

## PhD POSITION (m/f/d) in MOLECULAR CHEMICAL ECOLOGY

### Metabolic and biochemical causes mediating invasiveness of Canadian goldenrod (*Solidago canadensis*)

The Lackus Lab offers a PhD position at the **University of Würzburg (Germany)** in the Department of Pharmaceutical Biology. We are looking for a highly motivated student, preferably with background in biochemistry and molecular biology, with a Master's degree in biochemistry, biology or related disciplines. The applicant should have a strong enthusiasm for research, a strong interest in interdisciplinary collaboration, the ability to work independently, team spirit, and very good English skills. The applicant will be part of a newly established, young, and dynamic research group focusing on the biosynthesis, function, and regulation of specialized metabolites in plants.

**Project description:** Canadian goldenrod (*Solidago canadensis*) is a highly invasive plant in Europe. Several studies have shown that introduced Canadian goldenrod severely alters the ecosystem in invaded habitats by affecting native insect, bird, and plant communities. The invasiveness of Canadian goldenrod is largely attributed to the production of allelochemically active, specialized metabolites. In particular, root exudates of Canadian goldenrod have been shown to reduce growth of neighbouring plants. Although the invasiveness of Canadian goldenrod has been studied in the past, the specialized metabolites that mediate its allelopathic activity and the mode of action that contribute to its invasive nature are still poorly understood. Therefore, the goal of the PhD thesis is to investigate the metabolome of Canadian goldenrod in comparison to native European goldenrod (*S. virgaurea*) using state-of-the-art metabolomic methods. In addition, the PhD student will investigate the effects of invasive and native goldenrod species on neighbouring plants by performing metabolomic and transcriptomic analyses. Moreover, the PhD student will perform multiple analyses to identify candidate genes involved in the formation of allelochemicals, heterologously express and enzymatically characterize the respective candidates.

**Methods:** metabolomic analyses; RNAseq; qPCR; compound purification; cloning; heterologous expression (e.g. *Escherichia coli*); protein purification; enzymatic characterization;

**Selected References:** Morón *et al.* 2009; Morón *et al.* 2019; Wang *et al.* 2019; Wei *et al.* 2020; Abhilasha *et al.* 2008; Lackus *et al.* 2021; Lackus *et al.* 2020;

The Julius-von-Sachs Institute for Plant Science offers an excellent, multi-disciplinary research environment applying state-of-the-art techniques in molecular biology, plant physiology, analytical chemistry, biochemistry and eco-physiology. The successful candidate will benefit from a structured PhD education due to participation in the Graduate School of Life Sciences (GSLs), Würzburg. The University of Würzburg is an equal opportunity employer. As such, we explicitly encourage applications from qualified women. Severely handicapped applicants will be given preferential consideration when equally qualified. Payment as a research assistant according to TV-L.

Please, submit your complete application as **one composite PDF** file including a statement of motivation, a Curriculum vitae and two references to Jun.-Prof. Dr. Nathalie Lackus (nathalie.lackus@uni-wuerzburg.de). The position is available immediately and applications will be accepted until the position is filled.