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## Genotoxic Effects Of Zinc Oxide Nanoparticles

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*In Vitro Toxicity Assays for Small Molecule Development Everything Matters | Titanium | Ron Hipschman and Dr. Stuart Goodman | Exploratorium* *Dr. David Sinclair on Informational Theory of Aging, Nicotinamide Mononucleotide, Resveratrol* \u0026 More *Mod-01 Lec-01 Lecture-01-Introduction to Biomaterials* **Genotoxic Effects Of Zinc Oxide**

In summary, genotoxic and cytotoxic effects of ZnO-NP to hMSC were demonstrated in long-term and repetitive exposure. A protective effect was seen after one week of MSC differentiation into osteogenic and adipogenic lineages. Observations over a total of six weeks indicate a persisting intracellular accumulation of ZnO-NP and an ongoing toxic effect.

**Time-Dependent Toxic and Genotoxic Effects of Zinc Oxide ...**

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Here we have reported cytogenetic and genotoxic effects of ZnO NPs on the root cells of *A. cepa*. The effects of ZnO NPs on the mitotic index (MI), micronuclei index (MN index), chromosomal aberration index, and lipid peroxidation were determined through the hydroponic culturing of *A. cepa*. *A. cepa* roots were treated with the dispersions of ZnO NPs at four different concentrations (25, 50, 75, and 100 µg ml<sup>-1</sup>).

## **Cytogenetic and genotoxic effects of zinc oxide ...**

Genotoxic effects of Zinc oxide nanoparticles. April 2015; Nanoscale 7(19) DOI: 10.1039/C5NR01167A. ... Zinc oxide (ZnO) quantum dot (QD) is a promising inexpensive inorganic nanomaterials, of ...

## **(PDF) Genotoxic effects of Zinc oxide nanoparticles**

Nanoparticulate zinc oxide (ZnO) may be internalised through ambient air or the topical application of cosmetics, only to name a few, with unpredictable health effects. Therefore, we analysed the determinants of ZnO nanoparticle (NP) genotoxicity.

## **[PDF] Genotoxic effects of zinc oxide nanoparticles ...**

Nanoparticulate zinc oxide (ZnO) may be internalised through ambient air or the topical application of cosmetics, only to name a few, with unpredictable health effects. Therefore, we analysed the determinants of ZnO nanoparticle (NP) genotoxicity.

## **Genotoxic effects of zinc oxide nanoparticles - Nanoscale**

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The adsorption of dissolved zinc ions onto TiO<sub>2</sub>-NPs is discussed as the major antagonistic mechanism. The combination of both metal oxide nanoparticles interferes with the genotoxicity of ZnO-NPs and should be discussed as a

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reasonable and safe alternative to the sole use of ZnO-NPs in consumer products.

## **Genotoxic effects of zinc oxide nanoparticles in nasal ...**

The results of the study indicated cytotoxic effects of ZnO-NP beginning at high concentrations of 50  $\mu$ g/mL and genotoxic effects in hMSC exposed to 1 and 10  $\mu$ g/mL ZnO-NP.

Repetitive exposure enhanced cyto- but not genotoxicity.

Intracellular NP accumulation was observed up to 6 weeks.

The results suggest cytotoxic and genotoxic potential of ZnO-NP.

## **Time-Dependent Toxic and Genotoxic Effects of Zinc Oxide ...**

Here we have reported cytogenetic and genotoxic effects of ZnO NPs on the root cells of *A. cepa*. The effects of ZnO NPs on the mitotic index (MI), micronuclei index (MN index), chromosomal aberration index, and lipid peroxidation were determined through the hydroponic culturing of *A. cepa*. *A. cepa* roots were treated with the dispersions of ZnO NPs at four different concentrations (25, 50, 75, and 100  $\mu$ g ml<sup>-1</sup>).

## **Cytogenetic and genotoxic effects of zinc oxide ...**

Other cellular responses may be induced and give rise to genotoxicity, such as oxidative stress induction, inflammatory response, and aberrant signaling responses (Figure 3).<sup>1,35,97</sup> Moreover, putative mechanisms underlying the detrimental effects of ZnO and silica NPs are proposed (Figure 4). Figure 3.

## **Current investigations into the genotoxicity of zinc oxide**

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To our knowledge, this is the first study evaluating toxic properties of ZnO-NPs in human nasal mucosa cells. Beside

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cyto- and genotoxic effects, a dose-dependent release of pro-inflammatory IL-8 could be demonstrated. Our results suggest that ZnO-NPs are capable to induce DNA damage and inflammation even in low concentrations.

## **Cytotoxic, genotoxic and pro-inflammatory effects of zinc**

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Genotoxic effects of zinc oxide and titanium dioxide nanoparticles on root meristem cells of *Allium cepa* by comet assay E?ref DEM?R, Nuray KAYA\*, Bülent KAYA Department of Biology, Faculty of Sciences, Akdeniz University, Antalya, Turkey \* Correspondence: nkaya@akdeniz.edu.tr 1.

Introduction Industrial applications of nanotechnology are rapidly

## **Genotoxic effects of zinc oxide and titanium dioxide ...**

The overall data suggest that the potential genotoxicity of ZnONP in *Drosophila* can be considered weak according to the lack of mutagenic and recombinogenic effects and the induction of primary DNA damage only at high toxic doses of ZnONP.

## **Genotoxic and oxidative stress potential of nanosized and ...**

In this study, possible genotoxic effects of zinc oxide (ZnO) nanoparticles were investigated in cultured human peripheral lymphocytes by using chromosome aberrations and micronucleus assays (MN). For this purpose, the cells were treated with ZnO (1, 2, 5, 10, 15 and 20 ?g/mL) for 24 and 48 h. In this research, four types of chromosome aberrations were observed as chromatid and chromosome breaks, fragment and dicentric chromosomes.

## **In vitro genotoxic effects of ZnO nanomaterials in human**

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Zinc-Oxide Nanoparticles Exhibit Genotoxic, Clastogenic, Cytotoxic and Actin Depolymerization Effects by Inducing Oxidative Stress Responses in Macrophages and Adult Mice  
Rashmirekha Pati , Rashmirekha Pati

## **Zinc-Oxide Nanoparticles Exhibit Genotoxic, Clastogenic**

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Genotoxic effects of zinc oxide and titanium dioxide nanoparticles on root meristem cells of *Allium cepa* by comet assay E?ref DEM?R, Nurray KAYA\*, Bülent KAYA Department of Biology, Faculty of Sciences, Akdeniz University, Antalya, Turkey \* Correspondence: nkaya@akdenizedutr 1  
Introduction Industrial applications of nanotechnology are rapidly ...

## **[EPUB] Genotoxic Effects Of Zinc Oxide Nanoparticles**

Zinc oxide (ZnO) NPs are being used worldwide in consumer products and industrial applications. Based on predefined pathways, this study synthesized and characterized the nanostructures of ZnO NPs. The genotoxic effects of these nanomaterials were evaluated using a short-term in vivo bioassay, the somatic mutation and recombination test (SMART) in *Drosophila melanogaster* .

## **Genotoxicity of zinc oxide nanoparticles: an in vivo and**

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Bai et al revealed mitochondrial dysfunction leading to an increased ROS generation and consecutive DNA damage and cell death. 53 Another study indicated a stimulation of ROS production via the upregulation of lipxygenases in neuroblastoma cells. 54 It has been suggested that the dissolution of ZnO NPs into Zn<sup>2+</sup> ions and consecutive ROS generation after incorporation may be responsible for the

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genotoxic effects. 50,55 This seems to be all the more likely since zinc serves as a component of ...

## **[Full text] Effects of Zinc Oxide Nanoparticles in HUVEC**

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(2006) Clastogenicity, photo-clastogenicity or pseudo-photo-clastogenicity: genotoxic effects of zinc oxide in the dark, in pre-irradiated or simultaneously irradiated Chinese hamster ovary cells. *Mutation Research/Genetic Toxicology and Environmental Mutagenesis* 607(2): 215 – 224 .

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