

INTESTINAL BARRIER CROSSING OF SiO₂ AND TiO₂ NANOPARTICLES: SET UP OF EXPERIMENTAL CONDITIONS ACCORDING TO NANoREG PROTOCOLS

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Crossing of biological barriers is a crucial aspect for nanomaterials (NMs) distribution within the organism. In NANoREG project capability of NMs to cross different *in vitro* models of epithelial barriers were investigated. Results will be used in the development of both decision tree and regulatory framework/toolbox, two of the main outputs of this project.

We utilized differentiated Caco-2 cells as model of intestinal barrier. Crossing experiments were performed according to the common protocol developed in the project, taking into account NM peculiar characteristics.

Special attention was given to preparation and characterization of NM batch dispersions and NM dispersions in culture media at the beginning and at the end of treatment. Dynamic Light Scattering (DLS) was utilized to characterize NM dispersions.

DLS data of Z-Average and Polydispersity Index (PDI) showed a good reproducibility of batch dispersions of NMs in MilliQ-BSA (0.05%). NM dispersions in culture medium showed PDI and Z-Average values different from the batch dispersions, depending on exposure time and concentration of NMs.

To verify if chemical composition might affect absorption profile, experiments were ran with two silica (NM200, NM203) and two titania (NM100, NM101) nanoparticles.

None of selected NMs is toxic on Caco-2 cells (1-100 µg/ml) and none is able to alter intestinal barrier integrity. NMs crossing through Caco-2 barriers was evaluated by Scanning Electron Microscopy (SEM-EDX) technique, but NMs observation in cell medium is not easy due to the presence of high amount of organic background.

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