

Introduction

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Note : Text in BOLD means that the information is from the slides. Enjoy <3

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Introduction of Histology

- Organization level of histology begins with molecular aspect .

Chemical aspect → Biochemistry

Cellular aspect → Histology

- Cells stack above each other on the base which is called (cell membrane) and its situated above the connective tissue that separated by the basement membrane

Histology : the microscopic structure of the human body and the relationship with these structure

- We need an instrument to see these structure which we call a (microscope).
- But why do we study Histology ? Because we need to know the cellular component, whether they are healthy or non-healthy.

If the cellular component was healthy the study is called Histology .

If it wasn't healthy, we call it Pathology.

- Pathology : is a continuation of normal histological aspect. And normal histology is the normal status of the cell ,tissue, organ and system .

Lung → → Respiratory system

Heart → → Cardiovascular system

Guts → → Gastrointestinal system

Urine → → Urinary system

Each system has parts, and if you go down deep into the structural aspect, you will be able to see that these systems are made of cells and connective tissue . So the cellular level is the primary target of our study.

- Objectives of studying Histology : Slide #2
- The cells & the connective tissue make an organ, in addition to other structures in the organ, such as arteries, veins, nerves, etc.

Histology (Latin word) : it's a branch of anatomy
Histo : tissue ~logia : knowledge

- **The Anatomy can be divided into Gross and Microscopic Anatomy.**

Cells has a function wherever it's found

- Cells that cover the intestine has an (absorptive structure)
- Cells that are located in the brain could be (motor , sensor)
- Cells that are located in kidney (productive , filtration)

- Why do we consider the blood a connective tissue ? because it has cellular component and extracellular matrix. The fluid in the lung is just a fluid, if there were cells we call it a cellular tissue that is a connective tissue just like the blood.

HEART :

- Cells belong to the heart are called cardiomyocytes .
- They make the body of the heart.
- And connectively, if these myocytes are added together, they are connected and the separation between them (gaps) *بيعببها* connective tissue .
- It makes an organ called : cardiac muscle .
- The cardiovascular system it's not just made of the heart, but the heart is one part of the cardiovascular system .

HEART = (Cellular level + connective tissue + fibers + coverings)

- A system can be either one organ, or multiple organs that come together to form one system.

For example : cardiovascular system is composed of the heart and the vessels.

- The skin composed of 5 layers, each layer has a different structure. After these layers of cells you will see a separation that is the basement membrane, and after that you will see another part which is bigger than the superficial part and that's what we call Epidermis & Dermis, and within the Dermis inside, you will be able to see that there are cells, fibers, arteries, veins and special cells with the receptor there.
- Notice that when we study one organ, you will have to memorize so many structures

So practically, so in order for you to see cells, you need the aid of something that magnifies the structure and the magnification of the structure occurs by using the microscope.

The microscope could be a very simple one that reflects the light from outside into a mirror and this slide will be reflected on the tissue that sits into a base, the light goes through the tissue, and then up into our eyes, through 2 objectives: the eye objective and the objective that is meant to increase the magnification of the specimen, that is called the simple microscope, when we use only sunlight.

The microscope practically has 3 parts, the components of the microscopes are 3 :

- 1- Mechanical parts, that will adjust the distance between the tissue (specimen) on the slide and the objective.**
- 2- Magnifying parts, that is an enlargement of the specimen sight.**
- 3- Illuminating parts, either sunlight or a lamp (a light source).**

- **Function of Iris diaphragm → increase or decrease the amount of light reaching .**

- Focus knobs: the big one(Coarse) is the harsh focus, it will change the distance very much. (not slowly)

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- When we want to see the tissue we must stained (colored) by dyes .

Dehydration → by using different concentration of alcohol (to preserve it from rot)

Embedding → by wax (e.g **Paraffin wax**) to keep the shape and orientation of the specimen.

- Most common dyes :

i. Hematoxylin → inside the cell (like Nucleus) → blue → acidic → positively charged

ii. Eosin → cytoplasm → pink → basic → negatively charged

TEM → Transition electron microscope (inside the cell)

SEM → Scanner electron microscope (surface)

You can see the cilia at the light microscope as a line. In the electron microscope you will see it as filaments.

So that's the difference, you can see a subcellular level using a TEM. There's also SEM into which you can see the surface area of the cell or the tissues or the organ. You will see the indentation, this is a low magnification and you can see the cell, the contour of the cell, where it's ligated and the appendages of the cell.

We hope that was useful, if you have a note or found a mistake, feel free to contact the Academic Team of OD. Good luck :D