



# International Conference & Exhibition on Cell Science & Stem Cell Research

29 Nov - 1 Dec 2011 Philadelphia Airport Marriott, USA

## Human parthenogenetic stem cell derived neuronal cells as a tool for Parkinson's disease treatment

Ruslan Semechkin

International Stem Cell Corporation, USA

Human parthenogenetic stem cells (hpSC) are pluripotent stem cells derived from unfertilized oocytes. hpSC behave the same way as human embryonic stem cells (hESC) in their proliferation capacity and multilineage differentiation in vitro. hpSC can be either heterozygous or homozygous. Homozygous hpSC have the potential to serve as a useful source of cells in clinical therapy because if the HLA type is common, their differentiated derivatives can match millions of individuals. In addition, hpSC do not raise the same ethical concerns as conventional hESC because the generation of hpSC does not involve the destruction of a viable human embryo. Together these two advantages make hpSC a very promising source of various differentiated somatic cell lines including multipotent neuronal cells (NC). In this study we derive NC from hpSC using an approach based on the adherent model with modifications. Rosettes of neuroepithelial cells were formed by culturing hpSC in feeder-free conditions with no serum and high concentration of bFGF. The rosettes were then isolated, dissociated into single cell suspension, and propagated as an adherent cell culture leading to human parthenogenetic NC (hpNC). The hpNC can be propagated for up to 30 passages and express the neural markers NES (Nestin), SOX2, and MSI1 (Musashi-1) as determined by qRT-PCR and immunocytochemistry. Expression of OCT4 was not detected at the RNA and protein levels. hpNC can be further differentiated into neurons and glia. The hpNC derived neurons express TUBB3 (Tubulin beta III) and MAP2 and elicit action potentials and outward, and inward currents.

### Biography

Ruslan Semechkin, Ph.D., is Vice President, Head of Neurology Division of International Stem Cell Corporation. Dr. Semechkin was trained in medical genetics, physiology and stem cell biology and holds his M.S. degree from Faculty of Fundamental Medicine of Moscow State University. He earned his Ph.D. degree in physiology from Anokhin Research Institute, Russian Academy of Medical Sciences. Dr. Semechkin has lectured on stem cell biology, including the use of stem cells for neurology and skin regeneration. He has publications in the field of clinical and molecular biology, and is author of various patent applications..