

Role of Nano Gelatin and Hydrogel Based Scaffolds in Odontogenic Differentiation of Human Dental Pulp Stem Cells

Authors : Husain S. Yawer, Vasim Raja Panwar, Nidhi Priya

Abstract : The objective of this study is to evaluate and compare the role of nano-gelatin and Bioengineered Scaffolds on the attachment, proliferation, and osteogenic differentiation of human dental pulp stem cells (DPSCs). Tooth decay and early fall have each been one of the most prevailing dental disorders which cause physical and emotional suffering and compromise the patient's quality of life. The design of novel scaffolding materials will be based on mimicking the architecture of natural dental extracellular matrix which may provide as in vivo environments for proper cell growth. This methodology will involve the combination of nano-fibred gelatin as well as biodegradable hydrogel based tooth scaffold. We have measured and optimized the Dental Pulp Stem Cells growth profile in cultures carried out on collagen-coated plastic surface, however, for tissue regeneration study, we aim to develop an enhanced microenvironment for stem cell growth and dental tissue regeneration. We believe biomimetic cell adhesion and scaffolds might provide a near in vivo growth environment for proper growth and differentiation of human DPSCs, which further help in dentin/pulp tissue regeneration.

Keywords : nano-gelatin, stem cells, dental pulp, scaffold

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