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Oral Presentation

Cellular and Molecular Mechanisms of Spinal Cord Trauma

Mohammad Taghi Joghataei^{1*}, Kazem Mousavizadeh², Fereshteh Azedi Tehrani³

¹Cellular and Molecular Research Center, Iran University of Medical Sciences, Tehran, Iran.

²Department of Anatomy, Iran University of Medical Sciences, Tehran, Iran.

³Department of Neuroscience, Faculty of Advanced Technologies in Medicine, Iran University of Medical Sciences, Tehran, Iran.

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Abstract

The prevalence of spinal cord injury (SCI) is about 2.5 million in the worldwide and more than 130,000 new injuries reported each year. Regeneration in the CNS versus the PNS is very different from the other tissues and many factors can prevent regeneration in PNS and specially CNS. Previous researches demonstrated that regeneration of CNS can inhibit by inhibitory molecules and glial scar. Therefore, creating new approaches to CNS injury treatment is a hot topic in this field. Providing a permissive growth environment by transplanting neural cells and stem cells with using tissue engineering and nanofiber scaffolds, promote the survival and growth of damaged axons. In addition, using neurotrophins like stromal-derived factor-1 and granulocyte colony-stimulating factor, neutralizing inhibitory molecules improve the regeneration condition. Functional electrical stimulation such as standing and walking after spinal cord injury, combination treatment with different methods versus mono-therapy, and gene therapy are some of new approaches in this field. Our presentation will comprehensively summarize basic aspects of cellular and molecular mechanism of spinal cord injury, critically evaluate current experimental models that are used in basic research, and provide an overview on established and emerging neuroprotective, neurorestoration and gene therapies.

Keywords: Spinal Cord Injury, Stem Cell, Neural Regeneration.

***Corresponding Author:** Mohammad Taghi Joghataei

E-mail: joghataei@tums.ac.ir