

· 基础与临床研究 ·

选择性激光烧结技术构建 HA/PCL 骨组织工程支架的研究

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【摘要】目的 应用选择性激光烧结技术构建 3D 支架, 探讨其作为骨组织工程支架的可行性。**方法** 以羟基磷灰石 (HA) 和聚己内酯 (PCL) 为原材料, 运用选择性激光烧结技术, 制备纯 PCL 支架以及 HA 质量比为 5wt.% 和 10wt.% 的 HA/PCL 支架, 通过扫描电镜观察支架微观形貌, 测定各组支架的孔隙率、抗压强度及亲水性, MTT 法检测 10wt.% HA/PCL 支架浸提液的细胞毒性。**结果** 扫描电镜显示: 支架具有相互连通的三维孔隙结构, 5wt.% 和 10wt.% 的 HA/PCL 支架孔隙率分别达到 78.20% 和 80.75%。随着羟基磷灰石含量增高, 抗压强度略有下降, 但支架亲水性提高。MTT 的结果显示: 10wt.% HA/PCL 支架表现出良好的细胞相容性。**结论** 选择性激光烧结技术制备的 HA/PCL 支架具有外形可塑性及良好的孔隙结构, 其力学性能和细胞相容性可支持作为骨组织工程支架应用。

【关键词】 羟基磷灰石 聚己内酯 选择性激光烧结技术 骨组织工程支架

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Study on the fabrication of HA/PCL composite scaffolds using a selective laser sintering technique for bone tissue engineering

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【Abstract】Objective Novel three-dimensional scaffolds were fabricated using a selective laser sintering technique and investigated for bone tissue engineering applications. **Methods** The scaffolds were fabricated by hydroxyapatite(HA) (0wt.%, 5wt.% and 10wt.%) /poly-ε-caprolactone (PCL) composite using a selective laser sintering technique. The micro-structural and internal morphologies of the scaffolds were observed by scanning electron microscopy (SEM). The porosities, compressive strength and hydrophilicity of the scaffolds were measured *in vitro*. Bone marrow stroma cells of dog were cultured in the extracts of the 10wt.% HA/PCL scaffold, and the cytotoxicity was tested by MTT assay. **Results** In SEM images, the scaffolds showed interconnected pores structure, indicating highly porosities. The porosities of the 5wt.% HA/PCL and 10wt.% HA/PCL scaffolds were respectively 78.20% and 80.75%. With the weight ratios of HA increased, the compressive strength of the scaffolds were slightly reduced but the hydrophilicity of the scaffolds were increased. The MTT data showed that the extract of the scaffolds produced no effect on the cell proliferation and had low cytotoxicity. **Conclusions**

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