Universität für Bodenkultur Wien, Gregor-Mendel-Str. 33, 1180 Wien

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

Vienna, 19.08.2025

Title: Optimization of vacuum infiltration in *Nicotiana benthamiana*

Type of work: Research internship and master thesis
Day-to-day supervisor: Andreas Fradinger
Thesis supervisor: Johannes Buyel

Project abstract: The process of agroinfiltration is a widely used tool for transient protein expression in plants like *Nicotiana benthamiana*. It is based on the introduction of the bacterium *Rhizobium radiobacter*, formerly known as *Agrobacterium tumefaciens*, into the plant leaves. In large-scale operations, this is facilitated by the application of vacuum while submerging the plants in a bacterial suspension. In this project at the Institute of Bioprocess Science and Engineering, we are aiming for a better understanding of that process via the use of fluorescent imaging techniques to track bacterial adhesion and protein expression in plant leaves. Furthermore, optimization of the infiltration process will be done, mainly by refining the composition and additives of the bacterial suspension medium.

Tasks:

1. Perform molecular cloning in *Escherichia coli* and *Rhizobium radiobacter*
2. Conduct imaging via fluorescence microscopy of infiltrated *N. benthamiana* leaves
3. Test various compositions of bacterial suspension medium during the agroinfiltration process (e.g. pH-value, type of buffer system, use of wetting agents)
4. Set up an optimized protocol for vacuum infiltration in *N. benthamiana*
5. Write a glorious thesis and publication 😊

Requirements: The student successfully applying for this project has good basic knowledge in (plant) biotechnology and is willing to gain more insights into applied research in a synergistic, interdisciplinary environment. 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.

Duration: The initial internship will take ~8 weeks and the master thesis will be 6 months. During the project, weekly meetings with your supervisor as well as flexible on-demand meetings will ensure the success of your work.

Note: Only students currently enrolled at a university or ERASMUS students are eligible to apply.

Contact: For further questions and applications (including letter of motivation, CV and transcript of records), please contact Johannes Buyel (johannes.buyel@boku.ac.at)

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