Anatomy And Exercise Physiology

इंदिरा गाँधी राजकीय स्नातकोत्तर महाविद्यालय, बांगरमऊ, उन्नाव (उ.प्र.)
Indira Gandhi Government P. G. College (U.P.) (Accredited By NAAC)

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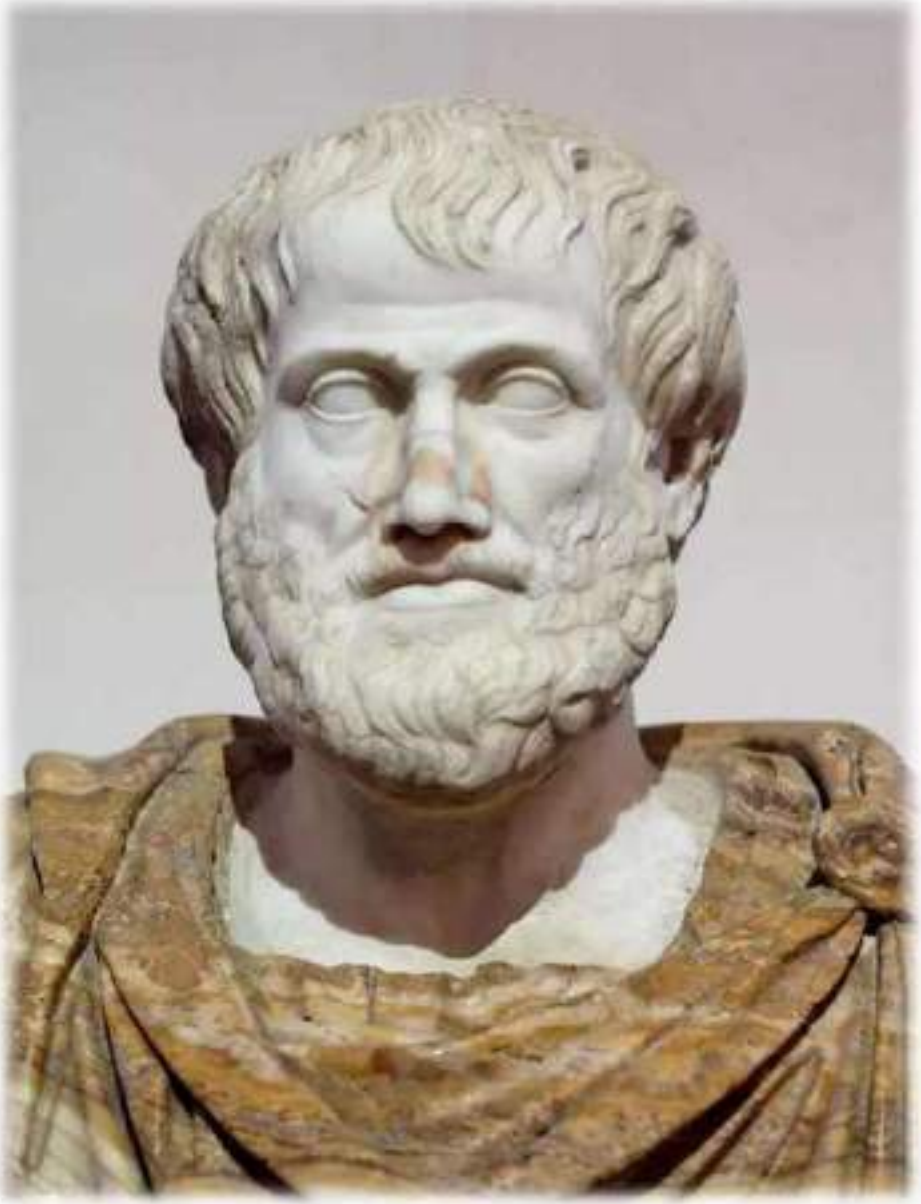
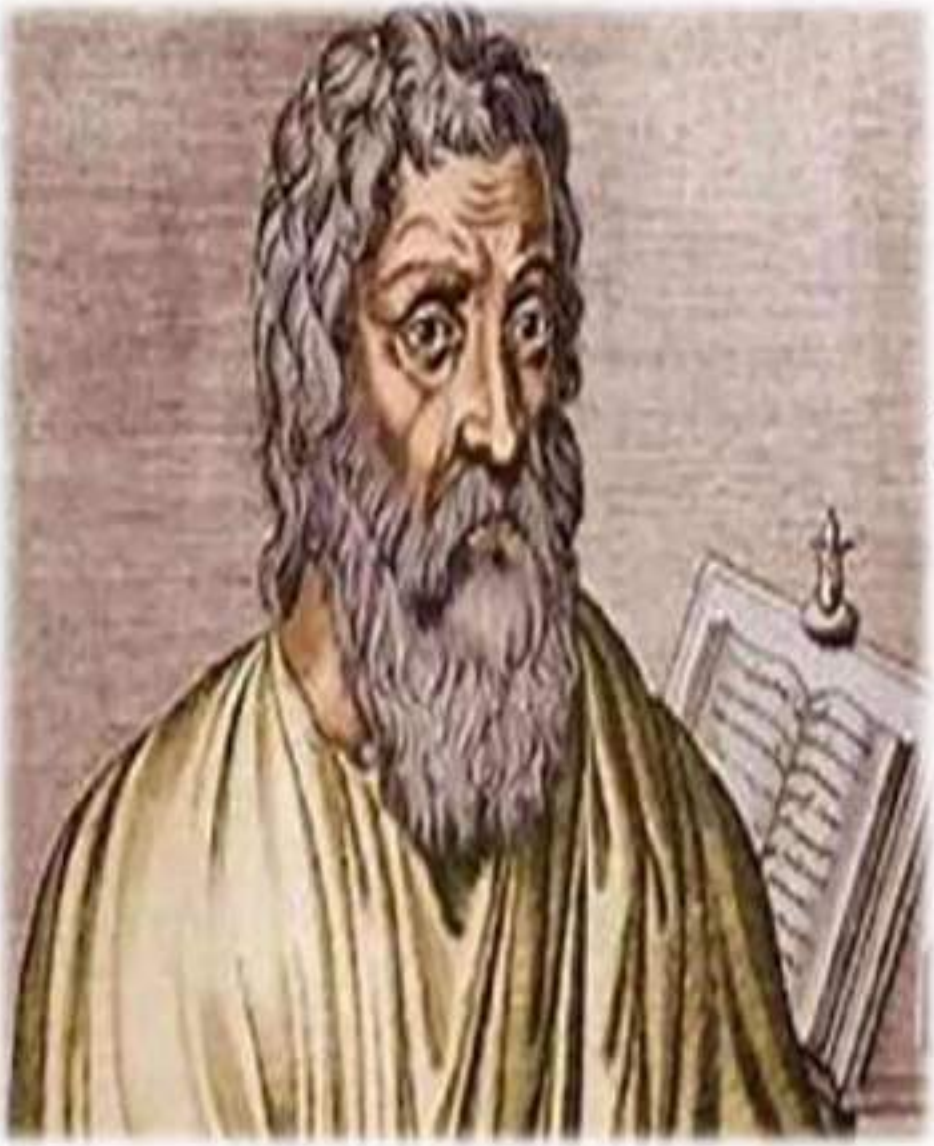
INTRODUCTION: ANATOMY

- Aristotle was the first person to use the term "anatome", a Greek word meaning "Cutting up or taking apart" (to take apart by cutting)
- Was first studied formally in Egypt
- Human Anatomy was taught in Greece by Hippocrates (460-377 BC): "Father of Anatomy"



- **Aristotle:**

First person to use the term "anatome"



- Hippocrates (460-377 BC): "Father of Anatomy"

MEANING: ANATOMY

- Anatomy is the study of structure and interrelationship of structures within the human body.

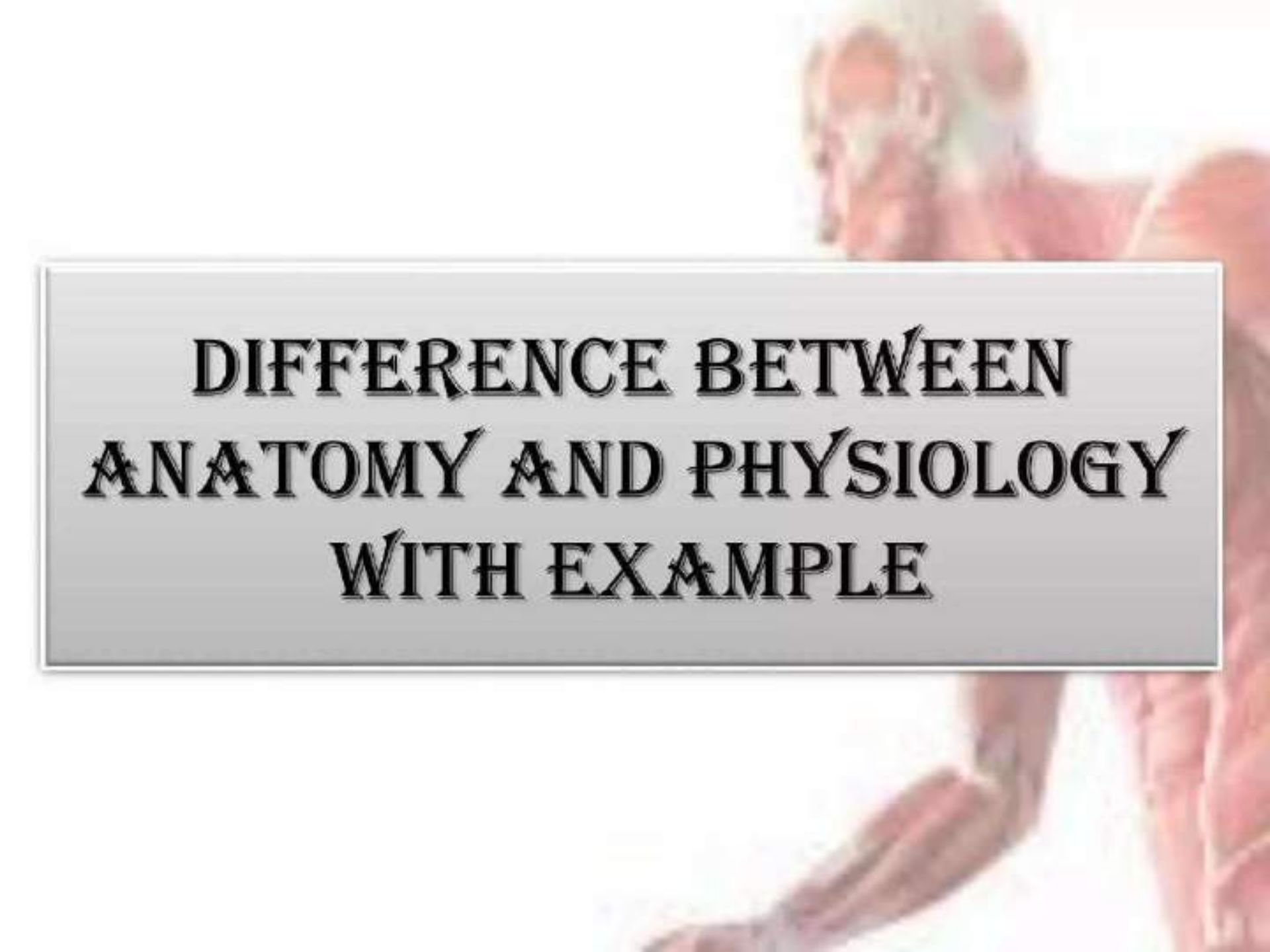
INTRODUCTION: PHYSIOLOGY

- The term Physiology is also derived from a Greek root with Latin equivalent *physiologia,* which denotes natural knowledge.

- Physiology is a study of the functions of living organisms as a whole or its constituent parts.

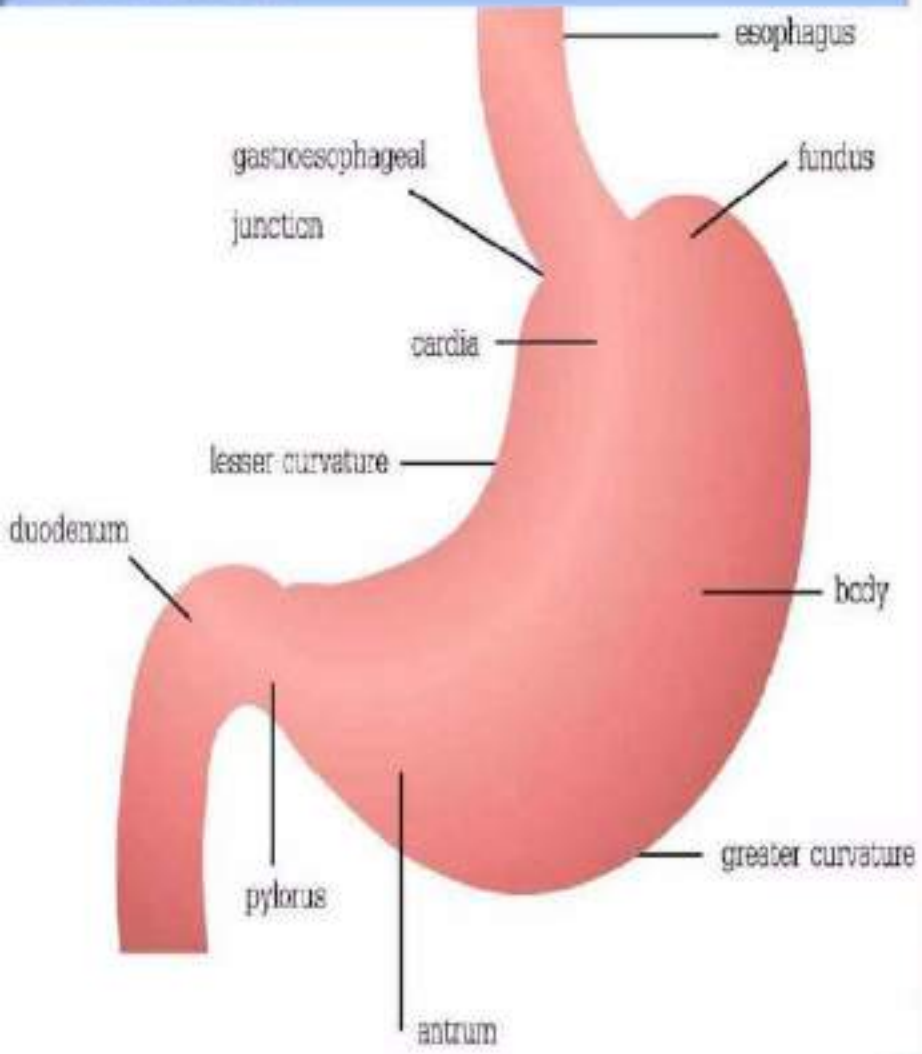
- Physiology is the discipline that deals with bodily functions and their control.

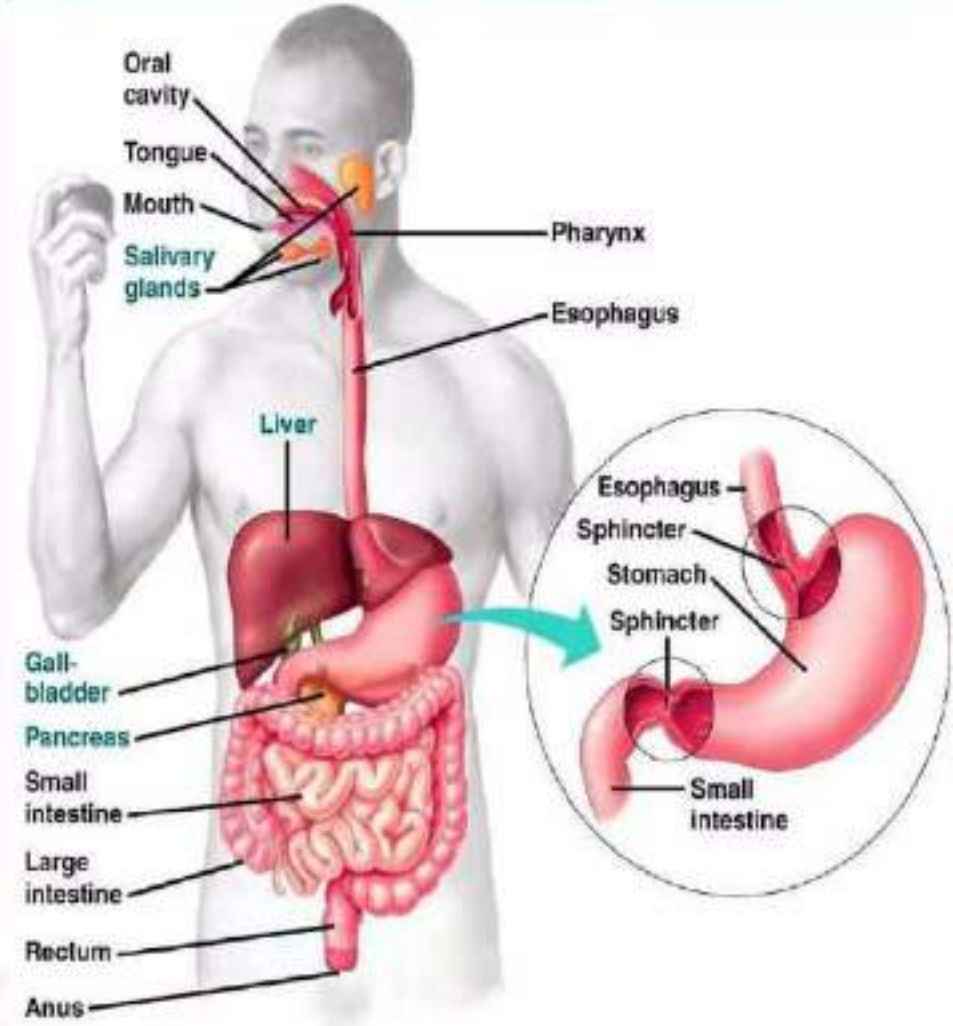
DIFFERENCE BETWEEN ANATOMY AND PHYSIOLOGY WITH EXAMPLE



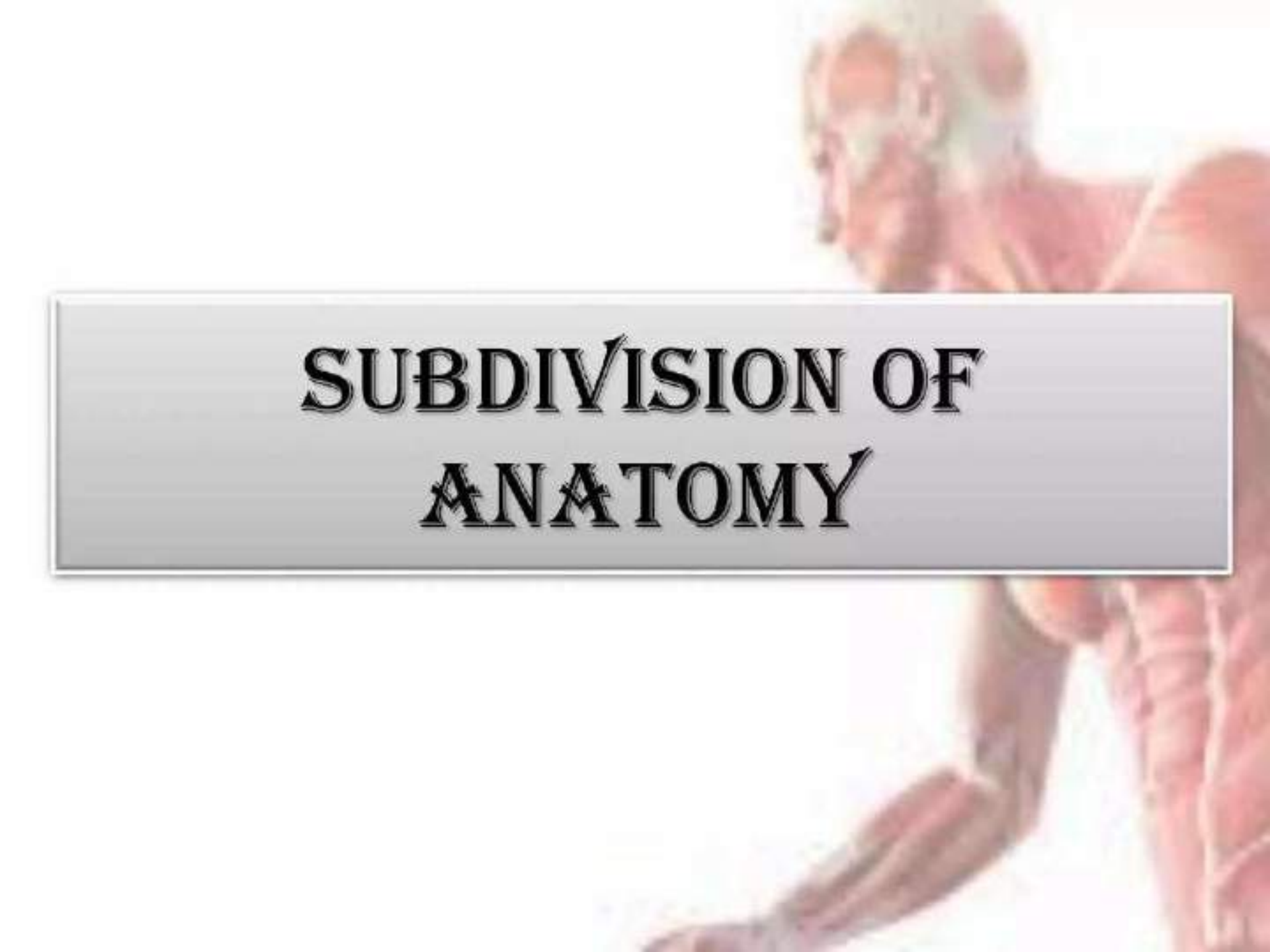
Anatomy: The study of the structure(Stomach) and identity of the parts of the stomach

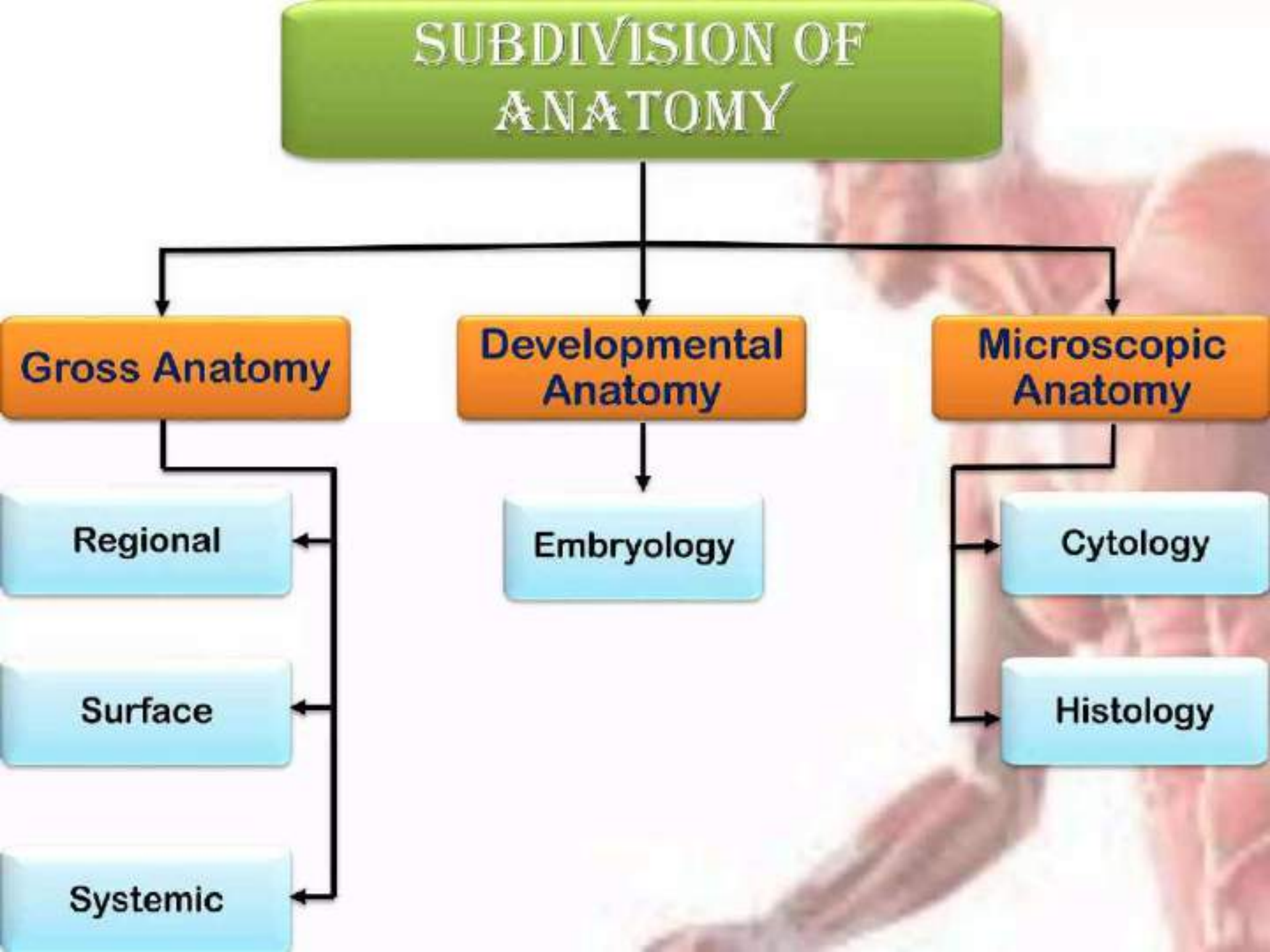
Physiology: The study of how these parts of stomach is carrying out it's function and relate to one another





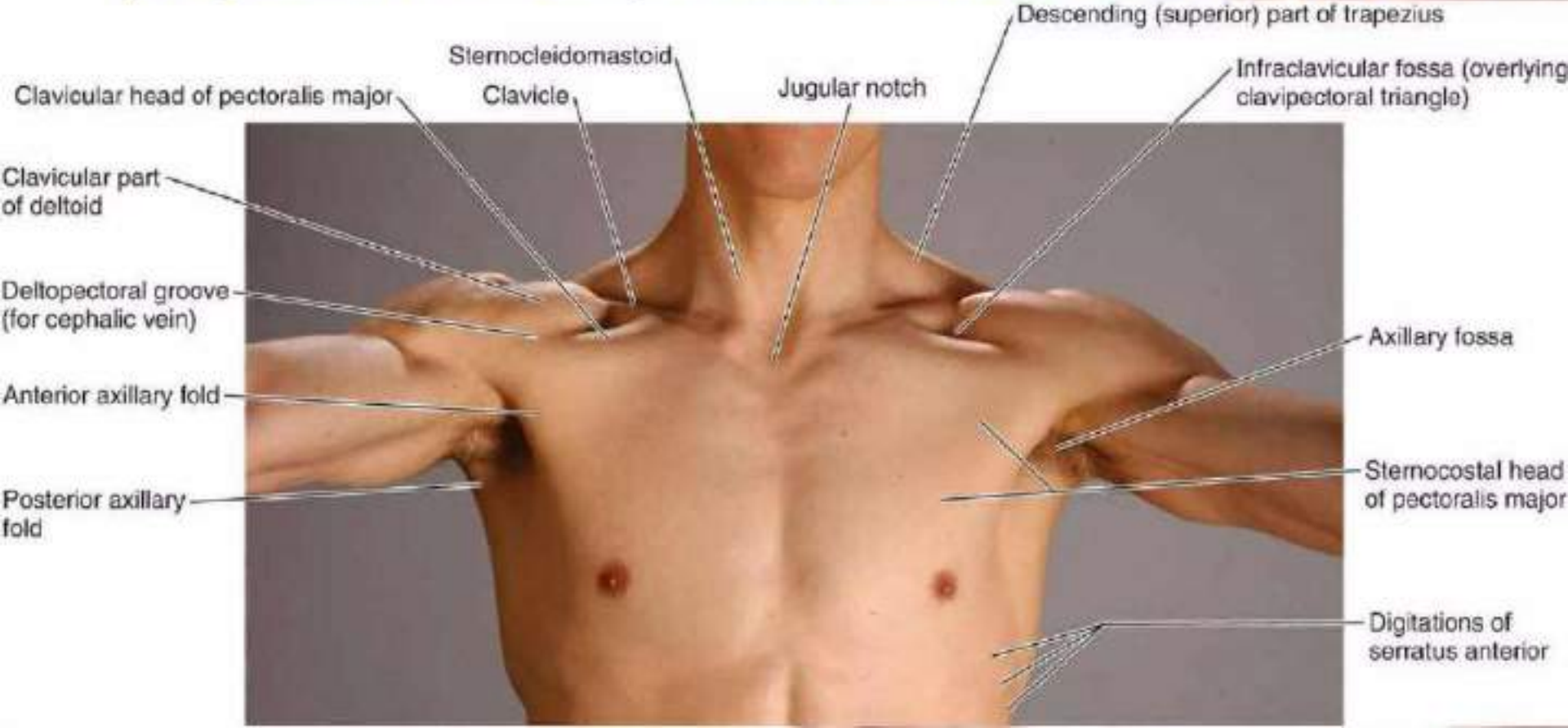
SUBDIVISION OF ANATOMY




SUBDIVISION OF ANATOMY
Gross Anatomy
Developmental Anatomy
Microscopic Anatomy
Regional
Surface
Systemic
Embryology
Cytology
Histology

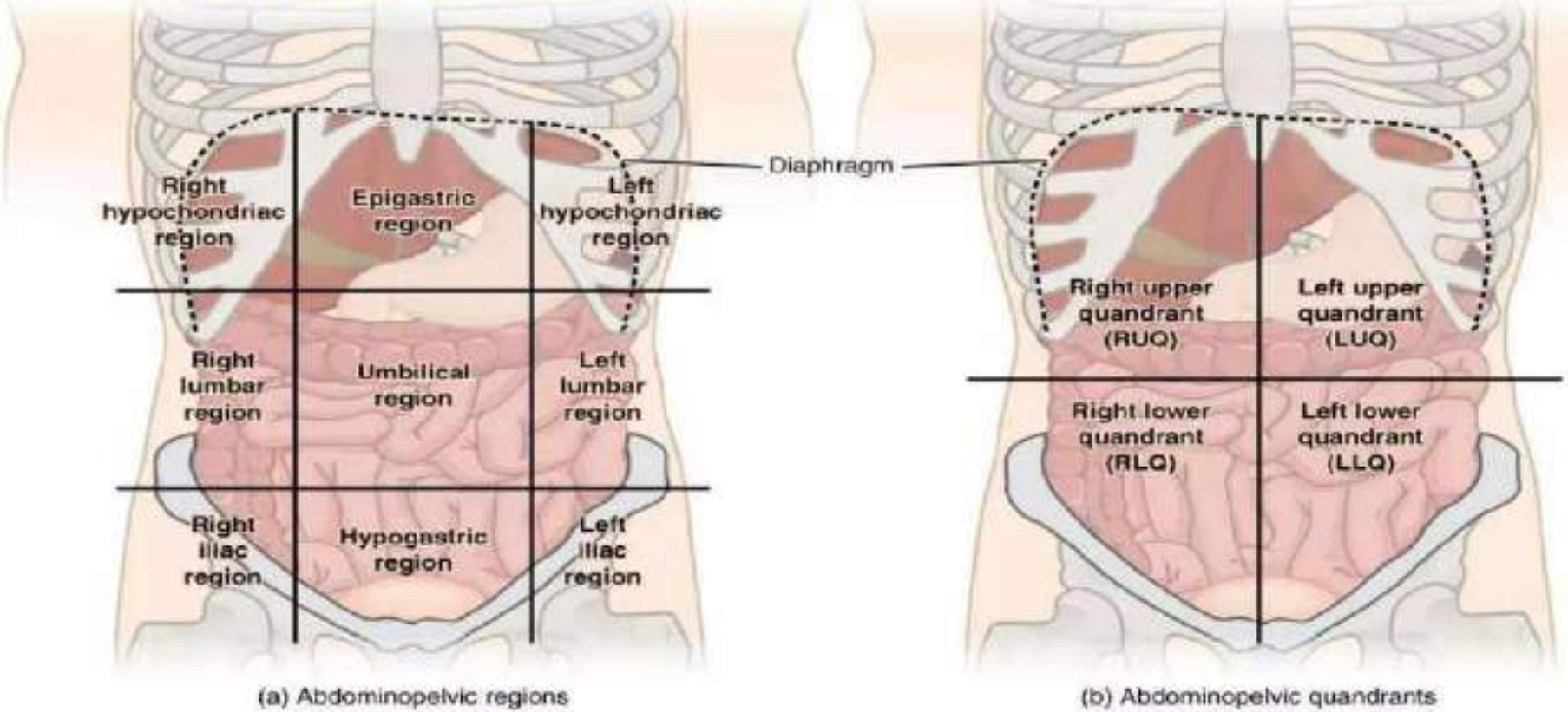
GROSS ANATOMY

- **Surface anatomy** is the study of external anatomical features without dissection. e.g. projection of deeper structures on the skin.

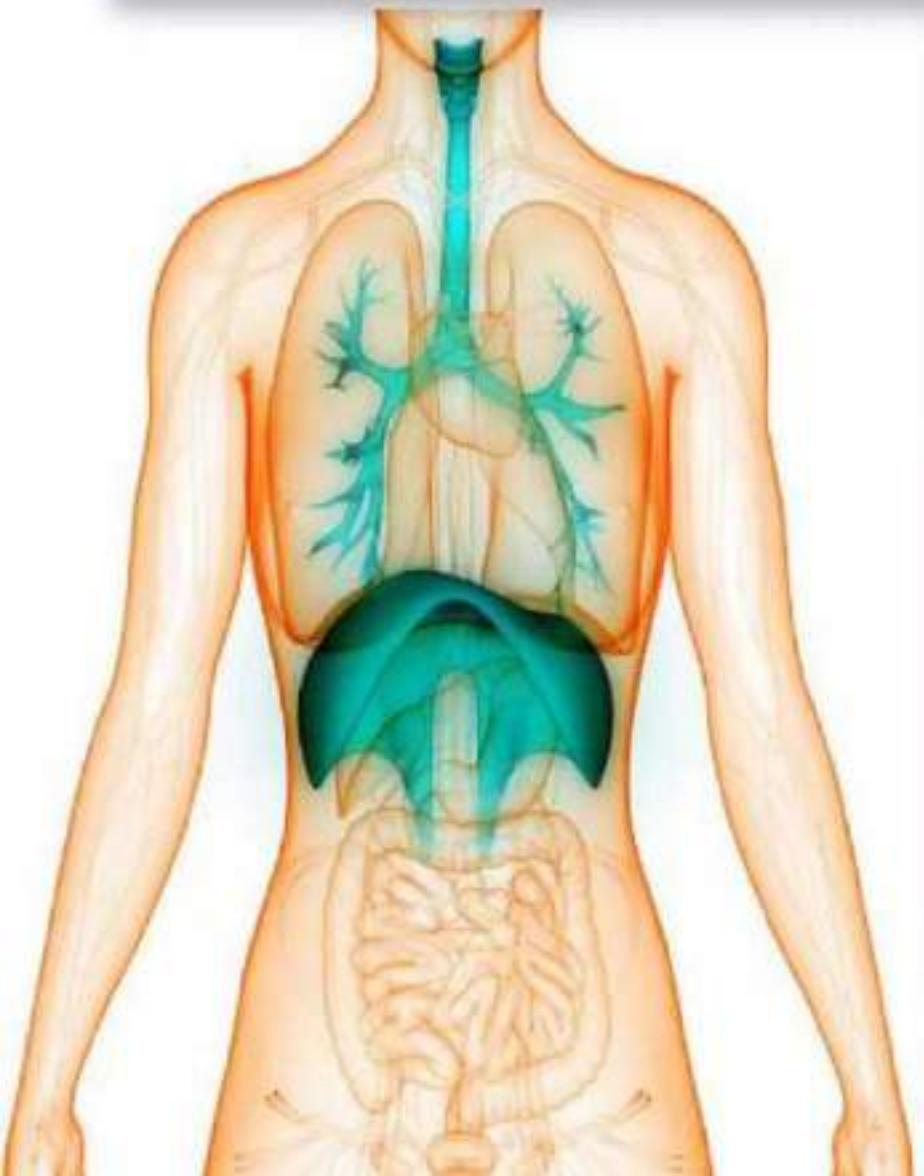


GROSS ANATOMY

- **Regional anatomy** focuses on specific external and internal regions of the body (such as the head or chest) and how different systems work together in that region.



GROSS ANATOMY



- **Systemic anatomy** is the study of the structure of various system of the body, such as the respiratory or nervous system

DEVELOPMENTAL ANATOMY

- **Embryology** is the branch of anatomy that studies structural changes of an individual from fertilization to maturity anatomy

OR

- The changes that cells, tissues, organs, and the body as a whole undergo from a germ cell of each parent to the resulting offspring.

Fetal Growth From 8 to 40 Weeks

MICROSCOPIC ANATOMY

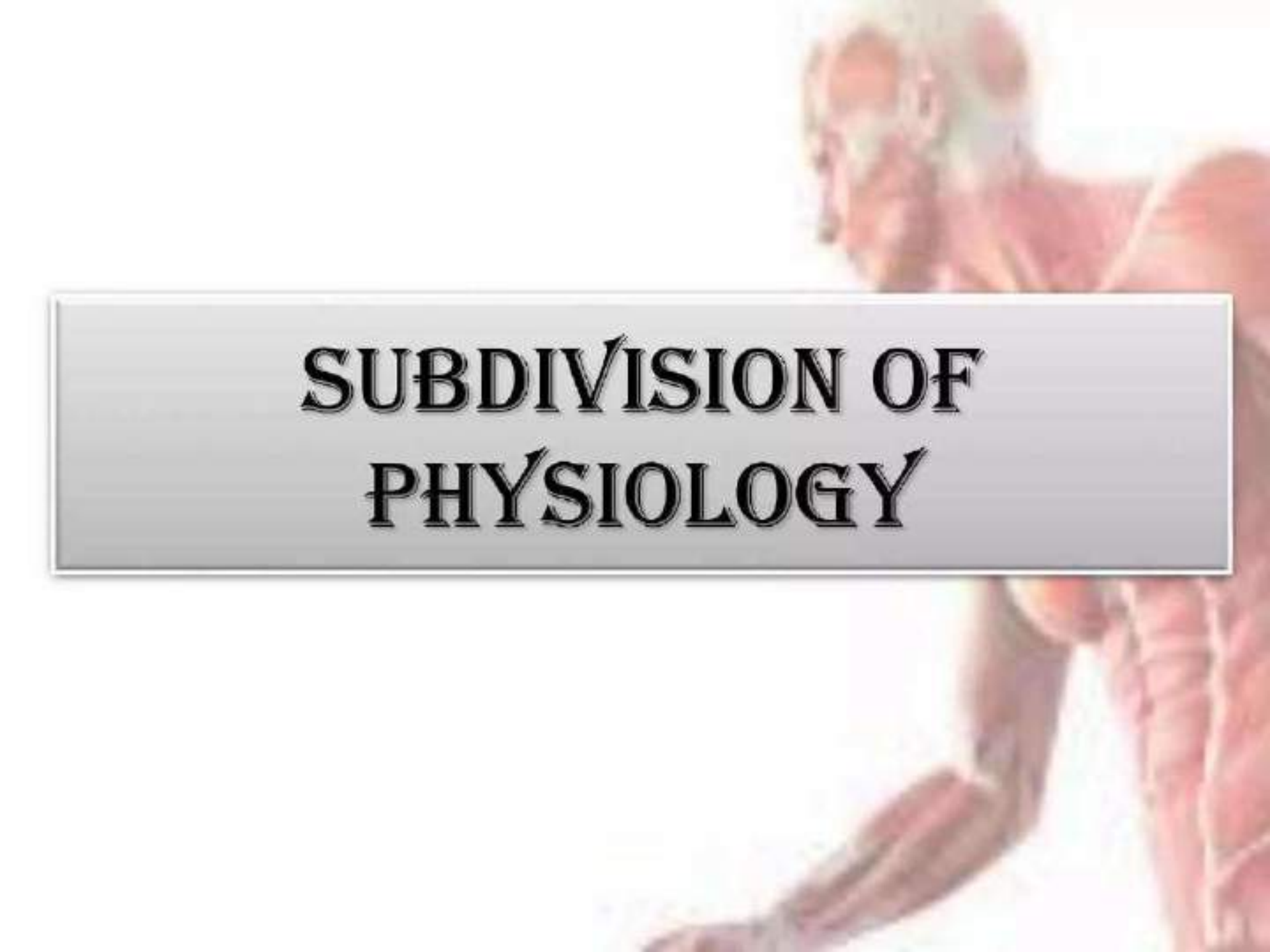
- **Cytology,** the study of the structure and function of cells.

- **Histology,** the study of the organization and details of biological tissues.

OTHER BRANCHES OF ANATOMY

- **Clinical anatomy** emphasizes certain relations that are important to the physician/surgeon/dentist.
- **Radiological and imaging anatomy** is the study of various components of the body by using X-ray, ultrasound, etc.
- **Genetics** deals with the information contained in the chromosomes.
- **Pathological anatomy** is the study of structural change (from gross to microscopic) associated with disease

SUBDIVISION OF PHYSIOLOGY



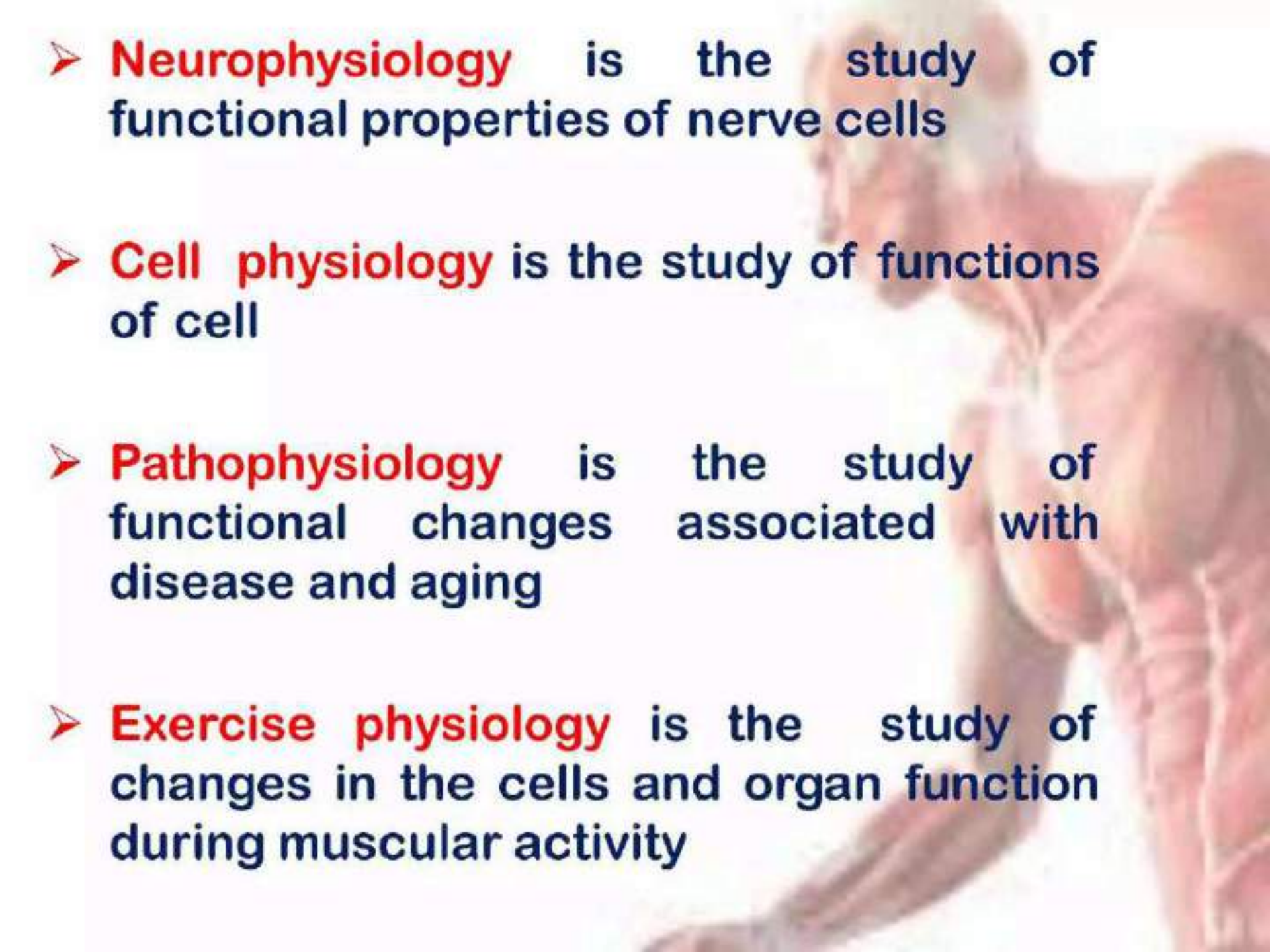
- Physiology can be subdivided into:
  - **Renal physiology** is the study of functions of kidney
  - **Endocrinology** is the study of hormones and how they control body functions
  - **Cardiovascular physiology** is the study of functions of heart and blood vessels
  - **Respiratory physiology** is the study of functions of air passage ways and lungs

- **Neurophysiology** is the study of functional properties of nerve cells

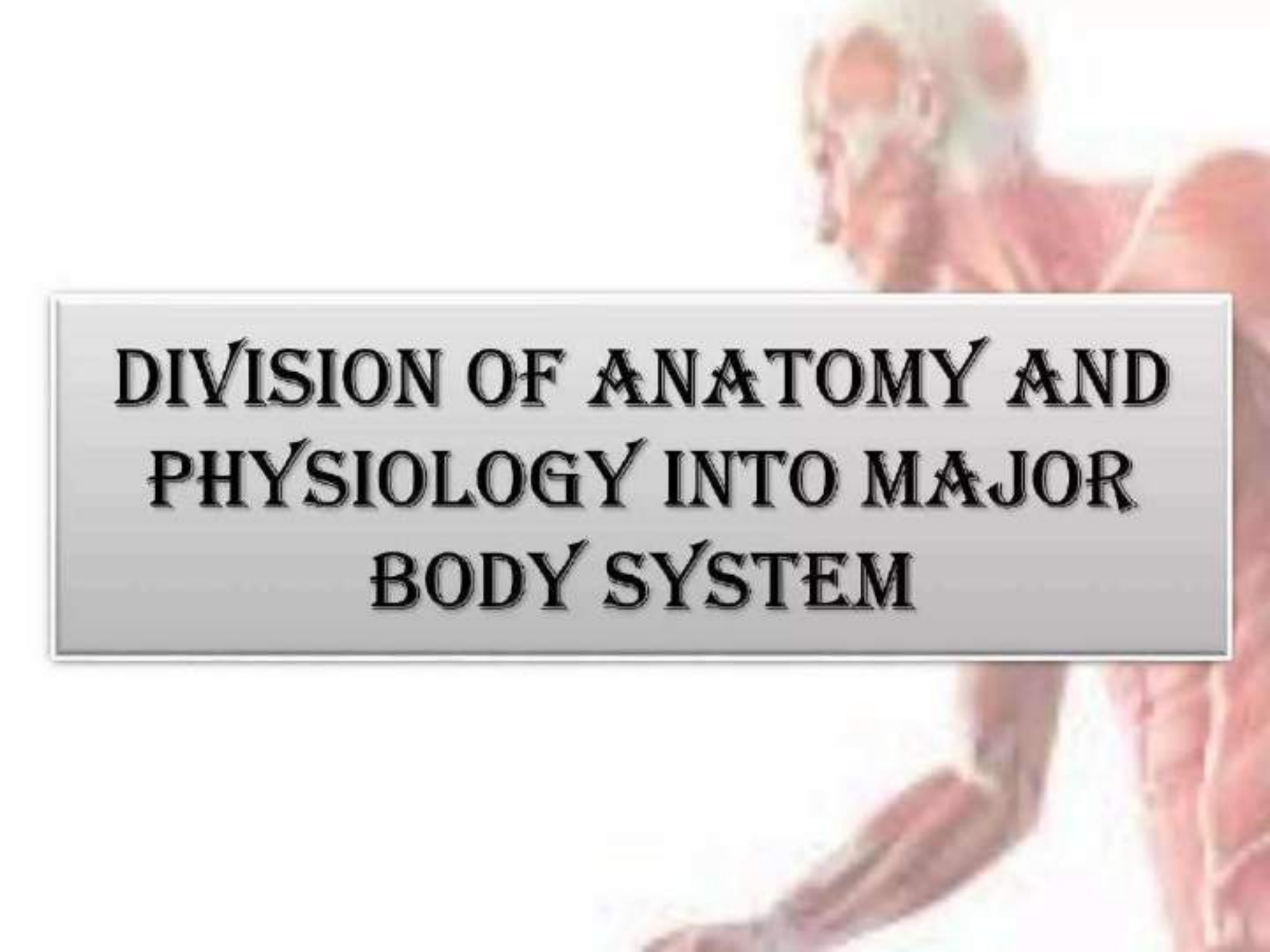
- **Cell physiology** is the study of functions of cell

- **Pathophysiology** is the study of functional changes associated with disease and aging

- **Exercise physiology** is the study of changes in the cells and organ function during muscular activity

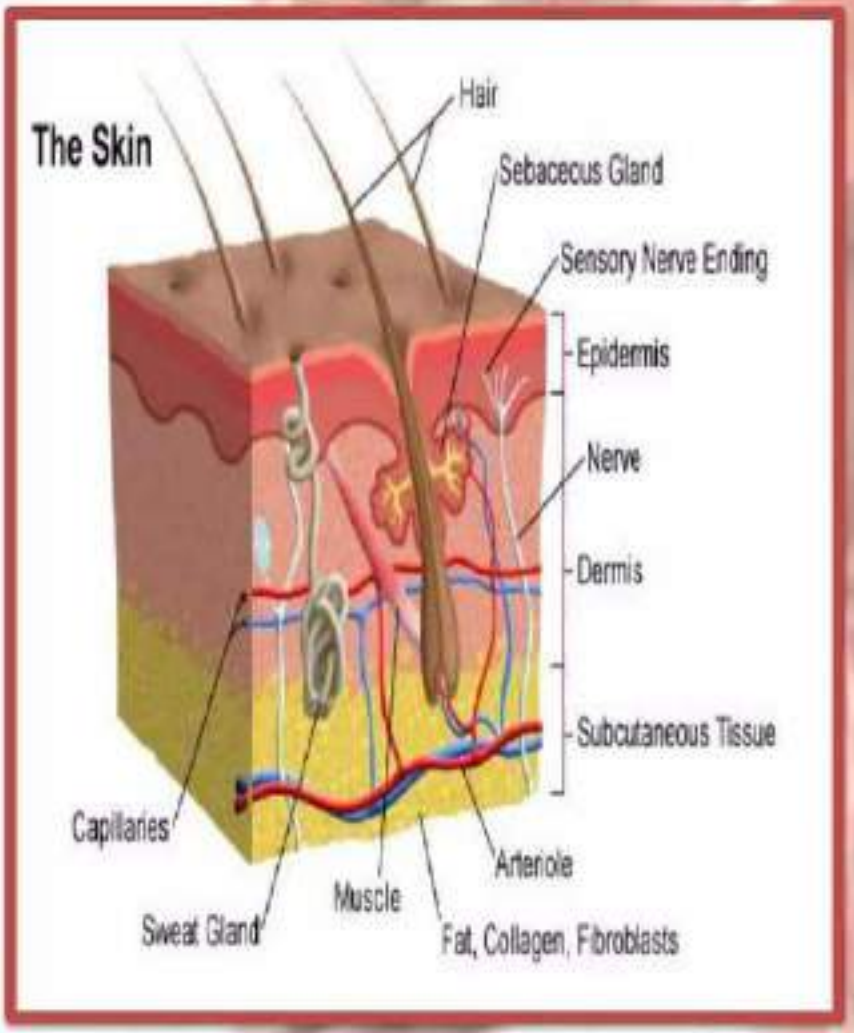


DIVISION OF ANATOMY AND PHYSIOLOGY INTO MAJOR BODY SYSTEM



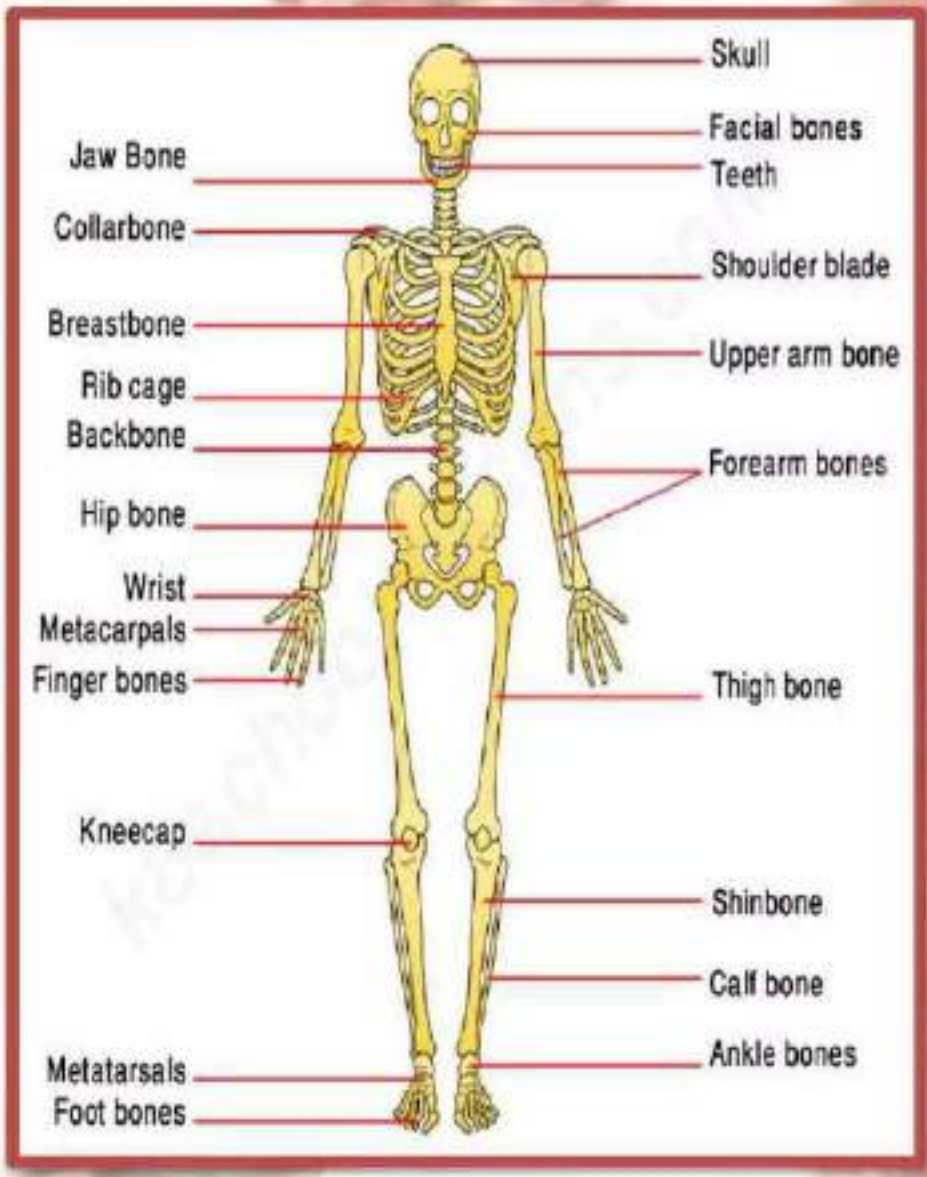
1. THE INTEGUMENTARY SYSTEM (DERMATOLOGY)

- Consists of the skin with its various appendages, i.e. hair, sweat gland, sebaceous gland and nail.
- Skin is the outer most protective and sensitive covering of the body.



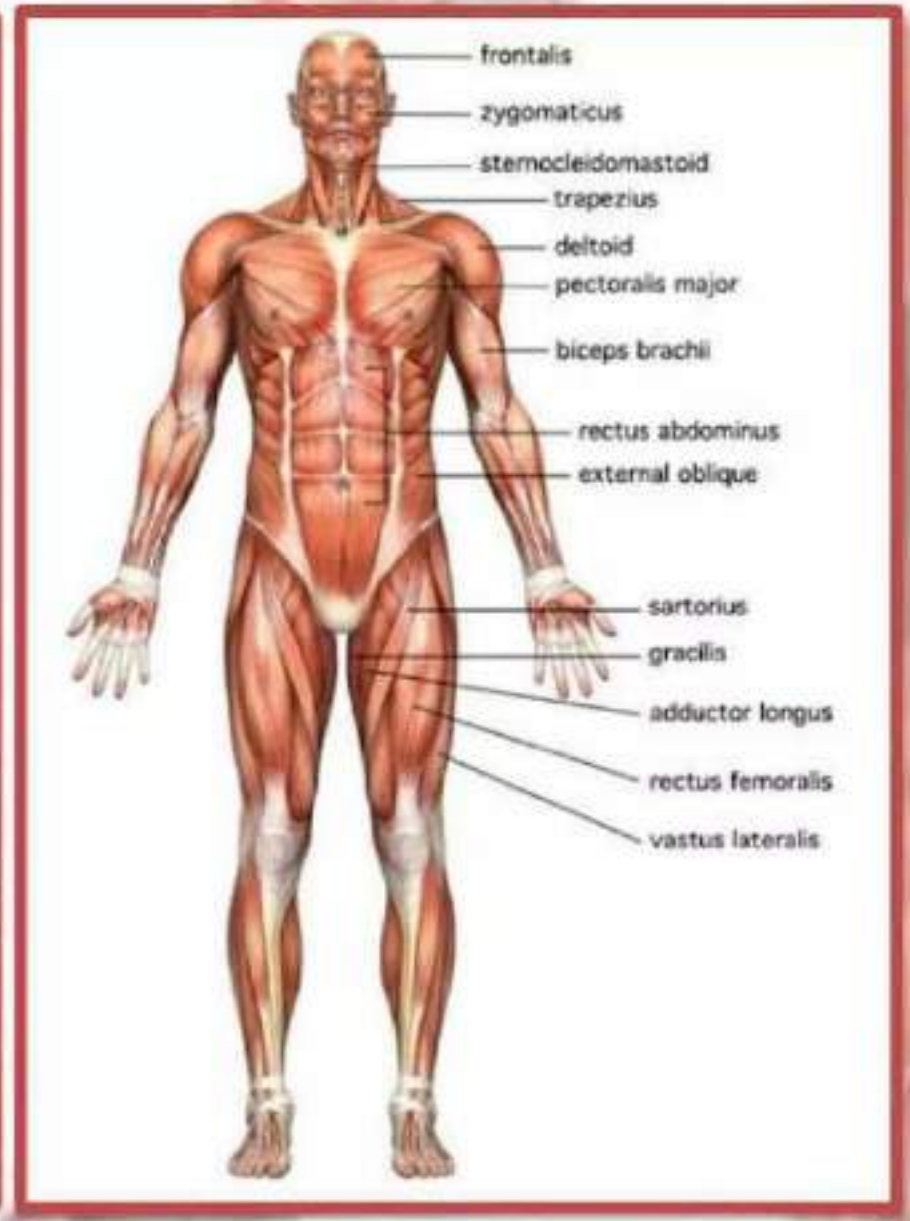
2. THE SKELETAL SYSTEM (OSTEOLOGY)

- Consist of numerous cartilages and bones, providing support and symmetry to the body.
- Cartilage keeps the respiratory pathway patent.
- Bones being the largest store house of chemical provide attachment to numerous skeletal muscles for locomotion.
- Bones also make cavities or cages for protection of organs like brain, heart, lungs and reproductive organs



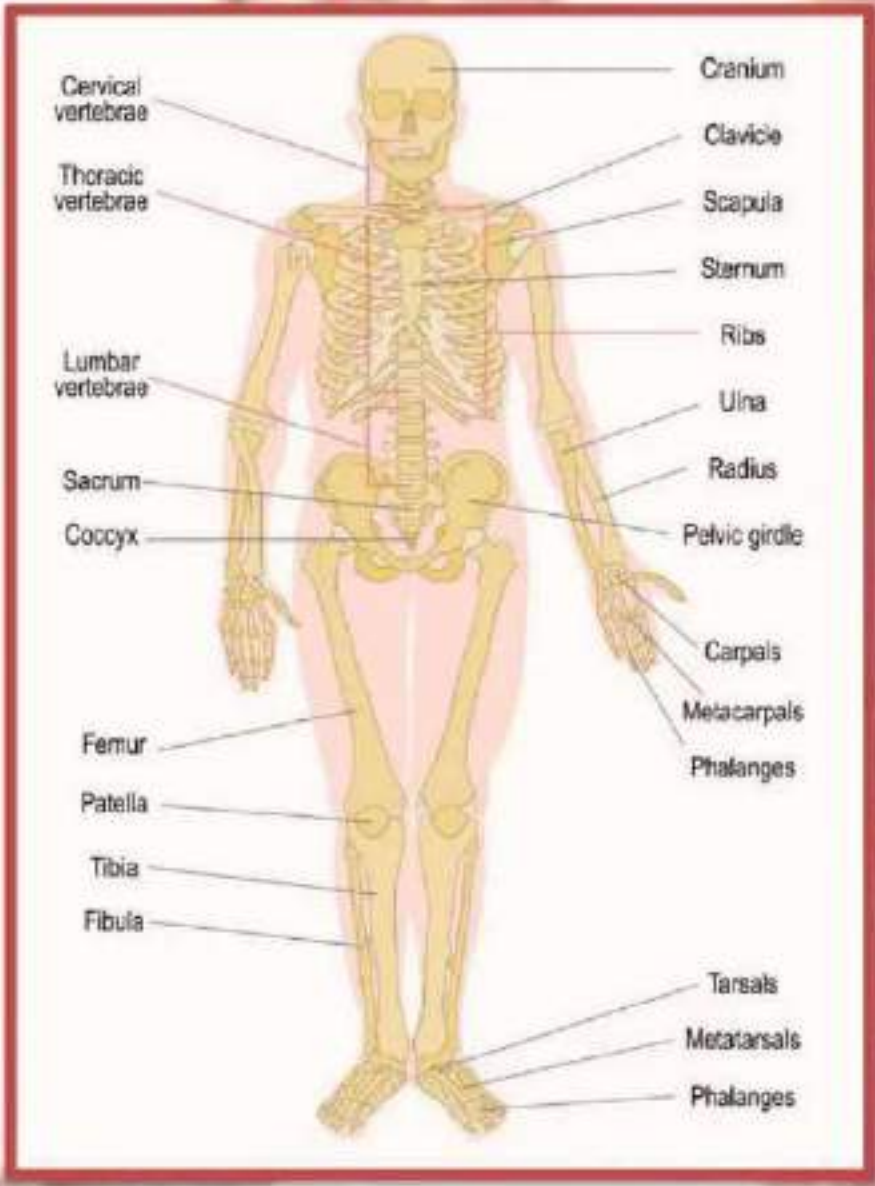
3. THE MUSCULAR SYSTEM

- Muscular system is the system which moves the body externally from one place to other and is responsible for facial expressions with the help of voluntary muscles.
- The smooth muscles of the digestive system move the food components from oesophagus down to stomach, intestines and eliminate the waste products.
- The third type of muscle is cardiac muscle which receives and propels the blood to the limbs and to various other parts of the body for providing oxygen



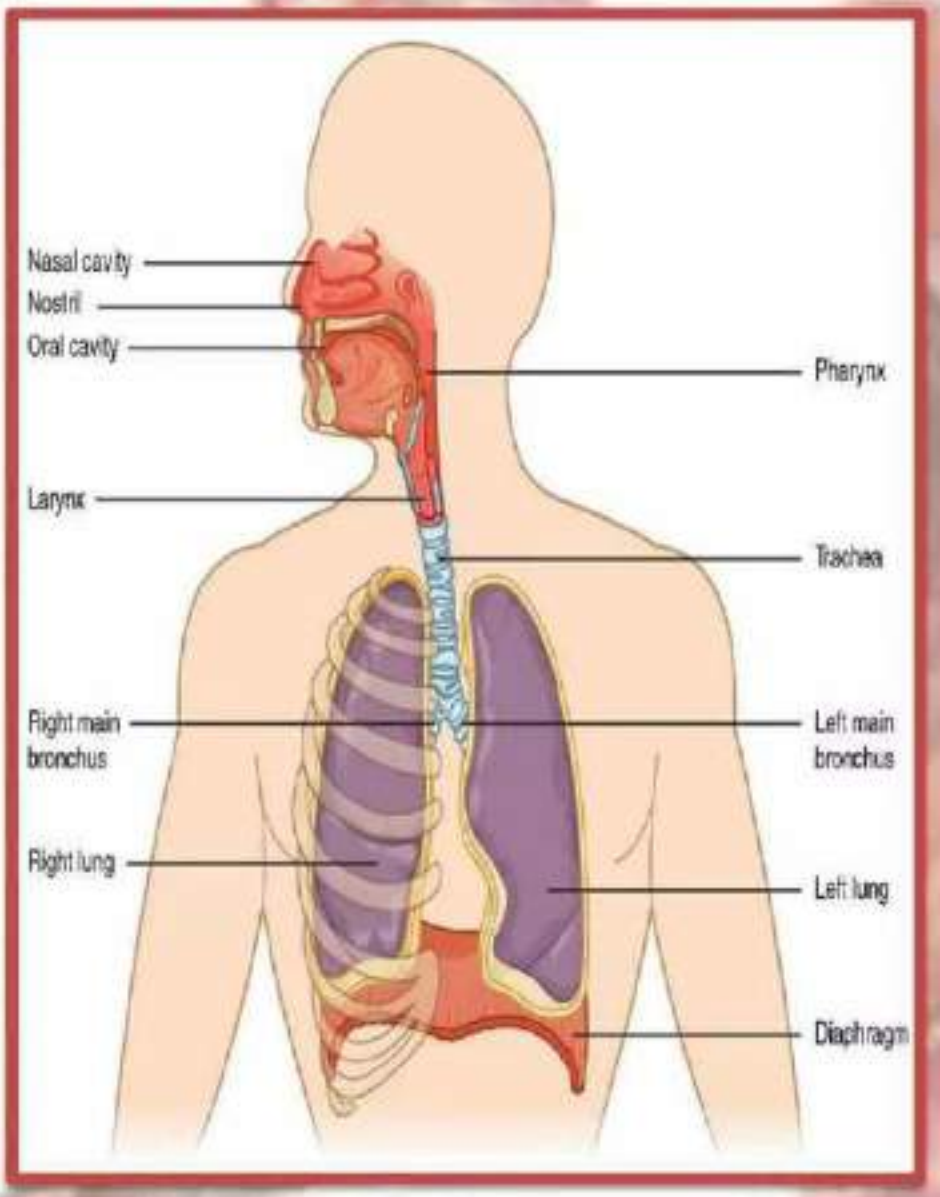
4. THE ARTICULAR SYSTEM (ARTHROLOGY)

- Comprises various joints with their ligaments.
- Various types of movements take place at the synovial joints.
- Cartilaginous joints are for growth of the bones during childhood and for providing stability.
- The fibrous joints also allow growth of the bones and provide integrity and stability to the adjoining bones.



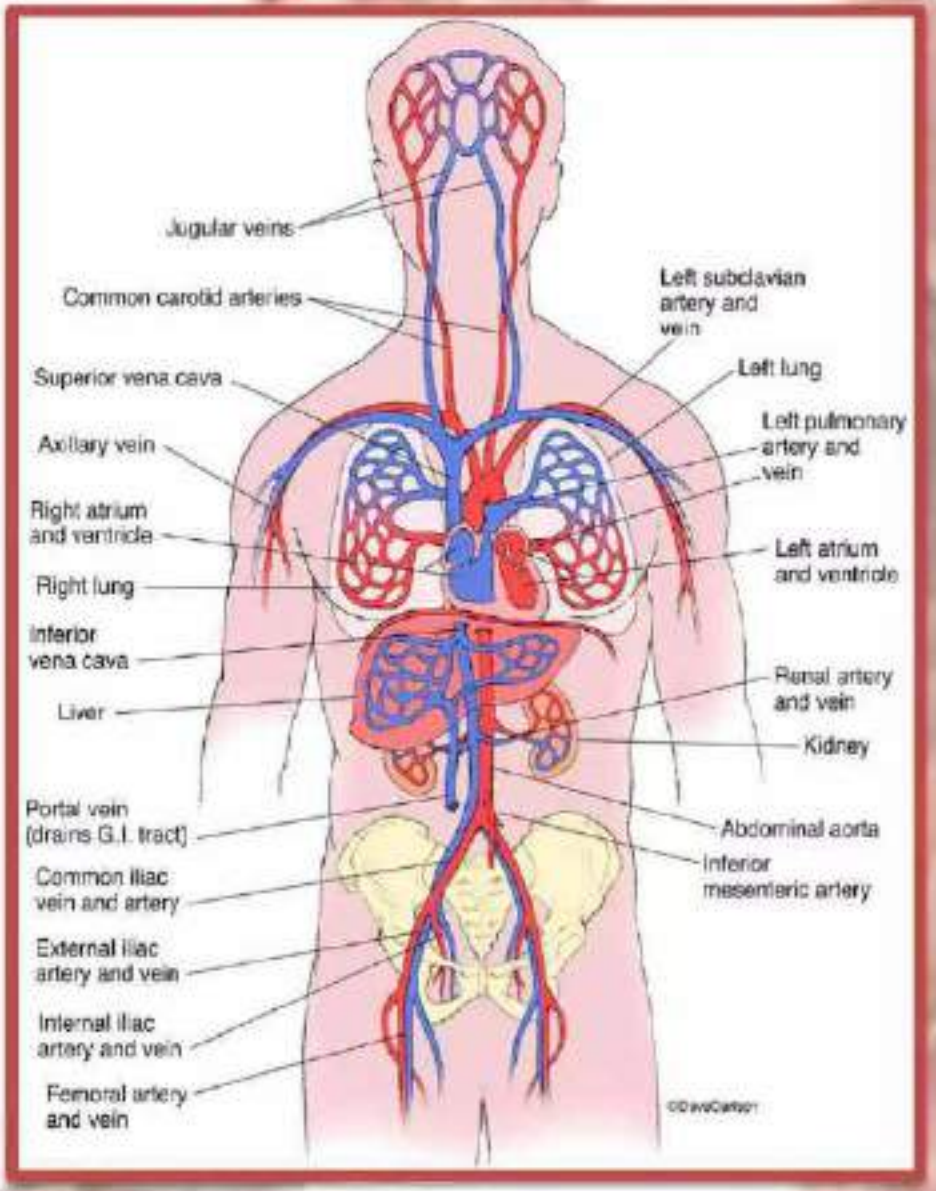
5. THE RESPIRATORY SYSTEM (PULMONOLOGY)

- Consist of nose, nasopharynx, larynx, trachea, bronchi, bronchioles, alveoli.
- These structures oxygenate the venous blood and help in elimination of carbon dioxide.



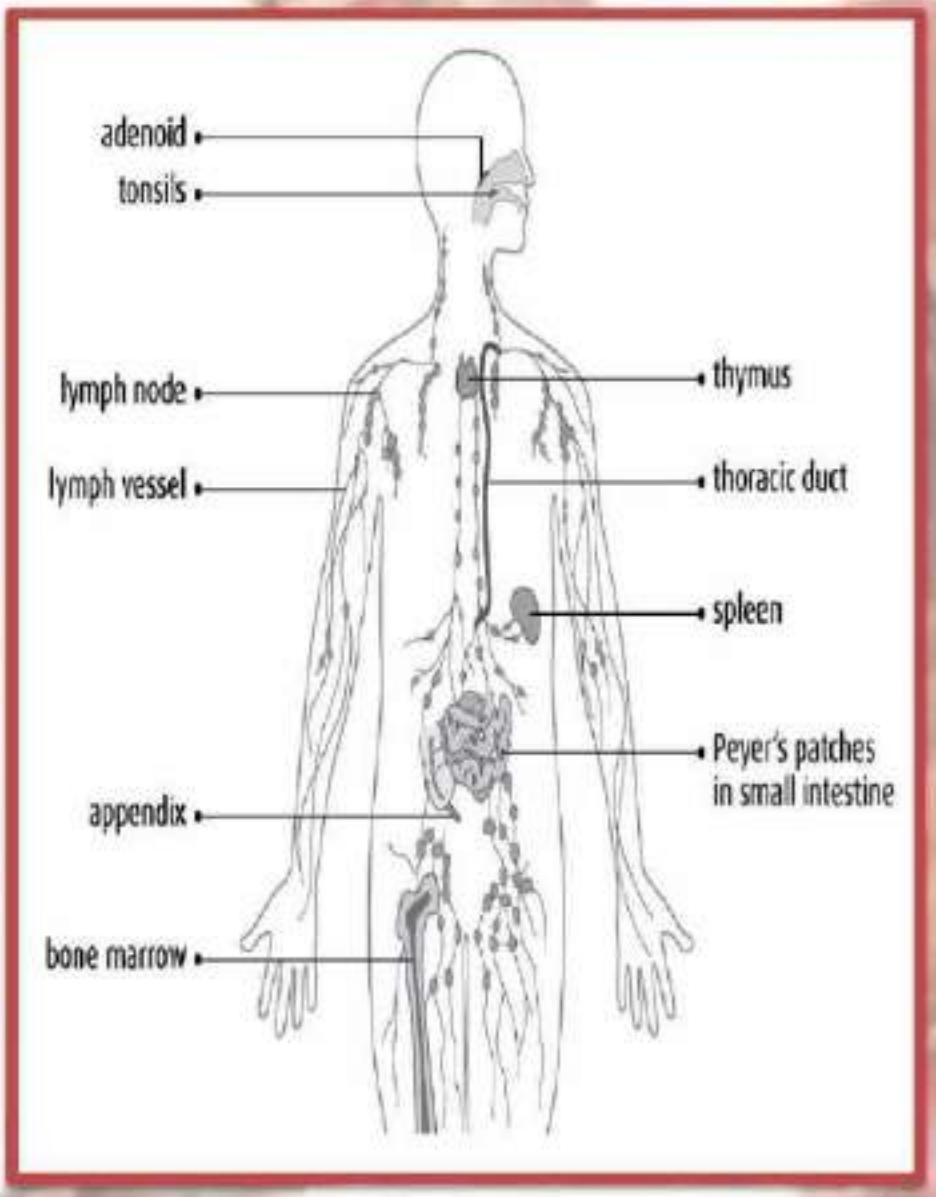
6. THE CIRCULATORY SYSTEM (ANGIOLOGY)

- Comprises cardiovascular system which consists of heart and blood vessels, i.e. arteries, veins and capillaries.
- Blood supplies nutrients and oxygen to cells and takes away carbon dioxide and waste from cells and help to regulate acid-base balance, temperature and water content of body fluids.
- Blood components help to defend against diseases and disease causing organisms.



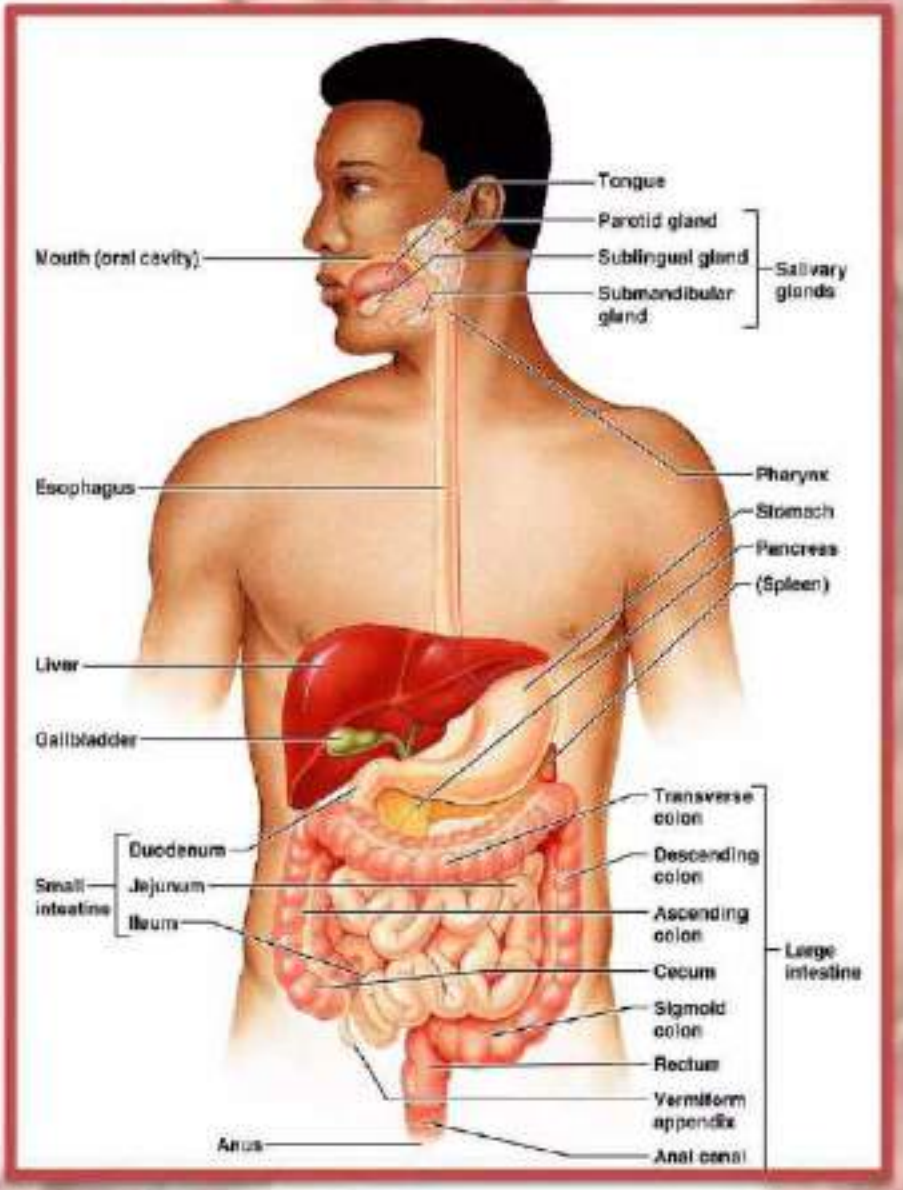
7. THE LYMPHATIC SYSTEM

- Comprises various lymph vessels which withdraw excess tissue fluid with macromolecules, filters it through lymph nodes and returns it to the venous system



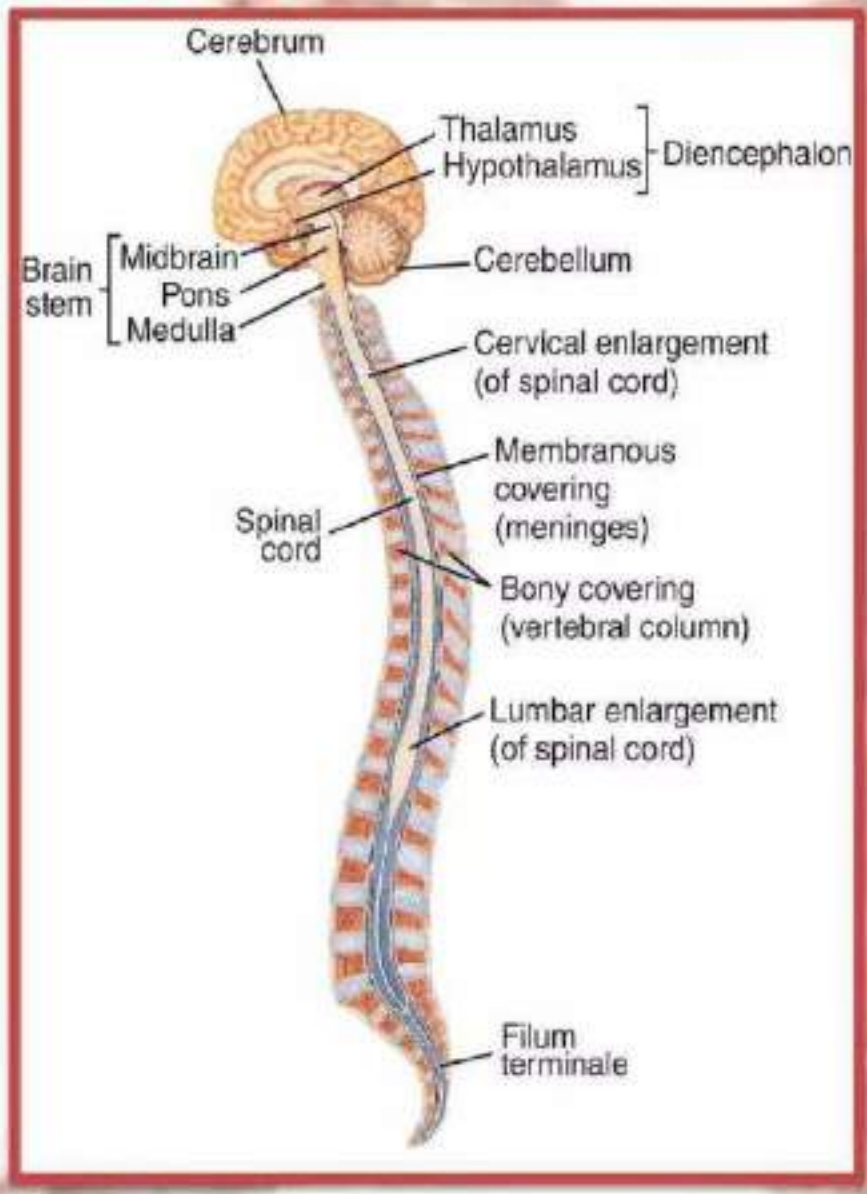
8. THE DIGESTIVE SYSTEM (GASTROENTEROLOGY)

- Comprises various organs associated with ingestion, mastication, deglutition, digestion of food components.
- This system also eliminates the solid waste from the body through anal canal.
- It is made up of a long salivary glands, gastric and intestinal glands.



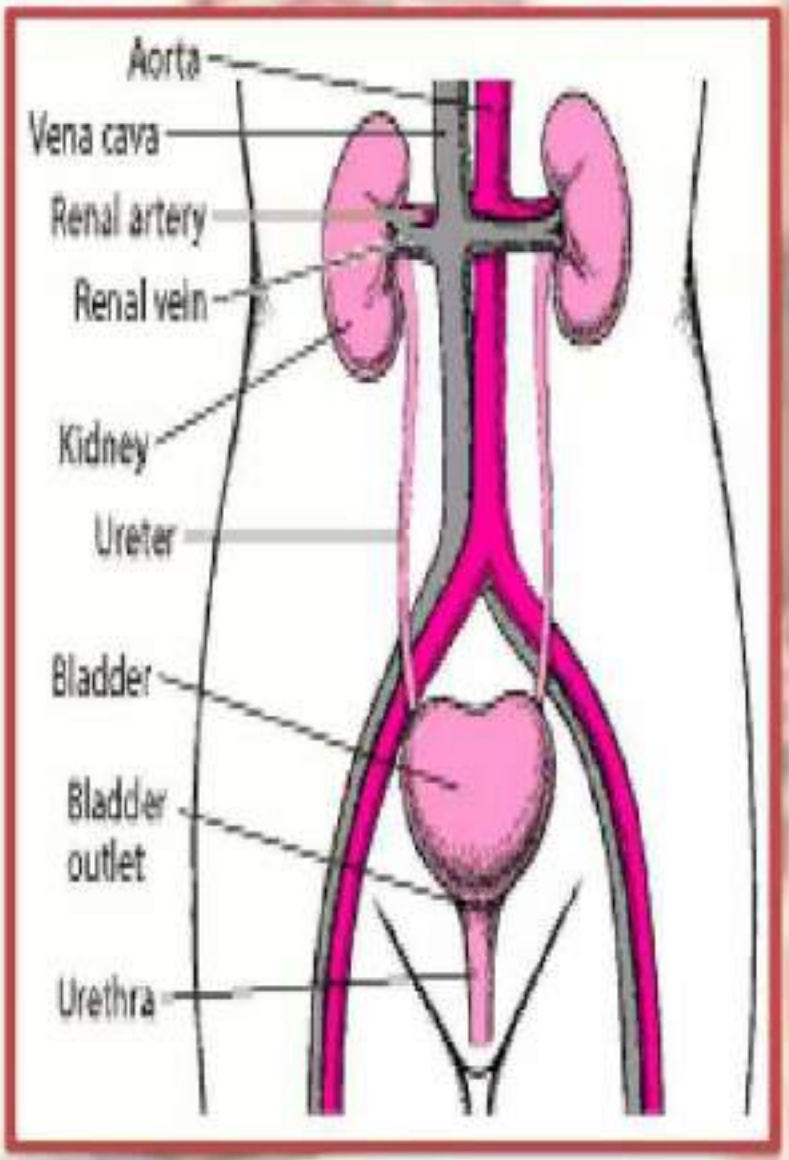
9. THE NERVOUS SYSTEM (NEUROLOGY)

- Consists of billions of neurons included in the CNS and peripheral system which controls the whole body including its muscles, glands and organs.
- The nervous system controls both our voluntary and involuntary activities.
- The personality of the person is dependent on the integrity of the nervous system.



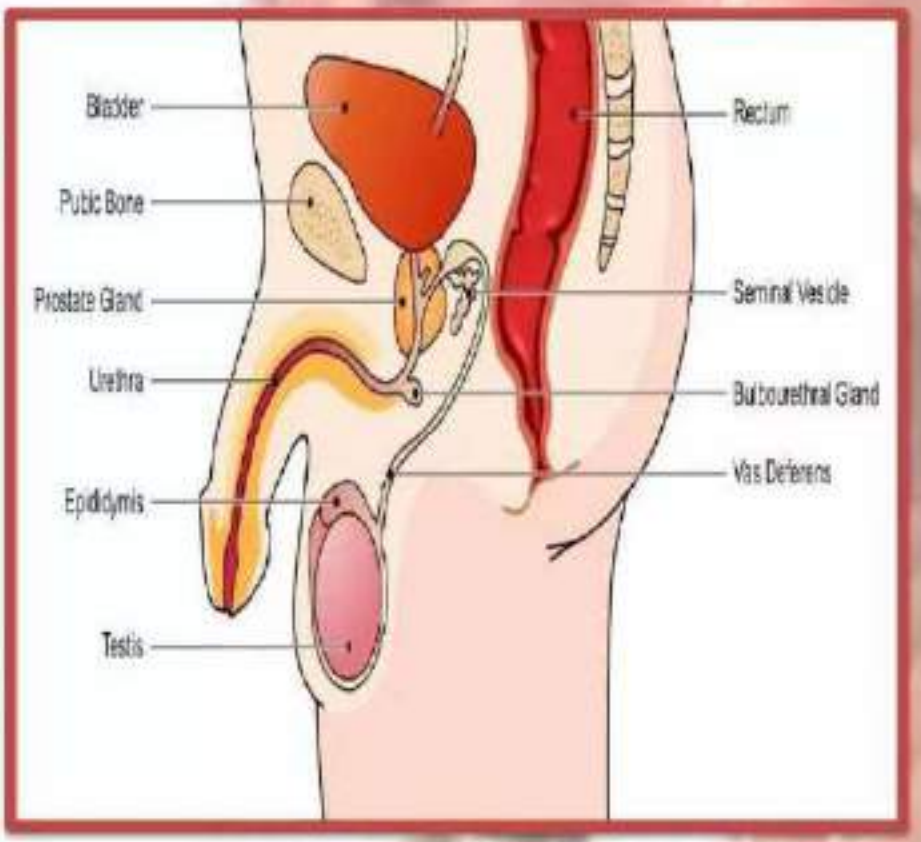
9. THE URINARY SYSTEM (NEPHROLOGY AND UROLOGY)

- Helps in excretion of liquid waste from the body.
- This system comprises kidneys, ureters, urinary bladder and urethra.
- The kidneys filter the blood and produce, transport, store and expel the urine at frequent intervals.



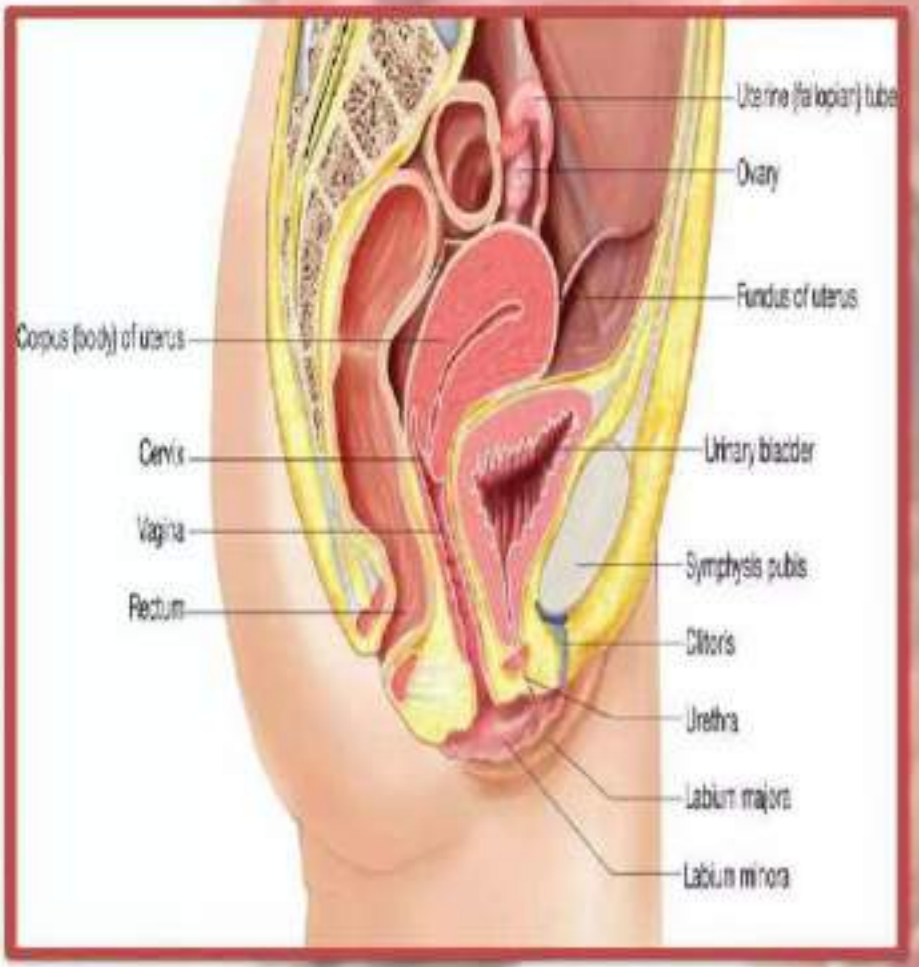
10. THE REPRODUCTIVE SYSTEM (ANDROLOGY)

- Reproductive organs in males are testes, epididymis, vas deferens, ejaculatory ducts, urethra, prostate, seminal vesicles and penis.



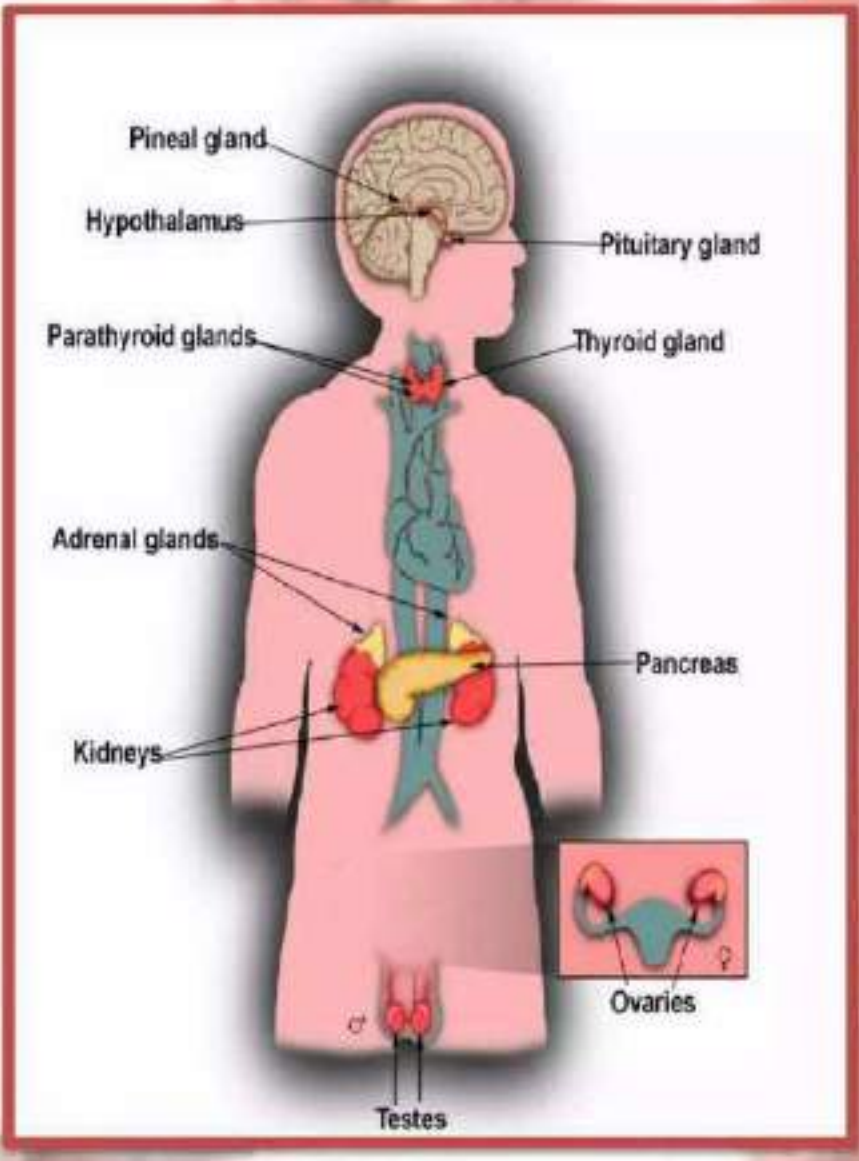
10. THE REPRODUCTIVE SYSTEM (GYNECOLOGY)

- In females, the organs are ovary, fallopian tubes, uterus, vagina.
- These two sets of organs are responsible for the production of ova and spermatozoa which on fertilization, implantation and proper nourishment in the uterus develops into a fetus.
- The fetus delivers out after 9 months of pregnancy.



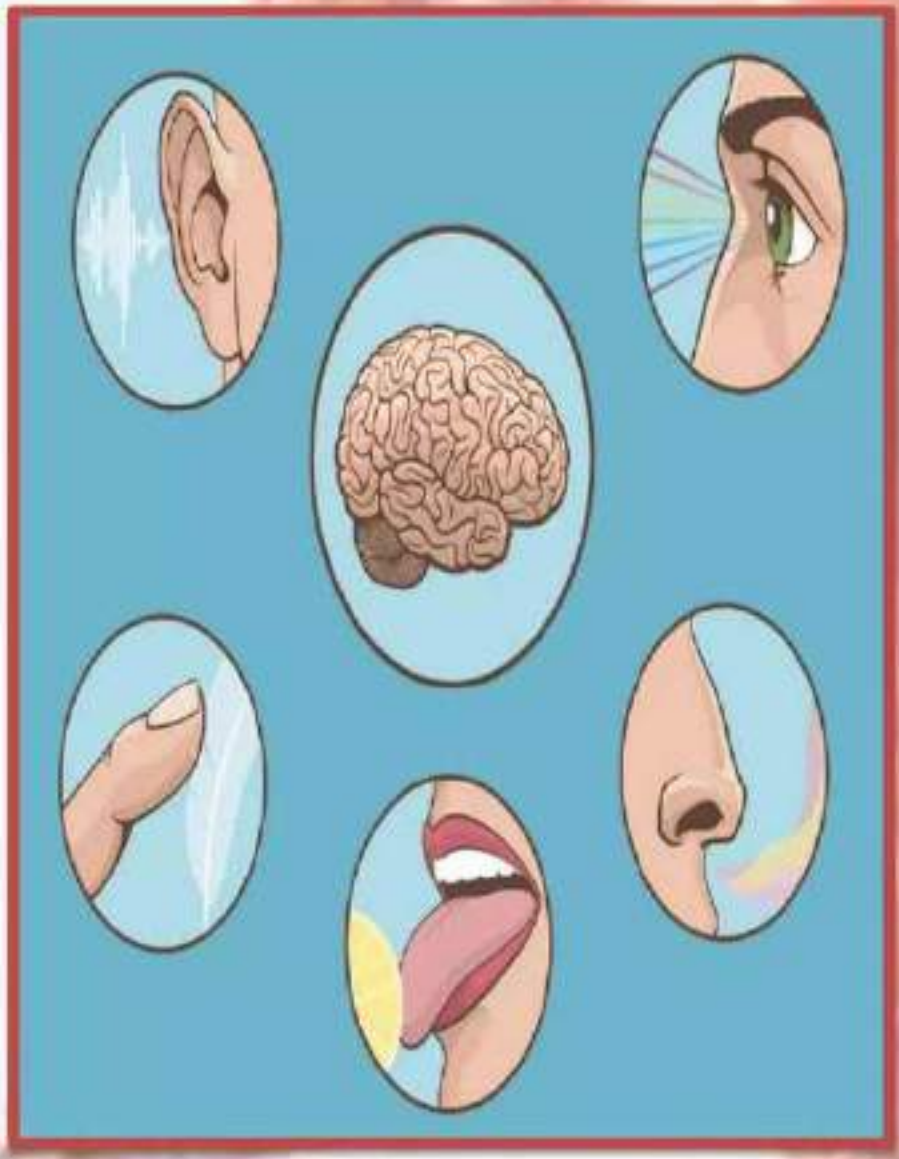
11. THE ENDOCRINE SYSTEM (ENDOCRINOLOGY)

- Consists of ductless glands like hypothalamus, hypophysis cerebri, thyroid, parathyroid, suprarenal glands and islets of langerhans in pancreas.
- These produce hormones, that are carried to various target organs via blood.
- These hormones influence metabolism and other processes like production of spermatozoa and the menstrual cycle.



12. SPECIAL SENSES

- Include senses of taste, sight, smell, hearing, balance and touch.
- Taste is appreciated by the papillae present in the tongue, epiglottis and soft palate.
- Sense of sight is appreciated in the nervous layer, the retina of the eyeball.
- Receptors of smell are only present in the mucous membrane of the uppermost part of the nasal cavity.
- Hearing and balance are compactly organized in the internal ear.
- Touch is perceived through the skin.

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