Bachmair lab

Master position in plant molecular biology

Introduction

A Master Thesis position is available in the Bachmair group at the Max Perutz Labs, starting February 2025.
Focus of the Bachmair lab lies on the biochemical and cell biological analysis of protein turnover driven by amino-terminal degradation signals. Protein turnover pathways are important for plant responses to environmental stimuli such as heat, flooding, or salt stress. Additional information can be found on the Bachmair lab web page.

Master Thesis topics and about the position

Investigation of plant ubiquitin ligases via model substrates – expression vectors for novel types of reporters, tandem fluorescent timer (tFT) proteins, shall be constructed. The tFT reporter proteins serve to investigate tissue-specific turnover and subcellular localization of metabolically unstable proteins in plants (test by transient expression in tobacco leaves, then stable expression in Arabidopsis).

Investigation of plant ubiquitin ligases via proximity labeling – the putative plant ubiquitin ligase BIG is a protein larger than 500 kDa, and while many phenotypes have been identified in mutant plants, the molecular functions are poorly understood. A fusion of the BIG gene with the in vivo biotinylation enzyme Turbo-ID shall be made via a novel cloning approach and expressed in Arabidopsis to identify proteins that associate with BIG in the plant.

Requirements: Finished study (B. Sc.) in Molecular Biology, Biochemistry or related, 45 ECTS accomplished in the Master module
Duration: max. 12 months
Payment: according to FWF rates

Contact

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https://www.maxperutzlabs.ac.at/research/research-groups/bachmair

Recent publications

Zhang, H., Rundle, C., Winter, N., Miricescu, A., Mooney, B. C., Bachmair, A., Graciet, E., Theodoulou, F. L. (2024)
BIG enhances Arg/N-degron pathway-mediated protein degradation to regulate Arabidopsis hypoxia responses and suberin deposition.
Plant Cell 36, 3177-3200. DOI: 10.1093/plcell/koae117. PMID: 38608155

Böhm, J., Winter, N., Kozlic, A., Telser, T., Nehlin, L., Bachmair, A. (2023)
Analysis of higher plant N-degron pathway components and substrates via expression in S. cerevisiae.
In: Meth Enzymol 686, 221-233. DOI: 10.1016/bs.mie.2023.02.006. PMID: 37532401.

Kozlic, A., Winter, N., Telser, T., Reimann, J., Rose, K., Nehlin, L., Berckhan, S., Sharma, G., Dambire, C., Boeckx, T., Holdsworth, M. J., Bachmair, A. (2022)
A yeast-based functional assay to study plant N-degron – N- recognin interactions.
Front Plant Sci 12, 806129. DOI: 10.3389/fpls.2021.806129. PMID: 35069663

Millar, A. H., Heazlewood, J. L., Giglione, C., Holdsworth, M. J., Bachmair, A., Schulze, W. X. (2019)
The scope, functions, and dynamics of posttranslational protein modifications.
Annu Rev Plant Biol 70, 119-151. DOI: 10.1146/annurev-arplant-050718-100211. PMID: 30786234

About the Max Perutz Labs

The Max Perutz Labs are a research institute established by the University of Vienna and the Medical University of Vienna to provide an environment for excellent, internationally recognized research and education in the field of Molecular Biology. Dedicated to a mechanistic understanding of fundamental biomedical processes, scientists at the Max Perutz Labs aim to link breakthroughs in basic research to advances in human health. The Max Perutz Labs are located at the Vienna BioCenter, one of Europe's hotspots for Life Sciences, and host 43 research groups, involving around 450 scientists and staff from more than 50 nations.

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