

Biological synthesis of silver nanoparticles from *Lepidium Sativum* leaves and its anticancer studies

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Abstract:

In recent years, nanoparticles have developed as diagnostic and therapeutic agents for the treatment of many diseases such as diabetes, asthma, allergies and cancer. Silver nanoparticles (Ag-NPs) are versatile materials with a broad range of applications in various fields such as cancer therapy, drug delivery. This research study describes the synthesis of silver nanoparticles using the aqueous extract of *Lepidium Sativum* leaves as a reducing agent by sonication, espousing green chemistry principles. Biologically synthesized nanoparticle-based drug delivery systems have significant potential in the field of biopharmaceutics due to its lesser in size entailing high surface area and synergistic effects of embedded bioactive molecules. In the present research work the cytotoxic effect of synthesized silver nanoparticles studied by MTT assay against breast cancer cells (MCF-7 cell line) showed significant cytotoxic activity with IC₅₀ value 7.04 µg/mL compared to that of standard cisplatin. The superior activity of the silver nanoparticles may be due to the spherical shape and smaller particle size 10–30 nm as confirmed from transmission electron microscope (TEM) analysis. The data obtained in the study reveal the potent therapeutic value of biogenic silver nanoparticles and the scope for further development of anticancer drugs.

Key words: Nanoparticles, Cancer therapy, drug delivery and transmission electron microscope (TEM)