

CONTENT OF THE SUBJECT

<b>Subject:</b>	<b>Histology and embryology 1</b>		
<b>Study</b>	<i>General medicine</i>	<b>Study Period:</b>	<i>1<sup>st</sup> year Summer time</i>
<b>Evaluation:</b>	<i>Absolved (A-E)</i>	<b>Subject Type:</b>	<i>Compulsory</i>
<b>Content:</b>	<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**

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

CONTENT OF THE SUBJECT

---

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