Cell Organelles

○ Cytoplasm:
  • The cytoplasm is a jelly-like substance that supports and protects cell organelles. Found in both animal and plant cells.

○ Ribosomes:
  • Ribosomes make proteins. Proteins do many critical jobs in cells. In fact, cells cannot live without proteins! Ribosomes use the instructions written on RNA in order to make proteins correctly. Found in both animal and plant cells.

○ Golgi Body/Golgi Apparatus
  • The Golgi receives vesicles containing proteins that were sent by the Rough ER. It then modifies the proteins (if necessary) and then sends them to where they need to go; found in both animal and plant cells.

○ Centrioles
  • Appear during cell division to guide chromosomes apart; found in animal cells.

○ Rough Endoplasmic Reticulum
  • The Rough ER is covered with ribosomes. This is what makes it look rough. The Rough ER is involved in transporting proteins. The proteins are sent away from the ER in vesicles that transport them to the Golgi Apparatus/Body. Found in both animal and plant cells.

○ Smooth Endoplasmic Reticulum
  • The Smooth ER makes lipids and performs other chemical reactions. It also detoxifies poisons. Found in both animal and plant cells.

○ Chloroplasts
  • Chloroplasts are the sites where photosynthesis takes place in a plant cell. They contain the chlorophyll used to make food. The chloroplast uses energy from the sun and carbon dioxide in a process called photosynthesis to make sugar and oxygen. Found in plant cells.

○ Cell Wall
  • The cell wall provides support and protection. It is made mostly of cellulose. Found in plant cells.

○ Cell/Plasma Membrane
- The plasma membrane is the boundary that surrounds all cells. It regulates what enters and leaves the cell to ensure that the cell maintains homeostasis. The plasma membrane is selectively permeable (or semi-permeable) because it allows some substances to pass through but not others. Found in both animal and plant cells.

- **Centrosome**
  - The centrosome is associated with the nuclear membrane during prophase of the cell cycle. In mitosis the nuclear membrane breaks down and the centrosome nucleated microtubules (parts of the cytoskeleton) can interact with the chromosomes to build the mitotic spindle. Found in both plant and animal cells.

- **Microtubules**
  - The microtubules help support and give shape to the cell; they also serve a transportation function; found in both animal and plant cells.

- **Lysosome**
  - Lysosomes have hydrolytic enzymes that break down or digest things in the cell. They digest and destroy viruses and other invaders. They also help to digest food particles and recycle cell parts. Found mostly in animal cells.

- **Mitochondria**
  - The mitochondria make ATP. The process of making ATP in cells is called cell Respiration. Respiration uses the FOOD you eat and the OXYGEN you breathe to make ATP, carbon dioxide, and water. Found in both plant and animal cells.

- **Vacuole**
  - Stores food, water, metabolic, and toxic waste. Much larger and plant cells found in both animal and plant cells.

- **Nucleus**
  - The nucleus holds and protects the cell’s DNA. DNA is the genetic material for the cell. DNA carries the information and instructions that direct the cell. Specifically, DNA has the instructions for making RNA. Because DNA cannot leave the nucleus, RNA is used as the instructions for making proteins. Found in both animal and plant cells.
  - The dark spot in the nucleus is the nucleolus. The nucleolus makes ribosomes. This is important because ribosomes make proteins.

- **Golgi Vesicles**
• Vesicles transport substances (such as proteins) to where they need to go in the cell. They are membrane sacs that carry the cell’s cargo. Found in both plant and animal cells.