



POSTER

Biomimetic release of growth factor from porous beads for enhanced bone regeneration

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Abstract

Three dimensional scaffolds which allow sustained release of bioactive molecules have been considered as an essential component for enhanced bone regeneration. In recent years, combination system of various bioactive molecules has been extensively investigated to reconstruct more sophisticated bone regeneration. It is well-known that if the certain bioactive molecules with appropriate dose and stimulation periods are applied to bone defect, the physiological processes in bone regeneration may be accelerated. However, many studies were not concerned stimulation periods of bioactive molecules occurred in body during new bone formation because of absence of proper release system for the bioactive molecules. In this study, we selected three bioactive molecules (PDGF-BB, VEGF, BMP-2) which widely used for effective bone healing, and developed a porous bead with leaf-stacked structure which can allow controlled release of growth factors by concentration and composition of Pluronic. The morphology, each growth factor release profiles, migration (boyden chamber assay), angiogenic differentiation (tube formation, ICC, and RT-PCR), osteogenic differentiation (ALP activity, calcium deposition, alizarin/ALP staining, ICC, and RT-PCR) of human periosteum-derived cells and new bone formation of rat calvarial defect model by controlled release of growth factors were estimated

Keywords

Growth factor, biomimetic release, porous beads, osteogenic differentiation

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References

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