



Dr. Luca Boselli

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CV

Dr. Luca Boselli obtained his M.Sc. in Photochemistry and Material Chemistry in 2011 from the University of Bologna. In 2014, he obtained his PhD in organometallic chemistry at the Laboratoire de Chimie de Coordination (LCC-CNRS) in Toulouse. From 2015 to 2019, he joined the Centre for BioNano Interactions (CBNI) – University College Dublin, as a Postdoctoral Fellow. During this period, he worked on the synthesis of nanoparticles (with different compositions, sizes, shapes, and surface chemistry), biomimetic systems, and the investigation of their behavior in the biological environment (i.e., understanding the bionano-interface and how it might influence/direct biological outcomes as targeting, toxicity, cell uptake, biodistribution, immune response).

He is currently a Researcher at the Italian Institute of Technology (NanoBD Lab), where his main scientific activities concern the development of innovative biomimetic nanosystems with plasmonic and enzyme-like properties (nanozymes) for therapeutic and diagnostic applications.

Martedì 16 gennaio 2024

DCCI aula 3 (only in presence)

ore 14.30

Seminar

Nanoparticles interactions with the biological machinery: what nano do to bio and vice-versa

Abstract

Nanoparticles (NPs), with their extraordinary physical-chemical and biological properties, hold a grand promise for a medical revolution in diagnostics and therapeutics. Nevertheless, Nanomedicine development is substantially hampered by some fundamental critical issues concerning the control over the nanomaterial features and their biological identity, which are still often overlooked and challenging to overcome. Thus, several steps are needed to meet regulatory agency requirements and improve the in vitro-to-in vivo translation, which is currently falling short. It is now clear that to make those steps concrete, in addition to how NPs can affect biology, it is necessary to analyze how the biological environment and machinery transform the NPs. When nanomaterials get in contact with biological fluids (i.e., blood, plasma, serum, saliva, urine), the biomolecules in the media immediately start interacting with them, adsorbing onto their surface and coating previously prepared functionalities, thus providing a new biological identity (and new surface chemistry). This coating, called biomolecular corona, defines the NP interactions and their final biological fate.

This seminar will introduce some promising strategies aiming to avoid or exploit bio-coatings, highlighting the important role of physical, chemical, and biological surfaces of different nanomaterials employed in a plethora of different contexts (including colorimetric diagnostic kits, antioxidant therapies, and adjuvant properties of potential nano-vaccines). Here, the potential of ultrasmall NPs, nanoshapes, nanozymes, and innovative biomimetic approaches will be discussed.