中国病理生理杂志 2009 24 (6): 1210-1213 ISSN: 1000-4718 CN: 44-1187/R

论著

壳聚糖-镁膜体外生物相容性的初步研究

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收稿日期 2008-7-4 修回日期 2008-12-3 网络版发布日期 2009-8-19 接受日期 2008-12-3

摘要 目的： 研究壳聚糖镁膜的制备及其与PC12细胞的体外生物相容性，初步探讨壳聚糖-镁络合后形成的复合物作为组织工程材料的可行性。方法: 合成壳聚糖-镁膜，应用扫描电镜观察复合材料的表面形态，并用X射线能谱仪分析壳聚糖-镁复合膜中镁的含量；测定复合膜的膨胀率；在体外将复合膜与PC12细胞共培养，用MTT方法检测细胞活力。扫描电镜观察PC12细胞在材料上的形态学变化。结果: 单纯壳聚糖与壳聚糖-镁膜各组相比，表面较为光滑，而复合膜表面含有大量的细小孔隙；复合膜中的镁元素的的含量与投入的硫酸镁量呈一定的剂量依赖。形态学观察表明，PC12细胞在CM上生长良好，至7 d时，可见微绒毛丰富并有较长突起，部分细胞之间形成突触状结构；MTT检测结果表明，培养7 d时实验组细胞活力超过对照组。结论: 壳聚糖可以与镁络合形成复合物，但是两者之间的络合率不成正比关系；壳聚糖镁膜与PC12细胞有良好的体外相容性。

关键词 壳聚糖； 硫酸镁； 生物相容性

分类号 R331

Primary study on biocompatibility of chitosan-Mg membrane in vitro

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Abstract

<FONT face=Verdana>AIM: To prepare the chitosan-Mg membranes (CM) and explore the biocompatibility of membranes with PC12 cells and feasibility of its usage as bionmaterials in tissue engineering.METHODS: The appearance of the chitosan-Mg membranes was observed by scanning electromicroscope (SEM) and the element of membranes was analyzed by X-ray energy spectrometer. The expansion coefficient of CM was also detected. PC12 cells were co-cultured with CM in vitro. The morphological changes of PC12 cells on membranes were observed under SEM and the cell vitality was detected by MTT assay.RESULTS: The surface of chitosan membranes (CS) was smoother than that of CM, but the CM were full of tiny pores. The content of Mg element was related with the dose of MgSO4 added into chitosan solution in a dose dependent manner. Morphology observation showed that PC12 cells grew well with CM compared with CS. The cells were rich of microvilli and long processes on 7th day, and synapses like structure was formed in many PC12 cells. In addition, the cell viability in experiment group was higher than that in control group (P<0.05) on 7th day detected by MTT method.CONCLUSION: Chitosan can combine with Mg2+. The complexation rate is related with the content of Mg2+ but not in direct ratio. Chitosan/Mg membranes show good biocompatibility with PC12 cells.</FONT>

Key words Chitosan Magnesium sulfate Biocompatibility

DOI: 1000-4718

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