PAB4102

Plant Genetics & Systems Biology

Module Description:

This Module provides advanced training in plant molecular genetics and systems biology. Fundamental aspects covered including nuclear and extranuclear inheritance, meiosis, genomes and comparative genetics, organellar genetics, epigenetics, transposons, cell and tissue biology, plant developmental and reproductive genetics, plant cell wall, plant model organisms, genetic and metabolic engineering, chromosomes & polyploidy, synthetic biology, and systems biology.

Learning Outcomes:

- LO1 Have developed a solid understanding of plant genetics and systems biology.
- LO2 Understand relationships between genes, genomes, genotypes, phenotypes and environmental interactions in the context of plant biology.
- LO3 Describe the developmental biology and genetics of key organs that define a plant.
- LO4 Define what is meant by a metabolic pathway or network and the factors that can influence the functioning of metabolism in plants.
- LO5 Have an appreciation of basic principles and techniques of genetic modifications, systems biology and synthetic biology.
- LO6 Explain the relationship between genetics and epigenetics, in the context of fundamental and applied plant biology.
- LO7 Have developed a capability to read, interpret and discuss the evidence presented in reviews and primary research papers.

Coordinator: Ronan Sulpice

Lecturers: Sara Farrona, Ronan Sulpice,

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Ronan Sulpice

Interests: plant systems biology, algae, biomass, plant breeding, metabolism.

https://sulpice-lab.com/

Sara Farrona

Interests: plant development and adaptation, epigenetics, chromatin.

http://www.farronalab.org/

Students' Testimonials

I enjoyed learning vastly different areas of different plant systems.

I enjoyed the module because it provided engaging and interactive learning experiences. I appreciated being able to actively participate in discussions, which made the learning process enjoyable and memorable for me..

Going over past exam questions was very useful and I thought overall the lectures were well explained sufficient support was provided regarding any questions about the material and the exam.

Lecture Topics

1. Genetics, Genomics & Applied Genetics
2. Regulation of Gene Expression by Chromatin & Epigenetics
3. Plant Metabolism
4. Heterosis
5. Genetic Mapping
6. Leaf development
7. Circadian clock

Module Assessment:

The assessment of this modules is based on **an exam (70%) and continuous assessment (CA – 30%).**

CA: The student will make a presentation on 1 concept present in the learning outcomes. The presentation will be 10 mins with 5 mins questions and will have to be developed for a non-scientific audience. A major part of the evaluation will be about judging the capacity of the student to explain scientific terms/concepts to a naive audience. Other students in attendance will be requested to act as a non scientific public