UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Histology

2122-1-H4102D087-H4102D021M

Aims

Students will be able to describe the structure and ultrastructure of the eukaryotic cell and the morphology correlate 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”.

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

See “Fundamentals of Human Morphology”

Assessment method

See “Fundamentals of Human Morphology”

Office hours

See “Fundamentals of Human Morphology”