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Histological and biochemical evaluations of decellularized meniscus tissues using sonication treatment system (Conference Paper)

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Abstract

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Meniscus plays fundamental roles in the knee mechanisms and functions but injuries happen in meniscus have poor healing ability that requires great interventions. Tissue engineered scaffolds serve as one of the interventions to regenerate the required tissue to treat early degenerative joint disease. The purpose of this research is to examine the effectiveness of sonication treatment system in complete cellular components removal with preserved extracellular matrix (ECM) compositions in meniscus tissues through histological and biochemical evaluations. Meniscus tissues were decellularized using sonication treatment system for 10 hours treatment time and continued with extensive washing process. Histological evaluations were based on van Gieson and Picrosirius red staining that portrayed complete cellular components removal and preserved collagen networks distribution within sonicated scaffolds respectively. Biochemical evaluations showed markedly reduction in the residual DNA content for sonicated scaffolds while maintain in collagen content. Lastly, agarose gel electrophoresis showed no visible DNA bands for sonicated scaffolds. Therefore, the results concluded that the prepared bioscaffolds by sonication treatment system managed to reduce the immunogenicity of scaffolds by removing most of the cellular components and successfully retained the properties of the extracellular matrix. Thus, it is a suitable decellularization method to be used in tissue engineering applications. © 2018 IEEE

SciVal Topic Prominence

Topic: Extracellular Matrix | Tissue Engineering | ECM scaffolds

Prominence percentile: 99.230

Author keywords

Decellularization | Extracellular matrix | Meniscus | Scaffolds | Sonication

Indexed keywords

Engineering controlled terms: Collagen | Electrophoresis | Histology | Scaffolds | Sonication | Tissue

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Structural integrity of aortic scaffolds decellularized by sonication decellularization system
Hazwani, A. , Sha'ban, M. , Azhim, A.
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Evaluation of recellularization on decellularized aorta scaffolds engineered by ultrasonication treatment
Fitriatul, N. , Sha'Ban, M. , Azhim, A.

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Engineering main heading: Scaffolds (biology)

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