

## MODIFIED GOLD AND SILVER NANOPARTICLES AS POTENTIAL GENE DELIVERY VECTORS

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Gold and silver nanoparticles are interested scientists for a long time. Over the past decades, many problems related to the control of synthesis, methods of functionalization and the search for optimal shapes and sizes of nanoparticles have been solved. Currently, gold and silver nanoparticles are attracting increasing interest in biomedical research. Their special properties suggest multitarget use. For example, they can be simultaneously used as an MRI contrast of tumors and a sensitizer for photodynamic therapy.

The functionalization of nanoparticles is an important aspect for reducing their various toxic effects, increasing the target efficiency (for example, accumulation in certain tissues), and increasing stability. One of the ways of functionalization is to modify the surface of a nanoparticle with dendrons (dendronization). Dendrons are special branching polymers that form structures similar to tree branches. Dendronization of nanoparticles allows them to effectively bind genetic material and deliver it to target cells. In addition, it has been shown that dendronization reduces hemotoxicity and cytotoxicity compared with the toxicity of nanoparticles or dendrons themselves.

It was also shown that dendronized gold and silver nanoparticles form stable complexes with various therapeutic oligonucleotides (miRNA, siRNA). Then, due to the positive charge of the terminal groups of the dendrons, the complexes effectively penetrate into the cells, releasing oligonucleotides, which ultimately have a therapeutic effect along one or another path.

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