UNIVERSITY OF SILESIA
IN KATOWICE

PHD STUDENT IN THE DOCTORAL SCHOOL – CALL FOR APPLICATIONS

Position: PhD student in biology discipline
Unit of the project realization: Faculty of Natural Sciences – University of Silesia in Katowice
Unit realizing the PhD student education: Doctoral School at the University of Silesia in Katowice

The project provides for a 4-year scholarship for the doctoral student responsible for conducting the research provided for in the project application. The duties of the doctoral student will also include the preparation of conference presentations and posters and the preparation of scientific publications on the obtained results.

Research will be carried out in the frame of the project „Metatrancriptomic analysis of bacterial activity enhancing phytoremediation of soil contaminated with petroleum hydrocarbons" (Preludium-Bis 2 project, 2020/39/O/NZ9/00342), financed from the National Science Center under management of dr hab. Tomasz Płociniczak, prof. UŚ.

Duration of the scholarship: 01.10.2021-30.09.2025

Scholarship amount:

until the mid-term evaluation - PLN 4 266.58 gross

after obtaining a positive result of the mid-term evaluation - PLN 5,119.89 gross

Project description:

The project will include research in the field of phytoremediation of soils contaminated with petroleum hydrocarbons. For its implementation, phytodegradation enhanced by plant growth promoting bacteria (PGPB), capable of synthesizing surface-active compounds (biosurfactants) and degrading petroleum hydrocarbons will be used. After isolation and characterization of the strains, selected isolates will be used in pot experiments to support phytoremediation with the use of perennial ryegrass (*Lolium perenne*). The main aspect of the research will be the soil transcriptomic analysis, which will help to answer the question: Which bacterial mechanisms are responsible for supporting phytoremediation processes in soil?
The role of the doctoral student will be to conduct scientific experiments covering the implementation of the following research goals:

- Evaluation of the activity of mechanisms of plant growth-promoting mechanisms, hydrocarbon degradation and biosurfactant production;

- Selection of rifampicin-resistant sontaneus mutants of tested strain;
- Species identification of strain showing the highest activity of mechanisms studied in task 1;
- Whole genome sequencing of strain chosen for pot experiments;
- Pot experiments using perennial ryegrass and bioaugmentation, biostimulation and control;
- Determination the level of removal of hydrocarbons and from different soil treatments and estimation of the impact of tested strains on plant biomass;
- Determination of survival of tested strain in soil;
- Transcriptomic analysis (RNA-Seq) of soil from different treatments;
- Estimation the expression of selected bacterial genes in soil from different treatments and statistical analysis.

Requirements:

1. Master degree in biotechnology, biology or related sciences (a scan of the diploma or a certificate sent to the project leader's email address by the end of the competition at the latest).
2. Certificates or other documents proving the level of English language proficiency, if the candidate has them.
3. Experience in working in a microbiological laboratory, experience in preparing and conducting phytoremediation experiments, including assisted phytoremediation; practical knowledge of molecular biology methods (isolation of DNA and RNA from bacterial cultures and soil and plant material, identification of bacteria based on sequence analysis of selected genes (16S rRNA, *gyrB*, *rpoD*, *rpoB*, *tuf* and *atpD*), real-time PCR (qPCR - quantitative PCR), the ability to study the survival of bacteria in soil and their ability to colonize plant tissues during bacterial-assisted phytoremediation.
4. Ability to use statistical software.
5. Ability to independently plan research and analyze their results.
6. Readiness to present research results at national and international scientific conferences (conference experience in the presentation of results is welcome).
7. Willingness to go on a 6-month internship abroad to Belgium, Hasselt University, (stay on a foreign internship or cooperation with foreign students will be an additional advantage).

Required documents:

1. Cover letter with a description of the subject of research interests;
2. List of scientific publications (with the candidate's participation marked) and conference presentations;
3. A copy of the graduate diploma in biotechnology, biology or related sciences, it is allowed to send a certificate of obtaining a master's degree in the above-mentioned fields;

4. CV containing a description of scientific achievements to date, including experience in conducting researches consistent with the subject of the project;
5. Documents confirming the competence to carry out specific tasks in the project;
6. Opinion of the research supervisor of the MA and BA thesis.

Candidates should register in IRK system and select „Doctoral School - admission by grant and implementation doctorate program".

Documents should be delivered till 19.07.2021 to an e-mail: tomasz.plociniczak@us.edu.pl
In case of any questions, before the formal application please contact to the grant leader for the e-mail address given above.
Documents will be rated by the commission, led by the project leader. Admission will be carried out according to the NCN regulations. Admission can be carried out both in Polish and in English. Meeting will be organized on **20.07.2021** on-line. Final decision will be sent to candidates via e-mail till **22.07.2021**