Title: Vital Role of Hydroxyapatite Particle Shape in Regulating the Porosity and Mechanical Properties of the Sintered Scaffolds

Author: <ce:author id="aut0005" author-id="S1005030217300166-2956692a1834ad733bbb0d5c414e0721"> Jinchuan Wu<ce:author id="aut0010" author-id="S1005030217300166-05387fac8f2db12954f1361aab006c34"> Changshun Ruan<ce:author id="aut0015" author-id="S1005030217300166-fae7e2a8c152d56879ad13e1c7f3e473"> Yufei Ma<ce:author id="aut0020" author-id="S1005030217300166-adcb758bf11cfddaa6110c0344f595ae"> Yuanliang Wang<ce:author id="aut0025" author-id="S1005030217300166-abd02d57f41bf1cc8a789d80270524b9"> Yanfeng Luo

PII: S1005-0302(17)30016-6
DOI: http://dx.doi.org/doi:10.1016/j.jmst.2017.01.008
Reference: JMST 895

To appear in:

Received date: 18-9-2016
Revised date: 4-11-2016
Accepted date: 6-12-2016

Please cite this article as: Jinchuan Wu, Changshun Ruan, Yufei Ma, Yuanliang Wang, Yanfeng Luo, Vital Role of Hydroxyapatite Particle Shape in Regulating the Porosity and Mechanical Properties of the Sintered Scaffolds, http://dx.doi.org/10.1016/j.jmst.2017.01.008

Vital Role of Hydroxyapatite Particle Shape in Regulating the Porosity and Mechanical Properties of the Sintered Scaffolds

Jinchuan Wu[1, 2], Changshun Ruan[3], Yufei Ma[1, 2, 3], Yuanliang Wang[1, 2,*], Yanfeng Luo[1, 2,*]

[1]Lab for Bioinspired & Smart Materials, College of Bioengineering, Chongqing University, Chongqing 400030, China

[2]Key Laboratory of Biorheological Science and Technology (Chongqing University), Ministry of Education, Chongqing 400030, China

[3]Center for Human Tissue and Organs Degeneration, Institute of biomedicine and Biotechnology, Shenzhen Institutes of Advanced Technology, Chinese Academy of Science, Shenzhen 518055, China

[Received 18 September 2016; Received in revised form 4 November 2016; Accepted 6 December 2016]

*Corresponding authors. Fax: +86 23 65102507.

E-mail address: wyl@cqu.edu.cn (Y.L. Wang); yfluo@cqu.edu.cn (Y.F. Luo).

The effect of particle shape on the porosity and compressive strength of porous hydroxyapatite (HA) scaffolds was investigated by sintering the mixture of rod-shaped HA (r-HA) and spherical HA (s-HA) with polyacrylamide used as the sacrificial template. It was found, for the first time, that addition of r-HA into s-HA could exponentially decrease the porosity of sintered HA scaffolds and enhance their compressive strength with the increase of r-HA content. The mechanism, according to the results from scanning electron microscopy and X-ray diffraction, lies in the restriction of s-HA to