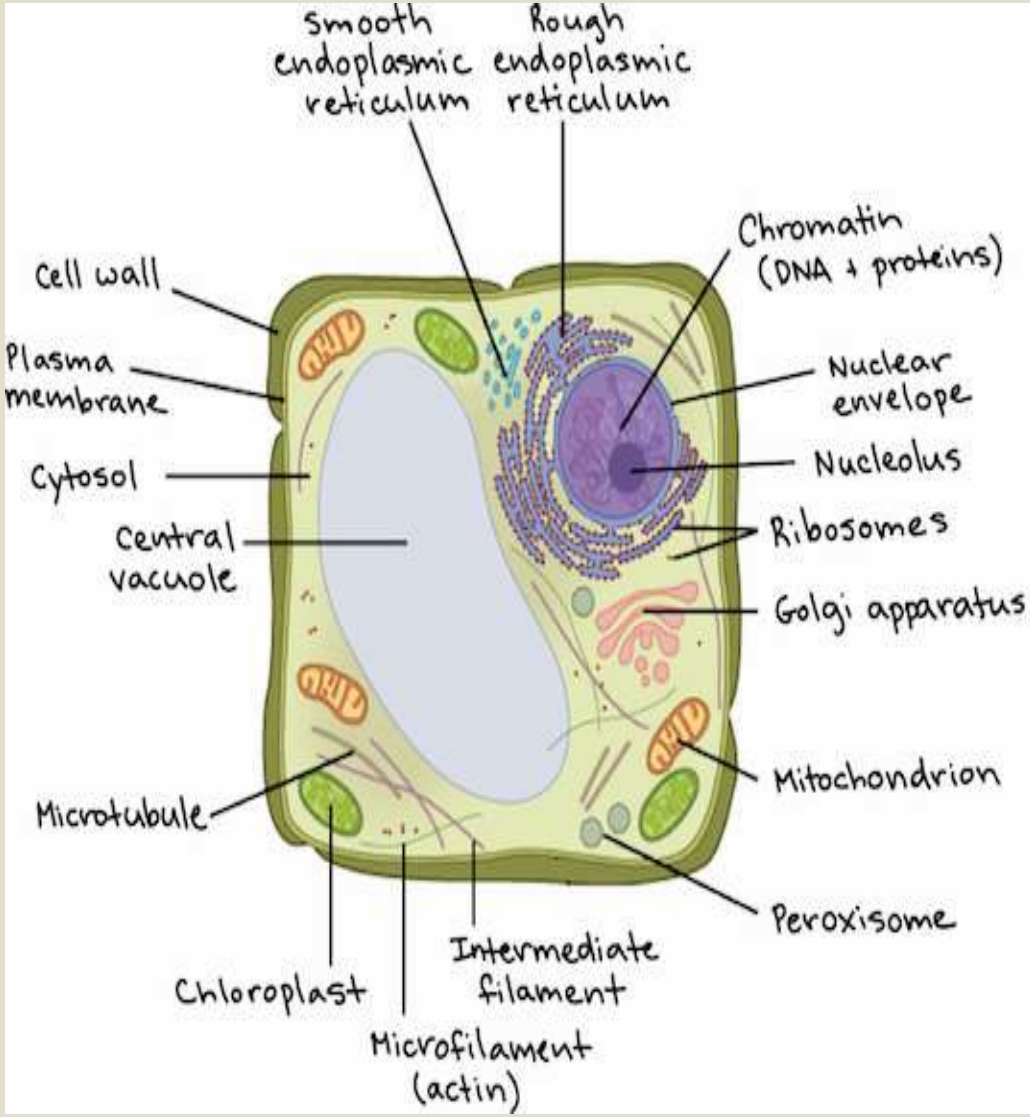
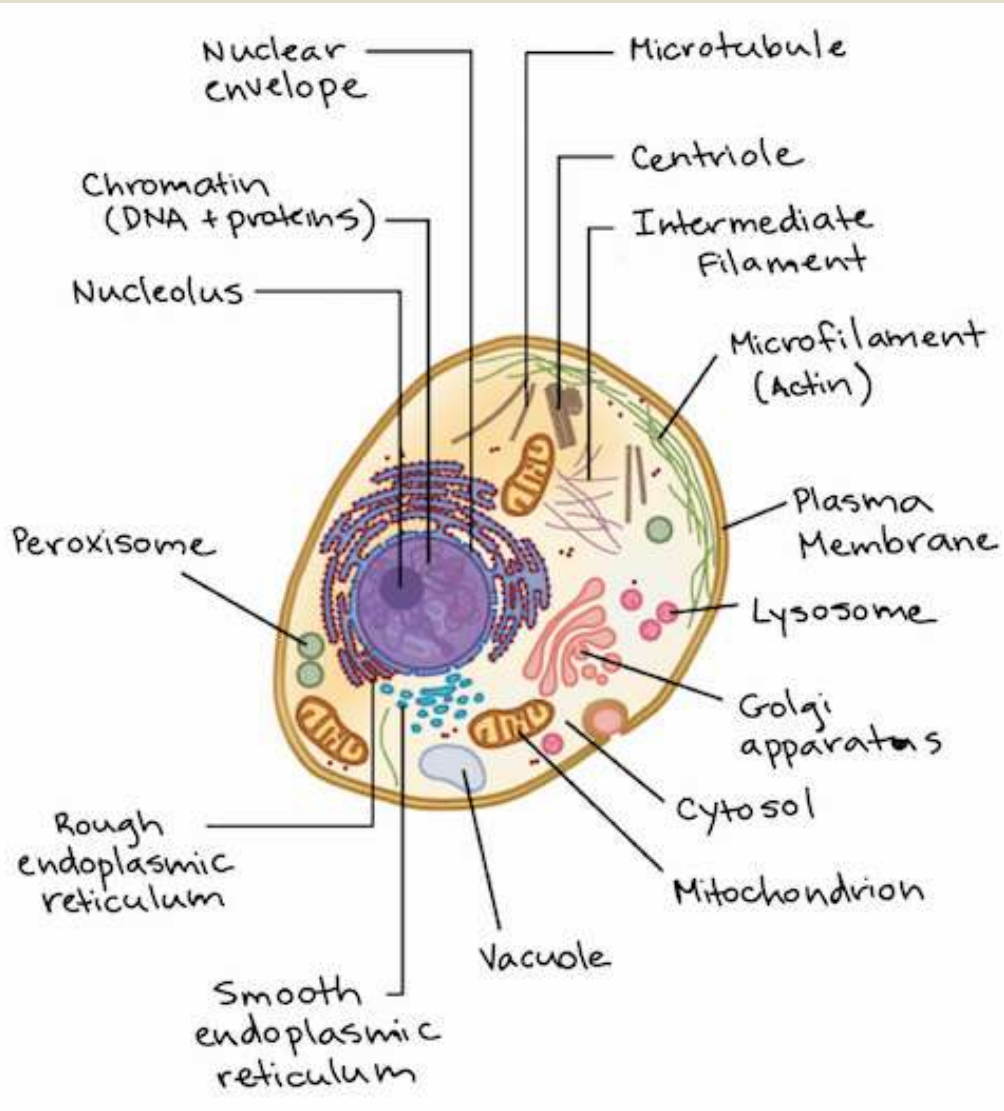
PLANT & ANIMAL CELL


Smooth endoplasmic reticulum
Rough endoplasmic reticulum
Chromatin (DNA + proteins)
Cell wall
Plasma membrane
Nuclear envelope
Cytosol
Nucleolus
Central vacuole
Ribosomes
Golgi apparatus
Mitochondrion
Microtubule
Peroxisome
Chloroplast
Intermediate filament
Microfilament (actin)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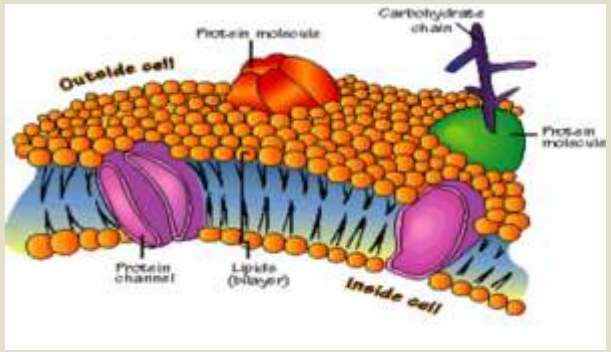
Golgi apparatus
Cytosol
Rough endoplasmic reticulum
Mitochondrion
Vacuole
Smooth endoplasmic reticulum

Sl.No	Plant Cell	Animal Cell
Cell: size and shape	Plant cell have fixed and rectangular shape.	The animal cell is irregular and round in shape.
Cell wall	A cell wall is present	A cell wall is absent
Plasma membrane	Present	Present
Endoplasmic reticulum	Are present	Are present
Nucleus	Are present and lies on one side of the cell.	Are present and lies in center of the cell
Lysosomes	Are present but are very rare	Are present
Centrosomes	Are absent	Are present
Golgi apparatus	Are present	Are present
Cytoplasm	Are present	Are present
Ribosome	Present	Present
Plastids	Are present with chloroplast in them.	Plastids are absent
Essential nutrients	The plant cell can synthesize amino acids, vitamins and coenzymes which are required by them	The animal cell cannot synthesize amino acids, vitamins, and coenzymes which are required by them
Vacuoles	Usually large and few central vacuoles	Usually small and numerous central vacuoles
Cilia	Are absent	Most of the animal cells consist of cilia in them
Mitochondria	Are present and are fewer.	Are present and are numerous.
Ribosomes	Are present	Are present

Cell Membrane/ Plasma Membrane

- Present in both plant cell and animal cell.
- Selectively Permeable: Allows the materials in and out of the cell according to the requirement of the cell.
- Made up of bilipid layer and protein (Fluid Mosaic Model)



- Functions:
  - Encloses the contents of the cell.
  - Provides shape: animal cell.
  - Allows transport: by Diffusion and Osmosis

Cell Wall

- Present only in a plant cell.
- Hard and rigid.
- Fully permeable.
- Made up of Cellulose in plant and peptidoglycan in bacteria.
- Functions:
  - Protection
  - Gives shape and turgidity.

Cytoplasm

- Contains 80-90% water and many organic and inorganic compounds.
- Colloidal, Viscous, Jelly like fluid inside the cell.
- Functions:
  - Contains enzymes responsible for all the metabolic activity taking place inside the cell.

Nucleus(Director/ Brain of the Cell)

- Covered by a double membranous nuclear membrane in a Eukaryotic Cell.
- contains DNA, RNA, Protein, nucleolus, and Chromatin network
- Functions:
  - Controls the activity of the cell.
  - Initiates cell division.
  - It has the chromosomes or DNA which controls the hereditary characters.

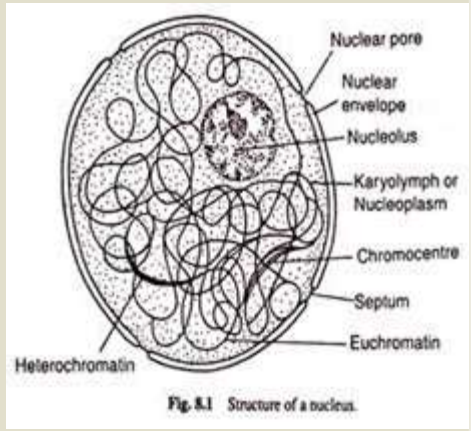
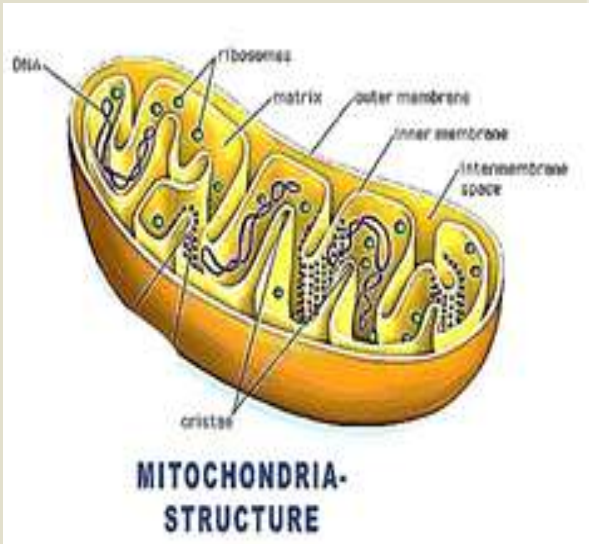


Fig. 8.1 Structure of a nucleus

Mitochondria (The Power House of The Cell / Storage Batteries)

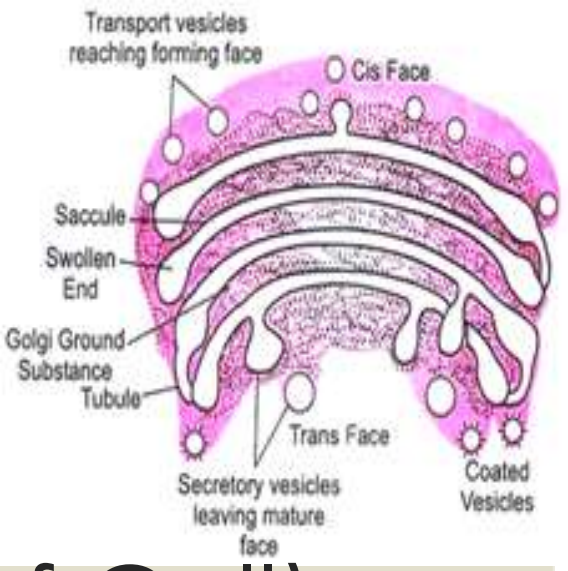
- Double membranous structure.
- Autonomous body as contains its own DNA which self duplicates.
- mtDNA is useful for maternity testing.
- Functions:
  - The main seat of respiration.
  - Stores energy in the form of ATP molecules.



MITOCHONDRIA-STRUCTURE

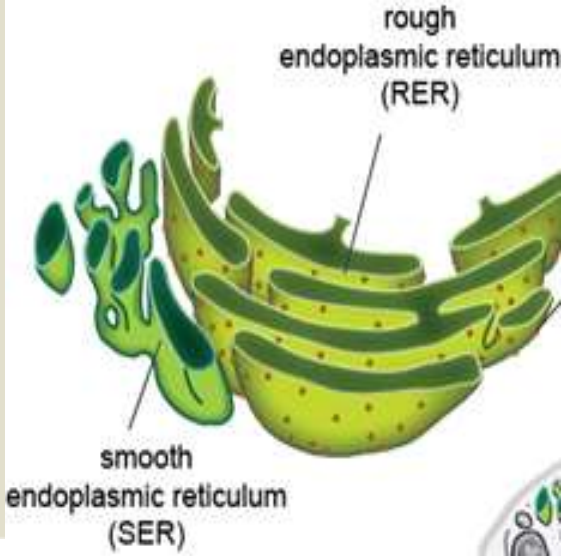
Golgi Bodies(Shipping Department of Cell)

- Discovered by Camillo Golgi in 1898.
- Originates from RER.
- Contains Sac like Cisternae and Vesicles.
- Has two faces – cis face or receiving face and trans face or supplying face.
- Functions:
  - Modification, Packaging and transport of materials
  - Synthesis of lysosomes, plasma membrane



Endoplasmic Reticulum (Framework of Cell)

- A network of membranes.
- RER bears ribosomes and appears rough
- SER do not have ribosomes
- Functions:
  - Transport of materials from one cell to other.
  - Provides a surface for the synthesis of material – Proteins in RER and Lipids in SER.
  - Formation of lysosomes, Golgi bodies and vacuoles
  - Membrane Biogenesis
  - Detoxification of harmful substances in the liver.



Vacuole

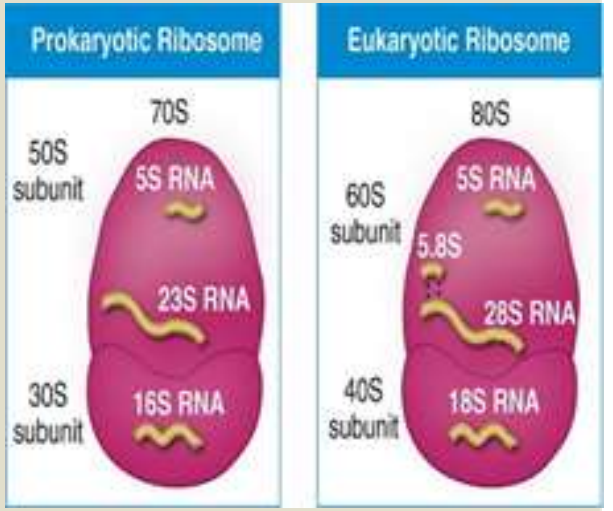
- Arise from ER and GB
- Surrounded by tonoplast and filled with cell sap
- Functions:
  - Store cell sap which may be liquid or solid food, toxic byproduct.
  - Provide rigidity and turgidity to plant cell

Lysosomes (Suicidal bags of Cell, natural scavenger, cellular housekeeper)

- Membrane-bound organelles
- Present in all animal cells and few plant cells
- Tiny circular single membrane-bound structures filled with digestive enzymes
- Functions:
  - Intracellular digestion of food in unicellular organisms.

Ribosomes (Protein Factories)

- Without a membrane
- Consist of two subunits – 60S and 40S in eukaryote both made up of RNA.
- Functions:
  - Synthesis of Proteins in a process called translation.



Plastids

- Autonomous self-duplicating body
- Types-
  - **Leucoplast** –Colourless plastid;
  - **Chromoplast**–Coloured Plastid – blue, red, yellow
  - **Chloroplast**– Green plastid
- Functions:
  - Leucoplast – Storage
  - Chromoplast – impart colour to flowers which help in pollination
  - Chloroplast – Perform Photosynthesis – Helps in the release of oxygen
  - Amyloplast –Store starch
  - Aleuroplast – Store Protein
  - Elaioplast – Store fat