

# Nanoparticle synthetic methods: Strength and limitations

## **Abstract**

Nanoparticles (NPs) are produced through nanotechnology development by reducing the metal to its nuclear size. NP synthesis includes a few techniques, such as physical, chemical, and biological techniques. Physical methods avoid NP solvent contamination but it is not negligible to consume a large quantity of energy for condensation and evaporation of particles. In addition, extremely high modulation of temperature and pressure indirectly expands the cost of NPs synthesis. In the chemical technique, reducing agents and protective agents are used to synthesize NP and prevent agglomeration in order to synthesize high purity and stable NP. High intake of strong chemicals leads to contamination of the synthetic NP. In comparison to NP's synthesis by chemical and physical techniques, the interest in NP biological synthesis has concentrated on its ecofriendly and effective technique. The biological technique used under green synthesis differs with the type of reduction agent used as microorganisms (bacteria and fungi) and plants and their extracts. Exclusion in the consumption of powerful chemical agents and set-up of high-energy reactions highlights the significant benefits of biological technique in NP synthesis. Thus, the synthesis of NP with plant extracts by biological method is the appealing technique for a large-scale production of NP and has a higher potential in significant medicinal applications.

## **Keywords**

Biological; Chemical; Nanoparticles; Physical; Synthesis methods