Genotoxic and mutagenic evaluation of graphene oxide

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Graphene oxide (GO) is a graphene derivative used in many different fields. Compared with other carbon materials, GO could provide advantages for biomedical applications. But any potential use will depend on its safety, and genotoxicity and mutagenicity aspects play a key role in any toxicological evaluation.

Thus, the aim of this work was to explore the genotoxicity of GO by the Micronucleus (MN) test (OECD 487) and the Comet assay. Mutagenicity was evaluated using the Mouse lymphoma assay (MLA, OECD 490). A lymphoma cell line (L5178Y Tk+/-) was used for MN and MLA and the human colorectal adenocarcinoma cell line (Caco-2) for the comet assay. 250 µg/mL GO was used as the highest concentration based on previous cytotoxicity studies. Regarding the MN test, GO did not increase the number of binucleated cells at any concentration assayed. No DNA damage was observed in Caco-2 cells treated with GO after 24h and 48h. For MLA, there was no mutagenic effect after both exposure times at any concentration assayed. We can conclude that GO is neither genotoxic nor mutagenic at the conditions tested, but further toxicological tests are required.

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Recent Publications

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Biography

Ángeles Jos is PhD in Pharmacy at the University of Sevilla. She is Full Professor of Toxicology in the Department of Nutrition and Bromatology, Toxicology and Medicine of this university. Her research focuses on different fields of Toxicology, such as the evaluation of food safety and toxicity of different substances (nanomaterials, food additives, or toxins).

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