

纳米羟基磷灰石/胶原复合材料制备方法研究

陈际达¹、王远亮¹、蔡绍哲¹、曹颖²

1 重庆大学生物力学与组织工程教育部重点实验室和生物工程学院

2 第三军医大学西南医院

研究了在脱钙骨基质内原位沉积纳米羟基磷灰石的电化学方法,探讨了影响沉积的实验因素和条件。并利用红外光谱和X衍射表征无机相的组成,透射电子显微镜观测晶体的形态和尺寸,光学显微镜观察无机相分布,灰化法测定无机成分含量。结果表明,电化学方法可以制备出纳米羟基磷灰石/胶原复合材料,其无机成分为 $53.9 \pm 3.2\%$,并且无机相的组成、分布、性质与自然骨非常一致,是纳米复合材料。

STUDY ON PREPARATION FOR NANO-HYDROXYAPATITE/COLLAGEN COMPOSITE

The electrochemical technique was used to prepare hydroxyapatite/collagen nano-composite in situ by deposition calcium phosphate in a thick plate of demineralized bone matrix (DBM), the factors and experimental conditions, which would influence on the deposition of calcium phosphate, were investigated as well. The weight percent of inorganic ingredient was $53.9 \pm 3.2\%$ determined through ash test. The distribution of inorganic ingredient (calcium phosphate, CP) in DBM was observed by microscope, the phase composition was tested through x-ray diffraction (XRD) and infrared spectroscopy (IR), the morphology and dimension of CP were investigated by transmission electron microscopy (TEM). The results indicated that calcium phosphate in DBM was non-stoichiometric apatite in the shape of rod-like and nano-dimension. The structure, component, and distribution of inorganic ingredient are closely similar to that of natural bone. It suggests that the product is nano-composite.

关键词

组织工程(Tissue engineering); 人工骨(Biomimic bone); 仿真骨(Artificial bone); 纳米复合材料(Nano-composite)