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ON MOLECULAR AND CELL BIOLOGY
WITH INTERNATIONAL PARTICIPATION**

*dedicated to the heroic struggle
of the Ukrainian people against russian invaders*

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CONFERENCE PROCEEDINGS

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GDVO₄:EU³⁺ NANOPARTICLES AFFECT PROLIFERATION OF FIBROBLAST CULTURE *IN VITRO*

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Aim. To investigate the effect of gadolinium orthovanadate doped with europium (GdVO₄:Eu³⁺) nanoparticles on the proliferative activity of fibroblast cell culture.

Methods. Fibroblasts were obtained from 20day-old rat embryos. Cells were cultured in DMEM with 10% fetal serum at 5% CO₂ and 37°C for up to 3 passages. These fibroblasts were transplanted into 12well plates at 100,000 cells per well and left for a day to provide adhesion. Thereafter, GdVO₄:Eu³⁺ nanoparticles at concentrations of 0-30-65-130-260-520 µg/ml were added. Following 72 hours, the cells were harvested with EDTA-trypsin solution. The number of cells was determined using a hemocytometer. The doubling time was calculated. Statistical data processing was conducted by performing the Kruskal-Wallis and Dunn's tests.

Results. Fibroblast cultivation with the studied nanoparticles in small concentrations resulted in an increase in the proliferative activity, evidenced by a decrease in the doubling time of cell population. At concentrations of up to 65 µg/ml, the doubling time increased to a greater extent than that of intact cells, while at the concentration of 130 µg/ml, the number of cells decreased following 72 hours. At concentrations of 260 µg/ml and above, it was technically impossible to count cells due to their small number. The data obtained in this study are consistent with our previous observations on the toxicity of these nanoparticles and provide insights for the application of nanoparticles in low concentrations for wound healing. When comparing the evaluation of proliferative activity with other methods used for the assessment of GdVO₄:Eu³⁺ nanoparticle toxicity, it can be assumed that this is one of the most sensitive evaluation criteria.

Conclusions. GdVO₄:Eu³⁺ nanoparticles increase proliferation rate of fibroblasts in cell cultures at small concentrations while reducing it at the high ones.