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Poster Presentation

The Role of Overexpression Transcription Factor BRN 4 in Multiple Sclerosis

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Abstract

Adult neurogenesis is a process of producing nerve cells from their progenitor that occurs in some areas in the brain such as the hypothalamus. Low activity in this area plays a role in neural degeneration and diseases such as multiple sclerosis, epilepsy and depression. MS is a neurodegenerative disease with a permanent disability that the main reason for it is axonal degeneration and neuronal death. Therefore, increased neurogenesis in the hypothalamus is an appropriate treatment for this disease. Transcription factor BRN4 is a transcription factor of the POU3F4 gene (which encodes a member of the POU-III class of neural transcription factors) that regulating the differentiation of striatal multipotent and precursors stem cells in the hippocampus of the adult brain. This factor also increased during the developing neural tube and the peak of neurogenesis at the time of embryo. IGF-1 is a factor that upregulate BRN4 by activating P13/Akt signaling pathway also BRN4 can regulate Ctbp2 and Notch2 genes that are related to neuronal differentiation. In one study in 2017, observed that after Lentivirus-mediated brn4 injected to dentate gyrus of rat hippocampus, differentiation and maturation of neural stem cells significantly increased. These results suggest that overexpression of brn4 enhance neurogenesis and neural differentiation in the hippocampus. We hypothesized that Overexpression of transcription factor BRN4 by injection of lentivirus-mediated brn4 or increased level of IGF-1 can be used as a great treatment modality in patients suffering from Multiple sclerosis, without injection neural stem cell. We suspect that with increase expression of BRN4 in the hippocampus of patients with the score 4- 5 because of disability affects daily routine (According to scoring EDSS) we can see significant improvement in their daily activities and treatment process.

Keywords: Hippocampus, Transcription factor Brn4, Multiple sclerosis, Neurogenesis

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