

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**

Week	Lectures http://portal.lf.upjs.sk	Practical lessons
1.	Introduction to the histology Cytology Structure and biochemical composition of the cell membrane. Function of the cell membrane. Cytoplasm and nucleus. Cell organelles, cytoplasmic inclusions, cytoskeleton.	Histological techniques Tissue sampling, fixation, dehydration, paraffin and celloidin embedding. Microtomes. Staining – principle. HE staining. Histochemistry. Immunohistochemistry. Light and electron microscopy.
2.	Epithelial tissue I Classification and characteristic features of epithelial tissue. Polarity of epithelial cells. Intercellular junctions – classification and basic characteristics. Basement membrane	Functional cytology Microscopic structure of cells producing proteins, steroids, mucus and ion-transporting cells. 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 II Glandular epithelium: endocrine and exocrine, classification, types of exocrine secretion. Secretory portion and duct system – structure and function. Introduction to connective tissue Main characteristics of connective tissues. Classification and composition of connective tissues.	Epithelial tissue I pulmo – simple squamous epithelium ren – simple cuboidal epithelium vesica fellea – simple columnar epithelium with microvilli
4.	Connective tissue Connective tissue proper, connective tissues with special properties. Composition - cells, amorphous ground substance, types of fibers. Function and location	Epithelial tissue II epididymis – pseudostratified columnar epithelium with stereocilia trachea – pseudostratified columnar ciliated epithelium ureter – transitional epithelium oesophagus – stratified squamous nonkeratinized epithelium cutis – stratified squamous keratinized epithelium
5.	Cartilage Characteristic features of the cartilage. Cartilage cells and extracellular cartilage matrix. Perichondrium. Types of cartilage, function, histophysiology, regeneration.	Connective tissue I cutis, papillary layer – loose connective tissue cutis, reticular layer – dense connective tissue irregular tendo – dense connective tissue regular

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6.	Bone tissue I Characteristic features of the bone tissue. Bone tissue cells, bone matrix. Primary and secondary bone tissue. Microscopic structure of compact and spongy bone tissue. Periosteum, endosteum.	Connective tissue II aorta/arteria elastica – elastic tissue nodus lymphaticus – textus reticularis – reticular tissue textus adiposus – adipose tissue funiculus umbilicalis – mucous tissue
7.	Bone tissue II Endochondral and intramembranous ossification.	Cartilage trachea – hyaline cartilage epiglottis – elastic cartilage cartilago fibrosa – fibrocartilage
8.	Muscle tissue Striated skeletal muscle tissue - origin, microscopic structure and function. Microscopic structure of myoneuronal junction. Cardiac muscle tissue and smooth muscle tissue - origin, microscopic structure and function.	Bone tissue textus osseus primarius – primary bone tissue textus osseus – secondary compact bone tissue ossificatio (epiphysis) – secondary spongy bone tissue.
9.	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.	Ossification intramembranous ossification of the flat bones ossificatio (epiphyseal plate) – endochondral ossification
10.	Blood and haematopoiesis Composition of the blood. Microscopic structure of blood formed elements (erythrocytes, leukocytes and thrombocytes). Erythropoiesis. Microscopic structure and function of the bone marrow.	Muscle tissue lingua – skeletal muscle tissue myocardium – cardiac muscle tissue intestinum tenue (jejunum) – smooth muscle tissue
11.	Embryology I Introduction to embryology. The role of embryology in medicine. Gametogenesis, fertilization, zygote, morula, blastocyst.	Nerve tissue medulla spinalis – nerve cells, ependymal cells (Nissl staining) cerebrum – glial cells (silver impregnation) cerebellum, medulla spinalis – astrocytes (GFAP immunohistochemistry)
12.	Embryology II Implantation. Decidual reaction and decidua. Development of the placenta. Placental barrier. Development of fetal membranes (chorion and amnion)	Blood and bone marrow sanguis – blood smear – red and white blood cells, platelets. textus osseus – red bone marrow ossificatio (epiphysis) – red and yellow bone marrow
13.	Embryology III 3. and 4. week of embryonic development. Gastrulation. Primitive organs of the embryo. Folding of the embryo.	Repetition of tissues
14.	Semestral written test	Semestral slide test