Subject card

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|---|---|---|---|
| Subject name and code | Cytology, PG_00146873 | | |
| Field of study | Genetics and Experimental Biology | | |
| Date of commencement of studies | October 2025 | Academic year of realisation of subject | 2025/2026 |
| Education level | Bachelor's studies | Subject group | Obligatory subject group in the field of study<br>Subject group related to scientific research in the field of study |
| Mode of study | full-time studies | Mode of delivery | at the university |
| Year of study | 1 | Language of instruction | Polish |
| Semester of study | 1 | ECTS credits | 4.0 |
| Learning profile | academic | Assessment form | credit |
| Conducting unit | Laboratory of Plant Cytology and Embryology -> Department of Experimental Biology and Plant Biotechnology -> Faculty of Biology -> Rector | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr Natalia Wiśniewska | |
| | Teachers | dr Natalia Wiśniewska | |

**Lesson types**

| Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|
| Number of study hours | 0.0 | 0.0 | 45.0 | 0.0 | 0.0 | 45 |

E-learning hours included: 0.0

**Learning activity and number of study hours**

| Learning activity | Participation in didactic classes included in study plan | Participation in consultation hours | Self-study | SUM |
|---|---|---|---|---|
| Number of study hours | 45 | 10.0 | 45.0 | 100 |

**Subject objectives**

1. Understanding the basics of functioning of organisms at the cell level.

2. Understanding the structure of prokaryotic and eukaryotic cells.

3. Ability to analyze the relationship between the structure of cellular structures and their functions

.4. Ability to work safely in the laboratory, plan and conduct experiments using a light microscope, and record and interpret results

## Learning outcomes

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| [GBEL3_W01] Understanding the structure and properties of basic types of biological macromolecules, molecular mechanisms of metabolic pathways and genetic information flow, as well as sources of genetic variability in organisms and mechanisms of evolution; explaining the rules of inheritance, elucidating differences in the structure and functioning of prokaryotic and eukaryotic cells, and understanding the structure and functional relationships at the cellular and tissue levels. | The graduate understands the importance of individual compartments in the functioning of cells and explains their role in the adaptation of cells to changing environmental conditions or the function performed in a plant or animal body. | [SW4] test/exam - oral or written<br>[SW2] presentation/project/paper/ report |
| [GBEL3_U03] Proficient in using research equipment and tools, while following the correct sequence of procedures, to conduct basic physical, biological, or chemical observations and measurements in laboratory work within the field of biological sciences. | The graduate is able to properly use chemical equipment, tools and reagents. Is able to plan and perform simple experiments and chemical stainings as well as interpret the obtained results. | [SU8] observation of student's independent or team work |
| [GBEL3_K08] Responsibility for entrusted equipment/materials and respect for the work of others. | The graduate is able to properly work with a light microscope and knows the principles of occupational health and safety. Is able to work safely in the laboratory and conduct experiments. | [SK8] observation of student's independent or team work |

## Subject contents

Laboratory exercises:1. Learning the techniques and research methods used in cytology2. Structure and function of a plant cell3. Cell growth and division4. Cell cycle and its regulation5. Genetic material of prokaryotic and eukaryotic cells, the impact of numerical and structural aberrations on the functioning of the body6. Cytoskeleton7. Polyploidization of cells8. Programmed cell death

## Prerequisites and co-requisites

## Assessment methods and criteria

| Subject passing criteria | Passing threshold | Percentage of the final grade |
|---|---|---|
| tests, presentation/project/paper/ report (laboratory reports, notebook), independent or team work. | 51.0% | 100.0% |

| | | |
|---|---|---|
| Recommended reading | Basic literature | A. Literature required to pass the course:<br><br>1. 1. used during classes:<br>• Alberts B. i wsp. Podstawy biologii komórki. 2005, PWN WarszawaKilarski, W. Strukturalne podstawy biologii komórki. PWN 2003<br>• Kłyszejko-Stefanowicz L. Cytobiochemia. 2002, Wyd. Naukowe PWN<br>• Wojtaszek P., Michejda J., Ratajczak, Biologia komórki roślinnej. T. 1 Struktura, T.2 Funkcja. PWN 2008/2009<br>• Woźny A. i in. [red.] 2001. Podstawy biologii komórki roślinnej, Wyd. Naukowe UAM, Poznań<br><br>1. 2. studied independently by the student:<br><br>• Rogalska S, J. Małuszyńska, M.J. Olszewska (red.). 2005. Podstawy cytogenetyki roślin, PWN, Warszawa |
| | Supplementary literature | • Litwin JA. 1999. Podstawy technik mikroskopowych. Wydawnictwo Uniwersytetu Jagiellońskiego, Kraków<br>• Alberts B. (red.), Johnson A, Lewis J, et al. Wstęp do biologii molekularnej. Książka on-lineNew York: Garland Science, 2002<br>• Kozieradzka-Kiszkurno M, Płachno BJ. (2013): Diversity of plastid morphology and structure along the micropyle-chalaza axis of differentCrassulaceae. Flora 208: 128-137.<br>• Pawlik, A., Wała, M., Hać, A., Felczykowska, A., & Herman-Antosiewicz, A. (2017). Sulforaphene, an isothiocyanate present in radish plants, inhibitsproliferation of human breast cancer cells. Phytomedicine, 29, 1-10.<br>• Wiczk, A., Hofman, D., Konopa, G., & Herman-Antosiewicz, A. (2012). Sulforaphane, a cruciferous vegetable-derived isothiocyanate, inhibits proteinsynthesis in human prostate cancer cells. Biochimica et Biophysica Acta (BBA)-Molecular Cell Research, 1823(8), 1295-1305.<br>• Pawlik, A., Wiczk, A., Kaczyńska, A., Antosiewicz, J., & Herman-Antosiewicz, A. (2013). Sulforaphane inhibits growth ofphenotypically different breast cancer cells. European journal of nutrition, 52(8), 1949-1958.<br>• Hać, A., Domachowska, A., Narajczyk, M., Cyske, K., Pawlik, A., & Herman-Antosiewicz, A. (2015). S6K1 controls autophagosome maturation inautophagy induced by sulforaphane or serum deprivation. European journal of cell biology, 94(10), 470-481.<br>• Płachno, B.J.; Kapusta, M.; Stolarczyk, P.; Świątek, P. Arabinogalactan Proteins in the Digestive Glands of Dionaea muscipula J.EllisTraps. Cells 2022, 11, 586. https://doi.org/10.3390/cells11030586 |
| | eResources addresses | |
| Example issues/ example questions/ tasks being completed | | |
| Work placement | Not applicable | |

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