

仿生鱼胶原复合膜引导牙周 / 骨组织再生的体外研究

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【摘要】目的 研制一种综合性能优异的仿生鱼胶原复合膜, 探讨其作为引导牙周 / 骨组织再生 (GTR/GBR) 膜的生物学潜能。**方法** 制备一种新型仿生静电纺鱼胶原 / 生物玻璃 / 壳聚糖 (Col/BG/CS) 复合纳米纤维膜, 分别研究复合膜的结构、性能、抗菌性及其诱导人牙周膜韧带细胞 (HPDLCs) 的生物学效应。**结果** 复合膜具有仿生结构和一定的力学强度。相比单纯的鱼胶原膜, 复合膜对变形链球菌显示出一定的抑菌效果。复合膜被证明能明显促进 HPDLCs 的粘附、增殖成骨分化以及 RUNX-2, OPN 蛋白的表达。**结论** 本研究首次开发一种具有主动诱导牙周组织再生能力并兼有一定抗菌性的多功能仿生鱼 Col/BG/CS 复合纳米纤维膜, 为其作为 GTR/GBR 膜的应用提供可能。

【关键词】 仿生 鱼胶原 引导牙周 / 骨组织再生膜 生物玻璃 壳聚糖 成骨分化

DOI: 10.11752/j.kqcl.2018.01.03

Biomimetic fish collagen composite nanofibers induce periodontal/bone tissue regeneration *in vitro*

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【Abstract】Objective The aim of the present study was to develop a biomimetic fish collagen composite nanofibers with excellent properties and discuss the biological potential for application in guided tissue or bone regeneration (GTR/GBR) membranes. **Methods** To prepare a biomimetic electrospun fish collagen/bioactive glass/chitosan (Col/BG/CS) composite nanofibers membrane and determine its structure, mechanical property, antibacterial activity, and biological effects on human periodontal ligament cells (HPDLCs). **Results** The composite membrane had a biomimetic structure with a certain tensile strength. Compared to the pure fish collagen membrane, the composite membrane showed some antibacterial activity on *Streptococcus mutans* (S. mutans). The composite membrane not only enhanced cell viability and osteogenic gene expression of HPDLCs, but also promoted the expression of RUNX2 and OPN protein. **Conclusion** The present study developed a biomimetic fish Col/BG/CS composite membrane that can actively induce tissue regeneration with a certain antibacterial activity, providing a basis for potential application as a GTR/GBR membrane.

【Key words】 Biomimetic Fish collagen GTR/GBR membrane Bioactive glass Chitosan Osteogenic differentiation

基金项目: 国家自然科学基金项目 (31470917); 上海市科委项目 (15DZ2290100)

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