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Poster Presentation

The Role of Extra Cellular Matrix in Brain Injury

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Abstract

Traumatic brain injury (TBI) results from a sudden and external physical impact to the head, and often leads to motor and cognitive impairment. Using tissue engineering strategies, we aimed to review aspects of extra cellular matrix (ECM) based scaffold that could be delivered to the injured brain. The ECM is produced intracellularly and secreted to form a dense network of proteins and glycans, occupying the parenchyma of virtually all cells. It is a source of diverse molecular signals that guide cellular growth, activity and survival. It is well known that changes to the ECM inhibit axonal regeneration; it is also becoming clear that such alterations, particularly chondroitin sulphate proteoglycans (CSPGs) accumulation, impair oligodendrocyte function and remyelination. In order to enhance therapeutic efficacy, many studies have reported benefits from remodeling the extracellular matrix to provide a suitable scaffold for regeneration of cells and axons. Therefore, due to the effects of various ECM components on signaling events, it is very difficult to design controlled experiments for ECM-based cell signaling. It is also difficult to gelatinize nano or picogram quantities of collagen or the other single ECM component alone. Meanwhile, our ability to maintain stable cell density throughout experiments is limited when using several cell lines that do not have consistent adherence to culture flasks. ECM can be focused in basic investigations for understanding its roles and making engineered scaffolds mimicking ECM to treat SCI.

Keywords: Traumatic Brain Injury, ECM, Cell Signaling.

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