

PhD and Post-doc Positions in Chemical Ecology

We are currently seeking a motivated PhD Student and a Post-Doctoral researcher to work on an ERC-funded project on plant defense modulation by the natural enemies of herbivores. The research will be conducted at the Institute of Plant Sciences, University of Bern, Switzerland.

Project description:

Multitrophic interactions between plants, herbivores and herbivore natural enemies are essential determinants of (agro)ecosystem processes. Recently, it became evident, that plants can perceive and respond directly to the presence of herbivore natural enemies. However, the underlying mechanisms and ecological relevance remain unclear. The ERC project, PRENEMA, will integrate the plant responses to members of the third trophic level as a novel infochemical pathway in the chemical ecology of tritrophic interactions. The selected PhD student and Post-Doctoral researcher will work together to address the following questions:

1. Do plants respond specifically to the third trophic level? To what extent plant responses to members of the third trophic level are specific is currently unclear. Systematic experiments are needed to evaluate the specificity of plant responses to the third trophic level as an important component of our general understanding of this phenomenon.

2. Which cues trigger plant responses to the third trophic level? A set of conserved nematode signalling molecules, so-called ascarosides, can trigger systemic plant defence responses, but whether they are implicated in specific, local defense responses to EPNs is unknown. As we currently lack a basic understanding of the nature of the chemical cues from natural enemies of herbivores that trigger specific plant responses, identifying the responsible molecular patterns would represent a major breakthrough.

3. Is this infochemical pathway relevant in nature? The impact of the third trophic level on plant interactions with higher trophic levels may differ under laboratory and field conditions. Testing for the occurrence and impact of this phenomenon under field conditions is crucial to assess the agricultural and potential ecological relevance of the phenomenon.

The project will use a tritrophic system involving maize plants, the root herbivore *Diabrotica balteata*, and the entomopathogenic nematode *Heterorhabditis bacteriophora* as natural enemy.

About us:

The group of Chemical Ecology is a small, but dynamic, team, consisting of motivated scientists with different backgrounds. The aim of the group is to identify new infochemical pathways that shape interactions between different trophic levels. The ultimate goal of our research is to provide knowledge to tackle societal challenges such as food production, climate change and human health. We value interdisciplinarity, challenging research questions, career planning, and open mindedness.

Requirements:

Applicants are required to have experience in either Molecular Biology, Biochemistry, or Plant Physiology. They are expected to have an interest in conducting interdisciplinary research. A previous experience in one (or several) of the following would be an advantage: biological activity-guided fractionation, HAMP/MAMP receptor identification, transcriptomics, metabolomics or calcium signalling measurements. Applicants should possess good English skills.

Application Process:

The position is open from May 2021. If interested, send a letter of motivation (max. 2 pages) describing previous experience and how it would benefit the current project, a CV including publications, names and contact information for two references. The application documents should be sent as a single pdf to Christelle.robert@ips.unibe.ch until April 15h. Please reference PhD1_PRENEMA or PostDoc1_PRENEMA in the subject line.