BioTime Reports Isolation of Seven Diverse Cartilage and Bone Cell Types From Human Embryonic Stem Cells

The Associated Press

ALAMEDA, Calif.--(BUSINESS WIRE)--Dec 18, 2012--BioTime, Inc. (NYSE MKT: BTX), a biotechnology company that develops and markets products in the field of regenerative medicine, and its subsidiaries OrthoCyte Corporation and LifeMap Sciences reported today a means of manufacturing seven distinct types of cartilage, bone, and tendon cells from human embryonic stem cells. The paper, scheduled to be published online (ahead of print) at 1600 GMT today in the peer-reviewed journal , characterizes the seven cell types generated using BioTime's proprietary PureStemTM technology. The study compared the novel cells with adult stem cells, known as mesenchymal stem cells (MSCs), and revealed properties of the new cell lines that are suggestive of a wide array of future applications in the practice of orthopedic medicine.

In the study published today, it was demonstrated that BioTime's cells, which can be manufactured on an industrial scale, are progenitors to diverse skeletal tissues of the human body. These cell lines bear diverse molecular markers that distinguish them from each other and from MSCs. The molecular markers of BioTime's cell lines suggest the lines may therefore be applicable to the repair of different types of bone, cartilage, and tendon for the treatment of degenerative diseases afflicting these tissue types such as non-healing bone fractures, osteoarthritis and degeneration of intervertebral discs, and tendon tears (tendinosis).

Chronic orthopedic disorders such as osteoarthritis, degeneration of the discs in the spine, osteoporosis, and tendon tears are among the leading complaints and causes of disability in an aging society. The recent isolation of new pluripotent stem cells such as human embryonic stem (hES) cells and induced pluripotent stem (iPS) cells opens the door to the manufacture of all of the cell types in the human body on an industrial scale. These achievements in the emerging field of regenerative medicine have made it feasible to introduce new modalities of repairing these and other tissues in the body.

As promising as these new stem cells may be for eventual human tissue repair, there has been little progress to date in identifying new ways to generate pure populations of the diverse cellular components of the human body using methods that are also compatible with industrial-scale manufacture. To address this need, BioTime scientists developed a novel and proprietary manufacturing process. These isolated PureStemTM (previously ACTCellerateTM) cell lines allow for the scale-up of more than 200 highly purified and identified cell types.

In today's publication, BioTime scientists reported on seven PureStemTM cell lines representing diverse cells of the developing human skeleton. One of these cell lines,

4D20.8, was previously shown by BioTime scientists to exhibit site-specific markers of craniofacial mesenchyme, and in particular, markers of proximal mandibular mesenchyme. This tissue type is of significance in that it naturally produces one of the strongest joint cartilages of the body. In today's report, this line was compared to the BioTime's lines 7PEND24, 7SMOO32, E15, MEL2, SK11, SM30, and to other commonly studied MSCs. BioTime's cell lines displayed markers that indicated the cells were progenitors of diverse cartilage, bone, and tendon cell types in the body.

There remains the need for safe methods of manufacturing cells at a high degree of purity and site-specific identity, in addition to an FDA-approvable combination with a matrix to facilitate the stable transplantation of those cells into the body. BioTime's HyStem® technology is designed to be an effective means of transplanting cells in an injectable liquid that can polymerize safely in the body into a tissue construct. BioTime anticipates that during the first quarter of 2013, a submission of a Phase I safety trial in humans will be made to the appropriate European Committee for review and approval of HyStem® formulated for the delivery of autologous fat-derived cells for skin applications, a product called Renevia™. In today's publication, the seven novel osteochondral cell lines were demonstrated to be successfully differentiated in HyStem® in laboratory experiments, supporting the potential use of the product together with these and other PureStemTM cell lines in combination products.

The study's demonstration of the manufacture of diverse site-specific tissue progenitors from pluripotent stem cells serves to highlight the utility of LifeMap Discovery ™, a powerful new database that provides a roadmap to the complex fabric of cells constituting the human body. In today's publication, BioTime and LifeMap scientists collaborated to map the molecular markers of the published PureStemTM cell lines within the database, thus making the lines available for the research community in the context of the human developmental tree.

"We are gratified to finally report in a scientific publication the power of monoclonal human embryonic progenitor cell lines to scale diverse cell types of the human body," said Michael D. West, Ph.D., BioTime's Chief Executive Officer. "Our confidence that many other cell types of the human body can be manufactured in this manner is the reason for our focus on this platform and for participating in building LifeMap DiscoveryTM to help the medical research community navigate this fascinating yet complex network of product development." Arnold Caplan, Ph.D., OrthoCyte's Chief Scientific Officer and Director of the Skeletal Research Center at Case Western Reserve University, commented that the paper by Sternberg and colleagues "emphasizes the scalability of clonal human embryonic stem cell-derived cell lines for musculoskeletal tissue engineering. The analysis at the molecular level of the biological markers gives us confidence that these groups of cells can be used for cartilage repair and regeneration. The amount of cells that can be generated is really practical for human musculoskeletal tissue regeneration." 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 [1] and www.orthocyte.com [2].

Authors of today's publication include Hal Sternberg, Jennifer Kidd, James T. Murai,

Jianjie Jiang, Isaac E. Erickson, Walter D. Funk, Karen B. Chapman, and Michael D. West of BioTime and OrthoCyte Corporation; Ariel Rinon of LifeMap Sciences; and C. Thomas Vangsness, Jr., of the Keck School of Medicine at the University of Southern California.

About BioTime, Inc. BioTime, headquartered in Alameda, Calif., is a biotechnology company focused on regenerative medicine and blood plasma volume expanders. Its broad platform of stem cell technologies is enhanced through subsidiaries focused on specific fields of application. BioTime develops and markets research products in the fields of stem cells and regenerative medicine, including a wide array of proprietary PureStem ™ cell lines, HyStem® hydrogels, culture media, and differentiation kits. BioTime is developing Renevia ™ (formerly known as HyStem® -Rx), a biocompatible, implantable hyaluronan and collagen-based matrix for cell delivery in human clinical applications. 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. 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-Dx ™ currently being developed for the detection of cancer in blood samples. 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 subsidiary LifeMap Sciences, Inc., markets GeneCards®, the leading human gene database, and has developed an integrated database suite to complement GeneCards® that includes the LifeMap Discovery ™ database of embryonic development, stem cell research and regenerative medicine, and MalaCards, the human disease database. LifeMap is also marketing BioTime research products. BioTime's lead product, Hextend®, is a blood plasma volume expander manufactured and distributed in the U.S. by Hospira, Inc., and in South Korea by CJ CheilJedang Corporation under exclusive licensing agreements. Additional information about BioTime can be found on the web at www.biotimeinc.com [1].

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.

To receive ongoing BioTime corporate communications, please click on the following link to join our email alert list: http://phx.corporate-ir.net/phoenix.zhtml?c=83805&p=irol-alerts [3].

CONTACT: BioTime, Inc.

Peter Garcia, 510-521-3390, ext 367 Chief Financial Officer
pgarcia@biotimemail.com [4] or Judith Segall, 510-521-3390, ext 301
jsegall@biotimemail.com [5] KEYWORD: UNITED STATES NORTH AMERICA CALIFORNIA INDUSTRY KEYWORD: STEM CELLS HEALTH BIOTECHNOLOGY RESEARCH SCIENCE SOURCE: BioTime, Inc. Copyright Business Wire 2012 PUB: 12/18/2012 09:00 AM/DISC: 12/18/2012 09:00 AM
http://www.businesswire.com/news/home/20121218005587/ [6]

Source URL (retrieved on *12/08/2013 - 3:52am*):
http://www.mdtmag.com/news/2012/12/biotime-reports-isolation-seven-diverse-cartilage-and-bone-cell-types-human-embryonic-stem-cells

Links:
[1] http://www.biotimeinc.com
[2] http://www.orthocyte.com
[3] http://phx.corporate-ir.net/phoenix.zhtml?c=83805&p=irol-alerts
[4] mailto:pgarcia@biotimemail.com
[5] mailto:jsegall@biotimemail.com
[6] http://www.businesswire.com/news/home/20121218005587/