PULSUS
WWW.PULSUSCONFERENCE.COM

Ruben Rabadan-Ros et al., Arch Med 2018, Volume 10
DOI: 10.21767/1989-5216-C2-006

Influence of topography of porous–Nurse´s A phase bioceramic on metabolic activity of adult human mesenchymal stem cells

Ruben Rabadan-Ros[1], Clara Meseguer-Ortiz[2], Belén Gil-Muñoz[3], JI Peña[4], Lorena Grima[4] , Luis Meseguer-Olmoand[1] and Dra Piedad N de Aza[5]

[1]Catholic University of Saint Anthony, Spain
[2]Morales Meseguer University Hospital, Spain
[3]Mesa del Castillo Hospital, Spain
[4]Zaragoza University-CSIC, Spain
[5]Miguel Hernández University, Spain

It is well known that Si-Ca-P bioceramics are promising bioactive materials for bone tissue engineering, particularly for bone repair[1]. Silicon incorporation to these ceramics may be fundamental to skeletal development stimulating mesenchymal stem cells proliferation and differentiation to osteoblasts [2,3]. An important characteristic of a bioceramic designed for bone reconstruction is its open porosity with a high area / volume ratio that facilitates the initial circulation of biological fluids, cell migration and vascular invasion after bone implantation [4,5]. In this work, we have processed a Si-Ca-P ceramic using a Q-switched Nd:YAG laser, obtaining biocompatible ceramics with 70 µm and 350 µm homogeneously distributed interconnected pores. *In vitro* assays using *ah*MSCs showed that cells seeded onto the top of these scaffolds could proliferate, cross the small pores and enter into big pores. So, if we use these bioceramics *in vivo*, we could probably observe how the cells penetrate into the bioceramics through the pores, improving the cellular and vascular colonization of the biomaterial and allowing initial circulation of the body fluids from the first moment of implantation, increasing the bioceramic biodegradability.

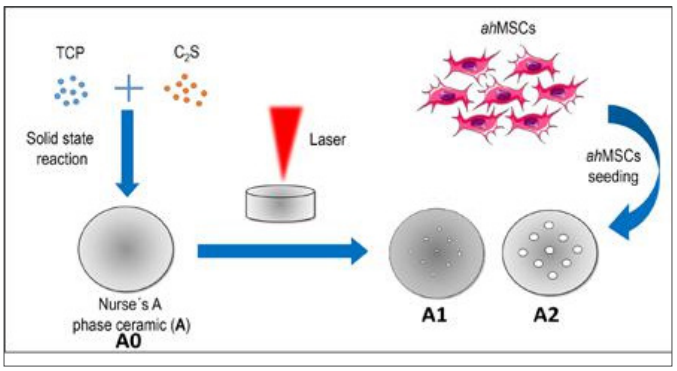

Figure: Synthesis of porous Nurse´s A phase and ahMSCs seeding

Biography

Ruben Rabadan (PhD) is a post-doctoral researcher who has his expertise in Tissue Repair, and passion in improving the health by the study of Organ and Tisse Regeneration. In his short career, he has focused in bone, ligament and cartilage regeneration, and he has helped to develop scaffolds based on the C2S-TCP phase diagram and combinating bioceramics with fibroin, specially testing their biocompatibility and osteointegration by *in vitro* and *in vivo* studies.

rubenrabadanros@gmail.com

Notes: