ADVANCED MATERIALS AND NANOTECHNOLOGY

SEMINAR SERIES 2019

CEITEC - BRNO UNIVERSITY OF TECHNOLOGY
LARGE MEETING ROOM

Prof. Samuel Sanchez

Institute for Bioengineering of Catalonia, the Barcelona Institute for Science and Technology and Catalan Institute for Research and Advanced Studies, Spain.

Nanorobots as novel theranostic tools: smart drug delivery and imaging

October, 15

Tuesday, 11:00

Seminar room **S2.02**

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Purkynova 123

Invited by:

Martin Pumera, Ph.D.

The combination of biological components and artificial ones emerges into what we called hybrid machines/bots. Alike bacteria or small swimmers found in nature, artificial nanobots convert bio-available fuels to generate propulsion force to swim at the nanoscale. One of the dreams in nanotechnology is to engineer small vehicles which can eventually be applied in vivo for medical purposes. Major advances have been demonstrated towards that end, however, questions like -how to swim at the nanoscale, how to achieve motion control and how to image these nanobots- need to be properly addressed.
Here, I will present our recent developments in the field of nanomotors that can autonomously swim and perform complex tasks in vitro. Our hybrid "bots" combine the best from the two worlds: biology (enzymes) and (nano)technology (nano- micro-particles) providing swimming capabilities, remote control, multifunctionality and actuation. I will present some of the proof-of-concept applications such as the efficient transport and the enhanced release of drugs into cancer cells and spheroids, sensing capabilities and the use of molecular imaging techniques for their tracking and localization. We will present our first preliminary results of enzyme nanomotors in vivo imaged by PET-CT.

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