MEDIA CONTACT
Andrea Fuller
afuller@triadstrategy.com
415-621-6447

FOR IMMEDIATE RELEASE

Stem Cells Isolated From Human Testis

Study moves one step closer to finding stem cells minus embryo ethical issues

Palo Alto, CA – January 7, 2009 – Scientists at Stanford's School of Medicine and the The Turek Clinic in San Francisco have succeeded in isolating stem cells from human testes. Although the cells can become the three main types of tissues of the body, they differ from traditional human embryonic stem cells and induced pluripotent stem cells made from skin. These adult testis stem cells appear to be more restricted in what kinds of cell types that they can become. Renee Reijo-Pera, a professor in obstetrics and gynecology at Stanford's School of Medicine, collaborated closely with Dr. Paul Turek, a urologist and male infertility specialist with The Turek Clinic in San Francisco to conduct the research, which will be published in the January 2009 issue of the journal Stem Cells. Dr. Reijo-Pera and Dr. Turek share senior authorship of the research that was published online on the journal's website on October 16, 2008 file://localhost/(http/::stemcells.alphamedpress.org).

The 'multipotent germline stem cells' identified by Reijo-Pera, who is the director of Stanford's Center for Human Embryonic Stem Cell Research and Education, and her collaborators seem to hover in a grey area between true pluripotency and the more limited, tissue-specific multipotency exhibited by many types of adult stem cells. Playing to these cells' strengths—in this case their likely ability to differentiate into cells involved in male reproduction—may be a wiser choice than trying to pigeonhole them as embryonic-stem-cell look-alikes. The findings are in contrast to those reported in a recent *Nature* paper in which a different research group announced that the cells were, in fact, pluripotent and could become virtually any other cell type in the body.

Coaxing specialized, or differentiated, adult cells to regress back into a more malleable embryonic-stem-cell-like state (a process called 'induced pluripotency') would also allow scientists to realize the therapeutic benefits of embryonic cells without the thorny ethical problems that plague cells derived from embryos. Until recently, however, the reprogramming of differentiated cells required the use of viruses to introduce specific genes into the cells, which may limit their usefulness.

"It's time to re-interpret the data and to accept that we're beginning to discover a family of different pluripotent stem cell types", said Dr. Renee Reijo-Pera. "Although they are all related to each other, they also all have unique therapeutic applications in which they surpass other family members."

The lure of pluripotency is strong. An easily accessible source of unmodified, pluripotent human cells would allow physicians and researchers to create cell lines and tissues identical to others in the donor's body. Theoretically such cells could be used as a perfectly matched therapy for that particular donor—perhaps to generate new cartilage to repair a knee injury or new neurons to treat nerve damage. Alternatively, the technique could be used to derive cell lines carrying specific disease-causing mutations—from a man with Parkinson's, for example—on which to conduct research.

"We are one critical step closer to the 'holy grail' of finding stem cells without using embryos", said Dr. Paul Turek co-senior author of the study. "These cells could potentially treat infertility or other diseases in men."

Study Methodology

The researchers used cells obtained from testis biopsies from nineteen male infertility patients. Each patients' cells were cultured in a manner similar to human embryonic stem cells; two of the 19 samples yielded cell lines with many characteristics of pluripotent cells. One of the two patients from whom the cell lines were derived withdrew from the study and his samples were discarded.

Further study on the remaining cell line indicated that it expressed many, but not all, genes associated with pluripotency. The cells could also be made to differentiate into decidedly non-testicular nerve cell precursors and they expressed the telomerase enzyme essential to keep pluripotent cells young and unspecialized, similar to embryonic stem cells. However, when the researchers examined the cells' patterns of methylation—a modification to DNA that affects gene expression—they found that the newly derived cell line showed a pattern distinctly different than that seen with embryonic stem cells. These cells were less-thoroughly methylated in one region and more heavily methylated in another region.

Finally, when the researchers injected the human stem cells into mice with compromised immune systems, they showed only a limited ability to form a kind of tumor with many cell types called a teratoma. Teratoma formation resulting from transplanted stem cells is a hallmark of true pluripotency. Together the results suggest that the stem cells isolated from adult male testis have some, but not all the characteristics of true pluripotent cells. Other Stanford investigators on the research include graduate students Nina Kossack and Cory Nicholas, research assistant Ha Nam Nguyen and postdoctoral scholar Shawn Chavez, PhD. The research was funded by the Gottlieb Daimler- and Karl Benz-Foundation, the California Institute of Regenerative Medicine, and the National Institutes of Health.

About The Turek Clinic

About The Turek Clinic

The Turek Clinic is a next-generation men's healthcare medical practice specializing issues facing reproductive age men. The practice was founded by Dr. Paul Turek, a leading surgeon and former endowed chair professor at the University of California San Francisco in May, 2008. Dr. Turek's work combines innovative and cutting edge techniques with the wisdom of old-world evidence based traditional medicine to treat the problems of men ages 21 to 55 years of age. For more information visit www.TheTurekClinic.com.