

TEACHING PLAN OF MEDICAL BIOLOGY

Autumn semester of the academic year 2022/2023

(General Medicine – 1st year)

- 1. week:** 12.-16.9.
Lecture: **Introduction to the medical biology** (prof. RNDr. Ondřej Slabý, Ph.D.)
Practice: *Instructions. Non-cellular organisms and infectious agents*
- 2. week:** 19.-23.9.
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:** 26.-30.9.
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:** 3.-7.10.
Lecture: **Genome organization – nucleic acids, chromosome structure, DNA replication** (prof. RNDr. Ondřej Slabý, Ph.D.)
Practice: *In vitro culture of human cells*
- 5. week:** 10.-14.10.
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:** 17.-21.10.
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)***
- 7. week:** 24.-28.10.
Lecture: **Gene expression II – translation, genetic code, post-translational modifications** (prof. RNDr. Ondřej Slabý, Ph.D.)
Practice: *DNA structure, DNA replication and gene expression*
- 8. week:** 31.10.-4.11.
Lecture: **Regulation of gene expression** (prof. RNDr. Ondřej Slabý, Ph.D.)
Practice: *Human karyotype and chromosomal aberrations*
- 9. week:** 7.-11.11.
Lecture: **Cellular communication – general principles of cell signalling, receptors, signalling pathways** (prof. RNDr. Ondřej Slabý, Ph.D.)
Practice: *Study of DNA damage*

- 10. week:** 14.-18.11.
Lecture: **Cell cycle and principles of its regulation** (Mgr. Stjepan Uldrijan, CSc.)
Practice: *Methods of cell cycle studying*
- 11. week:** 21.-25.11.
Lecture: **Cell division – mitosis and meiosis** (Mgr. Vladimír Rotrekl, Ph.D.)
Practice: *Mitosis observation under light microscope*
- 12. week:** 28.11.-2.12.
Lecture: **Cell death** (prof. MUDr. Iva Slaninová, Ph.D.)
Practice: *Biological significance of meiosis – gametogenesis*
- 13. week:** 5.-9.12.
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)**
- 14. week:** 12.-16.12. **Dissection week** – no biology lecture and practices

COMPULSORY 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.