

WILLIAMS: BLAME PLAYERS, NOT MILLEN

LIONS, 1C

ON GUARD FOR 177 YEARS

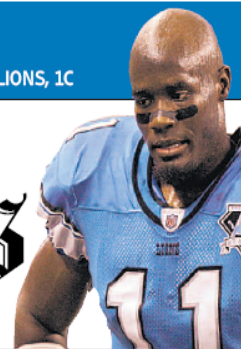
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METRO FINAL ♦♦



THE STEM CELL DEBATE



AMY LEANG/Detroit Free Press

PRO: Ryan Dinkgrave, 25, tests his blood sugar level at his Royal Oak home on Sept. 5. Dinkgrave has diabetes and is a volunteer working for Proposal 2. "There's no life being taken," he said of embryonic stem cell research. "I see no downside to this. It's being very misrepresented by people who oppose it. It's also being very misunderstood by people who oppose it."

CURES, JOBS, AND ETHICS

Opposing sides dig in as vote nears on Proposal 2

By MEGHA SATYANARAYANA
FREE PRESS STAFF WRITER

Ryan Dinkgrave lived a carefree life in Livonia until he was diagnosed with type 1 diabetes at age 10. Suddenly everything was ordered and careful.

"It makes you rethink everything you do," he said. "You're young, you're told you need to do shots, you're measuring your blood sugar. You have to count, carefully measure everything you eat."

Dinkgrave, now 25 and of Royal Oak, is among Michigan residents who support Proposal 2, a November ballot initiative allowing Michigan researchers to make embryonic stem cell cultures from excess embryos donated from fertility treatments. Researchers say the cells could unlock the secrets of disease and lead to cures for illnesses such as Alzheimer's and type 1 diabetes.

Voters will decide this emotionally charged issue on the basis of a 100-word

See STEM CELLS, 6A



REGINA H. BOONE/Detroit Free Press

CON: Dave Doyle, 49, is a spokesman for the group MiCAUSE. He said the language of Proposal 2 is deceptive and prevents the Legislature from regulating the science to ensure it is done safely and ethically.

■ One woman's tough call; plus primer on stem cells. 6A-7A.
■ At freep.com: Share your opinion on Proposal 2.

STEM CELLS | Cures, ethics and jobs on the line in vote

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affect people's health, but also the economy of Michigan for decades to come. Proponents say the measure could spark a life sciences sector and pump billions of dollars into the state's struggling economy.

Opponents insist embryonic stem cell research is unnecessary because alternative types of cells are available for research. They say the measure would take away regulatory power from the state Legislature and potentially lead to cloning. They also argue life begins at conception, so destroying embryos is wrong even if they might be discarded.

Under a 1978 state law that limits the destruction of embryos, making embryonic stem cell lines is a felony, punishable by up to \$10 million in fines and 10 years in prison. The law, which predates the discovery of embryonic stem cells by two decades, is one of the most restrictive in the nation.

Both groups believe they are saving lives. The difference is how.

A profound disadvantage

Sean Morrison researches stem cells in two nearly identical rooms at the University of Michigan, one for embryonic stem cells and one for adult stem cells. The embryonic stem cell room is privately funded, because the federal government banned funding for most embryonic stem cell research in 2001.

Because of the state ban, he cannot create new embryonic stem cell lines. He can either import other scientists' lines, or use a series of 21 embryonic stem cell lines preapproved by the Bush administration. Morrison says it's costly and complicated to transfer cell lines, and the approved lines are contaminated because they were grown with mouse cells.

"We cannot make our own lines in Michigan. This delays the research and creates an inhospitable climate for recruiting people who study ES cells to Michigan," he said. "People who specialize in embryonic stem cell research don't even apply to U-M for jobs. It puts the state at a profound disadvantage."

Even experienced researchers will move their labs for fear of what the next ban might be, Morrison said, noting a cancer stem cell researcher at U-M who moved to Stanford, partly because the research atmosphere was more open.

Morrison said scientists have become advocates, talking to the public about the need to create their own stem cell lines.

"The law was passed in the '70s, before we knew the embryonic stem cell existed. Why be held a slave to a law when we didn't even know they existed?" said Max Wicha, stem cell researcher and director of the U-M Comprehensive Cancer Center.

It's unclear how many embryos are discarded in Michigan each year, but researchers estimate there are 500,000 in storage nationwide. U-M has

about 200 frozen embryos that could be donated through informed consent if Proposal 2 passes, said spokesperson Robin Stephenson.

Ethical questions

Embryonic stem cell research is immoral because the good of a cure or therapy does not outweigh the evil of destroying an embryo, said Michael Hovey, director of Catholic Social Teaching at the Archdiocese of Detroit.

The Michigan Catholic Conference and the Right to Life lobby are funding a group called Michigan Citizens Against Unrestricted Science & Experimentation (MICAUSE) to oppose Proposal 2. "One life is not more valuable than the other, regardless of what point it's at," said Hovey, whose mother has Parkinson's disease.

Even if the research produces life-saving cures, Hovey said, he and other devout believers must conscientiously object.

The Catholic Church advocates adult stem cell research that Hovey said already treats dozens of diseases without destroying embryos. According to www.stemcellresearch.org, an anti-embryonic stem cell Web site, 73 diseases have adult stem cell therapies.

But U-M developmental biologist Doug Engel said the number was "completely bogus." Most of the diseases on the list are being treated with a single type of adult stem cell derived from blood, and many treatments are not Food and Drug Administration approved, he said.

Opponents also criticize the wording of Proposal 2. Cure Michigan's campaign manager, Mark Burton, said the language "is narrow," and keeps the Legislature from future bans on embryonic stem cell research, therapies and cures.

But Dave Doyle, MICAUSE spokesman, said the measure simply prevents the Legislature from regulating a new science. Morrison, noting that state regulation is rare and typically tied to state funding — which Proposal 2 does not address — said federal regulations on biomedical research already safeguard practices. In addition, many research universities have stem cell ethics boards.

Opponents also laud non-stem cells that mimic embryonic stem cells. They say these can be used in research without destroying embryos.

Researchers say the tech-



Sean J. Morrison is a researcher at Howard Hughes Medical Institute at the University of Michigan. "We cannot make our own lines in Michigan. This delays the research," he says.

nology for creating these cells causes tumors, however, and without more research into how embryonic stem cells work, they have no way of knowing if the substitute is the same as the real thing.

Biotech booms

Proponents say embryonic stem cell research could improve Michigan's economy by replacing lost auto jobs with biotech jobs spanning all levels and pay grades.

North Carolina made a similar transition when its textile industry faded, said Steve Rapundolo of MichBio, the state's biotechnology industry organization. The North Carolina Community College System BioNetwork now teaches manufacturing workers biotech basics and awards start-up grants.

"It's exactly the kind of thing we need in Michigan," he said.

Rapundolo said Michigan's research restrictions can discourage life science companies from locating here: "It's a horrible environment for life sciences," he said.

A handful of states, including New Jersey and California, fund the research themselves. A 2007 report by Rutgers University said that with \$720 million in infrastructure investment, New Jersey over time would gain an estimated \$2.2 billion in economic activity and \$15 million in new state revenues.

In California, the life sciences industry has grown from

about 17,000 jobs in the 1970s to about 285,000 today and now is the state's second largest employer, said Robert Klein, chairman of the board of the California Institute for Regenerative Medicine, which oversees funding of embryonic stem cell research.

A study by the public policy group Michigan Prospect said last week that Proposal 2 would have a small but significant economic impact on Michigan. Opponents called the study arbitrary.

A lesson in history

Carol Brenner, a reproductive biologist at Wayne State University, conducted human embryonic stem cell research in New Jersey. At WSU, she studies in vitro fertilization and heart repair using monkey embryonic stem cells instead.

Brenner said if Michigan voters reject Proposal 2, overturning the federal funding ban won't help. She still would need human cells to push her research forward.

Scientists like Brenner caution advocates like Ryan Dinkgrave, a volunteer with Michigan Citizens for Stem Cell Research and Cures, from overselling the promise, noting cures are years away. But both argue that to do nothing is immoral.

"If we want to find a cure, we pursue every promising avenue," Dinkgrave said.

It's an argument that's been heard before.

In the 1970s, scientists developed a way to use bacteria to create human proteins with therapeutic value. Opponents accused them of playing God but researchers and lawmakers created guidelines for the future of the technology, known as recombinant DNA, which has driven biomedical discovery and subsequent therapies ever since.

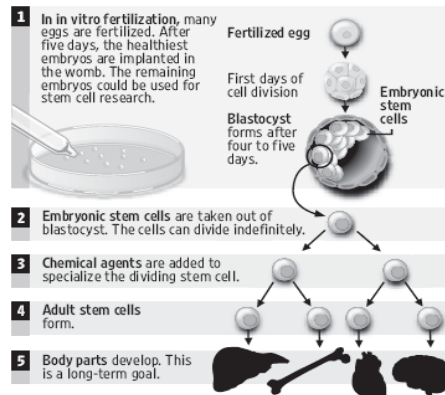
In 1982, the Food and Drug Administration approved its first recombinant-DNA derived therapeutic.

It was human insulin, the stuff that pumps into Ryan Dinkgrave several times a day.

Contact MEGHA SATYAN-ARAYANA at 313-223-4544 or megha@freepress.com.

How an embryonic stem culture is formed

Proposal 2 would allow Michigan researchers to make embryonic stem cell cultures from excess embryos donated from fertility treatments. Researchers say the embryonic stem cells could unlock secrets of disease and lead to cures for illnesses like Alzheimer's and diabetes.



Source: University of Michigan

DAVID PIERCE/Detroit Free Press

Stem cells and what they could do

WHAT IS AN EMBRYONIC STEM CELL?

Embryonic stem cells produce most cells in the body. They come from a 5-day-old, ball-shaped embryo called the blastocyst, and not from fetuses. They were discovered 10 years ago. Embryonic stem cells self-renew; at each division, one cell stays an embryonic stem cell and the other develops into a tissue cell. Adult stem cells likely develop from embryonic stem cells.

Embryonic stem cells grow endlessly in culture and can be steered toward becoming a specific cell type. They help scientists understand disease. Long-term, scientists hope to create therapeutic cells, for example, to replace nerve cells lost to stroke or Huntington's disease. Claims of embryonic stem cell therapies overseas from places like China have not been studied and approved in the United States.

Making embryonic stem cell lines from in vitro fertilized embryos does not involve nuclear transfer, a step in cell cloning.

WHAT IS AN ADULT STEM CELL?

Adult stem cells are found in fetuses, children and adults. They were discovered more than 40 years ago. They are in several tissues and organs, including liver, fat, heart and brain. They are limited to regenerating cells within related tissues and organs. For example, liver stem cells can replace lost liver cells and other related cells, but not brain cells. Scientists are studying how to change adult stem cells of one tissue family into cells of another. Adult stem cells also self-renew.

The most studied adult stem cell treatment is bone marrow transplantation, where blood stem cells in the marrow of the donor recreate the blood of the sick recipient. Umbilical cord blood contains adult stem cells, and could be an alternative to bone marrow transplants.

WHAT IS AN INDUCED PLURIPOTENT STEM CELL (CONSIDERED AN ALTERNATIVE TO AN EMBRYONIC STEM CELL)?

Induced pluripotent stem cells are fully formed cells, such as skin cells, that are genetically manipulated by scientists to mimic embryonic stem cells. IPS cells do not require destruction of an embryo, but scientists say they cannot predict the behavior of IPS cells without better understanding the embryonic stem cells they are supposed to mimic.

One concern is that some manipulated genes in IPS cells are active in cancer, and the method used to make the cells is potentially cancerous. IPS cells were created using human cells in 2007. Scientists last month reported a technique for transforming fully formed pancreas cells inside a mouse to those that resemble insulin-producing cells, which could help treat type 1, or juvenile diabetes. Scientists caution that neither breakthrough is safe for humans, yet.

What Proposal 08-2 says

A proposal to amend the state constitution to address human embryo and human embryonic stem cell research in Michigan.

The proposed constitutional amendment would:

- Expand use of human embryos for any research permitted under federal law subject to the following limits: the embryos —
 - are created for fertility treatment purposes;
 - are not suitable for implantation or are in excess of clinical needs;
 - would be discarded unless used for research;
 - were donated by the person

seeking fertility treatment.

- Provide that stem cells cannot be taken from human embryos more than 14 days after cell division begins.

- Prohibit any person from selling or purchasing human embryos for stem cell research.

- Prohibit state and local laws that prevent, restrict or discourage stem cell research, future therapies and cures.

SHOULD THIS PROPOSAL BE ADOPTED?

Yes
No

— MICHIGAN DEPARTMENT OF STATE

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MAX WICHA, stem cell researcher and director of the U-M Comprehensive Cancer Center.