

## MEETING ABSTRACTS

### CHALLENGES IN STUDYING NANOTOXICITY *IN VITRO*

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The broad use of nanomaterials in material science, medicine or industry has implied the request to evaluate their biological effects. *In vitro* cellular models provide a suitable approach to study those effects, but it can be difficult to ensure valid and repeatable experimental conditions for proper setting of biological testing. Indeed, a number of physicochemical parameters (e.g. type of dispersion, aggregation, colloid stability, agglomeration) can influence the obtained results. Thus, the topical goal of our study was to provide a complete view on testing of commonly used nanomaterial, i.e. titanium dioxide nanoparticles, in cultured cells.

We used several advanced methods to characterize the nanomaterials (SEM, XRD, Raman) and to determine their behavior at experimental conditions. Thus, we focused on determining optimal conditions of dispersion (DLS, AFM). To evaluate the biological effects in cultured cells, we used routine biochemical assays (dehydrogenase activity, glutathione levels) and microscopy. We found that the experimental parameters were capable to influence obtained results on cellular effects significantly. In contrast, we were allowed to obtain repeatable and valid results when optimal experimental conditions were guaranteed. Our study provided information on limitations and challenges in testing of nanotoxicity *in vitro*, especially in nanoparticles.

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