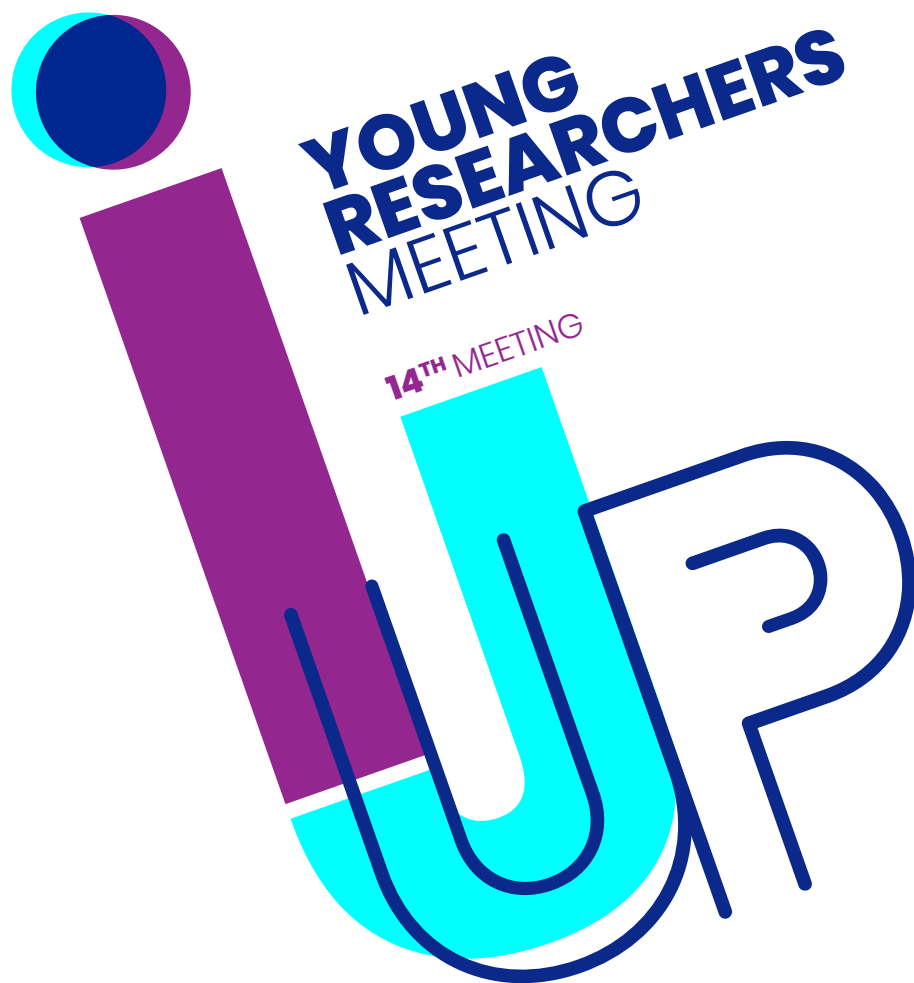




# BOOK OF ABSTRACTS



U. PORTO

## Comparative assessment of the acute toxicity of commonly used metal nanoparticles in two in vitro models of human barriers

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### Abstract

Metal nanoparticles (M-NP) have application in several areas such as industry, environment, agriculture, and biomedicine. Consequently, human exposure to these nanosized materials is increasing, which raises serious concerns regarding their safety to the human health and the environment. Biological barriers are important lines of defence to xenobiotics, thus expected targets for M-NP. The present study investigated the in vitro toxicity of different types of M-NP in two cell models of biological barriers: human intestinal (Caco-2) and trophoblastic (BeWo clone b30) epithelial cells. Cells were exposed for 24 h to varied concentrations (0.8-48  $\mu\text{g}/\text{cm}^2$ ) of M-NP of different chemical composition (Au, Ag, TiO<sub>2</sub>), primary size (10, 30 and 60 nm), capping (citrate, PEG) and crystal structure (rutile, anatase) and toxicity assessed by determining changes in cell morphology, metabolic activity, plasma membrane integrity, generation of intracellular reactive oxygen species (ROS) and intracellular ATP levels. Our data show that the potential toxicity of the tested M-NPs is similar for both cell lines with AgNPs > AuNPs > TiO<sub>2</sub>NPs, being the effects more visible at higher concentrations. The influence of the size in the cytotoxic-induced effects was more evident for AgNP than for AuNP, with the smaller NP causing more toxicity, being the BeWo cells more sensitive to these M-NP. In addition, PEG-capping effectively attenuated AuNP-induced toxicity both in Caco-2 and BeWo cells. Only cells exposed to AgNP exhibited significant increased levels of ROS. Thus, our data support that the physicochemical properties of the nanomaterials, in this particular case of M-NP, is an important determinant of their cytotoxicity and that intestinal and trophoblastic cells exhibit different sensitivity to the tested M-NP. Future studies would be useful to further explore the effects of M-NP in the human barriers.

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