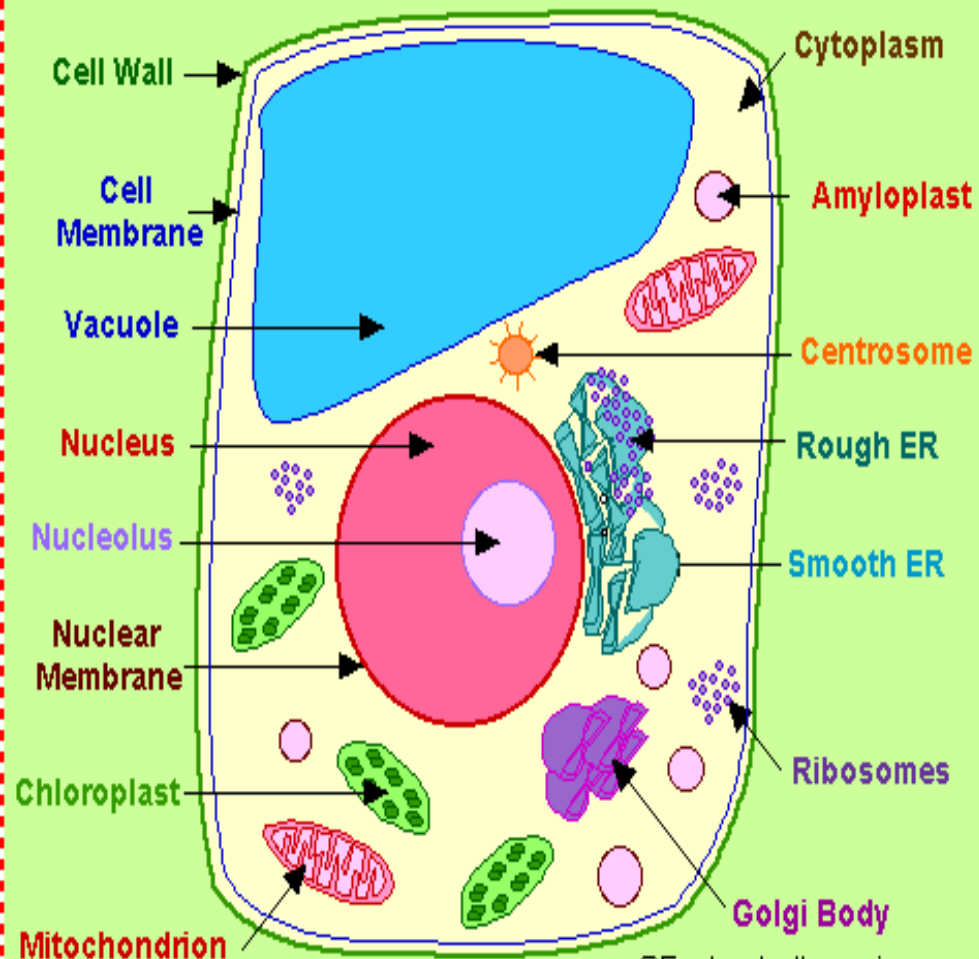


Plant cell Vs Animal Cell

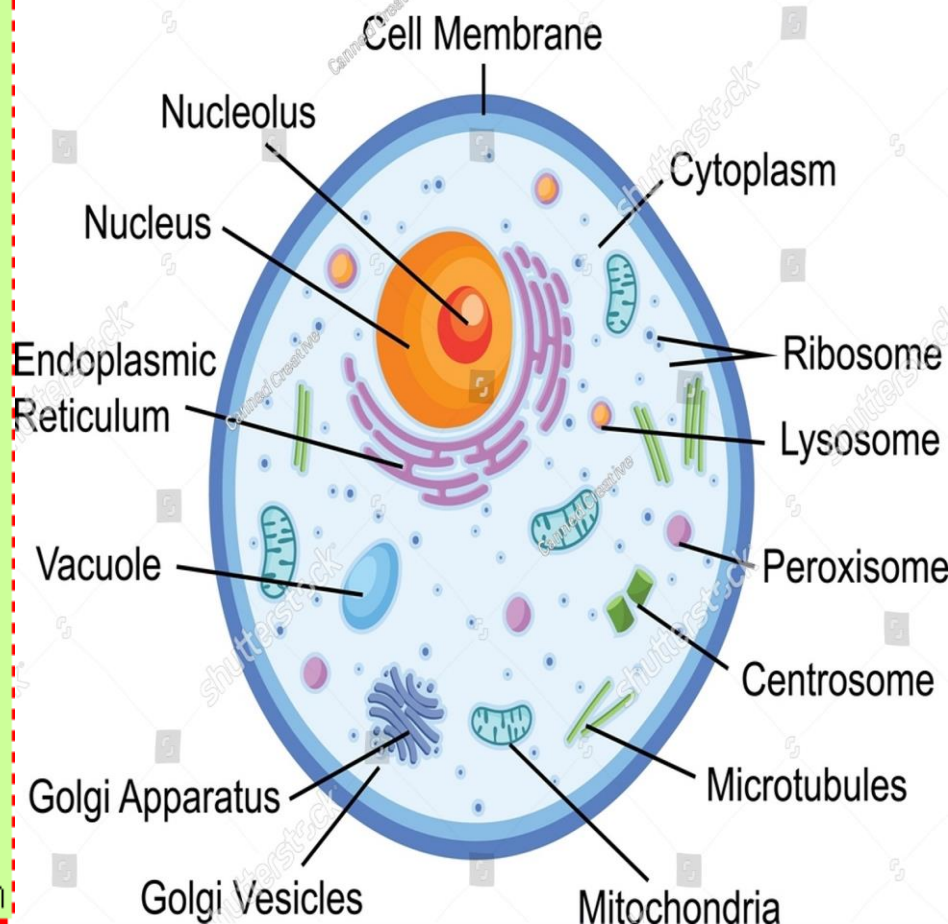


Cross-Section of a Plant Cell



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Animal Cell



Difference between plant and animal cell

Feature	Plant Cell	Animal Cell
Cell Shape	Square or rectangular	Irregular or round
Cell Wall	Present	Absent
Plasma/Cell Membrane	Present	Present
Endoplasmic Reticulum	Present	Present
Nucleus	Present and lies on one side	Present and lies in the center
Lysosomes	Present but rare	Present
Golgi Apparatus	Present	Present
Cytoplasm	Present	Present
Ribosomes	Present	Present
Plastids	Present	Absent
Vacuoles	Few large or centrally positioned	Usually small and numerous
Cilia	Absent	Present (in most cells)
Mitochondria	Present but fewer in number	Present and numerous
Mode of Nutrition	Primarily autotrophic	Heterotrophic
Chloroplasts	Present (responsible for photosynthesis)	Absent (cannot perform photosynthesis)
Centrioles	Absent	Present (involved in cell division)
Glycogen Storage	Stored as starch	Stored as glycogen
Motility	Generally immotile	Many cells have flagella or cilia for movement
Mitosis	Occurs throughout life for growth and repair	Occurs for growth and repair
Mitotic Spindle	Forms without centrioles during division	Centrioles used to form the mitotic spindle

Plant cell

- **Plasmodesmata:** Channels facilitating communication and substance transport between plant cells.
- **Tonoplast:** Membrane regulating solute movement around the central vacuole.
- **Starch Granules:** Storage of energy in the form of starch within some plant cells.
- **Cell Plate:** Formed during cell division, developing into the cell wall in daughter cells.
- **Peroxisomes:** Organelles involved in lipid metabolism and detoxification.
- **Central Vacuole:** Maintains turgor pressure, stores nutrients, and may contain pigments.
- **Plastids:** Include chloroplasts (photosynthesis), chromoplasts (pigmentation), and amyloplasts (starch storage).

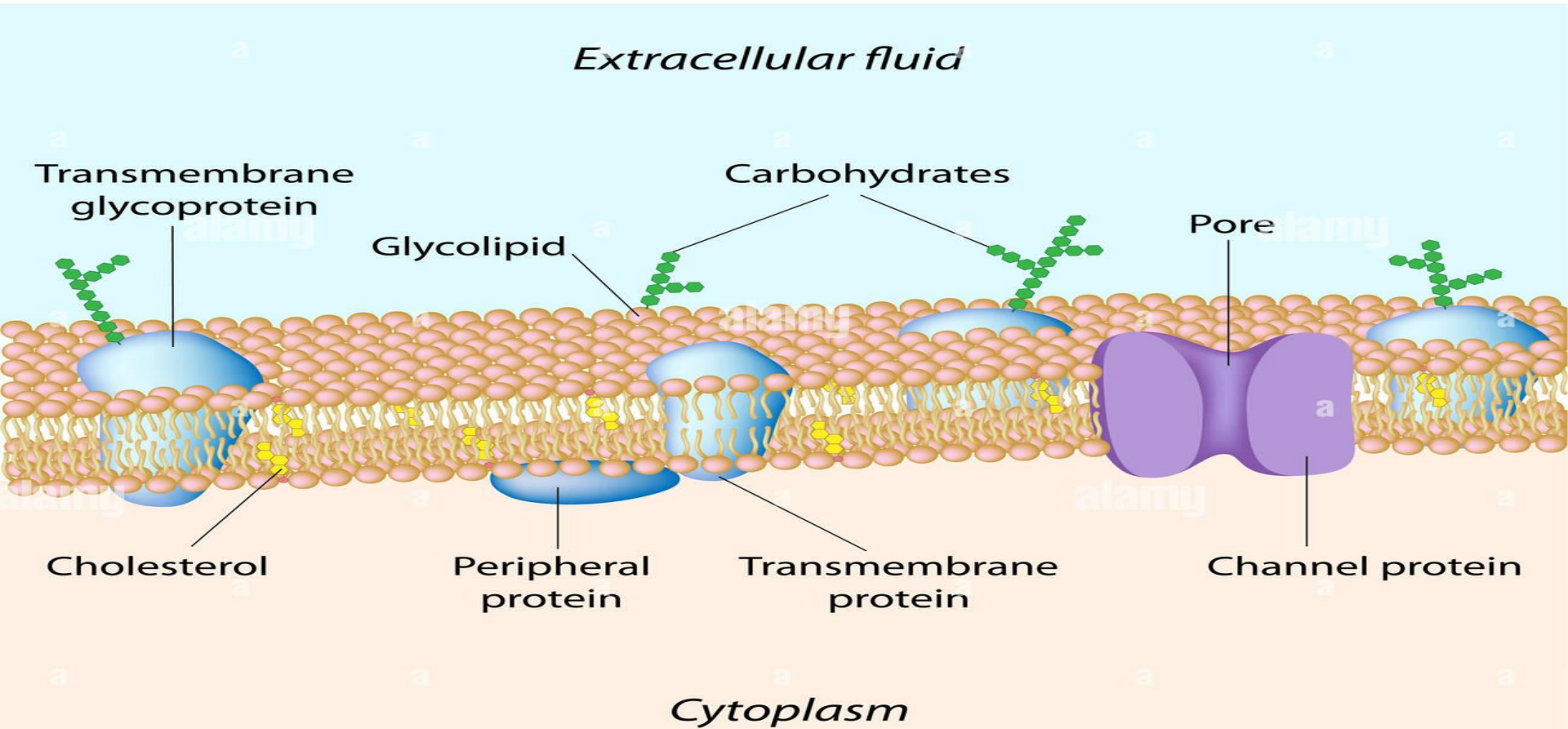
- **Guard Cells:** Specialized cells in the epidermis regulating stomatal opening and closing for gas exchange.
- **Plasmolysis:** Cytoplasm shrinking away from the cell wall due to water loss.
- **Turgor Pressure:** Fluid pressure in the central vacuole against the cell wall, aiding in maintaining cell shape.
- **Cellulose:** Primary component of the cell wall, a complex carbohydrate.
- **Pits:** Thin areas in the cell wall allowing communication and transport between plant cells.

Animal cell

- **Cytoskeleton:** Microtubules and microfilaments maintain cell shape, aid in cell division, and facilitate intracellular transport.
- **Centrioles:** Involved in cell division (mitosis and meiosis), typically found in animal cells.
- **Vacuoles and Vesicles:** Small storage compartments for various substances within animal cells.
- **Nucleolus:** Region within the nucleus responsible for ribosome assembly.
- **Peroxisomes:** Organelles for lipid metabolism and detoxification.
- **Cell Cortex:** Mesh-like protein network beneath the cell membrane providing mechanical support.
- **Lipid Bilayer:** Composed of phospholipids and proteins, maintaining cell integrity.

- **Flagella and Cilia:** Whip-like or hair-like structures for movement or sensory functions.
- **Glycogen Storage:** Energy storage in the form of glycogen.
- **Extracellular Matrix:** Supportive matrix surrounding animal cells providing structural support and signaling cues.
- **Gap Junctions:** Specialized cell-to-cell junctions allowing direct communication and ion exchange.
- **Cell Division:** Mitosis for growth and repair, meiosis for sexual reproduction.
- **Phagocytosis:** Engulfing and digesting foreign particles, as seen in some animal cells like white blood cells.
- **Hormone Receptors:** Specific receptors on cell surfaces for hormones and chemical signaling.
- **Neurons and Nerve Cells:** Specialized cells transmitting electrical signals in the nervous system.

Plasma Membrane Structure



Plasma membrane

Structure of the Plasma Membrane:

- The plasma membrane is a selectively permeable lipid bilayer that surrounds the cell.
- It consists of phospholipids, proteins, and carbohydrates.
- The lipid bilayer has a hydrophilic (water-attracting) head and hydrophobic (water-repelling) tails, which create a barrier between the intracellular and extracellular environments.

Function of the Plasma Membrane:

- Controlling the passage of substances in and out of the cell, allowing for selective permeability.
- Maintaining cell integrity by separating the cell's internal environment from the external environment.
- Cell signaling: The plasma membrane contains receptors for various molecules that allow cells to communicate with each other and respond to their environment.

Protein Components:

- **Integral proteins:** Span the lipid bilayer and are embedded within it. They can serve as transporters, receptors, or enzymes.
- **Peripheral proteins:** Attach to the inner or outer surface of the membrane and are often involved in signaling or structural functions.
- **Glycoproteins:** Proteins with attached carbohydrate chains that play a role in cell recognition and adhesion.

