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Workshop Presentation

Self-Assembling Peptide Nanofiber Containing Biologic Motif Induces Neural Differentiation, Tubulin Polymerization and Neurogenesis; In-Vitro, Ex-Vivo and In-Vivo Studies

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Abstract

Spinal cord injury (SCI) in humans remains a devastating and incurable disorder. A very important obstacle in axonal regeneration after spinal cord injury is astroglial scaring. The use of self-assembling peptide nanofiber, a hydrogel mimicking extracellular matrix, has been suggested as a scaffold for spinal cord regeneration and inhibition of astrogliosis. However, neurogenesis potential of laminim has been proved. The purpose of this study was to investigate the role of self-assembling peptide nanofiber containing long motif of laminin (SAPN-LL) in neural differentiation of human endometrial-derived stem cells (hEnSCs) in-vitro, in polymerization of tubulin isolated from sheep brain ex-vivo and assess the supportive effects of this hydrogel in an animal model of SCI. Results showed that although nanaofibers strongly differentiated hEnSC towards neuron and there were not significant differences between their neural differentiations but motor recovery results demonstrated that concentration of laminin influences motor recovery and tubulin polymerization. However, both of in-vitro and in-vivo results showed that SAPN-LL inhibited astrogenesis. Based on our results it might be concluded that, SAPN containing long motif of laminin holds great promise for spinal cord injury.

Keywords: Self-assembling Peptide Nanofiber, Long Motif of Laminin, Spinal Cord Injury, Polymerization of Tubulin.

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