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## Manipulation of adult stem cells plasticity with modulators of chromatin modifying enzymes

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Development of safe and effective technologies for turning one adult stem cell type into another will open up remarkable opportunities for regenerative medicine. It is now well established that epigenetic regulation of gene expression is one of the key mechanisms that is involved in the regulation of cellular stemness, lineage commitment, differentiation and maintenance of these states, and DNA and histone covalent modifications play a key role in these processes. Thus, modulators of chromatin modifying enzymes could be efficient tools for manipulating cell plasticity. Recently, we were able to convert human mesenchymal stem cells (hMSCs) into neural-like cells by exposing them to chromatin modulating agents and neural inducing factors. In this study, we demonstrated that epigenetically manipulated hMSCs grown in specific differentiation conditions generated different cell types, such as smooth muscle and different neural cell types. Interestingly, chromatin modifying agents also promoted cell lineage switches when cells were exposed to another differentiation condition while in their early stages of commitment. These data suggest that the plasticity of adult stem cells can be manipulated by the modulators of chromatin modifying enzymes when combined with specific differentiation factors in appropriate culture conditions.

### Biography

Arshak R Alexanian is currently the Chief Scientific Officer at Cell Reprogramming & Therapeutics LLC and an Adjunct Associate Professor in the Department of Medicine at the Medical College of Wisconsin (MCW). Previously, he held faculty positions in the Departments of Neurosurgery at MCW (2000-2013) and in the Departments of Anatomy and Neurobiology, as well as in Biochemistry and Molecular Biology, at Colorado State University (1997-2000). He has received training at universities and centers worldwide, including the Pasteur Institute and University of Montpelier in France, University of Saarland in Germany, Institute of Biochemistry in China and Russia and Colorado State University, where he gained extensive experience in the fields of Biochemistry, Molecular Biology, Cell Biology (stem cell biology) and Neurosciences. The areas of interest of his research are the epigenetic regulation of cell fate commitment and differentiation, development of cell reprogramming technologies to produce different neuronal and glial cell types and elucidation of the therapeutic effect of these specialized cell types in several neurological disorders.

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