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Poster Presentation

Self-Assembling Peptide Scaffolds as New Therapeutic Method in TBI: Focused on Bioactive Motifs

Mohammad Amin Bayat Tork[1], Mohsen Saberifar[1], Sajjad Sahab Negah[2*]

[1]Student Research Committee, Mashhad University of Medical Sciences, Mashhad, Iran

[2]Neuroscience Department, Mashhad University of Medical Sciences, Mashhad, Iran

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Abstract

Traumatic brain injury (TBI) is a common reason of brain tissue loss as a result of tumors, accidents, and surgeries. Renewal of the brain parenchyma is restricted by many reasons such as inimical substances produced as the result of trauma and also inflammatory responses. A strong cascade of inflammatory responses begins as a result of TBI which include recalling peripheral leukocytes into the damaged site of brain. Brain tissue engineering is a new and promising treatment for TBI which includes designing an artificial extracellular matrix (scaffold) and stem cell transplantation into the damaged site of the brain. Tissue scaffolds moderate inflammatory cascades of reactions in tissue around the injury and reduces scar formation as a result of suppressing the amount of glial cells and leukocytes. There are many substances considered as scaffolds .One of the promising and desirable scaffolds is RADA16-I because it induces supportive migration of microglia and astrocytes and also can carry stem cells. Furthermore attaching trophic motifs to the RADA16 scaffold is an effective way for inducing endogenous gliogenesis and neurogenesis. Different type of self-assembling peptide with different peptide sequences like RADA16- IKVAV (Laminin) and RADA16-BMHP (bone marrow homing peptide) are designed. Stem cells showed high viability, differentiation, and important improvement on cell spreading and adhesion on these scaffolds. Although recent studies focused on tissue engineering, using peptide based scaffolds, conjugated with bioactive motifs, still specific attention should be paid to role of the all kinds of scaffold and attaching bioactive motifs in controlling inflammatory reactions to determine their efficacy and finding the best treatment of TBI.

Keywords: Tissue engineering, TBI, Neuroinflamation, RADA16, Bioactive peptide

Corresponding Author: Sajjad Sahab Negah

E-mail: *sahabsajad@yahoo.com*

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