DAILY NEWS

Scientists Discover Way to Make Stem Cells without Human Embryos, Eggs

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In a stunning discovery, scientists have hit upon a way to make stem cells without using human embryos or eggs. The breakthrough could one day be used to replace unhealthy tissues in people with diabetes, Parkinson's disease and spinal-cord injuries - without the controversy surrounding the use of embryonic cells.

Two studies published yesterday describe a new technique that rewinds the developmental clock of skin cells so they behave like embryonic stem cells, which can turn into any type of cell in the body. The advance of direct reprogramming, reported in the journals Cell and Science, involves inserting a set of four genes into skin cells, causing them to transform into a kind of clean slate.

The Cell paper is from a team led by Dr. Shinya Yamanaka of Japan's Kyoto University. The team published by Science was led by Junying Yu, working in the lab of stem-cell pioneer James Thomson of the University of Wisconsin-Madison. "This work represents a tremendous scientific milestone - the biological equivalent of the Wright Brothers' first airplane," said Dr. Robert Lanza, chief science officer of Advanced Cell Technology in Los Angeles, which has been trying to extract stem cells from cloned human embryos. "It's a bit like learning how to turn lead into gold," he said.

Until now, scientists have relied on human embryos to extract stem cells, or taken them from eggs fertilized with DNA from a donor - the cloning process used to create Dolly the sheep. Critics see the destruction of human embryos to harvest stem cells as unethical. The embryos usually are left over from fertility treatments. Direct reprogramming avoids that issue. And it would let an individual patient's own cells be used to create healthy tissue, eliminating the risk of rejection.

There are caveats. Some of the genes and viruses used in direct reprogramming could cause cancer. But researchers believe that problem can be overcome. "All the hype surrounding it is justified," said Dr. Ihor Lemischka, director of the Black Family Stem Cell Institute at the Mount Sinai School of Medicine in Manhattan. Still, he said it was too soon to abandon research that uses stem cells from human embryos or from cloned cells. President Bush restricted government funding of embryonic stem-cell research and twice vetoed legislation that would have broadened it.

"It's going to fuel those who call for federal funding only for nonembryonic stem cell research," said Alta Charo, a professor of law and bioethics at the University of Wisconsin-Madison.

The New York Stem Cell Foundation said it would continue supporting researchers who use embryos and cloned cells because the new method hadn't been shown to create stem cells identical to those of human embryos.