

# Cell Theory

## THE CELL THEORY

- A cell's most fascinating trait is their incredibly small size
- Cells are so small you cannot see a single one of your body's cells with the naked eye
- Your body contains about one hundred trillion cells (100 000 000 000 000)
- *All your cells lined up end to end would reach to Mars and Back (500 000 000 km)*
- Since cells are so small they were not observed until the microscope was invented
- Cells were first described by Robert Hooke in 1665 while he was viewing a thin slice of cork under his primitive microscope. Hooke was observing the cells walls of the once living cork tree.
- A scientist by the name of Van Leeuwenhoek observed the first living cells

## Cell:

- Unit of living matter
- Involved with every life process
- Units of structure and function
- Come into being through the division of parent cells

The modern Cell Theory states:

1. All organisms are composed of one or more cells. Cells are units of structure.
2. Cells are the smallest living things and are the basic unit of organization of all organisms. Cells are units of function.
3. All cells come from pre-existing cells.

## Cell Components (Plant & Animal)

Cell Membrane – outermost layer or edge of the cell

Cytoplasm – area between the cell membrane and the nucleus where nutrients are absorbed, transported and processed.

Nucleus – the cell's control center. It contains the DNA or hereditary information in the form of strands called chromosomes.

Mitochondria – the powerplants of the cell. They provide the body with energy through a process called cell respiration. (Sugar and oxygen combine to release energy)

Ribosomes – the organelles in which proteins are synthesized. Proteins are needed for cell growth and reproduction.

Endoplasmic Reticulum – the series of canals that carry materials throughout the cytoplasm.

Lysosomes – sac-like structures that contain digestive enzymes which break down molecules that enter the cell. They break down food particles into a useful size for the cell or as a defense against harmful substances that enter the cell.

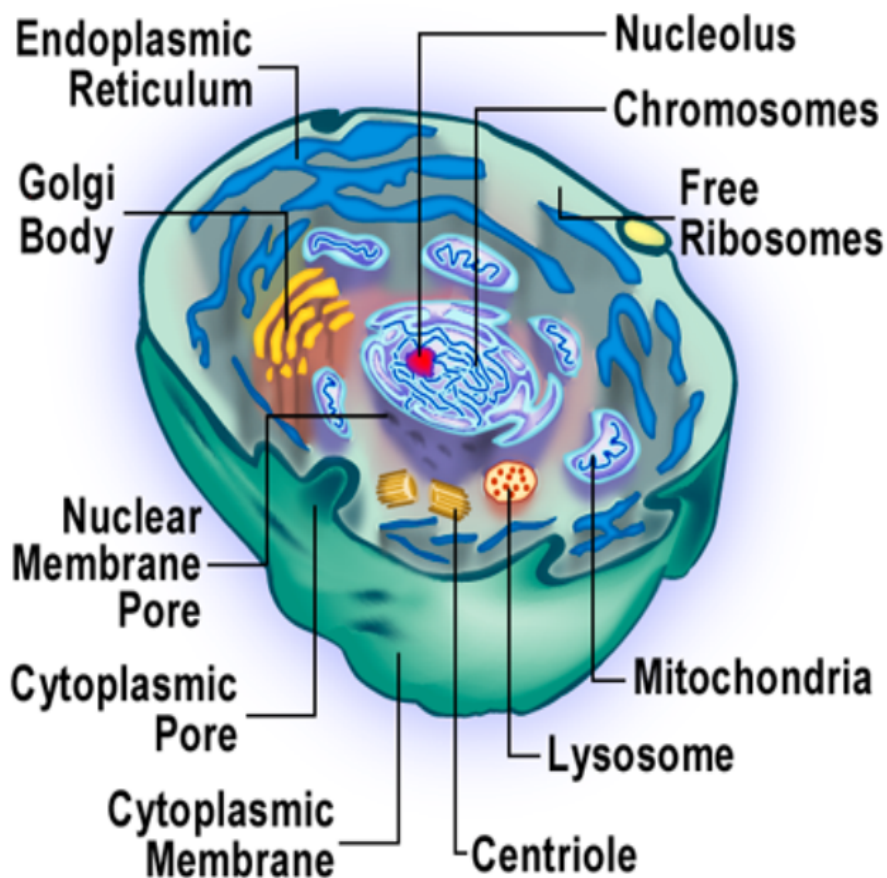
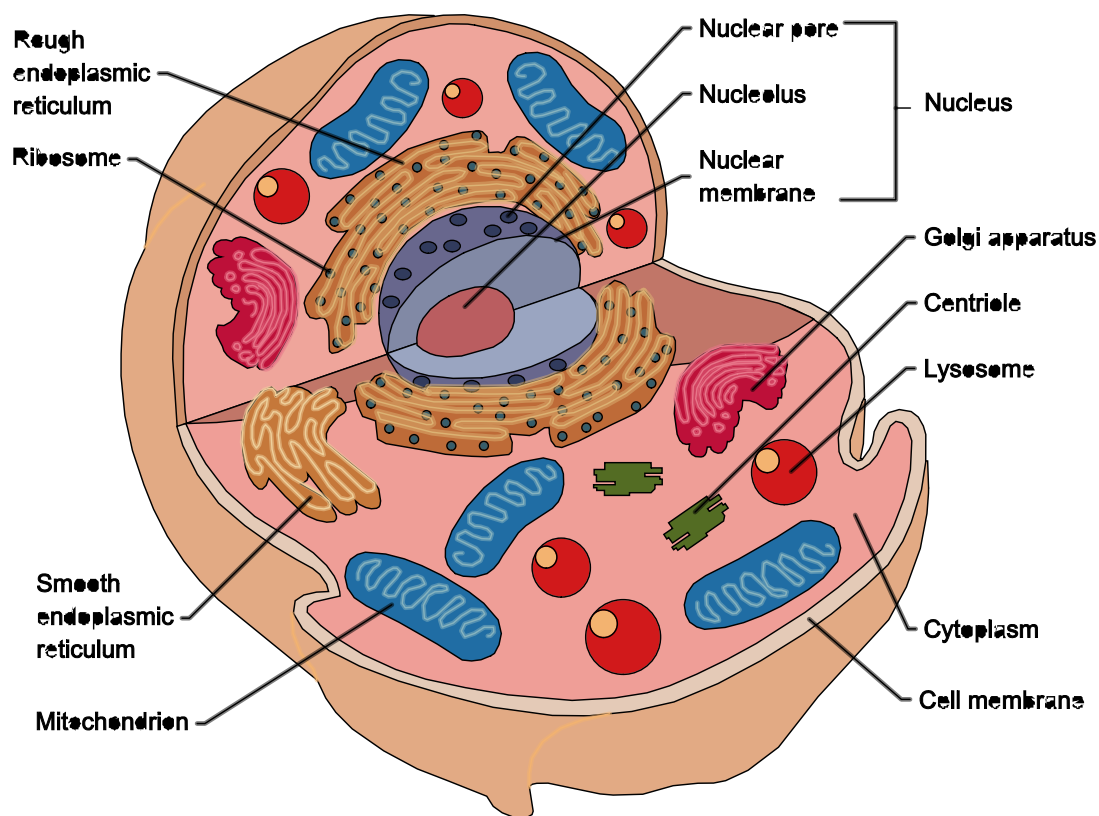
(Plant only components)

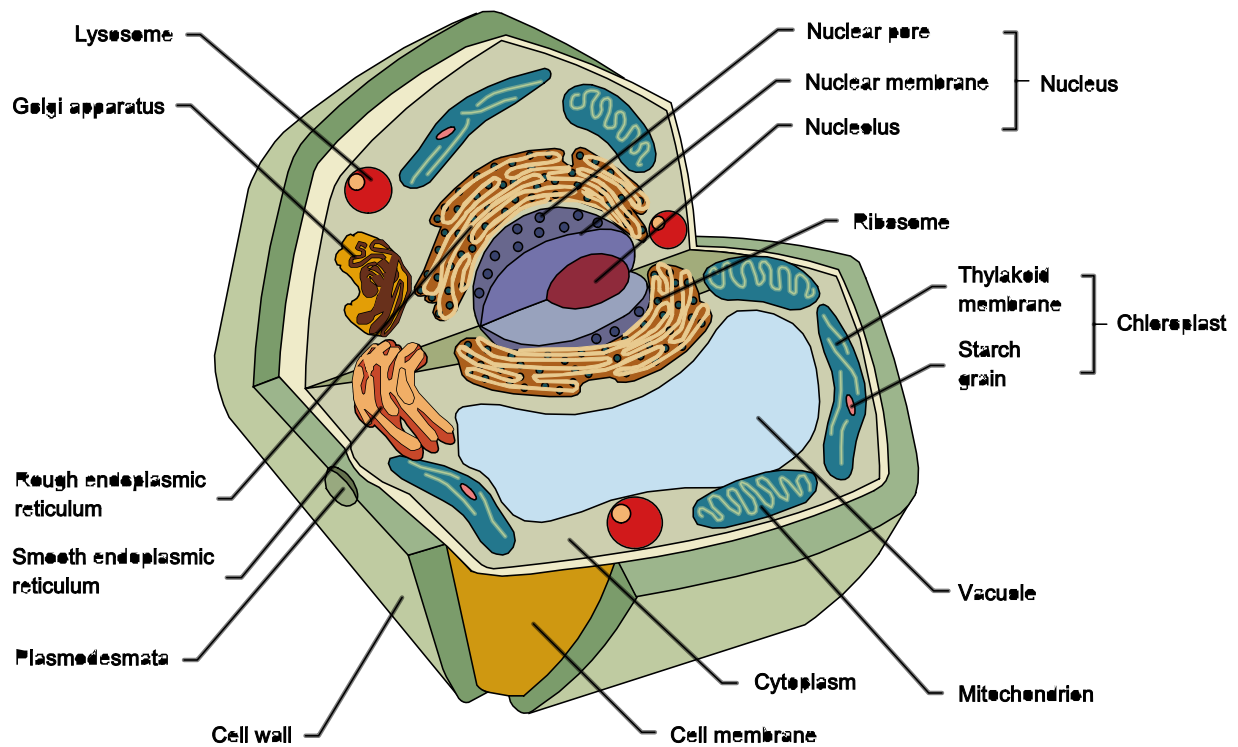
Plastids – specialized organelles involved in the production and storage of food in plant cells.

Vacuole – storage space for sugars, minerals and proteins.

Chloroplast – a plastid that contains chlorophyll used in the process of photosynthesis, where carbon dioxide is combined with water in the presence of light to produce sugar (energy) and release oxygen.

Cell Wall – a thick, rigid membrane that surrounds the cell and provides strength and support for the structure.





What do these term mean?

|                   |   |
|-------------------|---|
| Eukaryotic cells  | Cells with a true nuclear membrane            |
| Prokaryotic cells | Primitive cells with no true nuclear membrane |
| Chromosomes       | Thread like structures of DNA                 |
| Nucleolus         | Small spherical structure inside nucleus      |



What do these term mean?

Diffusion                      the movement of molecules from an area of high concentration to an area of low concentration.

Osmosis                      The diffusion of water through a selective permeable membrane.

Active transport              The cell using energy to move materials across a membrane against the concentration gradient.

Endocytosis                      Process where large particles are engulfed and transported by cells. Pinocytosis - liquid and Phagocytosis - solids.

Exocytosis                      Process where large particles are transported to the external environment.

