

قسم علم الحياة / المرحلة الأولى

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Biology / Lec. 2

The cell : Animal cell

There are two types of cells :

1 - Prokaryotic cells (bacteria) . Pro . = Primitive

Prokaryotic cells without nucleus only nuclear materials are present in the center of cell .

2 – Eukaryotic cells (Human and animals) . Eu . = truth.

Human cells Eukaryotic cells . Shape of the cells , vary in shape , circular , spindle , columnar and stellate in shape .

All human cells are composed from :

1 – Plasma membrane 2- Cytoplasm 3 – Nucleus

4 - Organelles

Plasma membrane : 1 - It has two layers , chemically compose lipid molecules in which proteins molecules are embedded .

2 - Lipid molecules have hydrophilic end and hydrophobic end . The hydrophobic ends facing each other while the hydrophilic ends facing the aqueous medium (In and outside the cells) .

3 - Function of plasma membrane is selective membrane for passing materials (nutrition , Oxygen , hormones , enzymes and treatment) .

Cytoplasm :

Cytoplasm is colloid fluid rich in protein In which organelles are suspended .

Nucleus :

1 – It is surrounded by nuclear envelope consisting two layers .

2 – Most nucleuses contain chromatin suspended in aqueous medium called nucleoplasm .

3 – Dense chromatin (heterochromatin) located close to the nuclear envelope , while loosely light chromatin called euchromatin which metabolically active >

4 – It contains DNA arranged in chromosomes

5 - Nuclear pores in nuclear envelop which permit some RNA molecules and some proteins pass through it .

Nucleolus :

It is densely stained area in nucleus , membraneless known as nucleolus , It forms ribosomes which is coding ribosomal RNA (rRNA) . This organelle plays a role in the synthesis protein .

Organelles :

Mitochondria :

1 – Houses of energy because they generate energy needed by the cell in the form of ATP (adenosine tri – phosphate) from glucose and oxygen .

2 – Mitochondria are bounded by a pair of membranes

3 – The inner membrane is usually folded forming cristae which protrude into mitochondria matrix .

4 – It is present mostly in skeletal muscles cells , in brain cells (neurons) and cardiac muscle cells .

The endoplasmic reticulum :

. There are two types of endoplasmic reticulum :

1 – Rough E. R.

It has granules of ribosomes plus RNA plus protein produce new living protein (such as hormones , enzymes , albumin globulin) . It is present mostly in liver cells .

2 – Smooth endoplasmic reticulum :

Its membrane smooth without ribosomes .

It is present abundant in secreting cells of glands . It responsible on production of steroid hormones and lipid molecules .

Golgi complex :

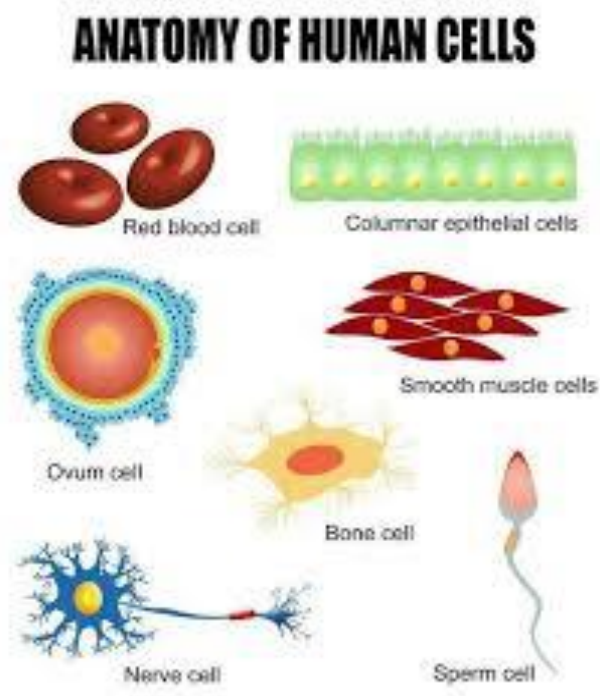
- 1- Golgi complex (Golgi apparatus) is located near nucleus .**
- 2- Consists of parallel curved cisternae vary in length , distended at both sides with vesicles .**
- 3- Function of Golgi complex secretion such as (hormones and enzymes) .**

Lysosomes :

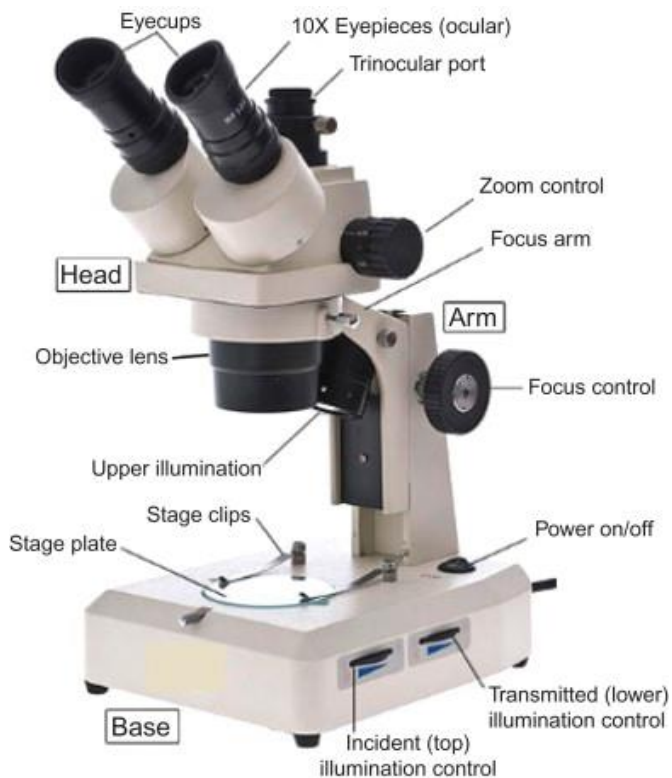
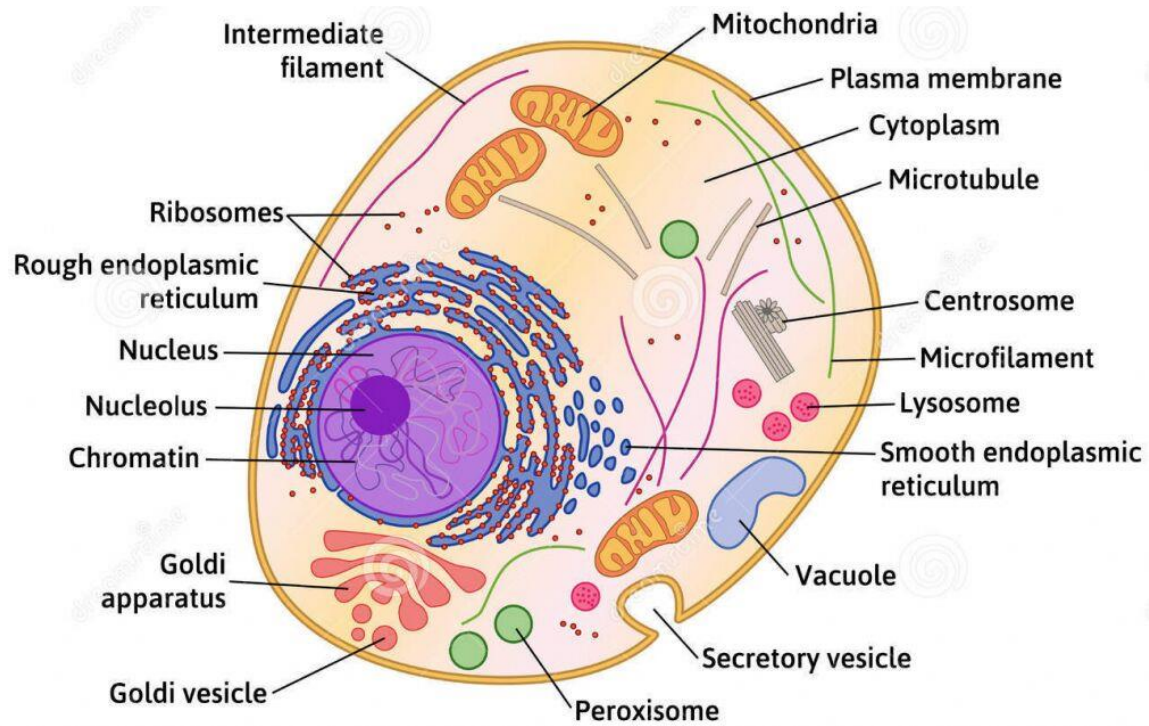
Membrane bounded organelle contain enzymes used for digestion of various intracellular macromolecules . Lysosome present in cells of digestive tract , in macrophages and neutrophils .

Centrioles :

Pairs structure , deeply stained , short rods , often near nucleus . They appear During cell division (Mitosis).



Shape and Size of Human cells



Tissues of Human body (Primary Tissues).

A - Muscular Tissues :

1 - Skeletal Muscles (Striated , Voluntary)

2 - Cardiac Muscle : (Striated , Involuntary)

3 – Smooth Muscles : (Non – striated and Involuntary)

B - Nervous Tissues :

**C - Connective Tissues : Bones ,
Cartilage , Blood , Tendons ,
Ligaments .**

**D – Epithelial Tissues : Cover and
lined human body such as Skin ,
peritoneum , pleura and Glands**

1 – Stratified Epithelial tissues

2 – Non – Stratified Epithelial tissues

