

ERC-funded PhD position:

Identification of molecular mechanisms downstream of auxin signaling that control morphogenesis in plants

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

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



Project summary

The phytohormone auxin plays key roles in the life of a plant – from coordinating the development to adaptation to the environment. One signaling molecule – auxin – initiates a plethora of responses and processes such as definition of primordia in shoot apical meristems, selecting the site of organogenesis in lateral root primordia, specification of stem cell niche in roots, directional growth towards light and against gravity in shoots and following gravity in roots. In majority of these processes, the TIR1/AFB receptor system is responsible for sensing auxin and relaying the signal to the downstream cellular responses.

Classically, the TIR1/AFB controls the transcriptional landscape of cells. Recently, it was shown that TIR1/AFB signaling involves the action of cyclic nucleotides as second messengers. The Fendrych team has pioneered research in the non-transcriptional responses to auxin mediated by the TIR1/AFB receptors, showing that auxin triggers ultra-rapid cellular processes such as calcium signaling and changes in ion fluxes across the plasma membrane of cells.

The central topic of this thesis is the question of how plant cells decode and interpret the auxin input and what are the mechanisms that execute the contrasting auxin responses. In particular, the focus will lie on the ultra rapid auxin response and what role it plays in the development and morphogenesis of plants. Finally, the thesis will address how the rapid auxin response impacts plant fitness its and ability to respond to environmental challenges.

Methodologically, the work will include molecular methods – preparation of constructs for plant transformation, discovering protein-protein interactions using proximity labeling, reverse genetics - preparation of mutants by CRISPR/Cas9 systems, phenotypic analysis of mutants using mainly advanced microscopy and live cell imaging techniques.

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 (<https://ueb.cas.cz/en/index.html>) is a leading institution in plant molecular, cellular and developmental biology with and exceptional in-house imaging facility (<https://ueb.cas.cz/en/research/Core-labs/Imaging-Facility/basic-information/>).

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 10. 4. 2026**

- A 1–page summary of your motivation for the position, and your research experiences
- Detailed CV
- Contact information of 2-3 referees

Important: Please attach a single PDF and use the subject: "[your name] PhD position".

The first review of applications will start immediately. A shortlist of applicants will be selected and invited for interviews. The **starting date is October 2026**. For further questions, contact Matyáš Fendrych (fendrych.m@ueb.cas.cz).