

In vitro Effect of Silver Nanoparticles on Superoxide Dismutase (SOD)

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Nanoscience and nanotechnology are one of the most promising technologies of the 21st century, and nanomaterials have been broadly used to improve public life. However, their effects on the human health and our environment have almost never known, therefore, it is important to clarify the unidentified effects of the nanomaterials before the widespread usage of nano-products. Here, we propose the evaluating method of engineered nanoparticles' effects on the human proteins to verify unintended toxicity of the nanoparticles. The conformational changes of the human proteins could cause a certain types of diseases. Thus, when it can be proved that the conformational changes of protein can be caused by certain nanoparticles, then, the results would be the evidence for toxicity of the nanoparticles. Based on this idea, we selected the Cu,Zn-superoxide dismutase (SOD1) related to the neurodegenerative disease as a test human protein, and commercial silver nanoparticles (AgNPs) as target materials, which are untreated with surface treatment agents. The conformational changes of SOD1 derived by AgNPs were measured by the SPR spectroscopy.