Selenium nanoparticles: Effects of particle properties on biological activity

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Nanotechnology, as a most promising approach in material science, has resulted in numerous enhancements and breakthroughs in diverse scientific fields. One of the examples is selenium nanoparticles (SeNPs) which emerged as a new form with some improved properties compared to other Se forms. Among these properties, anticancer, antimicrobial, antioxidative, and reduced toxicity are the most interesting from the aspect of biomedical applications. Due to simplicity, short duration, scalability, and reproducibility, chemical reduction is a synthesis technique very often applied in SeNPs production. The choice of reducing agents, their molar ratio with a precursor, and the choice of stabilizing agents are recognized as determining parameters for the application efficiency of designed SeNPs.

This presentation includes an overview of the results of SeNPs obtained by the reduction of sodium selenite and stabilized with different agents. Furthermore, the effects of synthesis parameters on the properties of obtained particles (size, morphology, crystallinity, stability, surface chemistry) and biological activities such as antimicrobial, antioxidative, and cytotoxicity will be elaborate. In addition, some potential applications of SeNPs will be discussed, with particular reference to the results of *in vivo* experiments.