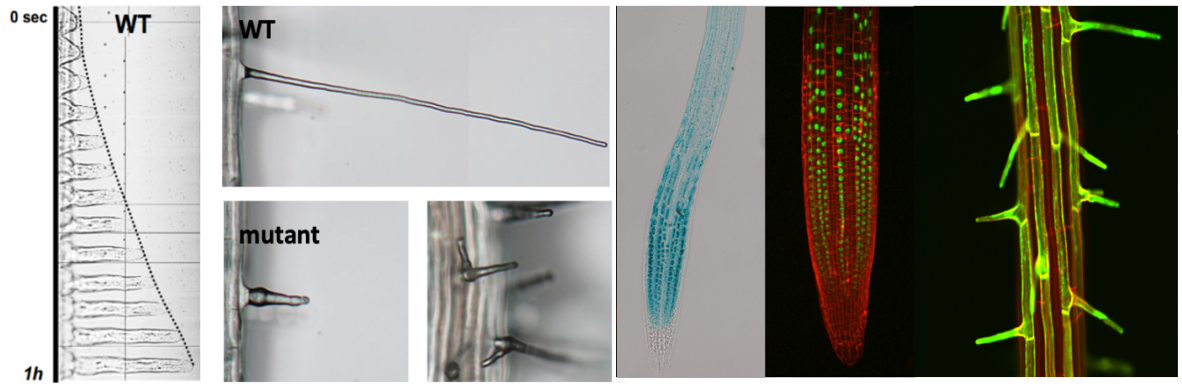
# EXPANDING THE CORE PLANT CELL GROWTH PATHWAY

Crop yield and global food security depend on plant growth. Plant growth itself is the result of individual cell growth, a complex process which depends on a series of interconnected pathways. Understanding these pathways is absolutely crucial to create the next generation of climate-resilient crops.
In our lab, we discovered a pathway which is key to plant cell growth. At the core of this pathway lie 4 proteins (FERONIA, RALF22, LLG1 and LRX1), which together allow the plant cell to expand. Cells lacking one or more of these proteins show irregular growth and frequently burst.
Crucially, most cells express not one but multiple family members of these proteins. Understanding the functional relevance and interdependency of these proteins for regulating cell growth is one of the next frontiers in plant growth research.

**During your thesis, you will determine which of these proteins interact with one another *in planta* and which RALF amino acids are crucial to mediate the interactions that regulate cell growth, using root hair elongation as a model.**
You will learn and combine a variety of molecular biological techniques such as DNA cloning (GateWay, GoldenGate), molecular modelling, interaction assays (Split-Luc) and advanced fluorescence microscopy coupled to microfluidics. You will benefit from a stimulating and friendly environment where you will receive continuous constructive mentoring and, like in all our projects, you will take active part in ongoing state-of-the-art research. Combined, your results will lead to important new insights into how plant growth is regulated at the molecular level.




**Methods:**
- modelling of protein-protein interactions using Alphafold3, and interaction validation using e.g. Split-Luc
- Molecular biology/Gateway or GoldenGate cloning/transformation of bacteria and plants
- Identification and characterization of new genetically modified plants
- *In vitro* plant culture
- Advanced live-cell fluorescence microscopy

**References:**

- Schoenaers et al. Nat Plants 2024 (doi: 10.1038/s41477-024-01637-8)
- Sarrion-Perdigones et al. PLoS One 2011 (doi : 10.1371/journal.pone.0021622)



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