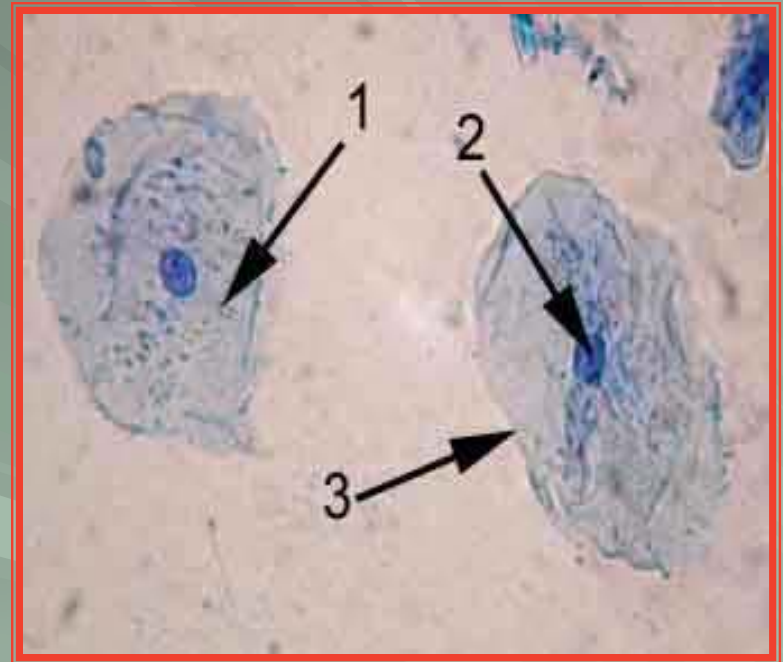


Animal and Plant Cells

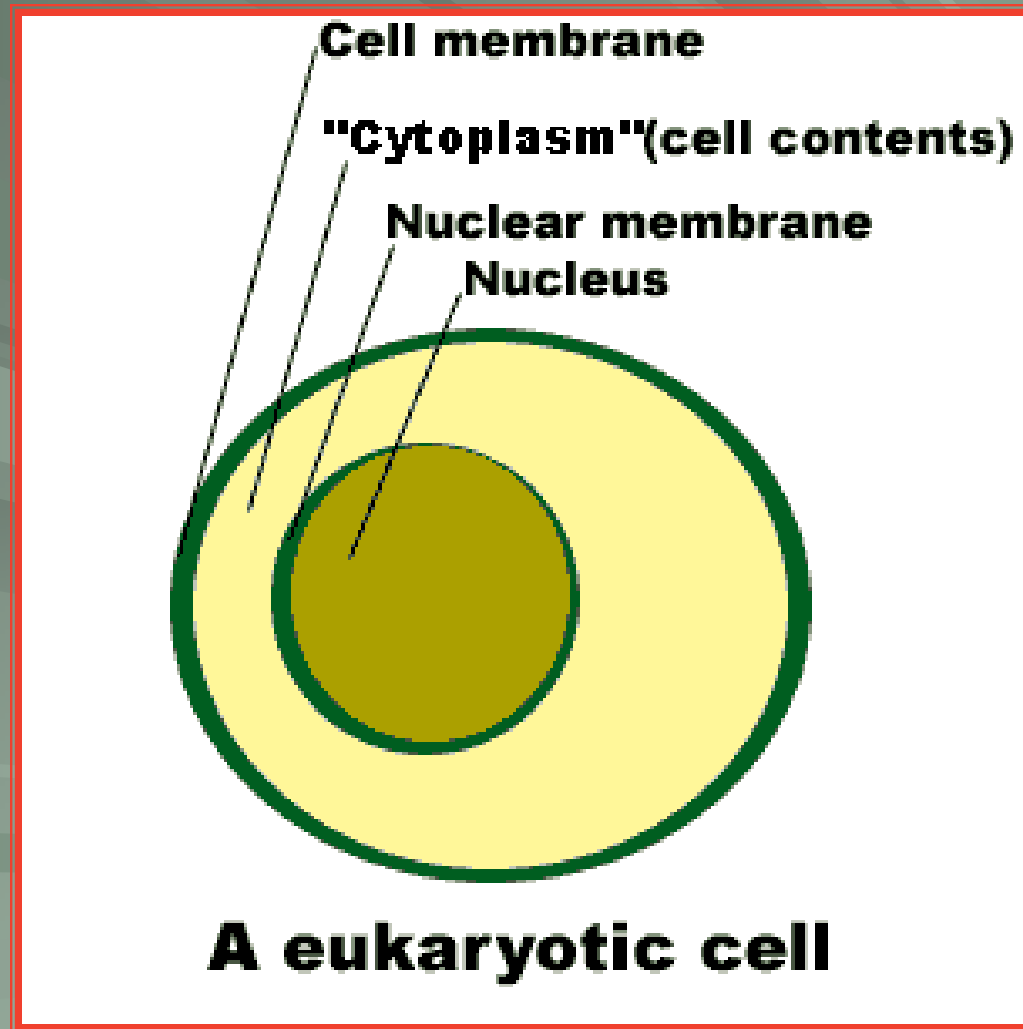
**The structure and function
of organelles**

What are Organelles?

- Cells contain *organelles*, specialized structures within cells that perform specific functions such as absorption, circulation, excretion, digestion, respiration, regulation, reproduction, and synthesis.

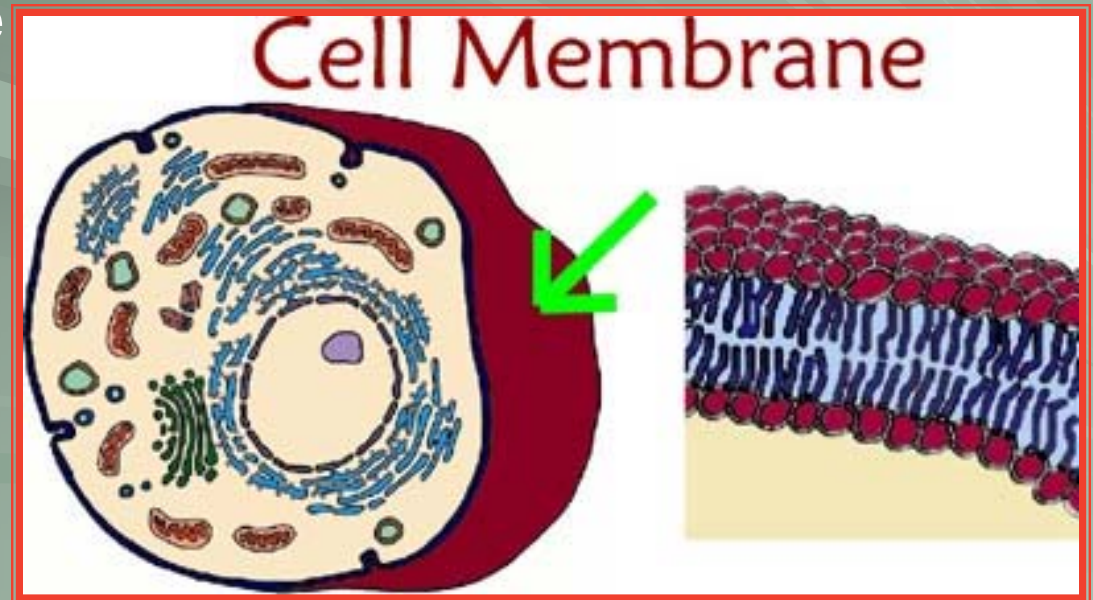


Basic Eukaryote Cell



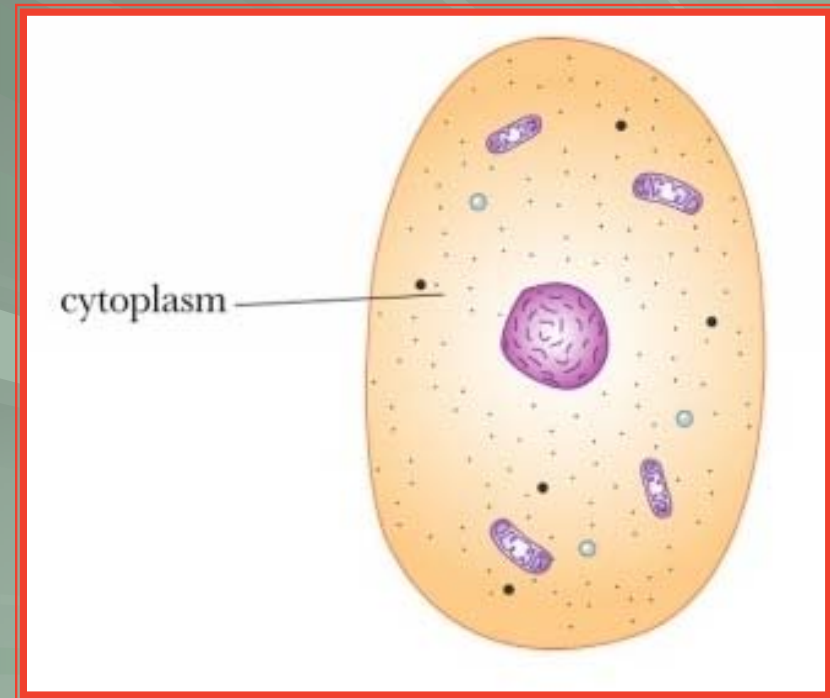
Cell Membrane

- Double membrane made up of phospholipids and proteins
- Separates the cell from the outside environment
- Gives the cell shape and support
- Selectively permeable



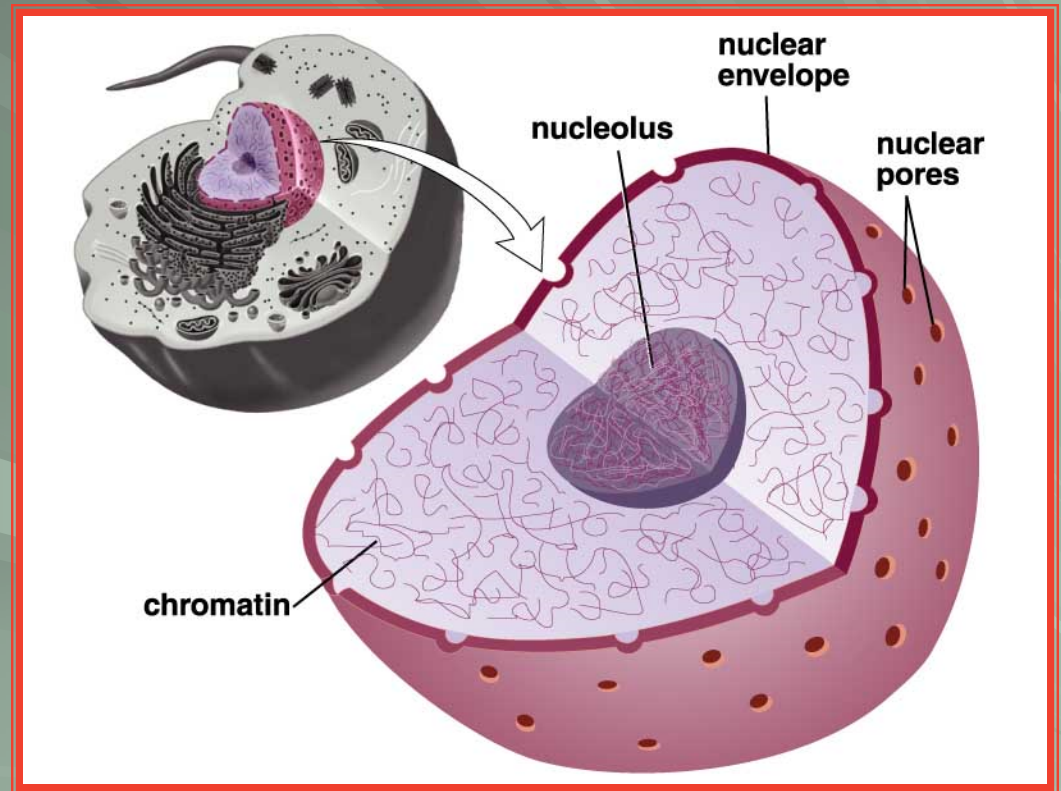
Cytoplasm

- Clear jelly-like substance in which the organelles are suspended.
- Provides a suitable environment where organelles can carry on the cell's life functions.
- Mostly made up of water.



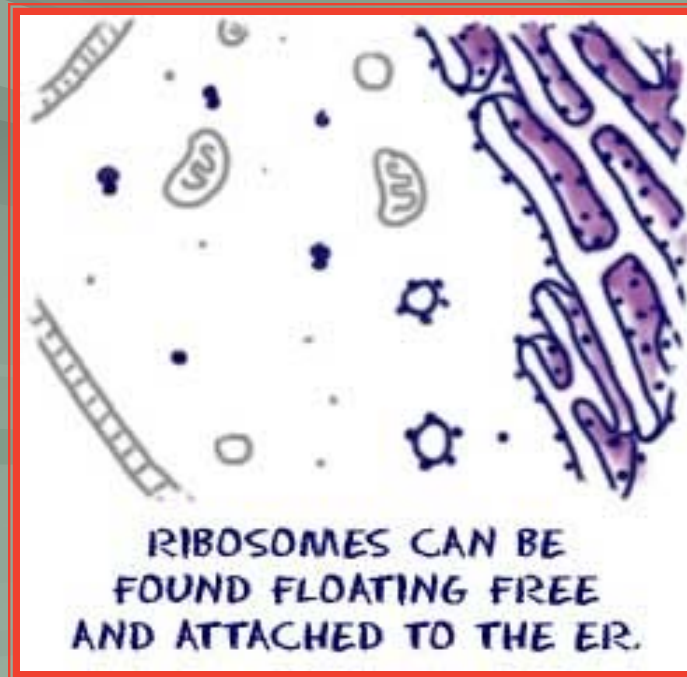
Nucleus

- “Brain of the cell”
- Bound by a nuclear membrane with nuclear pores for materials to enter/exit nucleus
- Houses chromosomes which generally exist as string-like material called **CHROMATIN**
- **NUCLEOLUS** is found inside the nucleus and is the site of *ribosome production*.



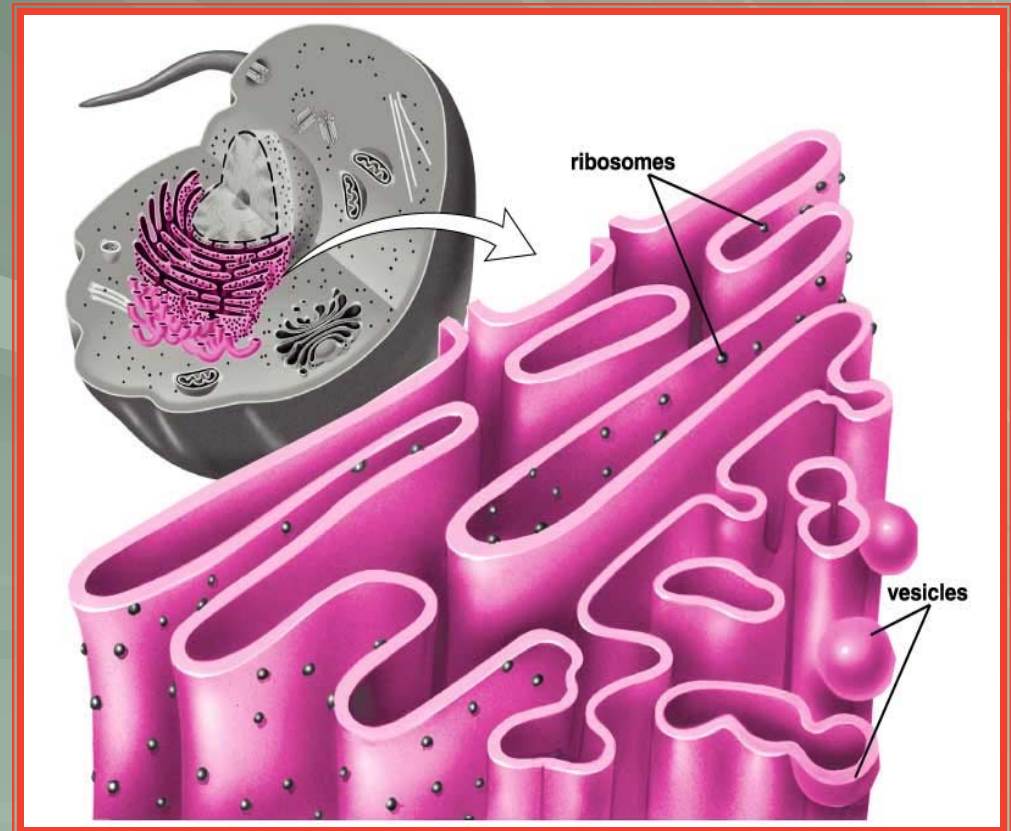
Ribosomes

- Ribosomes are found free floating in the cytoplasm or attached to the wall of the rough endoplasmic reticulum (ER).
- They are the sites of protein synthesis.

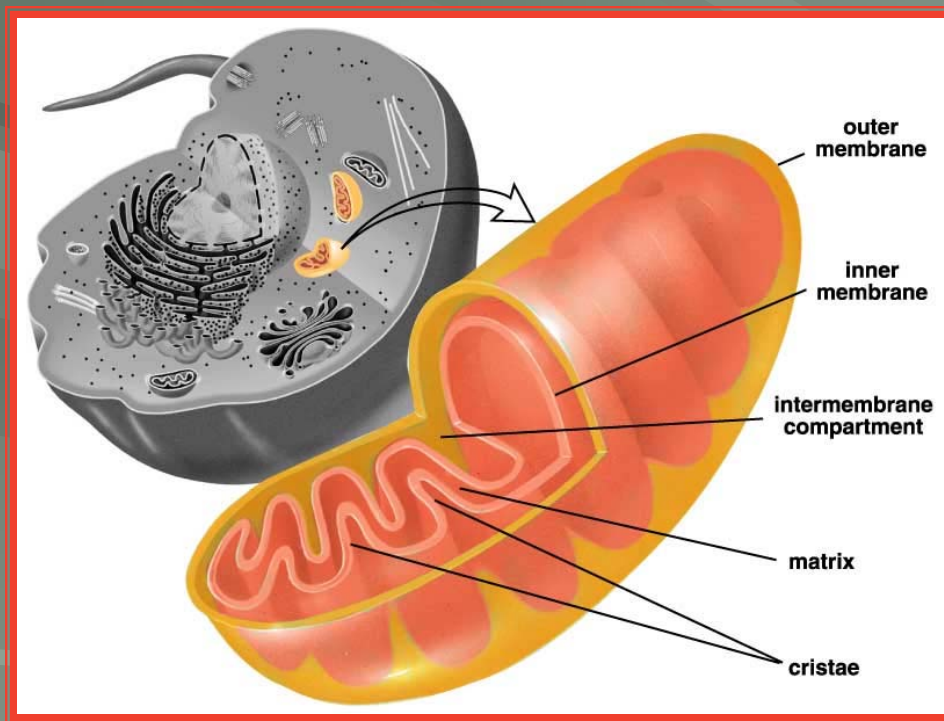


Endoplasmic Reticulum

- Hallways” of the cell
- Single continuous membrane
- Continuous with nuclear envelope
- Involved in *transport, storage, and synthesis* of materials within the cell
- 2 kinds of ER: *Rough ER* and *Smooth ER*
- Rough ER has ribosomes attached to its outer membrane.



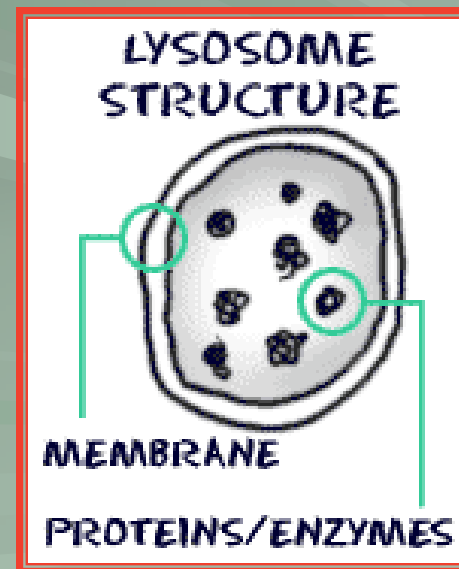
Mitochondria



- Powerhouse of the cell.
- site of cellular **AEROBIC** respiration
- Aerobic respiration uses oxygen as part of the chemical process to release energy by breaking the bonds of food molecules.
- **Cristae** – inner membrane folds that **increase the surface area** so that more energy can be released by cellular respiration.

Lysosomes

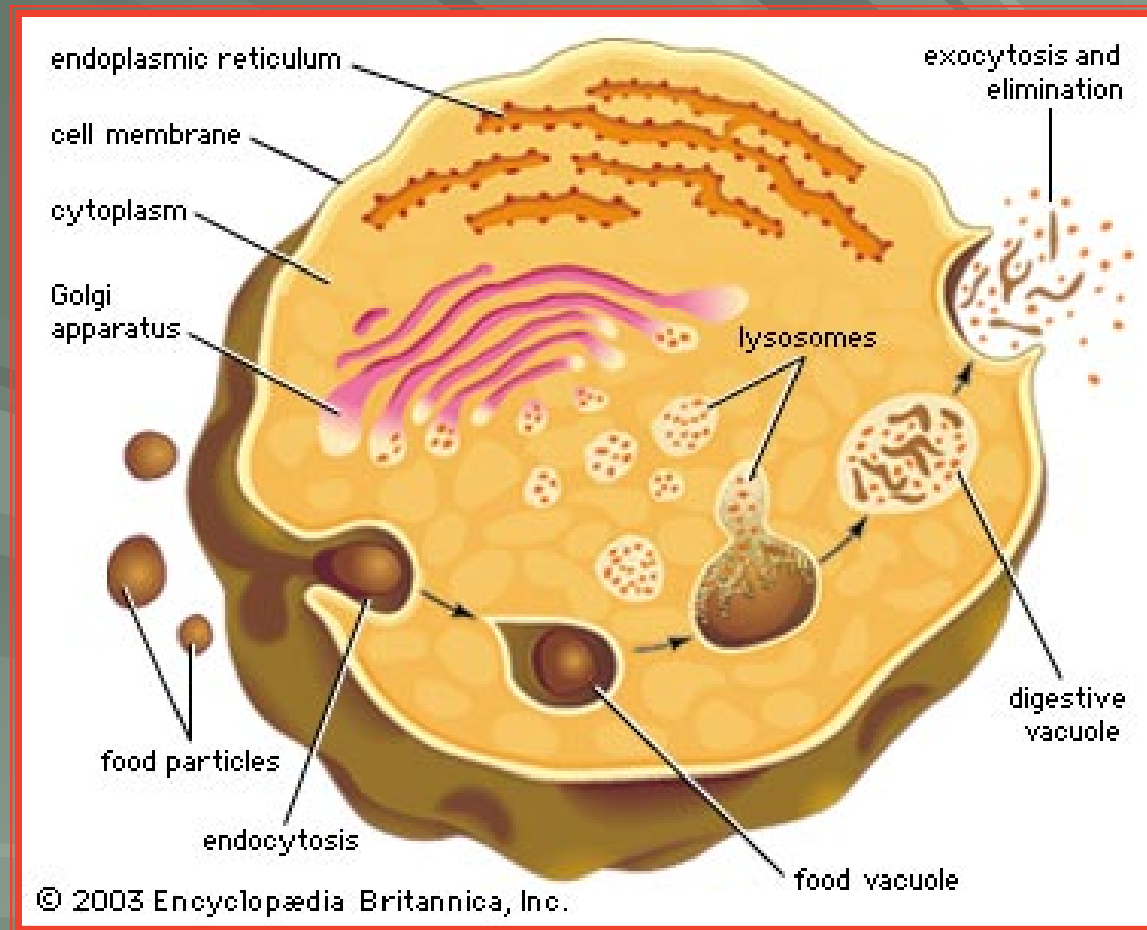
- Single bound membrane organelle that hold digestive enzymes.
- In single celled organisms, lysosomes are involved in food digestion.
- In multicellular organisms, they are involved in the break down of worn-out organelles.



Vacuoles

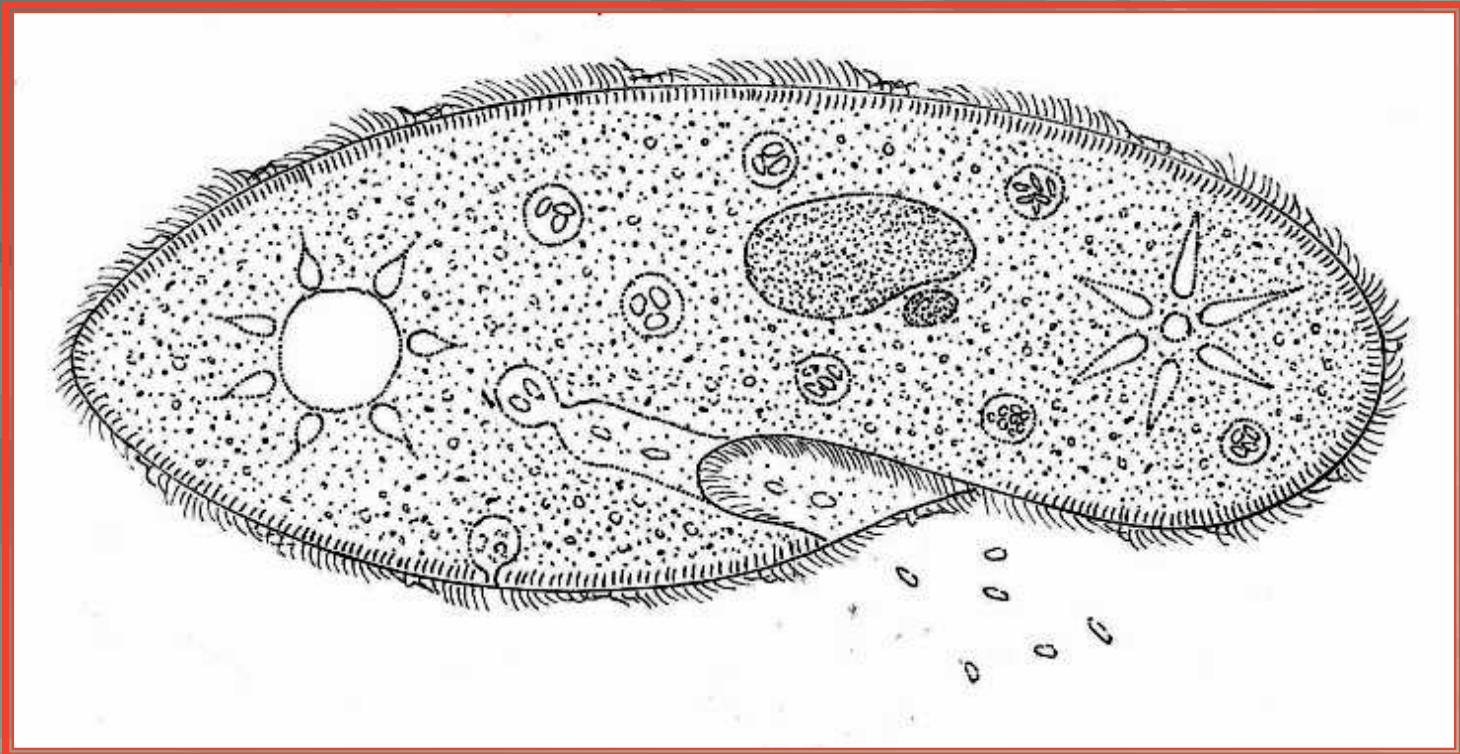
- **Warehouse**” of the cell
- Membrane bound sac that is involved in storage of materials
- Vacuoles can be involved in food digestion, storage of cellular wastes, or even the elimination of excess water
- **In animal cells, vacuoles tend to be small.**
- **In plant cells, there tends to be one or two large vacuoles that collect water, helping to make the plant cells rigid.**

Food Vacuoles



Why doesn't the cell digest itself?

Contractile Vacuoles



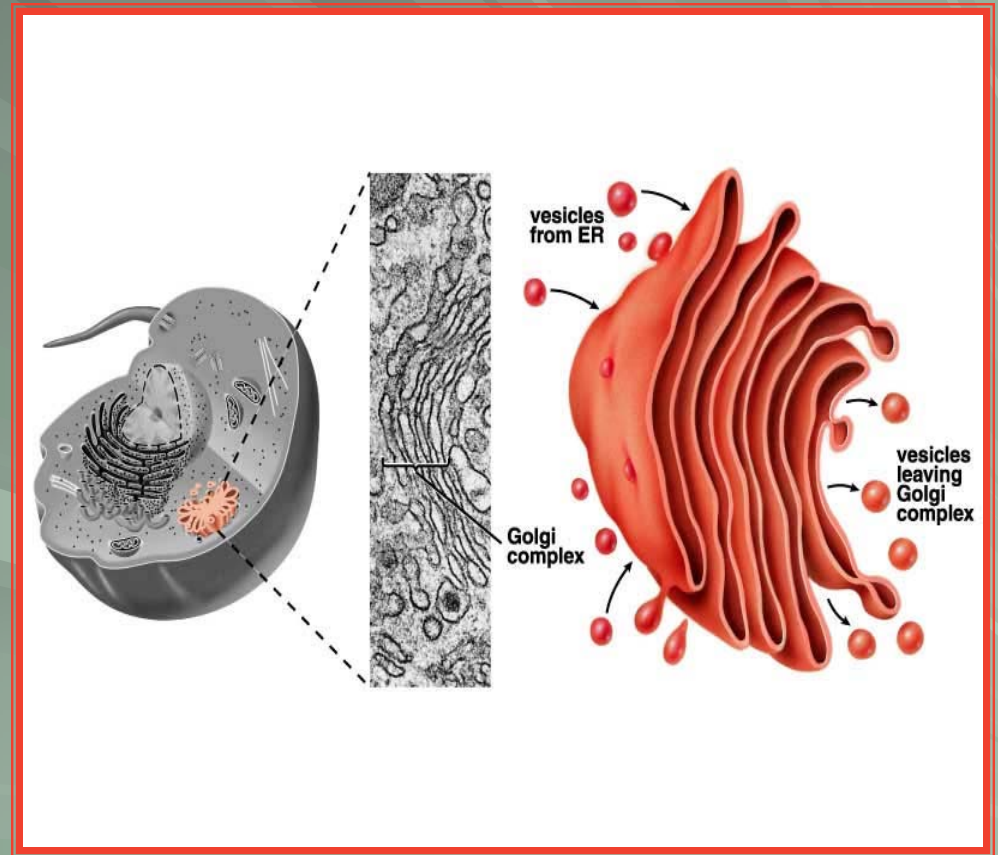
Why doesn't the paramecium explode from the continual flow of water into the cell?

Golgi Bodies

- Also known as the golgi body or golgi apparatus
- Single membrane bound stack of flattened pancake-looking sacs surrounded by smaller membrane bound vesicles. located near the cell membrane.
- Known as the *UPS of the cell* because it processes, modifies, packages macro-molecules that are either secreted by the cell or used within the cell for various functions.

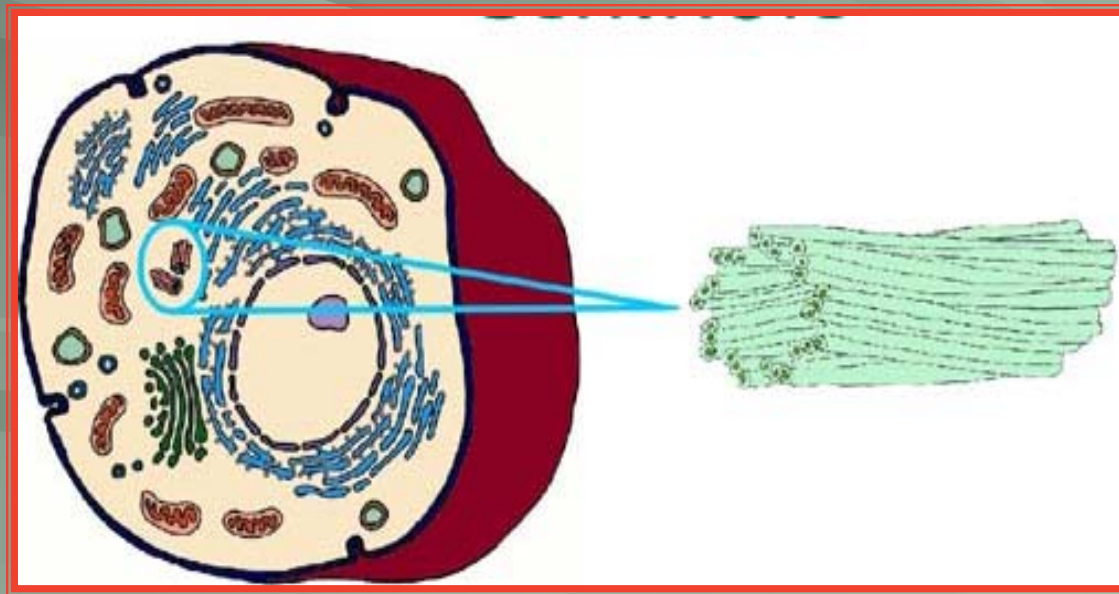
Vesicles

- Single membrane bound organelles used for short term transport and storage.
- Used to transport material from ER to Golgi Apparatus and to transport packaged molecules from Golgi to cell membrane for export out of cell.

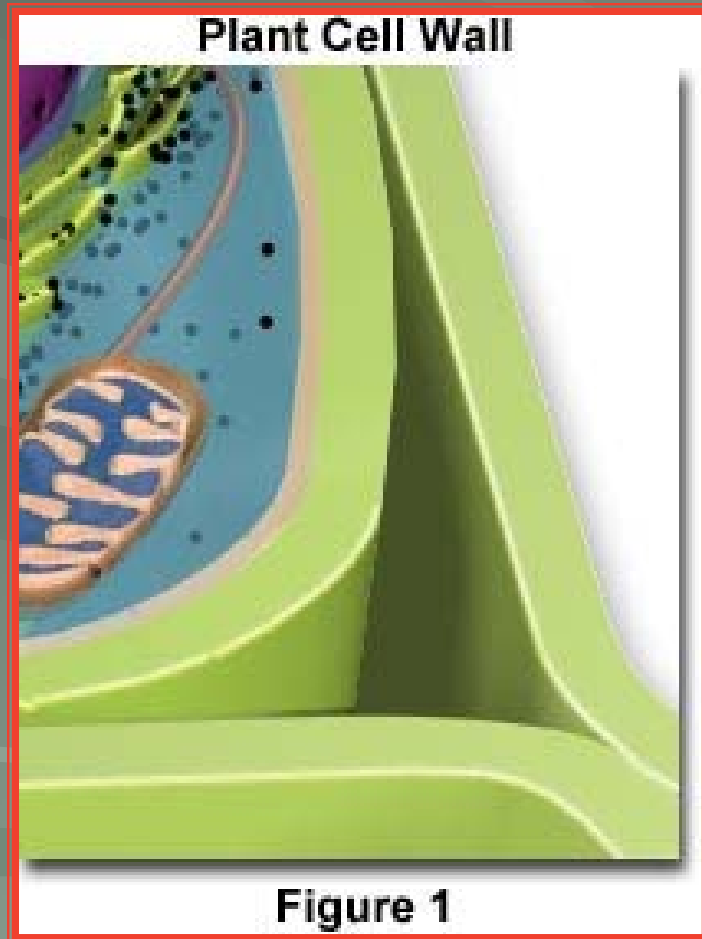


Centrioles

- A pair of barrel shaped organelles found near the nucleus that are made up of microtubules.
- Found only in animal cells.
- Involved in *reproduction* of animal cells.



Cell Wall



- Surrounds the outside of plant cells
- Composed of nonliving material called *cellulose*, a type of starch (complex carbohydrate)
- Completely permeable
- Provides protection from injury and support for the plant cells

Chloroplasts

- Membrane bound organelle found in the leaves of plants
- Contains the green pigment, **CHLOROPHYLL**
- Chlorophyll not only gives plant cells their green color, but also is involved in capturing light rays from the sun.
- ***Site of photosynthesis***, the process by which green plants manufacture their own food, converting the energy of light to chemical bond energy.

Chloroplasts (cont'd)

