UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Histology

2223-1-H4102D087-H4102D021M

Aims

Students will be able to describe the structure and ultrastructure of the eukaryotic cell and the morphology correlates with the function of each organelle; then they will be able to describe the structure and morpho-functional characteristics of human tissues (epithelial, connective, muscle and nervous tissues) as well as to describe the main events of gametogenesis and early embryogenesis.

Contents

Detailed program

- Histology and its methods of study
- Cytology: general properties of eukariotic cells
- Plasma membrane: structure, molecular composition, functions.
- Cell connections: tight junctions, gap junctions and desmosomes.
- Cytosol: molecular composition and functions

- Cytoplasmic organelles: Mitochondria, Ribosomes, Endoplasmic reticulum (rough and smooth), Golgi complex, Lysosomes, Peroxisomes
- Cytoskeleton: Microtubules, Actin filaments and intermediate filaments
- Trafficking, sorting and secretion of proteins
- Nucleus and nucleolus
- Cell death: Apoptosis and necrosis

Tissues:

- Epithelial tissue: covering epithelia and glandular epithelia. Microvilli, cilia, flagellum, stereocilia. Basement membrane.
- Connective tissue: cells, ground substance, fibers. Types of connective tissue: loose, dense irregular, dense regular, elastic connective tissue.
- Adipose tissue: unilocular and multilocular adipose tissue.
- Cartilage: hyaline, elastic and fibrocartilage.
- Bone: bone cells, bone matrix. Type of bone: primary and secondary bone tissue; compact and spongy bone. Histogenesis: intramembranous and endochondral ossification. Remodelling and repair.
- Muscle tissue: smooth, skeletal and cardiac muscle. Stimulation. Contraction. Regeneration.
- Nervous tissue: neurons and glial cells. Myelin: myelinated and unmyelinated fibers. Synaptc communication.
- Blood: plasma and cells (erythrocytes, leukocytes, platelets)

Embryology:

- Gametogenesis

- Fertilization
- First Week
- Second Week: Becoming Bilaminar and Fully Implanting
- Third Week: Becoming Trilaminar and Establishing Body Axes
- Fourth Week: Forming the Embryo
- Principles and Mechanisms of Morphogenesis
- Neurulation
- Somites and derivatives
- Placenta, allantoid, amnios, chorion and yolk sac

Prerequisites

College-level scientific knowledge

Teaching form

See “Fundamentals of Human Morphology”. Activities in attendance, subject to any ministerial changes following the COVID pandemic situation.

Textbook and teaching resource

Histology: A Text and Atlas, with Correlated Cell and Molecular Biology, by Michael H. Ross PhD, Wojciech Pawlina MD.
Junqueira's Basic Histology: Text and Atlas, by Anthony Mescher.
The developing human: Clinically oriented Embryology by Keith L. Moore and TVN Persaud

Semester

2nd term

Assessment method

Assessment of the suitability on the basis of the attendance/participation in the laboratory activities.

Knowledge and skills will be further assessed during the “Fundamentals of Human Morphology” examination, with the modalities there described.

(Activities in attendance, subject to any ministerial changes following the COVID pandemic situation)

Office hours

Every day, by appointment

Sustainable Development Goals

QUALITY EDUCATION | GENDER EQUALITY | REDUCED INEQUALITIES