

UE Introduction to Plant development and Signaling

 ECTS
6 credits

- > **Teaching language(s):** English
- > **Open to exchange students:** No

Presentation

Description

Course outline

Lectures (17)

- Approaches and tools to study plant development and signalling
- Gametogenesis, Fertilization and Self-Incompatibility
- Early embryogenesis: establishment of the apico-basal axis
- Late embryogenesis: ABA, desiccation tolerance and dormancy
- Function of the Meristems
 - Root Apical Meristem
 - Shoot Apical Meristem and Cambium
 - Floral Meristem and the basics of flower morphogenesis
- Phyllotaxis and organ growth (auxins, CKs, GAs, Ethylene...)
- Flowering transition (vernalisation, photoperiod, autonomous pathway)
- Photo/Skotosignaling and morphogenesis
- Retrograde signalling and plant development

- Photo perception and photosynthesis (Phototropins)
- Abiotic stress responses (nutrients, genotoxic agents, phytoremediation)

Methodology Tutorials (4,5)

During 3 TD sessions, we will review, several approaches, methodologies and tool that are used to answer questions in plant development and signalling: (1) Molecular cloning for sub-cellular visualization of a protein of interest; (2) Analysis of a transcription factor activity, (3) Analysis of protein-protein interactions. In these sessions, we will both summarize the principle behind each method and then analyse experimental datasets generated by these methods.

Tutorials + Discussions (11,5)

Individual students present a subject based on the study of article(s), on one of the topics developed in the lectures. Ahead of the presentation, a tutorial slot of 20min will be dedicated for consultation between each presenting student and his/her professor. A group of 2-3 students will also work together on the article(s) in order to prepare questions for the presenting student, and will give feedback on the answers. There will be 2 presentations by discussion session of 1h30.

Workshops during lab visit (5)

We will visit the LPCV lab in which workshops will be organised to illustrate real research life in the lab, including developmental phenotyping in Arabidopsis, confocal imaging or fluorescent markers *in planta*, light chromato-sensing in algae.

Course parts

UE Introduction to Plant development and Signaling - CM	Lectures (CM)	25,5h
UE Introduction to Plant development and Signaling - TD	Tutorials (TD)	23h

Recommended prerequisites

Pre-requisites:

- Knowing the bases of cell biology, gene regulation, and plant physiology.
- Knowing how to grasp a scientific question; to present research results in light of announced objectives; to bring a critical view on experimental results and to propose further experiments.

Skills

- Targeted skills:

- Searching, in a set of primary articles, for key/pertinent elements that inform on advances in a precise scientific field
- Working autonomously and in collaborative groups and networks
- Evaluating peers on an oral presentation

Skills to be developed both in oral and written exercises:

- Putting a scientific question in the context of the state-of-the-art
- Analysing and presenting a scientific dataset made of experimental results
- Understanding the experimental protocol behind a result, a methodology
- Proposing an approach and methodologies to answer to a scientific question

Useful info

Contacts

Program director

Christel Carles

✉ Christel.Carles@univ-grenoble-alpes.fr

Program director

Gabrielle Tichtinsky

✉ Gabrielle.Tichtinsky@univ-grenoble-alpes.fr

Campus

› [Grenoble - University campus](#)