

The department of Molecular Ecology at the Max Planck Institute for Chemical Ecology invites applications for a PhD fellowship in the project "**Metabolomics of *Nicotiana attenuata*'s ecological interactions**".

Project description: Our group uses a combination of metabolomics, transcriptomics and reverse genetics approaches to investigate gene-to-metabolite networks that allow plants to survive the attack of different insects in nature. The model plant we investigate, *Nicotiana attenuata*, is a wild tobacco species native from the Great Basin Desert in the USA. This pioneering plant germinates in post-fire habitat and as a consequence represents one of the essential nutritional sources for insect herbivores which re-colonize the ecosystem after fires. Using mass spectrometry-based metabolomics, we have gained a vast knowledge on the regulation of the plant herbivory-regulated metabolome¹ (HRM, which includes among others, compounds from the alkaloid, diterpene glycoside², phenolamide³, sucrose ester⁴, flavonoid glycosides classes). We are now investigating the biochemical and ecological aspects relative to this HRM. This implies: (i) the structural characterization of relevant individuals of the HRM, (ii) the generation of an in-house MS/MS library of *N. attenuata* for relevant ions across tissue types, (iii) and the bioinformatics analysis of gene-to-metabolite networks to assist in the pathway annotation process. We plan to investigate two fundamental ecological questions as proof of concepts and for the validation of these tools: the divergent HRM patterns elicited over-time by specialized and generalist herbivores and the variations of the HRM within a native and genetically diverse populations, as well as recombinant inbred lines (RILs).

We look for a highly motivated M. Sc. student who has a strong background in analytical chemistry and biochemistry. Knowledge or strong interest in computer science work would be a plus but is not required. Highly motivated students with solid training in other areas of plant biology are also encouraged to apply, particularly genetics. Our group possesses state-of-the art analytical equipments and offers an excellent research environment with enthusiastic scientists from different nationalities in the Department of Molecular Ecology (director: Prof. Ian T. Baldwin) at the Max Planck Institute for Chemical Ecology in Jena, Germany. Successful candidates will receive a PhD fellowship. The positions will be available from beginning 2012.

Please send your application including the usual supporting documents (CV, list of qualifications and research interests, names and e-mail addresses of 2 references who have first-hand knowledge of your research skills) by e-mail to egaquerel [at] ice.mpg.de.

[Dr. Emmanuel Gaquerel](#)

Max Planck Institute for Chemical Ecology

Department of Molecular Ecology

[Metabolomics Project Group](#)

Hans-Knöll-Str. 8

07745 Jena

1. Gaquerel, E. et al. *Journal of Agricultural and Food Chemistry* 58, 9418-9427 (2010).
2. Heiling, S. et al. *The Plant Cell* 22, 273-292 (2010).
3. Onkokesung et al. *Plant Physiology*, in press (2011)
4. Weinhold, A. & Baldwin, I.T. *Proceedings of the National Academy of Sciences of the United States of America* 108, 7855-7859 (2011).