

Export...

Add to Marked List

◀ 1 of 1 ▶

Histological and Biochemical Evaluations of Decellularized Meniscus Tissues using Sonication Treatment SystemBy: Yusof, F (Yusof, Fatimah)^[1]; Sha'ban, M (Sha'ban, Munirah)^[2]; Azhim, A (Azhim, Azran)^[1]

2018 IEEE-EMBS CONFERENCE ON BIOMEDICAL ENGINEERING AND SCIENCES (IECBES)

Book Group Author(s): IEEE

Book Series: IEEE EMBS Conference on Biomedical Engineering and Sciences

Pages: 356-359

Published: 2018

Document Type: Proceedings Paper

Conference

Conference: IEEE-EMBS Conference on Biomedical Engineering and Sciences (IECBES)

Location: Kuching, MALAYSIA

Date: DEC 03-06, 2018

Sponsor(s): SARAWAK Convent Bur; Physiolog Measurement

Abstract

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.

Keywords

Author Keywords: decellularization; sonication; meniscus; extracellular matrix; scaffolds

KeyWords Plus: SCAFFOLD; COMPLEX; REPAIR

Author Information

Reprint Address: Yusof, F (reprint author)

+ Int Islamic Univ Malaysia, Kuliyyah Allied Hlth Sci, Dept Biomed Sci, Kuantan, Pahang, Malaysia.

Addresses:

+ [1] Int Islamic Univ Malaysia, Kuliyyah Allied Hlth Sci, Dept Biomed Sci, Kuantan, Pahang, Malaysia

+ [2] Int Islamic Univ Malaysia, Kuliyyah Allied Hlth Sci, Dept Phys Rehabil Sci, Kuantan, Pahang, Malaysia

E-mail Addresses: fatihahyusof249@gmail.com; munirahshaban@iiu.edu.my; azranazhim@iiu.edu.my

Funding

| Funding Agency | Grant Number |
|------------------------------|--------------------|
| Ministry of Higher Education | FRGS15-204-0445 |
| | PRGS16-002-0033 |
| | TRGS16-02-001-0001 |

View funding text

Citation Network

In Web of Science Core Collection

0

Times Cited

Create Citation Alert

24

Cited References

View Related Records

Use in Web of Science

Web of Science Usage Count

0

Last 180 Days

0

Since 2013

Learn more

This record is from:

Web of Science Core Collection

- Conference Proceedings Citation Index-Science

Suggest a correction

If you would like to improve the quality of the data in this record, please [suggest a correction](#).

Publisher

IEEE, 345 E 47TH ST, NEW YORK, NY 10017 USA

Categories / Classification

Research Areas: Engineering

Web of Science Categories: Engineering, Biomedical

See more data fields

Cited References: 24

Showing 24 of 24 [View All in Cited References page](#)

(from Web of Science Core Collection)

| | | |
|-----|--|--------------------|
| 1. | The Use of Sonication Treatment to Completely Decellularize Blood Arteries: a Pilot Study By: Azhim, A.; Yamagami, K.; Muramatsu, K.; et al. 2011 ANNUAL INTERNATIONAL CONFERENCE OF THE IEEE ENGINEERING IN MEDICINE AND BIOLOGY SOCIETY (EMBC) Book Series: IEEE Engineering in Medicine and Biology Society Conference Proceedings Pages: 2468-2471 Published: 2011 | Times Cited: 18 |
| 2. | The use of sonication treatment to decellularize aortic tissues for preparation of bioscaffolds By: Azhim, A.; Syazwani, N.; Morimoto, Y.; et al. JOURNAL OF BIOMATERIALS APPLICATIONS Volume: 29 Issue: 1 Pages: 130-141 Published: JUL 2014 | Times Cited: 14 |
| 3. | The use of sonication treatment to completely decellularize aorta tissue By: Azhim, A.; Yamagami, K.; Muramatsu, K.; et al. World Congress Medical Physics and Biomedical Engineering Volume: 39 Pages: 1987-1990 Published: 2013 [Show additional data] | Times Cited: 4 |
| 4. | The Impact of Acoustic Intensity on Solution Parameters and Decellularization Using Sonication Treatment By: Azhim, Azran; Shafiq, Mohammad; Rasyada, A. Rahman; et al. JOURNAL OF BIOMATERIALS AND TISSUE ENGINEERING Volume: 5 Issue: 3 Pages: 195-203 Published: MAR 2015 | Times Cited: 6 |
| 5. | The Use of Whole Organ Decellularization for the Generation of a Vascularized Liver Organoid By: Baptista, Pedro M.; Siddiqui, Mohummad M.; Lozier, Genevieve; et al. HEPATOLOGY Volume: 53 Issue: 2 Pages: 604-617 Published: FEB 2011 | Times Cited: 327 |
| 6. | The meniscus: review of basic principles with application to surgery and rehabilitation. By: Brindle, T; Nyland, J; Johnson, D L Journal of athletic training Volume: 36 Issue: 2 Pages: 160-9 Published: 2001-Apr | Times Cited: 87 |
| 7. | Applications of ultrasound in food technology: Processing, preservation and extraction By: Chemat, Farid; Zill-e-Huma; Khan, Muhammed Kamran ULTRASONICS SONOCHEMISTRY Volume: 18 Issue: 4 Special Issue: SI Pages: 813-835 Published: JUL 2011 | Times Cited: 787 |
| 8. | An overview of tissue and whole organ decellularization processes By: Crapo, Peter M.; Gilbert, Thomas W.; Badylak, Stephen F. BIOMATERIALS Volume: 32 Issue: 12 Pages: 3233-3243 Published: APR 2011 | Times Cited: 1,059 |
| 9. | Polymeric scaffolds in tissue engineering application: a review By: Dhandayuthapani, B; Yoshida, Y; Maekawa, T; et al. Int J Polym Sci Volume: 2011 Pages: 2-19 Published: 2011 [Show additional data] | Times Cited: 3 |
| 10. | The effect of detergents on the basement membrane complex of a biologic scaffold material By: Faulk, D. M.; Carruthers, C. A.; Warner, H. J.; et al. ACTA BIOMATERIALIA Volume: 10 Issue: 1 Pages: 183-193 Published: JAN 2014 | Times Cited: 80 |
| 11. | Tissue engineering by decellularization and 3D bioprinting | |