U-M human embryonic stem cell line placed on national registry

February 14 2012

The University of Michigan's first human embryonic stem cell line will be placed on the U.S. National Institutes of Health's registry, making the cells available for federally-funded research. It is the first of the stem cell lines derived at the University of Michigan to be placed on the registry.

The line, known as UM4-6, is a genetically normal line, derived in October 2010 from a cluster of about 30 cells removed from a donated five-day-old embryo roughly the size of the period at the end of this sentence. That embryo was created for reproduction but was no longer needed for that purpose and was therefore about to be discarded.

"This is significant, because acceptance of these cells on the registry demonstrates our attention to details of proper oversight, consenting, and following of NIH guidelines established in 2009," says Gary Smith, Ph.D., who derived the line and also is co-director of the U-M Consortium for Stem Cell Therapies, part of the A. Alfred Taubman Medical Research Institute.

"It now makes the line available to researchers who can apply for federal funding to use it in their work; this is an important step."

The line is the culmination of years of planning and preparation and was made possible by Michigan voters' November 2008 approval of a state constitutional amendment permitting scientists here to derive embryonic stem cell lines using surplus embryos from fertility clinics or embryos

with genetic abnormalities and not suitable for implantation.

"We expect these cells will be used by investigators worldwide to enhance our understanding of stem cell biology, and together with disease-specific lines, discover treatments and cures for genetic diseases ," says Smith, who is a professor in the Department of Obstetrics and Gynecology at the University of Michigan Medical School.

U-M is among just a handful of U.S. universities creating human embryonic stem cell lines. There are only 147 stem cell lines available on the registry.

"We envision in the future that investigators will be able to use the genetically normal embryonic stem cell lines like UM4-6, together with disease-specific embryonic stem cell lines, as a model system to investigate what causes these diseases and come up with treatments," says Sue O'Shea, professor of Cell and Developmental Biology, and co-director of the Consortium for Stem Cell Therapies.

U-M also has two other human embryonic stem cells lines submitted to the national registry. Both are disease specific, the first carrying the genetic defect that causes hemophilia B, and the other carries the gene responsible for Charcot-Marie-Tooth disease, a hereditary neurological disorder.

Smith expects to soon submit eight additional human embryonic stem lines for consideration on the national registry: three genetically normal and five new disease specific lines.

This is a historic achievement that will lead to treatments and cures for serious, life-altering diseases and is more evidence that our University of Michigan researchers are leading the world in cutting-edge science that will impact health around the globe, says Eva Feldman, M.D., Ph.D.,

director of the A. Alfred Taubman Medical Research Institute.

"This is another major step forward for medical science in Michigan. This opens us another avenue for researchers to really begin exploring the causes and progression of those diseases, with the ultimate goal of finding new therapies for patients," says Feldman.

Contributors to the A. Alfred Taubman Medical Research Institute's Consortium for Stem Cell Therapies include the Taubman Institute; the Office of the Executive Vice President for Medical Affairs; the Office of the Medical School Dean; the Comprehensive Cancer Center; the Department of Pediatrics and Communicable Diseases; the Office of the Vice President for Research; the School of Dentistry; the Department of Pathology; the Department of Cell and Developmental Biology; the College of Engineering; the Life Sciences Institute; the Department of Neurology; and U-M's Michigan Institute for Clinical and Health Research.

A. Alfred Taubman, founder and chair of U-M's Taubman Institute, called the registry placement a tremendous step for stem cell research.

"I consider stem cells to be a modern medical miracle – the most exciting advance in medicine since antibiotics. The progress we have made throughout the state in stem cell research has been nothing short of remarkable," says Taubman.

"This milestone means much to the University of Michigan and the state of Michigan, but also to the world. It offers another route for researchers to move ahead in studying these horrible diseases. We hope it is the first of many lines that the University of Michigan can contribute to the global efforts to improve human health."