Cell biology

Cell biology : is a branch of biology studying the structure and function of the cell

Cells : are the structural, functional, and biological units of all living beings.

* Types of Cells:

1- Prokaryotes: bacteria

2- Eukaryotes: fungi, plants and animals.

Eukaryotic Cell (animals cell)

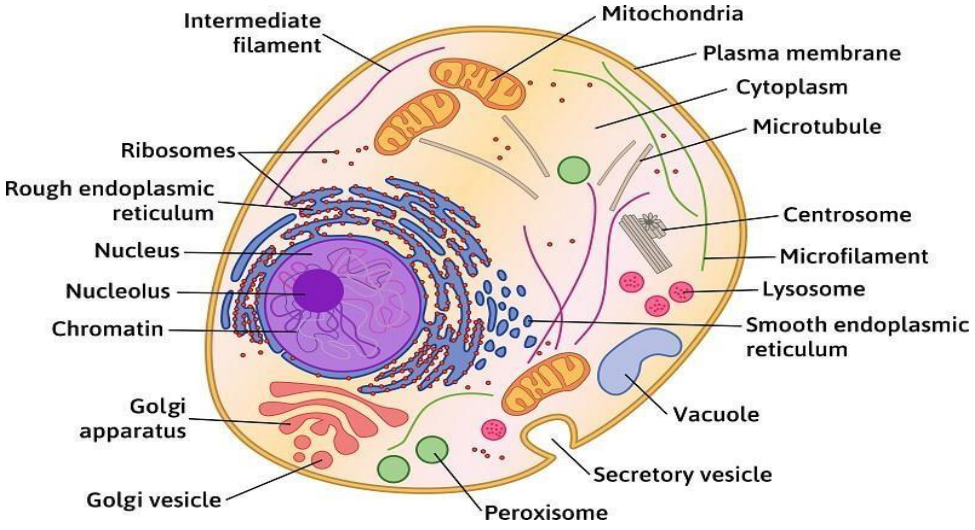
Eukaryotes are large and more complicated from other cell

1- Have organelles

2- Have chromosomes

3- Can be multicellular

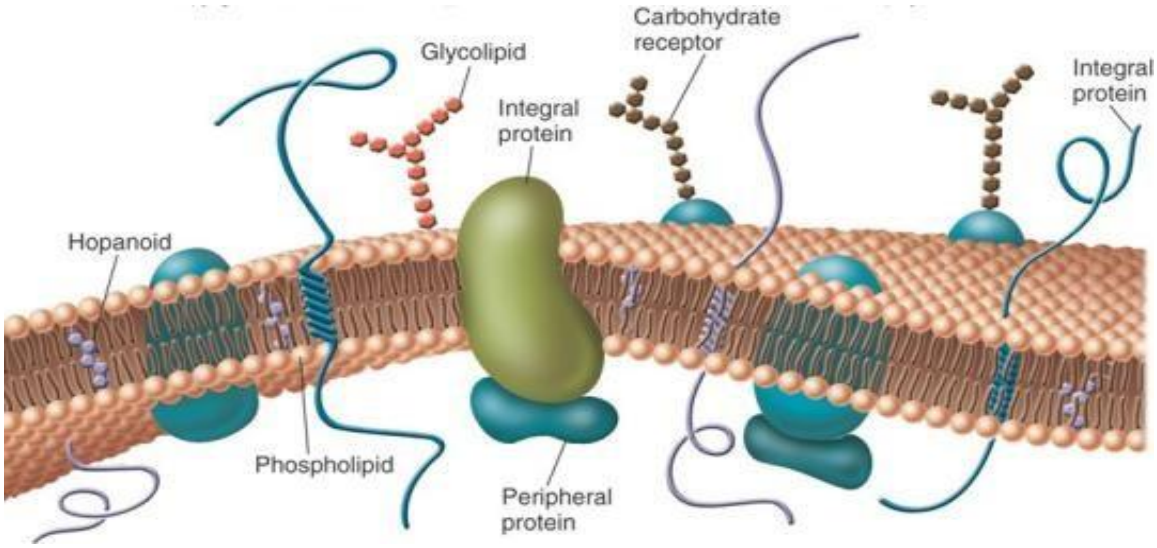
4- Include animal and plant cells



● Eukaryotes Cell Structures

1- Cell Membrane:

- ❖ The cell membrane is a biological membrane that separates the interior of all cells from the outside environment.
- ❖ The cell membrane is selectively permeable to ions and organic molecules and controls the movement of substances in and out of cells.
- ❖ It basically protects the cell from outside forces. It consists of the lipid bilayer with embedded proteins.

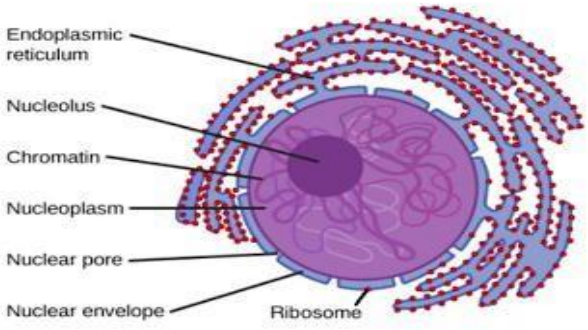


2- Cytoplasm

- ❖ is the gel-like substance residing between the cell membrane holding all the cell's internal sub-structures (organelles).
- ❖ The main function of the cytoplasm is to hold the cell organelles of the cell.

3- Nucleus

- The nucleus is a membrane-enclosed organelle found in eukaryotic cells. It contains most of the cell's genetic material (DNA molecules and proteins).
- The main function of the cell nucleus is to control gene expression

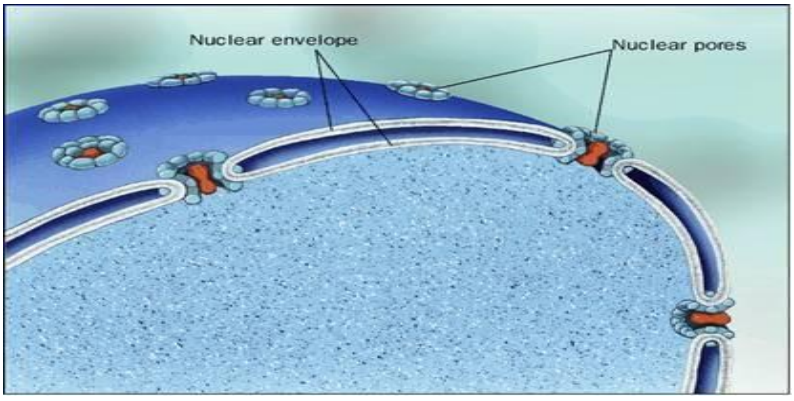


4- Nuclear Membrane:

* Surrounds nucleus

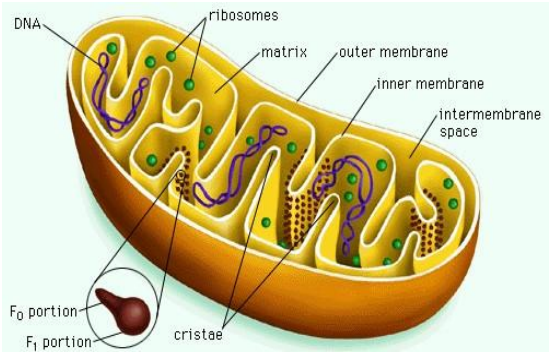
* Made of two layers

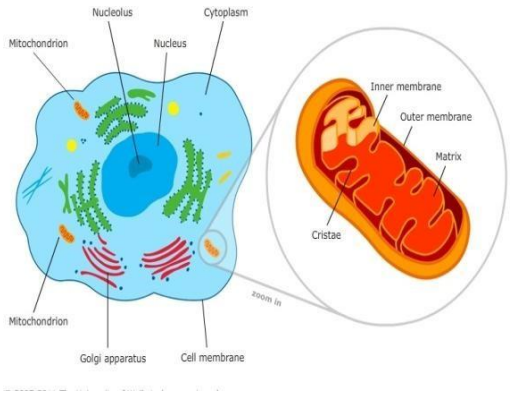
* contain Openings allow material to enter and leave nucleus called nuclear pores.



6- mitochondrion

- ❖ Mitochondrion is a membrane- enclosed organelle found in most eukaryotic cells.
- ❖ These organelles range from 0.5 to 1.0 micrometer in diameter. The most prominent roles of mitochondria are to produce the energy currency of the cell ATP



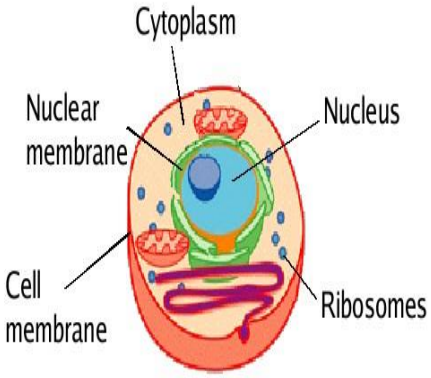


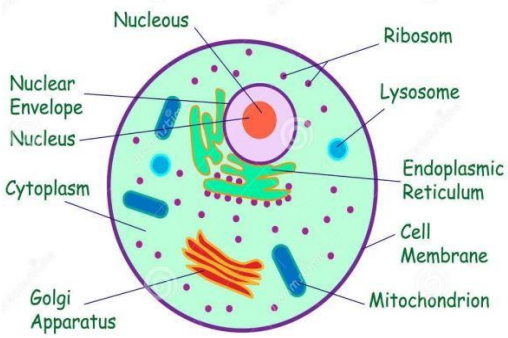
7- Ribosomes

1- build proteins from amino acids in cytoplasm

2- may be free-floating, or may be attached to ER

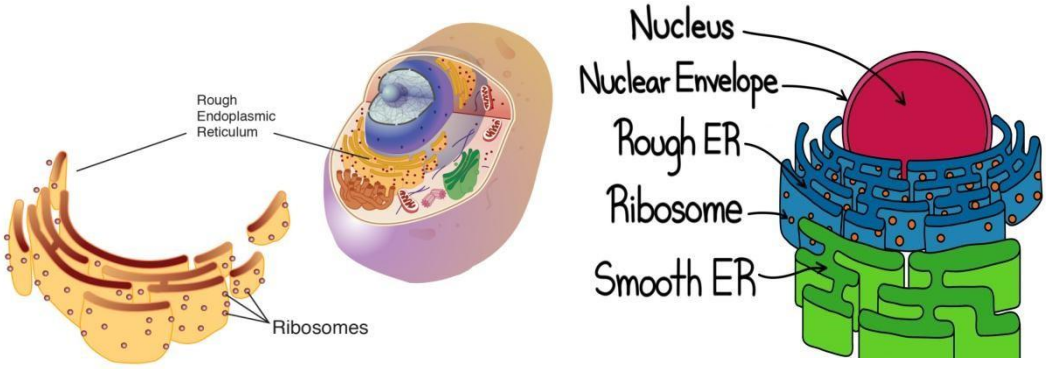
4- made of RNA





8- Endoplasmic reticulum

- The endoplasmic reticulum (ER) is an organelle of cells in eukaryotic organisms that forms an interconnected network of tubules, vesicles, and cisternae
- The endoplasmic reticulum serves many general functions, including the facilitation of protein folding and the transport of synthesized proteins in sacs called cisternae.

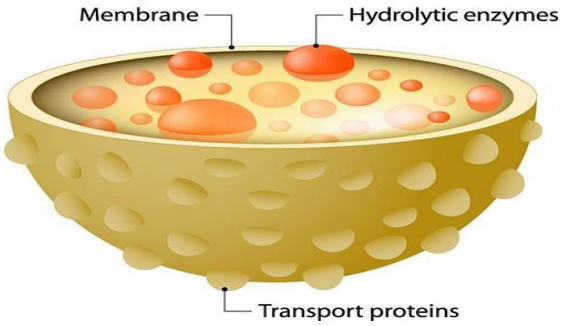


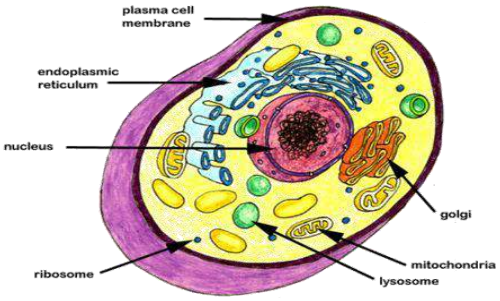
9- Golgi Complex:

- The Golgi apparatus, is an organelle found in most eukaryotic cells. the Golgi apparatus packages proteins inside the cell before they are used by Cell
- The Golgi apparatus is modifying, sorting, and packaging these macromolecules for cell secretion or use within the cell.

10- Lysosomes:

- Lysosomes are cellular organelles that contain acid hydrolase enzymes to break down waste materials and cellular debris.





11- Centrioles

1- pair of bundled tubes

2- organize cell division

12- Cytoskeleton

1- made of microtubules

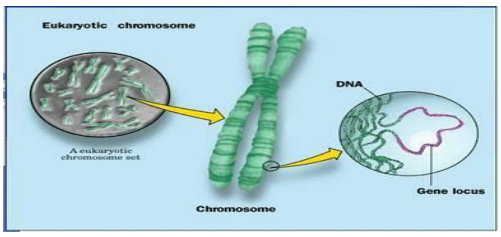
2- found throughout cytoplasm

3- gives shape to cell & moves organelles around inside.

13- Chromosomes

* In nucleus

* Contain instructions for traits & characteristic



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