



March 2, 2009

Stem Cell Breakthrough: New Method For Creating Stem Cells

ScienceDaily (Mar. 2, 2009) — Mount Sinai Hospital's Dr. Andras Nagy discovered a new method of creating stem cells that could lead to possible cures for devastating diseases including spinal cord injury, macular degeneration, diabetes and Parkinson's disease. The study, published by *Nature*, accelerates stem cell technology and provides a road map for new clinical approaches to regenerative medicine.

"We hope that these stem cells will form the basis for treatment for many diseases and conditions that are currently considered incurable," said Dr. Nagy, Senior Investigator at the Samuel Lunenfeld Research Institute of Mount Sinai Hospital, Investigator at the McEwen Centre for Regenerative Medicine, and Canada Research Chair in Stem Cells and Regeneration. "This new method of generating stem cells does not require embryos as starting points and could be used to generate cells from many adult tissues such as a patient's own skin cells."

Dr. Nagy discovered a new method to create pluripotent stem cells (cells that can develop into most other cell types) without disrupting healthy genes. Dr. Nagy's method uses a novel wrapping procedure to deliver specific genes to reprogram cells into stem cells. Previous approaches required the use of viruses to deliver the required genes, a method that carries the risk of damaging the DNA. Dr. Nagy's method does not require viruses, and so overcomes a major hurdle for the future of safe, personalized stem cell therapies in humans.

"This research is a huge step forward on the path to new stem cell-based therapies and indicates that researchers at the Lunenfeld are at the leading edge of regenerative medicine," said Dr. Jim Woodgett, Director of Research for the Samuel Lunenfeld Research Institute of Mount Sinai Hospital. Regenerative medicine refers to enabling the human body to repair, replace, restore and regenerate its own damaged or diseased cells, tissues and organs.

The research was funded by the Canadian Stem Cell Network and the Juvenile Diabetes Research Foundation (United States).

Dr. Nagy joined Mount Sinai Hospital as a Principal investigator in 1994. In 2005, he created Canada's first embryonic stem cell lines from donated embryos no longer required for reproduction by couples undergoing fertility treatment. That research played a pivotal role in Dr. Nagy's current discovery.

One of the critical components reported in Nagy's paper was developed in the laboratory of Dr. Keisuke Kaji from the Medical Research Council (MRC) Centre for Regenerative Medicine at the University of Edinburgh. Dr. Kaji's findings are also published in the March 1, 2009 issue of *Nature*. The two papers are highly complementary and further extend Nagy's findings.

"I was very excited when I found stem cell-like cells in my culture dishes. Nobody, including me, thought it was really possible," said Dr. Kaji. "It is a step towards the practical use of reprogrammed cells in medicine."