

Stem-Cell Researchers Claim Embryo Labs Are Still a Necessity

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The surveillance cameras and electronic locks are the only hints that a visitor has reached the border of a scientific frontier. Behind these laboratory doors a few blocks from Columbia University in Manhattan is a research enterprise quarantined by federal law because, for many people, it poses a moral hazard.

Inside, a technician adjusts a microscope and a cluster of human embryonic stem cells -- with the potential to develop into the body's many cell types -- springs into view, blurred only by politics, ethics disputes and conflicting beliefs about the beginnings of life.

A nonprofit foundation called Project ALS set up this privately funded lab -- the Jennifer Estess Laboratory for Stem Cell Research -- 18 months ago to allow scientists to circumvent federal restrictions on experiments with cells made from human embryos, often left over from commercial in vitro fertilization. Within its walls, researchers from Columbia, Harvard Medical School, the Salk Institute and others are studying embryonic cells in an effort to overcome an incurable fatal disease called amyotrophic lateral sclerosis, also known as Lou Gehrig's disease.

The Estess lab is a modest outpost in a network of new state and private stem-cell biology labs that together command billions of dollars in nonfederal funds for research into how embryonic cells might one day reverse ALS and other conditions, such as leukemia, diabetes and Parkinson's disease.

In November, stem-cell researchers in Japan and the U.S. announced an advance that may eliminate the need for human embryos in making stem cells. But the private charities and state agencies that established these "safe haven" laboratories see no reason to abandon their work. "Stem cells offer us our best hope," said Project ALS executive director Valerie Estess.

The private embryo-research facilities, in fact, may be more in demand than ever, said Susan Solomon, executive director of the New York Stem Cell Foundation, which has raised \$10 million in private funds for embryonic stem-cell research. At the least, more studies of human embryonic cells will be necessary to verify the reliability of the new technique. "There is a safety issue," she said. "The last thing anyone wants is a disaster that would shut down the field."

Sidestepping the need for human embryos, independent research teams led by Shinya Yamanaka at Kyoto University in Japan and by James Thomson at the University of Wisconsin had announced in November that they successfully converted human skin into cells that mimic embryonic stem cells. Called "induced pluripotent stem cells," these adult cells are altered by infecting them with a manmade virus that carries four extra genes designed to reset the cell's machinery.

The technique was hailed as the solution to a religious and political impasse that has long stymied U.S. stem-cell research. Congress has banned public funding for the embryo-based experiments since 1995. Last June, President Bush for the second time vetoed legislation to loosen research restrictions.

Within weeks of the recent news, researchers at the Whitehead Institute in Cambridge, Mass., said they had used the reprogrammed cells to cure sickle-cell anemia -- in mice.

For human use, the new technique may be too dangerous for the foreseeable future because the genetically engineered virus randomly alters a cell's genetic structure, raising the risk of cancer in modified cells. Dr. Yamanaka joined other scientists last month to urge continued stem-cell research with human embryos. "We hold research into all avenues of human stem-cell research must proceed together," they wrote in the journal *Stem Cell*.

"They are genetically changed in a way that should make us worried about using them in animals or people, or to model diseases," said Harvard University stem-cell biologist Kevin Eggan. He also is scientific director of the New York Stem Cell Foundation and its embryonic stem cell lab. Until the reprogrammed cells can be made safe and stable enough for clinical experiments, he added, "Human embryonic stem cells will be better, even if they are more complicated politically."

So far, private donors have contributed more than \$190 million to underwrite research with human embryonic stem cells, according to a partial accounting compiled by the journal *Nature*. Several states, including Connecticut, Maryland, Illinois and New York, are funding experiments. By far, the world's largest sponsor of human embryonic stem-cell research is the California Institute of Regenerative Medicine, with \$3 billion in state bond funds at its disposal.

"We still think human embryonic stem cells are the gold standard," said institute president Richard Murphy. By summer, the institute will have awarded about \$519 million for stem-cell research -- most of it for work on cells derived from surplus human embryos.

Even so, this month the California institute for the first time is seeking to award up to \$13 million for stem-cell research that doesn't destroy human embryos -- inspired, in part, by the recent genetic reprogramming innovation. "We need to sort out the realities," said Dr. Murphy.