### Accepted Manuscript

Title: Preparation and Characterization of Gelatin/ $\alpha$ -TCP/SF Biocomposite Scaffold for Bone Tissue Regeneration

Authors: JunTae Huh, JiUn Lee, WonJin Kim, Miji Yeo, GeunHyung Kim

PII: S0141-8130(17)32992-6

DOI: http://dx.doi.org/10.1016/j.ijbiomac.2017.09.030

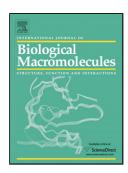
Reference: BIOMAC 8205

To appear in: International Journal of Biological Macromolecules

Received date: 10-8-2017 Revised date: 4-9-2017 Accepted date: 12-9-2017

Please cite this article as: JunTae Huh, JiUn Lee, WonJin Kim, Miji Yeo, GeunHyung Kim, Preparation and Characterization of Gelatin/α-TCP/SF Biocomposite Scaffold for Bone Tissue Regeneration, International Journal of Biological Macromoleculeshttp://dx.doi.org/10.1016/j.ijbiomac.2017.09.030

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



## ACCEPTED MANUSCRIPT

## Preparation and Characterization of Gelatin/α-TCP/SF Biocomposite Scaffold for Bone Tissue Regeneration

JunTae Huh, JiUn Lee, WonJin Kim, Miji Yeo, and GeunHyung Kim\*

Department of Bio-Mechatronic Engineering, College of Biotechnology and Bioengineering, Sungkyunkwan University, Suwon, South Korea

\*E-mail: gkimbme@skku.edu, Tel; +82-31-290-7828

#### Abstract

In this study, we suggest a new biocomposite scaffold composed of gelatin/ $\alpha$ -TCP (tricalcium phosphate)/SF (silk-fibroin) (GTS) which has enhanced mechanical strength and high level of cellular activity. To fabricate GTS scaffold, a temperature-controlled 3D printing process was used and appropriate printing conditions were selected based on rheological data. To show the feasibility as a biomedical scaffold for bone tissue regeneration, the various physical and biological results, using MG63 (osteoblast-like cells), of the GTS scaffold were compared with those of a pure gelatin (G) and gelatin/ $\alpha$ -TCP (GT) composite scaffold. GTS scaffolds showed enhanced mechanical properties in dry and wet state compared to those of the G and GT scaffolds. Also, significantly high cell-proliferation and differentiation of MG63 cells were observed in the GTS scaffold. Therefore, the GTS composite scaffold will be one of highly potential biomaterials to be used in bone regeneration.

### Download English Version:

# https://daneshyari.com/en/article/8328052

Download Persian Version:

https://daneshyari.com/article/8328052

<u>Daneshyari.com</u>