

SYLLABUS		
Lectures and laboratory seminars in Cytology, Histology and Embryology, I st year Medicine – summer term 2017/2018		
Week	Laboratory seminars - 3 h	Lectures - 2 h Prof. P. Atanassova
I week 12 - 16.02 2018	General Methods of Investigation in Histology. The cell – morphology. Cytoplasm. Cell organelles. <i>Microscopical preparations:</i> 1. Nissl substance (granules) 2. Mitochondria 3. Golgi complex <i>Electron microphotographs:</i> 1. Rough endoplasmatic reticulum 2. Smooth endoplasmatic reticulum 3. Ribosomes 4. Mitochondria 5. Golgi complex 6. Centrosome	Introduction to Cytology, Histology and Embryology. The cell. General organelles- structural, ultrastructural and functional characteristics. 1. Endoplasmatic reticulum 2. Mitochondria 3. Golgi complex 4. Lysosomes Specialized organelles - structural, ultrastructural and functional characteristics.
II week 19 - 23.02	Plasmalema. Cell inclusions. <i>Microscopical preparations:</i> 1. Lipid drops 2. Glycogen granules in hepatic cells 3. SDH – activity 4. Acid phosphatase activity	Nucleus in interphase and mitosis. 1. Interphase nucleus - structural, ultrastructural and functional characteristics. 2. Mitosis – phases
III week 26.02 - 02.03	Nucleus in interphase. Mitosis. <i>Microscopical preparations:</i> 1. Nucleus in interphase 1.1 H-E staining 1.2 Feulgen staining 2. DNA synthesis (histoautoradiography) 3. Mitosis in cells of pea radix <i>Electron microphotographs:</i> 1. Interphase nucleus	The cell. Cell membrane (plasmalema). Intercellular contacts.

<p>IV week 05 - 09.03</p>	<p>Plasmalema. Cell inclusions. Cytophysiology. <i>Microscopical preparations:</i> 1. Pigment inclusions 2. Phagocytosis 3. Secretion (secretory granules) 4. Mooving of cillia – demonstration <i>Electron microphotographs:</i> Cell membrane Microvilli Basal foldings Desmosomes Interdigitations Protein granules Glycogen granules Lipid drops Lysosomes Secretory granules Cilia – longitudinal and transverse section</p>	<p>Cytoskeleton. Structural, ultrastructural and functional characteristics. Cell inclusions.</p>
<p>V week 12 - 16.03</p>	<p>Epithelia. Unilayered epithelia. <i>Microscopical preparations:</i> 1. Simple squamous epithelium 1.1. H-E staining 1.2. Impregnation - demonstration 2. Simple cuboidal epithelium 3. Simple columnar epithelium 4. Unilayered (pseudostratified) ciliated columnar epithelium 5. Henle's epithelium</p>	<p>Cytophysiology. Metabolism. Phagocytosis, Synthesis, secretion, moving.</p>
<p>VI week 19 - 23.03</p>	<p>Cytology Colloquium (preliminary examination) 1. Practical part – 20 points: - 7 microscopical preparations (7 x 2 points = 14 points) - 6 electron microphotographs (6p.) 2. Theoretical part – 40 points (MCQ test) Total - 60 points Exemption: 90% /18p. + 36 p./</p>	<p>Tissues – classification, properties. Epithelia. Unilayered epithelia Multistratified epithelia 1. Histogenesis 2. General characteristics 3. Classification</p>

<p>VII week 26 - 30.03</p>	<p>Multistratified epithelia. Secretory epithelia. <i>Microscopical preparations:</i></p> <ol style="list-style-type: none"> 1. Stratified squamous epithelium 2. Stratified squamous keratinizing epithelium 3. Secretory epithelia <ol style="list-style-type: none"> 3.1. Simple tubular glands 3.2. Serous, mucous and compound alveolar (acinar) glands 	<p>Connective tissue.</p> <ol style="list-style-type: none"> 1. Histogenesis 2. General characteristics <ol style="list-style-type: none"> 1. Classification 2. Cells. 3. Intercellular substance
<p>VIII week 02 – 09.04</p>	<p>EASTER HOLIDAY</p>	
<p>IX week 09 - 13.04</p>	<p>Fibrous connective tissue. <i>Microscopical preparations:</i></p> <ol style="list-style-type: none"> 1. Loose connective tissue 2. Collagenous fibrous tissue 3. Elastic tissue 4. Pigment connective tissue 5. White adipose tissue <ol style="list-style-type: none"> 5.1. Sudan III staining 5.2. H-E staining 6. Brown adipose tissue. <p><i>Electron microphotographs:</i></p> <ol style="list-style-type: none"> 1. Multilocular adipocyte 2. Macrophage 3. Fibroblast 4. Mast cell 5. Plasma cell 6. Collagen fibers 	<p>Fibrous connective tissue Connective tissue with solid intercellular substance.</p> <ol style="list-style-type: none"> 1. Cartilage 2. The bone tissue
<p>X week 16 - 20.04</p>	<p>Connective tissue with solid intercellular substance. <i>Microscopical preparations:</i></p> <ol style="list-style-type: none"> 1. Hyaline cartilage 2. Elastic cartilage 3. Compact bone – decalcinated 4. Compact bone – Shliff 5. Osteogenesis <p><i>Electron microphotographs:</i></p> <ol style="list-style-type: none"> 1. Osteocyte 2. Osteoclast 	<p>Blood tissue.</p> <ol style="list-style-type: none"> 1. Histogenesis 2. General characteristics 3. Classification 4. Cells <ol style="list-style-type: none"> 4.1. Erythrocytes 4.2. Leucocytes 4.3. Platelets
<p>XI week 23 - 27.04</p>	<p>Test on Epithelial and Connective tissue.</p> <p>1. Practical part – 10 points (8 microscopic preparations + 2 electron microphotographs)</p> <p>2. Theoretical part (MCQ) - 30p.</p> <p>Total – 40 points</p>	<p>Muscle tissue.</p> <ol style="list-style-type: none"> 1. Histogenesis 2. General characteristics 3. Classification 4. Cells 5. Myofibers, myofibrils

<p>XII week 30.04 - 04.05</p>	<p>Blood tissue. <i>Microscopical preparations:</i> 1. Blood smear - preparation 2. Blood smear - examination <i>Electron microphotographs:</i> 1. Neutrophil granulocyte 2. Eosinophil granulocyte 3. Lymphocyte 4. Plateles</p> <p>Muscle tissue. <i>Microscopical preparations:</i> 1. Smooth (visceral) muscle tissue 2. Striated skeletal muscle tissue 3. Striated cardiac muscle tissue 4. Impulse conductive cardiac muscle tissue <i>Electron microphotographs:</i> 1. Smooth muscle cell 2. Myofibril – skeletal 3. Cardiomyocyte – myofibril 4. Intercalated disc</p>	<p>Nerve tissue. 1. Histogenesis 2. General characteristics 3. Classification 4. Cells – neurons, neuroglia 5. Nerve fibers 6. Myoneural synapse</p>
<p>XIII week 07 - 11.05</p>	<p>Nerve tissue. <i>Microscopical preparations:</i> 1. Multipolar neurons 2. Pear-like neurons 3. Pyramidal neurons 4. Myelinated nerve fibers 5. Fibrous astrocytes 6. Protoplasmic astrocytes <i>Electron microphotographs:</i> 1. Myelinated nerve fibers 2. Myoneural synapse</p>	<p>Reproductive tissue. 1. Histogenesis 2. General characteristics 3. Structural, ultrastructural and functional characteristics. 3.1. Oocytes 3.2. Spermatozoa.</p>
<p>XIV week 14 – 18.05</p>	<p>Test on Blood, Muscle and Nerve tissue. 1. Practical part – 10 points (6 microscopic preparations + 4 electron microphotographs) 2. Theoretical part (MCQ) - 40p. Total – 50 points</p>	<p>Early human embryonal development. Fertilization Clivage Blastocyst Implantation Gastrulation Primitive organs</p>

XV week 21 - 25.05	Reproductive tissue. <i>Microscopical preparations:</i> 1. Oocyte 2. Spermatozoa <i>Electron microphotographs:</i> 1. Oocyte 2. Spermatozoon General embryology. Gastrulation. 1. Early gastrulation	Extra-embryonic layers. Chorion, amnion, yolk sack, alantoic diverticulum, umbilical cord, fetal sack, placenta.
XVI week 22 - 26.05	General embryology. Gastrulation. 1. Late gastrulation Extra-embryonic layers <i>Microscopical preparations:</i> 1. Umbilical cord of 2-3 month old human embryo 2. Umbilical cord of newborn baby 3. Placenta 4. Fetal sack	Twins. Anomalies in the human embryonal development.

Term tests:

1. Cytology Colloquium – 60 points
2. Test on epithelial and connective tissues – 40 points
3. Test on blood, muscle and nerve tissues – 50 points

Total score points for the semester – 150

Evaluation

143 – 150 p. – 6,00	113 – 119 p. – 4,00
135 – 142 p. – 5,50	105 – 112 p. – 3,50
127 – 134 p. – 5,00	90 – 104 p. – 3,00
120 – 126 p. – 4,50	< 90 p. – 2,00

Textbooks

1. Basic Histology, I.C. Janqueira
2. Clinical and Functional Histology for Medical Students, Richard S. Snell
3. Histology, R. Henrikson
4. Histology – A Text and Atlas, M. Ross, Sixth edition
5. Human embryology, Inderbir Singh, Sixth edition
6. Practicum Cytology, Histology and Embryology with CD, P. Atanassova, I. Koeva, E. Petrova, N. Penkova, V. Trichkova
7. Handbook in Cytology, Histology and Embryology, I. Koeva

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EXEMPTION

Cytology Colloquium:

Students with **90% from practical part (18 points) and 90% from MCQ test (36 points)** exempt the Cytology section (practical and MCQ) from the final Cytology, Histology and Embryology exam.

Total score points (Cytology + Histology points):

Students with **90% of the maximum semester score (135 points or more)** exempt both practical and MCQ test on Cytology, Histology and Embryology from the final exam. They sit only for essay and oral part of the final exam.

Students with **less than 90% (< 135 p.)** of the maximum semester score sit for the entrance test (practical and MCQ test) of the final exam. If they pass the practical and MCQ test, they sit for the essay and oral part.