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Abstract Title (max 200 char):

Evaluation of the genotoxic and cytotoxic effects of titanium dioxide nanoparticles in human lymphocytes

Abstract text (max 1500 char):

Titanium dioxide nanoparticles (TiO₂-NP) are being increasingly used in cosmetics and pharmaceutical products. In view of its widespread use, there is a strong demand to evaluate their potential adverse effects to man, particularly their genotoxic effects. Although several studies have already addressed this issue, a conclusion about TiO₂-NP safety has not been reached yet. As part of a wider EU Joint Action, this work aims at characterizing the genotoxicity of four TiO₂-NP (anatase, rutile, and rutile/anatase), in human peripheral blood lymphocytes (PBL). The cytokinesis-block micronucleus (CBMN) assay (OECD 487) was used to assess both genotoxicity and cytotoxicity, following exposure to several concentrations of each NP (5-250 µg/mL), during 30h. Preliminary data indicate that the anatase and rutile TiO₂-NP do not display clear dose-response genotoxic or cytotoxic effects in PBL. Non-toxic effects had been previously reported in PBL and other cell lines, e.g., CHO and human lung cells, whereas genotoxicity had been found by others in human lymphoblastoid cells and in bronchial epithelial cells. Whether the present findings contribute to demonstrate that TiO₂-NP are not genotoxic or rather reflect the insensitivity of PBL to the genotoxicity of these NPs is a question that needs to be clarified in future studies. This work was supported by the EU, Grant Agreement 2009 21 01 (NANOGENOTOX), in the framework of the Health Programme.

Presentation Preference

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