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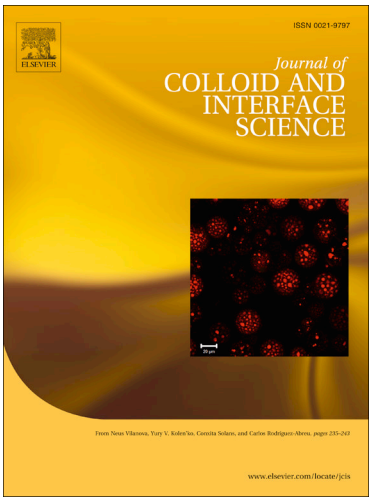

Biocompatible Gadolinium oxide nanoparticles as efficient agent against pathogenic bacteria

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Biocompatible Gadolinium oxide nanoparticles as efficient agent against pathogenic bacteria

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Abstract

The inappropriate and surfeit use of antibiotics have generated a hunt for safe and alternative antimicrobial agents against pathogenic bacteria. With the advancement in nanoscience and nanotechnology, promising opportunities for examining the bacterial effect of metal nanoparticles were demonstrated in literature. Focusing on this, our present study presentssynthesis of L-ascorbic coated gadolinium oxide nanoparticles via a simple precipitation route. Their complete characterization and detailed stability studies were carried out. The obtained nanoparticles were characterized by Fourier transform infrared (FT-IR) spectroscopy, confirming that L-ascorbic acid onto the surface of nanoparticles. The size and morphology were analyzed by Transmission electron Microcopy (TEM)and Field emission scanning electron microscopy (FE-SEM) which reveals their spherical nature. The stability studies were performed to know about their chemical and colloidal stability. The synthesized nanoparticles were found to be non-toxic to HaCaT cells upto the concentration of 125 µg/mL. The antimicrobial effect of nanoparticles was analyzed against three bacterial strains; *E. coli*, *S. aureus* and *S. typhimurium*. To summarize, the synthesized nanoparticles are found to be safe and protective against pathogenic bacteria. They further can be explored in biomedical applications considering their non-toxic nature.

Keywords: L-ascorbic acid; Gadolinium oxide nanoparticles; cytotoxicity; hemolysis, antimicrobial effect of nanoparticles