

## Distribution, accumulation and biological effects of gold nanoparticles *in vivo*

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Gold nanoparticles (AuNPs) are widely studied for their unique physicochemical properties as a very promising tool for biomedical applications. They can be utilized as drug delivery systems, anticancer treatment agents, imaging boosters, etc. AuNPs are in general considered biocompatible and safe but in most of the studies they were tested in *in vitro* conditions, which do not reflect the response of the whole organism. Another issue is the lack of long-term studies.

Four types of gold nanoparticles were used in our *in vivo* study with animal model. Gold nanospheres with 10 or 20 nm in diameter, coated with bovine serum albumin (BSA) or polyethylene glycol (PEG) were applied to C57BL/6 mice by systemic administration. We investigated the biodistribution, accumulation, and changes in investigated organs (liver, kidney, and spleen) during 120 days.

Our results show that nanoparticle treatment did not affect the appearance, behavior, or growth of mice during the experiment even though all types of nanoparticles were still detectable in all investigated organs four months post-application. We also detected various patterns of accumulation and distribution of these types of AuNPs as well as various responses of the organism to their presence.

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