

# U-M creates new stem cell lines

## Embryonic tools will boost research into inherited diseases

**Kim Kozlowski / The Detroit News**

*Ann Arbor*— A collaboration between the University of Michigan and a renowned Detroit doctor has led to new embryonic stem cell lines that will allow researchers to study how certain diseases form and progress, officials will announce today.

Unlike Michigan's first stem cell line created in October, the two new stem cell lines include genes for inherited disorders.

These are a milestone because they will give researchers tools they have never had before to study and possibly find ways to delay, better treat or even cure diseases.

One of U-M's new stem lines carries the genetic mutation that causes hemophilia B, a hereditary condition in which the blood does not clot properly. The other carries genes for Charcot-Marie-Tooth disease, another inherited disorder leading to degeneration of muscles in the foot, lower leg and hand.

The development puts U-M in the forefront of research that some regard as unethical, others as life-saving.

Only a few other U.S. universities have created disease-specific stem cell lines. Michigan could also become a world leader, some say, since the Ann Arbor-Detroit collaboration has the potential to lead to many more disease-affected stem cell lines.

"These cells aren't necessarily going to drive us toward discoveries of stem cell replacement therapies, but will give us information we've never had before with regards to how the diseases form and progress," said Dr. Gary Smith, co-director of the U-M Consortium for Stem Cell Therapies.

"By knowing that, we — and others — can work toward cures and treatments in ways we haven't been able to before. Once you have a new tool in science, it really opens up an avenue for many, many different discoveries. It's not just discovery by our laboratories at the University of Michigan, but discoveries from people across the world."

## ***Put to the test***

Scientists were able to create the new stem cell lines because of the 2008 voter-approved Michigan constitutional amendment, and embryo donations facilitated by Dr. Mark Hughes, president of Genesis Genetics in Detroit.

Hughes is a pioneer in pre-implantation genetic diagnosis, a test that helps couples have a healthy baby if they have had a child with an inherited genetic disorder.

The test requires all couples to go through in vitro fertilization — a reproductive technology normally used by infertile couples wanting to have children by creating embryos in a petri dish. Before the embryos are implanted in the mother, Hughes tests one cell in each to see if they're at risk of carrying genetic mutations responsible for inherited diseases.

Embryos that test positive for genetic abnormalities typically have been discarded as medical waste since couples do not want to use them. But now Hughes is asking couples if they want to donate them to science.

"We are interested in curing these dastardly diseases that affect mostly children and are generally incurable," said Hughes, who also works with Stanford University in a similar arrangement. "Current health care is barely capable of even effectively treating most of these conditions.

"At the moment, the best one can do is use medical technology to assist high-risk couples in avoiding in future children the disease that afflicts their family. 'Cure' is the mantra. And for many of these pediatric conditions, stem cell science offers the best hope at present to achieving that goal."

Some are disturbed by the technology that will help U-M further its research. "It sounds like a step toward eliminating imperfect children," said Dave Maluchnik, spokesman for the Michigan Catholic Conference. "It's frankly quite frightening."

Added Ed Rivet, legislative director for Right to Life of Michigan: "If you look at the history of ethical research, we don't destroy an individual with a disease in order to find cure for the disease.

"If it's human enough to know that it has the disease, it must be the same human beings that are born with the disease."

But those who are suffering from diseases or spinal cord injuries were thrilled to hear of the new stem cell lines, and impressed by the swift progress of U-M's research.

"It's encouraging and makes me hopeful," said Laura Jackson, a 22-year-old Livonia woman who was paralyzed from the neck down at age 14 and now relies on a wheelchair and ventilator. "This is a first stepping stone."

## ***Potential touted***

Supporters of the research say U-M's collaboration with Genesis Genetics has enormous potential, since it tests for nearly 200 inherited genetic diseases with fertility clinics around the globe.

Ten days ago, the university received a Michigan couple's donated embryos carrying genes responsible for myotonic dystrophy, a disorder characterized by progressive muscle wasting. The university is in the process of gaining consent with 20 couples from across the U.S. who want to donate their embryos with other genetic abnormalities.

This could put Michigan in the forefront of stem cell research, said Bernard Siegel, executive director of the Florida-based Genetics Policy Institute, which coordinates the World Stem Cell Summit, held last year in Detroit.

It also buttresses Michigan voters' passage of Proposal 2, a constitutional amendment that allowed for embryonic stem cell research in Michigan and has been fought unsuccessfully.

"The passage of Proposal 2 wasn't just a political statement," Siegel said. "This has been followed up with real, tangible research and real results that have the potential to impact human health. It portends very well for the future of stem cell research in Michigan."

U-M will soon be submitting these disease-specific lines to the National Institutes of Health to be placed on the Human Embryonic Stem Cell Registry. Researchers across the country will be able to use the lines for federally funded research. Of the 91 lines currently on the registry, three are disease-specific stem cell lines submitted by Harvard and Stanford universities.

"This is an important day for Michigan," A. Alfred Taubman, founder of a U-M medical research institute in his name, said last week from his home in Palm Beach, Fla.

"This puts us in the very forefront of science. We're (among) the very first to create embryonic stem cell lines that contain genetic defects that lead to specific inherited diseases. For the patients suffering from these diseases and the doctors trying to treat them, this is a major step forward. It can help us understand what causes these diseases and how they progress. But more importantly, these stem cell lines should pave the way for new treatments and cures."