- First demonstration of a scalable source of highly purified and identified progenitor cells capable of making definitive (non-hypertrophic) cartilage -

The Associated Press

ALAMEDA, Calif.--(BUSINESS WIRE)--Apr 23, 2012-- BioTime, Inc. (NYSE Amex: BTX) and its wholly owned subsidiary OrthoCyte Corporation reported today a means of manufacturing cartilage from human embryonic stem cells that is suited for industrial scale-up of a product for the treatment of osteoarthritis. The paper, published online (ahead of print) in the peer-reviewed journal Regenerative Medicine, characterizes a progenitor cell line produced from human embryonic stem (hES) cells using proprietary ACTCellerate(TM) technology. The study reports that the cells are capable of regenerating cartilage with long sought-after identification markers. The study also shows that the cells can be directly expanded on a scale needed for industrial manufacture, which will be necessary in order to make transplantable cells available in commercial quantities.

In today's publication, BioTime scientists reported on one ACTCellerate(TM) line designated 4D20.8. This proprietary cell line is the cellular component of OrthoCyte's product in development, OTX-CP07. The scientific publication demonstrates that 4D20.8 cells possess site-specific markers of craniofacial mesenchyme, in particular, markers of proximal mandibular mesenchyme. This tissue is of significance in that it naturally produces one of the strongest joint cartilages of the body. The study documented conditions in which the cells can be propagated on a large scale, conditions in which the cells can be differentiated into cartilage in the laboratory, and evidence that the cells could repair damage to knee joints in rat models.

Another significant finding reported in the study is that the OrthoCyte 4D20.8 cells lacked certain mesenchymal stem cell (MSC) markers. MSCs have the ability to proliferate in response to fractures to generate a transient type of cartilage called "hypertrophic cartilage" that functions as a temporary repair of the fracture. Over time, that hypertrophic cartilage is transformed into bone. Therefore, due to their propensity to hypertrophy, MSCs have not served as an effective source of definitive cartilage for joint repair. When compared to MSCs in studies published in the current paper, 4D20.8 cells displayed markers consistent with definitive cartilage progenitors and showed a marked decrease in the expression of hypertrophic chondrocyte markers.

"We see osteoarthritis as one of the low-hanging fruits in regenerative medicine," said Michael D. West, Ph.D., BioTime's Chief Executive Officer. "The rapid rise of this market due to the aging of the baby boom population, the current lack of a cure for the disease, and the ease of scaling our product have led to our prioritizing this

product for development." Arnold Caplan, Ph.D., OrthoCyte's Chief Scientific Officer and Director of the Skeletal Research Center at Case Western Reserve University, commented, "The long-stated goal in orthopedic research has been to isolate the progenitors to specific and diverse types of cartilage in the body, such as those of the ear, nose, trachea, sternum, and weight-bearing joints. Cloning progenitors derived from hES cells is a novel method of obtaining these cells, which will be of great interest to those in the research community and those seeking to cure the debilitating disease of osteoarthritis." A discussion of OrthoCyte's product development strategy delivered by Dr. Caplan and comments on the implications of BioTime's scientific advances are available online at www.biotimeinc.com and www.orthocyte.com.

Background The emerging field of regenerative medicine is based on new discoveries in stem cell biology that, for the first time in medicine, may lead to technologies with the capacity to manufacture all of the cell types in the human body. In an era when age-related degenerative disease is the largest category of unmet medical needs, there is great interest in the potential for stem cell therapies to lead to treatments. The most common complaint of an aging population is the degenerative disease known as osteoarthritis. This painful condition is caused by the degeneration of the cartilage lining the ends of the bones in the joint. Because human cartilage has no innate regenerative capacity, and there currently is no cure for the disease, much attention has been directed at finding a means of introducing cartilage-forming cells into the aged joint to repair the tissue. An estimated 27 million Americans suffer from the disease, and this number is rapidly growing with the aging of our population. A safe and effective means of regenerating functional cartilage cells in human patients could therefore address a significant market.

Human embryonic stem and induced pluripotent stem (iPS) cells have attracted attention due to their capacity to generate all body cell types, a characteristic called "pluripotency." The adult human body also contains stem cells called "adult stem cells" that reside in some tissues and can contribute to the repair of that tissue in the case of injury or disease. Adult stem cells include the MSCs found in bone; MSCs possess the ability to proliferate in response to fractures, generating a transient type of hypertrophic cartilage that functions as temporary fracture repair. However, because hypertrophic cartilage eventually transforms into bone, MSCs have not served as an effective source of definitive cartilage for joint repair.

ACTCellerate(TM) technology is a proprietary method of isolating and expanding cell lines from hES or iPS cells into human progenitor cell lines in a purified and primitive state. These human progenitor cell lines, or simply "ACTCellerate(TM) lines", may solve certain technological issues associated with the manufacture of products from hES or iPS cells, in particular, methods for the generation of large quantities of highly identified and purified cell types. This is critical in the case of cell replacement therapies. Human therapeutic products require a high degree of purity to meet the hurdles of regulatory approval and acceptance in medical practice. BioTime scientists have identified embryonic progenitors to diverse types of human cartilage that show a high degree of purity, known identity, and scalability. The 4D20.8 cell line provide for the first time a means of manufacturing cells that subsequently generate numerous types of other cells, which will potentially address

large unmet needs in orthopedic medicine and be useful in multiple applications that have not to date been addressed through the use of adult-derived stem cells.

About OrthoCyte Corporation OrthoCyte Corporation (OrthoCyte), www.orthocyte.com, a subsidiary of BioTime, Inc., is a biotechnology company developing cell-based therapies for orthopedic disease. The company's lead product is OTX-CP07, monoclonal human embryonic progenitor cells lines for the repair of osteoarthritis. In addition, OrthoCyte has proprietary hES-derived progenitors to skeletal muscle, tendon, and bone, all in the preclinical phases of development.

About BioTime, Inc.

BioTime, headquartered in Alameda, California, is a biotechnology company focused on regenerative medicine and blood plasma volume expanders. Its broad platform of stem cell technologies is developed through subsidiaries focused on specific fields of applications.

BioTime develops and markets research products in the field of stem cells and regenerative medicine, including a wide array of proprietary ACTCellerate(TM) cell lines, culture media, and differentiation kits.

BioTime's wholly owned subsidiary ES Cell International Pte. Ltd. has produced clinical-grade human embryonic stem cell lines that were derived following principles of Good Manufacturing Practice and currently offers them for use in research. BioTime's therapeutic product development strategy is pursued through subsidiaries that focus on specific organ systems and related diseases for which there is a high unmet medical need. BioTime's majority owned subsidiary Cell Cure Neurosciences, Ltd. is developing therapeutic products derived from stem cells for the treatment of retinal and neural degenerative diseases. Cell Cure's minority shareholder Teva Pharmaceutical Industries has an option to clinically develop and commercialize Cell Cure's OpRegen(TM) retinal cell product for use in the treatment of age-related macular degeneration. BioTime's subsidiary OrthoCyte Corporation is developing therapeutic applications of stem cells to treat orthopedic diseases and injuries. Another subsidiary, OncoCyte Corporation, focuses on the diagnostic and therapeutic applications of stem cell technology in cancer, including the diagnostic product PanC-DxTM currently being developed for the detection of cancer in blood samples, and therapeutic strategies using vascular progenitor cells engineered to destroy malignant tumors. ReCyte Therapeutics, Inc. is developing applications of BioTime's proprietary induced pluripotent stem cell technology to reverse the developmental aging of human cells to treat cardiovascular and blood cell diseases. BioTime's newest subsidiary, LifeMap Sciences, Inc., is developing an online database of the complex cell lineages arising from stem cells to guide basic research and to market BioTime's research products. In addition to its stem cell products, BioTime develops blood plasma volume expanders, blood replacement solutions for hypothermic (low-temperature) surgery, and technology for use in surgery, emergency trauma treatment and other applications. BioTime's lead product, Hextend(R), is a blood plasma volume expander manufactured and distributed in the U.S. by Hospira, Inc. and in South Korea by CJ CheilJedang Corp. under exclusive licensing agreements. Additional information about BioTime,

ReCyte Therapeutics, Cell Cure, OrthoCyte, OncoCyte, BioTime Asia, LifeMap Sciences, and ESI can be found on the web at www.biotimeinc.com.

Forward-Looking Statements Statements pertaining to future financial and/or operating results, future growth in research, technology, clinical development, and potential opportunities for BioTime and its subsidiaries, along with other statements about the future expectations, beliefs, goals, plans, or prospects expressed by management constitute forward-looking statements. Any statements that are not historical fact (including, but not limited to statements that contain words such as "will," "believes," "plans," "anticipates," "expects," "estimates") should also be considered to be forward-looking statements. Forward-looking statements involve risks and uncertainties, including, without limitation, risks inherent in the development and/or commercialization of potential products, uncertainty in the results of clinical trials or regulatory approvals, need and ability to obtain future capital, and maintenance of intellectual property rights. Actual results may differ materially from the results anticipated in these forward-looking statements and as such should be evaluated together with the many uncertainties that affect the business of BioTime and its subsidiaries, particularly those mentioned in the cautionary statements found in BioTime's Securities and Exchange Commission filings. BioTime disclaims any intent or obligation to update these forward-looking statements.

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