

**Histology and Embryology Pre-Uni-Study  
Program 2017 [10 meetings x (2 h)] = 20 h  
Prowadzący: dr Bartłomiej Kraziński  
dr Agnieszka Śliwińska-Jewsiewicka**

**1. Internal organization of the cell – part 1. (2h)**

- membrane structure
- membrane transport of small molecules and the electrical properties of membranes
- intracellular compartments
- intracellular vesicular traffic

**2. Internal organization of the cell – part 2. (2h)**

- energy conversion: mitochondria
- the cytoskeleton
- the cell cycle
- apoptosis, necrosis

**3. Basic genetic mechanisms. How cells read the genome: from DNA to protein. (2h)**

**4. Protein synthesis, processing and regulation. (2h)**

**5. Protein sorting and transport. The nucleus. (2h)**

- the endoplasmic reticulum, Golgi apparatus, and lysosomes
- structure of the nuclear envelope and traffic between the nucleus and the cytoplasm

**6. Introduction to histology**

- Histological methods
- Origin of tissues – from gametogenesis to gastrulation
- Classification and basic properties of tissues
- Organization of tissues within organs – examples

**7. Connective tissue. Extracellular matrix.**

- Classification of connective tissues
- Cells of connective tissues
- Components and organization of extracellular matrix

**8. Cell adhesion and cell junctions. Epithelial tissue and glands**

- Cell adhesion molecules
- Cell junctions – structural organization and function
- Epithelial tissues – classification and examples
- Glands – morphology and functioning with examples

**9. Nerve tissue**

- Basic morphology of nerve cells
- Classification of nerve cells
- Ultrastructure of neurolemma and synapsis – basics of neurotransmission
- Histological organization of nerve system – examples

**10. Muscle tissue**

- Skeletal muscle cells
- Cardiac muscle cells
- Smooth muscle cells
- Molecular mechanisms of muscle contraction – a comparison