

**Summer School for young scientist
"Nanotechnologies: from basic research to innovation"**

**Comparative study of the toxicity and selectivity of action of
the polysaccharides stabilized nanoparticles of silver, gold and
platinum on the leucosis and healthy lymphocyte cells**

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Gold (NPs AuPS), silver (AgPS) and platinum (PtPS) nanoparticles stabilized by polysaccharides of microalga *Chlorella* were synthesized with a modified Davies method - with the reducing agent ethanol (AuPS, AgPS) and with a ascorbic acid (PtPS). The size of such particles by AFM or TEM data - 23 ± 3 nm (AuPS), 40 ± 4 nm (AgPS) 38 ± 4 nm (PtPS). When introducing nanoparticles in the sol form the cell nutrient medium is diluted by the dispersion medium of this sol (Hank's solution or physiological saline). Investigations of the influence of this effect demonstrated that the vital functions of the leukemic cell line Namalwa retained upon such dilution is not more than about 4%. of saline or for NP in Hank's solution - in any proportions.

Mutual influence of cells and particles are demonstrated for the first time as a result of studies of changes of their ζ -potentials in the process of aggregation. So, ζ -potential of Namalwa cells with increasing of concentrations of AgPS systematically decreases, whereas in the same range of AuPS PtPS concentrations ζ -potential of these cells is increased. ζ -potential of the nanoparticles modified by adsorption to NP exobiopolymers that the cells secrete. These changes are more extreme for cancer cells compared to normal and depend on the composition of nanoparticle. This both effects define the selectivity of heterocoagulation of cells and particles.

As the results of complex studies of heterocoagulation, kinetics of this effect and the kinetics of the cytotoxic effect in the processes of aggregation of NP AuPS, PtPS AgPS with Namalwa cells and normal lymphocytes it was demonstrated that these effects are selective and have a greater magnitude for the leukemic cells. The magnitude of the toxic effect on leukemia cells of nanoparticles that were synthesized and studied in the work may be arranged in a row:

NP AuPS > AgPS \geq PtPS