Nanochemistry and biotechnology

SYNTHES AND RESORCH OF AURUM NANOPARTICLES

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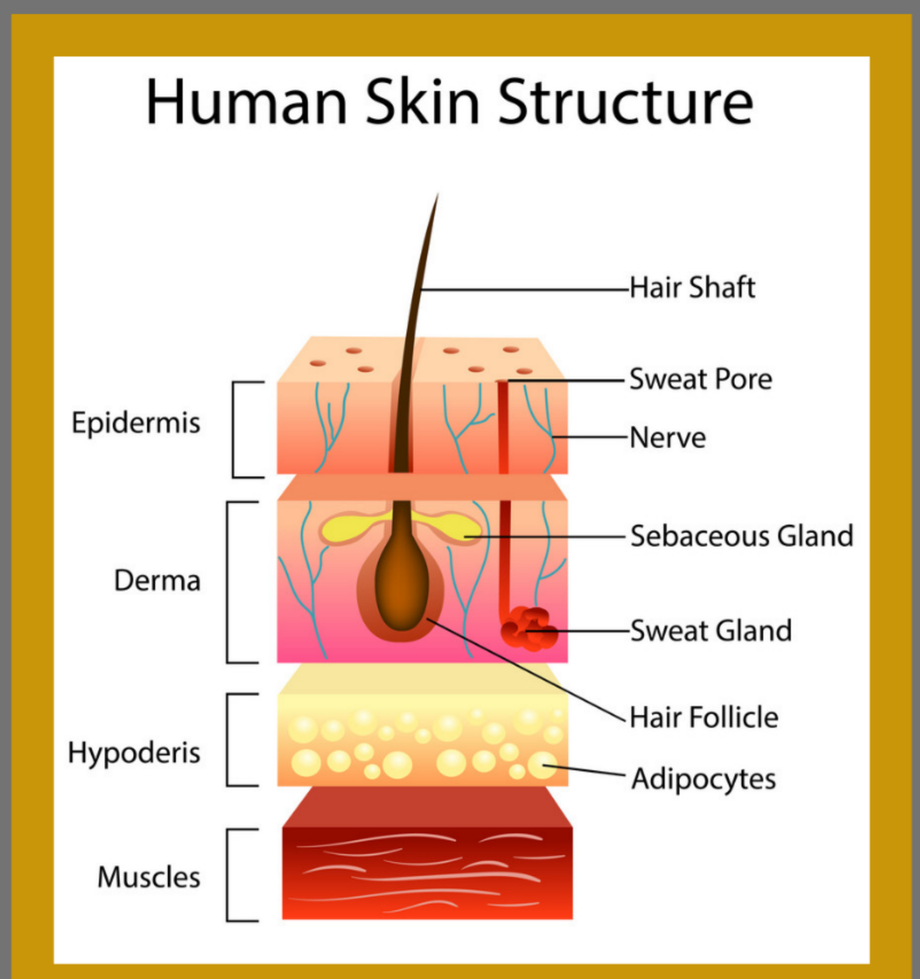
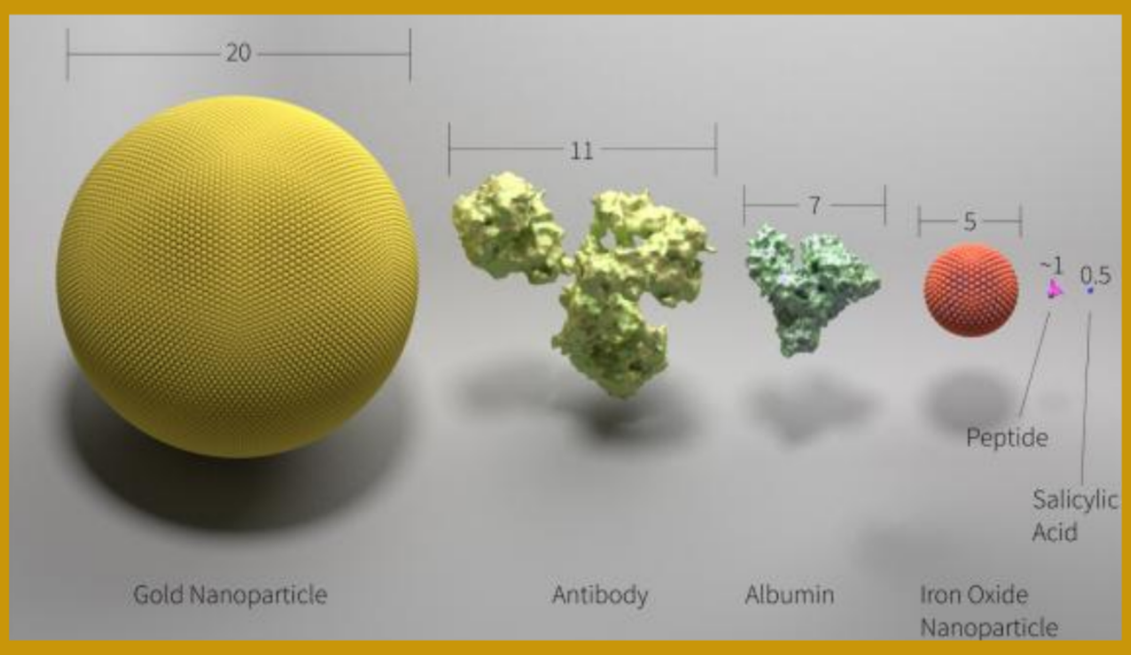
The use of gold nanoparticles (Gold NP) in various fields of science and technology determines the interest of researchers. Gold NP are used as catalyst precursors, to create new materials in electronics, in biology for sensor development, in medicine for cancer drug delivery systems, in cosmetology as a rejuvenating agent. Natural cosmetics containing "biogold" is one of the most effective rejuvenating agents in cosmetology. It is known that gold is able to slow down the aging process and rejuvenate the cells of the epidermis. The particle size of «nanogold» is in the range of 5-50 nm, which allows it to penetrate freely through the pores of the skin (pore size 240 nm). One of the most effective methods of synthesis is the reduction of compound of gold, where as a reducing agent using chemical reagents, in particular citric acid, sodium borohydride and the like. Despite the low toxicity and biocompatibility of gold NP, the substances that are source substances in the synthesis are of concern. Therefore, the synthesis of gold NP from such systems is relevant, which will not have a negative impact in alive organisms. The main idea of this work is the synthesis of gold NP in two ways: ,with the use of biologically active compounds - complexones: ethylenediaminetetraacetic (edta), ethylenediaminedisuccinic (edds) acids and with applying phytoextracts as reducing systems. They include lactones, flavonoids, ascorbic acid, gallic and other organic acids. These substances are often used as reducing agents in the production of gold nanoparticles.





Gold NP was synthesized by reduction of HAuCl4 by solutions of Na2edta, Na2edds and plant extracts in a slightly alkaline medium. Due to the surface activity of edta and edds,
additional stabilizers were not added into the system. Thus, dispersed systems obtained on the basis of edta and edds had a rich red-cherry color, and when used as reducing agents of plant extracts, the color was yellowish with a pronounced blue opalescence. The method of dynamic light scattering showed that the particle size in the studied systems is in the range of 25-50 nm. The presence of a surface plasmon resonance band in the range of 530-540 nm confirms the presence of nanoparticles in the obtained systems.