

Abstract

Nanotechnology is one of the emerging field among biological and natural sciences. Nanotechnology deals with particles, size ranging from 1-100nm. These particles have outstanding properties at atomic level. They may act as antimicrobial, anticancer, anti-aging, anti-inflammatory and anti-fungal. They may also help in the delivery of drug to target organs and used as carrier for drug loading and delivery system. Recent advances are made to synthesize nanoparticles which are more efficient in the context of above properties and are less toxic. Green synthesis methods are used to synthesize nanoparticles from plants extracts, bacterial strains or fungal hyphae. The biomolecules present in the plants' extracts make nanoparticles less toxic and biocompatible. Among other nanoparticles silver nanoparticles are mostly used due to their antibacterial and anti-fungal properties, but chemically synthesized silver nanoparticles are toxic to living cell when consumed at higher doses. Garlic (*Allium sativum*) is one of the oldest of all cultivated plants. Garlic is used as antioxidant and antiaging agent. Allicin is the major compound in garlic and the characteristic taste and smell of garlic is due to the allicin. Allicin was extracted from the garlic by solvent extraction method and used in the synthesis of silver nanoparticles (AgNPs). Allicin-mediated AgNPs were characterized by UV-Vis and optical absorption peak was observed at 412nm and 20-40nm size was confirmed by SEM analysis. Antioxidant activities of allicin-mediated silver nanoparticles were compared with chemically synthesized silver nanoparticles. Antioxidant activities were checked in mice liver and serum by assaying antioxidant enzymes such as SOD, CAT and GST and toxicity was checked from histology of liver and kidneys. Thirty albino mice (male) were randomly divided into five groups ($n=6$). One control group and four experimental groups. The experimental groups were dosed for 21 days, then sacrificed and liver, kidney and blood samples were extracted. The organs and serum were assayed for antioxidant activities. It was found that silver nanoparticles prepared from green method using Allicin were less toxic than those synthesized by chemical method.

Keywords: Nanotechnology, nanoparticles, antioxidant, antimicrobial, silver nanoparticles, Allicin, green synthesis.