

Two Open PhD Positions (m/f/d) in Microbial Natural Products Research

Start: October 2023

Deadline: 15.10. 2023

Institute of Pharmacy, Department of Pharmacognosy, University of Innsbruck, Austria

Project description

Title of project: ENDRUST - Role of endophytes in rust defense in Norway spruce

Phytopathogens and other stress factors are the major causes of economic and ecological losses and adversely affect agriculture and forestry. European *Picea abies* forests of the central Alpine region have witnessed severe infections emerging from the needle bladder rust phytopathogen *Chrysomyxa rhododendri*, which has deleterious effects on adult trees and fatal consequences for saplings. This project focuses on elucidation of the potential role of fungal endophytes communities in inducing rust resistance in *P. abies* trees in Tyrol province, Austria. The project is funded by FWF (Austrian Science Fund) and is a cooperation between the departments of Pharmacognosy, Microbiology, and Botany at the University of Innsbruck.

Job description

We are looking for highly motivated PhD candidates interested in pursuing their career in the area of microbial natural products. The candidate(s) will initially isolate and analyze fungal endophytes of rust susceptible and resistant trees, with the focus to identify taxa associated to rust resistance. This will be followed by i) LC-MS/MS-based untargeted metabolomics analysis of the selected fungal strains, ii) mass spectrometry- and bioactivity-guided isolation of metabolites, iii) structure elucidation of antifungal metabolites, iv) investigating the ability of selected strains for producing new, unique, and cryptic natural products using silent genes activation techniques. The candidates will work closely/co-supervised with internal collaboration partners at the University of Innsbruck for performing phylogenetical and microbiological studies, as well as conducting *in vivo/in natura* studies to investigate the efficacy of the metabolites isolated. The candidates will be hired at the department of Pharmacognosy and enrolled at Pharmaceutical Sciences study program and expected to manage the project, write publications/reports/participate in national or international conferences.

Qualifications required

PhD candidate 1

- Master in Pharmacy, Chemistry or similar;
- Strong background in natural products isolation and purification (in particular from fungi), and structure elucidation by 1&2D NMR, HRMS, ECD, computational methods;
- Experience with non-targeted metabolomics approaches and dereplication of natural products by LC-MS/MS (preferably by using molecular network) is a plus
- Experience in performing bioassays is a plus.

PhD candidate 2

- Master in Microbiology/fungal biology/ or related fields;
- Sterile working techniques, molecular techniques, phylogenetical analysis, bioassays, basics in bioinformatic analysis;
- Experience in fungal isolation, cultivation, identification, activation of silent genes, OSMAC approach, etc.;
- Experience in fungal natural products isolation and related techniques;
- Experience in the area of plant pathogens and performing related bioassays is a plus.

Duration and salary

The positions are for a maximum period of three and half years (initial contract 9 months), and the salary will be according to the personal costs of FWF and the hours of employment (60-75%). More information can be found on www.fwf.ac.at.

Application

Please include the following files in your application, preferably all in one PDF file:

- 1) Motivation letter
- 2) CV including the publication list
- 1) BSC. Diploma and transcript
- 2) MSC. Diploma and transcript (or equal degree)
- 3) Master or diploma thesis abstract (1-2 page)

Please send your application, including above-mentioned documents and further questions until 15th October 2023 to: Mostafa.alilou@uibk.ac.at