



Fabrication of cellulose based scaffolds for bone regeneration application

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Abstract : Carboxymethyl cellulose, a water-soluble cellulose derivative, has been used extensively as a biomaterial for wound healing and pharmacological applications. It is a biocompatible and biodegradable polymer but its poor stability, limits its long-term application. In this study, carboxymethyl cellulose scaffolds were prepared at different concentrations (2.5 wt% and 5.0 wt%) by freeze drying method and its structural stability was induced by adding crosslinkers such as citric acid and fumaric acid. The stability of the scaffolds was assessed in phosphate buffered saline (PBS) by soaking for 24 hours. The pH of PBS remains stable for fumaric acid crosslinked scaffolds compared to citric acid crosslinked scaffolds. The cytotoxicity of the scaffolds was assessed by Saos-2 osteoblast cells. The 2.5wt% CMC crosslinked scaffolds showed better cellular activity compared to other crosslinked scaffolds. This study showed that the addition of crosslinkers has improved the stability of scaffolds without affecting its biocompatibility.

Keywords : Carboxymethyl cellulose, scaffolds, crosslinkers, freeze-drying.

I. Manjubala *et al* /International Journal of ChemTech Research, 2016,9(6),pp 603-606.
