

Plant Physiology and Metabolism

2014/2015

Code: 42878
ECTS Credits: 9

Degree	Type	Year	Semester
4313771 Biologia i Biotecnologia Vegetal	OB	0	1

Contact

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Use of languages

Principal working language: espanyol (spa)
Some groups entirely in English: No
Some groups entirely in Catalan: Yes
Some groups entirely in Spanish: No

Teachers

Josep Allué Creus
Joan Barceló Coll
Isabel Corrales Pinart
Benet Gunsé Forcadell
Mercè Llugany Ollé
Roser Tolra Perez
Maria Soledad Martos Arias

Prerequisites

Basic knowledge on Plant Physiology

Objectives and Contextualisation

Acquisition of an integrated view of the different levels of study (cellular, molecular, physiological, metabolic) in whole plants.

Skills

- Apply biotechnological cell-factory methods to plants and fungi in order to obtain new products.
- Apply knowledge of the functional mechanisms of plants from the different organisational levels to the characterisation of processes of growth and development of the whole plant organism.
- Communicate and justify conclusions clearly and unambiguously to both specialised and non-specialised audiences.
- Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
- Propose and analyse ad hoc solutions deriving from research with plants, in line with the situations and needs of each case.
- Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
- Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.

- Use and manage bibliography and IT resources in the field of study.
- Use scientific terminology to account for research results and convey these in spoken and written English in an international context.

Learning outcomes

1. Aplicar los conocimientos del metabolismo secundario de los vegetales a los usos biotecnológicos en factorías de células vegetales
2. Communicate and justify conclusions clearly and unambiguously to both specialised and non-specialised audiences.
3. Describir los procesos de regulación del crecimiento y desarrollo de las plantas y ser capaz de aplicar técnicas para su estudio
4. Identificar marcadores metabólicos y citológicos de estrés en plantas
5. Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
6. Seleccionar y aplicar plantas modelo para el estudio de mecanismos funcionales en las plantas
7. Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
8. Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.
9. Use and manage bibliography and IT resources in the field of study.
10. Use scientific terminology to account for research results and convey these in spoken and written English in an international context.

Content

Richness and diversity of metabolism (primary and secondary)

Biotechnological uses of secondary metabolism products;

Plant cell cultures for the production of bioproducts

Mechanisms of regulation of plant development,

Systems of perception and transduction of signals inside plants indoor both under normal and environmental stress conditions.

Experimental Techniques in Plant Physiology and Metabolism

Phenotyping

Metabolomic Analysis

Stress indicators

-Cultivation of plants and fungi for experimentation techniques including in vitro (plant cells in suspension, callus, plant tissue cloning etc..) and its applications

Methodology

Lectures

Seminar

Laboratory practics

Consultation and analysis of articles and reports of interest

Personal study

Activities

Title	Hours	ECTS	Learning outcomes
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Type: Directed

Laboratory practics	12	0.48	3, 4, 7, 6, 8, 9, 10
Lectures	28	1.12	1, 3, 4, 5, 6
Seminar	5	0.2	5, 7, 2, 6, 8, 9, 10
Type: Supervised			
Performance of reports and homework	60	2.4	1, 5, 7, 8, 9, 10
Type: Autonomous			
Consultation and analysis of articles and reports of interest	40	1.6	1, 3, 4, 5, 7, 6, 8, 9
Personal study	80	3.2	1, 3, 4, 5, 7, 6, 8, 9

Evaluation

Contiuous evaluation

Performance of practical work (25%)

Seminar (25%)

Attendance and active participation in class (25%)

Delivery of reports and homework (25%)

Evaluation activities

Title	Weighting	Hours	ECTS	Learning outcomes
Lab Practical Work	25%	0	0	1, 3, 4, 5, 7, 6, 8, 10

Bibliography

Bibliography

Barceló J, Nicolás G, Sabater B, Sanchez Tamés R (2009) Fisiología Vegetal. Piramide, Madrid

Buchanan B, Gruissem W, Jones R (2002) Biochemistry and Molecular Biology of Plants. ASPB

Jones, R, Oughan H, Thomas H, Waaland S (2012) The Molecular Life of Plants. Wiley-Blackwell, ASPB

Taiz L, Zeiger E (2010) Plant Physiology 5th edition. Sinauer Assoc. Inc. Publ.

- Annual Review of Plant Biology

- Frontiers in Plant Science

- Trends in Plant Science