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## Hybrid nanostructures of inorganic particles and biomolecules: Fabrication, antimicrobial activity and application in deep-UV imaging of live cells

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Hybrid nanostructures that comprise inorganic nanoparticles (noble metals, semiconductors) and biomolecules received a considerable attention in last decades due to a number of interesting fundamental properties as well as a wide range of possible applications. Here, we present the results on two types of hybrid structures: noble metal (Ag, Au) nanoparticles functionalized with small biological molecules (tryptophan, riboflavin) and ZnO biomacromolecule (cellulose, alginate) hybrids. The obtained materials were studied in detail by microscopic (TEM, SEM) and optical (PL and UV vis) techniques. The antimicrobial activity of the ZnO-, Ag- and ZnO/Ag-biomolecule hybrids was tested against the *Staphylococcus aureus*, *Escherichia coli* and *Candida albicans* pathogens. Silver nanoparticles functionalized with amino acid tryptophan and gold nanoparticles bi-functionalized with tryptophan and riboflavin were tested as fluorescent probes for deep-UV (DUV) imaging of microbial and cancer cells. DUV imaging was performed on DISCO beam line of synchrotron SOEIL, France. ZnO-biomacromolecule hybrids exhibit other interesting properties such as ability to immobilize antibodies, catalytic activity and a strong CO<sub>2</sub> absorption, which will also be presented.

### Biography

Vladimir Djoković has completed his PhD in Physics at University of Belgrade, Faculty of Physics in 1999. He spent two year as a Postdoctoral fellow at University of the Free State, South Africa. In last couple of years, he was a Visiting Professor/Researcher at NASA-University Research Center, North Carolina Central University. He has published two book chapters and more than 60 papers in ISI journals. He is a leader of polymer nanocomposite group at Vinča Institute from 2005 and a Professor of Polymer Physics at Faculty of Physics, University of Belgrade.

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