Patent(s) or Patent Application(s)), Appendix B (Fields of Use and Territory), Appendix C (Royalties), Appendix D (Benchmarks and Performance), Appendix E (Commercial Development Plan), Appendix F (Example Royalty Report), and Appendix G (Royalty Payment Options). The Parties to this **Agreement** are:

1) The National Institutes of Health ("**NIH**"), an agency within the Department of Health and Human Services ("**HHS**"); and

2) The person, corporation, or institution identified above or on the Signature Page, having offices at the address indicated on the Signature Page, hereinafter referred to as the "**Licensee**".

The **NIH** and the **Licensee** agree as follows:

1. BACKGROUND

1.1 In the course of conducting biomedical and behavioral research, the **NIH** or the **FDA** investigators made inventions that may have commercial applicability.

1.2 By assignment of rights from **NIH** or **FDA** employees and other inventors, **HHS**, on behalf of the **Government**, owns intellectual property rights claimed in any United States or foreign patent applications or patents corresponding to the assigned inventions. **HHS** also owns any tangible embodiments of these inventions actually reduced to practice by the **NIH** or the **FDA**.

1.3 The Secretary of **HHS** has delegated to the **NIH** the authority to enter into this **Agreement** for the licensing of rights to these inventions.

1.4 The **NIH** desires to transfer these inventions to the private sector through commercialization licenses to facilitate the commercial development of products and processes for public use and benefit.

1.5 The **Licensee** desires to acquire commercialization rights to certain of these inventions in order to develop processes, methods, or marketable products for public use and benefit.

2. DEFINITIONS

2.1 "**Affiliate(s)**" means a corporation or other business entity, which directly or indirectly is controlled by or controls, or is under common control with the **Licensee**. For this purpose, the term "control" shall mean ownership of more than fifty percent (50%) of the voting stock or other ownership interest of the corporation or other business entity, or the power to elect or appoint more than fifty percent (50%) of the members of the governing body of the corporation or other business entity.

2.2 "**Benchmarks**" mean the performance milestones that are set forth in Appendix D.

2.3 "**Combination Product**" means a product that contains a **Licensed Product(s)** and at least one other active therapeutic component or device other than a **Licensed Product(s)** that is not claimed or covered by the **Licensed Patent Rights**.

2.4 "**Commercial Development Plan**" means the written commercialization plan attached as Appendix E.

2.5 "**CRADA"** means a Cooperative Research and Development Agreement.

2.6 "**FDA**" means the Food and Drug Administration.

2.7 "**First Commercial Sale**" means the initial transfer by or on behalf of the **Licensee**, its A**ffiliates** or sublicensees of the **Licensed Products** or the initial practice of a **Licensed Process** by or on behalf of the **Licensee**, its **Affiliates**, or sublicensees in a country or other jurisdiction, in each case, after all applicable marketing and pricing approvals (if any) have been granted by the applicable governing regulatory authority in such country or other jurisdiction, in exchange for cash or some equivalent consideration to which value can be assigned for the purpose of determining **Net Sales**.

2.8 "**Government**" means the Government of the United States of America.

2.9 "**Licensed Fields of Use**" means the fields of use identified in Appendix B

2.10 "**Licensed Patent Rights**" shall mean, subject to Paragraph 6.6:

(a) Patent applications (including provisional patent applications and PCT patent applications) or patents listed in Appendix A, all divisions and continuations of these applications, all patents issuing from these applications, divisions, and continuations, and any reissues, reexaminations, and extensions of these patents;

(b) to the extent that the following contain one or more claims directed to the invention or inventions disclosed in 2.10(a):

(i) continuations-in-part of 2.10(a);

(ii) all divisions and continuations of these continuations-in-part;

(iii) all patents issuing from these continuations-in-part, divisions, and continuations;

(iv) priority patent application(s) of 2.10(a); and

(v) any reissues, reexaminations, and extensions of these patents;

(c) to the extent that the following contain one or more claims directed to the invention or inventions disclosed in 2.10(a): all counterpart foreign and U.S. patent applications and patents to2.10(a) and 2.10(b), including those listed in Appendix A; and

(d) **Licensed Patent Rights** shall *not* include claims included in patents or applications identified in 2.10(b) or 2.10(c) to the extent that such claims are directed to new matter which is not the subject matter disclosed in 2.10(a).

2.11 "**Licensed Processes**" means processes which, in the course of being practiced, would be within the scope of one or more claims of the **Licensed Patent Rights**.

2.12 "**Licensed Products**" means tangible materials which, in the course of manufacture, use, sale, or importation, would be within the scope of one or more claims of the **Licensed Patent Rights**.

2.13 "**Licensed Territory**" means the geographical area identified in Appendix B.

2.14 (a)"**Net Sales**" means [***]

2.15 "**Practical Application**" means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to operate in the case of a machine or system; and in each case, under these conditions as to establish that the invention is being utilized and that its benefits are to the extent permitted by law or **Government** regulations available to the public on reasonable terms.

2.16 "**Research License**" means a nontransferable, nonexclusive license to make and to use the **Licensed Products** or the **Licensed Processes** as defined by the **Licensed Patent Rights** for purposes of research and not for purposes of commercial manufacture, sale, or distribution in lieu of purchase.

2.17 [***].

2.18 "**Licensee's Development Partner**" means Celgene Corporation, which was identified in **Licensee's** commercial development plan included with its license application as **Licensee's** partner for developing and commercializing the **Licensed Patent Rights**.

2.19 "**Notice**" means a legal notification by **Licensee** to **NIH** that is delivered in a written format to **NIH's** official mailing address for **Agreement** notices and reports.

2.20 "**Collaboration and Option Agreement**" means the amended and restated master collaboration agreement between **Licensee** and **Licensee's Development Partner**, dated as of June 3, 2015, focused on anti-BCMA product candidates, and as may be amended from time to time.

3. GRANT OF RIGHTS

3.1 The **NIH** hereby grants and the **Licensee** accepts, subject to the terms and conditions of this **Agreement**, an exclusive license under the **Licensed Patent Rights** in the **Licensed Territory** to make and have made, to use and have used, to sell and have sold, to offer to sell, and to import any **Licensed Products** in the **Licensed Field of Use I** and to practice and have practiced any **Licensed Process(es)** in the **Licensed Field of Use I**.

3.2 The **NIH** hereby grants and the **Licensee** accepts, subject to the terms and conditions of this **Agreement**, a non-exclusive license under the **Licensed Patent Rights** in the **Licensed Territory** to make and have made, to use and have used, to sell and have sold, to offer to sell, and to import any **Licensed Products** in the **Licensed Field of Use II** and to practice and have practiced any **Licensed Process(es)** in the **Licensed Field of Use II**. [***]

3.3 This **Agreement** confers no license or rights by implication, estoppel, or otherwise under any patent applications or patents of the **NIH** other than the **Licensed Patent Rights** regardless of whether these patents are dominant or subordinate to the **Licensed Patent Rights**.

4. SUBLICENSING

4.1 Upon written approval, which shall include prior review of any sublicense agreement by the **NIH** and which shall not be unreasonably withheld, the **Licensee** may enter into sublicensing agreements under the **Licensed Patent Rights**. With respect to any proposed sublicense agreement, if the **NIH** does not provide the **Licensee** with a written objection thereof within [***] after the date the **NIH** receives **Notice** of **Licensee's** intent to sublicense and a copy of the proposed sublicense from the **Licensee**, the **NIH** shall be deemed to have given its approval of such sublicense agreement and the **Licensee** shall have the right to enter into such sublicense agreement.

The **NIH** hereby provides written approval for the **Collaboration and Option Agreement** with the following stipulations:

[***]

4.2 The **Licensee** agrees that any sublicenses granted by it shall provide that the obligations to the **NIH** of Paragraphs 5.1-5.4, 8.1, 10.1, 10.2, 12.5, 13.6-13.8 of this **Agreement** shall be explicitly binding to sublicensee as if it were a party to this **Agreement**.

4.3 Any sublicenses granted by the **Licensee** shall provide for the termination of the sublicense, or the conversion to a license directly between the sublicensees and the **NIH**, at the option of the sublicensee, upon termination of this **Agreement** under Article 13. This conversion is subject to the **NIH** approval, which will not be unreasonably withheld, and contingent upon acceptance by the sublicensee of the remaining provisions of this **Agreement**.

4.4 The **Licensee** agrees to forward to the **NIH** a complete copy of each fully executed sublicense agreement postmarked within [***] of the execution of the agreement. To the extent permitted by law, the **NIH** agrees to maintain each sublicense agreement in confidence.

5. STATUTORY AND NIH REQUIREMENTS AND RESERVED GOVERNMENT RIGHTS

5.1 (a)the **NIH** reserves on behalf of the **Government** an irrevocable, non-exclusive, non-transferable, royalty-free license for the practice of all inventions licensed under the **Licensed Patent Rights** throughout the world by or on behalf of the **Government** and on behalf of any foreign government or international organization pursuant to any existing or future treaty or agreement to which the **Government** is a signatory; and

(b) in the event that the **Licensed Patent Rights** are Subject Inventions made under **CRADA**, the **Licensee** grants to the **Government**, to the extent set forth in 15 U.S.C. §3710a(b)(1)(A), a non-exclusive, non-transferable, irrevocable, paid-up license to practice the **Licensed Patent Rights** or have the **Licensed Patent Rights** practiced throughout the world by or on behalf of the **Government**. In the exercise of this license, the **Government** shall not publicly disclose trade secrets or commercial or financial information that is privileged or confidential within the meaning of 5 U.S.C. §552(b)(4) or which would be considered as such if it had been obtained from a non-Federal party.

5.2 The **Licensee** agrees that products used or sold in the United States embodying the **Licensed Products** or produced through use of the **Licensed Processes** shall be manufactured substantially in the United States, unless a written waiver is obtained in advance from the **NIH**, which written waiver will not be unreasonably withheld or denied.

5.3 The **Licensee** acknowledges that the **NIH** may enter into future **CRADA**s under the Federal Technology Transfer Act of 1986 that relate to the subject matter of this **Agreement**. The **Licensee** agrees not to unreasonably deny requests for a **Research License** from future collaborators with the **NIH** when acquiring these rights is necessary in order to make a **CRADA** project feasible. The **Licensee** may request an opportunity to join as a party to the proposed **CRADA**.

5.4 (a)in addition to the reserved license of Paragraph 5.1, the **NIH** reserves the right to grant **Research Licenses** directly or to require the **Licensee** to grant **Research Licenses** on reasonable terms. The purpose of these **Research Licenses** is to encourage basic research, whether conducted at an academic or corporate facility. In order to safeguard the **Licensed Patent Rights**, however, the **NIH** shall consult with the **Licensee** before granting to commercial entities a **Research License** or providing to them research samples of materials made through the **Licensed Processes**; and

(b) in exceptional circumstances, and in the event that the **Licensed Patent Rights** are Subject Inventions made under a **CRADA**, the **Government**, to the extent set forth in 15 U.S.C. §3710a(b)(1)(B), retains the right to require the **Licensee** to grant to a responsible applicant a nonexclusive, partially exclusive, or exclusive sublicense to use the **Licensed Patent Rights** in the **Licensed Field of Use** on terms that are reasonable under the circumstances, or if the **Licensee** fails to grant this license, the **Government** retains the right to grant the license itself. The exercise of these rights by the **Government** shall only be in exceptional circumstances and only if the **Government** determines:

(i) the action is necessary to meet health or safety needs that are not reasonably satisfied by the **Licensee**;

(ii) the action is necessary to meet requirements for public use specified by Federal regulations, and these requirements are not reasonably satisfied by the **Licensee**; or

(iii) the **Licensee** has failed to comply with an agreement containing provisions described in 15 U.S.C. §3710a(c)(4)(B); and

(c) the determination made by the **Government** under this Paragraph 5.4 is subject to administrative appeal and judicial review under 35 U.S.C. §203(b).

(d) The **NIH** acknowledges and agrees that a **Research License** or other right granted pursuant to this Paragraph 5.4 shall only pertain to the **Licensed Patent Rights** and shall not include a right or license to any patent or other intellectual property right solely owned or solely controlled by the **Licensee** or its **Affiliates** other than the **Licensed Patent Rights**. Without limiting the foregoing, except as expressly provided herein, nothing contained in this **Agreement** shall be construed as granting, by implication, estoppel or otherwise, any licenses or rights under any patents or other intellectual property rights other than the **Licensed Patent Rights**.

Notwithstanding anything to the contrary set forth in this **Agreement**, the **NIH** shall not grant to any third party any rights under the **Licensed Patent Rights** within the **Licensed Field of Use 1** and shall not provide any **Licensed Products** or materials made through the **Licensed Processes** to any third party for any commercial purpose within the **Licensed Field of Use 1**.

6.

6. ROYALTIES AND REIMBURSEMENT

6.1 The **Licensee** agrees to pay the **NIH** a non-creditable, non-refundable license issue royalty as set forth in Appendix C.

6.2 The **Licensee** agrees to pay the **NIH** a non-refundable, fully creditable (against earned royalties due for sales made in that specific year under Paragraph 6.3 below) minimum annual royalty as set forth in Appendix C.

6.3 The **Licensee** agrees to pay the **NIH** earned royalties as set forth in Appendix C.

6.4 The **Licensee** agrees to pay the **NIH** benchmark royalties as set forth in Appendix C.

6.5 The **Licensee** agrees to pay the **NIH** sublicensing royalties as set forth in Appendix C.

6.6 A patent or patent application, in any given country or other jurisdiction, licensed under this **Agreement** shall cease to fall within the **Licensed Patent Rights** for the purpose of computing earned royalty payments on the earliest of the dates that, in such country or other jurisdiction:

(a) the application has lapsed or been rejected, revoked or abandoned and not continued;

(b) the patent expires or irrevocably lapses, or

(c) the patent has been held to be revoked, invalid or unenforceable by an unappealed or unappealable decision of a court of competent jurisdiction or administrative agency.

(d) one or more claims have been pending before the United States Patent and Trademark Office for more than [***] as of the date of **Licensee's** signature found at the Signature Page of this **Agreement**, except that such [***] period shall be extended by a period equal to the time the examination of the claim(s) has been interrupted by (i) a derivation proceeding under 35 U.S.C. Section 135 or (ii) the claim(s) are the subject of an appeal filed by the **NIH** of a decision of an patent examiner pursuant to 37 C.F.R Part 1; provided, however, that if the claim(s) issue in a form substantially similar to the form in which they were originally filed, the claim(s) shall be deemed to fall within the scope of the **Licensed Patent Rights** on which royalties on **Net Sales** are due.

6.7 No multiple royalties shall be payable because any **Licensed Products** or **Licensed Processes** are covered by more than one of the **Licensed Patent Rights**.

6.8 On sales of the **Licensed Products** by the **Licensee** to its **Affiliates** or sublicensees or on sales made in other than an arms-length transaction, the value of the **Net Sales** attributed under this Article 6 to this transaction shall be that which would have been received in an arms-length transaction, based on sales of like quantity and quality products on or about the time of this transaction.

6.9 With regard to unreimbursed expenses associated with the preparation, filing, prosecution, and maintenance of all patent applications and patents included within the **Licensed Patent Rights** and paid by the **NIH** prior to the effective date of this **Agreement**, an amount equal to [***], the **Licensee** shall pay the **NIH**, as an additional royalty, within sixty (60) days of the **NIH's** submission of a statement and request for payment to the **Licensee** an amount equivalent to these unreimbursed expenses previously paid by the **NIH**, or a *pro rata* share thereof if there are multiple commercial licensees of the **Licensed Patent Rights** prior to the end of the sixty (60) day period for such payment by **Licensee**.

6.10 With regard to unreimbursed expenses associated with the preparation, filing, prosecution, and maintenance of all patent applications and patents included within the **Licensed Patent Rights** and paid by the **NIH** on or after the effective date of this **Agreement** and during the term of this **Agreement**, the **NIH**, at its sole option, may require the **Licensee**:

[***]

6.11 The **NIH** agrees, upon written request, to provide the **Licensee** with summaries of patent prosecution invoices for which the **NIH** has requested payment from the **Licensee** under Paragraphs 6.9 and 6.10. The **Licensee** agrees that all information provided by the **NIH** related to patent prosecution costs shall be treated as confidential commercial information and shall not be released to a third party except as required by law or a court of competent jurisdiction.

6.12 The **Licensee** may elect to surrender its rights in any country of the **Licensed Territory** under any of the **Licensed Patent Rights** upon thirty (30) days written notice to the **NIH** and owe no

payment obligation under Paragraph 6.10 for patent-related expenses paid in that country after thirty (30) days of the effective date of the written notice.

7. PATENT FILING, PROSECUTION, AND MAINTENANCE

7.1 Except as otherwise provided in this Article 7, the **NIH** agrees to take responsibility for the **Licensee** in the preparation, filing, prosecution, and maintenance of any and all patent applications or patents included in the **Licensed Patent Rights** and shall, on an ongoing basis, promptly furnish copies of all relevant patent-related documents to the **Licensee**. **NIH** shall instruct the law firm prosecuting the **Licensed Patent Rights** to furnish, upon execution of this **Agreement** and on a continuous basis thereafter as long as the **Agreement** is in effect, copies of relevant patent-related documents to **Licensee**, including all drafts of patent applications filings, domestic and foreign, amendments thereto, related correspondence and other related documents, sufficiently in advance to allow **Licensee** to comment thereon prior to filing or submission. **NIH** shall, in good faith, take into consideration all reasonable comments provided by **Licensee** relating to the preparation, filing, prosecution, and maintenance of any and all patent applications or patents included in the **Licensed Patent Rights**, provided however, that if **Licensee** has not commented prior to the relevant action deadline, **NIH** shall be free to act without consideration of **Licensee's** comments.

7.2 Upon the **NIH's** written request or upon any determination by the **NIH** not to proceed or continue with the preparation, filing, prosecution, or maintenance (or combination thereof) of any patent application or patent included in the **Licensed Patent Rights**, the **NIH** shall provide the **Licensee** with written notice of such determination at least sixty (60) days prior to the deadline for taking any action for such patent application or patent or the date on which the abandonment of any such patent or application would become effective, whichever is earlier, and the **Licensee** shall have the right but not the obligation to assume the responsibility for the preparation, filing, prosecution, and maintenance of any and all patent applications or patents included in the **Licensed Patent Rights** and shall, on an ongoing basis, promptly furnish copies of all relevant patent-related documents to the **NIH**. In this event, the **Licensee** shall select registered patent attorneys or patent agents to provide these services on behalf of the **Licensee** and the **NIH**. The **NIH** shall provide appropriate powers of attorney and other documents necessary to undertake this action to the patent attorneys or patent agents providing these services. The **Licensee** and its attorneys or agents shall consult with the **NIH** in all aspects of the preparation, filing, prosecution and maintenance of patent applications and patents included within the **Licensed Patent Rights** and shall provide the **NIH** sufficient opportunity to comment on any document that the **Licensee** intends to file or to cause to be filed with the relevant intellectual property or patent office. If **Licensee** notifies **NIH** that **Licensee** does not intend to pursue or pay (or both) the costs of an application, then **NIH** may file such application at its own expense and **Licensee's** rights derived from this **Agreement** to that application will terminate.

7.3 **NIH** may provide **Licensee** with written notice that **NIH** wishes to reassume control of the preparation, filing, prosecution, and maintenance of any and all patent applications or patents included in the **Licensed Patent Rights** only if **NIH** determines that the **Licensee**:

(a) is not executing the **Commercial Development Plan** submitted with **Licensee's** request for a license and the **Licensee** cannot otherwise demonstrate to **NIH's** satisfaction that the **Licensee** has taken, or can be expected to take within a reasonable time, effective steps to achieve **Practical Application** of the **Licensed Products** or **Licensed Processes**;

(b) has not achieved the **Benchmarks** as may be modified under Paragraph 9.2; or

(c) is not fulfilling its obligations regarding diligent preparation, filing, prosecutions, and maintenance of any and all patent applications or patents included in the **Licensed Patent Rights**.

7.4 In making the determination referenced in Paragraph 7.3, **NIH** shall take into account the normal course of such commercial development programs conducted with sound and reasonable business practices and judgment and the annual reports submitted by **Licensee** under Paragraph 9.2. Prior to resuming control under Paragraph 7.3, **NIH** shall give written notice to **Licensee** providing **Licensee** specific notice of, and a [***] opportunity to respond to, **NIH's** concerns as to the items referenced in 7.3(a)-7.3(c). If **Licensee** fails to initiate corrective action to **NIH's** satisfaction, **NIH** may reassume control of the preparation, filing, prosecution, and maintenance of any and all patent applications or patents included in the **Licensed Patent Rights**.

7.5 Each party shall promptly inform the other as to all matters that come to its attention that may affect the preparation, filing, prosecution, or maintenance of the **Licensed Patent Rights** and permit each other to provide comments and suggestions with respect to the preparation, filing, prosecution, and maintenance of the **Licensed Patent Rights**, which comments and suggestions shall be considered by the other party.

8. RECORD KEEPING

8.1 The **Licensee** agrees to keep accurate and correct records of the **Licensed Products** made, used, sold, or imported and the **Licensed Processes** practiced under this **Agreement** appropriate to determine the amount of royalties due the **NIH**. These records shall be retained for at least five (5) years following a given reporting period and shall be available during normal business hours, but not more than once per year, for inspection, at the expense of the **NIH**, by an accountant or other designated auditor selected by the **NIH** for the sole purpose of verifying reports and royalty payments hereunder. The accountant or auditor shall only have the right to audit those records that have not previously been audited pursuant to this Paragraph 8.1, unless the **NIH** determines that there is just cause for an additional audit, and shall only disclose to the **NIH** information relating to the accuracy of reports and royalty payments made under this **Agreement**. If an inspection shows an underreporting or underpayment in excess of five percent (5%) for any twelve (12) month period, then the **Licensee** shall reimburse the **NIH** for the cost of the inspection at the time the **Licensee** pays the unreported royalties, including any additional royalties as required by Paragraph 9.8. All royalty payments required under this Paragraph shall be due within sixty (60) days of the date the **NIH** provides to the **Licensee** notice of the payment due. The **Licensee** shall have the right to require that any accountant or auditor, prior to conducting an audit under this Paragraph 8.1, enter into an appropriate non-disclosure agreement with the **Licensee** regarding such financial information.

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT PURSUANT TO RULE 24B-2 PROMULGATED UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED.

9. REPORTS ON PROGRESS, BENCHMARKS, SALES, AND PAYMENTS

9.1 Prior to signing this **Agreement**, the **Licensee** has provided the **NIH** with the **Commercial Development Plan** in Appendix E, under which the **Licensee** intends to bring the subject matter of the **Licensed Patent Rights** to the point of **Practical Application**. This **Commercial Development Plan** is hereby incorporated by reference into this **Agreement**. Based on this plan, performance **Benchmarks** are determined as specified in Appendix D.

9.2 The **Licensee** shall provide written summary annual reports on [***] for each of the **Licensed Fields of Use** within [***] These progress reports shall include, but not be limited to: [***]The **NIH** also encourages these reports to include information on any of the **Licensee's** public service activities that relate to the **Licensed Patent Rights**. [***] the **Licensee** shall [***] In the annual report, the **Licensee** may [***] The **Licensee** agrees to provide any additional information reasonably required by the **NIH** to evaluate the **Licensee's** performance under this **Agreement**. The **Licensee** may amend the **Benchmarks** at any time upon written approval by the **NIH**, which approval shall not be unreasonably withheld. The **NIH** shall not unreasonably withhold approval of any request of the **Licensee** to [***]

9.3 The **Licensee** shall report to the **NIH** the dates for achieving **Benchmarks** specified in Appendix D and the **First Commercial Sale** in each country in the **Licensed Territory** within [***] of such occurrences.

9.4 Following **First Commercial Sale**, the **Licensee** shall submit to the **NIH**, within [***] after each calendar half-year ending June 30 and December 31, a royalty report, as described in the example in Appendix F, setting forth for the preceding half-year period the amount of the **Licensed Products** sold or **Licensed Processes** practiced by or on behalf of the **Licensee** in each country within the **Licensed Territory**, the **Net Sales**, and the amount of royalty accordingly due. With each royalty report, the **Licensee** shall submit payment of earned royalties due. If no earned royalties are due to the **NIH** for any reporting period, the written report shall so state. The royalty report shall be certified as correct by an authorized officer of the **Licensee** [***]. The royalty report shall also identify the site of manufacture for the **Licensed Product(s)** sold in the United States.

9.5 The **Licensee** agrees to forward semi-annually to the **NIH** a copy of these reports received by the **Licensee** from its sublicensees during the preceding half-year period as shall be pertinent to a royalty accounting to the **NIH** by the **Licensee** for activities under the sublicense.

9.6 Royalties due under Article 6 shall be paid in U.S. dollars and payment options are listed in Appendix G. [***] The royalty report required by Paragraph 9.4 shall be mailed to the **NIH** at its address for **Agreement** Notices indicated on the Signature Page.

9.7 [***]

9.8 [***] may be assessed by the **NIH** on any payment that is more than ninety (90) days overdue, and not the subject of a good faith dispute, at the rate of [***]

9.9 All plans and reports required by this Article 9 and marked "confidential" by the **Licensee** shall, to the extent permitted by law, be treated by the **NIH** as commercial and financial information

obtained from a person and as privileged and confidential, and any proposed disclosure of these records by the **NIH** under the Freedom of Information Act (FOIA), 5 U.S.C. §552 shall be subject to the predisclosure notification requirements of 45 C.F.R. §5.65(d).

10. PERFORMANCE

10.1 The **Licensee** shall use its reasonable commercial efforts to bring the **Licensed Products** and the **Licensed Processes** to **Practical Application**. "Reasonable commercial efforts" for the purposes of this provision shall include reasonable efforts to adhere to the **Commercial Development Plan** in Appendix E and performance of the **Benchmarks** in Appendix D. The efforts of a sublicensee shall be considered the efforts of the **Licensee**.

10.2 Upon the **First Commercial Sale**, until the expiration or termination of this **Agreement**, the **Licensee** shall use its reasonable commercial efforts to make the **Licensed Products** and the **Licensed Processes** reasonably accessible to the United States public. The efforts of a sublicensee shall be considered the efforts of the **Licensee**.

10.3 The **Licensee** agrees that, to the extent commercially reasonable or possible, after its **First Commercial Sale,** to make reasonable quantities of the **Licensed Products** or materials produced through the use of the **Licensed Processes** available to patient assistance programs.

10.4 The **Licensee** agrees, after its **First Commercial Sale** and as part of its marketing and product promotion, to develop educational materials (e.g., brochures, website, etc.) directed to patients and physicians reasonably detailing the **Licensed Products** or medical aspects of the prophylactic and therapeutic uses of the **Licensed Products**.

10.5 The **Licensee** agrees to supply to **NIH**, to the Mailing Address for **Agreement** Notices indicated on the Signature Page, the Office of Technology Transfer, samples of of the marketing brochures for the **Licensed Products** or the **Licensed Processes** for educational and display purposes only.

11. INFRINGEMENT AND PATENT ENFORCEMENT

11.1 The **NIH** and the **Licensee** agree to notify each other promptly of each infringement or possible infringement of the **Licensed Patent Rights**, as well as, any facts which may affect the validity, scope, or enforceability of the **Licensed Patent Rights** of which either party becomes aware.

11.2 Pursuant to this **Agreement** and the provisions of 35 U.S.C. Chapter 29, the **Licensee** may:

(a) bring suit in its own name, at its own expense, and on its own behalf for infringement of presumably valid claims in the **Licensed Patent Rights**;

(b) in any suit, enjoin infringement and collect for its use, damages, profits, and awards of whatever nature recoverable for the infringement; or

(c) settle any claim or suit for infringement of the **Licensed Patent Rights** provided, however, that the **NIH** and appropriate **Government** authorities shall have the first right to take such actions; and

(d) if the **Licensee** desires to initiate a suit for patent infringement, the **Licensee** shall notify the **NIH** in writing. If the **NIH** does not notify the **Licensee** of its intent to pursue legal action within [***], the **Licensee** shall be free to initiate suit. The **NIH** shall have a continuing right to intervene in the suit at its own expense. The **Licensee** shall take no action to compel the **Government** either to initiate or to join in any suit for patent infringement; provided, however, that the **Government** will participate in the suit if required for legal standing purposes. The **Licensee** may request the **Government** to initiate or join in any suit if necessary to avoid dismissal of the suit. Should the **Government** be made a party to any suit brought by the **Licensee**, the **Licensee** shall reimburse the **Government** for any costs, expenses, or fees which the **Government** incurs as a result of the motion or other action, including all costs incurred by the **Government** in opposing the motion or other action. In all cases, the **Licensee** agrees to keep the **NIH** reasonably apprised of the status and progress of any litigation. Before the **Licensee** commences an infringement action, the **Licensee** shall notify the **NIH** and give careful consideration to the views of the **NIH** and to any potential effects of the litigation on the public health in deciding whether to bring suit.

11.3 In the event that a declaratory judgment action alleging invalidity or non-infringement of any of the **Licensed Patent Rights** shall be brought against the **Licensee** or raised by way of counterclaim or affirmative defense in an infringement suit brought by the **Licensee** under Paragraph 11.2, pursuant to this **Agreement** and the provisions of 35 U.S.C. Chapter 29 or other statutes, the **Licensee** may:

(a) defend the suit in its own name, at its own expense, and on its own behalf for presumably valid claims in the **Licensed Patent Rights**;

(b) in any suit, ultimately to enjoin infringement and to collect for its use, sue for damages, profits, and awards of whatever nature recoverable for the infringement; and

(c) settle any claim or suit for declaratory judgment involving the **Licensed Patent Rights** provided, however, that the **NIH** and appropriate **Government** authorities shall have a continuing right to intervene in the suit at its own expense; and

(d) if the **NIH** does not notify the **Licensee** of its intent to respond to the legal action within a reasonable time, the **Licensee** shall be free to do so. The **Licensee** shall take no action to compel the **Government** either to initiate or to join in any declaratory judgment action. The **Licensee** may request the **Government** to initiate or to join any suit if necessary to avoid dismissal of the suit. Should the **Government** be made a party to any suit by motion or any other action brought by the **Licensee**, the **Licensee** shall reimburse the **Government** for any costs, expenses, or fees, which the **Government** incurs as a result of the motion or other action. If the **Licensee** elects not to defend against the declaratory judgment action, the **NIH**, at its option, may do so at its own expense. In all cases, the **Licensee** agrees to keep the **NIH** reasonably

apprised of the status and progress of any litigation. Before the **Licensee** commences an infringement action, the **Licensee** shall notify the **NIH** and give careful consideration to the views of the **NIH** and to any potential effects of the litigation on the public health in deciding whether to bring suit.

11.4 Except as otherwise set forth above, in any action under Paragraphs 11.2 or 11.3 the expenses including costs, fees, attorney fees, and disbursements, shall be paid by [***]

11.5 The **NIH** shall cooperate fully with [***] in connection with any action under Paragraphs 11.2 or 11.3. The **NIH** agrees promptly to provide access to all necessary documents and to render reasonable assistance in response to a request by [***].

12. NEGATION OF WARRANTIES AND INDEMNIFICATION

12.1 The **NIH** offers no other warranties than those specified in Article 1: (i) **HHS**, by assignment of rights from **NIH** employees, on behalf of the **Government**, owns all intellectual property rights claimed in the United States and foreign patent applications and patents in the **Licensed Patent Rights**, (ii) **HHS** owns tangible embodiments of inventions actually reduced to practice, and (iii) **NIH** has the authority, by delegation from the Secretary of **HHS**, to enter into this **Agreement**.

12.2 The **NIH** does not warrant the validity of the **Licensed Patent Rights** and makes no representations whatsoever with regard to the scope of the **Licensed Patent Rights**, or that the **Licensed Patent Rights** may be exploited without infringing other patents or other intellectual property rights of third parties.

12.3 THE **NIH** MAKES NO WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF ANY SUBJECT MATTER DEFINED BY THE CLAIMS OF THE **LICENSED PATENT RIGHTS** OR TANGIBLE MATERIALS RELATED THERETO.

12.4 The **NIH** does not represent that it shall commence legal actions against third parties infringing the **Licensed Patent Rights**.

12.5 The **Licensee** shall indemnify and hold the **NIH**, its employees, students, fellows, agents, and consultants harmless from and against all liability, demands, damages, expenses, and losses, including but not limited to death, personal injury, illness, or property damage to the extent arising out of any suit or proceeding brought by a third party for:

(a) the use by or on behalf of the **Licensee**, its sublicensees, their respective directors or employees, or third parties acting by the direction of **Licensee** of any **Licensed Patent Rights**; or

(b) the design, manufacture, distribution, or use of any **Licensed Products**, **Licensed Processes** or other materials, products or processes developed by or on behalf of the **Licensee** or its sublicensees in connection with or arising out of the **Licensed Patent Rights**.

12.6 **Licensee** shall have no obligation to indemnify hereunder with respect to any liability, demands, damages, expenses, and losses to the extent arising out of any negligence or willful misconduct of the **NIH** or its employees, students, fellows, agents or consultants, or any breach by the **NIH** of the warranty set forth in Section 12.1 above.

12.7 The **Licensee** agrees to maintain a liability insurance program consistent with sound business practice.

13. TERM, TERMINATION, AND MODIFICATION OF RIGHTS

13.1 This **Agreement** is effective when signed by all parties, unless the provisions of Paragraph 14.16 are not fulfilled, and shall extend to the expiration of the last to expire of the **Licensed Patent Rights** unless sooner terminated as provided in this Article 13.

13.2 In the event that the **Licensee** is in default in the performance of any material obligations under this **Agreement**, including but not limited to the obligations listed in Paragraph 13.5, and if the default has not been remedied within [***] after the date of notice in writing of the default, the **NIH** may terminate this **Agreement** by written notice and pursue outstanding royalties owed through procedures provided by the Federal Debt Collection Act.

13.3 In the event that the **Licensee** becomes insolvent, files a petition in bankruptcy, has such a petition filed against it, or receives notice of a third party's intention to file an involuntary petition in bankruptcy, the **Licensee** shall immediately notify the **NIH** in writing.

13.4 The **Licensee** shall have a unilateral right to terminate this **Agreement** or any licenses in any **Licensed Fields of Use** in any country or territory by giving the **NIH** [***] written notice to that effect.

13.5 The **NIH** shall specifically have the right to terminate or modify, at its option, this **Agreement** by written notice to the **Licensee**, if the **NIH** reasonably determines that the **Licensee**:

(a) is not executing the **Commercial Development Plan** submitted with its request for a license and the **Licensee** cannot otherwise demonstrate to the **NIH's** satisfaction that the **Licensee** has taken, or can be expected to take within a reasonable time, effective steps to achieve the **Practical Application** of the **Licensed Products** or the **Licensed Processes**;

(b) has not achieved the **Benchmarks** as may be modified under Paragraph 9.2;

(c) has willfully made a false statement of, or willfully omitted a material fact in the license application or in any report required by this **Agreement**;

(d) has committed a material breach of a covenant or agreement contained in this **Agreement** that has not been remedied within the [***] period set forth in Paragraph 13.2 above;

(e) is not keeping the **Licensed Products** or the **Licensed Processes** reasonably available to the public after commercial use commences;

(f) cannot reasonably satisfy unmet health and safety needs;

(g) cannot reasonably justify a failure to comply with the domestic production requirement of Paragraph 5.2 unless waived.

13.6 In making the determination referenced in Paragraph 13.5, the **NIH** shall take into account the normal course of such commercial development programs conducted with sound and reasonable business practices and judgment and the annual reports submitted by the **Licensee** under Paragraph 9.2. Prior to invoking termination or modification of this **Agreement** under Paragraph 13.5, the **NIH** shall give written notice to the **Licensee** providing the **Licensee** specific notice of, and a [***] opportunity to respond to, the **NIH's** concerns as to the items referenced in 13.5(a)-13.5(g). If the **Licensee** fails to alleviate the **NIH's** concerns as to the items referenced in 13.5(a)-13.5(g) or within [***] following written notice from the **NIH** or otherwise fails to initiate corrective action to the **NIH's** satisfaction, the **NIH** may terminate this **Agreement** upon written notice to the **Licensee**.

13.7 When the public health and safety so require, and after written notice to the **Licensee** providing the **Licensee** a [***] opportunity to respond, the **NIH** shall have the right to require the **Licensee** to grant sublicenses to responsible applicants, on reasonable terms, in any **Licensed Fields of Use** under the **Licensed Patent Rights**, unless the **Licensee** can reasonably demonstrate that the granting of the sublicense would not materially increase the availability to the public of the subject matter of the **Licensed Patent Rights**. The **NIH** shall not require the granting of a sublicense unless the responsible applicant has first negotiated in good faith with the **Licensee**.

13.8 The **NIH** reserves the right according to 35 U.S.C. §209(d)(3) to terminate or modify this **Agreement** upon written notice to the **Licensee** if it is determined that this action is necessary to meet the requirements for public use specified by federal regulations issued after the date of the license and these requirements are not reasonably satisfied by the **Licensee** within [***] following written notice from the **NIH**.

13.9 Within [***] of receipt of written notice of the **NIH's** unilateral decision to modify or terminate this **Agreement**, the **Licensee** may, consistent with the provisions of 37 C.F.R. §404.11, appeal the decision by written submission to the designated **NIH** official. The decision of the designated **NIH** official shall be the final agency decision. The **Licensee** may thereafter exercise any and all administrative or judicial remedies that may be available.

13.10 Within [***] of expiration or termination of this **Agreement** under this Article 13, a final report shall be submitted by the **Licensee**. Any royalty payments, including those incurred but not yet paid (such as the full minimum annual royalty), and those related to patent expenses, due to the **NIH** shall become immediately due and payable upon termination or expiration. If terminated under this Article 13, sublicensees may elect to convert their sublicenses to direct licenses with the **NIH** pursuant to Paragraph 4.3. Unless otherwise specifically provided for under this **Agreement**, upon termination or expiration of this **Agreement**, the **Licensee** shall have the right to offer for sale and sell any existing inventory of **Licensed Products** for a period of [***] following the effective termination date of this **Agreement**, subject to the royalty obligations as set forth in Appendix C. The **Licensee** may not be granted additional **NIH** licenses if the final reporting requirement is not fulfilled.

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT PURSUANT TO RULE 24B-2 PROMULGATED UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED.

14. GENERAL PROVISIONS

14.1 Neither party may waive or release any of its rights or interests in this **Agreement** except in writing. The failure of a party to assert a right hereunder or to insist upon compliance with any term or condition of this **Agreement** shall not constitute a waiver of that right by that party or excuse a similar subsequent failure to perform any of these terms or conditions by the other party.

14.2 This **Agreement** constitutes the entire agreement between the parties relating to the subject matter of the **Licensed Patent Rights**, the **Licensed Products** and the **Licensed Processes**, and all prior negotiations, representations, agreements, and understandings are merged into, extinguished by, and completely expressed by this **Agreement**.

14.3 The provisions of this **Agreement** are severable, and in the event that any provision of this **Agreement** shall be determined to be invalid or unenforceable under any controlling body of law, this determination shall not in any way affect the validity or enforceability of the remaining provisions of this **Agreement**.

14.4 If either party desires a modification to this **Agreement**, the parties shall, upon reasonable notice of the proposed modification by the party desiring the change, confer in good faith to determine the desirability of the modification. No modification shall be effective until a written amendment is signed by the signatories to this **Agreement** or their designees.

14.5 The construction, validity, performance, and effect of this **Agreement** shall be governed by Federal law as applied by the Federal courts in the District of Columbia.

14.6 All **Agreement** notices required or permitted by this **Agreement** shall be given by prepaid, first class, registered or certified mail or by an express/overnight delivery service provided by a commercial carrier, properly addressed to the other party at the address designated on the following Signature Page, or to another address as may be designated in writing by the other party. **Agreement** notices shall be considered timely if the notices are received on or before the established deadline date or sent on or before the deadline date as verifiable by U.S. Postal Service postmark or dated receipt from a commercial carrier. Parties should request a legibly dated U.S. Postal Service postmark or obtain a dated receipt from a commercial carrier or the U.S. Postal Service. Private metered postmarks shall not be acceptable as proof of timely mailing.

[***]

14.7 The **Licensee** agrees in its use of any **NIH**-supplied materials to comply with all applicable statutes, regulations, and guidelines, including **NIH** and **HHS** regulations and guidelines. The **Licensee** agrees not to use the materials for research involving human subjects or clinical trials in the United States without complying with 21 C.F.R. Part 50 and 45 C.F.R. Part 46. The **Licensee** agrees not to use the materials for research involving human subjects or clinical trials outside of the United States without notifying the **NIH**, in writing, of the research or trials and complying with the applicable regulations of the appropriate national control authorities. Written notification to the **NIH** of research involving human subjects or clinical trials outside of the United States shall be given no later than [***] prior to commencement of the research or trials.

14.8 The **Licensee** acknowledges that it is subject to and agrees to abide by the United States laws and regulations (including the Export Administration Act of 1979 and Arms Export Control Act) controlling the export of technical data, computer software, laboratory prototypes, biological material, and other commodities. The transfer of these items may require a license from the appropriate agency of the U.S. **Government** or written assurances by the **Licensee** that it shall not export these items to certain foreign countries without prior approval of this agency. The **NIH** neither represents that a license is or is not required or that, if required, it shall be issued.

14.9 The **Licensee** agrees to mark the **Licensed Products** or their packaging or containers in accordance with the applicable patent marking laws.

14.10 By entering into this **Agreement**, the **NIH** does not directly or indirectly endorse any product or service provided, or to be provided, by the **Licensee** whether directly or indirectly related to this **Agreement**. The **Licensee** shall not state or imply that this **Agreement** is an endorsement by the **Government**, the **NIH**, any other **Government** organizational unit, or any **Government** employee. Additionally, the **Licensee** shall not use the names of the **NIH**, the **FDA** or the **HHS** or the **Government** or their employees in any advertising, promotional, or sales literature in connection with this **Agreement** or the **Licensed Patent Rights** without the prior written approval of the **NIH**.

14.11 The parties agree to attempt to settle amicably any controversy or claim arising under this **Agreement** or a breach of this **Agreement**, except for appeals of modifications or termination decisions provided for in Article 13. The **Licensee** agrees first to appeal any unsettled claims or controversies to the designated **NIH** official, or designee, whose decision shall be considered the final agency decision. Thereafter, the **Licensee** may exercise any administrative or judicial remedies that may be available. Notwithstanding anything to the contrary in this **Agreement**, the **Licensee** shall have the right, without waiving any right or remedy available under this **Agreement** or otherwise, to seek and obtain from any court of competent jurisdiction any interim or provisional relief that is necessary or desirable to protect the rights or property of the **Licensee**, pending any such settlement or the determination of any such appeal.

14.12 Nothing relating to the grant of a license, nor the grant itself, shall be construed to confer upon any person any immunity from or defenses under the antitrust laws or from a charge of patent misuse, and the acquisition and use of rights pursuant to 37 C.F.R. Part 404 shall not be immunized from the operation of state or Federal law by reason of the source of the grant.

14.13 Any formal recordation of this **Agreement** required by the laws of any **Licensed Territory** as a prerequisite to enforceability of the **Agreement** in the courts of any foreign jurisdiction or for other reasons shall be carried out by the **Licensee** at its expense, and appropriately verified proof of recordation shall be promptly furnished to the **NIH**.

14.14 Paragraphs 4.3, 8.1, 9.5-9.9, 12.1-12.5, 13.9, 13.10, 14.11 and 14.14 of this **Agreement** shall survive termination of this **Agreement**.

14.15 The terms and conditions of this **Agreement** shall, at the **NIH's** sole option, be considered by the **NIH** to be withdrawn from the **Licensee's** consideration and the terms and conditions of this **Agreement**, and the **Agreement** itself to be null and void, unless this **Agreement** is executed by

the **Licensee** and a fully executed original is received by the **NIH** within sixty (60) days from the date of the **NIH's** signature found at the Signature Page.

SIGNATURES BEGIN ON NEXT PAGE

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT PURSUANT TO RULE 24B-2 PROMULGATED UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED.

NIH PATENT LICENSE AGREEMENT – *EXCLUSIVE*

SIGNATURE PAGE

For the **NIH**:

/s/ Richard U. Rodriguez — 8/21/2015
Richard U. Rodriguez — Date
Director, Division of Technology Development and Transfer
Office of Technology Transfer
National Institutes of Health

Mailing Address or E-mail Address for **Agreement** notices and reports:

Chief, Monitoring & Enforcement Branch
Office of Technology Transfer
National Institutes of Health
6011 Executive Boulevard, Suite 325
Rockville, Maryland 20852-3804 U.S.A.

E-mail: LicenseNotices_Reports@mail.nih.gov

For the **Licensee** (Upon, information and belief, the undersigned expressly certifies or affirms that the contents of any statements of the **Licensee** made or referred to in this document are truthful and accurate.):

by:

/s/ Jason F. Cole — 8/31/2015
Signature of Authorized Official — Date

Jason F. Cole
Printed Name

SVP, General Counsel
Title

I. Official and Mailing Address for **Agreement** notices:

Jason Cole
Name

SVP, General Counsel
Title

Mailing Address

bluebird bio, Inc.
150 Second Street, Third Floor
Cambridge, MA 02141

Email
Address: jcole@bluebirdbio.com

Phone:

Fax:

II. Official and Mailing Address for Financial notices (the **Licensee's** contact person for royalty payments)

Amber Casares
Name

Title

Mailing Address:

Accounts Payable

bluebirdbio, Inc.

150 Second Street

Cambridge, MA 02141

Email
Address: invoices@bluebirdbio.com

Phone:

Fax:

Any false or misleading statements made, presented, or submitted to the **Government**, including any relevant omissions, under this **Agreement** and during the course of negotiation of this **Agreement** are subject to all applicable civil and criminal statutes including Federal statutes 31 U.S.C. §§3801-3812 (civil liability) and 18 U.S.C. §1001 (criminal liability including fine(s) or imprisonment).

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APPENDIX A – PATENT(S) OR PATENT APPLICATION(S)

Patent(s) or Patent Application(s):

[***]

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT PURSUANT TO RULE 24B-2 PROMULGATED UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED.

APPENDIX B – LICENSED FIELDS OF USE AND TERRITORY

I: Licensed Field of Use I:

Exclusivity to the **Licensed Patent Rights** to make and have made, to sell, to offer for sale, to import, and to use in humans, human autologous peripheral blood T-cells modified by recombinant human immunodeficiency virus ("HIV")-based lentiviral vectors or murine leukemia virus ("MLV")-based gamma-retroviral vectors to express chimeric antigen receptors that recognize B-cell Maturation Antigen ("BCMA") for the treatment or prevention of cancer and autoimmune disease [***].

II: Licensed Field of Use II:

[***]

I. **Licensed Territory:** Worldwide

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT PURSUANT TO RULE 24B-2 PROMULGATED UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED.

APPENDIX C – ROYALTIES

Royalties:

I. The **Licensee** agrees to pay to the **NIH** a non-creditable, non-refundable license issue royalty in the amount of [***] within sixty (60) days from the effective date of this **Agreement.**

II. The **Licensee** agrees to pay to the **NIH** a non-refundable minimum annual royalty as follows:

[***]

III. (a)The **Licensee** agrees to pay the **NIH** [***] on **Net Sales** by or on behalf of the **Licensee** and its sublicensees, as follows:

[***]

IV. The **Licensee** agrees to pay the **NIH Benchmark** royalties for certain preclinical, clinical and commercial milestones within sixty (60) days of achieving each milestone:

[***]

V. The **Licensee** agrees to pay the **NIH** the following sublicensing royalties for granting each sublicense within sixty (60) days of the execution of each sublicense:

[***]

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT PURSUANT TO RULE 24B-2 PROMULGATED UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED.

APPENDIX D – BENCHMARKS AND PERFORMANCE

The **Licensee** agrees to the following **Benchmarks** for its performance under this **Agreement** and, within thirty (30) days of achieving a **Benchmark**, shall notify the **NIH** that the **Benchmark** has been achieved.

[***]

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT PURSUANT TO RULE 24B-2 PROMULGATED UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED.

APPENDIX E – COMMERCIAL DEVELOPMENT PLAN

[***]

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT PURSUANT TO RULE 24B-2 PROMULGATED UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED.

APPENDIX F – EXAMPLE ROYALTY REPORT

[***]

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT PURSUANT TO RULE 24B-2 PROMULGATED UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED.

APPENDIX G – ROYALTY PAYMENT OPTIONS

The OTT License Number MUST appear on payments, reports and correspondence.

[***]

Exhibit 31.1

CERTIFICATIONS

I, Nick Leschly, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q/A of bluebird bio, Inc.; and

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

Date: November 2, 2016

By: /s/ Nick Leschly
Nick Leschly
President and Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATIONS

I, Jeffrey Walsh, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q/A of bluebird bio, Inc.; and

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

Date: November 2, 2016

By: /s/ Jeffrey Walsh
Jeffrey Walsh
Chief Financial and Strategy Officer
(Principal Financial Officer)