PhD position in the Department of Microbiology at Nicolaus Copernicus University (NCU) in Toruń, Poland

within OPUS Grant of NSC Poland

PI: Aniketkumar Gade, PhD

PhD position at NCU in Toruń

We are looking for one PhD candidate with expertise in study on bionanotechnology and its application in plant growth promotion

Description of position

A 4-year PhD Studentship is available for an independent and highly motivated individual to work in the Departments of Microbiology at Nicolaus Copernicus University in Toruń (https://www.bio.umk.pl/en/department-of-microbiology/).

This position is associated to the **OPUS grant** funded by the National Science Center of Poland. The successful candidate will join a multidisciplinary research team to develop a PhD project focused on formulation of nanocarriers with mycogenic iron oxide nanoparticles as a novel and sustainable fertilizers in maize crops.

The scholarship for selected candidate will be 5000 PLN/month for first two years and 6500 PLN/month for next two years.

About the project

In the present project, a sustainable approach for supplementation of iron in the form of mycogenic iron oxide nanoparticles in the maize plant will be investigated. Mycogenic iron oxide nanoparticles will be encapsulated in casein-loaded calcium carbonate microspheres, which will serve as nanocarriers and enable the controlled release of iron in soil and nutrient delivery to the maize plant. This novel delivery system of nanocarriers will be synthesized via green fungal-mediated routes and characterized for morphology, encapsulation efficiency, and release kinetics under simulated conditions. Maize plants treated with these novel nanocarriers will be evaluated for physiological responses, with a particular focus on redox homeostasis through enzymatic and non-enzymatic antioxidant assays. In addition, the environmental fate of the nanoparticles will be tracked using spectroscopic and imaging techniques to assess their stability, transformation, and bioavailability in the rhizosphere and maize plant. Analysis of the microbial communities of the maize rhizosphere will be performed to understand the broader ecological implications. These studies will reveal shifts in microbial composition and functional gene expression linked to nutrient cycling, stress response, and iron metabolism. The analysis will help us to understand whether the nanoparticle treatment supports beneficial microbial consortia while enhancing iron uptake and plant redox balance.

The candidate will perform:

- Mycosynthesis and characterization of iron nanoparticles and casein-based nanocarriers
- Conducting the experiments on the effect of nanomaterials on plant growth and redox balance
- Analysis of nanoparticle fate in maize and release kinetics from carriers
- literature review, data analysis and contributing to the writing of scientific articles

- Presenting project results at international conferences research activities and events organised within the project;

Who can apply?

Applicants must be doctoral candidates, i.e. not already in possession of a doctoral degree at the date of the recruitment,
The applicants must be in the first four years of their research career (measured from the date they obtained a degree).

Position requirements for candidates:

- A Master degree in Life Sciences, preferably in Biology, Biotechnology or similar
- Experience in microbiology, especially in cultivation and screening for antimicrobial activity of bioactive compounds
- Experience in bionanotechnology, especially in biosynthesis of nanoparticles, nanocomplexes and their characterization with variable techniques
- Experience in plant cultivation
- Ability to work independently on its own initiative and in a team environment.
- Excellent oral and written communication skills in English are expected for an effective interaction with our multidisciplinary research team
- Experience in paper writing, conference presentations are welcome.

Applicants meeting these requirements should send to the following email address: hotbio@umk.pl

- A complete CV (personal details, academic/education history, research experience, experimental skills, publications, other).
- Names and contact information of at least two Scientists for reference letters
- A motivation letter – max 2 pages (Provide authorization to handle personal data according to EU General Data Protection Regulation).

Applications must be submitted as one PDF file containing all materials to be given consideration.
The deadline for applications is 31st May 2026
Shortlisted candidates may be invited for an online interview.
Candidates will be notified of the outcome through the same e-mail address. Start of the project is foreseen on 2nd November 2026.

We would like to encourage all nationalities to apply.