

## Cytotoxic Effects of Engineered Nanoparticles in Human Mesenchymal Stem Cells

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**Abstract :** Engineered nanoparticles' usage rapidly increased in various applications in the last decade due to their unusual properties. However, there is an ever increasing concern to understand their toxicological effect in human health. Particularly, metal and metal oxide nanoparticles have been used in various sectors including biomedical, food and agriculture. But their impact on human health is yet to be fully understood. In this present investigation, we assessed the toxic effect of engineered nanoparticles (ENPs) including Ag, MgO and Co<sub>3</sub>O<sub>4</sub> nanoparticles (NPs) on human mesenchymal stem cells (hMSC) adopting cell viability and cellular morphological changes as tools. The results suggested that silver NPs are more toxic than MgO and Co<sub>3</sub>O<sub>4</sub>NPs. The ENPs induced cytotoxicity and nuclear morphological changes in hMSC depending on dose. The cell viability decreases with increase in concentration of ENPs. The cellular morphology studies revealed that ENPs damaged the cells. These preliminary findings have implications for the use of these nanoparticles in food industry with systematic regulations.

**Keywords :** cobalt oxide, human mesenchymal stem cells, MgO, silver

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