

论著

犬骨髓基质干细胞与聚羟基烷酸酯体外相容性的实验研究

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收稿日期 2008-3-20 修回日期 2008-10-8 网络版发布日期 2009-2-8 接受日期 2008-10-8

摘要 目的: 评价聚羟基烷酸酯 (PHBV) 作为组织工程支架与犬骨髓基质干细胞 (BMSCs) 的生物相容性。方法: 原代培养犬 BMSCs, 传至 3-4 代后, 接种至 PHBV 膜和泡沫样三维支架上, 以接种至培养板上细胞为对照组, 倒置显微镜下观察细胞形态; 于培养 1、2、3 周分别采用 4% 多聚甲醛固定, 常规组织切片, HE 染色; 在 5、10、14 d 用 Hoechst 33258 荧光法定量测定细胞内 DNA 含量, BCA 法测定蛋白质含量。结果: 倒置显微镜观察 PHBV 纤维较粗, 且透光性差, 在相差显微镜下不易观察。第 3-4 代 BMSCs 接种至 PHBV 膜上 2 h 后即大部黏附, 3 d 后伸展良好, 呈纺锤形或梭形, 在三维支架的孔隙内立体生长, 1 周开始细胞间连接, 3 周广泛连接, 分泌大量基质; 培养接种 1 周后, 取二个膜状 PHBV 固定, HE 染色后, 见骨髓基质干细胞增殖。培养接种 2 周后, 骨髓基质干细胞增殖明显, 呈梭形密布于膜状 PHBV 上。培养接种 3 周后, 骨髓基质干细胞增殖较第二周无明显变化。定量测定接种的细胞内 DNA 含量和蛋白质含量与对照组相比无显著差异。结论: PHBV 作为 BMSCs 的组织工程支架材料, 具有良好的生物相容性。

关键词 [组织工程](#) [骨髓基质干细胞](#) [聚3-羟基烷酸酯-co3-羟基戊酸酯](#) [生物相容性材料](#)

分类号 [R318](#)

Experimental study on biocompatibility between canine bone marrow stem cells and copolymers of poly-3-hydroxybutyrate-co-3-hydroxyvalerate

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Abstract

AIM: To evaluate the biocompatibility between copolymers of poly-3-hydroxybutyrate-co-3-hydroxyvalerate (PHBV) and bone marrow stem cells (BMSCs).
METHODS: Canine BMSCs were isolated and cultured. The cells in passage 3-4 were seeded onto the PHBV films and three-dimensional foams. The seeded cells were observed under inverted microscope for morphology and cell attachment onto the PHBV films at 1, 2 or 3 weeks after seeding. With 4% paraformaldehyde formalin and staining, the protein content in seeded cells was determined by bicinchoninic acid assay (BCA). The content of DNA was quantified using the Hoechst 33258 assay.
RESULTS: Observation under inverted microscope showed that the PHBV fabric was fairly thickness, lucency is weak. Unser contrast phase microscope, PHBV fabric was uneasy to be observed. Most cells attached onto the PHBV films 2 h after seeding, and extended well and acquired a spindle fibrecyte-like morphology 3 d later. Moreover, on the three-dimensional foams, the seeded cells lay in micropores and grew tri-dimensionally. The conjunction of cells appeared about 1 week, and extended at 3 weeks, with a large amount of extracellular matrix around cells. The content of DNA and protein has no significant difference with control group.
CONCLUSION: As a kind of tissue engineering material for BMSCs seeding, PHBV has an excellent biocompatibility.

Key words [Tissue engineering](#) [Bone marrow stromal stem cells](#) [Poly-3-hydroxybutyrate-co-3-hydroxyvalerate](#) [Biocompatible materials](#)

DOI: 1000-4718

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