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Discovery could help scientists get around ban

State law prohibits embryonic study

FROM STAFF AND WIRE REPORTS

Scientists have made ordinary human skin cells take on the chameleon-like powers of embryonic stem cells, a startling breakthrough that might someday deliver the medical payoffs of embryo cloning without the controversy.

The discovery could be a boon to researchers in Michigan, where regulations against embryonic stem cell research are strict.

"It's possible that in future we'll use this reprogramming approach instead of, for example, doing nuclear transfer to derive embryonic stem cell lines for therapeutic cloning," said Sean Morrison, the director of the University's Center for Stem Cell Biology.

Laboratory teams on two continents report success in a pair of landmark papers released Tuesday. It's a neck-and-neck finish to a race that made headlines five months ago, when scientists announced that the feat had been accomplished in mice.

The "direct reprogramming" technique avoids the swarm of ethical, political and practical obstacles that have stymied attempts to produce human stem cells by cloning embryos.

Scientists familiar with the work said scientific questions remain and that it's still important to pursue the cloning strategy, but that the new work is a major coup.

"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, which has been trying to extract stem cells from cloned human embryos.

"It's a bit like learning how to turn lead into gold," said Lanza, while cautioning that the work is far from providing medical payoffs.

"It's a huge deal," agreed Rudolf Jaenisch, a prominent stem cell scientist at the Whitehead Institute in Cambridge, Mass. "You have the proof of principle that you can do it."

The White House lauded the papers, saying such research is what President Bush was advocating when he twice vetoed legislation to pave the way for taxpayer-funded embryo research.

Morrison cautioned against using the research released today to make that argument.

"Opponents of embryonic stem cell research will be citing this as a reason to stop research into embryonic stem cells," he said. "But we must remember that these breakthroughs today would not have happened without research on embryonic stem cells in the first place."

There is a catch with the new technique. At this point, it requires disrupting the DNA of the skin cells, which creates the potential for developing cancer. So it would be unacceptable for the most touted use of embryonic cells: creating transplant tissue that in theory could be used to treat diseases like diabetes, Parkinson's, and spinal cord injury.

But the DNA disruption is just a byproduct of the technique, and experts said they believe it can be avoided.

The new work is being published online by two journals, Cell and Science. The Cell paper is from a team led by Dr. Shinya Yamanaka of Kyoto University; the Science paper is from a team led by Junying Yu, working in the lab of in stem-cell pioneer James Thomson of the University of Wisconsin-Madison.

Both reported creating cells that behaved like stem cells in a series of lab tests.

Thomson, 48, made headlines in 1998 when he announced that his team had isolated human embryonic stem cells.

Yamanaka gained scientific notice in 2006 by reporting that direct reprogramming in mice had produced cells resembling embryonic stem cells, although with significant differences. In June, his group and two others announced they'd created mouse cells that were virtually indistinguishable from stem cells.