

## Abstract

In recent years, artificial nano/micro-systems inspired by biological processes have emerged as powerful tools for the design of functional nanomaterials and cell-mimicking platforms. In this talk, I will present examples of how enzymes can be leveraged as catalytic engines and dynamic control elements within artificial structures to create functional systems — based on the combination of enzymes, mesoporous silica nanoparticles, lipid vesicles, and responsive molecular structures. Ultimately, we seek to endow these systems with abilities that emulate biological functions such as environmental responsiveness, autonomous motion and communication; with potential applications in controlled drug delivery, sensing and artificial cell research.

## Biosketch

Antoni Llopis-Lorente is a "Ramón y Cajal" Researcher at the Polytechnic University of Valencia (Spain), in the Institute of Molecular Recognition and Technological Development. He graduated in Chemistry from the University of Valencia, and obtained his PhD in Nanotechnology in 2019 at the Polytechnic University of Valencia (UPV), under the supervision of Prof. Martínez-Máñez. From 2019 to 2022, he was a postdoctoral fellow at Eindhoven University of Technology (the Netherlands) in the group of Prof. van Hest. His research focuses on the development of smart nanodevices and artificial cells for sensing, controlled cargo release and chemical communication. He is co-author of 42 publications in journals such as Nano Letters, ACS Nano, Angewandte, JACS and Chemical Science.