# *Silver Nanoparticles Synthesized by Penicillium citreonigrum and Fusarium moniliforme Isolated from El-Sharkia, Egypt*

**Fahmy T. Ali, Hussein H.El-Sheikh, Mostafa M. El-Hady, Mahmoud M. Elaasser and Dalia M. El-Agamy**

***Abstract:***

Background: Although nanoparticles can be made using various physicochemical methods that remains expensive and involves the use of hazardous chemicals. Biological synthesis of nanoparticles appears as a suitable process since it requires less energy, is environmentally safe, emerges as an eco-friendly, scalability, exciting approach,it has low manufacture costs of scalability, and better nanoparticle stabilization, compared to chemically synthesized nanoparticles.

This study illustrates simple, green synthesis of AgNPs *in vitro* using cell lysate supernatant (CLS) of fungal species and to investigate its potential antimicrobial, antiviral activities, and cytotoxic effects against some tumor cell lines.The production ability of silver nanoparticles was investigated by the means of UV-V spectroscopy, electron microscopy and X-ray microanalysis.Results: The production of silver nanoparticles by Penicillium citreonigrum and Fusarium moniliforme is reported in this study. The biosynthesized nanoparticles exhibited typical plasmon absorption maximum of silver nanoparticles (420nm).Spherical silver nanoparticles were found to have size between 10 and 50 nm by electron microscope analysis. X-ray pattern revealed the crystalline nature of the silver nanoparticles. Silver nanoparticles have broad spectrum antimicrobial activity against Gram positive and negative bacteria and fungi. In the meantime, AgNPs exhibited promising cytoprotective efficacy towards Herpes simplex type 2 virus and pronounced cytotoxic activity against some tumor cell lines.Conclusions: The studies showed that the microbial susceptibility to Ag-NPs is different for each microorganism.Penicillium citreonigrum and Fusarium moniliformehave capacity to biosynthesize silver nanoparticles, which are intracellularly accumulated. This property is present in whole cells and in free cell extracts indicating that this process is probably enzymatically mediated, due to the requirement of NADH as cofactor for this biological transformation. Moreover, Silver nanoparticles have different biological applications.

**Key words*:*** Silver nanoparticles, antimicrobial, antiviral activities, and tumor cell lines.

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# AIM OF THE WORK

The present study carried out to search for microorganisms that may possibly use as a tool for synthesis of new functional nanomaterials.

The goal of this study was achieved by:

- Exploring nanomanufacturing ability of isolated microorganisms by simple, low cost and low energy methods.
- Moreover, these biosynthesized silver nanoparticles are used to investigate its biological activities against different pathogenic bacteria and fungi, antiviral activities and cytotoxic activities against different tumor cell lines to be applied in medical field.
- In addition, the optimum conditions for production silver nanoparticles were determined.

# *Acknowledgements*

*First and foremost, my deep praises to "**Allah**" who had guided us to this: never could we have found guidance, had it not been for the guidance of **Allah**. Thanks to **Allah** of all gifts given to me.*

*I express my deepest thanks to* PROF. DR. FAHMY T. ALI*, for suggesting the thesis subject, for his valuable supervision, the experience he gave me, sincere guidance, meticulous advice, constructive suggestion and wholehearted support throughout this work and above all for his moral support and fatherly attitude.*

*I would like also to express my deep gratitude to* PROF. DR. HUSSIEN H. EL-SHIEKH, *for his Kind supervision, for his constant support, the experience he gave me, valuables encouragement and guidance at every stage of this work.*

*Moreover, I would like to thank heartily* DR. MOSTAFA M. EL-HADY *the experience he gave me, for his kind*

*supervision, patience, meticulous observation, generous advice and great help throughout this work.*

*I also owe my thanks and gratitude to* **DR. MAHMOUD M. EL-AASSAR**, *for his great support, patience, helpful advice, valuable technical assistance, and generous comments without which this work would have never been accomplished.*

*In addition, I am also very thankful to all staff at the Regional Center for Mycology and Biotechnology for their kind help.*

*I would like to convey my thanks to my family Mother, father, sisters and brother for their encouragement.*

*Finally, my deepest sincere gratitude and thanks to my husband for his great patient, encouragement, unfailing support and his helpful efforts.*

# INTRODUCTION

# Aim of the Work

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# الملخص العربى

# ABSTRACT