Mycosynthesis of nanoparticles

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Abstract: Nanotechnology is a rapidly growing field which provides various applications in biomedical and engineering with reference to biocompatibility, efficient, fast, safety and cost effective. The development of nanotechnology has been a boon to mankind as its significance paved way for several applications in therapeutics, catalysis, microelectronics, biosensing devices, air and water purifiers. Using edible mushrooms is a cost effective, green and environmentally friendly approach for synthesis of NPs. The synthesized NPs were usually characterized using UV–visible spectroscopy, particle analyzer and X-ray diffraction. Fourier transform infrared spectroscopy (FTIR) measurements were often carried out to identify the possible biomolecules responsible for capping and efficient stabilization of the nanoparticles. The size and morphology of nanoparticles were analyzed by transmission electron microscopy (TEM). In addition various anti-microbial, anti-cancer and anti-fungal activities of these prepared NPs can be assessed. Hence, such type of synthesis methods for the production of nanomaterials at lower cost and with green energy would encourage the production of functionalized NPs like; Ag NPs, Au NPs at an industrial scale.. The use of these smaller size of AgNPs offers a wide range of applications in the field of nanomedicine. AgNPs are also used as an antimicrobial agent in wound dressings and coatings in medical devices.

Developing biocompatible molecules an anticancer agent is one of the novel approaches in the field of cancer therapy using nanotechnology. The biologically synthesized AgNPs have antiproliferative activity through induction of apoptosis in MDA-MB-231breast cancer cell line, suggesting that biologically synthesized AgNPs might be a potential alternative agent for human breast cancer therapy. This study demonstrates the possibility of using AgNPs to inhibit the growth of the tumor cells and their cytotoxicity for potential therapeutic treatments and offers a new method to develop molecule for cancer therapy. Finally cost-effectiveness, biocompatibility and facileness to modify these silver nanoparticles make them a viable choice in future biomedical applications.

References:

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