# The Cell

- The Cell Theory
  - All living things are made of cells
  - Cells come form other cells
  - Are the basic unit of all living things

- Unicellular: living organisms made up of only one cell
  - Bacteria, algae, protists

- Multicellular: living organisms made up of many cells
  - Water flea, mold, tree, dog, humans (75 trillion)

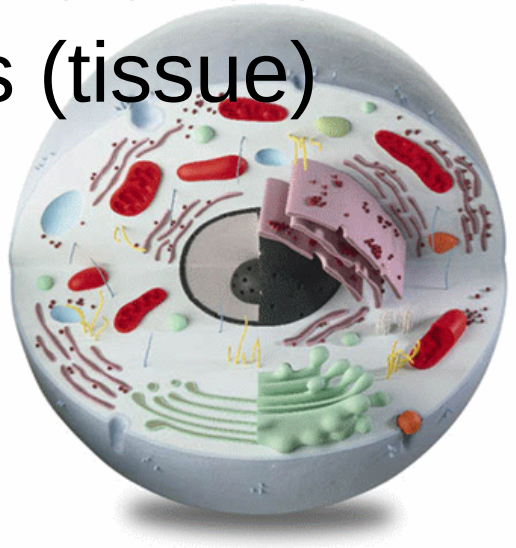
# Two different types of Cells

- Prokaryotes – means “before nucleus”
  - Small simple cells that lack a membrane bound nucleus & organelles.
  - Have a cell membrane, cytoplasm, ribosomes & simple DNA.
  - Most ancient of life forms – fist appear in fossil record 3.5 bill year ago.
  - Bacteria are the only living examples, most numerous I total # of all living things

- Eukaryotes – means “true nucleus”
  - Larger, more complex cells that contain a membrane bound nucleus and organelles
  - Make up all other living things
  - First appeared in the fossil record about 1.5 billion years ago.

# Structure of a Eukaryote Cell

- Cell membrane – outer edge of cytoplasm that controls what comes in & out of the cell (skin)
- Cytoplasm – semi- fluid jelly like substance between cell membrane & nucleus, contains organelles (tissue)

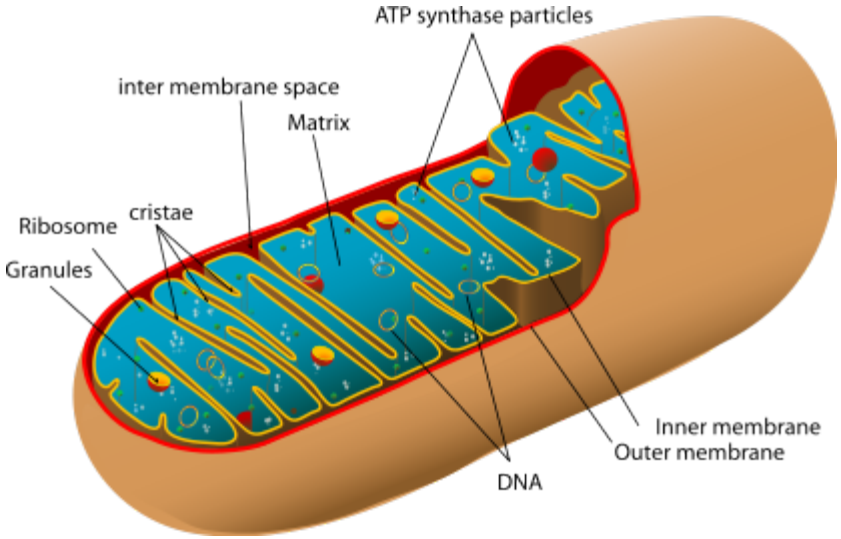


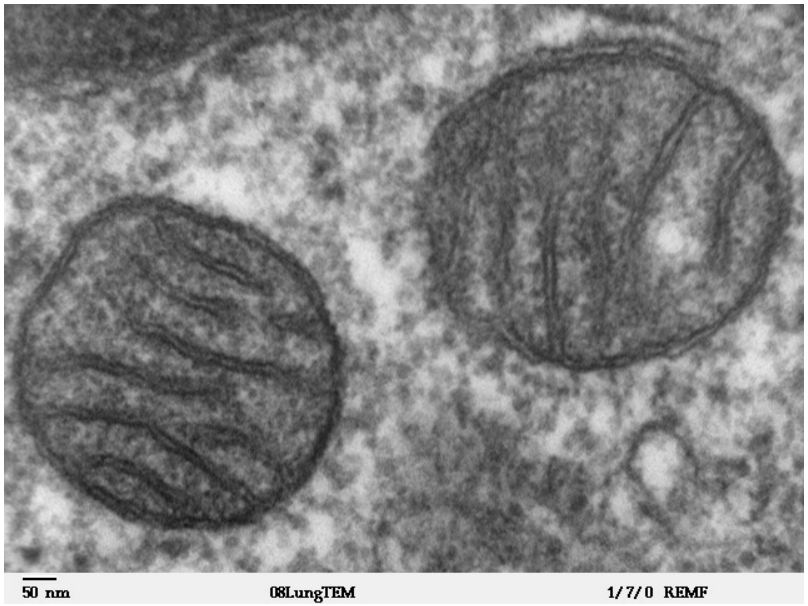
- Nucleus – Membrane bound compartment that contains DNA – directs the cells activities brain.

- Nucleolus – Concentrated area of chromatin, RNA, and proteins – helps in ribosomal formation.

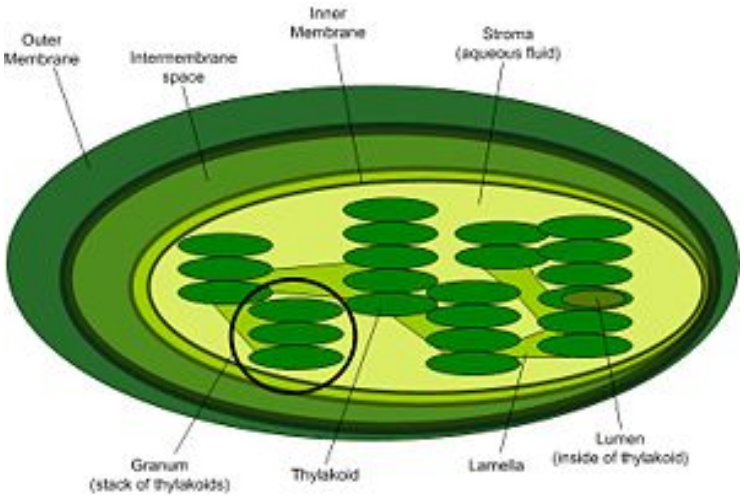
- Organelles – “tiny organs” – membrane bound compartments in the cytoplasm that have specific jobs.

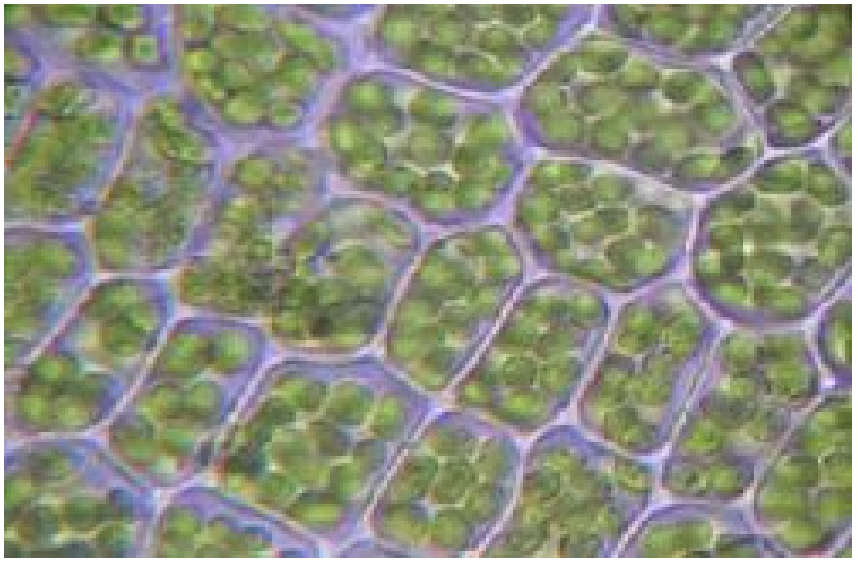
- Mitochondria – convert stored food into energy



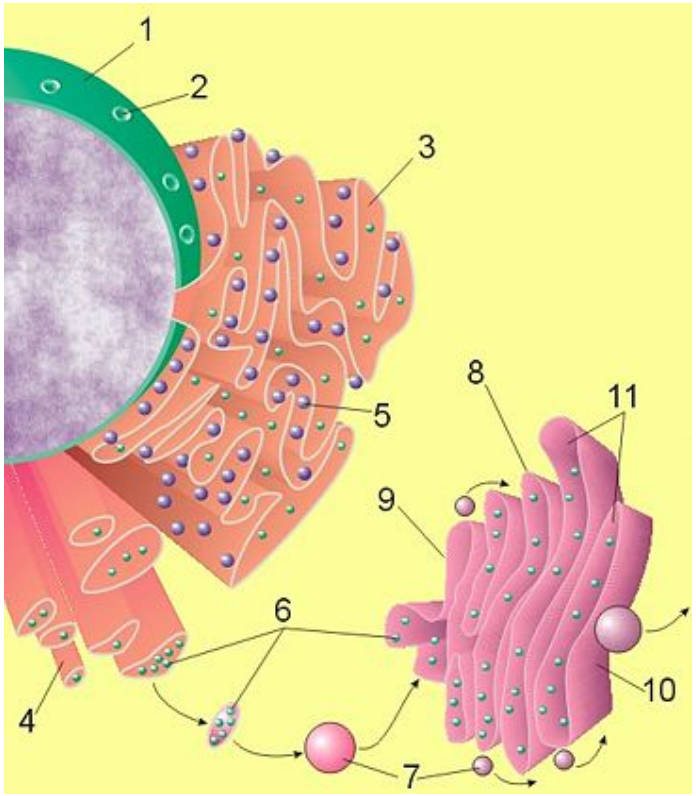



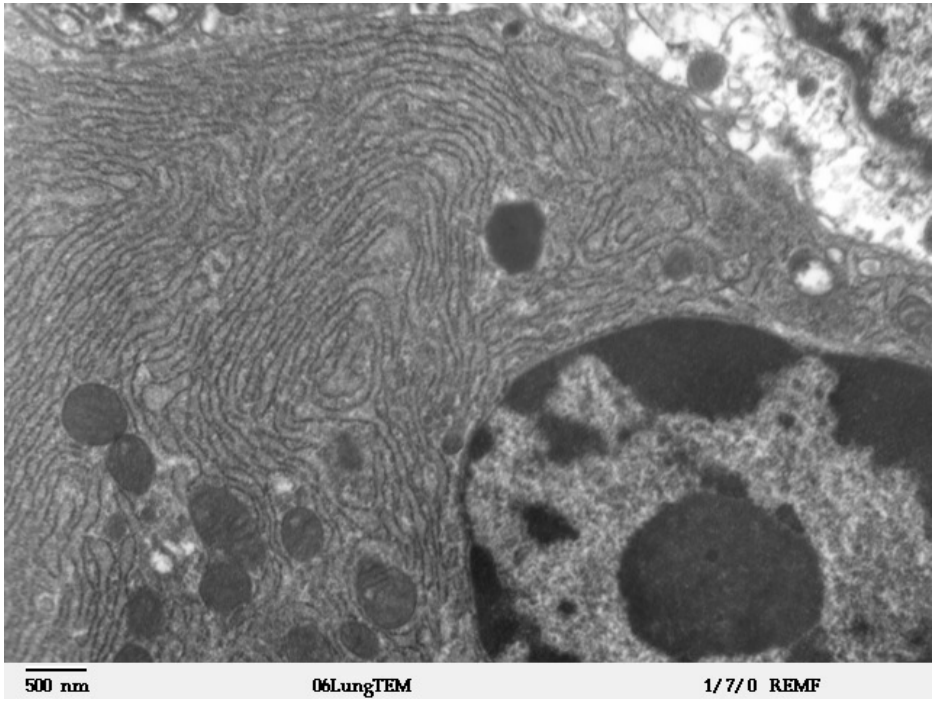
- Chloroplasts – produce food by the process of photosynthesis



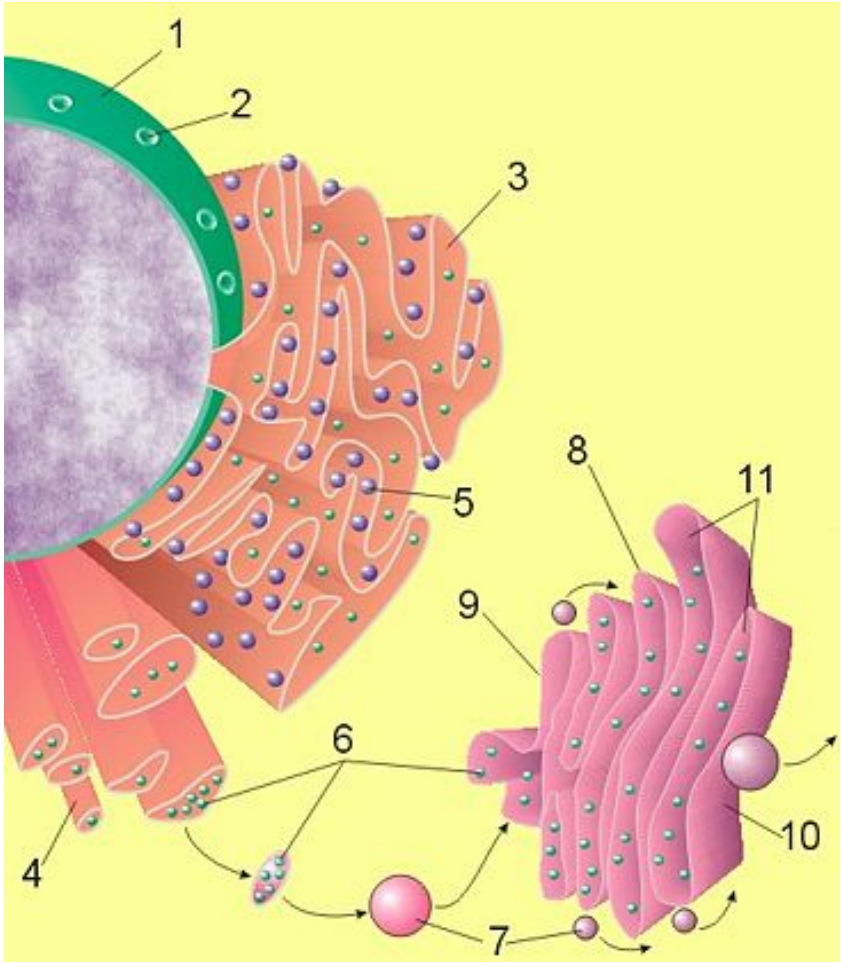



- Endoplasmic reticulum – network of membranes that transports materials thought the cytoplasm of the cell.

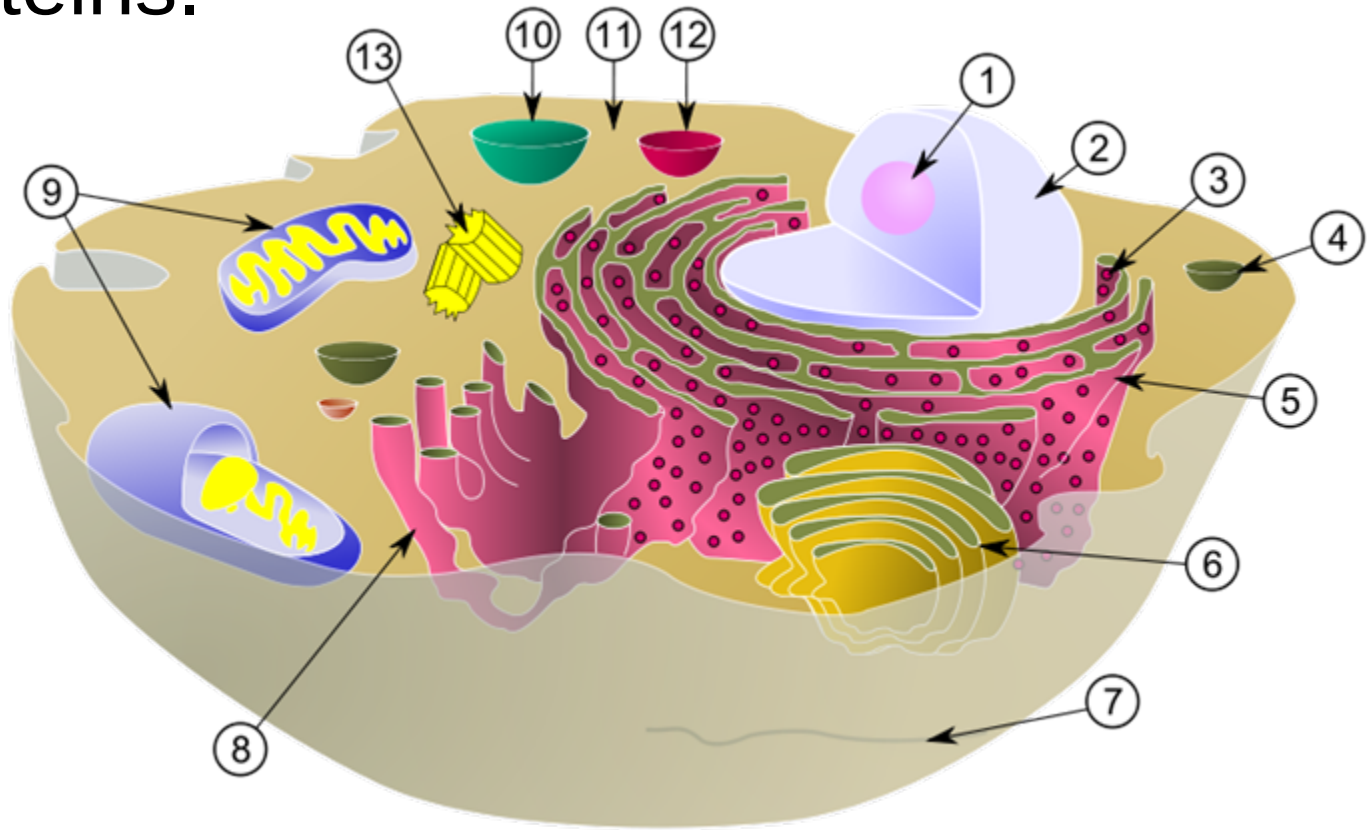


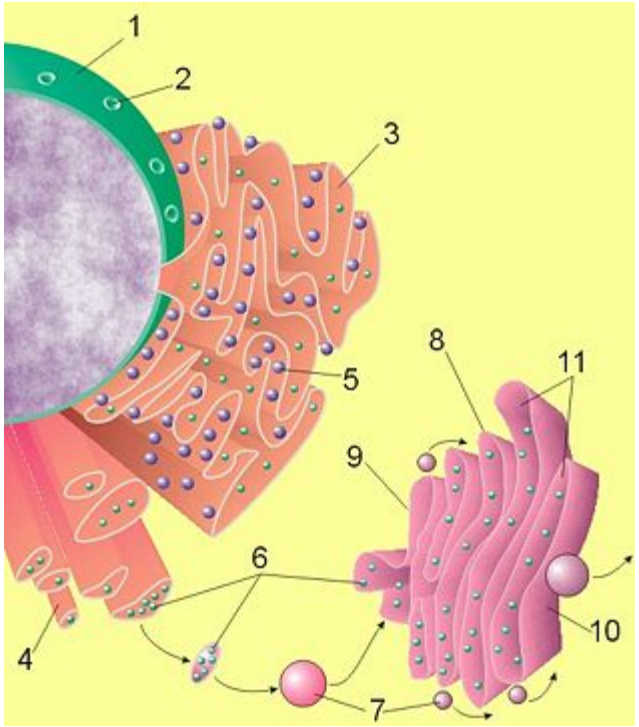
- Rough ER – studded with ribosomes – protein synthesis
- Smooth ER – has no ribosomes – lipid synthesis in some cells

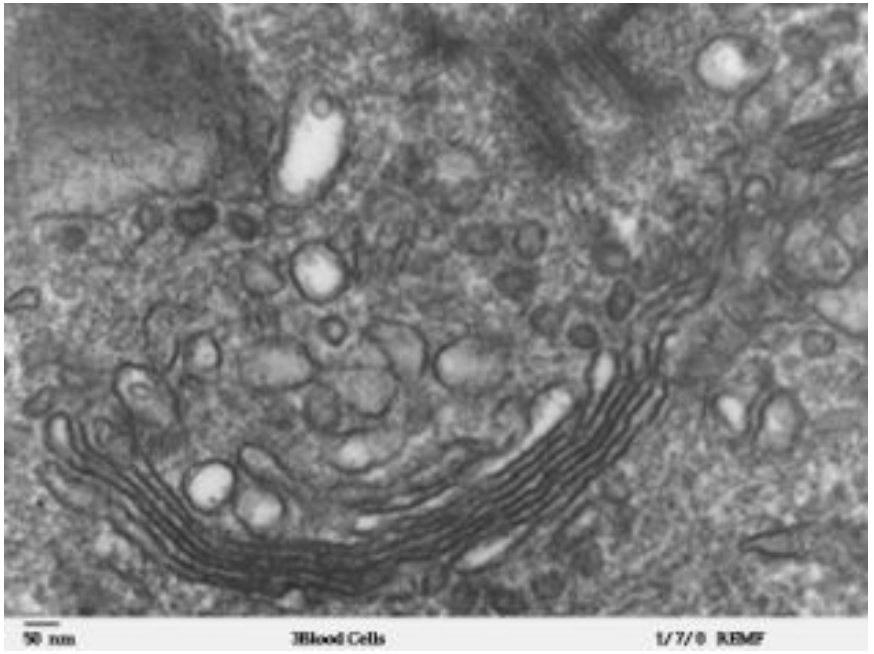


- Ribosomes – Small sphere-shaped structures located on the E.R. that make proteins.

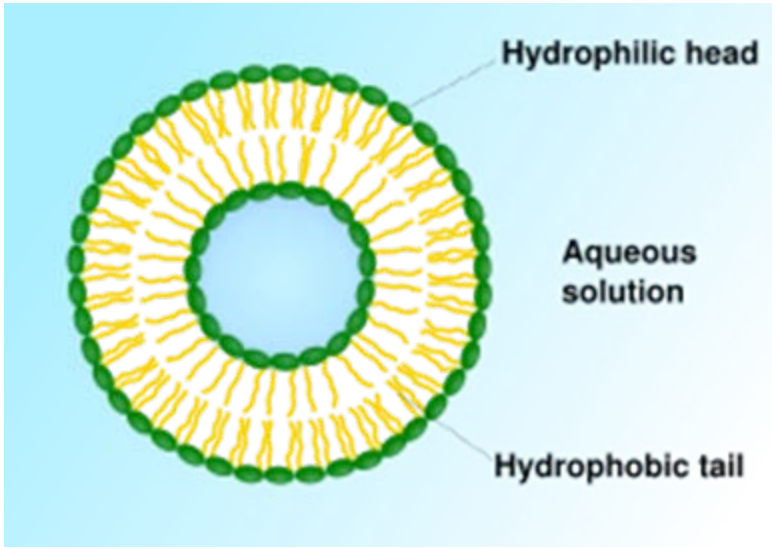


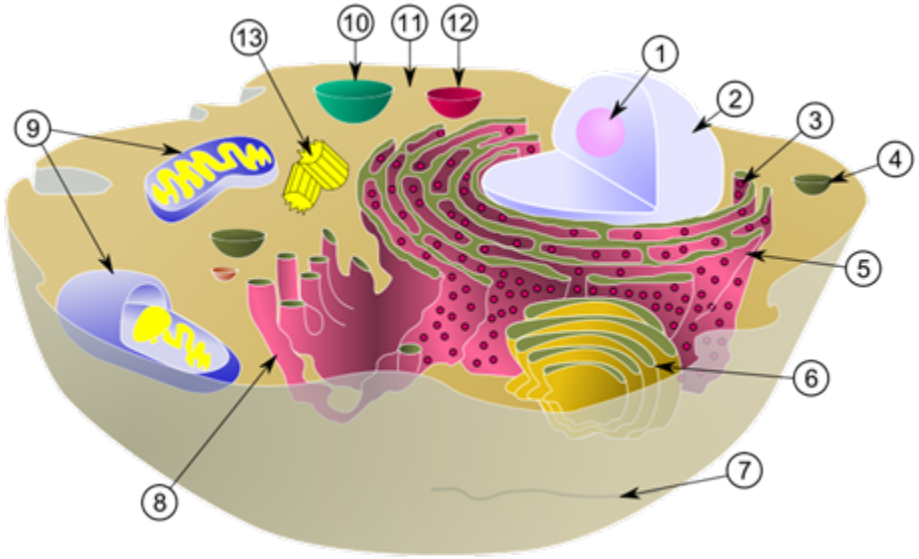
- Golgi Apparatus – Packaging and distribution center for the molecules produced by the cell – can be used in the cell or sent out to other cells.



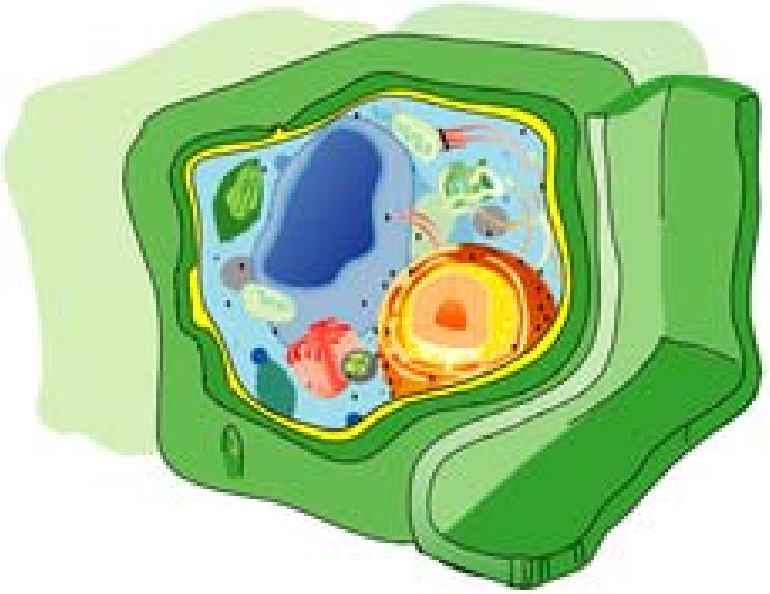



- Vacuoles – fluid filled spaces that store water, salt, proteins, etc; aid in digestion of products; and provide water balance – i.e. large vacuoles in plant cells give support and maintain their shape.
- Vesicles – storage and transport of substances.

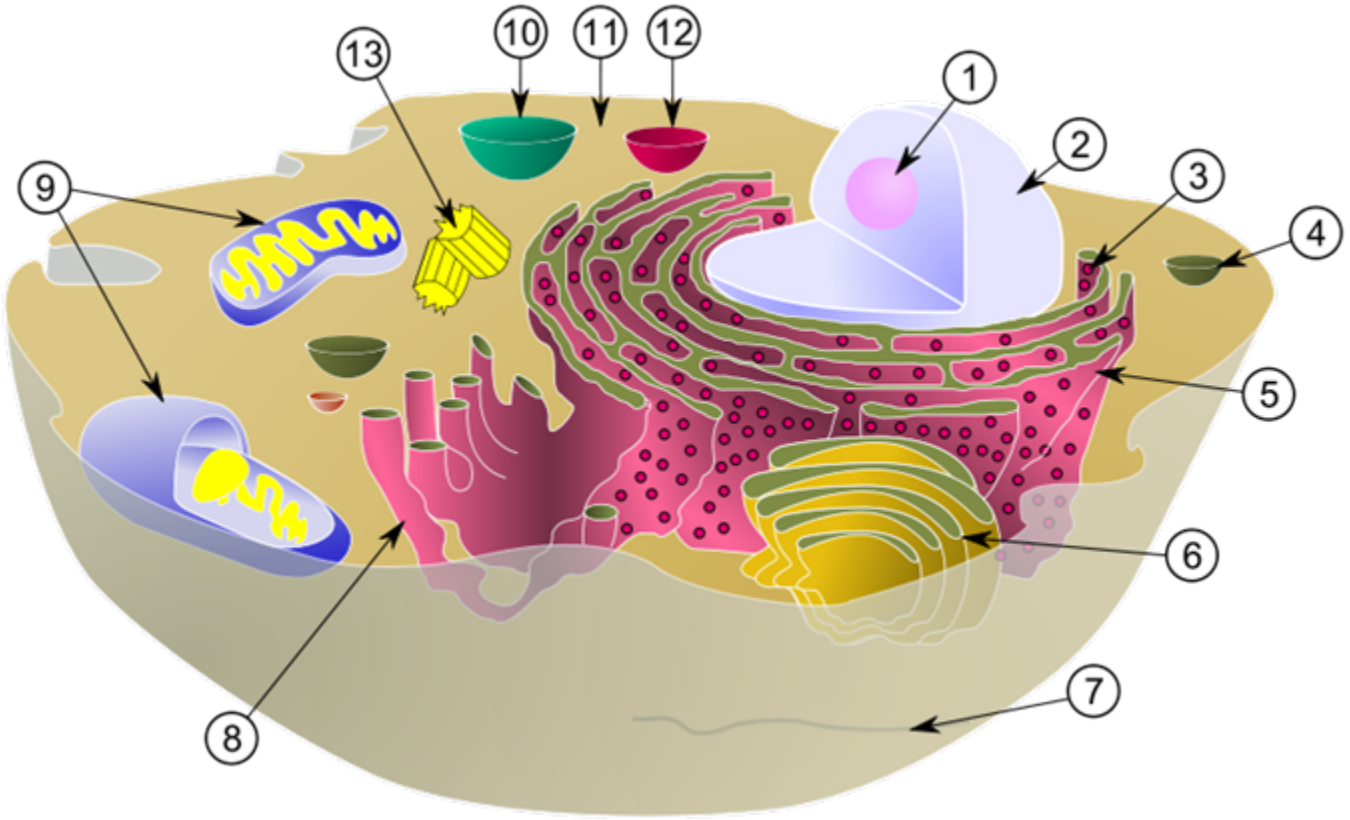


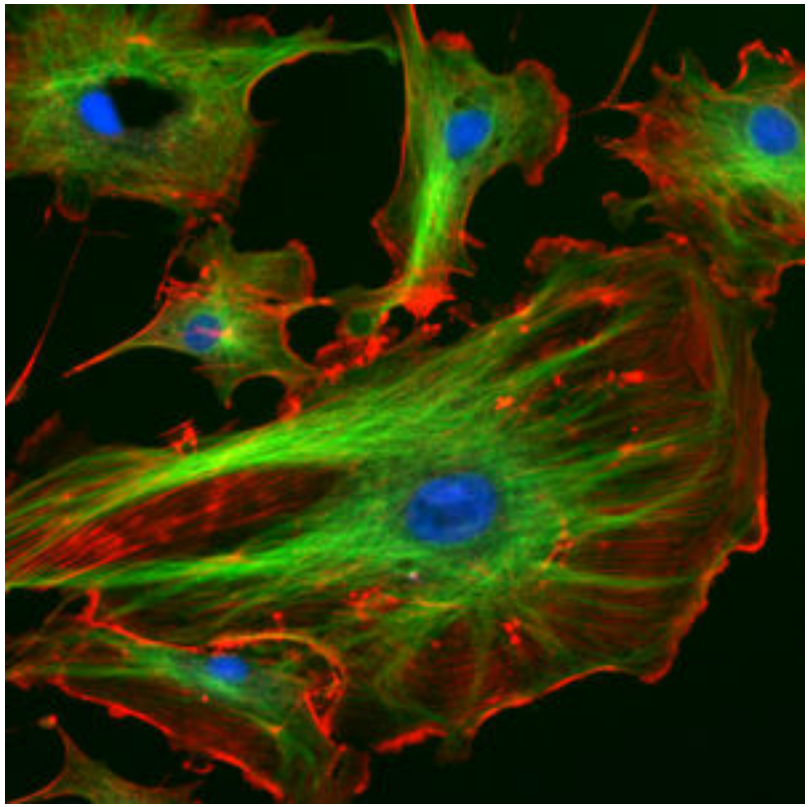
- Cell Wall – thick outer layer of plant cells – made up of cellulose – provides support and protection.



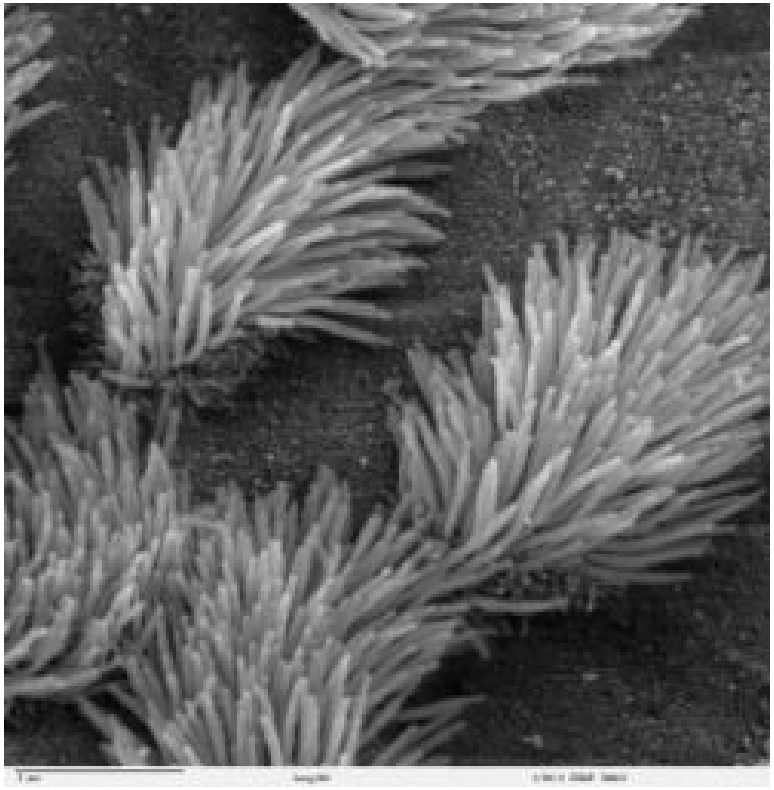
- Lysosomes – Vesicle containing digestive enzymes – intracellular digestion.

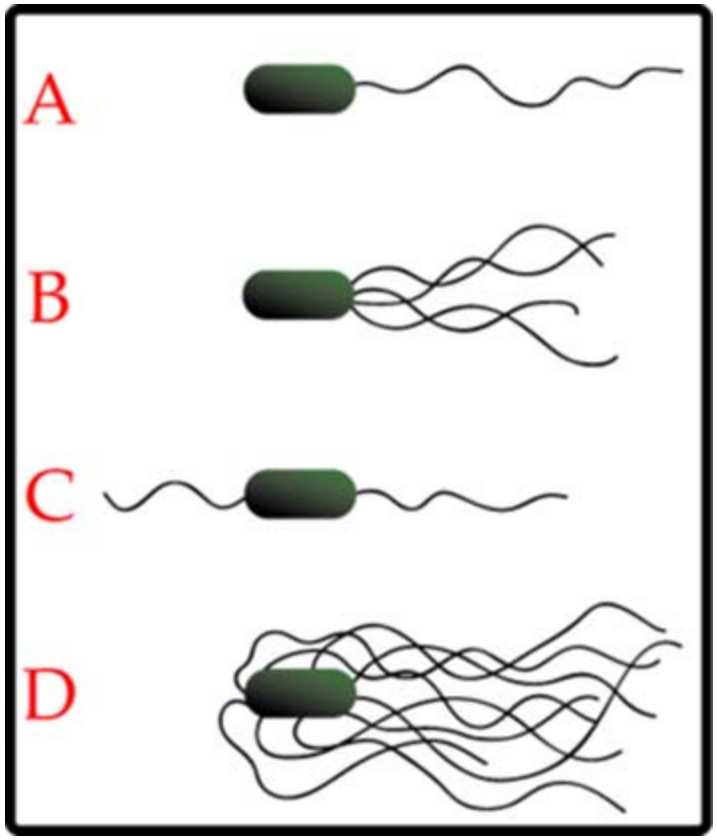


- Cytoskeleton – made of microtubules, filaments – shape of cell and movement of it parts.

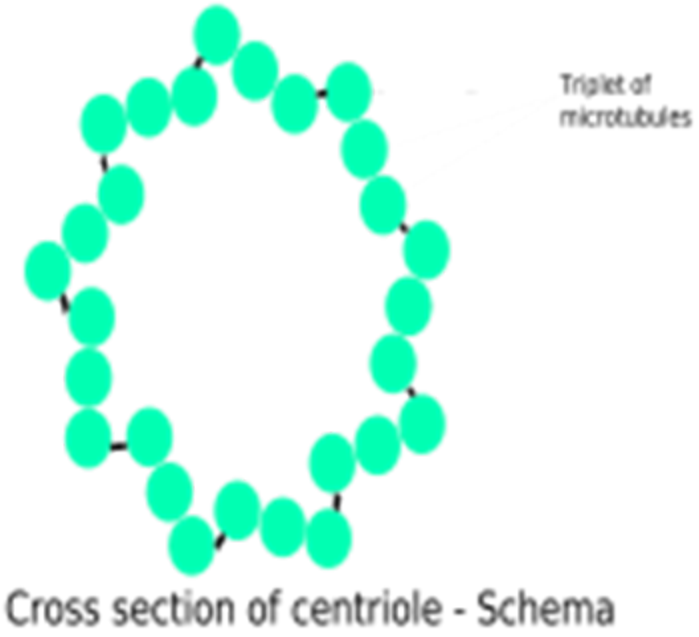


- Cilia and Flagella – made of microtubules – movement of cell





- Centriole – made of microtubules – formation of basal bodies.



# 3.2 Questions

**Write and answer the following questions in your notebook.**

1. What is an organelle?
2. What is the structure and function of the plasma membrane?
3. What types of fibers are in the cytoskeleton and what do they do?
4. Why is a nucleus indispensable to cells?
5. What role does each member of the endomembrane system play in cells?
6. How do you know that cilia and flagella are essential to human cells?
7. What is the structure and function of a mitochondrion?