


UNIT-1 HUMAN ANATOMY &PHYSIOLOGY

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- ▶ To Know basic structural and functional elements of human body.
- ▶ To Learn organs and structures involving in system formation and functions.
- ▶ To Understand circulatory system.
- ▶ To Learn urinary and special sensory system
- ▶ To Study about nervous system

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- ▶ What is anatomy?
 - ▶ the branch of science concerned with the bodily structure of humans, animals, and other living organisms, especially as revealed by dissection and the separation of parts.

- ▶ What is physiology?
- ▶ the branch of biology that deals with the normal functions of living organisms and their parts.
- ▶ the way in which a living organism or bodily part functions.
- ▶ "the physiology of the brain"



▶ **BASIC ELEMENTS OF HUMAN BODY**

- ▶ Cell: Structure and organelles - Functions of each component in the cell. Cell membrane - transport across membrane - origin of cell membrane potential - Action potential Tissue: Types - Specialized tissues - functions, Types of glands

Cell: Structure and organelles

- ▶ WHAT IS A CELL?
- ▶ Cell is the fundamental, structural and functional unit of all living organisms
- ▶ Robert Hooke (1665) - an English scientist who observed honeycomb like dead cells and coined the term CELL
- ▶ Anton Von Leeuwenhock first described a living cell (1667)
- ▶ Robert Browne discovered nucleus (1833)

Cell theory

- ▶ Schleiden ,Schwann - proposed cell theory.
- ▶ All living organisms are composed of cells and product of cells
- ▶ All cells arise from pre existing cells through the process of cell division
- ▶ The body of living organisms is made up of one or more cells

Cell number, size, shape

- ▶ Unicellular organisms - Organisms with single cell, capable of independent existence and carries all functions like digestion, excretion, respiration, growth & reproduction (Acellular). Examples, Amoeba, Euglena
- ▶ Multicellular organisms - Organisms with more than one cell
- ▶ Cells in multicellular organisms vary in size & shape depending on function

▶ **SHAPE:**

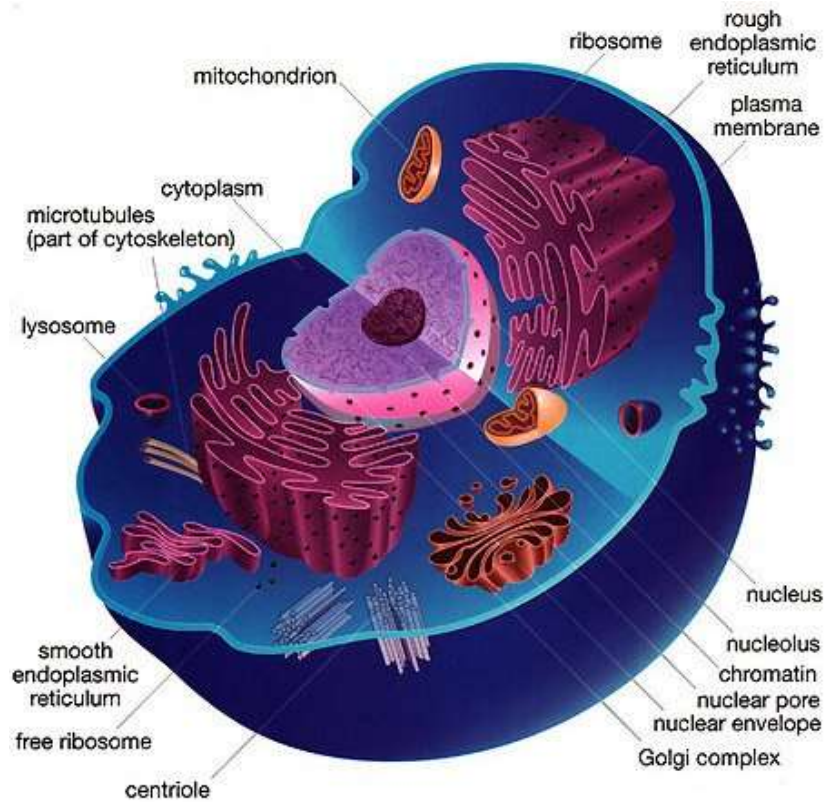
- ▶ Parenchyma - Polyhedral cells performs storage.
- ▶ Sclerenchyma - spindle shaped cells & provides mechanical support,
- ▶ Nerve cells- long and branched cells conducting nerve impulses
- ▶ RBC -Biconcave & helps in carrying oxygen
- ▶ Muscle cells- cylindrical or spindle shaped concerned with the movement of body parts.

CELL STRUCTURE &FUNCTIONS

- ▶ Cell has non living outer layer called CELL WALL found only in plant cells
- ▶ Below cell wall is CELL MEMBRANE
- ▶ CELL MEMBRANE encloses PROTOPLASM
- ▶ PROTOPLASM has semi fluid matrix called CYTOPLASM and large membrane bound structure called NUCLEUS

- ▶ CYTOPLASM has many membrane bound organelles like Endoplasmic reticulum , Golgi Bodies Mitochondria ,Plastids and vacuoles.
- ▶ They also have non membrane bound structures called Ribosomes and Centrosomes
- ▶ Cytoplasm without Cell organelles are called Cytosol.

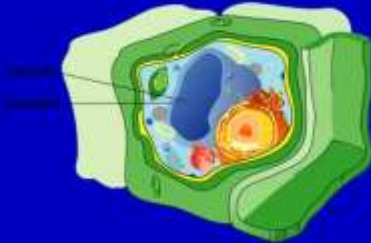
TYPICAL ANIMAL CELL



Difference between plant and animal cell

Plant cell

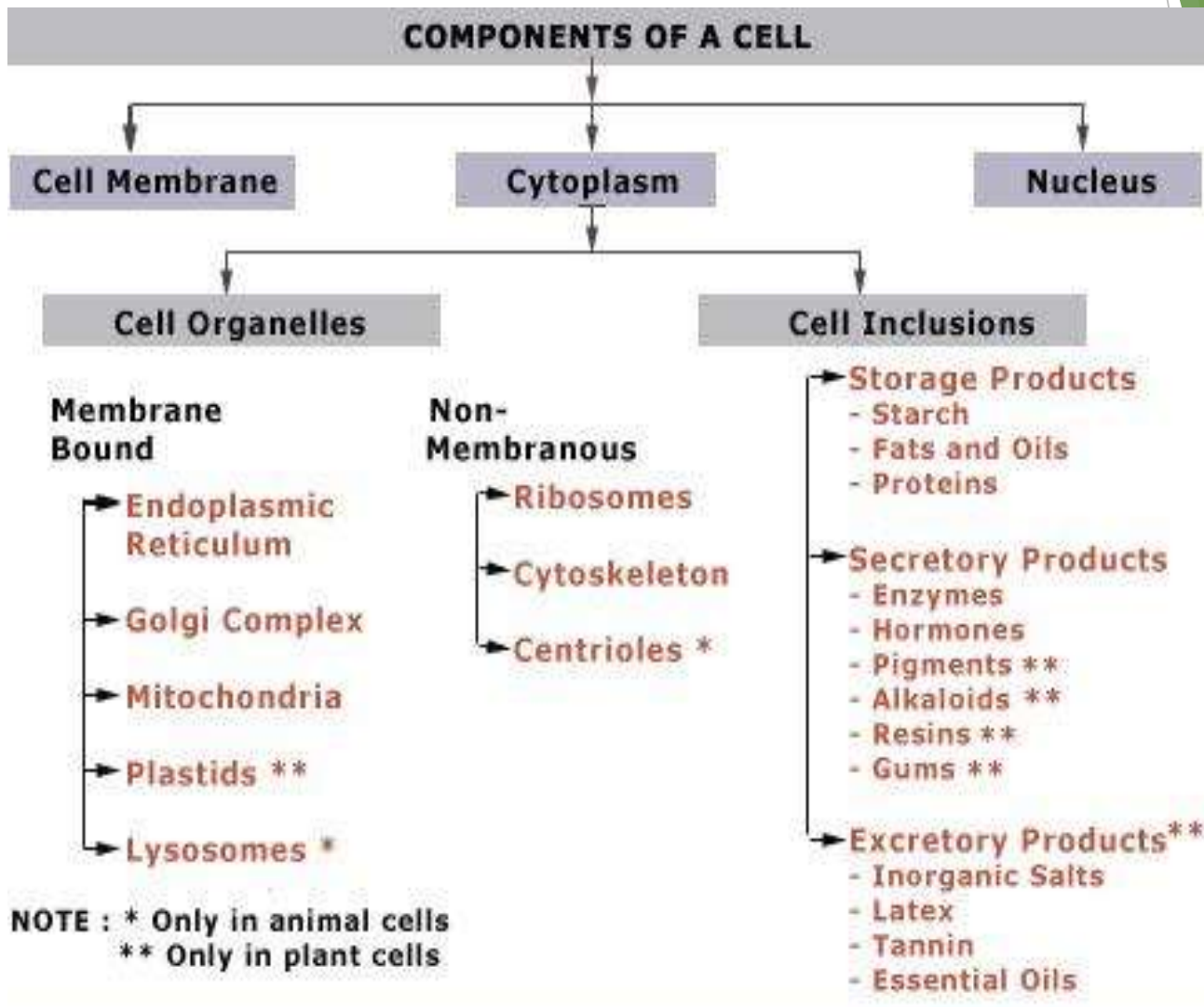
- Present in plant cell but absent in animal cell
- Cell wall
- Chloroplast
- Central vacuole



Animal cell

- Present in animal cell but absent in plant cell
- Centrosome with centriole
- Lysosome
- Flagella





CELL WALL

- ▶ Outermost layer, non living ,rigid
- ▶ Found in bacterial cells, fungal cells and plant cells.
- ▶ Permeable
- ▶ Made up of cellulose (in bacteria- peptidoglycans,
in fungus- Chitin)
- ▶ FUNCTION :
- ▶ Rigidity, mechanical support and protection

CELL MEMBRANE

- ▶ Present in all cells, just below the cell wall in plant cells,
- ▶ outermost membrane in animal cells
- ▶ Semi-permeable
- ▶ Made up of phospholipids, proteins, carbohydrates and
- ▶ Cholesterol
- ▶ FUNCTION : It allows outward and inward movement
- ▶ of molecules across it like diffusion, osmosis,
- ▶ active transport, phagocytosis and pinocytosis

▶ PROTOPLASM

▶ According to Huxley , protoplasm is “physical basis of life”

▶ Includes organic and inorganic molecules

▶ CYTOPLASM

▶ Semi fluid matrix present between cell membrane and nuclear membrane

▶ It has various living cell inclusions called cell organelles and non living substances called Ergastic substances