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New Method Makes Embryo-Safe Stem Cells

By THE ASSOCIATED PRESS

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NEW YORK (AP) -- A biotechnology company has developed a new way of creating stem cells without destroying human embryos, billing it as a potential solution to a contentious political and ethical debate.

"This will make it far more difficult to oppose this research," said Robert Lanza of Advanced Cell Technology, the Alameda, Calif., company that reported the new method.

Stem cell researchers were impressed by the new technique's ability to produce two robust lines of stem cells without requiring the destruction of embryos, and a White House spokeswoman called it encouraging. However, few on either side believe the new procedure will end the long-running bitter impasse over the science.

Stem cells have become a sort of holy grail for advocates of patients with a wide variety of illnesses because of the cells' potential to transform into any type of human tissue. But the Vatican, President Bush and others have argued that the promise of stem cells should not be realized at the expense of human life, even in its most nascent stages.

"The science is interesting and important," said John Harris, a professor of bioethics at the University of Manchester in Great Britain, commenting on the biotech company's efforts.

But a representative of the U.S. Conference of Catholic Bishops said the method "raises more ethical questions than it answers" and criticized the experiment itself as "gravely unethical" because it discarded the actual embryos it used.

A number of stem cell researchers and bioethicists dismissed it as scientifically suboptimal and politically ill-advised.

"This will please no one," predicted a longtime critic of the company, Glenn McGee, director of the Alden March Bioethics Institute in Albany, N.Y.

The new technique takes just a single cell from an early-stage embryo and uses it to seed a line of stem cells. The rest of the embryo retains the potential to develop into a healthy human.

A paper describing the method is being published online Wednesday by the British journal Nature. The journal published a similar paper by Advanced Cell Technology researchers last year demonstrating the
technique's viability in mice.

Stem cell researchers complain that the new approach, though it may hold future promise, simply isn't as efficient as their current method of creating stem cells. That procedure involves the destruction of embryos after about five days of development, when they consist of about 100 cells.

Those who oppose any research that destroys a biological entity with the potential for human life argue that the new procedure solves nothing, because even the single cell removed in the technique could theoretically grow into a full-fledged human.

"It is widely believed that one cell of a very early embryo may separate and become a new embryo, an identical twin," said Richard Doerflinger of the U.S. Conference of Catholic Bishops.

U.S. law currently bans federal funding of any research that harms human embryos. A White House spokeswoman said the new method’s eligibility for funding could not yet be determined, "but it is encouraging to see scientists at least making serious efforts to move away from research that involves the destruction of embryos."

Scientists at Advanced Cell devised a clever means of piggybacking on existing fertility treatments to avoid the creation, manipulation or destruction of embryos specifically for the production of stem cells. The fertility procedure, known as preimplantation genetic diagnosis, or PGD, is used when parents want to avoid having a child with a lethal or severely debilitating birth defect. About 1,000 such procedures are performed each year in the United States.

PGD begins with in vitro fertilization to produce numerous embryos. At a very early stage of development, when the embryos are no more than a ball of eight to 10 cells, a technician extracts a single cell from each one. The extracted cells are tested for genetic disorders, and those free of defect are then implanted in the mother in the hope that will develop.

The new stem cell production method takes a cell extracted during PGD and allows it to divide. One of the two resulting cells is genetically tested as in normal PGD; the other is cultured to encourage the development of stem cells.

"It's nothing revolutionary," said Yury Verlinsky, a Chicago geneticist who specializes in PGD.

Advanced Cell Technology was able to produce two viable stem cell lines from a total of 16 embryos. The lines appeared to exhibit the full potential of embryonic stem cells to develop into any type of human tissue, the researchers reported, but additional study is needed to verify that.

"I think this will become a standard way of producing stem cell lines," said Ronald M. Green, a Dartmouth College professor of religion who is an unpaid bioethics adviser to Advanced Cell Technology.

Embryonic stem cells have great medical potential because of their ability to transform themselves into virtually any human tissue. With further research, they might one day be used to treat patients with
cancer, Alzheimer's and Parkinson's disease, stroke, diabetes, arthritis, spinal cord injuries and other ailments.