



10th International Conference
on Nanotoxicology

**NanoTox 2021 Virtual
Conference
Book of Abstracts
20th to 22nd April 2021**

Conference Organisers



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Quaternary mixtures of TiO₂NP, CeO₂NP, arsenic, and mercury potentiate A549, HepG2 and SH-SY5Y cells cytotoxicity

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Parallel Session 1.3 - Hazard Characterisation & Ranking, April 20, 2021, 12:00 - 13:10

Introduction

Nanoparticles (NP) released to the environment interact with pre-existing contaminants, potentially leading to cytotoxicity and raising concerns regarding human safety to co-exposure to multiple chemicals. This work assesses and compares viability of A549, HepG2 and SH-SY5Y cells after short (24h; WST-1 assay) and long-term (7 days; clonogenic assay) exposure to single and quaternary mixtures of: titanium dioxide nanoparticles (TiO₂NP) 0.75; 75 mg/L; cerium oxide nanoparticles (CeO₂NP) 0.1; 10 µg/L; arsenic (As) 0.01; 0.75; 2.5 mg/L; and mercury (Hg) 0.5; 10; 20 mg/L. Mixtures were divided in four groups: low, mid-low, mid-high and high (Fig.1).

Results

Cytotoxicity of short single exposures increased with dose and was cell line-dependent with increased sensitivity in the order SH-SY5Y>A549>HepG2, while 7-days exposure caused proliferation decrease, even at low concentrations, in all cell lines. HepG2 and A549 were affected by 24h exposure to mid-high and high mixtures, while SH-SY5Y viability was decreased even at low mixture exposure. Prolonged mixture exposure caused a marked inhibition of cell proliferation and the sensitivity rank was inverted to HepG2>SH-SY5Y>A549.

Conclusions

Short and long-term cytotoxicity was dose, time, and cell line dependent. Statistical differences between exposure to single and quaternary mixtures were found in some conditions, emphasizing the importance of mixtures toxicity evaluation.

Summary

