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# State's Stem Cell Policy Begins To Pay Off

*Interest Surges Among Scientists; UConn Lab To Produce Its First Embryonic Stem Cells*

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The bright blue stickers are slapped onto every computer, refrigerator and centrifuge in Ren-He Xu's lab at the University of Connecticut Health Center, proudly proclaiming they are eligible for use in the creation of human embryonic stem cells.

Within the next six months, Xu's Farmington lab is expected to become one of a handful in the country to have extracted human embryonic stem cells from donated embryos, an act forbidden in labs that receive any form of federal funding.

This act of creation - or destruction, to critics of such research - will be the culmination of Connecticut's legislative rebellion against federal funding restrictions on use of embryonic cells. At UConn, Wesleyan and Yale, officials have begun to see the payoff to the policy - a surge of interest in stem cells among dozens of state scientists who never considered using them before.

In 2005, Connecticut authorized $100 million for stem cell research over 10 years, joining a handful of states that had earmarked funds for research denied federal funding. President Bush in August 2001 banned federal funding for research using embryonic cells created after that date, saying it was immoral to destroy embryos for their cells.

Last year, a state committee allocated the first $20 million for research in Connecticut, almost all of the money going to projects using human embryonic cells. And with $2.5 million in funding, UConn was named a "stem cell core" to distribute and create cells used by the researchers.

"This is the spot where it really counts," said stem cell pioneer Laura Grabel, who is eager to use new cells at Wesleyan, a partner in the creation of Xu's UConn Stem Cell Core in Farmington.

The job of creating human embryonic stem cells is not difficult, but is ethically controversial and economically challenging because of the prohibition against using equipment purchased with federal funds.

Yale this month is also opening up its own stem cell core laboratory built without federal funds at the Amistad Building in New Haven, enabling scientists to conduct research using the cells without the expense of buying all new equipment to avoid violating federal regulations.

"No single researcher could create their own stem cell lab," said Haifin Lin, director of Yale's new stem cell center. "Now, [the availability of stem cells] is impacting the entire Yale system."

The UConn Stem Cell Core has already distributed the older, approved "presidential lines" to researchers in Farmington and at UConn's Storrs campus, as well as at Yale and Wesleyan. But it is UConn's effort to create new lines of stem cells that will set the school apart from all but a few universities in the United States.

Nationally, only a few institutions, such as Harvard University, using private funds, and the University of Wisconsin, through Xu's former employer, the WiCell Research Institute, have created human embryonic cell lines for distribution.

Xu has received tentative ethics approval for the research from two university committees and at least two couples undergoing fertility treatments have said they are willing to donate excess embryos for the project. Also, to help with creation of new cell lines, Xu hired an expert in the manipulation of embryos from the Institute of Zoology in Beijing, which is conducting experiments in the cloning of giant pandas.

In Xu's stickered lab in the UConn Health Center, technicians will extract cells from the center of a 5-day-old embryo about the size of a period and place them in culture, where they can replicate indefinitely and have the potential to become any cell in the human body.

While older stem cell lines approved for research are helpful, they have several drawbacks, scientists say.

For one thing, the embryonic cell lines are old, and more likely to have accumulated genetic defects during years of cell division, said Michael Snyder of Yale, one of the first scientists in Connecticut to have used human embryonic stem cells in research. One of Snyder's projects is studying how the cells form brain cells.

The older cell lines were also cultured with animal proteins - from mouse cells and bovine serum - that will make them useless in clinical trials, Grabel said.

Grabel is studying embryonic stem cells and their potential to treat epilepsy.

"So why not start out working with lines that are more recently derived?" she said.

Lin said that Yale's own stem cell institute next year will explore making new embryonic stem cell lines for researchers studying specific diseases. The Yale scientists would use embryos that have been discarded at fertility clinics because they carry certain genetic defects. Scientists would then use the cells to study how the disease evolves.

The availability of such cells, and potential state funding for stem cell research, has galvanized the Yale scientific community.

While last year Snyder was probably the only Yale researcher using human embryonic cells in his research, Lin estimates that at least 10 Yale labs are doing it.

"And I would expect another 10-fold increase" as more funding and cells become available, Lin said.

At UConn, there are at least a dozen labs working with embryonic cells. The availability of cells is spurring more innovative approaches to old medical problems.

For instance, UConn scientist A. Jon Goldberg used to do research on improving biomaterials to make things like bridges and implants. Orthopedics researcher and fellow UConn researcher Lisa Kuhn studied ways to stimulate bone growth using a variety of drugs. Now the two are collaborating to see whether they can make scaffolds that would hold in place bone made not by drugs or chemistry, but by embryonic stem cells.

"Without the cells, we would not be doing this work," Goldberg said.