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Scientists predict a new era for stem cells after presidential election

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Hundreds of embryonic stem-cell lines that provide hope for treating devastating disorders such as sickle cell anemia and Down syndrome are available for research but are off-limits to federal scientists because of White House restrictions, scientists said Wednesday.

But, the scientists said at a conference in Half Moon Bay, a change in policy after next November's presidential election could make the cells available quickly.

The three presidential candidates - Republican John McCain and Democrats Hillary Clinton and Barack Obama - all support expanded federal funding of human embryonic stem cell research. Their actions would lift a restriction imposed by President Bush in 2001 that limits federally funded research to fewer than two dozen embryonic stem cell lines.

"The rubber could hit the road within months," said Story Landis, director of the National Institute of Neurological Disorders and Stroke at the National Institutes of Health. "It's not rocket science. We know how to do it."

Wednesday's first-ever conference of the Global Forum of the International Society for Stem Cell Research brought together experts to survey the current state of stem-cell science. Although closed to the media, participants shared their hopes for expanded research at a news conference.

Embryonic stem cells have the unique ability to be converted into almost any type of cell found in the body, holding out hope that they can be used to treat everything from severed spines to diseases such as diabetes and Parkinson's. But a significant minority of Americans believe that using the cells for research and to treat disease is immoral because extracting the cells destroys the embryos.

Stem cell advocates, however, counter that the embryos come from fertility clinics, which routinely throw thousands of embryos each year into the trash as medical waste.

California's stem-cell funding agency - created by a 2004 ballot measure - is moving forward and in April will announce funding of new labs at major research centers, including four in the Bay Area. Stanford University's plans are the most ambitious, with a \$200 million building planned. Stanford has promised \$150 million of its own money and is asking the state for \$50 million. About 200 scientists would work there.

"Stanford has shown exceptional commitment to the project, with a high level of leverage," said Robert Klein, director of the California Institute for Regenerative Medicine.

The most immediate application for stem cells will be to determine the toxicity of potential pharmaceuticals, Klein said. The reason stem cells are needed is that testing the safety of drugs in animals is notoriously unreliable. Agents that seem safe in rodents are often dangerous to humans.

Stem-cell-derived liver and heart cells will be the first to be tested for the pharmaceutical applications, predicted Klein, who expects trials to start within 18 months.

Klein said that trials of the safety of stem cell-derived treatments for acute paralysis could start within the next year and that trials to test the safety of stems in repairing the retina could start within two years.

Further down the road are stem-cell approaches to replace cartilage and bone, as well as blood-based therapies to expand the number of people who could benefit from bone marrow transplants to cure leukemia and lymphomas, Klein said.

"The beginning of trials are cause for celebration - but patients and their families know to expect setbacks and difficulties, as well as victories," he cautioned. "We have to have tolerance for setbacks and to respect patients' decision to take risks."

Despite recent successes in deriving stem cells from human skin rather than embryos, the scientists said, embryos continue to be an essential part of medical research.

"There is no reason to abandon human embryonic stem cell research," Landis said. "Imagine that there are four doors in front of you - and behind each one is a therapy. Then multiply all the diseases we worry about. You've got lots of doors. You would not want to lock any of those doors.

"It would be incredibly risky to say you cannot use human embryonic stem cells any more," Landis said. "It is just too early and the potential benefits are too important and costly to close those doors now."

Harvard University researcher George Daley said: "There will never be a time when we don't need human embryonic stem cells. There may be - one day - a particular method that does not need embryos. But it will never obviate the value for human embryonic stem cells."

The experts cautioned frustrated patients and their families against "stem cell tourism" - flying to distant countries for unapproved and expensive treatment. The society is writing guidelines for patients to use when seeking treatments.

"It is a real threat," Daley said.

He suggested that patients ask if the overseas clinics pushing these treatments can point to published research in respectable peer-reviewed journals.

Added Daley: "Are they affiliated with centers that have a record of research? Are they conducting clinical trials? And what is the justification for charging patients, in many instances, tens of thousands of dollars for what are experimental treatments?"