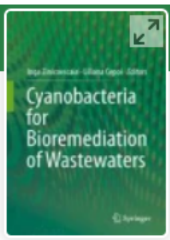

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Nanoparticle Biosynthesis Based on the Protective Mechanism of Cyanobacteria

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Abstract

The development of environmentally friendly methods of nanoparticles synthesis of different size and shape is one of the pressing challenges in current nanotechnology. Among microorganisms, cyanobacteria are of particular interest in nanoparticle production. Examples of gold, silver, platinum nanoparticles synthesis by cyanobacteria strains Plectonema boryanum, Spirulina platensis, Oscillatoria willei, Lyngbya majuscule, Spirulina subsalsa, etc. at different conditions are presented in the following chapter. Cyanobacteria can produce nanoparticles intra-and extracellularly. The size and shape of nanoparticles is strongly dependent on pH, temperature, metal concentration in solution, and incubation time. Beside nanoparticles production, the effect of engineered nanoparticles (silver, gold, titanium dioxide, cerium oxide, CdSe, ZnSe, and ZnS) of different size and concentrations towards cyanobacteria was examined. Nanoparticles of smaller size were shown to be more toxic due to their ability to easily penetrate into the cells. The results of the study concerning biochemical changes of the main components (proteins, lipids, carbohydrates, and phycobilin) in the cyanobacteria Spirulina platensis and Noscoc linkia biomass during silver nanoparticles formation are also presented.

Keywords: titanium dioxide nanoparticles, silver nanoparticles, gold nanoparticles, platinum nanoparticles, Spirulina Platensis

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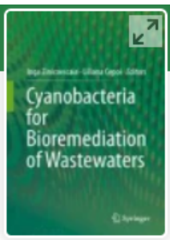

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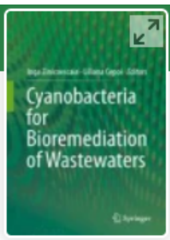

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