Semmelweis University
Department of Anatomy, Histology and Embryology
2025/2026

Faculty of Medicine
1st year, 2nd semester

HANDBOOK
Macroscopic Anatomy and Embryology II
Microscopic Anatomy and Embryology I

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Macroscopic Anatomy and Embryology I-II.
Microscopic Anatomy and Embryology I-II.

TEACHING DEPARTMENT:

SEMMELWEIS UNIVERSITY
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Budapest, Tűzoltó utca 58.
H-1094 Budapest
http://semmelweis.hu/anatomia/en/

LEARNING OBJECTIVES

Aims of the lectures in Macroscopic Anatomy - Presentation of important and/or complicated topics such as the structure of the body wall (e.g. thorax, pelvis), extremities and the cranium; the morphology of internal organs including the cardiovascular, digestive and urogenital systems; and the composition of the central nervous system, together with the organs of special senses and topography of body regions.

Aims of the lectures in Microscopic Anatomy/Histology - Presentation of the cell, basic principles in cellular morphology, detailed description of the epithelial, connective, muscle and nervous tissues. During the 2 semesters, the lectures contribute to the gross anatomical description of organs with a detailed presentation of their fine structures, including ultrastructural details. Important chapters: basic tissues, viscera, central nervous system.

Aims of the lectures in Embryology - Presentation of the early development from the differentiation of the germ cells to the formation of the human embryo (basic embryology). The embryology topics complement the gross anatomy and present histology lectures of the organs and systems also mentioning the most frequent malformations.

For the deeper understanding of relatively difficult questions small group discussions may be organized during the practical dissection room classes.

Aims of the practical dissection classes - In the first two semesters, based on their weekly programs, the students will study the morphology of the human body using anatomical specimens (bones, joints, muscles, viscera, brain) as well as learning the basic principles of dissection, including the proper usage of tools (scalpel, forceps, scizzors) under the supervision of their lab instructors. Human development is taught together with Macroscopy.

Aims of the histology practical classes - From the second semester of the first year, supervised by their lab instructor, Students will learn the use of the a digital light microscope. The individual viewing of histology slides will facilitate the understanding of the basic tissues (epithelial, connective, muscle and nervous) and the fine structure of the organs.

The knowledge of students will be tested by regular **mid-term examinations**.

Lectures: First semester: 2x 45 min (Macroscopic Anatomy and Embryology I); second semester: 4x45 min Macroscopic Anatomy and Embryology II and 1x 45 min Microscopic Anatomy and Embryology I; third semester: 2x 45 min (Microscopic Anatomy II)

Practical classes: First semester: 6x 45 min (Macroscopic Anatomy and Embryology I) ; second semester: 6x 45 min Macroscopic Anatomy II and 4x45 min Microscopic Anatomy and Embryology I; third semester: 2x 45 min Microscopic Anatomy II.

Topics:

First semester: Gross anatomy of the bones, joints and muscles; composition, vessels and nerves of limbs and the body wall, skull, organs, cavities, nervous and vascular supply of the head and neck regions. General Embryology. Development of the skull, spine and limbs.

Second semester: Morphology and Embryology of the heart and vessels, thoracic/abdominal/pelvic viscera, body cavities and serous membranes. Sectional anatomy of the thorax, abdomen and pelvis. Description of the diaphragms. Macroscopy of central and peripheral nervous systems, organs of special senses.

General histology (basic tissues). Histology of the heart and vessels, the lymphatic system, gastrointestinal and urogenital organs.

Third semester: Histology and embryology of the central and peripheral nervous system together with the organs of special senses and endocrine organs. Microscopy of the CNS

WORK / ENVIRONMENTAL PROTOCOL AND INFECTION CONTROL

GENERAL RULES

1. Frequently wash your hands using soap and warm water.
2. Sanitise your hand frequently.
3. Do not touch your face or eye.
4. It is **STRICTLY FORBIDDEN** to consume food, drinks or chewing gum in the **dissection rooms** and **histology laboratories**.
5. **Students are expected to be prepared for the practical work.** E
6. verybody is supposed to behave in the dissecting room conforming to the spirit of the site. Loud speech, out-of-place jokes and any kind of behaviour, disregarding the dignity of human corpses, should strictly be avoided.

SPECIFIC RULES CONCERNING THE HISTOLOGY LABORATORIES

1. You may clean the surfaces with wet towels before you start using them.
2. Food and drinks are **strictly forbidden** on the premises.

SPECIFIC RULES CONCERNING THE DISSECTION ROOMS

1. Lab coats (buttoned up) must be worn in the dissecting room at all time.
2. Use hand sanitizers upon entering. Rubber gloves are provided for dissection.
3. Loose/long hair must be tied back before dissection.
4. Food and drinks are **strictly forbidden** on the premises of the department.
5. Only the members of the study group can participate in the sessions, visitors may be present only with prior permission from the lab instructor/ Course Director. Students can leave the sessions only with the approval of the lab instructor.
6. **It is strictly prohibited to make any type of recording in the dissection room.**
7. Students may not stay in the dissecting room without the supervision of one of the assistants of the department. In the absence of an instructor, the technical personnel should ask the students to leave the dissecting room.
8. No valuable items should be left around, the department does not bear the responsibility for lost items/valuables.
9. Scalpels, blades and tweezers will have to be carried in a tightly closed and hard box. Please make sure that nobody is harmed when working with the sharp and pointed tools.
10. Accidents must be reported to the teacher first and wounds will be dressed with the help of the dissection room assistants.
11. Lab coats and rubber gloves are to be worn in the dissection room units only! Do not step out (not even for using the washroom) from the dissection unit while still wearing a lab coat.
12. It is strictly forbidden to take bones or other anatomical specimens or samples etc. from the dissecting room.
13. Dry and wet samples must be treated separately. Please wash the gloves during dissection before you start handling bones or dry /plastinated specimen.
14. There is a bell ringing 5 minutes before the end of the practical classes. Then all cadaver specimens will have to be properly wrapped and put away in their bags or boxes.
15. Dissection leftovers should be discarded in the special containers and the trays should be left clean and dry.
16. Dissection tools should be properly washed.
17. Disposable scalpels/blades could be disposed of **in special yellow/red containers designed for sharps and hazardous material**. Gloves must be discarded in labelled bins only, but NEVER in communal/paper waste!
18. The dissection unit may only be left following a thorough handwash using a disinfectant soap.
19. Please make sure that you leave the dissecting room quickly to provide time for the personnel to clean the surfaces between classes.

FIRE SAFETY PROTOCOL

1. The use of naked light or smoking is **STRICTLY PROHIBITED** on the premises of the Department, including the building and the yard.
2. In case of fire, a loud fire alarm signal is to ring throughout the building. In case of a fire drill, the building must be left organized, with the guidance of the teacher/instructor of the group, using the exits as quick as possible. Escape routes are illustrated on every floor.
3. All fire cases or signs/ suspicion of a possible fire should be reported to the teacher of the group.

EM I Macroscopic Anatomy and Embryology II.
Announcements

ACCEPTENCE OF THE SEMESTER:

1. Active participation in dissection room sessions is obligatory for every student. Students should attend at least 75% of the scheduled hours, including the midterm tests, to gain a signature proving the validity of the semester. Absences are therefore limited in **25%**. Attendance will be recorded in the dissection room classes.
2. At **least one of the two midterms will have to be passed with at least a mark 2**, **or the semester is not accepted**. Retake midterms are offered during the last two weeks of the semester, possibly in a pin test format, composed of the topics of the entire semester (i.e. both midterms topics) .

Attendance at practical classes is obligatory

Students should present themselves well prepared and on time to start with the dissection work. Attendance is regularly checked and students will have to sign a presence sheet once the teacher has verified their presence.
Students unfit to start the practical class at the **starting time specified in the time table** will be recorded as „*being late*". According to the *Study policy 28. § 12. point* - 3 (three) such occasions of „*being late*„ will add up to a **recorded absence**.
Furthermore, students arriving later than 5 minutes past the starting time may participate in the class but their presence will not be recorded/accepted (i.e. counts as an absence).

MIDTERM EXAMINATIONS

During the semester, both practical and theoretical knowledge will regularly be evaluated. Attendance and the passing of at least one of the midterm is obligatory to gain acceptance of the semester.
The midterms are held in the dissection room, and composed of identification of several structures on the specimen together with theoretical questions related to the subject.
Students failing both midterm tests are offered two retake possibilites during the last two weeks of the semester in the format of a pin test, see above. Students unsuccessful at either /both of retake midterms will not gain a signature, so they will not be able to sit for the final examination and will have to repeat the semester in the following academic year.

Test I. (oral, obligatory to attend) **Date:** 7th week (3rd class of the week ***except*** for the classes having ***their 3rd dissection class on Friday, their midterm will take place on the 2nd class of the week***)
Topics: *Internal organs of the head, neck, thorax, abdomen and pelvis, together with their development*

Test II. (oral, obligatory to attend) **Date**: 13th week (3rd class of the week)
Topics: *Organs of the retroperitoneal and pelvic organs together with their development. Macroscopy of the central nervous system, intracranial topography (without the topography of the orbit)*
1st and 2nd retake dates: Week 14 TBA

BONUS MARK - Students may earn a ***bonus mark*** (4 or 5 only) from the average of the two oral tests. A mark 4 (good) can be earned if the midterm average is 4,00 (4+4 or 3+5); while a mark 5 (excellent) will be earned if the average of the midterm marks is at least 4,50 (4+5 or 5+5).
This ***bonus mark*** will be added to the marks of the practical part of the final examination in case it increases the final mark.

*Please note that only **marks from the first, official, attempt are counted in**, marks earned at the retake midterm/s are not considered. Furthermore, the result of the first attempt cannot be improved/upgraded by taking the retake midterm.*

DISSECTION WORK – *during the two semesters, Students are given selected dissection tasks to improve their dexterity as well as to deepen their knowledge concerning topographical relations. Students should submit their task before the end of the the 1st or the 2nd semester to be able to sit for the final examination.*

EXAM COMPETITION (written)

All students with **an average of 4,0 from the two midterms are invited to participate** in a written (moodle) competition from the topics of the 2 semesters of the subject held on Week 13. Students achieving good marks (4 or 5) at the test may be **exempted**** from the written part of the final examination and thus will have to sit only for the oral/dissection part.

2nd round (pin test)

The **first 10 students** achieving the best results in the written test are invited to participate in the 2nd round (a pin test) where certain anatomical structures (labelled by numbers) will have to be identifed on true specimens / prosections. The competition is held during week 14.
The winners of the 1st, 2nd and 3rd prizes will be decorated with a diploma of merit.

FINAL EXAMINATION

Topics: Subject matter of the two semesters (Macroscopic Anatomy I-II.)

The final examination consists of practical and theoretical parts:

1. Written pretest (Macroscopic Anatomy questions, via the moodle system) unless exempted
2. Oral examination (Identification of structures on anatomical prosections, including relevant theoretical/ Embryology questions)

Marking system

The final result/mark of the examination is calculated from the following partial marks:

1. Written test (unless exempted**)
2. Musculoskeletal system
3. Internal organs
4. Macroscopy of the central nervous system

+

5. *Bonus dissection mark* (for those having an average of 4,00-5,00 from the midterm marks)

PLEASE NOTE

1. Only those students are eligible to sit for the final examination who have successfully finished their dissection task.
2. Students enrolled in a CV course in Macroscopic Anatomy I. may only sit for the final examination in Macroscopic Anatomy II. following a successful examination in Macroscopic Anatomy I.

Academic Year 2025/2026 Faculty of Medicine

Macroscopic Anatomy and Embryology II. EM I 1-12

Week	Lectures *EM 1-12 Mon 14.30-16.00 NET Green hall and Tue 10.00 -11.45 EOK Békésy Hall*	EM 1-12 Lecturers	Dissection room classes
Week 1 02.16 -20.	1. Nasal cavity, paranasal sinuses 2. Morphology and development of teeth 3. Oral cavity, tongue, palate, salivary glands, faucial isthmus 4. Larynx	1 Székely 2 Shahbazi 3 Kozsurek 4 Székely	Dissection /inspection of the walls and cavities of the head and neck region Dissection /inspection of the cervical internal organs
Week 2 02.23 -27.	5. Pharynx, esophagus 6. Development of the face, malformations 7. Development of the pharyngeal arches, development of the foregut 8. Thoracic cavity, mediastinum. Chambers of the heart, external features. Structure of heart wall, valves, fibrous skeleton. Pericardium	5 Vereczki 6 Nagy 7 Nagy 8 Kocsis	
Week 3 03.02- 06.	9. Cardiac vessels and nerves, conducting system. Surface projection. Auscultation points 10. ***Clinical anatomy of the heart*** 11. Development of the heart 12. Development of arteries	9 Kocsis 10 **clinician** 11 Nagy 12 Nagy	Opening of the thorax, dissection of the thoracic cavity Opening of the abdominal cavity, dissection /inspection of the abdominal organs Opening of the abdominal cavity,
Week 4 03.09 - 13.	13. Development of veins 14. Morphology of trachea and the lung. Pleura 15. Development of the respiratory system. 16. Stomach	13 Ádám 14 Rácz 15 Minkó 16 Ádám	
Week 5 03.16 -20.	17. Small intestines (duodenum, jejunum, ileum), spleen 18. Liver, gall bladder 19. Large intestine, rectum 20. Development of the midgut and hindgut	17 Hanics 18 Rácz 19 Székely 20 Nagy	
Week 6 03.23 -27.	21. Peritoneal relations of abdominal organs. Development of the peritoneum, separation of body cavities 22. ***Clinical anatomy of the abdominal cavity*** 23. *Retroperitoneal topography - consultation* 24. Morphology of the kidney, capsules of the kidney, ureter, urinary bladder.	21 Dóra 22 **clinician** 23 Németh 24 Lendvai	
Week 7 03.30 - 04.03. **EASTER FRIDAY**	25. Morphology and coats of the testicle 26. Morphology of the epididymis, spermatic cord, seminal vesicle and prostate 27. Morphology of penis and male urethra. Male perineum 28. Ovary, Fallopian tube and uterus	25 Katz 26 Barna 27 Dóra 28 Katz	**Midterm 1 Morphoplogy and development of the internal organs of the head&neck, thorax and abdomen.** Opening of the abdominal cavity, dissection /inspection of the abdominal organs
Week 8 04.06 -10. **EASTER MONDAY**	*29. EASTER MONDAY* *30. EASTER MONDAY* 31. Vagina, female perineum, external genital organs 32 ***Clinical anatomy of the male urogenital tract***	***29 Easter*** ***30 Easter*** 31 Csáki 32 **clinician**	Dissection/ inspection of the retroperitoneal organs and perineum together with organs of the lesser pelvis
Week 9 04.13 -17.	33. Development of the urinary system 34. Development of genital organs 35. Topographical divisions of the central nervous system, developmental units 36. Meninges, epidural and subarachnoideal spaces, ventricles, choroidal plexus, CSF	33 Puskár 34 Minkó 35 Ádám 36 Kozsurek	
Week 10 04.20 - 24.	37. Lobes of the cerebral cortex, topographical subdivisions, structure and function of the medial, lateral and basal cortical fields 38. Topography and components of the basal ganglia and the diencephalon (thalamus, hypothalamus), the 3rd ventricle. 39. Topography and components of the brainstem (midbrain, pons, medulla oblongata), the 4th ventricle 40. Arterious, venous and lymphatic circulation of the brain	37 Horváth 38 Horváth 39 Katz 40 Adorján	Dissection/ inspection of the brain and spinal cord.
Week 11 04.27 - 05.01.	41. Cranial nerve nuclei 42. Oculomotor (CN3), trochlear (CN4) and abducent (CN6) nerves 43. Trigeminal nerve (CN 5/1, 5/2) 44. Trigeminal nerve (CN 5/3)	41 Barna 42 Fejszák 43 Hanics 44 Hanics	Dissection/ inspection of the brain and spinal cord. Intracranial spaces.
Week 12 05.04 -08.	45. Facial nerve (CN 7) 46. Glossopharyngeal nerve (CN 9), hypoglossal nerve (CN 12) 47. Accessory nerve (CN 11), vagus nerve (CN 10) 48. *Consultational lecture concerning the cranial nerves*	45 Rácz 46 Dóra 47 Székely 48 Ádám	
Week 13 05.11 -15.	49. Spinal cord, spinal ganglia, spinal segment. Spinal nerves, nerve plexuses 50. Intracranial topography, orbit 51. The autonomic nervous system. Sympathetic nervous systems 52. The autonomic nervous system. Parasympathetic nervous systems ***COMPETITION (1st round - TBA)***	49 Horváth 50 Adorján 51 Tóth 52 Tóth	**Midterm 2. Retroperitoneum. Morphology and development of the pelvic organs. Macroscopy of CNS. Intracranial topography** Cranial nerve branches
Week 14 05.18 -22.	53. Lymphatic system. Regional lymphatic drainage of organ, lymph nodes. 54. Topographical relations of the thoracic cavity 55. Topographical relations of the abdominal cavity 56. Topographical relations of the pelvis ***COMPETITION (2nd round - TBA)***	53 Székely 54 Adorján 55 Lendvai 56 Katz	Cross sectional anatomy Revision

Academic Year 2025/2026 Faculty of Medicine
Macroscopic Anatomy and Embryology II. EM I 13-24

Week	Lectures *EM 12-22 Tue 8.00-9.45 and Wed 14.15-16.00 Békésy*	EM 13-24 Lecturers	Dissection room classes
Week 1 02.16 -20.	1. Nasal cavity, paranasal sinuses 2. Oral cavity, tongue, palate, salivary glands, faucial isthmus 3. Morphology and development of teeth 4. Pharynx, esophagus	1 Székely 2 Kozsurek 3 Shahbazi 4 Vereczki	Dissection /inspection of the walls and cavities of the head and neck region Dissection /inspection of the cervical internal organs
Week 2 02.23 -27.	5. Larynx 6. Development of the face, malformations 7. Development of the pharyngeal arches, development of the foregut 8. Thoracic cavity, mediastinum. Chambers of the heart, external features. Structure of heart wall, valves, fibrous skeleton. Pericardium	5 Alpár 6 Nagy 7 Nagy 8 Kocsis	
Week 3 03.02- 06.	9. Cardiac vessels and nerves, conducting system. Surface projection. Auscultation points 10. ***Clinical anatomy of the heart*** 11. Development of the heart 12. Development of arteries	9 Kocsis **10 clinician** 11 Nagy 12 Nagy	Opening of the thorax, dissection of the thoracic cavity Opening of the abdominal cavity, dissection /inspection of the abdominal organs Opening of the abdominal cavity,
Week 4 03.09 - 13.	13. Development of veins 14. Morphology of trachea and the lung. Pleura 15. Development of the respiratory system. 16. Stomach	13 Németh 14 Rácz 15 Minkó 16 Ádám	
Week 5 03.16 -20.	17. Small intestines (duodenum, jejunum, ileum), spleen 18. Liver, gall bladder 19. Large intestine, rectum 20. Development of the midgut and hindgut	17 Hanics 18 Rácz 19 Székely 20 Nagy	
Week 6 03.23 -27.	21. Peritoneal relations of abdominal organs. Development of the peritoneum, separation of body cavities 22. ***Clinical anatomy of the abdominal cavity*** 23. *Retroperitoneal topography - consultation* 24. Morphology of the kidney, capsules of the kidney, ureter, urinary bladder.	21 Dóra 22 **clinician** 23 Németh 24 Lendvai	
Week 7 03.30 - 04.03. **EASTER FRIDAY**	25. Morphology and coats of the testicle 26. Morphology of the epididymis, spermatic cord, seminal vesicle and prostate 27. Morphology of penis and male urethra. Male perineum 28. Ovary, Fallopian tube and uterus	25 Katz 26 Barna 27 Dóra 28 Katz	**Midterm 1 Morphoplogy and development of the internal organs of the head&neck, thorax and abdomen.** Opening of the abdominal cavity, dissection /inspection of the abdominal organs
Week 8 04.06 -10. **EASTER MONDAY**	*29. Consultational lecture on Tuesday* *30. Consultational lecture an Tuesday* 31. Vagina, female perineum, external genital organs 32 ***Clinical anatomy of the male urogenital tract***	29 30 31 Csáki 32 **clinician**	Dissection/ inspection of the retroperitoneal organs and perineum together with organs of the lesser pelvis
Week 9 04.13 -17.	33. Development of the urinary system 34. Development of genital organs. 35. Topographical divisions of the central nervous system, developmental units 36. Meninges, epidural and subarachnoideal spaces, ventricles, choroidal plexus, CSF	33 Puskár 34 Minkó 35 Ádám 36 Kozsurek	
Week 10 04.20 - 24.	37. Lobes of the cerebral cortex, topographical subdivisions, structure and function of the medial, lateral and basal cortical fields 38. Topography and components of the basal ganglia and the diencephalon (thalamus, hypothalamus), the 3rd ventricle. 39. Topography and components of the brainstem (midbrain, pons, medulla oblongata), the 4th ventricle 40. Arterious, venous and lymphatic circulation of the brain	37 Horváth 38 Horváth 39 Katz 40 Alpár	Dissection/ inspection of the brain and spinal cord.
Week 11 04.27 - 05.01.	41. Cranial nerve nuclei 42. Oculomotor (CN3), trochlear (CN4) and abducent (CN6) nerves 43. Trigeminal nerve (CN 5/1, 5/2) 44. Trigeminal nerve (CN 5/3)	41 Barna 42 Rácz 43 Hanics 44 Hanics	Dissection/ inspection of the brain and spinal cord. Intracranial spaces.
Week 12 05.04 -08.	45. Facial nerve (CN 7) 46. Glossopharyngeal nerve (CN 9), hypoglossal nerve (CN 12) 47. Accessory nerve (CN 11), vagus nerve (CN 10) 48. *Consultational lecture concerning the cranial nerves*	45 Rácz 46 Dóra 47 Ádám 48 Ádám	
Week 13 05.11 -15.	49. Spinal cord, spinal ganglia, spinal segment. Spinal nerves, nerve plexuses 50. Intracranial topography, orbit 51. The autonomic nervous system. Sympathetic nervous systems 52. The autonomic nervous system. Parasympathetic nervous systems ***COMPETITION (1st round - TBA)***	49 Horváth 50 Adorján 51 Tóth 52 Tóth	**Midterm 2. Retroperitoneum. Morphology and development of the pelvic organs. Macroscopy of CNS. Intracranial topography** Cranial nerve branches
Week 14 05.18 -22.	53. Lymphatic system. Regional lymphatic drainage of organ, lymph nodes. 54. Topographical relations of the thoracic cavity 55. Topographical relations of the abdominal cavity 56. Topographical relations of the pelvis ***COMPETITION (2nd round - TBA)***	53 Székely 54 Adorján 55 Lendvai 56 Katt	Cross sectional anatomy Revision

Topics of the final examination in Macroscopic Anatomy and Embryology II

Macroscopic Anatomy and Embryology I
see in the previous (1st semester)Handbook

Internal organs of the head & neck region (morphology and development)
Oral cavity (divisions, boundaries)
Floor of mouth, sulcus lateralis linguae
Macroscopy of the tongue
Types and morphology of teeth, blood supply and innervation
Tooth development
Salivary glands together with topography
Faucial isthmus, palate. Tonsils
Pharynx and parapharyngeal spaces
Blood supply and innervation of pharynx
Pharyngeal muscles
Nose, nasal cavity (boundaries, nasal meatus, vessels)
Paranasal sinuses (connections, vessels)
Larynx (shape, position, muscles, vessels, nerves)
Skeleton and joints of larynx together with the fibroelastic membranes, mucous membrane
Common and external carotid arteries and their branches. Maxillary artery and its branches
Venous drainage of face and neck
Lymph nodes and lymphatic vessels of the head&neck
Development of the face, including the development of the oral and nasal cavities
Development and differentiation of the foregut
Derivatives of the branchial arches
Derivatives of the branchial pouches and grooves
Development of the teeth and tongue

Circulatory system (morphology and development)
Shape, external features of heart
Chambers of heart
Endocardium, ostia, valves of heart
Skeleton of heart, anuli fibrosi
Structure of heart wall
Pulse generating and conducting system of heart
Pericardium
Position and surface projections of heart
Percussion and auscultation (area of cardiac dullness, heart sounds)
Radiology of heart
Early circulation (formation of vessels, basis vascular systems of the embryo/fetus)
Heart development
Pulmonary circulation
Ascending aorta, arch of aorta and its branches
Subclavian artery and its branches
Thoracic aorta and its branches
Abdominal aorta and its branches
Development of arteries (aorta, branchial arterious arches, umbilical arteries)
Celiac trunk and its branches
Superior mesenteric artery and its branches
Inferior mesenteric artery and its branches
External and internal iliac arteries and their branches
Internal pudendal artery and its branches
Superior vena cava and its tributaries
Inferior vena cava and its tributaries
Azygos and hemiazygos veins and their tributaries

Portal vein and its tributaries, portocaval anastomoses
Development of veins (inferior v. cava, portal v., superior v. cava, azygos and hemiazygos veins)
Fetal circulations
Lymphatic drainage of the abdominal and pelvic organs
Thoracic duct, right lymphatic trunk

Morphology and development of the thoracic, abdominal and pelvic organs
Trachea and bronchial tree
Lung (shape, parts, surfaces, hilum)
Lung (position, topography, vessels, nerves)
Surface projection of pleura and lung
Pleura, pleural cavity
Mediastinum (divisions and content)
Development of the lower airways including the lung
Description and topography of the esophagus
Stomach (shape, position, parts, blood supply and innervation). Peritoneal relations
Duodenum (shape, position, divisions, vessels)
Jejunum-ileum (shape, position, vessels)
Large intestine (shape, position, vessels)
Rectum, anal canal (shape, position, vessels)
Liver (shape, position, peritoneal relations, vessels)
Gall bladder and biliary passages (anatomy)
Pancreas (shape, position, vessels)
Peritoneum, greater and lesser omentum, mesentery, omental bursa
Formation and differentiation of the midgut
Formation and differentiation of the hindgut
Development of liver and pancreas
Development of the peritoneum
Formation of body cavities, development of the diaphragm

Kidney (shape, position, hilum, sinus, capsules, vascular architecture)
Renal pelvis and calyces. Ureter
Urinary bladder (shape, position, muscles, vessels)
Female urethra
Male urethra, bulbourethral gland
Development of kidneys
Development of urinary passages
Testis (shape, position, vessels). Scrotum, coats of testis
Epididymis, vas (ductus) deferens, spermatic cord
Seminal vesicle, prostate
Penis (shape, position, mechanism of erection, vessels, nerves)
Pelvic floor, male perineum (connective tissue spaces)
Hernia canals (inguinal and femoral)
Ovary (shape, position, vessels)
Uterine tube (shape, position, vessels)
Uterus (shape, parts, position, supporting structures, vessels) Broad ligament
Vagina, female perineum (connective tissue spaces)
External female genital organs (mons pubis, labia, vestibule of vagina, greater vestibular gland, vessels)
Development of gonads, formation and migration of primordial germ cells
Development of male genital system
Development of female genital system
Development of the external genital organs

Macroscopy of the nervous system
Intracranial topography Dura mater, dural sinuses
Arachnoid mater, pia mater, cisterns, CSF circulation
Description and meninges of the spinal cord
Brain stem (medulla oblongata, pons, midbrain)
Cerebellum
Diencephalon (parts, blood supply). Thalamus, hypothalamus
Lateral ventricles, III. ventricle, IV. ventricle
Hemispheres
Internal carotid artery (course, parts and branches)
Vertebral artery (course and branches)
Circle of Willis
Veins of the brain
Cranial nerve nuclei, macroscopy of cranial nerves together with the brain, dural and skull exits
Branches of cranial nerves (CN 3, CN 4, CN 5, CN 6, CN 7, CN 9, CN 10, CN 11, CN 12)
General composition of the autonomic nervous system
Sympathetic nervous system (cranial, cervical, thoracic and lumbar parts)
Sympathetic trunk
Parasympathetic system (cranial and sacral parts)
Topography of the orbit. Extraocular muscles. Eye movements.
Eyelids, conjunctiva, fasciae of the orbit, lacrimal apparatus

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EM I Microscopic Anatomy and Embryology I. Announcements

SUBJECT MATTER OF THE SEMESTER

I. Microscopy of basic tissues

Simple, stratified and glandular epithelia, connective & supporting tissues, muscle tissues, blood, bone marrow

II. Microscopical strucure of internal organs

Cardiovascular, gastrointestinal, respiratory and urogenital systems and elements of the peripheral nervous system apparent in the organs

ACCEPTENCE OF THE SEMESTER:

1. Active participation in dissection room sessions is obligatory for every student. Students should attend at least 75% of the scheduled hours, including the midterm tests, to gain a signature proving the validity of the semester. Absences are therefore limited in **25%**. Attendance will be recorded in the classes.
2. At **least one of the two midterms will have to be passed with at least a mark 2**, **or the semester is not accepted**. Two retake midterms are offered during the last two weeks of the semester, composed of the topics/slides of the entire semester (i.e. both midterms topics).

Attendance at practical classes is obligatory

Students should present themselves well prepared and on time to start with the work. Attendance is regularly checked and students will have to sign a presence sheet once the teacher has verified their presence.

Students unfit to start the practical class at the **starting time specified in the time table** will be recorded as „*being late*". According to the *Study policy 28. § 12. point* - 3 (three) such occasions of „*being late*„ will add up to a **recorded absence**.

Furthermore, students arriving later than 5 minutes past the starting time may participate in the class but their presence will not be recorded/accepted (i.e. counts as an absence).

MIDTERM TESTS

There are two written tests held in the Digital Histology Laboratories. Attendance and the passing of 1 of the two midterms with at least a mark 2 is obligatory

Midterm test 1 - Date: Week 5 (2nd class)
Basic tissues (slides viewed during weeks 1-4)

Midterm test 2 Date: Week 11 (2nd class)
Histology of organs (except for the female genital tract);
retakes are held during Weeks 13/14

EXEMPTIONS - Students may earn an ***exemption*** *from the written part of the semifinal examination with a good (4) or an excellent (5) grade, calculated from the average of the two written tests. A mark 4 (good) can be earned if the midterm average is 4,00; while a mark 5 (excellent) will be earned if the average of the midterm marks is at least 4,50.

SEMIFINAL EXAMINATION

Topics: Subject matter of the semester (Microscopic Anatomy and Embryology I.)

The semifinal examination consists of practical and theoretical parts:

1. Written pretest - unless exempted*(Microscopic Anatomy and Embryology questions)
2. Oral examination (Identification of structures on a digital slide including relevant theoretical question

Academic Year 2025/2026 Faculty of Medicine

Microscopic Anatomy I. EM I 1-12

Week	Lectures (EOK Hevesy lecture room) *EM 1-12 Wed 10.00-10.45*	Lecturers	Histology Laboratories (2x90 minutes) *EM 1-6 Mon Thurs* *EM 7-12 Tues Thurs*
Week 1 02.16 -20.	1 Epithelial tissues, cell contacts, intercellular connections Glandular epithelium	1 Kocsis	Epithelial tissues **1, 2, 3**
			Epithelial tissues II. **4a, 5, 6, 7a**
Week 2 02.23 -27.	2 Connective tissue cells and fibres. Extracellular matrix	2 Kocsis	Glandular epithelium **3, 10a, 11, 12,** *10c*
			Connective tissue cells/fibres **20a, 6, 21, 24, 25b,** *3, 22, 23a*
Week 3 03.02 - 06.	3 Supporting tissues (cartilage, bone)	3 Dóra	CT types: **20a, 6, 26, 10b, 27;** Blood **28**
			Supporting tissues **30, 32, 33, 34, 35, 36, 37,** *31,*
Week 4 03.09 -13.	4 Ossification, bone remodelling Erythropoesis, leukopoesis	4 Puskár	Types of bone formation **38a, 39**
			Nerve tissue **40, 41**
Week 5 03.16 -20.	5 Muscle tissues	5 Barna	Types of muscle tissues **50, 5, 51,** *52*
			MIDTERM 1 - Basic tissues Histology of vessels **25a, 60, 61, 1,** *25b, 62, 63, 64*
Week 6 03.23-27.	6 Cellular components of lymphatic tissue. Thymus, tonsils, MALT, lymph nodes and spleen	6 Nagy	Lymphatic organs (thymus, tonsils) **100a, 101, 103, 104,** *100b, 102a-b*
			Lymphatic organs (lymph node, spleen) **21, 105, 106a-b**
Week 7 03.30 -04.03	7. Histology of the tongue and teeth Histology of the esophagus	7 Hanics	Lip, tongue, lingual papillae **110, 61, 111, 112**
			Teeth, tooth bud **120a-b, 121**
Week 8 04.06 -10. **Easter Monday**	8. Histology of the stomach. Microscopical anatomy of the small and large intestines	8 Tóth	***EASTER MONDAY*** ***- no class for EM 1-6***
			Salivary glands **10c, 122, 123,** *10a* Esophagus, stomach, **5, 130a, 131, 134**
Week 9 04.13 -17.	9. Histology of the liver, gall bladder and pancreas	9 Dobolyi	Intestines **132a, 135a, 136a, 137, 138a,** *132b, 132c, 133, 136b, 138b*
			Liver, gall bladder, pancreas **140a-b, 141, 24, 2, 142a,** *140c*
Week 10 04.20 -24.	10. Histology of the airways	10 Katz	Epiglottis, larynx **150, 151,**
			Trachea, lung **3, 152, 153**, *154*
Week 11 04.27 - 05.01.	11. Microscopical anatomy of urinary organs	11 Ádám	Kidney, ureter, urinary bladder **160, 161, 162, 4a-b**
			MIDTERM 2 - histology of internal organs (except for the genital organs)
Week 12 05.04 -08.	12. Histology of the male genital system	12 Hanics	Histology of the male genital system II. **172, 173, 174a, 174b, 7a**, *7b, 7c*
			Histology of the male genital system I. **170a-b, 171**
Week 13 05.11 -15.	13. Histology of the female genital system I.	13 Tóth	Histology of the female genital system I. **180, 181a-b, 182**
			Histology of the female genital system II. **27, 183, 23a,** *23b, 187a-b-c*
Week 14 05.18 -22.	14. Histology of the female genital system II. Placenta, mammary gland	14 Minkó	Placenta, Mammary gland **184, 185, 20a, 186a**, *186b-c*
			Revision

Academic Year 2025/2026 Faculty of Medicine

Microscopic Anatomy I. EM I 13-24

Week	Lectures (EOK Hevesy lecture room) *EM 13-24 Thurs 12.15 – 13.00*	Lecturers	Histology Laboratories (2x90 minutes) *EM 13-18 Mon Thurs EM 18 -24 Tues Thurs*
Week 1 02.16 -20.	1 Epithelial tissues, cell contacts, intercellular connections. Glandular epithelium	1 Kocsis	Epithelial tissues **1, 2, 3** Epithelial tissues II. **4a, 5, 6, 7a**
Week 2 02.23 -27.	2 Connective tissue cells and fibres. Extracellular matrix	2 Kocsis	Glandular epithelium **3, 10a, 11, 12,** *10c* Connective tissue cells/fibres **20a, 6, 21, 24, 25b,** *3, 22, 23a*
Week 3 03.02- 06.	3 Supporting tissues (cartilage, bone)	3 Dóra	CT types: **20a, 6, 26, 10b, 27;** Blood **28** Supporting tissues **30, 32, 33, 34, 35, 36, 37,** *31,*
Week 4 03.09 - 13.	4 Ossification, bone remodelling	4 Puskár	Types of bone formation **38a, 39** Nerve tissue **40, 41**
Week 5 03.16 -20.	5 Muscle tissues	5 Barna	Types of muscle tissues **50, 5, 51,** *52* ***MIDTERM 1 - Basic tissues*** Histology of vessels **25a, 60, 61, 1,** *25b, 62, 63, 64*
Week 6 03.23 -27.	6 Cellular components of lymphatic tissue. Thymus, tonsils, MALT, lymph nodes and spleen	6 Nagy	Lymphatic organs (thymus, tonsils) **100a, 101, 103, 104,** *100b, 102a-b* Lymphatic organs (lymph node, spleen) **21, 105, 106a-b**
Week 7 03.30 - 04.03.	7 Histology of the tongue and teeth. Histology of the esophagus	7 Hanics	Lip, tongue, lingual papillae **110, 61, 111, 112** Teeth, tooth bud **120a-b, 121**
Week 8 04.06 -10. **Easter Monday**	8 Histology of the stomach. Microscopical anatomy of the small and large intestines	8 Tóth	***EASTER MONDAY*** ***- no class for EM 13-18*** Salivary glands **10c, 122, 123,** *10a* Esophagus, stomach, **5, 130a, 131, 134**
Week 9 04.13 -17.	9 Histology of the liver and pancreas	9 Dobolyi	Intestines **132a, 135a, 136a, 137, 138a,** *132b, 132c, 133, 136b, 138b* Liver, gall bladder, pancreas **140a-b, 141, 24, 2, 142a,** *140c*
Week 10 04.20 - 24.	10 Histology of the airways	10 Katz	Epiglottis, larynx **150, 151,** Trachea, lung **3, 152, 153**, *154*
Week 11 04.27 - 05.01.	11 Microscopical anatomy of urinary organs	11 Ádám	Kidney, ureter, urinary bladder **160, 161, 162, 4a-b** ***MIDTERM 2 - histology of internal organs (except for the genital organs)***
Week 12 05.04 -08.	12 Histology of the male genital system	12 Hanics	Histology of the male genital system I. **170a-b, 171** Histology of the male genital system II. **172, 173, 174a, 174b, 7a**, *7b, 7c*
Week 13 05.11 -15.	13 Histology of the female genital system I.	13 Tóth	Histology of the female genital system I. **180, 181ab, 182** Histology of the female genital system II. **27, 183, 23a,** *23b, 187a-b-c*
Week 14 05.18 -22.	14 Histology of the female genital system II. Placenta, mammary gland	14 Minkó	Placenta, Mammary gland **184, 185, 20a, 186a**, *186b-c* Revision

Microscopic Anatomy I. Faculty of Medicine 2025/ 2026 EM I

Week	Histological specimens
. Week 1 02.16 -20.	**Simple epithelial tissues** 1. Simple sqamous epithelium (pancreas, Toluidine blue (TB)) 2. Simple cuboidal + columnar epithelium (biliary vesicle, human, HE) 3. Pseudostratified simple columnar epithelium - Trachea (human, HE) --- **Simple and stratified epithelial tissues** 4.a Transitional epithelium - Urinary vesicle (monkey, HE) 5. Stratified non-keratinizing squamous epithelium - Esophagus: upper and middle portions (human, HE) 6. Stratified keratinizing squamous epithelium - Plantar skin (human, HE) 7.a Stratified columnar epithelium - Penis (human, HE)
Week 2 02.23 -27.	**Glandular epithelium** **3** Goblet cells (Trachea HE) 10.a. Merocrine secretion (seromucous) - Submandibular gland (human, HE) 11. Apocrine secretion - Axillary skin (human, HE) 12. Holocrine secretion - Hairy skin (HE) *10c. Submandibular gland (human, Movat pentachrome*) Connective tissue fibres and cells. Connective tissue types. --- 20a. Umbilical cord (newborn human, HE) 6. Plantar skin (human, HE) *3. Trachea (human, HE)* 21. Lymph node (semithin section; rat, toluidine blue) *155 Granulation tissue (connective tissue cells (HE)* 24. Liver (human, silver nitrate impregnation) 25.b Aorta (resorcin-fuchsin) *86. Vagina (human, trichrome)*
Week 3 03.02- 06	**Types of connective tissue** 20a Umbilical cord (newborn human, HE) 6. Plantar skin (human, HE) 26. Tendon (human, HE) 10.a. Submandibular gland (human, HE) 27 Uterus (human, HE) **28**. Blood smear (May-Grünwald-Giemsa = MGG) --- **Supporting tissues (cartilage, bone)** 30. Hyaline cartilage (human costal cartilage, HE) 35. Compact bone (cross section, Schmorl's picrothionin stain) 32. Auricule (human, Verhoeff's stain) 36. Compact bone (longitudinal section, Schmorl's stain) 33. Meniscus (human, HE) 37. Trabecular bone, bone marrow, (body of vertebra+intervertebral disc, human, HE) 34. Cross section of a long bone (human ulna, unstained) *31. Hyaline cartilage (lung , human, semithin section, toluidine blue)*
Week 4 . 03.09 - 13.	**Types of ossification, bone restructuring** 38.b Intramembranous ossification (calvary, human, AZAN) 39. Endochondral ossification (Week 17 human fetus, longitudinal section of developing foot, HE) --- **Nerve tissue** 40. Peripheral nerve (sciatic nerve, longitudinal and cross sections, human, HE) 41. Multipolar nerve cell (celiac ganglion, human, Bielschowsky's impregnation)
Week 5 03.16 -20.	**Smooth, skeletal and cardiac muscle types** 50. Skeletal muscle (iron hematoxylin) 5. Smooth muscle and visceral striated muscle (esophagus: upper and middle portions, human, HE) 51. Cardiac muscle (human, HE) *52. Eberth's line, heart, atrioventricular node (human, trichrome)* --- ***MIDTERM 1. Basic tissues*** **Histology of blood vessels** 25a. Large artery of elastic type (aorta, human, HE) *25b. Elastic artery (aorta, resorcin fuchsin)* 60. Medium size artery and vein (femoral vessels, Movat) 61. Small arteries, arterioles and small veins, venules (tongue, human, HE) 1. Capillaries (pancreas, semithin section, rat, toluidine blue) *63. Pericyte (skin of human abdominal wall, α-smooth muscle actin (SMA) immunocytochemistry)* *64. Arteriovenous anastomosis /glomus organ (fingertip, human hand, HE)*

Week 6 03.23 -27.	**Lymphatic organs** 100a Thymus (HE) *100b Thymus (pancytokeratin ICC),* 101. Palatine tonsil (HE) 103. Pharyngeal tonsil (HE) 102. Lingual tonsil (HE) *102 a,b Palatine tonsil (T/B cell ICC)* --- **Lymphatic organs** 21. Lymph node (rat, TB) 105. Spleen (human, HE) *106 a,b Spleen (human T/B cell ICC)*
Week 7 03.30 - 04.03.	**Gastrointestinal tract** 110. Lip (Krutsay trichrome) 61. Tongue: *filiform and fungiform papillae* (HE) 111. Tongue; foliate papillae (human + monkey or rabbit, HE) 112. Tongue: *circumvallate papillae* (HE) --- 120.a, b Ground tooth (unstained) 10c. Submandibular gland (Movat pentachrom) 121. Developing tooth (AZAN) 51. Parotid gland (HE) 122. Sublingual g+ submandibular glands (HE) *10a. Submandibular gland (human, HE)*
Week 8 04.06 -10. ***Easter Monday*** ***no class for EM 1-6, EM 13-18***	5. Esophagus: upper and middle portions (human, HE) 130a. Stomach, fundus (HE) 132.a Duodenum (HE) *132.b Duodenum (human PAS +H)* 131. Gastro-esophageal junction - cardia (HE) *132c Duodenum (human, alcian blue H picrosirius red)* 134. Pylorus (gastroduodenal junction, HE**)** *133 Duodenum (cat**,** HE)* --- 135a Jejunum (HE*)* *136a Ileum (human, HE**)*** 136a Ileum (Peyer's patches, human, HE) 138a. Vermiform appendix (human, HE) 137. Colon (human, HE) *138.b Vermiform appendix (aged, human, HE)*
Week 9 04.13 -17.	140.a,b Liver (human, HE) 24. Liver (human, silver impregnation) 141 Liver (human, trichrome) *140.c Liver (human, SMA ICC/H)* 2. Biliary vesicle: fundus & neck (human, HE) 70. Pancreas (HE)
Week 10 04.20 - 24	**Respiratory system** 150. Epiglottis (HE) 151. Larynx (HE) --- 3. Trachea (HE) 153. Lung (toluidine blue) 152. Lung (HE) *154. Fetal lung (human, HE)*
Week 11 04.27 - 05.01.	**Urinary system** 160. Kidney (HE) 161. Kidney (semithin, toluidine blue) 162. Ureter (HE) 4.a,b Urinary vesicle (monkey, HE) --- **MIDTERM 2. Histology of internal organs (except for the genital organs)**
Week 12 05.04 -08.	**Male genital system** 170.a, b Testicle (human,HE) 172. Spermatic cord (human, trichrome) 171.c Epididymis (human, HE) --- 173. Prostate (aged, human, HE) 174.a,b Seminal vesicle (HE) 7.a Penis (human, *HE)* *7.b Penis (human, Verhoeff's elastic stain)* *7.c Glans penis (HE)*
Week 13 05.11 -15.	**Female genital tract** 180. Ovary (rabbit, HE) 182. Fallopian tube, isthmus and ampulla (human, HE) 181.a, b Corpus luteum (human, HE) --- 27. Uterus, proliferation's phase (human, HE) 183. Uterus, secretory phase (human, HE) 23a. Vagina (human, trichrome) *23b. Vagina (human, HE)*
Week 14 05.18 -22	20a. Umbilical cord of a newborn (human, HE) 184. Mamma non-lactans (HE) 186a. Placenta (mature (delivered), human, HE) 185. Mamma Lactans (HE) *186b. Placenta (mature, human, pan-cytokeratin ICC)* *186c. Placenta (6th week of pregnancy, human, HE)* *187a Clitoris (glans, human, HE)* *187b Clitoris (body, HE)* *188. Clitoris (glans, Neurofibril staining)* --- ***REVISION***

Topics of the semifinal examination in Microscopic Anatomy I

General Histology

Concept of basic tissues
Definition and classification of epithelial tissue
Simple epithelia
Stratified epithelia
Membrane specializations of epithelia
Glandular epithelia
Pigment epithelium, sensory neuroepithelium
Cells of connective tissue
Ground substance and fibres of connective tissue
Types of connective tissue
Blood and the corpuscular elements of blood
Histology of the bone marrow, maturation of erythrocytes and platelets
Differentiation of granulocytes, lymphocytes and monocytes
Histology of cartilage
Histology of the bone tissue
Intramembranous ossification
Endochondral ossification
Growth and remodeling of bone
Smooth muscle and myoepithelial cells
Skeletal muscle tissue
Cardiac muscle tissue
Nervous tissue

Histology of organs

Histology of lymph organs (lymph node, MALT/ tonsilles, spleen, thymus)
Histological structure of arteries and arterioles
Composition of capillaries and veins
Wall structure of hollow organs
Histology of the lip, tongue and teeth
Structure of the esophagus
Histology of the airways (epiglottis, larynx, trachea, lung)
Histology of the stomach
Structure of the small and large intestines
Histology of the liver and biliary passages including the gall bladder
Histology of the pancreas
Histology of the kidney and the urinary passages (ureter, urinary bladder)
Histology of the testicles togeteher with the epididymis
Histology of the prostate, seminal vesicle, spermatic cord
Histology of the penis
Histology of the ovary, uterine tube; corpus luteum
Histology of the uterus
Histology of the vagina
Histology of the mammary gland
Placenta, umbilical cord

RECOMMENDED LITERATURE

List of textbooks

- Sobotta Atlas of Human Anatomy, 15th English ed. Musculoskeletal system, internal organs, head, neck, neuroanatomy, By Waschke & Paulsen, ISBN-13: 9780702052507 2013
- Gray's Anatomy for students with STUDENT CONSULT Online Access, 3rd Edition by R. Drake, A. W. Vogl, A. Mitchel, Elsevier; 2014; ISBN 9780702051319
- THIEME Atlas of Anatomy, General Anatomy and Musculoskeletal System, 2014 by Schuenke, ISBN: 9781604069228
- THIEME Atlas of Anatomy, Head, Neck and Neuroanatomy, 2016 by Schuenke, ISBN: 9781626231207
- THIEME Atlas of Anatomy, Internal Organs, 2016 by Schuenke, ISBN: 9781626231665
- McMinn and Abrahams' Clinical Atlas of Human Anatomy with STUDENT CONSULT Online Access , 7th Edition By Abrahams, Spratt, Loukas & van Schoor ISBN-13: 9780723436973 , 2013
- Netter: Atlas of Human Anatomy, Including Student Consult Interactive Ancillaries and Guides, 6th Edition, 2014.
- Human Anatomy, Color Atlas and Textbook, 6th Edition by J Gosling, P Harris, J Humpherson, I Whitmore and P Willan; ISBN 9780723438274 Elsevier, 2016.
- Functional Anatomy, Histology and Embryology for medical and dental students by M. Réthelyi and J. Szentágothai, Medicina, 2018.

- *Gray's Anatomy. The Anatomical Basis of Clinical Practice; 41st edition by S. Standring: 2015 ISBN : 9780702052309*
- *Netter's Clinical Anatomy with Online Access, 3rd Edition, by J. Hansen, 2014,* ***eBook ISBN:*** *9781455770632* ***eBook ISBN:*** *9780323312899 014*
- *Anatomy, A Photographic Atlas, 8th Edition by Rohen, Yokochi; Wolters Kluwer, 2016, ISBN: 978-1-4963-0870-2*
- *Bräuer: Sobotta Flashcards (Muscles; Bones, Ligaments, and Joints) URBFI, 2013.*
- *RMH McMinn: Last's Anatomy, Regional and Applied. Churchill Livingstone, Edinburgh 1990. ISBN 0-443-03484-4*

- Langmann's Medical Embryology, 13th Edition by TW Sadler, Wolters Kluwer, ISBN 9781469897806, 2014
- Histology: A Text and Atlas: With Correlated Cell and Molecular Biology; 7th Edition by MH Ross and W Pawlina ; Wolters Kluwer 2015, ISBN 9781451187427
- *Wheater's Functional Histology, A Text and Colour Atlas, 6th Edition by B Young, G O'Dowd and P Woodford Churchill Livingstone, Edinburgh, 2013, ISBN 9780702047473*
- Stevens & Lowe's Human Histology , Elsevier, 4th edISBN 978-0-723435020, 2015.

- Functional Anatomy, Histology and Embryology for medical and dental students by M. Réthelyi and J. Szentágothai, Medicina, 2018.

- *The Developing Human – Clinically Oriented Embryology, 10th ed. by KL Moore, TVN Persaud and M Torchia, Saunders, 2015; ISBN 9780323313384*
- *Histology Manual 1-3. by A. Nemeskéri and K. Kocsis: István Apáthy's Foundation, 2019.*
- *L. Kierszenbaum Histology and Cell Biology: An Introduction to Pathology, 4th Edition, Paperback with STUDENT CONSULT Online Access and E-Book ISBN: 9780323085885:, 2015*
- *Junqueira's Basic Histology: Text and Atlas; 13th Edition by Anthony Mescher, New York, McGraw-Hill Medical, 01/03/2013 ISBN13 978007178033*

- *Regional Anatomy, by T Tömböl, Medicina 2008, ISBN 963 242 186 8*
- *Sectional Anatomy – Workbook, by A. Nemeskéri; István Apáthy's Foundation, 2001.*
- *Neuroanatomy An Illustrated Colour Text, 4th Edition by Crossman & Neary Publication* Date*: 13/04/2010 ISBN-13: 97807020308*

Further study aids:

To be downloaded from the homepage of the Department of Anatomy, Histology and Embryology (http://semmelweis.hu/anatomia) or from Knowledgebase on the Library homepage: (https://lib.semmelweis.hu/knowledge_base).