

LF248-15 Plant Molecular Development

23/24

Department

Life Sciences

Level

Undergraduate Level 2

Module leader

Isabelle Carre

Credit value

15

Module duration

5 weeks

Assessment

Multiple

Study location

University of Warwick main campus, Coventry

Description

Introductory description

This module provides a broad introduction to the molecular genetic analysis of plant development and leads to a discussion of potential implications for food security and a more sustainable agriculture.

Module aims

This new, single term module will be introduced in order to offer an additional term 1 option for GSD students.

This module corresponds to part A of the LF217 module (Multicellular System). This in effect reinstates the discontinued BS248 module.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

1-2. The Plant Cell I and II (LF)

1. Establishment of the embryonic body plan (IC)
2. Meristems and their maintenance (IC)

5-6. Plant hormones. Auxin and its role in shaping plant growth (IC)

1. Light responses and photomorphogenesis (IC)
2. Photoreceptors and downstream signalling pathways (IC)
3. The life cycle of higher plants. Plant gametes and fertilization (JFG-M)
4. Seed development. Role of maternal tissue (JFG-M)
5. Control of germination and seedling establishment (JFG-M)
6. Sensing and responding to the environment in roots (MLG)
7. Symbiotic nitrogen fixation (MLG)
8. How plants cope with a stressful and changing environment (MLG)
9. Plants under attack: defense against pathogens (MLG)

Learning outcomes

By the end of the module, students should be able to:

- Level 5 understanding of the key aspects of plant development
- Level 5 understanding of how plant development is impacted by environmental signals (light, temperature, drought and nutrient availability)
- Level 5 understanding of mechanistic plant pathogens
- Level 5 understanding of the potential strategies to generate more resilient and more productive crops

Indicative reading list

"Plant Biology". Smith et al. (2009) Garland Science. ISBN 978-0-8153-4025-6
Taiz and Zeiger, Plant Physiology, 5th edn. (Sinauer Associates, 2010)

Subject specific skills

Outline the key differences between plant and animal development

Explain the mechanisms underlying pattern formation and tissue differentiation during development

Discuss the roles of different plant hormones and their mechanisms of action.

Describe how plants alter their development in response to environmental signals and explain the underlying mechanisms.

Transferable skills

Self directed learning, group learning, adult learning, technology enhanced learning, quantitative skills.

Study

Study time

Type	Required
Lectures	15 sessions of 1 hour (10%)
Practical classes	3 sessions of 6 hours (12%)
Private study	117 hours (78%)
Total	150 hours

Private study description

Self directed learning and revision for end of year exam

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group D

	Weighting	Study time
In Module Laboratory	30%	30 hours
In-module laboratory that assesses the expression and function of Auxin protein		
Online Examination	70%	45 hours
45 min short answer paper / 45 min essay paper		

- Online examination: No Answerbook required

Assessment group R

	Weighting	Study time
In-person Examination - Resit	100%	
45 min SAQ paper / 45 min essay paper		

- Answerbook Green (8 page)

Feedback on assessment

Model answers will be provided via Moodle.

[Past exam papers for LF248](#)

Availability

Courses

This module is Core for:

- UBSA-3 Undergraduate Biological Sciences
 - Year 2 of C100 Biological Sciences
 - Year 2 of C100 Biological Sciences
- Year 2 of ULFA-C1A1 Undergraduate Biological Sciences (MBio)
- Year 2 of ULFA-C113 Undergraduate Biological Sciences (with Placement Year)
- Year 2 of ULFA-C1A5 Undergraduate Biological Sciences with Industrial Placement (MBio)
- Year 2 of UIPA-C1L8 Undergraduate Life Sciences and Global Sustainable Development

This module is Core optional for:

- UIPA-C1L8 Undergraduate Life Sciences and Global Sustainable Development
 - Year 2 of C1L8 Life Sciences and Global Sustainable Development
 - Year 2 of C1LB Life Sciences and Global Sustainable Development: Ecology

This module is Optional for:

- Year 2 of UMDA-CF10 Undergraduate Integrated Natural Sciences (MSci)