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Press Release

Source: Advanced Cell Technology, Inc.

Functional Vasculature Generated From Advanced Cell Technologys Human Embryonic Stem Cells

Monday January 5, 11:05 am ET

Hemangioblasts form multilayered blood vessels with functional smooth muscle could provide an inexhaustible source of cells to treat vascular disease

WORCESTER, Mass.--(BUSINESS WIRE)--Advanced Cell Technology, Inc. ("ACT") (OTC: [ACTC.PK](#)) reported that it is feasible to differentiate human embryonic stem cells (hESCs) into functional human vasculature. The research, which appears in the January issue of the journal *Regenerative Medicine*, shows for the first time that human progenitor cells – known as hemangioblasts– have the potential for both endothelial cell (EC) and vascular smooth muscle cell (SMC) lineage differentiation. This dual potentiality is critical for the effective treatment of human vascular disease, especially the repair and formation of mature and larger-size (non-capillary) vessels.

"The cells participated in the formation of new blood vessels –both capillaries and larger vessels—and were capable of repairing damaged vessels in multiple vasculatures," said Robert Lanza, M.D., Chief Scientific Officer at ACT, and senior author of the study. "The cells restored blood flow in ischemic limbs to near normal levels. They also showed a similar regenerative capacity after myocardial infarction and participated in the repair of vascular injury in diabetic animals. The formation of mature and functional vasculature, except for capillary vessels, requires the interaction of endothelial and smooth muscle cells, the later playing a critical role in the structural and functional support of the vascular network. Thus, the ability to generate large numbers of these progenitor cells makes them an ideal source of cells for the treatment of human diseases caused by deficient vessel growth."

Although endothelial cells play an essential role in vasculogenesis and angiogenesis and form capillary vasculatures, they alone cannot complete the process of vessel growth and development. Vascular smooth muscle cells play a critical role in the support of the vascular network by stabilizing nascent endothelial vessels during vascular development and blood vessel growth. This outer layer of cells also protects the fragile channels from rupture and helps control blood flow.

Until now there was no evidence that blast cells (hemangioblasts) or their equivalents generated from hESCs possessed the ability to differentiate into smooth muscle cells. "The hESC-derived smooth muscle expressed SMC-specific markers (α -SM actin and calponin) and contracted upon stimulation with carbachol," stated Shi-Jiang Lu, first author of the paper. "When implanted in nude mice, the cells formed microvasculature with endothelial cells in Matrigel. The cells differentiated into both ECs and SMCs, and incorporated into blood vessels after injection into ischemic tissues, indicating that these cells are functional both *in vitro* and *in vivo*."

"We believe these cells could play an important future therapeutic role for patients with vascular disease," stated William M. Caldwell, CEO and Chairman of ACTC. "We are pleased to continue this work through our new joint venture with CHA Biotech Co, Ltd. (CHA). ACT scientists will work with the new company "Stem Cell & Regenerative Medicine International" to help translate this research into clinical therapies."

The paper's other researchers are Yordanka Ivanova, Qiang Feng, and Chenmei Luo.

Link to article: <http://www.futuremedicine.com/doi/abs/10.2217/17460751.4.1.37>

About Advanced Cell Technology, Inc.

Advanced Cell Technology, Inc. is a biotechnology company applying cellular technology in the field of regenerative medicine. For more information, visit <http://www.advancedcell.com>.

Forward-Looking Statements

Statements in this news release regarding future financial and operating results, future growth in research and development programs, potential applications of our technology, opportunities for the company and any other statements about the future expectations, beliefs, goals, plans, or prospects expressed by management constitute forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Any statements that are not statements of historical fact (including statements containing the words "will," "believes," "plans," "anticipates," "expects," "estimates," and similar expressions) should also be considered to be forward-looking statements. There are a number of important factors that could cause actual results or events to differ materially from those indicated by such forward-looking statements, including: limited operating history, need for future capital, risks inherent in the development and commercialization of potential products, protection of our intellectual property, and economic conditions generally. Additional information on potential factors that could affect our results and other risks and uncertainties are detailed from time to time in the company's periodic reports, including the report on Form 10-QSB for the quarter ended September 30, 2007. Forward-looking statements are based on the beliefs, opinions, and expectations of the company's management at the time they are made, and the company does not assume any obligation to update its forward-looking statements if those beliefs, opinions, expectations, or other circumstances should change.

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