Advances in Stem-Cell Research Avoid Killing Embryos

by Patrick Novecosky

CAMBRIDGE, Mass. — Researchers made two more advances toward stem-cell therapies recently — and neither required the killing of human embryos. In what they're calling a feat of "prestidigitation," scientists at Harvard University have turned one type of fully formed adult cell into another type of adult cell. Researchers turned mouse exocrine cells, which make up about 95% of the mouse pancreas, into insulin-producing beta cells. These beta cells, which comprise about 1% of the pancreas, die off in Type I diabetes. The team of scientists, led by the Harvard Stem Cell Institute's co-director Doug Melton, reported its findings in the Aug. 27 online edition of the *Journal Nature*.

The report is one of several advances announced in the past month by Harvard's stem-cell researchers. In late July, another Harvard team working with scientists at Columbia University reported that it had created the first stem-cell lines from a person suffering from ALS (amyotrophic lateral sclerosis), commonly known as Lou Gehrig's disease, then coaxed these cells to become nerve cells genetically matched to those that had failed in a patient's spinal cord.

Despite the hype, many scientists are downplaying Harvard's achievements. Dr. Alan Moy, founder of the John Paul II Stem Cell Research Institute, says the Harvard teams have moved the ball forward, but scientists have a long way to go before curing diseases. The advances made at Harvard are "an extension of work that's already been done," said Moy, whose Iowa City, Iowa-based institute advances stem-cell research and education in a manner consistent with pro-life bioethics.

"There are certainly issues with Melton's study," said Moy. "One has to be very careful about taking anything that's published in science journals and then extrapolate things into clinical medicine." Dr. Vincent Fortanasce, clinical professor of neurology at the University of Southern California and author of The Anti-Alzheimer's Prescription, concurs. The Harvard studies are impressive, but science has to make a big step before stem cells are used to cure chronic diseases like ALS or Alzheimer's, he said. Some people naively think scientists merely insert stem cells, and they're automatically going to become the type of cell that is needed, he said. "One has to know what the underlying cause of the disease is," Fortanasce said. "It's not enough to just replenish the cells. You have to know which cells need to be replenished. "It's almost like taking a broken-down car made of aluminum and thinking that by adding aluminum to the car, it's going to fix the engine," Fortanasce said. "It's not enough to just add the metal."

Study Conducted Ethically

However, Father Tadeusz Pacholczyk, director of education for the National Catholic Bioethics Center in Philadelphia, said the Harvard-Columbia study may have a long way to go — but at least it was conducted ethically. "Because this research uses the patient's own skin cells as the starting point, and does not involve embryos, eggs or cloning, the technique offers an ethically acceptable approach to studying and understanding various complex diseases like ALS," he said. "Unlike the case of embryonic stem-cell research, which relies on destroying young human beings who are still embryos, this kind of research is something we can all live with and encourage in the future." Interestingly, neither of Harvard's advances was developed with stem cells. Both teams of scientists began with fully developed "adult cells." Melton's team developed insulin-producing beta cells by reprogramming adult cells. The Harvard-Columbia team used a process that created induced pluripotent stem cells (iPS), which essentially turns adult cells into embryonic-like stem cells. Adult stem cells are present in human tissue, but embryonic stem cells are present only in the early stages of embryonic development.

Embryonic stem-cell research, which involves killing a unique human being, has proven not only destructive and costly, but has not produced a single cure or treatment in human beings. Adult stem-cell research, which utilizes cells from adult tissues or umbilical cords, does not require the destruction of human life. It has proven successful in treating different kinds of cancers and autoimmune diseases such as multiple sclerosis. Despite researchers' failure to produce cures or treatments using embryonic stem cells, a huge cadre of scientists insists on going forward, regardless of ethical concerns.

B.D. Colen, spokesman for the Harvard Stem Cell Institute, dismisses embryonic killing as a “religious” question. “Unless the scientist’s particular religious world view tells him that moral value of a blastocyst [an embryo in early development] is such that he shouldn’t do this work, there’s no reason not to do it,” he said. “Some life is higher on the protectability line than other forms of life.” However, the *Catechism of the Catholic Church* is clear: “From its conception, the child has the right to life” (No. 2322). Further explanation: “Since it must be treated from conception as a person, the embryo must be defended in its integrity, cared for, and healed, as far as possible, like any other human being” (No. 2274).

Big Debt

The real motivation, according to Fortanasce, is money. Californians passed a $3 billion initiative in 2004 that makes conducting stem-cell (including embryonic) research a state constitutional right. But now the state is in debt, he said. As a result, Californians will pay approximately $300 million per year out of the general fund for the next 24 years to eliminate it.

“Embryonic stem cell research has been known for 38 years,” Fortanasce explained. “It’s been a failure for 38 years, and almost 100% of laboratory animals have died either from immunological rejection or from cancer. No venture capitalist would put a dime into embryonic stem-cell research because of its dire results with animals.”

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