Stage Specific differentiation of Wharton Jelly derived Mesenchymal Stem cells to generate high quality neurons.

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I. Abstract

Neurodegenerative disorders of the central nervous system (CNS) remain as one of the major health concern, accounting for more than 10% of deaths due to different diseases. In neurodegenerative disorders, Alzheimer's disease, Parkinson's disease (PD), Amyotrophic lateral sclerosis (ALS), Multiple system atrophy (MSA) and Huntington disease are the major contributors. The current therapy, which involves medication and deep brain stimulation at advance stage, focuses on symptomatic treatment with none of them being able to counteract the progression of the disease. Keeping in mind the limitations associated with the present treatments, study of cell based therapy has been initiated.

In this study we have successfully trans-differentiated Wharton Jelly derived mesenchymal Stem cells (WJ-MSCs) into neuronal fate. WJ-MSCs were chosen for the study because of their hypo-immunogenic, immunomodulatory, and non-tumorigenic property. WJ-MSCs upon treatment with FGF-2 and EGF acquired neuroectodermal fate. Further analysis of these cells confirmed drastic decrease in the expression of MSCs related genes with concomitant expressing of SOX1, the important transcription factor involved in neural fate determination. Moreover, there was a drastic reduction in the number of cells expressing CD73 and CD105, pan-markers of MSCs. These neuroectodermal cells where further induced and differentiated into mature neuronal cells.

II. Biography:

Zaffar Equbal is a PhD student at National Institute of Immunology, India. He holds his expertise in the field of regenerative medicine. His PhD thesis work is on Mesenchymal stem cell and their potential to cure various neurodegenerative disorders. Apart from this he has also worked on the potential of Bone marrow cells to cure various different model of liver degeneration. He has also worked in the field of cancer stem cell. He has published 6 papers.

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