Universität für Bodenkultur Wien
University of Natural Resources and Life Sciences, Vienna

Department of Biotechnology
Institute of Bioprocess Sciences and Engineering

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To interested Master students
in Biology, Biotechnology and (Bio)Engineering

Vienna, 2023-05-11

Enzyme production for sustainable biopolymers

Research internship and **Master thesis**
at the **Institute of Bioprocess Sciences and Engineering**
in cooperation with the Institute for Environmental Biotechnology (IFA Tulln)

Dear interested Students,

Abstract: Climate change is challenging our understanding of all sorts of manufacturing, including that of macromolecules and polymers. Replacing petrochemical synthesis by biotechnological production has a great potential to reduce the environmental footprint of manufacturing. A plant enzyme, cutin synthase CD1, can make an important contribution to this effort. The enzyme synthesizes the polyester cutin that covers the aerial epidermis of all land plants as part of the hydrophobic cuticle consisting also of waxes, providing essential protection from desiccation and other stresses. Accordingly, cutin synthase has a high potential to be used in the green synthesis of new synthetic (bio)polymers. Here, we will produce a novel cutin synthase in plants and plant cells, purify the enzyme and subjected it to initial activity testing. And you can be part of this exciting development.

Your tasks:

1. Clone the coding sequence of the enzyme into different expression vectors
2. Express the protein in plants and plant cells
3. Extract and purify the protein to a relevant level facilitating initial activity testing
4. Optional: conduct in initial activity testing at the Institute for Environmental Biotechnology (Tulln)
5. Write a glorious thesis and publication 😊

Duration: The initial internship will take 1-3 months (depending on your availability) and the master thesis will be 6 months. In the course of the project, weekly meetings with your supervisor as well as flexible on-demand meetings and intensive exchange with colleagues will ensure the success of your work.

Requirements: The student successfully applying for this project has good basic knowledge in biotechnology and protein analytics and is keen to gain more insights into innovative plant molecular farming methods in the context of sustainable manufacturing. S/He is skilled in written and spoken English to familiarize herself/himself with the relevant protocols and to fluently communicate within the international environment at IBSE.

Contact: For further questions and applications, please contact Johannes Buyel

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