



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## COURSE SYLLABUS

### Histology

1920-1-H4102D007-H4102D021M

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#### 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

See "Fundamentals of Human Morphology"

#### 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. Synaptic 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, allantois, amnion, 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, 6th Edition 6th Edition

by Michael H. Ross PhD, Wojciech Pawlina MD.

Junqueira's Basic Histology: Text and Atlas, Thirteenth Edition 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”

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