



## Radicals on chemically modified graphene oxide: How they can be generated and exploited?



講演者：Dr. Alberto Bianco

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日時：令和4年9月12日（月）15:00-16:30

開催場所：知識科学系講義棟 2F 中講義室

（要予約：定員30名）

### 講演要旨

Graphene oxide (GO) is a promising platform for the treatment of cancer due to its intrinsic properties for drug delivery and photothermal treatment. However, few examples are reported in the literature on its use as photosensitizer. In this work, we investigated the mechanisms of radical generation on different functionalized GO conjugates under near-infrared (NIR) light irradiation. The GO conjugates have been designed to mimic a drug delivery system and to understand how chemical functionalization can influence the generation of radicals. The covalent functionalization relies on Diels-Alder modified molecules covalently grafted onto the surface of GO by epoxide ring opening. Both pristine and functionalized GO were irradiated by a NIR laser, and the production of different reactive oxygen species (ROS) was investigated through fluorimetry and electron paramagnetic resonance. These analytical techniques allowed to describe the type of radicals present on the surface of GO and to evidence a strong ROS photogeneration under NIR irradiation. Cytotoxicity and ROS generation of the different GO conjugates were then evaluated using breast cancer cells. From these experiments, we evidenced a reduced toxicity of the functionalized materials, while NIR irradiation triggered a concentration dependent cell death associated to the heat and ROS generation. Our study provides new indications to understand and cope with the formation of radicals on GO, opening the way to new therapeutic approaches.

### 講演者略歴

Dr. Alberto Bianco received his PhD from the University of Padova. He was visiting scientist at the University of Lausanne, at the University of Tübingen as an Alexander von Humboldt fellow and at the University of Padova. He is currently Research Director at the CNRS in Strasbourg. His research interests focus on the functionalisation of carbon-based nanomaterials for therapeutic, diagnostic and imaging applications, and their impact on health and environment.

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