

Accepted Manuscript

Full length article

Accelerated hardening of nanotextured 3D-plotted self-setting calcium phosphate inks

Santiago Raymond, Yassine Maazouz, Edgar B. Montufar, Roman A. Perez, Borja González, Joanna Konka, Jozef Kaiser, Maria-Pau Ginebra

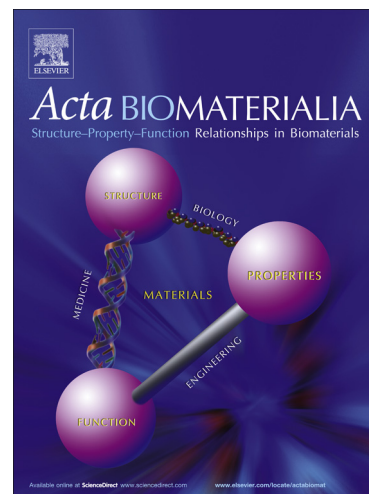
PII: S1742-7061(18)30319-2
DOI: <https://doi.org/10.1016/j.actbio.2018.05.042>
Reference: ACTBIO 5495

To appear in: *Acta Biomaterialia*

Received Date: 12 March 2018
Revised Date: 3 May 2018
Accepted Date: 25 May 2018

Please cite this article as: Raymond, S., Maazouz, Y., Montufar, E.B., Perez, R.A., González, B., Konka, J., Kaiser, J., Ginebra, M-P., Accelerated hardening of nanotextured 3D-plotted self-setting calcium phosphate inks, *Acta Biomaterialia* (2018), doi: <https://doi.org/10.1016/j.actbio.2018.05.042>

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.



Accelerated hardening of nanotextured 3D-plotted self-setting calcium phosphate inks

Santiago Raymond^{1,2,3‡}, Yassine Maazouz^{1,2,3‡}, Edgar B. Montufar^{1,4}, Roman A. Perez^{1,5}, Borja González¹, Joanna Konka^{1,2}, Jozef Kaiser⁴, Maria-Pau Ginebra^{1,2,6*}

¹ Dept. Materials Science and Metallurgical Engineering, Group of Biomaterials, Biomechanics and Tissue Engineering, Universitat Politècnica de Catalunya (UPC), Barcelona, Spain

² Barcelona Research Centre for Multiscale Science and Engineering, Universitat Politècnica de Catalunya (UPC), Barcelona, Spain

³ Mimetic Biomaterials, Cerdanyola del Vallès, Barcelona, Spain

⁴ CEITEC - Central European Institute of Technology, Brno University of Technology, Brno, Czech Republic.

⁵ UIC Regenerative Medicine Research Institute. Universitat Internacional de Catalunya (UIC), Barcelona, Spain

⁶ Institute for Bioengineering of Catalonia (IBEC), The Barcelona Institute of Science and Technology, Baldori Reixac 10-12, 08028 Barcelona, Spain

‡These two authors have contributed equally to this work.

Keywords: calcium phosphate; hydroxyapatite; biomimetic; bone regeneration; 3D plotting; direct ink writing; bone graft

Abstract

Direct ink writing (DIW) techniques open up new possibilities for the fabrication of patient-specific bone grafts. Self-setting calcium phosphate inks, which harden at low temperature, allow obtaining nanostructured scaffolds with biomimetic properties and enhanced bioactivity. However, the slow hardening kinetics hampers the translation to the clinics. We explored different hydrothermal treatments for the consolidation of DIW scaffolds fabricated with an α -tricalcium phosphate /pluronic F127 ink, comparing them with a biomimetic treatment. Three different scaffold architectures were analysed. The hardening process, associated to the conversion of α -tricalcium phosphate to hydroxyapatite was drastically

Download English Version:

<https://daneshyari.com/en/article/6482814>

Download Persian Version:

<https://daneshyari.com/article/6482814>

[Daneshyari.com](https://daneshyari.com)