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Preparation of Natural Polymeric Scaffold with Desired Pore Morphology for Stem Cell Differentiation

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Abstract : In the context of tissue engineering, the effect of microtopography as afforded by scaffold morphology is an important design parameter. Since the morphology of pores can effect on cell behavior, in this study, porous Chitosan (CHIT) - Gelatin (GEL)- Alginate (ALG) scaffolds with microtubule orientation structure were manufactured by unidirectional freeze-drying method and the effect of pore morphology on differentiation of Mesenchymal Stem Cells (MSCs) was investigated. This study showed that, the provided scaffold with natural polymer had good properties for cell behavior and the pores with highest orientation rate have produced appropriate substrate for the differentiation of stem cells.

Keywords : Chitosan, gelatin, Alginate, pore morphology, stem cell differentiation
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