



Universitat de Lleida

DEGREE CURRICULUM **HUMAN HISTOLOGY**

Coordination: SOLER TATCHÉ, ROSA MARIA

Academic year 2020-21

Subject's general information

Subject name	HUMAN HISTOLOGY			
Code	101539			
Semester	2nd Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Bachelor's Degree in Biomedical Sciences	1	COMPULSORY	Attendance-based
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	Activity type	PRALAB	PRAULA	TEORIA
	Number of credits	1.5	1.5	3
	Number of groups	4	2	1
Coordination	SOLER TATCHÉ, ROSA MARIA			
Department	EXPERIMENTAL MEDICINE			
Teaching load distribution between lectures and independent student work	<p>Lectures 60 hours Independent student work 90 hours</p> <p>Due to the pandemic caused by the COVID19 virus, the attendance / non-attendance distribution may be affected. However, if everything evolves favorably, we will maintain the usual attendance profile in the subject both in the third year and in the fourth year.</p>			
Important information on data processing	Consult this link for more information.			
Language	Catalan English Spanish			
Distribution of credits	<p>3 credits theory 1.5 credits practic/seminars classroom (sessions de 1 hora / 2 hores) 1.5 credits practic laboratory (sessions de 1 hora / 2 hores)</p>			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
GARCERA TERUEL, ANA	ana.garcera@udl.cat	6	
SOLER TATCHÉ, ROSA MARIA	rosa.soler@udl.cat	6	

Subject's extra information

According to curriculum approved by ANECA

20. To learn the basics of animal physiology and comparative.

21. To know the form, structure and functions of the apparatus and systems of the human body and its embryonic development and organogenesis.

22. To understand the diversity of animal cells and their integration in tissues and organs.

23. To recognize using macroscopic, microscopic and imaging techniques, morphology and structure of tissues, organs and systems.

42. To know how to interpret the results of laboratory diagnostic tests

Introduction to the subject

Fundamental human biology is a subject of basic training, according to Royal Decree 1393/2007 29th October about the organization of official university studies. In the formation of graduates in Biomedicine (Biomedical Sciences) is a fundamental course because of the relevance of Anatomy, Histology and Physiology knowledge in the human body function and disease.

The main objectives are to learn the structure (anatomy and histology) and the basic function (physiology) of human body for students that initiate the biomedicine degree. This knowledge will allow them to understand and interpret the most advanced physiology and the bases of human pathologies. In addition students also acquire skills of anatomy, histology and physiology terminology that are fundamental for future subjects such as Cellular Pathology and Physiopathology in the superior courses.

At practice level, students will become familiar with the techniques and equipment used to study the morphology and function of human apparatus and systems. It will be also one of the main objectives to develop aptitudes related to communication skills, teamwork and to use the Information Technologies. In addition, to facilitate the achievement of the theoretical and practical objectives, it will be used electronic dossiers (using electronic notes), seminars and practical anatomy laboratories (osteoteca and dissection), histology (lab. microscopy) and physiology.

It is strongly recommended to the students to have taken Biology at High School.

Learning objectives

1. At the level of knowledge:

To know and to differentiate the basic histological structure of the different tissues of the human body

To know the basic aspects of the development of the human body, from the embryonic stage to adulthood, as well as its evolution towards old age.

Provide sufficient knowledge to understand the functioning of different bodies and systems, and their control mechanisms.

To have an integrated vision of the functioning of the organism and to be able to relate the activity of the different organs and systems.

To know the terminology and basic scientific language related to Histology

2. At the level of capacities and applications:

Know how to recognize and distinguish the different tissues of the human body in microscopic images.

Understand the basic physiology of the body and know how to integrate it with morphological knowledge.

3. At the level of values and attitudes

Understand the need for a basic morphological training of the human body for the professional future within the field of health sciences.

Understand how scientific knowledge is generated; and to know and use the scientific method.

Develop your critical and scientific capacity.

Know how to present in public a scientific work elaborated from different sources of information.

4. The student who pass the subject, must achieve the following competencies:

Use correctly the basic technological environment in which they will develop their training (virtual campus, electronic mail, scientific databases and sources of information), and use at the user level general computer packages.

Acquisition of habits for self-formation: search, select and process information related to the subject using ICT; show regular habits of sustainable study.

Know how to collect the most relevant aspect of a scientific text, prepare a summary and expose it to the classmates.

To work in team in the resolution of problems and in the hypothesis approach.

Competences

Specific competences

20. To know the bases of animal and comparative physiology.

21. To know the form, the structure and functions of the human body systems, as well as the embryonic development and its organogenesis.

22. Know the diversity of animal cells and their integration into tissues and organs.

23. To recognize macroscopic, microscopic and imaging techniques, the morphology and structure of tissues, organs and systems.

42. Be able to interpret the results of laboratory diagnostic tests.

Transversal competences

24. Know the basis of the disease and the most prevalent human pathologies.

52. Acquire the knowledge of animal biology necessary to perform animal experiments.

Subject contents

HISTOLOGY:

Block 1. General Histology. Study of basic tissues.

Unit 1. The epithelial tissue. Coating epithelia. Glandular epithelia.

Unit 2. The connective tissue. The extracellular matrix and the fibroblast. Other connective tissue cells. Varieties of connective tissue.

Unit 3. Adipose tissue. Cells and types of adipose tissue

Unit 4. The cartilaginous tissue. Chondrocytes, extracellular matrix and types of cartilaginous tissue

Unit 5. Bone tissue. The bones and their constituent elements. Osteogenesis. The joints.

Unit 6. Muscle tissue. Skeletal muscle. Cardiac muscle and smooth muscle.

Unit 7. Nervous tissue. The neuron. The synapse. The neuroglia. The ependymal coating. The connective tissue associated with the nervous system. The nerve fiber. Peripheral nerve endings. Response to injury.

Block 2. Microscopic Organography.

Unit 8. The circulatory system. Blood capillaries. Arteries and veins. The heart.

Unit 9. The respiratory apparatus. The conductive portion. The respiratory area. The pleura.

Unit 10. Blood and Hematopoiesis. Cell types in blood and their origin in the hematopoietic tissue.

Unit 11. The immune system. Lymphoid tissue. The thymus. The vessels and lymph nodes. Spleen.

Unit 12. The digestive system. The oral cavity and the tongue. The salivary glands. The pharynx and the esophagus. Stomach. The intestine. The liver, bile ducts and gall bladder. The exocrine pancreas.

Unit 13. The endocrine system. The pituitary. The thyroid gland and the parathyroid glands. The adrenal gland. The endocrine pancreas. The pineal gland. The diffuse neuroendocrine system (SND).

Unit 14. The urinary system. The kidney. Excretory urinary tract.

Unit 15. The reproductive apparatus. The male reproductive system: the testis and the spermatic pathways, the attached glands and the penis. The female reproductive system: the ovary, the fallopian tube, the uterus and the vagina. The mammary gland.

Unit 16. The integumentary system. Skin and attachments.

Unit 17. Organs of the senses. The eye and the ear.

Methodology

Learning activity and development plan

Describe the purpose and content of the different tasks scheduled, as well as the type of activity and teacher.

In order to achieve the objectives and acquire the attributed competencies, the following activities will be programmed:

master classes: these will be done with all students. Their purpose is to give an overview of the thematic content highlighting those aspects that will be useful in their training. Teachers: Rosa M Soler and Ana Garcerá

seminars: they will be done with 1/2 of the students, they are obligatory and they must be done with the corresponding group. The seminars aim at students to apply theoretical concepts and to delve into the most important and complex aspects of the subjects. Teachers: Ana Garcerá and Rosa M Soler

laboratory practices: microscopy will be done with 1/2 of the students, are obligatory. They are intended to familiarize students with basic histological techniques, identification of tissues and histological bases that allow them to better understand the physiology and pathophysiology. Teachers: Ana Garcerá and Rosa M Soler

Laboratory practices Biomedicina

It is mandatory for the students to use during teaching practices:

- lab coat
- protective glasses (not in the case of observation under the microscope)
- chemical protective gloves (not in the case of observation under the microscope)

Not wearing the EPI / PPE (personal protective equipment) or not following the general safety standards detailed below, will mean that the student cannot go to the laboratories or that he/she must leave them.

General safety standards in laboratory

- keep the place clean and tidy. The work table/bench must be free of backpacks, folder, coats ...
- wear closed shoes during the practices
- wear long hair always collected
- keep the lab coat fastened to protect against splashes and chemical spills
- do not wear bracelets, necklaces or wide sleeves that can get caught in equipment, assemblies ...
- avoid contact lenses since the effect of chemicals is more dangerous if it is inserted between the lens and the cornea.
- do not eat or drink in the laboratory
- smoking is forbidden inside laboratories
- always wash your hands after contact with a chemical and before leaving the laboratory
- follow the teacher's instructions and ask any questions about safety

Development plan

Block 1. General Histology. Study of basic tissues.

Unit 1. The epithelial tissue. Coating epithelia. Glandular epithelia. Clases teóricas RMS (Rosa M Soler) seminario 1 y práctica 1 AG (Ana Garcerá)

Unit 2. The connective tissue. The extracellular matrix and the fibroblast. Other connective tissue cells. Varieties of connective tissue. Clases teóricas RMS seminario 1 y práctica 1 AG

Unit 3. Adipose tissue. Cells and types of adipose tissue. Clases teóricas RMS seminario 1/2 y práctica 1/2 AG

Unit 4. The cartilaginous tissue. Chondrocytes, extracellular matrix and types of cartilaginous tissue. Clases teóricas RMS seminario 2 y práctica 2 AG

Unit 5. Bone tissue. The bones and their constituent elements. Osteogenesis. Clases teóricas RMS seminario 2 y práctica 2 AG

Unit 6. Muscle tissue. Skeletal muscle. Cardiac muscle and smooth muscle. Clases teóricas RMS seminario 3 y práctica 3 AG

Unit 7. Nervous tissue. The neuron. The synapse. The neuroglia. The ependymal coating. The connective tissue associated with the nervous system. The nerve fiber. Peripheral nerve endings. Response to injury. Clases teóricas RMS seminario 3/4 y práctica 3/4 AG

Block 2. Microscopic Organography.

Unit 8. The circulatory system. Blood capillaries. Arteries and veins. The heart. Clases teóricas RMS seminario 4 y práctica 4 AG

Unit 9. The respiratory apparatus. The conductive portion. The respiratory area. The pleura. Clases teóricas RMS seminario 4 y práctica 4 AG

Unit 10. Blood and Hematopoiesis. Cell types in blood and their origin in the hematopoietic tissue. Clases teóricas RMS seminario 5 y práctica 5 AG

Unit 11. The immune system. Lymphoid tissue. The thymus. The vessels and lymph nodes. Spleen. Clases teóricas RMS seminario 5 y práctica 5 AG

Unit 12. The digestive system. The oral cavity and the tongue. The salivary glands. The pharynx and the esophagus. Stomach. The intestine. The liver, bile ducts and gall bladder. The exocrine pancreas. Clases teóricas RMS seminario 5/6 y práctica 5/6 AG

Unit 13. The endocrine system. The pituitary. The thyroid gland and the parathyroid glands. The adrenal gland. The endocrine pancreas. The pineal gland. The diffuse neuroendocrine system (SND). Clases teóricas RMS seminario 6 y práctica 6 AG

Unit 14. The urinary system. The kidney. Excretory urinary tract. Clases teóricas RMS seminario 7 y práctica 7 AG

Unit 15. The reproductive apparatus. The male reproductive system: the testis and the spermatic pathways, the attached glands and the penis. The female reproductive system: the ovary, the fallopian tube, the uterus and the vagina. The mammary gland. Clases teóricas RMS seminario 7 y práctica 7 AG

Unit 16. The integumentary system. Skin and attachments. Clases teóricas RMS

Unit 17. Organs of the senses. The eye and the ear. Clases teóricas RMS

Evaluation

The theoretical and practical knowledge of the subject, including the contents of the seminars and practices, will be assessed by performing several tests during the semester.

The final grade will be calculated from the following formula:

- 50% of the theoretical tests
- 25% of the seminars tests
- 25% of the practical part tests.

At least 4 tests will be carried out that will be exclusive and will have to be approved each of them independently to pass the subject. Exceptionally, it will only average with the rest of the grades when ONE of the tests scores a grade equal to or greater than 4.5.

The tests will be organized as follows:

Practical exams: includes the practical knowledge of histology, seminars and practices, will be evaluated by means of a practical exam that may include multiple answer questions and / or short questions

Theoretical exams: includes the theoretical knowledge of histology, will be evaluated by means of a written exam of multiple answer questions and / or short questions.

Bibliography

Histology text and atlas books

WEISS L. *Histología* Ed. Ateneo

FAWCETT, DW. *Tratado de Histología Bloom-Fawcett* Ed. McGraw-Hill-Interamericana

Ross, Kaye, Pawlina. *Histología. Texto y atlas color con Biología Celular y Molecular* Ed. Panamericana

Kierszenbaum, AL. *Histología y Biología Celular. Introducción a la Anatomía Patológica. 2a edición.* Ed. Elsevier Mosby

Boya, J. *Atlas de Histología y Organografía microscópica.* Ed. Panamericana

Erlandsen SL, Magney JE. *Coloratlas Histología.* Ed. Elsevier Mosby

Wheater PR, Burkitt HG. *Self-assessment in Histology..* Ed. Churchill Livingstone

Young B, Heath JW. *Wheater's Histología Funcional.* Ed. Harcourt

Internet addresses

Histology

- A digital atlas. General Histology. University of Southern California School of Dentistry:
<http://www.usc.edu/hsc/dental/ghisto/>
- Histology Course Web Site. College of Medicine. University of Illinois at Urban- Champaign:
<http://www.med.uiuc.edu/histo/small/atlas/slides.htm>
- Histology. Southern Illinois University School of Medicine:
<http://www.siumed.edu/~dking2/index.htm>
- Human Microscopy Anatomy. UC Davis Health System:
<http://medocs.ucdavis.edu/CHA/402/course.htm>
- JayDoc HistoWeb. Department of Anatomy and Cell Biology. University of Kansas:
<http://www.kumc.edu/instruction/medicine/anatomy/histoweb/index.htm>
- Mammalian Histology-B408. Department of Biological Sciences. University of Delaware:

<http://www.udel.edu/Biology/Wags/histopage/histopage.htm>

- Microanatomy Web Atlas. University of Texas Medical Branch:
<http://cellbio.utmb.edu/microanatomy/>
- PERLjam 2.01. Histology Image Atlas. Department of Pathology and Laboratory Medicine. Indiana University Medical Center: <http://erl.pathology.iupui.edu/>
- Web de Histología Humana. Facultad de Medicina de la Universidad de Salamanca: <http://www3.usal.es/~histologia/>

Microscopy

- Cell Ultrastructure. http://www.udel.edu/Biology/Wags/histopage/empage/_ecu/_ecu.htm