Cytotoxic effect of lead nanoparticles on mice endothelial cells

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It is known that endothelium performs many functions, playing an important role in the pathogenesis of toxicity of lead compounds nanoparticles.

The aim of the study was to evaluate the cytotoxic effect on mouse endothelial cells (MAEC line) under the action of lead sulfide nanoparticles depending on the size of the NP (nanoparticles).

Materials and methods. *In vitro* toxicity of nanoparticals (NP) lead compounds was estimated. PbS NP of average size 26-34 nm (PbS NP_{26-34}) and 50-80 nm (PbS NP_{50-80}) as well as ionic form (lead nitrate Pb $(NO_3)_2$) in IC50 concentration were studied using a micronucleus test on a model of mouse endothelial cells (MAEC line) using Acridine Orange (Sigma, USA) according to the Hayashi method in 1000 cells on an Axiostar plus microscope with a fluorescent prefix.

Results of the study. The obtained results show that PbS NP_{26-34} and Pb $(NO_3)_2$ in IC50 concentrations, namely 0.04 x 10^{-3} mol and 0.16 x 10^{-3} mol do not have a toxic effect on MAEC cells because the value of the micronucleus test significantly does not differ from this indicator of the control group (5.5 ± 0.7 and 6.0 ± 1.4 *vs* 5.0 ± 0.0). Statistically significant differences were determined only in the samples exposed to PbS NP_{50-80} - twice higher (11.5 ± 0.7) compared to the control. In addition, analysis of endothelium revealed apoptotic changes (vascularization of cellular structures, DNA out of the nucleus), blebing and deformation of the cell nucleus in the presence of PbS NP_{50-80} and PbS NP_{26-34}. The agent Pb $(NO_3)_2$ did not change the morphology of the cells.

Conclusion. Therefore, lead nanoparticles have a cytotoxic effect on MAEC cells and Pb $(NO_3)_2$ has an antiproliferative effect.

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Morphology of the rete ovarii and the development of cysts in the guinea pig (*Cavia porcellus*)