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MEETING ABSTRACTS

ASSESSMENT OF *IN VITRO* NEUROXICITY OF SILVER NANOPARTICLES IN PC12 CELLS

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Despite widespread use of metal nanoparticles (NPs) in diagnostic and therapeutic applications for neurodegenerative disorders, there is a lack of reliable neurotoxicological studies on the exact molecular mechanisms of NPs action on neuronal cells (1). The aim of the present study was to evaluate neurotoxic potential of silver NPs (AgNPs) of different sizes (10, 100 nm) in rat pheochromocytoma cells PC12. The cells were cultured in the presence of AgNPs (0.1–10 µg/ml) for different time periods (3–72 h) depending on the used analysis. Cell viability was assessed by detection of mitochondrial activity based on the MTT reduction and membrane integrity measuring LDH release. Intracellular ROS levels were measured using fluorescent probe DCF-DA. Levels of IL-6 in the culture media were measured by ELISA kit. Differentiation of PC12 cell was induced by recombinant human β-NGF (100 ng/ml), average length of neurites was evaluated based on microscopic images on days 1, 3, 5 of treatment (2). The exposure of PC12 cells to AgNPs induced concentration- and time-dependent inhibition of cell viability and increase of LDH release. The value IC_{50} ranged from 40 to 4 µg/ml depending on NP size and time of exposure. AgNPs (10 µg/ml) elevated ROS levels at all times monitored. Treatment of cells with AgNPs had no effect on IL-6 levels. Inhibition of neurite outgrowth induced by rhNGF in PC12 cells was observed after AgNPs treatment. In-depth evaluation of the neurotoxicity of NPs is crucial for designing safer nanosystems.

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Keywords: nanoparticles; silver; PC12 cells; neurotoxicity; differentiation

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