



Histology and embryology

1. IMPRINT	
Academic Year	2023/2024
Department	Faculty of Medicine
Field of study	Medicine
Main scientific discipline	Medical science
Study Profile	general academic
Level of studies	Uniform MSc
Form of studies	full-time studies
Type of module / course	obligatory
Form of verification of learning outcomes	exam
Educational Unit / Educational Units	<p>Department of Histology and Embryology Center for Biostructure Research 02-004 Warszawa, Chałubińskiego 5 Str.(Anatomicum bldg.) Web site: http://histologia.wum.edu.pl Department office is open for students on working days. Business hours 9: 30 - 14: 00, tel/fax 22 629-5282.</p> <p>Department of Transplantology and Main Tissue Bank Center for Biostructure Research 02-004 Warszawa, Chałubińskiego 5 Str.(Anatomicum bldg.) https://transplantologia.wum.edu.pl/ Department office is open for students on working days. Business hours 9: 30 - 14: 00, tel./fax 22 621 75 43</p> <p>Department of Methodology Preclinical Research Center Bldg. 02-091 Warszawa, 1b Banacha Street Web site: http://metodologia.wum.edu.pl metodologia@wum.edu.pl Department office is open for students on working days. Business hours 9: 30 - 14: 00</p>

Head of Educational Unit / Heads of Educational Units	Jacek Malejczyk, Ph.D. Professor Artur Kamiński, M.D., Ph.D., Associate professor Paweł Włodarski, MD, PhD, Professor
Course coordinator	Jacek Malejczyk, Ph.D., Professor jacek.malejczyk@wum.edu.pl
Person responsible for syllabus	Jacek Malejczyk, Ph.D., Professor jacek.malejczyk@wum.edu.pl
Teachers	<p>Department of Histology and Embryology: Jacek Malejczyk, Ph.D., Professor jacek.malejczyk@wum.edu.pl Stanisław Moskalewski, M.D., Ph.D., Professor stanislaw.moskalewski@wum.edu.pl Marek Kujawa, M.D., Ph.D. marek.kujawa@wum.edu.pl Anna Hyc, Ph.D., Associate professor anna.hyc@wum.edu.p Anna Iwan, Ph.D., Associate professor anna.iwan@wum.edu.pl Izabela Młynarczuk-Biały, M.D., Ph.D., Associate profesor imlynarczuk@wum.edu.pl Łukasz Biały, M.D., Ph.D. lukasz.bialy@wum.edu.pl Ewa Jankowska Steifer, Ph.D., Associate professor ewa.jankowska@wum.edu.pl Justyna Niderla-Bielińska, Ph.D., Associate professor justyna.niderla@wum.edu.pl Aneta Ścieżyńska, Ph.D. aneta.sciezynska@wum.edu.pl Ilona Kalaszczynska, Ph. D. ikalaszczynska@wum.edu.pl Kateryna Shevchenko, Ph.D. kateryna.shevchenko@wum.edu.pl</p> <p>Department of Transplantology and Main Tissue Bank: Izabela Uhrynowska-Tyszkiewicz, M.D., Ph.D. iuhrynowska@wum.edu.pl</p> <p>Department of Methodology: Paweł Włodarski, M.D., D.D.S., Ph.D., Professor pawel.wlodarski@wum.edu.pl</p>

2. BASIC INFORMATION			
Year and semester of studies	1 (1 and 2 semester)	Number of ECTS credits	10
FORMS OF CLASSES		Number of hours	ECTS credits calculation
Contacting hours with academic teacher			
Lecture (L)		10	0,5
Seminar (S)		30	1,0
Classes (C)		60	5
e-learning (e-L)		-	
Practical classes (PC)		-	
Work placement (WP)		-	
Unassisted student's work			
Preparation for classes and completions		100	3,5

3. COURSE OBJECTIVES

The aim of the course of Histology and Embryology is to demonstrate and explain structure of the cell, tissues and organs. Starting from the ultrastructure of the cell, which is discussed along with the function of the organelles, microscopic anatomy of all human tissues and major organs is shown. During the classes, functional connection between microscopic anatomy of the organ and the function is highlighted. This is the background for further education of Biochemistry, Physiology and Pathology. Basis of the molecular biology and examples of diagnostic methods are lectured.

O1	Gaining knowledge regarding structure and function of the cell organelles, tissues and organs, as well as morphological adaptation of tissues to their function.
O2	Gaining knowledge regarding the development of the embryo, development and function of fetal membranes and the most common fetal abnormalities.
O3	Gaining knowledge regarding identification of histological specimens and characteristic elements of the tissues under the microscope.

4. STANDARDS OF LEARNING – DETAILED DESCRIPTION OF EFFECTS OF LEARNING

Code and number of effect of learning in accordance with standards of learning	Effects in time
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Knowledge – Graduate* knows and understands:

A.W1.	appropriate Polish and English anatomical, histological and embryological terminology;
A.W4.	basic cell structures and their functional specialisations;
A.W5.	microarchitecture of tissues, extracellular matrix and organs;
A.W6.	developmental stages of the human embryo, the composition and function of foetal membranes and placenta, as well as developmental stages of particular organs and the influence of detrimental factors on the development of embryos and fetuses (teratogenic).
C.W49.	enzymes participating in digestion, mechanism of the production of hydrochloric acid in the stomach, the role of bile, course of absorption of digestion products;
B.W22.	physiology and regulation of reproductive functions of women and men;

Skills– Graduate* is able to:

A.U1.	use optical microscope, also when using immersion technique;
A.U2.	recognise histological structures of organs, tissues, cells and cellular structures under an optical and electron microscope, describe and interpret their structure and relations between the structure and the function;
A.U5.	use anatomical, histological and embryological terminology in spoken and written language;

* In appendix to the Regulation of Minister of Science and Higher education from 26th of July 2019 „graduate”, not student is mentioned.

5. ADDITIONAL EFFECTS OF LEARNING

Number of effect of learning	Effects of learning i time
Knowledge – Graduate knows and understands:	
K5	perceiving and recognizing own limitations and self-assessment of deficits and educational needs
K7	readiness to use objective sources of information
Skills– Graduate is able to:	
S1	
Social Competencies – Graduate is ready for:	
SC1	

6. CLASSES		
Form of class	Class contents	Effects of Learning
W – Lectures	<ol style="list-style-type: none"> 1. Skeletal muscle in health and in disease. 2. Hematopoiesis mechanisms – clinical considerations. 3. Hormonal regulation of hypothalamus – hypophysis – ovary – uterus axis. Gamete formation and menstrual cycle. 4. Fertilization and embryo formation till blastocyst stage. 5. Implantation and its regulation via growth and differentiation factors. Immunological issues of fertilization, improper places of implantation, embryo formation (presomite stage). 6. Development of chorionic cavity and trophoblast. Neural tube and neural crest formation, differentiation of mesoderm, blood vessel formation, embryo folding, endoderm differentiation, pharyngeal cleft and pouches. 7. Placenta formation, umbilical cord, maternal and fetal circulation, congenital malformations. 8. Connective tissue regeneration and degradation. 9. Angiogenesis – therapeutic approach. 10. Challenges of modern medicine. 	<p>A.W1. A.W4. A.W5. A.W6. C.W49. B.W22.</p>
(S) Seminars; (C) Practical classes;	<p>S - Microscope, histological technique. C - Various cell types.</p> <p>S - Compartments of cells and their function. C - Electron microscope and cell structure.</p> <p>S - Cell cycle and its regulation. C - Cell division.</p> <p>S - Structure and function of epithelial tissue. C - Epithelial tissue, glands.</p> <p>S - Structure and function of connective tissue proper and adipose tissue. C - Connective tissue proper and adipose tissue.</p> <p>S - Structure of cartilage and bone. C - Cartilage and bone.</p> <p>S - Development of various types of bone tissue; remodeling of bones.</p>	<p>A.W1. A.W4. A.W5. A.W6. C.W49. B.W22. A.U1. A.U2. A.U5. K5 K7</p>

	<p>C - Bone formation.</p> <p>S - Structure, organization and function of peripheral nervous system. C - Nervous tissue. Peripheral nervous system.</p> <p>S - Structure, organization and function of muscular tissue. C - Muscle.</p> <p>S - Formation of particular types of blood cells. C - Blood and bone marrow.</p> <p>S - Structure of vessels with particular emphasis on function of endothelial cells. C - Circulatory system.</p> <p>S - Demonstration of histological slides before the intermediate examination – general histology. C – Practical intermediate examination – general histology.</p> <p>S - Hormones produced by the hypophysis, regulation by the hypothalamus. C - Endocrine glands.</p> <p>S - Structure of female reproductive system and its hormonal regulation. C - Female reproductive system.</p> <p>S - Structure of male reproductive system and hormone regulation. C - Male reproductive system.</p> <p>S - Structure of the immune system, types of lymphocytes, lymphokines. C - Immune system</p> <p>S - Structures of the oral cavity. C - Gastro-intestinal system, part 1.</p> <p>S - Glands in stomach and intestines structure and function. C - Gastro-intestinal system, part 2.</p> <p>S - Relationship between structure and function of the liver. C - Gastro-intestinal system, part 3.</p> <p>S - Upper and distal respiratory tract. C - Respiratory system.</p> <p>S - Relationship between nephrons and blood vessels. C - Urinary system.</p> <p>S - Structure and function of skin, development of the mammary gland. C - Skin & its appendages, mammary gland.</p> <p>S - Structure of the eye and ear, function of the retina. C - Nervous system. Senses.</p> <p>S – Discussion and demonstration of histological slides – microscopic anatomy. C - Practical intermediate examination in Microscopic Anatomy.</p> <p>S - Discussion and demonstration of histological slides before Final Examination of the Histology and Embryology. C – Slide practice before Final Examination of the Histology and Embryology.</p>	
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7. LITERATURE
Obligatory
<ol style="list-style-type: none"> 1. Junqueira's Basic Histology: Text and Atlas, last edition 2. Gartner L. P., "Textbook of Histology", Elsevier, last edition. 3. Sadler T. W. "Langman's Medical Embryology", 2015, Wolters Kluwer Health, thirteenth edition. 4. Daniel J. Chiego, Jr.: "Essentials of Oral Histology and Embryology": A Clinical Approach, Elsevier 4th edition, 2014
Supplementary
<ol style="list-style-type: none"> 1. Stevens A., Lowe J. "Human Histology" 2005, Elsevier Mosby, third ed. 2. Ross M.H., Pawlina W. "Histology: A text and atlas", 2011, Lippincott Williams & Wilkins, sixth ed. 3. Schoenwolf, Bleyl, Brauer, Francis-West "Larsen's Human Embryology" 5th Ed. 4. Nanci A. "Ten Cate's - Oral Histology", 2008, Elsevier, seventh edition or newer

8. VERIFYING THE EFFECT OF LEARNING		
Code of the course effect of learning	Ways of verifying the effect of learning	Completion criterion
A.W1; A.W4; A.W5; A.W6; B.W22; C.W49; A.U5	intermediate examination, final examination	minimum 60 % of good answers in total
A.U1; A.U2	practical class – notebook drawings, practical intermediate examination, practical final examination	credit from the teacher; minimum 60 % of good answers in total in practical intermediate and final examinations
K5; K7	observation by the teacher during the classes	credit from the teacher

9. ADDITIONAL INFORMATION
<ol style="list-style-type: none"> 1. The student research club is supervised by Izabela Młynarczuk-Biały, M.D, Ph.D. and Ryszard Galus, M.D. Ph.D., Associate professor http://histologia.wum.edu.pl - Studenckie Koło Naukowe

General regulations - Histology and Embryology for medical students 6ED 2023/2024

Organization of classes and seminars

1. Histology and Embryology is taught during lectures, seminars and practical classes.
2. Presence in lectures, seminars and practical classes is obligatory. Coming late to class by more than 15 minutes will be treated as an absence.
3. Classes begin with the seminar followed by a practical part.
4. Students have to be prepared for the class. Tutor will verify student's preparation to the class. Subject of seminars and classes are specified in the Topics of classes and lectures.
5. During the class, students discuss with their professor topics of the class and inspect microscopic slides,
6. schemes and electronograms. Images of tissues and organs inspected under the microscope should be drawn with color crayons in the notebook. All drawings have to be properly described (legend to the drawing).
7. Microscopes are provided for every student in the class. At the end of the class student should switch off the microscope and cover it. Microscopic slides, electronograms, microscopes or their parts must not be removed from the class.
8. During the period preceding intermediate or final examinations, every student group can borrow a set of demonstration slides for an at-home training. Sets can be exchanged any number of times. Before exchanging or returning the set, students have to put slides in order, according to the attached list. Students are financially liable for lost or damaged slides.

Presence in the classes and seminars

1. To get the credit for the semester Student must be present in lectures and seminars and get credit in all classes.
2. The prerequisite for getting a credit for the class is a positive note received on the knowledge of the discussed subject and properly done drawings of microscopic slides.
3. Days of classes, including days of intermediate examinations, are days of obligatory presence.
4. **It is permitted to be absent up to 2 times during lectures and 2 times during classes in each semester.** Absence must be justified with the tutor. **Absence on 3 or more classes, regardless of the reason, results in not getting a credit for the semester,** hence student will not be admitted to the intermediate examination.
5. **When students are absent, they are expected to negotiate with professors the form for make-up of lectures, seminars or classes missed.**
6. Student is obliged to make up for missed class.
7. Classes uncredited because of an absence or being unprepared must be passed in the form established by the Head of the Department. Head of the Department will appoint the date of this test.

Credit

1. Dates of the intermediate examinations are decided by the university Pedagogical Council and cannot be changed.
2. Only students who were present in lectures, seminars and got credit for all the classes are admitted to the intermediate examination.
3. Intermediate examination in general histology and in microscopic anatomy consist of two parts: practical (slide recognition) and theoretical.
4. Intermediate examination in embryology has no practical part.
5. Intermediate examinations on the first and the second date are MCQ tests. Third final attempt of the intermediate examination (commission) have the form that is determined by the Head of the Department and is set after the permission obtained from the Dean's office.
6. Electronic intermediate examination tests online consist of 50 single choice questions. The duration of intermediate examination is 50 minutes. Electronic test examinations are held in the building of Main Library in the computer room.
7. The criteria to pass the test are determined by the Head of the Department, after the test, and they are expected to be not less than:
8. 60% of all questions in the test.
9. **Students may evaluate their paper during the quiz. Then, if any reservations arise, students can flag the question and express their concerns via the examination platform. Later complaints will not be accepted.**
10. Intermediate practical part must be passed before the date of the retake MCQ test. Students who failed practical part of any intermediate examination before the date of the retake examination will not qualify for the retake and last retake of MCQ test.

Final examination

1. The final examination comprises topics discussed during classes, seminars and lectures.
2. Student must pass all intermediate examinations scheduled in the program of the course to be admitted to the final examination.
3. Dates of the final examinations are decided by the university Pedagogical Council and cannot be changed.
4. Final examination consists of two parts: practical and theoretical.
5. Failing practical or theoretical part results in failing the examination.
6. **Head of the Department can set an oral appointment of THEORETICAL final examination for students, who obtained at least 88% of all points received on intermediate examinations. For such appointment student needs to apply to the Head of the Department in writing (template of the application is available on the Department web site). Student IS NOT exempted from PRACTICAL examination.**
7. **PRACTICAL EXAMINATION must be taken BEFORE the appointment with the Head for the Department.**
8. In the case of an absence during the final examination caused by medical condition, should present doctor's leave during three working days from the date of examination, or will receive a failing mark.
9. Retake of the examination is held during the retake examination session. If the student fails this examination, he/she can apply to the Dean for the permission for the second retake of the examination.

Practical examination

1. Practical part of the examination consists of recognizing 10 histological slides. Minimal number of recognized slides is 6. For each additionally recognized slide, the student receives 1 point, and for recognizing 10 slides - 5 points.
2. Students who failed practical examination on the first date will take the MCQ test, whose positive result will be treated as the result of retake examination (student has to take again only practical examination).
3. Students who passed practical examination on the first date, but failed the MCQ test, do not have to take the practical examination once again during the retake (student has to take again only MCQ test).

Theoretical examination

1. Theoretical part of the examination is the MCQ test that consists of 100 single choice questions. The duration of intermediate examination is 100 minutes. Electronic test examinations are held in the building of Main Library in the computer room.

2. Examination test contains questions on topics discussed in the course.
3. The criteria to pass the test are determined by the Head of the Department, after the test, and they are expected to be not less than:
 - 60% of questions in the remaining part of the test.
4. **Students may evaluate their paper during the quiz. Then, if any reservations arise, students can flag the question and express their concerns via examination platform. Later complaints will not be accepted.**

Final grade

1. Final mark is set on the basis of both: practical and theoretical examination. Points received on both parts of the examination are considered.
2. Points from the practical examination are added to the points received on the MCQ test only to students, who had passed the MCQ test.
3. Points from the practical examination are added only once. These points are not added in examinations conducted during the retake session.

Position of the Chair regarding cheating during examinations

Cheating on examinations is a breach of ethics and Regulations of Studies at the Warsaw Medical University. Person actively or passively participating in cheating shall be punished by being expelled from the examination and receiving a failing mark. On the top of that, the Department shall institute disciplinary procedure against the cheating students.

Person actively participating in cheating is the one, **who copies results from other students or uses illegal notes or electronic devices.**

Bringing such devices to examinations is forbidden.

Passive participation in cheating means allowing other students copy one's own responses. Thus, a student is obliged to behave honestly, not to allow other students copy his/her own responses.

Head of the Department obliges students and examiners to strictly obey these regulations.

ATTENTION

The final 10 minutes of the last class in the block/semester/year should be allocated to students' Survey of Evaluation of Classes and Academic Teachers