

BryoMolecule PhD stipend in Terpene biochemistry in Liverworts



HR EXCELLENCE IN RESEARCH

Type: PhD – D 412-1 and following of the Research code

3 years

Start of the position 01/09/2024

Affiliation : Laboratoire de Biotechnologies Végétales aux Plantes Aromatiques et Médicinales, Université Jean Monnet (UJM), St. Étienne, France

<https://lbvpm.univ-st-etienne.fr/fr/index.html>

Contact DRH : recrutementsujm@univ-st-etienne.fr

Contact Laboratoire : henrik.toft.simonsen@univ-st-etienne.fr

Application deadline : 5th of May, 2024

Description of the PhD project

The offered PhD stipend is part of the Horizon Europe project Bryomolecules. Bryophytes constitute an underexploited source of a wide range of biologically active compounds with high potential for the bioeconomy sector, like, ingredients of cosmetics/cosmeceuticals and pharmaceuticals. The overall aim of Bryomolecules is to discover new Bioactive compounds to be used in European industries. The aim of the PhD project is to elucidate the biosynthesis of terpenes. Terpenes represent the largest group of natural products but the biosynthesis of both simple terpenes and sesquiterpene lactones are not well described in Bryophytes. In this project we will focus on the two liverwort genera *Frullania* and *Plagiochila*, and several species within. Our aim to elucidate the biosynthesis of several terpenoids, including more complex sesquiterpenoids.

The aim of the thesis, is to explore the biosynthesis of terpenoids in these two genera. The project is part of a larger EU project, Bryomolecules, including co-supervision from Claudio Varotto, The Research and Innovation Centre (CRI) of the Fondazione Edmund Mach, Trento, Italy

The project includes species collection and participation in consortium meetings, apart from the biochemical studies in St. Etienne, along with biotechnological challenges to establish transformation of selected liverworts. The project can be divided into the following milestones

1. Collection and RNA extraction from 10 species, this includes establishment of sterile cultures in *in-vitro* settings.
2. In collaboration other lab members perform *In-planta* biochemical characterization of the terpene synthases in the model moss *Physcomitrium patens* and *Nicotiana benthamiana*.
3. Establish a transformation protocol for *leafy liverworts* and expand this to at least 2 liverworts.

Overall the target is to expand our knowledge of biosynthesis of liverworts terpenoids that are chemically unique when compared to other plants. Link this knowledge to their storage in the lipid droplets in the cells, and the subsequent ecological function.

What are we looking for:

We are looking for you that want to perform research within Plant biochemistry and molecular biology with a strong focus on terpenoid biochemistry. At Jean Monnet University, Saint Étienne, France you will be able to break new grounds within Plant Biochemistry and join a research project that go beyond current knowledge within bryophyte terpenoid biochemistry. Thus, we are looking for a candidate with a strong background and a strong desire to obtain a PhD degree from our laboratory

You will be part of The doctoral School EDSIS, UJM.

The preferred candidate must have a Master of Science (or engineering) degree in Molecular biology and/or Biochemistry or very similar fields, and preferably worked with plant molecular biology. The candidate should have some knowledge of bioinformatics and botany. We expect that the PhD candidate have some knowledge of enzyme characterization, cloning techniques, analytical chemistry, thus any knowledge in this is an advantage.

The candidate must be able to write and speak English at a scientific level, as this is the language of communication in the laboratory. The candidate should be willing to spend 2-3 months during the PhD studies in Trento, Italy, and should also be interested in field work in Massif Central.

We offer:

We offer a creative and stimulating international scientific environment, and access to state-of-the-art technologies. You are part of an international collaboration and thus will expand your network as such. LBVPam is a leading laboratory in plant fragrance biochemistry and is globally recognized for the excellence of our research, education, innovation and scientific advice. We offer a rewarding and challenging job in an international environment. We strive for academic excellence in an environment characterized by collegial respect and personal responsibility.

Main supervisor: Professor Henrik Toft Simonsen, LBVPAM, UJM

CO-supervisor: Claudio Varotto, CRI, Fondazione Edmund Mach

Application

Please sent your application to recrutementsujm@univ-st-etienne.fr before the deadline **5th of May, 2024**, it should include

- Letter of motivation
- CV (including personal information)
- Diploma/transcript of Master degree