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Neural Tissue Engineering Strategies in Traumatic Brain Injury Therapies

Sajad Sahab Negah[1, 2*]

[1]Department of Neuroscience, Mashhad University of Medical Sciences, Mashhad, Iran
[2]Shefa Neuroscience Research Center, Khatam Alanbia Hospital, Tehran, Iran

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Abstract

The incidence of traumatic brain injury (TBI) are annually increasing, developed tissue engineering methods could represent the definite remedies for patients with strongly injured central nervous system and have a great effect in the public healthcare cost. The current clinical treatments in TBI display several limitations. Furthermore, several therapies, coming from neural tissue engineering and nanotechnology, have revealed an absolute potential to regenerate damaged tissues and organs by using biomaterials capable of creating favorable microenvironments for tissue ingrowth. Neural tissue engineering approaches have established a very attractive alternative for neuroregeneration after brain injury. The approaches are using scaffolds encapsulated with cells and or embedded with molecules to achieve neural regeneration. In conclusion, in order to help to regenerate neurons in the CNS, the combination of the scaffolds with stem cells and/or growth factors and biomolecules seems beneficial. Thus, a combinatorial therapeutic approach will be the one that will probably provide the conclusive solution to the complex problem of brain injury repair.

Keywords: Traumatic brain injury, Tissue engineering, Stem cells.

Corresponding Author: Sajad Sahab Negah
E-mail: *sahabnegahs@mums.ac.ir*

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