



Ovarian Stem Cells Treated with Sex Steroids to Create Neuronal Stem Cells (NSC)

The Technology

According to the National Institute of Neurological Disorders and Stroke, injuries and disorders of the central nervous system (CNS) strike approximately 50 million Americans per year. Neurological disorders are often debilitating and very difficult to treat. While there are relatively effective treatments currently available for neurological disorders, more effective treatments and cures are needed and are constantly being sought. Recent developments in stem cell technology have given promise to neurological research and may hold the answer to the treatment of various debilitating and incurable neurological disorders, such as Alzheimer's and Parkinson's. In recent years, researchers have developed an increased interest in neuronal stem cells (NSC) and progenitor cells. These cells have various applications in research, including the potential to be used in drug discovery and delivery applications and in neural toxicology assessment.

Researchers at the University of Tennessee have discovered that human ovarian epithelial stem cells and porcine granulosa cells can transdifferentiate into NSC and differentiating neurons after exposure to certain combinations of sex steroids. This conversion into NSC and differentiating neurons occurs within 1 to 3 hours after treatment with the sex steroids. *In vivo* treatment with sex steroid combinations to improve neurodegenerative disorders may eliminate the need for *in vitro* developed stem cells. In addition, the ovarian stem cell cultures, which could regularly be obtained from postmenopausal ovaries, have an apparent potential to produce NSC for autologous regenerative medicine of these diseases in aging women. Finally, the proper combination of sex steroids could possibly be employed for transdifferentiation of adult bone marrow stem cells or mobilized peripheral blood cells into autologous NSC and stimulate their neuronal differentiation after homing in the CNS.

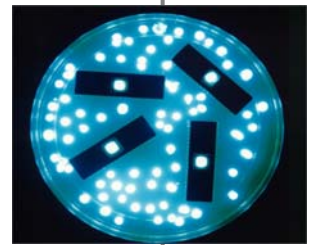
Advantages

- Novel method for generating neurons from stem cells
- May eliminate the need for creating in vitro stem cells for treatment of neurodegenerative disease
- Ovarian stem cell cultures readily obtainable from human ovaries regardless of the woman's age

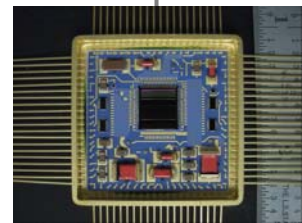
AGRICULTURE



BIOTECHNOLOGY



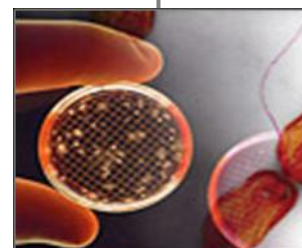
ENGINEERING



MATERIALS



MEDICINE





UNIVERSITY OF TENNESSEE **RESEARCH FOUNDATION**

<http://utr.f.tennessee.edu>

The Inventor

Dr. Antonin Bukovsky is a Professor of Obstetrics and Gynecology and Reproductive Biology in the Graduate School of Medicine at the University of Tennessee. The main focus of his research is female reproductive issues. He has produced several publications on reproductive biology including publications on stem cell research in female reproduction. He has several international collaborators and has presented at several meetings on his research in reproductive biology.

Patents

U.S. provisional patent application filed October 2008.

Contact

The University of Tennessee Research Foundation (UTRF) is a non-profit corporation responsible for commercializing University of Tennessee technologies and for supporting University research. UTRF is seeking parties interested in learning more about this technology and in exploring possible research and/or commercialization arrangements.

Lakita Cavin, J.D., Ph.D.

Licensing Associate/Staff Attorney

Ph: (901) 448-7825

Fax: (901) 448-2111

E-mail: lcavin@utmem.edu

Reference: PD 09013