

# **LIPID-BASED NANOSIZED DRUG DELIVERY SYSTEMS**

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## **PROFILE**

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Phospholipid aggregates are in common use as universal drug delivery carriers. Modulation of their physicochemical properties enables the design of particular systems with desired properties.

Currently we are working on the preparation and characterization of mixed systems constituted by phospholipids and molybdenum carbonylic metallosurfactants, a particular molecule which exhibits CO releasing properties. In recent years it has been corroborated that, at certain levels, local delivery of CO exhibits therapeutic effects, for example, as anti-inflammatory, in cardiovascular diseases and also in organ transplantation.

## **RESEARCH**

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### **RESEARCH INTERESTS**

Liposomes, metallosomes, metallosurfactants, drug delivery systems, carbon monoxide releasing molecules.

### **STRATEGIC OBJECTIVES**

Design and characterization of CO bearing molecules/aggregates intended for biomedical applications.

## MAIN RESEARCH LINES

Synthesis and characterization of CO releasing aggregates.

Pt-metallosomes as anticancer drug delivery systems.

Use of fluorescent dyes as cation sensors into vesicular systems.

## LAB FEATURED PUBLICATIONS:

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Direct Synthesis of Rhenium and Technetium-99m Metallosurfactants by a Transmetallation Reaction of Lipophilic Groups: Potential Applications in the Radiolabeling of Liposomes Jordi Borrás, Verónica Mesa, Joan Suades, and Ramon Barnadas-Rodríguez *Langmuir* (2020) 36: 1993-2002

Metallosomes for biomedical applications by mixing molybdenum carbonyl metallosurfactants and phospholipids Marín-García, M.; Benseny-Cases, N.; Camacho, M.; Perrie, Y.; Suades, J.; Barnadas-Rodríguez, R *Dalton Transactions* (2018), 47 (40), 14293-14303

Low-toxicity metallosomes for biomedical applications by self-assembly of organometallic metallosurfactants and phospholipids Marín-García, M.; Benseny-Cases, N.; Camacho, M.; Suades, J.; Barnadas-Rodríguez, R *Chemical Communications* (2017), 53(60), 8455-8458

Supramolecular Arrangement of Molybdenum Carbonyl Metallosurfactants with CO-Releasing Properties Parera, Elisabet; Marín-García, Maribel; Pons, Ramon; Comelles, Francesc; Suades, Joan; Barnadas-Rodríguez, Ramon *Organometallics* (2016), (35) 4, 484-493

Steroidal surfactants: Detection of Premicellar Aggregation, Secondary Aggregation Changes in Micelles, and Hosting of a Highly Charged Negative Substance Barnadas-Rodríguez, Ramon and Cladera, Josep *Langmuir* (2015), 31(33), 8980-8988

Characteristics and behaviour of liposomes when incubated with natural bile salt extract: implications for their use as oral drug delivery systems L.G. Hermida, M. Sabés, R. Barnadas-Rodríguez *Soft Matter* (2014), 10, 6677-6685

Effect and Mechanism of Association of 8-Hydroxy-1,3,6-pyrenetrisulfonic Acid to Chitosan: Physicochemical Properties of the Complex R. Barnadas-Rodríguez *Macromolecular Chemistry and Physics* (2013), 99-106

Photophysical changes of pyranine induced by surfactants: Evidence of premicellar aggregates R. Barnadas-Rodríguez, J. Estelrich *Journal of Physical Chemistry* (2009), B, 113, 1972-1982

Combined strategies for liposome characterization during in vitro digestion L.G. Hermida, M. Sabés-Xamaní, R. Barnadas-Rodríguez *Journal of Liposome Research* (2009), 19(3), 207-219

Factors involved in the production of liposomes with a high-pressure homogenizer R. Barnadas, M. Sabés *International Journal of Pharmaceutics* (2001), 213, 175-186