

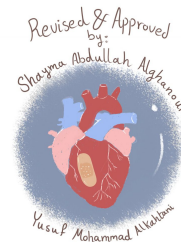
Introduction To physiology



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Red: Important

Black: In Male & Female slides

Blue: In male slides

Pink: In female slides

Green: Notes & extra information

Objectives

- Define physiology.
- Describe the levels of organisation of an organism.
- Provide an orientation to the subject of human physiology
- The cell is the basic unit of life .
- Describe briefly the basic structure of the cell and state the function of the different cellular organelles.
- Discuss briefly the different levels of organization starting from the cell to body systems giving examples at each level.

What is physiology ?

Definitions :

Physio + ology

Physio: Nature

Ology: science or study of

Physiology: the science dealing with the way a normal organism and their body parts function.

(Its cornerstone to medicine)

How it is related to medicine?

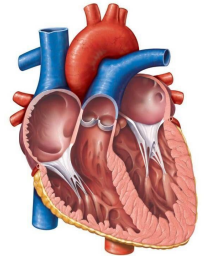
Many diseases can be viewed as physiology " gone wrong "
PATHOPHYSIOLOGY

Because the understanding of physiology is essential for the study and practice of medicine

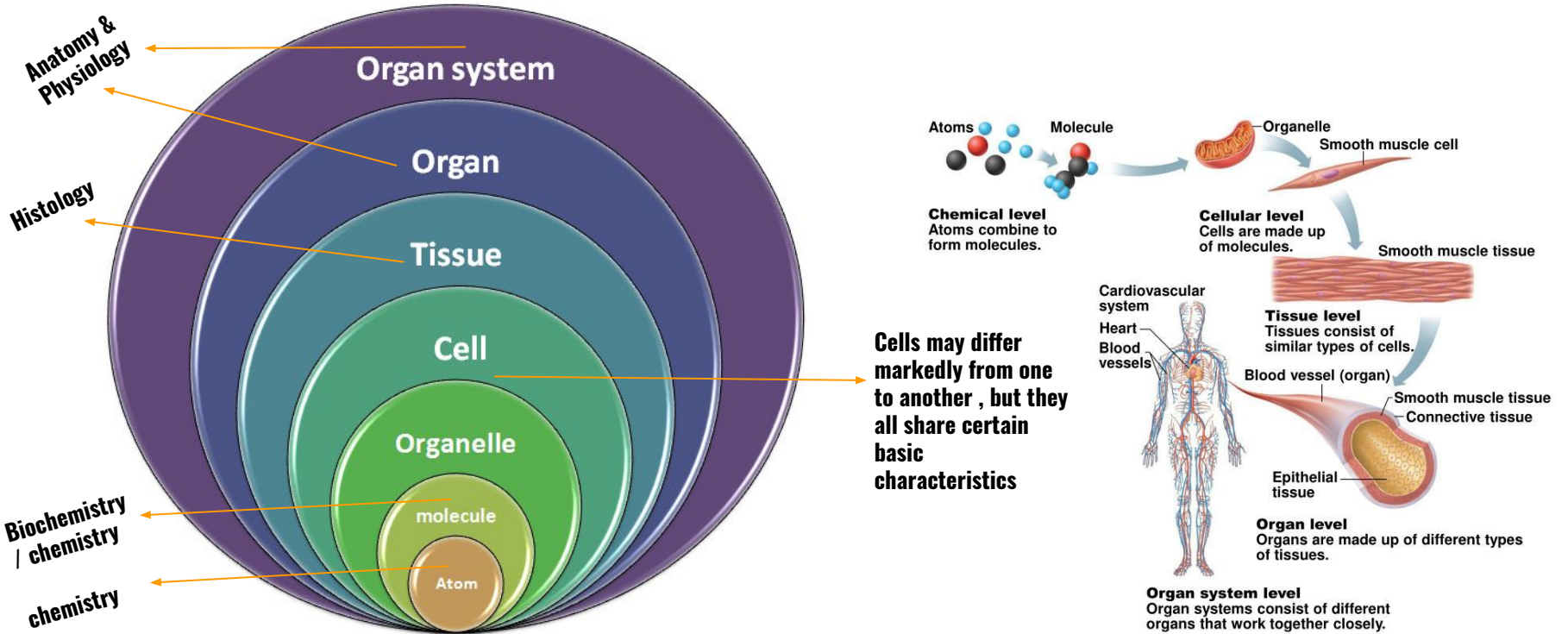
Types of physiology :

Cellular physiology	Systems physiology
Is the study of cellular components that primarily determines organ function .	Is the study of coordinated and networked processes that determines the whole body function and adaptation to change .
Examples:	
Golgi apparatus → Packaging, sorting... of proteins.	Respiratory system, cardiovascular system... Thus: different systems work in harmony to provide the Homeostasis.

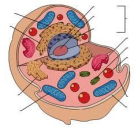
The Difference between anatomy and physiology:
Anatomy : the structure
Physiology :the function



Level of structural organization

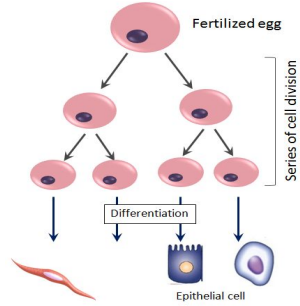


The cell



The basic unit of the body

- Each human being begins as a single cell (i.e. fertilized egg).
- The number of cells increase by cellular division.
- The process of transforming an unspecialized cell into a specialized cell is known as **differentiation**.



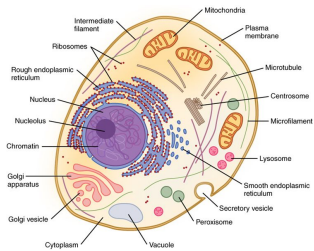
Cell structure

Cell organelles

- Nucleus.
- Ribosomes.
- Endoplasmic reticulum: Rough & Smooth
- Golgi apparatus.
- Mitochondria.
- Lysosomes.
- Peroxisomes.
- Cytoskeleton.

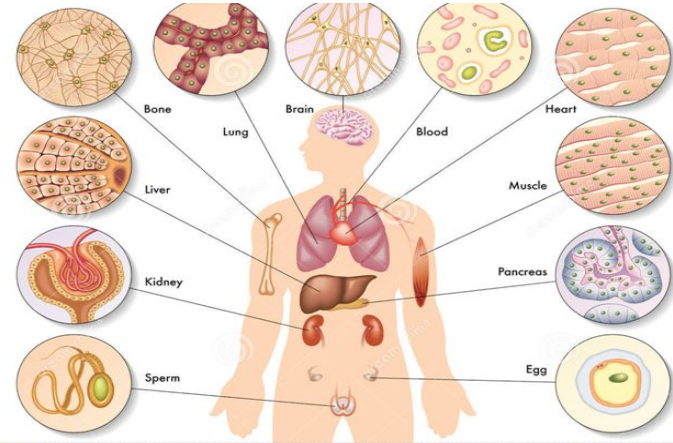
Cell membrane

Will be discussed later



- **function of each organelles**

Cells may differ markedly from one another, but they all share certain basic characteristics.

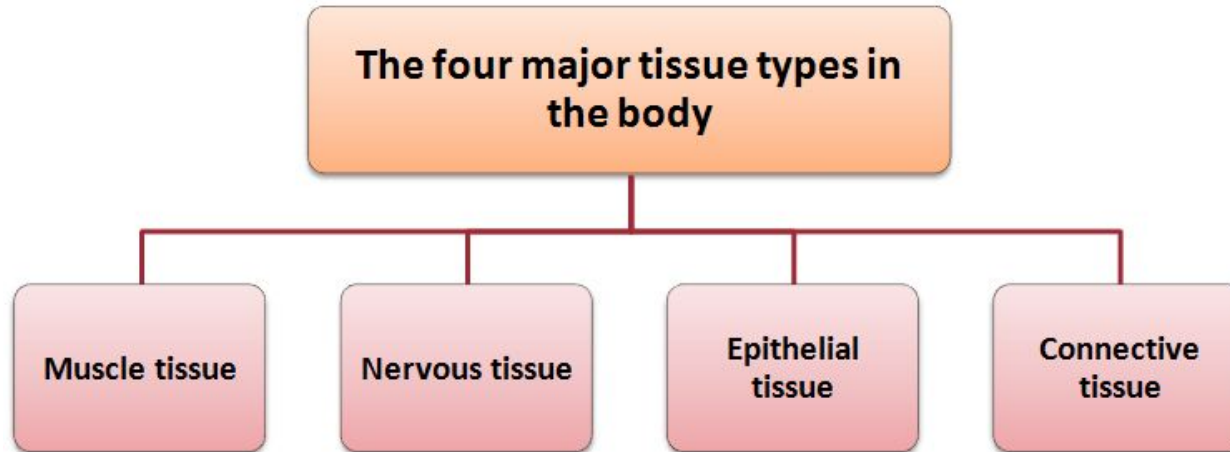
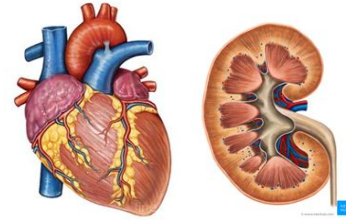


Tissues

A collection of a single type of specialized cells = tissue.

The combination of two or more types of tissues forms an organ.

Several organs come together and are organised into a system.



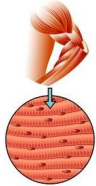
Types of tissues

Four types

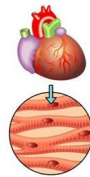
Muscle tissues:
Is specialized to generate **mechanical force**

Nervous tissues :
Is specialized to initiate ,
integrate , and conduct
electrical signals to other cells

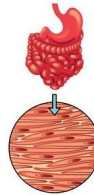
Skeletal Muscles



Cardiac muscles

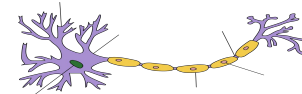


Smooth muscles



These signals may:

- Initiate new electrical signals in other neurons
- Stimulate a gland to secrete hormones
- Stimulate muscle contraction



The rest of the types is in the next slide

Types of tissues

This slide was found only in female slides

Four types

Epithelial tissues

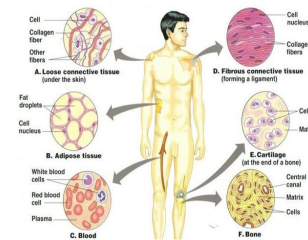
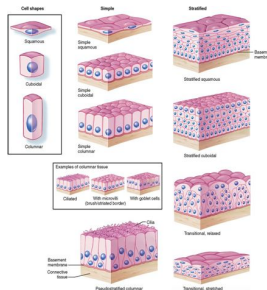
- There are many shapes of epithelial cells according to the function they need to perform.
- Thus, there are many types of epithelial tissue.

There are shared properties:

- It lines surfaces.
- Offers protection.
- May be involved in secretion and absorption of ions & organic molecules.

Connective tissues

It connects, anchors and support the structures of the body.
It consist of many and diverse cell and tissue types, each with its specific function.



QUIZ!

MCQs

Q1: a collection of specialized cells is called ?

A) system

B) organ

C) tissue

D) cells

Q2: muscle tissues is responsible for the generation force .

A) electrical

B) Mechanical

C) gravity

D) magnetic

Q3: the science dealing with the way a normal organism and their body parts function.

A) Cellular physiology

B) systems physiology

C) physiology

D) pathophysiology

Q4 : Many diseases can be viewed as physiology “ gone wrong “ is called ?

A) Morphology

B) pathophysiology

C) Histopathology

D) Pathology

SAQ

Q1: what are the four major types of tissues in the body ?

Q2: the process of transforming an unspecialized cell into a specialized cell is known as ?

MCQs key answer :
1) C
2) B
3) C
4) B

SAQ answer key :
1) Muscle tissues , nervous tissues , epithelial tissues and connective tissues .
2) Differentiations

Thank You

Special thank to Lina Alosimi Med438

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