



INSTITUT ZA FIZIKU

ZAJEDNIČKI SEMINAR IF i HBD

26. listopada 2015. (ponedjeljak) u 15:00 sati (točno)

Institut za fiziku, Bijenička cesta 46, Predavaonica III krilo

Mislav Mustapić

Drug delivery system

Design and construction of a complete drug delivery system, from a drug nano-carrier to an efficient system for drug activation in a localised volume of the human body requires a multidisciplinary approach and substantial investment. Selection of proper drug-carriers from various candidates such as liposomes, nanoparticles, nanoporous materials, polymer-drug conjugates, protein (albumin) nanoparticles, polymeric micelles, is the first part of this effort. Liposomal drug delivery systems (LDDSs) are promising tools used for the treatment of diseases where highly toxic pharmacological agents are administered.

LDDSs provide a widely applicable method of drug encapsulation and delivery. In their basic form liposomes consist of naturally occurring biocompatible phospholipid vesicles (Suntres et al. 2011) that act as physical barriers to protect the drug cargo from degradative enzymes.

Furthermore, nanoporous Fe_3O_4 structures can be used as a vehicle for the transport of drugs adsorbed onto their nanoporous surface. This material enables controlled release of the chemical payload via activation by a magnetic field. DC fields alone cause particle alignment, but no release. AC fields induced modest release. However, the greatest release occurred in the presence of a combined AC and DC field.

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Mislav Mustapić studied physics and chemistry at University of Zagreb where he graduated in 2008. Immediately after graduation he started to work on UKF project with Prof. Emil Babić on preparation of magnetic nanoparticles for enhancement of electromagnetic properties of MgB_2 superconductor.

2010 he moved to Australia, University of Wollongong, where. Mislav received his Ph.D. from University of Wollongong in 2013. Until recently he was a post-doc fellow at Victor Chang Cardiac Research Institute, where he worked with Prof. Boris Martinac on the development of new ways of drug delivery.

<https://www.youtube.com/watch?v=gsBEL-KzpM8>