

Lec.1

Anatomy

Anatomy is the study of the structure and shape of the body and its parts and their relationships to one another. The term anatomy is from Greek word and it is consist of two parts, the first part (ana) is mean (up) and second part (tomy) is mean (cutting).

Kinds of anatomy

There are four kind of anatomy as describe bellow:-

- 1- **Gross anatomy(Macroscopic)**:- is study of large body structures with the naked eyes and it is either study the body by region or by system.
- 2- **Microscopic anatomy**:- it is study very small structures that cannot be seen with naked eyes. Both cytology (cells) and Histology (tissue) are study in this kind of anatomy.
- 3- **Developmental anatomy**:- the study of anatomical changes in a life cycle. The Embryology study of prenatal development (before birth), while the postnatal study of structures after birth.
- 4- **Comparative anatomy**:- it is study of comparison of structures between organisms.

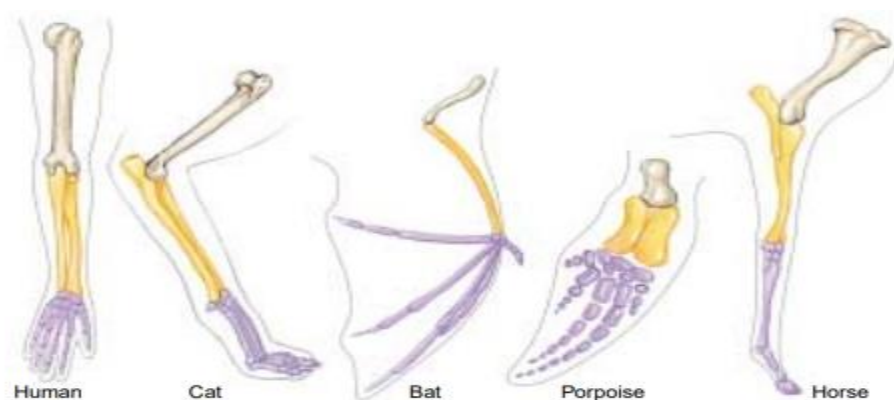


Figure.1. Homology among vertebrate limbs.



Structural levels of organization

The human body exhibits many levels of structural complexity.

1. **chemical level**:- this level is the simplest level:-
 - A. **The atom**:- it is the smallest particle of an element [i.e. hydrogen (H), oxygen(O), carbon (C)].
 - B. **Molecules**:- a particle composed of 2 or more joined atoms[(i.e. carbon dioxide (CO₂), water (H₂O)].
 - C. **Macromolecules**:- it is large molecule [i.e. carbohydrates, lipids, proteins, nucleic acids].
- 2- **organelles**:- it is the small organ of cell, that have a particular function (i.e. cell membrane, nucleus, ribosomes).
- 3- **cells**:- it is the basic unit of structure and function of living organisms(red blood cell, white blood cell, stem cell...).
- 4- **tissue**:- a tissue is defined as a group of similar cell that performs a specialized function[i.e. epithelia, connective, muscle, nervous].
- 5-**organ**:- is a structure composed of two or more tissue types that performs a specific function for the body.
- 6-**organ system**:- is a group of organs that work together to accomplish a common purpose.
- 7-**human organisms**:- an organism is the most complex level of organization and is defined as an individual living thing.

Body system

There are 11 organ system in body:-

1- Integumentary system

- Components
 - Skin.
 - Hair, nails.
- Function
 - External covering.
 - Protection.

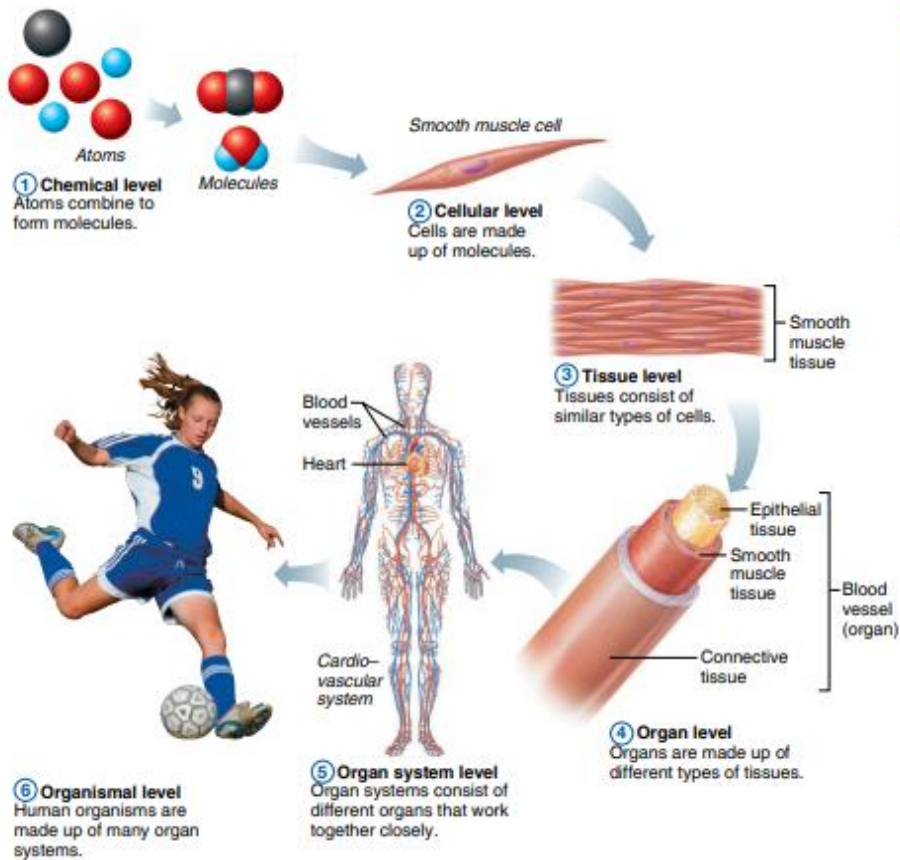


Figure.2. level of organization

- Location of sense receptors.
- synthesis of vitamin D

2- Skeletal system

- components
 - bones
 - joints and adjective cartilage
- function
 - support
 - blood cell production
 - mineral storage
 - Protection
 - Movement



3- Muscular system

- Components
 - Skeletal muscles
 - Associated connective
 - Tissues (tendons)
- Function
 - Locomotion
 - Manipulation of the environment
 - Facial expression
 - maintain posture
 - protection heat

4- Cardiovascular system

- Components
 - Heart
 - Vessels
- Function
 - Transportation of blood
 - Blood contains O_2 , CO_2 , nutrients, wasted, ...etc.
 - Blood is composed of plasma and cell.

5- Lymphatic system

- Components
 - Lymphatic organs (spleen, lymph nodes, thymus...etc.
 - Lymphatic vessels.
- Functions
 - Transportation of lymph.
 - Lymph is derived from tissue fluid.
 - Houses white blood cells.

6- Nervous system

- Components
 - Central Nervous System (CNS): brain and spinal cord.
 - Peripheral Nervous System (nerves, sense receptors).
- Functions



-control system.

-response to external and internal environments.

7- Endocrine system

- Components
 - glands that secrete hormones (i.e. pancreas, thyroid...etc.
- Functions
 - regulates processes such as growth, reproduction and nutrient use.
 - control system

8- Respiratory system

- Components
 - lungs
 - tubing (trachea, bronchus, ...etc.
 - larynx (vocal cords)
- Functions
 - exchange of respiratory gases (O_2 and CO_2)between blood and atmosphere.
 - voice production.

9- digestive system

- Components
 - alimentary canal (mouth, pharynx, esophagus, stomach, small intestine and large intestine)
 - accessory organs (liver, salivary glands)
- Functions
 - break down of food into small, absorbable pieces.
 - absorption of nutrients into blood.
 - eliminate waste products.



10- Urinary system

- Components
 - kidneys, ureters, urinary bladder, urthra.
- Functions
 - eliminate waste (nitrogen) from blood and external environment.
 - regulates water, acid/base balance

11- Reproductive system

- Components
 - male reproductive system
 - female reproductive system
- Functions
 - perpetuation of the species.
 - hormones influence structure and function.
 - sexually dimorphic species.