



## Magnetic Theranostics: From Conceptual Design to Preclinical Application

**Dr. Manuel Bañobre López**



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### Abstract

In the last years, starting from a fundamental understanding of nanomaterials' physico-chemical properties and disease and physiological pathways, the group has applied cross-disciplinary research focused on the development of effective nanostructure-based formulations for precise and accurate disease diagnosis/monitoring, therapy and, ultimately, theranostics. In general, our research makes use of magnetic nanomaterials as building blocks to form magnetic theranostic systems, where the magnetic component allows the integration of both imaging and therapy performances, thus enabling medical technologies such as magnetic resonance imaging, magnetic hyperthermia and magnetically assisted-drug delivery. Current effort in our group is paid on stimuli-responsive programmed specific targeting for controlled drug delivery and activatable theranostics in cancer nanomedicine. In this talk, I will provide an overview of our activities, with a few examples of recent developments in this area, covering from fundamental aspects involved in the rational design of theranostic agents to the proof-of-concept and preclinical validation in representative applications.

### Biosketch

Dr. Manuel Bañobre-López (MB) heads the Nanomedicine Group at the at the International Iberian Nanotechnology Laboratory – INL at Braga, Portugal. Manuel is a Chemistry graduate holding a Ph.D. degree in Solid State Chemistry from the Physical Chemistry Department at the University of Santiago de Compostela. In 2011 he joined the INL, where he occupied positions as Research Fellow (2011 – 2013), Staff Researcher (2013 - 2017) and Research Group Leader (since 2017). He performed short research visits at the University of Texas at Austin and Imperial College London. His research group interest focuses on the engineering of advanced magnetic nanostructures as medical platforms for precise imaging and therapy applications, with a strong focus on cancer, infection and inflammatory conditions. He has been the PI at the INL of > 20 competitive research projects funded by EU, regional and national bodies, including several industrial collaborations. He published >100 peer-reviewed papers (> 4100 citations, h-index 33, Web of Science) and 3 book chapters in different areas of Materials Chemistry, (Bio)-Nanotechnology and Nanomedicine, granted 2 patents and (co)supervised several MSc, PhD and postdoc students.