

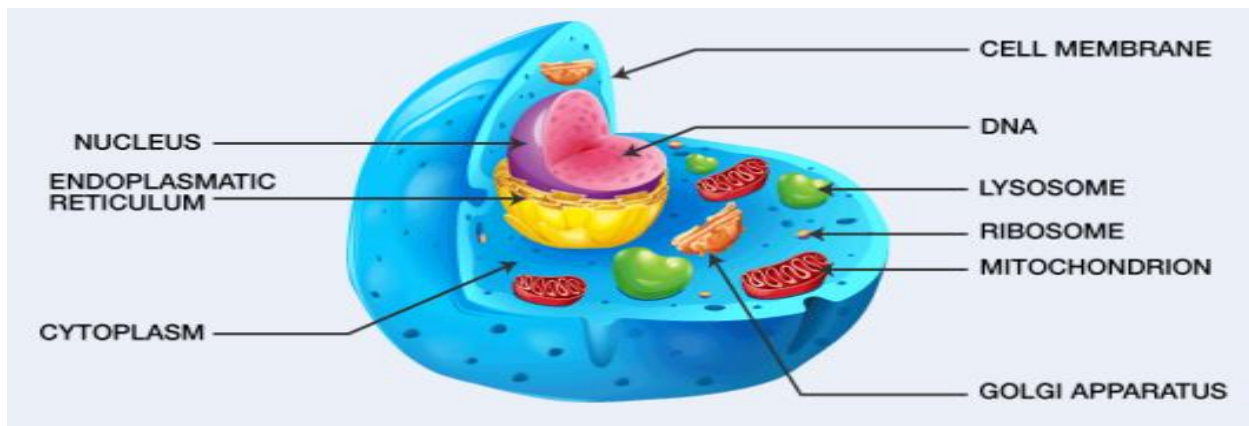


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## Cell Structure

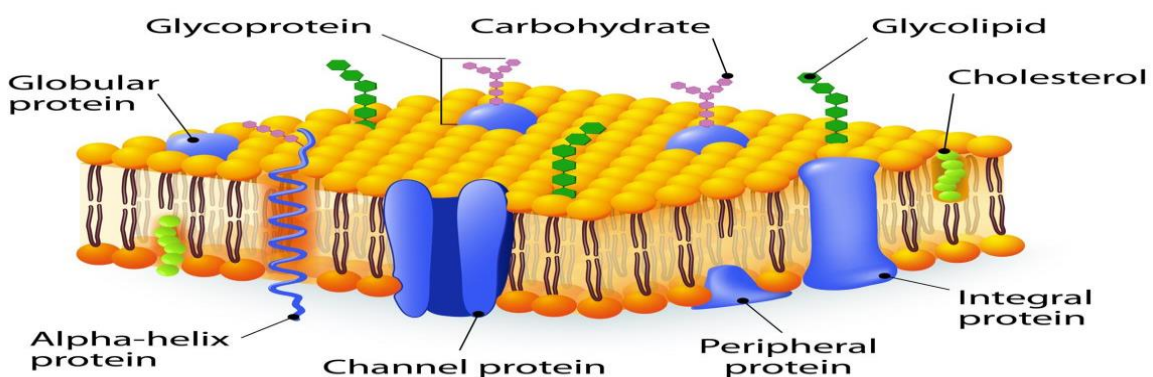
- ★ The cell structure comprises individual components with specific functions essential to carry out life's processes. These components include- cell wall, cell membrane, cytoplasm, nucleus, and cell organelles.



### ★ Cell Membrane

The biological structure that separates the interior of a cell from its outer environment, all living cells, prokaryotic and eukaryotic, are surrounded by a plasma membrane.

## CELL MEMBRANE





Department of Anesthesia Techniques  
Title of the lecture:-



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❖ **The Permeability of the Plasma Membrane:**

- ✚ The plasma membrane only allow some substances to pass through but not others, so it can control the entrance and exit of molecules and ions.
- ✚ There are two major ways that molecules can be moved across a membrane.
  - i. **Passive transport** of crossing a plasma membrane (diffusion and facilitated transport) do not require an expenditure of chemical energy.
  - ii. **Active transport** of crossing a plasma membrane (active transport and vesicle formation) do require an expenditure of chemical energy

★ **Cytoplasm**

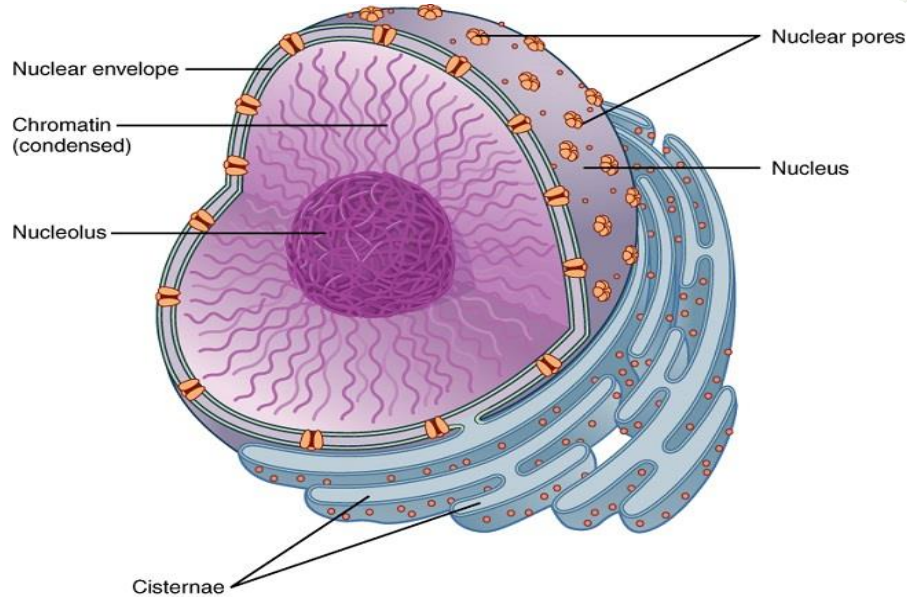
- The cytoplasm is a thick, clear, jelly-like substance present inside the cell membrane.
- The cell organelles such as endoplasmic reticulum, vacuoles, mitochondria, ribosomes, are suspended in this cytoplasm.

★ **Nucleus**

- The nucleus contains the hereditary material of the cell, the DNA.
- It sends signals to the cells to grow, mature, divide and die.
- The nucleus is surrounded by the nuclear envelope that separates the DNA from the rest of the cell.



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## Cell Organelles

Cells are composed of various cell organelles that perform certain specific functions to carry out life's processes. The different cell organelles, along with its principal functions, are as follows:

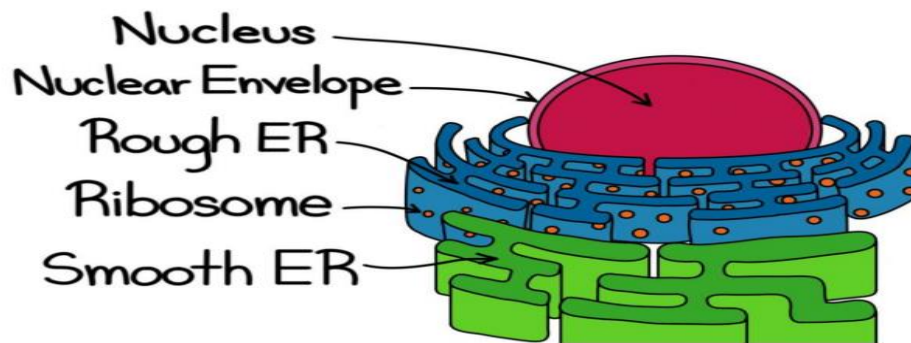
### 1. Endoplasmic reticulum

Endoplasmic reticulum (ER): serves multiple functions, being important particularly in the synthesis, folding, modification, and transport of proteins. Differences in certain physical and functional characteristics distinguish the two types of ER, known as rough ER and smooth ER.

- **Rough ER** Is named for its rough appearance, which is due to the ribosomes attached to its outer (cytoplasmic) surface.
- **Smooth ER** Is not associated with ribosomes, and its functions differ. The smooth ER is involved in the synthesis of lipids, including cholesterol and phospholipids, which are used in the production of new cellular membrane.

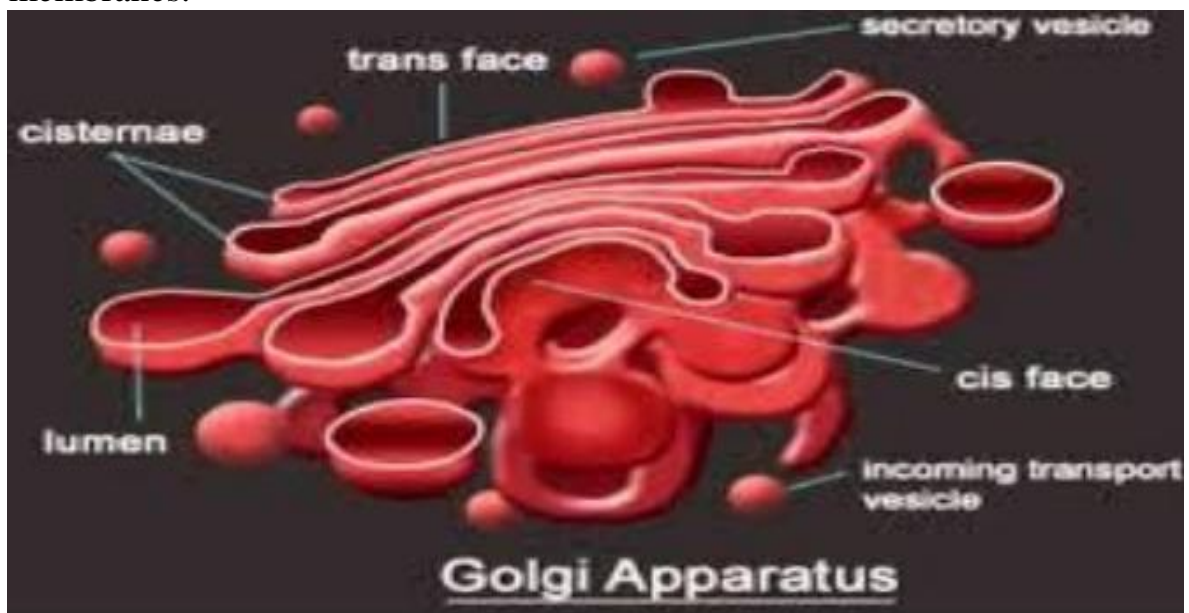


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## 2. Golgi Bodies

Golgi bodies are called the cell's post office as it is involved in the transportation of materials within the cell. The Golgi body is a portion of the cell that's made up of membranes, and there's different types of membranes.

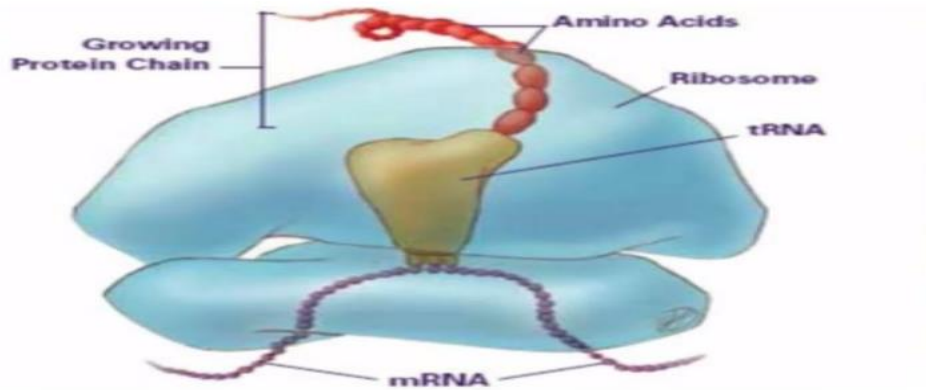


## 3-Ribosome

Ribosomes are a part of the protein-generating factory in the cell. The ribosome itself is a two-subunit structure that binds to messenger RNA

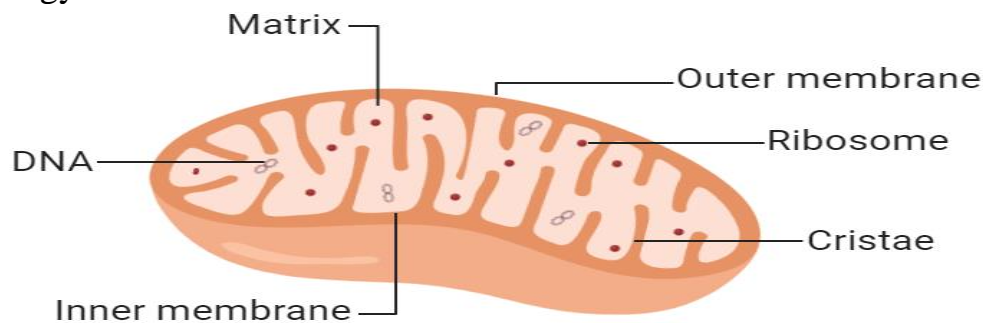


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#### 4. Mitochondria

The mitochondrion is called “the powerhouse of the cell.” It is called so because it produces ATP – the cell’s energy currency. Those membranes function in the purpose of mitochondria, which is essentially to produce energy.

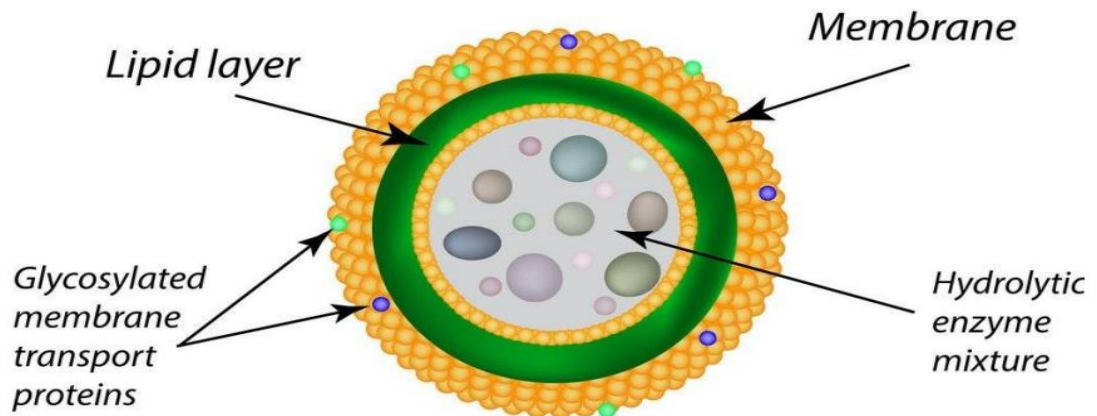


#### 3. Lysosomes

lysosome is a specific type of organelle that's very acidic. So that means that it has to be protected from the rest of the inside of the cell. It's a compartment that has a membrane around it that stores the digestive enzymes that require this acid. Those enzymes are called hydrolytic enzymes, and they break down large molecules into small molecules.



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## 6. Vacuoles

Vacuoles are membrane-bound organelles that can be found in both animals and plants. They're specialized lysosomes. That is to say that their function is really to handle waste products, and by handle, mean take in waste products and also get rid of waste products.

