

PhD position in the lab of Notburga Gierlinger

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Heat adaptation of plant cuticles on the micro- and nanoscale

Heatwaves have more than tripled and usually combine with drought. Under heat, stomata act at the leeway between cooling and critical water loss. Once they close, cooling ceases, leaf overheating boosts transpiration and water loss across cuticles becomes decisive. Little is known about the structural basis of cuticular transpiration and how it is affected by various heat doses. To close these knowledge gaps plants experiencing different heat doses (intensity x duration) in temperate alpine vs. tropical habitats will be compared in the FWF funded project (34717-B) "Plant water use under heat". In this project the Phd position will be embedded and co-supervised by Gilbert Neuner (University of Innsbruck), who is the project leader.

The Phd student will research the structure and chemistry of the cuticle on the micro and nanoscale. A combined Raman and Atomic force microscope will enable to reveal the microchemistry, nanostructure and nanomechanics of the cuticle on microsections. Additionally, in-situ studies to follow molecular and structural changes under the microscope during heat exposure will be tackled. Data analysis approaches will include multivariate methods, like spectral unmixing algorithm (e.g. non-negative matrix factorization).

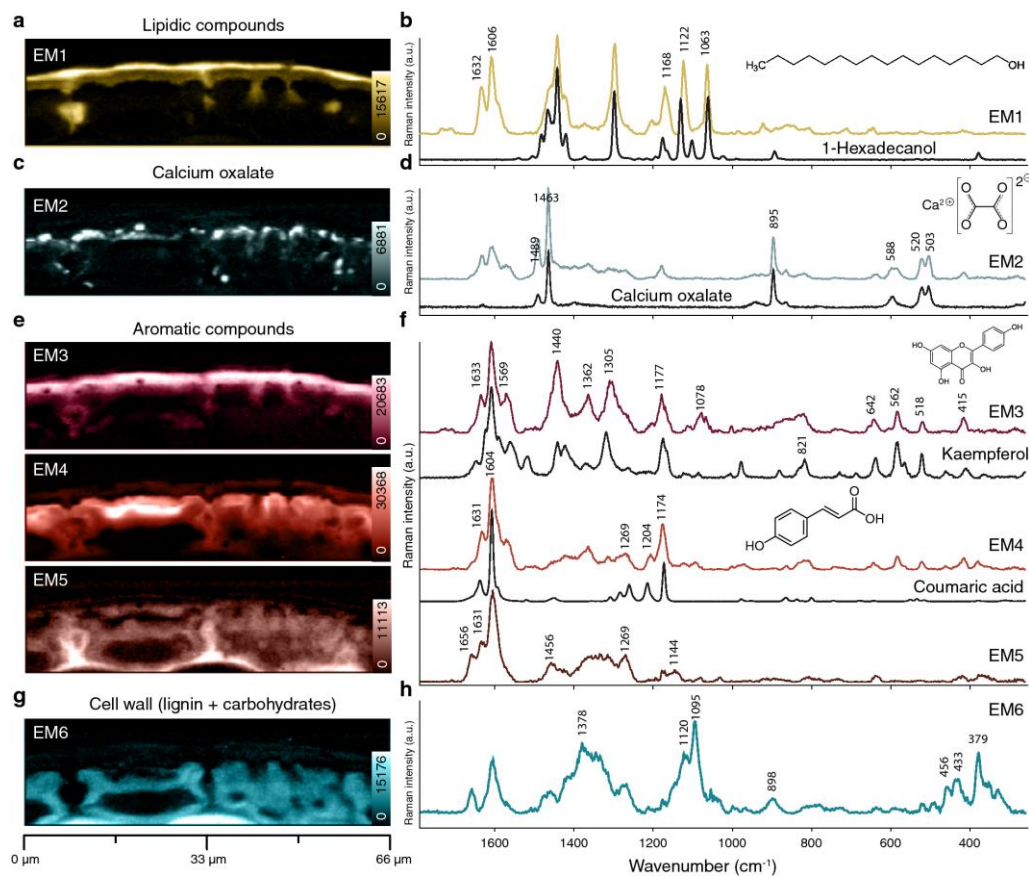


Figure 1 Non-negative matrix factorization analysis of the cuticle of Norway spruce. [Details see: Sasani, N; Bock, P; Felhofer, M; Gierlinger, N (2021) Raman imaging reveals in-situ microchemistry of cuticle and epidermis of spruce needles. *Plant Methods* 17(1): 17. DOI: [10.1186/s13007-021-00717-6](https://doi.org/10.1186/s13007-021-00717-6)]

Desired qualification

- Master's degree in biophysics, biochemistry, biology, material science or related discipline (or equivalent)
- Applicants are expected to have
 - a very strong research motivation and interest in biophysical methods (Raman microscopy and Atomic force microscopy) as well as plant stress responses
 - experience with data handling and statistical data analysis
 - microscopic and spectroscopic experience is preferred
 - good communication skills, fluent in English
 - excellent writing skills proven by an excellent Master thesis
 - motivation to publish the results in scientific journals

What is offered

Three year's contract - earliest starting date 1.11.2021. The salary is the standard salary for a PhD position as of the FWF.

The position offers the possibility for scientific qualification required for a dissertation. Application for membership in the doctoral school "Build like nature: Resilient Buildings, Materials and Society (Build.Nature, <https://boku.ac.at/docservice/doktoratsstudien/doktoratsschulen/build-like-nature-resilient-buildings-materials-and-society-buildnature>).

Application

Your application should consist of a motivation letter, a CV, academic transcripts (non-official copies are acceptable), and contact details of at least one academic references.

Please send your application including supporting documents mentioned above by 31.09.2021 at the latest as a single PDF by email burgi.gierlinger@boku.ac.at to the following address:

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