

## Graphene for Bioapplications: Preparation, Cytotoxicity and Integration in 3D-scaffolds.

Ester Vázquez

*Departamento de Química Orgánica, Facultad de Ciencias y Tecnologías Químicas-IRICA,  
Universidad de Castilla-La Mancha, Ciudad Real, (Spain)*

e-mail: ester.vazquez@uclm.es

Graphene has emerged as a new material, with outstanding mechanical and electronic properties that will permit a broad range of applications, from microelectronics to composite or even medicine. Although there has been a huge effort directed in the area of nanomedicine, biomedical applications of graphene derivatives have, so far, mainly focused on graphene oxide and reduce graphene oxide. The main reason for this fact is the difficult to obtain pristine graphene flakes, directly in water or in culture media, due to the intrinsic hydrophobicity of this material.

Our group have recently described an interesting approach for the preparation of stable dispersions of graphene in water, without detergents or any other additives, driven by an easy and eco-friendly ball milling approach. These aqueous suspensions can be rapidly frozen and, subsequently, lyophilized giving rise to a very soft and low-density black powder. Powders of graphene can be safely stored or shipped and they can be readily dispersed in culture media within the presence or absence of serum and antibiotics.

During this talk, we will discuss (i) optimized ways to generate graphene dispersions in culture media; (ii) studies of interaction of so-prepared solutions with cells. (ii) the use of graphene in polymeric 3D structures for drug delivery purposes and for 3D cell culture media.

