



Postdoc in the "MycoMedix" project - Mycology research group

80%-100% / 1260 Nyon

good food, healthy environment

The Mycology research group develops innovative research lines aimed at long-term monitoring of fungal diseases in cultivated plants and limiting the use of plant protection products. These research lines are: i) epidemiology and aetiology of fungal diseases, ii) creation of new bio-based fungicides, iii) development of predictive models, iv) use of fungi in degradation and mycoremediation processes, and v) exploration of biochemical mechanisms determining varietal resistance.

The MycoMediX project, funded by the Swiss National Science Foundation and Innosuisse (Bridge Discovery), is led by a consortium of experts drawn from the Mycology group at Agroscope (Dr Sylvain Schnée) and the Translational Microbiology group (Dr Thilo Köhler) and Natural Bioactive Products group (Prof. Jean-Luc Wolfender) at the University of Geneva. This multidisciplinary project aims to identify new anti-infective and anti-virulent compounds targeting three pathogenic bacteria (*Pseudomonas aeruginosa*, *Acinetobacter baumannii* and *Staphylococcus aureus*) regarded as priority organisms for the development of new antibiotics. The methodology will involve exploring and chemically characterising an extensive collection of fungal extracts with high potential for producing bioactive secondary metabolites, aided by innovative chemoinformatics tools.

Your tasks

- Researching taxonomic, biochemical and genomic criteria in order to select fungal strains with high potential for producing bioactive metabolites
- Developing techniques to induce fungal defence mechanisms (OSMAC, elicitor compound, new techniques)
- Management and statistical processing of all data (chemical profiling of fungal extracts, taxonomy of fungal strains, biological activity data)
- Establishing collaboration with research groups/institutes holding fungal strain collections of interest (e.g. extremophile species)
- Supervising a PhD student already involved in the project

Your profile

- PhD in microbiology / bioinformatics / natural products chemistry, ideally with experience in metabolomics (LC-MS)
- Ability to adapt to a multidisciplinary environment (three laboratories at two geographical locations: Agroscope Changins and University of Geneva)
- Rigorous and methodical approach to data management
- Autonomy and innovation
- Knowledge of two official languages of Switzerland; excellent knowledge of English

Agroscope is the Swiss federal centre of excellence for research in the agriculture and food sector. Its researchers carry out their work at a number of sites in Switzerland. Headquartered in Bern-Liebelfeld (as of 2025: Posieux, Canton of Fribourg), Agroscope is attached to the Swiss Federal Department of Economic Affairs, Education and Research EAER.

We offer a varied job in a dynamic work environment, as well as thorough training and a modern research infrastructure. Flexible working hours, good social benefits and a staff restaurant are among the perks of this position.

The Federal Administration is attentive to the different needs and backgrounds of its employees and promotes diversity. Equal treatment is a top priority.

If this challenge appeals to you and you meet the requirements profile, we look forward to receiving your online application at our jobs portal www.stelle.admin.ch, ref. no 7855.

For additional information, please contact Sylvain Schnee, Researcher in the Mycology research group: sylvain.schnee@agroscope.admin.ch (please do not send applications to this email address).

Start date: 1.1.2024 or by arrangement. The post is for a fixed period of 12 months, with a possibility of extension.

Postdoc Position

A Postdoc position is available within the “MycoMediX” project, dedicated to the: “Identification of antimicrobial and anti-virulence compounds from fungal microorganisms using a platform integrating metabolomics and innovative biological assays”.

Introduction

The MycoMediX project, funded by the « Bridge Discovery » program of the Swiss National Science Foundation, is led by a consortium of experts, including the Mycology group of the Agroscope (Sylvain Schnée), the translational microbiology group (Thilo Köhler) and the bioactive natural products research group from the University of Geneva (Jean-Luc Wolfender). This multidisciplinary consortium uses innovative experimental approaches to identify novel anti-infectious compounds targeting three pathogenic bacteria considered as priority organisms for the development of new antibiotics (*Pseudomonas aeruginosa*, *Acinetobacter baumannii* and *Staphylococcus aureus*). The project explores a large collection of genetically characterized fungal strains presenting a still largely under-explored potential of bioactive secondary metabolites. To decipher this potential, the production of metabolites will be stimulated biotically and abiotically. Metabolomic profiling will be carried out in order to evaluate the chemodiversity of fungal extracts and allow the prioritization of active compounds using innovative chemoinformatics tools. Simultaneous innovative screenings further explore alternative antimicrobial strategies (anti-virulence, anti-biofilm and potentiation activities of existing antibiotics), leading potentially to the characterization of natural products with anti-infective properties for possible future developments.

Tasks

- Establishment of taxonomic, biochemical and genomic criteria for the selection of fungal strains with high potential for the production of bioactive metabolites
- Development of techniques for inducing fungal defense mechanisms (OSMAC, elicitor compound, new techniques)
- Management and statistical processing of all data (chemical profiling of fungal extracts, taxonomy of fungal strains, biological activity data)
- Establishment of collaborations with other research groups/institutions with collections of fungal strains of interest (i.e. extremophile species)
- Supervision of a doctoral student already involved in the project

Education/Experience

- PhD in microbiology / bioinformatics / natural product chemistry, ideally with experience in metabolomics (LC-MS)
- Ability to integrate into a multidisciplinary environment (three laboratories in two geographic locations: Agroscope Changins, University of Geneva)
- Rigorous and methodological data management
- Autonomy and sense of innovation

Information on the employer(s)

The Agroscope is the Swiss Confederation's reference center for research in agriculture and food industry and defines the technical and scientific bases for efficient, sustainable and competitive agriculture. Research in the Agroscope Mycology Group focuses on developing reliable diagnostic methods, understanding pathogen-host plant interactions and establishing effective control methods for relevant fungal pathogens. A dynamic fungal library, created in 1994, contains more than 2400 fungal strains from various ecological sources (endophytes and epiphytes of plants, humid environments and composts) and belonging to 700 species reflecting the Swiss biodiversity. This strain collection is accessible to the scientific community via an interactive database, developed at the Agroscope (www.mycoscope.ch). This dynamic and chemically diverse fungal library constitutes an essential reservoir for the identification of novel bioactive compounds. In collaboration with the Phytochemistry and Natural Products research group at UNIGE, chemical profiling methods have been developed to study the fungal metabolome in confrontation with bacteria or other fungi. These have yielded interesting molecules with novel bioactive properties.

The Phytochemistry and Bioactive Natural Products research group (University of Geneva) has a solid background in the isolation and identification of natural products. The laboratory is also recognized for its expertise in establishing new strategies for rapid and rational analyses of bioactive extracts from plants and microorganisms. The inhouse state-of-the-art analytical platform for metabolite profiling and dereplication of crude plant extracts is the basis for all metabolomics studies. The most recent advances include the introduction of UHPLC-HRMS and molecular array for efficient profiling of natural extracts. The recently acquired 600 MHz NMR instrument equipped with a particle detector enables de novo structure analysis of natural products at the microgram scale by in-depth 2D NMR. This state-of-the-art analytical equipment combined with searchable databases provide rapid isolation and identification of bioactive compounds from plants and microorganisms at medium to high throughput capacities.

The Translational Microbiology research group (Faculty of Medicine, University of Geneva) focuses on difficult-to-treat pathogens, with a particular interest in the opportunistic pathogen *Pseudomonas aeruginosa*. Both basic research and applied research projects aim at exploring alternative strategies to conventional antibiotics. These include anti-quorum-sensing compounds, novel antimicrobial peptides as well as bacteriophages to treat multidrug-resistant Gram-negative pathogens. In collaboration with the phytochemistry group, the team developed screens to identify bioactive molecules from plant and fungal extracts with new antibacterial or anti-virulence properties.

We offer a diversified activity in a dynamic work environment as well as in-depth training. We provide a modern research infrastructure with flexible working hours and good social benefits.

Geographic location

1260 Nyon

Salary

According to regulations of the Swiss National Science Foundation

Occupation

100%

Application and contact

Please send your online application file including CV, motivation letter and addresses of two referees through the following website: www.stelle.admin.ch (please select German, French or Italian as your correspondence language, since English is not an official language of Switzerland).

For further information, please contact Prof. Jean-Luc Wolfender (Jean-Luc.Wolfender@unige.ch) or Dr Sylvain Schnée (sylvain.schnee@agroscope.admin.ch) (please do not send applications directly to these email addresses).

Starting date: 01.01.2024 or date to be agreed. The duration of the commitment is limited to 12 months, renewable.