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New stem-cell method offers another alternative to embryonic research

by Nancy Frazier O'Brien by Catholic News Service

Baltimore — A new method of creating versatile stem cells from a relatively simple manipulation of existing cells could further reduce the need for any stem-cell research involving human embryos, according to leading ethicists.

Although the process has only been tested in mice, two studies published Jan. 29 in the journal *Nature* detailed research showing success with a process called stimulus-triggered acquisition of pluripotency, or STAP.

Scientists from Japan's RIKEN research institute and Harvard's Brigham and Women's Hospital in Boston were able to reprogram blood cells from newborn mice by placing them in a low-level acidic bath for 30 minutes. Seven to 9 percent of the cells subjected to such stress returned to a state of pluripotency and were able to grow into other types of cells in the body.

"If this technology proves feasible with human cells, which seems likely, it will offer yet another alternative for obtaining highly flexible stem cells without relying on the destructive use of human embryos," said Fr. Tadeusz Pacholczyk, director of education at the National Catholic Bioethics Center in Philadelphia. "This is clearly a positive direction for scientific research."

Pacholczyk, a priest of the diocese of Fall River, Mass., who holds a doctorate in neuroscience from Yale University, said the only "potential future ethical issue" raised by the new STAP cells would be if scientists were to coax them into "a new degree of flexibility beyond classical pluripotency," creating cells "with essential characteristics of embryos and the propensity to develop into the adult organism."

"Generating human embryos in the laboratory, regardless of the specific methodology, will always raise

significant ethical red flags," he said.

The Catholic church opposes any research involving the destruction of human embryos to create stem cells.

Richard Doerflinger, associate director of the U.S. bishops' Secretariat for Pro-Life Activities, said if the new method were used to create stem cells so versatile that they could form placenta tissue and make human cloning easier, "then we would have serious moral problems with that." But there is no indication so far that the scientists could or would do so, he added.

"You could misuse any powerful technology, but the technique itself is not problematic" in terms of Catholic teaching, Doerflinger said.

David Prentice, senior fellow for life sciences at the Family Research Council in Washington, said the new STAP process is yet another indication that "there are all these different ways to create stem cells without ever having to endanger a human being."

He said adult stem cells -- drawn from living human beings without harming them, as well as from umbilical cord blood or bone marrow -- "are the only stem cells that have ever proven to help a single patient." More than 60,000 patients around the world are receiving treatments for a variety of diseases from adult stem cells, he added.

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Another type of adult stem cells, called induced pluripotent stem cells, or iPS cells, is still being used only in animal models, said Prentice, who holds a doctorate in biochemistry and was a founding member of Do No Harm: The Coalition of Americans for Research Ethics. Japanese scientist Shinya Yamanaka received the 2012 Nobel Prize in Physiology or Medicine for his discovery of the iPS technique.

A recent report by the Charlotte Lozier Institute, research arm of the Susan B. Anthony List, showed a turnaround in funding for adult versus embryonic stem-cell research in at least two states -- California and Maryland.

The California Institute for Regenerative Medicine devoted all of its \$121 million in funding in 2007, its inaugural year, to embryonic stem-cell research, while the Maryland Stem Cell Research Commission funded 11 embryonic stem-cell projects and four using adult stem cells that year, the report said.

But in 2012, the most recent year for which figures are available, the California institute funded 15 nonembryonic projects for some \$50 million and gave only six grants totaling \$19 million to projects that involved the destruction of human embryos. Maryland's grants in 2013 were to one stem-cell project using embryos and 28 not using them.

Doerflinger said he is also seeing a shift in the respect accorded to adult stem-cell research even by the most ardent supporters of embryonic stem-cell research.

When Yamanaka won the Nobel Prize in 2012, Julian Savulescu, a longtime proponent of embryonic research, said the Japanese scientist "has taken people's ethical concerns seriously about embryo research and modified the trajectory of research into a path that is acceptable for all. He deserves not only a Nobel Prize for medicine but a Nobel Prize for ethics."

"Even the severest critics (of adult stem-cell research) are admitting that the promise people had been holding out (for embryonic research) is being pursued without any moral problem," Doerflinger said. "The alternatives that the church had been encouraging for so long are really succeeding."

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