เป็นหนังสือภาษาอังกฤษ

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โครงการ

ศึกษากลไกระดับเซลล์ของ fibroblast growth factor (FGF2) และ LIM mineralization protein 1 (LMP1) ในการเหนี่ยวนำให้ osteoblast เปลี่ยนไปเป็นกระดูกที่สมบูรณ์

โดย

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Preparation of β-TCP/PCL Composite Scaffolds with High Content of Inorganic Phase and Porosity without Loss of Mechanical Strength

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Abstract:

Bioceramics and metals developed as bone repair and fixation devices all have too high Young's modulus. This causes stress stimulating and shielding effect after implantation, which often results in bone resorption and loosening of implants. The elimination of stress stimulating, stress shielding and interfacial loosening is the primary motivation for the development of inorganic/polymer bio-composite. A better property can be obtained if the biomaterial is more similar to natural tissue. In this study, the used β-TCP was mimic to bone apatite in morphology, phase composition and crystals structure. PCL, a long chain biodegradable polymer, is considered to be of thread-like structure similarly to collagen protein fibers that thread through a mineral phase of bone. By our established procedure, up to 50 wt% of β-TCP could be added in the PCL matrix with uniform distribution. Increasing of β-TCP to PCL ratio would help increase scaffold bioactivity *in vivo*. Also, increased hydrophilicity of scaffold surfaces was achieved by lowering the PCL content to about 20 wt% that advantageous for cell attachment. A porous three dimensional structure with porosity of 70% and pore size diameter of ~500 μm was fabricated with desired mechanical strength and modulus. Our made scaffolds had compromised mechanical properties in comparison with other previous works of which not less than 60 wt% of synthetic biopolymers was utilized. However, scaffold products that prepared were still optimal for use as tissue engineered material for non load-bearing reconstruction.