

ERC-funded PhD position:

Unraveling the role of rapid auxin responses in the morphogenesis of above-ground Arabidopsis body

Research group: Plant Morphodynamics [lab](#), [IEB](#) Prague, Czechia

PI: Matyas Fendrych ([profile](#))



Project summary

The phytohormone auxin triggers rapid cellular responses in various species and organs, such as Arabidopsis roots or tobacco cell cultures. Calcium (Ca) influx is a hallmark of these responses. The natural auxin IAA triggers calcium influx not only in the root, but also in Arabidopsis hypocotyl. The role of Ca signaling in various biotic and abiotic stresses has been characterized extensively, however, the relevance of auxin-induced Ca responses outside of roots has received little attention. Cell wall mechanics, Ca spiking, auxin transport, and auxin response are interdependent during morphogenesis. We have previously shown that the AFB1 receptor drives auxin-induced Ca influx and early gravitropism in Arabidopsis roots, and it functions as a negative regulator of lateral root emergence. However, the AFB1 receptor is also expressed in above-ground parts of Arabidopsis where it localizes primarily to cytoplasm, and the other AFB1 paralogs also show a partially cytoplasmic localization.

The aim of this thesis is to clarify the role the cytoplasmic auxin signaling pathway in the morphogenesis of above-ground Arabidopsis body and to dissect which of the known auxin receptors control rapid auxin responses in the above-ground tissues.

Methodologically, the project will involve advanced live cell imaging approaches, benefiting from the specialized microscopy available in the IEB. Specifically, the focus will be on the development of shoot apical meristem, hypocotyls and the patterning of leaf epidermal cells. The auxin signaling cascade in the above-ground body will be analyzed using protein-discovery and -omics approaches.

About the lab and IEB institute

The team of Matyáš Fendrych (<https://pm.ueb.cas.cz>) is a group of enthusiasts who focus on the dynamics of morphogenesis in plants. We combine advanced microscopy methods with molecular biological tools to grasp the molecular processes that steer plant development.

The Institute of Experimental Botany (<http://www.ueb.cas.cz>) is a leading institution in plant molecular, cellular and developmental biology with an exceptional in-house imaging facility (<http://www.ueb.cas.cz/en/if/equipment>).

Profile of the candidate

- Master's degree in biology, Biochemistry, Biotechnology, or equivalent.
- Skills/experience or interest in either of the following: a) (plant) protein biochemistry; b) live-cell imaging, image analysis, microscopy; c) developmental biology, physiology
- excellent English communication skills

We offer

- A 4-year PhD position in a PhD program at the [Faculty](#) of Science, Charles University, Prague
- An exciting project incorporated into a prestigious MORpH ERC CoG project that will use a combination of cutting edge biochemical and image analysis methods.
- Young dynamic research team and intensive interaction with both the team members and the PI.
- A multidisciplinary and highly stimulating and supporting research environment and access to state-of-the-art tools and imaging infrastructure.
- Support in career development and growth towards independence.
- A beautiful and safe city of Prague.

How to apply?

Send one PDF document with the following information to fendrych.m@ueb.cas.cz **before 15. 4. 2025**

A 1–page summary of your motivation for the position, and your research experiences

Detailed CV

Contact information of 2-3 referees

The first review of applications will start immediately. A shortlist of applicants will be selected and invited for interviews. The **starting date is October 2025**. For further questions, contact Matyáš Fendrych (fendrych.m@ueb.cas.cz).