

Module code

SPB-3414

Type of module

Undergraduate: Biological Sciences – Elective

Molecular Plant Biology and Biochemistry



Modular credits

4

Total student engagement

56 hours

Prerequisite

SPB-2202 (Cells, Biomolecules and Microbiology) SPB-2204 (Genetics) SPB-2208 (Principles of Biochemistry)

Anti-requisite

None

Aims

To explore plant cell physiology, molecular signalling, and immunity, with applications in plant breeding. To apply classical and molecular genetics to address biological questions. To develop critical thinking and research skills by analysing literature relevant to agricultural science.

Module learning outcomes (MLO)

On successful completion of this module, a student will be expected to be able to:

MLO 1

Analyse key molecular processes in plant cell signalling, stress responses, and immunity, and their relevance to breeding strategies.

MLO 2

Evaluate the mechanisms of signal perception, transduction, and integration under biotic and abiotic stresses.

MLO 3

Apply classical, molecular, and breeding approaches to investigate plant physiology and defence mechanisms.

MLO 4

Critically evaluate primary literature and experimental approaches in plant genomics, stress biology, and crop improvement.

MLO 5

Design research strategies, perform relevant techniques, and analyse data to address questions in plant signalling, stress adaptation, immunity and breeding.

Module contents

Signal perception, transduction and integration

Senescence and programmed cell death

Pathogens, pests, and disease

Immunity and defence

Abiotic stress response

Plant genomic tools and techniques

Assessment

50%

Examination

50%

Coursework

Examination
50%

10%

Laboratory reports
30%

■ Examination — 50%

■ Tutorial assignments — 5%

■ Presentation/debate — 10%

■ Laboratory reports — 30%

■ Class test — 5%

Formative assessment

Weekly discussion and feedback

Summative assessment

COMPONENT

WEIGHTING

Examination

50%

Coursework

50%

Individual

50%

Tutorial assignments

5%

Presentation/debate

10%

Laboratory reports

30%

Class test

5%

Graduate attributes and skills

Programme learning objectives (PLO) addressed

1	PLO 1 (Fundamental Theoretical Knowledge in Biology)	2	PLO 2 (Application of Scientific Methods and Data Analysis)
3	PLO 3 (Integrated Laboratory, Field and Technical Skills)	4	PLO 4 (Critical Thinking and Problem-Solving Skills)
5	PLO 5 (Sustainability and Responsible Practice)		

Sustainability concept addressed

2	SDG 2 Zero Hunger
13	SDG 13 Climate Action
15	SDG 15 Life on Land

Digital skills/software used (not limited to)

- Microsoft Office software (e.g. Word, Excel)
- Bioinformatic tools (e.g. GenBank, Protein Data Bank or PDB, BLAST, MEGA X)
- Statistical analysis software (e.g. R Studio)
- Graphics software (e.g. ImageJ/Fiji, CANVA)
- eLearning platforms (e.g. CANVAS, MS Teams, Zoom)

Micro-credentialling option

No

Stackable towards GenBESTARI Undergraduate Degree Programme or other relevant Lifelong Learning Programmes

No

Document details

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