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Mechanistic approach to study conjugation of nanoparticles for biomedical applications

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Abstract

Interaction of nanoparticles with biological systems turns out to be vibrant for their efficient application in biomedical field. Here, we have shown antibiotic amikacin loaded nanoparticles are responsible for the dual role as reducing and stabilizing the silver nanoparticles without the use of any undesired chemicals. Synthesized nanoparticles are well-dispersed having quasi spherical morphology with an average particle size around 10-11 nm. Crystallinity of nanoparticles was measured using selected area electron diffraction (SAED) and powder XRD analysis which show that particles are perfectly crystalline with cubic phase of geometry. UV-Vis, FTIR and circular dichroism (CD) analysis explained the presence and interaction of antibiotic on the nanoparticle's surface. Amikacin functionalized Ag nanoparticles used in this study have shown enhanced antibacterial activity against *E. Coli*. These studies will help in designing an in-depth understanding that how nanostructures can possibly interact with biological systems.

Keywords: Amikacin; Silver; Interaction; Nanoparticles; Circular dichroism; Antibacterial

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