DEVELOPMENT OF BIOMATERIAL SCAFFOLD FOR NERVE TISSUE ENGINEERING: BIOMATERIAL MEDIATED NEURAL REGENERATION

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Abstract- Neural tissue repair and regeneration strategies have received a great deal of attention because it directly affects the quality of the patient's life. There are many scientific challenges to regenerate nerve while using conventional autologous nerve grafts and from the newly developed therapeutic strategies for the reconstruction of damaged nerves. Recent advancements in nerve regeneration have involved the application of tissue engineering principles and this has evolved a new perspective to neural therapy. The success of neural tissue engineering is mainly based on the regulation of cell behavior and tissue progression through the development of a synthetic scaffold that is analogous to the natural extracellular matrix and can support three-dimensional cell cultures. As the natural extracellular matrix provides an ideal environment for topographical, electrical and chemical cues to the adhesion and proliferation of neural cells, there exists a need to develop a synthetic scaffold that would be biocompatible, immunologically inert, conducting, biodegradable, and infection-resistant biomaterial to support neurite outgrowth. This review outlines the rationale for effective neural tissue engineering through the use of suitable biomaterials and scaffolding techniques for fabrication of a construct that would allow the neurons to adhere, proliferate and eventually form nerves.