5.The Endoplasmic Reticulum

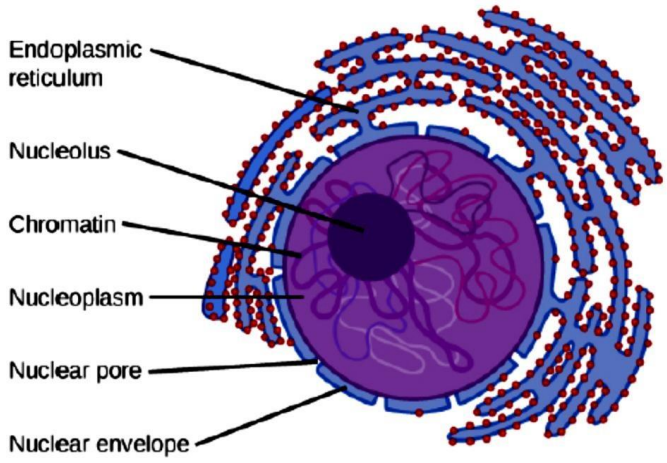
The endoplasmic reticulum (ER) is a series of interconnected membranous tubules that collectively modify proteins and synthesize lipids. However, these two functions are performed in separate areas of the endoplasmic reticulum: the **rough endoplasmic reticulum** and the **smooth endoplasmic reticulum**, respectively.

The rough endoplasmic reticulum (RER)

is so named because the ribosomes attached to its cytoplasmic surface give it a studded appearance when viewed through an electron microscope. The ribosomes synthesize proteins while attached to the ER, resulting in transfer of their newly synthesized proteins into the lumen of the RER, Since the RER is engaged in modifying proteins that will be secreted from the cell, it is abundant in cells that secrete proteins, such as the liver.

The smooth endoplasmic reticulum (SER)

is continuous with the RER but has few or no ribosomes on its cytoplasmic surface . The SER's functions include synthesis of carbohydrates, lipids and steroid hormones; detoxification of medications and poisons; alcohol metabolism; and storage of calcium ions.



6. The Golgi Apparatus

Golgi apparatus (also called the Golgi body), a series of flattened membranous sacs as a stack of semicircular flattened rings. As the proteins and lipids travel through the Golgi, they undergo further modifications.

7. Lysosomes

The lysosomes are the cell's garbage disposal. Digestive enzymes within the lysosomes aid the breakdown of proteins, lipids, nucleic acids, lysosomes are important for digestion of the food they ingest and the recycling of organelles.

8- Vesicles

Vesicles are membrane-bound sacs that function in storage and transport. Vesicles can fuse with other membranes within the cell system.

9.Ribosomes

Ribosomes are the cellular structures responsible for protein synthesis, Because protein synthesis is essential for all cells, free ribosomes appear as either clusters or single tiny dots floating freely in the cytoplasm. ribosomes are found in practically every cell, although they are smaller in prokaryotic cells.

10.Mitochondria

Mitochondria are often called the powerhouses or energy factories of a cell because they are responsible for making adenosine triphosphate (ATP), the cell's main energy-carrying molecule. The formation of ATP from the breakdown of glucose is known as cellular respiration.

Mitochondria are oval-shaped . Each membrane is a phospholipid bilayer embedded with proteins. The inner layer has folds called cristae.

Endocytosis

refers to the active process in which a cell forms internal vesicles by invigilating its plasma membrane, allowing the absorption of various molecules and macromolecules from the extracellular.

Exocytosis

cell to the cell exterior. Commonly, these macromolecules originate in storage vacuoles inside the cell and are moved to the exterior after an appropriate signal for this action.

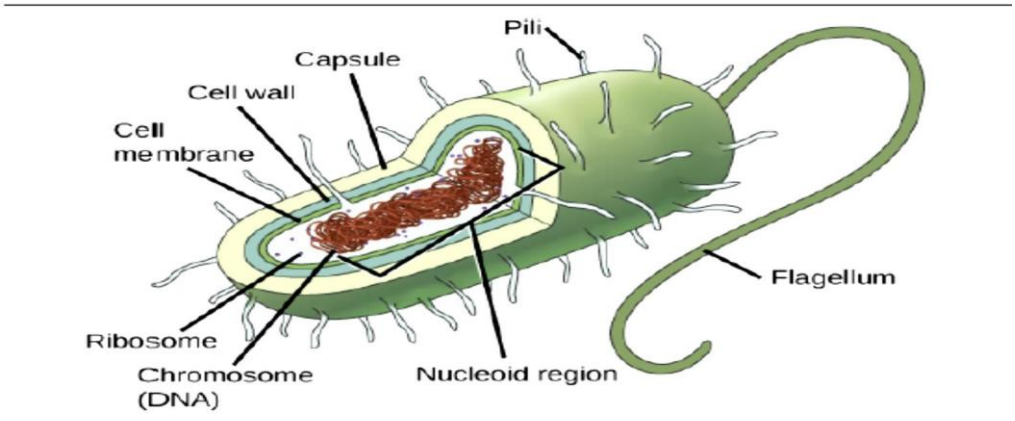
Prokaryotic and Eukaryotic Cells

Cells fall into one of two broad categories: prokaryotic and eukaryotic. The predominantly single-celled organisms of the domains Bacteria and Archaea are classified as prokaryotes.

Components of Prokaryotic Cells

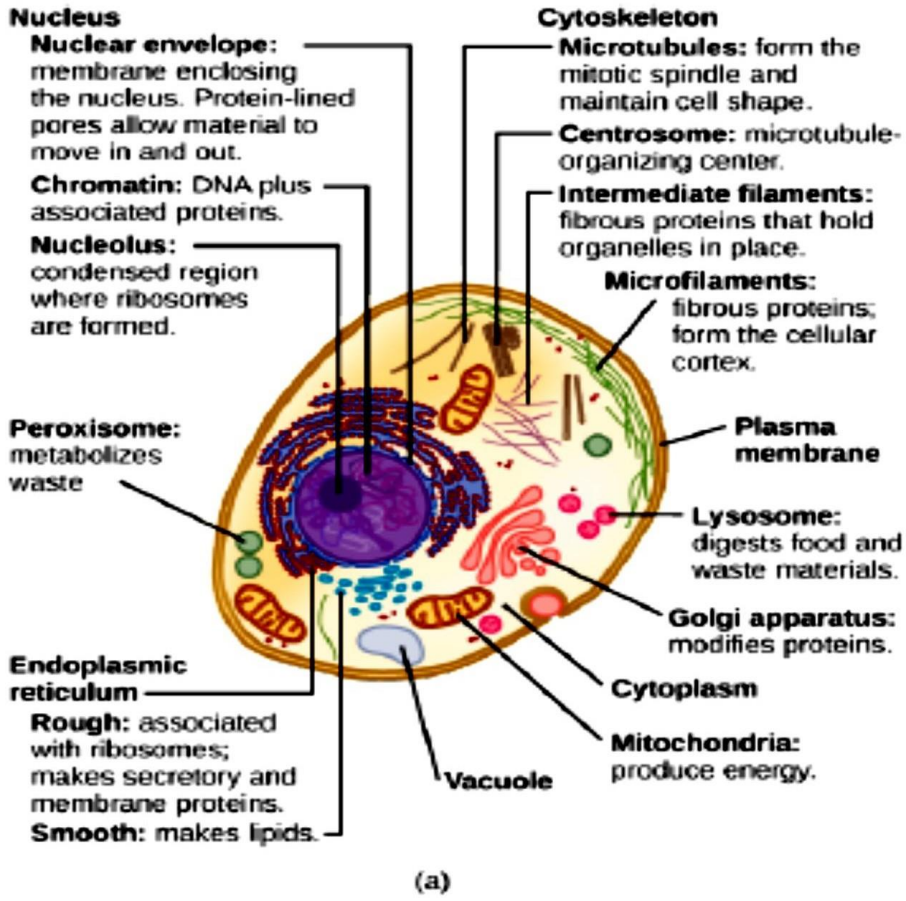
All cells share four common components:

1) a plasma membrane .2) an outer covering that separates the cell' interior from its surrounding environment. 3) cytoplasm .4) DNA, the genetic material of the cell. 6) ribosomes.



Eukaryotic Cells

A eukaryotic cell is a cell that has a membrane-bound nucleus and other membrane-bound compartments or sacs, called organelles, which have specialized functions.



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