



FIRST STEM CELLS EXTRACTED FROM CLONED HUMAN EMBRYO

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Scientists in South Korea have extracted stem cells from a cloned human embryo – a breakthrough that has potential for treating various diseases but also ignites fears that rogue scientists will use the technology to clone humans.

Other scientists have cloned small numbers of human embryos that lived for a short time, but the South Koreans who announced their work last week in the journal *Science*, apparently succeeded on a scale that far outstripped earlier human cloning efforts.

South Korean researchers make medical history

The researchers began with a group of 16 women who were given hormone treatments to produce large numbers of reproductive egg cells. They eventually obtained 242 eggs from the women.

Then the scientists used innovative techniques to strip out the nucleus from each of these egg cells. The nucleus is the portion of the cell containing many of the cell's genetic instructions.

The scientists next took body cells from the same women who had donated the egg cells. The body cells have two sets of chromosomes, the full genetic blueprint needed to create a human being. The scientists removed these body cells' nuclear material and placed it into the egg cells.

The result was 66 cloned eggs, in effect, human embryos, with the exact genetic makeup of the original females. The researchers grew 30 of the embryos for a week to the so-called blastocyst stage, when stem cells could be extracted.

Stem cells technology could help cure diseases

Embryonic stem cells are unique because they have the potential to develop into any type of tissue or cell in the body.

The research, called therapeutic cloning, could allow scientists to take a plug of skin or blood sample from a patient and use it to grow tissue, organs or batches of cells. The new cells would have the same genetic makeup as the donor and would therefore lower the risk that the injured or sick person's body would reject the new tissue.

“Our approach opens the door for the use of these specially developed cells in transplantation medicine,” said Woo Suk Hwang, who led the government-funded study.

Researchers also hope the stem cell research will lead to treatments for a range of diseases from Alzheimer's to Parkinson's to diabetes.

Ethical questions

But embryonic stem cell research is controversial because harvesting the cells destroys an embryo that could have grown into a baby if implanted in a woman's uterus.

President Bush is against making and destroying human embryos.

"The use of embryos to clone is wrong. We should not as a society, grow life to destroy it," he said in 2001.

The Bush administration policy does not allow the government to fund any research on stem cells taken from embryos destroyed after Aug. 9, 2001. Since the research is expensive, the ban has limited the amount of work being done in the United States.

Reproductive vs. therapeutic cloning

Some fear that the South Korean scientific advance will encourage people to create human clones, called reproductive cloning.

In reproductive cloning, which has been performed with animals but not people, the embryos are implanted in the womb and allowed to develop into a fetus. In therapeutic cloning, the embryos are never implanted, but are grown for a few days in the laboratory so that the stem cells can be extracted.

The first mammal was cloned in 1996 when Scottish researchers made Dolly the sheep. Dolly died a year ago of what scientists said was premature aging and complications from cloning.

Most scientists believe human reproductive cloning is unethical because any baby created by this method would be prone to severe deformities.

Scientific research in the United States

While many U.S. lawmakers would like to ban human reproductive cloning, the debate is complicated by the question of whether to allow therapeutic cloning. Conservative lawmakers have attached bans on embryonic stem cell research to all bills regarding reproductive and therapeutic cloning, preventing Congress from coming up with a clear policy.

Some U.S. scientists worry that the lack of government support for all cloning related to humans is already harming the future of American medical research.

"We will be sitting here with the best scientists in the world watching things on television," Dr. Jose Cibelli, professor of animal biotechnology at Michigan State University told the New York Times. Cibelli collaborated with the South Korean scientists and is an author of their paper.

Several countries in Europe ban all human cloning, including therapeutic cloning.

By Online NewsHour

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