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VABILO NA PREGLOV KOLOKVIJ / INVITATION TO THE PREGLO COLLOQUIUM

Prof. dr. Joseph Wang

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Petek / Friday, 20. 09. 2013, ob / at 12:30

Velika predavalnica / Lecture Hall at the National Institute of Chemistry; Hajdrihova 19, Ljubljana

Catalytic Nanomachines: Design and Biomedical Applications

Abstract:

The remarkable performance of biomotors is inspiring scientists to create synthetic nanomachines that mimic the function of these amazing natural systems. This presentation will discuss the challenges and opportunities facing the design and operation of artificial nanomotors and demonstrate their prospects for diverse biomedical applications. Particular attention will be given to catalytic nanowire and microtube motors propelled by the catalytic decomposition of a chemical fuel, as well as to fuel-free (magnetically or electrically-driven) nanomotors. While artificial nanomotors still pale compared to nature biomotors, recent advances indicate significant improvements in the velocity, power, motion control, cargo-towing force, scope and versatility of such catalytic nanomotors. The greatly improved capabilities of chemically-powered artificial nanomotors could pave the way to exciting and important applications ranging from drug delivery to nanosurgery, and to sophisticated nanoscale devices performing complex tasks.

References:

1. J. Wang, "Nanomachines: Fundamentals and Applications", Wiley-VCH, Weinheim, 2013.
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3. "Can Man-Made Nanomachines Compete with Nature Biomotors?" J. Wang, *ACS Nano*, 3(2009)4.
4. "Motion-based DNA Detection using Catalytic Nanomotors", J. Wu, S. Campuzano and J. Wang, *Nature Communications*, 1(2010); issue 4, pp 1-6.
5. "Highly Efficient Catalytic Microengines: Template Electrosynthesis of Bilayer Polyaniline-Platinum Conical Microtubes", W. Gao, and J. Wang, *J. Am. Chem. Soc.*, 133(2011)1182.

Joseph Wang is Professor in Department of Nanoengineering at University of California, San Diego (UCSD). He received Ph.D. from the Technion in 1978. He held Regents Professorship and a Manasse Chair positions at NMSU, and served as the director of Center for Bioelectronics and Biosensors of Arizona State University (ASU). Prof. Wang has published more than 900 papers, 10 books and he holds 12 patents (**H Index=101**). He received 2 ACS National Awards in 1999 and 2006 and 4 Honorary Professors from Spain, Argentina and China, and a Honorary Member of the **Slovenia National Institute of Chemistry** (2007). He became the most cited electrochemist in the world and received the 4th place in the ISI's list of 'Most Cited Researchers in Chemistry' in 1996-2006. Prof. Wang is the Editor-in-Chief of *Electroanalysis* (Wiley). His scientific interests are concentrated in the areas of nanomachines, bioelectronics, biosensors, bionanotechnology and electroanalytical chemistry.

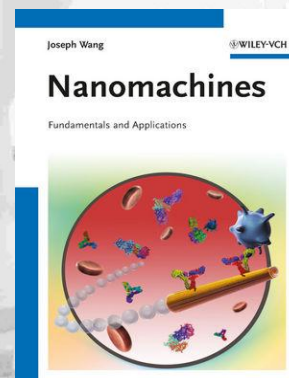


Figure 2. Capture of cancer cells (Ref. 1).

Vljudno vabljeni! / Kindly invited!

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