

P83. GENOTOXIC EFFECTS OF SILICON DIOXIDE NANOPARTICLES IN *ALLIUM CEPA*

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Silicon dioxide nanoparticles-SiO₂ NPs, are widely used in many nanotechnological products. So the production, usage, and release of these nanoparticles to the environment are increasing every day. It is reported that nanoparticles may have toxic, particularly genotoxic effects. The aim of this study was to investigate the genotoxic potential of SiO₂ NPs by using root cells of *Allium cepa* which is an indicator organism. Roots were treated with 50, 250, 500 and 1000 µg/ml for 24, 48 and 72 h. SiO₂ NPs decreased the mitotic index in *Allium cepa* however, this decrease was significant at 50 and 1000 µg/ml at 24 h, 1000 µg/ml at 48 h, and 50 µg/ml at 72 h treatment, compared to the control. Moreover, SiO₂ NPs increased the frequency of chromosomal abnormalities at all the concentrations and treatment times compared to the control. C-metaphase, sticky chromosomes, disturbed pro-meta-ana-telophase, chromosomal break, asynchron division, multipolarity, lagging and vagrant chromosomes, star anaphase, micronuclei, and loss of genetic material were observed under light microscopy. Transmission electron microscopy analyses showed internalization of NPs inside the cell. On entering the cells, the nanoparticles are transported from one cell to other through plasmadesmata. NPs can reach to the cell wall, cytoplasm, cell nucleus, mitochondria and some other structures like vacuole. These observations are verified by the cytotoxic and clastogenic/genotoxic effect of SiO₂ NPs detected by light microscopy. These findings also suggest that *Allium cepa* can be used for the genotoxicity monitoring of novel nanomaterials that are used in many consumer products.

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