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Testing Green Silver Nanoparticles for Genotoxicity, Antioxidant and Anticancer Activity

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The toxicity of the synthesized nanoparticles (NPs) by various physicochemical methods is one of the main problems for their application. NPs synthesized using plant extracts are less toxic than other methods of their congregation, so, in this regard, the synthesis of this so-called “Green NPs” is very important. Direct interaction of the AgNPs obtained from the 50% ethanol extract of *Ocimum araratum* with the genomic DNA of sarcoma S-180 cells by the method of retardation has been investigated. No genotoxicity of the stabilized green AgNPs has been detected, which extends its use *in vivo*. Testing of green NPs was carried out on outbred mice with S-180 induced sarcoma. The changes in the intensity of spontaneous chemiluminescence (SChL) of the homogenates of the tumor tissue of the S-180 sarcoma of all groups of mice were investigated. For evaluation of lipid peroxidation (POL), the formation of malonic dialdehyde (MDA) was determined using thiobarbituric acid (TBA-test), and the activity of superoxide dismutase (SOD) was measured for the activity of the endogenous antioxidant enzyme system. The highest values of SChL and MDA were observed in the experimental group, which was administered with a stabilized extract of AgNPs, compared with control animals. SOD activity increases both in the positive control group and in the experimental group. Since the formation of MDA is characteristic of lipid peroxidation reactions and the data obtained correlate with the results of SChL and SOD, it can be argued that AgNPs increase the level of ROS and cause damage of cellular structures and biopolymers, thus causing degradation of tumor tissue.