



POSTER

Effective bone formation through BMP-2-immobilized highly porous GBR membrane

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Abstract

Sound healing of large bone defects is critical challenges in most of clinical fields. In general healing process of bone regeneration, the rapid infiltration of connective tissue, whereas relatively slow bone regeneration in bone defect leads to the incomplete bone formation. To solve this drawback, guide bone regeneration (GBR) membrane which could prevent rapid infiltration of connective tissue into bone defect, thus GBR membrane is feasible for compact bone regeneration in clinical fields. In recent, the most researchers believed that bioactive molecules-grafted GBR membranes may enhance the bone regeneration. To allow graft of bioactive molecules from porous membrane, chemically modified scaffolds are commonly used. This modification leads to sufficient interaction with active sites of bioactive molecules to stable the immobilization of bioactive molecules in the body. However it is hard to apply to clinical applications because of the toxicity of chemical residue used for the modification. In this study, we developed a GBR membrane with leaf-stacked structure which can allow sustained release of bone morphogenetic protein-2 (BMP-2) without any additional modification. The morphology, mechanical property, BMP-2 release profile, osteogenic differentiation of human periosteum-derived cells, and new bone formation efficiency of the BMP-2-loaded GBR membrane compared with commercial product were investigated.

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GBR membrane, growth factor, BMP-2, osteogenic differentiation

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