UE Strategies in experimental biology

ECTS
12 crédits

Composante
UFR Chimie-Biologie

Période de l'année
Toute l'année

Langue(s) d'enseignement: Anglais

Ouvert aux étudiants en échange: Oui

Présentation

Description

The aim of this course is to introduce students to the design and the completion of a scientific project. The course takes the form of a tutored experimental project, in the scientific context of the response of photosynthetic organisms to environmental constraints. During this course, students will gain expertise on the main experimental techniques used in plant science. They will also develop their skills in collaborative work.

Plant responses to environmental stresses will be studied at the molecular level (signaling cascade, hormonal and physiological responses) in two plant models, the angiosperm *Arabidopsis thaliana* and the micro-alga *Chlamydomonas reinhardtii*. The students will take advantage of mutants to decipher biological and physiological responses to stresses. For this, they will employ plant physiology (photosynthesis studies, phenotypic analysis, hormone regulation) and molecular genetic approaches (effect of loss or gain of function on gene expression, protein accumulation…). They will also gain expertise in *in vitro* culture and general biology techniques (microscopy, western blot, RT-PCR). The conditions of a fluctuating environment, (light, temperature, hydric or nutritional stresses) will be simulated experimentally.

Teaching activities include:

- tutorials on methodological aspects of project design and data analysis.
- work sessions in small groups, guided by the teachers, to support the design of the project and the analysis of the data.
- a practical work session on a dedicated platform to carry out the planned experiments.

TD#1: Journal club
TD#2: Methods to analyze molecular expression of nucleic acids and proteins
TD#3: Photosynthesis measurements

TD#4: RStudio as a tool to represent and analyze data

Heures d'enseignement

TD	TD	15h
TP	TP	70h

Pré-requis recommandés

- Basic knowledge in cellular biology, molecular biology, biochemistry and plantphysiology (bachelor in Life sciences level);
- Notions of statistics, if possible, in the context of R and R studio
- English level B2 (the course is totally taught in English)

Période : Semestre 7

Compétences visées

The teaching objectives of the course fit in perfectly with the RNCP skills described for the Master's degree in Plant Biology: in particular,
- Study and management of complex and unpredictable contexts, requiring the implementation of new strategic approaches,
- Project management, and the ability to take responsibility for contributing to a team's knowledge and professional practices
- Scientific communication in English

Infos pratiques

Contacts

Responsables pédagogiques

Florence Courtois
Florence.courtois@univ-grenoble-alpes.fr

Lieu(x) ville

Grenoble

Campus

Grenoble - Domaine universitaire