

Fat-derived stem cells hold potential for regenerative medicine

November 9 2012

(Medical Xpress)—As researchers work on reconfiguring cells to take on new regenerative properties, a new review from Penn Medicine plastic surgeons sheds additional light on the potential power of adipose-derived stem cells - or adult stem cells harvested from fatty tissue - in reconstructive and regenerative medicine.

Reconstructive [plastic surgeons](#) have clinically integrated "fat grafting" into different [surgeries](#) for years, for breast, facial, and other reconstructive and restorative surgeries, with good success. Now, researchers are beginning to understand the power that [fatty tissue](#) holds. This new paper, published in the *Aesthetic Surgery Journal*, enforces that adipose-derived stem cells can be routinely isolated from patients and, once molecular methods are worked out, may be useful for a multitude of regenerative medicine applications.

"The opportunities for regenerative medicine interventions based on [adult stem cells](#) are tremendous. It is critically important for us to better understand the biology of these cells so that we can develop novel, safe and effective treatments for our patients using their own cells." said the paper's senior author, Ivona Percec, MD, PhD, assistant professor in the division of [Plastic Surgery](#) in the Perelman School of Medicine at the University of Pennsylvania.

Many groups are looking into different modes of isolating and modifying these cells for their regenerative properties, including experts at Penn's Institute for Regenerative Medicine and around Penn

Medicine. For example, Dr. Percec's team is conducting translational research into the mechanisms controlling adipose-derived stem cells, and how they contribute to the normal human aging process.

Stem cells can undergo multiple divisions without differentiation, making them useful tools for cell-replacement therapy. [Embryonic stem cells](#) can convert to any cell type, whereas adult stem cells, like the stem cells derived from fat, can differentiate into many, but not all, cell types. A person's own fat tissue could then potentially be converted into cells specially designed to repair damage to the heart, cartilage, blood vessels, brain, muscle, or bone.

As regenerative medicine techniques are refined, experts will continue to explore the utility and benefits of stem cells derived from adipose tissue.

Provided by University of Pennsylvania

Citation: Fat-derived stem cells hold potential for regenerative medicine (2012, November 9) retrieved 21 April 2023 from <https://medicalxpress.com/news/2012-11-fat-derived-stem-cells-potential-regenerative.html>

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