

TEACHING PLAN OF MEDICAL BIOLOGY

Autumn semester of the academic year 2023/2024

(General Medicine – 1st year)

- 1. week:** 18.-22.9.
Lecture: **Introduction to the medical biology** (prof. RNDr. Ondřej Slabý, Ph.D.)
Practice: *Instructions. Non-cellular organisms and infectious agents*
- 2. week:** 25.-29.9.
Lecture: **Fundamental chemistry of life – chemical components of cells, protein structure and function** (prof. RNDr. Ondřej Slabý, Ph.D.)
Practice: *Prokaryotic cells, basics of light microscopy*
- 3. week:** 2.-6.10.
Lecture: **Architecture and function of eukaryotic cell – membrane system and organelles, cytoskeletal system** (prof. RNDr. Ondřej Slabý, Ph.D.)
Practice: *Microscopic observation of eukaryotic cells*
- 4. week:** 9.-13.10.
Lecture: **Genome organization – nucleic acids, chromosome structure, DNA replication** (prof. RNDr. Ondřej Slabý, Ph.D.)
Practice: *In vitro culture of human cells*
- 5. week:** 16.-20.10.
Lecture: **Genome stability and instability – DNA damage, mutations, DNA repair and defects in DNA repair** (prof. RNDr. Ondřej Slabý, Ph.D.)
Practice: *Principles of electron microscopy and cellular ultrastructure*
- 6. week:** 23.-27.10.
Lecture: **Gene expression I – central dogma of molecular biology, gene structure, transcription and RNA modification** (prof. RNDr. Ondřej Slabý, Ph.D.)
Practice: ***Control test 1 (knowledge of weeks 1 to 5 – lectures and practices) + pipetting workshop***
- 7. week:** 30.10.-3.11.
Lecture: **Gene expression II – translation, genetic code, post-translational modifications** (prof. RNDr. Ondřej Slabý, Ph.D.)
Practice: *DNA structure, DNA replication, gene expression*
- 8. week:** 6.11.-10.11.
Lecture: **Regulation of gene expression** (prof. RNDr. Ondřej Slabý, Ph.D.)
Practice: *Human karyotype and chromosomal aberrations*
- 9. week:** 13.-17.11.
Lecture: **Cellular communication – general principles of cell signalling, receptors, signalling pathways** (prof. RNDr. Ondřej Slabý, Ph.D.)
Practice: *Study of DNA damage*

- 10. week:** 20.-24.11.
Lecture: **Cell cycle and principles of its regulation** (Mgr. Stjepan Uldrijan, CSc.)
Practice: *Methods for studying cell cycle*
- 11. week:** 27.11.-1.12.
Lecture: **Cell division – mitosis and meiosis** (Mgr. Vladimír Rotrekl, Ph.D.)
Practice: *Mitosis and meiosis observation under light microscope*
- 12. week:** 4.12.-8.12.
Lecture: **Cell death** (prof. MUDr. Iva Slaninová, Ph.D.)
Practice: *Methods for studying cell death*
- 13. week:** 11.-15.12.
Lecture: **Cells and tissue – cell junctions, adhesive molecules and extracellular matrix** (prof. RNDr. Ondřej Slabý, Ph.D.)
Practice: **Control test 2 (knowledge of weeks 7 to 12 – lectures and practices) + microscopy exam**
- 14. week:** 18.-22.12. **Dissection week** – no biology lecture or practice

COMPULSORY LITERATURE:

- SLABÝ, Ondřej (Editor). **Medical Biology I. Cell and Molecular Biology.** 1st edition. Masaryk University Press, 2023. ISBN 978-80-280-0158-2

OPTIONAL LITERATURE:

- ALBERTS, Bruce, Karen HOPKIN, Alexander JOHNSON, David Owen MORGAN, Martin C. RAFF, Keith ROBERTS a Peter WALTER. **Essential cell biology.** 5th edition. New York: W.W Norton, 2019
- SNUSTAD, D. Peter a Michael J. SIMMONS. **Principles of genetics.** 6th edition. Wiley, 2011