



Syllabus

Term: 2026/27/1 **Subject name:** Cell Biology - lecture **Subject code:** ENBIOB1301

Unit (Unit code) (BIOLOGIA)

Lecturer responsible for the course: Dr. KOVÁCS-ÖLLER Tamás

Requirement: Exam

Classes per week : 2/0/0

Classes per term: 26/0/0

Purpose of education:

Basic course that designed to provide the students with knowledge related to cell structure and function. The knowledge of this course is needed to study Comparative anatomy I, II, Basic developmental biology, Comparative physiology, Molecular biology and Basic genetics.

Contents:

The world of the cell: an overview of structure and function. The cell theory: from the beginning to emergence of cell biology.

Methods in cell biology: light and electron microscopy; separation of cells and organelles.

Membranes: chemistry, structure and function. Plasma membrane and intracellular membranes (endoplasmic reticulum, Golgi complex, endosomes, lysosomes and peroxisomes) Membrane synthesis and membrane flow.

Transport across membranes: passive and active transports. Endocytosis and exocytosis. Clatrin, caveolin and COP I and II mediated transports. Lysosomes and cellular digestion.

The extracellular matrix of animal cells. Cell-cell recognition and adhesion. Cell junctions.

Structure and function of the cytoplasm: soluble fractions and granular structures (lipid droplet, glycogen granule, ribosome, proteasome). The major structural elements of the cytoskeleton: microtubules, microfilaments and intermediate filaments. Motor proteins (kinesin, dynein, myosins) and their role in cellular movements.



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The mitochondrion and chloroplast: basic structure and function.

The structural basis of cellular information: DNA, chromosomes and nucleus. The cell cycle and its regulation. Mitosis and meiosis.

Intranucleolar suborganelles: nucleolus, Cayal-body, PML-body.

Cell signaling: structure and functions of cell surface and nuclear receptors.

Cell fusion, differentiation and programmed cell death. Pathological alterations of the cells.

System of examing and valuation:

Terminal examination (written or oral). Students must pass two interim written tests during the semester in order to be admitted to the terminal examination.

Bibliography:

Barbara Young, Geraldine O'Dowd, Phillip Woodford: Wheater's Functional Histology: A Text and Colour Atlas, 6th edition. Elsevier, Churchill, Livingstone 2013.

Bibliography: