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Stem cell breakthrough might help state life-sci industry

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A widely publicized breakthrough in embryonic stem cell research could help Michigan's life sciences industry sidestep a battle over the ethics of such scientific work.

Scientists in Japan and at the University of Wisconsin reported in November that they had genetically reprogrammed human skin cells to become embryonic stem cells.

Their findings could revolutionize the debate over embryonic stem cell research, because the new method does not result in the destruction of human embryos.

Michigan law prevents scientists from destroying human embryos during the research process. University researchers and life sciences companies have long complained that restrictive laws in Michigan represent a missed opportunity for the state and present a regressive message to the world life sciences research here.

The new findings could offer the first opportunity for Michigan companies and universities to conduct embryonic stem cell research - which life sciences experts believe could hold the key to discovering cures to diseases like Alzheimer's and Parkinson's.

But University of Michigan researchers and the nonprofit Michigan Citizens for Stem Cell Research and Cures said the state still needs to loosen restrictions on research.

"Certainly we're really thrilled that there are breakthroughs," said Marcia Baum, executive director of MCSCRC. "It's great, but it is not the end. ... We really would like our scientists to have access to all pathways."

Sean Morrison, director of the U-M Center for Stem Cell Biology, said embryonic stem cell research should continue - at least until more work is done on the new breakthrough.

Morrison was not available for comment, but he released a statement detailing his views on the research.

"This work will likely have an important impact but it is too soon to know whether this approach will replace the derivation of embryonic stem cells from embryos or by nuclear transfer. More work must be done with these de-differentiated cells to determine how stable they are and whether they really are functionally equivalent to embryonic stem cells," Morrison said. "Research must continue on ES cell lines derived from embryos, as well as nuclear transfer, while this alternative approach is further developed."

News of the breakthrough could affect at least a few companies in southeast Michigan that conduct adult stem cell research, which is not restricted under Michigan law.

Ann Arbor-based Aastrom Biosciences is developing technology that facilitates the proliferation of adult stem cells through a computer-controlled process.

George Dunbar, CEO of Aastrom, said at the annual MichBio Expo in Lansing in October that good news about stem cell research typically benefits his company.

"There's certainly not a month that goes by where there's some very startling news about what stem cells could do," he said. "If there's good news or bad news from any of those companies, we sort of rise and fall together."

Kris Maly, director of investor relations for Aastrom, acknowledged in an e-mail that the research conducted in Wisconsin and Japan was "similar to Aastrom's approach" because both use adult autologous cells.

But Maly said Aastrom's technology is fundamentally different and benefits from the fact that it has advanced further in the regulatory process. She said it "does not pose a direct threat to Aastrom's technology."

Aastrom's technology hopes to offer therapies to promote tissue repair, bone regeneration and vascular regeneration, for example.

"The curative potential of both technologies is similar, but the Aastrom technology is far more advanced in terms of its development stage and safety track record," Maly said.

It is unclear whether the news of the breakthrough could have an effect on public opinion about the need for a ballot initiative legalizing embryonic stem cell research.

A four-person committee affiliated with MCSCRC is exploring the possibility of launching a ballot initiative.

Baum said Michigan laws would have prevented researchers here from making the same discovery as the scientists in Wisconsin and Japan.

James Thomson at the University of Wisconsin, for example, has also played a controversial role in the embryonic stem cell research debate. In 1998, his team became the first to derive human embryonic stem cell lines from blastocysts.

"Our scientists aren't allowed to do many of the same things that his lab" has done, Baum said. "Our organization takes the position that the kind of research in both of these labs in Wisconsin and Japan could not have been done in Michigan because of our restrictions."

Dunbar said there's plenty of misinformation influencing the public debate about stem cell research.

"The companies that are actually trying to do good work and good science are dealing with a skeptical market and a skeptical audience," he said. "There's a lot of confusion. There's a lot of polarization going on and people are making a good living keeping it that way."

MichBio, the state's life sciences association, supports the repeal of laws restricting embryonic stem cell research.

Stephen Rapundalo, executive director of the Ann Arbor based association, testified in Lansing last month that allowing stem cell research would stoke the economy.

"Currently, Michigan is viewed as having laws that are unpredictable and antagonistic to the research environment, that we are being close-minded and restrictive, instead of progressive and supportive," Rapundalo said. "It's precisely this kind of perception that will prevent Michigan from reaching the upper tier of states viewed as being leaders in the life sciences and biotechnology sector."

Rapundalo cited studies that showed that investments in stem cell research produce a positive economy result. He cited a California study estimating that the economic impact for every dollar invested in stem cell research could churn out \$2.18 in new economic activity.

BACKGROUND

Embryonic stem cell research

The rules: Michigan outlaws the destruction of human embryos in stem cell research. **The debate:** There is public disagreement about whether destroying human embryos by extracting embryonic stem cells is morally acceptable.

The breakthrough: Researchers in Japan and at the University of Wisconsin may have found a way to produce embryonic stem cells without destroying human embryos. **Companies that could be affected:** Ann Arbor-based Aastrom Biosciences and Whitmore Lake-based BioFlow Technology Inc.