

[1]蒋科,熊雁,余江,等.负载转化生长因子B3微球的壳聚糖三维支架的制备[J].第三军医大学学报,2013,35(10):988-991.

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## 负载转化生长因子B3微球的壳聚糖三维支架的制备:

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Title: Preparation of controlled-released three-dimensional chitosan scaffold loading with TGF- $\beta$ 3 microspheres

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关键词: [壳聚糖](#); [转化生长因子B3](#); [微球](#)

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摘要: 目的 探讨制备负载转化生长因子B3微球的壳聚糖三维支架的可行性。 方法 利用冻干法制备壳聚糖三维支架,扫描电镜观察并测定其水结合率及孔隙率。利用乳化交联法制备负载转化生长因子B3的壳聚糖微球,检测负载微球的体外缓释情况及吸水膨胀率。制作负载转化生长因子B3微球的壳聚糖三维支架,扫描电镜观察支架形态特征。 结果 壳聚糖三维支架孔隙较为一致,孔隙直径( $180.4 \pm 35.3$ )  $\mu\text{m}$ ,孔隙率( $83.2 \pm 0.6$ )%,与水的结合能力为( $123 \pm 5$ )%。电镜观察微球表面光滑,分散性好,粒径( $28.5 \pm 5.1$ )  $\mu\text{m}$ 。对壳聚糖微球体外缓慢释放TGF- $\beta$ 3连续监测7 d,总释放率为( $46.2 \pm 0.3$ )%。负载TGF- $\beta$ 3微球的壳聚糖三维支架观察见微球在支架中分布均匀。 结论 负载TGF- $\beta$ 3微球的壳聚糖三维支架的制备技术成熟,理化性质稳定,微球缓释TGF- $\beta$ 3效果理想,可作为理想的组织工程材料。

Abstract: Objective To prepare a three-dimensional chitosan scaffold loading with transforming growth factor- $\beta$ 3 (TGF- $\beta$ 3)

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microspheres. **Methods** Three-dimensional chitosan scaffold was prepared by lyophilization, and water bonding capacity and porosity were measured. TGF- $\beta$ 3 loaded chitosan microspheres were prepared by emulsion-crosslinking method. The controlled release of TGF- $\beta$ 3 was monitored for 7 d and the swelling index was measured. At last, the three-dimensional chitosan scaffold loading with TGF- $\beta$ 3 microspheres was prepared and observed by scanning electron microscope (SEM).

**Results** SEM images showed the morphology of porous scaffold was uniform, and the mean diameter of interconnected pores was  $180.4 \pm 35.3 \mu\text{m}$ . The porosity was  $(83.2 \pm 0.6)\%$  and swelling index of microspheres was  $(123 \pm 5)\%$ . The microspheres were spherical and smooth, and the mean diameter of the microspheres was  $28.5 \pm 5.1 \mu\text{m}$ . The accumulated release of TGF- $\beta$ 3 reached  $(46.2 \pm 0.3)\%$  within 7 d. Most microspheres were uniform in the scaffold.

**Conclusion** The method for preparing three-dimensional chitosan scaffold loading with TGF- $\beta$ 3 microsphere is feasible, and the sustained release of TGF- $\beta$ 3 is realized.

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#### 参考文献/REFERENCES:

蒋科, 熊雁, 余江, 等. 负载转化生长因子 $\beta$ 3微球的壳聚糖三维支架的制备[J]. 第三军医大学学报, 2013, 35(10): 988-991.