

CONTENT OF THE SUBJECT

Subject:	Histology and embryology 1		
Study	<i>Dental medicine</i>	Study Period:	<i>1st year Winter time</i>
Evaluation:	<i>Absolved (A-E)</i>	Subject Type:	<i>Compulsory</i>
Content:	<i>2 h lectures and 3 h practical exercises / week</i>		<i>Total 28/42 hours</i>

Department: **Department of Histology and Embryology, UPJŠ FM**; AY: 2023-24

Week	Lectures	Practical lessons
1.	The subject matter of histology, history of the histology. Cytology I Structure (EM, biochemical composition) and function of cell membrane, transmembrane transport, receptors.	Histologic technics Tissue sampling, fixation, dehydration, clearing, embedding, sectioning, staining and mounting. Light and electron microscopy.
2.	Cytology II Membranous and nonmembranous organelles, nucleus and nucleolus, cytoplasmic matrix, cytoplasmic inclusions, cytoskeleton.	Observation under the light microscope: Cytology - the size and shape of the cells ganglion spinale – round cells medulla spinalis – star-shaped cells cerebellum – pear-shaped cells intestinum tenue (jejunum) – goblet cells
3.	Epithelial tissue I Characteristic of epithelial tissue. Polarity of epithelial cells. Intercellular junctions – zonula occludens, zonula adherens, macula adherens, nexus. Basement membrane - LM and EM structure. Covering epithelium.	Epithelial tissue I pulmo – simple squamous epithelium ren – simple cuboidal epithelium vesica fellea – simple columnar epithelium with microvilli epididymis – pseudostratified columnar epithelium with stereocilia
4.	Epithelial tissue II Glandular epithelium: endocrine and exocrine. Secretory and duct portion – structure and function. Types of exocrine secretion. Cells producing steroids, mucus, proteins. Ion-transporting cells.	Epithelial tissue II trachea – pseudostratified columnar ciliated epithelium ureter – transitional epithelium vagina – stratified squamous nonkeratinized epithelium cutis – stratified squamous keratinized epit.
5.	Connective tissue Introduction to connective tissue. Classification of connective tissues. Cells, amorphous ground substance, types of fibers. Connective tissue proper, connective tissues with special properties.	Connective tissue I cutis, papillary layer – loose connective tissue cutis, reticular layer – dense connective tissue irregular tendo – dense connective tissue regular
6.	Cartilage. Cartilage cells, extracellular cartilage matrix. Perichondrium. Types of cartilages, function, histophysiology, regeneration.	Connective tissue II aorta/arteria elastica – elastic tissue textus adiposus – adipose tissue nodus lymphaticus – textus reticularis – reticular tissue funiculus umbilicalis – mucous tissue

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7.	<p>Bone tissue I Characteristics of bone tissue. Bone tissue cells, bone matrix. Primary and secondary bone tissue. Microscopic structure of compact and spongy bone tissue. Periosteum, endosteum.</p>	<p>Cartilage trachea – hyaline cartilage epiglottis – elastic cartilage cartilago fibrosa – fibrocartilage</p>
8.	<p>Bone tissue II Endochondral and intramembranous ossification. Haematopoiesis - development of erythrocytes.</p>	<p>Bone tissue Textus osseus primarius – primary bone tissue textus osseus – secondary compact bone tissue ossificatio (epiphysis) – secondary spongy bone tissue.</p>
9.	<p>Muscular tissue I Striated skeletal muscle, light (LM) and electron microscopic (EM) structure. Sarcoplasmic reticulum. Principle of contraction. Function. Development.</p>	<p>Ossification intramembranous ossification of the flat bones ossificatio (epiphyseal plate) – endochondral ossification</p>
10.	<p>Muscular tissue II Cardiac muscle tissue, smooth muscle tissue. LM and EM structure. Efferent nerve ending – myoneuronal junction.</p>	<p>Muscle tissue lingua – skeletal muscle tissue myocardium – cardiac muscle tissue intestinum tenue (jejunum) – smooth muscle tissue</p>
11.	<p>Nerve tissue Neuron (structure and ultrastructure) and its processes – dendrites and axon. Synapses. Mediators. Myelination. Classification of neurons. Hematoencephalic barrier. Neuroglial cells – astrocytes, oligodendrocytes, microglial cells, ependymal cells.</p>	<p>Nerve tissue medulla spinalis – nerve cells, ependymal cells (Nissl staining) cerebrum – glial cells (silver impregnation) cerebellum, medulla spinalis – astrocytes (GFAP immunohistochemistry)</p>
12.	<p>Embryology I Developmental principles in the ontogenesis. Gametogenesis, fertilization, zygote, morula, blastocyst, implantation. 1st and 2nd week of development.</p>	<p>Blood and blood cells blood smear – red and white blood cells, platelets.</p>
13.	<p>Embryology II 3rd and 4th week of human development. Primitive streak, development of mesoderm, notochord, neurulation. Somites. Primitive cardiovascular system.</p>	<p>Haematopoiesis Bone marrow structure. Development of erythrocytes. Textus osseus – red bone marrow Ossificatio (epiphysis) – red and yellow bone marrow</p>
14.	<p>Semestral written test</p>	<p>Semestral slide test</p>

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