

Conferencia: Multifunctional nanoparticles for targeted delivery of immunomodulatory molecules

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Juan Mareque-Rivas
College of Science – Swansea
University

18/07/17

Aula de Seminarios
do CIQUS

12:15 h

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XUNTA DE GALICIA
CONSELLERÍA DE CULTURA, EDUCACIÓN
E ORDENACIÓN UNIVERSITARIA



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Jan 2011-present Ikerbasque Research Professor and group leader of the Theranostic Nanomedicine Laboratory, CIC biomaGUNE, San Sebastian, (+34) 943 005313; Email: jmareque@cicbiomagune.es

Sept 2015-Aug 2016 Reader in chemical engineering, School of Engineering, University of Aberdeen

March 2000-Jan 2011 Lecturer, Senior Lecturer School of Chemistry, University of Edinburgh

Oct. 1998-Sept. 2000 Postdoctoral Associate, Department of Chemistry, MIT

Sept. 1995-Sept. 1998 – Ph.D. in Supramolecular Chemistry, University of Missouri- St. Louis (Mallinckrodt Award and Best UMSL PhD Student Award); **Sept 1990-June 1995** – Licenciatura in Chemistry, Universidad de Santiago de Compostela and BSc Hons in Pure and Applied Chemistry, University of Strathclyde.

Research interests summary: My research is focused on how to design, synthesise, characterise, assemble, fabricate, operate and develop functional molecular systems (drug delivery vehicles, sensors, motors, actuators, and other molecule-based devices and machines) for different applications. I have an interest in integrating chemical, biological and electronic functions; on how to mix molecular building blocks on a single platform; how to retain/enhance function in moving from solution to a surface and from bulk to the nanoscale; surface functionalization of nano- and microparticles and for devices; understanding and resolving the interference between building blocks; molecules, materials and systems that display stimuli-responsiveness. My lab seeks the development and screening of novel types of organised nano/microscale architectures that are spontaneously self-assembled from multiple components and which when combined together exert special (therapeutic, diagnostic, molecular recognition, sensing or catalytic) functions. An important current focus in the lab is the design, development and study of molecules and nanoparticle constructs for immunomodulation and cancer immunotherapy.

Current projects:

- HORIZON 2020. (M-ERA.NET). MediSURF. Designed nanostructured bioactive surfaces for precision medicines €570.000 (Co-I and PI for CIC biomaGUNE).
- HORIZON 2020 (H2020-MSCA-ITN-2015), PET3D. PET imaging in drug design and development. € 3.917.495,16 (Co-I and PI for CIC biomaGUNE; 495.745,92 €).
- MINECO-Spain. CTQ2014-54761-R. Development of chemoimmunotherapeutic nanomaterials against metastatic cancer (PI). 177,870 € + FPI PhD studentship.
- HORIZON 2020 (H2020-MSCA-ITN-2014), TOLLerant. Toll-Like Receptor 4 activation and function in diseases: an integrated chemical-biology approach. 3,122,540€ (Co-I and PI at CIC biomaGUNE). (247,873€ for CIC biomaGUNE).
- Diputación de Gipuzkoa, Research Grant, Q+INMUNO T+D "Evaluación Teragnostica por Imagen Nuclear de Nanoplateformas para Quimio e Inmunoterapia". (PI). 77,000 €.
- Basque Government. Equipment Grant. Application of ICP-MS for detection and quantitation of nanomaterials in vitro and in vivo. (Co-PI), € 78,290.
- Basque Government. MV_201A4S_10_C3I9. Nanoparticles decorated with shark VNAR "nanobodies" for diagnostic and therapy applications. (PI) 9,973 €. Collaborative grant with Elasmogen Ltd and Scottish Biologics Facility at University of Aberdeen.

Selected relevant publications:

- "Microdosed Lipid-Coated ⁶⁷Ga-Magnetite Enhances Antigen-Specific Immunity by Image Tracked Delivery of Antigen and CpG to Lymph Nodes" A. Ruiz-de-Angulo, A. Zabaleta, V. Gomez-Vallejo, J. Llop, J. C. Mareque-Rivas, *ACS Nano*, **2016**, 10 (1), 1602–1618.
- "An Iron Oxide Nanocarrier Loaded with a Pt(IV) Prodrug and Immunostimulatory dsRNA for Combining Complementary Cancer Cell Killing" J. Hernández-Gil, M. Cobaleda-Siles, A. Zabaleta Azpiroz, V. Gómez Vallejo, B. Szczupak, J. Llop, L. Salassa, J. Calvo, M. Jimenez and J. C. Mareque-Rivas, *Adv. Healthcare Mater.* **2015**, 4, 1034-1042. (Journal Internal Cover).
- "Near Infrared Activation of an Anticancer Pt^{IV} Complex by Tm-Doped Upconverting Nanoparticles" E. Ruggiero, J. Hernández-Gil, J. C. Mareque-Rivas, L. Salassa, *Chem. Commun.*, **2015**, 51, 2091-2094.
- "An Iron Oxide Nanocarrier for dsRNA to Target Lymph Nodes and Strongly Activate Cells of the Immune System" M. Cobaleda-Siles, M. Henriksen-Lacey, A. Ruiz de Angulo, A. Bernecker, V. Gómez Vallejo, B. Szczupak, J. Llop, G. Pastor, S. Plaza-Garcia, M. Jauregui-Osoro, L. K. Meszaros, and J. C. Mareque-Rivas, *Small*, **2014**, 10(24), 5054-67. (Frontispiece)
- "Nano-functionalization of metal complexes for molecular imaging and anticancer therapy" C. R. Maldonado, L. Salassa, N. Gomez-Blanco, and J. C. Mareque-Rivas, *Coord. Chem. Rev.*, **2013**, 257, 2668–2688.
- "QD-filled micelles which combine SPECT and optical imaging with light-induced activation of a platinum(IV) prodrug for anticancer applications" C. R. Maldonado, N. Gómez-Blanco, M. Jauregui-Osoro, V. G. Brunton, L. Yate, and J. C. Mareque-Rivas, *Chem. Commun.*, **2013**, 49, 3985–7