

Thesis Project Offer

*Joint Research and Education Programme “Palestinian-German Science Bridge PGSB”
Forschungszentrum Jülich GmbH & Palestine Academy for Science and Technology*

Thesis type*

<input type="checkbox"/> BSc	<input checked="" type="checkbox"/> MSc	<input type="checkbox"/> PhD	Intended starting date (approx.): 2023
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Project description*

Agriculture provides food for humans, directly and indirectly. As the world population is increasing, it is necessary to use modern technologies such as bio and nanotechnologies in agricultural sciences. Plant diseases caused by pathogenic entities pose severe issues to global food security. Effective sensory applications and tools for the effective determination of plant diseases become crucial to the assurance of food supply and agricultural sustainability. Engineered nanoparticles (NPs) have been inserted into conventional laboratory sequence technologies or molecular assays that provide a remarkable increment in selectivity and sensitivity.

In our project about Nanoparticles in Agricultural applications and their role in disease management, we focused on the role of silver NPs in plant disease management. Our project consists of several parts: The first part focused on the isolation and identification of an endogenous isolate of the entomopathogenic fungi that has been done at Samara lab in Palestine and the second part focused on the extracellular synthesis and purification of silver nanoparticles which has been done at Jülich together with a Bachelor's student from PTUK university. The student could biosynthesis silver nanoparticles from the period from 01.09.2022 – 30.11.2022. Synthesis of nanoparticles was confirmed by visual detection in which the colorless solution gets changed to a brown-colored solution. Preliminary characterization was done by SEM, DLS, and SAXS analysis. The size of silver nanoparticles was found to be 20–30 nm approximately as determined by scanning electron microscopy (SEM). To continue with the project, further control of the biosynthesis of silver nanoparticles and further characterization using advanced techniques such as UV-visible spectroscopy, XRD, FTIR analysis, SEM/EDS, and FESEM need to be done at Jülich.

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