Taxus Cardium Pharmaceuticals Group Inc.
Form 10-K
May 22, 2015
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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, 2014

001-33635

(Commission file number)

TAXUS CARDIUM PHARMACEUTICALS GROUP INC.

(Exact name of registrant as specified in its charter)

Delaware	**27-0075787**
(State of incorporation)	**(IRS Employer Identification No.)**
11750 Sorrento Valley Rd., Suite 250	
San Diego, California 92121	**(858) 436-1000**
(Address of principal executive offices)	**(Registrant s telephone number)**

Securities registered under Section 12(b) of the Exchange Act:

None

Securities registered under Section 12(g) of the Exchange Act:

Common Stock, par value $0.0001 per share

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

Indicate by checkmark whether the registrant has submitted electronically and posted on its corporate Website, if any, every Interactive Data File required to be submitted and posted pursuant for Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). x 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 the 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.

Large accelerated filer ¨ Accelerated filer ¨ Non-accelerated filer ¨ Smaller reporting company x

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

The aggregate market value of common equity held by non-affiliates, computed on the basis of the closing sale price for the common stock as reported on the OTC QB on June 30, 2014, was $5.2 million. Shares of common stock held by executive officers, directors and by persons who own 10% or more of the outstanding common stock of the registrant have been excluded for purposes of the foregoing calculation in that such persons may be deemed to be affiliates. This does not reflect a determination that such persons are affiliates for any other purpose.

As of May 22, 2015, 12,775,044 shares of the registrant s common stock were outstanding.

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EXPLANATORY NOTE

Unless the context requires otherwise, all references in this report to the Company, Taxus Cardium, Cardium, we, our, and us refer to Tax Cardium Pharmaceuticals Group Inc. and, as applicable, our wholly-owned subsidiaries Angionetics Inc., Activation Therapeutics, Inc. (formerly Tissue Repair Company), To Go Brands, Inc. and LifeAgain Insurance Solutions, Inc.

Effective July 18, 2013 we effected a reverse split of our outstanding common stock, par value $0.0001 per share, in a ratio of 1 for 20. All common stock and per share amounts included in this report have been retroactively adjusted to reflect a 1 for 20 reverse stock split, as if such split had been effective at the beginning of the period reported.

SPECIAL NOTE ABOUT FORWARD-LOOKING STATEMENTS

Certain statements in this report, including information incorporated by reference, are forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, Section 21E of the Securities Exchange Act of 1934, and the Private Securities Litigation Reform Act of 1995. Forward-looking statements reflect current views about future events and financial performance based on certain assumptions. They include opinions, forecasts, intentions, plans, goals, projections, guidance, expectations, beliefs or other statements that are not statements of historical fact. Words such as may, will, should, could, would, expects, plans, believes, anticipates, intends, estimates, ap projects, or the negative or other variation of such words, and similar expressions may identify a statement as a forward-looking statement. Any statements that refer to projections of our future financial performance, anticipated growth and trends in our business, our goals, strategies, focus and plans, and other characterizations of future events or circumstances, including statements expressing general optimism about future operating results and the development of our products, are forward-looking statements. Forward-looking statements in this report may include statements about:

- our ability to fund operations and business plans, and the timing of any funding or corporate development transactions we may pursue;
- planned development pathways and potential commercialization activities or opportunities;
- the timing, conduct and outcome of discussions with regulatory agencies, regulatory submissions and clinical trials, including the timing for completion of clinical studies;
- our ability to increase revenues, and raise sufficient financing to meet our working capital requirements;
- our beliefs and opinions about the safety and efficacy of our products and product candidates and the anticipated results of our clinical studies and trials;
- our ability to enter into acceptable relationships with one or more contract manufacturers or other service providers on which we may depend, and the ability of such contract manufacturers or other service providers to manufacture biologics, devices, nutraceuticals or other key products or components, or to provide other services, of an acceptable quality on a timely and cost-effective basis;
- our ability to enter into acceptable relationships with one or more development or commercialization partners to advance the commercialization of new products and product candidates and the timing of any product launches;
- our growth, expansion and acquisition strategies, the success of such strategies, and the benefits we believe can be derived from such strategies;

our ability to pursue and effectively develop new product opportunities and acquisitions and to obtain value from such product opportunities and acquisitions;

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our intellectual property rights and those of others, including actual or potential competitors;

the outcome of any pending or threatened litigation matters;

the anticipated activities of our personnel, consultants and collaborators;

expectations concerning our operations outside the United States;

current and future economic and political conditions;

overall industry and market performance;

the impact of new accounting pronouncements;

management s goals and plans for future operations; and

other assumptions described in this report underlying or relating to any forward-looking statements.

The forward-looking statements in this report speak only as of the date of this report and caution should be taken not to place undue reliance on any such forward-looking statements. Forward-looking statements are subject to certain events, risks, and uncertainties that may be outside of our control. When considering forward-looking statements, you should carefully review the risks, uncertainties and other cautionary statements in this report as they identify certain important factors that could cause actual results to differ materially from those expressed in or implied by the forward-looking statements. These factors include, among others, the risks described under Item 1A and elsewhere in this report, as well as in other reports and documents we file with the United States Securities and Exchange Commission (the SEC).

PART I

ITEM 1. BUSINESS

Overview

We are a regenerative medicine biotechnology company focused on the development of advanced regenerative therapeutics designed to promote the activation and growth of (1) microvascular circulation to enhance perfusion of ischemic cardiac tissue as a potential treatment for heart disease; and (2) granulation tissue as a treatment for chronic non-healing wounds. We have a commercial FDA-cleared wound care product, a late clinical stage cardiovascular gene therapy product candidate and corresponding technology platforms as outlined below:

Lead Product	Technology Platform	Formulation	Status
Excellagen ® Commercial Product	Advanced Tissue Regeneration for Wounds & Biologics Delivery Platform	Aseptic Pharmaceutically-Formulated Fibrillar Collagen	Initial Product FDA-Cleared

Generx ®	Gene Therapy	Ad5FGF-4 DNA Construct	Phase 3 Registration Study
Product Candidate	Cardiovascular Growth Factor Therapeutics		

We also own non-core interests in the Healthy Brands Collective, a health products company, and LifeAgain Insurance Solutions, Inc., an advanced medical data analytics business.

Our business model is designed to create a portfolio of opportunities for success, avoiding reliance on any single technology platform or product type. We focus on late-stage product development bridging the critical gap between promising new technologies and product opportunities that are ready for commercialization. Consistent with our long-term strategy, we intend to consider various corporate development transactions designed to place our products or product candidates into larger organizations or with

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partners having existing commercialization, sales and marketing resources, and a need for innovative products. Such transactions could involve the sale, partnering or other monetization of particular product opportunities or businesses. In parallel, as our businesses are advanced and corresponding valuations established, we plan to pursue new product opportunities and acquisitions where we identify the potential for strong value enhancement.

Our current business are established in four subsidiaries: Angionetics Inc., Activation Therapeutics, Inc., To Go Brands, Inc. and LifeAgain Insurance Solutions, Inc. We formed the Angionetics Inc. subsidiary in 2015 to continue the late-stage clinical development and commercialization of the Company s Generx® angiogenic gene therapy product candidate. Activation Therapeutics, Inc. (formerly known as Tissue Repair Company) is focused on the commercialization of our Excellagen ® FDA-cleared wound care product and the joint clinical development of Excellagen product line extensions as an advanced biologic delivery platform for new and innovative wound healing therapeutics. During 2013 we completed the sale of our To Go Brands health sciences business in exchange for a minority stake in Healthy Brands Collective. Our LifeAgain® Insurance Solutions, Inc. subsidiary uses proprietary medical data analytics to develop unique survivable risk insurance products.

For 2015, we plan to focus on achieving key milestones with the potential to offer significant valuation inflection points of our core biotechnology assets, while evaluating option for sales or other monetizations of our non-core investments. The key elements of our business strategy include:

Advance our ASPIRE international Phase 3 registration clinical study for Generx ® which is currently underway in the Russian Federation. With clinical success in the Russian Federation, we plan to meet with the U.S. Food & Drug Administration (FDA) to seek harmonization between the ASPIRE international clinical study with Cardium s already FDA-cleared Generx Phase 3 clinical study, in an effort to advance U.S.-based clinical studies supported by a strategic partner.

Strategically partner and monetize our FDA-cleared pharmaceutically formulated collagen commercial wound care product Excellagen ® for select U.S.-based vertical market channels, and evaluate opportunities to leverage Excellagen into an advanced regenerative medicine delivery platform by identifying innovative product extensions for tissue regeneration based on stem cells, biologics, peptides and/or small molecule drugs for future development. The Excellagen website is www.excellagen.com

Entered into a binding term sheet with Shenzhen Qianhai Taxus Industry Capital Management Co., Ltd (Shenzhen Qianhai Taxus), as lead investor, to purchase an equity stake in Angionetics Inc., Under the terms of the agreement, Shenzhen Qianhai Taxus agreed to acquire 15% of Angionetics outstanding common stock for an aggregate purchase price of $3,000,000, payable in three tranches to be completed by May 30, 2015. On completion of the purchase, Taxus Cardium has agreed to grant Shenzhen Qianhai Taxus a right of first negotiation for exclusive license agreements for certain Asian markets to fund local country registrations, market and sell the Generx® product candidate, Excellagen®, an FDA-cleared dermal matrix product for advanced wound healing and a delivery platform for biologics and stem cells, and LifeAgain®, an advanced medical data analytics product technology platform. The agreement contemplates that this initial funding is a bridge equity investment to a separate larger financing to be conducted by Angionetics Inc., including a potential registration and public offering of securities. The terms provide for Taxus Cardium to gross up Shenzhen Qianhai Taxus shares to equate to a 15% interest in Angionetics following any such public offering. It also provides for certain registration rights for the shares purchased by Shenzhen Qianhai Taxus.

Advance the commercialization of our non-core LifeAgain advanced medical data analytics business investment, which is focused on the development, marketing and sale of survivable risk term life insurance for cancer survivors or others with medical conditions who are currently considered uninsurable based on traditional underwriting standards. The LifeAgain website address is www.lifeagain.com.

Monetize our equity stake in Cardium s non-core Healthy Brands Collective investment. We acquired this investment through the sale of our To Go Brands ® health sciences business through an asset exchange for a preferred equity position in Healthy Brands. Healthy Brands has been making significant acquisitions and has previously reported plans to move forward as a public company as its current businesses advance and grow through further acquisition. The Healthy Brands Collective website address is www.healthybrandsco.com .

Advance our strategic cooperation agreement with Shanxi Taxus Pharmaceuticals Ltd., a strategic Chinese investor, which includes the evaluation of opportunities to distribute our Excellagen product and Generx product candidate in China, and distribution of Shanxi Taxus Pharmaceutical Ltd. s oncology related products in the United States.

Deploy capital strategically to develop our portfolio of product candidates and create shareholder value.

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Core Biotechnology Focus

Angionetics Inc. Generx® [Ad5FGF-4]

Angionetics Inc. is a leader in the field of cardiovascular gene therapy. Generx (*alferminogene tadenovec*), Angionetics Phase 3 clinical study product candidate, is a transformative disease-modifying angiogenic gene therapy growth factor therapeutic that is being developed to promote the growth of cardiac microvascular circulation to enhance perfusion (blood flow) for patients with advanced coronary artery disease.

Generx represents a new class of therapeutic designed to address a large and unmet medical need among patients with heart disease. Generx is targeted for the potential treatment of patients with Cardiac Microvascular Insufficiency or CMI due to advanced coronary artery disease. CMI is a principal cause of microvascular angina or coronary microvascular dysfunction, a well-recognized clinical condition characterized by functional and structural abnormalities of the microvasculature (smaller blood vessels of the heart), which leads to myocardial ischemia and angina pectoris in the absence of large artery/obstructive disease. Generx is designed to be a one-time non-surgical treatment that may help many of such patients by directly addressing their underlying microvascular angina, as well as providing a non-surgical option for patients in whom coronary intervention is either contraindicated or not desirable. Observed results from our Phase 2 clinical trial demonstrated effects that were similar in magnitude to those reported in the medical literature for patients undergoing surgical revascularization procedures such as cardiac by-pass surgery, or angioplasty and stenting, as measured by improvements of reversible perfusion defects of comparable size following such procedures.

CMI frequently cannot be addressed using traditional surgical approaches such as coronary artery bypass graft (CABG) or percutaneous coronary intervention (PCI, i.e. angioplasty and stents). In particular, many patients have coronary artery disease that is not limited or localized to large vessels, continue to experience angina after CABG or PCI, and/or are not suitable candidates for surgical interventions. It is estimated that 12% of patients with obstructive coronary artery disease continue to experience angina because their underlying medical condition is not fully addressed or cannot be resolved by chronic drugs or surgical/mechanical interventions. In addition, a recent meta-analysis study reported that approximately 20% of patients who have a coronary angiography due to ongoing angina do not have obvious large vessel disease, a condition generally referred to as Cardiac Syndrome X, many of whom are presumed to have coronary disease that is diffuse and/or affects smaller vessels within the heart that are not reachable through surgical intervention.

Myocardial ischemia, including that associated with CMI, can be effectively diagnosed and its potential treatment quantified using SPECT imaging (Single-photon emission computed tomography). SPECT has both diagnostic and prognostic value in the management of patients with coronary artery disease because it identifies and quantitatively measures regions of the heart muscle that are at greatest risk during periods of ischemia, such as that brought on during exertion. We believe that other catheter-based diagnostic techniques, including catheter-based imaging diagnostics to measure fractional flow reserve and washout collaterometry, will be further developed, which may enhance and broaden clinical adoption of non-surgical Generx angiogenesis therapy following initial Generx registration.

Based on the data from four completed clinical studies, Generx appears to be safe and well tolerated and capable of improving myocardial perfusion, as measured by validated diagnostic SPECT imaging, in patients with reversible perfusion defect size of greater than 9%. Generx also improved exercise tolerance time, based on an analysis of pre-specified patient sub-groups with stable angina pectoris due to advanced coronary artery disease who were unresponsive to optimal medical therapy and are not considered suitable candidates for traditional coronary artery by-pass surgery, angioplasty and/or stenting.

Upon completion of the current ASPIRE Phase 3 international clinical study, data from the our five Generx clinical studies will represent one of the largest clinical and regulatory dossiers for a cardiac gene therapy product candidate in the world covering the treatment of over 750 patients in the United States, Canada, South America Western Europe and the Russian Federation at over 100 medical centers.

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In December 2013, we reported encouraging initial positive findings from our ASPIRE international clinical study. The results were consistent with those obtained in our AGENT Phase 2a clinical study which showed that Generx appeared to be safe and well tolerated. The AGENT study also observed effects for patients with advanced coronary artery disease receiving Generx were similar in magnitude to those reported in the medical literature for patients undergoing surgical revascularization procedures such as cardiac by-pass surgery, or angioplasty and stenting, as measured by improvements of reversible perfusion defects of comparable size following such procedures.

In March 2015 we announced our entry into a binding term sheet with Dr. Reddy s Laboratories, Inc. (NYSE: [RDY]) covering the co-development, marketing and sales of the Generx [Ad5FGF-4] angiogenic microvascular gene therapy Phase 3 product candidate for patients with refractory angina and myocardial ischemia due to cardiac microvascular insufficiency. The terms sheet outlines the principle agreements between the parties and is binding, but is expected to be superseded by a definitive agreement with more detailed terms. The term sheet grants Dr. Reddy s Laboratories an exclusive license to market and sell Generx in Russia, the Commonwealth of Independent States (CIS), Venezuela, Vietnam and Myanmar (the Licensed Territories) for a period of ten years with two five-year renewal options. Dr. Reddy s Laboratories Russian-based business unit currently markets and sells prescription products in Russia. The term sheet grants Dr. Reddy s Laboratories a right of first negotiation for the license rights to market and sell Generx in up to 32 other countries in Latin America and the Association of Southeast Asian Nations. Taxus Cardium retains full commercialization rights for North America, Europe, Japan, China, the Middle East, and Africa. Taxus Cardium has established a wholly-owned operating unit Angionetics to manage for the worldwide commercialization of the Generx. If we achieve clinical success in the Russian Federation, we plan to meet with the U.S. FDA to seek harmonization between the ASPIRE international clinical study with Cardium s already FDA-cleared Generx Phase 3 clinical study, in an effort to advance U.S.-based clinical studies supported by a strategic partner .

Coronary Artery Disease Market Data and Potential Economic Opportunity

According to the Centers for Disease Control and Prevention, heart disease is the leading cause of death for both men and women in the U.S. and the industrialized world. In the U.S. the American Heart Association (AHA) reports that there are approximately 15.4 million patients with coronary artery disease, and that the lifetime risk of developing the coronary heart disease after 40 years of age is 49% for men and 32% for women. The AHA reports there are currently 7.8 million Americans that have been diagnosed with angina pectoris due to coronary artery disease, and it is estimated that approximately 12% of patients with angina are unresponsive to optimal medical therapy and are considered not suitable for coronary artery bypass surgery, angioplasty or stenting. In addition, the AHA reports that each year there are over 2.4 million percutaneous interventional procedures, inpatient cardiac by-pass surgeries and diagnostic cardiac catheterizations in the U.S. Likewise, cardiovascular disease is the leading cause of death in the Russian Federation and other countries in the Commonwealth of Independent States (CIS). However, comparative health statistics show that in the Russian Federation there is an early onset of heart disease in the general population, and the mortality rate is even more severe than in the U.S. The U.S. cardiovascular death rate for males is 80 per 100,000 in the general population compared to almost 300 per 100,000 in the Russian Federation. The cardiovascular death rates in certain countries of the CIS are even more severe than in the Russian Federation and are reported to exceed 400 per 100,000 in the general population, over five times the U.S. cardiovascular death rate.

Of the approximately 7.7 million Americans with symptomatic angina pectoris, the Cleveland Clinic Foundation reports that approximately 12% (i.e. more than 900,000 patients) are relatively unresponsive to optimal medical therapy and are considered not suitable for coronary artery bypass surgery, angioplasty or stenting. If the safety and effectiveness of Generx continue to be demonstrated in clinical trials, it could potentially be labeled for the treatment of this very significant patient population. Overall, we project that this patient population could represent a $3.0 billion addressable market opportunity in the United States, and is significantly larger when considered on a global basis given the large and increasing number of patients worldwide that are affected by coronary artery disease.

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How Does Generx Work?

Generx is designed to be administrated to patients as a single non-surgical treatment during a standard catheter-based procedure by an interventional cardiologist in an out-patient setting using well established diagnostic angiography. Generx is an adenovector (serotype 5) DNA-based gene therapy construct that encodes the Fibroblast Growth Factor-4 (FGF-4) gene. Following administration by a catheter into the three major coronary arteries of the heart, Generx is designed to allow the cellular expression of FGF-4 protein which has been shown to stimulate the release and action of other angiogenic growth factors including Platelet-Derived Growth Factor (PDGF), Hepatocyte Growth Factor (HGF) and Vascular Endothelial Growth Factor (VEGF). This process is believed to activate and promote the growth of cardiac microvascular circulation (a functional collateral network) in ischemic cardiac tissue.

Generx is delivered through an intra-coronary angioplasty balloon catheter that produces transient myocardial ischemia. The induction of transient ischemia, together with the introduction of nitroglycerin, significantly facilitates the transfection of Generx into heart cells, apparently via enhanced penetration through microvessel endothelium and upregulation of Coxsackie-Adenovirus Receptor or CAR. Company-sponsored research demonstrates that Generx has the capacity to promote and enhance cardiac microvascular circulation through both angiogenesis (the formation of new capillary vessels) and arteriogenesis (enlargement of pre-existing collateral arterioles).

Generx Clinical Development Strategy

Generx is currently being evaluated in a Phase 3 registration study in the Russian Federation, conducted under the name ASPIRE. Generx has also been cleared by the U.S. FDA for a Phase 3 clinical study in the United States.

In 2012, Cardium initiated the ASPIRE study, which is expected to involve up to 100 patients with myocardial ischemia, defined as patients with a reversible perfusion defect of 9% or greater based on SPECT imaging. The international study is a randomized, multi-center study with two parallel arms conducted at leading medical centers in Moscow and Novosibirsk to supplement previously-obtained data from the four prior clinical studies. The study s primary efficacy endpoint is improvement in Reversible Perfusion Defect Size or RPDS, as measured by SPECT imaging eight weeks following Generx administration

In December 2013, we reported encouraging initial positive findings from the ASPIRE international clinical study, which is consistent with the results obtained in the AGENT Phase 2a clinical study which showed that Generx appeared to be safe and well tolerated and that observed effects for patients with advanced coronary artery disease receiving Generx were similar in magnitude to those reported in the medical literature for patients undergoing surgical revascularization procedures such as cardiac by-pass surgery, or angioplasty and stenting, as measured by improvements of reversible perfusion defects of comparable size following such procedures.

In March 2015 we announced our entry into a binding term sheet with Dr. Reddy s Laboratories, Inc. (NYSE: [RDY]) covering the co-development, marketing and sales of the Generx [Ad5FGF-4] angiogenic microvascular gene therapy Phase 3 product candidate for patients with refractory angina and myocardial ischemia due to cardiac microvascular insufficiency. The terms sheet outlines the principle agreements between the parties and is binding, but is expected to be superseded by a definitive agreement with more detailed terms. The term sheet grants Dr. Reddy s Laboratories an exclusive license to market and sell Generx in Russia, the Commonwealth of Independent States (CIS), Venezuela, Vietnam and Myanmar (the Licensed Territories) for a period of ten years with two five-year renewal options. Dr. Reddy s Laboratories Russian-based business unit currently markets and sells prescription productsin Russia. The term sheet grants Dr. Reddy s Laboratories a right of first negotiation for the license rights to market and sell Generx in up to 32 other countries in Latin America and the Association of Southeast Asian Nations. Taxus Cardium retains full commercialization rights for North America, Europe, Japan, China, the Middle East, and Africa. Taxus Cardium has established a wholly-owned operating unit Angionetics to manage for the worldwide commercialization of the Generx.

We also plan to pursue the registration of Generx in other international markets based on the extensive Generx clinical database and regulatory dossier which includes the safety and efficacy data derived from the five clinical studies in nine countries. In addition, we plan to meet with the U.S. FDA to discuss the Generx registration in the Russian Federation and seek to harmonize the clinical study design of the international clinical study with the U.S. clinical study in concert with a strategic partner.

Generx Clinical Study Data Summary

Upon completion of the international clinical study, Generx will have been the subject of five randomized and controlled multi-center clinical studies involving approximately 750 patients with advanced coronary artery disease at over 100 medical centers in the United States, Canada, Western Europe, South America and the

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Russian Federation. The study results from each of the completed AGENT clinical studies have been published in peer-reviewed journals and have supported, from a safety and preliminary efficacy perspective, the clearances by the U.S. FDA and the Russian Federation Health Ministry for us to conduct two Phase 3 clinical studies. With completion of the current international clinical study, data from the five clinical studies will represent one of the largest clinical and regulatory dossiers in the world. In summary, based on the clinical data from the four completed clinical studies, Generx appears to be safe and well tolerated and capable of improving myocardial perfusion, as measured by SPECT imaging, in patients with myocardial ischemia due to advanced coronary artery disease. Generx also improves exercise tolerance time based on an analysis of pre-specified patient sub-groups with stable angina pectoris due to advanced coronary artery disease who are not optimal candidates for traditional coronary artery by-pass surgery, angioplasty and/or stenting.

The international clinical study was designed based on positive results from the prior Generx Phase 2a clinical study (Grines et al., J Am Coll Cardiol 2003; 42:1339-47) showing that Generx improved myocardial blood flow in the ischemic region of the hearts of men and women following a single intracoronary infusion as measured by the objective efficacy endpoint of SPECT imaging. The mean change observed in Generx-treated patients was a 4.2% absolute reduction (which represents a 20% relative reduction) in the reversible perfusion defect size from baseline at eight weeks ($p<0.001$), while the placebo group showed only a 1.6% absolute reduction from baseline (not significant) at eight weeks following treatment. The observed treatment effect for patients receiving Generx was similar in magnitude to that reported in the literature for patients undergoing angioplasty/stent or revascularization procedures with reversible perfusion defects of comparable size at one year following these procedures.

An independent long-term prospective study published in Circulation (Meier et al, Circ. 2007; 116:975-983) provided key evidence indicating that men and women with more recruitable collateral circulation have a better chance of surviving a heart attack than patients who have less developed collateral circulation. This important study quantitatively evaluated coronary collateral blood flow in 845 patients with coronary artery disease during a 10-year follow-up period and showed that long-term cardiac mortality was approximately 66% lower in patients with a highly developed collateral vessel blood supply ($p=0.019$). For the first time, this study showed the importance of collateral circulation beyond simply the relief of angina and provided further support of the potential for long term benefits from angiogenic therapy, the primary premise behind Generx s therapeutic potential.

Cedars-Sinai Medical Center Nuclear Cardiology Core Laboratory is the core lab responsible for data collection and quality control of SPECT data from the Russian based clinical study sites. This Center is considered to be one of the world s leading core laboratories for SPECT imaging. It has operated as an independent core laboratory for over 20 years and has participated in numerous multi-center clinical trials, including the recent COURAGE (Clinical Outcomes Utilizing Revascularization and Aggressive Drug Evaluation) clinical study enrolling over 3,200 patients at over 60 clinical study sites. The scope of work performed by the Cedars-Sinai Core Laboratory includes imaging protocol design, quality assurance and control, interpretation, and data analysis of nuclear myocardial perfusion studies. The Core Laboratory is led by Daniel S. Berman, M.D., who has been the head of Nuclear Cardiology at Cedars-Sinai Medical Center for over 30 years, and is the Associate Director for Cardiac Imaging at the Cedars-Sinai Heart Institute. Dr. Berman is considered a leader in the field of SPECT myocardial perfusion imaging and has authored over 300 original peer-reviewed manuscripts dealing with non-invasive cardiac imaging.

Generx Technological Advances Supporting the Enhanced Delivery of Cardiovascular Therapy

Our researchers have developed an enhanced method of delivering Generx and potentially other agents to the heart, which has been tested in preclinical studies conducted at Emory University and is now being employed in the ASPIRE human clinical study. Our innovative technique employs transient cardiac ischemia, which has been found to dramatically enhance gene delivery and transfection efficiency after one-time intracoronary administration of adenovector in mammalian hearts. Two consecutive but brief periods of coronary

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artery occlusion combined with co-administration of nitroglycerin increased both adenovector presence (measured by PCR) and transgene expression (assessed by luciferase activity) by over two orders of magnitude (>100 fold) in the heart, as compared to prior intracoronary artery delivery methods.

Preclinical testing using Cardium s new approach, which was published in 2012 (Shi et al., Human Gene Therapy, 23(3): 204-212), effectively confirmed that the new technique for adenovector gene delivery in the heart can be used to dramatically boost vector delivery and therefore gene transfer. By enhancing uptake even in patients with less severe forms of disease and ischemia, it would be expected to reduce response variability and allow for the potential treatment of patients with a broader range of associated coronary artery disease. The new treatment protocols for our ASPIRE international clinical study have been developed to use this improved knowledge about induced transient ischemia techniques to enhance the non-surgical, catheter-based delivery of Generx to the heart.

Generx Manufacturing Capabilities and Simplified Product Handling

Angionetics has also been actively advancing its Generx product candidate s engineering and process technology in preparation for potential commercialization. We have successfully transferred a refined, improved and fully-validated manufacturing process from Schering AG (now part of Bayer AG) to SAFC, the custom manufacturing and services business unit of Sigma-Aldrich Corporation, a global specialty chemicals and biologics supplier, located in Carlsbad, California. As a result of the rigorous technical transfer process, important process improvements were achieved enabling much higher manufacturing process yields.

Generx s long-term product stability (at the current storage temperature of -70°C) has been established and validated at a minimum of six years making it possible to manufacture Generx in large, cost effective batch sizes. Based on the current Generx validated cGMP manufacturing processes, and a recommended dosage of 6 x 10 9 viral particles per treatment, Angionetics believes that it has the capacity to scale the manufacture of Generx to larger batch quantities (up to approximately 2.0 million doses annually) without the need for significant additional capital investment or major process technology engineering. Due to the validated six year stability of Generx, Cardium anticipates Generx can be campaign manufactured in large quantity and held for marketing, sale and distribution during the stability period. This flexibility will allow us to manufacture Generx at a highly economical direct cost, which could potentially yield economic gross margins that would be approximately equivalent to a favorable classic small molecule drug model.

In addition, the dose preparation process for Generx has been simplified through the integration of a fully-validated, closed-system drug transfer process incorporating the use of the Becton Dickinson PhaSeal ® System passive safety technology to streamline and simplify the cath-lab preparation process and eliminating the need to prepare Generx in a sterile, biological safety hood. The use of the PhaSeal system has now been integrated into the international clinical study and will be utilized for Generx commercialization. The Company has also developed a new and unique, fully-validated bio-activity performance-based, quality release assay to measure and evaluate the pro-angiogenic potency of each newly manufactured batch of Generx.

Activation Therapeutics, Inc. Excellagen®

Excellagen is an FDA-cleared, pharmaceutically-formulated acellular biological modulator that has been engineered to activate and promote wound healing through the growth of granulation tissue in chronic non-healing diabetic foot, pressure and venous ulcers, as well as other dermal wounds (including traumatic and surgical wounds). We believe that Excellagen is a cost-effective, easy to use professional product that has now been classified for reimbursement purposes by the U.S. Centers for Medicare and Medicaid Services as a unique skin substitute - a designation which is consistent with other forms of skin substitutes including living skin equivalents Dermagraft ® and Apligraf ® and human dermal and amnion placental tissue-based products including Graftjacket ® and EpiFix ®.

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Excellagen is prepared as a sterile professional-use syringe, containing a physiologically formulated homogenate of purified atelopeptide bovine dermal collagen (Type I) in its native 3-dimensional fibrillar configuration. Excellagen is designed to provide a structural scaffold for chemotaxis, cellular adhesion, migration and proliferation to promote wound healing. Company-funded research and published scientific literature also support Excellagen s capability to activate blood platelets to release growth factors, including Platelet-Derived Growth Factor (PDGF), an important endogenous wound healing mediator.

In a U.S.-based, multi-center, randomized and controlled clinical study (the Matrix study), a single protocol specified application of Excellagen was found to accelerate the rate of tissue granulation at one week by 204% compared to standard of care (p=0.018), and this accelerated healing response continued for two weeks (104%; p=0.032). While Excellagen is FDA-cleared for use in a broad array of dermal wounds, initial clinical focus has been on the treatment of chronic non-healing diabetic foot, pressure and venous ulcers. In December 2013, the Centers for Medicare and Medicaid Services (CMS) made a final determination to assign Excellagen a unique, product-specific Q code, classifying Excellagen as a skin substitute, after reviewing our HCPCS Level II Code Modification Request and subsequent supporting information for Excellagen as a wound care product indicated for the treatment of hard to heal wounds such as diabetic foot ulcers and pressure ulcers as well as other dermal wounds. This new reimbursement code took effect January 1, 2014, although a reimbursement rate has not yet been determined.

In addition to its application for dermal wounds, Excellagen s pharmaceutically formulated collagen has been engineered to serve as a biologics delivery platform, potentially enabling multiple device, tissue scaffolding and therapeutic product extensions for tissue regeneration based on stem cells, biologics, peptides and small molecule drugs. This technological attribute of Excellagen is expected to enable product extensions, which could be co-developed for commercialization with a variety of different strategic partners.

Consistent with our business strategy, Excellagen has been substantially credentialized and we are now seeking strategic partners to market and sell Excellagen in the United States and elsewhere through multiple marketing channels. The Company has continued to pursue a CE mark certification for Excellagen.

Excellagen Wound Healing Case Studies

We completed two clinical evaluation studies in collaboration with wound care practitioners to assess the use of Excellagen to treat chronic pressure ulcers in elderly patients in residence at long-term care facilities. The wounds studied in these patients were of over 18 months in duration and located in hard to treat areas, including the buttocks or coccyx, the most prevalent locations for pressure ulcers. Following weekly treatment regimens consisting of sharp debridement immediately followed by application of Excellagen, the three case study patients exhibited robust formation of new granulation tissue within their previously non-healing pressure ulcers, which led to either complete wound closure or substantial wound reduction after only 5 to 6 weeks of treatment. The results of this study, entitled Serial Sharp Debridement and Formulated Collagen Gel to Treat Pressure Ulcers in Elderly Long-term Care Patients , was published in the in the November 2013 issue of the peer-reviewed journal Ostomy Wound Management (Ostomy Wound Manage. 2013;59(11):43 49). The second case study involved elderly long-term care facility patients with chronic (>12 months duration) pressure ulcers located on the heel, the second most prevalent location for pressure ulcers. The weekly treatment regimen consisted of sharp debridement immediately followed by application of Excellagen. The study period was eight weeks in duration and all three case study patients exhibited rapid and robust formation of new granulation tissue within their previously non-healing heel pressure ulcers (decrease in wound volume of 93-100%). The patients

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were monitored for four weeks following the official eight week study period, and all three heel ulcers continued to improve, with one going to complete closure. The results of this study have been submitted for publication in the peer-reviewed journal, Advances in Skin and Wound Care.

Excellagen Stem Cell Delivery Platform Studies

We believe that Excellagen can also be useful for the delivery of stem cells to promote the growth of an engineered tissue graft using autologous mesenchymal fetal stem cells, and to promote diabetic wound healing using allogeneic stem cells, respectively. Ongoing collaborations are designed to confirm the opportunity to develop product line extensions using Excellagen as a delivery vehicle in combination with stem cells and other biologics for the development of new and innovative advanced regenerative therapeutics.

Researchers at Boston Children s Hospital are evaluating the use of Excellagen® as a delivery scaffold to seed autologous mesenchymal fetal stem cells for ex-vivo engineering of tissue grafts for transplantation into infants to repair prenatally diagnosed birth defects. Autologous mesenchymal fetal stem cells are derived prenatally from infants with a medical defect requiring life-saving tissue repairs. These stem cells are sourced from amniotic fluid, the placenta or umbilical cord blood. The stem cells are then seeded into a scaffold to promote the growth of an engineered tissue graft. These grafts will potentially be used to surgically repair, either in the fetus or immediately following birth, certain prenatally diagnosed birth defects that could include congenital diaphragmatic hernia, tracheal and chest wall defects, bladder extrophy and various cardiac anomalies. Preliminary pre-clinical research has confirmed that Excellagen collagen homogenate maintains mesenchymal fetal stem cell viability. Additional proof-of-concept studies are currently underway.

The Company is also collaborating with Orbsen Therapeutics in a European study that is designed to confirm the role of Excellagen in a diabetic wound model, with and without stem cells. The study is being conducted by researchers led by Professor Timothy O Brien at the National University of Ireland, in Galway and Orbsen Therapeutics Ltd., to evaluate the medical utility of Excellagen as a delivery agent for Orbsen s human mesenchymal stem cells (MSC) for the potential treatment of diabetic wounds. The research is sponsored by the European-funded ReddStar initiative.

Excellagen U.S. Market Opportunity

The U.S. advanced wound care market exceeds $5 billion annually with seven million Americans suffering from chronic wounds. The skin substitutes market segment, which includes Excellagen, as well as Dermagraft ® , Apligraf ® , EpiFix ® and Graftjacket ® , represents a $500 million annual market opportunity. This market is expected to grow due to the aging population and the rise in diabetes, obesity and the increased number of seniors living in long-term care facilities now and in the coming decade. According to the National Diabetes Fact Sheet (2011), over 25 million Americans are living with diabetes. Annually healthcare professionals treat approximately 900,000 diabetic foot ulcers. The National Institutes of Health estimates that 15% of people with diabetes will develop a foot ulcer. In addition, approximately 68,000 non-traumatic lower-limb amputations are performed annually in those with diabetes.

Cardium Business Strategy

For 2015, we plan to focus on achieving key milestones with the potential to offer significant valuation inflection points of our core biotechnology assets, while evaluating option for sales or other monetizations of our non-core investments. The key elements of our business strategy include:

Advance our ASPIRE international Phase 3 registration clinical study for Generx ® which is currently underway in the Russia Federation. Upon clinical success, the Company plans to meet with the U.S. FDA to seek harmonization between the international ASPIRE study with our FDA-cleared Generx Phase 3 clinical study and advance U.S.-based clinical studies supported by a strategic partner;

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Strategically partner and monetize our FDA-cleared pharmaceutically formulated collagen commercial wound care product Excellagen ® , for selected U.S.-based vertical market channels and leverage Excellagen s advanced regenerative medicine delivery platform by identifying innovative product extensions for tissue regeneration based on stem cells, biologics, peptides and/or small molecule drugs for future development and commercialization with one or more strategic partners. The Company has continued to pursue a CE mark certification for Excellagen, has fully responded to all information requested by the notified body, and looks forward to completing this process;

Advance the commercialization of our LifeAgain Insurance Solutions advanced medical analytics business, which is focused on the development, marketing and sale of survivable risk term life insurance for cancer survivors or others with medical conditions who are currently considered uninsurable based on traditional underwriting standards;

Monetize our equity stake in Cardium s Healthy Brands Collective investment. We acquired this investment through the sale of our To Go Brands ® health sciences business through an asset exchange for a preferred equity position in Healthy Brands. Healthy Brands has been making significant acquisitions and has previously reported plans to move forward as a public company as its current businesses advance and growth through further acquisition;

Leverage our cooperation agreement with Shanxi Taxus Pharmaceuticals Ltd. to distribute our Excellagen product and Generx product candidate in China, and distribute Shanxi Taxus Pharmaceuticals Ltd. s oncology related products in the United States; and

Deploy capital strategically to develop our portfolio of product candidates and create shareholder value.

Government Regulation

New drugs, biologics, devices, and nutraceuticals, are subject to extensive regulation in the United States under the federal Food, Drug, and Cosmetic Act. In addition, biologics are also regulated under the Public Health Service Act. We believe that the pharmaceutical products we are attempting to develop will be regulated either as biological products or as new drugs. Both statutes and their corresponding regulations govern, among other things, the testing, manufacturing, distribution, safety, efficacy, labeling, storage, record keeping, advertising and other promotional practices involving biologics or new drugs. FDA approval or other clearances must be obtained before clinical testing, and before manufacturing and marketing, of biologics and drugs. Obtaining FDA approval has historically been a costly and time-consuming process. Different regulatory regimes are applicable in other major markets.

In addition, any gene therapy and other DNA-based products we develop will require regulatory approvals before human trials and additional regulatory approvals before marketing. New biologics are subject to extensive regulation by the FDA and the Center for Biological Evaluation and Research and comparable agencies in other countries. Currently, each human-study protocol is reviewed by the FDA and, in some instances, the NIH, on a case-by-case basis. The FDA and the NIH have published guidance documents with respect to the development and submission of gene therapy protocols.

To commercialize our product candidates, we must sponsor and file an investigational new drug (IND) application and be responsible for initiating and overseeing the human clinical trials to demonstrate the safety and efficacy and, for a biologic product, the potency, which are necessary to obtain FDA approval of any such

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products. For any new drug applications, we will be required to select qualified investigators (usually physicians within medical institutions) to supervise the administration of the products, and we will be required to ensure that the clinical trials are conducted and monitored in accordance with FDA regulations and the general investigational plan and protocols contained in the IND application.

The FDA receives reports on the progress of each phase of testing, and it may require the modification, suspension, or termination of trials if an unwarranted risk is present to patients. If the FDA imposes a clinical hold, trials may not recommence without FDA authorization and then only under terms authorized by the FDA. The IND application process can thus result in substantial delay and expense. Human gene therapy products, a primary area in which we are seeking to develop products, are a new category of therapeutics. Because this is a relatively new and expanding area of novel therapeutic interventions, there can be no assurance as to the length of the trial period, the number of patients the FDA will require to be enrolled in the trials to establish the safety, efficacy and potency of human gene therapy products, or that the data generated in these studies will be acceptable to the FDA to support marketing approval.

After the completion of trials of a new drug or biologic product, FDA marketing approval must be obtained. If the product is regulated as a biologic, the Center for Biological Evaluation and Research will require the submission and approval, depending on the type of biologic, of either a biologic license application or a product license application and a license application before commercial marketing of the biologic. If the product is classified as a new drug, we must file a new drug application with the Center for Drug Evaluation and Research and receive approval before commercial marketing of the drug. The new drug application or biologic license applications must include results of product development, laboratory, animal and human studies, and manufacturing information. The testing and approval processes require substantial time and effort and there can be no assurance that the FDA will accept the new drug application or biologic license applications for filing and, even if filed, that any approval will be granted on a timely basis, if at all. In the past, new drug applications and biologic license applications submitted to the FDA have taken, on average, one to two years to receive approval after submission of all test data. If questions arise during the FDA review process, the approval process can take more than two years.

Notwithstanding the submission of relevant data, the FDA may ultimately decide that the new drug application or biologic license application does not satisfy its regulatory criteria for approval and may require additional studies. In addition, the FDA may condition marketing approval on the conduct of specific post-marketing studies to further evaluate safety and effectiveness. Rigorous and extensive FDA regulation of pharmaceutical products continues after approval, particularly with respect to compliance with current good manufacturing practices (GMPs), reporting of adverse effects, advertising, promotion and marketing. Discovery of previously unknown problems or failure to comply with the applicable regulatory requirements may result in restrictions on the marketing of a product or withdrawal of the product from the market, as well as possible civil or criminal sanctions.

Ethical, social and legal concerns about gene therapy, genetic testing and genetic research could result in additional regulations restricting or prohibiting the processes we or our suppliers may use. Federal and state agencies, congressional committees and foreign governments have expressed interest in further regulating biotechnology. More restrictive regulations or claims that our products are unsafe or pose a hazard could prevent us from commercializing any such products.

The approval and/or clearance for marketing of medical devices, such as Excellagen, are also subject to extensive controls by health regulatory and other authorities. Although some devices can be cleared for marketing pursuant to a procedure referred to as an FDA 501(k) clearance, other devices and/or indications may require additional clinical studies and may be subject to even more extensive regulatory and other controls.

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In addition to the foregoing, state and federal laws regarding environmental protection and hazardous substances, including the Occupational Safety and Health Act, the Resource Conservancy and Recovery Act and the Toxic Substances Control Act, affect our business. These and other laws govern our use, handling and disposal of various biological, chemical and radioactive substances used in, and wastes generated by, our operations. If our operations result in contamination of the environment or expose individuals to hazardous substances, we could be liable for damages and governmental fines. We believe that we are in material compliance with applicable environmental laws and that continued compliance therewith will not have a material adverse effect on our business. We cannot predict, however, how changes in these laws may affect our future operations.

We are also subject to a variety of other regulations in the United States, including those relating to bioterrorism, taxes, labor and employment, import and export, and intellectual property.

To the extent that we conduct operations outside the United States, any such operations would be similarly regulated by various agencies and entities in the countries in which we operate. The regulations of these countries may conflict with those in the United States and may vary from country to country. In markets outside the United States, we may be required to obtain approvals, licenses or certifications from a country s ministry of health or comparable agency before we begin operations or the marketing of products in that country. Approvals or licenses may be conditioned or unavailable for certain products. These regulations may limit our ability to enter certain markets outside the United States.

Competition

The pharmaceutical, biotechnology and medical device industries are intensely competitive. Our products and any product candidates developed by us would compete with existing drugs, therapies, bio-therapies, stem cell therapies, medical devices or procedures and with others under development that are designed to enhance cardiac perfusion in patients with coronary artery disease and other medical conditions that result in chronic myocardial ischemia and persistent angina pectoris. There are many pharmaceutical, biotechnology and medical device companies, public and private universities and research organizations actively engaged in research and development of products for the treatment of cardiovascular and related diseases. Many of these organizations have financial, technical, research, clinical, manufacturing and marketing resources that are greater than ours. If a competing company develops or acquires rights to a more efficient, more effective, or safer competitive approach for treatment of the same or similar diseases or conditions we have targeted, or one that offers significantly lower costs of treatment, our business, financial condition and results of operations could be materially adversely affected.

We are aware of products currently under development by competitors targeting the same or similar cardiovascular and vascular diseases as our Generx product candidate. These include biological treatments using forms of genes and therapeutic proteins. For example, CardioVascular BioTherapeutics is developing injectable and topical forms of FGF-1 for the potential treatment of cardiovascular diseases; NeoVasc is developing a catheter based product, similar to a stent, intended as a treatment for refractory angina; Juventas Therapeutics is developing Stromal Cell-Derived Factor-1 (SDF-1), a naturally-occurring chemokine, to induce neovascularization and angiogenesis to treat ischemic cardiovascular disease; and Neostem is developing a chemotactic hematopoietic stem cell product comprised of autologous bone marrow derived CD34/CXCR4 cells selected to treat damaged heart muscle following a heart attack. We will also face competition from entities using other traditional methods, including new drugs and mechanical therapies, to treat cardiovascular and vascular disease.

We believe that the most significant competitive factor in the field of new therapeutics and devices is the effectiveness of a product candidate, as well as its relative safety and cost as compared to other products, product candidates or approaches that may be useful for treating a particular disease condition. If validated and commercialized we expect that our Generex product will provide an effective and safe alternative for patients with CMI.

Our Generx® alferminogene tadenovec [Ad5FGF-4] Phase 3 product candidate is a first in class, single-dose, disease altering therapeutic specifically targeted for the cardiac micro-vasculature, that is designed to endogenously initiate the formation of new biologic structures in the heart to increase the level of micro-vascularity and enhance cardiac perfusion, and improve cardiac performance, as measured by exercise tolerance and the occurrence and severity of myocardial ischemia-driven angina. Current pharmacologic therapies for patients with CMI are limited to anti-anginal medications to relieve angina chest pain, which are dosed daily or episodically and carry physiologic side effects, and surgical and percutaneous interventions to address large vessel coronary artery disease. Angionetics product candidates are designed to easily fit within the current practice of medicine, as single-dose treatments, which are administered by interventional cardiologists using standard cardiac catheters, during an approximately one-hour, out-patient, angiogram-like procedure which is conducted in a hospital or medical center.

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We believe that our product development programs will be subject to significant competition from companies using alternative technologies, some of which are described above, as well as to increasing competition from companies that develop and apply technologies similar to ours. Other companies may succeed in developing products earlier than we do, obtaining approvals for these products from the FDA more rapidly than we do or developing products that are safer, more effective or less expensive than those under development or proposed to be developed by us. We cannot assure you that research and development by others will not render our technology or product candidates obsolete or non-competitive or result in treatments superior to any product candidate developed by us, or that any product candidate developed by us will be preferred to any existing or newly developed technologies.

In the areas of tissue repair and wound healing, such as Excellagen and others being developed by our Activation Therapeutics, Inc. subsidiary, there are a number of approaches being employed, including other collagen-based products, living skin equivalents, negative pressure wound therapy devices and other devices, and biologics and small molecule drugs designed to promote repair and healing. Competing products include Dermagraft ®, Apligraf ®, EpiFix ® and Graftjacket ®, and others.

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We believe that the most significant competitive factors in the field of new therapeutics and devices are the effectiveness, relative safety and cost as compared to other products, product candidates or approaches that may be useful for treating a particular disease condition. If validated and commercialized we expect that our Generex product will provide an effective and safe alternative for cardiac patients are no longer responsive to medical therapy, and are considered not suitable candidates for traditional percutaneous or surgical revascularization procedures such as cardiac by-pass surgery, or angioplasty and stenting. We also anticipate that treatment by Generex will cost substantially less than surgical procedures.

We believe that our product development programs will be subject to significant competition from companies using alternative technologies, some of which are described above, as well as to increasing competition from companies that develop and apply technologies similar to ours. Other companies may succeed in developing products earlier than we do, obtaining approvals for these products from the FDA more rapidly than we do or developing products that are safer, more effective or less expensive than those under development or proposed to be developed by us. We cannot assure you that research and development by others will not render our technology or product candidates obsolete or non-competitive or result in treatments superior to any product candidate developed by us, or that any product candidate developed by us will be preferred to any existing or newly developed technologies.

Manufacturing Strategy

We plan to outsource all product manufacturing to one or more contract manufacturers of clinical drug products that operate manufacturing facilities in compliance with current Good Manufacturing Practices. We may also seek to refine the current manufacturing process and final product formulation to achieve improvements in storage temperatures and the like.

The FDA has established guidelines and standards for the development and commercialization of molecular and gene-based drug products i.e.: *Guidance for Industry CMC for Human Gene Therapy INDs November 2004, Sterile Drug Products Produced by Aseptic Processing September 2004, Human Somatic Cell Therapy and Gene Therapy March 1998, PTC in the Characterization of Cell Lines Used to Produce Biologicals July 1993.* These industry guidelines, among others, provide essential oversight with regard to process methodologies, product formulations and quality control standards to ensure the safety, efficacy and quality of these drug products.

Marketing and Sales

The Company s key skill set is focused on the discovery, manufacturing process, engineering, clinical, and commercial development of new and innovative products. Taxus Cardium does not currently have the financial resources and internal capabilities to market and sell current core products and product candidates under development. We plan to rely on strategic partnerships and alliances for the United States and international marketing and sales for these products. Our marketing and sales strategies will vary by product line. Our product candidates, such as Generx must undergo clinical trials before any marketing and sales can begin. If we should obtain marketing approvals, we expect to engage in marketing and sales efforts through or in collaboration with a partner that specializes in commercialization, marketing and sales of drugs and therapeutics.

For our Excellagen ® wound care product, we expect to engage in sales principally through or in collaboration with a sales and distribution partner and/or strategic partners. We do not expect to generate meaningful levels of sales for Excellagen until strategic partnerships are established as appropriate.

Licensing and Intellectual Property

Our business strategy is focused on the acquisition and development of a portfolio of product opportunities which involves a variety of intellectual property rights, including patent prosecution and inbound and outbound licensing transactions.

Pursuant to a Technology Transfer Agreement entered into between Cardium and the Schering AG Group (now part of Bayer AG), we acquired from Schering a portfolio of methods and compositions directed at the treatment of cardiovascular diseases, some of which are included in Generx. In connection with that portfolio we acquired the rights to certain patents owned by the University of California and New York University, which would require us to pay royalties on products developed on the basis of those patents. Information related to our purchase from Schering AG Group is provided under Notes to Consolidated Financial Statements, Note 8 Commitments and Contingencies. Our patent portfolio includes allowed and issued patents covering our gene therapy approach both in Europe and in the United States. We have additional patents and patent applications directed to methods of cardiovascular gene therapy in the U.S., Europe, Russia and elsewhere, and we recently filed new patent applications directed to certain improved techniques for the treatment of heart disease that are currently the subject of our ASPIRE study in Russia.

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In August 2006, we acquired the rights to various technologies and products now part of our Activation Therapeutics subsidiary. In connection with that acquisition we acquired the rights to use certain patented technology related to a growth factor DNA in exchange for royalty payments. Our Excellagen product does not contain the growth factor DNA, and we do not have any ongoing material commitments or royalty obligations with respect to the new Excellagen product candidate. We are looking to develop extensions to that platform, including the patented growth factor DNA, which would require the payment of royalties if a product is ultimately developed and approved.

We expect to continue evaluations of the safety, efficacy and possible commercialization of our product candidates and technologies as they advance in development. On the basis of such evaluations, we may alter our current research and development programs, clinical studies, partnering or other development or commercialization activities. Accordingly, we may elect to amend or cancel, from time to time, one or more of our arrangements with third parties, subject to any applicable accrued liabilities and fees. Alternatively, the other parties to such arrangements may, in certain circumstances, be entitled to terminate the arrangements. Further, the amounts payable under certain of our arrangements may depend on the number of products or indications for which any particular technology is used. Thus, any statement of potential fees payable by us under each agreement is subject to a high degree of potential variation from the amounts indicated.

Although we or our licensors may file and prosecute patent applications related to various technologies under license or development, or seek to protect some technologies in other ways such as through the maintenance of trade secrets, our product candidates are based on complex and rapidly evolving technologies. There are a number of additional uncertainties affecting our ability to enforce any of our intellectual property rights as described below

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under Risks Related to Our Intellectual Property and Potential Litigation. There can be no assurance that any intellectual property assets, or other approaches to marketing exclusivity or priority, would be sufficient to protect our commercialization opportunities, nor that our planned commercialization activities will not infringe any intellectual property rights held or developed by third parties.

Employees

During the fourth quarter of 2014 we implemented significant reductions in headcount, and as of December 31, 2014 we had 3 full-time employees. We do not expect that employee headcount to increase significantly during the next 12 months while our products and product candidates advance. Our employees are not represented by a collective bargaining agreement and we have not experienced any work stoppages as a result of labor disputes. We rely on various consultants and advisors to provide services to us.

Available Information

Our website address is www.cardiumthx.com. We make available, free of charge, through our website our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, as soon as reasonably practicable after we electronically file or furnish such reports to the SEC. The information on our websites is not part of this or any other report we file with, or furnish to, the SEC. For additional financial information, including financial information about our business, please see the consolidated financial statements and accompanying notes to the consolidated financial statements included under Item 8 of this report.

ITEM 1A. RISK FACTORS

You should carefully review and consider the risks described below, as well as the other information in this report and in other reports and documents we file with the SEC when evaluating our business and future prospects. The risks and uncertainties described below are not the only ones we face. Additional risks and uncertainties, not presently known to us, or that we currently see as immaterial, may also occur. If any of the following risks or any additional risks and uncertainties actually occur, our business could be materially harmed, and our financial condition, results of operations and future growth prospects could be materially and adversely affected. In that event, the market price of our common stock could decline and you could lose all or a portion of the value of your investment in our stock. You should not draw any inference as to the magnitude of any particular risk from its position in the following discussion. .

Risks Related to Our Business and Industry

Our products and product candidates are subject to ongoing regulatory requirements or require regulatory approvals, and in some cases additional prior development or testing, before marketing. We may be unable to develop, obtain or maintain regulatory approval or market any of our product candidates or expand the market of our existing products and technology. If our product candidates are delayed or fail, we will not be able to generate revenues and cash flows from operations, and we may have to curtail or cease our operations.

Our Excellagen ® wound care and biologics products are subject to numerous rules and regulations promulgated by the FDA and other food and health regulatory authorities, including regulations governing the sourcing, manufacture, labeling, handling, storage, marketing and use of such products. In most cases, we will rely on third parties to perform many of these activities, which may not be performed in an effective or timely manner.

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Our Generx® and other product candidates require additional research and development, clinical testing and regulatory clearances before we can market them. To our knowledge, the FDA has not yet approved any gene therapy like that contained in our Generx product candidate, or similar product and there can be no assurance that it will. There are many reasons that our products and product candidates may fail or not advance beyond clinical testing, including the possibility that:

- our products and product candidates may be ineffective, unsafe or associated with unacceptable side effects;
- our product candidates may fail to receive necessary regulatory approvals or otherwise fail to meet applicable regulatory standards;
- our product candidates may be too expensive to develop, manufacture or market;
- physicians, patients, third-party payers or the medical community in general may not accept or use our products;
- our potential collaborators may withdraw support for or otherwise impair the development and commercialization of our products or product candidates;
- other parties may hold or acquire proprietary rights that could prevent us or our potential collaborators from developing or marketing our products or product candidates; or
- others may develop equivalent, superior or less expensive products.

In addition, our product candidates are subject to the risks of failure inherent in the development of biologics, gene therapy and other products based on innovative technologies. As a result, we are not able to predict whether our research, development and testing activities will result in any commercially viable products or applications. If our product candidates are delayed or we fail to successfully develop and commercialize our product candidates, or if we are unable to develop or successfully expand the market of our existing products or related technology, our business, financial condition or results of operations will be negatively affected, and we may have to curtail or cease our operations.

We rely on third party clinical research organizations to manage our clinical trials. Under this business model, we have less control over the clinical trials and may experience delays or errors in our clinical trials that could adversely affect our business, financial results and commercial prospects.

To obtain regulatory approvals for new products, we must, among other things, initiate and successfully complete multiple clinical trials demonstrating to the satisfaction of the FDA or other regulatory authority that our product candidates are sufficiently safe and effective for a particular indication. We currently rely on third party clinical research organizations to assist us in designing, administering and assessing the results of those trials. In relying on those third parties, we are dependent upon them to timely and accurately perform their services. We have experienced, and in the future may experience, delays in our clinical trials. Any such delay will result in additional costs, and defer any prospective opportunities to monetize the product candidate. Product development costs to us and our potential collaborators will increase, and our business may be negatively impacted, if we experience delays in testing or approvals or if we need to perform more or larger clinical trials than planned, for reasons such as the following:

- the FDA or other health regulatory authorities, or institutional review boards, do not approve a clinical study protocol or place a clinical study on hold;

suitable patients do not enroll in a clinical study in sufficient numbers or at the expected rate, or data is adversely affected by trial conduct or patient drop out;

patients experience serious adverse events, including adverse side effects of our drug candidate or device;

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patients die during a clinical study for a variety of reasons that may or may not be related to our product candidates, including the advanced stage of their disease and medical problems;

patients in the placebo or untreated control group exhibit greater than expected improvements or fewer than expected adverse events;

third-party clinical investigators do not perform the clinical studies on the anticipated schedule or consistent with the clinical study protocol and good clinical practices, or other third-party organizations do not perform data collection and analysis in a timely or accurate manner;

service providers, collaborators or co-sponsors do not adequately perform their obligations in relation to the clinical study or cause the study to be delayed or terminated;

regulatory inspections of manufacturing facilities, which may, among other things, require us or a co-sponsor to undertake corrective action or suspend the clinical studies;

the interim results of the clinical study are inconclusive or negative;

the clinical study, although approved and completed, generates data that is not considered by the FDA or others to be sufficient to demonstrate safety and efficacy; and

changes in governmental regulations or administrative actions affect the conduct of the clinical trial or the interpretation of its results.

Significant delays may adversely affect our financial results and the commercial prospects for our product candidates and delay our ability to become profitable. If third party organizations do not accurately collect and assess the trial data, we may discontinue development of viable product candidates or continue allocating resources to the development and marketing of product candidates that are not efficacious. Either outcome could result in significant financial harm to our company and damage to our reputation.

If we are unable to enter into successful sales, marketing and distribution agreements with third parties, we may not be able to successfully commercialize our products.

In order to commercialize any products successfully, we expect to principally rely on collaborations or other arrangements with third parties to sell, market and distribute our products. To the extent that we enter into licensing, distributorship, co-promotion, co-marketing or other collaborative arrangements, our product revenues are likely to be lower than if we directly marketed and sold our products, and any revenues we receive will depend upon the efforts of third parties, whose efforts may not meet our expectations or be successful.

We have entered into agreements with third parties to market our Excellagen product and to market our Generx product in certain territories if approved by relevant regulatory authorities, but there can be no assurance that the efforts of such third parties will meet our expectations or result in any significant product sales. While third parties would be largely responsible for the timing and extent of sales and marketing efforts, they may not dedicate sufficient resources to our product opportunities, and our ability to cause them to devote additional resources or to otherwise promote sales of our products may be limited.

We are a development stage company. We have incurred losses since our inception in December 2003 and expect to incur significant net losses in the foreseeable future and may never become profitable.

We have sustained operating losses to date and will likely continue to sustain losses as we seek to develop our products and product candidates. We expect these losses to be substantial because our product development and other costs, including significant amounts we expect to spend on development activities and clinical trials for

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our product candidates, cannot be offset by our limited revenues during our development stage. As of December 31, 2014, our accumulated deficit was approximately $111 million, and our cash and cash equivalents were approximately $217,000. To date, we have generated very limited revenues and a large portion of our expenses are fixed, including expenses related to facilities, equipment, contractual commitments and personnel. As a result, we expect our net losses from operations to continue for at least the next few years. Whether we will generate additional revenues and become profitable will depend largely on our ability, alone or with potential collaborators, to efficiently and successfully complete the development of our product candidates, successfully complete pre-clinical and clinical tests, obtain necessary regulatory approvals, and manufacture and market our products. There can be no assurance that any such events will occur or that we will ever become profitable. Even if we do achieve profitability, we cannot predict the level of such profitability. If we sustain losses over an extended period of time, we may be unable to continue our business.

We need substantial additional capital to develop our products and for our operations in the near term. If we are unable to obtain such funds when needed, we may have to delay, scale back or terminate our product development or our business.

Conducting the costly and time consuming research, pre-clinical and clinical testing necessary to obtain regulatory approvals and bring our products to market will require a commitment of substantial funds in excess of our current capital. Our future capital requirements will depend on many factors, including, among others: the progress of our current and new product development programs; the progress, scope and results of our pre-clinical and clinical testing; the time and cost involved in obtaining regulatory approvals; the cost of manufacturing our products and product candidates; the cost of prosecuting, enforcing and defending against patent claims and other intellectual property rights; competing technological and market developments; and our ability and costs to establish and maintain collaborative and other arrangements with third parties to assist in potentially bringing our products to market and/or to monetize the economic value of our product portfolio. We need to raise additional working capital to fund our operations. The audit opinion accompanying our consolidated financial statements for the year ended December 31, 2014, included under Item 8 of this report, includes an explanatory paragraph indicating substantial doubt about our ability to continue as a going concern.

We need to raise substantial additional capital to fund our future operations. We cannot be certain that additional financing will be available on acceptable terms, or at all. To the extent we raise additional capital through the sale of equity securities or we issue securities in connection with another transaction, the ownership position of existing stockholders could be substantially diluted. Anti-dilution adjustments to our securities currently outstanding would cause further dilution. If additional funds are raised through the issuance of preferred stock or debt securities, these securities are likely to have rights, preferences and privileges senior to our common stock and may involve significant fees, interest expense, restrictive covenants and the granting of security interests in our

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assets. Fluctuating interest rates could also increase the costs of any debt financing we may obtain. Raising capital through a licensing or other transaction involving our intellectual property could require us to relinquish valuable intellectual property rights and thereby sacrifice long term value for short-term liquidity.

Our failure to successfully address ongoing liquidity requirements would have a substantially negative impact on our business. If we are unable to obtain additional capital on acceptable terms when needed, we may need to take actions that adversely affect our business, our stock price and our ability to achieve cash flow in the future, including possibly surrendering our rights to some technologies or product opportunities, delaying our clinical trials or curtailing or ceasing operations.

Our technologies and product candidates may have unacceptable side effects that could delay or prevent product approval.

Possible side effects of therapeutic technologies may be serious and life threatening. The occurrence of any unacceptable side effects during or after pre-clinical and clinical testing of our product candidates, or the perception or possibility that our products cause or could cause such side effects, could delay or prevent approval of our products and negatively impact our business. For example, possible serious side effects of gene transfer like that contained in Generx could include viral or gene product toxicity resulting in inflammation or other injury to the heart or other parts of the body. In addition, the development or worsening of cancer in a patient could potentially be a perceived or actual side effect of gene therapy technologies such as our own. Furthermore, there is a possibility of side effects or decreased effectiveness associated with an immune response toward any viral vector or gene used in gene therapy. The possibility of such response may increase if there is a need to deliver the viral vector more than once.

Even if approved for marketing, our technologies and product candidates are relatively novel and unproven and they may fail to gain market acceptance.

Our ongoing business and future depends on the success of our technologies and product candidates. Gene-based therapy is a new and rapidly evolving medical approach that has any not been shown to be effective on a widespread basis. Biotechnology and pharmaceutical companies have successfully developed and commercialized only a limited number of biologic-based products to date and no gene therapy has yet been successfully commercialized. Our product candidates, and the technology underlying them, are new and unproven and there is no guarantee that health care providers or patients will be interested in our products even if they are approved for use. Our success will depend in part on our ability to demonstrate sufficient clinical benefits, reliability, safety and cost effectiveness of our product candidates and technology relative to other approaches, as well as on our ability to continue to develop our product candidates to respond to competitive and technological changes. If the market does not accept our products or product candidates, when and if we are able to commercialize them, then we may never become profitable. It is difficult to predict the future growth of our business, if any, and the size of the market for our product candidates because the market and technology are continually evolving. There can be no assurance that our technologies and product candidates will prove superior to technologies and products that may currently be available or may become available in the future or that our technologies or research and development activities will result in any commercially profitable products.

We may pursue acquisitions of other companies or product rights that, if not successful, could adversely affect our business, financial condition and results of operations.

As part of our business strategy, we may pursue acquisitions of other companies, technologies or products. Acquisitions of businesses or product rights involve numerous risks, including:

- our limited experience in evaluating businesses and product opportunities and completing acquisitions;
- the use of any existing cash reserves or the need to obtain additional financing to pay for all or a portion of the purchase price of such acquisitions and to support the ongoing operations of the businesses acquired;

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the potential need to issue convertible debt, equity securities, stock options and stock purchase warrants to complete an acquisition, which would dilute our stockholders and could adversely affect the market price of our common stock;

potential difficulties related to integrating the technology, products, personnel and operations of the acquired company;

requirements of significant capital infusions in circumstances under which the acquired business, its products and/or technologies may not generate sufficient revenue or any revenue to offset acquisition costs or ongoing expenses;

entering markets in which we have no or limited prior direct experience and where competitors have stronger market or intellectual property positions;

disruptions to our ongoing business, diversion of resources, increases in our expenses and distraction of management s attention from the normal daily operations of our business;

the potential to negatively impact our results of operations because an acquisition may require us to incur large one-time charges to earnings, amortize or write down amounts related to goodwill and other intangible assets, or incur or assume substantial debt or liabilities, or cause adverse tax consequences, substantial depreciation or deferred compensation charges;

an uncertain sales and earnings stream, or greater than expected liabilities and expenses, associated with the acquired company, product or product rights;

failure to operate effectively and efficiently as a combined organization utilizing common information and communication systems, operating procedures, financial controls and human resources practices;

potential loss of key employees of the acquired company; and

disruptions to our relationships with existing collaborators who could be competitive with the acquired business.

There can be no assurance that transactions that we may pursue will ultimately prove successful. If we pursue an acquisition but are not successful in completing it, or if we complete an acquisition but are not successful in integrating the acquired company s employees, products or operations successfully, our business, financial condition or results of operations could be harmed.

We may not successfully establish and maintain collaborative and licensing arrangements, which could adversely affect our ability to develop and commercialize our product candidates.

Our business strategy relies on establishing and maintaining collaborations with licensors and other third parties for the development, testing, manufacturing and commercialization of our product candidates. For example, we have various licenses from third parties relating to the development, marketing and sale of our Generx product candidate. We have also entered into collaboration agreements with third parties to assist in the completion of the clinical trials and regulatory filings to secure approval to market the products, as well as agreements to distribute the products on regulatory approval.

We may not be able to maintain or expand these or other licenses and collaborations or establish additional licensing and collaboration arrangements necessary to develop and commercialize our product candidates. Even if we are able to maintain or establish licensing or collaboration arrangements, these arrangements may not be on favorable terms and may contain provisions that will restrict our ability to develop, test and market our product candidates. Any failure to maintain or establish licensing or collaboration arrangements on favorable terms could adversely affect our business prospects, financial condition or ability to develop and commercialize our product candidates.

We expect to rely on third party service providers and collaborators to perform a number of activities relating to the development and commercialization of our product candidates, including the manufacture of product materials, the design and conduct of clinical trials, the obtaining of regulatory approvals and the marketing and distribution of any successfully developed products. Our collaborators also may have or acquire rights to control aspects of our product development and clinical

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programs. As a result, we may not be able to conduct these programs in the manner or on the time schedule we currently contemplate. In addition, if any of these collaborators withdraw support for our programs or product candidates or otherwise impair their development, our business could be negatively affected. To the extent we undertake any of these activities internally, our expenses may increase.

Our success hinges on the proper and effective performance of our service providers and collaborators of their responsibilities under their arrangements with us. Our existing or potential collaborators may not perform their obligations in a timely fashion or in a manner satisfactory to us. We and our present and future collaborators may fail to develop or effectively commercialize products covered by our present and future collaborations if, among other things:

- we do not achieve our objectives under our collaboration agreements;
- we or our collaborators are unable to obtain patent protection for the products or proprietary technologies we develop in our collaborations;
- we are unable to manage multiple simultaneous product discovery and development collaborations;
- our collaborators become competitors of ours or enter into agreements with our competitors;
- we or our collaborators encounter regulatory hurdles that prevent commercialization of our products; or
- we develop products and processes or enter into additional collaborations that conflict with the business objectives of our other collaborators.

In addition, conflicts may arise with our collaborators, such as conflicts concerning the interpretation of clinical data, the achievement of milestones, the interpretation of financial provisions or the ownership of intellectual property developed during the collaboration. If any conflicts arise with our existing or future collaborators, they may act in their self-interest, which may be adverse to our best interest. If we or our collaborators are unable to develop or commercialize products, or if conflicts arise with our collaborators, we will be delayed or prevented from developing and commercializing products, which will harm our business and financial results.

We will rely on third parties to manufacture our products and product candidates. There can be no guarantee that we can obtain sufficient and acceptable quantities of our product candidates on acceptable terms, which may delay or impair our ability to develop, test and market such products.

Our business strategy relies on third parties to manufacture and produce our products and product candidates and the catheters used to deliver the products in accordance with Good Manufacturing Practices established by the FDA and other regulators. These third party manufacturers are subject to extensive government regulation and must receive FDA approval before they can produce clinical material or commercial product.

Our products and product candidates may be in competition with other products for access to these facilities and may be subject to delays in manufacture if third parties give other products greater priority than our products. These third parties also may not deliver sufficient quantities of our products, manufacture our products in accordance with specifications, or comply with applicable government regulations. Successful large-scale manufacturing of gene-based therapy products has been accomplished by very few companies, and significant process development changes may be necessary before commercializing and manufacturing any of our biologic product candidates. Additionally, if the manufactured products fail to perform as specified, our business and reputation could be severely impacted.

If any manufacturing agreement is terminated or any third party service provider or collaborator experiences a significant problem that could delay or interrupt the supply of product to us, there are very few contract manufacturers who currently have the capability to produce our product candidates. There can be no assurance that manufacturers on whom we depend will be able to successfully produce our products or

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product candidates on acceptable terms, or on a timely or cost-effective basis, or in accordance with our product specifications and applicable FDA or other governmental regulations. We must have sufficient and acceptable quantities of our product materials to conduct our clinical trials and to market our product candidates, if and when such products have been approved by the FDA for marketing. If we are unable to obtain sufficient and acceptable quantities of our product material, we may be required to delay the clinical testing and marketing of our products, which would negatively impact our business.

We face intense and increasing competition and must cope with rapid technological change, which may adversely affect our financial condition and/or our ability to successfully commercialize and/or market our products and product candidates.

Our competitors and potential competitors include large pharmaceutical and medical device companies and more established biotechnology companies. These companies have significantly greater financial and other resources and greater expertise than us in research and development, manufacturing, pre-clinical and clinical testing, obtaining regulatory approvals and marketing. This may make it easier for them to respond more quickly than us to new or changing opportunities, technologies or market needs. Our larger competitors may be able to devote greater resources to research and development, marketing, distribution and other activities that could provide them with a competitive advantage. Many of these competitors operate large, well-funded research and development programs and have significant products approved or in development. Small companies may also prove to be significant competitors, particularly through collaborative arrangements with large pharmaceutical companies or through acquisition or development of intellectual property rights. Our potential competitors also include academic institutions, governmental agencies and other public and private research organizations that conduct research, seek patent protection and establish collaborative arrangements for product and clinical development and marketing.

Our industry is characterized by extensive research and development, rapid technological change, frequent innovations and new product introductions, and evolving industry standards. Existing products and therapies to treat vascular and cardiovascular disease, including drugs and surgical procedures, as well as competitive approaches to wound healing and tissue repair, will compete directly or indirectly with the products that we are seeking to develop and market. In addition, our competitors may develop more effective or more affordable products, or achieve earlier patent protection or product commercialization and market penetration than us. As these competitors develop their technologies, they may develop proprietary positions that prevent us from successfully commercializing our future products. To be successful, we must be able to adapt to rapidly changing technologies by continually enhancing our products and introducing new products. If we are unable to adapt, products and technologies developed by our competitors may render our products and product candidates uneconomical or obsolete, and we may not be successful in marketing our products and product candidates against competitors. We may never be able to capture and maintain the market share necessary for growth and profitability and there is no guarantee we will be able to compete successfully against current or future competitors.

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Changes and reforms in the health care system or reimbursement policies may adversely affect the sale of our products and future products or our ability to obtain an adequate level of reimbursement or acceptable prices for our products or future products.

Our ability to earn sufficient returns on our products and future products will depend in part on the extent to which reimbursement for our products and related treatments will be available from government health administration authorities, private health coverage insurers, managed care organizations and other third-party payers. If we fail to obtain appropriate reimbursement, it could prevent us from successfully commercializing and marketing our products and future products.

There have been and will continue to be efforts by governmental and third-party payers to contain or reduce the costs of health care through various means, including limiting coverage and the level of reimbursement. We expect that there will continue to be a number of legislative proposals to implement government controls and other reforms to limit coverage and reimbursement. Additionally, third-party payers, including Medicare, are increasingly challenging the price of medical products and services and are limiting the reimbursement levels offered to consumers for these medical products and services. If purchasers or users of our products or future products are not able to obtain adequate reimbursement from third-party payers for the cost of using the products, they may forego or reduce their use. Significant uncertainty exists as to the reimbursement status of newly approved health care products, including gene therapy and other therapeutic products and devices, and whether adequate third-party coverage will be available. The announcement or considerations of these proposals or reforms could impair our ability to raise capital and negatively affect our business.

If we are unable to attract and retain key personnel and advisors, it may adversely affect our ability to obtain financing, pursue collaborations or develop or market our products or product candidates.

Our future success depends on our ability to attract, retain and motivate highly qualified management and scientific and regulatory personnel and advisors. We currently rely on Christopher J. Reinhard, our Chairman of the Board, Chief Executive Officer, President and Treasurer, as our sole executive officer. The loss of Mr. Reinhards services would significantly disrupt our operations. We do not maintain any key man life insurance on our executive officers.

To pursue our business strategy, we will need to hire or otherwise engage qualified scientific personnel and managers, including personnel with expertise in clinical trials, government regulation, manufacturing, marketing and other areas. Competition for qualified personnel is intense among companies, academic institutions and other organizations. If we are unable to attract and retain key personnel and advisors, it may negatively affect our ability to successfully develop, test, commercialize and market our products and product candidates.

We will use hazardous and biological materials in our business. Any claims relating to improper handling, storage or disposal of these materials could be time consuming and costly.

Our products and processes will involve the controlled storage, use and disposal of certain hazardous and biological materials and waste products. We and our suppliers and other collaborators are subject to federal, state and local regulations governing the use, manufacture, storage, handling and disposal of materials and waste products. Even if we and these suppliers and collaborators comply with the standards prescribed by law and regulation, the risk of accidental contamination or injury from hazardous materials cannot be completely eliminated. In the event of an accident, we could be held liable for any damages that result, and any liability could exceed the limits or fall outside the coverage of any insurance we may obtain and exceed our financial resources. We may not be able to maintain insurance on acceptable terms, or at all. We may incur significant costs to comply with current or future environmental laws and regulations.

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To the extent that we enter markets outside the United States, our business will be subject to political, economic, legal and social risks in those markets, which could adversely affect our business.

There are significant regulatory and legal barriers in markets outside the United States that we must overcome to the extent we enter or attempt to enter markets in countries other than the United States. We will be subject to the burden of complying with a wide variety of national and local laws, including multiple and possibly overlapping and conflicting laws. We also may experience difficulties adapting to new cultures, business customs and legal systems. Any sales and operations outside the United States would be subject to political, economic and social uncertainties including, among others:

changes and limits in import and export controls;

increases in custom duties and tariffs;

changes in currency exchange rates;

economic and political instability;

changes in government regulations and laws;

absence in some jurisdictions of effective laws to protect our intellectual property rights; and

currency transfer and other restrictions and regulations that may limit our ability to sell certain products or repatriate profits to the United States.

Any changes related to these and other factors could adversely affect any business operations that we conduct outside the United States.

Risks Related to Our Intellectual Property and Potential Litigation

If our products and product candidates are not effectively protected by valid, issued patents or if we are not otherwise able to protect our proprietary information, or if our right to use intellectual property that we license from third parties is terminated or adversely affected, our financial condition, operations or ability to develop and commercialize our product candidates may be harmed.

The success of our operations will depend in part on our ability and that of our licensors, both in the United States and in other countries with substantial markets, to: obtain patent protection for our therapeutics, devices and procedures, and other methods or components on which we rely; defend patents once obtained; maintain trade secrets and operate without infringing upon the patents and proprietary rights of others; and obtain appropriate licenses upon reasonable terms to patents or proprietary rights held by others that are necessary or useful to us in commercializing our technology.

Our business substantially relies on our own or in-licensed intellectual property related to various technologies that are material to our products and processes. We depend on our and our licensors abilities to successfully prosecute and enforce the patents, file patent applications and prevent infringement of those patents and patent applications. The licenses and other intellectual property rights we acquire may or may not provide us with exclusive rights. To the extent that we do not have exclusive rights, others may license the same technology and may develop the technology more successfully or may develop products similar to ours and that compete with our products. Even if we are provided with exclusive rights, the scope of our rights under our licenses may be subject to dispute and termination or reduction by our licensors or third parties. Our licenses also contain milestones that we must meet and/or minimum royalty or other payments that we must make to maintain the licenses. There is no assurance that we will be able to meet such milestones and/or make such payments. Our licenses may be terminated if we fail to meet applicable milestones or make applicable payments.

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If we are not able to maintain adequate patent protection for our products and product candidates, we may be unable to prevent our competitors from using our technology or technology that we license.

The patent positions of the technologies being developed by us and our collaborators involve complex legal and factual uncertainties. As a result, we cannot be certain that we or our collaborators will be able to obtain adequate patent protection for our products or product candidates. There can be no assurance that (i) any patents will be issued from any pending or future patent applications of ours or our collaborators; (ii) the scope of any patent protection will be sufficient to provide us with competitive advantages; (iii) any patents obtained by us or our collaborators will be held valid if subsequently challenged; or (iv) others will not claim rights in or ownership of the patents and other proprietary rights we or our collaborators may hold. Unauthorized parties may try to copy aspects of our products and technologies or obtain and use information we consider proprietary. Policing the unauthorized use of our proprietary rights is difficult. We cannot guarantee that no harm or threat will be made to our or our collaborators intellectual property. In addition, changes in, or different interpretations of, patent laws in the United States and other countries may also adversely affect the scope of our patent protection and our competitive situation.

Due to the significant time lag between the filing of patent applications and the publication of such patents, we cannot be certain that our licensors were the first to file the patent applications we license or, even if they were the first to file, also were the first to invent, particularly with regards to patent rights in the United States. In addition, a number of pharmaceutical and biotechnology companies and research and academic institutions have developed technologies, filed patent applications or received patents on various technologies that may be related to our operations. Some of these technologies, applications or patents may conflict with our or our licensors technologies or patent applications. A conflict could limit the scope of the patents, if any, that we or our licensors may be able to obtain or result in denial of our or our licensors patent applications. If patents that cover our activities are issued to other companies, we may not be able to develop or obtain alternative technology.

Patents issued and patent applications filed internationally relating to gene therapy and biologics, collagen-based products, and other of our technologies are numerous, and we cannot assure you that current and potential competitors or other third parties have not filed or received, or will not file or receive applications in the future for patents or obtain additional proprietary rights relating to products or processes used or proposed to be used by us.

Additionally, there is certain subject matter that is patentable in the United States but not generally patentable outside of the United States. Differences in what constitutes patentable subject matter in various countries may limit the protection we can obtain outside of the United States. For example, methods of treating humans are not patentable in many countries outside of the United States. These and other issues may prevent us from obtaining patent protection outside of the United States, which would have a material adverse effect on our business, financial condition and results of operations.

We may be subject to costly claims, and, if we are unsuccessful in resolving conflicts regarding patent rights, we may be prevented from developing, commercializing or marketing our products and/ or product candidates.

There has been, and will likely continue to be, substantial litigation regarding patent and other intellectual property rights in the biotechnology industry. As more potentially competing patent applications are filed, and as more patents are actually issued, in the fields of gene therapy, biologics, collagen-based products, wound healing and tissue repair, adenoviral vectors or in other fields in which we may become involved and with respect to component methods or compositions that we may employ, the risk increases that we or our licensors may be subjected to litigation or other proceedings that claim damages or seek to stop our manufacturing, marketing, product development or commercialization efforts. Litigation may be necessary to enforce our or our licensors proprietary rights or to determine the enforceability, scope and validity of the proprietary rights of others. If we become involved in litigation, it could be costly and divert our efforts and resources. In addition, if any of our competitors file patent applications in the United States claiming technology also invented by us or our licensors, we may need to participate in interference proceedings held by the U.S. Patent and Trademark Office to determine priority of invention and the right to a patent for the technology. Like litigation, interference proceedings can be lengthy and often result in substantial costs and diversion of resources.

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If we are unsuccessful in defending against any adverse claims, we could be compelled to seek licenses from one or more third parties who could be direct or indirect competitors and who might not make licenses available on terms that we find commercially reasonable or at all. In addition, such proceedings, even if decided in our favor, involve lengthy processes, are subject to appeals, and typically result in substantial costs and diversion of resources.

Even if such patent applications or patents are ultimately proven to be invalid, unenforceable or non-infringed, such proceedings are generally expensive and time consuming and could consume a significant portion of our resources and substantially impair our marketing and product development efforts.

We may not have adequate protection for our unpatented proprietary information, which could adversely affect our competitive position.

We also rely on trade secrets, know-how, continuing technological innovations and licensing opportunities to develop and maintain our competitive position. However, others may independently develop substantially equivalent proprietary information and techniques or otherwise gain access to our trade secrets or disclose our technology. To protect our trade secrets, we may enter into confidentiality agreements with employees, consultants and potential collaborators. However, these agreements may not provide meaningful protection of our trade secrets or adequate remedies in the event of unauthorized use or disclosure of such information. Likewise, our trade secrets or know-how may become known through other means or be independently discovered by our competitors. Any of these events could prevent us from developing or commercializing our product candidates.

We face the risk of product liability claims, which could adversely affect our business and financial condition.

Our sales and marketing will expose us to product liability risks that are inherent in the testing, manufacturing and marketing of biotechnology and medical device products. Failure to obtain or maintain sufficient product liability insurance or otherwise protect against product liability claims could prevent or delay the commercialization or marketing of our products or product candidates or expose us to substantial liabilities and diversions of resources, all of which can negatively impact our business. Regardless of the merit or eventual outcome, product liability claims may result in withdrawal of product candidates from clinical trials, costs of litigation, damage to our reputation, substantial monetary awards to plaintiffs and decreased demand for products.

Product liability may result from harm to patients using our products, such as a complication that was either not communicated as a potential side effect or was more extreme than communicated. We will require all patients enrolled in our clinical trials to sign consents, which explain various risks involved with participating in the trial. However, patient consents provide only a limited level of protection, and it may be alleged that the consent did not address or did not adequately address a risk that the patient suffered from. Additionally, we will generally be

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required to indemnify the clinical product manufacturers, clinical trial centers, medical professionals and other parties conducting related activities in connection with losses they may incur through their involvement in the clinical trials. We may not be able to obtain or maintain product liability insurance on acceptable terms or with adequate coverage against potential liabilities.

Risks Related to Our Common Stock

The issuance of our Series A Convertible Preferred Stock may result in substantial dilution to holders of our common stock and may restrict our access to additional financing.

On April 4, 2013 we entered into a securities purchase agreement with an institutional investor to purchase up to 4,012 shares of our newly authorized Series A Convertible Preferred Stock for maximum proceeds of $4.0 million. The Series A Convertible Preferred Stock is convertible into shares of our common stock at a current conversion price of $0.6437 per post-split share. In addition, the conversion price is subject to downward adjustment if we issue common stock or common stock equivalents at a price less than the then effective conversion price. In connection with the offering of the Series A Convertible Preferred Stock we granted the investor certain rights of participation in future equity financings. At December 31, 2014, there were 1,176 shares of Series A Convertible Preferred Stock outstanding. As long as the Series A Convertible Preferred Stock is outstanding, we have also agreed not to incur specified indebtedness without the consent of the holders of the Series A Convertible Preferred Stock. These factors may restrict our ability to raise capital through equity or debt offerings in the future.

We will need substantial additional capital to develop our products and for our future operations in the near term, which can adversely affect our stock price and valuation

We will need to raise substantial additional capital to fund our future operations. We may raise that capital through the sale of additional debt or equity securities the Cardium parent level, or through direct investment into any of our subsidiaries. To the extent we raise additional capital through the sale of equity securities or we issue securities in connection with another transaction, our stock price can be adversely affected and the ownership position of existing stockholders could be substantially diluted. Anti-dilution adjustments to our securities currently outstanding would cause further dilution. If additional funds are raised through the issuance of preferred stock or debt securities, these securities are likely to have rights, preferences and privileges senior to our common stock and may involve significant fees, interest expense, restrictive covenants and the granting of security interests in our assets. Fluctuating interest rates could also increase the costs of any debt financing we may obtain. Raising capital through a licensing or other transaction involving our intellectual property could require us to relinquish valuable intellectual property rights and thereby sacrifice long term value for short-term liquidity.

The exercise of our outstanding warrants and stock options will significantly dilute the ownership interest of existing stockholders.

At December 31, 2014 we had an aggregate of 2,788,242 stock options and warrants outstanding at exercise prices ranging from $0.80 to $55.00. The exercise of some or all of our outstanding warrants would significantly dilute the ownership interests of existing stockholders. Any sales in the public market of the common stock issuable upon such exercise could adversely affect prevailing market prices of our common stock.

The price of our common stock is expected to be volatile and an investment in our common stock could decline substantially in value.

In light of our small size, limited resources, and dependence on relatively few products or product candidates, our stock price is expected to be highly volatile and can be subject to substantial drops, with or even in the absence of news affecting our business. The following factors, in addition to the other risk factors described in this report, may have a significant impact on the market price of our common stock, some of which are beyond our control:

- changes in economic conditions in the United States and worldwide;
- the availability to us or other companies of credit;

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anticipated or unanticipated changes in financial condition, operating results or the perceived value of our business;

anticipated or unanticipated changes that affect our ability to maintain the listing of our common stock on a national exchange;

developments concerning any research and development, clinical trials, manufacturing, and marketing efforts or collaborations;

our announcement of significant acquisitions, strategic collaborations, joint ventures or capital commitments;

announcements of technological innovations;

new products or services that we or our competitors offer;

the initiation, conduct and/or outcome of intellectual property and/or litigation matters;

changes in financial or other estimates by securities analysts or other reviewers or evaluators of our business;

conditions or trends in bio-pharmaceutical or other healthcare industries;

regulatory developments in the United States and other countries;

changes in the economic performance and/or market valuations of other biotechnology and medical device companies;

additions or departures of key personnel;

sales or other transactions involving our common stock; and

global unrest, terrorist activities, and economic and other external factors.

The market prices of securities of smaller biotechnology and medical device companies have experienced dramatic fluctuations that often have been unrelated or disproportionate to the operating results of these companies. Continued market fluctuations could result in extreme volatility in the price of the common stock, which could cause a decline in the value of the common stock. You should also be aware that price volatility may be worse if the trading volume of our common stock remains limited or declines.

Our company could be difficult to acquire due to anti-takeover provisions in our charter, our stockholder rights plan and Delaware law.

Our bylaws provide for a staggered board of directors and for advanced shareholder notice for actions to be taken at meetings of stockholders. In addition, our board of directors has adopted a stockholder rights plan in which preferred stock purchase rights were distributed as a dividend. These provisions may make it more difficult for stockholders to take corporate actions and may have the effect of delaying or preventing a change in control. These provisions also could deter or prevent transactions that stockholders deem to be in their interests. In addition, we are subject to the anti- takeover provisions of Section 203 of the Delaware General Corporation Law. Subject to specified exceptions, this section

provides that a corporation may not engage in any business combination with any interested stockholder during the three-year period following the time that such stockholder becomes an interested stockholder. This provision could have the effect of delaying or preventing a change of control of our company. The foregoing factors could reduce the price that investors or an acquirer might be willing to pay in the future for shares of our common stock.

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We have never paid cash dividends on our capital stock and we do not anticipate paying dividends in the foreseeable future.

We have never paid cash dividends on any of our classes of capital stock to date, and we currently intend to retain our future earnings, if any, to fund the development and growth of our business. In addition any future debt or credit facility we obtain also may preclude or limit our ability to pay any dividends. As a result, capital appreciation, if any, of our common stock will be your sole source of potential gain for the foreseeable future.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

We do not own any real property. We lease the following properties, which we believe are adequate to meet our operating requirements for the foreseeable future:

Location	Nature of Use	Square Feet	Monthly Base Rent	Lease Expiration Date
11750 Sorrento Valley Road, Suite 250 San Diego, CA USA	Corporate Headquarters Principal executive office	4,419	$ 10,016[1]	Aug. 31, 2016

[1] The monthly base rent increases to $10,367 in September 2015. In addition to base rent, we are also required to pay our proportionate share of any increase in operating expenses from 2014 levels for the office park in which our space is located.

ITEM 3. LEGAL PROCEEDINGS

As of December 31, 2014 neither Cardium nor its subsidiaries were a party to any material pending legal proceeding. In the course of our business, however, we could become engaged in various intellectual property, product-related, and other matters in connection with the technology we develop or license and the products we develop for commercialization. Any such proceedings, even if decided in our favor, involve lengthy processes, are subject to appeals, and typically result in substantial costs and diversion of resources.

In the course of our business, we are also routinely involved in proceedings such as disputes involving goods or services provided by various third parties to Cardium or its subsidiaries, which we do not consider likely to be material to the technology we develop or license, or the products we develop for commercialization, but which can nevertheless result in costs and diversions of resources to pursue and resolve. For example, in October 2014 we received a complaint filed by Biorasi LLC in Broward County, Florida, seeking payments of approximately $0.5 million related to its activities in connection with the Company s ASPIRE clinical trial conducted in the Russian Federation. We plan to defend the action and are awaiting a ruling on our request to dismiss; we have not recorded a liability for this contingency as we believe that the probability of an adverse outcome is remote.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

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PART II

ITEM 5. MARKET FOR OUR COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Market Information

Our common stock currently trades on OTC QB under the symbol CRXM. Prior to January 24, 2014, our common stock traded on the NYSE MKT market. Below are the high and low closing prices of our common stock for the time it has traded on the OTC QB and the high and low closing prices for the time it traded on the NYSE MKT, for each quarter of the years ended December 31, 2014 and 2013:

	2015		2014		2013	
	High	Low				