Notification No: 510/2022
Date of Award: 30/03/2022

Name of the Scholar	:	**IRSHAD AHAMAD**
Name of the Supervisor	:	**Prof. Tasneem Fatma**
Name of the Department/Faculty	:	**Biosciences/Natural Sciences**
Topic of Research	:	**Synthesis of silver nano particle facilitated by *Anabaena variabilis* for biological applications**

Finding

Biogenic silver nanoparticles (AgNPs) are of significant interest due to their widespread application. In order to make nontoxic cost-effective AgNPs, several microorganisms have been utilized. In the present study, emphasis was given to *Anabaena variabilis* mediated AgNPs synthesis. Optimal conditions for extract preparation were heating of extraction mixture at 100 °C for 5 min, while for AgNPs synthesis, optimal conditions were 1:9 v/v (cell extract: $AgNO_3$ (1 mM), pH 7.4, and 30 °C reaction temperatures. The synthesized AgNPs were characterized initially by UV-Vis spectrophotometer and the maximum absorbance peak was obtained at 440 nm. XRD technique confirmed their crystalline nature. SEM with EDX showed 66% elemental silver by weight, which signified the purity of AgNPs. DLS study showed nearly monodispersed nature of AgNPs. TEM observation confirmed the synthesis of 11–15 nm with spherical shape NPs. FTIR analysis of synthesized AgNPs showed the functional moieties responsible for their bioactivity. *Anabaena variabilis* mediated AgNPs showed good antibacterial and antifungal activity and anticancer activities. In combination with standard antibiotic (streptomycin) and antifungal agents (amphotericin B, fluconazole), AgNPs showed significant synergistic effect. The biocompatibility of *A. variabilis* derived AgNPs suggested their probable use in nanomedicine, this can pave the way for developing a new generation of antimicrobial, and anticancer bio-nanomedicine against the multidrug-resistant organisms as well as in liver and cervical cancers diseases.