

| “Plant physiology part 2” | | |
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| Institute of Plant Genetics Polish Academy of Sciences | Coordinator: dr hab. Lidia Błaszczyk, prof. IPG PAS | Lecturer: prof. dr hab. Arkadiusz Kosmala IPG PAS (A) dr Dawid Perlikowski IPG PAS (B) |

General information:

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| Number / form (s) / type (s) of classes | A series of lectures, 14 didactic hours (supervised by lecturers) |
| Didactic cycle | summer semester 2024/2025 |
| Language | English |
| ECTS credits | 2 |

Objective of the course (A):

To understand basic principles of photosynthesis in plants

Topics:

1. Introduction, chloroplasts and photosynthetic pigments, light-dependent reactions – part 1 (2 hr) [11/03/2025]
2. Light-dependent reactions – part 2, photosynthetic phosphorylation/synthesis of ATP (2 hr) [25/03/2025]
3. Light-independent reactions, photorespiration, C3/C4/CAM plants (2 hr) [15/04/2025]
4. Regulation of photosynthesis (1 hr) [29/04/2025]

Effects of the course (in terms of knowledge, skills):

1. Student will learn about the components of photosynthetic apparatus.
 2. Student will learn about light-dependent and light-independent photosynthetic reactions.
 3. Student will learn about differences between C3, C4 and CAM plants with respect to their photosynthetic activities.
 4. Student will learn about photosynthetic phosphorylation, photorespiration and regulation of photosynthesis.
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Objective of the course (B):

To understand abiotic stress response in plants

Topics:

1. Stress signaling pathways (1 hr) [29/04/2025]
2. Abiotic stresses and their impact on plant metabolism (2 hr) [13/05/2025]
3. Molecular basis of plant stress tolerance mechanisms – part 1 (2 hr) [27/05/2025]
4. Molecular basis of plant stress tolerance mechanisms – part 2 and stress memory (2 hr) [03/06/2025]

Effects of the course (in terms of knowledge, skills):

1. Student will learn about stress signaling molecules/compounds and stress signaling pathways.
 2. Student will learn about types of abiotic stresses and their impact on plant phenotype and metabolism.
 3. Student will learn about stress tolerance mechanisms, molecular response to stresses, stress related compounds, and stress related lipid membrane rearrangement.
 4. Student will learn about mechanism of acquiring and erasing stress memory.
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Course content:

- Basics of plant physiology
- Introduction to physiological aspects of plant stress response

Teaching methods / techniques:

lectures in English, on site lectures [no zoom lectures unless pandemic situation occurs]

Evaluation of learning outcomes:

- written exam