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YUCOMAT 2022
&
TWELFTH WORLD ROUND TABLE CONFERENCE
ON SINTERING
XII WRTCS**

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**Program
and
the Book of Abstracts**

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&
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Poster Presentations

W.P.S.F.1.

Biodegradable coatings improved mechanical properties and bioactivity of sintered calcium phosphate scaffolds

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Macro-porous bioactive and biocompatible ceramic materials were intensively developed in last decades in order to enable controlled environment and volume for new bone tissue formation in bioreactors or in vivo. Calcium phosphate nanoparticles doped with different ions, due to the chemical and morphological similarity with human hard tissue minerals, are good basis for scaffold processing. The aim of this study was the optimization of parameters for the processing of bioceramic scaffold based on calcium phosphates simultaneously doped with different cations and anions and further improvement of their mechanical properties and bioactivity by forming of different coatings based on gelatin or chitosan and bioactive nanostructured ceramic fillers. Meso-porous hydroxyapatite nanoparticles doped with magnesium and strontium in combination with different ions with potential antimicrobial activity were synthesized hydrothermally and used as main inorganic phase for scaffold forming by sponge replica method. Different combinations of dopants affected the stabilization of different ratios of bioactive α - and β -tricalcium phosphate phases during the sintering. Soft biodegradable coatings showed great potential for neutralizing the consequences of imperfect sintering and simultaneous improvements of the mechanical properties and bioactivity of biocompatible macro-porous scaffolds with residual antimicrobial potential.