

Human stem cells from fat tissue fuse with rat heart cells and beat

February 28 2011

If Dr. Doolittle is famous for talking to animals, then here's a story that might make him hold his tongue: According to new research published online in The *FASEB Journal*, scientists have successfully fused human stem cells derived from subcutaneous adipose (fat) tissue with muscle cells from rat hearts. Not only did these cells "talk" to form new muscle cells altogether, but they actually beat.

"Recovery of regenerative cells located in the stromal vascular fraction of a patient's own subcutaneous tissue is relatively simple and can be used for self-healing," said Christopher Alt, Ph.D., a researcher involved in the work from the Department of Molecular Pathology at the University of Texas in Houston. "A patient's quality of life can be improved by application of those recovered regenerative cells to the heart, as well as to bone, tendons, non-healing wounds and joints."

Using newborn rats, scientists studied the combination of rat [heart muscle cells](#) (cardiomyocytes) and human adipose (fat) stem cells derived from human subcutaneous adipose tissue. They found that the two fused and formed new heart muscle cells with several nuclei. When kept in a culture environment, these cells beat. These new cells exhibited an ability to compensate for a loss of cardiomyocytes as following a [myocardial infarction](#), via fusion with cardiomyocytes. Furthermore, this study shows that contrary to previous findings suggesting that genetic modification of certain embryonic genes in [adult stem cells](#) is required as a prerequisite for turning into [heart cells](#), the human stem cells used in this study were not genetically modified.

"Much work is still ahead before this method can be applied to humans, but the hope is that this technique might eventually make heart transplants unnecessary," said Gerald Weissmann, M.D., Editor-in-Chief of The [FASEB Journal](#). "This study not only shows the power of stem cell fusion technology, but also that cardiac regeneration is on the horizon."

More information: Roxana Metzele, Christopher Alt, Xiaowen Bai, Yasheng Yan, Zhi Zhang, Zhizhong Pan, Michael Coleman, Jody Vykoukal, Yao-Hua Song, and Eckhard Alt, Human adipose tissue-derived stem cells exhibit proliferation potential and spontaneous rhythmic contraction after fusion with neonatal rat cardiomyocytes, FASEB J March 2011 25:830-839; [doi:10.1096/fj.09-153221](https://doi.org/10.1096/fj.09-153221)

Provided by Federation of American Societies for Experimental Biology

Citation: Human stem cells from fat tissue fuse with rat heart cells and beat (2011, February 28) retrieved 1 May 2024 from <https://phys.org/news/2011-02-human-stem-cells-fat-tissue.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--