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Gene expression program of neural stem cells

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Abstract

Neural stem cells (NSC) are multipotent primary progenitors capable of self-renewal and differentiation. Brain-derived NSC can differentiate into different cell types within the central nervous system of a developing embryo and in the postnatal brain. *In vitro* cultured brain-derived neural stem cells provide an accessible system to study the basics of mammalian brain development and generate a source of differentiated neurons and glia for cell-therapy purposes. Despite our current progress to direct NSC differentiation towards specific cell types, we are still facing considerable challenge to produce pure populations of specific cell types for cell-based therapy strategies.

Understanding the mechanism of NSC differentiation is essential, since these cells have the potential to replace cells that are lost or damaged in diseases that affect cells within the central nervous system. Such diseases include stroke, spinal cord injury, Parkinson's and Alzheimer. By gene expression programming of neural stem cells from different origins, we aim to address fundamental unanswered questions on neural stem cell differentiation and cell commitments. Our research in stem cell and molecular biology combined with gene therapy approaches is focused on studying the role of specific genes in neural stem cell fate decisions. The outcome has future applications towards stem cell-based therapy strategies of human neurological disorders and in regenerative medicine.

Biography

Mojgan Rastegar has completed her Ph.D. at the Université Catholique de Louvain (UCL) in Belgium. She performed postdoctoral research at the IUPUI in Indianapolis, USA, McGill University in Montreal and Hospital for Sick Children in Toronto, Canada. Dr. Rastegar is currently an Assistant Professor of Biochemistry and Medical Genetics, and a Principle Investigator at the Regenerative Medicine Program at the University of Manitoba, Canada. She has published over 20 papers in reputed journals. Her research is focused on the genetic and epigenetic programming of brain-derived neural stem cells, with a focus on brain development and neurological disorders.