

عنوان مقاله:

Application of the bacterial cellulose as a bioscaffold

محل انتشار:

اولین کنگره بین المللی مهندسی بافت و پزشکی بازساختی ایران (سال: 1397)

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خلاصه مقاله:

Introduction Bacterial cellulose is one of most abundant bio-polymers. This material has high crystallinity, high purity, interconnected pores, biocompatibility, high water absorption capacity and adjustable mechanical strength. Its 3D nanofiber network is similar to extracellular matrix. The irregular structure of its nanofibers is comparable with collagen matrix. It has higher porosity and mechanical strength than collagen, but the rate of cell proliferation and differentiation is lower. Because of its unique properties, it can be used as scaffold for vascular, bone, cartilage, heart valve, tendon, smooth muscle cells and other tissues both in vito and in vivo. **Methods** Bacterial cellulose membranes were produced from *Gluconacetobacter xylinus* subsp. *sucrofermentas* BPR 2001 and *G. xylinus* PTCC 1734. These bacteria were cultured in HS broth medium and static culture for 7 days in 28°C and pH=6 and produced cellulose pellicles. The medium was supplemented with 2% w/v glucose, 0.5%w/v yeast extract, 0.5% w/v pepton, 0.27%w/v Na₂HPO₄ and 0.115% w/v citric acid. Pellicles were removed from medium and purified by NaOH 2% w/v for 15 min. They were immersed in distilled water to neutralize their pH and finally were sterilized by autoclaving. **Conclusion** In this study, bacterial cellulose was successfully produced which can be used as a bioscaffold. Most of natural scaffolds have animal source and may suffer from the risk of pathogene transmission. Furthurmore, decellularized tissues may create immune responses. Bacterial cellulose can be mixed with other materials such as nanomaterials and antibiotics to increase the efficiency of cell support and can be used as a safe and efficient scaffold for tissue .engineering. **Key words:** bacterial cellulose, scaffold, tissue engineering, regenerative medicine

کلمات کلیدی:

Bacterial cellulose, Scaffold, tissue engineering, Regenerative medicine

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