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

FORM 10-Q

(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, 2018

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 000-30171

SANGAMO THERAPEUTICS, INC.

(exact name of registrant as specified in its charter)

Delaware	**68-0359556**
(State or other jurisdiction of incorporation or organization)	**(IRS Employer Identification No.)**

501 Canal Blvd
Richmond, California 94804
(Address of principal executive offices)

(510) 970-6000
(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 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 (§ 232.405 of this chapter) 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, a smaller reporting company, or an emerging growth company. See definitions of "large accelerated filer," "accelerated filer", "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

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

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

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

As of May 1, 2018, 101,494,606 shares of the issuer's common stock, par value $0.01 per share, were outstanding.

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SANGAMO THERAPEUTICS, INC.

PART I. FINANCIAL INFORMATION

PART II. OTHER INFORMATION

Unless the context suggests otherwise, references in this Quarterly Report on Form 10-Q, or Quarterly Report, to "Sangamo," the "Company," "we," "us," and "our" refer to Sangamo Therapeutics, Inc. and, where appropriate, our wholly owned subsidiaries.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

Some statements contained in this report are forward-looking with respect to our operations, research, development and commercialization activities, clinical trials, operating results and financial condition. These statements involve known and unknown risks, uncertainties and other factors which may cause our actual results, performance or achievements to be materially different from any future results, performances or achievements expressed or implied by the forward-looking statements. Forward-looking statements include, but are not limited to, statements about:

- our strategy;
- product development and commercialization of our products;
- clinical trials;
- partnering, acquisition and other strategic transactions;
- revenues from existing and new collaborations;
- our research and development and other expenses;
- sufficiency of our cash resources;
- our operational and legal risks; and
- our plans, objectives, expectations and intentions and any other statements that are not historical facts.

In some cases, you can identify forward-looking statements by terms such as: “anticipates,” “believes,” “continues,” “could,” “estimates,” “expects,” “intends,” “may,” “plans,” “seeks,” “should” and “will.” These statements reflect our current views with respect to future events and are based on assumptions and subject to risks and uncertainties. Given these risks and uncertainties, you should not place undue reliance on these forward-looking statements. We discuss many of these risks in greater detail under the headings “Risk Factors” and “Management’s Discussion and Analysis of Financial Conditions and Results of Operations” in this Quarterly Report. Except as required by law, we undertake no obligation to update any forward-looking statements to reflect events or circumstances arising after the date of such statements. Readers are cautioned not to place undue reliance on the forward-looking statements, which speak only as of the date of this Quarterly Report.

PART I. FINANCIAL INFORMATION

ITEM 1. FINANCIAL STATEMENTS

SANGAMO THERAPEUTICS, INC.

CONDENSED CONSOLIDATED BALANCE SHEETS
(Unaudited; in thousands, except share and per share amounts)

	March 31, 2018	December 31, 2017
ASSETS		
Current assets:		
Cash and cash equivalents	$ 30,708	$ 49,826
Marketable securities	198,818	193,482
Interest receivable	373	240
Accounts receivable	3,575	3,343
Prepaid expenses and other current assets	2,802	1,506
Total current assets	236,276	248,397
Marketable securities, non-current	4,986	1,012
Property and equipment, net	33,601	31,066
Goodwill	1,585	1,585
Restricted cash and other non-current assets	4,720	4,681
Total assets	$ 281,168	$ 286,741
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable and accrued liabilities	$ 10,970	$ 11,035
Accrued compensation and employee benefits	3,211	5,479
Deferred revenues	35,209	28,345
Total current liabilities	49,390	44,859
Deferred revenues, non-current	23,964	29,244
Build-to-suit lease obligation	25,449	24,738
Total liabilities	98,803	98,841
Commitments and contingencies		
Stockholders' equity:		
Common stock, $0.01 par value; 160,000,000 shares authorized, 87,041,208 and 85,598,534 shares issued and outstanding at March 31, 2018 and December 31, 2017, respectively	870	856
Additional paid-in capital	696,429	682,809
Accumulated deficit	(514,549)	(495,479)
Accumulated other comprehensive loss	(385)	(286)
Total stockholders' equity	182,365	187,900
Total liabilities and stockholders' equity	$ 281,168	$ 286,741

See accompanying notes.

SANGAMO THERAPEUTICS, INC.

CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS
(Unaudited; in thousands, except per share amounts)

	Three months ended March 31,	
	2018	**2017**
Revenues:		
Collaboration agreements	$ 12,551	$ 3,306
Research grants	86	119
Total revenues	12,637	3,425
Operating expenses:		
Research and development	23,547	12,942
General and administrative	10,087	7,275
Total operating expenses	33,634	20,217
Loss from operations	(20,997)	(16,792)
Interest and other income, net	810	160
Net loss	$ (20,187)	$ (16,632)
Basic and diluted net loss per share	$ (0.23)	$ (0.23)
Shares used in computing basic and diluted net loss per share	86,334	71,025

See accompanying notes.

SANGAMO THERAPEUTICS, INC.

CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS
(Unaudited; in thousands)

	Three Months Ended March 31,	
	2018	**2017**
Net loss	$ (20,187)	$ (16,632)
Change in unrealized loss on available-for-sale securities	(99)	(112)
Comprehensive loss	$ (20,286)	$ (16,744)

See accompanying notes.

SANGAMO THERAPEUTICS, INC.

CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
(Unaudited; in thousands)

	Three Months Ended March 31,	
	2018	**2017**
Operating Activities:		
Net loss	$ (20,187)	$ (16,632)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	588	301
Amortization of (discount) premium on marketable securities	(459)	60
Stock-based compensation	3,050	2,788
Other	217	72
Net changes in operating assets and liabilities:		
Interest receivable	(133)	(174)
Accounts receivable	(232)	2,571
Prepaid expenses and other assets	(1,334)	70
Accounts payable and accrued liabilities	(77)	(418)
Accrued compensation and employee benefits	(2,268)	(846)
Deferred revenues	2,701	(870)
Net cash used in operating activities	(18,134)	(13,078)
Investing Activities:		
Purchases of marketable securities	(63,401)	(38,973)
Maturities of marketable securities	54,450	45,500
Purchases of property and equipment	(2,616)	(468)
Net cash (used in) provided by investing activities	(11,567)	6,059
Financing Activities:		
Proceeds from public offering of common stock, net of issuance costs	—	3,425
Taxes paid related to net share settlement of equity awards	(14)	(4)
Proceeds from issuance of common stock	10,597	23
Net cash provided by financing activities	10,583	3,444
Net decrease in cash, cash equivalents, and restricted cash	(19,118)	(3,575)
Cash, cash equivalents, and restricted cash, beginning of period	53,326	22,061
Cash, cash equivalents, and restricted cash, end of period	$ 34,208	$ 18,486
Supplemental disclosure of noncash investing activities:		
Property and equipment included in accrued liabilities	$ 1,227	$ 536
License included in accrued liabilities	$ —	950

See accompanying notes.

NOTE 1—ORGANIZATION, BASIS OF PRESENTATION AND SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Overview

Sangamo Therapeutics, Inc. was incorporated in the state of Delaware on June 22, 1995 and changed its name from Sangamo Biosciences, Inc. in January 2017 ("Sangamo" or the "Company"). Sangamo is focused on the research, development and commercialization of novel genomic therapies for unmet medical needs. Sangamo's genome editing and gene regulation technology platform is enabled by the engineering of a class of transcription factors known as zinc finger DNA-binding proteins ("ZFPs"). Sangamo will require additional financial resources to complete the development and commercialization of its product candidates.

Sangamo is currently working on a number of long-term development projects that involve experimental technology. The projects may require several years and substantial expenditures to complete and ultimately may be unsuccessful. The Company plans to finance operations with available cash resources, collaborations and strategic partnerships, research grants and from the issuance of equity or debt securities. Sangamo believes that its available cash, cash equivalents, marketable securities and interest receivable as of March 31, 2018, along with expected revenues from collaborations, strategic partnerships and research grants, will be adequate to fund its operations at least through the next twelve months. Sangamo will need to raise substantial additional capital to fund subsequent operations and complete the development and commercialization of its product candidates. Additional capital may not be available on terms acceptable to the Company, if at all. If adequate funds are not available, or if the terms of potential funding sources are unfavorable, the Company's business and ability to develop its technology and product candidates could be harmed. Furthermore, any sales of additional equity securities may result in dilution to the Company's stockholders, and any debt financing may include covenants that restrict the Company's business.

Basis of Presentation

The accompanying unaudited condensed consolidated financial statements have been prepared in accordance with U.S. generally accepted accounting principles for interim financial information and pursuant to the rules and regulations of the Securities and Exchange Commission ("SEC"). Accordingly, they do not include all of the information and footnotes required by generally accepted accounting principles for complete financial statements. In the opinion of management, all adjustments (consisting of normal recurring adjustments) considered necessary for a fair presentation have been included. Operating results for the three months ended March 31, 2018 are not necessarily indicative of the results that may be expected for the year ending December 31, 2018. The condensed consolidated balance sheet data at December 31, 2017 were derived from the audited consolidated financial statements included in Sangamo's Annual Report on Form 10-K for the year ended December 31, 2017, (the "2017 Annual Report"), as filed with the SEC. The accompanying condensed consolidated financial statements and related financial information should be read in conjunction with the audited financial statements and footnotes thereto for the year ended December 31, 2017, included in the 2017 Annual Report.

Use of Estimates

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the amounts reported in the financial statements and the accompanying notes. On an ongoing basis, management evaluates its estimates, including critical accounting policies or estimates related to revenue recognition, clinical trial accruals, and stock-based compensation. Estimates are based on historical experience and on various other market specific and other relevant assumptions that the Company believes to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results could differ from those estimates.

Cash and Cash Equivalents

Sangamo considers all highly-liquid investments purchased with original maturities of three months or less at the purchase date to be cash equivalents. Cash and cash equivalents consist of cash and deposits in money market investment accounts.

Marketable Securities

Sangamo classifies its marketable securities as available-for-sale which are recorded at estimated fair value based on quoted market prices or observable market inputs of almost identical assets. Unrealized holding gains and losses are included in accumulated other comprehensive income.

The Company's investments are subject to a periodic impairment review. The Company recognizes an impairment charge when a decline in the fair value of its investments below the cost basis is judged to be other-than-temporary. The Company considers

various factors in determining whether to recognize an impairment charge, including the length of time and extent to which the fair value has been less than the Company's cost basis, the financial condition and near-term prospects of the investee, and the Company's intent and ability to hold the investment for a period of time sufficient to allow for any anticipated recovery in the market value. Realized gains and losses on available-for-sale securities are included in other income, which is determined using the specific identification method.

Fair Value Measurements

The carrying amounts for financial instruments consisting of cash and cash equivalents, accounts receivable, accounts payable and accrued liabilities approximate fair value due to their short maturities. Marketable securities and contingent consideration liabilities are stated at their estimated fair values. The counterparties to the agreements relating to the Company's investment securities consist of the US Treasury, governmental agencies and various major corporations and financial institutions with investment-grade high credit ratings.

Revenue Recognition

Effective January 1, 2018, the Company adopted the provisions of Accounting Standards Codification ("ASC"), Topic 606, *Revenue from Contracts with Customers* ("Topic 606") resulting in a change to its accounting policy for revenue recognition. Topic 606 establishes a unified model to determine how revenue is recognized.

The Company's contract revenues consist of strategic partnering collaboration agreements and research activity grants and licensing. Research and licensing agreements typically include upfront signing or license fees, cost reimbursements, research services, minimum sublicense fees, milestone payments and royalties on future licensee's product sales. The Company has both fixed and variable consideration. Non-refundable upfront fees and funding of research and development activities are considered fixed, while milestone payments are identified as variable consideration. Sangamo's research grants are typically multi-year agreements and provide for the reimbursement of qualified expenses for research and development as defined under the terms of the grant agreement. Revenues under grant agreements are recognized when the related qualified research expenses are incurred. Deferred revenue represents the portion of research or license payments received but not earned.

In determining the appropriate amount of revenue to be recognized as it fulfills its obligations under its agreements, the Company performs the following steps: (i) identification of the promised goods or services in the contract; (ii) determination of whether the promised goods or services are performance obligations including whether they are distinct in the context of the contract; (iii) measurement of the transaction price, including the constraint on variable consideration; (iv) allocation of the transaction price to the performance obligations based on estimated selling prices; and (v) recognition of revenue when (or as) the Company satisfies each performance obligation.

A performance obligation is a promise in a contract to transfer a distinct good or service to the customer and is the unit of account in Topic 606. The Company's performance obligations include license rights, development services, and services associated with regulatory submission and approval processes. Significant management judgment is required to determine the level of effort required under an arrangement and the period over which the Company expects to complete its performance obligations under the arrangement. If the Company cannot reasonably estimate when its performance obligations either are completed or become inconsequential, then revenue recognition is deferred until the Company can reasonably make such estimates. The Company includes the unconstrained amount of estimated variable consideration in the transaction price. The amount included in the transaction price is constrained to the amount for which it is probable that a significant reversal of cumulative revenue recognized will not occur. At the end of each subsequent reporting period, the Company re-evaluates the estimated variable consideration included in the transaction price and any related constraint, and if necessary, adjusts its estimate of the overall transaction price. Revenue is then recognized over the remaining estimated period of performance using the cumulative catch-up method.

As part of the accounting for these arrangements, the Company must develop assumptions that require judgment to determine the stand-alone selling price of each performance obligation identified in the contract. The Company uses key assumptions to determine the stand-alone selling price, which may include forecasted revenues, development timelines, reimbursement rates for personnel costs, discount rates and probabilities of technical and regulatory success.

The Company allocates the total transaction price to each performance obligation based on the estimated relative standalone selling prices of the promised goods or service underlying each performance obligation. Estimated selling prices for license rights are calculated using an income approach model and include the following key assumptions: the development timeline, revenue forecast, commercialization expenses, discount rate and probabilities of technical and regulatory success. During the three months ended March 31, 2018, revenues related to the hemophilia A collaboration agreement with Pfizer Inc. ("Pfizer") and the hemoglobinopathies agreement with Bioverativ, a Sanofi company ("Bioverativ") represented 61% and 35%, respectively, of the Company's total revenue. During the three months ended March 31, 2017, revenues related to the Company's agreements with Bioverativ and Shire International GmBH ("Shire") represented 63% and 20%, respectively, of total revenue. Receivables from collaborations are typically unsecured and are concentrated in the biopharmaceutical industry. Accordingly, the Company may be exposed to credit risk generally associated with biopharmaceutical companies or specific to its collaboration agreements. To date, the Company has not experienced any losses related to these receivables.

Recent Accounting Pronouncements

Recently Adopted

In May 2014, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Updated ("ASU") 2014-09, *Revenue from Contracts with Customers* ("Topic 606"). This standard outlines a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers and supersedes most current revenue recognition guidance, including industry-specific guidance. The main principle of Topic 606 is to recognize revenues when promised goods or services are transferred to customers in an amount that reflects the consideration that is expected to be received for those goods or services. Topic 606 provides companies with two implementation methods: (i) apply the standard retrospectively to each prior reporting period presented (full retrospective application); or (ii) apply the standard retrospectively with the cumulative effect of initially applying the standard as an adjustment to the opening balance of retained earnings of the annual reporting period that includes the date of initial application (modified retrospective application). The Company choose to implement this standard under the modified retrospective method. This guidance is effective for annual reporting periods beginning after December 15, 2017, including interim periods within that reporting period. Under Topic 606, an entity recognizes revenue when its customer obtains control of promised goods or services, in an amount that reflects the consideration which the entity expects to receive in exchange for those goods or services. To determine revenue recognition for arrangements that an entity determines are within the scope of Topic 606, the entity performs the following five steps: (i) identify the contract(s) with a customer; (ii) identify the performance obligations in the contract; (iii) determine the transaction price; (iv) allocate the transaction price to the performance obligations in the contract; and (v) recognize revenue when (or as) the entity satisfies a performance obligation. Topic 606 also impacts certain other areas, such as the accounting for costs to obtain or fulfill a contract.

The Company adopted Topic 606 effective January 1, 2018, using the modified retrospective method. The new guidance has been applied to the most current period presented with a cumulative effect adjustment of $1.1 million reflected as a decrease to the opening balance of accumulated deficit and a decrease to deferred revenues, respectively. The Company's contracts and agreements that were within the scope of the guidance upon adoption were Bioverativ and the hemophilia A Pfizer agreements. The impact on the Bioverativ agreement was to reduce the amount of the recognition of up-front payment by approximately $4.1 million and the development and commercialization milestones are deemed constrained at March 31, 2018, as defined under Topic 606. The impact on the hemophilia A Pfizer agreement was to increase the amount of the recognition of the up-front payment by approximately $5.2 million and the development and commercialization milestones are deemed constrained at March 31, 2018, as defined under Topic 606. The net impact under the modified retrospective transition approach was a decrease of $1.1 million to accumulated deficit. With regards to Shire, Down AgroSciences, LLC ("Dow") and Sigma-Aldrich Corporation ("Sigma"), the Company's performance obligations under those arrangements were substantially complete at December 31, 2017. Comparative information has not been adjusted and continues to be reported under previous accounting standards. All future receipts under these agreements are contingent upon the counterparties achieving specified development, commercial, and/or sales targets which would be in the form of milestones or royalties, all of which management concluded are constrained at March 31, 2018, as defined under Topic 606. See *Revenue Recognition* above.

Refer below for a summary of the amount by which each financial statement line item was affected by the impact of the cumulative adjustment and as compared with the guidance that was in effect prior to the adoption:

	Impact of Topic 606 Adoption on Condensed Consolidated Balance Sheet as of January 1, 2018		
(in thousands)	**As reported under Topic 606**	**Adjustments**	**Balances without adoption of Topic 606**
Deferred revenue, current portion	$ 29,626	$ 1,281	$ 28,345
Deferred revenue, noncurrent portion	$ 26,846	$ (2,398)	$ 29,244
Accumulated deficit	$ (494,362)	$ 1,117	$ (495,479)

	Impact of Topic 606 Adoption on Condensed Consolidated Balance Sheet as of March 31, 2018		
(in thousands)	**As reported under Topic 606**	**Adjustments**	**Balances without adoption of Topic 606**
Deferred revenue, current portion	$ 35,209	$ (4,664)	$ 39,873
Deferred revenue, noncurrent portion	$ 23,964	$ 1,801	$ 22,163
Accumulated deficit	$ (514,549)	$ (2,863)	$ (517,412)

(in thousands)	Impact of Topic 606 Adoption on Condensed Consolidated Statement of Operations and Comprehensive Loss for the Three Months Ended March 31, 2018		
	As reported under Topic 606	Adjustments	Balances without adoption of Topic 606
Collaboration revenue	$ 12,551	$ 1,746	$ 10,805
Net loss	$ (20,187)	$ 1,746	$ (21,933)
Net loss per share - basic and diluted:	$ (0.23)	$ 0.02	$ (0.25)

(in thousands)	Impact of Topic 606 Adoption on Condensed Consolidated Statement of Cash Flows for the Three Months Ended March 31, 2018		
	As reported under Topic 606	Adjustments	Balances without adoption of Topic 606
Net loss	$ (20,187)	$ 1,746	$ (21,933)
Changes in deferred revenue	$ 2,701	$ (1,746)	$ 4,447

In November 2016, the FASB issued ASU 2016-18, *Statement of Cash Flows ("Topic 230").* The Company adopted Topic 230 in the beginning of fiscal 2018, which requires the statement of cash flows to explain the change during the period relating to total cash, cash equivalents, and restricted cash. The Company adopted this standard using the retrospective transition method by restating its condensed consolidated statements of cash flows to include restricted cash of $3.5 million in the beginning and ending cash, cash equivalents, and restricted cash balances. Net cash flows for the three months ended March 31, 2017, did not change as a result of including restricted cash with cash and cash equivalents when reconciling the beginning-of-period and end-of-period amounts presented on the statements of cash flows. Restricted cash was included in other non-current assets on the Company's condensed consolidated balance sheets.

Not yet adopted

In February 2016 the FASB issued ASU 2016-02, *Leases* ("ASU 2016-02"). ASU 2016-02 amends a number of aspects of lease accounting, including requiring lessees to recognize almost all leases with a term greater than one year as a right-of-use asset and corresponding liability, measured at the present value of the lease payments. The guidance will become effective for the Company beginning in the first quarter of 2019 with early adoption permitted and will be adopted using a modified retrospective approach. The Company is evaluating the impact of the adoption of this standard on its consolidated financial statements, and expect its operating lease commitments will be subject to the new standard and recognized as a right-of-use assets and operating lease liabilities upon adoption which will increase total assets and total liabilities as compared to amounts prior to adoption.

NOTE 2—FAIR VALUE MEASUREMENT

The Company measures certain financial assets and liabilities at fair value on a recurring basis, including cash equivalents, and available-for-sale marketable securities. The fair values of these assets were determined based on a three-tier hierarchy under the authoritative guidance for fair value measurements and disclosures that prioritizes the inputs used in measuring fair value as follows:

Level 1: Unadjusted quoted prices in active markets that are accessible at the measurement date for identical, unrestricted assets or liabilities;

Level 2: Quoted prices in markets that are not active or inputs which are observable, either directly or indirectly, for substantially the full term of the asset or liability; and

Level 3: Prices or valuation techniques that require inputs that are both significant to the fair value measurement and unobservable (i.e., supported by little or no market activity).

The fair value measurements of the Company's cash equivalents and available-for-sale marketable securities are identified at the following levels within the fair value hierarchy (in thousands):

	March 31, 2018			
	Fair Value Measurements			
	Total	Level 1	Level 2	Level 3
Assets:				
Cash equivalents:				
Money market funds	$ 20,142	$ 20,142	$ —	$ —
Total	20,142	20,142	—	—
Marketable securities:				
Commercial paper securities	125,881	—	125,881	—
Corporate debt securities	74,923	—	74,923	—
U.S. government-sponsored entity debt securities	3,000	—	3,000	—
Total	203,804	—	203,804	—
Total cash equivalents and marketable securities	$ 223,946	$ 20,142	$ 203,804	—

	December 31, 2017			
	Fair Value Measurements			
	Total	Level 1	Level 2	Level 3
Assets:				
Cash equivalents:				
Money market funds	$ 24,290	$ 24,290	$ —	$ —
Commercial paper securities	4,595	—	4,595	—
Total	28,885	24,290	4,595	—
Marketable securities:				
Commercial paper securities	110,247	—	110,247	—
Corporate debt securities	75,755	—	75,755	—
U.S. government-sponsored entity debt securities	8,492	—	8,492	—
Total	194,494	—	194,494	—
Total cash equivalents and marketable securities	$ 223,379	$ 24,290	$ 199,089	—

The Company generally classifies its marketable securities as Level 2. Instruments are classified as Level 2 when observable market prices for identical securities that are traded in less active markets are used. When observable market prices for identical securities are not available, such instruments are priced using benchmark curves, benchmarking of like securities, sector groupings, matrix pricing and valuation models. These valuation models are proprietary to the pricing providers or brokers and incorporate a number of inputs, including, listed in approximate order of priority: benchmark yields, reported trades, broker/dealer quotes, issuer spreads, two-sided markets, benchmark securities, bids, offers and reference data including market research publications. For certain security types, additional inputs may be used, or some of the standard inputs may not be applicable. Evaluators may prioritize inputs differently on any given day for any security based on market conditions, and not all inputs listed are available for use in the evaluation process for each security evaluation on any given day.

NOTE 3—MARKETABLE SECURITIES

The Company classifies its marketable securities as available-for-sale and records its investments at estimated fair value based on quoted market prices or observable market inputs of substantially identical assets. Unrealized holding gains and losses are included

in accumulated other comprehensive income (loss). Investments that have maturities beyond one year as of the end of the reporting period are classified as non-current.

The Company's investments are subject to a periodic impairment review. The Company recognizes an impairment charge when a decline in the fair value of its investments below the cost basis is judged to be other-than-temporary. The Company considers various factors in determining whether to recognize an impairment charge, including the length of time and extent to which the fair value has been less than the Company's cost basis, the financial condition and near-term prospects of the investee, and the Company's intent and ability to hold the investment for a period of time sufficient to allow for any anticipated recovery in the market value. Realized gains and losses on available-for-sale securities are included in other income, which is determined using the specific identification method

The table below summarizes the Company's investments (in thousands):

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized (Losses)	Estimated Fair Value
March 31, 2018				
Cash equivalents:				
Money market funds	$ 20,142	$ —	$ —	20,142
Total	20,142	—	—	20,142
Available-for-sale securities:				
Commercial paper securities	126,033	8	(160)	125,881
Corporate debt securities	75,125	—	(202)	74,923
U.S. government-sponsored entity debt securities	3,000	—	—	3,000
Total	204,158	8	(362)	203,804
Total cash equivalents and available-for-sale securities	$ 224,300	$ 8	$ (362)	$ 223,946
December 31, 2017				
Cash equivalents:				
Money market funds	$ 24,290	$ —	$ —	$ 24,290
Commercial paper securities	4,595	—	—	4,595
Total	28,885	—	—	28,885
Available-for-sale securities:				
Commercial paper securities	110,365	—	(118)	110,247
Corporate debt securities	75,886	—	(131)	75,755
U.S. government-sponsored entity debt securities	8,498	—	(6)	8,492
Total	194,749	—	(255)	194,494
Total cash equivalents and available-for-sale securities	$ 223,634	—	$ (255)	$ 223,379

The Company had no material realized losses or other-than-temporary impairments of its investments for the three months ended March 31, 2018 and 2017. As of March 31, 2018, all of the Company's investments had maturity dates within one year, except for $5.0 million, which matures within 24 months. The Company has the intent and ability to hold its investments for a period of time sufficient to allow for any anticipated recovery in market value.

NOTE 4—BASIC AND DILUTED NET LOSS PER SHARE

Basic net loss per share has been computed by dividing net loss by the weighted-average number of shares of common stock outstanding during the period. Diluted net loss per share is calculated by dividing net loss by the weighted-average number of shares of common stock and potential dilutive securities outstanding during the period.

The total number of shares subject to stock options and restricted stock units outstanding, which are all anti-dilutive, were excluded from consideration in the calculation of diluted net loss per share. Stock options and restricted stock units outstanding as of March 31, 2018 and 2017 were 8,858,623 and 10,620,257, respectively.

NOTE 5—MAJOR CUSTOMERS, PARTNERSHIPS AND STRATEGIC ALLIANCES

Collaboration Agreements

Kite Pharma, Inc

In February 2018, the Company entered into a collaboration and license agreement with Kite Pharma, Inc. ("Kite"), a wholly-owned subsidiary of Gilead Sciences, Inc., for the research, development and commercialization of potential engineered cell therapies

for cancer. Kite will be responsible for all clinical development and commercialization of any resulting products. The Kite agreement became effective on April 5, 2018 when the waiting periods under the Hart-Scott-Rodino Antitrust Improvements Act of 1976, as amended, and other customary closing conditions were completed.

Subject to the terms of this agreement, the Company granted Kite an exclusive, royalty-bearing, worldwide, sublicensable license, under the Company's relevant patents and know-how, to develop, manufacture and commercialize, for the purpose of treating cancer, specific cell therapy products that may result from the research program and that are engineered *ex vivo* using selected zinc finger nucleases ("ZFNs") and adeno-associated viral vectors ("AAVs") developed under the research program, to express chimeric antigen receptors ("CARs"), T-cell receptors ("TCRs") or NK-cell receptors ("NKRs") directed to candidate targets.

During the research program term and subject to certain exceptions, except pursuant to this agreement, the Company is prohibited from researching, developing, manufacturing and commercializing, for the purpose of treating cancer, any cell therapy product that, as a result of *ex vivo* genome editing, expresses a CAR, TCR or NKR that is directed to a target expressed on or in a human cancer cell. After the research program term concludes and subject to certain exceptions, except pursuant to this agreement, the Company will be prohibited from developing, manufacturing and commercializing, for the purpose of treating cancer, any cell therapy product that, as a result of *ex vivo* genome editing, expresses a CAR, TCR or NKR that is directed to a candidate target.

Following the effective date, in April 2018, the Company received a $150 million upfront payment from Kite. In addition, Kite will reimburse the Company's direct costs to conduct the joint research program, and Kite will be responsible for all subsequent development, manufacturing and commercialization of any licensed products. Sangamo is also eligible to receive contingent development- and sales-based milestone payments that could total up to $3.01 billion if all of the specified milestones set forth in this agreement are achieved. Of this amount, approximately $1.26 billion relates to the achievement of specified research, clinical development, regulatory and first commercial sale milestones, and approximately $1.75 billion relates to the achievement of specified sales-based milestones if annual worldwide net sales of licensed products reach specified levels. Each development- and sales-based milestone payment is payable (i) only once for each licensed product, regardless of the number of times that the associated milestone event is achieved by such licensed product, and (ii) only for the first ten times that the associated milestone event is achieved, regardless of the number of licensed products that may achieve such milestone event. In addition, the Company will be entitled to receive escalating, tiered royalty payments with a percentage in the single digits based on potential future annual worldwide net sales of licensed products. These royalty payments will be subject to reduction due to patent expiration, entry of biosimilar products to the market and payments made under certain licenses for third-party intellectual property.

Kite has the right to terminate this agreement, in its entirety or on a per licensed product or per candidate target basis, for any reason after a specified notice period. Each party has the right to terminate this agreement on account of the other party's bankruptcy or material, uncured breach. At this time, the Company is assessing the accounting impact of the agreement.

Pfizer Inc.

SB-525 Global Collaboration and License Agreement

In May 2017, the Company entered into an exclusive, global collaboration and license agreement with Pfizer, pursuant to which it established a collaboration for the research, development and commercialization of SB-525, its gene therapy product candidate for hemophilia A, and closely related products.

Under this agreement, the Company is responsible for conducting the Phase 1/2 clinical trial and certain manufacturing activities for SB-525, while Pfizer is responsible for subsequent worldwide development, manufacturing, marketing and commercialization of SB-525. Sangamo may also collaborate in the research and development of additional AAV-based gene therapy products for hemophilia A.

The Company received an upfront fee of $70.0 million and is eligible to receive development milestone payments contingent on the achievement of specified clinical development, intellectual property, regulatory and first commercial sale milestones for SB-525 and potentially other products. In addition, Sangamo is eligible to receive $208.5 million in payments upon the achievement of specified clinical development, intellectual property and regulatory milestones and $266.5 million in payments upon first commercial sale milestones for SB-525 and potentially other products. The total amount of potential clinical development, intellectual property, regulatory, and first commercial sale milestone payments, assuming the achievement of all specified milestones in the hemophilia A Pfizer agreement, is $475.0 million, which includes up to $300.0 million for SB-525 and up to $175.0 million for other products that may be developed under the agreement, subject to reduction on account of payments made under certain licenses for third party intellectual property. In addition, Pfizer agreed to pay the Company royalties for each potential licensed product developed under the agreement that are an escalating tiered, double-digit percentage of the annual net sales of such product and are subject to reduction due to patent expiration, entry of biosimilar products to the market and payment made under certain licenses for third party intellectual property. To date, no milestone payments have been received and no products have been approved and therefore no royalty fees have been earned under the hemophilia A Pfizer agreement. Sangamo is responsible for internal and external research costs as part of the upfront fee and has the ability to request additional reimbursement from Pfizer if certain conditions are met.

None of the clinical or regulatory milestones have been included in the $70 million transaction price, as all milestone amounts are fully constrained. As part of its evaluation of the constraint, the Company considered numerous factors, including the fact that achievement of the milestones at this time is uncertain and contingent upon future periods when the uncertainty related to the variable consideration is resolved. The Company will re-evaluate the transaction price, including its estimated variable consideration included in the transaction price and all constrained amounts, in each reporting period and as uncertain events are resolved or other changes in circumstances occur.

Subject to the terms of the agreement, the Company granted Pfizer an exclusive, worldwide, royalty-bearing license, with the right to grant sublicenses, to use certain technology controlled by the Company for the purpose of developing, manufacturing and commercializing SB-525 and related products. Pfizer granted the Company a non-exclusive, worldwide, royalty free, fully paid license, with the right to grant sublicenses, to use certain manufacturing technology developed under the agreement and controlled by Pfizer to manufacture the Company's products that utilize the AAV delivery system. During a specified period, neither the Company nor Pfizer will be permitted to clinically develop or commercialize, outside of the collaboration, certain AAV-based gene therapy products for hemophilia A.

Unless earlier terminated, the agreement has a term that continues, on a per product and per country basis, until the later of (i) the expiration of patent claims that cover the product in a country, (ii) the expiration of regulatory exclusivity for a product in a country, and (iii) fifteen years after the first commercial sale of a product in a country. Pfizer has the right to terminate the agreement without cause in its entirety or on a per product or per country basis. The agreement may also be terminated by either party based on an uncured material breach by the other party or the bankruptcy of the other party. Upon termination for any reason, the license granted by the Company to Pfizer to develop, manufacture and commercialize SB-525 and related products will automatically terminate. Upon termination by the Company for cause or by Pfizer in any country or countries, Pfizer will automatically grant the Company an exclusive, royalty-bearing license under certain technology controlled by Pfizer to develop, manufacture and commercialize SB-525 in the terminated country or countries.

The Company has identified the performance obligations within the hemophilia A Pfizer agreement as a license to the technology and on-going services. The Company concluded that the license is not discrete as it does not have stand-alone value to Pfizer apart from the services to be performed by the Company pursuant to the agreement. As a result, the Company recognizes revenue from the upfront payment based on proportional performance through 2020, the estimated period the Company will perform research services. The estimated period of performance and project cost is reviewed quarterly and adjusted, as needed, to reflect the Company's current assumptions regarding the timing of its deliverables. As of March 31, 2018, the Company had deferred revenue of $40.1 million related to this agreement. During the three months ended March 31, 2018 the Company recognized revenue of $7.7 million, related to the upfront fee that was received upon entering into the agreement.

C9ORF72 Research Collaboration and License Agreement

In December 2017, the Company entered into a separate exclusive, global collaboration and license agreement with Pfizer for the development and commercialization of potential gene therapy products that use ZFP transcription factors ("TFs") to treat amyotrophic lateral sclerosis ("ALS") and frontotemporal lobar degeneration ("FTLD") linked to mutations of the *C9ORF72* gene. Pursuant to this agreement, the Company agreed to work with Pfizer on a research program to identify, characterize and preclinically develop ZFP-TFs that bind to and specifically reduce expression of the mutant form of the *C9ORF72* gene.

The Company received a $12.0 million upfront payment from Pfizer and is eligible to receive up to $60.0 million in development milestone payments from Pfizer contingent on the achievement of specified preclinical development, clinical development and first commercial sale milestones, and up to $90.0 million commercial milestone payments if annual worldwide net sales of the licensed products reach specified levels. In addition, Pfizer will pay the Company royalties based on an escalating tiered, mid- to high-single digit percentage of the annual worldwide net sales of the licensed products. These royalty payments are subject to reduction due to patent expiration, entry of biosimilar products to the market and payments made under certain licenses for third party intellectual property. Each party will be responsible for the cost of its performance of the research program. Pfizer will be operationally and financially responsible for subsequent development, manufacturing and commercialization of the licensed products.

None of the clinical or regulatory milestones have been included in the $12 million transaction price, as all milestone amounts are fully constrained. As part of its evaluation of the constraint, the Company considered numerous factors, including the fact that achievement of the milestones at this time is uncertain and contingent upon future periods when the uncertainty related to the variable consideration is resolved. The Company will re-evaluate the transaction price, including is estimated variable consideration included in the transaction price and all constrained amounts, in each reporting period and as uncertain events are resolved or other changes in circumstances occur.

Subject to the terms of this agreement, the Company granted Pfizer an exclusive, royalty-bearing, worldwide, license under the Company's relevant patents and know-how to develop, manufacture and commercialize gene therapy products that use resulting ZFP-

TFs that satisfy pre-agreed criteria. During a specified period, neither the Company nor Pfizer will be permitted to research, develop, manufacture or commercialize outside of the collaboration any ZFPs that specifically bind to the *C9ORF72* gene.

Unless earlier terminated, the agreement has a term that continues, on a per licensed product and per country basis, until the later of (i) the expiration of patent claims that cover the licensed product in a country, (ii) the expiration of regulatory exclusivity for a licensed product in a country, and (iii) fifteen years after the first commercial sale of a licensed product in a major market country. Pfizer also has the right to terminate the agreement without cause in its entirety or on a per product or per country basis. The agreement may also be terminated by either party based on an uncured material breach by the other party or the bankruptcy of the other party. The agreement will also terminate if the Company is unable to identify any lead candidates for development within a specified period of time or if Pfizer elects not to advance a lead candidate beyond a certain development milestone within a specified period of time. Upon termination for any reason, the license granted by the Company to Pfizer to develop, manufacture and commercialize licensed products under the agreement will automatically terminate. Upon termination by the Company for cause or by Pfizer without cause for any licensed product or licensed products in any country or countries, the Company will have the right to negotiate with Pfizer to obtain a non-exclusive, royalty-bearing license under certain technology controlled by Pfizer to develop, manufacture and commercialize the licensed product or licensed products in the terminated country or countries.

Following termination by the Company for Pfizer's material breach, Pfizer will not be permitted to research, develop, manufacture or commercialize ZFPs that specifically bind to the *C9ORF72* gene for a period of time. Following termination by Pfizer for the Company's material breach, the Company will not be permitted to research, develop, manufacture or commercialize ZFPs that specifically bind to the *C9ORF72* gene for a period of time.

The Company has identified the performance obligations within this agreement as a license to the technology and on-going services. The Company concluded that the license is not discrete as it does not have stand-alone value to Pfizer apart from the services to be performed by the Company pursuant to the agreement. As a result, the Company recognizes revenue from the upfront payment based on proportional performance through March 31, 2019 the estimated period the Company will perform research services. The estimated period of performance and project cost is reviewed quarterly and adjusted, as needed, to reflect the Company's current assumptions regarding the timing of its deliverables. As of March 31, 2018, the Company had deferred revenue of $11.5 million related to this agreement. During the three months ended March 31, 2018 the Company recognized revenue of $0.5 million related to the upfront fee that was received upon entering into the agreement.

Bioverativ, a Sanofi company.

In January 2014, the Company entered into an exclusive worldwide collaboration and license agreement with Bioverativ to develop therapeutics for hemoglobinopathies, focused on beta-thalassemia and sickle cell disease ("SCD"). Under the agreement, the Company is jointly conducting two research programs: the beta-thalassemia program and the SCD program. In the beta-thalassemia program, the Company is responsible for all discovery, research and development activities through the first human clinical trial. In the SCD program, both parties are responsible for research and development activities through the submission of an investigational new drug ("IND") application for ZFP therapeutics intended to treat SCD.

Under both programs, Bioverativ is responsible for subsequent worldwide clinical development, manufacturing and commercialization of licensed products developed under the agreement. At the end of the specified research terms for each program or under certain specified circumstances, Bioverativ has the right to step in and take over any of our remaining activities. Furthermore, the Company has an option to co-promote in the United States any licensed products to treat beta-thalassemia and SCD developed under the agreement, and Bioverativ will compensate the Company for such co-promotion activities. Subject to the terms of the agreement, the Company has granted Bioverativ an exclusive, royalty-bearing license, with the right to grant sublicenses, to use certain ZFP and other technology controlled by the Company for the purpose of researching, developing, manufacturing and commercializing licensed products developed under the agreement. The Company also granted Bioverativ a non-exclusive, worldwide, royalty-free, fully paid license, with the right to grant sublicenses, under the Company's interest in certain other intellectual property developed pursuant to the agreement. During the term of the agreement, the Company is not permitted to research, develop, manufacture or commercialize, outside of the agreement, certain gene therapy products that target genes relevant to the licensed products.

Under the agreement, the Company received an upfront license fee of $20.0 million and is eligible to receive development and sales milestone payments upon the achievement of specified regulatory, clinical development and sales milestones. In addition, the Company will also be eligible to receive $115.8 million in payments upon the achievement of specified clinical development and regulatory milestones, as well as $160.5 million in payments upon the achievement of specified sales milestones. The total amount of potential regulatory, clinical development, and sales milestone payments, assuming the achievement of all specified milestones in the agreement, is $276.3 million. In addition, the Company will receive royalty payments for each licensed product that are a tiered double-digit percentage of annual net sales of each product. Bioverativ reimburses Sangamo for agreed upon costs incurred in connection with research and development activities conducted by Sangamo. To date, no milestone payments have been received and no products have been approved and therefore no royalty fees have been earned under the Bioverativ agreement.

The agreement may be terminated by (i) the Company or Bioverativ for the uncured material breach of the other party, (ii) the Company or Bioverativ for the bankruptcy or other insolvency proceeding of the other party; (iii) Bioverativ, upon 180 days' advance written notice to the Company and (iv) Bioverativ, for certain safety reasons upon written notice to, and after consultation with, the Company. As a result, actual future milestone payments could be lower than the amounts stated above.

All contingent payments under the agreement, when earned, will be non-refundable and non-creditable. None of the clinical or regulatory milestones have been included in the $75.7 million transaction price, which includes the upfront license fee and service costs over the estimated performance period, as all milestone amounts are fully constrained. As part of its evaluation of the constraint, the Company considered numerous factors, including the fact that achievement of the milestones at this time is uncertain and contingent upon future periods when the uncertainty related to the variable consideration is resolved. The Company will re-evaluate the transaction price, including the estimated variable consideration included in the transaction price and all constrained amounts, in each reporting period and as uncertain events are resolved or other changes in circumstances occur.

The Company has identified the performance obligations within this arrangement as a license to the technology and on-going research services activities. The Company concluded that the license is not discrete as it does not have stand-alone value to Bioverativ apart from the research services to be performed pursuant to the agreement. As a result, the Company recognizes revenue from the upfront payment based on proportional performance through 2022, the estimated period the Company will perform research services. The estimated period of performance and project cost is reviewed quarterly and adjusted, as needed, to reflect the Company's current assumptions regarding the timing of its deliverables. As of March 31, 2018, the Company had deferred revenue of $7.5 million related to this agreement.

Revenues recognized under the agreement for the three months ended March 31, 2018 and 2017 were as follows (in thousands):

	Three Months Ended March 31,	
	2018	2017
Revenue related to Bioverativ agreement:		
Recognition of upfront fee	$ 1,154	$ 442
Research services	3,228	1,709
Total	$ 4,382	$ 2,151

Shire International GmbH

In January 2012, the Company entered into a collaboration and license agreement with Shire to research, develop and commercialize a ZFP therapeutic for treating Huntington's disease. The Company received an upfront license fee of $13.0 million. In 2014, Sangamo recognized a $1.0 million milestone payment related to the hemophilia program. Shire does not have any milestone payment obligations, but is required to pay single digit percentage royalties to the Company, up to a specified maximum cap, on the commercial sales of therapeutic products for Huntington's disease. The Company is required to pay single digit percentage royalties to Shire, up to a specified maximum cap, on commercial sales of therapeutic products from programs returned under the original agreement (which include blood clotting Factors VIII and IX) that use two zinc fingers.

Pursuant to the agreement, the Company granted Shire an exclusive, world-wide, royalty-bearing license, with the right to grant sublicenses, to use the Company's ZFP technology for the purpose of developing and commercializing human therapeutic and diagnostic products for the *HTT* gene. During the term of the agreement, the Company is not permitted to research, develop or commercialize, outside of the agreement, certain products that target the *HTT* gene. The Company satisfied the deliverables and research services responsibilities within the amended arrangement which were completed in 2017. The agreement may be terminated by (i) the Company or Shire, in whole or in part, for the uncured material breach of the other party, (ii) the Company or Shire for the bankruptcy or other insolvency proceeding of the other party and (iii) Shire, in its entirety, effective upon at least 90 days' advance written notice.

The Company has concluded that the license is not a separate unit of accounting as it does not have stand-alone value to Shire apart from the research services to be performed pursuant to the Shire agreement. The Company satisfied the deliverables and research services responsibilities within the amended arrangement which were completed in 2017. As a result, the Company recognized the remaining $2.3 million of deferred revenue from the upfront payment during the year ended December 31, 2017.

Revenues recognized under the agreement for the three months ended March 31, 2018 and 2017 were as follows (in thousands):

	Three Months Ended March 31,	
	2018	2017
Revenue related to Shire agreement:		
Recognition of upfront fee	$ —	$ 583
Research services	—	107
Total	$ —	$ 690

NOTE 6—INCOME TAXES

On December 22, 2017, the U.S. government enacted comprehensive tax legislation commonly referred to as the Tax Cuts and Jobs Act (the "Tax Act"). The Tax Act makes broad and complex changes to the U.S. tax code that affected 2017, the current year and onwards, including, but not limited to, a reduction of the U.S. federal corporate tax rate from as high as 35% to 21%, a general elimination of U.S. federal income taxes on dividends from foreign subsidiaries, net operating loss deduction limitations, and 100% disallowance of entertainment expense.

In addition, on December 22, 2017, the SEC staff issued Staff Accounting Bulletin No. 118 ("SAB 118") which provides guidance on accounting for the tax effects of the Tax Act. SAB 118 provides a measurement period that should not extend beyond one year from the Tax Act enactment date for companies to complete the accounting under Accounting Standards Codification 740, *Income taxes* for the year ended December 31, 2017. In accordance with SAB 118, a company must reflect the income tax effects of those aspects of the Tax Act for which the accounting under ASC 740 is complete. The Company is still within the measurement period as of March 31, 2018 and no further conclusions have been made, as the Company reviews the law change and the impact to the Company.

Due to the Company's valuation allowance against its deferred tax assets, it does not expect to have a provision impact based the current year provisions of the Tax Act.

NOTE 7—STOCK-BASED COMPENSATION

The following table shows total stock-based compensation expense included in the condensed consolidated statements of operations for the three months ended March 31, 2018 and 2017 (in thousands):

	Three Months Ended March 31,	
	2018	2017
Research and development	$ 1,759	$ 1,218
General and administrative	1,291	1,570
Total stock-based compensation expense	$ 3,050	$ 2,788

NOTE 8—COMMITMENTS AND CONTINGENCIES

Brisbane Build-to-Suit Lease

In November 2017, the Company entered into a long-term property lease which includes construction by the lessor of a building with approximately 87,700 square feet of space, in Brisbane, California. Substantial completion of the building is estimated to occur in the last quarter of 2018. The lease agreement expires in May 2029, approximately ten years after substantial completion of the building. A letter of credit for $3.5 million was established as the deposit and is classified as restricted cash within restricted cash and other noncurrent assets in the accompanying financial statements. The Company has two options to extend the lease term for up to a combined additional ten years.

The Company is deemed, for accounting purposes only, to be the owner of the entire project including the building shell, even though it is not the legal owner as a result of the cold shell condition of the building and involvement in the construction process. In connection with the Company's accounting for this transaction, the Company capitalized the costs of construction as a build-to-suit property within property and equipment, net, and recognize a corresponding build-to-suit lease obligation, including interest. Fair value of the building was estimated at $20.9 million using comparable market prices per square foot for similar space for public real estate transactions in the surrounding area and is considered a Level 2 fair value measurement. As of March 31, 2018, $23.4 million was capitalized with a corresponding build-to-suit lease obligation recognized related to this lease for the building and construction costs.

Contingencies

Sangamo is not party to any material pending legal proceedings or contingencies. From time to time, the Company may be involved in legal proceedings arising in the ordinary course of business.

NOTE 9— STOCKHOLDERS' EQUITY

In May 2017, the Company entered into an amended and restated sales agreement with Cowen and Company, LLC ("Cowen") (the "ATM Facility") pursuant to which the Company may offer and sell, in its sole discretion, shares of common stock having an aggregate offering price of up to $75.0 million through Cowen acting as the Company's sales agent. Sales of the Company's common stock, if any, will be made at market prices by any method that is deemed to be an "at the market offering" as defined in Rule 415 under the Securities Act of 1933, as amended. The Company has not sold any common stock under the ATM Facility. As of March 31, 2018, the full $75.0 million provided for under the ATM Facility remained available for sale, subject to certain conditions as specified in the agreement.

NOTE 10— SUBSEQUENT EVENTS

Proceeds from the Kite agreement

In April 2018, the Kite agreement became effective when the waiting periods under the Hart-Scott-Rodino Antitrust Improvements Act of 1976, as amended and other customary closing conditions were satisfied. Following the effective date, the Company received a $150 million upfront payment from Kite.

Proceeds from public offering of common stock, net of issuance costs

In April 2018, Sangamo completed an underwritten public offering of its common stock, in which the Company sold an aggregate of 14.2 million shares of its common stock at a public offering price of $16.25 per share. The net proceeds to Sangamo from the sale of shares in this offering, after deducting underwriting discounts and commissions and other estimated offering expenses, were approximately $215.9 million.

ITEM 2. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The discussion in "Management's Discussion and Analysis of Financial Condition and Results of Operations" contains trend analysis, estimates and other forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. These forward-looking statements include, without limitation, statements containing the words "believes," "anticipates," "expects," "continue," "strategy," "will," "intend" and other words of similar import or the negative of those terms or expressions. Such forward-looking statements are subject to known and unknown risks, uncertainties, estimates and other factors that may cause our actual results, performance or achievements, or industry results, to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements , including but not limited to those described under the caption "Risk Factors" in Part II, Item 1A of this Quarterly Report on Form 10-Q. You should read the following discussion and analysis along with the financial statements and notes attached to those statements included elsewhere in this report and in our Annual Report on Form 10-K for the year ended December 31, 2017, or the 2017 Annual Report, as filed with the Securities and Exchange Commission, or SEC, on March 1, 2018.

Overview

We are a clinical stage biotechnology company focused on translating ground-breaking science into genomic therapies that transform patients' lives using our industry-leading platform technologies in genome editing, gene therapy, gene regulation and cell therapy.

We are a leader in the research and development of zinc finger proteins, or ZFPs, a naturally occurring class of proteins found in humans. We have used our knowledge and expertise to develop a proprietary technology platform in both genome editing and gene regulation. ZFPs can be engineered to make zinc finger nucleases, or ZFNs, proteins that can be used to specifically modify DNA sequences by adding or knocking out specific genes, or genome editing, and ZFP transcription factors, or ZFP TFs, proteins that can be used to increase or decrease gene expression, or gene regulation. In the process of developing this platform, we have accrued significant scientific, manufacturing and regulatory capabilities and know-how that are generally applicable in the broader field of gene therapy and have capitalized this knowledge into a conventional gene therapy platform based on adeno-associated viral vector, or AAV, complementary DNA, or cDNA, gene transfer.

Our strategy is to maximize the value and therapeutic use of our technology platforms. In certain therapeutic areas we intend to capture the value of our proprietary genome editing and gene therapy products by forward integrating into manufacturing, development and commercial operations. In other therapeutic areas we intend to partner with biopharmaceutical companies to develop products.

We are focused on the development of human therapeutics for diverse diseases with well-characterized genetic causes. We have several proprietary clinical and preclinical product candidates in development and have strategically partnered certain programs with biopharmaceutical companies to obtain funding for our own programs and to expedite clinical and commercial development.

We have an ongoing Phase 1/2 clinical trial evaluating SB-525, a gene therapy for the treatment of hemophilia A, a bleeding disorder. We also have ongoing Phase 1/2 clinical trials evaluating three product candidates using our proprietary *in vivo* genome editing approach: SB-FIX for the treatment of hemophilia B, a bleeding disorder; SB-318, for the treatment of Mucopolysaccharidosis Type I, or MPS I; and SB-913 for the treatment of Mucopolysaccharidosis Type II, or MPS II. MPS I and MPS II are rare lysosomal storage disorders, or LSDs. We are also initiating a Phase 1/2 clinical trial evaluating ST-400, developed using our proprietary ZFN-mediated *ex vivo* cell therapy platform, for the treatment of beta-thalassemia, a blood disorder. In addition, we have proprietary preclinical and discovery stage programs in other LSDs, hematological disorders and monogenic diseases, including certain central nervous system, or CNS, disorders, cancer immunotherapy, immunology and infectious disease.

In February 2018, we entered into a global collaboration and license agreement with Kite Pharma, Inc., or Kite, a wholly owned subsidiary of Gilead Sciences, Inc., for the research, development and commercialization of potential engineered cell therapies for cancer. In April 2018, the Kite agreement became effective when the waiting periods under the Hart-Scott-Rodino Antitrust Improvements Act of 1976, as amended and other customary closing conditions were completed. Following the effective date, we received a $150 million upfront payment from Kite. In this collaboration, we are working together with Kite on a research program under which we are designing ZFNs and AAVs to disrupt and insert certain genes in T cells and natural killer, or NK, cells, including the insertion of genes that encode chimeric antigen receptors, T-cell receptors, and NK-cell receptors directed to mutually agreed targets. Kite is responsible for all clinical development and commercialization of any resulting products.

In December 2017, we entered into a new research collaboration and license agreement with Pfizer Inc., or Pfizer, for the development and commercialization of potential gene therapy products that use ZFP TFs to treat amyotrophic lateral sclerosis, or ALS, and frontotemporal lobar degeneration, or FTLD, linked to mutations of the *C9ORF72* gene. Under this agreement, we are working with Pfizer on a research program to identify, characterize and preclinically develop ZFP TFs that satisfy pre-agreed criteria. Pfizer is responsible for subsequent development, manufacturing and commercialization of licensed products.

In May 2017, we entered into a global collaboration and license agreement with Pfizer for the research, development and commercialization of SB-525, our gene therapy product candidate for hemophilia A, and closely related products. Under this agreement, we are responsible for conducting the Phase 1/2 clinical trial and certain manufacturing activities for SB-525, while Pfizer is responsible for subsequent worldwide development, manufacturing, marketing and commercialization of SB-525. We and Pfizer may also collaborate in the research and development of additional AAV-based gene therapy products for hemophilia A.

We have also established a collaborative partnership with Bioverativ, a Sanofi company, or Bioverativ, to research, develop and commercialize therapeutic gene-edited cell therapy products in hemoglobinopathies, including beta-thalassemia and sickle cell disease, or SCD. We expect to begin enrolling patients in a Phase 1/2 clinical study for beta-thalassemia in the first half of 2018. Bioverativ is responsible for subsequent development, manufacturing and commercialization of licensed products.

We have a substantial intellectual property position in the genome editing field including the design, selection, composition and use of engineered ZFPs to support our research and development activities. As of February 15, 2018, we either owned outright or have exclusively licensed the commercial rights to over 860 patents issued in the United States and foreign jurisdictions, and over 610 patent applications pending worldwide. We continue to license and file new patent applications that strengthen our core and accessory patent portfolio. We believe that our intellectual property position is a critical element in our ability to research, develop and commercialize products and services based on genome editing, gene therapy, gene regulation and cell therapy.

Comparability

We adopted Accounting Standards Codification Topic 606—Revenue from Contracts with Customers, or Topic 606, on January 1, 2018, resulting in a change to our accounting policy for revenue recognition. We used the modified retrospective method and recognized the cumulative effect of initially applying Topic 606 as an adjustment to the opening balances of deferred revenues and accumulated deficit at January 1, 2018. Accordingly, comparative information has not been adjusted and continues to be reported under previous accounting standards. Refer to Note 1 in Part I, Item 1 of this Quarterly Report on Form 10-Q for additional information.

Critical Accounting Estimates

The accompanying discussion and analysis of our financial condition and results of operations are based upon our condensed consolidated financial statements and the related disclosures, which have been prepared in accordance with accounting principles generally accepted in the United States. The preparation of these financial statements requires us to make estimates, assumptions and judgments that affect the reported amounts in our condensed consolidated financial statements and accompanying notes. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions. Except for the change to our accounting policy for revenue recognition as a result of adopting Topic 606, there have been no significant changes in our critical accounting policies and estimates disclosed in our 2017 Annual Report.

Results of Operations

Three months ended March 31, 2018 and 2017

Revenues

	Three Months Ended March 31,			
	2018	2017	Change	% Change
	(In thousands, except percentage values)			
Revenues:				
Collaboration agreements	$ 12,551	$ 3,306	$ 9,245	280%
Research grants	86	119	(33)	-28%
Total revenues	$ 12,637	$ 3,425	$ 9,212	269%

Total revenues consisted of revenues from collaboration agreements and research grants. We anticipate revenues over the next several years will be derived primarily from our collaboration agreements with Kite, Pfizer and Bioverativ.

The increase in revenues from our collaboration agreements was primarily due to an increase of $7.7 million in revenues related to the hemophilia A Pfizer agreement, $2.2 million in revenues related to our agreement with Bioverativ, and $0.5 million related to the C9ORF72 Pfizer agreement, partially offset by a decrease of $0.7 million in revenue related to our agreement with Shire International GmbH, formerly Shire AG. The revenues from Pfizer reflect the partial recognition of an upfront fee of $70.0 million under the hemophilia A Pfizer agreement and upfront fee of $12 million under the C9ORF72 Pfizer agreement. Bioverativ included $3.2 million from research services and $1.2 million related to partial recognition of an upfront license fee of $20.0 million. Research grant revenues were approximately $0.1 million for the three months ended March 31, 2018 and 2017, respectively.

Operating Expenses

	Three Months Ended March 31,			
	2018	2017	Change	% Change
	(In thousands, except percentage values)			
Operating expenses:				
Research and development	$ 23,547	$ 12,942	$ 10,605	82%
General and administrative	10,087	7,275	2,812	39%
Total expenses	$ 33,634	$ 20,217	$ 13,417	66%

Research and Development Expenses

Research and development expenses consist primarily of salaries and personnel-related expenses, including stock-based compensation, laboratory supplies, preclinical and clinical studies, manufacturing expenses, allocated facilities expenses, contracted research expenses and expenses for technology licenses. We expect to continue to devote substantial resources to research and development in the future and expect research and development expenses to increase in the next several years if we are successful in advancing our clinical programs and if we are able to progress our earlier stage product candidates into clinical trials.

The increase of $10.6 million in research and development expenses was primarily due to increases of $5.3 million in manufacturing and clinical trial expenses due to timing of manufacturing activities, $2.1 million in salaries and benefits expense, $1.0 million in research and pre-clinical expense, $0.8 million in lab supply expense, $0.6 million in facility expense, $0.5 million in stock-based compensation expense, and $0.3 million in consultant expense.

At this time, we cannot provide reliable estimates of how much time or investment will be necessary to enable our product candidates to be commercialized. For a more complete discussion of the risks and uncertainties associated with our research and development activities and the development of our product candidates, see “Risk Factors” in Part II, Item 1A of this Quarterly Report on Form 10-Q.

General and Administrative Expenses

The increase of $2.8 million in general and administrative expenses was primarily due to increases of $1.1 million in salaries and benefits expense, $0.4 million in audit expense, $0.4 million in consultant expense, $0.3 million in facility expense, and $0.2

million in legal expense. The increases were primarily due to the growth of our business to support the continued advancement of our product candidates into clinical trials.

Interest and other income, net

The increase of $0.6 million in interest and other income, net, is primarily due to changes resulting from our treasury strategy.

Liquidity and Capital Resources

Liquidity

Since inception, we have incurred significant net losses and we have funded our operations primarily through the issuance of equity securities, payments from corporate collaborators and strategic partners, and research grants.

As of March 31, 2018, we had cash, cash equivalents, marketable securities and interest receivable, totaling $234.9 million, excluding restricted cash, compared to $244.6 million as of December 31, 2017, with the decrease primarily attributable to our net operating loss.

Our most significant use of capital pertains to salaries and benefits for our employees and external research and development expenses, such as manufacturing, clinical trials and preclinical activity related to our therapeutic programs. Our cash and investment balances are held in a variety of interest bearing instruments, including obligations of U.S. government agencies, U.S. Treasury debt securities, corporate debt securities and money market funds. Cash in excess of immediate requirements is invested in accordance with our investment policy with a view toward capital preservation and liquidity.

In February 2018, we entered into a global collaboration and license agreement with Kite for the research, development and commercialization of potential engineered cell therapies for cancer. In April 2018, the Kite agreement became effective when the waiting periods under the Hart-Scott-Rodino Antitrust Improvements Act of 1976, as amended and other customary closing conditions were satisfied. Following the effective date, we received a $150 million upfront payment from Kite.

In April 2018, we completed an underwritten public offering of our common stock, in which we sold an aggregate of 14.2 million shares of our common stock at a public offering price of $16.25 per share. The net proceeds to us from the sale of shares in this offering, after deducting underwriting discounts and commissions and other estimated offering expenses, were approximately $215.9 million.

In May 2017, we entered into an amended and restated sales agreement with Cowen and Company, LLC pursuant to which we may offer and sell, in our sole discretion, shares of common stock having an aggregate offering price of up to $75.0 million through Cowen acting as our sales agent. Sales of our common stock, if any, will be made at market prices by any method that is deemed to be an “at the market offering” as defined in Rule 415 under the Securities Act of 1933, as amended. We have not sold any common stock under this agreement. As of March 31, 2018, the full $75.0 million provided for under the agreement remained available for sale, subject to certain conditions as specified in the agreement. We are not able to make offers or sales under this agreement until the lock-up that was put in place in connection with the April 2018 public offering has expired.

Cash Flows

*Operating activities***.** Net cash used in operating activities was $18.1 million and $13.1 million for the three months ended March 31, 2018 and 2017, respectively. Net cash used in operating activities for the three months ended March 31, 2018 primarily reflected the net loss for the period as well as changes in accrued compensation and prepaid expenses, partially offset by an increase in deferred revenue and stock-based compensation. Net cash used in operating activities for the three months ended March 31, 2017 primarily reflected the net loss for the period as well as a decrease in deferred revenue and accrued liabilities, partially offset by stock-based compensation.

*Investing activities***.** Net cash used in investing activities for the three months ended March 31, 2018 was $11.6 million. Net cash provided by investing activities was $6.1 million for the three months ended March 31, 2017. Cash flows from investing activities for both periods primarily related to purchases and maturities of investments.

*Financing activities***.** Net cash provided by financing activities for the three months ended March 31, 2018 and 2017 was $10.6 million and $3.4 million, respectively. Cash flows from financing activities for both periods primarily related to the issuance of common stock upon exercise of stock options.

Operating Capital and Capital Expenditure Requirements

We anticipate continuing to incur operating losses for at least the next several years. While our rate of cash usage may increase in the future, in particular to support our product development endeavors, we believe our available cash resources as well as funds received from corporate collaborators, strategic partners and research grants will be adequate to sustain our current operations for at least the next twelve months. Future capital requirements will be substantial, and if our capital resources are insufficient to meet future capital requirements, we will need to raise additional capital to fund our operations, including gene therapy development activities, through equity or debt financing. We regularly consider fund raising opportunities and may decide, from time to time, to raise capital based on various factors, including market conditions and our plans of operation. Additional capital may not be available on terms acceptable to us, or at all. If adequate funds are not available, or if the terms of potential funding sources are unfavorable, our business and our ability to develop our technology and our gene therapy products would be harmed. Furthermore, any sales of additional equity securities may result in dilution to our stockholders, and any debt financing may include covenants that restrict our business.

Our future capital requirements will depend on many factors and are not limited to the following:

- the initiation, progress, timing and completion of clinical trials for our product candidates and potential product candidates;
- the outcome, timing and cost of regulatory approvals;
- the success of our collaboration agreements;
- delays that may be caused by changing regulatory requirements;
- the number of product candidates that we pursue;
- the costs involved in filing and prosecuting patent applications and enforcing and defending patent claims;
- the timing and terms of future in-licensing and out-licensing transactions;
- the cost and timing of establishing sales, marketing, manufacturing and distribution capabilities;
- the cost of procuring clinical and commercial supplies of our product candidates;
- the extent to which we acquire or invest in businesses, products or technologies; and
- the possible costs of litigation.

Off-Balance Sheet Arrangements

We do not have any off-balance sheet arrangements as defined in Regulation S-K, Item 303(a)(4)(ii) of Regulation S-K.

Contractual Obligations and Commercial Commitments

Our future minimum contractual commitments were reported in our 2017 Annual Report and there have been no material changes outside the ordinary course of business in the previously disclosed contractual commitments during the three months ended March 31, 2018.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Our exposure to market risk relates to our cash, cash equivalents and investments. The goals of our investment policy are preservation of capital, fulfillment of liquidity needs and capturing a market rate of return based on our investment policy parameters and market conditions. We select investments that maximize interest income to the extent possible within these guidelines. To achieve our goals, we maintain a portfolio of cash equivalents and investments in securities of high credit quality and with varying maturities to match projected cash needs.

The securities in our investment portfolio are not leveraged, are classified as available-for-sale and are, due to their short-term nature, subject to minimal interest rate risk. Our investments currently consist of U.S. Treasury securities, U.S. government-sponsored enterprise securities and corporate notes. Our investment policy, approved by our Board of Directors, limits the amount we may invest in any one type of investment issuer, thereby reducing credit risk concentrations. All investments have a fixed interest rate and are carried at market value, which approximates cost. We do not use derivative financial instruments in our investment portfolio. We do not believe that a change in interest rates would have a material negative impact on the value of our investment portfolio. Our market risks at March 31, 2018 have not changed materially from those discussed in Item 7A of our 2017 Annual Report.

ITEM 4. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

We maintain disclosure controls and procedures that are designed to provide reasonable assurance that information required to be disclosed in our Exchange Act reports is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms and that such information is accumulated and communicated to our management, including our principal executive officer and principal financial officer, as appropriate, to allow timely decisions regarding required disclosure.

Under the supervision of our principal executive officer and principal financial officer, we evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) of the Exchange Act) as of March 31, 2018. Based on that evaluation, our principal executive officer and principal financial officer have concluded that our disclosure controls and procedures were effective at the reasonable assurance level.

Inherent Limitations on Controls and Procedures

Our management, including the principal executive officer and principal financial officer, does not expect that our disclosure controls and procedures and our internal control over financial reporting will prevent all error and all fraud. A control system, no matter how well designed and operated, can only provide reasonable assurances that the objectives of the control system are met. The design of a control system reflects resource constraints; the benefits of controls must be considered relative to their costs. Because there are inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, for our company have been or will be detected. As these inherent limitations are known features of the disclosure and financial reporting processes, it is possible to design into the processes safeguards to reduce, though not eliminate, these risks. These inherent limitations include the realities that judgments in decision-making can be faulty and that breakdowns occur because of simple error or mistake. Controls can also be circumvented by the individual acts of some persons, by collusion of two or more people, or by management override of the control. The design of any system of controls is based in part upon certain assumptions about the likelihood of future events. While our disclosure controls and procedures and our internal control over financial reporting are designed to provide reasonable assurance of achieving their objectives, there can be no assurance that any design will succeed in achieving its stated goals under all future conditions. Over time, controls may become inadequate because of changes in conditions or deterioration in the degree of compliance with the policies or procedures. Because of the inherent limitations in a cost-effective control system, misstatements due to error or fraud may occur and not be detected.

Change in Internal Control over Financial Reporting

There has been no change in our internal control over financial reporting that occurred during the three months ended March 31, 2018 that has materially affected, or is reasonably likely to materially affect, our internal controls over financial reporting.

PART II. OTHER INFORMATION

ITEM 1. LEGAL PROCEEDINGS

We are not party to any material pending legal proceedings. From time to time, we may be involved in legal proceedings arising in the ordinary course of business.

ITEM 1A. RISK FACTORS

An investment in our common stock involves significant risk. You should carefully consider the information described in the following risk factors, together with the other information contained herein and in our Annual Report on Form 10-K filed with the Securities and Exchange Commission on March 1, 2018, including our consolidated financial statements and related notes, before making an investment decision regarding our common stock. If any of the events described in the following risk factors occurs, our business, operating results and financial condition could be seriously harmed.

Risks Relating to Development, Commercialization and Regulatory Approval of our Products and Technology

Our success depends substantially on the results of clinical trials of our lead therapeutic programs, and we may not be able to demonstrate safety and efficacy of our product candidates.

We do not have any products that have gained regulatory approval. We have initiated Phase 1/2 clinical trials evaluating product candidates for the treatment of hemophilia A (SB-525), hemophilia B (SB-FIX), MPS I (SB-318) and MPS II (SB-913). Our business is substantially dependent on our ability to obtain regulatory approval for, and, if approved, to successfully commercialize these product candidates in a timely manner. Our failure to enroll sufficient patients to conduct the trials, demonstrate safety or obtain positive clinical trial results, or our inability to meet the expected timeline of clinical trials or release of data for these programs would have a material adverse effect on our business operations and financial conditions, which may cause a significant decline in our stock price.

Our ability to conduct clinical trials successfully and on a timely basis for these programs is subject to a number of additional risks, including but are not limited to the following:

- disagreement with the design or implementation of our clinical trials;
- the ability to identify and recruit sufficient number of acceptable patients to complete enrollment of trials;
- failure to demonstrate that a product candidate is safe and effective for its proposed indication;
- the occurrence of unexpected adverse events or toxicity;
- disagreement with the U.S. Food and Drug Administration, or FDA, on the interpretation of data from preclinical studies or our clinical trial results;
- failure of clinical trials to meet the level of statistical significance required for approval;
- the insufficiency of data collected from clinical trials of our product candidates to support the submission and filing of a biologics license application, or BLA, or other submission or to obtain regulatory approval;
- changes in the approval policies or regulations that render our preclinical and clinical data insufficient for approval;
- failure to obtain approval of our manufacturing processes or facilities of third-party manufacturers with whom we contract for clinical and commercial supplies or our own manufacturing facility;
- defects in the preparation and manufacturing of our product candidates;
- failure by third parties, including vendors, manufacturers and clinical trial organizations, to provide timely and adequate supplies and services;
- development of similar gene therapies by our competitors;
- unexpected costs and expenses and lack of sufficient funding for these programs; and
- loss of licenses to critical intellectual properties.

We have not yet reached agreement with regulatory authorities on the development pathway for our product candidates. As a result, we have not yet determined what endpoints would support approval for certain of our programs. Due to the novelty of certain programs, such as SB-318 and SB-913, the endpoints needed to support regulatory approvals may be different than originally anticipated. Even if we are able to complete phase 1/2 trials for these programs successfully, we will likely be required to conduct additional clinical trials with larger patient populations, before obtaining the necessary regulatory approval to commercialize our

products. However, there is no guarantee that the positive results achieved in earlier trials are indicative of long-term efficacy in late stage clinical trials. A number of companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in late stage clinical trials even after achieving promising results in earlier-stage clinical trials. If a larger population of patients does not experience positive results, or if these results are not reproducible, our products may not receive approval from the FDA, which could have a material adverse effect on our business that would cause our stock price to decline significantly.

Even if a product candidate were to successfully obtain approval from the FDA and comparable foreign regulatory authorities, any approval might contain significant limitations related to use restrictions for specified age groups, warnings, precautions or contraindications, or may be subject to burdensome post-approval study or risk management requirements. If we are unable to obtain regulatory approval for one of our product candidates in one or more jurisdictions, or any approval contains significant limitations, we may not be able to obtain sufficient funding to continue the development of that product or generate revenues attributable to that product candidate. Also, any regulatory approval of our current or future product candidates, once obtained, may be withdrawn.

Success in preclinical studies or early clinical trials may not be indicative of results obtained in later trials.

Results from preclinical studies or previous clinical trials are not necessarily predictive of future clinical trial results, and interim results of a clinical trial are not necessarily indicative of final results. Our product candidates may fail to show the desired safety and efficacy in clinical development despite demonstrating positive results in preclinical studies or having successfully advanced through initial clinical trials or preliminary stages of clinical trials.

While we have achieved positive results in preclinical studies of our product candidates for hemophilia A (SB-525), hemophilia B (SB-FIX), MPS I (SB-318) and MPS II (SB-913), Phase 1/2 clinical trials have only recently begun and there is no guarantee that we can achieve positive safety and efficacy results. Furthermore, all four programs are novel *in-vivo* gene therapy or genome editing therapies that utilize AAV to deliver therapeutic levels of ZFN into the patient's blood stream. The AAV delivery system has not been validated in human clinical trials previously, and if such delivery system does not meet the safety criteria or cannot produce the desirable efficacy results we expect, we may be forced to suspend or terminate the affected program.

There is a high failure rate for drugs, biologic products and cell therapies proceeding through clinical trials. Many companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in late-stage clinical trials even after achieving promising results in preclinical testing and earlier-stage clinical trials. Data obtained from preclinical and clinical activities are subject to varying interpretations, which may delay, limit or prevent regulatory approval. In addition, we may experience regulatory delays or rejections as a result of many factors, including due to changes in regulatory policy during the period of our product candidate development. Any such delays could materially and adversely affect our business, financial condition, results of operations and prospects.

Our potential products are subject to a lengthy and uncertain regulatory approval process.

The FDA must approve any human therapeutic product before it can be marketed in the United States. The process for receiving regulatory approval is long and uncertain, and a potential product may not withstand the rigors of testing under the regulatory approval processes.

Before commencing clinical trials in humans, we must submit an Investigational New Drug, or IND, application to the FDA. The FDA has 30 days to comment on the application, and if the agency has no comments, we or our commercial partner may begin clinical trials. While we have stated our intention to file additional IND applications in the future, this is only a statement of intent, and we may not be able to do so because the associated product candidates may not meet the necessary preclinical requirements. In addition, there can be no assurance that, once filed, an IND application will result in the actual initiation of clinical trials or that we will be able to meet our targeted timeline for the initiation of clinical trials. Clinical trials are subject to oversight by institutional review boards and the FDA. In addition, our proposed clinical studies may require review from the Recombinant DNA Advisory Committee, or RAC, which is the advisory board to the NIH focusing on clinical trials involving gene transfer.

Clinical trials:

- must be conducted in conformance with the FDA's good clinical practices, within the guidelines of the International Council for Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use, or ICH, and other applicable regulations;
- must meet requirements for Institutional Review Board, or IRB, oversight;
- must follow Institutional Biosafety Committee, or IBC, and NIH RAC guidelines where applicable;
- must meet requirements for informed consent;
- are subject to continuing FDA or similar foreign government oversight;

- may require oversight by a Data Monitoring Committee, or DMC;
- may require large numbers of test subjects; and
- may be suspended by a commercial partner, the FDA, or us at any time if it is believed that the subjects participating in these trials are being exposed to unacceptable health risks or if the FDA finds deficiencies in the IND application or the conduct of these trials.

If we are not able to obtain the necessary regulatory approval to commercialize our products of if such approval is delayed or suspended, it would have an adverse effect on our business operations and trading price of our common stock.

We may encounter difficulties that may delay, suspend or scale back our efforts to advance additional early research programs through preclinical development and IND application filings and into clinical development.

We intend to advance early research programs through preclinical development and to file new IND applications for human clinical trials evaluating the preclinical candidates in our pipeline. The preparation and submission of IND applications requires us to conduct rigorous and time-consuming preclinical testing, studies, and prepare documentation relating to, among other things, the toxicity, safety, manufacturing, chemistry and clinical protocol of our product candidates. We may experience unforeseen difficulties that could delay or otherwise prevent us from executing this strategy successfully. For example, we may encounter problems in the manufacturing of our products and fail to demonstrate consistency in the formulation of the drug. Our preclinical tests may produce negative or inconclusive results, which may lead us to decide, or regulators may require us, to conduct additional preclinical testing. If we cannot obtain positive results in preclinical testing, we may decide to abandon the projects altogether. In addition, our ability to complete and file certain IND applications depends on the support of our partners and the timely performance of their obligations under relevant collaboration agreements. If our partners are not able to perform such obligations or if they choose to slow down or delay the progress, we may not be able to prepare and file the intended IND applications on a timely basis or at all. Furthermore, the filing of several IND applications involves significant cost and labor, and we may not have sufficient resources and personnel to complete the filing of all intended IND applications, which may force us to scale back the number of IND applications or forego potential IND applications that we believe are promising. Any delay, suspension or reduction of our efforts to pursue our preclinical and IND strategy could have a material adverse effect on our business and cause our stock price to decline.

We may not successfully identify, acquire, develop or commercialize new potential product candidates.

Part of our business strategy is to expand our product candidate pipeline by identifying and validating new product candidates, which we may develop ourselves, in-license or otherwise acquire from others. In addition, in the event that our existing product candidates do not receive regulatory approval or are not successfully commercialized, then the success of our business will depend on our ability to expand our product pipeline through in-licensing or other acquisitions. We may be unable to identify relevant product candidates. If we do identify such product candidates, we may be unable to reach acceptable terms with any third party from which we desire to in-license or acquire them.

We may encounter substantial delays in our clinical trials or we may fail to demonstrate safety and efficacy to the satisfaction of applicable regulatory authorities.

Before obtaining marketing approval from regulatory authorities for the sale of our product candidates, we must conduct extensive clinical trials to demonstrate the safety and efficacy of the product candidates. Clinical testing is expensive, time consuming and uncertain as to outcome. We cannot guarantee that any clinical trials will be conducted as planned or completed on schedule, if at all. A failure of one or more clinical trials can occur at any stage of testing. Events that may prevent successful or timely completion of clinical development include:

- delays in reaching a consensus with regulatory authorities on trial design;
- delays in reaching agreement on acceptable terms with prospective CROs and clinical trial sites;
- delays in opening clinical trial sites or obtaining required IRB or independent ethics committee approval at each clinical trial site;
- delays in recruiting suitable subjects to participate in our clinical trials;
- imposition of a clinical hold by regulatory authorities as a result of a serious adverse event or after an inspection of our clinical trial operations or trial sites;
- failure by us, any CROs we engage or any other third parties to adhere to clinical trial requirements;
- failure to perform in accordance with FDA good clinical practices, or GCP, or applicable regulatory guidelines in the European Union and other countries;

- delays in the testing, validation, manufacturing and delivery of our product candidates to the clinical sites, including delays by third parties with whom we have contracted to perform certain of those functions;
- delays in having subjects complete participation in a trial or return for post-treatment follow-up;
- clinical trial sites or subjects dropping out of a trial;
- selection of clinical endpoints that require prolonged periods of clinical observation or analysis of the resulting data;
- occurrence of serious adverse events associated with the product candidate that are viewed to outweigh its potential benefits;
- occurrence of serious adverse events in trials of the same class of agents conducted by other sponsors; or
- changes in regulatory requirements and guidance that require amending or submitting new clinical protocols.

Any inability to successfully complete preclinical and clinical development could result in additional costs to us or impair our ability to generate revenues from product sales, regulatory and commercialization milestones and royalties. In addition, if we make manufacturing or formulation changes to our product candidates, we may need to conduct additional studies to bridge our modified product candidates to earlier versions. Clinical trial delays also could shorten any periods during which we may have the exclusive right to commercialize our product candidates or allow our competitors to bring products to market before we do, which could impair our ability to successfully commercialize our product candidates and may harm our business, financial condition, results of operations and prospects.

Additionally, if the results of our clinical trials are inconclusive or if there are safety concerns or serious adverse events associated with our product candidates, we may:

- be delayed in obtaining marketing approval for our product candidates, if at all;
- obtain approval for indications or patient populations that are not as broad as intended or desired;
- obtain approval with labeling that includes significant use or distribution restrictions or safety warnings;
- be subject to changes in the way the product is administered;
- be required to perform additional clinical trials to support approval or be subject to additional post-marketing testing requirements;
- have regulatory authorities withdraw, or suspend, their approval of the product or impose restrictions on its distribution in the form of a modified risk evaluation and mitigation strategy;
- be subject to the addition of labeling statements, such as warnings or contraindications;
- be sued; or
- experience damage to our reputation.

We may not be able to find acceptable patients or may experience delays in enrolling patients for our clinical trials, which could delay or prevent us from proceeding with clinical trials of our product candidates.

Identifying and qualifying patients to participate in clinical trials of our product candidates is critical to our success. The timing of our clinical trials depends on our ability to recruit patients to participate as well as completion of required follow-up periods. For example, hemophilia trials often take longer to enroll due to the availability of existing treatments. We have been unable to enroll a patient in our hemophilia B clinical trial. If we are not able to enroll the necessary number of patients in a timely manner, we may not be able to complete the clinical trial. We may face similar challenges or delays in our other or future clinical trials. If patients are unwilling to participate in our gene therapy studies because of negative publicity from adverse events related to the biotechnology or gene therapy fields, competitive clinical trials for similar patient populations or for other reasons, the timeline for recruiting patients, conducting studies and obtaining regulatory approval of our product candidates may be delayed. These delays could result in increased costs, delays in advancing our product candidates, delays in testing the effectiveness of our product candidates or termination of the clinical trials altogether.

We may not be able to identify, recruit and enroll a sufficient number of patients, or those with required or desired characteristics, to complete our clinical trials in a timely manner. Patient enrollment and trial completion is affected by factors including:

- size of the patient population and process for identifying subjects;

- design of the trial protocol;
- eligibility and exclusion criteria;
- perceived risks and benefits of the product candidate under study;
- perceived risks and benefits of gene therapy-based approaches to treatment of diseases;
- availability of competing therapies and clinical trials;
- severity of the disease under investigation;
- availability of genetic testing for potential patients;
- proximity and availability of clinical trial sites for prospective subjects;
- ability to obtain and maintain subject consent;
- risk that enrolled subjects will drop out before completion of the trial;
- patient referral practices of physicians; and
- ability to monitor subjects adequately during and after treatment.

Our current product candidates are being developed to treat rare conditions. We plan to seek initial regulatory approvals in the United States and, subsequently, the European Union. We may not be able to initiate or continue clinical trials if we cannot enroll a sufficient number of eligible patients to participate in the clinical trials required by regulatory authorities. Our ability to successfully initiate, enroll and complete a clinical trial in any foreign country is subject to numerous risks unique to conducting business in foreign countries, including:

- difficulty in establishing or managing relationships with contract research organizations, or CROs, and physicians;
- different standards for the conduct of clinical trials;
- absence in some countries of established groups with sufficient regulatory expertise for review of gene therapy protocols;
- our inability to locate qualified local consultants, physicians and partners; and
- the potential burden of complying with a variety of foreign laws, medical standards and regulatory requirements, including the regulation of pharmaceutical and biotechnology products and treatment.

If we have difficulty enrolling a sufficient number of patients to conduct our clinical trials as planned, we may need to delay, limit or terminate ongoing or planned clinical trials, any of which would have an adverse effect on our business, financial condition, results of operations and prospects.

Our product candidates may cause undesirable side effects or have other properties that could delay or prevent their regulatory approval, limit the commercial potential or result in significant negative consequences following any potential marketing approval.

During the conduct of clinical trials, patients report changes in their health, including illnesses, injuries and discomforts, to their study doctor. Often, it is not possible to determine whether or not the product candidate being studied caused these conditions, particularly as many of the diseases we are studying have complex comorbidities. If clinical experience indicates that our product candidates have side effects or cause serious or life-threatening side effects, the development of the product candidate may fail or be delayed, or, if the product candidate has received regulatory approval, such approval may be revoked, which would severely harm our business, prospects, operating results and financial condition.

There have been several significant adverse side effects in gene therapy treatments in the past, including reported cases of leukemia and death seen in other trials using other genomic therapies. Gene therapy is still a relatively new approach to disease treatment and additional adverse side effects could develop. There also is the potential risk of significantly delayed adverse events following exposure to gene therapy products due to persistent biologic activity of the genetic material or other components of products used to carry the genetic material. Possible adverse side effects that could occur with treatment with gene therapy products include an immunologic reaction early after administration that, while not necessarily adverse to the patient’s health, could substantially limit the effectiveness of the treatment.

As we cannot predict whether or when we will obtain regulatory approval to commercialize our product candidates, we cannot predict the timing of any future revenue from these product candidates.

We cannot commercialize any of our product candidates to generate revenue until the appropriate regulatory authorities have reviewed and approved the marketing applications for the product candidates. We cannot ensure that the regulatory agencies will complete their review processes in a timely manner or that we will obtain regulatory approval for any product candidate that we or our collaborators develop. Satisfaction of regulatory requirements typically takes many years, is dependent upon the type, complexity and novelty of the product and requires the expenditure of substantial resources. Regulatory approval processes outside the United States include all of the risks associated with the FDA approval process. In addition, we may experience delays or rejections based upon additional government regulation from future legislation or administrative action or changes in FDA policy during the period of product development, clinical trials and FDA regulatory review.

We have limited experience in conducting advanced clinical trials.

We have initiated Phase 1/2 clinical trials evaluating product candidates for hemophilia A (SB-525), hemophilia B (SB-FIX), MPS I (SB-318) and MPS II (SB-913). For potential marketing application approval, additional clinical testing will be required, which involves significantly greater resources, commitments and expertise. Therefore, we may be required to scale up our operations and enter into collaborative relationships with pharmaceutical companies that could assume responsibility for late-stage development and commercialization.

We have limited experience in conducting advanced clinical trials and may not possess the necessary resources and expertise to complete such trials. We have entered into collaborative agreements to provide funding and assistance in the development of certain product candidates through the clinical trial process. However, there is no guarantee that we will be able to enter into future collaborative relationships with third parties that can provide us with the funding and expertise for later stage trials.

We may be unable to obtain additional orphan drug designations or orphan drug exclusivity for any product. If our competitors are able to obtain orphan drug exclusivity for products that constitute the same drug and treat the same indications as our product candidates, we may not be able to have competing products approved by the applicable regulatory authority for a significant period of time.

Regulatory authorities in some jurisdictions, including the United States and the European Union, may designate drugs for relatively small patient populations as orphan drugs. Under the Orphan Drug Act of 1983, the FDA may designate a product candidate as an Orphan Drug if it is intended to treat a rare disease or condition, which is generally defined as having a patient population of fewer than 200,000 individuals in the United States, or a patient population greater than 200,000 in the United States where there is no reasonable expectation that the cost of developing the drug will be recovered from sales in the United States. In the European Union, the European Medicines Agency's Committee for Orphan Medicinal Products grants such designation to promote the development of products that are intended for the diagnosis, prevention or treatment of a life-threatening or chronically debilitating condition affecting not more than five in 10,000 persons in the European Union. Additionally, orphan designation is granted for products intended for the diagnosis, prevention or treatment of a life-threatening, seriously debilitating or serious and chronic condition and when, without incentives, it is unlikely that sales of the drug in the European Union would be sufficient to justify the necessary investment in developing the drug or biologic product.

Our four most advanced product candidates, SB-525, SB-FIX, SB-318 and SB-913 have all been granted Orphan Drug Designation by the FDA, and SB-525 and SB-318 and SB-913 have also been designated Orphan Medicinal Products by the European Medicines Agency, or EMA. If we request such designation for our other current or future product candidates, there can be no assurances that the FDA or the EMA will grant any of our product candidates such designation. Additionally, such designation does not guarantee that any regulatory agency will accelerate regulatory review of, or ultimately approve, that product candidate, nor does it limit the ability of any regulatory agency to grant such designation to product candidates of other companies that treat the same indications as our product candidates prior to our product candidates receiving exclusive marketing approval.

Generally, if a product candidate with an orphan drug designation receives the first marketing approval for the indication for which it has such designation, the product is entitled to a period of marketing exclusivity, which precludes the FDA or the EMA from approving another marketing application for a product that constitutes the same drug treating the same indication for that marketing exclusivity period, except in limited circumstances. If another sponsor receives such approval before we do (regardless of our orphan drug designation), we will be precluded from receiving marketing approval for our product for the applicable exclusivity period. The applicable period is seven years in the United States and 10 years in the European Union. The exclusivity period in the United States can be extended by six months if the BLA sponsor submits pediatric data that fairly respond to a written request from the FDA for such data. The exclusivity period in the European Union can be reduced to six years if a product no longer meets the criteria for orphan drug designation or if the product is sufficiently profitable so that market exclusivity is no longer justified. Orphan drug exclusivity may be revoked if any regulatory agency determines that the request for designation was materially defective or if the manufacturer is unable to assure sufficient quantity of the product to meet the needs of patients with the rare disease or condition.

Even if we obtain orphan drug exclusivity for a product candidate, that exclusivity may not effectively protect the product candidate from competition because different drugs can be approved for the same condition. In the United States, even after an orphan

drug is approved, the FDA may subsequently approve another drug for the same condition if the FDA concludes that the latter drug is not the same drug or is clinically superior in that it is shown to be safer, more effective or makes a major contribution to patient care. In the European Union, marketing authorization may be granted to a similar medicinal product for the same orphan indication if:

- the second applicant can establish in its application that its medicinal product, although similar to the orphan medicinal product already authorized, is safer, more effective or otherwise clinically superior;
- the holder of the marketing authorization for the original orphan medicinal product consents to a second orphan medicinal product application; or
- the holder of the marketing authorization for the original orphan medicinal product cannot supply sufficient quantities of orphan medicinal product.

Commercialization of our technologies will depend, in part, on strategic partnering with other companies. If we are not able to find partners in the future or if our partners do not diligently pursue product development efforts, we may not be able to develop our technologies or product candidates, which could slow our growth and decrease the value of our stock.

We expect to rely, to some extent, on our strategic partners to provide funding in support of our research and to perform independent research and preclinical and clinical testing. Our technology is broad-based, and we do not currently possess the resources necessary to fully develop and commercialize potential products that may result from our technologies or the resources or capabilities to complete the lengthy marketing approval processes that may be required for the products. Therefore, we plan to rely on strategic partnerships to help us develop and commercialize our products. We have entered into collaborative agreements to provide funding and assistance in the development of certain product candidates through the clinical trial process. For example, we have an agreement with Kite for potential engineered cell therapies for cancer, two separate agreements with Pfizer, one for SB-525 for hemophilia A, and another for amyotrophic lateral sclerosis and frontotemporal lobar degeneration linked to mutations of the *C9ORF72* gene, and an agreement with Bioverativ for our beta-thalassemia and sickle cell disease product candidates.

If we are unable to find additional partners or if the partners we are unable or unwilling to advance our programs, or if they do not diligently pursue product approval, this may slow our progress and adversely affect our ability to generate revenues. In addition, our partners may sublicense or abandon development programs or we may have disagreements or disputes with our partners, which would cause associated product development to slow or cease. In addition, the business or operations of our partners may change significantly through restructuring, acquisition or other strategic transactions or decisions that may negatively impact their ability to advance our programs.

There can be no assurance that we will be able to establish further strategic collaborations for our products. We may require significant time to secure collaborations or partners because we need to effectively market the benefits of our technology to these future collaborators and partners, which may direct the attention and resources of our research and development personnel and management away from our primary business operations. Further, each collaboration or partnering arrangement will involve the negotiation of terms that may be unique to each collaborator or partner. These business development efforts may not result in a collaboration or partnership.

The loss of partnering agreements may delay or terminate the potential development or commercialization of products we may derive from our technologies, but it may also delay or terminate our ability to test our product candidates. If any partner fails to conduct the collaborative activities successfully or in a timely manner, the preclinical or clinical development or commercialization of the affected product candidates or research programs could be delayed or terminated.

Under typical partnering agreements, we would expect to receive revenue for the research and development of our product candidates based on achievement of specific milestones, as well as royalties based on a percentage of sales of the commercialized products. Achieving these milestones will depend, in part, on the efforts of our partner as well as our own. If we, or any partner, fail to meet specific milestones, then the partnership may be terminated, which could reduce our revenues. For more information on risks relating to our third-party collaborative agreements, see “Risks Relating to our Collaborative Relationships.”

We may be unable to license gene transfer technologies that we may need to commercialize our zinc finger protein technology.

In order to regulate or modify a gene in a cell, the zinc finger protein, or ZFP, must be efficiently delivered to the cell. We have licensed certain gene transfer technologies for our ZFP in research including adeno-associated viral vector, or AAV, and mRNA technology. We are evaluating these systems and other technologies that may need to be used in the delivery of ZFP into cells for *in vitro* and *in vivo* applications. However, we may not be able to license the gene transfer technologies required to develop and commercialize our product candidates. We have not developed our own gene transfer technologies, and we rely on our ability to enter into license agreements to provide us with rights to the necessary gene transfer technology. Our approach has been to license appropriate technology as required. The inability to obtain a license to use gene transfer technologies with entities which own such

technology on reasonable commercial terms, if at all, could delay or prevent the preclinical evaluation, drug development collaborations, clinical testing, and/or commercialization of our therapeutic product candidates.

Our gene regulation and genome editing technology is relatively new, and if we are unable to use this technology in all our intended applications, it would limit our revenue opportunities.

Our technology involves a relatively new approach to gene regulation and genome editing. Although we have generated ZFPs for thousands of gene sequences, we have not created ZFPs for all gene sequences and may not be able do so, which could limit the usefulness of our technology. In addition, while we have demonstrated the function of engineered zinc finger nucleases, or ZFNs, and ZFP transcription factors, or ZFP TFs, in mammalian cells, yeast, insects, plants and animals, we have not yet demonstrated clinical efficacy of this technology in a controlled clinical trial in humans, and the failure to do so could restrict our ability to develop commercially viable products. If we, and our collaborators or strategic partners, are unable to extend our results to new commercially important genes, experimental animal models, and human clinical studies, we may be unable to use our technology in all its intended applications.

The expected value and utility of our ZFNs and ZFP TFs is in part based on our belief that the targeted editing of genes or specific regulation of gene expression may enable us to develop a new therapeutic approach as well as to help scientists better understand the role of genes in disease, and to aid their efforts in drug discovery and development. We also believe that ZFP-mediated targeted genome editing and gene regulation will have utility in agricultural applications. There is only a limited understanding of the role of specific genes in all these fields. Life sciences companies have developed or commercialized only a few products in any of these fields based on results from genomic research or the ability to regulate gene expression. We, our collaborators or our strategic partners, may not be able to use our technology to identify and validate drug targets or to develop commercial products in the intended markets.

Effective delivery of ZFNs and ZFP TFs into the appropriate target cells and tissues is critical to the success of the therapeutic applications of our ZFP technology. In order to have a meaningful therapeutic effect, product candidates based on our ZFP technology must be delivered to sufficient numbers of cells in the targeted tissue. The ZFN or ZFP TF must be present in that tissue for sufficient time to effect either modification of a therapeutically relevant gene or regulation of its expression. In our current clinical and preclinical programs, we administer these product candidates as a nucleic acid that encodes the ZFN or ZFP TF. We use different formulations to deliver the ZFN or ZFP TF depending on the required duration of expression, the targeted tissue and the indication that we intend to treat, including our proprietary AAV delivery system. However, there can be no assurances that we will be able to effectively deliver our ZFNs and ZFP TFs to produce a beneficial therapeutic effect.

We are conducting proprietary research to discover new product candidates. These programs increase our financial risk of product failure, may significantly increase our research expenditures, and may involve conflicts with future collaborators and strategic partners.

Our proprietary research programs consist of research that is funded solely by us or by grant funding and in which we retain exclusive rights to therapeutic products generated by such research. This is in contrast to certain of our research programs that may be funded by corporate partners in which we may share rights to any resulting products. Conducting proprietary research programs may not generate corresponding revenue and may create conflicts with our collaborators or strategic partners over rights to our intellectual property with respect to our proprietary research activities. Any conflict with our collaborators or strategic partners could reduce our ability to enter into future collaborations or partnering agreements and negatively impact our relationship with existing collaborators and partners that could reduce our revenue and delay or terminate our product development. As we continue to focus our strategy on proprietary research and therapeutic development, we expect to experience greater business risks, expend significantly greater funds and require substantial commitments of time from our management and staff.

Even if our technology proves to be effective, it still may not lead to commercially viable products.

Even if our collaborators or strategic partners are successful in using our ZFP technology in drug discovery, protein production, therapeutic development or other areas in which we have licensed our technology, such as plant agriculture, they may not be able to commercialize the resulting products or may decide to use other methods competitive with our technology. To date, no company has received marketing approval or has developed or commercialized any therapeutic or agricultural products based on our ZFP technology. Should our technology fail to provide safe, effective, useful or commercially viable approaches to the discovery and development of these products, this would significantly limit our business and future growth and would adversely affect our value.

Even if our product development efforts are successful and even if the requisite regulatory approvals are obtained, our products may not gain market acceptance among physicians, patients, healthcare payers and the medical community.

Even if we obtain regulatory approval for any of our product candidates that we may develop or acquire in the future, the applicable product may not gain market acceptance among physicians, healthcare payors, patients or the medical community. Market acceptance of any of our product candidates for which we receive approval depends on a number of factors, including:

- the efficacy and safety of such product candidates as demonstrated in clinical trials;
- the clinical indications and patient populations for which the product candidate is approved;
- acceptance by physicians, major cancer treatment centers and patients of the drug as a safe and effective treatment;
- the adoption of novel gene therapies by physicians, hospitals and third-party payors;
- the potential and perceived advantages of product candidates over alternative treatments;
- the safety of product candidates seen in a broader patient group, including its use outside the approved indications;
- any restrictions on use together with other medications;
- the prevalence and severity of any side effects;
- product labeling or product insert requirements of the FDA or other regulatory authorities;
- the timing of market introduction of our products as well as competitive products;
- the development of manufacturing and distribution processes for our product candidates;
- the cost of treatment in relation to alternative treatments;
- the availability of coverage and adequate reimbursement and pricing by third-party payors and government authorities and the willingness of patients to pay out-of-pocket in the absence of coverage by third-party payors;
- relative convenience and ease of administration; and
- the effectiveness of our sales and marketing efforts and those of our collaborators.

If any of our product candidates are approved but fail to achieve market acceptance among physicians, patients, healthcare payors or treatment centers, we will not be able to generate significant revenues, which would compromise our ability to become profitable.

Even if we are able to commercialize our product candidates, the products may not receive coverage and adequate reimbursement from third-party payors in the United States and in other countries in which we seek to commercialize our products, which could harm our business.

Our ability to commercialize any product successfully will depend, in part, on the extent to which coverage and adequate reimbursement for these products and related treatments will be available from government health administration authorities, private health insurers and other organizations.

Government authorities and third-party payors, such as private health insurers and health maintenance organizations, determine which medications they will cover and establish reimbursement levels. A primary trend in the healthcare industry is cost containment. Government authorities and third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications. Increasingly, third-party payors are requiring that drug companies provide them with predetermined discounts from list prices and are challenging the prices charged for medical products. Third-party payors may also seek additional clinical evidence, beyond the data required to obtain regulatory approval, demonstrating clinical benefits and value in specific patient populations before covering our products for those patients. We cannot be sure that coverage and adequate reimbursement will be available for any product that we commercialize and, if reimbursement is available, what the level of reimbursement will be. Coverage and reimbursement may impact the demand for, or the price of, any product candidate for which we obtain regulatory approval. If reimbursement is not available or is available only at limited levels, we may not be able to successfully commercialize any product candidate for which we obtain regulatory approval.

There may be significant delays in obtaining coverage and reimbursement for newly approved drugs, and coverage may be more limited than the purposes for which the drug is approved by the FDA or comparable foreign regulatory authorities. Moreover, eligibility for coverage and reimbursement does not imply that any drug will be paid for in all cases or at a rate that covers our costs, including research, development, manufacture, sale and distribution. Interim reimbursement levels for new drugs, if applicable, may also not be sufficient to cover our costs and may only be temporary. Reimbursement rates may vary according to the use of the drug and the clinical setting in which it is used, may be based on reimbursement levels already set for lower cost drugs and may be incorporated into existing payments for other services. Net prices for drugs may be reduced by mandatory discounts or rebates

required by government healthcare programs or private payors and by any future relaxation of laws that presently restrict imports of drugs from countries where they may be sold at lower prices than in the United States. Third-party payors in the United States often rely upon Medicare coverage policy and payment limitations in setting their own reimbursement policies. Our inability to promptly obtain coverage and profitable reimbursement rates from both government-funded and private payors for any approved products that we develop could have a material adverse effect on our operating results, our ability to raise capital needed to commercialize products and our overall financial condition.

Recently enacted and future legislation, including potentially unfavorable pricing regulations or other healthcare reform initiatives, may increase the difficulty and cost for us to obtain regulatory approval of and commercialize our product candidates and affect the prices we may obtain.

The regulations that govern, among other things, regulatory approvals, coverage, pricing and reimbursement for new drug products vary widely from country to country. In the United States and some foreign jurisdictions, there have been a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay regulatory approval of our product candidates, restrict or regulate post-approval activities and affect our ability to successfully sell any product candidates for which we obtain regulatory approval. In particular, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, collectively, the Affordable Care Act, was enacted, which substantially changes the way health care is financed by both governmental and private insurers, and significantly impacts the U.S. pharmaceutical industry. The Affordable Care Act and its implementing regulations, among other things, addressed a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for certain drugs and biologics, including our product candidates, that are inhaled, infused, instilled, implanted or injected, increased the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program, extended the Medicaid Drug Rebate Program to utilization of prescriptions of individuals enrolled in Medicaid managed care organizations, subjected manufacturers to new annual fees and taxes for certain branded prescription drugs, provided incentives to programs that increase the federal government's comparative effectiveness research and established a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D.

Some of the provisions of the Affordable Care Act have yet to be fully implemented, and there have been legal and political challenges to certain aspects of the Affordable Care Act. Since January 2017, President Trump has signed two executive orders and other directives designed to delay, circumvent, or loosen certain requirements mandated by the Affordable Care Act. Concurrently, Congress has considered legislation that would repeal or repeal and replace all or part of the Affordable Care Act. While Congress has not passed repeal legislation, the Tax Cuts and Jobs Act of 2017 includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the Affordable Care Act on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate". Additionally, on January 22, 2018 President Trump signed a continuing resolution on appropriations for fiscal year 2018 that delayed the implementation of certain Affordable Care Act-mandated fees. Congress may consider other legislation to repeal or replace elements of the Affordable Care Act.

Other legislative changes have been proposed and adopted in the United States since the Affordable Care Act was enacted. In August 2011, the Budget Control Act of 2011, among other things, created measures for spending reductions by Congress. A Joint Select Committee on Deficit Reduction, tasked with recommending a targeted deficit reduction of at least $1.2 trillion for the years 2013 through 2021, was unable to reach required goals, thereby triggering the legislation's automatic reduction to several government programs. This includes aggregate reductions of Medicare payments to providers of 2% per fiscal year, which went into effect in April 2013, and, due to subsequent legislative amendments to the statute, including the Bipartisan Budget Act of 2018, will remain in effect through 2027 unless additional Congressional action is taken. In January 2013, President Obama signed into law the American Taxpayer Relief Act of 2012, or the ATRA, which, among other things, further reduced Medicare payments to several providers, including hospitals and cancer treatment centers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

Also, there has been heightened governmental scrutiny recently over pharmaceutical pricing practices in light of the rising cost of prescription drugs and biologics. Such scrutiny has resulted in several recent Congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for pharmaceutical products, some of which are included in the Trump administration's budget proposal for fiscal year 2019. At the federal level, Congress and the Trump administration have each indicated that it will continue to seek new legislative and/or administrative measures to control drug costs. At the state level, legislatures have become increasingly active in passing legislation and implementing regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, have been designed to encourage importation from other countries and bulk purchasing.

There have been, and likely will continue to be, legislative and regulatory proposals at the foreign, federal and state levels directed at broadening the availability of healthcare and containing or lowering the cost of healthcare. We cannot predict the initiatives that may be adopted in the future. The continuing efforts of the government, insurance companies, managed care organizations and other payors of healthcare services to contain or reduce costs of healthcare and/or impose price controls may adversely affect:

- the demand for our product candidates, if we obtain regulatory approval;
- our ability to set a price that we believe is fair for our products;
- our ability to generate revenue and achieve or maintain profitability;
- the level of taxes that we are required to pay; and
- the availability of capital.

Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors, which may adversely affect our future profitability.

Legislative and regulatory proposals have been made to expand post-approval requirements and restrict sales and promotional activities for pharmaceutical products. We cannot be sure whether additional legislative changes will be enacted, or whether the FDA regulations, guidance or interpretations will be changed, or what the impact of such changes on the regulatory approvals of our product candidates, if any, may be.

In the United States, the European Union and other potentially significant markets for our product candidates, government authorities and third-party payors are increasingly attempting to limit or regulate the price of medical products and services, particularly for new and innovative products and therapies, which has resulted in lower average selling prices. For example, in the United States, there have been several recent Congressional inquiries and proposed bills designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drugs. Furthermore, the increased emphasis on managed healthcare in the United States and on country and regional pricing and reimbursement controls in the European Union will put additional pressure on product pricing, reimbursement and usage, which may adversely affect our future product sales and results of operations. These pressures can arise from rules and practices of managed care groups, judicial decisions and governmental laws and regulations related to Medicare, Medicaid and healthcare reform, pharmaceutical reimbursement policies and pricing in general.

Price controls may be imposed in foreign markets, which may adversely affect our future profitability.

In some countries, particularly member states of the European Union, the pricing of prescription drugs is subject to governmental control. In these countries, pricing negotiations with governmental authorities can take considerable time after receipt of regulatory approval for a product. In addition, there can be considerable pressure by governments and other stakeholders on prices and reimbursement levels, including as part of cost containment measures. Political, economic and regulatory developments may further complicate pricing negotiations, and pricing negotiations may continue after reimbursement has been obtained. Reference pricing used by various European Union member states and parallel distribution, or arbitrage between low-priced and high-priced member states, can further reduce prices. In some countries, we, or our collaborators, may be required to conduct a clinical trial or other studies that compare the cost-effectiveness of our product candidates to other available therapies in order to obtain or maintain reimbursement or pricing approval. Publication of discounts by third-party payors or authorities may lead to further pressure on the prices or reimbursement levels within the country of publication and other countries. If reimbursement of our products is unavailable or limited in scope or amount, or if pricing is set at unsatisfactory levels, our business could be adversely affected.

Even if we complete the necessary preclinical and clinical studies, we cannot predict when or if we will obtain regulatory approval to commercialize a product candidate or the approval may be for a more narrow indication than we expect.

We cannot commercialize a product until the appropriate regulatory authorities have reviewed and approved the product candidate. Even if our product candidates demonstrate safety and efficacy in clinical studies, the regulatory agencies may not complete their review processes in a timely manner, or we may not be able to obtain regulatory approval. Additional delays may result if an FDA Advisory Committee or other regulatory advisory group or authority recommends non-approval or restrictions on approval. In addition, we may experience delays or rejections based upon additional government regulation from future legislation or administrative action, or changes in regulatory agency policy during the period of product development, clinical studies and the review process. Regulatory agencies also may approve a treatment candidate for fewer or more limited indications than requested or may grant approval subject to the performance of post-marketing studies. In addition, regulatory agencies may not approve the labeling claims that are necessary or desirable for the successful commercialization of our treatment candidates. For example, the development of certain product candidates for pediatric use is an important part of our current business strategy, and if we are unable to obtain regulatory approval for the desired age ranges, our business may suffer.

Even if we obtain regulatory approval for a product candidate, our products will remain subject to regulatory scrutiny.

Even if we obtain regulatory approval in a jurisdiction, the regulatory authority may still impose significant restrictions on the indicated uses or marketing of our product candidates, or impose ongoing requirements for potentially costly post-approval studies, post-market surveillance or patient or drug restrictions. For example, the FDA typically advises that patients treated with gene therapy undergo follow-up observations for potential adverse events for a 15-year period. Additionally, the holder of an approved BLA is obligated to monitor and report adverse events and any failure of a product to meet the specifications in the BLA. The holder of an approved BLA must also submit new or supplemental applications and obtain FDA approval for certain changes to the approved product, product labeling or manufacturing process. Advertising and promotional materials must comply with FDA rules and are subject to FDA review, in addition to other potentially applicable federal and state laws.

In addition, product manufacturers and their facilities are subject to payment of user fees and continual review and periodic inspections by the FDA and other regulatory authorities for compliance with good manufacturing practices, or GMP, and adherence to commitments made in the BLA. If we or a regulatory agency discovers previously unknown problems with a product such as adverse events of unanticipated severity or frequency, or problems with the facility where the product is manufactured, a regulatory agency may impose restrictions relative to that product or the manufacturing facility, including requiring recall or withdrawal of the product from the market or suspension of manufacturing.

If we fail to comply with applicable regulatory requirements following approval of any of our product candidates, a regulatory agency may:

- issue a warning letter asserting that we are in violation of the law;
- seek an injunction or impose civil or criminal penalties or monetary fines;
- suspend or withdraw regulatory approval;
- suspend any ongoing clinical studies;
- refuse to approve a pending marketing application, such as a BLA or supplements to a BLA submitted by us;
- seize product; or
- refuse to allow us to enter into supply contracts, including government contracts.

Any government investigation of alleged violations of law could require us to expend significant time and resources in response and could generate negative publicity. The occurrence of any event or penalty described above may inhibit our ability to commercialize our product candidates and generate revenues.

Failure to obtain regulatory approval in international jurisdictions would prevent our product candidates from being marketed abroad.

In addition to regulations in the United States, to market and sell our products in the European Union, many Asian countries and other jurisdictions, we must obtain separate regulatory approvals and comply with numerous and varying regulatory requirements. The approval procedure varies among countries and can involve additional testing. The time required to obtain approval may differ substantially from that required to obtain FDA approval. The regulatory approval process outside the United States generally includes all of the risks associated with obtaining FDA approval. Clinical trials accepted in one country may not be accepted by regulatory authorities in other countries. In addition, many countries outside the United States require that a product be approved for reimbursement before it can be approved for sale in that country. A product candidate that has been approved for sale in a particular country may not receive reimbursement approval in that country. We may not be able to obtain approvals from regulatory authorities outside the United States on a timely basis, if at all. Approval by the FDA does not ensure approval by regulatory authorities in other countries or jurisdictions, and approval by one regulatory authority outside the United States does not ensure approval by regulatory authorities in other countries or jurisdictions or by the FDA. We may not be able to file for regulatory approvals and may not receive necessary approvals to commercialize our products in any market. If we are unable to obtain approval of any of our product candidates by regulatory authorities in the European Union, Asia or elsewhere, the commercial prospects of that product candidate may be significantly diminished, our business prospects could decline and this could materially adversely affect our business, results of operations and financial condition.

Our relationships with customers and third-party payors will be subject to applicable anti-kickback, fraud and abuse and other healthcare laws and regulations, which could expose us to criminal sanctions, civil penalties, contractual damages, reputational harm and diminished profits and future earnings.

Healthcare providers, physicians and third-party payors will play a primary role in the recommendation and prescription of any product candidates for which we obtain regulatory approval. Our current and future arrangements with healthcare providers, third-

party payors and customers may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations that may constrain the business or financial arrangements and relationships through which we would market, sell and distribute our products. As a biotechnology company, even though we will not control referrals of healthcare services or bill directly to Medicare, Medicaid or other third-party payors, federal and state healthcare laws and regulations pertaining to fraud and abuse and patients' rights are and will be applicable to our business. Restrictions under applicable federal and state healthcare laws and regulations that may affect our ability to operate include the following:

- the federal healthcare Anti-Kickback Statute will constrain our marketing practices, educational programs, pricing policies, and relationships with healthcare providers or other entities, by prohibiting, among other things, persons from knowingly and willfully soliciting, offering, receiving or providing remuneration, directly or indirectly, overtly or covertly, in cash or in kind, to induce or reward, or in return for, either the referral of an individual for, or the purchase, order or recommendation of, any good or service, for which payment may be made under a federal healthcare program such as Medicare and Medicaid;

- federal civil and criminal false claims laws and civil monetary penalty laws impose criminal and civil penalties, including through civil whistleblower or qui tam actions, against individuals or entities for knowingly presenting, or causing to be presented, to the federal government, including the Medicare and Medicaid programs, claims for payment or approval that are false or fraudulent or making a false statement to avoid, decrease or conceal an obligation to pay money to the federal government;

- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, imposes criminal and civil liability for executing a scheme to defraud any healthcare benefit program and also created federal criminal laws that prohibit knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statements in connection with the delivery of or payment for healthcare benefits, items or services;

- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, or HITECH, also imposes obligations, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information held by certain healthcare providers, health plans and healthcare clearinghouses and their business associates;

- the federal Physician Payments Sunshine Act created under the Affordable Care Act requires certain manufacturers of drugs, devices, biologics and medical supplies to report annually to the Centers for Medicare & Medicaid Services, or CMS, information related to payments and other transfers of value to physicians, other healthcare providers, and teaching hospitals, and ownership and investment interests held by physicians and other healthcare providers and their immediate family members and applicable group purchasing organizations;

- analogous state and foreign laws and regulations, such as state anti-kickback and false claims laws, may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers; some state laws require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government and may require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures; and

- state and foreign laws govern the privacy and security of health information in specified circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

Efforts to ensure that our business arrangements with third parties will comply with applicable healthcare laws and regulations will involve substantial costs. It is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of these laws or any other governmental regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, personal imprisonment, exclusion from government funded healthcare programs, such as Medicare and Medicaid, additional reporting requirements and oversight if become subject to a corporate integrity agreement or similar agreement to resolve allegations of non-compliance with these laws, and the curtailment or restructuring of our operations. If any physicians or other healthcare providers or entities with whom we expect to do business are found to not be in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs.

Our employees may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements, which could cause significant liability for us and harm our reputation.

We are exposed to the risk of employee fraud or other misconduct, including intentional failures to comply with FDA regulations or similar regulations of comparable foreign regulatory authorities, provide accurate information to the FDA or

comparable foreign regulatory authorities, comply with manufacturing standards we have established, comply with federal and state healthcare fraud and abuse laws and regulations and similar laws and regulations established and enforced by comparable foreign regulatory authorities, report financial information or data accurately or disclose unauthorized activities to us. Employee misconduct could also involve the improper use of information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation. It is not always possible to identify and deter employee misconduct, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business and results of operations, including the imposition of significant fines or other sanctions.

Product liability lawsuits against us could cause us to incur substantial liabilities and to limit commercialization of any products that we may develop.

We face an inherent risk of product liability exposure related to the testing of our product candidates in human clinical trials and will face an even greater risk if we commercially sell any products that we may develop. Product liability claims may be brought against us by subjects enrolled in our clinical trials, patients, healthcare providers or others using, administering or selling our products. If we cannot successfully defend ourselves against claims that our product candidates or products caused injuries, we could incur substantial liabilities. Regardless of merit or eventual outcome, liability claims may result in:

- decreased demand for any product candidates or products that we may develop;
- termination of clinical trial sites or entire trial programs;
- injury to our reputation and significant negative media attention;
- withdrawal of clinical trial participants;
- significant costs to defend the related litigation;
- substantial monetary awards to trial subjects or patients;
- loss of revenue;
- diversion of management and scientific resources from our business operations; and
- the inability to commercialize any products that we may develop.

We currently hold product liability insurance coverage at a level that we believe is customary for similarly situated companies and adequate to provide us with insurance coverage for foreseeable risks, but which may not be adequate to cover all liabilities that we may incur. Insurance coverage is increasingly expensive. We may not be able to maintain insurance coverage at a reasonable cost or in an amount adequate to satisfy any liability that may arise. We intend to expand our insurance coverage for products to include the sale of commercial products if we obtain regulatory approval for our product candidates in development, but we may be unable to obtain commercially reasonable product liability insurance for any products that receive regulatory approval. Large judgments have been awarded in class action lawsuits based on drugs that had unanticipated side effects. A successful product liability claim or series of claims brought against us, particularly if judgments exceed our insurance coverage, could decrease our cash and adversely affect our business.

We currently rely on third parties to conduct some or all aspects of manufacturing of our product candidates for preclinical and clinical development. If one of our third-party manufacturers fails to perform adequately or fulfill our needs, we may be required to incur significant costs and devote significant efforts, to find new suppliers or manufacturers.

We currently have limited experience in, and we do not own facilities for, clinical-scale manufacturing of our product candidates and we rely upon third-party contract manufacturing organizations to manufacture and supply drug product for our preclinical and clinical studies. The manufacture of pharmaceutical products in compliance with the FDA's current good manufacturing practices, or cGMP, requires significant expertise and capital investment, including the development of advanced manufacturing techniques and process controls. Manufacturers of pharmaceutical products often encounter difficulties in production, including difficulties with production costs and yields, quality control, including stability of the product candidate and quality assurance testing, shortages of qualified personnel, as well as compliance with strictly enforced cGMP requirements, other federal and state regulatory requirements and foreign regulations. If our manufacturers were to encounter any of these difficulties or otherwise fail to comply with their obligations to us or under applicable regulations, our ability to provide study biologics in our clinical studies would be jeopardized. Any delay or interruption in the supply of clinical study materials could delay the completion of our clinical studies, increase the costs associated with maintaining our clinical study programs and, depending upon the period of delay, require us to commence new studies at significant additional expense or terminate the studies completely.

All manufacturers of our product candidates must comply with cGMP requirements enforced by the FDA through its facilities inspection program. These requirements include, among other things, quality control, quality assurance and the maintenance of records and documentation. Manufacturers of our product candidates may be unable to comply with these cGMP requirements and with other FDA, state and foreign regulatory requirements. The FDA or similar foreign regulatory agencies may also implement new standards at any time, or change their interpretation and enforcement of existing standards for manufacture, packaging or testing of products. We have limited control over our manufacturers' compliance with these regulations and standards. Failure to comply with these requirements may result in fines and civil penalties, suspension of production, suspension or delay in product approval, product seizure or recall or withdrawal of product approval. If the safety of any product supplied is compromised due to our manufacturers' failure to adhere to applicable laws or for other reasons, we may not be able to obtain regulatory approval for or successfully commercialize our products and we may be held liable for any injuries sustained as a result. Any of these factors could cause a delay of clinical studies, regulatory submissions, approvals or commercialization of our product candidates, entail higher costs or impair our reputation.

Our current agreements with our suppliers do not provide for the entire supply of the drug product necessary for all anticipated clinical studies or for full scale commercialization. If we and our suppliers cannot agree to the terms and conditions for them to provide the drug product necessary for our clinical and commercial supply needs, we may not be able to manufacture the product candidate until a qualified alternative supplier is identified, which could also delay the development of, and impair our ability to commercialize, our product candidates.

The number of third-party suppliers with the necessary manufacturing and regulatory expertise and facilities is limited, and it could be expensive and take a significant amount of time to arrange for alternative suppliers, which could have a material adverse effect on our business. New suppliers of any product candidate would be required to qualify under applicable regulatory requirements and would need to have sufficient rights under applicable intellectual property laws to the method of manufacturing the product candidate. Obtaining the necessary FDA approvals or other qualifications under applicable regulatory requirements and ensuring non-infringement of third-party intellectual property rights could result in a significant interruption of supply and could require the new manufacturer to bear significant additional costs which may be passed on to us.

We intend to design and build a manufacturing facility that could support future clinical production of our product candidates. We have no experience as a company manufacturing pharmaceutical products, and there can be no assurance that we will be able to build our manufacturing facility or, if built, we will be able to successfully manufacture any of our product candidates.

We expect to utilize both contract manufacturing organizations, or CMOs, and our own facility to meet our projected needs for clinical supply. We intend to expand our manufacturing capacity by designing and building a manufacturing facility that we plan to initially use to support our clinical supply needs. To meet these objectives we will need to transition manufacturing processes and know-how of our product candidates to our own facility. Transferring manufacturing processes and know-how is complex and involves review and incorporation of both documented and undocumented processes that may have evolved over time. In addition, transferring production to different facilities may require utilization of new or different processes to meet the specific requirements of a given facility. Additional studies may also need to be conducted to support the transfer of certain manufacturing processes and process improvements. We cannot be certain that all relevant know-how and data has been adequately incorporated into the manufacturing process until the completion of studies (and the related evaluations) intended to demonstrate the comparability of material previously produced with that generated by our CMO. Although some of our employees have experience in the manufacturing of pharmaceutical products from prior employment at other companies, we, as a company, have no prior experience in pharmaceutical product manufacturing, and operating this facility would require us to comply with complex regulations and to continue to hire and retain experienced scientific, quality control, quality assurance and manufacturing personnel. Designing and building a manufacturing facility will be time-consuming and expensive, and we may experience delays or cost overruns. In addition, government approvals would be required for us to operate a manufacturing facility and can be time-consuming to obtain. As a manufacturer of pharmaceutical products, we also would be required to demonstrate and maintain cGMP compliance. These requirements include, among other things, quality control, quality assurance and the maintenance of records and documentation. Furthermore, establishing manufacturing operations may require a reallocation of other resources, particularly the time and attention of our senior management. Even if we are able to establish our own manufacturing capabilities, we could encounter challenges in operating the manufacturing facility in compliance with cGMP, regulatory or other applicable requirements, resulting in potential negative consequences, including regulatory actions, which could undermine our ability to utilize this facility for our own manufacturing needs. Any failure or delay in the development of our manufacturing capabilities could adversely impact the development of our product candidates.

There are risks associated with manufacturing for clinical and commercial use. Manufacturing biological components at the appropriate scale and quality is complex and difficult.

There are risks associated with manufacturing our product candidates including, among others, cGMP compliance, cost overruns, technical problems with process scale-up, process reproducibility, stability issues, lot consistency and timely availability of

raw materials. Even if efficacy and safety data from our clinical trials would otherwise support regulatory approval for a product candidate, there is no assurance that we or any third-party manufacturer will be able to manufacture our product candidates to specifications at levels necessary to support or maintain regulatory approval by the FDA or other regulatory authorities. In addition, we may not be able to manufacture our product candidates in sufficient quantities to meet the requirements for a potential launch or to meet potential future demand. If we or our third-party manufacturers are unable to produce sufficient quantities of the approved product for commercialization, either on a timely basis or at all, our commercialization efforts would be impaired, which would have a material adverse effect on our business, financial condition, results of operations and growth prospects.

We face uncertainties and risks associated with the manufacture of our product candidates. Our product candidates are biologics and their manufacture involves complex processes, including the development of cell lines or cell systems to produce the biologic, with the challenge of significant variability. Further, there are difficulties in growing large quantities of such cells and harvesting and purifying the biologic produced by them. The cost to manufacture biologics is generally far higher than traditional small molecule chemical compounds, and the manufacturing process can be difficult to reproduce. There is no guarantee we will be successful in establishing a larger-scale commercial manufacturing process for our pipeline product candidates or obtaining the needed manufacturing capacity. Due to the high cost to manufacture, inherent uncertainty related to manufacturing costs, and uncertainty in our patient population, there is risk that some of our product candidates may not be commercially viable.

We do not currently have the infrastructure or capability to manufacture, market and sell therapeutic products on a commercial scale.

In order for us to commercialize our therapeutic products directly, we would need to develop, or obtain through outsourcing arrangements, the capability to manufacture, market and sell our products on a commercial scale. Currently, we do not have the ability nor the financial resources to establish the infrastructure and organizations needed to execute these functions, including such infrastructure needed for the commercialization of any product based on our ZFP technology, which can be complex and costly. If we are unable to establish adequate manufacturing, sales, marketing and distribution capabilities, we will not be able to directly commercialize our therapeutics products, which would limit our future growth.

If we are unable to establish sales and marketing capabilities or enter into agreements with third parties to market and sell our product candidates, we may be unable to generate any revenue.

We do not currently have an organization for the sale, marketing and distribution of pharmaceutical products and the cost of establishing and maintaining such an organization may exceed the cost-effectiveness of doing so. In order to market any products that may be approved by the FDA and comparable foreign regulatory authorities, we must build our sales, marketing, managerial and other non-technical capabilities or make arrangements with third parties to perform these services. There are significant risks involved in building and managing a sales organization, including our ability to hire, retain and incentivize qualified individuals, generate sufficient sales leads, provide adequate training to sales and marketing personnel and effectively manage a geographically dispersed sales and marketing team. Any failure or delay in the development of our internal sales, marketing and distribution capabilities would adversely impact the commercialization of any approved products. If we are unable to establish adequate sales, marketing and distribution capabilities, whether independently or with third parties, we may not be able to generate product revenues and may not become profitable. We will be competing with many companies that currently have extensive and well-funded sales and marketing operations. Without an internal commercial organization or the support of a third party to perform sales and marketing functions, we may be unable to compete successfully against these more established companies. If we are not successful in commercializing our current or future product candidates either on our own or through collaborations with one or more third parties, our future product revenue will suffer and we would incur significant additional losses.

We will need to grow the size of our organization, and we may experience difficulties in managing this growth.

As of March 31, 2018, we had 190 full-time employees. We need to grow the size of our organization in order to support our continued development and potential commercialization of our product candidates. In particular, we will need to add substantial numbers of additional personnel and other resources to support our development and potential commercialization of our product candidates. As our development and commercialization plans and strategies continue to develop, or as a result of any future acquisitions, our need for additional managerial, operational, manufacturing, sales, marketing, financial and other resources will increase. Our management, personnel and systems currently in place may not be adequate to support this future growth. Future growth would impose significant added responsibilities on members of management, including:

- managing our preclinical studies and clinical trials effectively;
- identifying, recruiting, maintaining, motivating and integrating additional employees;
- managing our internal development efforts effectively while complying with our contractual obligations to licensors, licensees, contractors and other third parties;

- improving our managerial, development, operational, information technology, and finance systems; and
- expanding our facilities.

As our operations expand, we will also need to manage additional relationships with various strategic partners, suppliers and other third parties. Our future financial performance and our ability to commercialize our product candidates and to compete effectively will depend, in part, on our ability to manage any future growth effectively. To that end, we must be able to manage our development efforts and preclinical studies and clinical trials effectively and hire, train and integrate additional management, research and development, manufacturing, administrative and sales and marketing personnel. Our failure to accomplish any of these tasks could prevent us from successfully growing our company

Risks Relating to our Industry

If our competitors develop, acquire, or market technologies or products that are more effective than ours, this would reduce or eliminate our commercial opportunity.

Any products that we or our collaborators or strategic partners develop by using our ZFP technology platform will enter into highly competitive markets. Even if we are able to generate products that are safe and effective for their intended use, competing technologies may prove to be more effective or less expensive, which, to the extent these competing technologies achieve market acceptance, will limit our revenue opportunities. In some cases, competing technologies have proven to be effective and less expensive. Competing technologies may include other methods of regulating gene expression or modifying genes. ZFNs and ZFP TFs have broad application in the life sciences industry and compete with a broad array of new technologies and approaches being applied to genetic research by many companies. Competing proprietary technologies with our product development focus include but are not limited to:

- For genome editing and gene therapy products:
  - recombinant proteins;
  - other gene therapy/cDNAs;
  - antisense;
  - siRNA and microRNA approaches, exon skipping;
  - small molecule drugs;
  - monoclonal antibodies;
  - CRISPR/Cas technology; and
  - TALE proteins, meganucleases, and MegaTALs.
- Our non-therapeutic applications compete against similar technologies:
  - *For protein production:* gene amplification, CRISPR/Cas technology, TALE technology, insulator technology, and mini-chromosomes;
  - *For target validation:* antisense, siRNA, TALE technology and CRISPR/Cas technology;
  - *For plant agriculture:* recombination approaches, mutagenesis approaches, TALE technology, CRISPR/Cas technology, mini-chromosomes; and
  - *For transgenic animals:* somatic nuclear transfer, embryonic stem cell, TALE, CRISPR/Cas technology and transposase technologies.

In addition to possessing competing technologies, our competitors include pharmaceutical and biotechnology companies with:

- substantially greater capital resources than ours;
- larger research and development staffs and facilities than ours; and
- greater experience in product development and in obtaining regulatory approvals and patent protection.

These organizations also compete with us to:

- attract qualified personnel;

- attract parties for acquisitions, joint ventures or other collaborations; and
- license the proprietary technologies of academic and research institutions that are competitive with our technology, which may preclude us from pursuing similar opportunities.

Accordingly, our competitors may succeed in obtaining patent protection or commercializing products before us. In addition, any products that we develop may compete with existing products or services that are well established in the marketplace.

Our product candidates are based on a novel technology, which makes it difficult to predict the timing and costs of development and of subsequently obtaining regulatory approval.

We have concentrated our research and development efforts on genome editing, gene therapy, gene regulation and cell therapy. The regulatory approval process for novel product candidates such as ours is unclear and may be lengthier and more expensive than the process for other, better-known or more extensively studied product candidates.

Adverse developments in clinical trials of gene therapy products conducted by others may cause the FDA or other oversight bodies to change the requirements for approval of our product candidates.

These regulatory review committees and advisory groups, and any new guidelines they promulgate, may lengthen the regulatory review process, require us to perform additional preclinical studies or clinical trials, increase our development costs, lead to changes in regulatory positions and interpretations, delay or prevent approval and commercialization of our current or future product candidates or lead to significant post-approval limitations or restrictions. As we advance our product candidates, we will be required to consult with these regulatory and advisory groups and comply with applicable guidelines. If we fail to do so, we may be required to delay or discontinue development of our product candidates. These additional processes may result in a review and approval process that is longer than we otherwise would have expected. Delay or failure to obtain, or unexpected costs in obtaining, the regulatory approval necessary to bring a potential product to market could decrease our ability to generate sufficient product revenue, and our business, financial condition, results of operations and prospects would be harmed. Even if our product candidates are approved, we expect that the FDA will require us to submit follow-up data regarding our clinical trial subjects for a number of years after any approval. If this follow-up data shows negative long-term safety or efficacy outcomes for these patients, the FDA may revoke its approval or change the label of our products in a manner that could have an adverse impact on our business.

In addition, adverse developments in clinical trials of gene therapy products conducted by others may cause the FDA or other oversight bodies to change the requirements for approval of our product candidates. The FDA only recently approved the first *in vivo* gene therapy, LUXTURNA, and only two *in vivo* gene therapy products, uniQure N.V.'s Glybera and GlaxoSmithKline's Strimvelis, have received marketing authorization from the EMA. As a result, it is difficult to determine how long it will take or how much it will cost to obtain regulatory approvals for our product candidates.

Our gene therapy approach utilizes vectors derived from viruses, which may be perceived as unsafe or may result in unforeseen adverse events. Negative public opinion and increased regulatory scrutiny of gene therapy may damage public perception of the safety of our product candidates and adversely affect our ability to conduct our business or obtain regulatory approvals for our product candidates.

Gene therapy remains a novel technology, with only one *in vivo* gene therapy product approved for a genetic disease to date in the United States and only two *in vivo* gene therapy products for genetic diseases approved to date in the European Union. Public perception may be influenced by claims that gene therapy is unsafe, and gene therapy may not gain the acceptance of the public or the medical community. In particular, our success will depend upon physicians who specialize in the treatment of genetic diseases targeted by our product candidates, prescribing treatments that involve the use of our product candidates in lieu of, or in addition to, existing treatments with which they are familiar and for which greater clinical data may be available. More restrictive government regulations or negative public opinion would have an adverse effect on our business, financial condition, results of operations and prospects and may delay or impair the development and commercialization of our product candidates or demand for any products we may develop. For example, earlier gene therapy trials led to several well-publicized adverse events, including cases of leukemia and death seen in other trials using other vectors. Serious adverse events in our clinical trials, or other clinical trials involving gene therapy products or our competitors' products, even if not ultimately attributable to the relevant product candidates, and the resulting publicity, could result in increased government regulation, unfavorable public perception, potential regulatory delays in the testing or approval of our product candidates, stricter labeling requirements for those product candidates that are approved and a decrease in demand for any such product candidates.

Laws or public sentiment may limit the production of genetically modified agricultural products, and these laws could reduce our partner's ability to sell such products.

Genetically modified products are currently subject to public debate and heightened regulatory scrutiny, either of which could prevent or delay production of agricultural products. We have exclusive right to use our ZFP technology to modify the genomes or

alter the nucleic acid or protein expression of plant cells, plants or plant cell cultures. The field-testing, production and marketing of genetically modified plants and plant products are subject to federal, state, local and foreign governmental regulation. Regulatory agencies administering existing or future regulations or legislation may not allow production and marketing of our genetically modified products in a timely manner or under technically or commercially feasible conditions. In addition, regulatory action or private litigation could result in expenses, delays or other impediments to our product development programs or the commercialization of resulting products.

The FDA currently applies the same regulatory standards to foods developed through genetic engineering as those applied to foods developed through traditional plant breeding. Genetically engineered food products, however, will be subject to pre-market review if these products raise safety questions or are deemed to be food additives. Governmental authorities could also, for social or other purposes, limit the use of genetically modified products created with our gene regulation technology.

Even if the regulatory approval for genetically modified products developed using our ZFP technology is obtained, our success will also depend on public acceptance of the use of genetically modified products including drugs, plants, and plant products. Claims that genetically modified products are unsafe for consumption or pose a danger to the environment may influence public attitudes. Our genetically modified products may not gain public acceptance. The subject of genetically modified organisms has received negative publicity in the United States and particularly in Europe, and such publicity has aroused public debate. The adverse publicity in Europe could lead to greater regulation and trade restrictions on imports of genetically altered products. Similar adverse public reaction or sentiment in the United States to genetic research and its resulting products could result in greater domestic regulation and could decrease the demand for our technology and products.

Risks Relating to our Finances

We have incurred significant operating losses since inception and anticipate that we will incur continued losses for the foreseeable future.

We have generated operating losses since we began operations in 1995. Our net losses for the years ended December 31, 2017, 2016 and 2015 were $54.6 million, $71.7 million and $40.7 million, respectively. The extent of our future losses and the timing of profitability are uncertain, and we expect to incur losses for the foreseeable future. We have been engaged in developing our ZFP technology since inception, which has and will continue to require significant research and development expenditures. To date, we have generated our funding from issuance of equity securities, revenues derived from collaboration agreements, other strategic partnerships in non-therapeutic applications of our technology, federal government research grants and grants awarded by research foundations. As of March 31, 2018, we had an accumulated deficit of $514.5 million. Since our initial public offering in 2000, we have generated an aggregate of approximately $418.6 million in gross proceeds from the sale of our equity securities. We expect to continue to incur additional operating losses for the next several years as we continue to advance our product candidates. If the time required to generate significant product revenues and achieve profitability is longer than we currently anticipate or if we are unable to generate liquidity through equity financing or other sources of funding, we may be forced to curtail or suspend our operations.

We may be unable to raise additional capital, which would harm our ability to develop our technology and products.

We have incurred significant operating losses and negative operating cash flows since inception and have not achieved profitability. We expect capital outlays and operating expenditures to increase over the next several years as we expand our infrastructure and research and product development activities. While we believe our financial resources will be adequate to sustain our current operations for at least the next twelve months, we will likely seek additional sources of capital through equity or debt financing. In addition, as we focus our efforts on proprietary human therapeutics, we will need to seek FDA approval of potential products, a process that could cost in excess of hundreds of millions of dollars per product. Furthermore, we may experience difficulties in accessing the capital market due to external factors beyond our control such as volatility in the equity markets for emerging biotechnology companies and general economic and market conditions both in the United States and abroad. We cannot be certain that we will be able to obtain financing on terms acceptable to us, or at all. Our failure to obtain adequate and timely funding will materially adversely affect our business and our ability to develop our technology and products candidates. Furthermore, any sales of additional equity securities may result in dilution to our stockholders and any debt financing may include business and financial covenants that restricts our operations.

We are at the development phase of operations and may not succeed or become profitable.

We began operations in 1995, are in the early phases of product development for the most advanced candidates in our therapeutics pipeline, and we have incurred significant losses since inception. To date, our revenues have been generated from collaboration agreements, other collaborations in non-therapeutic applications of our technology, federal government research grants and grants awarded by research foundations. Our focus on higher-value therapeutic product development and related collaboration requires us to incur substantial expenses associated with product development. In addition, the preclinical or clinical failure of any

single product may have a significant effect on the actual or perceived value of our stock. Our business is subject to all of the risks inherent in the development of a new technology, which includes the need to:

- attract and retain qualified scientific and technical staff and management, particularly scientific staff with expertise to develop our early-stage technology into therapeutic products;
- obtain sufficient capital to support the expense of developing our technology platform and developing, testing and commercializing products;
- develop a market for our products; and
- successfully transition from a company with a research focus to a company capable of supporting commercial activities.

The recently passed comprehensive tax reform bill could adversely affect our business and financial condition.

On December 22, 2017, President Trump signed into law new legislation that significantly revises the Internal Revenue Code of 1986, as amended (the Code). The newly enacted federal income tax law, among other things, contains significant changes to corporate taxation, including adoption of a flat 21% corporate tax rate, limitation of the tax deduction for interest expense to 30% of adjusted earnings (except for certain small businesses), limitation of the deduction of net operating losses generated in tax years beginning after December 31, 2017 to 80% of current year taxable income and elimination of carrybacks of such net operating losses, one time taxation of offshore earnings at reduced rates regardless of whether they are repatriated, current inclusion in U.S. federal taxable income of certain earnings of controlled foreign corporations, immediate deductions for certain new investments instead of deductions for depreciation expense over time, and modifying or repealing many business deductions and credits (including reducing the business tax credit for certain clinical testing expenses incurred in the testing of certain drugs for rare diseases or conditions generally referred to as “orphan drugs”). Notwithstanding the reduction in the corporate income tax rate, the overall impact of the new federal tax law is uncertain, and our business and financial condition could be adversely affected. In addition, it is uncertain if and to what extent various states will conform to the newly enacted federal tax law. The impact of this tax reform on holders of our common stock is also uncertain and could be adverse. Investors should consult with their legal and tax advisors with respect to this legislation and the potential tax consequences of investing in or holding our common stock.

Risks Relating to our Relationships with Collaborators and Strategic Partners

If conflicts arise between us and our collaborators or strategic partners, these parties may act in their self-interest, which may limit our ability to implement our strategies and otherwise harm our business and prospects.

If conflicts arise between our corporate or academic collaborators or strategic partners and us, the other party may act in its self-interest, which may limit our ability to implement our strategies. Some of our academic collaborators and strategic partners are conducting multiple product development efforts within each area that is the subject of the collaboration with us. Our collaborators or strategic partners may develop, either alone or with others, products in related fields that are competitive with the products or potential products that are the subject of these collaborations. Competing products, either developed by the collaborators or strategic partners or to which the collaborators or strategic partners have rights, may result in the withdrawal of partner support for our product candidates.

Some of our collaborators or strategic partners could also become our competitors in the future. Our collaborators or strategic partners could develop or invest in competing products, preclude us from entering into collaborations with their competitors, fail to obtain timely regulatory approvals, terminate their agreements with us prematurely, or fail to devote sufficient resources to the development and commercialization of product candidates covered by the applicable agreement.

In addition, conflicts could arise between us and our collaborators resulting from disputes regarding our or our collaborators’ or strategic partners’ performance under the applicable agreement, including disputes arising from alleged breaches of our agreements with our collaborators and strategic partners. For example, we have certain confidentiality obligations to our collaborators and strategic partners under our agreements with them, and it is possible that, in connection with the data security incident we disclosed in April 2018, we could be subject to claims that we have breached our confidentiality obligations, which could result in damages payable by us and/or the affected collaborator or strategic partner seeking to terminate its agreement with us.

Any of these developments could harm our product development efforts and otherwise adversely affect our business and prospectus.

Our collaborators and strategic partners may control aspects of our clinical trials, which could result in delays and other obstacles in the commercialization of our proposed products.

We depend on third-party collaborators and strategic partners to design and conduct our clinical trials for some of our therapeutic programs. As a result, we may not be able to conduct these programs in the manner or on the time schedule we currently

contemplate, which may negatively impact our business operations. In addition, if any of these collaborators or strategic partners withdraws support for our programs or proposed products or otherwise impair their development; our business could be negatively affected.

For example, under our agreements with Kite, Pfizer and Bioverativ, they have control and broad discretion over all or certain aspects of the clinical development and commercialization of any product developed under the agreement, and we will have little, if any, influence on how these programs will be conducted. Our lack of control over the clinical development in such agreements could cause delays or other difficulties in the development and commercialization of our product candidates, which may prevent us from completing the intended IND filings in a timely fashion and receiving any milestone, royalty payments and other benefits under the agreement. In addition, under their respective agreements, our third-party collaborators have certain rights to terminate the agreements by providing us with advance notices, therefore, the actual milestone payments that we may receive under these agreements may be substantially lower than the full amounts provided for under these agreements.

Our collaborators or strategic partners may decide to adopt alternative technologies or may be unable to develop commercially viable products with our technology, which would negatively impact our revenues and our strategy to develop these products.

Our collaborators or strategic partners may adopt alternative technologies, which could decrease the marketability of ZFP technology. Additionally, because many of our collaborators or strategic partners are likely to be working on more than one development project, they could choose to shift their resources to projects other than those they are working on with us. If they do so, this would delay our ability to test our technology and would delay or terminate the development of potential products based on our ZFP technology. Further, our collaborators and strategic partners may elect not to develop products arising out of our collaborative and strategic partnering arrangements or to devote sufficient resources to the development, manufacturing, marketing or sale of these products. If they terminate the collaborative relationship with us, we will be required to seek the support of other partners or collaborators. We may not have sufficient resources and expertise to develop these programs by ourselves, and we may not be able to identify a suitable partner or negotiate a favorable collaboration agreement to allow us to continue the development of these programs. If any of these events occur, we may not be able to develop our technologies or commercialize our products.

If the licensed products under our non-therapeutic license agreements are not successfully commercialized, or our third-party licensees terminate our agreements, our ability to generate revenue under these license agreements may be limited.

We have a number of collaboration agreements with third parties whereby we licensed our ZFP technologies to develop products in non- therapeutic fields, such as laboratory research reagents, protein pharmaceuticals, and, transgenic animals, as well as plant agriculture

We cannot be certain that we or our collaboration partners will succeed in the development of commercially viable products in these non-therapeutic fields of use, and there is no guarantee that we or our collaboration partners will achieve the milestones set forth in the respective license agreements. To the extent we or our collaboration partners do not succeed in developing and commercializing products or if we or our collaboration partners fail to achieve such milestones, our revenues and benefits under the license agreements will be limited. In the event our third party licensees decide to terminate the license agreements, our ability to generate revenue under such license agreements will cease.

Our collaborations with outside scientists may be subject to change, which could limit our access to their expertise.

We work with scientific advisors and collaborators at academic research institutions. These scientists are not our employees and may have other commitments that would limit their availability to us. Although our scientific advisors generally agree not to do competing work, if a conflict of interest between their work for us and their work for another entity arises, we may lose their services. Although our scientific advisors and academic collaborators sign agreements not to disclose our confidential information, it is possible that some of our valuable proprietary knowledge may become publicly known through them, which may cause competitive harm to our business.

Risks Relating to our Intellectual Property

Because it is difficult and costly to protect our proprietary rights, and third parties may have filed patent applications that are similar to ours, we cannot guarantee the proprietary protection of our technologies and products.

Our commercial success will depend in part on obtaining patent protection of our technology and successfully defending any of our patents that may be challenged. The patent positions of pharmaceutical and biotechnology companies can be highly uncertain and can involve complex legal and factual questions. No consistent policy regarding the breadth of claims allowed in biotechnology patents has emerged to date. Accordingly, we cannot predict the breadth of claims allowed in patents we own or license that a third party may receive.

As disclosed herein, we are a party to various license agreements that give us rights under specified patents and patent applications. Our current licenses, as our future licenses frequently will, contain performance obligations. If we fail to meet those obligations, the licenses could be terminated. If we are unable to continue to license these technologies on commercially reasonable terms, or at all, we may be forced to delay or terminate aspects of our product development and research activities.

With respect to our present and any future sublicenses, because our rights derive from those granted to our sublicensor, we are subject to the risk that our sublicensor may fail to perform its obligations under the master license or fail to inform us of useful improvements in, or additions to, the underlying intellectual property owned by the original licensor.

We are unable to exercise the same degree of control over intellectual property that we license from third parties as we exercise over our internally developed intellectual property. We do not control the prosecution of certain of the patent applications that we license from third parties; therefore, the patent applications may not be prosecuted as we desire or in a timely manner.

The degree of future protection for our proprietary rights is uncertain, and we cannot ensure that:

- we or our licensors were the first to make the inventions covered by each of our pending patent applications;
- we or our licensors were the first to file patent applications for these inventions;
- the patents of others will not have an adverse effect on our ability to do business;
- others will not independently develop similar or alternative technologies or reverse engineer any of our products, processes or technologies;
- any of our pending patent applications will result in issued patents;
- any patents issued or licensed to us or our collaborators or strategic partners will provide a basis for commercially viable products or will provide us with any competitive advantages;
- any patents issued or licensed to us will not be challenged and invalidated by third parties; or
- we will develop additional products, processes or technologies that are patentable.

Others have filed and in the future are likely to file patent applications that are similar to ours. We are aware that there are academic groups and other companies that are attempting to develop technology that is based on the use of zinc finger, TALE, CRISPR/Cas and other DNA-binding proteins, and that these groups and companies have filed patent applications. Several patents have been issued, although we have no current plans to use the associated inventions. If these or other patents issue, it is possible that the holder of any patent or patents granted on these applications may bring an infringement action against our collaborators, strategic partners, or us claiming damages and seeking to enjoin commercial activities relating to the affected products and processes. The costs of litigating the claim could be substantial. Moreover, we cannot predict whether we, our collaborators, or strategic partners would prevail in any actions. In addition, if the relevant patent claims were upheld as valid and enforceable and our products or processes were found to infringe the patent or patents, we or our collaborators could be prevented from making, using, or selling the relevant product or process unless we or our collaborators could obtain a license or were able to design around the patent claims. We can give no assurance that such a license would be available to us and our collaborators on commercially reasonable terms, or at all, or that we would be able to successfully design around the relevant patent claims. There may be significant litigation in the genomics industry regarding patent and other intellectual property rights, which could subject us to litigation. If we become involved in litigation, it could consume a substantial portion of our managerial and financial resources.

We rely on trade secrets to protect technology where we believe patent protection is not appropriate or obtainable. Trade secrets, however, are difficult to protect. While we require employees, academic collaborators and consultants to enter into confidentiality agreements, we may not be able to adequately protect our trade secrets or other proprietary information or enforce these confidentiality agreements.

Our collaborators, strategic partners, and scientific advisors have rights to publish data and information in which we may have rights. If we cannot maintain the confidentiality of our technology and other confidential information in connection with our collaborations and strategic partnerships, then we may not be able to receive patent protection or protect our proprietary information.

If we are unable to obtain or protect intellectual property rights related to our product candidates, we may not be able to compete effectively in our markets.

We rely upon a combination of patents, trade secret protection and confidentiality agreements to protect the intellectual property related to our product candidates. The strength of patents in the biotechnology and pharmaceutical field involves complex legal and scientific questions and can be uncertain. The patent applications that we own or in-license may fail to result in issued patents with claims that cover our product candidates in the United States or in other foreign countries. There is no assurance that all

of the potentially relevant prior art relating to our patents and patent applications has been found, which can invalidate a patent or prevent a patent from issuing from a pending patent application. Even if patents do successfully issue and even if such patents cover our product candidates, third parties may challenge their validity, enforceability or scope, which may result in such patents being narrowed or invalidated. Furthermore, even if they are unchallenged, our patents and patent applications may not adequately protect our intellectual property, provide exclusivity for our product candidates or prevent others from designing around our claims. Any of these outcomes could impair our ability to prevent competition from third parties, which may have an adverse impact on our business.

If the patent applications we hold or have in-licensed with respect to our programs or product candidates fail to issue, if their breadth or strength of protection is threatened, or if they fail to provide meaningful exclusivity for our product candidates, it could dissuade companies from collaborating with us to develop product candidates, and threaten our ability to commercialize, future products. Several patent applications covering our product candidates have been filed recently. We cannot offer any assurances about which, if any, patents will issue, the breadth of any such patent or whether any issued patents will be found invalid and unenforceable or will be threatened by third parties. Any successful opposition to these patents or any other patents owned by or licensed to us could deprive us of rights necessary for the successful commercialization of any product candidates that we may develop. Further, if we encounter delays in regulatory approvals, the period of time during which we could market a product candidate under patent protection could be reduced. Since patent applications in the United States and most other countries are confidential for a period of time after filing, and some remain so until issued, we cannot be certain that we were the first to file any patent application related to a product candidate. Furthermore, if third parties have filed such patent applications, an interference proceeding in the United States can be initiated by a third party to determine who was the first to invent any of the subject matter covered by the patent claims of our applications. In addition, patents have a limited lifespan. In the United States, the natural expiration of a patent is generally 20 years after it is filed. Various extensions may be available however the life of a patent, and the protection it affords, is limited. Even if patents covering our product candidates are obtained, once the patent life has expired for a product, we may be open to competition from generic medications.

In addition to the protection afforded by patents, we rely on trade secret protection and confidentiality agreements to protect proprietary know-how that is not patentable or that we elect not to patent, processes for which patents are difficult to enforce and any other elements of our product candidate discovery and development processes that involve proprietary know-how, information or technology that is not covered by patents. However, trade secrets can be difficult to protect. We seek to protect our proprietary technology and processes, in part, by entering into confidentiality agreements with our employees, consultants, scientific advisors and contractors. We also seek to preserve the integrity and confidentiality of our data and trade secrets by maintaining physical security of our premises and physical and electronic security of our information technology systems. While we have confidence in these individuals, organizations and systems, agreements or security measures have been and may in the future be breached, and we may not have adequate remedies for any breach. See also the risk factor titled, "*—Significant disruptions of our information technology systems or data security incidents could result in significant financial, legal, regulatory, business and reputational harm to us.*" In addition, our trade secrets may otherwise become known or be independently discovered by competitors.

Although we expect all of our employees and consultants to assign their inventions to us, and all of our employees, consultants, advisors and any third parties who have access to our proprietary know-how, information or technology to enter into confidentiality agreements, we cannot provide any assurances that all such agreements have been duly executed or that our trade secrets and other confidential proprietary information will not be disclosed or that competitors will not otherwise gain access to our trade secrets or independently develop substantially equivalent information and techniques. Misappropriation or unauthorized disclosure of our trade secrets could impair our competitive position and may have a material adverse effect on our business. Additionally, if the steps taken to maintain our trade secrets are deemed inadequate, we may have insufficient recourse against third parties for misappropriating the trade secret. In addition, others may independently discover our trade secrets and proprietary information. For example, the FDA, as part of its Transparency Initiative, is currently considering whether to make additional information publicly available on a routine basis, including information that we may consider to be trade secrets or other proprietary information, and it is not clear at the present time how the FDA's disclosure policies may change in the future, if at all.

Further, the laws of some foreign countries do not protect proprietary rights to the same extent or in the same manner as the laws of the United States. As a result, we may encounter significant problems in protecting and defending our intellectual property both in the United States and abroad. If we are unable to prevent material disclosure of the non-patented intellectual property related to our technologies to third parties, and there is no guarantee that we will have any such enforceable trade secret protection, we may not be able to establish or maintain a competitive advantage in our market, which could materially adversely affect our business, results of operations and financial condition.

Third-party claims of intellectual property infringement may prevent or delay our development and commercialization efforts.

Our commercial success depends in part on our avoiding infringement of the patents and proprietary rights of third parties. There is a substantial amount of litigation, both within and outside the United States, involving patent and other intellectual property rights in the biotechnology and pharmaceutical industries, including patent infringement lawsuits, interferences, oppositions, *ex part*e

reexaminations, post-grant review, and *inter partes* review proceedings before the U.S. Patent and Trademark Office, or U.S. PTO, and corresponding foreign patent offices. Numerous U.S. and foreign issued patents and pending patent applications, which are owned by third parties, exist in the fields in which we are pursuing development candidates. As the biotechnology and pharmaceutical industries expand and more patents are issued, the risk increases that our product candidates may be subject to claims of infringement of the patent rights of third parties.

Third parties may assert that we are employing their proprietary technology without authorization. There may be third-party patents or patent applications with claims to materials, formulations, methods of manufacture or methods for treatment related to the use or manufacture of our product candidates. Because patent applications can take many years to issue, there may be currently pending patent applications which may later result in issued patents that our product candidates may infringe. In addition, third parties may obtain patents in the future and claim that use of our technologies infringes upon these patents. If any third-party patents were held by a court of competent jurisdiction to cover the manufacturing process of any of our product candidates, any molecules formed during the manufacturing process or any final product itself, the holders of any such patents may be able to block our ability to commercialize such product candidate unless we obtained a license under the applicable patents, or until such patents expire. Similarly, if any third-party patents were held by a court of competent jurisdiction to cover aspects of our formulations, processes for manufacture or methods of use, including combination therapy, the holders of any such patents may be able to block our ability to develop and commercialize the applicable product candidate unless we obtained a license or until such patent expires. In either case, such a license may not be available on commercially reasonable terms or at all.

Parties making claims against us may obtain injunctive or other equitable relief, which could effectively block our ability to further develop and commercialize one or more of our product candidates. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from our business. In the event of a successful claim of infringement against us, we may have to pay substantial damages, including treble damages and attorneys' fees for willful infringement, pay royalties, redesign our infringing products or obtain one or more licenses from third parties, which may be impossible or require substantial time and monetary expenditure.

We may not be successful in obtaining or maintaining necessary rights to gene therapy product components and processes for our development pipeline through acquisitions and in-licenses.

Presently we have rights to the intellectual property, through licenses from third parties and under patents that we own, to develop our gene therapy product candidates. Because our programs may involve additional product candidates that may require the use of proprietary rights held by third parties, the growth of our business will likely depend in part on our ability to acquire, in-license or use these proprietary rights. In addition, our product candidates may require specific formulations to work effectively and efficiently and these rights may be held by others. We may be unable to acquire or in-license any compositions, methods of use, processes or other third-party intellectual property rights from third parties that we identify. The licensing and acquisition of third-party intellectual property rights is a competitive area, and a number of more established companies are also pursuing strategies to license or acquire third-party intellectual property rights that we may consider attractive. These established companies may have a competitive advantage over us due to their size, cash resources and greater clinical development and commercialization capabilities.

For example, we sometimes collaborate with U.S. and foreign academic institutions to accelerate our preclinical research or development under written agreements with these institutions. Typically, these institutions provide us with an option to negotiate a license to any of the institution's rights in technology resulting from the collaboration. Regardless of such right of first negotiation for intellectual property, we may be unable to negotiate a license within the specified time frame or under terms that are acceptable to us. If we are unable to do so, the institution may offer the intellectual property rights to other parties, potentially blocking our ability to pursue our program.

In addition, companies that perceive us to be a competitor may be unwilling to assign or license rights to us. We also may be unable to license or acquire third-party intellectual property rights on terms that would allow us to make an appropriate return on our investment. If we are unable to successfully obtain rights to required third-party intellectual property rights, our business, financial condition and prospects for growth could suffer.

If we fail to comply with our obligations in the agreements under which we license intellectual property rights from third parties or otherwise experience disruptions to our business relationships with our licensors, we could lose license rights that are important to our business.

We are a party to a number of intellectual property license agreements that are important to our business and expect to enter into additional license agreements in the future. Our existing license agreements impose, and we expect that future license agreements will impose, various diligence, milestone, royalty and other obligations on us. If we fail to comply with our obligations under these agreements, or we are subject to a bankruptcy, the licensor may have the right to terminate the license, in which event we would not be able to market products covered by the license.

We may need to obtain licenses from third parties to advance our research or allow commercialization of our product candidates, and we have done so from time to time. We may fail to obtain any of these licenses at a reasonable cost or on reasonable terms, if at all. In that event, we may be required to expend significant time and resources to develop or license replacement technology. If we are unable to do so, we may be unable to develop or commercialize the affected product candidates, which could harm our business significantly. We cannot provide any assurances that third-party patents do not exist that might be enforced against our current product candidates or future products, resulting in either an injunction prohibiting our sales, or, with respect to our sales, an obligation on our part to pay royalties and/or other forms of compensation to third parties.

In many cases, patent prosecution of our licensed technology is controlled solely by the licensor. If our licensors fail to obtain and maintain patent or other protection for the proprietary intellectual property we license from them, we could lose our rights to the intellectual property or our exclusivity with respect to those rights, and our competitors could market competing products using the intellectual property. In certain cases, we control the prosecution of patents resulting from licensed technology. In the event we breach any of our obligations related to such prosecution, we may incur significant liability to our licensing partners. Licensing of intellectual property is of critical importance to our business and involves complex legal, business and scientific issues and is complicated by the rapid pace of scientific discovery in our industry. Disputes may arise regarding intellectual property subject to a licensing agreement, including:

- the scope of rights granted under the license agreement and other interpretation-related issues;
- the extent to which our technology and processes infringe on intellectual property of the licensor that is not subject to the licensing agreement;
- the sublicensing of patent and other rights under our collaborative development relationships;
- our diligence obligations under the license agreement and what activities satisfy those diligence obligations;
- the ownership of inventions and know-how resulting from the joint creation or use of intellectual property by our licensors and us and our partners; and
- the priority of invention of patented technology.

If disputes over intellectual property that we have licensed prevent or impair our ability to maintain our current licensing arrangements on acceptable terms, we may be unable to successfully develop and commercialize the affected product candidates.

We may be involved in lawsuits to protect or enforce our patents or the patents of our licensors, which could be expensive, time-consuming and unsuccessful.

Competitors may infringe our patents or the patents of our licensors. To counter infringement or unauthorized use, we may be required to file infringement claims, which can be expensive and time-consuming. In addition, in an infringement proceeding, a court may decide that a patent of ours or our licensors is not valid, is unenforceable and/or is not infringed, or may refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover the technology in question. An adverse result in any litigation or defense proceedings could put one or more of our patents at risk of being invalidated or interpreted narrowly and could put our patent applications at risk of not issuing.

Interference proceedings provoked by third parties or brought by us may be necessary to determine the priority of inventions with respect to our patents or patent applications or those of our licensors. An unfavorable outcome could require us to cease using the related technology or to attempt to license rights to it from the prevailing party. Our business could be harmed if the prevailing party does not offer us a license on commercially reasonable terms. Our defense of litigation or interference proceedings may fail and, even if successful, may result in substantial costs and distract our management and other employees. We may not be able to prevent, alone or with our licensors, misappropriation of our intellectual property rights, particularly in countries where the laws may not protect those rights as fully as in the United States.

Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. There could also be public announcements of the results of hearings, motions or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have a material adverse effect on the price of our common stock.

Patent reform legislation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents.

On September 16, 2011, the Leahy-Smith America Invents Act, or the Leahy-Smith Act, was signed into law. The Leahy-Smith Act includes a number of significant changes to U.S. patent law, including provisions that affect the way patent applications will be prosecuted and may also affect patent litigation. The U.S. PTO is currently developing regulations and procedures to govern

administration of the Leahy-Smith Act, and many of the substantive changes to patent law associated with the Leahy-Smith Act, and in particular, the first to file provisions, were enacted March 16, 2013. However, it is not clear what, if any, impact the Leahy-Smith Act will have on the operation of our business. However, the Leahy-Smith Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents, all of which could have a material adverse effect on our business and financial condition.

We may be subject to claims that our employees, consultants or independent contractors have wrongfully used or disclosed confidential information of third parties or that our employees have wrongfully used or disclosed alleged trade secrets of their former employers.

We employ individuals who were previously employed at universities or other biotechnology or pharmaceutical companies, including our competitors or potential competitors. Although we try to ensure that our employees, consultants and independent contractors do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or our employees, consultants or independent contractors have inadvertently or otherwise used or disclosed intellectual property, including trade secrets or other proprietary information, of any of our employee's former employer or other third parties. Litigation may be necessary to defend against these claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel, which could adversely impact our business. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

We may be subject to claims challenging the inventorship or ownership of our patents and other intellectual property.

We may also be subject to claims that former employees, collaborators or other third parties have an ownership interest in our patents or other intellectual property. Litigation may be necessary to defend against these and other claims challenging inventorship or ownership. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights, such as exclusive ownership of, or right to use, valuable intellectual property. Such an outcome could have a material adverse effect on our business. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

Obtaining and maintaining our patent protection depends on compliance with various procedural, document submission, fee payment and other requirements imposed by governmental patent agencies, and our patent protection could be reduced or eliminated for non-compliance with these requirements.

Periodic maintenance fees, renewal fees, annuity fees and various other governmental fees on patents and/or applications will be due to be paid to the U.S. PTO and various governmental patent agencies outside of the United States in several stages over the lifetime of the patents and/or applications. We have systems in place to remind us to pay these fees, and we employ an outside firm and rely on our outside counsel to pay these fees due to non-U.S. patent agencies. The U.S. PTO and various non-U.S. governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process. We employ professionals to help us comply, and in many cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with the applicable rules. However, there are situations in which non-compliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, our competitors might be able to enter the market and this circumstance would have a material adverse effect on our business.

Issued patents covering our product candidates could be found invalid or unenforceable if challenged in court.

If we or one of our licensing partners initiated legal proceedings against a third party to enforce a patent covering one of our product candidates, the defendant could counterclaim that the patent covering our product candidate is invalid and/or unenforceable.

In patent litigation in the United States, defendant counterclaims alleging invalidity and/or unenforceability are commonplace. Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, including patent eligible subject matter, lack of novelty, obviousness or non-enablement. Grounds for an unenforceability assertion could be an allegation that someone connected with prosecution of the patent withheld relevant information from the U.S. PTO, or made a misleading statement, during prosecution. Third parties may also raise similar claims before administrative bodies in the United States or abroad, even outside the context of litigation. Such mechanisms include re-examination, post grant review, and equivalent proceedings in foreign jurisdictions (e.g., opposition proceedings). Such proceedings could result in revocation or amendment to our patents in such a way that they no longer cover our product candidates. The outcome following legal assertions of invalidity and unenforceability is unpredictable. With respect to the validity question, for example, we cannot be certain that there is no invalidating prior art, of which we and the patent examiner were unaware during prosecution. If a defendant were to prevail on a legal assertion of invalidity and/or unenforceability, we would lose at least part, and perhaps all, of the patent protection on our product candidates. Such a loss of patent protection would have a material adverse impact on our business.

Changes in U.S. patent law could diminish the value of patents in general, thereby impairing our ability to protect our products.

As is the case with other biotechnology companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the biotechnology industry involve both technological and legal complexity, and is therefore obtaining and enforcing biotechnology patents is costly, time-consuming and inherently uncertain. In addition, the United States has recently enacted and is currently implementing wide-ranging patent reform legislation. Recent U.S. Supreme Court rulings have narrowed the scope of patent protection available in certain circumstances and weakened the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on decisions by the U.S. Congress, the federal courts, and the U.S. PTO, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce our existing patents and patents that we might obtain in the future.

We may not be able to protect our intellectual property rights throughout the world.

Filing, prosecuting and defending patents on product candidates in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the United States can be less extensive than those in the United States. In addition, the laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the United States. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the United States, or from selling or importing products made using our inventions in and into the United States or other jurisdictions. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own products and further, may export otherwise infringing products to territories where we have patent protection, but enforcement is not as strong as that in the United States. These products may compete with our products and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents, trade secrets and other intellectual property protection, particularly those relating to biotechnology products, which could make it difficult for us to stop the infringement of our patents or marketing of competing products in violation of our proprietary rights generally. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our patents at risk of being invalidated or interpreted narrowly and our patent applications at risk of not issuing and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate and the damages or other remedies awarded, if any, may not be commercially meaningful. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license.

Risks Relating to our Business Operations

Significant disruptions of our information technology systems or data security incidents could result in significant financial, legal, regulatory, business and reputational harm to us.

We are increasingly dependent on information technology systems and infrastructure, including mobile technologies, to operate our business. In the ordinary course of our business, we collect, store, process and transmit large amounts of sensitive information, including intellectual property, proprietary business information, personal information and other confidential information. It is critical that we do so in a secure manner to maintain the confidentiality, integrity and availability of such sensitive information. We have also outsourced elements of our operations (including elements of our information technology infrastructure) to third parties, and as a result, we manage a number of third-party vendors who may or could have access to our computer networks or our confidential information. In addition, many of those third parties in turn subcontract or outsource some of their responsibilities to third parties. As a result, our information technology systems, including the functions of third parties that are involved or have access to those systems, is very large and complex. While all information technology operations are inherently vulnerable to inadvertent or intentional security breaches, incidents, attacks and exposures, the size, complexity, accessibility and distributed nature of our information technology systems, and the large amounts of sensitive information stored on those systems, make such systems potentially vulnerable to unintentional or malicious, internal and external attacks on our technology environment. Potential vulnerabilities can exploited from inadvertent or intentional actions of our employees, third-party vendors, business partners, or by malicious third parties. Attacks of this nature are increasing in their frequency, levels of persistence, sophistication and intensity, and are being conducted by sophisticated and organized groups and individuals with a wide range of motives (including, but not limited to, industrial espionage) and expertise, including organized criminal groups, “hacktivists,” nation states and others. In addition to the extraction of sensitive information, such attacks could include the deployment of harmful malware, ransomware, denial-of-service attacks, social engineering and other means to affect service reliability and threaten the confidentiality, integrity and availability of information. In addition, the prevalent use of mobile devices increases the risk of data security incidents.

Significant disruptions of our, our third-party vendors' and/or business partners' information technology systems or other similar data security incidents could adversely affect our business operations and/or result in the loss, misappropriation, and/or unauthorized access, use or disclosure of, or the prevention of access to, sensitive information, which could result in financial, legal, regulatory, business and reputational harm to us. For example, in April 2018, we announced a data security incident involving the compromise of a senior executive's company email account. Upon learning of the incident on March 28, 2018, external network security experts were promptly engaged, and the incident response team worked diligently to investigate the incident. We also promptly notified federal law enforcement of the incident. The investigation concluded that the incident was limited to the compromise of the senior executive's company email account for approximately 11 weeks. The investigation did not reveal any evidence that our network or other information technology systems were otherwise compromised in connection with the incident or that the incident resulted in the disclosure of or access to personal information about patients or other individuals besides the holder of the company email account that was affected. However, proprietary, confidential and other sensitive information of ours and that of other entities was accessed and may have been compromised as a result of the incident. We are continuing to analyze the effects of the incident, along with appropriate remediation of our information technology systems, and that analysis and the related remediation efforts could ultimately reveal that other company information technology systems were compromised and/or that additional information was revealed or compromised. In addition, unforeseen developments related to this incident could occur, which could have a further adverse impact on us. Accordingly, we are still in the process of assessing the financial and other impacts on us and our business resulting from this incident. We do not maintain cyber liability insurance and will therefore have no coverage for any losses resulting from this data security incident. Any litigation or regulatory review arising from this incident could result in significant legal exposure to us. In addition, information technology system disruptions, whether from attacks on our technology environment or from computer viruses, natural disasters, terrorism, war and telecommunication and electrical failures, could result in a material disruption of our development programs and our business operations. For example, the loss of clinical trial data from completed or future clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data.

While we aware of the company email incident described above, there is no way of knowing with certainty whether we have experienced any other data security incidents that have not been discovered. While we have no reason to believe this to be the case, attackers have become very sophisticated in the way they conceal access to systems, and many companies that have been attacked are not aware that they have been attacked. Any event, including the company email incident described above, that leads to unauthorized access, use or disclosure of personal information, including but not limited to personal information regarding our patients or employees, could disrupt our business, harm our reputation, compel us to comply with applicable federal and/or state breach notification laws and foreign law equivalents, subject us to time consuming, distracting and expensive litigation, regulatory investigation and oversight, mandatory corrective action, require us to verify the correctness of database contents, or otherwise subject us to liability under laws, regulations and contractual obligations, including those that protect the privacy and security of personal information. This could result in increased costs to us, and result in significant legal and financial exposure and/or reputational harm. In addition, any failure or perceived failure by us or our vendors or business partners to comply with our privacy, confidentiality or data security-related legal or other obligations to third parties, or any further security incidents or other inappropriate access events that result in the unauthorized access, release or transfer of sensitive information, which could include personally identifiable information, may result in governmental investigations, enforcement actions, regulatory fines, litigation, or public statements against us by advocacy groups or others, and could cause third parties, including clinical sites, regulators or current and potential partners, to lose trust in us or we could be subject to claims by third parties that we have breached our privacy- or confidentiality-related obligations, which could materially and adversely affect our business and prospects. Moreover, data security incidents and other inappropriate access can be difficult to detect, and any delay in identifying them may lead to increased harm of the type described above. While we have implemented security measures intended to protect our information technology systems and infrastructure, there can be no assurance that such measures will successfully prevent service interruptions or further security incidents.

If we use biological and hazardous materials in a manner that causes injury or violates laws, we may be liable for damages.

Our research and development activities involve the controlled use of potentially harmful biological materials as well as hazardous materials, chemicals, and various radioactive compounds typically employed in molecular and cellular biology. We routinely use cells in culture and gene delivery vectors, and we employ small amounts of radioisotopes in trace experiments. Although we maintain up-to-date licensing and training programs, we cannot completely eliminate the risk of accidental contamination or injury from the use, storage, handling, or disposal of these materials. In the event of contamination or injury, we could be held liable for damages that result, and any liability could exceed our resources. We currently carry insurance covering certain claims arising from our use of these materials. However, if we are unable to maintain our insurance coverage at a reasonable cost and with adequate coverage, our insurance may not cover any liability that may arise. We are subject to federal, state, and local laws and regulations governing the use, storage, handling, and disposal of these materials and specified waste products.

Failure to attract, retain, and motivate skilled personnel and cultivate key academic collaborations will delay our product development programs and our research and development efforts.

Our success depends on our continued ability to attract, retain, and motivate highly qualified management and scientific personnel and our ability to develop and maintain important relationships with leading research and academic institutions and scientists. Competition for skilled and qualified personnel and academic and other research collaborations is intense. If we lose the services of personnel with the necessary skills, including the members of our senior management team, it could significantly impede the achievement of our research and development objectives. If we fail to negotiate additional acceptable collaborations with academic and other research institutions and scientists, or if our existing collaborations are unsuccessful, our development programs may be delayed or may not succeed.

Third parties on which we rely and we may be adversely affected by natural disasters and our business continuity and disaster recovery plans may not adequately protect us from a serious disaster.

Natural disasters could severely disrupt our operations and have a material adverse effect on our business, financial condition, results of operations and prospects. If a natural disaster, power outage or other event occurred that prevented us from using all or a significant portion of our headquarters, that damaged critical infrastructure or that otherwise disrupted operations, it may be difficult or, in certain cases, impossible for us to continue our business for a substantial period of time. The disaster recovery and business continuity plans we have in place currently are limited and may not prove adequate in the event of a serious disaster or similar event. We may incur substantial expenses as a result of the limited nature of our disaster recovery and business continuity plans, which could have a material adverse effect on our business, financial condition, results of operations and prospects.

Risks Relating to our Common Stock and Corporate Organization

Our stock price has been volatile and may continue to be volatile, which could result in substantial losses for investors.

Our stock price has been volatile and may continue to be volatile, which could cause stockholders to incur substantial losses. An active public market for our common stock may not be sustained, and the market price of our common stock may continue to be highly volatile. The market price of our common stock has fluctuated significantly in response to various factors, some of which are beyond our control, including but not limited to the following:

- announcements by us or collaborators providing updates on the progress or development status of product candidates;
- data from clinical trials;
- initiation or termination of clinical trials;
- changes in market valuations of similar companies;
- overall market and economic conditions, including the equity markets for emerging biotechnology companies;
- deviations in our results of operations from the guidance given by us;
- announcements by us or our competitors of new or enhanced products, technologies or services or significant contracts, acquisitions, strategic relationships, joint ventures or capital commitments;
- announcement of changes in business and operations by our collaborators and partners, or changes in our existing collaboration agreements;
- regulatory developments;
- changes, by one or more of our security analysts, in recommendations, ratings or coverage of our stock;
- additions or departures of key personnel;
- future sales of our common stock or other securities by us, management or directors, liquidation of institutional funds that comprised large holdings of our stock; and
- decreases in our cash balances.

Actual or potential sales of our common stock by our employees, including our executive officers, pursuant to pre-arranged stock trading plans could cause our stock price to fall or prevent it from increasing for numerous reasons, and actual or potential sales by such persons could be viewed negatively by other investors.

In accordance with the guidelines specified under Rule 10b5-1 of the Securities Exchange Act of 1934, as amended, and our policies regarding stock transactions, a number of our employees, including executive officers and members of our board of directors, have adopted and may continue to adopt stock trading plans pursuant to which they have arranged to sell shares of our common stock from time to time in the future. Generally, sales under such plans by our executive officers and directors require public filings. Actual

or potential sales of our common stock by such persons could cause the price of our common stock to fall or prevent it from increasing for numerous reasons.

Future sales and issuances of our common stock or rights to purchase common stock, including pursuant to our equity incentive plans, could result in additional dilution of the percentage ownership of our stockholders and could cause our stock price to fall.

Additional capital will be needed in the future to continue our planned operations. To the extent we raise additional capital by issuing equity securities, our stockholders may experience substantial dilution. We may sell common stock, convertible securities or other equity securities in one or more transactions at prices and in a manner we determine from time to time. If we sell common stock, convertible securities or other equity securities in more than one transaction, investors may be materially diluted by subsequent sales. These sales may also result in material dilution to our existing stockholders, and new investors could gain rights superior to our existing stockholders.

Our stock price is also influenced by public perception of gene therapy and government regulation of potential products.

Reports of serious adverse events in a retroviral gene transfer trial for infants with X-linked severe combined immunodeficiency (X-linked SCID) in France and subsequent FDA actions putting related trials on hold in the United States had a significant negative impact on the public perception and stock price of certain companies involved in gene therapy. Stock prices of these companies declined whether or not the specific company was involved with retroviral gene transfer for the treatment of infants with X-linked SCID, or whether the specific company's clinical trials were placed on hold in connection with these events. Other potential adverse events in the field of gene therapy may occur in the future that could result in greater governmental regulation of our potential products and potential regulatory delays relating to the testing or approval of our potential products. These external events may have a negative impact on public perception of our business, which could cause our stock price to decline.

If securities or industry analysts do not publish research or publish inaccurate or unfavorable research about our business, our stock price and trading volume could decline.

The trading market for our common stock will depend in part on the research and reports that securities or industry analysts publish about us or our business. In the event securities or industry analysts who cover us downgrade our stock or publish inaccurate or unfavorable research about our business, our stock price would likely decline. If one or more of these analysts cease coverage of our company or fail to publish reports on us regularly, demand for our stock could decrease, which might cause our stock price and trading volume to decline.

We do not intend to pay dividends on our common stock so any returns will be limited to the value of our stock.

We have never declared or paid any cash dividends on our common stock. We currently anticipate that we will retain future earnings for the development, operation and expansion of our business and do not anticipate declaring or paying any cash dividends for the foreseeable future. Any return to stockholders will therefore be limited to the appreciation of their stock.

Anti-takeover provisions in our certificate of incorporation and Delaware law could make an acquisition of our company more difficult and could prevent attempts by our stockholders to remove or replace current management.

Anti-takeover provisions of Delaware law and in our certificate of incorporation and our bylaws may discourage, delay or prevent a change in control of our company, even if a change in control would be beneficial to our stockholders. In addition, these provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our board of directors. In particular, under our certificate of incorporation our board of directors may issue up to 5,000,000 shares of preferred stock with rights and privileges that might be senior to our common stock, without the consent of the holders of the common stock. Moreover, without any further vote or action on the part of the stockholders, the board of directors would have the authority to determine the price, rights, preferences, privileges, and restrictions of the preferred stock. This preferred stock, if it is ever issued, may have preference over, and harm the rights of, the holders of common stock. Although the issuance of this preferred stock would provide us with flexibility in connection with possible acquisitions and other corporate purposes, this issuance may make it more difficult for a third party to acquire a majority of our outstanding voting stock.

Similarly, our authorized but unissued common stock is available for future issuance without stockholder approval. Our certificate of incorporation further provides that stockholders may not take action by written consent.

In addition, our amended and restated bylaws, as amended:

- establish advance notice requirements for nominations for election to the board of directors or proposing matters that can be acted upon at stockholders' meetings; and

- prohibit stockholders from calling a special meeting of stockholders.

We are also subject to Section 203 of the Delaware General Corporation Law, which provides, subject to certain exceptions, that if a person acquires 15% of our voting stock, the person is an "interested stockholder" and may not engage in "business combinations" with us for a period of three years from the time the person acquired 15% or more or our voting stock. The application of Section 203 may, in some circumstances, deter or prevent a change in control of our company even when such change may be beneficial to our stockholders.

Our amended and restated bylaws, as amended, provide that the Court of Chancery of the State of Delaware will be the exclusive forum for the adjudication of certain disputes, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers, or employees.

Our amended and restated bylaws, as amended, provide that the Court of Chancery of the State of Delaware is the sole and exclusive forum for:

- any derivative action or proceeding brought on our behalf;
- any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee of Sangamo to us or our stockholders;
- any action asserting a claim arising pursuant to any provision of the General Corporation Law of the State of Delaware; and
- any action asserting a claim governed by the internal affairs doctrine.

This provision further provides that any person or entity that acquires any interest in shares of our capital stock will be deemed to have notice of and consented to the provisions of such provision.

This provision may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers, or other employees, which may discourage lawsuits against us and our directors, officers, and other employees. If a court were to find this provision to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving the dispute in other jurisdictions, which could seriously harm our business.

ITEM 2. UNREGISTERED SALES OF EQUITY SECURITIES AND USE OF PROCEEDS

None.

ITEM 3. DEFAULTS UPON SENIOR SECURITIES

Not applicable.

ITEM 4. MINE SAFEY DISCLOSURES

Not applicable.

ITEM 5. OTHER INFORMATION

None.

ITEM 6. EXHIBITS

(a) Exhibits:

3.1(A)	Composite copy of Seventh Amended and Restated Certificate of Incorporation of Sangamo Therapeutics, Inc., as amended.
3.2(B)	Composite copy of Second Amended and Restated Bylaws of Sangamo Therapeutics, Inc., as amended.
10.1†	Collaboration and License Agreement between the Company and Kite Pharma, Inc., dated February 20, 2018.
10.2(+)	Amended and Restated Incentive Compensation Plan.
31.1	Rule 13a — 14(a) Certification of Principal Executive Officer.
31.2	Rule 13a — 14(a) Certification of Principal Financial Officer.
32.1*	Certification Pursuant to 18 U.S.C. Section 1350.
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

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

† Confidential treatment has been requested for certain information contained in this document. Such information has been omitted and filed separately with the Securities and Exchange Commission.

(+) Indicates management contract or compensatory plan or arrangement.

(A) Incorporated by reference to Exhibit 3.1 to the Registrant's Quarterly Report on Form 10-Q (File No. 000-30171), filed with the SEC on August 9, 2017.

(B) Incorporated by reference to Exhibit 3.2 to the Registrant's Quarterly Report on Form 10-Q (File No. 000-30171), filed with the SEC on August 9, 2017.

SIGNATURES

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

Dated: May 10, 2018

SANGAMO THERAPEUTICS, INC.

/s/ KATHY Y. YI

Kathy Y. Yi
Senior Vice President and Chief Financial Officer
(Principal Financial and Accounting Officer)

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

Exhibit 10.1

COLLABORATION AND LICENSE AGREEMENT

This **Collaboration and License Agreement** (this "**Agreement**") is made as of February 20, 2018 (the "**Execution Date**"), by and between **Sangamo Therapeutics, Inc.**, a Delaware corporation having an office at 501 Canal Blvd., Richmond, CA 94804 ("**Sangamo**"), and **Kite Pharma, Inc.**, a Delaware corporation having an office at 2225 Colorado Avenue, Santa Monica, CA 90404 ("**Kite**"). Gilead Sciences, Inc., a Delaware corporation having an office at 333 Lakeside Drive, Foster City, CA 94404 ("**Gilead**"), is a party to this Agreement solely for purposes of Section 16.18. Kite and Sangamo are referred to in this Agreement individually as a "**Party**" and collectively as the "**Parties**".

RECITALS

WHEREAS, Kite is a biopharmaceutical company engaged in the development of novel immunotherapy products, with a primary focus on engineered T cell therapies for the treatment of oncology indications;

WHEREAS, Sangamo, a biopharmaceutical company, has technology and expertise in genome editing technology, including through the use of zinc finger nucleases and adeno-associated viruses, and is applying such technology to develop therapeutic products for the treatment of genetic diseases, infectious diseases and cancers; and

WHEREAS, Kite and Sangamo desire to enter into a collaboration to use Sangamo's proprietary genome editing technology to research and develop engineered T cell and NK cell therapies and, if successful, for Kite to further develop and commercialize such products under an exclusive license from Sangamo, all under the terms and conditions set forth herein.

NOW, THEREFORE, in consideration of the foregoing premises and the mutual covenants contained herein, the receipt and sufficiency of which are hereby acknowledged, Kite and Sangamo hereby agree as follows:

ARTICLE 1
DEFINITIONS

Unless the context otherwise requires, the terms in this Agreement with initial letters capitalized shall have the meanings set forth below, or the meaning as designated in the indicated places throughout this Agreement.

1.1 "**AAV**" means (a) adeno-associated virus type 2/6, which has the inverted terminal repeats from adeno-associated virus type 2 and the capsid from adeno-associated virus type 6 or

(b) any other adeno-associated virus that (i) is useful in Immune Cells and (ii) is included in a Research Plan.

1.2 "**Acquired Competing Product**" means any Directly Competing Product acquired by Kite or its Affiliates, whether as part of a Competing Collaboration or Competing Acquisition.

1.3 "**Acquired Non-Competing Product**" means any product acquired by Kite or its Affiliates as part of a Competing Program that is not a Directly Competing Product.

1.4 "**Affiliate**" means, with respect to any Person, any other Person that controls, is controlled by, or is under common control with, such Person. For purposes of this Agreement, a Person shall be deemed to control another Person if it owns or controls, directly or indirectly, at least fifty percent (50%) of the equity securities of such other Person entitled to vote in the election of directors (or, in the case that such other Person is not a corporation, for the election of the corresponding managing authority), or otherwise has the power to direct the management and policies of such other Person. The Parties acknowledge that in the case of certain entities organized under the laws of certain countries outside the United States, the maximum percentage ownership permitted by law for a foreign investor may be less than fifty percent (50%), and that in such case such lower percentage will be substituted in the preceding sentence, provided that such foreign investor has the power to direct the management and policies of such entity.

1.5 "**Allogeneic Modification**" means a gene disruption (knock-out) or gene insertion (knock-in) in an Immune Cell (or the Stem Cell from which the Immune Cell is differentiated).

1.6 "**Allo HD Licensed Product**" means a product that incorporates, uses or administers a Modified Cell that was created from Immune Cells obtained from healthy donors.

1.7 "**Allo UCL Licensed Product**" means a product that incorporates, uses or administers a Modified Cell that was differentiated from a Universal Cell Line.

1.8 "[*]" means, with respect to [*], as applicable, [*], either: (a) [*], if such Licensed Product [*], or (b), [*], if such Licensed Product [*].

1.9 "**Auto Licensed Product**" means a product that incorporates, uses or administers a Modified Cell that was created from the individual patient that is treated with such product.

1.10 "[*]" means the [*] or [*].

1.11 "**Biosimilar Product**" means, in a particular country with respect to a particular Licensed Product, any biopharmaceutical product that: (a) has received all necessary approvals by the applicable Regulatory Authorities in such country to market and sell such product as a biopharmaceutical product; (b) is marketed or sold by a Third Party that either (i) has not obtained the rights to market or sell such product as a Sublicensee or as a distributor of Kite or any of its Affiliates or Sublicensees, in each case with respect to such Licensed Product or (ii) received the right to market or sell such product pursuant to a license or settlement, in each case in connection with litigation with Kite, its Affiliate or a Sublicensee under the Biologics Price Competition and Innovation Act of 2009 or an equivalent under foreign law; and (c) is approved as (i) a "biosimilar"

(in the United States) of such Licensed Product, (ii) a "similar biological medicinal product" (in the EU) with respect to which such Licensed Product is the "reference medicinal product", or (iii) if not in the US or EU, the foreign equivalent of a "biosimilar" or "similar biological medicinal product" of such Licensed Product; in each case for use in such country pursuant to an expedited regulatory approval process governing approval of generic biologics based on the then-current standards for regulatory approval in such country (e.g., the Biologics Price Competition and Innovation Act of 2009 or an equivalent under foreign law) and where such regulatory approval was based in part upon clinical data generated by a Party or any of its Affiliates, licensees or sublicensees with respect to such Licensed Product.

1.12 "**BLA**" means a Biologic License Application, as defined in the U.S. Public Health Service Act, as amended, and applicable regulations promulgated thereunder by the FDA.

1.13 "**Business Day**" means a day other than a Saturday, Sunday or a day on which banking institutions in San Francisco, California are required by law to remain closed, or December 26 through December 31.

1.14 **"Calendar Quarter"** means each successive period of three (3) calendar months commencing on January 1, April 1, July 1 and October 1, except that the first Calendar Quarter of the Term shall commence on the Effective Date and end on the day immediately prior to the first to occur of January 1, April 1, July 1 or October 1 after the Effective Date, and the last Calendar Quarter shall end on the last day of the Term.

1.15 **"Calendar Year"** means each successive period of twelve (12) calendar months commencing on January 1 and ending on December 31, except that the first Calendar Year of the Term shall commence on the Effective Date and end on December 31 of the year in which the Effective Date occurs and the last Calendar Year of the Term shall commence on January 1 of the year in which the Term ends and end on the last day of the Term.

1.16 "**Candidate Target**" means [*], and any Other Target selected pursuant to Section 4.4(a), in each case unless and until any such Target is no longer considered a Candidate Target pursuant to Section 4.4(b) or 13.3(a).

1.17 "**CAR**" means a chimeric antigen receptor.

1.18 "[*]" means [*] or [*].

1.19 "**cGMP**" means current Good Manufacturing Practices as specified in the United States Code of Federal Regulations, ICH Guideline Q7A, or equivalent laws, rules, or regulations of an applicable Regulatory Authority at the time of manufacture.

1.20 "**Change of Control**" means, with respect to a Party, (a) a merger or consolidation of such Party with a Third Party that results in the voting securities of such Party outstanding immediately prior thereto, or any securities into which such voting securities have been converted or exchanged, ceasing to represent at least fifty percent (50%) of the combined voting power of the surviving entity or the parent of the surviving entity immediately after such merger or consolidation, or (b) a transaction or series of related transactions in which a Third Party, together

with its Affiliates, becomes the beneficial owner of fifty percent (50%) or more of the combined voting power of the outstanding securities of such Party, or (c) the sale or other transfer to a Third Party of all or substantially all of such Party's business.

1.21 "**Combination**" means (a) a biopharmaceutical product in finished form containing both a Modified Cell and one or more Other Compounds that are separate and distinct from such Modified Cell, in which the Modified Cell and Other Compounds are co-formulated or co-packaged within a single box or sales unit or (b) a Modified Cell and Other Compounds are approved for use in combination and are sold by Kite, its Affiliate or a Sublicensee in separate packages but at a single price point.

1.22 "**Commercially Reasonable Efforts**" means, with respect to a Party, the efforts and resources typically used by biotechnology or pharmaceutical companies similar in size and scope to such Party (together with its Affiliates) to perform the obligation at issue, which efforts shall be substantially the same as those efforts made with respect to other products at a similar stage of development or in a similar stage of product life, with similar developmental risk profiles, of similar market and commercial potential, taking into account the competitiveness of the marketplace, the proprietary position of the products, the regulatory structure involved, Regulatory Authority approved labeling, product profile, the profitability of the applicable products, issues of safety and efficacy, the likely timing of the product's entry into the market, the likelihood of receiving Marketing Approval and other relevant scientific, technical and commercial factors.

1.23 "**Committee**" means the JSC, Project Team and any subcommittee established by the JSC, as applicable.

1.24 "**Competing Acquisition**" means acquisition of a Third Party or a portion of the business of a Third Party (whether by merger, stock purchase or purchase of assets) that is, prior to such acquisition, conducting one or more Competing Programs involving one or more Candidate Targets.

1.25 "**Competing Collaboration**" means entry of a license, collaboration or other arrangement with a Third Party with respect to one or more Competing Programs involving one or more Candidate Targets, or an amendment to an existing license, collaboration or other arrangement to include a Competing Program involving a Candidate Target.

1.26 "**Confidential Information**" of a Party means all Know-How, unpublished patent applications and other non-public information and data of a financial, commercial, business, operational or technical nature (including information comprising or relating to concepts, discoveries, inventions, data, designs or formulae) that is disclosed by or on behalf of such Party or any of its Affiliates or otherwise made available to the other Party or any of its Affiliates, whether made available orally, in writing or in electronic form in connection with this Agreement. The terms and conditions of this Agreement shall constitute the Confidential Information of both Parties.

1.27 "**Control**" or "**Controlled**" means the possession of the ability to grant a license or sublicense of, or access to, Patent Rights, Know-How, or other tangible or intangible rights as provided for herein, other than any such ability obtained pursuant to a license granted under this

Agreement, without violating the terms of any agreement or arrangement with any Third Party. Notwithstanding anything in this Agreement to the contrary, a Party (or an Affiliate of a Party, as applicable) shall be deemed not to Control any Patent Rights or Know-How or such other rights that are owned or controlled by a Third Party described in the definition of "Change of Control" or such Third Party's Affiliates (other than such Party and its Affiliates in existence immediately prior to such Change of Control), except to the extent such Patent Rights or Know-How or other rights: (a) arise from activities conducted by such Third Party or its Affiliates under this Agreement after such Change of Control; or (b) are developed or conceived by such Third Party or its Affiliates after such Change of Control using or incorporating such Party's or such Party's Affiliates' technology prior to such Change of Control, including any improvements thereto.

1.28 "**Cover**" means, with respect to a product and Patent Right, that but for a license granted to a Person under such Patent Right (or ownership thereof), the manufacture, use, or sale of such product by such Person would infringe a Valid Claim included in such Patent Right (considering pending patent applications under clause (b) of the definition of Valid Claims to be issued with the then-pending claims).

1.29 "**Directly Competing Product**" means, with respect to a Licensed Product, a product that is the subject of a Competing Program and that (a) [*]; (b) [*]; (c) [*]; and (d) [*].

1.30 "**Dollar**" means the U.S. dollar, and "$" shall be interpreted accordingly.

1.31 "**Effective Date**" means the first (1st) Business Day after the satisfaction or waiver of the conditions set forth in Section 12.4 of this Agreement.

1.32 **"EMA"** means the European Medicines Agency or any successor entity thereto.

1.33 "**EU**" means the European Union and its member states as of the Execution Date and any member states added during the Term, and will be deemed to include the United Kingdom.

1.34 "**Excluded Third Party Licenses**" means those agreements related to AAV manufacturing listed on **Exhibit A**.

1.35 "**Executive Officer**" means (a) with respect to Sangamo, the Chief Executive Officer (or equivalent) of Sangamo or (b) with respect to Kite, Executive Vice President, Oncology Therapeutics (or equivalent).

1.36 "**Existing Third Party Licensor**" means any licensor of an Existing Third Party License.

1.37 "**Existing Third Party Licenses**" means any agreements entered into by Sangamo with a Third Party prior to the Execution Date, including any amendments thereto as of the Execution Date, pursuant to which Sangamo Controls any Sangamo Technology, but excluding all Excluded Third Party Licenses. All Existing Third Party Licenses are listed on **Exhibit B**.

1.38 "**FDA**" means the United States Food and Drug Administration or any successor entity thereto.

1.39 "**Field**" means the treatment, adjuvant treatment or palliation of cancer.

1.40 "**Filing**" of a BLA or MAA means the acceptance for filing by a Regulatory Authority of such filed or submitted BLA or MAA.

1.41 "**Final AAV**" means an AAV that (a) [*], and (b) [*].

1.42 "**Final ZFN**" means a ZFN that (a) [*], and (b) [*].

1.43 "**First Commercial Sale**" means, with respect to a particular Licensed Product and country, the first sale in such country of such Licensed Product after Marketing Approval of such Licensed Product in such country.

1.44 "**FTE**" means the equivalent of a full time person, working for a minimum of [*] hours per year, conducting activities under a Research Plan, technology transfer activities, regulatory support activities, or other activities requested by Kite. In the case that any individual works partially on such activities under this Agreement and partially on other work in a given year, then the full-time equivalent to be attributed to such individual's work hereunder shall be equal to the percentage of such individual's total work time in such year that such individual spent working on such activities under this Agreement. In no event shall (a) any one individual be counted as more than one (1) FTE; or (b) indirect personnel (including support functions such as managerial, financial, legal or business development) constitute FTEs, except for research, development, regulatory and technical operations managers, in each case, who conduct activities under a Research Plan, technology transfer activities, regulatory support activities, or other activities requested by Kite. Alliance managers and project managers will constitute FTEs solely to the extent included in a budget under a JSC approved Research Plan.

1.45 "**FTE Rate**" means an initial rate of [*] per FTE per year. Commencing on January 1, 2019, the FTE Rate shall be changed annually [*]; provided that the FTE Rate will in no event be less than [*] per FTE per year.

1.46 "**GAAP**" means the U.S. generally accepted accounting principles, consistently applied.

1.47 "**GCP**" means the then current good clinical practice standards for clinical trials for pharmaceuticals, as set forth in the United States Food, Drug and Cosmetic Act, as amended from time to time, or other applicable law, and such standards of good clinical practice as are required by the Regulatory Authorities of the EU and other organizations and Governmental Authorities in countries for which the applicable Licensed Product is intended to be developed, to the extent such standards are not less stringent than United States GCP.

1.48 "**Genome Editing**" means [*].

1.49 "[*]" mean [*] that [*].

1.50 "**GLP**" means the then-current good laboratory practice standards promulgated or endorsed by the FDA as defined in 21 C.F.R. Part 58, or comparable regulatory standards in jurisdictions outside the United States.

1.51 "**Governmental Authority**" means any national, international, federal, state, provincial or local government, or political subdivision thereof, or any multinational organization or any authority, agency or commission entitled to exercise any administrative, executive, judicial, legislative, police, regulatory or taxing authority or power, any court or tribunal (or any department, bureau or division thereof, or any governmental arbitrator or arbitral body).

1.52 "**HSR Act**" means the Hart-Scott-Rodino Act of 1976.

1.53 "**Immune Cells**" means T-lymphocytes (T cells) and natural killer (NK) cells, including [*].

1.54 "**IND**" means any investigational new drug application, clinical trial application, clinical trial exemption or similar or equivalent application or submission for approval to conduct human clinical investigations filed with or submitted to a Regulatory Authority in conformance with the requirements of such Regulatory Authority.

1.55 "**IND Acceptance**" means, with respect to an IND, the earlier of (a) receipt by Kite, its Affiliate or a Sublicensee of written confirmation from a Regulatory Authority or other applicable Person that human clinical studies may proceed under such IND, and (b) expiration of the applicable waiting period after which human clinical studies may proceed under such IND.

1.56 "**Invention**" means any information, including discoveries, improvements, modifications, processes, methods, assay, designs, protocols, formulas, data, inventions, know-how and trade secrets, patentable or otherwise, that is discovered, generated, conceived and/or reduced to practice by or on behalf of a Party or its Affiliate or sublicensee pursuant to activities conducted under this Agreement, including all rights, title and interest in and to the intellectual property rights therein and thereto.

1.57 "[*] **Patents**" means all Patent Rights claiming [*].

1.58 "[*] **Patents**" means all Patent Rights claiming [*].

1.59 "**Kite Technology**" means all Know-How and Patent Rights that are Controlled by Kite or its Affiliates as of the Execution Date or during the Research Term and necessary or useful for Sangamo to perform its obligations under this Agreement.

1.60 "**Know-How**" means any information, including discoveries, improvements, modifications, processes, methods, assays, designs, protocols, formulas, data, inventions, know-how and trade secrets (in each case, patentable, copyrightable or otherwise), but excluding any Patent Rights, including Materials.

1.61 "**Law**" means any federal, state, local, foreign or multinational law, statute, standard, ordinance, code, rule, regulation, resolution or promulgation, or any order by any

Governmental Authority, or any license, franchise, permit or similar right granted under any of the foregoing, or any similar provision having the force or effect of law.

1.62 "**Licensed Product**" means an Auto Licensed Product, Allo HD Licensed Product or Allo UCL Licensed Product.

1.63 "**MAA**" or "**Marketing Authorization Application**" means an application to the appropriate Regulatory Authority outside of the U.S. for approval to market a Licensed Product (but excluding Pricing Approval) in any particular jurisdiction, and all amendments and supplements thereto.

1.64 "**Major EU Countries**" means France, Germany, Italy, Spain, and United Kingdom.

1.65 "**Major Market Countries**" means [*].

1.66 "**Marketing Approval**" means all approvals, licenses, registrations, or authorizations necessary for the commercial sale of a Licensed Product in a given country or regulatory jurisdiction. Marketing Approval shall include Pricing Approval if Pricing Approval is necessary for commercial sale of such Licensed Product in such country or regulatory jurisdiction.

1.67 "**Modified Cell**" means an Immune Cell that [*].

1.68 "**MRC Agreement**" means that certain Intellectual Property Agreement between Sangamo, as successor in interest to Gendaq Limited (formerly known as Endlock Limited), and the Medical Research Council, dated May 21, 1999.

1.69 "**Net Sales**" means the gross amount invoiced for sales of a Licensed Product by Kite, its Affiliates or Sublicensees to Third Parties, less:

(a) Normal and customary trade, cash and quantity discounts actually given, credits, price adjustments or allowances for damaged Licensed Products, returns or rejections of Licensed Products;

(b) Adjustments, allowances, credits, fees, reimbursements, chargeback payments and rebates (or the equivalent thereof) for Licensed Products granted to group purchasing organizations or other buying groups, managed health care organizations, pharmacy benefit management companies, health maintenance organizations and any other providers of health insurance coverage, health care institutions (including hospitals) or other health care organizations, Third Party health care administrators or patient assistance or other similar programs, or to federal, state/provincial, local and other governments, including their agencies, or to wholesalers, distributors or other trade customers;

(c) Compulsory payments and cash rebates related to the sales of such Licensed Product paid to a governmental authority (or agent thereof) pursuant to governmental regulations by reason of any national or local health insurance program or similar program, including required chargebacks and retroactive price reductions, to the extent allowed and taken; including

government levied fees as a result of healthcare reform policies, to the extent such fees are specifically allocated to sales of such Licensed Product as a percentage of Kite's, its Affiliate's or a Sublicensee's entire pharmaceutical product sales;

(d) Amounts invoiced for sales of Licensed Product that are written off as uncollectible after reasonable collection efforts, in accordance with standard practices of Kite; provided that any such amounts subsequently collected will be included in Net Sales for the period in which such amounts were collected;

(e) Reasonable and customary freight, shipping insurance and other transportation expenses, each directly related to the sale of the Licensed Products (if actually borne by Kite, its Affiliates or Sublicensees without reimbursement from any Third Party); and

(f) Sales or excise taxes, tariffs and duties, including, without limitation, VAT and U.S. sales tax, and all other taxes and government charges related to the sale of Licensed Product, in each case to the extent that each such item is actually borne by Kite, its Affiliates or Sublicensees without reimbursement from any Third Party (but excluding taxes properly assessed or assessable against the income derived by Kite, its Affiliates or Sublicensees from such sale).

The transfer of Licensed Products by Kite or one of its Affiliates or Sublicensees to another Affiliate or Sublicensee shall not be considered Net Sales, unless such Affiliate or Sublicensee is an end user. Net Sales will include the cash consideration received on a sale and the fair market value of all non-cash consideration. Disposition of Licensed Product for, or use of the Licensed Product in, clinical trials or other scientific testing, as free samples, or under named patient use, compassionate use, patient assistance, or test marketing programs or other similar programs or studies, in each case where the Licensed Product is provided at or below cost, shall not result in any Net Sales.

All discounts, allowances, credits, rebates, and other deductions shall be fairly and equitably allocated to the Licensed Product and other products or services of Kite, its Affiliates, and Sublicensees such that the Licensed Product does not bear a disproportionate portion of such deductions. In the event that any discounts, reductions, payments, or rebates are offered for a Licensed Product sold in a grouped set of products or services, the applicable discount, reduction, payment, or rebate for the Licensed Product in such set shall be based on the weighted average discount, reduction, payment, or rebate of such grouped set of products or services, each to the extent consistent with GAAP and Kite's, its Affiliate's, or Sublicensee's usual course of dealing for its products and services other than the Licensed Product.

The foregoing amounts shall be determined from the books and records of Kite, its Affiliates or Sublicensees maintained in accordance with GAAP, consistently applied. For clarity, if a single item falls into more than one of the categories set forth in clauses (a) to (f) above, such item may not be deducted more than once. With respect to Net Sales not denominated in U.S. Dollars, Kite shall convert such Net Sales from the applicable foreign currency into U.S. Dollars in accordance with Section 9.8.

Net Sales for a Combination in a country shall be calculated as follows:

(i) If the Modified Cell in such Combination and the Other Compounds each are sold separately in such country in the applicable Calendar Year and are not sold together at a single price point that is less than A+B, Net Sales will be calculated by multiplying the total Net Sales (as defined above) of the Combination by the fraction A/(A+B), where A is the public or list price in such country of the Modified Cell sold separately in the same formulation and dosage and for a comparable indication, and B is the (sum of the) public or list price(s) in such country of the Other Compounds sold separately in the same formulation and dosage and for a comparable indication, during the applicable Calendar Year.

(ii) If such Modified Cell is sold independently for the same formulation and dosage and for a comparable indication of the Other Compounds in such country in such Calendar Year, but the public or list price in such country of the Other Compounds cannot be determined, Net Sales will be calculated by multiplying the total Net Sales (as defined above) of such Combination by the fraction A/C, where A is the public or list price in such country of such Modified Cell sold independently and C is the public or list price in such country of the Combination during the applicable Calendar Year.

(iii) If the public or list price in such country of such Modified Cell cannot be determined and/or if the Modified Cell and Other Compound are sold together at a single price point that is less than A+B, the Parties shall discuss an appropriate allocation of Net Sales to the Modified Cell and to the Other Compounds in good faith based on an equitable method of determining the same that takes into account variations in potency, the relative contribution of each therapeutically active ingredient, and relative value to the end user of each therapeutically active ingredient. If the Parties fail to agree on such allocation, it will be determined by an independent Third Party expert agreed by the Parties, whose decision will be final and binding on the Parties.

For clarity, no allocation of Net Sales will be applied for a combination therapy in which a Modified Cell and one or more Other Compounds are each sold at a different price point and such Modified Cell is invoiced by Kite, its Affiliate or a Sublicensee and one or more of such Other Compounds are invoiced by a Third Party.

1.70 "**NKR**" means a Natural Killer activating receptor.

1.71 "**Other Compound**" means, with respect to a Modified Cell, (a) any pharmaceutically or therapeutically active compound or molecule that is not within, on the cell surface of, or secreted by, such Modified Cell or (b) any pharmaceutically or therapeutically active cell that is not such Modified Cell or another Modified Cell.

1.72 "**Other Sangamo Patent**" means any Sangamo Patent (excluding any Joint Patent) that [*].

1.73 "**Other Target**" means any Target other than the [*].

1.74 "**Patent Rights**" means all patents and patent applications (which for the purpose of this Agreement shall be deemed to include certificates of invention and applications for certificates of invention), including all divisionals, continuations, substitutions, continuations-in-

part, re-examinations, reissues, additions, renewals, revalidations, extensions, registrations and supplemental protection certificates and the like of any such patents and patent applications, and any and all foreign equivalents of the foregoing.

1.75 "**Person**" means any individual, partnership, limited liability company, firm, corporation, association, trust, unincorporated organization, Governmental Authority, or other entity.

1.76 "**Phase 1 Clinical Trial**" means a human clinical trial of a Licensed Product that would satisfy the requirements of 21 C.F.R. 312.21(a) or corresponding foreign regulations.

1.77 "**Phase 1/2 Clinical Trial**" means a Phase 1 Clinical Trial that (a) is also designed to satisfy the requirements of 21 C.F.R. 312.21(b) or corresponding foreign regulations; or (b) is subsequently optimized or expanded to satisfy the requirements of 21 C.F.R. 312.21(b) or corresponding foreign regulations.

1.78 "**Phase 2 Clinical Trial**" means a human clinical trial of a Licensed Product that would satisfy the requirements of 21 C.F.R. 312.21(b) and that is intended to explore a variety of doses, dose response, and duration of effect, and to generate evidence of clinical safety and effectiveness for a particular therapeutic indication or therapeutic indications in a target patient population, or a similar study prescribed by the relevant Regulatory Authorities in a country other than the United States.

1.79 "**Pivotal Clinical Trial**" means a human clinical trial of a Licensed Product that (a) would satisfy the requirements of 21 C.F.R. 312.21(c) or corresponding foreign regulations; or (b) that is intended to provide sufficient efficacy data to support the Filing of a BLA or MAA for such Licensed Product in such country.

1.80 "**PMDA**" means Japan's Pharmaceuticals and Medical Devices Agency or any successor entity thereto.

1.81 "**Pricing Approval**" means such governmental approval, agreement, determination or decision establishing prices for a Licensed Product that can be charged and/or reimbursed in regulatory jurisdictions where the applicable Governmental Authorities approve or determine the price and/or reimbursement of pharmaceutical products.

1.82 "[*] **Sangamo Patent"** means any Sangamo Patent (excluding Sangamo's interest in any Joint Patent) that [*].

1.83 "**Regulatory Authority**" means any applicable Governmental Authority responsible for granting INDs or Marketing Approvals for Licensed Products, including the FDA, EMA, PMDA and any corresponding national or regional regulatory authorities.

1.84 "**Regulatory Exclusivity**" means any exclusive marketing rights or data exclusivity rights conferred by any Regulatory Authority with respect to a biopharmaceutical product other than Patent Rights, including orphan drug exclusivity, new chemical entity exclusivity, data exclusivity, pediatric exclusivity, rights conferred in the United States under the

Hatch-Waxman Act, the FDA Modernization Act of 1997 or the Biologics Price Competition and Innovation Act, or rights similar thereto outside the United States.

1.85 "**Regulatory Materials**" means any regulatory application, submission, notification, communication, correspondence, registration and other filings and submissions made to, received from or otherwise conducted with a Regulatory Authority in order to research, develop, manufacture, or commercialize a Licensed Product in a particular country or jurisdiction. "Regulatory Materials" include all INDs, BLAs, MAAs and Marketing Approvals.

1.86 "**Sangamo Equivalent Product**" means, with respect to an Acquired Competing Product or Acquired Non-Competing Product, as applicable, a product that (a) [*], (b) [*], (c) [*], and (d) [*].

1.87 "**Sangamo Genome Technology**" means all Know-How and Patent Rights that are Controlled by Sangamo or its Affiliates as of the Execution Date or during the Term (excluding Sangamo's interest in any Joint Inventions and Joint Patents) that are (a) related to (i) Genome Editing using ZFNs [*]; and (b) necessary or useful to develop, manufacture, use, sell, offer for sale, import or otherwise commercialize a Modified Cell as part of a Licensed Product in the Field in the Territory; provided however that Sangamo Genome Technology shall exclude ZFN Design IP, Excluded Third Party Licenses, or any Know-How or Patent Rights licensed to Sangamo or its Affiliates by a Third Party pursuant to a license agreement that is not a Third Party License.

1.88 "[*] **Patents**" mean all Patent Rights claiming [*]. For clarity, [*].

1.89 "**Sangamo Patents**" means the Patent Rights included in (a) the Sangamo Genome Technology; or (b) the Sangamo Product Technology, and including for the avoidance of doubt, any Product-Specific Sangamo Patents. The Sangamo Patents existing as of the Execution Date are listed on **Exhibit C**.

1.90 "**Sangamo Product Technology**" mean all Know-How and Patent Rights that are Controlled by Sangamo or its Affiliates as of the Execution Date or during the Term (excluding Sangamo's interest in any Joint Inventions and Joint Patents) that are necessary or useful to develop, manufacture, use, sell, offer for sale, import or otherwise commercialize a Licensed Product in the Field in the Territory; provided however that Sangamo Product Technology shall exclude (a) Sangamo Genome Technology; [*].

1.91 **"Sangamo Technology**" means Sangamo Genome Technology and Sangamo Product Technology.

1.92 "**Stem Cells**" means cells that have the ability to renew and divide in culture or *in-vivo* and to give rise to multiple cell lineages and specialized cells, including Immune Cells. Stem Cells include renewable cell sources such as induced pluripotent stem cells ("**iPSCs**") and embryonic stem cells and hematopoietic stem and progenitor cells.

1.93 "**Sublicensee**" means (a) a Third Party to whom Kite or its Affiliates has granted or grants rights to develop, manufacture or commercialize a Licensed Product or (b) any further permitted sublicensee or other grantee of such rights (regardless of the number of tiers, layers or

levels of sublicenses or other grant of such rights), but in each case excluding for the avoidance of doubt, any distributors or subcontractors.

1.94 "**Target**" means any single antigen (and not a family of antigens) that is expressed on or in a human malignant tumor cell.

1.95 "**TCR**" means a T cell receptor comprising several subunits including (a) two heterologous protein subunits including an alpha chain encoded by the TCRA gene (HGNC ID12027) and a beta chain encoded by the TCRB gene (HGNC ID 12155); (b) two heterologous protein subunits including a gamma chain encoded by the TCRG gene (HGNC ID12271) and a delta chain encoded by the TCRD gene (HGNC ID12252); (c) the pre-TCR-alpha protein encoded by the PTCRA gene (HGNC:21290) or the murine counterpart, alone or in conjunction with an alpha, beta, gamma, or delta chain as defined in (a) and (b); or (d) a single molecule, heterodimer, chimera or any engineered variant of such alpha, beta, gamma, delta, pre-TCR-alpha human or murine chain combinations.

1.96 "**Territory**" means worldwide.

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

1.98 "**Third Party Licenses**" means the Existing Third Party Licenses and any Third Party agreement that is deemed to be a Third Party License pursuant to Section 2.5(b), including [*].

1.99 "**United States**" or "**U.S.**" means the United States of America, including its territories and possessions.

1.100 "[*]" means [*].

1.101 "**Universal Cell Lines**" means [*] created through the *ex vivo* use of [*].

1.102 "**Valid Claim**" means (a) a claim of an issued and unexpired patent (as may be extended through supplementary protection certificate or patent term extension or the like) that (i) has not been revoked or held unenforceable, unpatentable or invalid by a decision of a court or other governmental agency of competent jurisdiction that is not appealable or has not been appealed within the time allowed for appeal, and (ii) has not been abandoned, disclaimed, denied or admitted to be invalid or unenforceable through reissue, re-examination or disclaimer or otherwise, or (b) a claim of a pending patent application that has been pending less than [*] from the earliest date on which such patent application claims priority and which claim was filed and is being prosecuted in good faith and has not been cancelled, withdrawn or abandoned or finally rejected by an administrative agency action from which no appeal can be taken.

1.103 "**ZFN**" means a zinc finger nuclease polypeptide.

1.104 "[*]" means [*].

1.105 "**ZFN Design IP**" mean any Know-How or Patent Rights to the extent related to the design, screening or optimization of ZFNs, [*].

1.106 **Interpretation.** In this Agreement, unless otherwise specified:

(a) The words "include", "includes" and "including" shall be deemed to be followed by the phrase "without limitation".

(b) words denoting the singular shall include the plural and vice versa and words denoting any gender shall include all genders;

(c) the words "shall" and "will" have the same meaning;

(d) references to any specific law, rule or regulation, or article, section or other division thereof, will be deemed to include the then-current amendments thereto or any replacement or successor law, rule or regulation thereof;

(e) references to "days" will mean calendar days, unless otherwise specified;

(f) any definition of or reference to any agreement, instrument or other document herein will 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);

(g) words such as "herein", "hereof", and "hereunder" refer to this Agreement as a whole and not merely to the particular provision in which such words appear; and

(h) the Exhibits and other attachments form part of the operative provision of this Agreement and references to "this Agreement" shall include references to the Exhibits and attachments.

1.107 **Additional Definitions.** The following table identifies the location of definitions set forth in various Sections of the Agreement:

Definition	Section
Abandoning Party	**10.2(c)(ii)(2)**
[*]	**[*]**
Base Abandonment	**10.2(c)(ii)**
Base Patent Jurisdictions	**10.2(c)(i)**
[*]	**[*]**
Competing Program	**2.4(c)(i)(1)**
Confidentiality Agreement	**16.8**
Continuing Party	**10.2(c)(ii)(2)**
CREATE Act	**10.1(a)(iv)**
Development Plan	**5.2**
Disclosing Party	**11.1(a)**
Dispute	**16.5**
[*]	**[*]**
Indemnified Party	**15.3(a)**
Indemnifying Party	**15.3(a)**
Infringer	**10.3(b)**
Infringing Product	**10.3(a)**
iPSCs	**1.92**
Joint Inventions	**10.1(a)(iii)**
Joint Patents	**10.1(a)(iii)**
Joint Steering Committee or JSC	**3.1**
Joint Territories	**10.2(c)(i)**
[*]	**[*]**
Kite Indemnitees	**15.1**
Kite Withholding Tax Action	**9.11**
Liabilities	**15.1**
Materials	**4.11(a)**
[*]	**[*]**
Negotiation Period	**2.6**
Non-Base Abandonment	**10.2(c)(ii)**
Other Joint Patents	**10.2(c)(i)**
Product Infringement	**10.3(a)**
Product Marks	**10.7**
Project Team	**3.2**
Receiving Party	**11.1(a)**
Research Plan	**4.1**
Research Program	**4.1**
Research Term	**4.2**

Royalty Floor	**9.6(c)(iii)**
Royalty Term	**9.6(b)**
[*]	**[*]**
Sangamo Indemnitees	**15.2**
Sangamo Party	**6.3**
[*]	**[*]**
SEC	**11.5(b)**
[*]	**[*]**
Third Party Infringement	**10.4**
Term	**13.1**
[*]	**[*]**
[*]	**[*]**
ZFN License	**2.6**

ARTICLE 2
LICENSES

2.1 Licenses to Kite.

(a) Research License. Subject to the terms and conditions of this Agreement, Sangamo hereby grants to Kite a royalty-free, non-exclusive license, with the right to grant sublicenses only to its Affiliates and subcontractors, under the Sangamo Technology, Joint Patents and Joint Inventions, solely to conduct those research activities allocated to Kite in the Research Plans.

(b) Product License. Subject to the terms and conditions of this Agreement, Sangamo hereby grants to Kite an exclusive (even as to Sangamo), royalty-bearing license, with the right to grant sublicenses solely as provided in Section 2.1(c), under:

(i) the Sangamo Genome Technology and Sangamo's interest in Joint Inventions and Joint Patents, to:

(A) make and have made Final ZFNs and Final AAVs solely for the purposes set forth in (i)(B) below,

(B) use [*] *ex vivo* (1) on or in Immune Cells to generate Modified Cells solely for use in Licensed Products in accordance with (ii) below or (2) on or in Stem Cells to generate Universal Cell Lines solely for use to generate Modified Cells for use in Licensed Products in accordance with (ii) below, and

(C) make and have made, from the Modified Cells generated pursuant to (i)(B), additional quantities of such Modified Cells solely for use in Licensed Products in accordance with (ii) below; and

(ii) the Sangamo Product Technology and Sangamo's interest in Joint Inventions and Joint Patents, to:

(A) make and have made Licensed Products using the Modified Cells made through (i)(B) or (i)(C) above solely for the purposes set forth in (ii)(B) below and

(B) research, develop, use, sell, offer for sale, import, or otherwise commercialize such Licensed Products in the Field in the Territory.

For clarity, the license grant in this Section 2.1(b) to Sangamo Technology and Sangamo's interest in Joint Inventions and Joint Patents does not include the rights to make, have made, use, sell, offer

for sale, import or otherwise commercialize any pharmaceutically or therapeutically active ingredient that is (a) not a CAR, TCR, or NKR in a Modified Cell where each antigen to which such receptor is directed is a Candidate Target, or (b) a gene insertion (knock-in) or gene disruption (knock-out), in a Modified Cell, that is not identified in the applicable Research Plan.

(c) Sublicenses.

(i) Subject to the terms and conditions of this Agreement and the applicable Third Party Licenses, Kite may grant to one or more Affiliates or Third Parties (through one or more tiers) a sublicense under the licenses granted by Sangamo to Kite hereunder. Kite shall remain responsible for the performance of all of its Affiliates and Sublicensees to the same extent as if such activities were conducted by Kite, and shall remain responsible for any payments due hereunder with respect to activities of any of its Affiliates or Sublicensees.

(ii) Kite shall provide Sangamo with a copy of each executed agreement under which Kite grants a sublicense under the license granted in Section 2.1(b) to any Affiliates [*] or Sublicensee within thirty (30) days after execution thereof, which shall be treated by Sangamo as Kite's Confidential Information. With respect to those Existing Third Party Licenses identified on **Exhibit D** or any additional Third Party License added under Section 2.5(b) that require Sangamo to provide the applicable Third Party licensor a copy of any agreement with a Sublicensee or Affiliate of Kite that includes a sublicense under such Third Party License [*] or a summary of the terms of such agreement, [*]. Prior to providing a copy of such Sublicensee (or, if applicable, Affiliate) agreement to Sangamo, Kite may, [*], redact certain terms of any such agreement to the extent not pertinent to an understanding of a Party's obligations or benefits under this Agreement or a verification of compliance with the requirements of this Agreement; provided further, that [*].

(iii) Each agreement in which Kite grants a sublicense hereunder shall be subject to the applicable terms and conditions of this Agreement and any Third Party Licenses sublicensed to such Sublicensee or Affiliate, and shall expressly include (A) the terms set forth in **Exhibits D and D-1** with respect to each Existing Third Party License sublicensed to a Sublicensee or Affiliate and (B) a requirement to provide a copy of any agreement granting a sublicense thereunder to Kite for provision to the applicable Third Party licensor, in the case of each of (A) and (B), solely to the extent Kite is obligated to provide a copy of a written agreement with any Affiliate or Sublicensee pursuant to Section 2.1(c)(ii).

(iv) If Kite, its Affiliate, or a Sublicensee cannot grant further sublicenses under a particular Third Party License, then at Kite's request in conjunction with Kite's granting of a sublicense under this Section 2.1(c), or its Affiliate's or Sublicensee's granting of a further sublicense, Sangamo shall grant a sublicense under such Third Party License to such Affiliate or Sublicensee (or further Sublicensee) for no additional consideration to Sangamo (but subject to Section 2.1(c)(v)) and otherwise on terms that are consistent with the Third Party License, the sublicense granted by Kite to its Affiliate or such Sublicensee, and the terms of this Agreement.

(v) [*].

(d) Retained Rights. Notwithstanding the exclusive license granted by Sangamo to Kite, Sangamo retains the rights under the Sangamo Technology, Joint Inventions and Joint Patents solely to the extent necessary to exercise its rights and perform its obligations under this Agreement, whether directly or through one or more licensees or subcontractors.

2.2 License to Sangamo. Subject to the terms and conditions of this Agreement, Kite hereby grants to Sangamo a royalty-free, non-exclusive license, with the right to grant sublicenses only to its Affiliates and subcontractors, under the Kite Technology, Joint Patents and Joint Inventions, solely to conduct those activities allocated to Sangamo in the Research Plans or those activities performed by Sangamo at Kite's request in Sections 5.1(b), 6.1, 6.2 and 7.3.

2.3 No Implied Licenses; Negative Covenant. Except as expressly set forth herein, neither Party shall acquire any license or other intellectual property interest, by implication or otherwise, under or to any Patent Rights, Know-How, or other intellectual property owned or controlled by the other Party. Neither Party shall, nor shall permit any of its Affiliates or sublicensees to, practice any Patent Rights or Know-How licensed to it by the other Party outside the scope of the license granted to it under this Agreement; provided that, notwithstanding anything to the contrary in this Agreement, nothing in this Agreement shall be deemed to prevent or restrict in any way the ability of those employees of a Party or its Affiliates or other sublicensees, in each case, without use of Confidential Information of the other Party, to conduct any activities in the Territory, which activities would be allowed under any safe harbor, research exemption, government or executive declaration of urgent public health need, or similar right available in law or equity if conducted by a Third Party.

2.4 Exclusivity.

(a) During the Research Term. Subject to Sections 2.4(c), 2.4(d) and 2.4(e), during the Research Term, except for activities conducted under this Agreement, neither Party nor its Affiliates shall, whether for itself or any Third Party and including the grant or receipt of any license to or from any Third Party, research, develop, manufacture or commercialize in the Field, any product containing an engineered Immune Cell that, as a result of *ex vivo* Genome Editing, expresses or is capable of expressing on its cell surface a CAR, NKR, or TCR that is directed to any Target; provided, however, that [*].

(b) After the Research Term. Subject to Sections 2.4(c), 2.4(d) and 2.4(e), during the remainder of the Term after the end of the Research Term, except for activities conducted under this Agreement, neither Party nor its Affiliates shall, whether for itself or any Third Party and including the grant or receipt of any license to or from any Third Party, develop, manufacture or commercialize in the Field, any product containing an engineered Immune Cell that, as a result of *ex vivo* Genome Editing, expresses or is capable of expressing on its cell surface a CAR, NKR, or TCR that is directed to any Candidate Target.

(c) Exceptions for Acquired Competing Program, Collaboration, or Change of Control.

(i) **By Sangamo**.

(1) Acquired Competing Programs. Notwithstanding Sections 2.4(a) and 2.4(b), in the event that Sangamo or its Affiliate acquires a Third Party or a portion of the business of a Third Party (whether by merger, stock purchase or purchase of assets) that is, prior to such acquisition, conducting a research, development, manufacturing or commercialization program with respect to a Target or Candidate Target, which program, if conducted by a Party or its Affiliate at such time, would be a breach of such Party's exclusivity obligations set forth above (a "**Competing Program**"), Sangamo shall either (A) wind-down such Competing Program promptly following the closing of such acquisition, or (B) use Commercially Reasonable Efforts to divest such Competing Program promptly following the closing of such acquisition and in any event within [*] after the closing of such acquisition; provided that if Sangamo elects option (B), (I) such time period shall be extended, and Sangamo shall not be in breach of Section 2.4(a) or 2.4(b), if at the expiration of such time period (and any extensions thereto), Sangamo provides competent evidence of reasonable ongoing efforts to divest such Competing Program; and (II) Sangamo shall cease all research (solely during the Research Term), development and commercialization activities with respect to such Competing Program if Sangamo has not completed such divestment within [*] after the closing of such acquisition (it being understood that Sangamo may thereafter continue its efforts to divest such asset). For clarity, if Sangamo elects option (B), the continued conduct of such Competing Program during such [*] period shall not be deemed a breach of Sangamo's exclusivity obligations set forth herein, provided that such Competing Program is conducted independently of Sangamo's activities under this Agreement and [*].

(2) Change of Control. In the event of a Change of Control of Sangamo, Sections 2.4(a) and 2.4(b), as applicable, shall not apply to the subject matter of any Competing Program that (A) is owned or controlled by a Third Party described in the definition of "Change of Control" or its Affiliates prior to or as of the closing of such Change of Control, or (B) becomes owned or controlled by such Third Party or its Affiliates after the closing of such Change of Control, in each case if such Competing Program is conducted independently of Sangamo's activities under this Agreement and [*]; provided further that, [*] following consummation of such Change of Control, [*].

(ii) **By Kite**.

(1) Acquired Competing Products. Notwithstanding Sections 2.4(a) and 2.4(b),

(a) if Kite or its Affiliate enters into either a Competing Collaboration with one or more Directly Competing Product(s) or a Competing Acquisition where the primary purpose of such Competing Acquisition was to obtain Directly Competing Products, then Kite shall have [*] following the effective date of the closing of such transaction to elect one of the following actions with respect to such Acquired Competing Product(s) upon written notice to Sangamo: [*]; and

(b) if Kite or its Affiliate acquires one or more Directly Competing Product(s) in a Competing Acquisition where acquisition of such Directly Competing Product(s) was not the primary purpose of such Competing Acquisition, then Kite shall have [*] following the effective date of the closing of such Competing Acquisition to elect one of the following actions with respect to each such Acquired Competing Product upon written notice to Sangamo: [*].

(2) [*]. Notwithstanding Sections 2.4(a) and 2.4(b), if Kite or its Affiliates enters into a Competing Collaboration or a Competing Acquisition that contains an Acquired Non-Competing Product, then with respect to such Acquired Non-Competing Product: (a) Kite and its Affiliates shall [*]; (b) Kite shall [*]; (c) Sangamo and its Affiliates shall [*]; and (d) Sections 2.4(a) and 2.4(b) shall otherwise continue to apply with respect to [*]. For the avoidance of doubt, [*] on account of acquisition of any Acquired Non-Competing Products.

(3) [*]. Notwithstanding Section 2.4(a), during the Research Term, in the event that Kite or its Affiliate (a) acquires a Competing Program involving a Target, whether by [*].

(4) [*]. If Kite elects to terminate this Agreement with respect to Licensed Product(s) corresponding to the Acquired Competing Product(s), then (a) Sections 2.4(a) and 2.4(b) will terminate [*] with respect to the [*]; (b) Kite will [*]; (c) Kite and its Affiliates shall [*]; and (d) Sangamo and its Affiliates shall [*]. Kite's election to terminate this Agreement with respect to the Licensed Product corresponding to the Acquired Competing Product will [*] or [*].

> *For example*, consider the following hypothetical situation: the Parties are developing [*], and [*]. If Kite acquires from a Third Party, [*], such product shall be deemed [*]. If Kite elects to terminate this Agreement with respect to [*], then: (i) this Agreement would terminate with respect to [*], (ii) Sections 2.4(a) and 2.4(b) would terminate with respect to [*], (iii) the Agreement would remain in effect with respect to [*], (iv) Kite and its Affiliates would [*], (v) Sangamo and its Affiliates would [*], (vi) Sections 2.4(a) and 2.4(b) would otherwise continue to apply [*] with respect to [*], and (vii) Kite would [*].

(5) [*].

(6) [*].

(7) Consequences of Divestment. If Kite elects to divest a Directly Competing Product above, Kite shall use Commercially Reasonable Efforts to complete such divestment within [*] after the effective date of closing of such transaction; provided that such [*] period shall be extended, and Kite shall not be in breach of Section 2.4(a) or 2.4(b), if (a) at the expiration of such time period (and any extensions thereto), Kite provides competent evidence of reasonable ongoing efforts to divest such Directly Competing Product, and Kite ceases all research (solely during the Research Term), development and commercialization activities with respect to such Directly Competing Product within [*] after the closing of such transaction (it being understood that Kite may thereafter continue its efforts to divest such asset) and (b) such Directly Competing Product is conducted independently of Kite's activities under this Agreement and [*].

(8) Change of Control. In the event of a Change of Control of Kite, Sections 2.4(a) and 2.4(b), as applicable, shall not apply to the subject matter of any Competing Program that (A) is owned or controlled by a Third Party described in the definition of "Change of Control" or its Affiliates prior to or as of the closing of such Change of Control, or (B) becomes owned or controlled by such Third Party or its Affiliates after the closing of such Change of Control, in each case if such Competing Program is conducted independently of Kite's activities under this Agreement and [*]; provided further that, [*] following consummation of such Change of Control, [*].

(d) **Sangamo Exception**. Kite acknowledges that Sangamo, prior to the Execution Date, entered into agreements pursuant to which it granted licenses to Third Parties with respect to [*], and that such licenses are not prohibited by this Section 2.4. Kite also acknowledges that Sangamo, prior to the Execution Date, entered into material transfer agreements with [*], and that the performance of such material transfer agreements are not prohibited by this Section 2.4.

(e) **Kite Exceptions**.

(i) **[*]**. Sangamo acknowledges that Kite, prior to the Execution Date, entered into an agreement with [*] with respect to the [*], and that such continued activities are not prohibited by this Section 2.4; provided that (a) [*]; and (b) [*].

(ii) **[*]**. At Kite's election, provided by written notice to Sangamo, the exclusivity obligations of each Party set forth in Section 2.4(a) during the Research Term shall not apply with respect to (a) any Target for which [*]; (b) any Candidate Target for which [*]; or (c) any Target that [*].

(iii) **[*]**. In addition, at Kite's election, provided by written notice to Sangamo, the exclusivity obligations of Kite set forth in Section 2.4(b) after the Research Term shall not apply with respect to any Licensed Product for which (a) [*]; and (b) [*]. For clarity, during the period of exclusivity with respect to such Licensed Product, Kite and its Affiliates shall [*].

(iv) **[*]**. Notwithstanding Sections 2.4(a) and 2.4(b), Kite and its Affiliates may [*] and [*] shall not be deemed a breach of its exclusivity obligations set forth in such sections if [*] and [*].

2.5 **Third Party Licenses**.

(a) **Terms of Third Party Licenses**. Kite acknowledges that the licenses granted to Kite in Section 2.1 include sublicenses under certain Sangamo Technology that is licensed to Sangamo pursuant to Third Party Licenses and that such sublicenses are subject to those terms and conditions of such Third Party Licenses, which are (i) set forth on **Exhibits D and D-1**, in the case of Existing Third Party Licenses, or (ii) disclosed to Kite in accordance with Section 2.5(b) in the case of other Third Party Licenses.

(b) **Additional Third Party License**. If Sangamo or any of its Affiliates desires to enter into any agreement with a Third Party after the Execution Date to obtain a license from

such Third Party to any Know-How or Patent Rights that are necessary or useful to manufacture, use, or commercialize any Licensed Product (including related Final ZFNs and [*]) in the Field, other than licenses for [*].

(c) In the event that Sangamo receives written notice of an alleged material breach by Sangamo or its Affiliates under any Third Party License, where termination of such Third Party License or any diminishment of the licenses granted to Kite under the Sangamo Technology is being or could be sought by the Third Party licensor, then Sangamo will promptly, but in no event less than [*] days thereafter, provide written notice thereof to Kite and grant Kite the right (but not the obligation) to cure such alleged breach, and if Kite elects to and does cure such breach, then Kite may offset any such reasonable out-of-pocket costs and expenses incurred by or on behalf of Kite or any of its Affiliates or Sublicensees in connection with curing such breach against Kite's future payment obligations to Sangamo under this Agreement. Each Party shall notify the other Party if it intends to cure such breach and again promptly after curing such breach.

(d) In the event that the Third Party License is terminated by the applicable Third Party licensor, and such Third Party license permits the sublicense to survive, Kite will have the right, at Kite's election, to convert the sublicenses granted under this Agreement by Sangamo to a direct license from the applicable Third Party licensor to Kite on the terms and conditions contained in such Third Party License, or such other terms and conditions as may be negotiated by Kite and the applicable Third Party licensor, and Sangamo will cooperate with Kite and its Affiliates to effectuate such direct license. In the event Kite enters into any such direct license with a Third Party licensor, Kite may offset any such reasonable out-of-pocket costs and expenses incurred by or on behalf of Kite or any of its Affiliates or Sublicensees in connection with entering into and exercising its rights or performing under such direct license to the extent that Sangamo would have borne such costs if the applicable Third Party License had not been terminated, against Kite's future payment obligations to Sangamo under this Agreement.

2.6 Right of First Negotiation. Sangamo hereby grants to Kite a right of first negotiation to obtain from Sangamo a license to [*] (a "**ZFN License**") as follows. If, at any time during [*], Sangamo or any Affiliate wishes to grant to a Third Party a ZFN License with respect to [*], Sangamo shall notify Kite in writing. If Kite desires to obtain such a ZFN License, Kite shall promptly notify Sangamo and, during the [*] period after the receipt of the notice from Sangamo regarding such ZFN License (the "**Negotiation Period**"), Kite and Sangamo shall negotiate exclusively and in good faith to agree upon the terms and conditions of and enter into a definitive agreement pursuant to which Sangamo will grant such a ZFN License to Kite. If Kite does not wish to obtain such a ZFN License, or if the Parties do not enter into a definitive agreement for such a ZFN License before the expiration of the Negotiation Period, then Sangamo shall be free to negotiate with any Third Party with respect to such a ZFN License and to grant such a ZFN License to any Third Party, without any further obligations to Kite. For clarity, the foregoing right of first negotiation shall expire and shall no longer apply [*] after the expiration of [*].

2.7 Right of First Notice. Sangamo hereby grants to Kite a right of first notice with respect to commercial licensing to and collaboration with Third Parties regarding certain products

[*] as follows. If Sangamo wishes to grant a Third Party a license under Sangamo Technology to, or otherwise collaborate with a Third Party to, develop and commercialize any product that [*], Sangamo shall, with respect to [*], (a) notify Kite in writing, (b) not enter into, or allow any of its Affiliates to enter into, any agreement with a Third Party for such a license or collaboration during the [*] period after such notice, and (c) have no further obligation to Kite after the expiration of such [*] period. The foregoing right of first notice shall expire and no longer apply after the earlier of (i) [*]; and (ii) the date of [*], as applicable.

ARTICLE 3
GOVERNANCE

3.1 Joint Steering Committee. Within thirty (30) days after the Effective Date, the Parties shall establish a joint steering committee (the "**Joint Steering Committee**" or the "**JSC**"), composed of three (3) senior officers of each Party or its Affiliate, to manage the overall collaboration of the Parties under this Agreement. The JSC shall in particular:

(a) coordinate the activities of the Parties under this Agreement, including facilitating communications between the Parties with respect to the research, development, manufacture and commercialization of Licensed Products;

(b) provide a forum for the discussion of the development, manufacture and commercialization of Licensed Products;

(c) review and approve each Research Plan and amendment thereto, and supervise the execution of the Research Plans in multiple functional areas, such as research, CMC and regulatory strategy;

(d) review and approve, as a [*] or Final ZFN, as appropriate, each [*] or ZFN that is nominated as such by a Party and meets the criteria therefor set forth in the applicable Research Plan;

(e) direct and oversee the operation of the Project Team and any other joint subcommittee established by the JSC, including resolving any disputed matter of such Committees;

(f) determine the strategy and review procedure for scientific publications and presentations pertaining to the Licensed Products in accordance with Section 11.4;

(g) establish additional joint subcommittees as it deems necessary or advisable to further the purpose of this Agreement; and

(h) perform such other functions as appropriate to further the purposes of this Agreement, as expressly set forth in this Agreement or allocated to it by the Parties' written agreement.

3.2 Project Team. Within thirty (30) days after the Effective Date, the Parties shall establish a joint project team (the "**Project Team**") composed of at least two (2) representatives

of each Party, to monitor and coordinate the conduct of the Research Program under all Research Plans. Each Project Team representative shall have knowledge and expertise in the research and development of products similar to the Licensed Products and the Project Team shall include a project manager from each Party. The Project Team shall in particular:

(a) coordinate the activities of the Parties under the Research Plans and oversee the implementation of the Research Plans;

(b) prepare updates and amendments to existing Research Plans and new Research Plans for additional Licensed Products, and submit such revised or new Research Plans to the JSC for review and approval;

(c) provide a forum for and facilitate communications between the Parties with respect to the research projects conducted under the Research Plans; and

(d) perform such other functions as may be appropriate to further the purposes of this Agreement with respect to the research and development of the Licensed Products, as directed by the JSC.

3.3 Committee Membership and Meetings.

(a) Committee Members. Each Committee representative shall have appropriate knowledge and expertise and sufficient seniority (including budgetary authority, as applicable) within the applicable Party to make decisions (if any) arising within the scope of the applicable Committee's responsibilities. Each Party may replace its representatives on any Committee on written notice to the other Party, but each Party shall strive to maintain continuity in the representation of its Committee members. Each Party shall appoint one (1) of its representatives on each Committee to act as a co-chairperson of such Committee. The co-chairpersons or project managers shall jointly prepare and circulate agendas to Committee members before each Committee meeting and shall direct the preparation of reasonably detailed minutes for each Committee meeting, which shall be approved by the co-chairpersons and circulated to Committee members within thirty (30) days of such meeting.

(b) Meetings. Each Committee shall hold meetings at such times as it elects to do so, but at least once every three (3) months. Meetings of any Committee may be held in person, by audio or video teleconference; provided that unless otherwise agreed by both Parties, at least one (1) meeting per year for each Committee shall be held in person, and all in-person Committees shall be held at locations in the U.S. to be selected by the Parties. Each Party shall be responsible for all of its own expenses of participating in any Committee meetings. No action taken at any meeting of a Committee shall be effective unless at least one representative of each Party is participating.

(c) Non-Member Attendance. Each Party may from time to time invite a reasonable number of participants, in addition to its representatives, to attend the Committee meetings in a non-voting capacity; provided that if either Party intends to have any Third Party (including any consultant) attend such a meeting, such Party shall provide prior written notice to the other Party and obtain the other Party's approval for such Third Party to attend such meeting,

which approval shall not be unreasonably withheld or delayed. Such Party shall ensure that such Third Party is bound by confidentiality and non-use obligations consistent with the terms of this Agreement.

3.4 Decision-Making. All decisions of each Committee shall be made by unanimous vote, with each Party's representatives collectively having one (1) vote. If after reasonable discussion and good faith consideration of each Party's view on a particular matter before the Project Team or a subcommittee of the JSC and within the scope of its authority, the representatives of the Parties cannot reach an agreement as to such matter within five (5) Business Days after such matter was brought to such Committee for resolution, such disagreement shall be referred to the JSC for resolution. If after reasonable discussion and good faith consideration of each Party's view on a particular matter before the JSC and within the scope of its authority, the representatives of the Parties on the JSC cannot reach an agreement as to such matter within [*] Business Days after such matter was brought to the JSC for resolution or after such matter has been referred to the JSC, such disagreement shall be referred to the Executive Officers for resolution. If the Executive Officers cannot resolve such matter within [*] Business Days after such matter has been referred to them, then, except with respect to [*], which must be mutually agreed upon by the Parties, Kite shall have the final decision-making authority, which includes for the avoidance of doubt, [*]; provided, however, that (a) such decision by Kite shall be consistent with the terms of this Agreement, and (b) Kite shall not exercise such final decision-making authority beyond the scope of authority delegated to the JSC under this Agreement. For clarity, Kite shall not have the final decision-making authority to: [*].

3.5 General Committee Authority. Each Committee shall have solely the powers expressly assigned to it in this Article 3 and elsewhere in this Agreement. No Committee shall have any power to interpret, amend, modify, or determine or waive compliance with, this Agreement.

3.6 Discontinuation of Participation on a Committee. The activities to be performed by each Committee shall solely relate to governance under this Agreement, and are not intended to be or involve the delivery of services. Each Committee shall continue to exist until the first to occur of: (a) the Parties mutually agreeing to disband the Committee; (b) Sangamo providing written notice to Kite, at any time after [*], of Sangamo's intention to disband and no longer participate in such Committee; or (c) Kite providing written notice to Sangamo, at any time after [*], of Kite's intention to disband and no longer participate in such Committee. Once a Committee is disbanded, such Committee shall have no further obligations under this Agreement and, thereafter, each Party shall designate a contact person, who may be the project manager, for the exchange of information under this Agreement and decisions of such Committee shall be decisions as between the Parties (and failure to agree shall be resolved in accordance with Section 3.4 as if such decision were a JSC decision), subject to the other terms and conditions of this Agreement.

ARTICLE 4
RESEARCH PROGRAM

4.1 General. Subject to the terms and conditions of this Agreement, the Parties desire to establish a research and preclinical development program (the "**Research Program**") under

which the Parties will collaborate to conduct research and preclinical development activities pursuant to one or more mutually agreed research plans (each, a "**Research Plan**"), with each Research Plan directed to the research and early development of one Licensed Product through IND Acceptance for such Licensed Product.

4.2 Research Term. The initial term of the Research Collaboration (the "**Research Term**") shall be the [*] period after the Effective Date. Kite shall have the option to extend the Research Term for up to [*] additional periods of [*] each. Kite may exercise the extension option by providing written notice to Sangamo no later than [*] before the expiration of the then-current Research Term, which notice shall be accompanied by a non-refundable, non-creditable extension payment of [*] for each extension. All research activities assigned to Sangamo under the Research Plans will need to be completed before the end of the Research Term; provided, however, that if any such activity is delayed beyond the end of the Research Term due primarily to factors within Sangamo's reasonable control, then Sangamo shall use Commercially Reasonable Efforts to complete such research activities promptly after the end of the Research Term, without any extension payment by Kite.

4.3 Research Plans.

(a) The JSC shall use Commercially Reasonable Efforts to agree on and approve a Research Plan for each Licensed Product to be developed hereunder, and all Research Program activities shall be conducted pursuant to the agreed upon Research Plans. The Research Plan for a particular Licensed Product shall set forth the timeline and details of all research activities to be conducted by the Parties [*] used to make such Licensed Product [*], and go/no-go success criteria for such Licensed Product. Each Research Plan shall identify the genes of interest for *ex vivo* use of ZFNs to achieve the desired disruption (knock-out) and/or knock-in phenotype. Each Research Plan shall also include activities to [*].

(b) Each Research Plan shall be developed by the Parties through the Project Team and subject to approval by the JSC. As of the Effective Date, the Parties have agreed upon [*] initial Research Plans, [*]. Such initial Research Plans are attached hereto as **Exhibit E**. From time to time, and on at least an annual basis, the Project Team shall prepare appropriate amendments to the then-current Research Plans, including updated budgets, and shall prepare new Research Plans for additional Licensed Products. In addition, if at any time Sangamo anticipates exceeding the budget under a Research Plan, or believes that amendments to any Research Plan are appropriate based on results of activities conducted under such Research Plan, Sangamo may prepare an amendment to the Research Plan for the Project Team's review and approval. If Kite desires that Sangamo modify any Final ZFN or [*], Kite may propose that the Project Team prepare a new Research Plan or amendment to a Research Plan to include the relevant activities by Sangamo. The Project Team shall submit such amendments and new Research Plans to the JSC for review and approval. Each Party's Committee members shall consider in good faith all such amendments proposed by the other Party. Each such amended or new Research Plan shall become effective only upon approval by the JSC. Each Research Plan shall be consistent with the terms of this Agreement and shall form a part of this Agreement. In the event of an inconsistency between a Research Plan and this Agreement, the terms of this Agreement will prevail.

4.4 Selection of Candidate Targets.

(a) Kite will have the right to nominate one or more Other Targets by written notice to Sangamo to include in the Research Program under the Agreement. Promptly following such written nomination by Kite, the Project Team shall prepare a Research Plan to research and pre-clinically develop a Licensed Product directed to such Other Target, and the Project Team shall submit such Research Plan to the JSC for review and approval. Once the JSC approves a Research Plan for a Licensed Product directed to such Other Target, such Other Target shall become a Candidate Target under this Agreement. Notwithstanding the foregoing, the JSC shall not be permitted to approve a Research Plan for any Other Target during the last [*] of the Research Term or after the expiration or termination of the Research Term.

(b) If Sangamo believes at any time that [*]. If all Research Plans for all Licensed Products directed to a Candidate Target are terminated (and none have been completed), then at such time, such Candidate Target shall no longer be considered a Candidate Target under this Agreement. After the completion (but not early termination) of a Research Plan for a Candidate Target, such Candidate Target shall remain a Candidate Target unless terminated (or deemed terminated) by Kite pursuant to Section 13.2(a).

4.5 Allocation of Research Responsibilities. The Research Plan shall reasonably allocate research activities between the Parties in order to best utilize each Party's expertise and resources, and are currently anticipated to be allocated as follows:

(a) Sangamo shall be responsible for: [*]; and

(b) Kite shall be responsible for all other activities necessary or useful for the research and early development of the applicable Licensed Product [*].

4.6 Substitute Genes. The JSC may amend the Research Plans to include additional genes or substitute genes to be edited using *ex vivo* use of Final ZFNs.

4.7 Research Cost. Kite shall reimburse Sangamo, in accordance with Section 9.2, for those documented costs and expenses that Sangamo incurs with respect to activities assigned to it under the JSC-approved Research Plans.

4.8 Conduct of Research. Each Party shall use Commercially Reasonable Efforts to carry out the activities assigned to it under the Research Plans in accordance with the timeline therefor contemplated by the applicable Research Plan and shall conduct such activities in good scientific manner, in compliance with all applicable Laws in all material respects, including where applicable, cGMP, GLP and GCP.

4.9 Research Records. Each Party shall maintain, and cause its Affiliates and their respective employees and subcontractors to maintain, records and laboratory notebooks of its activities under the Research Plans in sufficient detail and in a good scientific manner appropriate for regulatory and intellectual property protection purposes, which records and laboratory notebooks shall be segregated from other research activities not performed under this Agreement.

Such records and laboratory notebooks shall be complete and accurate in all material respects and shall fully and properly reflect all work done, data and developments made, and results achieved.

4.10 Research Reports. Each Party shall keep the other Party reasonably informed on the status, progress and results of its activities under the Research Plans through the regularly scheduled Project Team meetings. At least two (2) Business Days before each Project Team meeting, each Party shall submit to the Project Team a written summary of such activities since its prior report. The Project Team shall review and discuss the results, status and progress of the Research Program. Without limiting the foregoing, Sangamo shall provide Kite with a final written report within [*] of the completion or earlier termination of such Research Plan, which report will summarize the research activities undertaken and all accomplishments achieved under such Research Plan and contain a copy of all results generated by Sangamo in the performance of such Research Plan (other than [*]). All such reports shall be deemed Kite's Confidential Information.

4.11 Materials.

(a) To facilitate the conduct of the Research Program or the performance of other activities under this Agreement, either Party may provide to the other Party certain biological materials or chemical compounds Controlled by the supplying Party for use by the other Party to conduct its obligations pursuant to one or more Research Plans including those materials to be provided by Sangamo to Kite as part of the technology transfer and process development assistance (such materials or compounds and any progeny and derivatives thereof, collectively, "**Materials**"). All such Materials shall remain the sole property of the supplying Party, but be subject to the licenses granted herein, shall be used only in the fulfillment of obligations or exercise of its rights under this Agreement, shall not be used or delivered to or for the benefit of any Third Party without the prior written consent of the supplying Party (except as permitted by Section 2.1(c) or 4.12), and except as provided under Section 4.11(b), shall not be used in research or testing involving human subjects, unless expressly agreed in writing by the supplying Party. Except as provided under Section 4.11(b), the Materials are supplied "as is" and must be used with prudence and appropriate caution in any experimental work, since not all of their characteristics may be known.

(b) As and to the extent set forth in the Research Plan [*] that is attached hereto as **Exhibit E** or any amendment to any such Research Plan, Sangamo may supply to Kite GMP-grade [*] and Final ZFNs in accordance with the terms set forth on **Exhibit F**.

4.12 Subcontractors. Each Party may engage subcontractors to perform any activities assigned to it under the Research Plans. Each contract between a Party and a subcontractor shall be consistent with the provisions of this Agreement and shall include provisions, including intellectual property provisions, adequate for the other Party to enjoy the licenses and rights granted hereunder as though such Party had performed the contracted work itself. Each Party shall be responsible for the management of its subcontractors and shall remain directly responsible for its obligations to conduct the activities assigned to it under the Research Plans that have been delegated or subcontracted to any subcontractor, and shall be directly responsible for the performance of its subcontractors.

ARTICLE 5
DEVELOPMENT

5.1 General.

(a) Subject to the terms and conditions of this Agreement, as between the Parties, Kite will be solely responsible for the development of each Licensed Product in the Field after the completion of the applicable Research Plan, at Kite's sole cost and expense.

(b) Upon Kite's request, Sangamo shall provide reasonable assistance to Kite in connection with assay development and preclinical development conducted as part of Kite's development of Licensed Products in the Field pursuant to Section 5.1(a), including by making its technical personnel reasonably available to Kite for consultation. [*].

5.2 Development Plans. The development of each Licensed Product under this Agreement after the completion of the applicable Research Plan shall be conducted pursuant to a development plan (each, a "**Development Plan**"). The Development Plan for a particular Licensed Product shall set forth a general timeline and all material development activities to be conducted in the Field [*].

5.3 Development Diligence. Kite shall (either directly or through one or more Affiliates or Sublicensees) use Commercially Reasonable Efforts [*].

5.4 Development Costs. Kite shall be solely responsible for all costs and expenses incurred in the development of the Licensed Products under this Agreement.

5.5 Development Reports. The Parties have agreed on the format and required content of the written reports that Kite will provide for the development of the Licensed Products, which is set forth in **Exhibit G** attached hereto. Kite shall provide the JSC (or Sangamo, if the JSC has been disbanded) with [*] written report in accordance with **Exhibit G**. Upon Sangamo's reasonable request, Kite shall discuss the information in such report with Sangamo and Kite shall timely respond to Sangamo's reasonable questions or requests for additional information relating to the development of the Licensed Products in the Field.

ARTICLE 6
REGULATORY

6.1 Regulatory Strategies and Responsibilities.

(a) Except as provided under Section 6.1(c) herein, as between the Parties, Kite shall be responsible for all regulatory affairs for the Licensed Products in the Field, including the preparation and filing of the IND, BLA, MAA and other Regulatory Materials for the Licensed Products in the Field, at its sole expense.

(b) Kite shall provide Sangamo with notice of each IND Acceptance, BLA Filing or approval, and MAA Filing or approval, in each case, with respect a Regulatory Authority

in any Major Market Country (including the EMA) for a Licensed Product in a timely manner after the submission or receipt thereof.

(c) Upon Kite's request, Sangamo shall provide reasonable assistance to Kite in connection with the regulatory activities for the Licensed Products in the Field, including the preparation of the relevant Regulatory Materials. [*].

6.2 Meetings with Regulatory Authorities. At Kite's request, Sangamo shall provide input to Kite in preparation for any in-person meeting or teleconference with a Regulatory Authority (or related advisory committees), and shall provide assistance to Kite in responding to any request of a Regulatory Authority that relates to any Licensed Product, [*].

6.3 Notice for Certain Regulatory Actions. In the event that Kite issues a recall, market withdrawal, or takes any other similar action in connection with any Licensed Product in the Field, and Kite in its reasonable judgment determines that such action is reasonably related to the Final ZFN used to manufacture such Licensed Product, then [*]. For clarity, Kite shall have the sole right to decide and control such action at its own cost and expense. In the event that Sangamo, its Affiliates, or any of its licensees or sublicensees (a "**Sangamo Party**") issues a recall, market withdrawal, or takes any other similar action in connection with any product using a Final ZFN, and the applicable Sangamo Party in its reasonable judgment determines that such action is reasonably related to the Final ZFN used to manufacture such product, then [*].

ARTICLE 7
MANUFACTURING AND SUPPLY

7.1 General. [*], as between the Parties, Kite shall be solely responsible for the manufacture and supply of all Licensed Products for use in the Field, including the mRNA encoding the Final ZFNs, the [*], and all other components of such Licensed Products, at Kite's sole cost and expense.

7.2 Technology Transfer. At Kite's request, Sangamo shall provide to Kite or its designee [*] information in Sangamo's possession and Control (but excluding any information licensed by Sangamo under Excluded Third Party Licenses) to the extent necessary for or used by or on behalf of Sangamo in the (i) non-GMP manufacture of the Final ZFNs and [*] for use in the Licensed Product and (ii) the manufacture of the GMP-grade [*] and Final ZFNs provided by Sangamo pursuant to Section 4.11(b). Sangamo shall cooperate with Kite in good faith to enable a smooth transfer of such materials. Kite acknowledges that [*]. Sangamo shall not be under any obligation to [*], provided however, that Sangamo shall [*], and Kite shall [*].

7.3 Process Development and Technology Transfer.

(a) Except for the assistance to be provided by Sangamo pursuant to Section 7.3(b), Kite shall (either by itself or through its Affiliates or a Third Party contractor manufacturer) be responsible for process development for manufacturing of Licensed Products for use in the Field, as part of a Research Plan or thereafter, at Kite's sole cost and expense.

(b) Upon Kite's request, Sangamo shall provide reasonable assistance to Kite in connection with the technology transfer set forth in Section 7.2 and the manufacture process development for the mRNAs encoding the Final ZFNs and [*], including by making its technical personnel reasonably available to Kite for consultation and introducing Kite to Sangamo's existing contract manufacturer(s) for [*] manufacturing. [*]

ARTICLE 8
COMMERCIALIZATION

8.1 General. Subject to the terms and conditions of this Agreement, as between the Parties, Kite shall be solely responsible, at its sole cost and expense, for commercialization of Licensed Products in the Field in the Territory.

8.2 Commercial Diligence. Kite shall (either directly or through one or more Affiliates or Sublicensees) use Commercially Reasonable Efforts to [*].

8.3 Commercialization Reports. The Parties have agreed on the format and required content of the written reports that Kite will provide for the commercialization of the Licensed Products, which is set forth in **Exhibit H** attached hereto. Kite shall provide the JSC (or Sangamo, if the JSC has been disbanded) with [*] written reports in accordance with **Exhibit H**.

ARTICLE 9
FINANCIAL PROVISIONS

9.1 Upfront Payment. Within [*] Business Days of the Effective Date, Kite shall pay to Sangamo a one-time, non-refundable, non-creditable upfront payment of one hundred fifty million Dollars ($150,000,000).

9.2 Reimbursement of Research and Other Costs. Kite shall reimburse Sangamo for the cost and expenses incurred by Sangamo under any Research Plan [*] as follows:

(a) Within [*] days after the end of each Calendar Quarter during which Sangamo has performed activities under any Research Plan [*], Sangamo shall submit to Kite a reasonably detailed invoice setting forth the total costs and expenses incurred by Sangamo during such Calendar Quarter in the course of conducting its activities under the applicable Research Plan or providing such other requested Kite assistance, including both internal costs (at the then-current FTE Rate) and out-of-pocket costs with no mark-up.

(b) For FTE performing Sangamo's activities under a Research Plan, Kite shall only be obligated to reimburse Sangamo for the costs of such FTEs at the FTE Rate to the extent that such costs do not exceed [*] of the budget set forth in such Research Plan. If Sangamo anticipates that its FTE costs for any particular Research Plan will exceed [*] of the approved budget therefor, Sangamo shall promptly notify the JSC, and the JSC shall discuss in good faith and decide whether to increase such budget.

(c) For out-of-pocket costs incurred by Sangamo under a Research Plan, Kite shall reimburse Sangamo for all such out-of-pocket costs, provided however, that if any actual out-

of-pocket cost exceeds the budget therefor set forth in such Research Plan, Sangamo shall notify the JSC, and obtain the JSC's approval, before incurring such out-of-pocket cost. The JSC may also agree on an alternative vendor to provide the requisite goods or services at a cost that does not exceed the budget therefor. If the JSC does not approve such excess cost or agree on such an alternative vendor, Sangamo shall have no obligation to incur such out-of-pocket costs that exceed the budget therefor.

(d) [*]

(e) Subject to the limitations set forth in Sections 9.2(b), (c) and (d), Kite shall pay to Sangamo the undisputed amount set forth in Sangamo's invoice within [*] days after Kite's receipt of each such invoice.

9.3 [*] Milestone Payments.

(a) Subject to the remainder of this Section 9.3, Kite shall pay to Sangamo [*] upon the first time that [*] and [*].

(b) Subject to the remainder of this Section 9.3, Kite shall pay to Sangamo [*] upon the first time that [*] and [*].

(c) Kite will notify Sangamo within [*] days after achievement of each [*] milestone event set forth above. After receipt of each such notice, Sangamo shall submit an invoice for [*] to Kite. Kite will pay to Sangamo such amount within [*] days of its receipt of such invoice.

(d) Each [*] milestone payment in this Section 9.3 will be non-refundable, non-creditable and payable only once. For clarity, in no event shall Kite pay Sangamo more than [*] under this Section 9.3, regardless of the number of [*] achieved.

9.4 Development Milestone Payments. Subject to the remainder of this Section 9.4, Kite shall pay to Sangamo the milestone payments set forth in the table below within [*] days after the first achievement of the applicable milestone event with respect to each Licensed Product in the Field (whether by Kite, its Affiliates or Sublicensees):

Milestone Event with respect to each Licensed Product	**Milestone Payments**
[*]	[*]
Total Development Milestone Payments per Licensed Product	$125,000,000

(a) Each development milestone payment in this Section 9.4 will be non-refundable, non-creditable, and payable (i) only once for each Licensed Product, regardless of the number of times that such milestone event is achieved by such Licensed Product, and (ii) only for the first ten (10) times such milestone event is achieved, regardless of the number of Licensed Products that achieve such milestone event. For clarity, in no event shall Kite pay Sangamo more

than one billion two hundred and fifty million Dollars ($1,250,000,000) pursuant to this Section 9.4, regardless of the number of Licensed Products that achieve any development milestone event.

(b) If [*], then milestone event [*], if not previously achieved with respect to such Licensed Product, shall be achieved upon [*].

(c) In the event that milestone event [*] is achieved with respect to a Licensed Product and, at such time, milestone event [*] has not been achieved with respect to such Licensed Product, then milestone event [*] for such Licensed Product shall be deemed achieved at the time of achievement of such milestone event [*].

(d) In the event that any of milestone events [*] is achieved with respect to a Licensed Product and, at such time, milestone event [*] has not been achieved with respect to such Licensed Product, then milestone event [*] for such Licensed Product, as applicable, to the extent not previously achieved, shall be deemed achieved at the time of achievement of such milestone event [*].

(e) For the purpose of Sections 9.4, 9.5 and 9.6, a Licensed Product shall be considered a separate Licensed Product from another Licensed Product if such Licensed Product is [*], in which case such Licensed Product shall, subject to the limitations set forth in such Sections, be eligible for a separate set of development milestone payments and sales milestone payments.

(f) Kite will notify Sangamo within [*] days after achievement of each development milestone event. After receipt of notice of achievement of such development milestone event, Sangamo shall submit an invoice to Kite for the corresponding development milestone payment. Kite will pay to Sangamo the corresponding milestone payment set forth in the table above within [*] days of its receipt of such invoice.

9.5 Sales Milestone Payments. Subject to the remainder of this Section 9.5, Kite shall pay to Sangamo the milestone payments set forth in the table below when the annual aggregate Net Sales of each Licensed Product first reach the values indicated below.

Annual Net Sales of each Licensed Product in the Territory per Calendar Year	**Milestone Payments**
1.Exceed [*]	[*]
2.Exceed [*]	[*]
3.Exceed [*]	[*]
Total Sales Milestone Payments (per Licensed Product)	$175,000,000

(a) Each sales milestone payment in this Section 9.5 will be non-refundable, non-creditable and payable (i) only once for each Licensed Product, regardless of number of times such milestone event is achieved by such Licensed Product; and (ii) only for the first ten (10) times

such milestone event is achieved, regardless of the number of Licensed Products that achieve such milestone event. For clarity, in no event shall Kite pay Sangamo more than one billion seven hundred and fifty million Dollars ($1,750,000,000) pursuant to this Section 9.5, regardless of the number of Licensed Products that achieve any sales milestone event.

(b) The milestone payments in this Section 9.5 shall be additive, such that if more than one milestone event specified above is achieved in the same Calendar Year, then the milestone payments for all such milestone events so achieved shall be payable in the same Calendar Year in accordance with Section 9.5(c).

(c) As part of the Calendar Quarterly royalty report in Section 9.6(d), Kite shall notify Sangamo if the aggregate annual Net Sales of any Licensed Product first reached a value set forth above during the Calendar Quarter to which such report pertains. Kite shall pay to Sangamo the applicable sales milestone payment(s) concurrent with the delivery of such report.

9.6 Royalty Payments.

(a) Royalty Rates. Subject to the remainder of this Section 9.6, Kite shall make non-refundable and non-creditable (except as otherwise provided in this Agreement) royalty payments to Sangamo on the incremental annual Net Sales of each Licensed Product at the applicable royalty rates set forth below.

For that portion of annual Net Sales of each Licensed Product in the Territory	**Royalty Rate**
1.Less than or equal to [*]	[*]
2.Greater than [*] but less than or equal to [*]	[*]
3.Greater than [*]	[*]

By way of example only, if Kite, its Affiliates and Sublicensees sell two Licensed Products in the Territory in a given Calendar Year and the Net Sales in the Territory of the first Licensed Product in such year are [*] and the Net Sales in the Territory of the second Licensed Product in such year are [*], then the royalties payable by Kite under this Section 9.6(a) during such year would be calculated as follows:

Royalty for the first Licensed Product:
[*]

Royalty for the second Licensed Product:
[*]

(b) Royalty Term. Kite's royalty payment obligations under Section 9.6(a) shall, on a Licensed Product-by-Licensed Product and country-by-country basis, commence on the First Commercial Sale of such Licensed Product in such country and expire upon the latest of:

(i) the expiration of the last to expire Valid Claim [*] in such country that Covers the manufacture, use or sale of (A) such Licensed Product (including the Modified Cell contained therein) or (B) any Final ZFN or [*] used to generate (1) the Modified Cell in such Licensed Product or (2) the Universal Cell Line from which the Modified Cell in such Licensed Product was differentiated; (ii) the expiration of all applicable Regulatory Exclusivity, if any, for such Licensed Product in such country; and (iii) [*] years after the First Commercial Sale of such Licensed Product in such country (the "**Royalty Term**"). Upon expiration of a Royalty Term for a Licensed Product in a given country, the product license granted to Kite in Section 2.1(b) will automatically become fully paid-up, perpetual, irrevocable, and royalty-free with respect to such Licensed Product in such country, except that expiration of such Royalty Term shall not affect Kite's obligation to pay royalties or sales milestone payments on Net Sales of such Licensed Product sold prior to such expiration.

(c) Royalty Reductions.

(i) Subject to Section 9.6(c)(iii) below, on a Licensed Product-by-Licensed Product and country-by-country basis, royalties on Net Sales of a Licensed Product in a country shall be reduced by:

(1) [*], at any time when there is no Valid Claim [*] in such country that Covers the manufacture, use or sale of (A) such Licensed Product (including the Modified Cell contained therein) or (B) any Final ZFN or [*] used to generate (1) the Modified Cell in such Licensed Product or (2) the Universal Cell Line from which the Modified Cell in such Licensed Product was differentiated; and

(2) [*], if there is a Biosimilar Product of such Licensed Product being sold in such country and the unit volume of such Biosimilar Product exceeds [*] of the combined unit volume of such Licensed Product and such Biosimilar Product sold in such country during such Calendar Quarter (which determinations of unit volume shall be based on a mutually acceptable calculation method and using market share data provided by a reputable and mutually agreed upon provider, such as IQVIA (f/k/a Quintiles IMS Health).

(ii) If it is necessary or useful for Kite to obtain a license or assignment from a Third Party [*] in a particular country in order to develop, use, manufacture, import, sell or otherwise commercialize a Licensed Product [*] in the Field in a particular country in the Territory and Kite obtains such a license or assignment, then, subject to Section 9.6(c)(iii) below, Kite may deduct, from the royalty payment that would otherwise have been due pursuant to Section 9.6(a) with respect to Net Sales of such Licensed Product in such country in a particular Calendar Quarter, an amount equal to [*] paid by Kite to such Third Party pursuant to such license or assignment on account of the sale of such Licensed Product in such country during such Calendar Quarter.

(iii) Notwithstanding the foregoing, during any Calendar Quarter in the Royalty Term for any Licensed Product in any country in the Territory, the operation of Sections 9.6(c)(i)(1), 9.6(c)(i)(2) and 9.6(c)(ii) individually or in combination shall not reduce the royalties due to Sangamo with respect to Net Sales of such Licensed Product in such country during such Calendar Quarter to less than the greater of (1) [*] of the royalties that would otherwise have been

due under Section 9.6(a) with respect to such Net Sales without any such reduction or deduction; or (2) the sum of (A) the total royalties owed by Sangamo to Third Parties with respect to such Net Sales [*], plus (B) [*] of such Net Sales; provided, however, that [*] with respect to such Net Sales [*] (the "**Royalty Floor**"). Any amount of royalty reduction that Kite is entitled to take with respect to a particular Licensed Product in a particular country but that is limited by the foregoing Royalty Floor shall be carried forward and Kite may reduce subsequent royalty payment amounts due to Sangamo hereunder in accordance with this Section 9.6(c)(iii) by such amount, until the full amount that Kite was entitled to reduce royalty payments has been applied.

(d) Reports and Payment. Within [*] days after the end of each Calendar Quarter during the applicable Royalty Term, Kite shall (i) provide Sangamo with a report that contains the following information for the applicable Calendar Quarter, on a Licensed Product-by-Licensed Product and country-by-country basis: (A) the amount of gross sales of the each Licensed Product, (B) an itemized calculation of Net Sales showing deductions provided for in the definition of "Net Sales," (C) a calculation of the royalty due on such sales, including any reductions or deductions made in accordance with Section 9.6(c), (D) the exchange rate for such country, and (E) whether any sales milestone event has been achieved during such Calendar Quarter; and (ii) pay in Dollars all royalty and sales milestone payments due to Sangamo for such Calendar Quarter.

9.7 Payments for Third Party IP Rights. Sangamo shall remain responsible for all obligations to and payments of royalty, milestone and other payments under (a) Existing Third Party Licenses; (b) Third Party licenses [*]; and (c) [*] Third Party Licenses entered into after the Execution Date; provided however that Kite shall be responsible for paying (i) those payments under Existing Third Party Licenses for which [*]; and (ii) those payments under Third Party licenses entered into by Sangamo after the Effective Date that are deemed Third Party Licenses pursuant to Section 2.5(b) and in accordance with the terms set forth in such Section 2.5(b). Sangamo shall provide Kite with (x) written notice describing any royalty and other reports required from Kite to permit Sangamo to comply with its reporting and payment obligations under such Third Party Licenses, which reports Kite shall provide within [*] days after receipt of such notice, and (y) an invoice for any payments owed by Kite pursuant to this Section 9.7, including those based on reports provided by Kite pursuant to the preceding clause (x), and Kite shall pay the undisputed portion of such invoice within [*] days of its receipt of such invoice. Sangamo shall pay such amounts, to the extent that Sangamo has timely received the necessary information from Kite, to the applicable Third Party on or before the applicable due date.

9.8 Currency; Exchange Rate. All payments to be made by Kite to Sangamo under this Agreement shall be computed and paid in Dollars by bank wire transfer in immediately available funds to a bank account designated by Sangamo by written notice. With respect to sales of a Licensed Product and other amounts received that are invoiced in a currency other than U.S. dollars, such amounts and amounts payable will be converted to U.S. dollars using the exchange rate mechanism generally applied by Kite or its Affiliates in preparing its financial statements for the applicable Calendar Quarter, provided that such mechanism is in compliance with GAAP.

9.9 Late Payments. If Sangamo does not receive payment of any undisputed sum due to it on or before the due date therefor, simple interest shall thereafter accrue on the sum due from the due date until the date of payment at a per-annum rate of [*] over the then-current one month

USD-LIBOR as quoted on Bloomberg (or if it no longer exists, similarly authoritative source) or the maximum rate allowable by applicable Law, whichever is less.

9.10 Disputed Payments. If Kite disputes in good faith the amount of any invoice provided by Sangamo pursuant to this Agreement or the obligation to make any payment alleged by Sangamo to be due hereunder, Kite shall notify Sangamo in writing within [*] days of Kite's receipt of such invoice or allegation, and the Parties shall use good faith efforts to promptly resolve such dispute; provided, that any failure to provide such notice shall not limit or restrict Kite to dispute the amount or basis for such payment in the future.

9.11 Withholding Taxes.

(a) Taxes on Income. Each Party shall be solely responsible for the payment of all taxes imposed on its share of income arising directly or indirectly from the activities of the Parties under this Agreement.

(b) Tax Cooperation. The Parties agree to cooperate with one another and use reasonable efforts to avoid or reduce tax withholding or similar obligations in respect of the milestone payments, royalties and other payments made by Kite to Sangamo under this Agreement. To the extent Kite is required to deduct and withhold taxes on any payment to Sangamo, Kite shall pay the amounts of such taxes to the proper Governmental Authority in a timely manner and promptly transmit to Sangamo an official tax certificate or other evidence of such payment sufficient to enable Sangamo to claim such payment of taxes. Sangamo shall provide Kite any tax forms that may be reasonably necessary in order for Kite to not withhold tax or to withhold tax at a reduced rate under an applicable bilateral income tax treaty, to the extent legally able to do so. Sangamo shall use reasonable efforts to provide any such tax forms to Kite in advance of the due date. Each Party shall also provide the other Party with reasonable assistance to enable the recovery, as permitted by Law, of withholding taxes or similar obligations resulting from payments made under this Agreement, such recovery to be for the benefit of Sangamo.

(c) Taxes Resulting From Kite's Action. If a withholding or deduction obligation arises as a result of any action by Kite, including any assignment, sublicense, change of place of incorporation, or failure to comply with applicable Laws or filing or record retention requirements (an "**Kite Withholding Tax Action**"), then the sum payable by Kite (in respect of which such deduction or withholding is required to be made) shall be increased to the extent necessary to ensure that Sangamo receives a sum equal to the sum which it would have received had no such Kite Withholding Tax Action occurred.

9.12 Records and Audit Rights. Each Party shall maintain complete and accurate records in sufficient detail to permit the other Party to confirm the accuracy of the amount of research and other costs to be reimbursed, achievement of milestones, royalties and other amounts payable under this Agreement for the then current Calendar Year, and during the preceding [*] Calendar Years. Upon reasonable prior notice, which shall be no less than upon [*] days prior written notice, such records shall be open during regular business hours for a period of [*] years from the creation of individual records for examination by an independent certified public accountant selected by the auditing Party and reasonably acceptable to the audited Party for the

sole purpose of verifying for the auditing Party the basis and accuracy of the financial reports furnished by the audited Party pursuant to this Agreement or of any payments made, or required to be made, by or to the audited Party pursuant to this Agreement; provided however, that records for a particular period may only be audited once. Such audits may occur no more often than [*]. Such auditor shall enter into a confidentiality agreement between the auditor and the auditing Party and not disclose the audited Party's Confidential Information to the auditing Party. Any undisputed amounts shown to be owed but unpaid, or overpaid and in need of refund, shall be paid or refunded (as the case may be) within [*] days after the accountant's report, plus interest (as set forth in Section 9.9) from the original due date. The auditing Party shall bear the full cost of such audit unless such audit reveals an underpayment by more than [*] of the amount due for the entire period being audited, in which case the audited Party shall reimburse the auditing Party for the reasonable costs for such audit.

9.13 Payments. Notwithstanding the non-refundable or non-creditable nature of any payments hereunder, but subject to the limitations set forth in Section 15.5, nothing in this Agreement shall limit either Party's rights to assert or obtain damages for breach of this Agreement, including damages calculated based on the payments made under this Agreement.

ARTICLE 10
INTELLECTUAL PROPERTY RIGHTS

10.1 Inventions.

(a) Ownership.

(i) Excluding [*], and subject to Section 10.1(a)(v), ownership of all Inventions shall be based on inventorship, as determined in accordance with the rules of inventorship under United States patent laws, and each Party shall solely own any Inventions made solely by its and its Affiliates' and sublicensees' employees, agents, or independent contractors, and the Parties shall jointly own any Inventions that are made jointly by employees, agents, or independent contractors of one Party and its Affiliates and sublicensees together with employees, agents, or independent contractors of the other Party and its Affiliates and sublicensees.

(ii) To the extent any Invention within [*] is made by or on behalf of [*] or its Affiliates, whether solely or jointly with [*], [*] shall and hereby does assign to [*] all of [*] and its Affiliates' and subcontractors' interest in such Invention, including damages for past infringement. Upon [*] request, [*] shall execute and take such further actions reasonably necessary to effectuate [*] ownership in and to such Inventions included within [*]. [*] shall not, without [*] prior written consent, file any patent application claiming an Invention that [*].

(iii) All Inventions jointly owned by the Parties as set forth above shall be referred to as "**Joint Inventions**". All Patent Rights claiming patentable Joint Inventions shall be referred to herein as "**Joint Patents**". Except to the extent either Party is restricted by (A) the licenses granted to the other Party or (B) the covenants provided by a Party under this Agreement, each Party shall be entitled to practice, license (through multiple tiers), assign (their respective

interest only) and otherwise exploit the Joint Inventions and Joint Patents in all countries and jurisdictions without the duty of accounting or seeking consent from the other Party.

(iv) Notwithstanding anything to the contrary in this Agreement, neither Party will have the right to invoke the Cooperative Research and Technology Enhancement Act of 2004, 35 U.S.C. § 103(c)(2)-(c)(3) (the "**CREATE Act**") when exercising its rights under this Agreement without the prior written consent of the other Party. In the event that a Party is permitted to invoke the CREATE Act as required by the preceding sentence, the Parties will cooperate and coordinate their activities with respect to any submissions, filings or other activities in support thereof. The Parties acknowledge and agree that this Agreement is a "joint research agreement" as defined in the CREATE Act.

(v) Kite shall not, and shall not permit its Affiliates or Sublicensees to, (A) [*] or (B) [*]. [*] Sangamo shall not, and shall not permit its Affiliates, licensees, or sublicensees to, (1) [*]; or (2) [*]. [*]

(b) **Non-Exclusive Licenses**.

(i) Kite hereby grants to Sangamo, subject to the licenses and covenants in this Agreement, a worldwide, non-exclusive, fully-paid, royalty-free, perpetual, irrevocable license, with the right to grant sublicenses only in connection with a license under other Patent Rights and Know-How Controlled by Sangamo, under the [*].

(ii) Sangamo hereby grants to Kite, subject to the licenses and covenants in this Agreement, a worldwide, non-exclusive, fully-paid, royalty-free, perpetual, irrevocable license, with the right to grant sublicenses only in connection with a license under other Patent Rights and Know-How Controlled by Kite, under the [*].

(c) **Disclosure.** Each Party shall promptly disclose to the other Party all Inventions made by or on behalf of such Party and its Affiliates and sublicensees, including all invention disclosures or other similar documents submitted to such Party by its, or its Affiliates' or sublicensees', employees, agents or independent contractors relating to such Inventions, and shall also respond promptly to reasonable requests from the other Party for additional information relating to such Inventions.

(d) **Personnel Obligations.** Each employee, agent or independent contractor of a Party or its respective Affiliates or sublicensees performing work under this Agreement shall, prior to commencing such work, be bound by invention assignment obligations, including: (i) promptly reporting any invention, discovery, process or other intellectual property right; (ii) presently assigning to the applicable Party all of his or her right, title and interest in and to any invention, discovery, process or other intellectual property (excluding any agreements with academic universities and/or other governmental entities, for which a non-exclusive license, or an option for an exclusive license may be obtained); (iii) cooperating in the preparation, filing, prosecution, maintenance, defense, and enforcement of any patent and patent application; and (iv) performing all acts and signing, executing, acknowledging and delivering any and all documents required for effecting the obligations and purposes of this Agreement. It is understood

and agreed that such invention assignment agreement need not reference or be specific to this Agreement.

10.2 Patent Prosecution.

(a) [*] Patents.

(i) As between the Parties, [*] shall have the first right, but not the obligation, to file, prosecute and maintain [*] Patents throughout the world, at its sole cost and expense. [*] shall keep [*] reasonably informed of the status of [*] Patents and shall promptly provide [*] with material correspondence received from any patent authorities in connection therewith. In addition, [*] shall promptly provide [*] with drafts of all proposed material filings and correspondence to any patent authorities with respect to [*] Patents for [*] review and comment prior to the submission of such proposed filing or correspondence. [*] shall confer with [*] and take into consideration [*] reasonable comments prior to submitting such filing or correspondence, provided that [*] provides such comments within [*] Business Days of receiving the draft filing or correspondence from [*]. If [*] does not provide comments within such period of time, then [*] shall be deemed to have no comment to such proposed filing or correspondence. In case of a disagreement between the Parties with respect to the filing, prosecution or maintenance of [*] Patents, the final decision shall be made by [*], provided however, that such final decision is not reasonably expected to be detrimental to the prosecution or enforcement of any Patent Right [*].

(ii) [*] shall notify [*] of any decision to cease prosecution and/or maintenance of any [*] Patent in any country. [*] shall provide such notice sufficiently in advance of any filing or payment due date, or any other due date that requires action in order to avoid loss of rights, in connection with such [*] Patent. In such event, [*] shall permit [*], at its discretion and expense, to continue prosecution or maintenance of such [*] Patent in such country; subject to keeping [*] reasonably informed of the status of [*] Patents and promptly providing [*] with material correspondence received from any patent authorities in connection therewith. [*] prosecution or maintenance of such [*] Patent shall not change the Parties' respective rights and obligations under this Agreement with respect to such [*] Patent other than with respect to those prosecution and maintenance activities expressly set forth in this Section 10.2(a). In case of a disagreement between the Parties with respect to the filing, prosecution or maintenance of [*] Patents following [*] election to continue such prosecution and maintenance, the final decision shall be made by [*]; provided however, that such final decision is not reasonably expected to be detrimental to the prosecution or enforcement of any Patent Right [*].

(iii) For the purpose of this Article 10, "prosecution" shall include any post-grant proceeding, including supplemental examination, post grant review proceeding, patent interference proceeding, opposition proceeding, reissue and reexamination, but excluding inter parties reviews, which shall be governed by Section 10.3.

(b) [*] Patents.

(i) As between the Parties, [*] shall have (A) the sole right, but not the obligation, to file, prosecute and maintain those [*] Patents other than [*] Patents throughout the

world, at its sole cost and expense, and (B) the first right, but not the obligation, to file, prosecute and maintain those [*] Patents. [*] shall keep [*] reasonably informed of the status of all such [*] Patents and shall promptly provide [*] with material correspondence received from any patent authorities in connection therewith.

(ii) In addition, with respect to those [*] Patents (A) that [*] or (B) that are [*] ((A) and (B), collectively, the "[*] **Patents**"), [*] shall promptly provide [*] with drafts of all proposed material filings and correspondence to any patent authorities with respect to such [*] Patents for [*] review and comment prior to the submission of such proposed filing or correspondence. [*] shall confer with [*] and take into consideration [*] reasonable comments prior to submitting such filing or correspondence, provided that [*] provides such comments within [*] Business Days of receiving the draft filing or correspondence from Sangamo. If [*] does not provide comments within such period of time, then [*] shall be deemed to have no comment to such proposed filing or correspondence. In case of a disagreement between the Parties with respect to the filing, prosecution or maintenance of such [*] Patents, the final decision shall be made by [*], provided however, that such final decision is not reasonably expected to be detrimental to the prosecution or enforcement of any Patent Right [*].

(iii) [*] shall notify [*] of any decision to cease prosecution and/or maintenance (a "[*] **Abandonment**") of any [*] Patents in any country. [*] shall provide such notice of a [*] Abandonment sufficiently in advance of any filing or payment due date, or any other due date that requires action in order to avoid loss of rights, in connection with such [*] Patent.

(1) In the event of a [*] Abandonment with respect to any [*] Patents other than those that [*], if requested by [*], [*] shall, at [*] election, acting reasonably, either (a) permit [*], at its discretion and expense (provided that [*]), to continue prosecution or maintenance of such [*] Patent in such country, subject to keeping [*] reasonably informed of the status of such [*] Patent and promptly providing [*] with material correspondence received from any patent authorities in connection therewith, or (b) itself continue prosecution or maintenance of such [*] Patent in such country, at [*] expense (provided that [*]), in which case [*] shall continue to have the review and comment rights provided for in Section 10.2(b)(ii) above. [*] prosecution or maintenance of any such [*] Patent shall not change the Parties' respective rights and obligations under this Agreement with respect to such [*] Patent other than with respect to those prosecution and maintenance activities expressly set forth in this Section 10.2(b). In case of a disagreement between the Parties with respect to the filing, prosecution or maintenance of any such [*] Patents following [*] request and [*] election to continue such prosecution and maintenance, whether by [*] or by [*], the final decision shall be made by [*], provided however, that such final decision is not reasonably expected to be detrimental to the prosecution or enforcement of any Patent Right [*].

(2) In the event of a [*] Abandonment with respect to any [*] Patents that [*], at [*] election, acting reasonably, [*] shall and hereby does assign to [*] its right, title and interest in and to such [*] Patent in such country, including damages for past infringement, and [*] itself shall continue prosecution or maintenance of such Patent Right in such country, at its sole cost and expense. [*] shall execute all documents and instruments and cooperate with [*]

and its representatives to effectuate such assignment at [*] sole cost. [*] will and hereby does grant [*], subject to the licenses and covenants contained in this Agreement, a worldwide, non-exclusive, royalty-free, perpetual, irrevocable license, with the right to grant sublicenses, under any such assigned [*] Patent to research, develop, manufacture, commercialize and otherwise exploit any and all products; provided however, that the right to grant sublicenses shall [*].

(3) For the avoidance of doubt, [*] shall have no rights to conduct prosecution and/or maintenance of any Patent Rights contained within [*], except for those Patent Rights that are [*] Patents.

(c) Joint Patents.

(i) As between the Parties, (A) Sangamo shall have the first right, but not the obligation, to file, prosecute and maintain [*] Joint Patents throughout the world, at the Parties' joint cost and expense with respect to those jurisdictions set forth on **Exhibit J** (the "**Base Patent Jurisdictions**"), and (B) Kite shall have the first right, but not the obligation, to file, prosecute and maintain the Joint Patents that are not [*] Joint Patents (the "**Other Joint Patents**") throughout the world, at the Parties' joint cost and expense with respect to the Base Patent Jurisdictions. The Parties shall jointly share all costs and expenses to file, prosecute and maintain Joint Patents in jurisdictions other than the Base Patent Jurisdictions; provided however, that if the Party with the first right to file a particular Joint Patent elects to file, prosecute, and maintain such Joint Patent in any jurisdiction other than the Base Patent Jurisdictions, and the other Party does not wish to pay its 50% share of such costs and expenses in such jurisdiction, then such other Party shall have the right to elect not to pay its 50% share, which election shall be deemed a Non-Base Abandonment with respect to such Joint Patent in such jurisdiction. Each prosecuting Party shall keep the other Party reasonably informed of the status of each Joint Patent prosecuted by such Party in the Base Patent Jurisdictions and those other jurisdictions where the Parties jointly share the costs and expenses for such Joint Patent (collectively, the "**Joint Territories**" with respect to such Joint Patent) and shall promptly provide the other Party with material correspondence received from any patent authorities in connection therewith. In addition, each prosecuting Party shall (x) promptly provide the other Party with drafts of all proposed material filings and correspondence to any patent authorities with respect to such Joint Patents in the Joint Territories for the other Party's review and comment prior to the submission of such proposed filing or correspondence; and (y) confer with the other Party and take into consideration the other Party's comments prior to submitting such filing or correspondence, provided that the other Party provides such comments within [*] Business Days of receiving the draft filing or correspondence from the prosecuting Party. If a Party does not provide comments within such period of time, then then such Party shall be deemed to have no comment to such proposed filing or correspondence. In case of a disagreement between the Parties with respect to the filing, prosecution or maintenance of any [*] Joint Patents in the Joint Territories, the final decision shall be made by [*], provided however, that such final decision is not reasonably expected to be detrimental to the prosecution or enforcement of any Patent Right [*]. In case of a disagreement between the Parties with respect to the filing, prosecution or maintenance of any [*] Patents in the Joint Territories, the final decision shall be made [*], provided however, that such final decision is not reasonably expected to be detrimental to the prosecution or enforcement of any Patent Right [*].

(ii) The Party with the first right to file, prosecute, and maintain a particular Joint Patent shall notify the other Party of any decision (A) not to file such Joint Patent in a Base Patent Jurisdiction or (B) to cease prosecution and/or maintenance of such Joint Patent in any Joint Territory (each of (A) and (B), a "**Base Abandonment**") or not to file any Joint Patent in any country outside the Base Patent Jurisdictions (each a "**Non-Base Abandonment**"), and shall provide such notice of a Base Abandonment or Non-Base Abandonment sufficiently in advance of any filing or payment due date, or any other due date that requires action in order to avoid loss of rights, in connection with such Joint Patent in such country.

(1) In the event of a Base Abandonment, the Party with the first right to prosecute such Joint Patent shall permit the other Party, at the other Party's discretion and the Parties' joint expense, to continue prosecution or maintenance of such Joint Patent in such country. The other Party's prosecution or maintenance of such Joint Patent shall not change the Parties' respective rights and obligations under this Agreement with respect to such Joint Patent other than those expressly set forth in this Section 10.2(c), and the Party electing not to file, prosecute, or maintain such Joint Patent will continue to have the same review, comment, and decision-making provided for in Section 10.2(c)(i).

(2) In the event of a Non-Base Abandonment, or in the event of a Base Abandonment where the Party electing such Base Abandonment does not wish to pay its 50% share of such costs and expenses, then the Party electing such Non-Base Abandonment or Base Abandonment (the "**Abandoning Party**") shall and hereby does assign to the Party electing to continue prosecution of such Joint Patent (the "**Continuing Party**") its right, title and interest in and to such Patent Right in such country, including damages for past infringement, and the Continuing Party itself shall continue prosecution or maintenance of such Patent Right in such country, at its sole cost and expense. The Abandoning Party shall execute all documents and instruments and cooperate with the Continuing Party and its representatives to effectuate such assignment at the Continuing Party's sole cost. The Continuing Party will and hereby does grant the Abandoning Party, subject to the licenses and covenants contained in this Agreement, a worldwide, non-exclusive, royalty-free, perpetual, irrevocable license, with the right to grant sublicenses, under any such assigned Joint Patent to research, develop, manufacture, commercialize and otherwise exploit any and all products; provided however, that the right to grant sublicenses shall [*].

(d) **Cooperation.** Each Party shall provide the other Party, at the other Party's request and expense, all reasonable assistance and cooperation in the patent prosecution efforts under this Section 10.2, including providing any necessary powers of attorney and executing any other required documents or instruments for such prosecution, or assignment, as applicable. Without limiting the foregoing, (i) each Party's internal and/or external patent counsel(s) will meet regularly to provide an update and discuss the status of all Sangamo Patents and Joint Patents being prosecuted and maintained under this Agreement, as applicable to such Party, along with any material updates regarding the prosecution and maintenance of such Patent Rights, including the strategy for the preparation, filing, prosecution, and maintenance of such Patent Rights (including national stage filings); (ii) each Party will take into consideration the other Party's comments in good faith; and (iii) the Parties will cooperate and implement reasonable filing and prosecution strategies (including filing divisionals, continuations, or otherwise) so that, to the extent reasonably

feasible, Patent Rights for distinct Inventions are pursued in distinct Patent Rights, [*] Patents are pursued in addition to [*] Patents, and [*] Patents are pursued in addition to [*] Patents.

10.3 Patent Enforcement.

(a) Notice. If either Party becomes aware of any (i) infringement, anywhere in the world, of any issued Patent Right within the [*] Patents or [*] Patents on account of a Third Party's manufacture, use, importation, offer for sale or sale in the Field (whether or not such use is on-label) of any product [*] (an "**Infringing Product**"), including any BLA or MAA filed by a Third Party for an Infringing Product that names a Licensed Product as a reference product (or similar filing in a country other than the U.S.) or (ii) declaratory judgment action or inter partes review action by a Third Party that is developing, manufacturing, or commercializing an Infringing Product in the Field (whether or not such use is an approved use) alleging the invalidity, unenforceability or non-infringement of any of the [*] Patents or [*] Patents (collectively, (i) and (ii), a "**Product Infringement**"), such Party will promptly notify the other Party in writing to that effect. In addition, each Party shall promptly notify the other of any infringement of any issued [*] Patent that is not a Product Infringement.

(b) Enforcement by [*]. [*] shall have the first right, but not the obligation, to take action, control and obtain a discontinuance of the Product Infringement or bring suit against the applicable Third Party (such Third Party, the "**Infringer**") under any [*] Patent or any [*] Patent other than [*]. If [*] has not taken steps to obtain a discontinuance of Product Infringement of such [*] Patent or [*] Patent or filed suit against any such Infringer of such [*] Patent or [*] Patent within [*] from the date of receipt of written notice of Product Infringement, then upon [*] written consent (not to be unreasonably withheld), [*] shall have the right, but not the obligation, to bring suit under the applicable [*] Patent or [*] Patent against such Infringer.

(c) Enforcement by [*]. [*] shall have the sole right, but not the obligation, to take action, control and obtain a discontinuance of the Product Infringement or bring suit against the applicable Infringer under any [*] Patent within [*].

(d) [*] Patents. In the case of any other infringement of a [*] Patent, the Parties will discuss in good faith to determine a course of action, and neither Party shall have the right to enforce such [*] Patent without the other Party's prior written consent, which shall not be unreasonably withheld. Unless agreed otherwise by the Parties in writing, a Party enforcing a [*] Patent (as consented by the other Party pursuant to the preceding sentence) shall bear all costs and expenses and retain all recoveries associated with such enforcement.

(e) Cooperation. The enforcing Party under this Section 10.3 shall keep the other Party reasonably informed of all material developments in connection with any such suit. The non-enforcing Party shall reasonably cooperate with the enforcing Party in any such suit (including joining as a party plaintiff) as reasonably requested by the enforcing Party and at the enforcing Party's cost and expense. The non-enforcing Party shall have the right to consult with the enforcing Party and to participate in and, if appropriate, be represented by independent but mutually agreed upon counsel in such litigation at the non-enforcing Party's own cost and expense. Neither Party shall, without the other Party's prior written consent, enter into any settlement or

consent decree that requires any payment by or admits or imparts any other liability to the other Party or admits the invalidity or unenforceability of or adversely affects the scope of any such Sangamo Patent or Joint Patent, which consent shall not be unreasonably withheld or conditioned.

(f) Cost and Expense; Recovery. The enforcing Party shall bear all the costs and expenses of any action brought by it under this Section 10.3 against Product Infringement of any [*] Patent or any [*] Patent. Any recoveries obtained by either Party as a result of any proceeding against a Product Infringement under this Section 10.3 shall first be used to reimburse the costs and expenses incurred by the Parties in connection with such enforcement action. Any recoveries in excess of such costs and expenses shall be retained by the enforcing Party; provided that if Kite is the enforcing Party [*], such excess recoveries [*] shall be deemed Net Sales and subject to royalty payment under Section 9.6.

(g) Other Infringements. [*] shall have the sole right, but not the obligation, to bring and control, at its own cost and expense, any legal action in connection with any infringement of any [*] Patents (excluding [*] Patents) that is not a Product Infringement, and retain all recoveries from such action. [*] shall have the sole right, but not the obligation, to bring and control, at its own cost and expense, any legal action in connection with any infringement of any Patent Rights [*] (excluding [*] Patents), and retain all recoveries from such action.

10.4 Defense. If a Party becomes aware of any actual or potential claim alleging that the research, development, manufacture, or commercialization of any ZFNs or AAVs under this Agreement or Licensed Product infringes, misappropriates, or otherwise violates any intellectual property rights of a Third Party (or would if carried out) ("**Third Party Infringement**"), then such Party will notify the other Party as promptly as possible following the receipt of service of process in such action, suit, or proceeding, or the date on which such Party becomes aware that such action, suit, or proceeding has been instituted, and the Parties will meet as soon as possible to discuss the overall strategy for defense of such matter. If either Party has an obligation under Article 15 to indemnify the other Party with respect to such claim, then the provisions of Article 15 will apply with respect thereto. Nothing in this Section 10.4 will limit a Party's rights to defend such claim.

10.5 Patent Extensions. The Parties shall cooperate in obtaining patent term restoration (under but not limited to the U.S. Drug Price Competition and Patent Term Restoration Act), supplemental protection certificates or their equivalents, and patent term extensions with respect to the [*] Patents or [*] Patents in any country and/or region where applicable; provided that if the Parties fail to agree, [*] shall have the final decision-making authority over whether to extend (or apply for any equivalent with respect to) any (a) [*] Patent, unless such [*] Patent is a [*] Patent, and (b) [*] Patent, and [*] shall have the final decision-making authority with respect to any [*] Patent or any [*] Patent. [*] shall file for such extensions at [*] sole cost and expense, and [*] shall file for its permitted extensions at [*] sole cost and expense.

10.6 Patents Licensed From Third Parties. Each Party's rights under this Article 10 with respect to the prosecution and enforcement of any Sangamo Patent that is licensed by Sangamo from a Third Party shall be subject to the rights retained by such Third Party to prosecute and enforce such Patent Rights.

10.7 **Trademarks.** Kite shall have the right to brand Licensed Products using Kite related trademarks and any other trademarks and trade names it determines appropriate, which may vary by country or within a country ("**Product Marks**"). Kite shall own all rights in the Product Marks and shall have the right to register and maintain the Product Marks in the countries and regions that it determines reasonably necessary, at Kite's cost and expense.

ARTICLE 11
CONFIDENTIALITY; PUBLICATION

11.1 **Duty of Confidence.** Subject to the other provisions of this Article 11:

(a) all Confidential Information of a Party (the "**Disclosing Party**") shall be maintained in confidence and otherwise safeguarded by the other Party (the "**Receiving Party**") and its Affiliates, in the same manner and with the same protections as the Receiving Party maintains its own confidential information, but in any event no less than reasonable efforts;

(b) the Receiving Party may only use any such Confidential Information for the purposes of performing its obligations or exercising its rights under this Agreement; and

(c) the Receiving Party may only disclose Confidential Information of the other Party to: (i) its Affiliates, licensees, sublicensees and permitted assignees; and (ii) employees, directors, agents, contractors, consultants and advisers of the Receiving Party and its Affiliates, licensees, sublicensees and permitted assignees, in each case of (i) and (ii) to the extent reasonably necessary for the purposes of, and for those matters undertaken pursuant to, this Agreement; provided that such Persons are bound by legally enforceable obligations to maintain the confidentiality of the Confidential Information in a manner consistent with the confidentiality provisions of this Agreement.

11.2 **Exceptions.** The foregoing obligations as to particular Confidential Information of a Disclosing Party shall not apply to the extent that the Receiving Party can demonstrate that such Confidential Information:

(a) is known by the Receiving Party at the time of its receipt without an obligation of confidentiality, and not through a prior disclosure by the Disclosing Party, as documented by the Receiving Party's business records;

(b) is in the public domain before its receipt from the Disclosing Party, or thereafter enters the public domain through no fault of the Receiving Party;

(c) is subsequently disclosed to the Receiving Party by a Third Party who may lawfully do so and is not under an obligation of confidentiality to the Disclosing Party; or

(d) is developed by the Receiving Party independently and without use of or reference to any Confidential Information received from the Disclosing Party, as documented by the Receiving Party's business records.

Any combination of features or disclosures shall not be deemed to fall within the foregoing exclusions merely because individual features are published or available to the general public or in the rightful possession of the Receiving Party unless the combination itself and principle of operation are published or available to the general public or in the rightful possession of the Receiving Party.

11.3 Authorized Disclosures. Notwithstanding the obligations set forth in Sections 11.1 and 11.5, a Party may disclose the other Party's Confidential Information (including this Agreement and the terms herein) to the extent:

(a) such disclosure is reasonably necessary: (i) to such Party's or its Affiliates' directors, attorneys, independent accountants, financial advisors or other representatives for the sole purpose of enabling such directors, attorneys, independent accountants financial advisors or other representatives to provide advice to such Party or Affiliate, provided that in each such case such recipients are bound by confidentiality and non-use obligations substantially consistent with those contained in this Agreement; or (ii) to actual or potential investors, acquirors, licensees and other financial or commercial partners solely for the purpose of evaluating or carrying out an actual or potential investment, acquisition or collaboration, provided that in each such case such recipients are bound by confidentiality and non-use obligations substantially consistent with those contained in the Agreement (except that the term of such obligations may be shorter, but at least [*] years);

(b) such disclosure is required by Law, or judicial or administrative process, provided that in such event such Party shall promptly inform the other Party of such required disclosure and provide the other Party an opportunity to challenge or limit the disclosure obligations. Confidential Information that is disclosed pursuant to this Section 11.3(b) shall remain otherwise subject to the confidentiality and non-use provisions of this Article 11, and the Party disclosing Confidential Information pursuant to Law or court order shall (i) cooperate with and reasonably assist the other Party (at the other Party's expense) if the other Party seeks a protective order or other remedy in respect of any such disclosure and (ii) furnish only that portion of the Confidential Information which, in the opinion of such Party's legal counsel, is responsive to such requirement; or

(c) [*]

11.4 Scientific Publication. Scientific publication strategy shall be managed by the JSC, which shall consider Sangamo's and Kite's interest in publishing the results of its research in order to obtain recognition within the scientific community and to advance the state of scientific knowledge, the need to protect Confidential Information and the Parties' mutual interest in obtaining valid patent protection, protecting reasonable business interests and trade secret information and having an integrated approach to permit Kite to develop one or more Licensed Products in the Field. Each Party shall have the right to make publications in accordance with this Section 11.4; provided that any publication by [*] of any results obtained under this Agreement shall be subject to [*] prior written consent, such consent not to be unreasonably withheld. Either Party or its Affiliates shall deliver to the other Party for review and comment a copy of any scientific proposed publication or presentation that pertains to the Licensed Product(s), pursuant

to a procedure to be established by the JSC; provided further that [*] obligation to deliver, and [*] right to review and comment on, such publication or presentation, [*]. The reviewing Party shall have the right to require modifications of the publication or presentation: (a) to protect the Parties' Confidential Information; (b) for trade secret reasons or reasonable business reasons; and/or (c) to delay such submission for an additional period up to [*] days as may be reasonably necessary to seek patent protection for the information disclosed in such proposed submission. The Parties shall comply with traditional standards of authorship with respect to scientific publications.

11.5 Publicity; Use of Names.

(a) The Parties will mutually agree on language of a joint press release announcing this Agreement to be issued by the Parties promptly after the Execution Date. Subject to Section 11.3 above, no other public disclosure of the existence or the terms of this Agreement may be made by either Party or its Affiliates except as provided in this Section 11.5, and no Party shall use the name, trademark, trade name or logo of the other Party, its Affiliates or their respective employees in any publicity, promotion, news release or disclosure relating to this Agreement or its subject matter, except as provided in this Section 11.5, as may be required by applicable Law, or with the prior express written permission of the other Party.

(b) A Party may disclose this Agreement and its terms, in securities filings with the Securities Exchange Commission (the "**SEC**") or equivalent foreign agency to the extent required by applicable Law after complying with the procedure set forth in this Section 11.5(b). In such event, the Party seeking such disclosure shall prepare a draft confidential treatment request and proposed redacted version of this Agreement to request confidential treatment for the redacted portions of this Agreement, and the other Party agrees to promptly (and in any event, within [*] Business Days after receipt of such confidential treatment request and proposed redactions) give its input in a reasonable manner in order to allow the Party seeking disclosure to file its request within the time lines proscribed by applicable Law. The Party seeking such disclosure shall reasonably consider any comments thereto provided by the other Party within such [*] Business Day period, and shall use reasonable efforts to obtain confidential treatment of this Agreement from the SEC (or equivalent foreign agency) as represented by the redacted version revised by the other Party.

(c) Each Party acknowledges that the other Party may be legally required to make public disclosures (including in filings with the Governmental Authorities) of certain terms of or material developments or material information generated under this Agreement and agrees that each Party may make such disclosures as required by Law, provided that the Party seeking such disclosure first provides the other Party a copy of the proposed disclosure, and shall reasonably consider any comments thereto provided by the other Party within [*] Business Days after the receipt of such proposed disclosure or such shorter period required to comply with applicable Law.

(d) Other than the press release set forth in **Exhibit J**, the Parties agree that the portions of any other news release or other public announcement relating to this Agreement or the performance hereunder that would disclose information other than that already in the public domain, shall first be reviewed and approved by both Parties within [*] Business Days after the

receipt of such proposed disclosure, except as otherwise provided in Section 11.5(c). Notwithstanding the foregoing, (i) Kite and its Affiliates shall have the right to disclose publicly any information relating to the development, manufacture or commercialization of any Licensed Products hereunder that doesn't include Confidential Information of Sangamo; and (ii) Sangamo shall have the right to disclose publicly: (A) the receipt of any milestone payments under this Agreement (but not the amount); (B) the grant of Marketing Approval of any Licensed Product; (C) the First Commercial Sale of any Licensed Product; and (D) that royalties were received from Kite (without disclosing the amount, rate or Net Sales reported). For each such disclosure, Sangamo shall first provide Kite with a draft of such disclosure at least [*] Business Days prior to its intended release for review and comment, and shall consider Kite's comments in good faith. If Sangamo does not receive comments from Kite within [*] Business Days from Kite's receipt thereof, Sangamo shall have the right to make such disclosure without further delay.

(e) The Parties agree that after a disclosure pursuant to Section 11.5(a), (b), (c), or (d) has been reviewed and approved by the other Party, the disclosing Party may make subsequent public disclosures reiterating such information without having to obtain the other Party's prior consent and approval.

ARTICLE 12
EFFECTIVENESS.

12.1 **Effective Date**. Except for the Parties' obligations under Article 11, this Article 12 and Article 14, which shall be effective as of the Execution Date, this Agreement shall not become effective until the Effective Date.

12.2 **Filings**. The Parties shall cooperate with one another in the preparation and execution of all documents that are required to be filed pursuant to the HSR Act and each Party will file, as promptly as possible but in any event no later than ten (10) Business Days after the Execution Date, its pre-merger notification and report forms with the Federal Trade Commission and the U.S. Department of Justice, which forms shall specifically request early termination of the initial HSR Act waiting period. The related filing fees associated with the submission under the HSR Act shall be paid by Kite.

12.3 **Outside Date.** If the Effective Date has not occurred prior to [*] days after the Execution Date, either Party may terminate this Agreement upon written notice to the other Party; provided, however, that, as of such date, the Party terminating this Agreement is not in breach of this Agreement.

12.4 **Conditions to Effectiveness**. The effectiveness of this Agreement shall be subject to the satisfaction by each Party of the following conditions any or all of which may be waived in whole or in part by the other Party in its sole discretion, subject to applicable Law:

(a) the expiration or termination of all applicable waiting periods under the HSR Act;

(b) the representations and warranties made by such Party in Section 14.1 shall be true and correct in all material respects as of the Effective Date with the same force and effect

as if they had been made as of the Execution Date, and with respect to Sangamo as such Party, Sangamo is not in breach of the covenants set forth in Section 14.3;

(c) Sangamo notifies Kite if any of the representations and warranties set forth in Section 14.2 have become untrue between the Execution Date and the Effective Date; and

(d) the provision by each Party to the other Party of an officer's certificate certifying that Section 12.4(a), 12.4(b) and 12.4(c) above are true and correct with respect to such Party as of the Effective Date.

ARTICLE 13
TERM AND TERMINATION

13.1 Term. Subject to Section 12.1, the term of this Agreement shall commence upon the Effective Date and continue in full force and effect, on a Licensed Product-by-Licensed Product and country-by-country basis, until such time as the Royalty Term with respect to such Licensed Product expires in such country (the "**Term**"). In the event that there are no Candidate Targets remaining at the end of the Research Term, this Agreement shall expire in its entirety at the end of the Research Term.

13.2 Termination.

(a) Termination by Kite for Convenience. Kite may terminate this Agreement in its entirety or on a Candidate Target-by-Candidate Target basis (with respect to all Licensed Products for the applicable Candidate Target) or Licensed Product-by-Licensed Product basis by providing written notice of termination to Sangamo, which notice specifies the scope of the termination and includes an effective date of termination at least (i) [*] after the date of the notice if such notice is provided [*] or (ii) [*] after the date of the notice if such notice is provided [*]. If Kite terminates this Agreement pursuant to this Section 13.2(a) with respect to particular Candidate Targets or Licensed Products and subsequently terminates this Agreement pursuant to this Section 13.2(a) with respect to all remaining Candidate Targets or Licensed Products at any time after the end of the Research Term, then the Agreement shall terminate in its entirety upon the effective date of such subsequent termination. If Kite terminates this Agreement pursuant to this Section 13.2(a) with respect to particular Licensed Products and subsequently terminates this Agreement pursuant to this Section 13.2(a) with respect to all remaining Licensed Products directed to the same Candidate Target(s) at any time after the end of the Research Term, then the Agreement shall terminate with respect to such Candidate Target(s) upon the effective date of such subsequent termination.

(b) Termination for Material Breach. If either Party believes that the other is in material breach of this Agreement, then the non-breaching Party may deliver notice of such breach to the other Party. For all material breaches other than a failure to make an undisputed payment as set forth in this Agreement by the applicable due date, the allegedly breaching Party shall have [*] from such notice to cure such breach. For any breach arising from a failure to make an undisputed payment set forth in this Agreement by the applicable due date, the allegedly breaching Party shall have [*] from the receipt of the notice to cure such breach. If the Party receiving notice of breach fails to cure such material breach within the applicable period set forth

above, then the Party originally delivering the notice of breach may terminate this Agreement effective on written notice of termination to the other Party. During the pendency of any good faith dispute with respect to the existence or materiality of an alleged breach of this Agreement, all of the terms and conditions of this Agreement shall remain in effect and the Parties shall continue to perform all of their respective obligations hereunder and to use good faith efforts to promptly resolve such dispute in accordance with Sections 16.5 and 16.7.

(c) **Termination for Bankruptcy.** This Agreement may be terminated at any time during the Term by either Party upon the other Party's filing or institution of bankruptcy, reorganization, liquidation or receivership proceedings, or upon an assignment of a substantial portion of the assets for the benefit of creditors by the other Party; *provided*, *however*, that in the case of any involuntary bankruptcy proceeding such right to terminate shall only become effective if the Party consents to the involuntary bankruptcy or such proceeding is not dismissed within ninety (90) days after the filing thereof.

13.3 **Effect of Termination**.

(a) Upon the termination of this Agreement for any reason, all rights and obligations of each Party hereunder will cease, except as otherwise expressly provided herein, including Section 13.3(b) below; provided that if such termination is by Kite pursuant to Section 13.2(a) with respect to one or more specified Candidate Targets or Licensed Products, then such rights and obligations shall cease solely with respect to such terminated Candidate Targets (and their applicable [*], Modified Cells, Universal Cell Lines and Licensed Product(s)) or such Licensed Products, as applicable, and, in the case of termination by Kite pursuant to Section 13.2(a) with respect to one or more specified Candidate Targets, with respect to activities occurring during the remainder of the Term of this Agreement, (i) each such terminated Candidate Target shall no longer be considered a Candidate Target or a Target, (ii) the Parties' exclusivity obligations under Section 2.4 shall no longer apply to such former Candidate Target, (iii) each Modified Cell or Universal Cell Line that recognizes such terminated Candidate Target shall no longer be considered a Modified Cell or Universal Cell Line, respectively, and (iv) products incorporating, using or administering such former Modified Cell shall no longer be considered Licensed Products.

(b) In the event Sangamo terminates this Agreement pursuant to Section 13.2(b) or 13.2(c), any sublicenses granted by Kite or its Affiliates to a Sublicensee shall, at the Sublicensee's request and subject to Sangamo's written consent (not to be unreasonably withheld), survive such termination, provided that the Sublicensee is not in material breach of any of its obligations under such sublicense. In order to effect this provision, at the request of the Sublicensee, Sangamo shall enter into a direct license with the Sublicensee on substantially the same terms as the sublicense, provided that Sangamo shall not be required to undertake obligations in addition to those required by this Agreement, and that Sangamo's rights under such direct license shall be consistent with its rights under this Agreement, taking into account the scope of the license granted under such direct license.

(c) Upon termination of this Agreement for any reason, each Party shall promptly return to the other Party or destroy, at the other Party's request, all Confidential

Information of such other Party, except for any such Confidential Information to which such Party still has a license under this Agreement.

(d) Upon notice of any termination of a Research Plan, Sangamo shall wind-down any activities promptly and use all reasonable efforts to minimize costs and expenses. Kite shall reimburse Sangamo for those amounts incurred by Sangamo after the effective date of termination on account of those reasonable and documented non-cancelable commitments made by Sangamo prior to receipt of notice of termination pursuant to any JSC approved Research Plan for a Licensed Product for which this Agreement is terminated (or all Research Plans, if this Agreement is terminated in its entirety), provided that (i) Sangamo has used all reasonable efforts to minimize such amounts; and (ii) any such termination is not due to material breach of this Agreement by, or bankruptcy of, Sangamo.

13.4 Survival. Expiration or termination of this Agreement shall not relieve the Parties of any obligation accruing prior to such expiration or termination. Without limiting the foregoing, the provisions of Sections 2.3, 4.11(a), 6.3, 9.9, 9.10, 9.11, 9.12, 9.13, 10.1(a), 10.1(b), 10.2(b)(iii)(2) (solely with respect to the non-exclusive license), 10.2(c), 10.3(d), 10.3(e) (solely as it relates to Joint Patents), 10.4, 13.3, 13.4, 13.5, and 14.6 and Articles 11, 15, and 16 (but excluding Sections 16.16 and 16.19) shall survive the expiration or termination of this Agreement.

13.5 Termination Not Sole Remedy. Termination is not the sole remedy under this Agreement and, whether or not termination is effected and notwithstanding anything contained in this Agreement to the contrary, all other remedies shall remain available except as agreed to otherwise herein.

ARTICLE 14
REPRESENTATIONS AND WARRANTIES

14.1 Mutual Representations and Warranties. Each Party represents and warrants to the other Party as of the Execution Date and as of the Effective Date that:

(a) **Organization**. Such Party is duly organized, validly existing and in good standing under the laws of the jurisdiction in which it is organized.

(b) **Authorization and Enforcement of Obligations**. Such Party: (i) has the requisite power and authority and the legal right to enter into this Agreement and to perform its obligations hereunder, and (ii) has taken all requisite action on its part to authorize the execution and delivery of this Agreement and the performance of its obligations hereunder. This Agreement has been duly executed and delivered on behalf of such Party, and constitutes a legal, valid, binding obligation, enforceable against such Party in accordance with its terms.

(c) **Consents**. Subject to compliance with the HSR Act, all necessary consents, approvals and authorizations of all Governmental Authorities and other Persons required to be obtained by such Party in connection with the execution and delivery of this Agreement have been obtained.

(d) **No Conflict**. The execution and delivery of this Agreement and the performance of such Party's obligations hereunder: (i) do not conflict with or violate any requirement of applicable Laws of Governmental Authorities, (ii) do not conflict with, or constitute a breach or default under, any contractual obligation of such Party, and (iii) do not conflict with or result in a breach of any provision of the organizational documents of such Party.

14.2 **Representations and Warranties by Sangamo.** Sangamo represents and warrants to Kite as of the Execution Date that:

(a) it has the right to grant the licenses granted to Kite under Section 2.1;

(b) it (i) has not received any written notice from any Third Party asserting or alleging that the development of Sangamo Technology infringes or misappropriates the intellectual property rights of such Third Party; and (ii) to Sangamo's knowledge, it has not received any other notice from any Third Party asserting or alleging that the development of Sangamo Technology infringes or misappropriates the intellectual property rights of such Third Party;

(c) except [*], to Sangamo's knowledge as of the Execution Date, (i) [*]and [*], in each case, [*] as of the Execution Date, and (ii) [*], in each of (i) and (ii), will not infringe or misappropriate any intellectual property rights of any Third Party;

(d) except as set forth on Schedule 14.2(d), there are no judgments, orders, decrees, or settlements against or owed by Sangamo or any of its Affiliates, and, there is no written claim, written demand, suit, proceeding, arbitration, and to Sangamo's knowledge as of the Execution Date, other claim, demand, inquiry, investigation or other legal action of any nature, civil, criminal, regulatory or otherwise, pending or, to the knowledge of Sangamo, threatened against Sangamo or any of its Affiliates, in each case relating to the Sangamo Technology or the transactions contemplated by this Agreement;

(e) Sangamo is the sole and exclusive owner of the Sangamo Patents identified on **Exhibit C** as solely owned by Sangamo, all of which are free and clear of any claims, liens, charges or encumbrances other than licenses granted by Sangamo, which licenses do not conflict with the licenses granted to Kite under this Agreement;

(f) (i) **Exhibit C** sets forth a true and complete list of all Sangamo Patents Controlled by Sangamo or its Affiliates as of the Execution Date that constitute Sangamo Technology, (ii) except for expired provisional patent applications and PCT patent applications that have entered the national phase, each such Patent Right identified as owned by Sangamo (and, to Sangamo's knowledge as of the Execution Date, each such Patent Right that is otherwise Controlled by Sangamo), is in full force and effect, (iii) Sangamo or its Affiliates (or to Sangamo's knowledge as of the Execution Date, Existing Third Party Licensors) have timely paid, or caused the appropriate Third Parties to pay, all filing and renewal fees due prior to the Execution Date with respect to such Patent Rights; and (iv) Sangamo has complied with the duty of candor and duty of disclosure obligations in each jurisdiction with respect to the Sangamo Patents owned by Sangamo;

(g) to Sangamo's knowledge as of the Execution Date, (i) no Third Party is infringing any Sangamo Patents; or (ii) except as set forth on Schedule 14.2(g), no Third Party has challenged or threatened to challenge the inventorship, ownership, Sangamo's right to use, scope, validity or enforceability of, or Sangamo's or any Existing Third Party Licensor's rights in or to, any Sangamo Patents (including, by way of example, through the institution or written threat of institution of interference, derivation, post-grant review, opposition, nullity or similar invalidity proceedings before the United States Patent and Trademark Office or any analogous foreign Governmental Authority);

(h) Sangamo (i) (or, with respect to Sangamo Patents licensed under Existing Third Party Licenses, to Sangamo's knowledge as of the Execution Date, the applicable Existing Third Party Licensor), has obtained from each inventor of a Sangamo Patent, a valid and enforceable agreement assigning to Sangamo or such licensor such inventor's entire right, title and interest in and to all such Sangamo Patent; and (ii) has no knowledge as of the Execution Date of any Person who claims to be an inventor of an invention claimed in a Sangamo Patent and is not identified as an inventor of such invention in the filed patent documents for such Sangamo Patent that specify the identity of the inventors of such invention; and

(i) (i) there are no Existing Third Party Licenses other than those set forth on **Exhibit B**, and except to the extent set forth on **Exhibit D or D-1**, none of the Existing Third Party Licenses include any obligations that restrict or conflict with the practice of the licenses granted by Sangamo hereunder, (ii) true, correct and complete copies of each Existing Third Party License set forth on **Exhibit B** have been provided to Kite, except that certain financial terms or terms related to the issuance of Sangamo's securities, in each case which do not affect the rights or obligations of Kite, its Affiliates or Sublicensees under this Agreement, have been redacted, (iii) no Third Party has any right, title or interest in or to, or any license under, any Sangamo Technology owned by Sangamo or its Affiliates (solely, or with respect to Sangamo's or its Affiliate's interest in any jointly owned Patent Rights or Know-How) that conflicts with the rights granted to Kite hereunder, (iv) no rights granted by or to Sangamo or its Affiliates under any rights to Sangamo Technology obtained by Sangamo pursuant to an Existing Third Party License conflict with any right or license granted to Kite hereunder and (v) Sangamo and its Affiliates are, and to Sangamo's knowledge, each Existing Third Party Licensor is, in compliance in all material respects with all Existing Third Party Licenses.

14.3 Sangamo Covenants. Sangamo hereby covenants to Kite that, from the Execution Date until expiration or termination of this Agreement:

(a) Sangamo will not, and will cause its Affiliates not to (i) license, sell, or assign (other than in a connection with a permitted assignment of this Agreement by Sangamo pursuant to Section 16.2) or otherwise transfer to any Person (other than Kite, its Affiliates or Sublicensees pursuant to the terms of this Agreement) any Sangamo Technology, Joint Inventions, or Joint Patents (or agree to do any of the foregoing) in each case in a manner that is inconsistent with the licenses and other rights granted to Kite under this Agreement; or (ii) incur or permit to exist, with respect to any Sangamo Technology, Joint Patents, or Joint Inventions, any lien, encumbrance, charge, security interest, mortgage, liability, assignment, grant of license or other

binding obligation in each case that is inconsistent with the licenses and other rights granted to Kite under this Agreement;

(b) Sangamo will not, without the consent of Kite (i) take any action with respect to any Third Party License (including amending, terminating or otherwise modifying) that diminishes the rights under the Sangamo Technology granted to Kite under this Agreement; or (b) fail to take any action with respect to a Third Party License that is reasonably necessary to avoid diminishing the rights under the Sangamo Technology granted to Kite under this Agreement;.

(c) Sangamo (i) will not enter into any agreement with a Third Party that conflicts with (A) the rights granted to Kite, Kite's Affiliates, or Sublicensees hereunder, (B) Sangamo's ability to fully perform its obligations hereunder; (ii) will not enter into any agreements that impose additional obligations or liabilities on Kite, Kite's Affiliates, or Sublicensees except as permitted under Section 2.5(b); and (iii) will promptly furnish Kite with true, complete and correct copies of all (A) amendments to the Existing Third Party Licenses and (B) Third Party Licenses, in each case of (A) and (B), executed following the Execution Date which, in each case, may redact financial terms which do not affect the rights or obligations of Kite, its Affiliates or Sublicenses under this Agreement; and

(d) Sangamo will, upon Kite's reasonable request, (i) update the list of Sangamo Patents on **Exhibit C** to reflect any additional Patent Rights included within Sangamo Technology; and (ii) update the list of those Select Other Sangamo Patents on **Exhibit I**, to include any additional Other Sangamo Patents for which the Parties mutually agree Kite should have prosecution and maintenance rights.

14.4 Representation and Warranty by Kite. Kite represents and warrants to Sangamo as of the Execution Date that, to Kite's knowledge as of the Execution Date, [*].

14.5 Mutual Covenants.

(a) **No Debarment**. In the course of the research, development, manufacture and commercialization of the Licensed Products, neither Party nor its Affiliates or sublicensees shall use any employee or consultant who has been debarred by any Regulatory Authority, or, to such Party's or its Affiliate's knowledge, is the subject of debarment proceedings by a Regulatory Authority. Each Party shall notify the other Party promptly upon becoming aware that any of its or its Affiliates' or sublicensees' employees or consultants has been debarred or is the subject of debarment proceedings by any Regulatory Authority.

(b) **Compliance**. Each Party and its Affiliates shall comply in all material respects with all applicable Laws (including all anti-bribery laws) in the research, development, manufacture and commercialization of the Licensed Products and performance of its obligations under this Agreement.

14.6 No Other Warranties. EXCEPT AS EXPRESSLY STATED IN THIS AGREEMENT, (A) NO REPRESENTATION, CONDITION OR WARRANTY WHATSOEVER IS MADE OR GIVEN BY OR ON BEHALF OF KITE OR SANGAMO; AND (B) ALL OTHER CONDITIONS AND WARRANTIES WHETHER ARISING BY

OPERATION OF LAW OR OTHERWISE ARE HEREBY EXPRESSLY EXCLUDED, INCLUDING ANY CONDITIONS AND WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT. WITHOUT EXCUSING EITHER PARTY'S PERFORMANCE OF ITS OBLIGATIONS UNDER THIS AGREEMENT, EACH PARTY HEREBY DISCLAIMS ANY REPRESENTATION OR WARRANTY THAT THE RESEARCH, DEVELOPMENT, MANUFACTURE OR COMMERCIALIZATION OF ANY MODIFIED CELL OR LICENSED PRODUCT PURSUANT TO THIS AGREEMENT WILL BE SUCCESSFUL.

ARTICLE 15
INDEMNIFICATION; LIABILITY; INSURANCE

15.1 Indemnification by Sangamo. Sangamo shall indemnify, defend and hold harmless Kite and its Affiliates and Sublicensees, and each of their respective directors, officers, employees and agents (collectively "**Kite Indemnitees**"), from and against all losses, liabilities, damages and expenses, including reasonable attorneys' fees and costs (collectively, "**Liabilities**"), to the extent resulting from any claims, demands, actions or other proceedings by any Third Party arising out of:

(a) the breach of any representation, warranty or covenant by Sangamo under this Agreement;

(b) the recklessness, negligence or intentional misconduct of any Sangamo Indemnitees or subcontractors; or

(c) any activities by or on behalf of Sangamo or its Affiliates under or in connection with the Research Program;

except, in each case, to the extent arising out of any activities set forth in Section 15.2 for which Kite is obligated to indemnify the Sangamo Indemnitees.

15.2 Indemnification by Kite. Kite shall indemnify, defend and hold harmless Sangamo and its Affiliates, and each of their respective directors, officers, employees and agents (collectively "**Sangamo Indemnitees**"), from and against all Liabilities to the extent resulting from any claims, demands, actions or other proceedings by any Third Party arising out of:

(a) the breach of any representation, warranty or covenant by Kite under this Agreement;

(b) the recklessness, negligence or intentional misconduct of any Kite Indemnitees or subcontractors;

(c) any activities by or on behalf of Kite or its Affiliates under or in connection with the Research Program; or

(d) the development, manufacture, sale, or other commercialization of any Licensed Products by or on behalf of Kite, its Affiliates or Sublicensees;

except, in each case, to the extent arising out of any activities set forth in Section 15.1 for which Sangamo is obligated to indemnify the Kite Indemnitees.

15.3 Indemnification Procedure.

(a) Notification. If either Party is seeking indemnification under Section 15.1 or 15.2 (the **"Indemnified Party"**), it shall inform the other Party (the **"Indemnifying Party"**) of the claim giving rise to the obligation to indemnify pursuant to such Section as soon as reasonably practicable after receiving notice of the claim provided, however, that no delay on the part of the Indemnified Party in notifying the Indemnifying Party will relieve the Indemnifying Party from any obligation hereunder unless (and then only to the extent that) the Indemnifying Party is prejudiced thereby.

(b) Control. The Indemnifying Party shall have the right, exercisable by notice to the Indemnified Party within thirty (30) days after receipt of notice from the Indemnified Party of the commencement of or assertion of any Third Party claim, to assume the direction and control of the defense, litigation, settlement, appeal or other disposition of any such claim for which it is obligated to indemnify the Indemnified Party (including the right to settle the claim solely for monetary consideration) with counsel selected by the Indemnifying Party and reasonably acceptable to the Indemnified Party. During such time as the Indemnifying Party is controlling the defense of such Third Party claim, the Indemnified Party shall cooperate with the Indemnifying Party. In the event that the Indemnifying Party does not notify the Indemnified Party of the Indemnifying Party's intent to defend any Third Party claim within thirty (30) days after notice thereof, the Indemnified Party may (with notice to the Indemnifying Party) undertake the defense thereof with counsel of its choice and at the Indemnifying Party's expense (including reasonable, out-of-pocket attorneys' fees and costs and expenses of enforcement or defense). The Indemnifying Party or the Indemnified Party, as the case may be, shall have the right to participate (including the right to conduct discovery, interview and examine witnesses and participate in all settlement conferences), but not control, at its own expense and with counsel of its choice, in the defense of any claim that has been assumed by the other Party.

(c) Settlement. Neither Party shall have the obligation to indemnify the other Party in connection with any settlement made without the Indemnifying Party's written consent, which consent shall not be unreasonably withheld or delayed. If the Parties cannot agree as to the application of Section 15.1 or 15.2 as to any claim, pending resolution of such dispute, the Parties may conduct separate defenses of such claims, with each Party retaining the right to claim indemnification from the other Party in accordance with Section 15.1 or 15.2 upon resolution of the underlying claim.

15.4 Mitigation of Loss. Each Indemnified Party shall take and shall procure that its Affiliates take all such reasonable steps and action as are reasonably necessary or as the Indemnifying Party may reasonably require in order to mitigate any claims (or potential losses or damages) under this Article 15. Nothing in this Agreement shall or shall be deemed to relieve any Party of any common law or other duty to mitigate any losses incurred by it.

15.5 Limitation of Liability. NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, PUNITIVE, OR INDIRECT DAMAGES ARISING FROM OR RELATING TO ANY BREACH OF THIS AGREEMENT, REGARDLESS OF ANY NOTICE OF THE POSSIBILITY OF SUCH DAMAGES. NOTWITHSTANDING THE FOREGOING, NOTHING IN THIS SECTION 15.5 IS INTENDED TO OR SHALL LIMIT OR RESTRICT THE (A) INDEMNIFICATION RIGHTS OR OBLIGATIONS OF ANY PARTY UNDER SECTION 15.1 OR 15.2, OR (B) DAMAGES AVAILABLE FOR A PARTY'S BREACH OF ITS CONFIDENTIALITY OBLIGATIONS IN ARTICLE 11 OR INTELLECTUAL PROPERTY OBLIGATIONS IN ARTICLE 10; OR (C) DAMAGES AVAILABLE FOR A PARTY'S GROSS NEGLIGENCE, INTENTIONAL MISCONDUCT OR FRAUD.

15.6 Insurance. Each Party shall procure and maintain, during the Term, (a) commercial general liability insurance, with limits of not less than [*]; (b) workers' compensation insurance in compliance with local state/jurisdiction requirements in which the work is to be performed; (c) employer's liability insurance in amounts not less than [*]; and (d) automobile liability insurance for bodily injury, property damage and automobile contractual liability covering all hired autos with a combined single limit of liability for each accident of not less than [*]. Carriers shall be rated by AM Best A-VII (or equivalent) or better. All general liability policies shall name the other Party, its officers, directors, employees and volunteers, as additional insureds (it being understood that a blanket additional insured endorsement will meet this obligation). Each Party shall provide the other Party with evidence of such insurance by furnishing a certificate of insurance upon request and shall provide the other Party with written notice in accordance with the applicable policy provisions of any cancellation, non-renewal or material changes in such insurance. Insurance coverage shall be on an occurrence form, and if any such coverage is on a claims made form, then coverage must be maintained for at least [*] years following the expiration or earlier termination of the Agreement. Where permitted by law, workers' compensation insurance shall contain a waiver of the insurer's subrogation rights against the other Party. Neither Party's insurance will be construed to create a limit of liability with respect to its indemnification obligations under this Article 15.

ARTICLE 16
GENERAL PROVISIONS

16.1 Force Majeure. Neither Party shall be held liable to the other Party nor be deemed to have defaulted under or breached this Agreement for failure or delay in performing any obligation under this Agreement to the extent such failure or delay is caused by or results from causes beyond the reasonable control of the affected Party, potentially including embargoes, war, acts of war (whether war be declared or not), acts of terrorism, insurrections, riots, civil commotions, strikes, lockouts or other labor disturbances, fire, floods, earthquakes or other acts of God, or acts, generally applicable action or inaction by any governmental authority (but excluding any government action or inaction that is specific to such Party, its Affiliates or sublicensees, such as revocation or non-renewal of such Party's license to conduct business), or omissions or delays in acting by the other Party, or unavailability of materials related to the manufacture of the Licensed Products or components thereof. The affected Party shall notify the other Party in writing of such force majeure circumstances as soon as reasonably practical, and shall promptly undertake

and continue diligently all Commercially Reasonable Efforts necessary to cure such force majeure circumstances or to perform its obligations in spite of the ongoing circumstances.

16.2 Assignment. This Agreement may not be assigned or otherwise transferred, nor may any right or obligation hereunder be assigned or transferred, by either Party without the prior written consent of the other Party. Notwithstanding the foregoing, either Party may, without consent of the other Party, assign this Agreement and its rights and obligations hereunder in whole or in part to an Affiliate of such Party, or in whole to its successor in interest in connection with the sale of all or substantially all of its stock or its assets to which this Agreement relates, or in connection with a merger, acquisition or similar transaction. In addition, Kite may, without the consent of Sangamo, assign its rights and obligations under this Agreement to a Third Party, where Kite or its Affiliate is required, or makes a good faith determination based on advice of counsel, to divest a Licensed Product in order to comply with Law or the order of any Governmental Authority as a result of a merger or acquisition or similar transaction. Any attempted assignment not in accordance with this Section 16.2 shall be null and void and of no legal effect. Any permitted assignee shall assume all assigned obligations of its assignor under this Agreement. The terms and conditions of this Agreement shall be binding upon, and shall inure to the benefit of, the Parties and their respected successors and permitted assigns.

16.3 Severability. If any one or more of the provisions contained in this Agreement is held invalid, illegal or unenforceable in any respect, the validity, legality and enforceability of the remaining provisions contained herein shall not in any way be affected or impaired thereby, unless the absence of the invalidated provision(s) adversely affects the substantive rights of the Parties. The Parties shall in such an instance use all reasonable efforts to replace the invalid, illegal or unenforceable provision(s) with valid, legal and enforceable provision(s) which, insofar as practical, implement the purposes of this Agreement.

16.4 Notices. All notices which are required or permitted hereunder shall be in writing and sufficient if delivered personally, sent by facsimile (and promptly confirmed by personal delivery, registered or certified mail or overnight courier), sent by nationally-recognized overnight courier or sent by registered or certified mail, postage prepaid, return receipt requested, addressed as follows:

If to Sangamo:

Sangamo Therapeutics, Inc.
501 Canal Blvd.
Richmond, CA 94804
Attn: General Counsel
Fax: (510) 236-8951

with copies to:

Sangamo Therapeutics, Inc.
501 Canal Blvd.
Richmond, CA 94804
Attn: Chief Financial Officer
Fax: (510) 236-8951

Cooley LLP
3175 Hanover Street
Palo Alto, CA 94304
Attn: Marya Postner, Ph.D.
Fax: (650) 849-7400

If to Kite:

Kite Pharma, Inc.
2400 Broadway
Santa Monica, CA 90404
Attn: Head of Legal
Fax: (310) 824-9994

with a copy to:

Gilead Sciences, Inc.
333 Lakeside Drive
Foster City, CA 94404
Attn: General Counsel
Fax: (650) 522-5771

or to such other address(es) as the Party to whom notice is to be given may have furnished to the other Party in writing in accordance herewith. Any such notice shall be deemed to have been given: (a) on the Business Day when delivered if personally delivered or sent by facsimile on a Business Day (or if delivered or sent on a non-Business Day, then on the next Business Day); (b) on the Business Day after dispatch if sent by nationally-recognized overnight courier; or (c) on the fifth (5th) Business Day following the date of mailing, if sent by mail.

16.5 Dispute Resolution. The Parties recognize that disputes as to certain matters may from time to time arise that relate to either Party's rights and/or obligations hereunder, including the interpretation, alleged breach, enforcement, termination or validity of this Agreement (a "**Dispute**"). For clarity, Dispute shall not include matters within the JSC's authority, which are resolved under Section 3.4. It is the objective of the Parties to establish procedures to facilitate the resolution of such Disputes arising under this Agreement in an expedient manner by mutual cooperation. To accomplish this objective, the Parties agree that if a Dispute arises under this Agreement, and the Parties are unable to resolve such Dispute within thirty (30) days after such Dispute is first identified by either Party in writing to the other, the Parties shall refer such Dispute to the Executive Officers of the Parties for attempted resolution by good faith negotiations within thirty (30) days after such notice is received. If the Executive Officers are not able to resolve such Dispute within thirty (30) days, then either Party shall be entitled to all available remedies, subject to Section 16.7. Notwithstanding the foregoing, and without waiting for the expiration of the time periods set forth above, each Party have the right to apply to any court of competent jurisdiction for appropriate interim or provisional relief, as necessary to protect its rights or property.

16.6 Governing Law. This Agreement shall be governed by and construed in accordance with the laws of [*], without reference to any rules of conflict of laws; provided that the United Nations Convention on Contracts for International Sale of Goods shall not apply.

16.7 Jurisdiction. The Parties hereby irrevocably submit to the exclusive jurisdiction of the courts of [*] and [*], in respect of the interpretation and enforcement of the provisions of this Agreement and of the documents referred to herein, and in respect of the transactions hereby, and hereby waive, and agree not to assert, as a defense in any action, suit or proceeding for the interpretation or enforcement hereof or thereof, that it is not subject thereto or that such action, suit or proceeding may not be brought or is not maintainable in said courts or that the venue thereof may not be appropriate or that this Agreement or any such document may not be enforced in or by such courts, and the Parties irrevocably agree that all claims with respect to such action or proceeding shall be heard and determined in such a [*] court. The Parties hereby consent to and grant any such court jurisdiction over the person of such parties and over the subject matter of such dispute and agree that mailing of process or other papers in connection with any such action or proceeding in the manner provided in Section 16.4 or in such other manner as may be permitted by applicable Law, shall be valid and sufficient service thereof. With respect to any particular action, suit or proceeding, venue shall lie solely in [*]. A Party hereto may apply either to a court of competent jurisdiction or to an arbitrator, if one has been appointed, for prejudgment remedies and emergency relief pending final determination of a claim pursuant to this Section 16.7.

16.8 Entire Agreement; Amendments. This Agreement, together with the Exhibits hereto, contains the entire understanding of the Parties with respect to the subject matter hereof. Any other express or implied agreements and understandings, negotiations, writings and commitments, either oral or written, with respect to the subject matter hereof are superseded by the terms of this Agreement. The Exhibits to this Agreement are incorporated herein by reference and shall be deemed a part of this Agreement. This Agreement may be amended, or any term hereof modified, only by a written instrument duly executed by authorized representative(s) of both Parties hereto. The Parties agree that, effective as of the Execution Date, that certain Mutual Confidentiality Agreement between the Parties dated as of [*] and that certain Mutual Confidential Disclosure Agreement between Kite's Affiliate, Gilead Sciences, Inc., and Sangamo, dated as of [*] (collectively, the "**Confidentiality Agreement**") are hereby terminated by this Agreement, and that disclosures made prior to the Execution Date pursuant to the Confidentiality Agreements shall be deemed to be Confidential Information and shall be subject to the confidentiality and non-use provisions of this Agreement.

16.9 Headings. The captions to the several Articles, Sections and subsections hereof are not a part of this Agreement, but are merely for convenience to assist in locating and reading the several Articles and Sections hereof.

16.10 Independent Contractors. It is expressly agreed that Sangamo and Kite shall be independent contractors and that the relationship between the two Parties shall not constitute a partnership, joint venture or agency. Neither Sangamo nor Kite shall have the authority to make any statements, representations or commitments of any kind, or to take any action, which shall be binding on the other Party, without the prior written consent of the other Party.

16.11 Waiver. No provision of this Agreement will be waived by any act, omission or knowledge of a Party, its Affiliates or their respective agents or employees except by an instrument in writing expressly waiving such provision and signed by a duly authorized officer of the waiving Party. The waiver by either Party hereto of any right hereunder, or of any failure of the other Party to perform, or of any breach by the other Party, shall not be deemed a waiver of any other right hereunder or of any other breach by or failure of such other Party whether of a similar nature or otherwise.

16.12 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.

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

16.14 Business Day Requirements. In the event that any notice or other action or omission is required to be taken by a Party under this Agreement on a day that is not a Business Day then such notice or other action or omission shall be deemed to be required to be taken on the next occurring Business Day.

16.15 Translations. This Agreement is in the English language only, which language shall be controlling in all respects, and all versions hereof in any other language shall be for accommodation only and shall not be binding upon the Parties. All communications and notices to be made or given pursuant to this Agreement, and any dispute proceeding related to or arising hereunder, shall be in the English language. If there is a discrepancy between any translation of this Agreement and this Agreement, this Agreement shall prevail.

16.16 Further Actions. Each Party agrees to execute, acknowledge and deliver such further instruments, and to do all such other acts, as necessary or appropriate in order to carry out the purposes and intent of this Agreement.

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

16.18 Guarantee by Gilead. In consideration of the rights granted to Kite hereunder, Gilead hereby unconditionally and irrevocably guarantees to Sangamo the full payment and performance, as and when due hereunder, of all obligations of Kite under this Agreement. This guarantee shall be enforceable upon the failure by Kite to pay or perform any obligation it may have under this Agreement in accordance with its terms, and shall be effective regardless of the solvency or insolvency of Kite at any time, or the subsequent reorganization, merger, consolidation or other restructuring of Kite. Gilead hereby expressly waives any requirement that Sangamo exhaust any right, power or remedy under this Agreement, or proceed against Kite under this Agreement, for any obligation or performance hereunder prior to proceeding directly against Gilead under this Section 16.18. For clarity, this provision shall apply for so long as Kite is a Party

to this Agreement, and shall otherwise terminate upon any permitted assignment under Section 16.2 to a Third Party.

16.19 Bankruptcy. All rights and licenses granted under or pursuant to this Agreement by a Party are, and shall otherwise be deemed to be, for purposes of Section 365(n) of the U.S. Bankruptcy Code, licenses of rights to "intellectual property" as defined under Section 101 of the U.S. Bankruptcy Code. The Parties agree that each Party, as licensee of intellectual property under this Agreement, shall retain and may fully exercise all of its rights and elections under the U.S. Bankruptcy Code. The Parties further agree that in the event of a rejection of this Agreement by a Party in any bankruptcy proceeding by or against such Party under the U.S. Bankruptcy Code, (i) the other Party shall be entitled to a complete duplicate of (or complete access to, as appropriate) any such intellectual property and all embodiments of such intellectual property that are necessary for the other Party to practice its license to such intellectual property, which, if not already in such other Party's possession, shall be promptly delivered to it upon its written request therefor, and (ii) such Party shall not interfere with the other Party's rights to such intellectual property, and shall assist and not interfere with such other Party in obtaining such intellectual property and such embodiments of such intellectual property from another entity. The term "embodiments" of intellectual property means all tangible embodiments of the intellectual property licensed hereunder to the extent of the license scope, and shall exclude, without limitation, all inventory of Licensed Products and filings with Regulatory Authorities. All rights, powers and remedies provided in this Section 16.19 are in addition to and not in substitution for any and all other rights, powers and remedies now or hereafter existing at Law or in equity (including the Bankruptcy Code) in the event of the commencement of a case under the U.S. Bankruptcy Code.

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IN WITNESS WHEREOF, the Parties and Gilead intending to be bound have caused this Collaboration and License Agreement to be executed by their duly authorized representatives as of the Execution Date.

Sangamo Therapeutics, Inc.	**Kite Pharma, Inc.**
By: /s/ Alexander Macrae	By: /s/ Robin Washington
Name: Alexander Marcrae	Name: Robin Washington
Title: President + CEO	Title: Director

Solely for purposes of Section 16.18:

Gilead Sciences, Inc.

By: /s/ John F. Milligan

Name: John F. Milligan, Ph.D.

Title: President and Chief Executive Officer

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

LIST OF EXHIBITS

Exhibit A: **Excluded Third Party Licenses**
Exhibit B: **Existing Third Party Licenses**
Exhibit C: **Sangamo Patents as of the Effective Date**
Exhibit D: **Certain Terms of Third Party Licenses**
Exhibit E: **Initial Research Plans**
Exhibit F: **Material Supply Terms**
Exhibit G: **Form of Development Report**
Exhibit H: **Form of Commercialization Report**
Exhibit I: **Select Other Sangamo Patents as of the Effective Date**
Exhibit J: **Base Patent Jurisdictions**

Schedules
Schedule 14.2(d)
Schedule 14.2(g)

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

Exhibit A Excluded Third Party Licenses

[*]

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

Exhibit B Existing Third Party Licenses

[*]

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

Exhibit C
Sangamo Patents as of the Effective Date

Ref. number	Assignee(s)	Country	Status	Title	Application	Filing Date	Publication number	Patent number
[*]	[*]	[*]	[*]	[*]	[*]	[*]	[*]	[*]

(18 pages omitted)

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

EXHIBIT D
Certain Terms of Third Party Licenses

Capitalized terms used in this Exhibit D but not defined herein or elsewhere in the Agreement shall have the meanings ascribed to them in the applicable Third Party License.

[*] (6 pages omitted)

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

EXHIBIT D-1
Copy of Provisions from [*]

[*] (2 pages omitted)

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

EXHIBIT E
Initial Research Plans

[*] (20 pages omitted)

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

Exhibit F
Material GMP Supply Terms

[*]

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

Exhibit G

Form of Development Report

In accordance with Section 5.5 of the Collaboration and License Agreement between Kite Pharma, Inc. and Sangamo Therapeutics, Inc., dated February [__], 2018, we are hereby providing you with the [*] Development Report detailing the progress and results of the clinical development activities undertaken by or on behalf of Kite, its Affiliates and Sublicensees to further the development of Licensed Products.

LICENSED PRODUCT 1 [INSERT CANDIDATE TARGET AND PRODUCT TYPE, e.g. "[*] LICENSED PRODUCT"]

Overall

- Summary of development activities

Clinical

- Material safety-related development results
- To the extent published: clinical outcomes, safety/toxicities, and clinical pharmacokinetics.
- Additional studies for which there are approved budgets and which are planned for initiation in the next year: summary of study designs, primary and secondary endpoints, duration and other relevant study considerations if these are available.

Regulatory

- Summary of regulatory authority submissions

LICENSED PRODUCT 2 [INSERT CANDIDATE TARGET AND PRODUCT TYPE]

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

Exhibit H

Form of Commercialization Report

In accordance with Section 8.3 of the Collaboration and License Agreement between Kite Pharma, Inc. and Sangamo Therapeutics, Inc., dated February [__], 2018, we are hereby providing you with the [*] Commercialization Report detailing the progress and results of the activities undertaken by or on behalf of Kite, its Affiliates and Sublicensees to support the commercialization of Licensed Products.

LICENSED PRODUCT 1 [INSERT CANDIDATE TARGET AND PRODUCT TYPE, e.g. "[*] LICENSED PRODUCT"]

Overall

- Summary of commercialization activities
- High-level description of commercialization strategy and key objectives

Pre-Launch (for Major Market Countries)

- List of countries anticipated for commercial activity in the Major Market Countries
- Target Population
  - Anticipated on-label indication(s)
- Timing
  - Anticipated date of approval

Post-Launch for Major Market Countries)

- High level commercialization timeline.
- Launch status for Major Market Countries

LICENSED PRODUCT 2 [INSERT CANDIDATE TARGET AND PRODUCT TYPE]

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

Exhibit I

Select Other Sangamo Patents as of the Effective Date

Ref. number	Assignee(s)	Country	Status	Title	Application	Filing Date	Publication number	Patent number
[*]	[*]	[*]	[*]	[*]	[*]	[*]	[*]	[*]

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

Exhibit J

Base Patent Jurisdictions

- [*]

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

Disclosures

Schedule 14.2(d)

[*]

Schedule 14.2(g)

[*]

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

AMENDED AND RESTATED INCENTIVE COMPENSATION PLAN

1. Purpose. The Sangamo Therapeutics, Inc. Amended and Restated Incentive Compensation Plan (the "***Plan***") is for purposes of providing cash incentive compensation to employees of Sangamo Therapeutics, Inc. (the "***Company***") and its subsidiaries and who meet the eligibility criteria for participation in the Plan as specified herein (the "***Participants***"). As of the Effective Date, the Plan amends and restates in its entirety the Company's Incentive Compensation Plan that became effective on June 21, 2012. Certain capitalized terms used in this Plan document are defined on the attached **APPENDIX A**.

2. How Awards Are Earned Under the Plan.

(a) ***General Plan Description.*** The Plan provides the opportunity for eligible employees to earn a cash bonus for each Performance Period based on the level of attainment of Performance Objectives and subject to satisfaction of any Continuous Service requirements established for the Performance Period and other requirements as set forth in the applicable Criteria approved by the Committee for each Performance Period.

(b) ***Performance Periods.*** Unless the Committee determines otherwise, each Performance Period shall be coincident with the calendar year, commencing with the 2018 calendar year.

(c) ***Eligibility.*** Unless otherwise determined by the Committee, the eligible employees who will be the Participants in a Performance Period are those individuals employed by the Company or any subsidiary thereof on or before October 31st of the applicable Performance Period.

(d) ***Performance Objectives and Performance Period***. Actual Award amounts will be calculated based upon the level of attainment of the Performance Objectives established for each applicable Performance Period pursuant to the following guidelines. The Committee will approve the applicable Corporate Objectives for each Performance Period, which may, but are not required to, include a Threshold Goal. The Committee will approve the applicable weighting of the Corporate Objectives. The Actual Award amount will be calculated based on level of attainment of the designated Performance Objectives during the Performance Period based on the applicable weighting. If a Threshold Goal is applicable to a Performance Period but is not achieved during such Performance Period the Participants will not earn any Actual Award under the Plan with respect to such Performance Period.

(e) ***Service Requirements.***

(i) The Committee will determine the applicable Continuous Service requirements that must be satisfied for a Participant to earn an Actual Award for a Performance Period. If a Participant terminates Continuous Service for any reason prior to satisfying the applicable Continuous Service requirement for the Performance Period the Participant will forfeit the right to receive any Actual Award under the Plan for such Performance Period.

(ii) In order to be eligible to participate for a Performance Period an employee's first date of employment with the Company or a subsidiary thereof must be on or before October 31st of such Performance Period.

(iii) If a Participant is promoted during a Performance Period and the Target Award percentage of Base Salary changes as a result due of the change in the Participant's position, the Actual Award calculation will be pro-rated to include both Target Award amounts (as applicable to the Base Salary amount earned during the portion of the Performance Period that the Target Award percentage applied).

3. Other Plan Provisions.

(a) ***Determination and Payment of Actual Awards.*** Assessment of actual performance, determination of the Actual Awards and any payment in respect of Actual Awards will be subject to the Committee's determination that the applicable Performance Objectives, any Continuous Service requirements, and any other conditions set forth in the Criteria for such Performance Period have been satisfied. All Actual Awards which are earned under the Plan will be paid to Participants as soon as administratively practicable following determination of the Actual Award, but in no event later than March 31st of the calendar year that follows the expiration of the Performance Period.

(b) ***Withholding.*** The Company will withhold from payment of any Actual Award an amount in satisfaction of any federal, state or local tax withholding obligation relating to the payment of the Actual Award as necessary to satisfy the Company's required tax withholding obligations using the minimum statutory withholding rates for federal, state, local and foreign tax purposes, including payroll taxes, as applicable to supplemental taxable income.

(c) ***No Employment or Service Rights.*** Nothing in the Plan or any instrument executed pursuant to the Plan will (i) confer upon any Participant any right to continue to be retained in the employ or service of the Company or any subsidiary, (ii) change the at-will employment relationship between the Company or any subsidiary and a Participant, or (iii) interfere with the right of the Company or any subsidiary to discharge any Participant or other person at any time, with or without cause, and with or without advance notice.

(d) ***Plan Administration.*** The Committee will be responsible for all decisions and recommendations regarding Plan administration and retains final authority regarding all aspects of Plan administration, interpretation of the Plan, the resolution of any disputes, and application of the Plan in any respect to a Participant except to the extent the Committee delegates such authority to the Company's officers and/or management as specified in the Criteria. All determinations and interpretations made by the Committee (or its delegate) in good faith will not be subject to review by any person and will be final, binding and conclusive on all persons. The Committee may, without notice, amend, suspend or terminate the Plan; *provided*, *however*, that no such action may adversely affect any Participant unless (i) expressly provided by the Committee; and (ii) with the consent of the Participant, unless such action is necessary to comply with any applicable law, regulation or rule.

(e) ***Recovery.*** Any amounts paid under the Plan will be subject to recoupment in accordance with any clawback policy adopted pursuant to the listing standards of any national securities

exchange or association on which the Company's securities are listed or as is otherwise adopted pursuant to the Dodd-Frank Wall Street Reform and Consumer Protection Act or other applicable law. No recovery of compensation under such a clawback policy will be an event giving rise to a right to resign for "good reason" or "constructive termination" (or similar term) under any plan of or agreement with the Company.

(f) ***Validity.*** If any provision of the Plan is held invalid, void, or unenforceable, the same will not affect, in any respect whatsoever, the validity of any other provision of the Plan.

(g) ***Section 280G.***

(i) If any payment or benefit a Participant would receive from the Company pursuant to this Plan or otherwise ("***Payment***") would (i) constitute a "parachute payment" within the meaning of Section 280G of the Code, and (ii) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "***Excise Tax***"), then such Payment shall be equal to the Reduced Amount. The "***Reduced Amount***" shall be either (x) the largest portion of the Payment that would result in no portion of the Payment being subject to the Excise Tax or (y) the largest portion, up to and including the total, of the Payment, whichever amount, after taking into account all applicable federal, state and local employment taxes, income taxes, and the Excise Tax (all computed at the highest applicable marginal rate), results in the Participant's receipt, on an after-tax basis, of the greater economic benefit notwithstanding that all or some portion of the Payment may be subject to the Excise Tax. If a reduction in a Payment is required pursuant to the preceding sentence and the Reduced Amount is determined pursuant to clause (x) of the preceding sentence, the reduction shall occur in the manner (the "***Reduction Method***") that results in the greatest economic benefit for the Participant. If more than one method of reduction will result in the same economic benefit, the items so reduced will be reduced pro rata (the "***Pro Rata Reduction Method***").

(ii) Notwithstanding any provision of paragraph (i) to the contrary, if the Reduction Method or the Pro Rata Reduction Method would result in any portion of the Payment being subject to taxes pursuant to Section 409A of the Code that would not otherwise be subject to taxes pursuant to Section 409A of the Code, then the Reduction Method and/or the Pro Rata Reduction Method, as the case may be, shall be modified so as to avoid the imposition of taxes pursuant to Section 409A of the Code as follows: (A) as a first priority, the modification shall preserve to the greatest extent possible, the greatest economic benefit for the Participant as determined on an after-tax basis; (B) as a second priority, Payments that are contingent on future events (e.g., being terminated without cause), shall be reduced (or eliminated) before Payments that are not contingent on future events; and (C) as a third priority, Payments that are "deferred compensation" within the meaning of Section 409A of the Code shall be reduced (or eliminated) before Payments that are not deferred compensation within the meaning of Section 409A of the Code.

(iii) In the event it is subsequently determined by the Internal Revenue Service that some portion of the Reduced Amount as determined pursuant to clause (x) in the preceding paragraph is subject to the Excise Tax, the Participant agrees to promptly return to the Company a sufficient amount of the Payment so that no portion of the Reduced Amount is subject to the Excise Tax. For the avoidance of doubt, if the Reduced Amount is determined pursuant to clause (y) in the preceding paragraph, the Participant will have no obligation to return any portion of the Payment pursuant to the preceding sentence.

(iv) The accounting firm engaged by the Company for general tax compliance purposes as of the day prior to the effective date of the Change in Control shall perform the foregoing calculations unless otherwise determined by the Company. If the accounting firm so engaged by the Company is serving as accountant or auditor for the individual, entity or group effecting the Change in Control, the Company shall appoint a nationally recognized accounting firm to make the determinations required hereunder. The Company shall bear all expenses with respect to the determinations by such accounting firm required to be made hereunder.

(h) ***Section 409A.*** All Plan payments are intended to qualify for an exemption from application of Section 409A or comply with its requirements to the extent necessary to avoid adverse personal tax consequences to the Participants under Section 409A, and any ambiguities herein shall be interpreted accordingly. The Company reserves the right to accelerate the payment of Plan benefits to the extent permitted by Section 409A.

APPENDIX A--DEFINITIONS

(a) "***Actual Award***" means the amount of any cash bonus awarded to and earned by a Participant for a Performance Period as calculated based on the level of achievement of the Performance Objectives during the applicable Performance Period.

(b) ***"Base Salary"*** means the amount of the Participant's base pay (excluding incentive pay, premium pay, commissions, overtime, bonuses and other forms of variable compensation) earned during the applicable Performance Period.

(c) "***Committee***" means the Compensation Committee of the Board of Directors.

(d) ***"Continuous Service"*** means that the Participant's employment with the Company or any subsidiary is not interrupted or terminated. If a Company subsidiary for which a Participant is rendering services ceases to remain a subsidiary of the Company, as determined by the Committee, in its sole discretion, such Participant's Continuous Service shall be considered to have terminated on the date such entity ceases to be a subsidiary of the Company. To the extent permitted by law, the Committee in its discretion may determine whether Continuous Service shall be considered interrupted in the case of any Company approved leave of absence, including sick leave, military leave or any other personal leave.

(e) ***"Corporate Objectives"*** shall mean one or more specific Company performance objectives designated by the Committee for a particular Performance Period, and which may include (i) revenue, organic revenue, net sales, or new-product revenue or net sales, (ii) achievement of specified milestones in the discovery and development of the Company's technology or of one or more of the Company's products, (iii) achievement of specified milestones in the commercialization of one or more of the Company's products, (iv) achievement of specified milestones in the manufacturing of one or more of the Company's products, (v) expense targets, (vi) share price, (vii) total shareholder return, (viii) earnings per share, (ix) operating margin, (x) gross margin, (xi) return measures (including, but not limited to, return on assets, capital, equity, or sales), (xii) productivity ratios, (xiii) operating income, (xiv) net operating profit, (xv) net earnings or net income (before or after taxes), (xvi) cash flow (including, but not limited to, operating cash flow, free cash flow and cash flow return on capital), (xvii) earnings before or after interest, taxes, depreciation, amortization and/or stock-based compensation expense, (xviii) economic value added, (xix) market share, (xx) working capital targets, (xxi) achievement of specified milestones relating to corporate partnerships, collaborations, license transactions, distribution arrangements, mergers, acquisitions, dispositions or similar business transactions, (xxii) employee retention and recruiting and human resources management, and (xxiii) other corporate performance criteria approved by the Committee. Corporate Objectives may be specified with respect to Company performance as measured on an absolute basis, relative to prior Company performance, internal business plans, or the performance of peers, with respect to any of the Company's business units or divisions or any parent or subsidiary entity, on a per-share basis, or other measurement methods as approved by the Committee.

(f) "***Criteria***" means the conditions for a Performance Period that must be satisfied for Participants to earn an Actual Award for such Performance Period and the manner and method by which Actual Awards will be calculated as approved by the Committee. The Criteria will include the Target Award levels, Performance Objectives and relative weightings, including any applicable Threshold Goal,

any Continuous Service requirements, and other terms approved by the Committee for such Performance Period as not inconsistent with the Plan.

(g) "***Effective Date***" means March 19, 2018.

(h) ***"Individual Objectives"*** shall mean one or more specific performance objectives designated for a Participant to attain in a particular Performance Period and which may include one or more of the following criteria: (i) the Participant's contribution toward the achievement of a specific Corporate Objective, (ii) the contribution of the business unit or division supervised by the Participant toward the achievement of a specific Corporate Objective, (iii) the Participant's development of professional skills, and (iv) other criteria approved by the Participant's supervisor.

(i) ***"Maximum Award"*** means the maximum Actual Award that may be earned by a Participant for a Performance Period. Unless otherwise determined by the Committee the Maximum Award is 200% of the Target Award.

(j) ***"Performance Objectives"*** means the Corporate Objectives and/or Individual Objectives established for the Performance Period.

(k) ***"Performance Period"*** means each applicable period approved by the Committee under which a cash bonus may be earned under the Plan.

(l) ***"Threshold Goal"*** means the minimum performance level that must be attained to any portion of an Actual Award to be earned for such Performance Period. The Committee may, but is not required to, establish a Threshold Goal with respect to any designated Performance Period.

(m) ***"Section 409A"*** means Section 409A of the Internal Revenue Code of 1986, as amended from time to time, including regulations and other guidance thereunder, and any state law of similar effect.

(n) ***"Target Award"*** means the applicable award amount that would be payable to a Participant as an Actual Award for a Performance Period if the Performance Objectives for such Performance Period were attained at exactly 100% of the target level and the Participant satisfied any other conditions necessary to earn an Actual Award for such Performance Period.

Exhibit 31.1

CERTIFICATION

I, Alexander D. Macrae, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Sangamo Therapeutics, Inc.;

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

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a — 15(f) and 15d — 15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: May 10, 2018

/s/ Alexander D. Macrae
Alexander D. Macrae
President and Chief Executive Officer

Exhibit 31.2

CERTIFICATION

I, Kathy Y. Yi, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Sangamo Therapeutics, Inc.;

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

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a — 15(f) and 15d — 15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: May 10, 2018

/s/ Kathy Y. Yi
Kathy Y. Yi
Senior Vice President and Chief Financial Officer
(Principal Financial and Accounting Officer)

Exhibit 32.1

Certification Pursuant to 18 U.S.C. §1350, as Adopted
Pursuant to §906 of the Sarbanes-Oxley Act of 2002

Pursuant to the requirement set forth in Rule 13a-14(b) of the Securities Exchange Act of 1934, as amended, (the "Exchange Act") and Section 1350 of Chapter 63 of Title 18 of the United States Code (18 U.S.C. §1350), each of the undersigned hereby certifies in his or her capacity as an officer of Sangamo Therapeutics, Inc. (the "Company"), that, to the best of his or her knowledge:

(1) the Company's Quarterly Report on Form 10-Q for the period ended March 31, 2018, to which this Certification is attached as Exhibit 32.1 (the "Report") fully complies with the requirements of Section 13(a) or Section 15(d) of the Exchange Act; and

(2) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ Alexander D. Macrae
Alexander D. Macrae
President and Chief Executive Officer
(Principal Executive Officer)

Date: May 10, 2018

/s/ Kathy Y. Yi
Kathy Y. Yi
Senior Vice President and Chief Financial Officer
(Principal Financial and Accounting Officer)

Date: May 10, 2018

This certification accompanies the Quarterly Report on Form 10-Q to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of Sangamo Therapeutics, Inc. under the Securities Act of 1933, as amended, or the Exchange Act (whether made before or after the date of the Form 10-Q), irrespective of any general incorporation language contained in such filing. A signed original of this written statement required by Section 906 of the Sarbanes-Oxley Act of 2002 has been provided to Sangamo Therapeutics, Inc. and will be retained by Sangamo Therapeutics, Inc. and furnished to the Securities and Exchange Commission or its staff upon request.