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

Form 10-K

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

For the fiscal year ended December 31, 2011

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: 0-30171

SANGAMO BIOSCIENCES, INC.

(Exact name of registrant as specified in its charter)

Delaware	**68-0359556**
(State or other jurisdiction of incorporation or organization)	*(I.R.S. Employer Identification No.)*
501 Canal Boulevard, Suite A Richmond, California	**94804**
(Address of principal executive offices)	*(Zip Code)*

(510) 970-6000

(Registrant's telephone number, including area code)

None

(Former name, former address and former fiscal year, if changed since last report)

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

Title of Each Class	Name of Each Exchange on Which Registered
Common Stock, $0.01 par value per share	Nasdaq Global Market

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

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

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

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

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

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

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

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

The aggregate market value of the voting stock held by non-affiliates of the registrant based upon the closing sale price of the common stock on June 30, 2011 (the last business day of the registrant's most recently completed second fiscal quarter), as reported on the Nasdaq Global Market was $294,045,039. For purposes of this calculation, directors and executive officers of the registrant have been deemed affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

Indicate the number of shares outstanding of each of the issuer's classes of common stock, as of the latest practicable date.

Class	Outstanding at February 1, 2012
Common Stock, $0.01 par value per share	52,554,795 shares

DOCUMENTS INCORPORATED BY REFERENCE

Document	Parts Into Which Incorporated
Proxy Statement for the 2012 Annual Meeting of Stockholders	Part III

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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;
- 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 Results of Operations” in this Form 10-K. Sangamo undertakes no obligation to publicly release any revisions to forward-looking statements to reflect events or circumstances arising after the date of this report. Readers are cautioned not to place undue reliance on the forward-looking statements, which speak only as of the date of this Annual Report on Form 10-K.

ZFP Therapeutic® is a registered trademark of Sangamo BioSciences, Inc. This report also contains trademarks and trade names that are the property of their respective owners.

PART I

ITEM 1 – BUSINESS

Overview

We are a clinical stage biopharmaceutical company focused on the research, development and commercialization of engineered DNA-binding proteins for the development of novel therapeutic strategies for unmet medical needs. Our current mission is to develop ZFP Therapeutics® through early stage clinical testing and strategically partner with biopharmaceutical companies at key value inflection points to execute late-stage clinical trials and commercial development. In the long term, our goal is to forward integrate to capture the value of late-stage and commercial ZFP Therapeutic products.

We, and our licensed partners, are the leaders in the research, development and commercialization of zinc finger DNA-binding proteins (ZFPs), a naturally occurring class of proteins. We have used our knowledge and expertise to develop a proprietary technology platform. ZFPs can be engineered (see Fig. 1) to make ZFP nucleases (ZFNs), proteins that can be used to modify DNA sequences in a variety of ways and ZFP transcription factors (ZFP TFs), proteins that can be used to turn genes on or off. As ZFPs act at the DNA level, they have broad potential applications in several areas including human therapeutics, plant agriculture, research reagents, as well as production of transgenic animals and cell-line engineering.

The main focus for our company is the development of novel human therapeutics and we are building a pipeline of ZFP Therapeutics. Our lead ZFP Therapeutic, SB-728-T, a ZFN-modified autologous T-cell product for the treatment of HIV/AIDS, is the first therapeutic application of our ZFN technology and is being evaluated in an ongoing Phase 2 and two Phase 1/2 clinical trials. We expect to present preliminary data from this program at appropriate scientific and medical meetings in 2012.

We have preclinical ZFP Therapeutic development programs in hemophilia and Parkinson's disease. In addition, we have research stage programs in other monogenic diseases; genetic conditions that result from a defect in a single gene, including hemoglobinopathies such as sickle cell anemia, lysosomal storage diseases and certain immunodeficiencies. On January 31, 2012, we entered into a collaboration and license agreement with Shire AG (Shire), pursuant to which we will collaborate with Shire to research, develop and commercialize human therapeutics for hemophilia and other monogenic diseases based on our ZFP technology.

We believe the potential commercial applications of ZFPs are broad-based and we have licensed our ZFP platform in fields outside human therapeutics as follows to facilitate the sale or license of ZFNs and ZFP TFs in those fields:

- We have a license agreement with the research reagent company Sigma-Aldrich Corporation (Sigma). Sigma has the exclusive rights to develop and market high value laboratory research reagents based upon our ZFP technology as well as ZFP-modified cell lines for commercial production of protein pharmaceuticals and ZFP-engineered transgenic animals. Sigma is marketing ZFN-derived gene editing tools under the trademark CompoZr® and is selling transgenic animals through its SAGE™ Labs business unit.
- We have a license agreement with Dow AgroSciences, LLC (DAS), a wholly owned subsidiary of Dow Chemical Corporation. Under the agreement, we have provided DAS with access to our ZFP technology and the exclusive rights to use it to modify the genomes or alter the nucleic acid or protein expression of plant cells, plants, or plant cell cultures. DAS markets our ZFN technology under the trademark EXZACT™ Precision Technology. We have retained rights to use plants or plant-derived products to deliver ZFP TFs or ZFNs into human or animals for diagnostic, therapeutic, or prophylactic purposes.

- We also have license agreements with pharmaceutical and life sciences companies including Genentech Inc. (Genentech), F. Hoffmann–La Roche Ltd and Hoffmann-La Roche Inc. (Roche) and Open Monoclonal Technology, Inc. (OMT). Pursuant to these license agreements, we granted non-exclusive rights to use our ZFP technology for protein pharmaceutical production and transgenic animals.

We have a substantial intellectual property position in the design, selection, composition, and use of engineered ZFPs to support all of these commercial activities. As of February 1, 2012, we either own outright or have exclusively licensed the commercial rights to approximately 347 patents issued in the United States and foreign national jurisdictions, and we have 420 patent applications owned and licensed 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 ZFP technology across our chosen applications.

DNA, Genes, and Transcription Factors

DNA is present in all cells except mature red blood cells, and encodes the inherited characteristics of all living organisms. A cell's DNA is organized in chromosomes as thousands of individual units called genes. Genes encode proteins, which are assembled through the process of transcription—whereby DNA is transcribed into ribonucleic acid (RNA)—and, subsequently, translation—whereby RNA is translated into protein. DNA, RNA, and proteins comprise many of the targets for pharmaceutical drug discovery and therapeutic intervention.

The human body is composed of specialized cells that perform different functions and are thus organized into tissues and organs. All somatic cells in an individual's body contain the same set of genes. However, only a fraction of these genes are turned on, or expressed, in an individual human cell at any given time. Genes are regulated (i.e. turned on or turned off) in response to a wide variety of stimuli and developmental signals. Distinct sets of genes are expressed in different cell types. It is this pattern of gene expression that determines the structure, biological function, and health of all cells, tissues, and organisms. The aberrant expression of certain genes can lead to disease.

Transcription factors are proteins that bind to DNA and regulate gene expression. A transcription factor recognizes and binds to a specific DNA sequence within or near a particular gene and causes expression of that gene to be "turned on" (activated) or "turned off" (repressed). In higher organisms, naturally occurring transcription factors typically comprise two principal domains: the first is a DNA-binding domain, (designated in Figure 1 as the "recognition domain") which recognizes a target DNA sequence and thereby directs the transcription factor to the proper chromosomal location; the second is a functional domain that causes the target gene to be activated or repressed (see Figure 1).

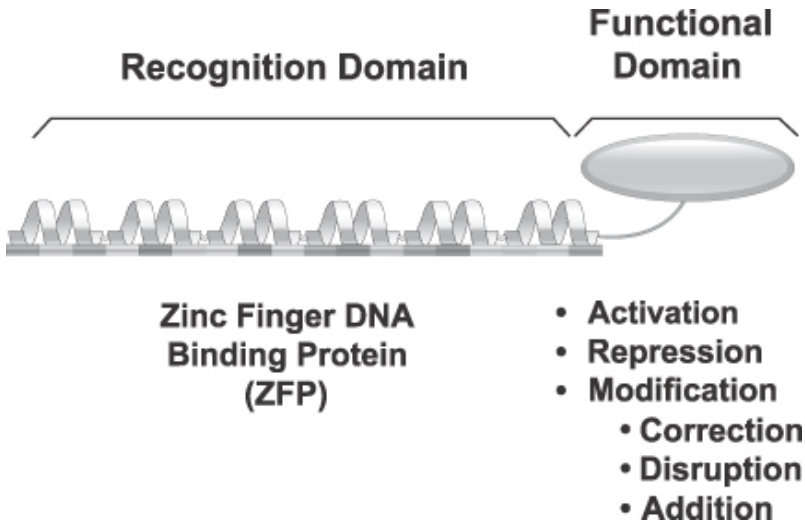

Figure 1

Schematic of the Two-Domain Structure of a ZFP Therapeutic

Engineered ZFP Nucleases (ZFNs) for Gene Modification and Engineered Zinc Finger Protein Transcription Factors (ZFP TFs) for Gene Regulation

Zinc finger DNA-binding proteins or ZFPs are the largest class of naturally occurring transcription factors in organisms from yeast to humans. Consistent with the two-domain structure of natural ZFP transcription factors, we take a modular approach to the design of the proteins that we engineer. The ZFP portion, the DNA-recognition domain, is typically composed of three or more zinc fingers. Each individual finger recognizes and binds to a three-four base pair sequence of DNA and multiple fingers can be linked together to recognize longer stretches of DNA, thereby improving specificity. By modifying the amino acids of a ZFP that directly interact with DNA, we can engineer novel ZFPs capable of recognizing pre-selected DNA sequences within, or near, virtually any gene. We use the engineered ZFP DNA-binding domain linked to a functional domain. The ZFP DNA-binding domain brings the functional domain into the proximity of the gene of interest.

Our engineered ZFPs can be attached to a cleavage domain of a restriction endonuclease, an enzyme that cuts DNA, creating a zinc finger nuclease or ZFN. The ZFN is able to recognize its intended gene target through its engineered ZFP DNA-binding domain. When a pair of such ZFNs is bound to the DNA in the correct orientation and spacing, the DNA sequence is cut between the ZFP binding sites. DNA binding by both ZFNs is necessary for cleavage, as both domains of the restriction endonuclease must be present, in the correct orientation, to mediate DNA cutting. This break in the DNA triggers a natural process of DNA repair in the cell. The repair process can be harnessed to achieve one of several outcomes that may be therapeutically useful. If cells are simply treated with ZFNs alone the repair process frequently results in joining together of the two ends of the broken DNA and the consequent loss of a small amount of genetic material that results in disruption of the original DNA sequence. This can result in the generation of a shortened or non-functional protein, i.e. gene

disruption. We believe that ZFN-mediated gene modification may be used to disrupt a gene that is involved in disease pathology such as disruption of the CCR5 gene to treat HIV infection. In contrast, if cells are treated with ZFNs in the presence of an additional "donor" DNA sequence that encodes the correct gene sequence, the cell can use the donor as a template to correct the cell's gene as it repairs the break resulting in ZFN-mediated gene correction. ZFN-mediated gene correction enables a corrected gene to be expressed in its natural chromosomal context and may provide a novel approach for the precise repair of DNA sequence mutations responsible for monogenic diseases such as hemophilia, sickle cell anemia or X-linked severe combined immunodeficiency (X-linked SCID). In addition, by making the donor sequence a gene-sized segment of DNA, a new copy of a gene can also be added into the genome at a specific location. The ability to place a gene-sized segment of DNA specifically into a pre-determined location in the genome eliminates the insertional mutagenesis concerns associated with traditional gene replacement approaches, in which insertion of the altered gene typically occurs at random locations in the genome, and broadens the range of mutations of a gene that can be corrected in a single step.

We can also create a ZFP TF which is capable of controlling or regulating the expression of a target gene in the desired manner. For instance, attaching an activation domain to a ZFP will cause a target gene to be "turned on." Alternatively, a repression domain causes the gene to be "turned off." We have a preclinical ZFP Therapeutic program for Parkinson's disease in which we are evaluating a ZFP TF designed to upregulate the gene for glial cell line-derived neurotrophic factor (GDNF), thus increasing the expression of this potent neurotrophic factor that has shown promise in preclinical testing to slow or stop the progression of Parkinson's. Based on successful studies of a ZFP activator of GDNF in a rat model, the ZFP Therapeutic approach is being evaluated in a non-human primate model of the disease.

To date, we have designed, engineered, and assembled several thousand ZFPs and have tested many of these proteins for their affinity, or tightness of binding to their DNA target as well as their specificity, or preference for their intended DNA target. We have developed methods for the design, selection, and assembly of ZFPs capable of binding to a wide spectrum of DNA sequences and genes. We have linked ZFPs to numerous functional domains to create gene-specific ZFP TFs and have demonstrated the ability of these ZFP TFs to regulate hundreds of genes in dozens of different cell types and in whole organisms, including mice, rats, rabbits, pigs, fruit flies, worms, zebrafish and yeast, and in plant species including canola and maize. We and our collaborators have published data in peer-reviewed scientific journals on the transcriptional function of ZFP TFs, successful gene modification using ZFNs and the resulting changes in the behavior of the target cell, tissue, or organism. Sigma is currently using ZFNs to generate transgenic animals and cell lines that have specific genetic modifications that make them useful models of human disease. These high value biologic tools are being used by academics, and biotechnology and pharmaceutical companies for medical research and drug development. We are currently evaluating the safety and efficacy of ZFNs in human clinical trials.

ZFP Therapeutics Provide the Opportunity to Develop a New Class of Human Therapeutics

With our ability to generate and deliver gene-specific ZFNs for the correction, disruption or addition of target genes and DNA sequences and ZFP TFs for the activation or repression of genes, we are focused on developing a new class of highly differentiated human therapeutics. We believe that as more genes are linked to specific diseases, the clinical breadth and scope of our ZFP Therapeutic applications may be substantial.

We believe that ZFP Therapeutics provide a unique and proprietary approach to drug design and may have differential competitive advantages over small-molecule drugs, protein pharmaceuticals and RNA-based approaches enabling the development of therapies for a broad range of unmet medical needs.

For example, ZFP Therapeutics can:

- **Potentially be used to treat a broad range of diseases.** ZFP Therapeutics act at the DNA level to regulate gene expression or modify genes. We believe that we can generate ZFPs to recognize virtually any gene target allowing direct modulation of the gene and enabling a potentially broad applicability.
- **Target "non-druggable" targets.** ZFNs and ZFP TFs act through a mechanism that is unique among biological drugs: direct regulation or modification of the disease-related or therapeutic gene as opposed to the RNA or protein target encoded by that gene. Following the genomics revolution of the 1990s, the sequencing and publication of the human genome, and the industrialization of genomics-based drug discovery, pharmaceutical and biotechnology companies have validated and characterized many new drug targets. Many of these targets have a clear role in disease processes but cannot be bound or modulated for therapeutic purposes by small molecules. Alternative therapeutic approaches may be required to modulate the biological activity of these so-called "non-druggable" targets. This may create a significant clinical and commercial opportunity for the therapeutic modification or regulation of disease-associated genes using engineered ZFNs or ZFP TFs. Thus, a target which may be intractable to treatment using a small molecule or monoclonal antibody can be modified, turned on or turned off at the DNA level using ZFP technology.
- **Provide novel activities such as gene modification and regulation of gene expression to address drug targets.** Engineered ZFNs enable the disruption, correction or targeted addition of a gene sequence and ZFP TFs enable not just repression of the expression of a therapeutically relevant gene but also its activation in a cell. This gives our technology a degree of flexibility not seen in other drug platforms. Our ZFN gene-editing technology allows the correction of a mutation in a defective gene. This provides a novel therapeutic approach for monogenic diseases, diseases caused by a mutation in a single gene, such as hemophilia and sickle cell anemia. In contrast, direct modification of genes cannot be achieved using antisense RNA, or siRNA, which act by interfering with the expression of cellular RNA, or conventional small molecules, antibodies, or other protein pharmaceuticals that primarily act to "block" or antagonize the action of a protein.
- **Provide high specificity and selectivity for targets.** ZFP Therapeutics can be designed to act with high specificity and we have published such data (*Proc. Natl. Acad. Sci* (2003) vol:100, 11997-12002; *J Neurosci. (2010) 30(49):16469-74; Nat Biotechnol. (2008) 26(7):808-16 and Nature (2011)478(7369):391-4*). In addition, there are generally only two targets per cell for a ZFP Therapeutic which means that ZFNs and ZFP TFs need to be available in the cell in very low concentrations. In contrast, drugs that act on protein and RNA targets that are naturally present in higher cellular concentrations need to be administered in higher concentrations. Many small molecule and RNA-based approaches either affect multiple targets demonstrating so-called "off-target effects" or are toxic in the concentrations required to be therapeutically effective.
- **Be used transiently to obtain a permanent therapeutic effect.** Permanent gene disruption, correction or addition requires only brief cellular expression of ZFNs.

THERAPEUTIC PRODUCT DEVELOPMENT

ZFP Therapeutic Product Development Programs

Product Candidate	Targeted Indication	Stage of Development	Protocol	Milestones
SB-728-T	HIV/AIDS	Phase 2	SB-728-902 Cohort 5	Trial initiated in January 2012
		Phase 1/2	SB-728-1101	Trial initiated in January 2012
		Phase 1/2	SB-728-1002	Trial initiated in October 2010 data in 2012
		Phase 1	SB-728-902	Enrollment completed
		Phase 1	SB-728-T*	Trial ongoing at University of Pennsylvania data in 1Q 2012
SB-313xTZ	Glioblastoma	Phase 1	GRm13Z40-2*	Trial ongoing at City of Hope

Table 1: Summary of ongoing clinical trials evaluating our ZFP Therapeutics.

* Investigator sponsored trial

Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS)

Market Opportunity

HIV infection results in the death of immune system cells, particularly CD4+ T-cells, and thus leads to AIDS, a condition in which the body's immune system is depleted to such a degree that the patient is unable to fight off common infections. Ultimately, these patients succumb to opportunistic infections or cancers. According to UNAIDS/WHO, over 2.7 million people were newly infected with HIV in 2010. An estimated 1.8 million people died of AIDS in the same year. There are now over 34 million people living with HIV and AIDS worldwide. The CDC estimates that, in the United States alone, there are 1.2 million people living with HIV/AIDS, approximately 50,000 new infections each year and more than 16,000 people with AIDS were estimated to have died in 2008.

Current Treatments and Unmet Medical Need

Currently, there are approximately 30 antiretroviral drugs approved by the FDA to treat people infected with HIV. These drugs fall into four major classes: reverse transcriptase inhibitors, protease inhibitors, integrase inhibitors and entry and fusion inhibitors. This latter class also includes a small molecule antagonist of the CCR5 receptor, Selzentry® (maraviroc). This drug is being used in combination with other antiretroviral agents for treatment-experienced adult patients infected with CCR5-tropic HIV-1 strains that are resistant to multiple antiretroviral agents. The drug carries a black box warning of liver toxicity.

As HIV reproduces, variants of the virus emerge, including some that are resistant to antiretroviral drugs. Therefore, doctors recommend that people infected with HIV take a combination of antiretroviral drugs known as highly active antiretroviral therapy, or HAART. This strategy typically combines drugs from at least three different classes of antiretroviral drugs. Currently available drugs do not cure HIV infection or AIDS. They can suppress the virus, even to undetectable levels, but they cannot eliminate HIV from the body. Hence, people with HIV need to take antiretroviral drugs continuously which can have significant side effects over time. There is no therapeutic approach available which protects CD4+ T-cells, reduces viral load and does not require daily dosing.

Sangamo's Therapeutic Approach

Our therapeutic approach aims to use our ZFN-mediated gene editing technology to replicate a naturally occurring human mutation which renders individuals largely resistant to infection with the most common strain

of HIV. CCR5 is a co-receptor for HIV entry into T-cells and, if CCR5 is not expressed on their surface, HIV infects them with lower efficiency. A population of individuals that is immune to HIV infection, despite multiple exposures to the virus, has been identified and extensively studied. The majority of these individuals have a natural mutation, CCR5 delta-32, resulting in the expression of a shortened, or truncated, and non-functional CCR5 protein. This mutation appears to have no observable deleterious effect. Individuals who carry the CCR5 delta-32 mutation on only one of their two CCR5 gene copies (heterozygotes), so-called "long term non-progressors" tend to take longer to develop AIDS. In addition, a study published in *Blood* in December 2010 reported an effective cure when an AIDS patient with leukemia received a bone marrow transplant from a "matched" donor with this CCR5 delta-32 mutation. This approach transferred the hematopoietic stem cells (HSCs) residing in the bone marrow from the delta-32 donor, and provided a self-renewable and potentially lifelong source of HIV-resistant immune cells. After transplantation, the AIDS patient was able to discontinue all anti-HIV drug treatments, CD4 counts increased, and viral load dropped to an undetectable level, demonstrating effective transplantation of protection from HIV infection.

We are using our ZFN-mediated gene disruption technology to disrupt the CCR5 gene in cells of a patient's immune system to make these cells permanently resistant to HIV infection. The aim is to provide a population of HIV-resistant cells that can fight HIV and opportunistic infections mimicking the situation in individuals that carry the natural mutation. In December 2008, in collaboration with scientists at the University of Pennsylvania, an IND application was filed for a Phase 1 trial of our CCR5 ZFP Therapeutic, SB-728-T. This single-dose investigator-sponsored trial began enrolling subjects in February 2009, at the University of Pennsylvania. In September 2009, we filed an IND application and initiated a dose-escalation Phase 1 clinical trial (SB-728-902) of SB-728-T. Both Phase 1 studies were in HIV-infected individuals who were on HAART. The studies were designed primarily to evaluate the safety and tolerability of this ZFP Therapeutic approach; however, subjects' CD4 T-cell counts, levels of CCR5-modified T-cells and viral burden were also monitored. Preliminary data from both trials were presented in the first quarter of 2011 and demonstrated that the approach was well-tolerated in these subjects. In addition, we observed durable engraftment and persistence of SB-728-T, the ability of these cells to traffic to the gut mucosa and improvements the overall CD4 T-cell count and the CD4:CD8 ratio in multiple subjects.

In October 2010, we also initiated a new Phase 1/2 study (SB-728-1002) to evaluate SB-728-T in HIV-infected individuals who are not yet on HAART. We have completed accrual of this trial. In January 2012, we announced the initiation of two new studies (SB-728-1101 and SB-728-902, Cohort 5), based on data from our Phase 1 trials that demonstrated a strong correlation between the estimated numbers of engrafted cells in which both copies of the CCR5 gene were modified (biallelic modification) and the reduction in viral load in treated subjects that underwent a HAART treatment interruption (TI). Using different approaches, both studies aim to increase the numbers of biallelically modified engrafted cells in SB-728-T-treated subjects and to evaluate the effect of increasing the numbers of these cells on the immune system and on viral load during a TI.

We also have a preclinical stage program to investigate this approach to treating HIV in hematopoietic stem cells and, with our collaborators at City of Hope and the University of Southern California, have funding for this program from a $14.5 million Disease Team Research Award granted by the California Institute for Regenerative Medicine (CIRM) of which we expect to receive $5.2 million in aggregate during the term of our four year collaboration. In addition, we have an early research stage program to develop our ZFN approach as an *in-vivo* application for which we received a Grand Challenges Explorations grant of $0.1 million from the Bill and Melinda Gates Foundation in 2009.

Glioblastoma Multiforme (GBM)

Clinicians at City of Hope (COH) are evaluating a ZFP Therapeutic that uses our ZFN technology to disrupt the expression of the gene encoding the glucocorticoid receptor in T-cells. Scientists at COH have developed an engineered protein known as an IL-13 "zetakine" that, when expressed in cytotoxic or "killer" T-cells, enables them to seek out and destroy glioblastoma cells in the brain. In an investigator-sponsored IND, patients have

been treated with zetakine-modified T-cells which have shown significant anti-tumor activity. In this clinical protocol, T-cells are modified to express the zetakine. These modified cells are infused into the brain following surgery for the targeted elimination of residual tumor cells. Frequently, however, a glucocorticoid such as Decadron® must be administered to patients post-surgery to control brain swelling. Glucocorticoids inactivate or kill the therapeutic T-cells through a protein known as the glucocorticoid receptor (GR). Cells without a functional GR are drug-resistant and are therefore available to destroy tumor cells. The goal is to generate zetakine positive, GR-negative T-cells, thus enabling the full treatment effect to occur even in the presence of Decadron.

In December 2006, we entered into an exclusive license agreement with COH for use of the zetakine with our technology. We retain commercialization rights and COH receives success-based milestone and downstream payments. In 2009, our collaborators at COH filed an investigator-sponsored IND application for a Phase 1 clinical trial of this therapeutic and have an ongoing Phase 1 trial in subjects with recurrent/refractory GBM. However, due to changes in the standard of care for glioblastoma patients – namely the introduction of Avastin – subjects with recurrent GBM are not presenting with the same pattern of recurrent tumor as when the trial protocol was conceived. Thus, subjects whose clinical profiles fit the original trial design have been difficult to recruit. We expect that our collaborators will report data if, and when, they have treated an appropriate number of subjects.

Diabetic Neuropathy and Amyotrophic Lateral Sclerosis (ALS)

In October 2011, we announced that our Phase 2b study (SB-509-901) did not meet its primary or secondary clinical endpoints in subjects with moderate severity diabetic neuropathy (DN) as compared to placebo, and thus we ceased all development activities for this drug. SB-509 was an injectable plasmid encoding a ZFP TF designed to upregulate the endogenous expression of the gene encoding vascular endothelial growth factor (VEGF-A) and had been in clinical studies to evaluate its use to treat diabetic neuropathy and Amyotrophic Lateral Sclerosis (ALS) and in preclinical studies in models of stroke, spinal cord injury and traumatic brain injury.

ZFP Therapeutic Pre-Clinical Stage Programs

Hemophilia B

Hemophilia, a rare bleeding disorder in which the blood does not clot normally, is an example of a monogenic disease (a disease that is caused by a genetic defect in a single gene). There are several types of hemophilia caused by mutations in genes that encode factors which help the blood clot and stop bleeding when blood vessels are injured. The most prevalent form of the disease, hemophilia A, is caused by a defect in clotting Factor VIII while defects in clotting Factor IX lead to hemophilia B. The most severe forms of hemophilia affect males. According to the National Hemophilia Foundation, hemophilia A occurs in about one in every 5,000 male births in the US, and hemophilia B in about 1 in every 25,000. The standard treatment for individuals with hemophilia is replacement of the defective clotting factor with regular infusion of concentrates or recombinant factors, which are expensive, carry the risk of transmission of blood-borne diseases such as hepatitis and other viral infections, and sometimes stimulate the body to produce antibodies against the factors that inhibit the benefits of treatment. In these situations, other clotting factors such as Factor VII and X may be used to treat patients.

Using our ZFN-gene editing technology, we have published data demonstrating functional correction of the human factor IX gene in the liver by direct intravenous delivery of ZFNs in a mouse model of the disease *(Nature (2011)475(7355):217-21)*. Further preclinical studies are ongoing to develop a treatment therapy for

hemophilia B which will provide a permanent correction and reduce or eliminate the need for infusions of clotting factor products.

Parkinson's Disease (PD)

Parkinson's disease is a chronic, progressive disorder of the central nervous system and results from the loss of cells in a section of the brain called the substantia nigra. These cells produce dopamine, a chemical messenger responsible for transmitting signals within the brain. Loss of dopamine causes critical nerve cells, or neurons, in the brain, to fire out of control, leaving patients unable to direct or control their movement in a normal manner. The symptoms of Parkinson's may include tremors, difficulty maintaining balance and gait, rigidity or stiffness of the limbs and trunk and general slowness of movement (also called bradykinesia). Patients may also eventually have difficulty walking, talking, or completing other simple tasks. Symptoms often appear gradually yet with increasing severity and the progression of the disease may vary widely from patient to patient. There is no cure for Parkinson's disease. Drugs have been developed that can help patients manage many of the symptoms; however, they do not prevent disease progression. According to the Parkinson's disease Foundation, approximately 60,000 Americans are diagnosed with PD each year and approximately one million people in the US live with the disease.

Glial cell line-derived neurotrophic factor (GDNF) is a potent neurotrophic factor that has shown promise in preclinical testing to slow or stop the progression of PD. In January 2007, we were awarded a two-year grant of $950,000 by The Michael J. Fox Foundation for Parkinson's Research (MJFF) to support the development of a ZFP TF activator of GDNF to treat PD. We have published positive preclinical studies in a rat model of the disease in collaboration with scientists at the University of California, San Francisco (UCSF) (*J Neurosci. (2010) 30(49):16469-74)*. In July 2010, we were awarded a second round of funding by MJFF to support further studies of ZFP TF activators of GDNF in non-human primates. The $900,000 award will be paid over a period of two years.

ZFP Therapeutic Research Programs

We also have several research stage ZFP Therapeutic programs in progress that use our ZFN-gene editing technology to address monogenic diseases. These include hemophilia A, hemoglobinopathies such as sickle cell anemia, lysosomal storage diseases and immune system disorders such as X-linked severe combined immunodeficiency (X-linked SCID).

CORPORATE RELATIONSHIPS

We are applying our ZFP technology platform to several commercial applications in which our products provide us and our strategic partners and collaborators with potential technical, competitive and economic advantages. Where and when appropriate, we have established and will continue to pursue corporate partnerships in non-therapeutic areas and ZFP Therapeutic strategic partnerships with selected pharmaceutical, biotechnology and chemical companies to fund internal research and development activities and to assist in product development and commercialization.

Collaboration and License Agreement with Shire AG in Human Therapeutics and Diagnostics

On January 31, 2012, we entered into a collaboration and license agreement with Shire AG (Shire), pursuant to which we will collaborate to research, develop and commercialize human therapeutics and diagnostics for hemophilia and other monogenic diseases based on our ZFP technology. Under the agreement, the two companies may develop potential human therapeutic or diagnostic products for seven gene targets. The initial four gene targets are blood clotting Factors VII, VIII, IX and X, and products developed for such initial gene targets would be used for treating or diagnosing hemophilia. Shire has the right, subject to certain limitations, to designate three additional gene targets. Pursuant to the Agreement, we have granted Shire an exclusive, world-

wide, royalty-bearing license, with the right to grant sublicenses, to use our ZFP technology for the purpose of developing and commercializing human therapeutic and diagnostic products for the gene targets.

The initial research term of the agreement is six years and is subject to extensions upon mutual agreement and under other specified circumstances. We are responsible for all research activities through the submission of an Investigative New Drug Application (IND) or European Clinical Trial Application (CTA), while Shire is responsible for clinical development and commercialization of products generated from the research program from and after the acceptance of an IND or CTA for the product. Shire will reimburse us for our internal and external research program-related costs.

Under the agreement, we received an upfront license fee of $13.0 million. In addition, for each gene target, we are eligible to receive milestone payments upon the achievement of specified research, regulatory, clinical development, commercialization and sales milestones. The total amount of potential milestone payments for each of the seven gene targets, assuming the achievement of all specified milestones in the Agreement, is $213.5 million. The milestone payments for each gene target through the acceptance of an IND or CTA submission total $8.5 million. We will also receive royalty payments that are a tiered double-digit percentage of net sales of products developed under the collaboration.

The agreement may be terminated by (i) us or Shire, in whole or in part, for the uncured material breach of the other party, (ii) us or Shire for the bankruptcy or other insolvency proceeding of the other party and (iii) Shire, in its entirety, beginning 24 months after the effective date of the agreement upon 90 days advance written notice. In addition, Shire may terminate the Agreement with respect to an individual gene target at any time, and under certain circumstances may designate a replacement gene target for a terminated gene target. As a result, actual future milestone payments could be lower than the amounts stated above

Agreement with Sigma-Aldrich Corporation in Laboratory Research Reagents, Transgenic Animal and Commercial Protein Production Cell-line Engineering

In July 2007, we entered into a license agreement with Sigma-Aldrich Corporation (Sigma). Under the license agreement, we agreed to provide Sigma with access to its proprietary ZFP technology and the exclusive right to use the technology to develop and commercialize research reagents products and services in the research field, excluding certain agricultural research uses that we previously licensed to Dow AgroSciences LLC. Under the agreement, we and Sigma agreed to conduct a three-year research program to develop laboratory research reagents using our ZFP technology during which time we assisted Sigma in connection with its efforts to market and sell services employing our technology in the research field. We transferred the ZFP manufacturing technology to Sigma.

In October 2009, we expanded the license agreement with Sigma. In addition to the original terms of the license agreement, Sigma received exclusive rights to develop and distribute ZFP-modified cell lines for commercial production of protein pharmaceuticals and certain ZFP-engineered transgenic animals for commercial applications. Under the terms of the agreement, Sigma made an upfront cash payment of $20.0 million, consisting of a $4.9 million purchase of 636,133 shares of our common stock, valued at $4.9 million, and a $15.1 million upfront license fee. The upfront license fee was recognized on a straight-line basis from the effective date of the expanded license through July 2010, which represents the period over which we were obligated to perform research services for Sigma. We are also eligible to receive commercial license fees of $5.0 million based on a percentage of net sales and sublicensing revenue and thereafter a reduced royalty rate of 10.5% of net sales and sublicensing revenue. During the term of the license agreement, Sigma is obligated to pay us minimum annual payments, a share of certain revenues received by Sigma from sublicensees, and royalty payments on the sale of licensed products and services. Sigma also has the right to sublicense the ZFP technology for research applications and we will receive 50% of any sublicensing revenues in the first two years and 25% of any sublicensing revenues thereafter. We retain the sole right to use and license our ZFP technology for GMP production purposes, for the production of materials used in or administered to humans, and for any other

industrial commercial use. In addition, upon the achievement of certain cumulative commercial milestones Sigma will make milestone payments to us up to an aggregate of $25.0 million. The agreements may be terminated by Sigma at any time with a 90-day notice or by either party upon an uncured material breach of the other party. As a result, actual future milestone payments could be lower than the amounts stated above. In the event of any termination, all rights to use our ZFP technology will revert to us, and Sigma will no longer be permitted to practice our ZFP technology or to develop or, except in limited circumstances, commercialize any products derived from our ZFP technology. Through December 31, 2011, we have received approximately $43.6 million from Sigma under the collaboration agreement.

Agreement with Dow AgroSciences in Plant Agriculture

We and our collaborators have shown that ZFNs and ZFP TFs can be used to regulate and modify genes in plants. The ability to regulate gene expression with engineered ZFP TFs may lead to the creation of new plants that increase crop yields, lower production costs and are more resistant to herbicides, pesticides, and plant pathogens, which could permit the development of branded agricultural products with unique nutritional and processing characteristics. In addition, ZFNs may be used to facilitate the efficient and reproducible generation of transgenic plants.

In October 2005, we entered into an exclusive commercial license with DAS. Under this agreement, we provide DAS with access to our proprietary ZFP technology and the exclusive right to use the technology to modify the genomes or alter the nucleic acid or protein expression of plant cells, plants, or plant cell cultures. We have retained rights to use plants or plant-derived products to deliver ZFNs and ZFP TFs into humans or animals for diagnostic, therapeutic, or prophylactic purposes. Our agreement with DAS provided for an initial three-year research term. In June 2008, DAS exercised its option under the agreement to obtain a commercial license to sell products incorporating or derived from plant cells generated using our ZFP technology, including agricultural crops, industrial products and plant-derived biopharmaceuticals.

We agreed to supply DAS and its sublicensees with ZFNs and ZFP TFs for both research and commercial use over the initial three year period of the agreement and have amended and extended this provision. The agreement also provides for minimum sublicense fees each year due to us every October, provided the agreement is not terminated by DAS. Annual fees range from $250,000 to $3.0 million and total $25.3 million over 11 years. Furthermore, DAS has the right to sublicense our ZFP technology to third parties for use in plant cells, plants, or plant cell cultures, and we will be entitled to 25% of any cash consideration received by DAS under such sublicenses. We do not have any performance obligations with respect to the sublicensing activities to be conducted by DAS. DAS has the right to terminate the agreement at any time; accordingly, our actual sublicense fees over the term of the agreement could be lower than $25.3 million. In addition, each party may terminate the agreement upon an uncured material breach of the agreement by the other party. In the event of any termination of the agreement, all rights to use our ZFP technology will revert to us, and DAS will no longer be permitted to practice our ZFP technology or to develop or, except in limited circumstances, commercialize any products derived from our ZFP technology. We amended the agreement with DAS to extend the period of reagent manufacturing and research services through December 31, 2012. Through December 31, 2011, we have received approximately $39.8 million from DAS under the collaboration agreement.

Other Programs and Partners

Prior to our agreements with Sigma and DAS we marketed our ZFP TF and ZFN technology and intellectual property in products and areas outside ZFP Therapeutics directly to the pharmaceutical and biotechnology industry and established agreements in cell line engineering for pharmaceutical protein production and the development of transgenic animals.

Pharmaceutical Protein Production

The production of pharmaceutical proteins, such as therapeutic antibodies, is an important area of commercial growth. We and our collaborators have demonstrated that ZFP-engineered mammalian cells may be used to increase the yield of systems used for pharmaceutical protein production.

We have established several research collaborations in this area, including a research collaboration agreement with Pfizer Inc. (Pfizer) in December 2004 to use our ZFP technology to develop enhanced cell lines for protein pharmaceutical production. Under the terms of the agreement, Pfizer funded research at Sangamo and we provided our proprietary ZFP technology for Pfizer to assess its feasibility for use in mammalian cell-based protein production, and we had received all funding under the agreement in 2009. We also granted Pfizer a worldwide, non-exclusive license for the use of certain ZFN reagents to permanently eliminate the Glutamine Synthetase gene in Chinese Hamster Ovary cell lines and for the use of these ZFN-modified cells for clinical and commercial production of therapeutic proteins. We received a onetime payment of $3.0 million from Pfizer pursuant to this agreement.

In April 2007, we entered into a research and license agreement with Genentech, Inc. pursuant to which we provide Genentech with access to our proprietary ZFN technology for use in mammalian cell-based protein pharmaceutical production. Under this agreement, we developed and delivered to Genentech ZFNs capable of making certain targeted modifications to the genome of an identified Genentech cell line to generate cell lines with novel characteristics for protein pharmaceuticals. We also granted Genentech a non-exclusive, worldwide, sublicensable right to use our ZFNs to generate cell lines with novel characteristics for protein pharmaceutical production purposes and to generate the same targeted modifications in the Genentech cell lines using our ZFN technology. Genentech has paid us a total of $1.3 million under the agreement, which consists of an upfront fee, technology access fees and milestone payments for the achievement of research-based milestones. Genentech has continuing obligations to pay us an annual technology access fee and, for each product developed by Genentech containing a protein expressed by the modified cell line created using our ZFN technology, aggregate milestone payments of up to $5.4 million upon achievement of specified milestones relating to the development and commercialization of such products. The research and license agreement continues until the later of ten years or expiration of specified patents relating to our ZFN technology covered under the agreement. In addition, Genentech may terminate the research and license agreement upon thirty days written notice. Either party may terminate the agreement upon a material breach by the other party.

In February 2008, we expanded the relationship with Genentech by increasing the number of potential targets in the genome of the identified Genentech cell line against which Genentech may use or apply our ZFN technology in mammalian cell-based protein pharmaceutical production. Under this expanded agreement, Genentech paid us an up-front fee, an annual on-going technology access fee, and milestone payments upon achievement of specified milestones relating to the construction and delivery of ZFNs. In addition, for each product developed by Genentech containing a protein expressed by a modified cell line using our ZFN technology, Genentech will make aggregate milestone payments of up to $5.4 million upon the achievement of specified milestones relating to the development and commercialization of such products. Under the second license and research agreement, to date Genentech has paid us $0.4 million for an up-front fee, annual technology access fees and the achievement of research-based milestones. The expanded agreement continues until the later of ten years or expiration of specified patents relating to our ZFN technology covered under the agreement. In addition, Genentech may terminate at any time any research plan or license relating to a designated target. Either party may terminate the agreement upon a material breach by the other party.

Transgenic Animals

In April 2008, we entered into a license agreement with Open Monoclonal Technology, Inc. (OMT), pursuant to which we granted a royalty-bearing, non-exclusive, sublicensable worldwide license to OMT for the commercial use of a transgenic animal generated using our ZFN technology. In consideration of the license and

rights granted to OMT, OMT paid us an upfront license fee, and will pay us for each product created or developed through use of our ZFN technology aggregate milestone payments of up to $0.9 million upon the achievement of certain specified clinical development milestones, a small percentage royalty on sales of any product developed using our ZFN technology and a low single-digit percentage share of payments received by OMT from sublicensees. For any given OMT product, OMT has the right to buy out its future royalty payment obligations under the license agreement by paying a lump sum fee to us. To date, OMT has paid us $0.3 million under the license agreement. The license agreement shall continue in effect until neither OMT nor we have any further payment obligations. OMT may terminate the license agreement at any time. Either party may terminate the agreement upon a material breach by the other party.

In July 2008, we entered into a research and license agreement with F. Hoffmann-La Roche Ltd and Hoffmann-La Roche Inc. (collectively, Roche), pursuant to which we provided Roche with access to aspects of our proprietary ZFN technology to generate ZFN-modified cell lines and animals having targeted modifications in a specified gene in a specified species, solely for research purposes. In December 2009, pursuant to the research and license agreement, Roche exercised an option to receive an exclusive, worldwide license to use such animals in the production of therapeutic and diagnostic products. This exclusive commercial license shall continue, on a country-by-country and product-by-product basis, until the later of 10 years after the first commercial sale in such country or the expiration of the last valid patent claim covering such product. Under the research and license agreement, to date Roche has paid us $0.6 million for research milestone payments, quarterly maintenance research fees and an option license fee. Roche has agreed to pay us an additional research fee upon the delivery of the ZFN specified in the research and license agreement, a quarterly ongoing research maintenance fee during the research term and milestone payments upon the achievement of certain clinical development milestones relating to products produced under such commercial license, and low-single digit royalties on sales of such products. The aggregate milestone payments for therapeutic products will not exceed $5.75 million, but the diagnostics milestone payments are not similarly capped. Under the research and license agreement, on a product-by-product basis, Roche has the right to buy out its future royalty payment obligations by paying specified fixed amounts. Roche has the right to terminate this research and license agreement in its entirety or in part (on a country and product basis) upon thirty days advance written notice. Either party may terminate the agreement upon a material breach by the other party.

Funding from Research Foundations

California Institute for Regenerative Medicine

In October 2009, the California Institute for Regenerative Medicine (CIRM), a State of California entity, granted a $14.5 million Disease Team Research Award to develop an AIDS-related lymphoma therapy based on the application of ZFP nuclease (ZFN) gene-editing technology in stem cells. The four year grant supports an innovative research project conducted by a multidisciplinary team of investigators, including investigators from the University of Southern California, City of Hope National Medical Center and Sangamo BioSciences. We expect to receive funding up to $5.2 million from the total amount awarded based on expenses incurred for research and development efforts by us as prescribed in the agreement. The award is intended to substantially fund our research and development efforts related to the agreement. The State of California has the right to receive, subject to the terms and conditions of the agreement, payments from us resulting from sales of a commercial product resulting from research and development efforts supported by the grant, not to exceed two times the amount we receive in funding under the agreement with CIRM. Through December 31, 2011, we have received $2.4 million in funding from CIRM under this agreement.

The Juvenile Diabetes Research Foundation International

In October 2006, we announced a partnership with the Juvenile Diabetes Research Foundation International (JDRF) to provide financial support to one of our Phase 2 human clinical studies (SB-509-601) of SB-509, a ZFP Therapeutic that is in development for the treatment of diabetic neuropathy. Under the agreement with JDRF, and

subject to its terms and conditions, including our achievement of certain milestones associated with the Phase 2 clinical trial (SB-509-601) of SB-509 for the treatment of mild to moderate diabetic neuropathy, JDRF was obligated to pay us an aggregate amount of up to $3.0 million which was received in full by the end of 2009.

In January 2010, we amended the agreement and subject to its terms and conditions, JDRF agreed to provide additional funding of up to $3.0 million for our Phase 2b trial in diabetic neuropathy (SB-509-901) which partially funded expenses related to the trial. Under the amended agreement, we were obligated to use commercially reasonable efforts to carry out the Phase 2b trial and, thereafter, to develop and commercialize a product containing SB-509 for the treatment of diabetes and complications of diabetes. We were also obligated to cover all costs of the Phase 2b trial that were not covered by JDRF's grant. In October 2011, we announced that the Phase 2b trial had failed to meet both its primary and secondary end-points and further development of SB-509 was discontinued. JDRF has the right, subject to certain limitations, to obtain an exclusive, sublicensable license to the intellectual property generated by us in the course of the Phase 2b trial, to make and commercialize products containing SB-509 for the treatment of diabetes and complications of diabetes. If JDRF obtains such a license, it is obligated to pay us a percentage of its revenues from product sales and sublicensing arrangements. If JDRF fails to satisfy its obligations to develop and commercialize a product containing SB-509 under the agreement, then their license rights will terminate and we will receive a non-exclusive, fully paid license, for any intellectual property developed during JDRF's use of the license, to research, develop and commercialize products containing SB-509 for the treatment of diabetes and complications of diabetes. Through December 31, 2011 we have received $2.0 million in funding under the amended agreement with JDRF.

The Michael J. Fox Foundation

In January 2007, we entered into a partnership with the Michael J. Fox Foundation for Parkinson's Research (MJFF) to provide financial support of our program to develop ZFP TFs to activate the expression of glial cell line-derived neurotrophic factor (GDNF) which has shown promise in preclinical testing to slow or stop the progression of Parkinson's disease. Under the agreement with MJFF and subject to its terms and conditions, MJFF paid us $1.0 million, the total funds due under the agreement, over a period of two years. In June 2010, we received a commitment for renewed funding from MJFF to support further studies of ZFP TF activators of GDNF. Subject to the terms and conditions of the agreement, the $0.9 million award is being paid over a period of two years and is intended to substantially fund our research efforts related to the agreement. Revenue will be recognized based on expenses incurred by us pursuant to the research conducted as set forth in the agreement. Through December 31, 2011 we have received the entire $1.9 million in funding available under the agreements with MJFF.

The Bill and Melinda Gates Foundation

In May 2009, we announced that we were awarded a Grand Challenges Explorations Grant of $0.1 million by the Bill and Melinda Gates Foundation (Gates Foundation) to support research into the use of our ZFNs to develop an *in vivo* treatment of HIV/AIDS. We received the entire grant in 2009.

INTELLECTUAL PROPERTY AND TECHNOLOGY LICENSES

Patents and licenses are important to our business. Our strategy is to file or license patent applications to protect technology, inventions and improvements to inventions that we consider important for the development of our technology. We seek patent protection and licenses that relate to our technology and candidates in our pipeline and/or may be important to our future. We have filed numerous patents and patent applications with the United States Patent and Trademark Office (USPTO) and foreign jurisdictions. This proprietary intellectual property includes methods relating to the design of zinc finger proteins, therapeutic applications and enabling technologies. We rely on a combination of patent, copyright, trademark, proprietary know–how, continuing technological innovations, trade secret laws, as well as confidentiality agreements, materials transfer agreements and licensing agreements, to establish and protect our proprietary rights.

Technology Licenses

We have licensed intellectual property directed to the design, selection, and use of ZFPs, ZFNs and ZFP TFs for gene modification and regulation from the Massachusetts Institute of Technology, Johnson & Johnson, The Scripps Research Institute, The Johns Hopkins University, Harvard University, the Medical Research Council, the California Institute of Technology, City of Hope, and the University of Utah. These licenses grant us rights to make, use, and sell ZFPs, ZFNs, and ZFP TFs under 15 families of patent filings. As of February 1, 2012 these patent filings have resulted in 23 issued U.S. patents and 39 granted foreign patents, with 5 currently pending U.S. patent applications and 30 pending applications in foreign patent offices.

We believe that these in-licensed patents and patent applications include several of the early and important patent filings directed at the design, selection, composition and use of ZFPs, ZFNs and ZFP TFs, particularly the agreements with Johns Hopkins University, the Massachusetts Institute of Technology, Johnson & Johnson and The Scripps Research Institute.

Johns Hopkins University

We entered into a license agreement with the Johns Hopkins University on June 29, 1995, as subsequently amended, whereby Johns Hopkins University granted us a worldwide exclusive license to technology and patents relating to nuclease and gene targeting technology for all fields of use, including the right to sublicense. Under the license agreement, we are obligated to pay low single-digit royalties on licensed product sales, a low single-digit percentage of license fees received from sublicensees and a high single-digit or low teens percentage of sublicense royalties received from sublicensees for sales of products. We are subject to an annual minimum royalty, which we currently pay. The license agreement expires upon the expiration of the last patent covered by the license agreement. Based on currently issued patents, the license agreement will terminate on or about February 10, 2014. Johns Hopkins University may terminate the license agreement upon a material default by us that remains uncured following written notice. We may terminate the license agreement at any time upon six months' written notice.

Massachusetts Institute of Technology

We entered into a patent license agreement with the Massachusetts Institute of Technology, or MIT, on May 9, 1996, as subsequently amended, whereby Massachusetts Institute of Technology granted us a worldwide exclusive license to technology and patents relating to the design, selection and use of ZFPs for all fields of use, including the right to sublicense. Under the patent license agreement, we are obligated to pay an annual license fee, low single-digit royalties of product sales, an up-front sublicense and annual sublicense fees, a percentage of its sublicense revenues, and milestone payments upon achievement of certain commercial development milestones. The aggregate milestone payments under the patent license agreement are $450,000, of which $150,000 has been paid. The patent license agreement expires upon the expiration of the last patent covered by the patent license agreement. Based on currently issued patents and currently filed patent applications, the patent license agreement will terminate on or about September 13, 2022. MIT may terminate the license agreement upon a material default by us that remains uncured following written notice. We may terminate the license agreement at any time upon six months' written notice.

Johnson & Johnson

We entered into a sublicense agreement with Johnson & Johnson on May 9, 1996, whereby Johnson & Johnson granted us a worldwide exclusive sublicense to technology and patents for the research, development and commercialization of human and animal therapeutic and diagnostic products using engineered ZFPs, including the right to sublicense. These patents were originally exclusively licensed by Johnson & Johnson from The Scripps Research Institute. Under the sublicense agreement, we will pay low single-digit royalty payments based upon sales of license products by us or our sublicensees and a milestone payment upon the achievement of

a commercial development milestone. The sublicense agreement expires upon the expiration of the last patent covered by the sublicense agreement. Based on currently issued patents and currently filed patent applications, the sublicense agreement will terminate on or about October 3, 2025. Johnson & Johnson has the right to terminate the sublicense agreement upon a breach or default by us that remains uncured following written notice of such default. We may terminate the sublicense agreement at any time upon sixty days' written notice.

The Scripps Research Institute

We entered into a license agreement with The Scripps Research Institute on March 14, 2000, as subsequently amended, whereby The Scripps Research Institute granted us a worldwide exclusive license to technology and patents for the research, development and commercialization of products and services using engineered ZFPs, excluding the use of these engineered ZFPs in plant agriculture, therapeutics and diagnostics. Under the license agreement, we are required to pay a low-single digit royalty on sales of licensed products by us and our sublicensees, subject to an annual minimum. The license agreement expires upon the expiration of the last patent covered by the license agreement. Based on currently issued patents and currently filed patent applications, the license agreement will terminate on or about June 5, 2018. Each party may terminate the license agreement upon a material default by the other party that remains uncured following written notice.

Sangamo Intellectual Property

In addition to our in-licensed patent portfolio, as of February 1, 2012, we had 96 families of Sangamo-owned or co-owned patent filings, including 81 issued U.S. patents, 204 granted foreign patents, 96 pending U.S. patent applications and 289 pending foreign patent applications. These patent filings are directed to the design, composition, and use of ZFPs, ZFNs, and ZFP TFs and TALE (Transcription activator-like effector) proteins. The earliest patents in our portfolio are set to begin expiring in 2015, with the majority of our currently issued patents expiring between 2019 and 2021. However, these patents in our estate may be subject to Patent Term Adjustment (due to delays in patent prosecution by the USPTO), Patent Term Extension (due to review of a patented product by a regulatory agency) or terminal disclaimer. Additionally, patents that may be issued from our pending applications will extend the patent exclusivity of our patent estate. Accordingly, all dates given above for patent expirations are estimates and the actual dates of expirations may differ.

We believe that our licensed patents and patent applications, as well as the issued Sangamo patents and pending Sangamo patent applications, in the aggregate, will provide us with a substantial intellectual property position in our commercial development of ZFP technology. In this regard, patents issued to us, applied for by us, or exclusively and non-exclusively licensed to us, cover the following types of inventions, processes and products:

- *ZFP and ZFN design, engineering and compositions:* includes DNA target site selection and zinc finger binding domain design and nuclease domain design (see newly issued US7914796 and US8034598), target site arrays, ZFP libraries (see newly issued US7943553 and US7947469) databases and methods of construction, as well as methods to increase zinc finger binding specificity, linker designs (see newly issued US7928195), and methods of making modified plant zinc finger proteins;
- *ZFP targeted regulation of endogenous genes:* methods relating to activation and inhibition of endogenous cellular genes (see newly issued US7985887), modulation of ZFP-regulated gene expression by small molecules, identification of accessible regions within chromatin, regulation of tocopherol synthesis in plants, and regulation of endogenous plant genes;
- *ZFP Therapeutics:* Treatment of virally or microbially infected cells, cancer therapeutics such as methods to alter tumor growth, activation of endogenous PEDF for treatment of head and neck cancer, glioblastoma, prostate cancer and pancreatic cancer, regulation of angiogenesis (including newly issued US8012946 and US8071564), treatments for ischemic conditions, neuropathic pain, crushed nerves, Parkinson's disease, chronic pain, diabetic neuropathy, peripheral vascular disease, ocular neovascularization including age-related macular degeneration (AMD), diabetic retinopathy (DR) and retinopathy of prematurity, modulation of cardiac contractility and methods to regulate the glucocorticoid receptor;

- *ZFN Therapeutics:* Treatments for HIV (see newly issued US7951925), sickle cell anemia, and X-linked severe combined immunodeficiency (SCID);
- *Non-Therapeutic Applications of ZFPs:* Methods for linking genes and phenotypes, identification of genes, analysis of gene regulation (see newly issued US7923542), structure and biological function, methods of agricultural biotechnology, methods of altering cellular differentiation state, methods of chromatin modification (see newly issued US8106255, exclusively licensed from University of Utah, and US8071370), and methods of introducing exogenous nucleic acids of interest into a safe harbor locus, and methods of genome editing (see newly issued US7888121 and US7972854);
- *Non-Therapeutic Applications of ZFNs:* Methods for identification of regulatory DNA sequences, prediction of patient response to drug therapeutics, and development of cell lines for improved protein production (see newly issued US7785792); and
- TALE protein methods of design and use (see published US application US20110301073).

We have been advised that certain aspects of our technology can give us and our collaborators independence from third party patent claims to gene sequences. In general, under United States patent law, a patent may be obtained for any new and useful process, machine, manufacture, or composition of matter. An underlying theme of United States patent law, as related to biotechnology, is that the sequence of a gene, as it exists in the chromosome, is not new, even when newly discovered, unless it is isolated or modified from its normal chromosomal context. As a result, for over a decade, patent courts have held that a DNA sequence must be purified, isolated or modified to be patentable. Accordingly, U.S. patent claims to DNA sequences can cover only isolated, purified or modified nucleic acid sequences (e.g., a purified DNA fragment or a DNA sequence inserted into a vector). We have been advised that U.S. patent claims to DNA sequences do not, and cannot, cover gene sequences as they exist in their natural chromosomal environment, and international patent law is even more stringent than U.S. patent law in this regard. Most current methods for over-expression of a gene or protein involve the introduction into a cell of a vector containing a DNA encoding the protein to be over-expressed. Since such a vector contains isolated sequences which encode the protein, it would be covered by any patent claims to those sequences. In contrast, our methods for over-expression utilize ZFP TFs that target endogenous genes as they exist in the chromosome. As a result, our methods do not require the use of isolated DNA sequences encoding the protein to be over-expressed and, our counsel has advised us, do not infringe patent claims to such sequences. Notwithstanding this advice, we realize that others could take a contrary position that could result in litigation. While we believe that we would prevail in any such litigation, the uncertainties involved in litigation generally make it impossible to provide assurance as to the ultimate outcome of such matters. See *"Risk Factors—Because it is difficult and costly to protect our proprietary rights, and third parties have filed patent applications that are similar to ours, we cannot ensure the proprietary protection of our technologies and products."*

The patent positions of pharmaceutical and biotechnology firms, including our patent position, are uncertain and involve complex legal and factual questions for which important legal tenets are largely unresolved. Patent applications may not result in the issuance of patents and the coverage claimed in a patent application may be significantly reduced before a patent is issued. Although we have filed for patents on some aspects of our technology, we cannot provide assurances that patents will be issued as a result of these pending applications or that any patent that has been or may be issued will be upheld. The laws of some foreign countries may not protect our proprietary rights to the same extent as do the laws of the United States. One of our licensed foreign patents, which forms the basis for five European Regional Phase patents, has been revoked as a result of an opposition by a third party. Our licensor, The Johns Hopkins University, appealed the revocation. In April 2007, the European Technical Board of Appeal released its decision dismissing the appeal. As of January 13, 2011, the re-examination of US patent number US6265196, licensed to us from The Johns Hopkins University, was terminated by the USPTO with the publication of a notice of intent to issue a Reexamination Certificate. In addition, in 2008, US5792640, also licensed from Johns Hopkins University, completed a first re-examination process and a re-exam certificate was issued on September 9, 2008. A second re-exam proceeding ordered on

November 4, 2008 was recently completed and a Reexamination Certificate was issued on January 5, 2011. These re-examination procedures have narrowed the scope of claims provided under the original patent issued. Accordingly, while we have preserved specific protection afforded under the original patent relating to our engineered ZFN technology, we do not have a valid claim over the full scope of the patent as originally issued.

In the future, third parties may assert patent, copyright, trademark, and other intellectual property rights to technologies that are important to our business. Any claims asserting that our products infringe or may infringe proprietary rights of third parties, if determined adversely to us, could significantly harm our business. See *"Risk Factors—Because it is difficult and costly to protect our proprietary rights, and third parties have filed patent applications that are similar to ours, we cannot ensure the proprietary protection of our technologies and products."*

Estimated Licensing Expenses

If we are successful in the development and commercialization of our products, we will be obligated by our license agreements to make milestone and royalty payments to some or all of the licensors mentioned above. For risks associated with our intellectual property, see *"Risk Factors—Because it is difficult and costly to protect our proprietary rights, and third parties have filed patent applications that are similar to ours, we cannot ensure the proprietary protection of our technologies and products."* We plan to continue to license and to internally generate intellectual property covering the design, selection, composition, and use of ZFPs; the genes encoding these proteins; and the application of ZFPs, ZFNs, and ZFP TFs in ZFP Therapeutics, and non-therapeutic applications of the technology including applications in research and plant agriculture, and intellectual property relating to TALE design and use.

COMPETITION

We, and our licensed partners, are the leaders in the research, development, and commercialization of DNA binding proteins for the regulation of gene expression and gene modification. We are aware of several companies focused on other methods for regulating gene expression and modifying genes and a limited number of commercial and academic groups pursuing the development of ZFP gene regulation and gene modification technology. The field of applied gene regulation and gene modification is highly competitive and we expect competition to persist and intensify in the future from a number of different sources, including pharmaceutical, agricultural, and biotechnology companies; academic and research institutions; and government agencies that will seek to develop ZFPs as well as technologies that will compete with our ZFP technology platform.

Accordingly, our competitors may succeed in obtaining patent protection, receiving FDA approval, or commercializing ZFP Therapeutics or other competitive products before us. If we commence commercial product sales, we may be competing against companies with greater marketing and manufacturing capabilities, areas in which we have limited or no experience. In addition, any product candidate that we successfully develop may compete with existing products that have long histories of safe and effective use.

Although we are in the clinical development phase of operations and have no current therapeutic product sales, we believe the following companies, products and/or technologies may potentially be competitive with our technology or our products under development:

- Small molecules in development from both in-house drug discovery programs of pharmaceutical companies such as Eli Lilly and Company, Merck & Co., Inc., Takeda Pharmaceutical Company Limited and Pfizer, Inc. as well as from biotechnology companies with expertise and capabilities in small molecule discovery and development such as Exelixis Inc., Rigel Pharmaceuticals and Gilead.
- Monoclonal antibody companies and product candidates from certain biotechnology firms such as Amgen Inc., Genentech, Inc. and Human Genome Sciences.

- Protein pharmaceuticals under development at pharmaceutical and biotechnology companies such as Amgen Inc., Biogen Idec, Eli Lilly and Company, Genentech, Inc., Johnson & Johnson and numerous other pharmaceutical and biotechnology firms.
- Gene therapy companies developing gene-based products in clinical trials. None of these products have yet been approved. Our competitors in this category may include Amsterdam Molecular Therapeutics, GenVec Inc. and VIRxSYS Corporation.
- Cell therapy companies developing cell-based products. Our competitors in this category may include Dendreon.
- Nuclease technologies. Life Technologies, Inc. and Cellectis SA are developing TALE nucleases and Cellectis SA and Precision BioSciences, Inc. are developing meganucleases to accomplish gene modification.
- Antisense therapeutics and RNA interference technology, including RNAi and microRNA, which are technologies that may compete with ZFP Therapeutics in the development of novel therapeutic products acting through the regulation of gene expression. These technologies are being developed by several companies including Alnylam Pharmaceuticals, Inc., Isis Pharmaceuticals, Inc. and Regulus Therapeutics, LLC.

We expect to face intense competition from other companies for collaborative arrangements with pharmaceutical and biotechnology companies; for establishing relationships with academic and research institutions; and for licenses to proprietary technology. These competitors, either alone or with their collaborative partners, may succeed in developing technologies or products that are more effective or less costly than ours.

Our ability to compete successfully will depend, in part, on our ability to:

- develop safe and efficacious proprietary products;
- obtain access to gene transfer technology on commercially reasonable terms;
- obtain required regulatory approvals;
- attract and retain qualified scientific and product development personnel;
- obtain and enforce patents, licenses or other proprietary protection for our products and technologies;
- formulate, manufacture, market and sell any product that we develop; and
- develop and maintain products that reach the market first and are technologically superior to or are of lower cost than other products in the market.

GOVERNMENT REGULATION

The research, testing manufacturing and marketing of human therapeutics are extensively regulated in the United States and the rest of the world.

Before marketing in the United States, any therapeutic or pharmaceutical products we develop must undergo rigorous preclinical testing (generally conducted in animals) and clinical trials in humans and an extensive regulatory clearance process implemented by the U.S. Food and Drug Administration (FDA) under the federal Food, Drug and Cosmetic Act. The FDA regulates, among other things, the development, testing, manufacture, safety, efficacy, record keeping, labeling, storage, approval, advertising, promotion, sale, and distribution of biopharmaceutical products. The regulatory review and approval process, which includes preclinical testing and clinical trials of each product candidate, is lengthy, expensive and uncertain. Securing FDA approval requires the submission of extensive preclinical and clinical data and supporting information including manufacturing information and stability data to the FDA for each indication to establish a product candidate’s safety and

efficacy. The approval process takes many years, requires the expenditure of substantial resources, involves post-marketing surveillance and may involve ongoing requirements for post-marketing studies.

Before commencing clinical investigations in humans in the U.S., we must carry out preclinical testing. In addition, our proposed clinical studies require review from the Recombinant DNA Advisory Committee (RAC), which is the advisory board to the National Institutes of Health (NIH), focusing on clinical trials involving gene transfer. We typically submit a proposed clinical protocol and other product-related information to the RAC three to six months prior to the expected IND application filing date.

Preclinical tests include laboratory and animal studies to evaluate product characteristics, potential safety and efficacy. The results of these studies must be submitted to the FDA as part of an Investigational New Drug (IND) Application, which must be reviewed by the FDA before proposed clinical testing in humans can begin. The FDA has 30 days to comment on the application and if the agency has no comments, we or our clinical partner may begin clinical trials.

Clinical trials are lengthy and are typically conducted in three sequential phases, but the phases may overlap or be combined. At each stage of testing, the proposed clinical protocol must be reviewed by the FDA and reviewed and approved by an independent ethics committee or institutional review board of each participating center before it can begin. Phase 1 usually involves the initial introduction of the investigational drug into small numbers of healthy volunteers or patients to evaluate certain factors, including its safety and dose tolerance. Phase 2 usually involves trials in a limited patient population to evaluate dosage tolerance and appropriate dosage, identify possible adverse effects and safety risks, and evaluate preliminary efficacy of the drug for specific indications. Phase 3 trials usually further evaluate clinical efficacy and test further for safety by using the drug in its final form in an expanded patient population. Phase 2 and 3 trials must be registered in a government database of clinical trials. Later clinical trials may fail to support the findings of earlier trials, which can delay, limit or prevent regulatory approvals.

We filed a Phase 1 clinical protocol for review by the RAC in the fourth quarter of 2004, an IND application in January 2005, and Phase 2 protocols for review by the FDA in 2006, 2007 and 2009 for our first product candidate, SB-509, for the potential treatment of diabetic neuropathy. In addition, in 2008 we filed an IND application for SB-509 for the treatment of ALS. We have also filed Phase 1 clinical protocols for review by the RAC for our HIV (SB-728-T) and glioblastoma programs (SB-313). Both of these program protocols received unanimous approval from this committee. In December 2008 and August 2009, we filed IND applications for SB-728-T for the treatment of HIV/AIDS leading to the initiation of Phase 1 studies in February and October 2009. In October 2010 and January 2012 we initiated Phase 1/2 clinical trials and a Phase 2 trial of this ZFP Therapeutic in subjects infected with HIV.

The results of the preclinical and clinical testing of a pharmaceutical product are submitted to the FDA in the form of a New Drug Application (NDA), or a Biologic License Application (BLA), for approval to commence commercial sales. In responding to an NDA or a BLA, the FDA may grant marketing approval, grant conditional approval (such as an accelerated approval), request additional information or deny the application if the FDA determines that the application does not provide an adequate basis for approval. Most research and development projects fail to produce data sufficiently compelling to enable progression through all of the stages of development and to obtain FDA approval for commercial sale. See also "*Our potential therapeutic products are subject to a lengthy and uncertain regulatory process, and we may encounter unanticipated toxicity or adverse events or fail to demonstrate efficacy, causing us to delay, suspend or terminate the development of a ZFP Therapeutic. If these potential products are not approved, we will not be able to commercialize those products*." under "Risk Factors" below in Part I, Item 1A of this Form 10-K.

Outside the United States, our ability to market a product is contingent upon receiving marketing authorization from the appropriate regulatory authorities. The requirements governing the conduct of clinical

trials, marketing authorization, pricing, and reimbursement vary widely from country to country. At present, foreign marketing authorizations are applied for at a national level; although, within the European Union (EU), registration procedures are available to companies wishing to market a product in more than one EU member state. If the regulatory authority is presented with adequate evidence of safety, quality, and efficacy, they will grant a marketing authorization. This foreign regulatory approval process involves all of the risks associated with FDA clearance discussed above.

We have hired personnel with expertise in preclinical and clinical development of therapeutic programs, clinical manufacturing and products and clinical and regulatory affairs to assist us in developing our programs and obtaining appropriate regulatory approvals as required. We also intend to work with collaborators who have experience in clinical development to assist us in obtaining regulatory approvals for collaborative products. *See Risk Factors—"Our potential therapeutic products are subject to a lengthy and uncertain regulatory process, and if these potential products are not approved, we will not be able to commercialize those products and—Regulatory approval, if granted, may be limited to specific uses or geographic areas which could limit our ability to generate revenues.*"

EMPLOYEES

As of February 1, 2012, we had 83 full-time employees, all of whom are located at our headquarters in Richmond, California. None of our employees are represented by a collective bargaining organization or covered by a collective bargaining agreement, nor have we experienced work stoppages. We believe that our relations with our employees are good.

AVAILABLE INFORMATION

We were incorporated in June 1995.

Sangamo can be found on the internet at http://www.sangamo.com. We make available free of charge, on or through our internet site, our annual, quarterly, and current reports and any amendments to those reports filed or furnished pursuant to Section 13(a) of the Exchange Act as soon as reasonably practicable after we electronically file such material with, or furnish it to, the SEC. Information contained in our internet site is not part of, nor incorporated by reference into, this report.

ITEM 1A – RISK FACTORS

This Form 10-K contains forward-looking information based on our current expectations. Because our actual results may differ materially from any forward-looking statements made by or on our behalf, this section includes a discussion of important factors that could affect our actual future results, including, but not limited to, our revenues, expenses, net loss and loss per share.

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

ZFP Therapeutics have undergone limited testing in humans and our ZFP Therapeutics may fail safety studies in clinical trials.

In December 2008, in collaboration with scientists at the University of Pennsylvania, we filed an IND application for a Phase 1 trial of our CCR5 ZFN-based therapeutic, SB-728-T, for treatment of HIV/AIDS. In September 2009, we announced the FDA's review and acceptance of our IND application to initiate an open-label, repeat-dosing Phase 1 clinical trial of SB-728-T (SB-728-902). Preliminary data from these studies demonstrated that, to date, treatment of aviremic HIV-infected subjects with SB-728-T has been well-tolerated. We also have an on-going Phase 2 (SB-728-902, Cohort 5) and two Phase 1/2 trials (SB-728-1101 and 1002) for

this indication. In addition, we have previously completed enrollment and the treatment phase of a Phase 1 and several Phase 2 clinical trials of our ZFP Therapeutic, SB-509, for diabetic neuropathy and ALS and the drug was well tolerated in these studies. However, if one of our ZFP Therapeutic fails one of its safety studies, it could reduce our ability to attract new investors and corporate partners.

All of these studies are designed primarily to evaluate the safety and tolerability of this ZFP Therapeutic approach. Our clinical studies are a highly visible test of our ZFP Therapeutics. Since we have increased our focus on therapeutic research and development, investors increasingly assess the value of our technology based on the continued progress of ZFP Therapeutic products into and through clinical trials. If clinical trials of our ZFP Therapeutic products were halted due to safety concerns, this would negatively affect our operations and the value of our stock.

Our progress in early Phase 1 and Phase 2 trials may not be indicative of long-term efficacy in late stage clinical trials, and we have discontinued our SB-509 programs based on negative results from Phase 2 clinical studies.

The results in early phases of clinical testing are based upon limited numbers of patients and a limited follow-up period. Typically, our Phase 1 clinical trials for indications of safety enroll less than 25 patients. The initial results from the Phase 1 clinical trial of our ZFP Therapeutic product, SB-509, became available in the first half of 2006 and the complete data set was presented in June 2008. The primary end point of the trial was clinical and laboratory safety; however, we collected some preliminary efficacy data that showed trends of clinical improvement in some subjects. Notwithstanding this preliminary efficacy data, the top-line data from our Phase 2b clinical study for SB-509-901 did not meet the key primary or secondary endpoints for the study and as a result we have discontinued development of our SB-509 program.

In September 2011, we announced preliminary data from our Phase 1 clinical program to develop SB-728-T for the treatment of HIV/AIDS. The data demonstrated a statistically significant relationship between SB-728-T and the reduction of HIV/AIDS viral load. In January 2012, we initiated a Phase 2 clinical study (SB-728-902, Cohort 5) and a Phase 1/2 clinical study (SB-728-1101) for the treatment of HIV/AIDS. However, there is no guarantee that these and other future studies of SB-728-T in later stage trials involving larger patient groups may produce positive results.

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. Failure to confirm favorable results from earlier trials by demonstrating the safety and effectiveness of our ZFP Therapeutic products in late stage clinical trials with larger patient populations could have a material adverse effect on our business that would cause our stock price to decline significantly.

Our decision to discontinue the development of SB-509 may subject our business to new risks and challenges.

In October 2011, we reported top-line date from our Phase 2b clinical study (SB-509-901) that did not meet the key primary or secondary endpoints for the study, and based on this data we decided to discontinue development of our SB-509 program. Following the termination of our SB-509 program, our most advanced clinical studies are our Phase 2 clinical trials for the treatment of HIV/AIDS and the Phase 1 trial for a treatment for recurrent glioblastoma multiforme. As a result, we may be perceived as a higher risk company due to the early stage of our development and commercialization of human therapeutics, which may subject us to new risks and challenges, including difficulties in attracting and retaining key employees, maintaining and gaining financial analyst coverage of our company and raising capital for our operations. In addition, the success of our

business will be heavily dependent upon the results of clinical trials of our lead program for the treatment of HIV/AIDS, and we may not be able to mitigate or offset any negative effect on our operations or financial results due to delays, problems or failures of our HIV/AIDS program through the performance or potential of other preclinical or clinical programs.

We have limited experience in conducting clinical trials.

Our ZFP Therapeutics may fail to show the desired safety and efficacy in initial clinical trials. We have an ongoing Phase 2 trial and two Phase 1/2 studies of a ZFP Therapeutic for HIV/AIDS. However, the FDA will require additional clinical testing which involves significantly greater resources, commitments and expertise that may require us to enter into a collaborative relationship with a pharmaceutical company that could assume responsibility for late-stage development and commercialization. We have limited experience in conducting clinical trials and may not possess the necessary resources and expertise to complete such trials, and there is no guarantee that we will be able to enter into collaborative relationships with third parties that can provide us with the funding and expertise for such trials.

We may not be able to find acceptable patients or may experience delays in enrolling patients for our clinical trials.

We may experience difficulties or delays in recruiting and enrolling a sufficient number of patients to participate in our clinical trials due to a variety of reasons, including competition from other clinical trial programs for the same indication, failure of patients to meet our enrollment criteria and premature withdraws of patients prior to the completion of clinical trials. The FDA and institutional review boards may also require large numbers of patients, and the FDA may require that we repeat a clinical trial. Any delay resulting from our failure to enroll a sufficient number of patients on a timely basis may have a material adverse affect on our business.

Our potential therapeutic products are subject to a lengthy and uncertain regulatory process, and we may encounter unanticipated toxicity or adverse events or fail to demonstrate efficacy, causing us to delay, suspend or terminate the development of a ZFP Therapeutic. If these potential products are not approved, we will not be able to commercialize those products.

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 (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 during the next several years, 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. Clinical trials are subject to oversight by institutional review boards and the FDA. In addition, our proposed clinical studies require review from the Recombinant DNA Advisory Committee (RAC), which is the advisory board to the National Institutes of Health (NIH), focusing on clinical trials involving gene transfer. We will typically submit a proposed clinical protocol and other product-related information to the RAC three to six months prior to the expected IND application filing date.

Clinical trials:

- must be conducted in conformance with the FDA's good clinical practices, within the guidelines of the International Conference on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH) and other applicable regulations;

- must meet requirements for Institutional Review Board (IRB) oversight;
- must follow Institutional Biosafety Committee (IBC) and NIH RAC guidelines where applicable;
- must meet requirements for informed consent;
- are subject to continuing FDA oversight;
- may require oversight by a Data Safety Monitoring Board (DSMB);
- 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.

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 ZFP Therapeutics to generate revenue until the appropriate regulatory authorities have reviewed and approved the applications for the product candidates. We cannot assure 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.

Regulatory approval, if granted, will be limited to specific uses or geographic areas, which could limit our ability to generate revenues.

Regulatory approval will be limited to the indicated use for which we can market a product. Further, once regulatory approval for a product is obtained, the product and its manufacturer are subject to continual review. Discovery of previously unknown problems with a product or manufacturer may result in restrictions on the product, manufacturer, and manufacturing facility, including withdrawal of the product from the market. In Japan and Europe, regulatory agencies also set or approve prices.

Even if regulatory clearance of a product is granted, this clearance is limited to those specific states and conditions for which the product is useful, as demonstrated through clinical trials. We cannot ensure that any ZFP Therapeutic product developed by us, alone or with others, will prove to be safe and effective in clinical trials and will meet all of the applicable regulatory requirements needed to receive marketing clearance in a given country.

Outside the United States, our ability to market a product is contingent upon receiving a marketing authorization from the appropriate regulatory authorities; therefore we cannot predict whether or when we would be permitted to commercialize our product. These foreign regulatory approval processes include all of the risks associated with FDA clearance described above.

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 our partners do not diligently pursue product development efforts, we may not be able to develop our technologies or products, 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 ZFP Therapeutic products. If we are unable to find partners or if the partners we find are unable or unwilling to advance our programs, or if they do not diligently pursue product approval, this may slow our progress and defer our revenues. Our partners may sublicense or abandon development programs or we may have disagreements with our partners, which would cause associated product development to slow or cease. There can be no assurance that we will be able to establish strategic collaborations for ZFP Therapeutic product development. 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 any future partnering agreements would not only 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 ZFP Therapeutic candidates for specific genes. If any partner fails to conduct the collaborative activities successfully and 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 a ZFP Therapeutic product 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 ZFP technology.

In order to regulate or modify a gene in a cell, the ZFP must be efficiently delivered to the cell. We have licensed certain gene transfer technologies for our ZFP in research. 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, including ZFP Therapeutics. However, we may not be able to license the gene transfer technologies required to develop and commercialize our ZFP Therapeutics. 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 gene modification 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 gene modification. 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 ZFNs and ZFP TFs in mammalian cells, yeast, insects, plants, and animals, we have not yet demonstrated clinical benefit of this technology 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 modification 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 the targeted gene addition 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, the ZFP Therapeutic 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 our ZFP Therapeutics as a nucleic acid that encodes the ZFN or ZFP TF. We use different formulations to deliver the ZFP Therapeutic depending on the required duration of expression, the targeted tissue and the indication that we intend to treat. In our gene editing technology, a permanent change in the targeted gene requires only a transient exposure to the ZFNs whereas the function of a ZFP TF requires it to be present in the cell in sufficient concentrations for as long as its effect is needed. In the ZFP Therapeutic applications that we are developing, it is not necessary to deliver our ZFP Therapeutic to every cell in a tissue. For example, in a ZFN gene modification approach to a monogenic disease such as hemophilia, in which the secreted Factor IX clotting factor is defective, gene correction in sufficient liver cells to yield circulating levels of corrected Factor IX that are as little as 5% of normal could have a significant benefit to the patient. 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 ZFP Therapeutic 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 which 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 and 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 which 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 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 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 ZFP Therapeutics may not gain market acceptance among physicians, patients, healthcare payers and the medical community.

A number of additional factors may limit the market acceptance of products including the following:

- rate of adoption by healthcare practitioners;
- rate of a product's acceptance by the target population;
- timing of market entry relative to competitive products;
- availability of alternative therapies;
- price of our product relative to alternative therapies;
- availability of third-party reimbursement;
- extent of marketing efforts by us and third-party distributors or agents retained by us; and
- side effects or unfavorable publicity concerning our products or similar products.

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 from our HIV/AIDS programs, 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.

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 ZFP Therapeutics 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:

- For ZFP Therapeutics:
  - small molecule drugs;
  - monoclonal antibodies;

- recombinant proteins;
- gene therapy/cDNAs;
- antisense;
- siRNA and microRNA approaches;
- TALE (transcription activator-like effector) technology; and
- Meganucleases.

- For our Non-Therapeutic Applications:
  - *For protein production:* gene amplification, meganucleases, TALE technology, insulator technology, mini-chromosomes;
  - *For target validation:* antisense, siRNA, TALE technology;
  - *For plant agriculture:* recombination approaches, mutagenesis approaches, meganucleases, TALE technology, mini-chromosomes; and
  - *For transgenic animals:* somatic nuclear transfer, embryonic stem cell, TALE 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.

Adverse public perception in the field of gene therapy may negatively impact regulatory approval of, or demand for, our potential products.

Our potential therapeutic products are delivered to patients as gene-based drugs, or gene therapy. The clinical and commercial success of our potential products will depend in part on public acceptance of the use of gene therapy for the prevention or treatment of human diseases. Public attitudes may be influenced by claims that gene therapy is unsafe, and, consequently, our products may not gain the acceptance of the public or the medical community. Negative public reaction to gene therapy in general could result in greater government regulation and stricter labeling requirements of gene therapy products, including any of our products, and could cause a decrease in the demand for any products we may develop.

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. In October 2005, we entered into a research license and commercial option agreement with DAS. In June 2008, DAS exercised its option for a commercial license to our technology. Under this agreement, we will provide DAS with access to our proprietary ZFP technology and the 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 under our agreement with DAS was 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. 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 strategic partnering agreements, other collaborations in non-therapeutic applications of our technology, federal government research grants and grants awarded by research foundations. As of December 31, 2011, we had an accumulated deficit of $253.2 million. From 2005 to date, we have generated an aggregate of approximately $157.2 million in net 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 expand and extend our research and development activities into human therapeutic product development. 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 ZFP Therapeutic product development activities. While we believe our financial resources will be adequate to sustain our current operations at least through 2013, we may need to seek additional sources of capital through equity or debt financing. Since the financial crisis in 2008, the credit markets have experienced significant upheaval, while the equity market has exhibited a high degree of volatility. These external factors have contributed to the difficulty of emerging biotechnology companies to raise capital through equity or debt financing. While we have observed improvements in the capital market recently, we cannot be certain that this trend will continue or that we will not experience similar difficulties in accessing the capital market in the future. 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. 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 ZFP Therapeutic products. Furthermore, any sales of additional equity securities may result in dilutions to our stockholders.

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

We began operations in 1995 and are in the early phases of ZFP Therapeutic product development. We have incurred significant losses and our net losses for the three years ended December 31, 2011, 2010 and 2009 were $35.8 million, $24.9 million and $18.6 million, respectively. To date, our revenues have been generated from strategic partners, other collaborations in non-therapeutic applications of our technology, and federal government and research foundation grants. Our focus on higher-value therapeutic product development and related strategic partnerships 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 shares. Our business is subject to all of the risks inherent in the development of a new technology, which include 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;
- successfully transition from a company with a research focus to a company capable of supporting commercial activities; and
- attract and enter into research collaborations with research and academic institutions and scientists.

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.

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, however, 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 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 products. Any of these developments could harm our product development efforts.

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.

For some programs we may be dependent on third party collaborators and strategic partners to design and conduct our clinical trials. 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 withdraw support for our programs or proposed products or otherwise impair their development; our business could be negatively affected.

On January 31, 2012, we entered into a research and collaborative agreement with Shire AG (Shire), pursuant to which we are engaging in a joint program with Shire to research, develop and commercialize human therapeutics and diagnostics for hemophilia and other monogenic diseases based on our ZFP technology. Under this agreement, we are responsible for all research activities through the submission of an IND and European Clinical Trial Application (CTA), while Shire is responsible for clinical development and commercialization of products generated from the research program from and after the acceptance of an IND or CTA for the product. Under the agreement, we may be eligible to receive milestone payments upon the achievement of specified clinical development, commercialization and post-commercialization milestones. The total amount of potential milestone payments for each gene target, assuming the achievements of all specified milestones in the agreement, is $213.5 million. We will also receive royalty payments based on specified percentages of net sales of products. Once an IND or CTA is submitted, Shire will have control and broad discretion over all aspects of the clinical development and commercialization of any product developed under the program, and we will have little, if any, influence on how such programs will be conducted. Our lack of control over the clinical development of gene targets in our agreement with Shire could cause delays or other difficulties in the development and commercialization of our product candidates, which may prevent us from receiving any milestone, royalty payments and other benefits under the agreement.

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 any of these events occur, we may not be able to develop our technologies or commercialize our products.

If we do not successfully commercialize ZFP-based research reagents, ZFP-modified cell lines for commercial protein production, or ZFP-engineered transgenic animals under our license agreement with Sigma-Aldrich Corporation or ZFP-based agricultural products with Dow AgroSciences, or if Sigma or Dow AgroSciences terminates our agreements, our ability to generate revenue under these license agreements may be limited.

In July 2007, we entered into a license agreement with Sigma to collaborate in the application and development of ZFP-based products for use in the laboratory research reagents markets. The agreement provides Sigma with access to our ZFP technology and the exclusive right to use our ZFP technology to develop and commercialize products for use as research reagents and to offer services in related research fields. This relationship was expanded in October 2009 when we amended our license agreement with Sigma to provide Sigma with the exclusive rights to develop and distribute ZFP-modified cell lines for commercial production of protein pharmaceuticals and, certain ZFP-engineered transgenic animals for commercial applications. In June 2008, following a research period, Dow AgroSciences (DAS) exercised its commercial license option under a license agreement with us relating to plant agriculture. This agreement provides DAS with the exclusive right to develop agricultural products using our ZFP technology in plant cells, plants, or plant cell cultures. Both companies also have the right to sublicense our technology in their respective areas. In addition to upfront payments, we may also receive additional license fees, shared sublicensing revenues, royalty payments and milestone payments depending on the success of the development and commercialization of the licensed products and services covered under both agreements. The commercial milestones and royalties are typically based upon net sales of licensed products.

We cannot be certain that we or our collaboration partners will succeed in the development of commercially viable products in these 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 addition, the respective license agreements may be terminated by Sigma and DAS at any time by providing us with a 90-day notice. In the event Sigma or DAS decides 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 and Business Operation

Because it is difficult and costly to protect our proprietary rights, and third parties have filed patent applications that are similar to ours, we cannot ensure 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.

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 our product development and research activities.

With respect to our present and any future sublicenses, since 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 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 could be prevented from making, using, or selling the relevant product or process unless we 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 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 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. To date, we have not experienced significant costs in complying with regulations regarding the use of these materials.

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.

We are a small company with 83 full-time employees as of February 1, 2012, and 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 personnel and academic and other research collaborations is intense. The success of our technology development programs depends on our ability to attract and retain highly trained personnel. We have experienced a rate of employee turnover that we believe is typical of emerging biotechnology companies. If we lose the services of personnel with the necessary skills, it could significantly impede the achievement of our research and development objectives. We are not presently aware of any plans of specific employees to retire or otherwise leave the company. If we fail to negotiate additional acceptable collaborations with academic and other research institutions and scientists, or if our existing collaborations are unsuccessful, our ZFP Therapeutic development programs may be delayed or may not succeed.

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.

During the quarter ended December 31, 2011, our common stock price ranged from a low of $2.36 to high of $3.45. During the past two fiscal years our common stock price has fluctuated, ranging from a low of $2.36 to a high of $8.66 during the year ended December 31, 2011, and a low of $2.96 to a high of $7.11 during the year ended December 31, 2010. The market instability caused by the financial crisis of 2008 has contributed to the volatility of our stock price. Volatility in our common stock 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 ZFP Therapeutics; ;
- data from clinical trials;
- initiation or termination of clinical trials;
- changes in market valuations of similar companies;
- overall market and economic conditions;
- deviations in our results of operations from the guidance given by us or estimates of securities analysts;
- 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;
- regulatory developments;
- 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.

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.

Anti-takeover provisions in our certificate of incorporation and Delaware law could make an acquisition of the 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.

In addition, our bylaws:

- state that stockholders may not act by written consent but only at a stockholders' meeting;
- 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.

ITEM 1B – UNRESOLVED STAFF COMMENTS

None.

ITEM 2 – PROPERTIES

We currently lease approximately 27,000 square feet of research and office space located at 501 Canal Boulevard in Richmond, California. The lease expires in August of 2014. We believe such facilities are sufficient for the foreseeable future.

ITEM 3 – LEGAL PROCEEDINGS

We are not a party to any material legal proceeding.

ITEM 4 – MINE SAFETY DISCLOSURES

Not Applicable.

PART II

ITEM 5 – MARKET FOR THE REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Our common stock has traded on the NASDAQ Global Market under the symbol "SGMO" since our initial public offering on April 6, 2000.

The high and low closing prices of our common stock for each quarterly period during the last two fiscal years as reported by the NASDAQ Global Market were as follows:

Common Stock

	Price	
	High	Low
Year ended December 31, 2011		
First Quarter	$8.66	$6.77
Second Quarter	$8.36	$5.59
Third Quarter	$6.52	$4.18
Fourth Quarter	$3.45	$2.36
Year ended December 31, 2010		
First Quarter	$6.63	$4.76
Second Quarter	$6.47	$3.71
Third Quarter	$4.72	$2.96
Fourth Quarter	$7.11	$3.34

Holders

As of February 1, 2012, there were 78 holders of record of Sangamo's common stock. This number does not include "street name" or beneficial holders, whose shares are held of record by banks, brokers, financial institutions and other nominees.

Dividends

Sangamo has not paid dividends on its common stock, and currently does not plan to pay any cash dividends in the foreseeable future.

Stock Trading Plans

From time to time our directors, executive officers and other insiders, including Edward O. Lanphier II, President and CEO, have adopted stock trading plans pursuant to Rule 10b5-1 of the Securities Exchange Act of 1934, as amended, and made sales pursuant to such plans.

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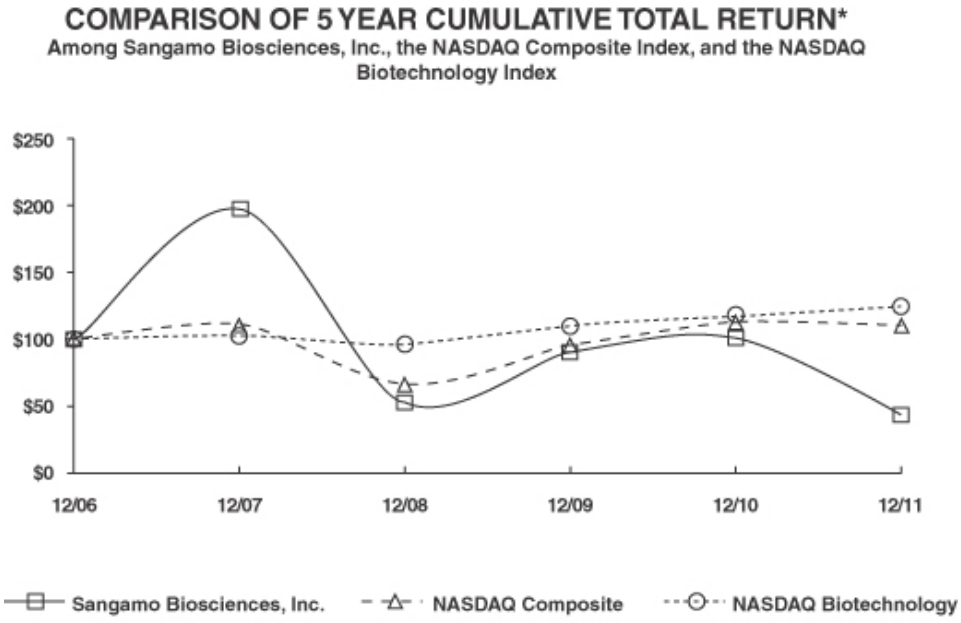
Stock Performance Graph



*$100 invested on 12/31/06 in stock or index, including reinvestment of dividends.
Fiscal year ending December 31.

The above Stock Performance Graph and related information shall not be deemed "soliciting material" or to be "filed" with the Securities and Exchange Commission, nor shall such information be incorporated by reference into any future filing under the Securities Act of 1933 or Securities Exchange Act of 1934, each as amended, except to the extent that the Company specifically incorporates it by reference into such filing.

ITEM 6 – SELECTED FINANCIAL DATA

The following Selected Financial Data should be read in conjunction with "Item 7—Management's Discussion and Analysis of Financial Condition and Results of Operations" and "Item 8—Financial Statements and Supplementary Data" included elsewhere in this Annual Report on Form 10-K.

Selected Financial Data

	Year Ended December 31,				
	2011	2010	2009	2008	2007
	(In thousands, except per share data)				
Statement of Operations Data:					
Total revenues	$ 10,319	$ 20,805	$ 22,187	$ 16,186	$ 9,098
Operating expenses:					
Research and development	32,098	33,154	28,984	31,229	25,559
General and administrative	14,042	12,586	12,605	10,332	8,310
Total operating expenses	46,140	45,740	41,589	41,561	33,869
Loss from operations	(35,821)	(24,935)	(19,402)	(25,375)	(24,771)
Interest income, net	71	81	547	2,231	3,217
Other (expense)/income	—	—	268	(1,158)	74
Net loss	$(35,750)	$(24,854)	$(18,587)	$(24,302)	$(21,480)
Basic and diluted net loss per common share	$ (0.71)	$ (0.55)	$ (0.44)	$ (0.60)	$ (0.58)
Shares used in computing basic and diluted net loss per common share	50,512	45,167	42,048	40,825	37,355

	As of December 31,				
	2011	2010	2009	2008	2007
	(In thousands)				
Balance Sheet Data:					
Cash, cash equivalents, marketable securities, and interest receivable	$ 84,463	$ 60,622	$ 85,281	$ 65,025	$ 81,412
Working capital	78,488	54,222	70,116	54,221	72,437
Total assets	87,336	62,999	87,439	67,850	83,900
Accumulated deficit	(253,245)	(217,495)	(192,641)	(174,054)	(149,752)
Total stockholders' equity	80,132	55,907	71,782	55,396	72,122

ITEM 7 – 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," 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 the actual results, performance or achievements of the Company, or industry results, to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements. Actual results could differ materially from those set forth in such forward-looking statements as a result of, but not limited to, the "Risk Factors" described in Part I, Item 1A. You should read the following discussion and analysis along with the "Selected Financial Data" and the financial statements and notes attached to those statements included elsewhere in this report.

Overview

We are a clinical stage biopharmaceutical company focused on the research, development and commercialization of engineered DNA-binding proteins for the development of novel therapeutic strategies for unmet medical needs. Our scientific and business development endeavors currently focus on the engineering of novel zinc finger DNA-binding proteins (ZFPs) for the regulation and modification of genes. Our strategy is to develop highly specific ZFP nucleases (ZFNs) and ZFP transcription factors (ZFP TFs) through early stage clinical testing and strategically partner with biopharmaceutical companies to execute late-stage clinical trials and commercial development.

We have incurred net losses since inception and expect to incur losses in the future as we continue our research and development activities. To date, we have funded our operations primarily through the issuance of equity securities, borrowings, payments from corporate collaborations and research grants.

For the year ended December 31, 2011, we incurred a consolidated net loss of $35.8 million, or $0.71 per share, compared to a net loss of $24.9 million, or $0.55 per share, for the same period in 2010. As of December 31, 2011, we had cash, cash equivalents, marketable securities and interest receivable totaling $84.5 million compared to $60.6 million as of December 31, 2010. As of December 31, 2011, we had an accumulated deficit of $253.2 million.

Our revenues have consisted primarily of revenues from our corporate partners for ZFNs and ZFP TFs, contractual payments from strategic partners for research programs and research milestones, and research grant funding. We expect revenues will continue to fluctuate from period to period and there can be no assurance that new collaborations or partner funding will continue beyond their initial terms.

In the development of our ZFP technology platform, we are focusing our resources on higher-value ZFP Therapeutic product development and less on our non-therapeutic applications. We are conducting a Phase 2 and two Phase 1/2 clinical trials to evaluate a ZFP Therapeutic for the treatment of HIV/AIDS. Development of novel therapeutic products is costly and is subject to a lengthy and uncertain regulatory process by the FDA. Our future products will be gene-based therapeutics. Adverse events in both our own clinical program and other programs may have a negative impact on regulatory approval, the willingness of potential commercial partners to enter into agreements and the perception of the public.

In January 2012, we entered into a collaboration and license agreement with Shire AG (Shire), pursuant to which we will collaborate with Shire to research, develop and commercialize human therapeutics for hemophilia and other monogenic diseases based on our ZFP technology

The accompanying discussion and analysis of our financial condition and results of operations are based upon our 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 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. We believe the following policies to be the most critical to an understanding of our financial condition and results of operations because they require us to make estimates, assumptions and judgments about matters that are inherently uncertain.

Revenue Recognition

Revenue is generally recognized when the four basic criteria of revenue recognition are met: (1) persuasive evidence of an arrangement exists; (2) delivery has occurred or services have been rendered; (3) the fee is fixed

and determinable; and (4) collectability is reasonably assured. Determination of criteria (3) and (4) is based on management's judgments regarding the nature of the fee charged for products or services delivered and the collectability of those fees.

Since our inception, a substantial portion of our revenues has been generated from research and licensing agreements. Revenue under such agreements typically includes upfront signing or license fees, cost reimbursements, milestone payments and royalties on future licensee's product sales.

Revenue from research activities made under strategic partnering agreements and collaborations is recognized as the services are provided when there is persuasive evidence that an arrangement exists, delivery has occurred, the price is fixed or determinable, and collectability is reasonably assured. Revenue generated from research and licensing agreements typically includes upfront signing or license fees, cost reimbursements, minimum sublicense fees, milestone payments and royalties on future licensee's product sales.

Multiple Element Arrangements prior to the adoption of ASU No. 2009-13, Revenue Recognition – Multiple Deliverable Revenue Arrangements (ASU 2009-13). For revenue arrangements entered into before January 1, 2011, that include multiple deliverables, the elements of such agreement were divided into separate units of accounting if the deliverables met certain criteria, including whether the fair value of the delivered items could be determined and whether there was evidence of fair value of the undelivered items. In addition, the consideration was allocated among the separate units of accounting based on their fair values, and the applicable revenue recognition criteria are considered separately for each of the separate units of accounting. Prior to the adoption of ASU 2009-13, we recognized nonrefundable signing, license or non-exclusive option fees as revenue when rights to use the intellectual property related to the license were delivered and over the period of performance obligations if we had continuing performance obligations. We estimated the performance period at the inception of the arrangement and reevaluated it each reporting period. Changes to these estimates were recorded on a prospective basis.

Multiple Element Arrangements after the adoption of ASU 2009-13. ASU 2009-13 amended the accounting standards for certain multiple element revenue arrangements to:

- provide updated guidance on whether multiple elements exist, how the elements in an arrangement should be separated, and how the arrangement consideration should be allocated to the separate elements;
- require an entity to allocate arrangement consideration to each element based on a selling price hierarchy, also called the relative selling price method, where the selling price for an element is based on vendor-specific objective evidence ("VSOE"), if available; third-party evidence ("TPE"), if available and VSOE is not available; or the best estimate of selling price ("ESP"), if neither VSOE nor TPE is available; and
- eliminate the use of the residual method and require an entity to allocate arrangement consideration using the selling price hierarchy.

Since adoption of ASU 2009-13, we have not entered into new agreements and recognized revenues under this standard as of December 31, 2011. For future revenue agreements with multiple element arrangements, such as license and development agreements, we will allocate revenue to each non-contingent element based on the relative selling price of each element. When applying the relative selling price method, we determine the selling price for each deliverable using VSOE of selling price or TPE of selling price. If neither exists we use ESP for that deliverable. Revenue allocated is then recognized when the basic four revenue recognition criteria are met for each element.

Research and Development Expenses

We expense research and development expenses as incurred. Research and development expenses consist of direct and research-related allocated overhead costs such as facilities costs, salaries and related personnel costs,

and material and supply costs. In addition, research and development expenses include costs related to clinical trials, validation of our testing processes and procedures and as well as related overhead expenses. Research and development costs incurred in connection with collaborator-funded activities are expensed as incurred. Costs to acquire technologies that are utilized in research and development that have no alternative future use are expensed as incurred. Expenses resulting from clinical trials are recorded when incurred based in part on factors such as estimates of work performed, patient enrollment, progress of patient studies and other events. We make good faith estimates that we believe to be accurate, but the actual costs and timing of clinical trials are highly uncertain, subject to risks and may change depending upon a number of factors, including our clinical development plan.

Share-Based Compensation

We measure and recognize compensation expense for all share-based payment awards made to our employees and directors, including employee stock options, employee stock purchases related to the Employee Share Purchase Plan (ESPP) and restricted stock units (RSUs), on estimated fair values. The fair value of share-based awards is amortized over the vesting period of the award using a straight-line method over the requisite service period.

To estimate the value of a stock option award and purchases related to ESPP, we use the Black-Scholes option pricing model. This model requires inputs such as expected life, expected volatility and risk-free interest rate. These inputs are subjective and generally require significant analysis and judgment to develop. While estimates of expected life and volatility are derived primarily from our historical data, the risk-free rate is based on the U.S. Treasury yield curve in effect at the time of grant commensurate with the expected life assumption. To estimate the value of RSUs, we use the closing market value of our common stock on the date the award is issued. Further, we are required to estimate forfeitures at the time of grant and revise those estimates in subsequent periods if actual forfeitures differ from those estimates. If factors change and different assumptions are employed in determining the fair value of stock-based awards, the stock based compensation expense recorded in future periods may differ significantly from what was recorded in the current period.

Results of Operations

Years Ended December 31, 2011, 2010 and 2009

Revenues

	Year Ended December 31,							
	2011	2010	Change	% Change	2010	2009	Change	% Change
	(In thousands, except percentage values)							
Revenues:								
Collaboration agreements	$ 6,110	$16,819	$(10,709)	(64%)	$16,819	$21,553	$(4,734)	(22)%
Research grants	4,209	3,986	223	6%	3,986	634	3,352	529%
Total revenues	$10,319	$20,805	$(10,486)	(50%)	$20,805	$22,187	$(1,382)	(6)%

Total revenues consisted of revenues from collaboration agreements and research grants. We anticipate revenues over the next several years will primarily be derived from our collaboration agreements with Shire, Sigma-Aldrich Corporation (Sigma) and Dow AgroSciences LLC (DAS), a wholly owned subsidiary of Dow Chemical Corporation.

Revenues from our corporate collaboration agreements were $6.1 million in 2011, $16.8 million in 2010, and $21.6 million in 2009. The decrease in 2011 from 2010 was primarily due to the completion in July 2010 of the amortization period of revenues related to the commercial license fee received from Sigma under the

expanded agreement of October 2009. The decrease in 2010 from 2009 was primarily due to decreased revenues of $4.5 million in connection with our license agreement with DAS which was mainly due to a decrease in amortized revenues associated with the commercial option fee paid by DAS in June 2008.

Research grant revenues were $4.2 million in 2011, $4.0 million in 2010 and $0.6 million in 2009. The increase in 2011 relates to $1.1 million of increased revenues from our agreement with the CHDI Foundation, Inc. (CHDI) to develop a novel therapeutic for Huntington's disease, increased revenues of $0.7 million from the California Institute for Regenerative Medicine (CIRM) and increased revenues of $0.4 million for other research grants, partially offset by decreased revenues of $1.0 million related to funding from the Juvenile Diabetes Research Foundation International (JDRF) to support development of SB-509 for the development of diabetic neuropathy (DN) due to completion of our Phase 2b clinical trial SB-509-901. Additionally, we received $1.0 million in funds awarded and recognized as revenue for four qualifying therapeutic discovery projects under the Patient Protection and Affordable Care Act in 2010. The increase of $3.4 million in 2010 from 2009 was primarily due to an increase of $1.0 million from JDRF, $1.0 million from CIRM as well as $1.0 million for four qualifying therapeutic discovery projects funded under the Patient Protection and Affordable Care Act in 2010.

Operating Expenses

	Year Ended December 31,							
	2011	2010	Change	% Change	2010	2009	Change	% Change
	(In thousands, except percentage values)							
Operating expenses:								
Research and development	$32,098	$33,154	$(1,056)	(3%)	$33,154	$28,984	$4,170	14%
General and administrative	14,042	12,586	1,456	12%	12,586	12,605	(19)	0%
Total operating expenses	$46,140	$45,740	$ 400	1%	$45,740	$41,589	$4,151	10%

Research and Development Expenses

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 HIV/AIDS program in the clinic and if we are able to progress our earlier stage ZFP Therapeutic product candidates into clinical trials. We also expect that expenses related to research performed under our collaboration and license agreement with Shire will increase our research and development expenses during the term of the agreement. Pursuant to the terms of the agreement with Shire, future expenses related to research activities related to the collaboration will be reimbursed by Shire, including employee and external research costs. The reimbursement funds received from Shire will be recognized as revenue as the costs are incurred and collection is assured.

Research and development expenses were $32.1 million in 2011 compared to $33.2 million in 2010 and $29.0 million in 2009. The decrease of $1.1 million in 2011 from 2010 was primarily due to decreased clinical and manufacturing expenses related to our SB-509 program, specifically our Phase 2b study in diabetic neuropathy, offset partially by increased spending on our HIV/AIDS program. The increase of $4.2 million in 2010 from 2009 was primarily due to increased clinical expenses related to diabetic neuropathy (DN), specifically our Phase 2b study. In October 2011, we announced that the SB-509-901 trial did not meet its primary or secondary clinical endpoints in subjects with moderate severity DN as compared to placebo and we decided not to pursue additional clinical development of the SB-509 program.

The main focus of our resources is on the development of ZFP therapeutics, and we have a novel therapeutic for HIV/AIDS in Phase 2 clinical trials. We also have preclincal projects in hemophilia and Parkinson's disease as well as monogenic rare diseases. Additionally, under the collaboration and license agreement with Shire we

are being funded by Shire to carry out all research activities through the submission of an Investigative New Drug Application or European Clinical Trial Application for the development of seven gene targets for potential human therapeutic products. The initial four gene targets are blood clotting Factors VII, VIII, IX and X, and products developed for such initial gene targets would be used for treating hemophilia. Shire has the right, subject to certain limitations, to designate three additional gene targets.

We also have two collaborations in non-therapeutic applications of our technology. Under the terms of the collaboration agreement with DAS, we provide manufacturing and research assistance for our ZFP technology through 2012. In addition, to the extent we receive royalties pursuant to these collaborations, we will incur fees related to certain technologies that we have in-licensed.

Drug development is inherently uncertain and the successful completion of our development programs is subject to numerous technological challenges and risks and we cannot presently estimate anticipated completion dates for any of our programs. Material cash inflows associated with the sale of products, if any, which result from our research efforts are not expected for at least five years. See Risk Factors—*"Our potential therapeutic products are subject to a lengthy and uncertain regulatory process, and if these potential products are not approved, we will not be able to commercialize these products" and "Our gene regulation and gene modification technology is relatively new, and if we are unable to use this technology in all our intended applications, it would limit our revenue opportunities*."

The table below shows research and development expenses for our two primary clinical development programs, SB-728-T and SB-509, as well as expenses associated with all other projects in our research and development pipeline. Other projects consist primarily of numerous pre-clinical research projects and activity associated with various research collaborations.

	Year Ended December 31, (In thousands)		
Programs	**2011**	**2010**	**2009**
SB-728-T	$13,535	$ 7,079	$ 4,705
SB-509[1]	5,567	12,904	9,677
Other research and development projects	12,996	13,171	14,602
Total research and development expenses	$32,098	$33,154	$28,984

General and Administrative Expenses

General and administrative expenses consist primarily of salaries and personnel related expenses for executive, finance and administrative personnel, stock-based compensation expenses, professional fees, allocated facilities expenses, patent prosecution expenses and other general corporate expenses. As we pursue commercial development of our therapeutic leads we expect the business aspects of the Company to become more complex. We may be required in the future to add personnel and incur additional costs related to the maturity of our business.

General and administrative expenses were $14.0 million in 2011, $12.6 million in 2010 and $12.6 million in 2009. The increase of $1.4 million in 2011 from 2010 was primarily due to increased professional services, including legal fees, and higher salaries and personnel related expenses due to higher headcount. There were no significant changes in general and administrative expenses in 2010 from 2009.

[1] Program terminated in October 2011.

Interest income, net

Interest income, net, was $0.1 million in 2011 and 2010, compared to $0.5 million in 2009. The decrease in 2010 from 2009 was due to lower investment yields and lower average investment balances.

Other income

There was no other income in 2011 or 2010. Other income for 2009 was $0.3 million. Other income in 2009 was primarily comprised of net foreign currency remeasurement gains related to the cash balance held by our wholly-owned UK subsidiary, Gendaq Limited. The cash balance was transferred to our U.S. investment account in the third quarter of 2009.

Liquidity and Capital Resources

Liquidity

Since inception, we have incurred significant annual 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 December 31, 2011, we had cash, cash equivalents, marketable securities and interest receivable totaling $84.5 million compared to $60.6 million as of December 31, 2010. The increase was primarily attributable to the completion of an underwritten public offering of our common stock in April 2011, in which 6,700,000 shares of our common stock were sold at a public offering price of $7.70 per share. The net proceeds to us from the sale of shares in this offering, after deducting underwriting discounts and commissions and other offering expenses, were approximately $50.2 million. This was partially offset by the use of capital required to fund our continuing operations, including the advancement of our ZFP Therapeutic programs. Our most significant use of capital pertains to salaries and benefits for our employees and external development expenses, such as manufacturing and clinical trial activity, related to our ZFP 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 January, 2012, we entered into a collaboration and license agreement with Shire AG (Shire), pursuant to which we will collaborate with Shire to research, develop and commercialize certain gene targets in human therapeutics and diagnostics for hemophilia and other monogenic diseases based on our ZFP technology. Under the Agreement, we received an upfront license fee of $13.0 million. We are also eligible to receive milestone payments upon the achievement of specified research, regulatory, clinical development, commercialization and sales milestones. The total amount of potential milestone payments for each gene target, assuming the achievement of all specified milestones, is $213.5 million. The milestone payments for each gene target through the acceptance of an IND or CTA submission total $8.5 million. We will also receive royalty payments that are a tiered double-digit percentage of net sales of products developed under the collaboration.

Cash Flow

Net cash used in operating activities was $25.9 million in 2011, $23.9 million in 2010 and $6.1 million in 2009. For all periods, net cash used in operating activities primarily reflects our net operating losses. The increase in net cash used in operating activities in 2011 compared to 2010 was primarily the result of decreased cash received related to our revenues in 2011 as well as increased operating expenses. The increase in net cash used in operating activities in 2010 compared to 2009 was primarily the result of increased research and development expenses associated with our clinical operations and deferred revenues under our $15.0 million license agreement with Sigma, which was received in full in October 2009, but recognized through July 2010.

Net cash used in investing activities was $20.0 million in 2011. Net cash provided by investing activities was $12.4 million in 2010. Net cash used in investing activities was $19.2 million in 2009. Cash flows from investing activities for all periods primarily related to purchases, sales and maturities of investments.

Net cash provided by financing activities was $51.9 million in 2011, $1.2 million in 2010 and $26.8 million in 2009. Net cash provided by financing activities in 2011 was primarily attributable to the completion of an underwritten public offering of the our common stock in April 2011, in which 6,700,000 shares of our common stock were sold at a public offering price of $7.70 per share. The net proceeds to us from the sale of shares in this offering, after deducting underwriting discounts and commissions and other offering expenses, were approximately $50.2 million. Cash provided by financing activities in 2010 primarily related to proceeds from the issuance of common stock upon exercise of stock options. Cash provided by financing activities in 2009 were primarily attributable to the sale of our common stock. In October 2009, pursuant to the expanded license agreement with Sigma, we issued 636,000 shares of common stock valued at $7.73 per share to Sigma, resulting in proceeds of $4.9 million. Additionally, in October 2009, we completed an underwritten public offering of common stock, in which we sold an aggregate of 3,000,000 shares of common stock at a public offering price of $7.20 per share, resulting in net proceeds of approximately $20.9 million.

Operating Capital and Capital Expenditure Requirements

We anticipate continuing to incur operating losses for at least the next several years. While we expect our rate of cash usage to increase in the future, in particular to support our product development endeavors, we believe that the available cash resources as well as funds received from corporate collaborators, strategic partners and research grants will enable us to maintain our currently planned operations through 2013. 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 ZFP Therapeutic development activities, through equity or debt financing. 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 ZFP Therapeutic products would be harmed. Furthermore, any sales of additional equity securities may result in dilutions to our stockholders.

Our future capital requirements will depend on many forward looking factors, including 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 agreement with Shire;
- 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.

There is no provision for income taxes because we have only incurred losses since our inception. As of December 31, 2011, we had net operating loss carryforwards for federal and state income tax purposes of

approximately $170.4 million and $162.1 million, respectively. If not utilized, the net federal and state operating loss carryforwards will begin to expire in 2012. We also have federal and state research tax credit carryforwards of $5.5 million and $5.4 million, respectively. The federal research credits will begin to expire in 2018 while the state research credits have no expiration date. Utilization of our net operating loss carryforwards and research tax credit carryforwards may be subject to substantial annual limitations due to the ownership change limitations provided by the Internal Revenue Code and similar state provisions. The annual limitation could result in the expiration of the net operating loss carryforwards and research tax credit carryforwards before use.

Contractual Obligations and Commercial Commitments

As of December 31, 2011, we had contractual obligations and commercial commitments as follows (in thousands):

		Payments Due by Period			
Contractual Obligations	Total	Less Than 1 Year	1-3 Years	3-5 Years	More Than 5 Years
Operating leases	$1,633	$ 600	$1,033	$ —	$ —
License obligations	2,905	370	580	570	1,385
Total contractual obligations	$4,538	$ 970	$1,613	$ 570	$ 1,385

Operating leases consist of base rents for facilities we occupy in Richmond, California. License obligations consist of ongoing license maintenance fees associated with cancelable in-licensed patent agreements.

Recent Accounting Pronouncement

In October 2009, the FASB issued ASU No. 2009-13, Revenue Recognition – *Multiple Deliverable Revenue Arrangements* (ASU 2009-13). ASU 2009-13 updates revenue recognition standards for arrangements with multiple elements. The revised guidance provides for two significant changes to the existing multiple-element arrangements guidance. The first relates to the determination of when the individual deliverables included in a multiple-element arrangement may be treated as separate units of accounting. This change is significant as it will likely result in the requirement to separate more deliverables within an arrangement. The second change modifies the manner in which the transaction consideration is allocated across the separately identifiable deliverables. We may be required to exercise considerable judgment in determining the estimated selling price of delivered items under new agreements. We adopted this guidance prospectively beginning January 1, 2011. There was no effect on the financial statements for fiscal year 2011 as we did not enter into or modify any such agreements as contemplated by the new standard. However, we expect that this adoption could have a material impact on our financial statements going forward, including on the accounting for the collaboration agreement with Shire.

In June 2011, Accounting Standards Codification Topic 220, *Comprehensive Income* was amended to increase the prominence of items reported in other comprehensive income. Accordingly, a company can present all non-owner changes in stockholders' equity either in a single continuous statement of comprehensive income or in two separate but consecutive statements. We plan to adopt this guidance as of January 1, 2012 on a retrospective basis and do not expect the adoption thereof to have a material effect on our consolidated financial statements.

ITEM 7A – 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. As of December 31, 2011, none of our securities have maturities exceeding one year.

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.

ITEM 8 – FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

SANGAMO BIOSCIENCES, INC.

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Board of Directors and Stockholders
Sangamo BioSciences, Inc.

We have audited the accompanying consolidated balance sheets of Sangamo BioSciences, Inc. as of December 31, 2011 and 2010, and the related consolidated statements of operations, stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2011. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of Sangamo BioSciences, Inc. as of December 31, 2011 and 2010, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2011, in conformity with U.S. generally accepted accounting principles.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the effectiveness of Sangamo BioSciences Inc.'s internal control over financial reporting as of December 31, 2011, based on the criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated February 22, 2012 expressed an unqualified opinion thereon.

/s/ ERNST & YOUNG LLP

San Jose, California
February 22, 2012

SANGAMO BIOSCIENCES, INC.

CONSOLIDATED BALANCE SHEETS

	December 31,	
	2011	2010
	(In thousands, except share and per share amounts)	
ASSETS		
Current assets:		
Cash and cash equivalents	$ 16,766	$ 10,784
Marketable securities	67,366	49,501
Interest receivable	331	337
Accounts receivable	919	366
Prepaid expenses	310	326
Total current assets	85,692	61,314
Property and equipment, net	1,603	1,673
Other assets	41	12
Total assets	$ 87,336	$ 62,999
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable and accrued liabilities	$ 5,515	$ 5,654
Accrued compensation and employee benefits	1,672	1,357
Deferred revenue	17	81
Total current liabilities	7,204	7,092
Commitments and contingencies		
Stockholders' equity:		
Common stock, $0.01 par value; 80,000,000 shares authorized, 52,554,795 and 45,377,739 shares issued and outstanding at December 31, 2011 and 2010, respectively	526	454
Additional paid-in capital	332,839	272,954
Accumulated deficit	(253,245)	(217,495)
Accumulated other comprehensive income / (loss)	12	(6)
Total stockholders' equity	80,132	55,907
Total liabilities and stockholders' equity	$ 87,336	$ 62,999

See accompanying Notes to Consolidated Financial Statements.

SANGAMO BIOSCIENCES, INC.

CONSOLIDATED STATEMENTS OF OPERATIONS

	Year Ended December 31,		
	2011	2010	2009
	(In thousands, except per share amounts)		
Revenues:			
Collaboration agreements	$ 6,110	$ 16,819	$ 21,553
Research grants	4,209	3,986	634
Total revenues	10,319	20,805	22,187
Operating expenses:			
Research and development	32,098	33,154	28,984
General and administrative	14,042	12,586	12,605
Total operating expenses	46,140	45,740	41,589
Loss from operations	(35,821)	(24,935)	(19,402)
Interest income, net	71	81	547
Other income	—	—	268
Net loss	$ (35,750)	$ (24,854)	$ (18,587)
Basic and diluted net loss per share	$ (0.71)	$ (0.55)	$ (0.44)
Shares used in computing basic and diluted net loss per share	50,512	45,167	42,048

See accompanying Notes to Consolidated Financial Statements.

SANGAMO BIOSCIENCES, INC.

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

	Common Stock		Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Income/ (Loss)	Total Stockholders' Equity
	Shares	Amount				
	(In thousands, except share data)					
Balances at December 31, 2008	41,057,077	$ 410	$228,764	$ (174,054)	$ 276	$ 55,396
Issuance of common stock in connection with underwritten public offering	3,000,000	30	20,830	—	—	20,860
Issuance of common stock in connection with license agreement	636,133	6	4,911	—	—	4,917
Issuance of common stock upon exercise of stock options and in connection with restricted stock units	160,159	2	486	—	—	488
Issuance of common stock under employee stock purchase plan	141,040	2	497	—	—	499
Stock-based compensation	—	—	8,467	—	—	8,467
Comprehensive loss:						
Net unrealized loss on marketable securities	—	—	—	—	(258)	(258)
Net loss	—	—	—	(18,587)	—	(18,587)
Comprehensive loss	—	—	—	—	—	(18,845)
Balances at December 31, 2009	44,994,409	$ 450	$263,955	$ (192,641)	$ 18	$ 71,782
Issuance of common stock upon exercise of stock options and in connection with restricted stock units	249,156	2	736	—	—	738
Issuance of common stock under employee stock purchase plan	134,174	2	445	—	—	447
Stock-based compensation	—	—	7,818	—	—	7,818
Comprehensive loss:						
Net unrealized loss on marketable securities	—	—	—	—	(24)	(24)
Net loss	—	—	—	(24,854)	—	(24,854)
Comprehensive loss	—	—	—	—	—	(24,878)
Balances at December 31, 2010	45,377,739	$ 454	$272,954	$ (217,495)	$ (6)	$ 55,907
Issuance of common stock in connection with underwritten public offering	6,700,000	67	50,152	—	—	50,219
Issuance of common stock upon exercise of stock options and in connection with restricted stock units	324,416	3	1,191	—	—	1,194
Issuance of common stock under employee stock purchase plan	152,640	2	461	—	—	463
Stock-based compensation	—	—	8,081	—	—	8,081
Comprehensive loss:						
Net unrealized gain on marketable securities	—	—	—	—	18	18
Net loss	—	—	—	(35,750)	—	(35,750)
Comprehensive loss	—	—	—	—	—	(35,732)
Balances at December 31, 2011	52,554,795	$ 526	$332,839	$ (253,245)	$ 12	$ 80,132

See accompanying Notes to Consolidated Financial Statements.

SANGAMO BIOSCIENCES, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS

	Year Ended December 31,		
	2011	2010	2009
	(In thousands)		
Operating activities:			
Net loss	$ (35,750)	$ (24,854)	$(18,587)
Adjustments to reconcile net loss to net cash used in operating activities:			
Depreciation and amortization	646	676	572
Amortization of premium / discount on marketable securities	1,576	1,187	288
Stock-based compensation	8,081	7,818	8,467
Net loss on disposal of property and equipment	—	—	34
Other	—	—	(302)
Net changes in operating assets and liabilities:			
Interest receivable	6	4	(147)
Accounts receivable	(553)	(297)	431
Prepaid expenses and other assets	(13)	97	(96)
Accounts payable and accrued liabilities	(139)	3,196	(1,390)
Accrued compensation and employee benefits	315	(28)	997
Deferred revenue	(64)	(11,733)	3,596
Net cash used in operating activities	(25,895)	(23,934)	(6,137)
Investing activities:			
Purchases of marketable securities	(112,974)	(100,027)	(79,406)
Maturities of marketable securities	83,411	113,096	60,500
Proceeds from sales of marketable securities	10,139	—	—
Purchases of property and equipment	(576)	(695)	(272)
Net cash provided by / (used in) investing activities	(20,000)	12,374	(19,178)
Financing activities:			
Proceeds from issuance of common stock	51,877	1,185	21,846
Issuance of common stock in connection with license agreements	—	—	4,917
Net cash provided by financing activities	51,877	1,185	26,763
Effect of exchange rate changes on cash	—	—	302
Net increase / (decrease) in cash and cash equivalents	5,982	(10,375)	1,750
Cash and cash equivalents, beginning of period	10,784	21,159	19,409
Cash and cash equivalents, end of period	$ 16,766	$ 10,784	$ 21,159

See accompanying Notes to Consolidated Financial Statements.

SANGAMO BIOSCIENCES, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

NOTE 1 – ORGANIZATION AND SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Sangamo

Sangamo BioSciences, Inc. (the Company) was incorporated in the State of Delaware on June 22, 1995 and is focused on the development and commercialization of novel transcription factors for gene regulation and gene modification. Sangamo's gene regulation and gene modification technology platform is enabled by the engineering of a class of transcription factors known as zinc finger DNA-binding proteins (ZFPs). Potential applications of Sangamo's technology include development of human therapeutics, plant agriculture and enhancement of pharmaceutical protein production. Sangamo will require additional financial resources to complete the development and commercialization of its products including ZFP Therapeutics.

Sangamo is currently working on a number of long-term development projects that will involve experimental and unproven 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, funds received under research grants and collaborations and strategic partnerships, and from the issuance of equity or debt securities. Sangamo believes that its available cash, cash equivalents and investments as of December 31, 2011, along with expected revenues collaborations and strategic partnerships, will be adequate to fund its operations through 2013. Sangamo will need to raise substantial additional capital to fund subsequent operations and complete the development and commercialization of its products either through significant corporate partnerships, research grants or issuance of equity securities. Sangamo may seek to raise additional capital when conditions permit; however, there is no assurance funding will be available on favorable terms, if at all.

Basis of Presentation

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. Actual results could differ from those estimates. The consolidated financial statements include the accounts of Sangamo and its wholly owned subsidiary, Gendaq Limited, after elimination of all intercompany balances and transactions.

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 deposits in money market investment accounts, government sponsored entity debt securities, US Treasury debt securities and corporate bank accounts.

Marketable Securities

Sangamo 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 almost identical assets, with the unrealized holding gains and losses 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 (expense)/income, which is determined using the specific identification method.

Fair Value of Financial Instruments

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 are stated at their estimated fair values, based on quoted market prices for the same or similar instruments. The counterparties to the agreements relating to the Company's investment securities consist of the US Treasury, various major corporations, governmental agencies and financial institutions with high credit standing.

Property and Equipment

Property and equipment are stated at cost, less accumulated depreciation and amortization. Depreciation is calculated using the straight-line method based on the estimated useful lives of the related assets (generally three to five years). For leasehold improvements, amortization is calculated using the straight-line method based on the shorter of the useful life or the lease term. The Company reviews its property, plant and equipment assets for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable.

Foreign Currency Translation

The functional currency of the Company's foreign subsidiary, Gendaq Limited, is the U.S. dollar. Monetary assets and liabilities which are denominated in foreign currency are remeasured at the exchange rates in effect at the balance sheet date. Nonmonetary assets and liabilities, if any, are remeasured at the historical exchange rates. Income and expenses are remeasured using the average exchange rate for the period. Gains and losses from remeasurement of the foreign subsidiary's financial statements are recorded as other income / (expense). During the third quarter of 2009, the cash balance held at Gendaq was transferred to Sangamo's U.S. investment account, eliminating foreign currency remeasurement gains and losses.

In 2011 and 2010, the Company did not record foreign currency remeasurement gains or losses. In 2009, the Company recorded a foreign currency remeasurement gain of $0.3 million.

Comprehensive Loss

Comprehensive loss is comprised of net loss and other comprehensive income (loss) which primarily consist of unrealized gains/(losses) on marketable securities. Comprehensive loss for the years ended December 31, 2011, 2010 and 2009 is included in the statement of stockholders' equity.

Revenue Recognition

Revenue from research activities made under strategic partnering agreements and collaborations is recognized as the services are provided when there is persuasive evidence that an arrangement exists, delivery has occurred, the price is fixed or determinable, and collectability is reasonably assured. Revenue generated from research and licensing agreements typically includes upfront signing or license fees, cost reimbursements, minimum sublicense fees, milestone payments and royalties on future licensee's product sales.

Multiple Element Arrangements prior to the adoption of ASU No. 2009-13, Revenue Recognition—Multiple Deliverable Revenue Arrangements (ASU 2009-13). For revenue arrangements entered into before January 1,

2011, that include multiple deliverables, the elements of such agreement were divided into separate units of accounting if the deliverables met certain criteria, including whether the fair value of the delivered items could be determined and whether there was evidence of fair value of the undelivered items. In addition, the consideration was allocated among the separate units of accounting based on their fair values, and the applicable revenue recognition criteria are considered separately for each of the separate units of accounting. Prior to the adoption of ASU 2009-13, the Company recognized nonrefundable signing, license or non-exclusive option fees as revenue when rights to use the intellectual property related to the license were delivered and over the period of performance obligations if the Company had continuing performance obligations. The Company estimated the performance period at the inception of the arrangement and reevaluated it each reporting period. Changes to these estimates were recorded on a prospective basis.

Multiple Element Arrangements after the adoption of ASU 2009-13. ASU 2009-13 amended the accounting standards for certain multiple element revenue arrangements to:

- provide updated guidance on whether multiple elements exist, how the elements in an arrangement should be separated, and how the arrangement consideration should be allocated to the separate elements;
- require an entity to allocate arrangement consideration to each element based on a selling price hierarchy, also called the relative selling price method, where the selling price for an element is based on vendor-specific objective evidence (“VSOE”), if available; third-party evidence (“TPE”), if available and VSOE is not available; or the best estimate of selling price (“ESP”), if neither VSOE nor TPE is available; and
- eliminate the use of the residual method and require an entity to allocate arrangement consideration using the selling price hierarchy.

Since adoption of ASU 2009-13, the Company has not entered into new agreements and recognized revenues under this standard as of December 31, 2011. For future revenue agreements with multiple element arrangements, such as license and development agreements, the Company will allocate revenue to each non-contingent element based on the relative selling price of each element. When applying the relative selling price method, the Company determines the selling price for each deliverable using VSOE of selling price or TPE of selling price. If neither exists the Company uses ESP for that deliverable. Revenue allocated is then recognized when the basic four revenue recognition criteria are met for each element.

Additionally, the Company recognizes milestone payments, which are subject to substantive contingencies, upon completion of specified milestones, which represents the culmination of an earnings process, according to contract terms. Fees from licensees upon sublicensing Sangamo technologies by them to third parties (sublicense fees) are recognized as revenue in the period such fees are due. Minimum annual sublicense fees are also recognized as revenue in the period in which such fees are due. Royalties are generally recognized as revenue upon the receipt of the related royalty payment. The Company recognizes cost reimbursement revenue under collaborative agreements as the related research and development costs for services are rendered. Deferred revenue represents the portion of research or license payments received which have not been earned.

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. Revenue under grant agreements is recognized when the related qualified research expenses are incurred.

During 2011, revenues related to Sigma-Aldrich Corporation (Sigma), Dow AgroSciences LLC (DAS), California Institute for Regenerative Medicine (CIRM) and CHDI Foundation, Inc. (CHDI) represented 15%, 43%, 18% and 11% of total revenues, respectively. During 2010, revenues related to Sigma and DAS represented 59% and 21%, respectively, of total revenues. During 2009, revenues related to Sigma and DAS represented 50% and 40%, respectively, of total revenues.

Research and Development Expenses

Research and development costs are expensed as incurred. Research and development expenses consist of direct and research-related allocated overhead costs such as facilities costs, salaries and related personnel costs, and material and supply costs. In addition, research and development expenses include costs related to clinical trials, validation of our testing processes and procedures and as well as related overhead expenses. Research and development costs incurred in connection with collaborator-funded activities are expensed as incurred. Costs to acquire technologies that are utilized in research and development that have no alternative future use are expensed as incurred.

Stock-Based Compensation

The Company measures and recognizes compensation expense for all share-based payment awards made to Sangamo employees and directors, including employee share options, restricted stuck units (RSUs) and employee share purchases related to the Employee Share Purchase Plan (ESPP), based on estimated fair values at grant date. The fair value of equity-based awards is amortized over the vesting period of the award using a straight-line method.

To estimate the value of an award, the Company uses the Black-Scholes option pricing model. This model requires inputs such as expected life, expected volatility and risk-free interest rate. These inputs are subjective and generally require significant analysis and judgment to develop. While estimates of expected life and volatility are derived primarily from the Company's historical data, the risk-free rate is based on the U.S. Treasury yield curve in effect at the time of grant commensurate with the expected life assumption. Further, the Company is required to estimate forfeitures at the time of grant and revise those estimates in subsequent periods if actual forfeitures differ from those estimates. The Company uses historical data to estimate pre-vesting option forfeitures and record stock-based compensation expense only for those awards that are expected to vest.

Income Taxes

Income tax expense has been provided using the liability method. Deferred tax assets and liabilities are determined based on the difference between the financial statement and tax bases of assets and liabilities as measured by the enacted tax rates that will be in effect when these differences reverse. The Company provides a valuation allowance against net deferred tax assets if, based upon the available evidence, it is not more likely than not that the deferred tax assets will be realized.

Net Loss Per Share

Basic net loss per share has been computed by dividing the 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.

Because Sangamo is in a net loss position, diluted net loss per share excludes the effects of common stock equivalents consisting of options, which are all anti-dilutive. The total stock options outstanding excluded from the calculation of diluted net loss per share at the end of 2011, 2010 and 2009 were 8,346,190, 8,109,901 and 7,469,501, respectively.

Segments

The Company operates in one segment. Management uses one measurement of profitability and does not segregate its business for internal reporting. As of December 31, 2011 and 2010, all of the Company's assets

were maintained in the U.S. For the years ended December 31, 2011, 2010 and 2009, 100% of revenues and operating expenses were generated and incurred in the U.S.

Recent Accounting Pronouncement

In October 2009, the FASB issued ASU 2009-13. ASU 2009-13 updates revenue recognition standards for arrangements with multiple elements. The revised guidance provides for two significant changes to the existing multiple-element arrangements guidance. The first relates to the determination of when the individual deliverables included in a multiple-element arrangement may be treated as separate units of accounting. This change is significant as it will likely result in the requirement to separate more deliverables within an arrangement. The second change modifies the manner in which the transaction consideration is allocated across the separately identifiable deliverables. The Company may be required to exercise considerable judgment in determining the estimated selling price of delivered items under new agreements. The Company adopted this guidance prospectively beginning January 1, 2011. There was no effect on 2011 financial statements as the Company did not enter into or materially amend any such agreements. However, the Company expects that this adoption could have a material impact on its financial statements going forward, including on the accounting for the collaboration agreement with Shire AG (Shire).

NOTE 2 – INVESTMENTS AND FAIR VALUE MEASUREMENT

The table below summarizes the Company's available-for-sale securities (in thousands):

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized (Losses)	Estimated Fair Value
December 31, 2011				
Cash equivalents:				
Money market funds	$ 15,258	—	—	$ 15,258
Total	15,258	—	—	15,258
Marketable securities:				
U.S. government sponsored entity debt securities	27,020	—	(7)	27,013
U.S. treasury debt securities	751	1	—	752
Corporate debt securities	39,583	18	—	39,601
Total	67,354	19	(7)	67,366
Total cash equivalents and marketable securities	$ 82,612	$ 19	$ (7)	$ 82,624
December 31, 2010				
Cash equivalents:				
Money market funds	$ 9,390	—	—	$ 9,390
Total	9,390	—	—	9,390
Marketable securities:				
U.S. government sponsored entity debt securities	42,141	—	(6)	42,135
U.S. treasury debt securities	4,806	1	—	4,807
Corporate debt securities	2,560	—	(1)	2,559
Total	49,507	1	(7)	49,501
Total cash equivalents and marketable securities	$ 58,897	$ 1	$ (7)	$ 58,891

As of December 31, 2011, all of investments had maturity dates within one year and there were no material unrealized losses during 2011. The Company had no realized losses for the year ended December 31, 2011 and no other-than-temporary impairments of available-for-sale securities for the years ended December 31, 2011, 2010 and 2009.

Fair Value Measurement

The Company measures certain financial assets at fair value on a recurring basis, including cash equivalents and available-for-sale securities. The fair value of these assets was 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;

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

	December 31, 2011 Fair Value Measurements			
	Total	Level 1	Level 2	Level 3
Assets:				
Cash equivalents:				
Money market funds	$15,258	$15,258	$ —	$ —
Total	15,258	15,258	—	—
Marketable securities:				
U.S. government sponsored entity debt securities	27,013	—	27,013	—
U.S. treasury debt securities	752	—	752	—
Corporate debt securities	39,601	—	39,601	—
Total	67,366	—	67,366	—
Total cash equivalents and marketable securities	$82,624	$15,258	$67,366	$ —

	December 31, 2010 Fair Value Measurements			
	Total	Level 1	Level 2	Level 3
Assets:				
Cash equivalents:				
Money market funds	$ 9,390	$9,390	$ —	$ —
Total	9,390	9,390	—	—
Marketable securities:				
U.S. government sponsored entity debt securities	42,135	—	42,135	—
U.S. treasury debt securities	4,807	—	4,807	—
Corporate debt securities	2,559	—	2,559	—
Total	49,501	—	49,501	—
Total cash equivalents and marketable securities	$58,891	$9,390	$49,501	$ —

NOTE 3 – STOCK-BASED COMPENSATION

The following table shows total stock-based compensation expense recognized in the consolidated statements of operations (in thousands):

	Year Ended December 31,		
	2011	2010	2009
Research and development	$3,769	$3,612	$4,115
General and administrative	4,312	4,206	4,352
Total stock-based compensation expense	$8,081	$7,818	$8,467

As of December 31, 2011, total compensation cost related to unvested stock options to be recognized in future periods was $9.4 million, which is expected to be expensed over a weighted-average period of 2.48 years. As of December 31, 2011, total compensation cost related to unvested RSUs to be recognized in future periods was $1.4 million, which is expected to be expensed over a weighted-average period of 2.93 years. There was no capitalized stock-based employee compensation cost as of December 31, 2011.

Valuation Assumptions

The employee stock-based compensation expense was determined using the Black Scholes option valuation model. Option valuation models require the input of subjective assumptions and these assumptions can vary over time.

The Company primarily bases its determination of expected volatility through its assessment of the historical volatility of its common stock. The Company relied on its historical exercise and post-vested termination activity for estimating its expected term for use in determining the fair value of these options.

The weighted–average assumptions used for estimating the fair value of the employee stock options are as follows:

	Year Ended December 31,		
	2011	2010	2009
Risk-free interest rate	0.93-2.11%	1.5-2.6%	2.0-2.2%
Expected life of option	5.39-5.41 yrs	5.23-5.41 yrs	5.31-5.38 yrs
Expected dividend yield of stock	0%	0%	0%
Expected volatility	0.83-0.86	0.83-0.84	0.83

The weighted–average assumptions used for estimating the fair value of the ESPP purchase rights are as follows:

	Year Ended December 31,		
	2011	2010	2009
Risk-free interest rate	0.05-0.61%	0.2-1.0%	0.2-0.9%
Expected life of option	0.5-2.0 yrs	0.5-2.0 yrs	0.5-2.0 yrs
Expected dividend yield of stock	0%	0%	0%
Expected volatility	0.58-0.85	0.62-1.14	0.63-1.97

NOTE 4 – MAJOR CUSTOMERS, PARTNERSHIPS AND STRATEGIC ALLIANCES

Collaboration Agreements

Agreement with Sigma-Aldrich Corporation in Laboratory Research Reagents, Transgenic Animal and Commercial Protein Production Cell-line Engineering

In July 2007, Sangamo entered into a license agreement with Sigma. Under the license agreement, Sangamo agreed to provide Sigma with access to its proprietary ZFP technology and the exclusive right to use the technology to develop and commercialize research reagent products and services in the research field, excluding certain agricultural research uses that Sangamo previously licensed to Dow AgroSciences LLC. Under the agreement, Sangamo and Sigma agreed to conduct a three-year research program to develop laboratory research reagents using Sangamo's ZFP technology during which time Sangamo agreed to assist Sigma in connection with its efforts to market and sell services employing the Company's ZFP technology in the research field. Sangamo has transferred the ZFP manufacturing technology to Sigma.

In October 2009, Sangamo expanded its license agreement with Sigma. In addition to the original terms of the license agreement, Sigma received exclusive rights to develop and distribute ZFP-modified cell lines for commercial production of protein pharmaceuticals and certain ZFP-engineered transgenic animals for commercial applications. Under the terms of the agreement, Sigma made an upfront cash payment of $20.0 million consisting of a $4.9 million purchase of 636,133 shares of Sangamo common stock, valued at $4.9 million, and a $15.1 million upfront license fee. The upfront license fee was recognized on a straight-line basis from the effective date of the expanded license through July 2010, which represents the period over which Sangamo was obligated to perform research services for Sigma. Sangamo is also eligible to receive commercial license fees of $5.0 million based upon a percentage of net sales and sublicensing revenue and thereafter a reduced royalty rate of 10.5% of net sales and sublicensing revenue. In addition, upon the achievement of certain cumulative commercial milestones Sigma will make milestone payments to Sangamo up to an aggregate of $25.0 million.

License fee and milestone revenues related to the Sigma agreements were $0.7 million, $11.6 million and $11.1 million during 2011, 2010 and 2009, respectively. Royalty revenues under the Sigma agreement were $0.9 million, $0.7 million and $0.3 million during 2011, 2010 and 2009, respectively. Related costs and expenses incurred under the Sigma agreement were $0.5 million, $1.2 million and $2.6 million during 2011, 2010 and 2009, respectively.

Agreement with Dow AgroSciences in Plant Agriculture

In October 2005, Sangamo entered into an exclusive commercial license with DAS. Under this agreement, Sangamo is providing DAS with access to its proprietary ZFP technology and the exclusive right to use the technology to modify the genomes or alter the nucleic acid or protein expression of plant cells, plants, or plant cell cultures. Sangamo has retained rights to use plants or plant-derived products to deliver ZFP transcription factors (ZFP TFs) or ZFP nucleases (ZFNs) into humans or animals for diagnostic, therapeutic, or prophylactic purposes. The Company's agreement with DAS provided for an initial three-year research term. In June 2008, DAS exercised its option under the agreement to obtain a commercial license to sell products incorporating or derived from plant cells generated using the Company's ZFP technology, including agricultural crops, industrial products and plant-derived biopharmaceuticals. The exercise of the option triggered a one-time commercial license fee of $6.0 million, payment of the remaining $2.3 million of the previously agreed $4.0 million in research milestones, development and commercialization milestone payments for each product, and royalties on sales of products. Furthermore, DAS has the right to sublicense Sangamo's ZFP technology to third parties for use in plant cells, plants, or plant cell cultures, and Sangamo will be entitled to 25% of any cash consideration received by DAS under such sublicenses. In December 2010, the Company amended its agreement with DAS to extend the period of reagent manufacturing services through December 31, 2011 and research services through December 31, 2012.

The agreement also provides for minimum sublicense fees each year due to Sangamo every October, provided the agreement is not terminated by DAS. Annual fees range from $250,000 to $3.0 million and total $25.3 million over 11 years. The Company does not have any performance obligations with respect to the sublicensing activities to be conducted by DAS. DAS has the right to terminate the agreement at any time; accordingly, the Company's actual sublicense fees over the term of the agreement could be lower than $25.3 million. In addition, each party may terminate the agreement upon an uncured material breach of the agreement by the other party. In the event of any termination of the agreement, all rights to use the Company's ZFP technology will revert to Sangamo, and DAS will no longer be permitted to practice Sangamo's ZFP technology or to develop or, except in limited circumstances, commercialize any products derived from the Company's ZFP technology.

Revenues under the agreement were $4.5 million, $4.4 million and $8.8 million during 2011, 2010 and 2009, respectively. Related costs and expenses incurred under the agreement were $0.9 million, $0.7 million and $0.6 million during 2011, 2010 and 2009, respectively.

Funding from Research Foundations

California Institute for Regenerative Medicine

In October 2009, the CIRM, a State of California entity, granted a $14.5 million Disease Team Research Award to develop an AIDS-related lymphoma therapy based on the application of ZFN gene-editing technology in stem cells. The four year grant supports an innovative research project conducted by a multidisciplinary team of investigators, including investigators from the University of Southern California, City of Hope National Medical Center and Sangamo BioSciences. Sangamo expects to receive funding up to $5.2 million from the total amount awarded based on expenses incurred for research and development efforts by Sangamo as prescribed in the agreement, and subject to its terms and conditions. The award is intended to substantially fund Sangamo's research and development efforts related to the agreement. The State of California has the right to receive, subject to the terms and conditions of the agreement between Sangamo and CIRM, payments from Sangamo resulting from sales of a commercial product resulting from research and development efforts supported by the grant, not to exceed two times the amount Sangamo receives in funding under the agreement with CIRM.

Revenues attributable to research and development performed under the CIRM grant agreement for AIDS-related lymphoma therapy were $1.7 million, $1.0 million and $0 during 2011, 2010 and 2009, respectively.

CHDI Foundation, Inc.

In April 2011, Sangamo entered into an agreement with the CHDI to develop a novel therapeutic for Huntington's disease based on Sangamo's proprietary ZFP technology. The ZFP therapeutic approach will target the gene that causes Huntington's disease, an inherited neurodegenerative disease for which there are currently no therapies available to slow the disease progression. Under the agreement with CHDI, and subject to its terms and conditions, CHDI will pay the Company $1.3 million, the total funds due under the agreement, over a period of one year which is intended to substantially fund the Company's research efforts related to the agreement.

Revenues attributable to research and development performed under the CHDI collaboration agreement were $1.1 million during 2011.

The Michael J. Fox Foundation for Parkinson's Research

In January 2007, Sangamo entered into an agreement with the Michael J. Fox Foundation for Parkinson's Research (MJFF) to provide financial support of a program to develop Sangamo's ZFP TFs to activate the expression of glial cell line-derived neurotrophic factor (GDNF) that has shown promise in preclinical testing to

slow or stop the progression of Parkinson's disease. Under the agreement with MJFF, and subject to its terms and conditions, MJFF paid the Company $1.0 million, the total funds due under the agreement, over a period of two years. In June 2010, Sangamo received a commitment for renewed funding from MJFF to support further studies of ZFP TF activators of GDNF. Subject to the terms and conditions of the agreement, the $0.9 million award was paid over a period of two years and was intended to substantially fund the Company's research efforts related to the agreement. As of December 31, 2011, all revenues under the agreement have been recognized.

Revenues attributable to research and development performed under the MJFF agreement were $0.4 million in 2011 and 2010 and $0 in 2009.

The Juvenile Diabetes Research Foundation International

In October 2006, Sangamo entered into an agreement with the Juvenile Diabetes Research Foundation International (JDRF) to provide financial support for one of Sangamo's Phase 2 human clinical studies (SB-509-601) of the Company's product candidate SB-509, a ZFP Therapeutic ® that was in development for the treatment of diabetic neuropathy. In January 2010, JDRF and Sangamo amended the agreement and, subject to its terms and conditions, JDRF agreed to provide additional funding of up to $3.0 million for a Phase 2b trial in diabetic neuropathy (SB-509-901) which was intended to partially fund expenses related to the trial. Under the amended agreement, Sangamo was obligated to use commercially reasonable efforts to carry out the Phase 2b trial and, thereafter, to develop and commercialize a product containing SB-509 for the treatment of diabetes and complications of diabetes. Sangamo is obligated to cover all costs of the Phase 2b trial that are not covered by JDRF's grant.

On October 3, 2011, the Company announced that the SB-509-901 trial did not meet its primary or secondary clinical endpoints in subjects with moderate severity diabetic neuropathy as compared to placebo. Further, the Company decided not to pursue additional clinical development of the SB-509 program. Upon termination of the program and pursuant to the terms of the agreement, JDRF may have the right, subject to certain limitations, to obtain an exclusive, sublicensable license, to the intellectual property generated by the Company in the course of the Phase 2b trial, to make and commercialize products containing SB-509 for the treatment of diabetes and complications of diabetes. If JDRF obtains such a license, it is obligated to pay Sangamo a percentage of its revenues from product sales and sublicensing arrangements. If JDRF fails to satisfy its obligations to develop and commercialize a product containing SB-509 under the agreement, then their license rights will terminate and Sangamo will receive a non-exclusive, fully paid license, for any intellectual property developed during JDRF's use of the license, to research, develop and commercialize products containing SB-509 for the treatment of diabetes and complications of diabetes.

Revenues attributable to research and development activities performed under the JDRF agreements were $0.5 million, $1.5 million and $0.5 million during 2011, 2010 and 2009, respectively.

Funding from Other Sources

Qualifying Therapeutic Discovery Project Program

In October 2010, Sangamo was awarded a total of $1.0 million in grants for four qualifying therapeutic discovery projects under the Patient Protection and Affordable Care Act. There was no such funding in 2011 or 2009.

NOTE 5 – PROPERTY AND EQUIPMENT

Property and equipment consist of the following (in thousands):

	December 31,	
	2011	2010
Laboratory equipment	$ 2,851	$ 2,406
Furniture and fixtures	442	403
Leasehold improvements	1,036	944
	4,329	3,753
Less accumulated depreciation	(2,726)	(2,080)
	$ 1,603	$ 1,673

Depreciation and amortization expense was $0.6 million, $0.7 million and $0.6 million for 2011, 2010 and 2009, respectively.

NOTE 6 – COMMITMENTS

Sangamo occupies office and laboratory space under operating leases in Richmond, California that expire in August 2014. Rent expenses were $0.6 million for 2011, 2010 and 2009. Future minimum payments under contractual obligations at December 31, 2011 consist of the following (in thousands):

Fiscal Year:	Operating Lease
2012	$ 600
2013	616
2014	417
Thereafter	—
Total minimum payments	$ 1,633

NOTE 7 – STOCKHOLDERS' EQUITY

Convertible Preferred Stock

All outstanding convertible preferred stock converted into common stock upon consummation of the Company's initial public offering in April 2000. The Company has 5,000,000 preferred shares authorized, which may be issued at the Board's discretion.

Common Stock

In April 2011, Sangamo completed an underwritten public offering of its common stock, in which the Company sold an aggregate of 6,700,000 shares of its common stock at a public offering price of $7.70 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 $50.2 million.

In October 2009, pursuant to the expansion of the license agreement with Sigma, Sangamo issued 636,000 shares of common stock valued at a price of $7.73 per share for aggregate proceeds of $4.9 million.

In October 2009, Sangamo completed an underwritten public offering of its common stock, in which Sangamo sold an aggregate of 3,000,000 shares of its common stock at a public offering price of $7.20 per share, resulting in net proceeds of approximately $20.9 million.

Stock Incentive Plan

Sangamo's 2004 Stock Incentive Plan (the 2004 Plan), which supersedes the 2000 Stock Incentive Plan (the 2000 Plan), provides for the issuance of common stock and grants of options for common stock to employees, officers, directors and consultants. The exercise price per share will be no less than 85 percent of the fair value per share of common stock on the option grant date, and the option term will not exceed ten years. If the person to whom the option is granted is a 10 percent stockholder, and the option granted qualifies as an Incentive Stock Option Grant, then the exercise price per share will not be less than 110 percent of the fair value per share of common stock on the option grant date, and the option term will not exceed five years. Options granted under the 2004 Plan generally vest over four years at a rate of 25 percent one year from the grant date and one thirty-sixth per month thereafter and expire ten years after the grant, or earlier upon employment termination. Options granted under the 2004 Plan may be exercised prior to vesting, with the related shares subject to Sangamo's right to repurchase the shares that have not vested at the issue price if the option holder terminates employment. The right of repurchase lapses over the original option vesting period, as described above. Approximately 6.5 million shares were initially reserved for issuance pursuant to the 2000 Plan and the 2004 Plan. The number of shares authorized for issuance under the 2004 Plan automatically increases on the first trading day of the fiscal year by an amount equal to 3% of the total number of shares of the Company's common stock outstanding on the last trading day of the preceding fiscal year, but in no event shall any such increase exceed 1.75 million shares per year. During 2011, 2010 and 2009, 1,361,332, 1,349,832 and 1,231,712 additional shares, respectively, were authorized for issuance under the 2004 Plan pursuant to the evergreen increase feature of such plan.

Employee Stock Purchase Plan

Sangamo's 2010 Employee Stock Purchase Plan (Purchase Plan), which supersedes the 2000 Employee Stock Purchase Plan, provides a total reserve of 2,100,000 shares of common stock for issuance under the Purchase Plan. Eligible employees may purchase common stock at 85 percent of the lesser of the fair market value of Sangamo's common stock on the first day of the applicable two-year offering period or the last day of the applicable six-month purchase period.

The weighted-average estimated fair value per share of ESPP purchase rights during 2011, 2010 and 2009 were $1.62, $2.76 and $3.11, respectively, based upon the assumptions in the Black-Scholes valuation model described in Note 1.

Stock Option Activity

A summary of Sangamo's stock option activity is as follows:

	Number of Shares	Weighted-Average Exercise per Share Price	Weighted Average Remaining Contractual Term (In years)
Options outstanding at December 31, 2010	8,109,901	$ 6.54	7.30
Options granted	836,000	$ 4.65	
Options exercised	(303,353)	$ 4.10	
Options canceled	(296,358)	$ 11.04	
Options outstanding at December 31, 2011	8,346,190	$ 6.28	6.78
Options exercisable at December 31, 2011	5,455,800	$ 7.00	5.84

There were no shares subject to Sangamo's right of repurchase as of December 31, 2011. The intrinsic value of options exercised during 2011 was $1.0 million and the intrinsic value of options exercised during both 2010 and 2009 was $0.5 million.

At December 31, 2011, the aggregate intrinsic values of the outstanding and exercisable options were $0.1 million and $16,122, respectively. The aggregate intrinsic value of shares vested and expected to vest during 2011, 2010 and 2009 was $0.1 million, $11.2 million, $7.4 million, respectively.

The weighted-average fair value per share of options granted during 2011, 2010 and 2009 was $3.20, $3.85 and $3.61, respectively, based upon the assumption in the Black-Scholes valuation model described in Note 1.

The following table summarizes information with respect to stock options outstanding at December 31, 2011:

	Options Outstanding and Exercisable		Options Exercisable	
Range of Exercise Price	Number of Shares of common stock subject to options	Weighted Average Remaining Contractual Life (In years)	Number of Shares of common stock subject to options	Weighted Average Exercise Price
$ 2.04 – $ 3.42	389,744	9.28	39,744	$ 2.50
$ 3.45 – $ 3.45	1,733,092	6.94	1,232,118	$ 3.45
$ 3.61 – $ 5.12	841,830	4.24	758,579	$ 4.08
$ 5.18 – $ 5.30	279,767	2.96	279,767	$ 5.19
$ 5.35 – $ 5.35	1,138,866	7.93	558,866	$ 5.35
$ 5.42 – $ 5.66	70,875	6.24	35,458	$ 5.56
$ 5.70 – $5.70	1,144,500	8.93	286,125	$ 5.70
$ 5.90 – $6.82	1,044,230	6.62	634,965	$ 6.59
$ 6.88 – $13.98	1,398,286	5.56	1,325,178	$ 12.03
$14.27 – $14.62	305,000	5.92	305,000	$ 14.28
	8,346,190	6.78	5,455,800	$ 7.00

During 2011, the Company issued 550,000 RSUs under the Company's 2004 Stock Incentive Plan at a grant date fair value of $2.55. These awards will vest as follows: one-third of the award will vest on the second anniversary of the award date and two-thirds of the award will vest on the third anniversary of the award date. During 2010, the Company issued 10,000 RSUs under the Company's 2004 Stock Incentive Plan at a grant date fair value of $6.05. These RSUs will vest in equal monthly installments over a two-year service period. Fair value of restricted stock units are estimated based upon the closing sales price of the Company's common stock on the grant date. As of December 31, 2011, 551,667 RSUs were outstanding under the Company's stock option plans.

As of December 31, 2011, 2,824,067 shares were reserved for future awards under the Company's stock incentive plans. As of December 31, 2011, there are 2,036,330 shares of common stock reserved for future issuance under the 2010 Employee Stock Purchase Plan.

NOTE 8 – COMPREHENSIVE LOSS

Activities in comprehensive loss were as follows (in thousands):

	Year Ended December 31,		
	2011	2010	2009
Net loss	$(35,750)	$(24,854)	$(18,587)
Increase / (Decrease) in unrealized gains on marketable securities	18	(24)	(258)
Comprehensive loss	$(35,732)	$(24,878)	$(18,845)

NOTE 9 – INCOME TAXES

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. Significant components of the Company's deferred tax assets are as follows (in thousands):

	December 31,	
	2011	2010
Deferred tax assets:		
Net operating loss carryforwards	$ 67,395	$ 56,254
Research and development tax credit carryforwards	6,844	4,689
Capitalized research	117	259
Stock-based compensation	7,355	831
Other	1,125	1,066
	82,836	63,099
Valuation allowance	(82,836)	(63,099)
Net deferred tax assets	$ —	$ —

Realization of deferred tax assets is dependent upon future earnings, if any, the timing and amount of which are uncertain. Accordingly, the net deferred tax assets have been fully offset by a valuation allowance. The valuation allowance increased by $19.7 million, $7.4 million and $4.1 million for the years ended December 31, 2011, 2010 and 2009, respectively. As of December 31, 2011, Sangamo had net operating loss carryforwards for federal and state income tax purposes of approximately $170.4 million and $162.1 million, respectively. If not utilized, the net federal and state operating loss carryforwards will begin to expire in 2012. The Company also has federal and state research tax credit carryforwards of $5.5 million and $5.4 million, respectively. The federal research credits will begin to expire in 2018 while the state research credits have no expiration date. Utilization of the Company's net operating loss carryforwards and research tax credit carryforwards may be subject to substantial annual limitations due to the ownership change limitations provided by the Internal Revenue Code and similar state provisions. The annual limitation could result in the expiration of the net operating loss carryforwards and research tax credit carryforwards before use.

The Company files U.S and state income tax returns with varying statutes of limitations. The tax years from 2000 forward remain open to examination due to the carryover of net operating losses or tax credits. We also file various foreign income tax returns with varying statutes of limitations, and the tax years from 2005 and thereafter remain open to examination.

The Company's practice is to recognize interest and/or penalties related to income tax matters in income tax expense. As of December 31 2011, the Company had no accrued interest and/or penalties. The unrecognized tax benefits may change during the next year for items that arise in the ordinary course of business. In the event that any unrecognized tax benefits are recognized, the effective tax rate will not be affected.

The following table summarizes the activity related to the Company's unrecognized tax benefits (in thousands):

	December 31,		
	2011	2010	2009
Beginning balance	$1,896	$1,643	$1,282
Additions based on tax positions related to the current year	589	253	361
Additions for tax positions of prior years	265	—	—
Reductions for tax positions of prior years	—	—	—
Ending Balance	$2,750	$1,896	$1,643

NOTE 10 – ACCOUNTS PAYABLE AND ACCRUED LIABILITIES

Accounts payable and accrued liabilities consist of the following (in thousands):

	December 31,	
	2011	2010
Accounts payable	$4,110	$3,537
Accrued clinical trial expense	968	1,405
Accrued professional fees	299	278
Deferred rent	131	153
Other	7	281
Total accounts payable and accrued liabilities	$5,515	$5,654

NOTE 11 – QUARTERLY FINANCIAL DATA (UNAUDITED)

The following table sets forth certain unaudited quarterly financial data for the eight quarters ended December 31, 2011. The unaudited information set forth below has been prepared on the same basis as the audited information and includes all adjustments necessary to present fairly the information set forth herein. The operating results for any quarter are not indicative of results for any future period. All data is in thousands except per common share data.

	2011				2010			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Revenues	$ 2,200	$ 1,514	$ 1,857	$ 4,748	$ 6,648	$ 6,525	$ 2,943	$ 4,689
Expenses	$11,801	$ 11,795	$11,431	$11,113	$10,651	$10,404	$11,658	$13,027
Net loss	$ (9,578)	$(10,259)	$ (9,554)	$ (6,359)	$ (3,978)	$ (3,860)	$ (8,695)	$ (8,321)
Net loss per share	$ (0.21)	$ (0.20)	$ (0.18)	$ (0.12)	$ (0.09)	$ (0.09)	$ (0.19)	$ (0.18)

NOTE 12 – SUBSEQUENT EVENT

On January 31, 2012, The Company entered into a collaboration and license agreement (the Agreement) with Shire, pursuant to which the Company and Shire will collaborate to research, develop and commercialize human therapeutics and diagnostics for monogenic diseases based on Sangamo's ZFP technology. Under the Agreement, the Company and Shire may develop potential human therapeutic or diagnostic products for seven gene targets. The initial four gene targets are blood clotting Factors VII, VIII, IX and X, and products developed for such initial gene targets would be used for treating or diagnosing hemophilia. Shire has the right, subject to certain limitations, to designate three additional gene targets. Pursuant to the Agreement, the Company granted Shire an exclusive, world-wide, royalty-bearing license, with the right to grant sublicenses, to use Sangamo's ZFP technology for the purpose of developing and commercializing human therapeutic and diagnostic products for the gene targets.

The initial research term of the Agreement is six years and is subject to extensions upon mutual agreement and under other specified circumstances. The Company is responsible for all research activities through the submission of an Investigative New Drug Application (IND) or European Clinical Trial Application (CTA), while Shire is responsible for clinical development and commercialization of products generated from the research program from and after the acceptance of an IND or CTA for the product. Shire will reimburse Sangamo for its internal and external research program-related costs.

Under the Agreement, the Company received an upfront license fee of $13.0 million. Pursuant to the terms of the agreement with Shire, future expenses related to research activities related to the collaboration will be reimbursed by Shire, including employee and external research costs. In addition, for each gene target, Sangamo is eligible to receive milestone payments upon the achievement of specified research, regulatory, clinical development, commercialization and sales milestones. The total amount of potential milestone payments for each of the seven gene targets, assuming the achievement of all specified milestones in the Agreement, is $213.5 million. The milestone payments for each gene target through the acceptance of an IND or CTA submission total $8.5 million. Sangamo will also receive royalty payments that are a tiered double-digit percentage of net sales of products developed under the collaboration.

The Agreement may be terminated by (i) Sangamo or Shire, in whole or in part, for the uncured material breach of the other party, (ii) Sangamo or Shire for the bankruptcy or other insolvency proceeding of the other party and (iii) Shire, in its entirety, beginning 24 months after the effective date of the Agreement upon 90 days advance written notice. In addition, Shire may terminate the Agreement with respect to an individual gene target at any time, and under certain circumstances may designate a replacement gene target for a terminated gene target

ITEM 9 – CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A – CONTROLS AND PROCEDURES

(I) Evaluation of Disclosure Controls and Procedures

We maintain disclosure controls and procedures to ensure that information we are required to disclose in reports that we file or submit under the Securities Exchange Act of 1934, as amended (Exchange Act) is recorded, processed, summarized and reported within the time periods specified in Securities and Exchange Commission's (SEC) rules and forms. Our management evaluated, with the participation of our chief executive officer (CEO) and our chief financial officer (CFO), the effectiveness of our disclosure controls and procedures, as such term is defined under Rule 13a-15(e) under the Exchange Act. Based on that evaluation, our CEO and CFO concluded that our disclosure controls and procedures were effective, at a reasonable assurance level, as of December 31, 2011 and as of the date of this filing.

There have been no significant changes in our internal control over financial reporting that have materially affected, or are reasonably likely to materially affect internal control over financial reporting during the fiscal quarter ended December 31, 2011.

(II) Management's Report on Internal Control over Financial Reporting

Internal control over financial reporting refers to the process designed by, or under the supervision of, our CEO and CFO, and effected by our Board of Directors, management and other personnel, 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, and includes those policies and procedures that:

(1) Pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of the assets of the Company;

(2) Provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the Company are being made only in accordance with authorizations of management and directors of the Company; and

(3) Provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the Company's assets that could have a material effect on the financial statements.

Management is responsible for establishing and maintaining an adequate internal control over financial reporting for the Company. Internal control over financial reporting cannot provide absolute assurance of achieving financial reporting objectives because of its inherent limitations. Internal control over financial reporting is a process that involves human diligence and compliance and is subject to lapses in judgment and breakdowns resulting from human failures. Internal control over financial reporting also can be circumvented by collusion or improper management override. Because of such limitations, there is a risk that material misstatements may not be prevented or detected on a timely basis by internal control over financial reporting. However, these inherent limitations are known features of the financial reporting process. Therefore, it is possible to design into the process safeguards to reduce, though not eliminate, this risk.

Under the supervision and with the participation of our management, including our principal executive officer and principal financial officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting based on the framework set forth in "Internal Control—Integrated Framework" issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on our evaluation under the framework set forth in "Internal Control—Integrated Framework," our management concluded that our internal

control over financial reporting was effective as of December 31, 2011. The effectiveness of our internal control over financial reporting as of December 31, 2011 has been audited by Ernst & Young LLP, an independent registered public accounting firm, as stated in their report which is included herein.

(III) Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders
Sangamo BioSciences, Inc.

We have audited Sangamo BioSciences, Inc.'s internal control over financial reporting as of December 31, 2011, based on criteria established in *Internal Control—Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission (the COSO criteria). Sangamo BioSciences, Inc.'s management is responsible for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the company's internal control over financial reporting based on our audit.

We conducted our audit in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

A company's internal control over financial reporting is a process designed 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. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

In our opinion, Sangamo BioSciences, Inc. maintained, in all material respects, effective internal control over financial reporting as of December 31, 2011 based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the consolidated balance sheets of Sangamo BioSciences, Inc. as of December 31, 2011 and 2010, and the related consolidated statements of operations, stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2011 and our report dated February 22, 2012 expressed an unqualified opinion thereon.

/s/ ERNST & YOUNG LLP

San Jose, California
February 22, 2012

ITEM 9B – OTHER INFORMATION

In December 2011, following the recommendation of the Compensation Committee, the Board of Directors approved a 2012 cash incentive plan for the senior management of the Company, including Edward O. Lanphier II, Chief Executive Officer and President, H. Ward Wolff, Executive Vice President and Chief Financial Officer, Geoffrey Nichol, M.B., Ch.B., Executive Vice President, Research and Development, Dale G. Ando, M.D., Vice President, Therapeutic Development and Chief Medical Officer, Philip Gregory, D. Phil., Vice President, Research and Chief Science Officer, and David Ichikawa, Senior Vice President, Business Development. Under the plan, the Board has established clinical, business development, research and financial goals for the 2012 year and assigned relative weightings to these goals. For 2012 Mr. Lanphier is eligible for a bonus of up to 50% of his base salary, Messrs. Wolff and Nichol are eligible for a bonus of up to 40% of their base salary, Messrs. Ando and Gregory are eligible for a bonus of up to 30% of their base salary and Mr. Ichikawa is eligible for a bonus of up to 25% of his base salary, all based upon the Company's achievement of corporate objectives for 2012. The Compensation Committee has the discretion to increase, reduce or eliminate the bonus that would otherwise be payable to one or more participants on the basis of the level of attained performance or to grant supplemental bonuses to individual officers that are above or below the established target based on the established criteria and its subjective assessment of such officer's performance.

PART III

Certain information required by Part III is omitted from this Report on Form 10-K since we intend to file our definitive Proxy Statement for our next Annual Meeting of Stockholders, pursuant to Regulation 14A of the Securities Exchange Act of 1934, as amended (the 2012 Proxy Statement), no later than April 30, 2012, and certain information to be included in the 2012 Proxy Statement is incorporated herein by reference.

ITEM 10 – DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information required by this item concerning our directors, executive officers, Section 16 compliance and corporate governance matters is incorporated by reference to the information set forth in the sections titled "Election of Directors," "Management," and "Section 16(a) Beneficial Ownership Reporting Compliance" in our 2012 Proxy Statement.

ITEM 11 – EXECUTIVE COMPENSATION

The information required by this item regarding executive compensation is incorporated by reference to the information set forth in the sections titled "Executive Compensation" in our 2012 Proxy Statement.

ITEM 12 – SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by this item regarding security ownership of certain beneficial owners and management is incorporated by reference to the information set forth in the section titled "Security Ownership of Certain Beneficial Owners and Management" and "Equity Compensation Plans" in our 2012 Proxy Statement.

ITEM 13 – CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information required by this item regarding certain relationships and related transactions is incorporated by reference to the information set forth in the section titled "Certain Relationships and Related Transactions" in our 2012 Proxy Statement.

ITEM 14 – PRINCIPAL ACCOUNTING FEES AND SERVICES

The information required by this item regarding principal accounting fees and services is incorporated by reference to the information set forth in the section titled "Principal Accounting Fees and Services" in our 2012 Proxy Statement.

PART IV

ITEM 15 – EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(a) The following documents are included as part of this Annual Report on Form 10-K:

1. Financial Statements—See Index to Consolidated Financial Statements in Item 8.
2. Financial Statement Schedules—Not Applicable.
3. Exhibits—See Index to Exhibits.

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SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized, on February 22, 2012.

SANGAMO BIOSCIENCES, INC.

By: /s/ EDWARD O. LANPHIER II
Edward O. Lanphier II
President, Chief Executive Officer and Director

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed by the following persons on behalf of the registrant and in the capacities and on the dates indicated:

Signature	Title	Date
/s/ EDWARD O. LANPHIER II **Edward O. Lanphier II**	President, Chief Executive Officer and Director (Principal Executive Officer)	February 22, 2012
/s/ H. WARD WOLFF **H. Ward Wolff**	Executive Vice President and Chief Financial Officer (Principal Financial and Accounting Officer)	February 22, 2012
/s/ WILLIAM R. RINGO **William R. Ringo**	Director and Chairman of the Board	February 22, 2012
/s/ PAUL B. CLEVELAND **Paul B. Cleveland**	Director	February 22, 2012
/s/ STEPHEN G. DILLY, M.B.B.S, PH.D **Stephen G. Dilly, M.B.B.S, Ph.D**	Director	February 22, 2012
/s/ JOHN W. LARSON **John W. Larson**	Director	February 22, 2012
/s/ STEVEN J. MENTO, PH.D **Steven J. Mento, Ph.D**	Director	February 22, 2012
/s/ THOMAS G. WIGGANS **Thomas G. Wiggans**	Director	February 22, 2012

INDEX TO EXHIBITS

Exhibit Number	Description of Document
3.1	Amended and Restated Certificate of Incorporation (incorporated by reference to Exhibit 3.1 to the Company's Registration Statement on Form S-1/A (Registration No. 333-30134) filed April 4, 2000).
3.2	Amended and Restated Bylaws (incorporated by reference to Exhibit 3.2 to the Company's Registration Statement on Form S-1/A (Registration No. 333-30134) filed April 4, 2000).
4.1	Form of Specimen Common Stock Certificate (incorporated by reference to Exhibit 4.1 to the Company's Registration Statement on Form S-1/A (Registration No. 333-30134) filed April 4, 2000).
10.1(+)	2000 Employee Stock Purchase Plan (incorporated by reference to Exhibit 10.2 to the Company's Registration Statement on Form S-1/A (Registration No. 333-30134) filed February 24, 2000).
10.2	Form of Indemnification Agreement entered into between Sangamo and each of its directors and executive officers (incorporated by reference to Exhibit 10.4 to the Company's Registration Statement on Form S-1/A (Registration No. 333-30134) filed February 24, 2000).
10.3	Sublicense Agreement, by and between Sangamo and Johnson & Johnson, dated May 9, 1996 (incorporated by reference to Exhibit 10.3 to the Company's Annual Report on Form 10-K/A filed April 22, 2010).
10.4	Patent License Agreement between Sangamo and Massachusetts Institute of Technology, dated May 9, 1996, as amended by the First Amendment, dated December 10, 1997 (incorporated by reference to Exhibit 10.4 to the Company's Annual Report on Form 10-K/A filed April 22, 2010).
10.5	License Agreement between Sangamo and the Johns Hopkins University, dated June 25, 1995, as amended by Amendment No. 1, dated July 16, 1998 (incorporated by reference to Exhibit 10.5 to the Company's Annual Report on Form 10-K/A filed April 22, 2010).
10.6	Triple Net Laboratory Lease, between Sangamo and Point Richmond R&D Associates II, LLC, dated May 23, 1997 (incorporated by reference to Sangamo's Registration Statement on Form S-1 (Reg. No. 333-30314), as amended).
10.7(+)	Employment Agreement, between Sangamo and Edward O. Lanphier II, dated June 1, 1997 (incorporated by reference to Exhibit 10.15 to the Company's Registration Statement on Form S-1/A (Registration No. 333-30134) filed March 14, 2000).
10.8†	Second Amendment to Patent License Agreement between Sangamo and Massachusetts Institute of Technology, dated December 2, 1998 (incorporated by reference to Exhibit 10.8 to the Company's Annual Report on Form 10-K, filed March 5, 2010).
10.9	Amendment No. 2 to License Agreement between Sangamo and the Johns Hopkins University, effective as of July 26, 1999 (incorporated by reference to Exhibit 10.9 to the Company's Annual Report on Form 10-K, filed March 5, 2010).
10.10†	Third Amendment to Patent License Agreement between Sangamo and Massachusetts Institute of Technology, dated September 1, 1999 (incorporated by reference to Exhibit 10.10 to the Company's Annual Report on Form 10-K, filed March 5, 2010).
10.11	Fourth Amendment to Patent License Agreement between Sangamo and Massachusetts Institute of Technology, effective as of February 10, 2000 (incorporated by reference to Exhibit 10.11 to the Company's Annual Report on Form 10-K, filed March 5, 2010).

Exhibit Number	Description of Document
10.12	Amendment No. 3 to License Agreement between Sangamo and the Johns Hopkins University, effective as of March 10, 2000 (incorporated by reference to Exhibit 10.12 to the Company's Annual Report on Form 10-K, filed March 5, 2010).
10.13	License Agreement by and between The Scripps Research Institute and Sangamo, dated March 14, 2000 (incorporated by reference to Exhibit 10.13 to the Company's Annual Report on Form 10-K, filed March 5, 2010).
10.14†	Fifth Amendment to Patent License Agreement between Sangamo and Massachusetts Institute of Technology, effective as of December 15, 2000 (incorporated by reference to Exhibit 10.14 to the Company's Annual Report on Form 10-K, filed March 5, 2010).
10.15(+)	2004 Stock Incentive Plan (incorporated by reference to Appendix C of the Company's Definitive Proxy Statement on Schedule 14A filed April 29, 2004).
10.16	First Amendment to Triple Net Laboratory Lease, between Sangamo and Point Richmond R&D Associates II, LLC, dated March 12, 2004 (incorporated by reference to Sangamo's Annual Report on Form 10-K for the year ended December 31, 2004).
10.17†	Sixth Amendment to Patent License Agreement between Sangamo and Massachusetts Institute of Technology, dated September 1, 2005 (incorporated by reference to Exhibit 10.17 to the Company's Annual Report on Form 10-K, filed March 5, 2010).
10.18†	Research and Commercial Option License Agreement, dated October 5, 2005, between Sangamo and Dow AgroSciences LLC (incorporated by reference to Exhibit 10.23 to the Company's Annual Report on Form 10-K, filed March 16, 2006).
10.19†	Research, Development and Commercialization Agreement dated October 24, 2006 between Sangamo and Juvenile Diabetes Research Foundation International (incorporated by reference to Exhibit 10.19 to the Company's Annual Report on Form 10-K, filed March 1, 2007).
10.20†	Seventh Amendment to Patent License Agreement between Sangamo and Massachusetts Institute of Technology, dated October 27, 2006 (incorporated by reference to Exhibit 10.20 to the Company's Annual Report on Form 10-K, filed March 5, 2010).
10.21	First Amendment of Research and Commercial Option License Agreement between Sangamo and Dow AgroSciences LLC, dated November 7, 2006 (incorporated by reference to Exhibit 10.21 to the Company's Annual Report on Form 10-K, filed March 5, 2010).
10.22	Asset Purchase Agreement dated December 1, 2006 by and between Sangamo and Edwards Lifesciences LLC (incorporated by reference to the Company's Form 8-K filed on December 28, 2006).
10.23	Eighth Amendment to Patent License Agreement between Sangamo and Massachusetts Institute of Technology, dated February 1, 2007 (incorporated by reference to Exhibit 10.23 to the Company's Annual Report on Form 10-K, filed March 5, 2010).
10.24†	Research and License Agreement between Sangamo and Genentech, Inc., dated April 27, 2007 (incorporated by reference to Exhibit 10.1 to the Company's Form 10-Q, filed August 9, 2007).
10.25†	Amendment No. 4 to License Agreement between Sangamo and the Johns Hopkins University, effective as of May 21, 2007 (incorporated by reference to Exhibit 10.25 to the Company's Annual Report on Form 10-K, filed March 5, 2010).
10.26†	License Agreement between Sangamo and Sigma-Aldrich Corporation, dated July 10, 2007 (incorporated by reference to Exhibit 10.1 to the Company's Form 10-Q, filed November 1, 2007).

Exhibit Number	Description of Document
10.27	Common Stock Purchase Agreement between Sangamo and Sigma-Aldrich Corporation, dated July 10, 2007 (incorporated by reference to Exhibit 10.1 to the Company's Form 8-K filed on July 10, 2007).
10.28	First Amendment of the License Agreement between Sigma-Aldrich Corporation and Sangamo, dated November 9, 2007 (incorporated by reference to Exhibit 10.1 to the Company's Form 10-Q filed on November 6, 2009).
10.29†	Letter Agreement between Sangamo and Sigma-Aldrich Corporation, dated February 25, 2008 (incorporated by reference to Exhibit 10.2 to the Company's Form 10-Q filed on May 9, 2008).
10.30†	Second Research and License Agreement between Sangamo and Genentech, Inc., dated February 27, 2008 (incorporated by reference to Exhibit 10.1 to the Company's Form 10-Q filed on May 9, 2008).
10.31†	License Agreement between Sangamo and Open Monoclonal Technology, Inc., dated April 2, 2008 (incorporated by reference to Exhibit 10.1 to the Company's Form 10-Q filed on August 7, 2008).
10.32†	Amendment to License Agreement by and between The Scripps Research Institute and Sangamo, dated April 29, 2008 (incorporated by reference to Exhibit 10.32 to the Company's Annual Report on Form 10-K, filed March 5, 2010).
10.33†	Research and License Agreement between Sangamo and F. Hoffmann-La Roche Ltd and Hoffmann-La Roche Inc., dated July 2, 2008 (incorporated by reference to Exhibit 10.1 to the Company's Form 10-Q filed on November 4, 2008).
10.34(+)	Plan Amendment to 2004 Stock Incentive Plan (incorporated by reference to Exhibit 10.2 to the Company's Form 10-Q filed on August 7, 2008).
10.35†	Letter Agreement between Sangamo and Sigma-Aldrich Corporation, dated July 2, 2008 (incorporated by reference to Exhibit 10.2 to the Company's Form 10-Q filed on November 4, 2008).
10.36†	License Agreement between Sangamo and Pfizer Inc., dated December 19, 2008 (incorporated by reference to Exhibit 10.25 to the Company's Annual Report on Form 10-K, filed March 3, 2009).
10.37(+)	Amended and Restated Employment Agreement between Sangamo and H. Ward Wolff, dated December 31, 2008 (incorporated by reference to Exhibit 10.26 to the Company's Annual Report on Form 10-K, filed March 3, 2009).
10.38(+)	First Amendment to Employment Agreement between Sangamo and Edward O. Lanphier, dated December 31, 2008 (incorporated by reference to Exhibit 10.27 to the Company's Annual Report on Form 10-K, filed March 3, 2009).
10.39†	Second Amendment of Research and Commercial Option License Agreement between Sangamo and Dow AgroSciences LLC, dated February 13, 2009 (incorporated by reference to Exhibit 10.39 to the Company's Annual Report on Form 10-K, filed March 5, 2010).
10.40	Third Amendment of Research and Commercial Option License Agreement between Sangamo and Dow AgroSciences LLC, dated February 28, 2009 (incorporated by reference to Exhibit 10.40 to the Company's Annual Report on Form 10-K, filed March 5, 2010).
10.41†	Second Amendment of the License Agreement between Sigma-Aldrich Corporation and Sangamo, dated September 25, 2009 (incorporated by reference to Exhibit 10.2 to the Company's Form 10-Q filed on November 6, 2009).

Exhibit Number	Description of Document
10.42	Common Stock Purchase Agreement between Sangamo and Sigma-Aldrich Corporation, dated October 2, 2009 (incorporated by reference to Exhibit 10.3 to the Company's Form 8-K filed on October 5, 2009).
10.43†	Third Amendment to the License Agreement between Sigma-Aldrich Corporation and Sangamo, dated October 2, 2009 (incorporated by reference to Exhibit 10.1 to the Company's Form 10-Q filed on November 6, 2009).
10.44†	First Amendment to the Research, Development and Commercialization Agreement between Sangamo and Juvenile Diabetes Research Foundation International, dated January 8, 2010 (incorporated by reference to Exhibit 10.44 to the Company's Annual Report on Form 10-K, filed March 5, 2010).
10.45	Fourth Amendment of Research and Commercial Option License Agreement between Sangamo and Dow AgroSciences LLC, dated January 8, 2010 (incorporated by reference to Exhibit 10.45 to the Company's Annual Report on Form 10-K, filed March 5, 2010).
10.46	Form of Non-Employee Director Restricted Stock Issuance Agreement (incorporated by reference to Exhibit 10.1 to the Company's Form 10-Q filed on August 5, 2010).
10.47	Fifth Amendment of the Research and Commercial License Option Agreement between Sangamo BioSciences, Inc. and Dow AgroSciences LLC, dated May 14, 2010 (incorporated by reference to Exhibit 10.1 to the Company's Form 10-Q filed on November 3, 2010).
10.48†	Sixth Amendment of the Research and Commercial License Option Agreement between Sangamo BioSciences, Inc. and Dow AgroSciences LLC, dated August 27, 2010 (incorporated by reference to Exhibit 10.2 to the Company's Form 10-Q filed on November 3, 2010).
10.49†	Seventh Amendment of the Research and Commercial License Option Agreement between Sangamo BioSciences, Inc. and Dow AgroSciences LLC, dated December 3, 2010 (incorporated by reference to Exhibit 10.49 to the Company's Form 10-K filed on February 16, 2011).
10.50†	Letter Agreement Amendment regarding the Research and Commercial License Option Agreement between Sangamo BioSciences, Inc. and Dow AgroSciences LLC, dated December 3, 2010 (incorporated by reference to Exhibit 10.50 to the Company's Form 10-K filed on February 16, 2011).
10.51†	Letter Agreement between Sangamo and Sigma-Aldrich Corporation, dated March 1, 2011 (incorporated by reference to Exhibit 10.1 to the Company's Form 10-Q filed on August 5, 2011).
10.52†	Letter dated May 19, 2011 from Dow AgroSciences LLC ("DAS") to Sangamo amending the Research and Commercial License Option Agreement between DAS and Sangamo, dated as of October 1, 2005, as amended (incorporated by reference to Exhibit 10.2 to the Company's Form 10-Q filed on August 5, 2011).
10.53(+)	Amended and Restated Employment Agreement between Sangamo and Edward O. Lanphier II, dated June 21, 2011 (incorporated by reference to Exhibit 10.3 to the Company's Form 10-Q filed on August 5, 2011).
10.54(+)	Employment Agreement between Sangamo and Dr. Geoff Nichol, dated June 17, 2011 (incorporated by reference to Exhibit 10.4 to the Company's Form 10-Q filed on August 5, 2011).
10.55(+)	Amended and Restated Employment Agreement between Sangamo and H. Ward Wolff, dated December 15, 2011.
10.56(+)	Form of Restricted Stock Unit Agreement under the Company's 2004 Stock Incentive Plan (incorporated by reference to Exhibit 10.1 to the Company's Form 8-K filed on December 3, 2007).

Exhibit Number	Description of Document
10.57††	Collaboration and License Agreement between Sangamo and Shire AG, dated January 31, 2012.
21.1	Subsidiaries of the Company (incorporated by reference to Exhibit 21.1 to the Company's Annual Report on Form 10-K, filed March 27, 2003).
23.1	Consent of Independent Registered Public Accounting Firm.
31.1	Rule 13a-14(a) Certification of Chief 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

† Confidential treatment has been granted for certain information contained in this document pursuant to an order of the Securities and Exchange Commission. Such information has been omitted and filed separately with the Securities and Exchange Commission.

†† 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.

Exhibit 10.55

AMENDED AND RESTATED EMPLOYMENT AGREEMENT

Amended and Restated Employment Agreement ("Agreement") made effective as of the 15th day of December 2011, by and between Sangamo BioSciences, Inc., a Delaware corporation (the "Company"), and H. Ward Wolff ("Executive").

R E C I T A L S

A. The Company and Executive previously entered into an Employment Agreement, dated November 30, 2007, as amended and restated effective as of December 31, 2008 (the "Original Agreement").

B. Section 409A of the Internal Revenue Code of 1986, as amended (the "Code"), places certain restrictions, among other things, as to the timing of distributions from nonqualified deferred compensation plans and arrangements; and

C. The Executive and the Board of Directors of the Company desire to amend the terms and conditions of the Original Agreement to take advantage of the relief and guidance contained in Internal Revenue Service Notice 2010-80 with respect to payments at separation from service subject to the requirement to submit a release of claims, so as to bring those terms and conditions into documentary compliance with Section 409A of the Code and the final Treasury Regulations thereunder and to continue Employee's employment with the Company upon the amended and restated terms and conditions set forth herein.

NOW, THEREFORE, the parties agree that the Original Agreement is amended and restated as follows:

1. Position.

The Board has elected Executive to the full-time position of Executive Vice President and Chief Financial Officer of the Company and Executive has accepted this position.

2. Compensation.

Executive will be paid as compensation for his services a base salary at the annual rate of $375,000 (which shall increase to an annual rate of $390,000 commencing on January 1, 2012), or such higher rate as the Board may determine from time to time. The salary shall be payable in accordance with the standard payroll procedures of the Company. The annual compensation specified in this Section 2, together with any increases in such compensation that may be granted from time to time, is referred to in this Agreement as "base salary."

3. Annual Performance Bonus.

Executive shall be eligible to receive a bonus of up to 40% of his base salary for his performance each calendar year. This bonus shall be paid not later than February 28 of the year following the year for which it is being paid based upon the achievement of certain individual and Company performance criteria as agreed upon by the Board and Executive. The determination of Executive's performance in relation to the performance criteria and the amount of the bonus shall be in the sole discretion of the Board.

4. Benefits.

Executive will be entitled to the employee benefits generally provided to other executive officers of the Company.

5. Equity.

(a) The Board (or a committee of the Board) previously granted Executive a stock option to purchase 300,000 shares of the Company's Common Stock at the fair market value on the date of grant ("Option") and 100,000 restricted stock units ("Restricted Stock Units") under the Company's 2004 Stock Incentive Plan ("Plan"). The Option is evidenced by a standard stock option agreement and the Restricted Stock Units are evidenced by a standard restricted stock units agreement and are subject to the terms and conditions of those agreements and the Plan, with one-quarter of the Option shares and Restricted Stock Units vesting 12 months from the date of grant and the remainder vesting in equal monthly installments for 36 months thereafter, provided Executive remains a full-time employee during those time periods. Vesting of the Option, Restricted Stock Units and any subsequent equity grants will cease upon termination of Executive's employment by either party for any reason provided, however, in the event of the termination of Executive's employment by the Company without "Cause" (as hereafter defined) or by Executive for "Good Reason" (as hereafter defined), in either case, within 12 months of the Change in Control (as hereafter defined), Executive shall vest in full with respect to the Option, Restricted Stock Units and any other equity incentive award then held by Executive.

(b) For purposes of the foregoing:

Change in Control shall mean a change in ownership or control of the Company effected through any of the following transactions:

(i) a merger, consolidation or other reorganization approved by the Company's stockholders, *unless* securities representing more than fifty percent (50%) of the total combined voting power of the voting securities of the successor corporation are immediately thereafter beneficially owned, directly or indirectly and in substantially the same proportion, by the persons who beneficially owned the Company's outstanding voting securities immediately prior to such transaction,

(ii) a stockholder-approved sale, transfer or other disposition of all or substantially all of the Company's assets in complete liquidation or dissolution of the Company, or

(iii) the closing of any transaction or series of related transactions pursuant to which any person or any group of persons comprising a "group" within the meaning of Rule 13d-5(b)(1) of the 1934 Act (other than the Company or a person that, prior to such transaction or series of related transactions, directly or indirectly controls, is controlled by or is under common control with, the Company) becomes directly or indirectly the beneficial owner

(within the meaning of Rule 13d-3 of the 1934 Act) of securities possessing (or convertible into or exercisable for securities possessing) more than fifty percent (50%) of the total combined voting power of the Company's securities (as measured in terms of the power to vote with respect to the election of Board members) outstanding immediately after the consummation of such transaction or series of related transactions, whether such transaction involves a direct issuance from the Company or the acquisition of outstanding securities held by one or more of the Company's existing stockholders.

(d) In the event of any conflict with the terms of the stock option agreement or restricted stock unit agreement or the Plan, and this Agreement, this Agreement will control.

6. Employment Period.

Executive's employment with the Company pursuant to this Agreement shall commence upon execution of this Agreement and shall continue until terminated by either party ("Employment Period"). Executive's employment may be terminated by either party upon thirty (30) days written notice to the other party. Upon such termination, Executive will be entitled to the severance benefits described herein.

7. Severance Benefits.

(a) If Executive's employment is terminated by the Company for Cause, or by Executive without Good Reason, or upon Executive's death, then Executive will receive his unpaid salary and benefits (including accrued, but unused vacation time) earned up to the effective date of his termination and nothing else.

(b) If Executive incurs a Separation from Service (as hereafter defined) because his employment is reduced or terminated by the Company without "Cause" or by Executive with "Good Reason" in either case within twelve (12) months following a Change in Control, Executive will be entitled to receive the following benefits:

(i) The Company shall immediately pay to Executive the amounts described in Section 7(a) above.

(ii) The Company shall pay in cash an amount equal to (A) Executive's annual base salary then in effect plus (B) Executive's target bonus for the year in which the termination occurs as a severance payment. Such severance payment shall be paid over a twelve (12) month period in a series of successive equal installments. The first such payment shall be made within the sixty (60)-day period measured from the date of the Executive's Separation from Service (as hereafter defined) as a result of a reduction or termination specified in this Section 7(b), provided that the General Release has been delivered by Executive pursuant to Section 7(f) below and is effective and enforceable following the expiration of the maximum review and revocation periods applicable to that release under law. However, should such sixty (60)-day period span two (2) taxable years, then the first such payment shall be made during the portion of that sixty (60)-day period that occurs in the second taxable year. The remaining installments shall be made in accordance with the Company's regular payroll schedule for its salaried employees. The severance payments under this Section 7(b) shall be treated as a right to a series of separate payments for purposes of Section 409A of the Internal Revenue Code of 1986, as amended (the "Code").

(iii) Provided the Executive and his eligible dependents elect to continue medical care coverage under the Company's group health care plan pursuant to their COBRA rights following such termination of employment, the Company shall reimburse the Executive for the costs the Executive incurs to obtain such continued coverage (collectively, the "Coverage Costs") until the earlier of (a) the expiration of the twelve (12)-month period measured from the first day of the month following such termination of employment or (b) the first date on which the Executive and his eligible dependents are covered under another employer's health benefit program without exclusion for any pre-existing medical condition. During the COBRA continuation period, such coverage shall be obtained under the Company's group health care plans. Following the completion of the applicable COBRA continuation period, such coverage shall continue under the Company's group health plans or one or more other plans providing equivalent coverage. In order to obtain reimbursement for the Coverage Costs under the applicable plan or plans, the Executive must submit appropriate evidence to the Company of each periodic payment within sixty (60) days after the required payment date for those Coverage Costs, and the Company shall within thirty (30) days after such submission reimburse the Executive for that payment. To the extent the Executive incurs any other medical care expenses reimbursable pursuant to the coverage obtained hereunder, the Executive shall submit appropriate evidence of each such expense to the applicable plan administrator within sixty (60) days after incurrence of that expense and shall receive reimbursement of the documented expense within thirty (30) days after such submission or after any additional period that may be required to perfect the claim. During the period such medical care coverage remains in effect hereunder, the following provisions shall govern the arrangement: (a) the amount of Coverage Costs or other medical care expenses eligible for reimbursement in any one calendar year of such coverage shall not affect the amount of Coverage Costs or other medical care expenses eligible for reimbursement in any other calendar year for which such reimbursement is to be provided hereunder; (ii) no Coverage Costs or other medical care expenses shall be reimbursed after the close of the calendar year following the calendar year in which those Coverage Costs or expenses were incurred; and (iii) the Employee's right to the reimbursement of such Coverage Costs or other medical care expenses cannot be liquidated or exchanged for any other benefit. To the extent the reimbursed Coverage Costs are treated as taxable income to the Executive the Company shall report the reimbursement as taxable W-2 wages and collect the applicable withholding taxes, and the resulting tax liability shall be the Executive's sole responsibility. Any additional health care coverage to which the Executive and his dependents may be entitled under COBRA following the period for which the Executive is entitled to the reimbursement of Coverage Costs hereunder shall be at the sole cost and expense of the Executive's and/or his dependents.

(c) If Executive's employment is terminated by the Company without "Cause" or by Executive with "Good Reason" in the absence of a Change in Control or more than twelve (12) months after a Change in Control, Executive will be entitled to receive the following benefits:

(i) The Company shall immediately pay to Executive the amounts described in Section 7(a) above.

(ii) The Company shall pay in cash an amount equal to Executive's annual base salary then in effect as a severance payment. Such severance payment will be paid over a twelve (12) month period in a series of successive equal installments. The first such payment shall be made within the sixty (60)-day period measured from the date of the Executive's Separation from Service (as hereafter defined) as a result of a termination specified in this Section 7(c), provided that the General Release has been delivered by Executive pursuant to Section 7(f) below and is effective and enforceable following the expiration of the maximum review and revocation periods applicable to that release under law. However, should such sixty (60)-day period span two (2) taxable years, then the first such payment shall be made during the portion of that sixty (60)-day period that occurs in the second taxable year. The remaining installments shall be made in accordance with the Company's regular payroll schedule for its salaried employees. The severance payments under this Section 7(c) shall be treated as a right to a series of separate payments for purposes of Section 409A of the Code.

(iii) Provided the Executive and his eligible dependents elect to continue medical care coverage under the Company's group health care plan pursuant to their COBRA rights following such termination of employment, the Company shall reimburse the Executive for the costs the Executive incurs to obtain such continued coverage (collectively, the "Coverage Costs") until the earlier of (a) the expiration of the twelve (12)-month period measured from the first day of the month following such termination of employment or (b) the first date on which the Executive and his eligible dependents are covered under another employer's health benefit program without exclusion for any pre-existing medical condition. During the COBRA continuation period, such coverage shall be obtained under the Company's group health care plans. Following the completion of the applicable COBRA continuation period, such coverage shall continue under the Company's group health plans or one or more other plans providing equivalent coverage. In order to obtain reimbursement for the Coverage Costs under the applicable plan or plans, the Executive must submit appropriate evidence to the Company of each periodic payment within sixty (60) days after the required payment date for those Coverage Costs, and the Company shall within thirty (30) days after such submission reimburse the Executive for that payment. To the extent the Executive incurs any other medical care expenses reimbursable pursuant to the coverage obtained hereunder, the Executive shall submit appropriate evidence of each such expense to the applicable plan administrator within sixty (60) days after incurrence of that expense and shall receive reimbursement of the documented expense within thirty (30) days after such submission or after any additional period that may be required to perfect the claim. During the period such medical care coverage remains in effect hereunder, the following provisions shall govern the arrangement: (a) the amount of Coverage Costs or other medical care expenses eligible for reimbursement in any one calendar year of such coverage shall not affect the amount of Coverage Costs or other medical care expenses eligible for reimbursement in any other calendar year for which such reimbursement is to be provided hereunder; (ii) no Coverage Costs or other medical care expenses shall be reimbursed after the close of the calendar year following the calendar year in which those Coverage Costs or expenses were incurred; and (iii) the Employee's right to the reimbursement of such Coverage Costs or other medical care expenses cannot be liquidated or exchanged for any other benefit. To the extent the reimbursed Coverage Costs are treated as taxable income to the Executive the Company shall report the reimbursement as taxable W-2 wages and collect the applicable withholding taxes, and the resulting tax liability shall be the Executive's sole responsibility. Any additional health care coverage to which the Executive and his dependents

may be entitled under COBRA following the period for which the Executive is entitled to the reimbursement of Coverage Costs hereunder shall be at the sole cost and expense of the Executive's and/or his dependents.

(d) For purposes of this Agreement, "Cause" shall be defined as:

(i) commission of a felony or any other crime against or involving the Company;

(ii) an act of fraud, dishonesty or misappropriation committed by Executive with respect to the Company;

(iii) willful or reckless misconduct by Executive that materially affects the Company or any of its officers, directors, employees, clients, partners, insurers, subsidiaries, parents, or affiliates;

(iv) a material breach of this Agreement or the Proprietary Information and Assignment of Inventions Agreement between Executive and the Company ("Proprietary Information Agreement").

The foregoing is an exclusive list of the acts or omissions that shall be considered "Cause" for the termination of Executive's employment.

(e) For purposes of this Agreement, "Good Reason" shall be defined as one or more of the following conditions arising without Executive's written consent:

(i) a material diminution in Executive's base salary or material reduction of the bonus opportunity provided in Section 3; or

(ii) a material relocation of Executive's principal place of business, with a relocation of more than fifty (50) miles to be deemed material for such purposes; or

(iii) a material breach of this Agreement by the Company.

In order for a termination of employment to be for Good Reason, Executive must provide written notice to the Board of the existence of one or more conditions described above and his intent to resign for Good Reason hereunder within a period not to exceed thirty (30) days of his knowledge of the initial existence of the condition. Following his providing this notice, the Company shall be provided a period of at least thirty (30) days during which to remedy the condition. Executive shall continue to receive the compensation and benefits provided by this Agreement during the cure period and if the condition is not cured at the end of such period Executive's employment shall cease and Executive will become entitled to the severance benefits described above. If the condition is cured, Executive shall not be deemed to have "Good Reason" to terminate his employment.

(f) Notwithstanding the foregoing, in order to receive any severance payments or benefits under this Section 7, Executive must first execute and deliver to the Company, within thirty (30) days (or forty-five (45) days if such longer period is required under applicable law) after the effective date of his Separation from Service under Section 7, a Separation Agreement and General Release in substantially the form attached hereto as Exhibit A (a "General Release"), and such General Release must become effective and enforceable in accordance with its terms following the expiration of any applicable revocation period under federal or state law. If such General Release is not executed and delivered to the Company within the applicable thirty (30)(or forty-five (45))-day period hereunder or does not otherwise become effective and enforceable in accordance with its terms, then no severance benefits will provided Executive under this Section 7.

(g) For purposes of this Agreement, "Separation from Service" shall mean Executive's cessation of Employee status and shall be deemed to occur at such time as the level of the bona fide services Executive is to perform in Employee status (or as a consultant or other independent contractor) permanently decreases to a level that is not more than twenty percent (20%) of the average level of services Executive rendered in Employee status during the immediately preceding thirty-six (36) months (or such shorter period for which Executive may have rendered such service). Any such determination as to Separation from Service, however, shall be made in accordance with the applicable standards of the Treasury Regulations issued under Section 409A of the Code. For purposes of determining whether Executive has incurred a Separation from Service, Executive will be deemed to continue in "**Employee**" status for so long as he remains in the employ of one or more members of the Employer Group, subject to the control and direction of the employer entity as to both the work to be performed and the manner and method of performance. "**Employer Group**" means the Company and any other corporation or business controlled by, controlling or under common control with, the Company as determined in accordance with Sections 414(b) and (c) of the Code and the Treasury Regulations thereunder, except that in applying Sections 1563(1), (2) and (3) for purposes of determining the controlled group of corporations under Section 414(b), the phrase "at least 50 percent" shall be used instead of "at least 80 percent" each place the latter phrase appears in such sections and in applying Section 1.414(c)-2 of the Treasury Regulations for purposes of determining trades or businesses that are under common control for purposes of Section 414(c), the phrase "at least 50 percent" shall be used instead of "at least 80 percent" each place the latter phrase appears in Section 1.4.14(c)-2 of the Treasury Regulations.

8. Full-time Services to the Company.

As a full-time executive employee, the Company requires that Executive devotes his full business time, attention, skills and efforts to the duties and responsibilities of his position. However, Executive will not be precluded from providing services to non-profit organizations or sitting on the board of directors of companies approved by the Board or the Compensation Committee of the Board, so long as such services will not otherwise interfere with Executive's ability to satisfactorily fulfill his duties and responsibilities to the Company.

9. Tax Withholdings.

Any and all cash compensation and other benefits paid to Executive under this Agreement shall be subject to all applicable tax withholding requirements, and the Company shall make such other deductions as may be required and/or allowed by applicable law and/or as authorized in writing by Executive.

10. Section 409A Delayed Commencement of Benefits.

(a) The severance and other benefits under this Agreement are intended, where possible, to comply with the "short term deferral exception" and the "involuntary separation pay exception" to Code Section 409A. Accordingly, the provisions of this Agreement applicable to the severance benefits described in Section 7 and the determination of the Executive's Separation from Service due to termination of the Executive's employment without Cause or the Executive's resignation for Good Reason shall be applied, construed and administered so that those payments and benefits qualify for one or both of those exceptions, to the maximum extent allowable. However, to the extent any payment or benefit to which the Executive becomes entitled under this Agreement is deemed to constitute an item of deferred compensation subject to the requirements of Code Section 409A, the provisions of this Agreement applicable to that payment or benefit shall be applied, construed and administered so that such payment or benefit is made or provided in compliance with the applicable requirements of Code Section 409A. In addition, should there arise any ambiguity as to whether any other provisions of this Agreement would contravene one or more applicable requirements or limitations of Code Section 409A and the Treasury Regulations thereunder, such provisions shall be interpreted, administered and applied in a manner that complies with the applicable requirements of Code Section 409A and the Treasury Regulations thereunder.

(b) Notwithstanding any provision in this Agreement the contrary, no payment or distribution under this Agreement which constitutes an item of deferred compensation under Section 409A of the Code and becomes payable by reason of the Executive's termination of employment with the Company will be made to the Executive until the Executive incurs a Separation from Service in connection with such termination of employment. For purposes of this Agreement, each amount to be paid or benefit to be provided to the Executive shall be treated as a separate identified payment or benefit for purposes of Section 409A of the Code. In addition, no payment or benefit which constitutes an item of deferred compensation under Section 409A of the Code and becomes payable by reason of the Executive's Separation from Service will be made to the Executive prior to the ***earlier*** of (i) the first day of the seventh (7th)-month following the date of such Separation from Service or (ii) the date of the Executive's death, if the Executive is deemed at the time of such Separation from Service to be a specified employee (as determined pursuant to Code Section 409A and the Treasury Regulations thereunder) and such delayed commencement is otherwise required in order to avoid a prohibited distribution under Code Section 409A(a)(2). Upon the expiration of the applicable deferral period, all payments and benefits deferred pursuant to this Section 10(b) (whether they would have otherwise been payable in a single sum or in installments in the absence of such deferral) shall be paid or provided to the Executive in a lump sum on the first day of the seventh (7th) month after the date of the Executive's Separation from Service or, if earlier, the first day of the month immediately following the date the Company receives proof of the Executive's death. Any remaining payments or benefits due under this Agreement will be paid in accordance with the normal payment dates specified herein.

11. Arbitration.

Any dispute, controversy, or claim, whether contractual or non-contractual, between Executive and the Company, unless mutually settled, shall be resolved by binding arbitration in accordance with the Employment Arbitration Rules of Judicial Arbitration and Mediation Service ("JAMS"). Executive and the Company each agree that before proceeding to arbitration, they will mediate disputes before the JAMS by a mediator approved by the JAMS. If mediation fails to resolve the matter, any subsequent arbitrator shall be conducted by an arbitration approved by the JAMS and mutually acceptable to Executive and the Company. All disputes, controversies, and claims shall be conducted by a single arbitrator. If Executive and the Company are unable to agree on the mediator or the arbitrator, then the JAMS shall select the mediator/arbitrator. The resolution of the dispute by the arbitrator shall be final, binding, non-appealable, and fully enforceable by a court of competent jurisdiction under the Federal Arbitration Act. The arbitration award shall be in writing and shall include a statement of the reasons for the award. The arbitration shall be held in San Francisco, California. The Company shall pay all JAMS, mediation, and arbitrator's fees and costs.

12. Severability.

If any provision of this Agreement as applied to any party or to any circumstance should be adjudged by a court of competent jurisdiction (or determined by the arbitrator) to be void or unenforceable for any reason, the invalidity of that provision shall in no way affect (to the maximum extent permissible by law) the application of such provision under circumstances different from those adjudicated by the court or determined by the arbitrator, the application of any other provision of this Agreement, or the enforceability or invalidity of this Agreement as a whole. Should any provision of this Agreement become or be deemed invalid, illegal or unenforceable in any jurisdiction by reason of the scope, extent or duration of its coverage, then such provision shall be deemed amended to the extent necessary to conform to applicable law so as to be valid and enforceable or, if such provision cannot be so amended without materially altering the intention of the parties, then such provision will be stricken, and the remainder of this Agreement shall continue in full force and effect.

13. Miscellaneous.

Executive acknowledges and agrees that in deciding to sign this Agreement he has not relied on any representations, promises or commitments concerning his employment, whether spoken or in writing, made to him by any representative of the Company, except for what is expressly stated in this Agreement, and the Proprietary Information Agreement. This Agreement can only be changed by another written agreement signed by Executive and an authorized representative of the Company and, to be effective, must specifically state that it is intended to alter or modify this Agreement. Except as provided for herein, this Agreement and the Proprietary Information Agreement consist of the entire agreement between the parties and supersede and replace any prior verbal or written agreements between Executive and the Company.

This Agreement shall be construed and interpreted in accordance with the laws of the State of California. Each provision of this agreement is severable from the others, and if any provision hereof shall be to any extent unenforceable, it and the other provisions shall continue to be enforceable to the full extent allowable, as if such offending provision had not been a part of this Agreement.

SANGAMO BIOSCIENCES, INC.

By: /s/ Edward O. Lanphier II
Edward O. Lanphier II
Chief Executive Officer

/s/ H. Ward Wolff
H. Ward Wolff

EXHIBIT A

GENERAL SETTLEMENT AND RELEASE AGREEMENT

PURSUANT TO SECTION 7(F) OF THE EMPLOYMENT AGREEMENT BETWEEN SANGAMO BIOSCIENCES, INC. AND H. WARD WOLFF, EXECUTION OF A GENERAL SETTLEMENT AND RELEASE AGREEMENT, IN SUBSTANTIALLY THE SAME FORM AS THIS EXHIBIT A IS A CONDITION TO MR. WOLFF'S RECEIPT OF CERTAIN PAYMENTS AND BENEFITS PURSUANT TO SECTION 7 OF SUCH AGREEMENT. THIS DOCUMENT IS INTENDED AS A FORM OF THE GENERAL SETTLEMENT AND RELEASE AGREEMENT AND MUST BE FINALIZED BY SANGAMO BIOSCIENCES, INC. PRIOR TO EXECUTION.

GENERAL SETTLEMENT AND RELEASE AGREEMENT

This General Settlement and Release Agreement (the "Agreement") is by and between Sangamo BioSciences, Inc., for itself and for all of its affiliated, related, parent and direct and indirect subsidiary companies, joint venturers and partnerships, successors and permitted assigns and each of them (collectively, the "Company"), on the one hand, and H. Ward Wolff for himself, and his agents, representatives, heirs and assigns (the "Executive"), on the other hand.

1. **Payments**. In full and complete consideration for the Executive's promises and undertaking set forth in this Agreement, following the eighth (8th) day following receipt by the Company of a fully executed General Settlement and Release Agreement from the Executive, the Company will provide the Executive the consideration, if any, to which the Executive is entitled pursuant to the Amended and Restated Employment Agreement between the parties, dated December 15, 2011, at the times specified in Section 7 of that Agreement unless the signature on this Agreement is revoked pursuant to Section 8 below.

2. **Release of Known and Unknown Claims**.

(a) It is understood and agreed by the parties to this Agreement that in consideration of the mutual promises and covenants contained in this Agreement, and after consultation with counsel, the Executive irrevocably and unconditionally releases and forever discharges the Company, its parent, subsidiary and affiliated companies, and all of their past and present officers, directors, employees, agents and assigns (collectively, the "Released Parties"), from any and all causes of action, claims, actions, rights, judgments, obligations, damages, demands, accountings or liabilities of whatever kind or character, which the Executive may have against the Company or any of the Released Parties, or any of them, by reason of or arising out of, touching upon or concerning the Executive's employment, separation of his employment and reapplication for employment with the Company, or any statutory claims, or any and all other matters of whatever kind, nature or description, whether known or unknown, occurring prior to the date of the execution of this Agreement. The Executive acknowledges that this release of claims specifically includes, but is not limited to, any and all claims for fraud; breach of contract; breach of the implied covenant of good faith and fair dealing; inducement of breach; interference with contractual rights; wrongful or unlawful discharge or demotion; violation of public policy; sexual assault and battery; invasion of privacy; intentional or negligent infliction of emotional distress; intentional or negligent misrepresentation; conspiracy; defamation; unlawful effort to prevent employment; discrimination or harassment on the basis of age, race, color, sex, gender, national origin, ancestry, religious creed, physical or mental disability, medical condition, marital status, sexual orientation, genetic information or characteristics, or any other basis protected by applicable law; any claim under: Title VII of the Civil Rights Act of 1964 ("Title VII"); the Americans With Disabilities Act of 1990 ("ADA"); the Age Discrimination in Employment Act of 1967 ("ADEA"); the Employee Retirement Income Security Act of 1974 ("ERISA"); the Equal Pay Act of 1963 ("EPA"); the Fair Labor Standards Act ("FLSA"); the Consolidated Omnibus Budget Reconciliation Act ("COBRA"); the Worker Adjustment and Retraining

Notification Act ("WARN"); the Occupational Safety and Health Act ("OSHA"); the Lilly Ledbetter Fair Pay Act of 2009 ("Fair Pay Act"); the California Fair Employment and Housing Act ("FEHA"); the California Labor Code; and CalOSHA, or any other wrongful conduct, based upon events occurring prior to the date that this Agreement is executed by the Executive. Notwithstanding anything to the contrary herein, this Agreement shall not release the Executive's right, if any, to claims he may have for: (i) indemnification pursuant to the bylaws of the Company or insurance policies of the Company, for any claims arising out of the Executive's conduct as an employee or officer of the Company during his employment, (ii) unemployment, state disability and/or paid family leave insurance benefits pursuant to the terms of applicable state law, (iii) continuation of existing participation in Company-sponsored group health benefit plans under COBRA and/or an applicable state counterpart law, (iv) any benefit entitlements that are vested as of the Executive's termination date pursuant to the terms of a Company-sponsored benefit plan governed by ERISA, (v) stock and/or vested option shares pursuant to the written terms and conditions of the Executive's existing stock option grants and agreements, existing as of his termination date, (vi) violation of any federal, state or local statutory and/or public policy right or entitlement that, by applicable law, is not waivable, and (vii) any wrongful act or omission occurring after the date the Executive signs this Agreement.

(b) The Executive represents and warrants that he has not assigned or subrogated any of his rights, claims or causes of action, including any claims referenced in this Agreement, or authorized any other person or entity to assert such claims on his behalf, and he agrees to indemnify and hold harmless the Company and each of the Released Parties against any assignment of said rights, claims and/or causes of action.

3. **Waiver of Unknown Claims**.

(a) The Executive does hereby expressly waive and relinquish all rights and benefits afforded to him under law, and does so understanding and acknowledging the significance and consequences of such a waiver.

(b) Releases of Unknown Claims/Waiver of Civil Code Section 1542. The parties agree that this Agreement is a full and final release of any and all claims and the Executive expressly waives the benefit of Section 1542 of the California Civil Code, which provides:

> "A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS OR HER FAVOR AT THE TIME OF EXECUTING THE RELEASE, WHICH IF KNOWN BY HIM OR HER MUST HAVE MATERIALLY AFFECTED HIS OR HER SETTLEMENT WITH THE DEBTOR."

(c) The Executive acknowledges and understands that he is being represented in this matter by counsel, and he expressly acknowledges and agrees that this Agreement is intended to include in its effect, without limitation, all claims which he does not know or suspect to exist at the time of the execution of this Agreement, and that this Agreement contemplates the extinguishment of those claims.

(d) The Executive acknowledges and agrees that he may later discover facts different from or in addition to those he now knows or believes to be true in entering into this Agreement. The Executive agrees to assume the risk of the possible discovery of additional or different facts, including facts which may have been concealed or hidden, and agrees that this Agreement shall remain effective regardless of such additional or different facts. The Executive further acknowledges and agrees that neither the Company nor any of the other Released Parties had any duty to disclose any fact to him prior to the execution of this Agreement.

4. **Government Agency Claims Exception**. Nothing in Section 2 above, or elsewhere in this Agreement, prevents or prohibits the Executive from filing a claim with a government agency, such as the U.S. Equal Employment Opportunity Commission, that is responsible for enforcing a law on behalf of the government. However, the Executive understands that he may only seek and receive non-personal forms of relief through any such claim unless otherwise provided by law.

5. **Non-Admission of Liability**. The Executive expressly recognizes that this Agreement shall not in any way be construed as an admission by the Company or any of the other Released Parties of any unlawful or wrongful acts whatsoever against the Executive or any other person or entity. The Company and each of the Released Parties expressly denies any violation of any policy or procedure, or of any state or federal law or regulation. The Company and each of the Released Parties also specifically denies any liability to or wrongful acts against the Executive, or any other person, on the part of themselves or any other employees or agents of the Company. This Agreement shall not be admissible in any proceeding as evidence of or any admission by the Company of any violation of any law or regulation or wrongful act. This Agreement may, however, be introduced in any proceeding to enforce this Agreement.

6. **No Filing of Claims**. The Executive specifically represents that he has no pending complaints or charges against the Company or any of the other Released Parties with any state or federal court or any local, state or federal agency, division or department based on any events occurring prior to the date of execution of this Agreement.

7. **Advice of Counsel**. The Executive acknowledges that he has been given twenty-one days (21) to seek the advice of counsel and to consider the effects of this Agreement upon his legal rights (the "Consideration Period"). To the extent that the Executive has signed the Agreement without obtaining the advice of counsel or before expiration of the Consideration Period, the Executive acknowledges that he has done so voluntarily with a full understanding of the Agreement and its effect upon his legal rights. Any discussion between the Executive and the Company or any of the Released Parties concerning the terms and conditions of this Agreement does not extend the Consideration Period.

8. **Revocation Period**. The Executive acknowledges that he has been informed that, after he signs this Agreement, he has the right to revoke his signature for a period of seven days (7) from the date that he signs the Agreement. To be effective, the revocation must be in writing, signed by the Executive, and delivered to Vice President of Human Resources at 501 Canal Boulevard, Point Richmond Technology Center, Richmond, California 94804 before the close of business on the seventh day (7th) day following the date the Executive signs this Agreement. The Executive acknowledges and agrees that the Company has no obligation to comply with the terms of this Agreement until the Revocation Period has expired without revocation, at which time this Agreement will become effective and enforceable.

9. **Nondisparagement**. The Executive agrees that he will not disparage the Company or any of the Released Parties, or their products, services, officers, directors, employees, with any written or oral statement and the Company agrees that it will not disparage the Executive.

10. **Confidentiality**. The Executive consents and agrees that he will not, at any time, disclose the existence of this Agreement, the terms of his severance benefits and/or the alleged facts or circumstances giving rise to any actual or alleged claims to any person, firm, company, association, or entity or the press or media for any reason or purpose whatsoever, other than to his attorney, his immediate family and to his accountant or financial advisor for tax purposes. If the Executive is served with any subpoena, court order, or other legal process seeking disclosure of any such information, the Executive shall promptly send to the Company, within forty-eight (48) hours, via facsimile at (510) 970-_____, such subpoena, court order, or other legal process so that the Company may exercise any applicable legal remedies. The Executive agrees and acknowledges that a violation of this paragraph by the Executive shall be a material breach of this Agreement.

11. **Delivery of Documents**. The Executive represents and warrants that he has not removed any documents, records or other information, including any such documents, records or information that are or were electronically stored, from the premises of the Company. The Executive acknowledges that such documents, records and other information are the exclusive property of the Company or its subsidiaries or affiliates.

12. **Remedies For Breach Of This Agreement**.

(a) Injunctive Relief. In the event of a breach of the provisions of this Agreement, the Executive agrees that any remedy at law for any breach or threatened breach of the provisions of such paragraphs and the covenants set forth therein, will be inadequate and, accordingly, each party hereby stipulates that the other is entitled to obtain injunctive relief for any such breaches or threatened breaches (without the necessity of posting a bond). The injunctive relief provided for in this paragraph is in addition to, and is not in limitation of, any and all other remedies at law or in equity otherwise available to the applicable party.

(b) Remedies Cumulative. The remedies in this paragraph are not exclusive, and the parties shall have the right to pursue any other legal or equitable remedies to enforce the terms of this Agreement.

(c) Governing Law; Consent to Jurisdiction. This Agreement shall be deemed to be a contract made under, and shall be construed in accordance with, the laws of the State of California, without giving effect to conflict of laws principles thereof. All questions concerning the construction, validity, and interpretation of this Agreement shall be governed by and construed in accordance with the domestic laws of the State of California, without giving effect to any choice of law or conflict of law provision that would cause the application of the laws of any jurisdiction other than the State of California. Each of the parties hereby irrevocably and unconditionally consents to submit to the exclusive jurisdiction of the courts of the State of

California or the United States District Court for the Northern District of California for any litigation, proceeding or action arising out of or relating to this Agreement (and agrees not to commence any litigation, proceeding or action relating thereto except in such courts). Each of the parties hereby irrevocably and unconditionally waives any objection to the laying of venue of any litigation, proceeding or action arising out of this Agreement or thereby in the courts of the State of California or the United States District Court for the Northern District of California and hereby further irrevocably and unconditionally waives and agrees not to plead or claim in any such court that any such litigation, proceeding or action brought in any such court has been brought in an inconvenient forum.

13. **Counsel**. The parties hereby acknowledge that they have had the reasonable opportunity to consult with attorneys of their own choice concerning the terms and conditions of this Agreement, that they have read and understand this Agreement, that they are fully aware of the contents of this Agreement and that they enter into this agreement freely and knowingly and with a full understanding of its legal effect.

14. **Entire Agreement**. This is the entire agreement between the Executive and the Company with respect to the subject matter hereof and the Agreement supersedes any previous negotiations, agreements and understandings. The Executive acknowledges that he has not relied on any oral or written representations by the Company (or its counsel) or any of the other Released Parties to induce him to sign this Agreement, other than the terms of this Agreement. No modifications of this Agreement can be made except in writing signed by the Executive and the Company.

15. **Section 409A**. It is the intention of the parties that the provisions of this Agreement comply with the requirements of Section 409A of the Internal Revenue Code ("Section 409A") and the Treasury Regulations thereunder. Accordingly, to the extent there is any ambiguity as to whether one or more provisions of this Agreement would otherwise contravene the applicable requirements or limitations of Section 409A, then those provisions shall be interpreted and applied in a manner that does not result in a violation of the applicable requirements or limitations of Section 409A and the Treasury Regulations thereunder. In no event may the Executive, directly or indirectly, designate the calendar year of a payment.

16. **Severability**. If any provision of this Agreement is held to be illegal, invalid or unenforceable under existing or future laws effective during the term of this Agreement, such provisions shall be fully severable, the Agreement shall be construed and enforced as if such illegal, invalid or unenforceable provision had never comprised a part of this Agreement, and the remaining provisions of this Agreement shall remain in full force and effect and shall not be affected by the illegal, invalid or unenforceable provision or by its severance from this Agreement. Furthermore, in lieu of such illegal, invalid or unenforceable provision, there shall be added automatically as part of this Agreement a provision as similar in terms to such illegal, invalid or unenforceable provision as may be possible and be legal, valid and enforceable.

17. **Ambiguities**. Attorneys for both parties have participated in the negotiation of this Agreement and, thus, it is understood and agreed that the general rule that ambiguities are to be construed against the drafter shall not apply to this Agreement. In the event that any language of this Agreement is found to be ambiguous, each party shall have an opportunity to present evidence as to the actual intent of the parties with respect to any such ambiguous language.

18. **Waiver**. No waiver by any party of any breach of any term or provision of this Agreement shall be a waiver of any preceding, concurrent or succeeding breach of this Agreement or of any other term or provision of this Agreement. No waiver shall be binding on the part of, or on behalf of, any other party entering into this Agreement.

19. **Counterparts**. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, all of which together shall constitute one and the same instrument.

THE SIGNATORIES HAVE CAREFULLY READ THIS ENTIRE AGREEMENT. ITS CONTENTS HAVE BEEN FULLY EXPLAINED TO THEM BY THEIR ATTORNEYS. THE SIGNATORIES FULLY UNDERSTAND THE FINAL AND BINDING EFFECT OF THIS AGREEMENT. THE ONLY PROMISES MADE TO ANY SIGNATORY ABOUT THIS AGREEMENT, AND TO SIGN THIS AGREEMENT, ARE CONTAINED IN THIS AGREEMENT. THE SIGNATORIES ARE SIGNING THIS AGREEMENT VOLUNTARILY.

PLEASE READ CAREFULLY.
THIS SETTLEMENT AGREEMENT AND GENERAL RELEASE INCLUDES A RELEASE OF KNOWN AND UNKNOWN CLAIMS AND OF ANY RIGHTS OR CLAIMS ARISING UNDER THE AGE DISCRIMINATION IN EMPLOYMENT ACT OF 1967

IN WITNESS WHEREOF, the parties have executed this General Settlement and Release Agreement on the dates set forth below.

SANGAMO BIOSCIENCES, INC.:

_____

DATE: _____

EXECUTIVE:

_____

DATE: _____

Exhibit 10.57

NOTE: Portions of this Exhibit are the subject of a Confidential Treatment Request by the Registrant to the Securities and Exchange Commission (the "Commission"). Such portions have been redacted and are marked with a "[***]" in the place of the redacted language. The redacted information has been filed separately with the Commission.

Execution Copy
Confidential

COLLABORATION AND LICENSE AGREEMENT

This Collaboration and License Agreement (this "*Agreement*"), effective as of January 31, 2012 (the "*Effective Date*"), is entered into by and between Sangamo BioSciences, Inc., a company organized under the laws of Delaware and having a place of business at 501 Canal Blvd. Suite A100, Richmond, CA 94804 ("*Sangamo*"), and Shire AG, a company limited by shares organized under the laws of Switzerland, with its registered office at Business Park Terre-Bonne, Batiment A1, Ch. De Terre-Bonne 1, 1262 Eysins, Switzerland ("*Shire*", and each of Shire and Sangamo, a "Party" or collectively the "Parties"), with respect to the following facts:

RECITALS

WHEREAS, Shire is a leading specialty biopharmaceutical company that has technology and expertise in developing and commercializing therapies for human genetic diseases.

WHEREAS, Sangamo has technology and expertise in the development of zinc finger DNA-binding protein/nuclease technology used for diagnostic and therapeutic purposes.

WHEREAS, Sangamo and Shire desire to engage in a collaborative research program to identify products and processes employing Sangamo's zinc finger DNA-binding technology for treating certain diseases caused by particular monogenic defects, which can be advanced into human clinical trials and following regulatory approval, commercialized.

WHEREAS, Sangamo is willing to grant a license of certain of its technology to Shire to clinically develop and commercialize such products and processes, and Shire wishes to obtain such a license on the terms of this Agreement.

NOW THEREFORE, in consideration of the foregoing premises and the mutual covenants set forth below, the Parties agree as follows:

1 DEFINITIONS

For purposes of this Agreement, the terms set forth in this **Article 1** shall have the respective meanings set forth below:

1.1 "*Additional Targets*" shall have the meaning set forth in **Section 2.2**.

1.2 "*Affiliate*" means, with respect to any person or entity, any other person or entity which controls, is controlled by, or is under common control with, such person or entity. For purposes of this Agreement, a person or entity shall be deemed to control an entity if it owns or controls, directly or indirectly, at least fifty percent (50%) of the equity securities of the subject entity entitled to vote in the election of directors (or, in the case of an entity that 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 entity.

1.3 "*Change of Control*" means, with respect to a Party, (a) a merger or consolidation of such Party with a Third Party which results in the voting securities of such Party outstanding immediately prior thereto ceasing to represent at least fifty percent (50%) of the combined voting power 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 to which the subject matter of this Agreement relates.

1.4 "*Clinical Development Plan*" means the description and time-line covering the specific activities to be performed by Shire to develop, after the first IND or CTA filing and up to Market Approval, a particular Shire ZF Product.

1.5 "*CTA*" means a clinical trial application filed with a competent European regulatory authority to support the authorization of a clinical trial on a medicinal product for human use.

1.6 "*Commercially Reasonable Efforts*" means:

(i) in the case of Sangamo, the efforts and resources typically used by biotechnology companies similar in size and scope to Sangamo to perform the obligation at issue;

(ii) in the case of Shire, the efforts and resources typically used by Shire and its Affiliates to perform the obligation at issue;

in each case, which efforts shall not be less than 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 market place, the proprietary position of the products, the regulatory structure involved, the profitability of the applicable products (taking into account payments to Sangamo under this Agreement) and other relevant factors. Commercially Reasonable Efforts requires that the Party: (a) promptly assign responsibility for such obligation to specific employee(s) who are held accountable for progress and monitor such progress on an on-going basis, (b) set and seek to achieve specific and meaningful objectives for carrying out such obligation, and (c) make and implement decisions and allocate resources designed to advance progress with respect to such objectives.

1.7 "*CDA*" shall have the meaning set forth in **Section 1.8**.

1.8 "*Confidential Information*" means all Know-How and other proprietary information (including information about any element of a Party's technology or business) that is disclosed by a Party or its Affiliates or by any of the Party's or its Affiliates' employees or consultants ("the Disclosing Party") to the other Party or its Affiliates or to any of the other Party's or its Affiliates' employees or consultants ("the Receiving Party") except to the extent that the information: (a) as of the date of disclosure is demonstrably known to the Receiving Party, as shown by written documentation, other than by virtue of a prior confidential disclosure by the Disclosing Party, (b) as of the date of disclosure is in, or subsequently enters, the public

domain, through no fault or omission of the Receiving Party or (c) as of the date of disclosure or thereafter is obtained by the Receiving Party from a Third Party free from any obligation of confidentiality to the Disclosing Party. Unless otherwise provided herein, all work product by either Party under this Agreement, including any Joint Technology, is deemed to be Confidential Information of each Party. The terms and conditions of this Agreement shall be considered Confidential Information of each Party. In addition, all confidential Know-How disclosed by either Party pursuant to that certain Confidential Disclosure Agreement between Shire Pharmaceuticals Inc. (an Affiliate of Shire) and its Affiliates and Sangamo dated [***] (the "*CDA*") shall be deemed to be the disclosing Party's Confidential Information hereunder (with the mutual understanding and agreement that any use or disclosure thereof that is authorized under **Article 11** shall not be restricted by, or be deemed a violation of, the CDA).

1.9 "*Control*" or "*Controlled*" means the possession of the ability to grant a license, sublicense or [***] of Patent Rights, Know-How, or other tangible or intangible rights as provided for herein without violating the terms of any agreement or arrangement with any Third Party.

1.10 "*Donor Nucleic Acid*" means, with respect to a ZF Product, a nucleic acid that has been designed to be inserted, or is capable (in the form in existence in such ZF Product) of being inserted, in the location in the genome that is cleaved by the ZF Compound-associated nucleases in such ZF Product.

1.11 "*Earned Royalties*" shall have the meaning set forth in **Section 9.4**.

1.12 "*Excluded Compound*" shall have the meaning set forth in **Subsection 5.2(c)**.

1.13 "*Excluded Target*" means a Target that: (a) during the [***] period after the Effective Date, is an Initial Excluded Target, or (b) commencing [***], (i) is subject to rights granted or intended to be granted to a Third Party pursuant [***] or (ii) is subject to a current and active [***] which Sangamo already has invested in direct expenses for such program at least [***], of which at least [***] is documented expenses for products or services provided by Third Parties. A direct expense pursuant to this **Section 1.13** means an expense that (A) arises only after a [***], (B) is related to work undertaken [***], and (C) is a documented expense for products or services provided by [***] based upon the amount [***] program (which shall be calculated at the [***].

1.14 "*Existing Third Party Licenses*" means the agreements, entered into by Sangamo prior to the Effective Date, including any amendments thereto as of the Effective Date, pursuant to which Sangamo Controls Sangamo Licensed Technology. Such agreements existing as of the Effective Date are listed on **Schedule 1.14**. Notwithstanding the foregoing, Shire understands and acknowledges that the [***] Licenses (and hence are not listed in **Schedule 1.14**), and the licenses granted to Shire under **Subsection 7.1(a)** do not include sublicenses of any licenses received by Sangamo under such agreements.

1.15 "*Existing Third Party Patent Rights*" means Patent Rights licensed to Sangamo under Existing Third Party Licenses.

1.16 "*Extended Research Term*" means any additional period of time added to the Initial Research Term pursuant to **Section 3.9**.

1.17 "*FDA*" means the Food and Drug Administration of the United States, or the successor thereto.

1.18 "*Field*" means: (a) with respect to a Shire ZF Product described in **Subsection 1.73(a)(i) or (ii)** or **Subsection 1.73(b)(i) or (ii)**, [***] (b) with respect to a Shire ZF Product described in [***] that are [***] in connection with any [***] for which [***].

1.19 "*First Commercial Sale*" means, with respect to a particular Shire ZF Product, the first Net Sales in any country of such Shire ZF Product for any indication.

1.20 "*First GLP Tox Studies*" means, with respect to a Shire ZF Product or Shire Target, (1) GLP toxicology studies or (2) animal toxicology study the results of which are intended to be included in an IND or CTA, as designated in the Research Plan by the JSC, in each case (1) and (2) with respect to such Shire ZF Product or of any Shire ZF Product for such Shire Target, respectively.

1.21 "*FTE*" means a full time equivalent scientific person (with B.S., M.S. or Ph.D. level or equivalent degrees), working for a minimum of a total of [***] hours per year of scientific or other work and who is an employee of Sangamo working on the Research Program, or performing work directly related to and in support of, the Research Program, including recording and writing up results, reviewing literature and references, holding scientific discussions, and managing and leading scientific staff to the extent that such management and leading is directed to any work on, directly related to or in support of the Research Program.

1.22 "*FTE Rate*" shall have the meaning set forth in **Subsection 3.6(d)**.

1.23 "*Generic Product*" means, with respect to a particular therapeutic Shire ZF Product in a particular country, a product on the market in such country commercialized by any Third Party that is not a Sublicensee of Shire or its Affiliates and that did not purchase such product in a chain of distribution that included any of Shire or its Affiliates or Sublicensees, that: (i) is approved, under any then-existing laws and regulations in the applicable country pertaining to approval of [***]; (ii) is otherwise recognized as a [***] interchangeable product [***]; (iii) is a [***] approved in such country for, or prescribed by [***], an indication that is [***] (iv) in the case where the [***] is in effect solely on the basis of [***] is any [***] for an indication that is the [***].

1.24 "*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 the successor thereto, or comparable regulatory standards in jurisdictions outside the U.S.

1.25 "*Infringement*" shall have the meaning set forth in **Subsection 10.3(a)**.

1.26 "*IND***"** means an investigational new drug application filed with the FDA for approval to commence Phase I Clinical Trials or any successor to the FDA for equivalent purposes.

1.27 "*Initial Excluded Target*" means the up to [***] provided by Sangamo to Marya Postner prior to the Effective Date and held in escrow by Marya Postner on behalf of Sangamo's outside counsel Cooley LLP (or by another individual designated by Cooley LLP if Marya Postner becomes unavailable or is no longer affiliated with Cooley LLP), which list contains (i) [***] identified by [***] are subject to [***], existing prior [***], provided that the Initial Excluded Targets do not include the following [***], each as defined by Gene ID in the [***]. Shire acknowledges and agrees that in the event of a dispute, including litigation, between Sangamo and Shire with respect to the Initial Excluded Targets or the list held by Cooley LLP, [***] in connection with [***], and Shire shall [***] in connection with such a [***].

1.28 "*Initial Research Term*" means the six (6) year period following the Effective Date.

1.29 "*Initial Targets*" means the four (4) Targets identified on **Schedule 1.29**.

1.30 "*JAMS Rules*" shall have the meaning set forth in **Subsection 3.10(c)(v)**.

1.31 "*Joint Know-How"* means Know-How that is conceived, discovered, invented, created, made or reduced to practice or tangible medium jointly by at least one employee of each of the Parties, their Affiliates, or their Subcontractors during the course of performing activities under this Agreement. For the avoidance of doubt, "Joint Know-How" does not include Patent Rights in the Joint Know-How.

1.32 "*Joint Patent Rights*" means any Patent Rights (i) claiming Joint Know-How and (ii) naming at least one inventor with [***] such Patent Rights to Shire (or a Shire Affiliate) and at least one inventor with [***] such Patent Rights to Sangamo (or a Sangamo Affiliate), with inventorship determined according to U.S. patent laws.

1.33 "*Joint Steering Committee*" or "*JSC*" means the scientific oversight committee comprised of representatives of Shire and Sangamo described in **Article 4**.

1.34 "*Joint Technology*" means the Joint Know-How and the Joint Patent Rights.

1.35 "*Know-How*" means intellectual property, data, results, pre-clinical and clinical protocols and study data, information, materials, compounds, inventions, know-how, formulas, trade secrets, techniques, methods, processes, procedures, and developments; except that "Know-How" does not include Patent Rights in the foregoing.

1.36 "*Major European Country*" means France, Germany, Italy, Spain or the United Kingdom.

1.37 "*Marketing Approval*" means, with respect to a particular country or territory, the approval of a new drug application, biologic license application ("*BLA*"), marketing authorization application ("*MAA*") or similar approval required to sell a ZF Product in such country or territory, including, where required by applicable law, pricing and reimbursement approval and schedule classifications.

1.38 "*Milestone Event*" shall have the meaning set forth in **Section 9.3**.

1.39 "*Milestone Payment*" shall have the meaning set forth in **Section 9.3**.

1.40 "*Necessary to Obtain a License*" shall have the meaning set forth in **Subsection 10.4(b)**.

1.41 "*Net Sales*" means the gross amount invoiced for sales of Shire ZF Product(s), in arm's length sales by Shire or its Affiliates or Sublicensees to Third Parties ("*Gross Sales*"), less:

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

(b) Adjustments, allowances, credits, fees, reimbursements, chargeback payments and rebates (or the equivalent thereof) for the Shire ZF Products granted to group purchasing organisations or other buying groups, managed health care organisations, pharmacy benefit management companies, health maintenance organisations and any other providers of health insurance coverage, health care institutions (including hospitals) or other health care organisations, 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) Reasonable and customary freight, shipping insurance and other transportation expenses, each directly related to the sale of the Shire ZF Products (if actually borne by Shire, its Affiliates or Sublicensees without reimbursement from any Third Party);

(d) Distribution commissions/fees paid or payable to any Third Party providing distribution services to Shire, its Affiliates, or Sublicensees;

(e) 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 Shire ZF Product, in each case to the extent that each such item is actually borne by Shire, its Affiliates, Sublicensees or distributors without reimbursement from any Third Party (but excluding taxes properly assessed or assessable against the income derived by Shire or its Affiliates from such sale);

(f) Actual bad debt expense (but not exceeding [***] of Net Sales); and

(g) Any item substantially similar in character or substance to any of the foregoing, which is permitted by US GAAP prevailing at the time and customary in the pharmaceutical industry at the time.

The transfer of Shire ZF Products by Shire or one of its Affiliates or Sublicensees to another Affiliate or Sublicensee shall not be considered Net Sales.

For the avoidance of doubt, disposal or use of Shire ZF Products in clinical trials, as free samples, or under compassionate use, patient assistance, named patient or test marketing programs or non-registrational studies or other similar programs or studies where the Shire ZF Product is supplied without charge, shall not be considered Net Sales or result in any Net Sales

under this **Section 1.41**. Nor shall any Shire ZF Products donated by a Party, its Affiliates or Sublicensees, to non-profit institutions or government agencies for a non-commercial purpose, result in any Net Sales. Similarly, any free Shire ZF Products which are supplied to a Third Party in conjunction with the offer for sale, or sale of any Shire ZF Product (in an amount customary in the industry), will not result in any Net Sales of such free goods. The use of a Shire ZF Product by a Party, its Affiliates or Sublicensees for research and development purposes shall not result in any Net Sales. For clarity, there shall be no limit on the quantity of Shire ZF Products which may be used in clinical trials. Such amounts shall be determined from the books and records of Shire maintained in accordance with US GAAP, consistently applied.

In the event any Shire ZF Product is sold as part of a combination product (being a product containing both a Shire ZF Product and one or more other active ingredients, or a product in which both a Shire ZF Product and one or more other active ingredients are packaged, in each case where such other active ingredients are not part of or used to implement any zinc finger technology (e.g., vectors for delivering ZF Compounds or Donor Nucleic Acids whose insertion is accomplished in part using ZF Compounds are not considered other active ingredients)), the Net Sales from the combination product, for the purposes of determining royalty payments, shall be determined by multiplying the Net Sales of the combination product (as defined in the standard Net Sales definition), during the applicable royalty reporting period, by the fraction, A/(A+B), where A is the average per unit sale price of Shire ZF Product when sold separately as a stand-alone ZF Product in finished form in the country in which the combination product is sold and B is the average per unit sale price of the other active ingredients contained in the combination product when sold separately as stand-alone products in finished form in the country in which the combination product is sold, in each case during the applicable royalty reporting period or, if sales of stand-alone Shire ZF Product did not occur in such period, then in the most recent royalty reporting period in which arms-length fair market sales of such Shire ZF Product, as applicable, occurred. In the event that such average sale price cannot be determined for the stand alone Shire ZF Products or the other products, Net Sales for the purposes of determining royalty payments shall be mutually agreed upon by the Parties based on the relative value contributed by each component, such agreement not to be unreasonably withheld, conditioned or delayed.

1.42 "*New Third Party Patent Rights*" means Patent Rights licensed to Sangamo under Third Party Licenses entered into by Sangamo pursuant to **Subsection 10.4(c)** or **Subsection 10.4(e)**.

1.43 "*Party*" and "*Parties*" shall have the meaning set forth in the first paragraph of this Agreement.

1.44 "*Patent Rights*" means issued patents and pending patent applications in any country or region, including all provisional, non-provisionals, substitutions, continuations, continuations-in-part, divisionals, renewals and all patents granted thereon, and all reissues, reexaminations, extensions, confirmations, revalidations, registrations and patents of addition thereof, including supplementary protection certificates.

1.45 "*Phase I Clinical Trial*" means a human clinical trial of a Shire ZF Product in human subjects according to 21 C.F.R. §312.21(a), as amended, or its equivalent, as appropriate, in foreign jurisdictions.

1.46 "*Phase II Clinical Trial*" means a human clinical trial of a Shire ZF Product according to 21 C.F.R. §312.21(b), as amended, or its equivalent, as appropriate, in foreign jurisdictions.

1.47 "*Phase III Clinical Trial*" means a human clinical trial of a Shire ZF Product intended to be a pivotal trial for obtaining Marketing Approval, or according to 21 C.F.R. §312.21(c), as amended, or its equivalent, as appropriate, in foreign jurisdictions.

1.48 "*Replacement Target*" shall have the meaning set forth in **Section 2.3**.

1.49 "*Research Plan*" means, with respect to each Shire Target, the description, time-line and budget covering the specific activities to be performed by Sangamo during the Research Term to identify ZF Compound(s) that Specifically Bind such Shire Target or a [***] and to develop pre-clinically Shire ZF Product(s) for such Shire Target. For the avoidance of doubt, pre-clinical development respecting a particular Shire ZF Product may extend beyond IND/CTA filing.

1.50 "*Research Program*" means the research collaboration between the Parties, under the direction and oversight of the JSC, aimed at identifying ZF Compounds that Specifically Bind a Shire Target or a [***] and developing through IND/CTA filings Shire ZF Products for Shire Targets and shall include all activities of the Parties in the performance of any and all Research Plans during the Research Term.

1.51 "*Research Term*" means the Initial Research Term plus any Extended Research Term.

1.52 "*Royalty Payment*" shall have the meaning set forth in **Subsection 10.4(c)**.

1.53 "*Royalty Period*" means, with respect to each different Shire ZF Product, the period commencing on the First Commercial Sale of such Shire ZF Product in any country and continuing until the longer of: (i) [***] such First Commercial Sale of such Shire ZF Product; (ii) on a country by country basis, the [***]; and (iii) on a country by country basis, the expiration of all [***] which, but for the licenses granted or assignments made herein, would be [***] by, in each case, the [***]. Only for the purposes of this **Section 1.53,** a [***] when the [***]. For the avoidance of doubt, changes to [***]. Only for the purposes of making the determination under **Subsection 1.53(iii),** [***] as though they are [***] that are pending and that have an [***].

1.54 "[***]" means a [***].

1.55 "*Sangamo Know-How*" means any Know-How Controlled by Sangamo as of the Effective Date or that comes into the Control of Sangamo after the Effective Date and during the term of this Agreement (other than through the grant of a license by Shire or its Affiliates or Sublicensees hereunder) that is (a) necessary to practice the licenses granted herein, (b) utilized by Sangamo pursuant to the Research Program or pursuant to activities conducted pursuant to

Subsection 5.2(c) in making a Shire ZF Compound, [***] or Shire ZF Product, or (c) part of, used to implement, or directly related to zinc finger technology and useful to practice the licenses granted herein. For the avoidance of doubt, the Sangamo Know-How does not include any Patent Rights. Notwithstanding anything in this Agreement to the contrary, in the event of a Change of Control of Sangamo, the Sangamo Know-How shall not include any Know-How that is (i) owned or controlled by a Third Party described in the definition of "Change of Control" prior to the closing of such Change of Control, (ii) developed after such Change of Control without the use of the Sangamo Know-How in existence prior to the closing of such Change of Control, or (iii) developed after such Change of Control and not directly related to zinc finger technology. Notwithstanding the foregoing, Sangamo Know-How shall not include any Know-How licensed to Sangamo or its Affiliates by a Third Party unless (A) such Know-How can be sublicensed by Sangamo to Shire free of any financial or other material obligation owing to the Third Party as a result of such sublicense to Shire or (B) such Know-How is licensed pursuant to a Third Party License.

1.56 "*Sangamo Licensed Technology*" means all Sangamo Know-How, Sangamo Patent Rights and Sangamo's interest in the Joint Technology, and any Third Party intellectual property that is included as Sangamo Licensed Technology pursuant to **Section 10.4.** For the avoidance of doubt, Sangamo Licensed Technology shall not include [***].

1.57 "*Sangamo Patent Rights*" means Patent Rights Controlled by Sangamo as of the Effective Date or that come into the Control of Sangamo after the Effective Date and during the term of this Agreement (other than through the grant of a license by Shire hereunder) that are (a) necessary to practice the licenses granted herein or (b) part of, used to implement, or directly related to zinc finger technology and useful to practice the licenses granted herein. The Sangamo Patent Rights existing as of the Effective Date are set forth on **Schedule 1.57** (it being understood that any Sangamo Patent Right existing as of the Effective Date that is not set forth on such schedule shall, notwithstanding such omission, still be a Sangamo Patent Right to the extent otherwise provided in this **Section 1.57**). Notwithstanding anything in this Agreement to the contrary, in the event of a Change of Control of Sangamo, the Sangamo Patent Rights shall not include any Patent Rights owned or controlled by a Third Party described in the definition of "Change of Control" and (1) existing prior to the closing of such Change of Control, (2) existing after the closing of such Change of Control and claiming inventions made prior to the closing of such Change of Control, (3) claiming only inventions made after such Change of Control without the use of the Sangamo Know-How in existence prior to the closing of such Change of Control, or (4) claiming only inventions made after such Change of Control and not directly related to zinc finger technology. Notwithstanding the foregoing, Sangamo Patent Rights shall include Existing Third Party Patent Rights and New Third Party Patent Rights but shall not include (i) any other Patent Rights licensed to Sangamo or its Affiliates by a Third Party unless such Patent Rights can be licensed by Sangamo to Shire free of any financial or other material obligation owing to the Third Party as a result of such sublicense to Shire and (ii) the [***] that have been [***] to Shire pursuant to **Subsection 10.1(b)**.

1.58 "[***]" shall have the meaning provided in **Subsection 3.4(c)**.

1.59 "[***]" means the Shire Target Specific [***] Patent Rights and the [***].

1.60 "*Shire Exclusive Target Pool*" means the group of Shire Targets that constitutes the exclusive target pool for the Research Program. The Shire Exclusive Target Pool existing as of the Effective Date consists of the Initial Targets, as set forth on **Schedule 1.29**. For the avoidance of doubt, the Shire Targets in the Shire Exclusive Target Pool are licensed exclusively to Shire as set forth in **Subsection 7.1(a)**, unless a Shire Target becomes a Terminated Target.

1.61 "*Shire Patent Rights*" means Patent Rights Controlled by Shire or its Affiliates as of the Effective Date or that come into the Control of Shire or its Affiliates after the Effective Date and during the term of this Agreement (other than through the [***] or grant of a license by Sangamo hereunder) that are necessary or useful to practice under the licenses granted herein.

1.62 "[***]*"* means any [***] that:

i) contains [***],

ii) does not contain any [***] (a) any [***] (b) the manufacture or use of such [***],

iii) Sangamo reasonably determines, after consultation with Shire, that such Patent Right will not be subject to [***],

iv) Shire agrees in writing to accept such assignment.

1.63 "[***]" means [***] (b) [***] **Subsection 3.4(c)**.

1.64 "[***] *Patent Rights*" means, with respect to a particular [***] that includes limitations to (a) a [***] (b) [***].

1.65 "[***]" means any [***] **Subsection 1.73(b)**.

1.66 "[***]" means any [***].

1.67 "*Shire Target*" means an Initial Target or any other Target made part of the Shire Exclusive Target Pool pursuant to **Section 2.2 or 2.3**; provided, however, that a Target shall cease to be a Shire Target when it becomes a Terminated Target.

1.68 "*Shire Target Specific Assigned Patent Rights*" means the Shire Target Specific ZF Compound Patent Rights and the Shire Target Specific ZF Product Patent Rights.

1.69 "*Shire Target Specific ZF Compound Patent Rights*" means any Patent Right that contains only claims limited to Shire ZF Compounds. For the purposes of this **Section 1.69**, a "claim limited to Shire ZF Compounds" means a claim that (i) includes language that specifically describes one or more ZF Compounds that Specifically Bind a particular Shire Target, (ii) if presumed to be issued, would not be infringed by a ZF Compound (or the manufacture or use of a ZF Compound) that Specifically Binds a locus other than such Shire Target, if such ZF Compound were combined with the non-ZF Compound elements in such claim, (iii) does not include language that specifically describes a product (or the manufacture or use of such product) that is not a Shire Target Specific Product, and (iv) does not include

language describing any product (other than a Shire ZF Compound) or process that is Know-How, whether patentable or not, conceived, discovered, invented, created, made or reduced to practice or tangible medium, whether solely or jointly, by one or more employees, agents or contractors of Sangamo, if such Know-How is being protected as a trade secret by Sangamo, is the subject of a claim in a Patent Right controlled by Sangamo, or is sufficiently disclosed in a Patent Right controlled by Sangamo to support a claim to such Know-How in such Patent Right under 35 U.S.C § 112 (first paragraph), unless Sangamo consents in writing to the inclusion of such Know-How.

1.70 "*Shire Target Specific ZF Product Patent Rights*" means any Patent Right that contains only claims limited to Shire Target Specific Products. For the purposes of this **Section 1.70**, a "claim limited to Shire Target Specific Products" means a claim that (i) includes language that specifically describes one or more Shire Target Specific Products, (ii) if presumed to be issued, would not be infringed by a product (or the manufacture or use of such product) that is not a Shire Target Specific Product, (iii) does not include language that specifically describes a product (or the manufacture or use of such product) that is not a Shire Target Specific Product, and (iv) does not include language describing any product (other than a Shire ZF Compound) or process that is Know-How, whether patentable or not, conceived, discovered, invented, created, made or reduced to practice or tangible medium, whether solely or jointly, by one or more employees, agents or contractors of Sangamo, if such Know-How is being protected as a trade secret by Sangamo, is the subject of a claim in a Patent Right controlled by Sangamo, or is sufficiently disclosed in a Patent Right controlled by Sangamo to support a claim to such Know-How in such Patent Right under 35 U.S.C § 112 (first paragraph), unless Sangamo consents in writing to the inclusion of such Know-How.

1.71 "*Shire Unilateral Target Termination"* shall have the meaning provided in **Subsection 3.10(a)**.

1.72 "*Shire ZF Compound*" means any ZF Compound that Specifically Binds a particular Shire Target, as shown pursuant to the Research Program or pursuant to activities conducted pursuant to **Subsection 5.2(c)**. For the avoidance of doubt, any ZF Compound that was formerly a Shire ZF Compound and that Specifically Binds a Terminated Target shall no longer be a Shire ZF Compound.

1.73 "*Shire ZF Product*" means, with respect to a Shire Target:

(a) a "Shire Target Specific Product", meaning:

(i) a pharmaceutical product or medical therapy for deleting, inactivating, repairing, modulating the expression of, or inserting a functional version of, such Shire Target but not any other Target or locus, which product or therapy (1) contains or employs at least one Shire ZF Compound which Specifically Binds such Shire Target and (2) does not contain or employ (A) any ZF Compound that Specifically Binds a Target or other chromosomal location that is not such Shire Target or within such Shire Target, or (B) any Donor Nucleic Acid that encodes a protein (including a functional portion of a larger protein) that is neither a protein encoded by such Shire Target nor a functional version of the protein encoded by such Shire Target;

(ii) a pharmaceutical product or medical therapy that contains or employs a human cell or tissue made using a product or therapy described in (a)(i); or

(iii) a diagnostic product or service for detecting the sequence or allele of such Shire Target, which product or service (1) contains or employs one or more Shire ZF Compounds each of which Specifically Binds such Shire Target and (2) does not contain or employ (A) any ZF Compound that Specifically Binds a Target or other chromosomal location that is not such Shire Target or within such Shire Target, or (B) any Donor Nucleic Acid that encodes a protein (including a functional portion of a larger protein) that is neither a protein encoded by such Shire Target nor a functional version of the protein encoded by such Shire Target; or

(b) a "[***]", meaning:

(i) a pharmaceutical product or medical therapy for [***] contains or employs (A) at least [***] is included in the [***] is developed and shown to [***], and (B) a [***] that encodes a [***] and (2) does not contain or employ (A) any [***] or (B) any [***] that is not a protein encoded [***]; or

(ii) a pharmaceutical product or medical therapy that contains or employs [***].

1.74 "*Specifically Bind*" means, with respect to a ZF Compound and Target or locus, that such ZF Compound preferentially binds such Target or locus without known off-Target or off-locus binding that is preclinically or clinically significant.

1.75 "*Subcontractor*" shall have the meaning set forth in **Subsection 3.4(b)**.

1.76 *"Sublicensee*" means an Affiliate or Third Party to whom Shire (or a Sublicensee or Affiliate) has granted a right to make, use, develop, sell, offer for sale or import a Shire ZF Product.

1.77 "*Target*" means a human gene, including all naturally occurring mutants or allelic variants of such gene, which contributes to a human disease or medical condition when the gene or the protein encoded by such gene is defective, including regions within such gene [***] regions [***] provided that such [***] are not in [***] and that the [***] does not affect the expression of [***].

1.78 "*Term*" shall have the meaning provided in **Section 14.1**.

1.79 "*Terminated Products*" shall have the meaning set forth in **Subsection 14.5(a)(v)**.

1.80 "*Terminated Target*" means a former Shire Target that was terminated by the JSC, terminated by Shire under **Section 3.10**, or terminated under **Article 14**.

1.81 *"Territory"* means the entire world.

1.82 "*Third Party*" means any person or entity other than Sangamo and Shire (and their respective Affiliates).

1.83 "*Third Party IP Rights*" shall have the meaning set forth in **Subsection 10.4(b)**.

1.84 "*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 **Subsection 10.4(c)** or **Subsection 10.4(e).**

1.85 "*Triggering Event*" has the meaning set forth in the letter agreement between the Parties of even date herewith.

1.86 "*Valid Claim*" means a claim of any issued, unexpired patent within the Sangamo Patent Rights, [***] or Joint Patent Rights that has not been dedicated to the public, disclaimed, abandoned or held invalid or unenforceable by a court or other body of competent jurisdiction in an unappealed or unappealable decision and a claim of any patent application within the Sangamo Patent Rights, [***] or Joint Patent Rights to the extent that the effective priority date for such claim is less than five years.

1.87 "*Value Added Tax (VAT)*" means tax applicable under Council Directive 2006/112/EC or any similar or equivalent indirect tax system operated outside of the European Union and any sales, purchase or turnover tax in any applicable jurisdiction.

1.88 "*Vector Rights*" means Third Party IP Rights that cover a delivery vector used to introduce a Shire ZF Product into a cell. Potential delivery vectors include, but are not limited to, viral vectors [***] and non-viral vectors [***].

1.89 "*ZF Compound*" means any zinc finger nucleic acid binding protein and any nucleic acid that encodes such protein.

1.90 "*ZF Product*" means any therapeutic or diagnostic product containing a ZF Compound.

2 OVERVIEW

2.1 Collaboration. Shire and Sangamo shall collaborate for the purpose of identifying and developing pre-clinically Shire ZF Products for Shire to advance through human clinical trials and bring to patients as commercial therapeutics and diagnostics in the applicable Fields, by performing the activities of the Research Program, which activities are outlined in **Article 3**. The Research Program will focus on Shire Targets, unless any such Shire Target is terminated as provided in **Section 3.10** or **Article 14**. This Agreement shall be understood to be a joint research agreement under 35 U.S.C. § 103(c)(3) entered into for the purpose of researching, identifying and developing Shire ZF Products. For the avoidance of doubt, the Research Program will continue during the Research Term until the completion of all activities under the Research Plans, unless the Agreement is terminated in its entirety as provided in **Article 14**.

2.2 Shire Target Selection. The Initial Targets are included in the Shire Exclusive Target Pool as of the Effective Date. Shire shall have the right to designate three additional Targets ("*Additional Targets*") for inclusion as Shire Targets in the Shire Exclusive Target Pool as provided below in this **Section 2.2**, provided that each of the Additional Targets is not ineligible as a Section 2.2 Rejected Target and is not a gene that is related to the cause or treatment of any of the following: [***]. Unless otherwise agreed to by the Parties in writing, Shire shall be entitled to have up to seven active Shire Targets in the Research Program and the Shire Exclusive Target Pool at any one time during the Research Term. The Additional Targets are included as Shire Targets in the Shire Exclusive Target Pool according to the following procedure:

(a) Within the [***] period immediately following the Effective Date (the "*Additional Target Period*"), Shire shall identify in writing to Sangamo at least four (4) and up to twelve (12) proposed Additional Targets and shall include in such notice, for each such proposed Additional Target, (i) the nucleic acid sequence and locus identification number of the wild-type allele (as obtained from a mutually agreed publicly available database), (ii) the cell(s) in which the protein encoded by such proposed Additional Target is normally expressed, (iii) whether the product or therapy of interest to Shire for such proposed Additional Target would be designed to delete, inactivate, repair, modulate the expression of or insert a functional version of such proposed Additional Target, and (iv) the particular mutation(s) of interest. Shire may identify such proposed Additional Targets at any time during the Additional Target Period and shall not be required to identify all such proposed Additional Targets at one time.

(b) Within [***] (or sooner if practical) of receipt by Sangamo of the identity of, and the required information described in (a) for, each such proposed Additional Target, Sangamo shall notify Shire whether the Target is an Excluded Target. (Prior to [***], if such proposed Additional Target is an Initial Excluded Target, and during the six (6)-month period after the Effective Date, if such proposed Additional Target is a Target in clause (i) of the definition of Initial Excluded Target but is not an Excluded Target in clause (b) of the definition of Excluded Target, such notification shall include a confirmation in writing by Marya Postner (or other Cooley LLP designee) that the Target is on the list of Initial Excluded Targets held in escrow by Cooley LLP.) Following such notification, Sangamo shall conduct initial *in silico* feasibility studies for each such proposed Additional Target that is not an Excluded Target, during which conduct the Parties shall discuss the results of such studies and potential approaches to address any issues or concerns arising from such studies. Within thirty (30) days of receipt by Sangamo of the information described in (a) for each proposed Additional Target, Sangamo shall notify Shire in writing whether or not each such proposed Additional Target: (i) is not a technically viable candidate for developing ZF Compounds that Specifically Bind such proposed Additional Target for the type of product or therapy identified pursuant to **Subsection 2.2(a)(iii)** or for developing [***] for such proposed Additional Target, or (ii) is subject to any other substantial, bona fide concern known to Sangamo with respect to developing a Shire ZF Product for such proposed Target. Such notification under **Subsection 2.2(b)(i) or (ii)** shall include an explanation of the reasons why the Target is not a technically viable candidate and/or Sangamo's other substantial bona fide concern.

(c) If Sangamo notifies Shire that a proposed Additional Target is rejected because (i) under **Subsection 2.2(b)** the proposed Additional Target is an Excluded Target or (ii)

under **Subsection 2.2(b)(i)** the proposed Additional Target is subject to any such conditions (a "***Section 2.2** Rejected Target*"), then such **Section 2.2** Rejected Target shall not be included as a Shire Target in the Shire Exclusive Target Pool.

(d) If any such proposed Additional Target is not a **Section 2.2** Rejected Target, then Shire shall have [***] from receipt of notice from Sangamo under the penultimate sentence of **Subsection 2.2(b)** to conduct a review and evaluation of all relevant intellectual property and any concerns raised under **Subsection 2.2(b)(ii)** relating to each such proposed Additional Target and the Parties shall discuss the same; *provided*, that Shire shall be solely responsible for all intellectual property assessments concerning each such Target. During such [***] review period, the Parties, each at its own expense, shall collaborate to develop, and shall develop, a Research Plan for each such proposed Additional Target.

(e) Prior to the end of the review period set forth in **Subsection 2.2(d)**, Shire shall, in its sole discretion, determine whether to designate each such Target as a Shire Target, provided that Shire shall designate no more than (3) proposed Additional Targets as Shire Targets in the Shire Exclusive Target Pool, which Shire Exclusive Target Pool shall not exceed a total of seven (7) Shire Targets, and shall notify Sangamo of such determination.

(f) If Shire does not elect in **Subsection 2.2(e)** to designate a proposed Target as a Shire Target in the Shire Exclusive Target Pool by the end of the applicable [***] period, such proposed Target shall not be included in the Shire Exclusive Target Pool and neither Party shall have any rights or obligations to the other Party hereunder in respect of such Target, except as required pursuant to **Article 11**.

(g) If Shire elects under **Subsection 2.2(e)** to include a proposed Additional Target as a Shire Target in the Shire Exclusive Target Pool, then such Additional Target shall be included in the Shire Exclusive Target Pool.

(h) If at the end of the review period set forth in **Subsection 2.2(d)**, fewer than three (3) proposed Additional Targets are added to the Shire Exclusive Target Pool for any reason, then during the [***] following the Effective Date, Shire may propose Additional Targets for inclusion in the Shire Exclusive Target Pool. Upon identifying to Sangamo such proposed Additional Target(s) and providing the information described in **Subsection 2.2(a)** for each such proposed Additional Target, the procedures outlined in **Subsections 2.2(b)-(g)** shall be followed.

(i) If the Triggering Event occurs and Shire provides notice of [***] with respect to the [***], then Shire shall be entitled to [***], provided that (i) the total number of Shire Targets [***] and (ii) [***] shall be included in the [***] identifying to Sangamo up to four (4) proposed Additional Targets and providing Sangamo with the information described in subsection (a) above and the Parties following the procedures set forth in subsections (b) through (g) above.

2.3 Replacement Targets. If the JSC determines during the Research Term that any Shire Target in the Shire Exclusive Target Pool fails to meet the criteria established in the applicable Research Plan for continuing work on such Shire Target under such Research Plan,

such Target shall be deemed a Terminated Target to which **Sections 3.10 and 14.5** apply, and Shire shall be entitled to replace only one such Terminated Shire Target with a single replacement Target ("*Replacement Target*") for inclusion in the Shire Exclusive Target Pool. The Replacement Target is included in the Shire Exclusive Target Pool subject to the following procedure:

(a) If the JSC determines during the Research Term that one (1) or more Shire Targets failed to meet the criteria established in the Research Plans for such Shire Target(s), Shire shall have the right to notify Sangamo in writing during the Research Term that Shire proposes to designate a Target as a Replacement Target. Such notice shall identify up to four (4) proposed Replacement Targets from which a single Replacement Target will be selected and shall include, for each such proposed Replacement Target, (i) the nucleic acid sequence and locus identification number of the wild-type allele (as obtained from a mutually agreed publicly available database), (ii) the cell(s) in which the protein encoded by such proposed Replacement Target is normally expressed, (iii) whether the product or therapy of interest to Shire for such proposed Replacement Target would be designed to delete, inactivate, repair, modulate the expression of or insert a functional version of such proposed Replacement Target, and (iv) the particular mutation(s) of interest.

(b) Within [***] (or sooner if practical) of receipt by Sangamo of the identity of, and the required information described in (a) for, each such proposed Replacement Target, Sangamo shall notify Shire whether the proposed Replacement Target is an Excluded Target. Following such notification, Sangamo shall conduct initial *in silico* feasibility studies for each such proposed Replacement Target that is not an Excluded Target, during which conduct the Parties shall discuss the results of such studies and potential approaches to address any issues or concerns arising from such studies. Within thirty (30) days of receipt by Sangamo of the information described in (a) for each proposed Replacement Target, Sangamo shall notify Shire in writing whether or not each such proposed Replacement Target: (i) is not a technically viable candidate for developing ZF Compounds that Specifically Bind such proposed Replacement Target for the type of product or therapy identified pursuant to **Subsection 2.3(a)(iii)** or for developing [***] for such proposed Replacement Target; or (ii) is subject to any other substantial, bona fide concern known to Sangamo with respect to the technical feasibility of developing a Shire ZF Product for such proposed Replacement Target. Such notification under **Subsection 2.3(b)(i) or (ii)** shall include an explanation of the reasons why the Target is not a technically viable candidate and/or Sangamo's other substantial bona fide concern.

(c) If Sangamo notifies Shire that a proposed Replacement Target [***] such [***] Rejected Target shall not be [***]. Shire shall have the right [***].

(d) If any such proposed Target is not a Section 2.3 Rejected Target, then Shire shall have an [***] from delivery of the notice by Sangamo under the penultimate sentence of **Section 2.3(b)** to conduct a review and evaluation of all relevant intellectual property and any concerns raised under **Subsection 2.3(b)(ii)** relating to each such proposed Replacement Target and the Parties shall [***] *provided*, that Shire shall be [***]. During such [***] review period, the Parties [***].

(e) Prior to the end of the review period set forth in **Subsection 2.3(d)**, Shire shall, [***] and shall [***].

(f) If Shire does not elect [***], such proposed [***] shall not [***], except as required pursuant [***].

(g) If Shire elects under **Subsection 2.3(e)** to include a proposed Replacement Target in the Shire Exclusive Target Pool, such Replacement Target shall be included in the Shire Exclusive Target Pool, and within 60 days of such election, (i) Shire shall pay Sangamo [***], which payment shall be non-refundable and non-creditable, and (ii) the JSC shall direct the Parties to initiate work under the Research Plan for such Replacement Target.

(h) If the Triggering Event occurs and Shire provides notice of a Shire Unilateral Target Termination pursuant to**Subsection 2.2(i)** and **Section 3.10** with respect to the [***] (i) [***] and (ii) if the JSC determines during the Research Term that a [***], then Shire shall have the right to [***]. Such [***] shall be [***] by following the procedures set forth in subsections (a) through (g) above, and the payment set forth in **Subsection 2.3(g)** shall be due [***].

3 RESEARCH PROGRAM; RESEARCH TERM

3.1 Sangamo Responsibilities. During the Research Term and subject to the oversight of the JSC, Sangamo shall be solely responsible for carrying out the tasks allocated to Sangamo in each Research Plan, which shall be developed and approved by the JSC. Subject to **Section 3.6**, Sangamo shall use Commercially Reasonable Efforts in the performance of its obligations under the Research Program and the applicable Research Plans during the Research Term.

3.2 Shire Responsibilities. During the Research Term, Shire shall be solely responsible for the costs set forth in the budgets for the Research Plans, which budgets shall be developed and approved by the JSC. Upon request by Sangamo, Shire shall provide reasonable consulting and technical support in order to assist Sangamo in carrying out its Research Program obligations. For the avoidance of doubt, the JSC shall have the right to prioritize Shire Targets within the Research Program and make final decisions as to whether and when to proceed with particular activities under the Research Program, provided that, during the Research Term, for so long as there are [***] in the Shire Exclusive Target Pool, Shire shall be required to fund the budget for a [***] Research Plans, each of which will attempt, where commercially and scientifically reasonable, to achieve an IND or CTA filing for a Shire ZF Product within [***] after the initiation of activities under such Research Plan.

3.3 Research Plans. Research Plans shall be developed and approved by the JSC. Each Shire Target shall be the subject of a separate Research Plan, which shall be reviewed and updated as necessary, but at least quarterly, by the JSC. Each Research Plan will define events leading to and including submission of either an IND or a CTA for at least one Shire ZF Product for the applicable Shire Target and will include (a) a description of the process for identifying and the criteria for selecting ZF Compounds to be used with Shire ZF Products (which description shall not include any Know-How Controlled by Sangamo with respect to the design

of ZF Compounds), (b) a description of the Shire ZF Product to be researched and preclinically developed under such Research Plan, including lead and back-up ZF Compounds and Shire ZF Products, (c) the proposed indication for the applicable Shire Target, (d) a description of the companion diagnostic Shire ZF Product, if any, that will be developed under such Research Plan for use with the therapeutic Shire ZF Product developed under such Research Plan, (e) a listing of the specific components that each potential Shire ZF Product will contain, (f) a description of the specific activities to be performed by Sangamo, including the pre-clinical work necessary to file an IND/CTA and to support the related clinical trials through BLA/MAA submission, and for each animal toxicology study, a designation of whether such study will be GLP compliant and whether the results of such study are intended to be included in an IND/CTA, (g) projected timelines for completion of such activities, (h) a budget, (i) particular decision points and associated criteria, including decisions as to whether to terminate the applicable Shire Target, whereby expenditures will not be undertaken for subsequent activities unless and until such criteria have been met as determined by the JSC, and (j) a plan for technology transfer from Sangamo to Shire with respect to Shire ZF Products. At the appropriate time, as determined by the JSC, each Research Plan also will provide the details of and budget for the manufacture and supply of Shire ZF Products. In addition, each Research Plan shall identify a Sangamo project leader, reasonably acceptable to Shire, which project leader shall devote no less than [***] of his/her time to carrying out the Research Plan during the active conduct of such Research Plan. Each Research Plan shall be consistent with the terms of this Agreement and shall be appended to and form a part of this Agreement. In the event of an inconsistency between the Research Plan and this Agreement, the terms of this Agreement will prevail. The Research Plans as of the Effective Date, which may be subsequently modified by the JSC in accordance with this **Section 3.3**, for [***] of the Initial Targets are set forth in **Schedule 3.3**.

3.4 Conduct.

(a) The Parties will form a working team for each Research Plan comprising at least the project leader for the Research Plan (who will be a Sangamo employee) and one or more representative(s) from each of Shire and Sangamo, which team will stay in active communication about activities taking place and information arising under the respective Research Plan. This team shall be subordinate to the JSC and shall confer regularly, and at such specific times as the JSC shall reasonably request, to ensure close cooperation and exchange of information between the Parties as Sangamo fulfills its responsibilities under the Research Program. The working teams will have decision-making authority, by unanimous agreement, solely in order to carry out the day to day implementation of a Research Plan but will not have the authority to alter a Research Plan.

(b) In performing its activities under the Research Plan and this Agreement, Sangamo shall, and shall require its Affiliates and any consultant, subcontractor, or other vendor conducting Sangamo's obligations under a Research Plan (each, a "*Subcontractor*") to, comply with all applicable laws, regulations and guidelines concerning such manufacturing and development activities, including where appropriate in accordance with current Good Manufacturing Practices and GLP (or similar standards) for the performance of laboratory activities as are required by applicable law. For the avoidance of doubt, during the period prior to Sangamo's transfer of information and materials to Shire pursuant to **Subsection 5.2(b)(ii)(B)** or **4.6(w)(A**) with respect to a Research Plan, Sangamo shall, and shall require its Affiliates and any Subcontractor to, maintain such information and materials as required by law in connection with any IND or CTA anticipated to be filed under such Research Plan.

(c) As of the Effective Date, the only [***]. In the course of developing and updating a Research Plan or conducting the Research Program, either Party may propose [***] Sangamo shall reasonably consider [***]. Upon the Parties' written agreement that [***] and the relevant Research Plan(s) will be [***], if Sangamo is developing a [***], or if the JSC is developing a Research Plan that [***], Sangamo shall [***]. As used in this **Subsection 3.4(c)**, "[***]" means a locus (A) that is not [***], (B) to which [***], and (c) to which Sangamo has the right [***].

(d) Sangamo will provide to Shire a copy of all substantive written correspondence from any regulatory authority involving an IND/CTA regulatory submission for a Shire ZF Product, notify Shire of all oral substantive communications from any regulatory authority involving a regulatory submission for a Shire ZF Product and provide Shire with an advance draft of each proposed regulatory submission for a Shire ZF Product sufficiently in advance of providing the submission to the regulatory authority (and no less than ten (10) days in advance, where possible) to enable Shire to have a meaningful opportunity to provide input on the content of such submission. To the extent permitted by applicable laws and regulations, Sangamo shall permit Shire to[***]. For the avoidance of doubt, IND/CTA regulatory submissions by Sangamo respecting Shire ZF Products are subject to the oversight and approval of the JSC.

(e) Sangamo shall [***] be the owner of any IND/CTA filing for a Shire ZF Product. Following acceptance of the IND/CTA by a regulatory authority, Sangamo shall [***].

(f) To facilitate the conduct of the Research Program, or otherwise pursuant to **Section 5.2(c)**, either Party may provide to the other Party certain biological materials or chemical compounds owned by or licensed to the supplying Party for use by the other Party (such materials or compounds and any progeny and derivatives thereof, collectively, "*Materials*"). All such Materials shall remain the sole property of the supplying Party, shall be used only in the fulfillment of obligations or exercise of rights under this Agreement and solely under the control of the receiving Party, shall not be used or delivered to or for the benefit of any Third Party without the prior written consent of the supplying Party, and shall not be used in research or testing involving human subjects, unless expressly agreed. The Materials supplied under this **Subsection 3.4(f)** 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.

3.5 Subcontractors. Sangamo may engage any Subcontractor to perform any work under the Research Program; *provided* that all such engagements and any contracts related to such engagements are subject to prior approval by the JSC. Such contracts shall include provisions, including intellectual property provisions, adequate for Shire to enjoy the licenses granted hereunder as though Sangamo had performed the contracted work. To facilitate approval by the JSC, Sangamo shall identify each Subcontractor, the activities proposed to be performed by such Subcontractor and the budget for such activities. The JSC in its discretion may request a copy of the proposed contract with the Subcontractor prior to approving such contract. Sangamo shall be responsible for the management of its permitted Subcontractors. The engagement of any

Subcontractor in compliance with this **Section 3.5** shall not relieve Sangamo of its obligations under this Agreement or any applicable Research Plan. Any agreement with a permitted Subcontractor pertaining to the Research Program shall be consistent with the provisions of this Agreement.

3.6 Funding of the Research Program.

(a) Budgeted costs. Shire shall pay all FTE costs and external costs incurred by Sangamo and its Affiliates in the conduct of the Research Program, in accordance with the budget set forth in each of the Research Plans. For the avoidance of doubt, external costs will be passed through to Shire with no mark-up by Sangamo. The JSC shall in good faith establish [***] budgets for each of the Research Plans. The JSC in its sole discretion shall approve such [***] budgets. Sangamo shall be deemed to agree to a budget unless within ten (10) days of Sangamo receiving notification that the JSC has approved a budget, Sangamo notifies Shire in writing that Sangamo disagrees with such budget. Such notification shall include a Sangamo proposed budget, which Sangamo proposed budget shall identify the activity and cost differences from the JSC approved budget. If Sangamo is deemed to agree with a budget, then except as provided by **Subsection 3.6(e)**, variances from the budget shall be paid by Sangamo, unless otherwise agreed to by the JSC.

(b) Budget changes. A change to a budget can be made only by the JSC. If Sangamo reasonably anticipates that the costs of conducting, or having a Subcontractor conduct, any activity set forth in a Research Plan will exceed the budgeted amount therefor, Sangamo shall notify the JSC and request a change to the budget. The JSC shall in good faith consider all such reasonable requests by Sangamo to change a budget for a Research Plan. The JSC in its sole discretion shall approve such reasonable requests to change the budget within thirty (30) days of Sangamo's request. Sangamo shall be deemed to agree to such a change to the budget or such JSC decision not to approve Sangamo's request to change a budget unless within ten (10) days of Sangamo receiving notification that the JSC has approved such change to the budget or decided not to approve Sangamo's request to change a budget, Sangamo notifies Shire in writing that Sangamo disagrees with the budget change or decision. Such notification shall include a Sangamo proposed budget change, which Sangamo proposed budget change shall identify the activity and cost differences from the JSC approved budget change or existing budget, if the JSC decided not to approve Sangamo's request to change the existing budget. If Sangamo is deemed to agree [***], then except as provided by [***].

(c) Failure to agree. In the event Sangamo does not agree to a JSC approved Research Plan budget, a JSC approved change to such budget or a JSC decision not to approve Sangamo's request to change a budget, then (i) Sangamo shall not be obligated to conduct, or cause any Subcontractor to conduct, any activity under a Research Plan that will not be fully reimbursed by Shire; and (ii) Shire shall have the right to subcontract such activity to a Third Party; provided, that the cost charged by such Third Party subcontractor for such activity does not exceed [***] of the cost proposed by Sangamo for such activity and that Shire shall not have any right, in connection with any such subcontract, to access Sangamo Know-How relating to ZF Compound design (including optimization).

(d) FTE rate. Shire shall pay Sangamo the rate for each FTE of [***] per year (the "*FTE Rate*") for the first [***] months of this Agreement. Beginning at month [***], the FTE rate shall increase [***] annually.

(e) Invoices. Sangamo shall accrue and report its actual costs quarterly. Sangamo shall provide an invoice within five (5) business days of the end of each quarter, with sufficient detail reasonably acceptable to Shire, for the activities performed during such quarter and external costs invoiced to Sangamo during such quarter. The actual number of FTEs or external costs reported in the invoice may vary by not more than [***] from the expected number based on each budget for each Research Plan, provided that the actual number is consistent with, and not more than [***] above, the overall budget for a particular Research Plan. Subject to **Section 3.6(b)**, Shire shall have no obligation to pay Sangamo any amount that (i) is more than [***] above the budget for any Research Plan in any quarter, and (ii) exceeds by [***] the overall budget under a Research Plan.

(f) Annual budgets. No later than September 30 of each calendar year during the Research Term (except for the last calendar year during the Research Term), the JSC will prepare and approve a budget for each Research Plan under which activities are anticipated to be conducted in the following calendar year.

3.7 Records.

(a) Research Records. Sangamo shall maintain, and cause its employees and Subcontractors to maintain, records and laboratory notebooks in sufficient detail and in a good scientific manner appropriate for (i) inclusion in filings with regulatory authorities, and (ii) obtaining and maintaining intellectual property rights and protections, including Patent Rights. 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. Laboratory notebooks shall be signed, dated and witnessed on a regular basis. During the Research Term Sangamo shall periodically, but not less than [***], allow Shire to inspect and, to the extent necessary or useful for such regulatory or intellectual property protection purposes, copy such records.

(b) JSC Reports. Sangamo shall keep the JSC informed of the progress of its activities under each Research Plan, including a detailed written quarterly report of its progress under each Research Plan.

(c) Expense Records. Sangamo shall maintain complete and accurate books, records and accounts used for the determination of FTEs and external expenses incurred in connection with the performance of its obligations under the Research Program, in sufficient detail to confirm the accuracy of any payments required under this Agreement, which books, records and accounts will be retained by Sangamo for three (3) years after creation of the individual records, or longer as is required by applicable law. Such books, records and accounts shall be kept in accordance with U.S. GAAP and Sangamo's then-current accounting procedures. For the avoidance of doubt, if Sangamo's then-current accounting procedures are not US GAAP compliant, then Sangamo shall alter its accounting procedures such that they are US GAAP compliant.

3.8 Shire Audit Rights.

(a) Upon fourteen (14) days advance written notice by Shire and not more than once in each calendar year, Sangamo and its Affiliates shall permit an independent certified public accounting firm of internationally recognized standing, selected by Shire and reasonably acceptable to Sangamo, at Shire's expense, to have access during normal business hours to such of the records of Sangamo and its respective Affiliates as may be reasonably necessary to verify the accuracy of the invoices provided by Sangamo to Shire pursuant to **Subsection 3.6(e)** for any year ending not more than eighteen (18) months prior to the date of such request. No year may be audited more than once, except for cause. The accounting firm will enter a confidentiality agreement reasonably acceptable to Sangamo governing the use and disclosure of Sangamo's information disclosed to such firm, and such firm shall disclose to Shire only whether the invoices are correct or not and the specific details concerning any discrepancies, which information shall be Confidential Information of Sangamo.

(b) Unless disputed by Shire or Sangamo in good faith, if such accounting firm concludes that the amounts paid during the audited period were more or less than the amounts actually due to Sangamo, Shire shall pay any additional amounts due, and Sangamo will refund any amounts overpaid, in each case plus interest as set forth in **Section 9.13**, within thirty (30) days after the date the written report of the accounting firm so concluding is delivered to Sangamo and Shire. The fees charged by such accounting firm shall be paid by Shire; *provided*, that if the audit discloses that the amounts payable by Shire for such period have been overpaid by more than [***], then, subject to **Subsection 3.8(c)**, Sangamo shall pay the reasonable fees and expenses charged by such accounting firm.

(c) In the event of a good faith dispute by Shire or Sangamo regarding the result of an audit made pursuant to this **Section 3.8**, the Parties shall agree in good faith on an alternative independent certified public accounting firm of internationally recognized standing to perform a second audit. If such audit is requested by Shire because Shire was found by the initial audit to have underpaid and the second audit confirms that Shire underpaid, then Shire shall bear all costs associated with the second audit. If such audit is requested by Sangamo because Shire was found by the initial audit to have overpaid and the second audit confirms that Shire overpaid, then Sangamo shall bear all costs associated with the second audit. Notwithstanding the above, in the event that the second audit confirms the findings of the first audit, the requesting Party shall pay. No over or under payment indicated by the initial audit shall be payable in the event of a dispute until the second audit is complete and such second audit shall be binding on the Parties, with any under or over payment determined thereby, plus interest as set forth in **Section 9.13**, being payable within thirty (30) days after the date the written report of the accounting firm so concluding is delivered to Sangamo and Shire.

(d) Shire shall treat all financial information disclosed by its accounting firm pursuant to this **Section 3.8** as Confidential Information of Sangamo for purposes of **Article 11** of this Agreement, and shall cause its accounting firm to do the same.

3.9 Research Term.

(a) Extension of the Initial Research Term.

The Initial Research Term may be extended as follows:

(i) If the Parties agree, the Initial Research Term may be extended by two (2) years, one or more times; and

(ii) If activity under a specific Research Plan for a Shire Target has been initiated within four (4) years of the Effective Date, then Shire shall have the right, at its option and in its sole discretion, to extend the Research Term for a period of time sufficient to complete the pre-clinical activities contemplated by the Research Plan.

(b) Re-establishment of the Research Term. If the Research Term has expired and if Shire is pursuing clinical development or maintenance of Marketing Approval of a first Shire ZF Product for a Shire Target, then, at Shire's request and expense, the Research Term may be re-established for a term as necessary for Sangamo to provide such assistance to Shire as necessary for Shire to obtain or maintain Marketing Approval (i) for such first Shire ZF Product for such Shire Target or (ii) a second Shire ZF Product for such Shire Target if Shire fails to gain Marketing Approval for such first Shire ZF Product, provided that Sangamo has sufficient expertise and then available capacity to provide such assistance or is capable of acquiring sufficient capacity through the use of Commercially Reasonable Efforts. If Sangamo declines to provide such assistance on account of such insufficient expertise or such incapability of acquiring sufficient capacity, then at Shire's option, Shire shall be allowed to obtain such assistance from a Third Party subcontractor, in which case Sangamo shall grant to such Third Party licenses under the Sangamo Licensed Technology to the extent necessary to conduct the specific requested activities. By way of example and not limitation, such assistance may involve conducting further pre-clinical studies on the Shire ZF Product in clinical development or as a post-marketing commitment, conducting studies on new formulations of the Shire ZF Product in clinical development, or conducting full pre-clinical studies on a back-up Shire ZF Product for the respective Shire Target.

3.10 Termination of a Shire Target.

(a) Right to Terminate-Shire Unilateral Termination. In addition to each Party's rights to terminate this Agreement under **Article 14** and subject to **Section 3.2,** at any time during the Research Term, any particular Shire Target may be terminated and its respective Research Plan halted in its entirety upon ninety (90) days prior written notice from Shire to Sangamo (a "*Shire Unilateral Target Termination*"), provided that, for the first 24 months of this Agreement, Shire may not terminate all Shire Targets. Such termination shall take effect at the expiration of such ninety (90) day period. For the avoidance of doubt, Shire may not terminate this Agreement in its entirety during the 24 month period after the Effective Date.

(b) JSC Termination. During the Research Term, the JSC may unanimously agree at any time to terminate a particular Shire Target and halt its respective Research Plan in its entirety. Such termination shall take effect no later than ninety (90) days from such unanimous decision. Any unanimous decision by the Parties to discontinue a Research Plan prior to IND or CTA filing shall be deemed a termination by the JSC subject to this **Section 3.10**.

(c) Effects of Target Termination. Upon notice of a Shire Unilateral Target Termination, or upon a unanimous JSC decision to terminate all activities under a Research Plan for a Shire Target:

(i) Wind down costs. During such ninety (90) day notice period (in the case of a Shire Unilateral Target Termination), or such ninety (90) day period following a JSC unanimous decision to terminate a Shire Target, Sangamo shall wind down the Research Plan for the Terminated Target, and Shire shall pay all FTE costs of Sangamo for direct work [***] necessary for Sangamo to wind down such Research Plan. Upon expiration of such ninety (90) day notice period (in the case of a Shire Unilateral Target Termination), or such ninety (90) day period following a JSC unanimous decision to terminate a Shire Target, [***], except as provided in **Subsection 3.10(c)(ii)** below. Such reasonably necessary costs shall be invoiced as provided in **Subsection 3.6(e)**. Sangamo shall use [***] efforts to minimize any costs incurred following receipt of the notice of termination by Shire or decision to terminate by the JSC.

(ii) Non-cancelable costs. Shire shall pay any non-cancelable costs relating to such Terminated Target to which Sangamo has committed after the Effective Date prior to receiving such notice under **Subsection 3.10(a)** or such unanimous decision under **Subsection 3.10(b)**. Such non-cancelable costs shall be invoiced as provided in **Subsection 3.6(e)**. Sangamo shall use [***] efforts to minimize any non-cancelable costs incurred upon receiving such notice under **Subsection 3.10(a)** or such unanimous decision under **Subsection 3.10(b)**.

(iii) Target Removal from Pool. Such Terminated Target shall be removed from the Shire Exclusive Target Pool and shall no longer be a Shire Target.

(iv) [***]. Within sixty (60) days of such notice or decision, to the extent Sangamo elects, Shire shall [***] to Sangamo all [***] and [***] that (1) relate to the Terminated Target and (2) were [***] to Shire from Sangamo.

(v) Other Shire Intellectual Property. Within [***] days of such notice or decision, if Sangamo elects, the Parties shall negotiate in good faith and on commercially reasonable terms with respect [***] (i) any or all [***] and (ii) [***] that both (a) relate to the [***] (b) for which [***] have been initiated under the Research Program, provided that such agreement shall include, if the [***] Such negotiation shall take into consideration[***] and if Sangamo has requested [***] to the extent applicable to the [***] In addition, if Sangamo's [***] Notwithstanding anything to the contrary in this Agreement, if Shire or its Affiliates is [***] then Shire shall not be required to [***] provided that Shire agrees[***] By way of example, if Shire [***] In addition, for the avoidance of doubt, Sangamo shall not have the right to[***] under clause (ii) above will include [***] in clause (ii) above that exists as of the [***] In the event that the Parties are unable to agree upon commercially reasonable terms within [***] then the Parties shall submit the determination of commercially reasonable terms to an independent arbitrator agreed upon by Parties who has significant relevant experience in the licensing of pharmaceutical products. If the Parties do not agree on an arbitrator within [***] then either Party may request that JAMS appoint an arbitrator with such experience on behalf of the Parties in accordance with JAMS' Comprehensive Arbitration Rules & Procedures then in effect, except that the Parties expressly agree that [***] The date on which such arbitrator is

selected or appointed will be the "*Section 3.10 Arbitration Commencement Date*". The arbitration shall be conducted under the JAMS Rules, to the extent consistent with this **Subsection 3.10(c)(v)**. Within [***] after the Section 3.10 Arbitration Commencement Date, each Party will [***] provided that unless the Parties agree otherwise in writing in advance[***] Within[***] after receipt of the other Party's [***] each Party may submit to the arbitrator (with a copy to the other Party)[***] Within [***] after the Section 3.10 Arbitration Commencement Date, the arbitrator will[***] provided that, for the avoidance of doubt, in no circumstance will Shire be obligated to[***] except for those [***] The decision of the arbitrator shall be final and unappealable. Within thirty (30) days of receiving the arbitrator's decision, Sangamo shall notify Shire of its acceptance or rejection of the selected Section 3.10 Proposal, which election shall be in Sangamo's sole discretion. [***] The arbitrator's fees and expenses will be [***] The effects of termination set forth in **Subsections 14.5(a) (i), (iv), (vi), (vii)** and **(viii)** shall apply to such Terminated Target, to the extent applicable.

4 JOINT STEERING COMMITTEE

4.1 Composition. The JSC shall be formed as soon as practicable, but no later than 30 days following the Effective Date of this Agreement. The JSC shall be comprised of an equal number of representatives from each Party, initially four (4). A representative from each Party who is a specialist with respect to intellectual property matters shall attend JSC meetings when appropriate as an ad hoc, non-voting member in addition to the regular voting membership of the JSC. If mutually agreed by all JSC members on a case-by-case basis, the JSC may invite other non-members to participate in the discussions and meetings of the JSC, provided that such participants shall have no voting authority at the JSC. Each Party shall notify the other Party in writing of its initial representatives to the JSC within ten business days after the Effective Date, and may substitute one or more representatives from time-to-time effective upon written notice to the other Party. [***], and in such capacity, he/she shall be responsible for setting the agenda for meetings of the JSC, with input from the other members, and for conducting the meetings of the JSC.

4.2 Responsibilities.

(i) **Oversight.** The JSC shall be responsible for oversight of the Research Program during the Research Term, including the Research Plans, pre-clinical work, and IND/CTA submissions for each Shire Target. Any amendments or modifications to the Research Plans shall require the approval of the JSC and shall be subject to the applicable terms of this Agreement, and the JSC shall be required to formally document updates to the Research Plans on a quarterly basis as part of the agreed upon and accepted minutes of the quarterly meetings of the JSC. The JSC shall manage the technology transfer of Know-How from Sangamo to Shire that is set forth in a Research Plan or that otherwise is necessary for Shire to practice the licenses granted under this Agreement, except that Sangamo shall have no obligation to transfer Know-How concerning the design of ZF Compounds. In addition to the foregoing general responsibilities, the JSC shall in particular: (a) establish and approve budgets and timelines in the Research Plans, (b) manage the overall strategy for the research and development of potential Shire ZF Products under the Research Plans, (c) determine the development and staging of lead and back-up Shire ZF Compounds and Shire ZF Products, (d) determine whether criteria set forth in a Research Plan with respect to a Shire Target and/or

potential Shire ZF Products have been met, (e) make decisions on whether and how to continue activities under a particular Research Plan at each decision point set forth in such Research Plan based on the then-available data and results and consistent with the criteria set forth in such Research Plan, including with respect to whether to terminate the Research Plan for a particular Shire Target, (f) approve any Subcontractors (and, if requested by Shire, contracts with Subcontractors) proposed by Sangamo and the budgets therefor, (g) oversee the preparation of the [***], subject to decision-making authority as set forth in **Subsection 10.2(a)** (which authority shall not be subject to Shire's final decision-making authority under **Section 4.4**), and (h) review and approve the draft IND or CTA for each Shire ZF Product. The JSC will have solely the powers assigned to it in this **Article 4** and elsewhere in this Agreement, and will not have any power to amend, modify, or waive compliance with this Agreement. For clarity, Sangamo, and not the JSC, will be responsible for decisions with respect to the day-to-day implementation of each Research Plan, unless [***] to Shire. The JSC, in its discretion, may establish subcommittees to assist the JSC in carrying out the responsibilities of the JSC.

(ii) **Manufacture**. The JSC shall oversee the manufacture of Shire ZF Products and components thereof according to the Research Plans during the Research Term; if Sangamo is responsible for performing such manufacture or engaging a Subcontractor to do so, then such manufacture shall be performed pursuant to the Research Plan and Shire shall reimburse Sangamo with respect thereto in accordance with **Section 3.6**. For each Research Plan, the JSC shall at a minimum: establish the amount to be manufactured and maintained by Sangamo; review the manufacture of (and supply chain for) each Shire ZF Product to identify potential risks and where necessary, implement through the Research Plan risk management strategies; analyze and review technical and quality control issues for each Shire ZF Product; review and approve any manufacturing agreements with Third Parties pursuant to which Shire ZF Products are manufactured; review and approve all manufacturing specifications for Shire ZF Products including release specifications; and manage the transfer of manufacturing capability for Shire ZF Products from Sangamo to Shire pursuant to the Research Plan in a manner to permit Shire to undertake its clinical development activity without delay. For the avoidance of doubt, Shire has the sole authority respecting the manufacture of clinical supplies of Shire ZF Products for which Sangamo files an IND/CTA.

(iii) **General**. Sangamo shall update **Schedule 1.57** as necessary, but in no event less than[***] Sangamo shall[***] The JSC shall conduct its responsibilities hereunder in good faith and with reasonable care and diligence.

4.3 Meetings.

(a) The JSC shall meet in person or by teleconference not less than once per calendar quarter during the Research Term. Subject to the preceding sentence, the JSC shall meet on such dates and at such times and places as agreed to by the members of the JSC. Meetings of the JSC shall be alternately hosted by the Parties, with the host determining whether the meeting will be in person or by teleconference; *provided*, that at least one meeting hosted by each Party in each calendar year shall be in person. Shire shall host the first meeting of the JSC at a mutually agreeable time and place no later than 60 days from the Effective Date of this Agreement. Each Party shall be responsible for all its own expenses relating to attendance at or participation in JSC meetings.

(b) Within 10 days following each JSC meeting, the Party hosting the meeting shall cause to be prepared and will provide to the other Party a draft of reasonably detailed written minutes describing all matters reviewed or considered by the JSC and all determinations made and actions taken by the JSC and a summary of the reasons therefor stated by the members at the meeting. Discussions relating to amendments to the Research Program shall be included in the minutes. The minutes of any meeting of the JSC must be finalized by approval of the members of the JSC within 15 days of the meeting. The final minutes shall include the relevant executed amendments to the Research Plans reflecting the discussed and approved changes. The minutes and the drafts of any minutes shall be the Confidential Information of both Parties.

4.4 Actions. Each Party shall be entitled to cast one vote on matters before the JSC. For the transaction of business, a quorum consisting of not less than one representative of each Party must be present at a meeting. Decisions of the JSC shall be made by unanimous approval, *provided* that a quorum is present. If the JSC is unable to reach agreement with respect to any decision within the scope of its authority, the Chief Executive Officer of Sangamo (or his/her nominee) and a Senior Vice President of Shire (or his/her nominee) will meet promptly to attempt to resolve the dispute by good faith negotiations. If these individuals are unable to resolve the dispute within [***] of the request for such meeting, then Shire shall[***] provided that such [***] For the avoidance of doubt, Shire shall not [***]. The Parties expressly understand and agree that the[***] will not authorize Shire to [***].

4.5 Term. The term of the JSC shall commence on the Effective Date and continue in effect until the expiration or earlier termination of the Research Term. Thereafter, Shire will provide annually to Sangamo a written summary of, or the Parties will meet annually to share information regarding, Shire's development and commercialization of Shire ZF Products. For the avoidance of doubt, the term of the JSC shall be re-established for any period during which the Research Term is re-established according to **Subsection 3.9(b)**.

4.6 Change of Control. In the event of a Change of Control of Sangamo during the Research Term, within thirty (30) days of such Change of Control, the Parties shall meet to discuss Shire's concerns, if any, regarding the effect of such Change of Control. If Shire determines, in good faith and in its sole discretion, that [***] then Shire may, [***] do the following:

(i) For any Research Plan where an [***] or, if a potential [***] or, if applicable, such [***] (ii) For any Research Plan where either an [***] or, if a [***] Shire may (1) maintain the [***] or, if applicable, such [***] In the event Shire assumes all remaining activities of the Research Program with respect to a particular Research Plan according to this **Section 4.6**, then (v) Sangamo shall promptly[***] that (1) is necessary for the completion of such Research Plan with respect to [***] and shall [***] that are necessary for such completion of such Research Plan, to the extent such [***] in each case solely to complete such Research Plan with respect to the applicable products, or (2) is necessary for Shire to practice the licenses granted under **Subsection 7.1(a)** with respect to the Shire Target which is the subject of such Research Plan; (w) Sangamo shall (A) [***] (if any) in Sangamo's possession and control that are required by law or regulation to be maintained [***] (B) for any [***] described in clause (A) but that are in Sangamo's control and in the possession of a Third Party service provider, [***] provided that Shire

[***] and (C) provide [***] that are related to such [***] and used or generated in conducting activities under the applicable Research Plan but are not addressed in clause (A) or (B), which information and materials Sangamo shall maintain for [***] years following Shire's assumption of such Research Plan and shall not thereafter destroy without providing Shire notice and the opportunity to access such information and materials, and (x) Sangamo shall promptly [***] solely relating to the Research Plans being assumed by Shire, such that Shire may continue, to the extent possible without interruption, the activities under such Research Plans and Shire's clinical development activities; provided that [***] but is otherwise necessary for Shire to [***] then Sangamo shall use [***] so long as Shire [***] prior to the applicable due date [***] (y) Sangamo shall provide, [***] to the extent that Sangamo has the [***] and then available [***] and (z) Shire shall provide [***] to Sangamo a report of its progress under the Research Program. Solely in the event Shire assumes remaining activities under a Research Plan under which Sangamo is [***].

5 CLINICAL DEVELOPMENT AND COMMERCIALIZATION

5.1 Shire Responsibilities.

During the Term:

(a) Subject to **Subsections 5.1(b) and 5.4(a)**, Shire shall be solely responsible for and have sole discretion over (i) the planning and conduct of, and expenses associated with, clinical trials of Shire ZF Products; (ii) all regulatory filings and interactions with regulatory agencies with respect to such Shire ZF Products, except those filings and interactions in connection with any IND/CTA under a Research Plan; (iii) the selection of the countries in which Shire will pursue and maintain Marketing Approvals for such Shire ZF Products and expenses related to obtaining and maintaining such Marketing Approvals; and (iv) commercialization of such Shire ZF Products in the Territory and expenses associated with the commercialization of such Shire ZF Products.

(b) For each Shire Target for which Sangamo has filed an IND or CTA for a Shire ZF Product directed to such Shire Target, or for which Shire has assumed the applicable Research Plan pursuant to **Section 4.6**, Shire shall use Commercially Reasonable Efforts to obtain Marketing Approval for at least one therapeutic Shire ZF Product directed to such Shire Target in each of the United States and at least one Major European Country. For the avoidance of doubt, if [***] Shire may [***].

(c) In the event that a Shire Target for which Sangamo has filed or intends to file an IND, CTA, or other foreign equivalent qualifies for an orphan drug designation, that designation will be in the name of Shire or one of its Affiliates.

5.2 Sangamo Responsibilities.

During the Term:

(a) In order to permit Shire to conduct clinical trials without substantial delay, at the direction of the JSC and at least 60 days prior to filing an IND/CTA for a Shire ZF Product

(or in the event Shire assumes all remaining activities of a Research Plan in accordance with **Section 4.6**), Sangamo will complete the transfer to Shire, in accordance with the Research Plan but subject to **Subsection 3.6(c)**, or otherwise as determined by the JSC and subject to Shire's reimbursement of Sangamo's [***] FTE costs and [***] external costs to conduct such transfer, of all Sangamo Know-How (including synthesis protocols and documentation) necessary for Shire to manufacture clinical supplies of such Shire ZF Product according to the specifications and manufacturing techniques then in use by Sangamo for such Shire ZF Product. Sangamo will provide such technical assistance to Shire as necessary to complete the transfer of such Sangamo Know-How in accordance with the Research Plan, subject to **Subsection 3.6(c)**, or otherwise as determined by the JSC and subject to Shire's reimbursement of Sangamo's [***] FTE costs and [***] external costs of such technical assistance. In addition, no later than the date on which Sangamo files an IND/CTA for a Shire ZF Product (or in the event Shire assumes all remaining activities of a Research Plan in accordance with **Section 4.6**), (i) Sangamo will supply to Shire any then-existing supplies of such Shire ZF Product manufactured by or on behalf of Sangamo (except to the extent that any such supplies need to be retained by Sangamo or its manufacturer, consistent with the requirements of regulatory authorities or otherwise as required by law), and (ii) to the extent any manufacturing contracts between Sangamo and a Third Party contract manufacturer are specific to such Shire ZF Product, Sangamo will, if permitted under the terms of the contract, assign such contract to Shire.

(b) After filing and acceptance of an IND/CTA for a Shire ZF Product and upon payment of the development milestone under **Section 9.3** for "First acceptance of either an IND or a CTA submission by the applicable regulatory agency", (i) Shire shall assume sole control, subject to **Subsections 5.1(b)** and **5.4(a)**, for all development, regulatory, manufacturing and commercialization activities for such Shire ZF Product, and JSC oversight shall cease for that Shire ZF Product and, in Shire's discretion, its related Shire Target, and (ii) Sangamo shall (A) promptly assign to Shire such IND/CTA, (B) promptly transfer to Shire all information and materials in Sangamo's possession and control that are required by law or regulation to be maintained by the holder of such IND/CTA, (C) for any information and materials of the type otherwise described in clause (B) but that are in Sangamo's control and in the possession of a Third Party service provider, either assign to Shire such contract (which contract Shire shall assume), to the extent assignable, and if not assignable (either by its terms or because it does not relate solely to such Shire ZF Product), provide access to such information and materials to Shire, provided that Shire bears all costs for maintenance of and access to such information and materials, (D) provide Shire access, to the extent reasonably requested by Shire and necessary or useful for Shire to pursue the clinical development and Marketing Approval of (or the maintenance of Marketing Approval of) such Shire ZF Product, to any information and materials in Sangamo's control that are related to such Shire ZF Product and used or generated in conducting activities under the applicable Research Plan but are not addressed in clause (B) or (C), which information and materials Sangamo shall maintain for two (2) years following assignment of the IND/CTA to Shire and shall not thereafter destroy without providing Shire notice and the opportunity to access such information and materials, and (E) provide, at Shire's expense, such technical assistance as Shire may reasonably request to assist Shire in the clinical development, Marketing Approval and commercialization of such Shire ZF Product during the Royalty Period for such Shire ZF Product, to the extent that Sangamo has the relevant expertise and then available capacity by functional group or is capable of acquiring sufficient capacity through the use of Commercially Reasonable Efforts.

(c) If, after completion of activities under a Research Plan for a Shire Target, Shire desires to (i) change one or more Shire ZF Compounds in the Shire Target Specific Product directed to such Shire Target or (ii) change one or more [***] in the [***] directed to such Shire Target, as applicable, Shire shall notify Sangamo in writing, identifying the proposed change; provided that (A) any such change to a Shire ZF Compound shall not change the Shire Target to which such Shire ZF Compound Specifically Binds and shall not cause such Shire ZF Compound to Specifically Bind any other Target or chromosomal location other than the Shire Target, (B) any such change to a [***] shall not result in a ZF Compound that is identical in amino acid sequence to a ZF Compound that Sangamo or its Affiliates or Third Party licensees or collaborators is pursuing or to which Sangamo or its Affiliate has granted or intends to grant, pursuant to a then-existing bona fide written document (including a term sheet or letter of intent), exclusive or non-exclusive rights to a Third Party (each such ZF Compound, an "*Excluded Compound*"), and (C) any such change to a [***], if it changes the [***] to which such [***] Specifically Binds, shall cause such ZF Compound to Specifically Bind to a different locus that is also a [***]. If such notice includes a proposed change to a [***], then Sangamo shall notify Shire, within fifteen (15) days after receipt of such notice from Shire, if such modified ZF Compound is identical in amino acid sequence to an Excluded Compound, in which case, Shire shall not research, develop or commercialize such modified ZF Compound. If, in the case of a [***], the modified ZF Compound is not identical in amino acid sequence to an Excluded Compound, and for all Shire ZF Compounds and [***], in each case if such change complies with the rules set forth above, Sangamo shall notify Shire, within such fifteen (15)-day period, whether (i) Sangamo would conduct the necessary development activities, in which case Sangamo shall use commercially reasonable efforts to develop the modified ZF Compound, at Shire's expense, pursuant to a Research Plan or (ii) Sangamo declines to conduct the necessary development activities, in which case Shire has the right to conduct such activities; provided that in no event shall Sangamo be obligated to disclose to Shire any Know-How related to the design of ZF Compounds. Upon successful development of the modified ZF Compound by Sangamo or Shire, the modified ZF Compound shall be deemed a Shire ZF Compound or [***], as applicable.

5.3 Clinical Development.

(a) Upon the filing and acceptance of an IND/CTA for a particular Shire ZF Product, Shire shall, itself or through its Sublicensees hereunder, or any Affiliates of any of the foregoing, or Third Parties, complete clinical development activities and seek Marketing Approval for such Shire ZF Product in accordance with a Clinical Development Plan for such Shire ZF Product, subject to **Subsection 5.1(b)**. Each Clinical Development Plan will be developed, and amended from time to time, by Shire. Each Clinical Development Plan, including each such amendment, will be presented in the form of a written summary provided to Sangamo that includes sufficient detail for Sangamo to understand the activities planned by Shire and Shire's anticipated timelines for performing such activities.

(b)Shire shall provide Sangamo with prompt written notice of Shire's decision to change the Donor Nucleic Acid in any Shire ZF Product, such notice to include the nucleic acid sequence of the new Donor Nucleic Acid.

(c) Shire shall keep Sangamo informed about the status of Shire's clinical development activity by providing, in a timely manner, a copy of the clinical study report synopsis for each clinical trial arising out of such activity. Shire will use reasonable efforts to keep Sangamo informed as to material developments in clinical trials, prior to issuing press releases about such developments.

(d) [***] prior to the first IND filing respecting [***] the Parties agree to meet to negotiate and draft a [***] as it stands at the time of such [***].

5.4 Commercialization.

(a) Shire and its Affiliates, as appropriate, shall use Commercially Reasonable Efforts to commercialize each Shire ZF Product in each country for which Marketing Approval of such Shire ZF Product is obtained.

(b) In performing its marketing and promotion activities in respect of Shire ZF Products, Shire and its Affiliates shall comply with all applicable laws, regulations and guidelines concerning such promotional activities.

6 SUPPLY AND MANUFACTURE

6.1 Shire's Exclusive Right to Manufacture. Except as permitted under this Agreement for Sangamo to meet its obligations under this Agreement, Shire shall have the exclusive right in the Territory to manufacture Shire ZF Compounds and Shire ZF Products for use in the applicable Field, either directly or through one or more Affiliates or Third Parties selected by Shire in its sole discretion.

6.2 Requirements regarding Supply and Manufacture. Each of the Parties agrees that all supply and manufacture of Shire ZF Compound and Shire ZF Product, as the case may be, pursuant to this Agreement, whether by a Party or a Third Party, shall comply with all applicable legal and regulatory requirements, including applicable good manufacturing practices.

7 GRANT OF LICENSES

7.1 Grants by Sangamo

(a) License Grant. Subject to the terms and conditions of this Agreement, Sangamo hereby grants to Shire an exclusive, royalty-bearing license, with the right to sublicense as provided in **Subsection 7.1(b),** under the Sangamo Licensed Technology, (i) to make, have made, use, and import Shire ZF Compounds and [***] in the Territory solely for the purpose of developing and commercializing Shire ZF Products pursuant to the license granted in **Subsection 7.1(a)(ii)**, and (ii) to make, have made, use, develop, sell, offer for sale, and import Shire ZF Products in the applicable Field in the Territory.

(b) Sublicenses.

(i) *Affiliates.* Subject to the terms and conditions of this Agreement, Shire may grant to one or more of its Affiliates a sublicense under the rights granted to Shire

under **Subsection 7.1(a)**. Such sublicense may be in whole or in part of the rights granted to Shire under **Subsection 7.1(a)** and may be on a country by country basis. Shire shall remain responsible for the performance of such Affiliates under such rights to the same extent as if such activities were conducted by Shire, and shall remain responsible for any payments due hereunder with respect to activities of such Affiliates.

(ii) *Third Parties.* Subject to the terms and conditions of this Agreement, Shire may also grant, through one or more tiers, to Third Parties a sublicense under the rights granted to Shire under **Subsection 7.1(a)**. Such sublicense may be in whole or in part of the rights granted to Shire under **Subsection 7.1(a)** and may be on a country by country basis. Shire shall remain responsible for any payments due hereunder with respect to activities of the Sublicensee. In the event of termination of this Agreement by Sangamo pursuant to **Section 14.2** or **14.3**, any permitted sublicense under this **Subsection 7.1(b)(ii)** shall, at the Sublicensee's option, survive such termination, provided that the Sublicensee is not in material breach of any of its obligations under such sublicense. In the event of termination of this Agreement by Shire pursuant to **Section 14.4**, any permitted sublicense under this **Subsection 7.1(b)(ii)** shall, at the Sublicensee's option and with Sangamo's prior written consent, not to be unreasonably withheld, conditioned, or delayed, 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 and, if applicable, with consent of Sangamo pursuant to the preceding sentence, 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.

(iii) *Notice.* With respect to any sublicense agreement that includes a sublicense under a Third Party License that requires Sangamo to provide the applicable Third Party licensor a copy of any sublicense agreement or a summary of the terms of such sublicense agreement, Shire shall provide Sangamo with such copy or summary within fifteen (15) days of the execution of such sublicense agreement. Any such copy or summary shall be treated by Sangamo as Shire's Confidential Information.

(iv) *Requirements*. Each agreement in which Shire grants a sublicense under the license granted in **Subsection 7.1(a)** shall be subject to (i) the applicable terms and conditions of this Agreement and (ii) the applicable terms and conditions set forth in **Schedule 7.6B** of any Third Party Licenses sublicensed to the Sublicensee, and shall expressly include the terms set forth in **Schedule 7.1(b)(iv)** respecting each Third Party License sublicensed to the Sublicensee.

(v) *Direct Sublicense from Sangamo.* If Shire cannot grant further sublicenses under a particular Third Party License, then at Shire's request in conjunction with Shire's granting of a sublicense to a Sublicensee under this **Subsection 7.1(b)**, subject to **Subsection 7.1(b)(vi)**, Sangamo shall grant a sublicense under such Third Party License to such Sublicensee on terms that are consistent with the Third Party License, the sublicense granted by Shire to such Sublicensee and the terms of this Agreement.

(vi) *Payments under Third Party Licenses*. Notwithstanding anything in **Section 10.4** to the contrary, Shire shall be solely responsible for paying any sublicense issuance and sublicense maintenance fees owed to Third Parties pursuant to Third Party Licenses on account of the grant of a sublicense by Shire or its Sublicensees or by Sangamo pursuant to **Subsection 7.1(b)(v)**, which fees are set forth in **Schedule 7.1(b)(vi)**.

7.2 Grant by Shire. Subject to the terms and conditions of this Agreement, Shire hereby grants to Sangamo a royalty-free, non-exclusive license, with the right to grant sublicenses only to permitted Subcontractors under **Section 3.5**, under all Shire Patent Rights and other intellectual property rights Controlled by Shire and its Affiliates as of the Effective Date or that come into the Control of Shire and its Affiliates during the Research Term solely as necessary to perform the activities to be performed by or on behalf of Sangamo under the Research Program during the Research Term.

7.3 Exclusivity. During the Term, Sangamo shall not work independently of this Agreement for itself or any Affiliate or Third Party (including the grant of any license to any Third Party) with respect to the discovery or research of any product that is intended to be used clinically or diagnostically to (1) [***] or (2) [***]other than through the [***]. During the Term, Sangamo shall not work independently of this Agreement for itself or any Affiliate or Third Party (including the grant of any license to any Third Party) with respect to the development or commercialization, for therapeutic or diagnostic purposes, of (a) any product that can be used clinically or diagnostically to (1) [***], or (2) [***] other than through the [***], (b) any Shire ZF Product, (c) any ZF Compound that Specifically Binds a Shire Target, or (d) any [***]. [***] in each case (i), (ii) and (iii) unless and until such [***]. For the avoidance of doubt and not by way of limitation, during the Term, Sangamo shall not work independently of this Agreement for itself or any Affiliate or Third Party (including the grant of any license to any Third Party) on any therapeutic product containing a ZF Compound or process employing a ZF Compound that (i) with respect to either the Factor VII gene and Factor X gene, for so long as each such gene is a Shire Target and not a Terminated Target, provides a functional copy of such gene, or (ii) with respect to any other Shire Target, corrects expression of such defective Shire Target or provides a functional copy of the protein encoded by the non-defective version of such Shire Target. Sangamo's obligations under this **Section 7.3** shall terminate with respect to a Target when it ceases to be a Shire Target and becomes a Terminated Target. Shire acknowledges that Sangamo, prior to the Effective Date, entered into agreements pursuant to which it granted licenses to Third Parties with respect to research and agricultural uses of ZF Compounds and that such licenses are not prohibited by this **Section 7.3**. If Sangamo acquires a Third Party that is, prior to such acquisition, researching, developing or commercializing a product or service described in the first two sentences of this **Section 7.3**, Sangamo (i) [***] (ii) shall not [***] (iii) shall not [***] and (iv) shall [***] the obligations of Sangamo under this **Section 7.3** shall not apply to any product or service that (1)[***].

Sangamo shall notify Shire promptly if it decides to [***] or if it is contacted by a Third Party to[***] in each case with respect to a [***] provided, however, that Sangamo shall not [***] Upon Shire's request within [***] days after such notice, the Parties will negotiate in good faith for up to sixty (60) days (the "*Negotiation Period*") regarding the terms under which Sangamo [***] Sangamo may engage in [***].

7.4 No Implied Rights. Except as expressly provided in this Agreement, neither Party shall be deemed by estoppel, implication or otherwise to have granted the other Party any license or other right with respect to any intellectual property of such Party.

7.5 Negative Covenant. Each Party covenants that it will not knowingly use or practice any of the other Party's intellectual property rights licensed to it under this **Article 7** except for the purposes expressly permitted in the applicable license grant.

7.6 Third Party Licenses. The licenses granted to Shire in **Subsection 7.1(a)** include sublicenses under Sangamo Licensed Technology licensed to Sangamo pursuant to Third Party Licenses, which sublicenses are subject to the terms set forth on **Schedule 7.6A**, which terms Shire hereby acknowledges. **Schedule 7.6B** sets forth those obligations under the Third Party License that are obligations of Shire under this Agreement. Shire hereby agrees to be bound by the terms set forth in **Schedule 7.6B.**

8 REPRESENTATIONS AND WARRANTIES

8.1 Mutual Representations. Each Party represents and warrants to the other Party as follows as of the Effective Date:

(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, (ii) has the requisite resources and expertise to perform its obligations hereunder, and (iii) 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. All necessary consents, approvals and authorizations of all governmental authorities and other persons or entities 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, regulations or orders of governmental bodies, (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.

8.2 Additional Sangamo Representations. Sangamo further represents and warrants to Shire as of the Effective Date as follows:

(a) No Conflicts. Sangamo has not granted, and will not grant during the Term, any rights that are inconsistent with the rights granted to Shire herein. Neither Sangamo nor its Affiliates has entered into any agreement, arrangement or understanding with any Third Party that is inconsistent with the provisions of this Agreement. Sangamo has the right to grant the licenses granted in **Subsection 7.1(a).**

(b) Litigation. Except as set forth in **Schedule 8.2(b),** there are no actions, suits, proceedings or investigations pending or, to its knowledge, threatened against Sangamo before any court, government or regulatory body, agency, commission, official or any arbitrator that is reasonably expected to have an adverse effect on Sangamo's ability to consummate the transactions contemplated hereby.

(c) Sangamo Intellectual Property. **Schedule 1.57** is an accurate listing by owner, inventor(s), serial number, filing date, country, and status of all of the Sangamo Patent Rights. Except as set forth in **Schedule 8.2(c),** Sangamo owns, is the licensee in good standing of, or Controls all Sangamo Licensed Technology. Except as set forth in **Schedule 8.2(c)**, (i) there is no fact or circumstance known to Sangamo that would cause Sangamo to reasonably conclude that any of the issued patents in the Sangamo Patent Rights is invalid or unenforceable, (ii) the inventorship of each Sangamo Patent Right owned by Sangamo and, to Sangamo's knowledge, of each Sangamo Patent Right licensed to Sangamo, is properly identified on each patent, (iii) all official fees, maintenance fees and annuities for the Sangamo Patent Rights owned by Sangamo and, to Sangamo's knowledge, for the Sangamo Patent Rights licensed to Sangamo, have been paid and all administrative procedures with governmental agencies have been completed for the Sangamo Patent Rights owned by Sangamo and, to Sangamo's knowledge, for the Sangamo Patent Rights licensed to Sangamo, such that the Sangamo Patent Rights owned by Sangamo and, to Sangamo's knowledge, the Sangamo Patent Rights licensed to Sangamo are subsisting and in good standing, (iv) Sangamo, including its employees and agents, has complied with its U.S. PTO duty of disclosure respecting the prosecution of all of the Sangamo Patent Rights, and, to Sangamo's knowledge, the licensors of the Existing Third Party Licenses, including their employees and agents, have complied with the U.S. PTO duty of disclosure respecting the prosecution of the applicable Sangamo Patent Rights, (v) none of the Sangamo Patent Rights owned by Sangamo, and to Sangamo's knowledge none of the Sangamo Patent Rights licensed to Sangamo, is currently involved in any interference, reissue, re-examination, cancellation or opposition proceeding and neither Sangamo, nor any of its Affiliates, has received any written notice from any person of such actual or threatened proceeding, (vi) Sangamo has not done or omitted to do anything which may cause Sangamo Patent Rights in existence as of the Effective Date to lapse prematurely, (vii) Sangamo has not received notice that any of the Sangamo Patent Rights is the subject of a compulsory licence, and (viii) Sangamo has disclosed to Shire all information of which it is aware or which is in its possession or control that is material to the novelty or validity of the Sangamo Patent Rights in existence as of the Effective Date and any challenges thereto.

(d) Third Party Intellectual Property. Sangamo is not aware of, or, alternatively, has described in **Schedule 8.2(d)**, any Patent Rights or other intellectual property rights of any Third Party that could materially adversely affect Sangamo's ability to consummate the transactions contemplated hereby with respect to (1) the experiments contemplated in the Research Plans set forth in **Schedule 3.3**, (2) the zinc finger protein technology platform, (3) zinc finger proteins targeted to an Initial Target, [***], or the native locus of [***], (4) Donor Nucleic Acids encoding a protein encoded by an Initial Target or by the [***] (5) [***] for zinc finger nucleases, and (6) [***] for zinc finger proteins (collectively, the "*Initial Subject Matter*"). To

Sangamo's knowledge, except as identified in **Schedule 8.2(d)**, (i) the exercise of Shire's rights granted under and contemplated by this Agreement with respect to the Initial Subject Matter will not infringe or conflict with any Third Party intellectual property rights and will not result in any obligation by Shire to any Third Party, and (ii) there are no pending Third Party patent applications which, if issued with the currently pending or published claims, would materially adversely affect the right of Shire to practice the Sangamo Licensed Technology as contemplated by this Agreement with respect to the Initial Subject Matter. Sangamo has disclosed to Shire all information of which it is aware or which is in its possession or control that is material to evaluating any Third Party intellectual property rights which might be an obstacle to Shire's commercialization of the Sangamo Licensed Technology to the extent related to the Initial Subject Matter. Sangamo agrees to immediately notify Shire in writing in the event that Sangamo becomes aware of any patent, trade secret or other right of the nature referred to in this **Subsection 8.2(d).** For the avoidance of doubt, a disclosure of any item or other matter in **Schedule 8.2(d)** is not an admission or indication that such item or other matter is required to be disclosed, or an admission of any current or potential obligation or liability to any Third Party or of any actual or potential breach or violation of any law or regulation.

(e) Third Party Infringement. So far as Sangamo is aware, except as set forth in **Schedule 8.2(e)**, no Third Party is infringing or has infringed any of the Sangamo Patent Rights or has misappropriated any of the Sangamo Know-How.

(f) Existing Third Party Licenses. The Existing Third Party Licenses are in full force and effect as modified or amended prior to the Effective Date. Neither Sangamo nor, to Sangamo's knowledge, any Third Party licensor is in default with respect to a material obligation under, and neither such party has claimed or, to Sangamo's knowledge, has grounds upon which to claim that the other party is in default with respect to a material obligation under, any Existing Third Party License. Sangamo will promptly provide Shire with a copy of any amendments to the Existing Third Party Licenses made after the Effective Date and will not amend the Existing Third Party Licenses in a manner that will materially adversely affect Shire's rights under this Agreement, without Shire's prior written consent. Except as identified in **Schedule 8.2(f),** Sangamo does not Control any other Third Party intellectual property necessary or useful for Shire to practice the licenses granted under this Agreement.

(g) Other Encumbrances. No order has been made, no petition has been presented, no board meeting has been convened to consider a resolution, and no resolution has been passed, for the winding up or dissolution of Sangamo; (b) no agreement or arrangement with creditors for [***] of Sangamo's intellectual property assets for the benefit of creditors exists or has been proposed in respect of the Sangamo Patent Rights or Sangamo Know-How; and (c) no event has occurred causing, or which upon instruction or notice by any Third Party may cause, any security interest to be perfected in the Sangamo Patent Rights or Sangamo Know-How.

(h) Confidentiality. Sangamo has entered into all confidentiality agreements necessary to be in compliance with this Agreement as of the Effective Date.

(i) Disclosure. Sangamo, to its knowledge, has disclosed to Shire all information respecting zinc finger technology in Sangamo's possession or Control material to Shire's decision to enter into this Agreement.

8.3 Disclaimer. EXCEPT AS OTHERWISE EXPRESSLY SET FORTH HEREIN, THE PARTIES MAKE NO REPRESENTATIONS AND EXTEND NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, AND PARTICULARLY THE PARTIES DISCLAIM ALL IMPLIED WARRANTIES OF TITLE, NON-INFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

9 PAYMENTS AND VALUE ADDED TAX

9.1 License Fee. Within ten (10) business days after the Effective Date, Shire shall pay to Sangamo a non-creditable, non-refundable license fee of thirteen million U.S. dollars ($13,000,000.00).

9.2 Ongoing Research and Development Payments. In respect of the activities conducted by or on behalf of Sangamo under the Research Plans, Shire shall make non-creditable, non-refundable quarterly payments in U.S. dollars to reimburse Sangamo for actual costs incurred as specified in **Section 3.6.** Subject to any good faith disputes promptly brought to Sangamo's attention and for which Shire is diligently seeking resolution, Shire shall pay such invoices within 30 days of the date of receipt of the invoice.

9.3 Milestone Payments. Shire will make the following non-refundable, non-creditable payments ("*Milestone Payments*") to Sangamo within thirty (30) business days after the first occurrence of each of the following events by Shire or its Affiliates or Sublicensees ("*Milestone Events*") on a Shire Target-by-Shire Target basis:

Milestone Event		**Milestone Payment** (in Millions ("M") in USD). Respecting Milestone Events 1-4, for the first Shire ZF Product to achieve the Milestone Event on a Shire Target-by-Shire Target Basis
1	[***]	$ 1M
2	First acceptance of either an IND or a CTA submission by the applicable regulatory agency	$ 7.5M
[***]	[***]	[***]
[***]	[***]	[***]
[***]	[***]	[***]
[***]	[***]	[***]
[***]	[***]	[***]
[***]	[***]	[***]
[***]	[***]	[***]
[***]	[***]	[***]

***** CONFIDENTIAL PORTIONS OMITTED AND FILED SEPARATELY WITH THE COMMISSION**

(i) Milestone Payments shall be made [***]

(ii) Following the First Commercial Sale of a Shire ZF Product for any indication, Shire may seek [***] as used herein, means any [***] that is related to the[***] are (i) treating substantially [***] (ii) achieving one or more of the [***] (iii) expanding the [***] (iv) expanding the [***] For the avoidance of doubt, Milestone Payments [***] shall not be due in the event [***] Less likely is that Shire will [***] as used herein, means any [***] An example of an [***] would be [***].

(iii) If a Shire ZF Product for a specific Shire Target is discontinued in development after Shire has paid one or more Milestone Payments for Milestone Events achieved by such Shire ZF Product and [***] then [***].

(iv) If more than one Milestone Event is achieved in the same year, all applicable Milestone Payments shall be payable for such year.

(v) No Milestone Payments shall accrue and be due for a terminated Shire Target (or all Shire Targets if this Agreement is terminated in its entirety), for a Milestone Event that occurs after notice has been given by Shire or the JSC for termination pursuant to [***].

(vi) In the event that a Milestone Payment is based on a [***] Event for an indication that is an indication with less than [***] For the avoidance of doubt, this **Subsection 9.3(vi)** shall not apply to [***].

9.4 Earned Royalties. Shire shall pay Sangamo a royalty calculated as the following percentages of the annual Net Sales of all Shire ZF Products on a Shire Target-by-Shire Target basis (the "*Earned Royalties*").

Annual Net Sales for all Shire ZF Products for a Shire Target	Royalty Rate
Amount of annual Net Sales up to or equal to [***]	[***]%
Amount of annual Net Sales over [***]	[***]%

For example, for annual Net Sales of [***] of all Shire ZF Products for a particular Shire Target, the total Earned Royalty would be calculated as follows:

[***]

(i) Only one Earned Royalty shall be payable on a single Shire ZF Product regardless of the number of Sangamo Patent Rights, Joint Patent Rights and [***] covering such Shire ZF Product. For the avoidance of doubt, only one Earned Royalty shall be payable on a single Shire ZF Product regardless of the number of ZF Compounds in the Shire ZF Product and regardless of whether the Shire ZF Product contains both diagnostic and therapeutic components.

(ii) [***]. In the event Shire, or the JSC as appropriate, reasonably believes it Necessary to Obtain a License (as defined in **Subsection 10.4(b)**) from a Third Party pursuant to **Section 10.4** under the Third Party's intellectual property rights to research, develop, manufacture or commercialize particular Shire ZF Products (but not including any part of a combination product that is not a Shire ZF Product), and a license is obtained in accordance with **Sections 10.4(c), 10.4(d), or 10.4(e)**, then Shire shall be entitled to the [***].

(iii) [***]

(A) The Earned Royalties due to Sangamo for Net Sales of a Shire ZF Product in a country shall be[***] if following the [***] the [***] in such country of such Shire ZF Product in any [***] are [***] by more than [***] of such Shire ZF Product in such country [***] immediately prior to the [***] in such country. If such [***] takes effect, it will apply for each [***] thereafter in which the [***] of such Shire ZF Product in such country remain [***] by at [***]%[***] of such Shire ZF Product in such country [***] immediately prior to the [***] in such country.

(B) The Earned Royalties due to Sangamo for Net Sales of a Shire ZF Product in a country shall be [***]%[***] if following [***] respecting such Shire ZF Product in such country[***] in such country of such Shire ZF Product in [***]% [***] of such Shire ZF Product in such country [***] immediately prior to the first sale of such Generic Product in such country. If such reduction takes effect, it will apply for [***] thereafter in which the [***] of such Shire ZF Product in such country remain [***]%[***] of such Shire ZF Product in such country [***] immediately prior to [***] in such country.

(C) For clarity, subsections (A) and (B) shall not apply simultaneously. Notwithstanding anything to the contrary, if any [***] in a country in which (A) or (B) applies, the [***].

9.5 Following expiration of the Royalty Period for any Shire ZF Product in any country, no further Earned Royalties shall be payable to Sangamo in respect of Net Sales of such Shire ZF Product in such country and thereafter the licenses granted to Shire hereunder with respect to such Shire ZF Product in such country shall be fully paid-up, exclusive, irrevocable and royalty-free; provided, however, that if after the expiration of the Royalty Period for a Shire ZF Product in a country any payments are due by Sangamo to Third Parties under the Third Party Licenses on account of Shire's or its Affiliates' or Sublicensees' development or sale of a

Shire ZF Product in a country after the expiration of the Royalty Period for such Shire ZF Product in such country, Shire shall pay to Sangamo such amounts due to such Third Parties under any such Third Party License, and the sublicense with respect to the applicable Sangamo Licensed Technology shall be fully-paid up, exclusive, irrevocable and royalty-free only after all such payment obligations expire. **Schedule 9.5** identifies those Existing Third Party Licenses in which Sangamo's payment obligations may extend beyond the Royalty Period.

9.6 Payment of Earned Royalties. Earned Royalties shall become due and payable forty-five (45) days following the end of the calendar quarter during which such First Commercial Sales occur, and within forty-five (45) days of the end of each calendar quarter thereafter during the Royalty Period, for sales made during each such calendar quarter.

9.7 Payments for Third Party IP Rights. To the extent that Sangamo obtains a license to any Third Party intellectual property rights and grants Shire a sublicense under such Third Party intellectual property rights pursuant to **Subsection 10.4(c) or 10.4(e)** (thus causing the applicable license agreement to be a Third Party License), Shire shall pay to Sangamo all payments due by Shire to Sangamo under such sublicense within thirty (30) days after the applicable due date in such Third Party License and provide to Sangamo, at least ten (10) days before the applicable due date in such Third Party License, all reports required under the applicable license agreement between Sangamo and such Third Party on account of Shire's and its Affiliates' and Sublicensees' development, manufacture and commercialization of Shire ZF Products, such that Sangamo may comply with all payment and reporting obligations under such license agreements. Provided it receives such items in a timely manner, Sangamo shall pay such amounts to, and file such reports with, the applicable Third Party on or before the applicable due date.

9.8 Royalty Reports.

(a) Within 45 days after the end of each calendar quarter during the Royalty Period, Shire shall furnish to Sangamo a written report showing in reasonably specific detail, on a Shire ZF Product-by-Shire ZF Product and country-by-country basis: (i) the Gross Sales of all Shire ZF Product sold by Shire, its Sublicensees hereunder and their respective Affiliates during such calendar quarter, (ii) the calculation of Net Sales from Gross Sales of Shire ZF Product, (iii) the withholding taxes, if any, required by law to be deducted with respect to royalties due on such sales and (iv) the exchange rates, if any, used in determining the amount payable to Sangamo in United States dollars.

(b) With respect to sales of Shire ZF Product invoiced in United States dollars, all such amounts shall be expressed in United States dollars. With respect to sales of Shire ZF Product invoiced in a currency other than United States dollars, all such amounts shall be expressed both in the currency in which the amount is invoiced and in the United States dollar equivalent. Whenever for the purpose of calculating Net Sales, conversion from any foreign currency shall be required, the amount of such sales in foreign currencies shall be converted into US dollars using the exchange rate for the relevant month as determined by Shire's accounting policies (the "*Monthly Rate*"), such Monthly Rate being determined as the last price rate of exchange for such currencies on the last business day of the immediately preceding calendar month as published on Bloomberg page FXC (or such other publication as may be agreed between the Parties from time to time).

(c) Shire shall keep complete and accurate records in sufficient detail to enable the royalties and Milestone Payments based on Net Sales payable under this **Article 9** to be determined.

9.9 Audits.

(a) Upon fourteen days advance written request by Sangamo and not more than once in each calendar year, Shire, its Sublicensees and their Affiliates shall permit an independent certified public accounting firm of internationally recognized standing, selected by Sangamo and reasonably acceptable to Shire, at Sangamo's expense, to have access during normal business hours to such of the records of Shire, its Sublicensees hereunder and their respective Affiliates as may be reasonably necessary to verify the accuracy of the royalty reports and Milestone Payments based on Net Sales hereunder for any year ending not more than eighteen (18) months prior to the date of such request. No year may be audited more than once, except for cause. The accounting firm will enter a confidentiality agreement reasonably acceptable to Shire governing the use and disclosure of Shire's information disclosed to such firm, and such firm shall disclose to Sangamo only whether the reports are correct or not and the specific details concerning any discrepancies, which information shall be Confidential Information of Shire.

(b) Unless disputed by Shire or Sangamo in good faith, if such accounting firm concludes that the royalties or Milestone Payments based on Net Sales paid during the audited period were more or less than the royalties and Milestone Payments based on Net Sales due, Shire shall pay any additional amounts due, and Sangamo will refund any amounts overpaid, in each case plus interest as set forth in **Section 9.13,** within thirty (30) days after the date the written report of the accounting firm so concluding is delivered to Sangamo and Shire. The fees charged by such accounting firm shall be paid by Sangamo; *provided*, that if the audit discloses that the royalties and Milestone Payments payable by Shire for such period have been underpaid by [***] then, subject to **Subsection 9.9(c),** Shire shall pay the reasonable fees and expenses charged by such accounting firm.

(c) In the event of a good faith dispute by Shire or Sangamo regarding the result of an audit made pursuant to this **Section 9.9,** the Parties shall agree in good faith on an alternative independent certified public accounting firm of internationally recognized standing to perform a second audit. If such audit is requested by Shire because Shire was found by the initial audit to have underpaid and the second audit confirms that Shire underpaid, then Shire shall bear all costs associated with the second audit. If such audit is requested by Sangamo because Shire was found by the initial audit to have overpaid and the second audit confirms that Shire overpaid, then Sangamo shall bear all costs associated with the second audit. Notwithstanding the above, in the event that the second audit confirms the findings of the first audit, the requesting Party shall pay. No over or under payment indicated by the initial audit shall be payable in the event of a dispute until the second audit is complete and such second audit shall be binding on the Parties, with any under or over payment determined thereby, plus interest as set forth in **Section 9.13,** being payable within thirty (30) days after the date the written report of the accounting firm so concluding is delivered to Sangamo and Shire.

(d) Sangamo shall treat all financial information disclosed by its accounting firm pursuant to this **Section 9.9** as Confidential Information of Shire for purposes of **Article 11** of this Agreement, and shall cause its accounting firm to do the same.

9.10 Withholding Taxes

(a) As of the Effective Date, the Parties agree that the payments set forth in **Sections 9.1 – 9.4** above are not subject to any withholding taxes. If after the Effective Date any laws, rules or regulations change such that withholding of income taxes or other taxes is imposed upon payments set forth in **Sections 9.1 – 9.4** above, Shire shall make such withholding payments as required and subtract such withholding payments from the payments due to Sangamo. Shire shall submit appropriate proof of payment of the withholding taxes to Sangamo within a reasonable period of time. At the request of Sangamo, Shire shall give Sangamo such reasonable assistance, which shall include the provision of appropriate certificates of such deductions made together with other supporting documentation as may be required by the relevant tax authority, to enable Sangamo to claim exemption from such withholding or other tax imposed or obtain a repayment thereof or reduction thereof and shall upon request provide such additional documentation from time to time as is reasonably required to confirm the payment of tax.

(b) Notwithstanding **Subsection 9.10(a),** if Shire is required to make a payment to Sangamo that is subject to a deduction or withholding of tax, then if such withholding or deduction obligation arises as a result of any action by Shire, including any assignment or sublicense, or any failure on the part of Shire to comply with applicable laws or filing or record retention requirements, that has the effect of modifying the tax treatment of the Parties hereto (a "*Shire Withholding Tax Action*"), then the sum payable by Shire (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 Shire Withholding Tax Action occurred.

(c) Notwithstanding **Subsection 9.10(a),** if Shire is required to make a payment to Sangamo that is subject to a deduction or withholding of tax, then if such withholding or deduction obligation arises as a result of any action by Sangamo, including any assignment or any failure on the part of Sangamo to comply with applicable laws or filing or record retention requirements, that has the effect of modifying the tax treatment of the Parties hereto, then the sum payable by Shire (in respect of which such deduction or withholding is required to be made) shall be made to Sangamo after deduction of the amount required to be so deducted or withheld, which deducted or withheld amount shall be remitted to the proper governmental authority in accordance with applicable laws.

9.11 Value Added Tax.

(a) All payments stated in **Sections 3.2**, **3.6 and 9.2** of this Agreement are for the purposes of VAT considered to be both - exclusive of VAT & consideration for the supply of services.

(b) For the purposes of this **Section 9.11,** Sangamo refers not only to Sangamo but also to any business that this Agreement or part interest in this Agreement may be transferred to.

(c) For the purposes of VAT, the services performed by Sangamo under this agreement shall be considered to be covered by Art 44 of Council Directive 2006/112/EC (or any equivalent provision in the country of performance if performed outside the European Union) and as such will be considered to be liable for VAT in the country where the recipient is established. For the purposes of this agreement, it is understood that Sangamo is established in the USA and Shire AG is established in Switzerland.

(d) If at any stage, the local Tax Authorities assert that they consider the services performed by Sangamo to be subject to local VAT, Sangamo shall in the first instance undertake all reasonable steps to refute any such assertions by the local Tax Authority. Only once this process is completed should Sangamo raise valid tax invoices for the additional VAT liability.

(e) Shire shall take all reasonable steps to recover any additional VAT liability from the same local Tax Authorities by submitting regular claims. Sangamo shall provide all reasonably necessary assistance to facilitate the recovery of this tax. However, if in the event that the tax cannot be recovered then Shire shall be entitled to offset this tax against future payments to Sangamo

(f) Any penalties or interest accruing to incorrect VAT treatment of the supplies made by Sangamo will rest with Sangamo.

(g) Should these services be considered to be subject to Art 44 of Council Directive 2006/112, both Sangamo & Shire warrants that they will fulfill all their necessary VAT reporting requirements in respect of these services.

(h) In the event that an invoice is raised that is subject to VAT but is raised in a currency other than the local currency of the territory from where the tax is being charged, the invoice must additionally display this tax in the local currency of the territory having been converted using the relevant monthly exchange rate published on Bloomberg.

(i) Sangamo hereby represents and warrants that it is not, has never been and has no obligation for whatever reason to be established for VAT purposes in any jurisdiction outside the United States of America. Solely on this basis Shire acknowledges and agrees that: (1) as of the Effective Date, it is a fully taxable entity for VAT purposes in Switzerland; and (2) as of the Effective Date, Shire expects to recover any self-assessed Swiss VAT that Shire will need to report to the Swiss VAT authorities in relation to payments to made by Shire to Sangamo under this Agreement.

(j) Termination: In the event that this agreement is terminated, Shire will be entitled to withhold from any remaining sums payable to Sangamo any outstanding VAT claims from the local Tax Authority. These sums will be paid to Sangamo upon successful refunding of the claims from the local Tax Authority.

9.12 Payment Method. All payments by Shire to Sangamo hereunder shall be in United States dollars in immediately available funds and shall be made by wire transfer to a bank account designated in writing by Sangamo to Shire.

9.13 Late Payments. If a Party does not receive payment of any sum due to it on or before the due date therefor, simple interest shall thereafter accrue on the sum due to the Party from the due date until the date of payment at a per-annum rate of two percent (2%) over the then-current prime rate reported in *The Wall Street Journal* or the maximum rate allowable by applicable laws, whichever is lower.

10 INTELLECTUAL PROPERTY

10.1 Ownership

(a) Inventions. Except as provided in **Subsection 10.1(b)** below, (i) each Party, as between such Party and the other Party, shall own all Know-How conceived, discovered, invented, created, made or reduced to practice or tangible medium solely by employees, agents or contractors of such Party (and all Patent Rights claiming such Know-How), and (ii) the Parties shall jointly own and have an undivided one-half interest in and to all Joint Know-How and Joint Patent Rights. All determinations of inventorship under this Agreement shall be made in accordance with the patent law of the United States. Each Party may exploit any Joint Technology without accounting to or obtaining consent from the other Party, subject to the exclusive license of Sangamo's interest thereunder granted, as part of the Sangamo Licensed Technology, under **Subsection 7.1(a),** provided, however, that nothing in this **Subsection 10.1(a)** shall be construed as a grant to any other intellectual property held by the other Party.

(b) Shire [***] Patent Rights. Sangamo agrees to [***] and does hereby [***] to Shire, Sangamo's entire right, title and interest in and to any [***]. In each case, Sangamo shall execute and deliver to Shire [***] [***], in a mutually agreeable form, within thirty (30) days after such Patent Right comes into existence. Any such [***] [***] and shall constitute Confidential Information of Shire for the purposes of this Agreement unless it is [***] to Sangamo in accordance with this **Section 10.1(b),** in which case it shall constitute the Confidential Information of Sangamo. Notwithstanding the foregoing or anything to the contrary in this Agreement, Shire shall not, directly or indirectly through Affiliates or Third Parties, practice any of the [***] outside of the scope of the licenses granted to Shire under this Agreement. For any Patent Right that ceases to be a [***] at any time during the Term by virtue of an amendment of the claims, Shire shall [***], and does hereby [***], effective as of the date of such claim amendment, its entire right, title and interest in and to each such Patent Right to Sangamo. In each case, Shire shall execute and deliver to Sangamo a deed(s) of such [***], in a mutually agreeable form, within thirty (30) days after the date such Patent Right ceased to be an [***].

(c) Personnel Obligations. Each employee, agent or independent contractor of a Party or its respective Affiliates 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 or Affiliate all of his or her right, title and interest in and to any invention, discovery, process or other intellectual property; (iii) cooperating in the preparation, filing, prosecution, maintenance 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 Preparation, Filing, Prosecution and Maintenance of Patent Rights.

(a) [***].

(i) Preparation of [***]. Shire [***] will be prepared by Sangamo, as set forth in **Subsection 10.2(c).**

(ii) [***]. With respect to the preparation of any patent application that will be a [***], the Parties shall collaborate in reviewing relevant data, in preparing drafts, and in preparing a final version for filing of such patent application. Shire shall have the final decision making authority, with Sangamo's prior written consent not to be unreasonably withheld, respecting the content of any application that will be a [***], provided that Shire shall not include in any such application any information beyond that required to meet the requirements of 35 U.S.C. § 112. Shire shall consider in good faith, take into account, and implement where possible the reasonable comments made by Sangamo respecting the preparation and content of any [***]. For the avoidance of doubt, Sangamo shall not file a claim limited to Shire ZF Compounds in any patent application that will not be a [***]. For the purpose of this **Subsection 10.2(a)(ii),** a "claim limited to Shire ZF Compounds" means a claim that (1) includes language that specifically describes one or more ZF Compounds that Specifically Bind a particular Shire Target, (2) if presumed to be issued, would not be infringed by a ZF Compound (or the manufacture or use of a ZF Compound) that Specifically Binds a locus other than such Shire Target, if such ZF Compound were combined with the non-ZF Compound elements in such claim, and (3) does not include language that specifically describes a product (or the manufacture or use of such product) that is not a Shire Target Specific Product.

(iii) Filing, prosecution and maintenance of [***] [***]. Shire, at its own expense, shall have the sole right (subject to **Subsection 10.2(f))** to file, prosecute and maintain, throughout the world, the [***]. Shire shall not, in its filings, change the specification as prepared under **Subsection 10.2(a)(ii) or 10.2(c)(i),** without Sangamo's prior written consent not to be unreasonably withheld. Shire shall keep Sangamo informed as to material developments with respect to the filing, prosecution and maintenance of the [***], including by providing, copies of all office actions or any other substantive documents received from any patent office, including notice of all interferences, reissues, re-examinations, oppositions or requests for patent term extensions. Shire shall provide drafts of submissions relating thereto, including drafts of any material filings or responses to be made to such patent offices, within a

reasonable amount of time in advance of submitting such filings or responses to permit Sangamo an opportunity to review and comment thereon. Shire shall consider in good faith, take into account and implement where possible the reasonable comments made by Sangamo, including comments directed to preventing any detrimental effect of Shire's patent prosecution actions on the prosecution or enforcement of any Genus [***], Sangamo Patent Rights or other Patent Rights owned or controlled by Sangamo.

(b) Shire Patent Rights. Shire, at its own expense, shall have the sole right, but not the obligation, to prepare, file, prosecute and maintain, throughout the world, any Shire Patent Rights.

(c) [***].

(i) The Parties intend that each [***] and [***] will have the same or substantially the same specification and priority date as (1) certain related Sangamo Patent Rights (that are not [***] or [***]) that include support for the same [***] and/or [***] as does such [***] or [***] or (2) certain other Sangamo Patent Rights (that are not [***]), or other Patent Rights owned or controlled by Sangamo that are not included in the Sangamo Patent Rights, that include support for ZF Compounds that Specifically Bind the same [***] but are not [***] ((1) and (2) collectively, with respect to such [***], the "[***]"). Sangamo shall have the sole right to prepare, and shall be responsible for preparing, at its own expense, the specifications of all [***], which Patent Rights will, if possible, be filed either on the same day as, or as a divisional application claiming priority from, the applicable [***] and [***]. Shire shall have the right to review and comment on patent application drafts that will be a (i) [***] which support or could reasonably be drafted to support a claim to a Shire Target and (ii) [***]. Sangamo shall consider in good faith, take into account and implement where possible the reasonable comments made by Shire, provided that Sangamo does not reasonably determine such comments to be detrimental to the prosecution or enforcement of any [***], Sangamo Patent Rights or other Patent Rights owned or controlled by Sangamo.

(ii) Subject to **Subsections 10.2(g)** and the remainder of this **Subsection 10.2(c)(ii),** Sangamo, at its own expense, shall have the sole right to prepare the claims of, file, prosecute and maintain, throughout the world, the [***] that are not [***]. Sangamo shall keep Shire informed as to material developments with respect to the filing, prosecution and maintenance of such [***], including by providing Shire with copies of all material communications (including office actions and notices of interferences, reissues, re-examinations or oppositions) from any patent office regarding such [***] and shall provide Shire drafts of submissions relating thereto, including drafts of any material filings or responses to be made to such patent offices, within a reasonable amount of time in advance of submitting such filings or responses to permit Shire an opportunity to review and comment thereon. Sangamo shall consider in good faith, take into account and implement where possible the reasonable comments made by Shire, provided that Sangamo does not reasonably determine such comments to be detrimental to the prosecution or enforcement of any [***], Sangamo Patent Rights or other Patent Rights owned or controlled by Sangamo.

(d) Sangamo Patent Rights.

(i) Except as provided in **Subsection 10.2(c),** Sangamo, at its own expense, shall have the sole right (subject to **Subsection 10.2(g)**) to prepare, file, prosecute and maintain, throughout the world, the Sangamo Patent Rights.

(ii) Sangamo shall keep Shire informed as to material developments with respect to the filing, prosecution and maintenance of such Sangamo Patent Rights, including by providing Shire with copies of all material communications (including office actions and notices of interferences, reissues, re-examinations or oppositions) from any patent office regarding such Sangamo Patent Rights and shall provide Shire drafts of submissions relating thereto, including drafts of any material filings or responses to be made to such patent offices, within a reasonable amount of time in advance of submitting such filings or responses to permit Shire an opportunity to review and comment thereon. Sangamo shall consider in good faith, take into account and implement where possible the reasonable comments made by Shire, provided that Sangamo does not reasonably determine such comments to be detrimental to the prosecution or enforcement of any Sangamo Patent Rights or other Patent Rights owned or controlled by Sangamo.

(e) Joint Patent Rights. If the Parties make any Joint Know-How, the Parties shall promptly meet to discuss and determine whether to seek Joint Patent Rights thereon. If either Party decides to seek any Joint Patent Rights, then Sangamo shall have the first right, but not the obligation, to prepare, file, prosecute and maintain throughout the world, at its expense, any Joint Patent Right (other than a [***], the prosecution of which is governed by **Subsection 10.2(a)**) that claims the composition, manufacture or use of a ZF Compound or of a product or method containing, employing or made using a ZF Compound, using patent counsel or patent agent selected by Sangamo and reasonably acceptable to Shire. Shire shall have the first right, but not the obligation, to prepare, file, prosecute and maintain throughout the world, at its expense, any other Joint Patent Right (other than a [***], the prosecution of which is governed by **Subsection 10.2(a)),** using patent counsel or patent agent selected by Shire and reasonably acceptable to Sangamo. The prosecuting Party shall keep the non-prosecuting party informed as to material developments with respect to the filing, prosecution and maintenance of the Joint Patent Rights, including by providing copies of all material communications (including office actions and notices of interferences, reissues, re-examinations or oppositions) from any patent office regarding such Joint Patent Rights and shall provide the non-prosecuting party drafts of submissions relating thereto, including drafts of any material filings or responses to be made to such patent offices, within a reasonable amount of time in advance of submitting such filings or responses to permit the non-prosecuting party an opportunity to review and comment thereon. The prosecuting party shall consider in good faith, take into account and implement where possible the reasonable comments made by the non-prosecuting party.

(f) Shire Abandonment. If Shire elects not to file a patent application covering any Joint Know-How or Know-How that would be a [***], or elects to cease the prosecution and maintenance of any Joint Patent Right or [***] in any country or as a PCT application (and does not elect to file one or more new patent applications covering the subject matter claimed in such Patent Right), Shire will promptly provide Sangamo with written notice, but not less than 30 days if reasonably practical, before any action is required, and will permit Sangamo, at Sangamo's sole discretion and expense, to file such patent application or continue prosecution or maintenance of such patent application or patent in such country, as applicable.

Upon request from Sangamo, Shire will execute such documents and perform such acts as may be reasonably necessary to permit Sangamo to make such filing or continue such prosecution or maintenance, as applicable, in Shire's name. Notwithstanding the foregoing, if such Patent Right is a [***] that (i) would have been solely owned by Sangamo but for the [***] pursuant to **Subsection 10.1(b)** and is a filing in Australia, Canada, a Major European Country, Japan or the United States, then Shire shall [***], and does hereby [***], effective upon Sangamo's written request, to Sangamo all of Shire's right, title and interest in such [***] in such jurisdiction or (ii) would have been jointly owned by the Parties but for the [***] pursuant to **Subsection 10.1(b)** and is a filing in Australia, Canada, a Major European Country, Japan or the United States, then Shire shall [***], and does hereby [***], effective upon Sangamo's written request, to Sangamo an undivided one-half interest in such [***] in such jurisdiction. Such [***] shall not, after [***] from Shire to Sangamo pursuant to the preceding sentence, be included in Sangamo Patent Rights if they pertain to Australia, Canada, a Major European Country, Japan or the United States.

(g) Sangamo Abandonment. If Sangamo elects not to file a patent application covering any Joint Know-How, or elects to cease the prosecution and maintenance of any Sangamo Patent Right or Joint Patent Right in any country or as a PCT application (and does not elect to file one or more new patent applications covering the subject matter claimed in such Sangamo Patent Right or Joint Patent Right, as applicable), Sangamo will promptly provide Shire with written notice, but not less than 30 days before any action is required, and will permit Shire, at Shire's sole discretion and expense, to continue prosecution or maintenance of any such Sangamo Patent Right or Joint Patent Right in such country, as applicable, to the extent that no Third Party has a prior right to assume the prosecution or maintenance of such Sangamo Patent Right. Upon request from Shire, Sangamo will execute such documents and perform such acts as may be reasonably necessary to permit Shire to continue such prosecution or maintenance, as applicable.

(h) Patent Term Extensions. In connection with the Marketing Approval of a Shire ZF Product, Shire shall consult with Sangamo before determining which Patent Right, if any, is to be extended, by way, for example, of a Patent Term Restoration and a Supplementary Protection Certificate. Shire shall not have the right to extend in any country (i) a Sangamo Patent Right that is not a [***] or (ii) a Joint Patent Right that is the subject of any such extension for a product other than a Shire ZF Product. Shire shall have the sole discretion to determine whether a Shire Patent Right, a [***] or a [***] is to be extended. Sangamo shall cooperate with Shire to the extent reasonably requested by Shire to effectuate the intent of this **Subsection 10.2(h).**

(i) Orange Book Listing. In connection with the Marketing Approval of a Shire ZF Product, Shire shall have the sole right, in accordance with applicable laws and regulations, to choose whether a patent(s) is to be listed in the Orange Book or in any similar equivalent thereto in the Territory. Sangamo shall cooperate with Shire to the extent reasonably requested by Shire to effectuate the intent of this **Subsection 10.2(i)**.

(j) Third Party Rights. For the avoidance of doubt, Shire's rights under this **Section 10.2** to file, prosecute and maintain any Sangamo Patent Right licensed to Sangamo under a Third Party License may be exercised in Sangamo's name and for the benefit of Sangamo, provided that this **Section 10.2** shall be subject to the terms of such Third Party License.

10.3 Enforcement of Patent Rights.

(a) Notice. If either Shire or Sangamo becomes aware of any infringement, anywhere in the world, of (i) any issued patent within the Sangamo Patent Rights or Joint Patent Rights on account of a Third Party's manufacture, use or sale of a Shire ZF Compound or a Shire ZF Product in the Field, or (ii) any issued patent within the [***] or [***] (an "*Infringement*"), such Party will promptly notify the other Party in writing to that effect.

(b) Enforcement against a Third Party Infringer.

(i) In the case of any Infringement, [***], but not the obligation, to take action to obtain a discontinuance of the Infringement or bring suit against the applicable Third Party (such Third Party, the "*Third Party Infringer*") under the applicable [***] and the [***], within six months from the date of notice and, if with respect to the [***], to join Sangamo as a party plaintiff. Shire shall bear all the expenses of any suit brought by it claiming Infringement of any such Patent Rights. Sangamo shall cooperate with Shire in any such suit as reasonably requested by Shire and at Shire's expense and shall have the right to consult with Shire and to participate in and, if appropriate, be represented by independent counsel in such litigation at its own expense. Shire shall not, without Sangamo's prior written consent, enter into any settlement or consent decree that requires any payment by or admits or imparts any other liability to Sangamo or admits the invalidity or unenforceability of any such Patent Rights, which consent shall not be unreasonably withheld. If Shire has not taken steps to obtain a discontinuance of infringement of such Patent Rights or filed suit against any such Third Party infringer of such Patent Rights within six months from the date of notice of Infringement, then Sangamo shall have the right, but not the obligation, to bring suit against such Third Party Infringer, *provided,* that Sangamo shall bear all the expenses of such suit. Shire shall cooperate with Sangamo in any such suit for infringement of such Patent Rights brought by Sangamo against a Third Party (including joining as a party plaintiff) at Sangamo's request and expense, and shall have the right to consult with Sangamo and to participate in and be represented by independent counsel in such litigation at its own expense. Sangamo shall not, without Shire's prior written consent, which consent shall not be unreasonably withheld, enter into any settlement or consent decree that requires any payment by or admits or imparts any other liability to Shire or admits the invalidity or unenforceability of any such Patent Rights, or adversely impacts Shire's ability to maximize Net Sales or impacts market share of Shire ZF Products. The enforcing Party under this **Subsection 10.3(b)** shall keep the other Party reasonably informed of all material developments in connection with any such suit.

(ii) Any recoveries obtained by either Party as a result of any proceeding against a Third Party Infringer under this **Subsection 10.3(b)** shall be allocated as follows:

(A) Such recovery shall first be used to reimburse the enforcing Party for all out-of-pocket litigation costs in connection with such litigation paid by that Party, and then to reimburse out-of-pocket litigation costs paid by the other Party;

(B) If Shire is the enforcing Party against an Infringement in the Field, with respect to any remaining portion of such recovery, Sangamo shall receive an amount equal to [***]% of such amount, but not more than the amounts that would be payable, pursuant to **Sections 9.3 and 9.4** if the recovery on infringing sales, after reimbursing the Parties under **Subsection 10.3(b)(ii)(A),** were treated as Net Sales of a Shire ZF Product, and Shire shall receive any remaining portion of such recovery;

(C) If Sangamo is the enforcing Party against an Infringement in the Field, Sangamo shall receive [***]%, and Shire shall receive [***]%, of the remaining portion of such recovery;

(D) For any enforcement against an Infringement outside the Field of an issued patent in the [***] or [***], Sangamo shall receive [***]%[***]% [***].

(c) Other Infringement of Sangamo Patent Rights. If the Infringement of any Sangamo Patent Right does not fall within the category of Infringements covered by **Subsection 10.3(b),** Sangamo shall have the first right, but not the obligation, to take action to obtain a discontinuance of the Infringement or bring suit against the applicable Third Party Infringer under the applicable Sangamo Patent Rights within six months from the date of notice and to join Shire as a party plaintiff. Sangamo shall bear all the expenses of any suit brought by it claiming Infringement of any such Patent Rights. Shire shall cooperate with Sangamo in any such suit as reasonably requested by Sangamo and at Sangamo's expense and shall have the right to consult with Sangamo and to participate in and, if appropriate, be represented by independent counsel in such litigation at its own expense. Sangamo shall not, without Shire's prior written consent, enter into any settlement or consent decree that requires any payment by or admits or imparts any other liability to Shire or admits the invalidity or unenforceability of any such Patent Rights, which consent shall not be unreasonably withheld. If Sangamo has not taken steps to obtain a discontinuance of infringement of such Patent Rights or filed suit against any such Third Party infringer of such Patent Rights within six months from the date of notice of Infringement, then upon Sangamo's written consent (not to be unreasonably withheld), Shire shall have the right, but not the obligation, to bring suit under such Sangamo Patent Rights against such Third Party Infringer, provided, that Shire shall bear all the expenses of such suit. Sangamo shall cooperate with Shire in any such suit for infringement of such Patent Rights brought by Shire against a Third Party (including joining as a party plaintiff) at Shire's expense, and shall have the right to consult with Shire and to participate in and be represented by independent counsel in such litigation at its own expense. Shire shall not, without Sangamo's prior written consent, which consent shall not be unreasonably withheld, enter into any settlement or consent decree that requires any payment by or admits or imparts any other liability to Sangamo or admits the invalidity or unenforceability of any such Patent Rights. The enforcing Party under this **Subsection 10.3(c)** shall keep the other Party reasonably informed of all material developments in connection with any such suit.

(i) Any recoveries obtained by either Party as a result of any proceeding against a Third Party Infringer under this **Subsection 10.3(b)** shall be allocated as follows:

(A) Such recovery shall first be used to reimburse the enforcing Party for all out-of-pocket litigation costs in connection with such litigation paid by that Party, and then to reimburse out-of-pocket litigation costs paid by the other Party;

(B) If Shire is the enforcing Party, with respect to any remaining portion of such recovery, Sangamo shall receive an amount equal to [***] of such amount, but not more than the amounts that would be payable, pursuant to **Sections 9.3 and 9.4** if the recovery on infringing sales, after reimbursing the Parties under **Subsection10.3(c)(i)(A)**, were treated as Net Sales of a Shire ZF Product, and Shire shall receive any remaining portion of such recovery;

(C) If Sangamo is the enforcing Party, Sangamo shall receive [***], and Shire shall receive [***], of the remaining portion of such recovery.

(ii) Third Party Rights. For the avoidance of doubt, with respect to any Sangamo Patent Right licensed to Sangamo by a Third Party, Shire's rights under this **Subsection 10.3(c)** may be exercised in Sangamo's name, provided that Shire's rights under this **Subsection 10.3(c)** shall be subject to the rights of such Third Party to enforce such Sangamo Patent Right and to receive a portion of any recoveries obtained as a result of any proceeding against a Third Party Infringer under such Sangamo Patent Right.

(d) Other Infringement of Joint Patent Rights. With respect to any Third Party infringement of any Joint Patent Right, other than in the case of a Joint Patent Right subject to **Subsection 10.3(b)** above, each Party shall promptly notify the other Party of such infringement and the Parties shall meet as soon as reasonably practicable thereafter to discuss such infringement and determine an appropriate course of action. Unless the Parties agree to jointly address such infringement, if the infringement relates to ZF Compounds or ZF Products or their manufacture, delivery or use, Sangamo shall have the first right but not the obligation, and if the infringement does not relate to ZF Compounds or ZF Products, Shire shall have the first right but not the obligation, to bring an action against such Third Party infringer or otherwise address such alleged infringement within six months from the date of notice and to control such litigation or other means of addressing such infringement. If, after the expiration of the six month period (or, if earlier, the date upon which the Party with the first right provides written notice that it does not plan to bring suit), the Party with the first right has not obtained a discontinuance of infringement of such Joint Patent Right or filed suit against any such Third Party infringer of such Joint Patent Right, then the other Party shall have the right, but not the obligation, to bring suit against such Third Party infringer of such Joint Patent Right, *provided,* that such other Party shall bear all the expenses of such suit. In any suit under this **Subsection 10.3(d)**, the non-enforcing Party shall cooperate with the enforcing Party, at the enforcing Party's request and expense, in any such suit and shall have the right to consult with the enforcing Party and to participate in and be represented by independent counsel in such litigation at its own expense. Any recoveries obtained by either Party as a result of any such proceeding against a Third Party infringer shall be allocated as follows:

(i) Such recovery shall first be used to reimburse each Party for all litigation costs in connection with such litigation paid by that Party; and

(ii) With respect to any remaining portion of such recovery, the enforcing Party shall receive an amount equal to [***] of such amount, and the other Party shall receive the remaining [***] of such amount, and if the Parties brought such proceeding jointly, such remaining portion shall be shared [***] to each Party.

10.4 Infringement and Third Party Licenses.

(a) Existing Third Party Licenses. Notwithstanding anything suggesting the contrary in this **Section 10.4**, Sangamo shall be solely responsible for all payments respecting Existing Third Party Licenses, except as provided in **Sections 7.1(b)(vi), 9.4 and 9.5**.

(b) Infringement of Third Party Patents; Course of Action. If the conduct of the Research Program or the development, manufacture or commercialization in the Field of any Shire ZF Compound or Shire ZF Product is alleged by a Third Party to infringe a Third Party's patent or other intellectual property rights, the Party becoming aware of such allegation shall promptly notify the JSC (or, if after the Research Term, the other Party). If either Party believes that, based upon its review of a Third Party's patent or patent application or other intellectual property rights (collectively, "*Third Party IP Rights*"), it is Necessary to Obtain a License under such Third Party IP Rights, such Party shall promptly notify the JSC (or, if after the Research Term, the other Party) of such determination. The JSC, or if after the Research Term, the Parties, shall promptly schedule and hold a meeting to discuss such Third Party IP Rights. "*Necessary to Obtain a License*" as used herein means, with respect to Third Party IP Rights, that [***] that such [***] (1) for which [***] pursuant to a Research Plan or (2) for which [***] The[***] shall make a determination whether it is [***] Such licensing negotiations shall be handled solely [***] unless, at the time that the JSC decided that it is [***] Shire had [***]

(c) Sangamo Rights. If the [***] that is the subject of a Research Plan that it is [***] and that it is [***] then Sangamo shall have the[***] For the avoidance of doubt, the[***] Such license shall not be [***] Such license, once obtained by Sangamo, shall be deemed [***] to the extent falling within [***] will be sublicensed to Shire only if: (i) Sangamo [***] (ii) Sangamo and Shire agree [***] and (iii) Shire provides Sangamo with [***] in which (1) Shire consents to [***] (2) Shire agrees to make [***] and (3) Shire acknowledges in writing that [***] Respecting all Third Party Licenses pursuant to which [***] shall have the right to [***]%[***] *except* that [***] (A) by more than [***]%[***] or (B)(i) if such [***] that is less than the [***] and (ii) if such [***] to an amount that is less than [***]% [***] Illustrative examples of the application of this **Subsection 10.4(c)** are set forth in [***] Such examples are provided solely for the purposes of clarifying the intended application of this **Subsection 10.4(c).** The Parties acknowledge that the hypothetical assumptions upon which such examples are based may not ever happen and should not be interpreted as reflecting any expectations of the Parties regarding such matters. For the avoidance of doubt, for any [***] pursuant to this **Subsection 10.4(c)**, [***].

(d) Shire Rights.

(i) (a) If Sangamo fails to [***] within [***] appropriate time during the Research Term to[***] or (b) [***] Shire shall have the right[***] provided that Shire shall notify Sangamo [***] Shire shall provide Sangamo with a[***] If practical, such agreement shall [***].

(ii) [***] shall [***] due under the terms of the [***] except that [***] shall be [***], provided that [***] under this **Section 10.4** [***] (A) if such [***] **Subsections 10.4(c) and 10.4(e)**) on account of the event giving rise to such Milestone Payment and (B) if such [***].

(iii) Respecting all other Third Party IP Rights licensed by Shire pursuant to this **Subsection 10.4(d)**, Shire shall have the right to[***]%[***] *except* that such [***] under this **Section 10.4** [***] does not reduce [***] (A) by [***]%[***] or (B)(i) if such [***] (excluding those amounts payable by Shire to Sangamo [***] and (ii) if such payment is a [***] For the avoidance of doubt, for any non-royalty payments that Shire makes with respect to a Shire ZF Product under the terms of any license agreement with a Third Party entered into pursuant to this **Subsection 10.4(d)**, other than [***] Shire shall have the right to [***].

(e) If Sangamo obtains during the Term a license from a Third Party, other than [***] that fall within the scope of the [***] then Sangamo shall notify Shire[***] Such license agreement shall be deemed [***] to the extent falling within the [***] only if: (i) Sangamo [***] to the extent applicable to the [***], (ii) if any [***] as a result of Sangamo's [***] Sangamo and Shire agree in writing to an [***] with respect to the rights [***] and (iii) [***] in which (1) [***] consents to [***] such license agreement to the definition [***] (2) [***] agrees to [***] and (3) [***] acknowledges [***] shall have the right to [***]%[***], *except* that [***] (A) by [***], or (B)(i) if [***] and (ii) if [***] For the avoidance of doubt, for any [***] with respect to [***].

(f) For the avoidance of doubt, notwithstanding **Subsections 10.4 (b), (c), and (d),** either Party may [***] In addition, either Party may [***] which are useful, but which are [***] except that, [***] other than through the [***] In addition, [***] agrees that during the period from the Effective Date until [***] will not [***] other than in accordance with **Subsection 10.4(d).**

(g) Third Party Infringement Suit. If a Third Party sues a Party or any of such Party's Affiliates or any Sublicensees (each Person so sued being referred to herein as a "*Sued Party*"), alleging that the conduct by either Party of the Research Program or the development, manufacture or commercialization of any Shire ZF Compound or Shire ZF Product related to a Shire Target in the Shire Exclusive Target Pool pursuant to this Agreement infringes or will infringe such Third Party's intellectual property, then if the Sued Party is entitled to indemnification pursuant to **Article 12** on account of such suit, then the terms and conditions of **Article 12** and not this **Subsection 10.4(g)** shall apply to such suit. If the Sued Party is not entitled to indemnification pursuant to **Article 12** on account of such suit, then this **Subsection 10.4(g)** shall apply to suit. Upon the Sued Party's request and in connection with the Sued Party's defense of any such Third Party infringement suit, the other Party shall provide reasonable assistance to the Sued Party for such defense, at the Sued Party's expense. The Sued Party shall keep the other Party reasonably informed of all material developments in connection with any such suit and shall not, 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. In the event that Shire is the Sued Party, Shire shall have the right to offset [***] of (i) all costs incurred by Shire in defending the suit, (ii) all damages awarded in the suit, and (iii) all payments made by Shire for the purposes of resolving the dispute against Milestone Payments and Royalty Payments due under this Agreement for the applicable Shire ZF Product, *except* that such offset shall be decreased (or eliminated) so that the combined effect of offsets under this **Section 10.4** and royalty reductions under **Subsection 9.4(iii)** does not reduce any payment due to Sangamo for a particular Shire ZF Product (A) by more than [***] from the amount that would otherwise be owed to Sangamo without taking into account such offsets and royalty reductions, or (B)(i) if such payment is a Milestone Payment, to an amount that is less than the aggregate amounts due under all Third Party Licenses (excluding those amounts paid by Shire to Sangamo pursuant to **Section 9.7** in accordance with **Subsections 10.4(c)** or **10.4(e)**) on account of the event giving rise to such Milestone Payment and (ii) if such payment is a Royalty Payment, to an amount that is less than the aggregate amounts due under all Third Party Licenses (excluding those amounts paid by Shire to Sangamo pursuant to **Section 9.7** in accordance with **Subsections 10.4(c)** or **10.4(e)**) on account of the Net Sales giving rise to such Royalty Payment plus [***] of such Net Sales.

10.5 Declaratory Judgment Actions by Third Party.

(a) Shire's Rights. If a Third Party brings a declaratory judgment suit against Shire with respect to [***], [***], Joint Patent Rights or any other Patent Rights owned or controlled by Shire, then Shire shall have the sole right, but not the obligation, to control the defense of such suit. Sangamo shall cooperate with Shire in any such suit as reasonably requested by Shire and at Shire's expense. If the suit involves a [***], [***], or Joint Patent Right, then Sangamo also shall have the right to consult with Shire, and to participate in and be represented by independent counsel in such litigation at its own expense. Shire shall not, without Sangamo's prior written consent, enter into any settlement or consent decree that requires any payment by or admits or imparts any other liability to Sangamo or admits the invalidity or unenforceability of any Sangamo Patent Rights, Joint Patent Rights, or [***], which consent shall not be unreasonably withheld.

(b) Sangamo's Rights. If a Third Party brings a declaratory judgment suit against Sangamo respecting the Sangamo Patent Rights or Joint Patent Rights, then Sangamo shall have the sole right, but not the obligation, to control the defense of such suit. Shire shall cooperate with Sangamo in any such suit as reasonably requested by Sangamo and at Sangamo's expense, and Shire shall have the right to consult with Sangamo and to participate in and, if appropriate, be represented by independent counsel in such litigation at its own expense in the event the loss of such Patent Rights would adversely impact Shire's ability to maximize Net Sales or impact market share of a Shire ZF Product. Sangamo shall not, without Shire's prior written consent, enter into any settlement or consent decree that requires any payment by or admits or imparts any other liability to Shire or admits the invalidity or unenforceability of any Sangamo Patent Rights, Joint Patent Rights, or [***], which consent shall not be unreasonably withheld.

(c) Other Rights. If a Third Party brings a declaratory judgment suit against Shire with respect to Sangamo Patent Rights that are not [***], then Sangamo shall have the first right, but not the obligation, to control the defense of such suit with respect to such Sangamo

Patent Rights. If Sangamo exercises such right, then Shire shall cooperate with Sangamo in any such suit as reasonably requested by Sangamo and at Sangamo's expense. Shire shall have the right to consult with Sangamo and to participate in and be represented by independent counsel in such litigation at its own expense. Sangamo shall not, without Shire's prior written consent, enter into any settlement or consent decree that requires any payment by or admits or imparts any other liability to Shire or admits the invalidity or unenforceability of any Sangamo Patent Rights, which consent shall not be unreasonably withheld. If Sangamo informs Shire that Sangamo does not intend to exercise its first right to control the defense of such suit, then Shire shall control the defense of such suit and Sangamo shall cooperate with Shire in any such suit as reasonably requested by Shire and at Shire's expense. With respect to such Sangamo Patent Rights, Sangamo shall have the right to consult with Shire and to participate in and be represented by independent counsel in such litigation at its own expense. Shire shall not, without Sangamo's prior written consent, enter into any settlement or consent decree that requires any payment by or admits or imparts any other liability to Sangamo or admits the invalidity or unenforceability of any Sangamo Patent Rights, Joint Patent Rights or [***], which consent shall not be unreasonably withheld.

10.6 Interference, Opposition, Revocation and Declaratory Judgment Actions by Parties. If the Parties mutually determine that, based upon the review of a Third Party's patent or patent application or other intellectual property rights and subject to applicable laws and regulations, it may be desirable in connection with a Shire ZF Compound or a Shire ZF Product to provoke or institute an interference, opposition, revocation or declaratory judgment action with respect thereto, then the Parties shall consult with one another and shall reasonably cooperate in connection with such an action. Unless otherwise agreed to by the Parties, if the Third Party patent or patent application covers a Shire Target or the making, using or selling in the Field of a Shire ZF Compound or Shire ZF Product, then in connection with an opposition, revocation or declaratory judgment action Shire may, at its discretion, control such action and select counsel for such action. Shire shall be responsible for, and shall bear, all the out-of-pocket expenses of any such action brought by Shire. If the Third Party patent or patent application is otherwise directed to the Sangamo Licensed Technology, Sangamo may, at its discretion, control such action and select counsel for such action. Sangamo shall be responsible for, and shall bear, all the out-of-pocket expenses of any such action brought by Sangamo. Unless otherwise agreed to by the Parties, in connection with an interference, the Party responsible for prosecuting the patent application involved in the interference may, at its discretion, control such action and select counsel for such action, and shall be responsible for and bear all the out-of-pocket expenses of, any such action. The prosecuting party shall consider in good faith, take into account and implement where possible the reasonable comments made by the non-prosecuting Party.

11 CONFIDENTIALITY

11.1 Confidentiality. During the Term and for [***] years thereafter, each Party shall maintain in confidence the Confidential Information of the other Party, shall not use or grant the use of the Confidential Information of the other Party except as expressly permitted under this Agreement (which includes the exercise of any rights or the performance of any obligations hereunder), and shall not disclose the Confidential Information of the other Party except on a need-to-know basis to such Party's directors, officers and employees, and to such Party's

consultants working on such Party's premises or Subcontractors, to the extent such disclosure is necessary in connection with such Party's activities as expressly authorized by this Agreement. To the extent that disclosure to any person is authorized by this Agreement (including Subcontractors as described in **Section 3.5**), prior to disclosure, a Party shall obtain, or shall have obtained prior to the date of this Agreement, written agreement of such person to hold in confidence and not disclose, use or grant the use of the Confidential Information of the other Party except as expressly permitted under this Agreement. Each Party shall notify the other Party promptly upon discovery of any unauthorized use or disclosure of the other Party's Confidential Information.

11.2 Terms of Agreement. Neither Party shall disclose any terms or conditions of this Agreement to any Third Party without the prior written consent of the other Party; *provided*, that a Party may disclose the terms or conditions of this Agreement, (a) on a need-to-know basis to its legal and financial advisors to the extent such disclosure is reasonably necessary in connection with such Party's activities as expressly permitted by this Agreement, and (b) to a Third Party in connection with: (i) an equity investment in or by, or underwriting by, such Third Party, (ii) a merger, consolidation or similar transaction involving such Third Party, or (iii) the sale of all or substantially all of the assets of the Party to such Third Party; *provided, further*, that such Party shall make such disclosure only under appropriate conditions of confidentiality by the Third Party. Notwithstanding the foregoing, Sangamo may disclose the terms and conditions of this Agreement to the extent that such disclosure is required pursuant to the terms of any Third Party License, provided that the licensor of such Third Party License is bound by a confidentiality obligation reasonably acceptable to Shire. Shire acknowledges that the licensors of all Existing Third Party Licenses are bound by confidentiality obligations reasonably acceptable to Shire.

11.3 Permitted Disclosures. Notwithstanding **Sections 11.1 and 11.2**, each Party may disclose Confidential Information of the other Party to the extent required by applicable law, regulation or order of a governmental agency or a court of competent jurisdiction, or in prosecuting or defending litigation; *provided*, that such Party shall provide advance written notice thereof (to the extent practicable) to the other Party, consult with the other Party with respect to such disclosure, use reasonable efforts to minimize the amount of information necessary to be disclosed and provide the other Party sufficient opportunity to object to any such disclosure or to request confidential treatment thereof. Notwithstanding **Sections 11.1 and 11.2**, Sangamo may disclose Confidential Information of Shire to the extent required by any Third Party License, provided that the licensor of such Third Party License is bound by a confidentiality obligation reasonably acceptable to Shire. Shire acknowledges that the licensors of all Existing Third Party Licenses are bound by confidentiality obligations reasonably acceptable to Shire. The Parties acknowledge that either or both Parties may be obligated to file a copy of this Agreement with the SEC or other government authorities. Each Party shall be entitled to make such a required filing subject to the provisions of this **Section 11.3**, provided that any request by the other Party to redact information is consistent with the legal requirements governing redaction of information from material agreements that must be publicly filed.

11.4 Confidentiality and Disclosure Agreement. The terms of the CDA, attached hereto as **Schedule 11.4**, are incorporated herein by reference. To the extent there are any conflicts between this Agreement and the CDA, this Agreement shall control.

11.5 Press Release and Publications. On or after the Effective Date, the Parties shall issue a joint press release relating to this Agreement in the mutually agreed upon form set forth in **Schedule 11.5**. Any other press release, public announcement, presentation or publication (including abstracts, posters, or other scientific publications) that Sangamo proposes to present or issue specifically regarding this Agreement or any of the activities performed hereunder or data arising therefrom, must be agreed upon by Shire in advance of its release, with at least [***] days notice by the disclosing Party prior to any submission for publication. Sangamo shall not be required to seek the permission of Shire to repeat any such information that has already been publicly disclosed by Sangamo in accordance with this **Section 11.5**, provided such information remains accurate as of such time. Notwithstanding the foregoing, Sangamo shall have the right to issue press releases without the prior consent of Shire, that disclose any information required by the rules and regulations of the United States Securities and Exchange Commission or similar federal, state or foreign authorities, as determined in good faith by independent legal counsel to the disclosing Party, subject to **Section 11.3** and provided that Sangamo shall use reasonable efforts to give Shire prior notice of the content and timing of such press release. Shire shall provide Sangamo with notice of any intent to terminate this Agreement, whether in its entirety or with respect to a Shire Target, prior to issuing a press release about such intent.

12 INDEMNIFICATION

12.1 Sangamo. Sangamo shall indemnify, defend and hold harmless Shire and its Affiliates and Sublicensees, and each of its respective directors, officers, employees and agents (collectively "*Shire Indemnified Party*"), 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 material breach of any representation, warranty or covenant by Sangamo under this Agreement; (b) the practice by Sangamo of the licenses granted by Shire, (c) the development, clinical testing, manufacture, use, handling, storage, distribution, marketing, promotion or sale of any ZF Compound or ZF Product by Sangamo, its Affiliates or licensees, as licensed and/or granted to Sangamo pursuant to **Sections 3.10 and 14.5** (including any such Liabilities arising out of or alleged to arise out of any ZF Compound or ZF Product manufactured, sold or distributed by or for Sangamo, its Affiliates or licensees or any violation of law by Sangamo, its Affiliates or licensees); (d) the recklessness, negligence or intentional misconduct of any Sangamo Indemnified Party or licensees; (e) the practice by Sangamo, its Affiliates or licensees of the Sangamo Licensed Technology, and (f) the breach by Sangamo of any Third Party license (other than such breach caused directly by the act or omission of Shire); except, in each case ((a), (b), (c) (d), (e) and (f)), to the extent (i) caused by the gross negligence or intentional misconduct of any Shire Indemnified Party or a breach by Shire of any of its representations, warranties or covenants set forth in this Agreement or (ii) associated with any claim of patent infringement of Third Party intellectual property rights based on activity conducted by Sangamo at the JSC's direction, notwithstanding Sangamo's objection to conducting such activity based on intellectual property concerns, as a result of Shire's exercise of its final decision making authority.

12.2 Shire. Shire shall indemnify, defend and hold harmless Sangamo and its Affiliates, and each of its respective directors, officers, employees and agents (collectively "*Sangamo Indemnified Party*"), 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 material

breach of any representation, warranty or covenant by Shire under this Agreement; (b) the practice of the licenses granted by Sangamo or the development, clinical testing, manufacture, use, handling, storage, distribution, marketing, promotion or sale of Shire ZF Compounds, Shire [***] or Shire ZF Products by Shire, its Affiliates or Sublicensees (including any such Liabilities arising out or alleged to arise out of any Shire ZF Product manufactured, sold or distributed by or for Shire, its Affiliates or Sublicensees or any violation of law by Shire, its Affiliates or Sublicensees); (c) any claim of infringement or misappropriation of Third Party intellectual property rights with respect to performance of the Research Program in accordance with a Research Plan that was approved as a result of Shire's exercise of its final decision-making authority; or (d) the recklessness, negligence or intentional misconduct of any Shire Indemnified Party; except, in each case ((a), (b), (c) and (d), to the extent caused by the gross negligence or intentional misconduct of any Sangamo Indemnified Party or a breach by Sangamo of any of its representations, warranties or covenants set forth in this Agreement.

12.3 Procedure. If a Party (the "*Indemnitee*") intends to claim indemnification under this **Article 12**, it shall promptly notify the other Party (the "*Indemnitor*") in writing of any claim, demand, action or other proceeding for which the Indemnitee intends to claim such indemnification, and the Indemnitor shall have the right to participate in, and, to the extent the Indemnitor so desires, to assume the defense thereof with counsel of its choice, which counsel shall be reasonably acceptable to the Indemnitee; *provided* that an Indemnitee shall have the right to retain its own counsel at its expense. Further, the obligations of this **Article 12** shall not apply to amounts paid in settlement of any claim, demand, action or other proceeding if such settlement is effected without the consent of the Indemnitor, which consent shall not be unreasonably withheld, conditioned, or delayed. The Indemnitor shall not settle any claim, demand, action or other proceeding without the prior written consent of the Indemnified Party, not to be unreasonably withheld, conditioned or delayed, unless the settlement involves only the payment of money. The failure to deliver written notice to the Indemnitor within a reasonable time after the commencement of any such action, to the extent prejudicial to its ability to defend such action, shall relieve the Indemnitor of any obligation to the Indemnitee under this **Article 12**. The Indemnitee, its employees and agents, shall reasonably cooperate with the Indemnitor and its legal representatives in the investigation of any claim, demand, action or other proceeding covered by this **Article 12**.

13 INSURANCE

13.1 Insurance.

(a) Shire. During the Research Term (and for a tail period of five years thereafter) and for so long as Shire develops or sells Shire ZF Products anywhere in the world (and for a tail period of five years thereafter), Shire shall, at its expense, maintain (i) comprehensive General Liability insurance covering death and bodily injury and property damage, in a combined single limit of not less than [***], which policy shall include coverage for products liability and blanket contractual liability applicable to this Agreement; and (ii) Workers' Compensation insurance including Employers Liability limit of not less than $500,000 per accident or disease. All of the insurance policies required under this **Subsection 13.1(a)** shall be underwritten by insurers having a A.M. Best's Rating of A-VII or higher.

(b) Sangamo. During the Research Term and for a tail period of five years thereafter, Sangamo shall, at is expense, maintain commercial general liability insurance with reputable and financially secure insurance carriers to cover its indemnification obligations under **Section 12.1** with limits of not less than [***] per occurrence and in the aggregate. All of the insurance policies required under this **Subsection 13.1(b)** shall be underwritten by insurers having a A.M. Best's Rating of A-VII or higher.

13.2 Certificates of Insurance. At the request of a Party, the other Party shall furnish proof of all insurance coverages outlined in this **Article 13** in the form of insurance certificates reasonably acceptable to the other Party. Each Party shall provide the other Party with written notice at least thirty (30) days prior to the cancellation, non-renewal or material change in such insurance or self-insurance which materially adversely affect the rights of the other Party hereunder.

14 TERM; TERMINATION; EFFECTS OF TERMINATION

14.1 Term. Unless earlier terminated as provided herein, the term of this Agreement shall commence on the Effective Date and shall continue until such time as all payment obligations with respect to all Shire ZF Products expire (the "*Term*").

14.2 Termination for Breach. Failure by a Party to comply with any of its material obligations contained herein shall entitle the Party not in default to give to the Party in default notice specifying the nature of the default, requiring it to make good or otherwise cure such default, and stating its intention to terminate if such default is not cured. If such default is not cured within 90 days after the receipt of such notice (or within thirty (30) days after the receipt of such notice in the event such default is solely based upon a Party's failure to pay any amounts due hereunder), the Party not in default shall be entitled, without prejudice to any of its other rights conferred on it by this Agreement, and in addition to any other remedies available to it by law or in equity, to terminate this Agreement in whole or in part as appropriate; *provided*, that any right to terminate under this **Section 14.2** shall be stayed in the event that, during such cure period, the Party alleged to have been in default shall have initiated dispute resolution in good faith in accordance with **Section 15.2** with respect to the alleged default, which stay shall last so long as the initiating Party diligently and in good faith cooperates in the prompt resolution of such dispute resolution proceedings. [***].

14.3 Termination for Insolvency. This Agreement may be terminated by either Party upon notice to the other should the other Party: (a) consent to the appointment of a receiver or a general assignment for the benefit of creditors or (b) file or consent to the filing of a petition under any bankruptcy or insolvency law or have any such petition filed against it which has not been stayed within 60 days of such filing.

14.4 Termination by Shire. In addition to the termination provisions set forth in **Section 3.10**, beginning 24 months from the Effective Date, Shire may terminate this Agreement in whole or in part on a Target-by-Target basis, effective upon at least ninety (90) days prior written notice, provided that any termination of a Shire Target (and not the entire Agreement) during Sangamo's conduct of the Research Plan for such Shire Target shall be deemed a Shire Unilateral Target Termination under **Section 3.10** and shall be subject to the terms thereof.

14.5 Effect of Expiration or Termination.

(a) By Sangamo under **Sections 14.2 or 14.3** or by Shire under **Section 14.4**. If this Agreement is terminated by Sangamo (in its entirety or with respect to one or more Shire Targets) under **Sections 14.2 or 14.3,** or if this Agreement is terminated by Shire in its entirety or with respect to one or more Shire Targets under **Section 14.4,** in addition to any remedy available at law, then:

(i) Upon termination of this Agreement, whether in its entirety or for one or more Shire Targets, all licenses and obligations with respect to the applicable Terminated Target(s), including all ZF Compounds and ZF Products directed to or developed with respect to such Terminated Target(s), shall terminate;

(ii) All Terminated Targets shall be removed from the Shire Exclusive Target Pool and shall no longer be Shire Targets;

(iii) Upon receipt of notice of termination, the provisions of **Subsection 3.10(c)** (including without limitation **Subsection 3.10(c)(iv)**) shall apply as to all Terminated Target(s);

(iv) Shire shall assign to Sangamo any IND/CTA previously assigned by Sangamo to Shire;

(v) To the extent requested by Sangamo, respecting any Shire ZF Product related to each such Terminated Target for which Shire has obtained Marketing Approval and respecting all Shire ZF Products related to each such Terminated Target for which Shire has conducted clinical development but not obtained Marketing Approval (other than Shire ZF Products whose clinical development Shire terminated for safety reasons) ("*Terminated Products*"), the Parties shall negotiate, in good faith, an agreement on commercially reasonable terms, which terms shall include, [***].

(A) Assignment by Shire to Sangamo of all Marketing Approvals and other regulatory filings in respect of the Terminated Products;

(B) Grant by Shire to Sangamo of a worldwide right and license, with the right to sublicense through multiple tiers in any country, such grant to sublicense only in conjunction with a sub-license or assignment of the applicable Terminated Product(s), under all intellectual property rights Controlled by Shire and its Affiliates at the time of notice of termination that are necessary to develop, manufacture, sell, offer to sell, import and otherwise commercialize such Terminated Product(s) as they exist at the time of notice of termination (such intellectual property, the "*Shire Licensed IP*"), provided that such agreement shall include, if the license is non-exclusive, a covenant by Shire not to practice or license such licensed intellectual property within the scope of the license granted to Sangamo. Notwithstanding anything to the contrary in this Agreement, if Shire or its Affiliates is protecting any Know-How within such intellectual property rights as a trade secret, then Shire shall not be required to [***], provided that [***] agrees, as part of the terms of such agreement, to conduct or have conducted those activities necessary [***] By way of example, if [***] the terms shall include [***] Such negotiation shall take into consideration,[***] or if Shire made [***] and if

Sangamo has requested a [***] the amounts of such payments, to the extent applicable to the [***] that Shire was entitled to [***] In addition, for the avoidance of doubt, [***] shall not have the right to any [***] after the notice of termination; provided, however, that the Shire Licensed IP will include [***].

(C) In the event that the Parties are unable to agree upon a commercially reasonable terms within [***] days of Sangamo's election, then the Parties shall submit the determination of [***] to an independent arbitrator agreed upon by Parties who has significant relevant experience in the [***] If the Parties do not agree on an arbitrator within [***] days after the termination of the [***] day period immediately following Sangamo's election, then either Party may request that JAMS appoint an arbitrator with such experience on behalf of the Parties in accordance with JAMS' Comprehensive Arbitration Rules & Procedures then in effect, except that the Parties expressly agree that any arbitration pursuant to this **Subsection 14.5(a)(v)(C)** shall be [***] The date on which such arbitrator is selected or appointed will be the "*Section 14.5 Arbitration Commencement Date*". The arbitration shall be conducted under the JAMS Rules, to the extent consistent with this **Subsection 14.5(a)(v)(C).** Within [***] business days after the Section 14.5 Arbitration Commencement Date, each Party will prepare and deliver to both the arbitrator and the other Party its proposed terms for the license or acquisition of the applicable data and/or intellectual property rights (the "*Section 14.5 Proposal*"), along with a memorandum (the "*Section 14.5 Support Memorandum*") in support thereof; provided that unless the Parties agree otherwise in writing in advance, neither Section 14.5 Proposal may include an upfront payment from Sangamo to Shire. The arbitrator will also be provided with a copy of this Agreement. Within [***] business days after receipt of the other Party's Section 14.5 Support Memorandum, each Party may submit to the arbitrator (with a copy to the other Party) a rebuttal to the other Party's Section 14.5 Support Memorandum. Neither Party may have communications (either written or oral) with the arbitrator other than for the sole purpose of engaging the arbitrator or as expressly permitted in this **Subsection 14.5(a)(v)(C)** or as directed by the arbitrator. Within [***] days after the Section 14.5 Arbitration Commencement Date, the arbitrator will select from the two Section 14.5 Proposals provided by the Parties the Section 14.5 Proposal that he or she believes most accurately reflects [***] provided that, for the avoidance of doubt, in no circumstance will [***] except for [***] The decision of the arbitrator shall be final and unappealable. Within [***] days of receiving the arbitrator's decision, Sangamo shall notify Shire of its acceptance or rejection of the selected Proposal, [***] Upon Sangamo's acceptance of the selected Section 14.5 Proposal, the [***] Upon rejection of the selected Section 14.5 Proposal, [***] The arbitrator's fees and expenses will be shared equally by the Parties. Each Party shall otherwise bear its own costs.

(vi) At Sangamo's request, Shire shall assign to Sangamo all right, title and interest in and to the trademarks then used by Shire in connection with the commercialization of Terminated Products (excluding any such trademarks that include, in whole or part, any corporate name or logo of Shire or its Affiliate or Sublicensee), provided that Sangamo [***].

(vii) Shire shall, at Sangamo's expense, provide reasonable consultation and assistance for a period of no more than one hundred eighty (180) days for the purpose of transferring or transitioning to Sangamo all Know-How in the Shire Licensed IP not already in Sangamo's possession and, at Sangamo's request, all then-existing commercial arrangements

relating specifically to Terminated Products that Shire is able, using reasonable commercial efforts, to transfer or transition to Sangamo, in each case, to the extent reasonably necessary or useful for Sangamo to commence or continue developing, manufacturing, or commercializing Terminated Products. The foregoing shall include, without limitation, transferring, upon request of Sangamo, any agreements with Third Party suppliers or vendors that specifically cover the supply or sale of Terminated Products. If any such contract between Shire and a Third Party is not assignable to Sangamo (whether by such contract's terms or because such contract does not relate specifically to Terminated Products) but is otherwise reasonably necessary or useful for Sangamo to commence or continue developing, manufacturing, or commercializing Terminated Products or if Shire manufactures the Terminated Product itself (and thus there is no contract to assign), then Shire shall reasonably cooperate with Sangamo to negotiate for the continuation of such license and/or supply from such entity, and Shire shall supply such Terminated Product, as applicable, to Sangamo, for a reasonable period (not to exceed twelve (12) months) until Sangamo establishes an alternative, validated source of supply for the Terminated Products. Sangamo shall pay Shire for such supply an amount equal to Shire's cost of supplying, without markup.

(viii) Sangamo shall have the right to purchase from Shire any or all of the inventory of Terminated Products held by Shire as of the date of termination (that are not committed to be supplied to any Third Party or Sublicensee, in the ordinary course of business, as of the date of termination) at a price equal to Shire's actual cost to acquire or manufacture such inventory. Sangamo shall notify Shire within sixty (60) days after the date of termination whether Sangamo elects to exercise such right.

(ix) The rights and obligations of the Parties with respect to all Shire Targets (if any) other than any such Terminated Target shall remain in full force and effect.

(b) Alternative to Termination by Shire under **Section 14.2 or 14.3**.

(i) If Shire has the right to terminate this Agreement with respect to one or more Shire Targets pursuant to **Section 14.2 or 14.3,** on account of a Sangamo's material breach, then in addition to any remedies available at law, Shire may by notice to Sangamo keep the Agreement in effect but (1) if such material breach was not a Fundamental Sangamo Breach, reduce the Milestone Payments due to Sangamo in respect of such one or more Terminated Targets by [***] and reduce the future Earned Royalties with respect to such Terminated Target by [***] of the amount specified in **Article 9** or (2) if such material breach was a Fundamental Sangamo Breach, reduce the Milestone Payments due to Sangamo in respect of such one or more Terminated Targets by [***] and reduce the future Earned Royalties with respect to such Terminated Target by [***] of the amount specified in **Article 9**. Such reductions shall be credited against any award obtained by Shire on account of such material breach, whether or not such material breach was a Fundamental Sangamo Breach.

(ii) For the purpose of this **Subsection 14.5(b),** *"Fundamental Sangamo Breach"* means a material breach in the performance of Sangamo's obligations under **Subsections 7.1(a), 7.3(a), 8.2, 10.1(b),** and **10.3(b)** of this Agreement that fundamentally frustrates the objectives or transactions contemplated by this Agreement.

(iii) The rights and obligations of the Parties with respect to all Shire Targets (if any) other than any such Terminated Target shall remain in full force and effect.

(c) Survival of Certain Obligations. Expiration or termination of this Agreement shall not relieve the Parties of any obligation that accrued before such expiration or termination. In addition to all other provisions contained in this Agreement that by their terms survive expiration or termination of this Agreement, the following provisions also shall survive expiration or termination of this Agreement: **Article 1**, **Sections 3.7(c), 3.8, 3.10(c), 8.3, 9.9-9.13, 10.1(a)** (excluding the proviso in the first sentence)**, 11.1, 11.2 and 11.3, Article 12, Article 13, Section 14.5, and Article 15.**

15 MISCELLANEOUS

15.1 Governing Law. This Agreement shall be governed by the laws of Delaware without regard to its choice of law principles, *provided,* that the United Nations Convention on Contracts for the International Sale of Goods shall not apply.

15.2 Dispute Resolution. Matters within the authority of the JSC shall be resolved as provided in **Section 4.4**. For matters outside the authority of the JSC:

(a) Notice of Dispute. The Parties recognize that a bona fide dispute as to certain matters may from time to time arise during the term of this Agreement that relates to either Party's rights and/or obligations hereunder. In the event of any dispute between the Parties with respect to any matter relating to this Agreement, one Party may provide the other Party with a notice of dispute.

(b) Upon a Party's receipt of a notice of dispute, the Parties shall first use their good faith efforts to resolve such dispute among themselves without resorting to Executive Resolution.

(c) Executive Resolution. In the event that such dispute is not resolved within thirty (30) days of providing a notice of dispute, the dispute shall be taken to the Chief Executive Officer or an Executive Vice President of Sangamo and a Senior Vice President of Shire for resolution. If these individuals are unable to resolve the dispute within thirty (30) days of the request for such meeting, then the Parties shall be free to pursue any avenue available to them under law or equity to resolve the dispute.

15.3 Assignment. Neither this Agreement nor any right or obligation hereunder may be assigned or delegated, in whole or part, by either Party without the prior express written consent of the other, which consent shall not be withheld unreasonably; *provided,* that either Party may assign or delegate any right or obligation hereunder, in whole or in part, to any of its Affiliates so long as such entity remains an Affiliate; provided, however, that the assigning Party shall remain liable for its obligations hereunder to the extent not fulfilled by assignee. Either Party may assign this Agreement in its entirety to a successor in interest in connection with a Change of Control of such Party. **Sections 4.6 and 7.3** shall be applicable upon a Change of Control of Sangamo. Any permitted assignee shall assume all obligations of its assignor under this Agreement, and any permitted assignment shall be binding on the successors of the assigning Party. Any purported assignment in violation of this **Section 15.3** shall be void.

Notwithstanding the foregoing, Sangamo shall not assign or delegate any right or obligation in full or in part to an Affiliate incorporated in Switzerland without Shire's prior written consent, which Shire shall not unreasonably withhold, other than in connection with a Change of Control. For the avoidance of doubt, a disadvantageous tax implication for Shire constitutes a reasonable reason to withhold consent.

15.4 Independent Contractors. The relationship of the Parties hereto is that of independent contractors. Neither Party hereto shall be deemed to be the agent, partner or joint venturer of the other for any purpose as a result of this Agreement or the transactions contemplated thereby.

15.5 Further Actions. Each Party agrees to execute, acknowledge and deliver such further documents and instruments and to perform all such other acts as may be necessary or appropriate in order to carry out the purposes and intent of this Agreement.

15.6 Notices. All requests and notices required or permitted to be given to the Parties hereto shall be given in writing, shall expressly reference the section(s) of this Agreement to which they pertain, and shall be delivered to the other Party by mail, any commercial delivery service or by facsimile transmission, in all cases with confirmation of receipt and with delivery to be effective on receipt, at the appropriate address as set forth below or to such other addresses as may be designated in writing by the Parties from time-to-time during the Term.

If to Shire:

Shire AG
Batiment 1
Business Park Terre Bonne
Chemin de Terre Bonne
Eysins 1262
Vaud
Switzerland
Att: Legal Department
Fax: 44 1256 894710

Copy to:

Shire Human Genetic Therapies, Inc.
300 Shire Way
Lexington, MA 02421
Att: Legal Department
Fax: 781-482-2918

If to Sangamo:

Sangamo BioSciences, Inc.
Point Richmond Tech Center II
501 Canal Boulevard, Suite A100
Richmond, California 94804
Att: Chief Executive Officer
Fax: 510-236-8951

Copy to:

Cooley LLP
3175 Hanover Street
Palo Alto, CA 94304
Att: Marya A. Postner, Esq.
Fax: 650-849-7400

15.7 Force Majeure. Nonperformance of a Party (other than for the payment of money) shall be excused to the extent that performance is rendered impossible by strike, fire, earthquake, flood, governmental acts or orders or restrictions, terrorist acts, failure of suppliers, or any other reason where failure to perform is beyond the reasonable control and not caused by the negligence, intentional conduct or misconduct of the nonperforming Party; *provided*, that the nonperforming Party shall use Commercially Reasonable Efforts to resume performance as soon as reasonably practicable.

15.8 No Consequential Damages. IN NO EVENT SHALL A PARTY BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THIS AGREEMENT OR THE EXERCISE OF ITS RIGHTS HEREUNDER, INCLUDING LOST PROFITS ARISING FROM OR RELATING TO ANY BREACH OF THIS AGREEMENT, REGARDLESS OF ANY NOTICE OF SUCH DAMAGES. NOTHING IN THIS **SECTION 15.8** IS INTENDED TO LIMIT OR RESTRICT THE DAMAGES AVAILABLE FOR A BREACH OF **ARTICLE 11** OR THE INDEMNIFICATION RIGHTS OR OBLIGATIONS OF EITHER PARTY UNDER **ARTICLE 12** ABOVE.

15.9 Complete Agreement. This Agreement constitutes the entire agreement between the Parties regarding the subject matter hereof, and all prior representations, understandings and agreements regarding the subject matter hereof, either written or oral, expressed or implied, are superseded and shall be of no effect. The foregoing shall not be interpreted as a waiver of any remedies available to either Party as a result of any breach, prior to the Effective Date, by the other Party of its obligations pursuant to the CDA.

15.10 Counterparts. This Agreement may be executed in counterparts, each of which shall be deemed to be an original and together shall be deemed to be one and the same agreement.

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

15.12 Construction. This Agreement was negotiated and executed in English, and the original language version shall be controlling; all communications and notices hereunder shall be in English. The Parties acknowledge that they have both had the opportunity to negotiate regarding any issues in connection with this Agreement that were of concern to them and,

therefore, expressly waive the benefit of any presumption that ambiguities should be construed in favor of or against either Party. Except where the context otherwise requires, the use of any gender herein shall be deemed to be or include the other genders, the use of the singular shall be deemed to include the plural (and vice versa) and the word "or" is used in the inclusive sense. The words "include", "includes" and "including" shall be deemed to be followed by the phrase "without limitation." The word "will" shall be construed to have the same meaning and effect as the word "shall." Unless the context requires otherwise, (a) any definition of or reference to any agreement, instrument or other document herein shall be construed as referring to such agreement, instrument or other document as from time to time amended, supplemented or otherwise modified (subject to any restrictions on such amendments, supplements or modifications set forth herein), (b) any reference herein to any Person shall be construed to include the Person's successors and assigns, (c) the words "herein", "hereof" and "hereunder", and words of similar import, shall be construed to refer to this Agreement in its entirety and not to any particular provision hereof and (d) all references herein to sections or Exhibits shall be construed to refer to sections or Exhibits of this Agreement.

15.13 Amendment. No amendment, modification or supplement of any provision of this Agreement shall be valid or effective unless made in writing and signed by a duly authorized officer of each Party.

15.14 Waiver. No provision of the Agreement shall be waived by any act, omission or knowledge of a Party or its 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 of the Parties of any breach of any provision hereof by the other Party shall not be construed to be a waiver of any succeeding breach of such provision or a waiver of the provision itself.

15.15 Severability. If any clause or portion thereof in this Agreement is for any reason held to be invalid, illegal or unenforceable, the same shall not affect any other portion of this Agreement, as it is the intent of the Parties that this Agreement shall be construed in such fashion as to maintain its existence, validity and enforceability to the greatest extent possible. In any such event, this Agreement shall be construed as if such clause or portion thereof had never been contained in this Agreement, and there shall be deemed substituted therefor such provision as will most nearly carry out the intent of the Parties as expressed in this Agreement to the fullest extent permitted by applicable law.

[The remainder of this page is left blank intentionally.]

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their respective duly authorized officers as of the day and year first above written.

SANGAMO BIOSCIENCES, INC.

By: /s/ Edward O. Lanphier II

Name: Edward O. Lanphier II

Title: President and Chief Executive Officer

SHIRE AG

By: /s/ Ross Murdoch

Name: Ross Murdoch

Title: SAG Director

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the Registration Statements (Form S-8 No. 333-174034, 333-166220, 333-157733, 333-132823, 333-64642 and 333-34196) and in the Registration Statement (Form S-3 No. 333-157732) and in the related prospectuses of Sangamo BioSciences, Inc. of our reports dated February 22, 2012, with respect to the consolidated financial statements of Sangamo BioSciences, Inc., and the effectiveness of internal control over financial reporting of Sangamo BioSciences, Inc., included in its Annual Report (Form 10-K) for the year ended December 31, 2011.

/s/ Ernst & Young LLP

San Jose, California
February 22, 2012

Exhibit 31.1

CHIEF EXECUTIVE OFFICER CERTIFICATE

I, Edward O. Lanphier II, certify that:

1. I have reviewed this annual report on Form 10-K of Sangamo BioSciences, Inc. (the "registrant");

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 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 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 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:

   (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: February 22, 2012

/s/ Edward O. Lanphier II

Edward O. Lanphier II
President, Chief Executive Officer and Director
(Principal Executive Officer)

Exhibit 31.2

PRINCIPAL FINANCIAL OFFICER CERTIFICATE

I, H. Ward Wolff, certify that:

1. I have reviewed this annual report on Form 10-K of Sangamo BioSciences, Inc. (the "registrant")

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 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 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 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:

   (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: February 22, 2012

/s/ H. Ward Wolff

H. Ward Wolff
Executive 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

Each of the undersigned hereby certifies pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, in his capacity as an officer of Sangamo BioSciences, Inc. (the "Company"), that:

(1) the Annual Report of the Company on Form 10-K for the year ended December 31, 2011, as filed with the Securities and Exchange Commission (the "Report") fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; 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/ Edward O. Lanphier II

Edward O. Lanphier II
President, Chief Executive Officer and Director
(Principal Executive Officer)
February 22, 2012

/s/ H. Ward Wolff

H. Ward Wolff
Executive Vice President and Chief Financial Officer
(Principal Financial and Accounting Officer)
February 22, 2012