UCLouvain

lbio1235t

2026

General cell physiology - vegetal part

1.00 credits		Q1

Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	To follow this course, it is necessary to master the knowledge and skills developed in the courses LBIO1111 and LBIO1112
Learning outcomes	
Evaluation methods	**Animal Cell Component** Assessment is continuous and consists of four tests plus one summative assessment, all of which are individual, written, certifying examinations. Participation in these assessments is mandatory. For a total of 20 points: each test is worth 3.5 points, and the summative assessment is worth 5 points. Participation in the cooperative reading activity on the *Perusall* platform will also be evaluated according to the criteria defined and available on the platform. Regular and meaningful participation may be rewarded with up to two bonus points. Final grades exceeding 20/20 will be reduced to that maximum. Students who obtain a grade below 10/20 in continuous assessment **and** those absent from the summative assessment (even with a valid medical certificate) must take a written exam during the examination session. This written exam is organized exclusively for students who either fail the continuous assessment or are absent from the summative assessment. The grade obtained on this exam will constitute the entire grade for this component. **Plant Cell Component** Assessment consists of a written examination. **Final Rule** If either component is failed with a grade of 7/20 or lower, this grade will automatically become the final grade for the activity. A student who fails one of the two course components is required to retake only the failed component. In the case of failure in the Animal Cell component, the student will retake the final written exam, which will then constitute their sole grade for that component.
Teaching methods	**Teaching Methods** Lectures, article reading, and independent work. **Animal Cell Component** Students are required to read and annotate a reference textbook (*Animal Physiology* by Lauralee Sherwood, Hillar Klandor, and Paul Yancey, French edition) using the *Perusall* platform. They are assigned to groups and collaborate to develop an understanding of the concepts covered. The instructor acts as moderator and discussion facilitator. No traditional lectures are delivered in the classroom. The only in-person sessions are those dedicated to continuous assessment. **Plant Cell Component** Lecture-based teaching.
Content	**Course Content** This course addresses the physiology of animal and plant cells. In particular, it focuses on exchanges between the cell and its environment, and the mechanisms regulating these exchanges. It also explores how cells use solute diffusion mechanisms to regulate their activity, with particular emphasis on excitability induced by environmental changes or interactions with other cells. Mechanisms of cell motility are also examined. A comparative approach is adopted to highlight similarities and differences between processes in plants and animals. **Plant Cell Component** This part of the course provides a comprehensive overview of membrane transporters (channels, carriers, and pumps). A distinction between active and passive transport is established using the Nernst equation. Kinetic aspects of membrane transport are introduced, and the differences between primary and secondary active transport are explained. The concepts of symport and antiport are discussed, and comparisons are made between plasma membrane transporters and those of the tonoplast. The importance and role of proton pumps are emphasized. The structure of the cell wall is described in relation to the nature and properties of its polymers. Mechanisms of cell expansion are analyzed with reference to the orientation of cellulose microfibrils. The role of expansins, as well as the processes of lignification and endoderm differentiation, are presented. The mechanisms of programmed cell death are examined, including autophagy and its genetic control.

	Leaf senescence is addressed, with an emphasis on its biological and agronomic significance, particularly in relation to reserve mobilization and abscission processes. Finally, the concept of plant cell totipotency is introduced. In vitro culture techniques are illustrated, including micropropagation, callus culture, cell suspension culture, anther culture, somaclonal variation, and the applications of in vitro selection.
Inline resources	Collaborative reading platform: www.perusall.com
Bibliography	"**Physiologie animale**" de Lauralee Sherwood, Hillar Klandor et Paul Yancey, dans sa version française publiée chez De Boeck Supérieur. "Plant Physiology and Development" de Lincoln Taiz, Eduardo Zeiger, Ian M. Møller, et Angus Murphy, 6ème édition publiée par Sinauer Associates.
Faculty or entity in charge	BIOL