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**CARDIUM ANNOUNCES NEW ORTHOBIOLOGICS PRODUCT
INITIATIVE EXTENDING GENE ACTIVATED MATRIX TECHNOLOGY
TO DELIVER BONE GROWTH FACTORS**

SAN DIEGO, Calif. – July 30, 2009 – Cardium Therapeutics (NYSE Amex: CXM) today announced plans to develop a DNA-based orthobiologics product portfolio based on research and development by Cardium's Tissue Repair Company that will initially focus on non-union bone fractures for medically-compromised patients, and spinal fusion for patients with degenerative disc disease. Orthobiologics is a rapidly growing segment of the orthopedics market and represents biologically-active products designed to enhance musculo-skeletal repair and regeneration.

Following on results observed with Tissue Repair's Excellerate™ product candidate, which is targeted to the repair of soft tissues (particularly diabetic ulcers), the Company's orthobiologics initiative will build on and extend the underlying technology that has been developed by the Tissue Repair Company to hard tissue applications such as bone, including: (1) proprietary Gene Activated Matrix™ or GAM™ delivery and ligand targeting; (2) use of GAM to locally produce proteins capable of stimulating bone and other tissue growth; and (3) a substantial body of pre-clinical research and development supporting the use of GAM to deliver bone growth factors. Cardium believes that future DNA-based products offer the potential to provide patients and healthcare systems with more cost-effective alternatives to current and planned protein-based therapeutics.

Cardium's initial orthobiologics focus will be on the development of Osteorate™, a DNA-based non-surgical injectable bone graft gel to repair bone fractures and regenerate tissue in certain medically-compromised patient populations. Osteorate will be based on a reformulation of Cardium's DNA-based Excellerate wound healing product candidate, now in late-stage clinical development, which is designed to stimulate localized and sustained cellular production of platelet-derived growth factor-B (PDGF-B) protein as a treatment for patients with non-healing diabetic foot ulcers. The Gene Activated Matrix technology allows for a broad spectrum of formulations which would include, but not be limited to, collagen, demineralized bone matrices, allograft and synthetic graft materials. Based on recently announced formulation advances, Osteorate would be developed as a pre-mixed ready-to-use-syringe that would be stored in a physician's office at a temperature of about 4 degrees Celsius. PDGF-B protein is a well known bone growth mediator and is already used in several FDA approved products and medical devices for soft and hard tissue healing.

The Gene Activated Matrix technology platform is expected to be further expanded with the use of other genes capable of promoting bone repair, in order to biologically enhance surgical spinal fusion procedures in patients with degenerative disc disease. Exemplary genes include a chimeric variant of BMP-4 (chBMP4), which offers the potential for the localized and sustained cellular expression and release of Bone Morphogenetic Protein-4 (BMP-4) to potentially enhance spinal fusions. A pre-clinical research study, conducted by Cardium's Tissue Repair Company, entitled *Bone Induction by AdBMP-2/Collagen Implants*, (Schreiber, et al., *J Bone Joint Surg*, 2005, May; 87(5): 1059-1068) demonstrated that local delivery of an adenovector encoding BMP-2 (AdBMP-2) in a collagen matrix rapidly induced new bone formation compared to controls. The chBMP4 variant is believed to be even more effective for orthobiologics applications such as bone repair.

Cardium plans to explore potential collaborations with other companies in the orthopedics space, including orthopedic device manufacturers and others having an interest in developing novel approaches designed to improve the healing and regeneration of bone following traumatic bone injuries, which are affecting a substantial and increasing proportion of the human population as patients survive to older ages along with general improvements in medicine and healthcare.

"With the completion of the sale of our InnerCool Therapies operating unit to Royal Philips Electronics, the first monetization from Cardium's bio-medical investment portfolio, we have now decided to expand our focus in regenerative medicine to include orthobiologics," reported Christopher J. Reinhard, Chairman and Chief Executive Officer of Cardium Therapeutics and Tissue Repair Company. "Cardium's Gene Activated Matrix technology and protein-producing DNA gene portfolio are important building blocks as we now broaden our strategy and development programs, that include cardiovascular and wound healing biologics, into the emerging new high growth market segment of orthobiologics."

Gene Activated Matrix Technology Platform

Cardium's proprietary Gene Activated Matrix technology platform is designed to provide a therapeutic level of protein synthesis at a specific site in the body and can be used in soft tissue such as skin, ligament, tendons and cartilage, as well as in hard tissue such as bone. The technology is distinctive in that it is immobilized gene delivery that allows for localized control of gene uptake. The Gene Activated Matrix comprises any biocompatible matrix containing a gene or DNA vector encoding for a growth factor or any therapeutic protein. The Gene Activated Matrix technology allows for a broad spectrum of formulations and the use of any biocompatible matrix, natural or synthetic, which would include, but not be limited to, collagen, demineralized bone, allograft and other synthetic graft materials.

The Company's studies have shown that proliferative cells migrate into the Gene Activated Matrix and then take up the immobilized gene resulting in localized and sustained production of micro quantities of growth factor proteins or other therapeutic proteins based on the protein-producing DNA of choice. Compared with current protein therapy, which may be limited due to the inherent short half-life of a protein once administered into the human body, the Company believes that the localized and sustained production of micro-quantities of DNA-driven proteins at the injury site within a Gene Activated Matrix offers the opportunity to significantly enhance the availability of therapeutic proteins to the cells performing tissue repair and lower the overall level of protein required.

Growth Factor Gene Portfolio

Growth factor proteins stimulate cellular proliferation and cellular differentiation. Growth factors regulate a variety of cellular processes, as well as other signaling molecules, which play

key roles in the regeneration and repair of soft tissues (skin, ligaments, tendons and cartilage) and hard tissues (bone). Based on Cardium's other regenerative development activities in the fields of wound healing and cardiovascular disease, the Company has access to a portfolio of protein-producing DNA sequences that include Platelet Derived Growth Factor-B (PDGF-B), Insulin like Growth Factor-I (IGF-I) and Fibroblast Growth Factor-4 (FGF-4).

In addition, researchers at Cardium's Tissue Repair Company have shown that a chimeric variant of BMP-4 (chBMP4) enhances the properties of the BMP-4 gene construct in order to optimize performance in the Gene Activated Matrix. The original BMP-4 protein is considered to be one of the more potent members of the Bone Morphogenetic Protein (BMP) family. By creating a chimeric variant that further improves the BMP-4 construct, the resulting protein was found to be produced very efficiently and to be highly effective. ([Click here](#) to see x-ray images from TRC pre-clinical research relating to chBMP-4). BMPs play a key role in the transformation of mesenchymal cells into bone and naturally recruit stem cells from the surrounding tissue to initiate the bone formation cascade. BMPs have been the focus of many orthopedic clinical development programs. Along with PDGF-B, BMPs are the only FDA-approved growth factors for healing bone.

In 2001, the first BMP (BMP-7/OP-1) received FDA approval for use in the U.S. (by Stryker) for hard-to-heal long bone fractures. In 2002, Medtronic's INFUSE[®] (BMP-2) received FDA approval for use in certain spinal fusion procedures and was later expanded to include certain long bone fractures, and dental bone graft applications. Both products use a collagen carrier matrix to provide an osteoconductive environment for bone cells to attach and grow.

Cardium's Orthobiologics Research

Significant pre-clinical research has been conducted and published by researchers and collaborators at Cardium's Tissue Repair Company and the University of Michigan demonstrating the safety and benefits of adenovector-mediated platelet-derived growth factor gene expression in the areas of periodontal tissue engineering and bone-grafting applications. Published data for periodontal tissue engineering include: (1) *Platelet-Derived Growth Factor Gene Delivery Stimulates ex Vivo Gingival Repair*, (Anusaksathien, et al., *Tissue Eng.* 2003 August; 9(4): 745-756); (2) *Engineering of Tooth-Supporting Structures by Delivery of PDGF Gene Therapy Vectors*, (Jin, et al., *Mol Ther*, 2004 April; 9(4): 519-526); (3) *Platelet-derived Growth Factor-B Gene Delivery Sustains Gingival Fibroblast Signal Transduction*, (Lin, et al., *J Periodont Res*, 2008; 43: 440-449); and (4) *Adenovirus Encoding Human Platelet-Derived Growth Factor-B Delivered to Alveolar Bone Defects Exhibits Safety and Biodistribution Profiles Favorable for Clinical Use*, (Chang, et al., *Human Gene Therapy*, 2009 May; 20: 486-496). This body of research by the Tissue Repair Company and its collaborators demonstrates the potential safety and benefits of PDGF gene therapy for periodontal tissue repair and regeneration. In addition, a pre-clinical research study, conducted by Cardium's Tissue Repair Company, entitled *Bone Induction by AdBMP-2/Collagen Implants*, (Schreiber, et al., *J Bone Joint Surg*, 2005, May; 87(5): 1059-1068) demonstrated that local delivery of an adenovector encoding BMP-2 (AdBMP-2) in a collagen matrix rapidly induced new bone formation compared to controls.

Market Opportunity of Orthobiologics

A new and rapidly growing market in orthopedics is orthobiologics. According to one industry research report, orthobiologics is the fastest growing segment in orthopedics with an estimated growth rate of 17% and total worldwide sales of \$4.2 billion in 2007. The global market for such products is projected to almost double from 2007 levels by 2012.

It is estimated that there are more than 6.8 million bone fractures annually in the United States. Of these fractures, it is reported that 5% to 10% do not heal properly due to non-union or

delayed union of the bone due to the extreme severity of the fracture or because the patient is medically impaired due to an illness such as diabetes or osteoporosis or life style choices such as smoking. These non-healing fractures, known as non-union fractures, are costly and debilitating. Aging is another important factor affecting hard tissue injuries, and as populations survive to greater ages, both the incidence of non-healing bone injuries and their consequences have increased.

Orthopedic surgeons for decades have been using a patient's own bone (autologous bone) to improve healing. Harvesting bone from a second site to augment healing has been the gold standard but not without drawbacks such as pain, longer surgical times and more anesthesia. Certain patients including those at risk for poor healing are not candidates for autologous grafts. A host of substitutes have been used with varying success. They include processed cadaver bone (allograft), demineralized bone matrices, synthetic materials and growth factors, primarily bone morphogenetic proteins.

Market data indicates that there are more than 500,000 surgical spine fusion procedures performed annually in the U.S. for patients with degenerative disc disease. These surgical fusion procedures utilize autograft, bone graft substitutes or BMPs to facilitate vertebrae fusion. The use of BMP growth factor proteins is becoming more widely adopted in part to reduce the need for harvesting surgical procedures and the inherent risks associated with these surgeries.

The orthobiologics market now has several protein products. Medtronic's INFUSE[®], approved in 2002 uses BMP-2 in a collagen sponge for spinal fusion. Stryker also has a BMP protein product known as OP-1 under a compassionate use exemption for certain orthopedic applications. BioMimetic's GEM 21S[®] Growth-factor Enhanced Matrix received FDA approval in November 2005 for the treatment of periodontal bone defects. GEM 21S, which is now owned and being marketed by Luitpold Pharmaceuticals, Inc., utilizes the same growth factor as Excellerate, PDGF. Medtronic's INFUSE[®] product dominates the bone morphogenetic protein market with over 90% of the U.S. sales totaling \$815 million in 2008. A recent *Journal of American Medical Association* article reviewing the use of bone morphogenetic proteins in spinal fusions estimated that in 2006 approximately 25% of spinal fusion procedures utilized a BMP product to improve healing of the fused vertebrae.

About Cardium

Cardium is focused on the acquisition and strategic development of new and innovative biomedical product opportunities and businesses that have the potential to address significant unmet medical needs and definable pathways to commercialization, partnering and other economic monetizations. Cardium's investment portfolio includes the Tissue Repair Company and Cardium Biologics, medical technology companies primarily focused on the development of innovative therapeutic products for tissue repair and cardiovascular indications. In May 2009, Cardium announced completion of the enrollment for the Matrix Phase 2b clinical study to evaluate the Excellerate product candidate as a treatment for patients with non-healing diabetic ulcers. News from Cardium is located at www.cardiumthx.com.

Forward-Looking Statements

Except for statements of historical fact, the matters discussed in this press release are forward looking and reflect numerous assumptions and involve a variety of risks and uncertainties, many of which are beyond our control and may cause actual results to differ materially from stated expectations. For example, there can be no assurance that an orthobiologics product initiative can be initiated and successfully developed, that results or trends observed in pre-clinical or clinical studies or procedures will be reproduced in subsequent studies or procedures, that the MATRIX

study or other human clinical trials can be conducted and completed in an efficient and successful manner, that clinical studies even if successful will lead to product advancement or partnering, that product formulation enhancements will be successful or will effectively simplify or expand the use of product candidates or technologies, that the GAM technology can be successfully broadened or applied to additional wound healing or tissue repair opportunities, that Excellerate, Osteorate or our other product candidates will prove to be sufficiently safe and effective, that our products or product candidates will not be unfavorably compared to competitive products that may be regarded as safer, more effective, easier to use or less expensive, that FDA or other regulatory clearances or other certifications, or other commercialization efforts will be successful or will effectively enhance our businesses or their market value, that our products or product candidates will prove to be sufficiently safe and effective after introduction into a broader patient population, or that third parties on whom we depend will perform as anticipated.

Actual results may also differ substantially from those described in or contemplated by this press release due to risks and uncertainties that exist in our operations and business environment, including, without limitation, risks and uncertainties that are inherent in the development of complex biologics and in the conduct of human clinical trials, including the timing, costs and outcomes of such trials, our ability to obtain necessary funding, regulatory approvals and expected qualifications, our dependence upon proprietary technology, our history of operating losses and accumulated deficits, our reliance on collaborative relationships and critical personnel, and current and future competition, as well as other risks described from time to time in filings we make with the Securities and Exchange Commission. We undertake no obligation to release publicly the results of any revisions to these forward-looking statements to reflect events or circumstances arising after the date hereof.

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