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Abstract

Nanoparticle toxicology is an emergent field that focuses on establishing the hazards of human exposure to nanoparticles and their potential risk. Accurate assessments of nanoparticles risk involve the investigation of multiple factors such as the nanoparticles parameters, the u

adsorption of various molecules on the surface of NPs also an additional toxicity due to a change in the accumulation of heavy metals in the existence of metal oxide NPs [20]. Since then studies have been focused on achieving a well dispersed suspension by the addition of surfactant or additives which could control the NPs agglomeration [21]. A recent study investigated if the interference of NPs is based on the surface characteristic of metallic NPs by studying the effect of different surface coatings of Silver (AgNPs) and maghemite NPs (γ-Fe_2O_3NPs) on classical *in-vitro* assays targeting two of the main cytotoxic points which are cell viability and oxidative stress response [22]. The cell viability assays were MTT, MTS, and WST-8 and assays utilizing fluorescent dyes as markers for the production of reactive oxygen species such as DCFH-DA, DHE and glutathione level. The results concluded that the NPs affected all of the investigated assays giving a false interpretation of the obtained data [22]. The range and the type of interference were dependent on the surface coating of NPs, their stability in biological media, concentration, and particle and assay dependence [22].

In conclusion, we recommend more stringent control for nanotoxicological studies to minimize the potential of NPs interaction with assays. Concentrations ≥ 10 mg/ml have shown to interfere with the assay function and the use of this concentration is not rare in nanotoxicological studies. Thus, NPs concentration should be completely limited, knowing that even with multiple washes and/or centrifugation NPs are able to remain within the cells or attached to membranes. However, multiple centrifugations to remove NPs bounded to the assay components can lead to remove dyes and proteins important in obtaining an accurate reading. Finally, each *in-vitro* test system has to be evaluated for every NPs type to avoid faws and gives an accurate assessment of the safety of NPs toxicity.

Reference

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