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A bi-functional graphene oxide nanohybrid for photo-stimulated nitric oxide release and photothermia

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Graphene Oxide (GO) is a novel low-cost material, presenting intriguing proprieties. Obtained by oxidation of graphite, Graphene oxide is a hydrophilic and so water-soluble biocompatible compound, making it the perfect candidate in the design of nanocarriers. The presence of hydroxyl, epoxy and carboxyl groups on its surface enables its easy functionalization and high loading capacity (circa 200% in some cases). In addition, it presents photo-thermal activity, which means it is able to convert light absorbed into heat. Photo-Thermal Therapy (PTT) is an emerging discipline envisaged for Cancer and Antibiotic treatments. The photo production of cytotoxic species, known as Photodynamic Therapy (PDT), presents several advantages, such as good spatiotemporal release control, fast reaction rates and the absence of residues after the reaction. Nitric Oxide (NO) is an example of those species, which can have beneficial or deleterious effect, depending on the concentration. This short half live radical presenting reduced distance diffusion in cellular environment does not suffer Multidrug Resistance (MDR). Here resides the interest of combining light-controlled NO release with suitable nanocarriers. Covalent link of a nitro-aniline derivative nitric oxide photo donor to nanoGO results in a bimodal nanoplatform that combine light-controlled NO release with photo-thermal proprieties.

ReferencesI.E B Caruso, S Petralia, S Conoci, S Giuffrida and S Sortino (2007) Photodelivery of Nitric Oxide from Water-Soluble Platinum Nanoparticles. *J. Am. Chem. Soc.*; 129: 480-481.**Biography**

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