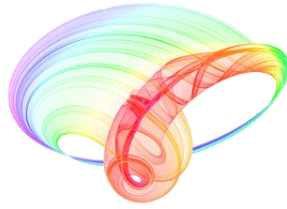


# Book of abstracts



## PHOTONICA2017

The Sixth International School and Conference on Photonics

& COST actions: MP1406 and MP1402



&H2020-MSCA-RISE-2015 CARDIALLY workshop



28 August – 1 September 2017

Belgrade, Serbia

*Editors*

Marina Lekić and Aleksandar Krmpot

Institute of Physics Belgrade, Serbia

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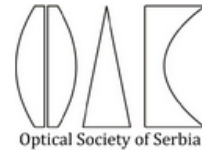
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## One-step synthesis of NIR-responsive NaYF<sub>4</sub>:Yb,Er@Chitosane nanoparticles for biomedical application

I. Dinic<sup>1</sup>, A. Djukic-Vukovic<sup>2</sup>, L. Mojovic<sup>2</sup>, M.G. Nikolic<sup>3</sup>, M.D. Rabasovic<sup>3</sup>,  
A.J. Krmpot<sup>3</sup>, O. Milosevic<sup>1</sup> and L. Mancic<sup>1</sup>

<sup>1</sup>*Institute of Technical Sciences of SASA, Belgrade, Serbia*

<sup>2</sup>*Department of Biochemical Engineering and Biotechnology*

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

<sup>3</sup>*Photonic Center, Institute of Physics Belgrade, University of Belgrade, Zemun, Belgrade, Serbia*

e-mail: lidija.mancic@itn.sanu.ac.rs

There is a great technological interest in synthesis of lanthanide doped upconverting nanoparticles with specific morphological characteristics and efficient luminescence response suitable for biomedical use [1]. A conventional approach for generation of such particles comprises decomposition of organometallic compounds in an oxygen-free environment and additional ligand exchange [2,3]. The biocompatible and water soluble NaYF<sub>4</sub>:Yb,Er@Chitosane particles used in this study were synthesized through facile one-pot hydrothermal synthesis and were characterized using X-ray powder diffraction (XRPD), Fourier-transform infrared (FTIR) spectroscopy, field emission scanning and transmission electron microscopy (FESEM and TEM) and photoluminescence measurement (PL). Due to the presence of the amino groups at their surface these particles exhibit excellent hydrophilic properties and low cytotoxicity against human gingival fibroblasts (HGF), which was proven by MTT assay. Furthermore, upon 980 nm laser irradiation the as-prepared particles were successfully used for *in-vitro* visualization of the primary cell cultures of head and neck squamous carcinoma cells (HNSCC). In a NaYF<sub>4</sub>:Yb,Er phase upconversion is enabled by the sequential absorption of two or more near-infrared photons by Yb<sup>3+</sup> and subsequent energy transfer to the long-lived metastable electron states of Er<sup>3+</sup> which produces luminescence emission at visible spectra after relaxation.

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