

THIRTEENTH ANNUAL CONFERENCE

YUCOMAT 2011

Hunguest Hotel Sun Resort Herceg Novi, Montenegro,
September 5-9, 2011
<http://www.mrs-serbia.org.rs>

Programme and The Book of Abstracts

Organised by:
Materials Research Society of Serbia

under the auspices of
Federation of European Material Societies
and
Materials Research Society

Title: THE THIRTEENTH ANNUAL CONFERENCE
YUCOMAT 2011
Programme and The Book of Abstracts

Publisher: Materials Research Society of Serbia
Knez Mihailova 35/IV, 11000 Belgrade, Serbia
Phone: +381 11 2185-437; Fax: + 381 11 2185-263
<http://www.mrs-serbia.org.rs>

Editor: Prof. Dr. Dragan P. Uskoković

Technical editor: Aleksandra Stojičić

Cover page: Aleksandra Stojičić and Milica Ševkušić

Copyright © 2011 Materials Research Society of Serbia

Acknowledgment:



Printed in: Biro Konto
Sutorina bb, Igalo – Herceg Novi, Montenegro
Phones: +382-31-670123, 670025, E-mail: bkonto@t-com.me
Circulation: 250 copies. The end of printing: August 2011

O.S.E.3.

**MULTIFUNCTIONAL NANO PARTICULATE SYSTEMS BASED ON
HYDROXYAPATITE AS SYSTEMS FOR LOCAL DELIVERY OF VITAMIN D3**

N. Ignjatović¹, Z. Ajduković², S. Drmanić³, D. Uskoković¹

¹*Institute of Technical Sciences of the SASA, Belgrade, Serbia,*

²*Faculty of Medicine, Clinic of Stomatology, Department of Prosthodontics, Niš, Serbia,*

³*Faculty of Technology and Metallurgy, University of Belgrade, Belgrade, Serbia*

Multifunctional drug delivery system based on hydroxyapatite may be a research challenge in the treatment and reconstruction of bone tissue. Vitamin D3 has a positive effect on osteogenesis as it increases osteoblast differentiation and mineralization of bone tissue.

The purpose of the study presented in this paper has been to examine the possibility of the synthesis of a new multifunctional nanoparticulate system for local delivery of vitamin D3 suitable for applications in bone engineering. The synthesis, characterization and application of three nano particle systems was shown: hydroxyapatite, hydroxyapatite/vitamin D3 and hydroxyapatite/PLGA/vitamin D3.

The obtained vitamin D3-loaded nanoparticles based on hydroxyapatite. Characterization was performed with wide-angle X-ray structural analysis (XRD), infrared spectroscopy (FT-IR), field-emission scanning electron microscopy (FESEM), zeta potential (ZP) and particle sized distribution (PSD) methods. Basic *in vitro* studies were performed implantation of materials in rats. XRD and FT-IR analyses confirmed that the vitamin D3 is loaded hydroxyapatite and PLGA. Different values of zeta potential may refer to different phenomenological processes during *in vivo* studies.