

Title: Gated materials for biomedical applications.

Abstract: Progress in bio-molecular chemistry and nanotechnology has recently resulted in the design of biologically inspired systems with innovative bio-related functions. A key issue in this field is the design of new “smart” systems based on nanoscopic structures and a variety of biomolecules which perform unprecedented functions, boosting areas such as bio-engineering, bio-sensing, bio-nanotechnology and drug delivery into new directions. In delivery applications, the development of stimuli-responsive nanoscopic hybrid gated materials involving (bio)molecules as caps and showing the ability to release entrapped guests upon application of an external stimulus has attracted tremendous attention. These devices contain a support that constitutes a reservoir in which certain compounds can be stored and molecules or molecularly appended objects attached on these containers that act as “gates”, allowing the controlled release of entrapped molecules at will. Both components have been carefully selected and arranged to achieve a wide range of control functions. Capped materials have been mainly used in drug delivery but also other biomedical applications. Based on this, selected examples for different applications will be shown.

Curriculum: **Prof. Ramón Martínez-Mañez** is full Professor of Inorganic Chemistry at the Department of Chemistry at the Polytechnic University of Valencia (UPV) and belongs to the Interuniversity Research Institute for Molecular Recognition and Technological Development (IDM) in Valencia. He is also Scientific Director of the Biomedical Research Center Network in Bioengineering, Biomaterials and nanomedicine (CIBER BBN). He also belongs to the “Joint Research Unit in Nanomedicine and Sensors” in the Hospital La Fe in Valencia and the “Joint Research Unit in Disease Mechanisms and Nanomedicine” in the Centro de Investigación Príncipe Felipe. He is an active researcher in the field of sensing and hybrid organic-inorganic nanostructured gated materials in nanomedicine for delivery applications. His publications (more than 510) have been cited over 23000 times and has an h index of 73 (web of Science; h index of 78 and 28000 times cited in Google Scholar). He has participated in over 100 research projects as coordinator. He has co-authored a scientific reference book published by Wiley in 2010 and is also co-author of 17 book chapters. Has participated in over 170 research conferences. He holds 52 PhD thesis supervised (11 obtained the Polytechnic University of Valencia Ph.D. Award). He is coordinator of the Interuniversity PhD Program in Chemistry at the UPV, which obtained the prize of the Social Council of the UPV to the best doctoral program of the 2017/2018 academic year. He has been visiting researcher at the University of Cambridge, UK. He has been Co-Chairman of the journal ChemistryOpen and member of the International Advisory Board of the journals Chem. Asian. J., ChemPlusChem and Dyes&Pigments. He has participated in 42 projects in collaboration with national and international companies. He holds 29 patents, 17 of them international. Four of these patents have been transferred to companies. He is co-founder of the spin-offs Senolytic Therapeutics SL (Barcelona and Boston) and Match Biosystems. He received the Research Excellence Award 2016 from Real Sociedad Española de Química and the Rey Jaime I Price of New Technologies in 2018.