

MATERIALS RESEARCH SOCIETY OF SERBIA  
INSTITUTE OF TECHNICAL SCIENCES OF SASA

*Programme and the Book of Abstracts*

**SEVENTEENTH YOUNG RESEARCHERS' CONFERENCE  
MATERIALS SCIENCE AND ENGINEERING**

Belgrade, December 5–7, 2018

Materials Research Society of Serbia

<http://www.mrs-serbia.org.rs/index.php/young-researchers-conference>

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**Materials Research Society of Serbia  
&  
Institute of Technical Sciences of SASA**

**November 2018, Belgrade, Serbia**

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## **Aim of the Conference**

Main aim of the conference is to enable young researchers (post-graduate, master or doctoral student, or a PhD holder younger than 35) working in the field of materials science and engineering, to meet their colleagues and exchange experiences about their research.

## **Topics**

Biomaterials  
Environmental science  
Materials for high-technology applications  
Nanostructured materials  
New synthesis and processing methods  
Theoretical modelling of materials

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### Results of the Conference

Beside printed «Program and the Book of Abstracts», which is disseminated to all conference participants, selected and awarded peer-reviewed papers will be published in journal “Tehnika – Novi Materijali”. The best presented papers, suggested by Session Chairpersons and selected by Awards Committee, will be proclaimed at the Closing Ceremony. Part of the award is free-of-charge conference fee at YUCOMAT 2019.

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LABORATORY EQUIPMENT

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организација  
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10-5

***In vitro* testing of genotoxic and apoptotic potential  
of two synthesized nanomaterials by DNA fragmentation assay**

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Nanomaterials represent a relatively new and developing class of materials that are widely used because of their unique mechanical and physiochemical properties. Due to the particles' size and the ability to easily enter the cells and interact with different cellular components, nanoparticles can exhibit toxic effects in biological systems, so it is necessary to conduct a thorough *in vitro* biocompatibility testing. Our aim was to examine the *in vitro* genotoxic and apoptotic potential of two different synthesized nanomaterials intended for bone tissue engineering and regenerative applications: biphasic calcium phosphate coated with poly-D,L-lactide-co-glycolide (CP/PLGA) and cobalt-substituted hydroxyapatite (CoHAp), by DNA fragmentation assay. NB4 cells (acute promyelocytic leukemia cell line) were incubated with different concentrations of CP/PLGA and CoHAp nanomaterials for 24 hours. Cells cultured in standard medium, without nanomaterials, were used as negative control and cells treated with hydrogen peroxide were used as positive control. After incubation with materials the genomic DNA was extracted from the cells and applied on horizontal agarose gel electrophoresis. The results of DNA fragmentation assay were observed on gel documentation system. Higher examined concentrations of CP/PLGA caused DNA fragmentation at some extent with DNA laddering at approximately 180 bp which is characteristic for later stages of apoptosis, while DNA laddering was not seen in the case of CoHAp at the same concentrations. Although both materials are in the form of nanoparticles, a different effect in apoptotic DNA fragmentation was observed which suggests that the chemical composition of nanomaterials notably affects the genotoxicity and apoptosis potential in addition to the particle size.

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