

Two-year Postdoctoral position on fungal bioremediation potential and biotechnological valorization

Research units :

- LEMAR - BIODIMAR
- Laboratoire Universitaire de Biodiversité et Ecologie Microbienne (LUBEM), Université de Bretagne Occidentale (F-29280 Plouzané)

Location : BIODIMAR (Brest-downtown) and LUBEM Plouzané (Brest suburbs)

Context : The funded MicGiver PRCE project (ANR) focuses on exploring the biotechnological potential of fungi for the bioremediation of various emblematic Hazardous and Noxious Substances (HNS), more precisely glyphosate and AMPA (AminoMethyl Phosphonic acid), picric acid and hydrocarbon compounds (waxes and diesel).

Fungi can grow on a vast variety of organic substrates from simple compounds to complex ones, under various cultural conditions. Thanks to their outstanding enzymatic armamentarium, they are notably known as the most effective degraders of recalcitrant organic matter on earth, e.g. lignocellulosic material. During biodegradation processes, fungi can also excrete secondary metabolites such as surfactants. These mycosurfactants have multiple ecophysiological roles including the ability to increase the bioavailability of lipophilic compounds or the degradation of complex macromolecules.

The project will start from a TRL 3 (proof of concept) and will be conducted until industrial maturation (TRL8 to 9) toward a progressive labwork :

- Screening of fungal strain for enzymatic bioassay and mycosurfactant production
- Structural chemistry
- Culture scale-up
- Operational assessment.

In the frame of the 1st Work Package (WP) of the MicGiver project entitled "Screening for biodegradation activities and surfactant production", an extensive screening of a pre-selected collection of 500 fungal isolates, mainly obtained from polluted habitats, will be evaluated by the candidate for their abilities to efficiently degrade HNS and to produce mycosurfactants potentially facilitating/enhancing the biodegradation potential.

This work will also provide crucial data on their functional diversity/ecology and on the strategies used by fungi to grow and thrive in these highly toxic and anthropized environments, probably highlighting unsuspected metabolic pathways and leading to potential high IF publications..

The key tasks are

- To screen 500 fungal isolates for their ability to utilize HNS as carbon sources and produce mycosurfactants using mid/high-throughput approaches
- To optimize culture conditions and screen intracellular content and culture supernatant from fungal strains
- To adapt or elaborate innovative bioassays to screen for fungal enzymatic activities specific to HNS biodegradation.
- To plan experimentations for a complete characterization of fungal new bioactive compounds (i.e. produce and analyze metabarcoding data in a context of bioactive compounds impact evaluation)
- To collaborate across various departments and organizations.
- To communicate effectively with project stakeholders and leadership
- To participate in training and supervision of students.

Qualifications

- Ph.D. in microbiology, biotechnology or a related field
- Demonstrated experience in microbiology, bioassay and metabolomic
- Applicants must have excellent skills in scientific analysis and design, independent working and time management, as well as in oral and written presentation
- Strong team player and capable to work independently
- Proficient verbal/written communication and presentation skills
- Fluent in English, a basic knowledge of French could be helpful but not required

Additional information

Type of contract: Temporary contract (24 months)

Starting date: June 2022

Applications will be considered until April 15th

Monthly gross salary: 2500€

For other information, please contact

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How to apply

To apply for the position, please submit your electronic application by mail to lubem@univ-brest.fr (motivation letter, CV, publication list and contact details of at least two references)