UCLA ELI and EDYTHE BROAD
Center Of Regenerative Medicine
and Stem Cell Research

PRESS RELEASE
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THREE HUMAN EMBRYONIC STEM CELL LINES CREATED AT UCLA ARE ADMITTED INTO NATIONAL INSTITUTES OF HEALTH REGISTRY

Three human embryonic stem cell lines created by researchers at the UCLA Broad Stem Cell Research Center have been accepted into the National Institutes of Health (NIH) Human Embryonic Stem Cell Registry, allowing them to be used in federally funded research projects and increasing the diversity of cell lines available for study.

The addition of the three human embryonic stem cells lines to the registry brings the total number of lines available for federal funding to 64, NIH officials said. Another 100 lines are pending approval. UCLA is one of only nine institutions in the world with stem cell lines admitted to the NIH registry.

The lines were developed by Amander Clark, an assistant professor of molecular, cell and developmental biology. Clark collaborated on the project with Nissim Benvenisty, co-director of the International Stem Cell Research Institute at Cedars Sinai Medical Center.

Dr. Owen Witte, director of the UCLA Broad Stem Cell Research Center, said the development of the three lines reflects the quality of work done by researchers at the stem cell center.

“These stem cell lines are very well characterized. We know their precise passage history, chromosome content and stability,” Witte said. “Pluripotent stem cells have the potential to play a vital role in developing effective therapies. Developing new human embryonic stem cell lines is a crucial field of research, and we’re gratified that our scientists were able to accomplish this important feat in a relatively short period of time.”

The stem cells lines were created using residual embryos from donors who had undergone in vitro fertilization. The stored embryos were no longer needed for reproductive purposes. All donors provided informed consent that met the highest regulatory and ethical standards. The three UCLA human embryonic stem cell lines were created using donated blastocysts, embryos that were frozen at five to six days after fertilization, Clark said.

The creation of the stem cell lines took about 18 months, Clark said, although developing appropriate protocols and creating the consent forms took much longer because UCLA adhered to the highest standards.

The stem cell line creation process includes many steps. The donated, frozen blastocysts are thawed and the inner cell mass – the 20 to 50 cells that are fully pluripotent in the blastocyst - is placed in culture with cells that support its growth. Within 24 hours, researchers can determine whether the cells in culture have the potential to create a viable stem cell line. A small piece of the developing stem cell colony, or group of cells, is cut away and placed into a culture dish to further expand, a process called passaging.

Clark said the resulting three stem cell lines were passaged 20 times each, and periodic tests were performed to characterize the cells, ensuring that they pass all the appropriate tests to be considered an embryonic stem cell line. . The genome of the stem cell line also is analyzed in order to distinguish them from other stem cell lines. The final tests ensure that the embryonic stem cells can differentiate into other cell types.

"We have a very clear and detailed history of these cells from the beginning of the derivation process to where they are today. We also have frozen stocks of cells at less than ten passages from the inner cell mass," Clark said.

About 10 percent of attempts to create stem cell lines are successful at UCLA, Clark said. Success depends on many factors, including the quality of the donated embryo.

Previously, less than a dozen human embryonic stem cell lines were available for federally funded research. However, President Barack Obama issued an executive order in March 2009 that removed some of the previous barriers involving research on human stem cells. The executive order stated that the secretary of health and human services, through the director of the NIH, may support and conduct responsible, scientifically worthy human stem cell research, including human embryonic stem cell research.

The NIH then created guidelines to implement the executive order, establishing policy and procedures under which the NIH can fund such research, and to ensure that NIH-funded stem cell research is ethically responsible, scientifically worthy and conducted in accordance with the law.

The executive order has resulted in the registration of many new stem cell lines derived at institutions across the country, significantly increasing the diversity of lines available to scientists and allowing them to test their research and clinical potential more thoroughly, Clark said.

The derivation of the stem cell lines was supported by the California Institute of Regenerative Medicine and the UCLA Broad Stem Cell Research Center.

The stem cell center was launched in 2005 with a UCLA commitment of $20 million over five years. A $20 million gift from the Eli and Edythe Broad Foundation in 2007 resulted in the renaming of the center. With more than 200 members, the Eli and Edythe Broad Center of Regenerative Medicine and Stem Cell Research is committed to a multi-disciplinary, integrated collaboration of scientific, academic and medical disciplines for the purpose of understanding adult and human embryonic stem cells. The center supports innovation, excellence and the highest ethical standards focused on stem cell research with the intent of facilitating basic scientific inquiry directed towards future clinical applications to treat disease. The center is a collaboration of the David Geffen School of Medicine, UCLA's Jonsson Cancer Center, the Henry Samueli School of Engineering and Applied Science and the UCLA College of Letters and Science. To learn more about the center, visit our web site at http://www.stemcell.ucla.edu. To learn more about the center, visit our web site at http://www.stemcell.ucla.edu.

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