Hydroxyapatite Reinforced Natural Polymer Scaffold for Bone Tissue Regeneration

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Abstract

Medical Advances had led to an increase in life expectancy. However, one of the challenges confronted by the orthopaedic surgeon is the repair and restoration of large skeletal bone defects resulting from resection of a malignant bone neoplasms and trauma. Nano hydroxyapatite is a naturally occurring mineral form of calcium apatite. Hydroxyapatite is the main component of bone which is constantly synthesized and degraded naturally by living bone and hence effectively used as a bio implant. Hydroxyapatite combined with starch can be used as a biomaterial for making scaffolds for bone tissue regeneration since starch is a natural polymer that is used for load bearing applications. This is used to improve the biocompatibility of scaffold for living cells. The materials are synthesized by Wet Chemical Method in liquid phase, dried to obtain solid particles and solvent casting technique is used for making scaffold in the ratio 1:1. Prepared materials are characterized using DLS, FTIR, XRD, and SEM. The size of prepared Hydroxyapatite particle is found to be 174.2 nm. Cytotoxicity test reveals highly compatible and non-toxic to the body.

Keywords: *Biomaterials, Hydroxyapatite, Polymers, Scaffold, Biocompatible, Cytotoxicity, SEM*