UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Istologia

2526-1-H4602D001-H4602D00105

Aims

The objectives of the course are to provide expertise in histology, and embryology and practical skills on microscopic anatomy.

Contents

The primary goal of the course is to provide the fundamental principles of tissues organization and embryonic development.
The course also provides practical skills in using the optical microscope to recognize typical histological structures of human organs.
Some clinical correlations will also be addressed during the course

Detailed program

GENERAL HISTOLOGY

Introduction. General methods of investigation in histology and histological stainings.

Morphological features of cellular organelles.

Tissues: general characteristics and classification.

Methods for preparation of histological specimens.

For each of the following tissue structural, ultrastructural, functional characteristics and classification will be discussed:

Lining epithelia;

Exocrine gland epithelia. Merocrine, apocrine, holocrine and eccrine secretion;

Proper connective tissue. Intercellular substance of the connective tissue (fibres and ground substance). Biosynthesis of collagen. Connective tissue cells;

Adipose tissue (unilocular and multilocular adipose tissue);

Cartilage (hyaline, elastic and fibrous cartilage);

Bone (woven and lamellar bone, compact and trabecular bone). Osteogenesis (intramembranous and endochondral ossification);

Muscle tissue (smooth, skeletal striated and cardiac striated muscle tissue). Sarcomere ultrastructure and mechanisms of contraction, neuromuscular spindle and Golgi tendon organ;

Nervous tissue (neurones and neuroglia). Myelin and myelination. Nervous fibres;

Blood tissue.

Histology of the tooth (enamel, dentin, cementum, dental pulp) and periodontium

GENERAL EMBRYOLOGY

Introduction. Gametogenesis (spermatogenesis and spermatozoa, oogenesis and oocytes).

Capacitation. Fertilization. Cortical reaction. Zygote.

First week of development: segmentation, morula, cavitation, blastocyst (embryoblast and trophoblast)

Implantation.

Early development of human embryo: formation of epiblast and ipoblast, bilaminar embryonic disc.

Late development of human embryo: primitive streak, epithelial-mesenchymal transition (gastrulation), formation of mesoderm, trilaminar embryonic disc, notochord and formation of body axes, neurulation (neural tube and neural crest cells).

Cephalo-caudal and lateral folding.

Germ layers (ectoderm, endoderm and mesoderm) and their derivatives.

Somites and their derivatives.

Intra-embryonic Coelom formation.

Pharyngeal arches and their derivatives.

Odontogenesis

Teratogenic factors.

MICROSCOPIC ANATOMY EXERCISES

- Basics of using the light microscope
- Recognition of the main histological structures in slides of the following human and/or animal organs: esophagus, stomach, duodenum, tongue, lip, major salivary glands, liver, trachea, lung, thyroid, palatine tonsil, uterus, testis, and bladder.

Prerequisites

Scientific knowledge at high school level

Teaching form

15 Frontal lessons (2 hours each) in attendance (Prof. Nicolini)
6 practical exercises (2 hours each) in attendance (Prof. Carozzi)

Textbook and teaching resource

Histology:
-Ross M.H. e Pawlina W. Istologia Testo e atlante. Casa Editrice Ambrosiana;
-Mattioli Belmonte et al., Istologia Umana, Casa Editrice Idelson-Gnocchi

Embriology:
-Bertini et al., Embriologia umana. Casa Editrice Idelson-Gnocchi.
-Moore, Persaud, Torchia. Lo sviluppo prenatale dell'uomo. Embriologia ad orientamento clinico. Edra.
-Sadler. Embriologia medica di Langman. Edra.
-Schoenwolf, Bleyl, Brauer, Francis-West. Larsen. Embriologia umana. Edra

Oral cavity histology ed embriology:
Ten Cate, Istologia orale, Piccin

For all books, refer to the latest edition

Semester

Second semester

Assessment method

For the assessment method and final evaluation see the syllabus of the general course.

Office hours

From Monday to Friday upon request for an appointment via email (gabriella.nicolini@unimib.it; valentina.carozzi1@unimib.it).

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION | GENDER EQUALITY | REDUCED INEQUALITIES