

## **Abstract**

Biological response to presence of gold and silica nanoparticles is extensively researched area of science. However there is only limited knowledge and understanding of the effects of small and ultrasmall nanoparticles. Regarding the unique physical and chemical properties that originate from the small size have these nanoparticles ability to interact very specifically on molecular level with organisms. Once the particle enters the complex physiological environment of the body molecules (predominantly of protein character) adsorb on the surface and form a polymeric case called biomolecular corona. There is a presumption that the first contact of the nanoparticle with the cell is mediated through the molecules of this corona and are important in subsequent steps of interactions of nanoparticle-biocolona complex. Therefore the genesis and structure of biocolona is as essential as the structure of the nanoparticle itself. Nanoparticles enter and are internalized within the cell and cellular compartments through the same mechanisms like naturally occurring molecules and substances. There are slightly different patterns of behavior of small and ultrasmall nanoparticles that are not fully researched and understood. Response of mammalian cells to the presence of the ultrasmall nanoparticles is very variable and research has not yet discovered universal rules regarding this matter. The reason behind this phenomenon is probably the uniqueness of the physical and chemical properties of nanoparticles and broad physiological complexity of mammalian organisms.

**Key words:** biomolecular corona, gold nanoparticles, silica nanoparticles, cells, proteins