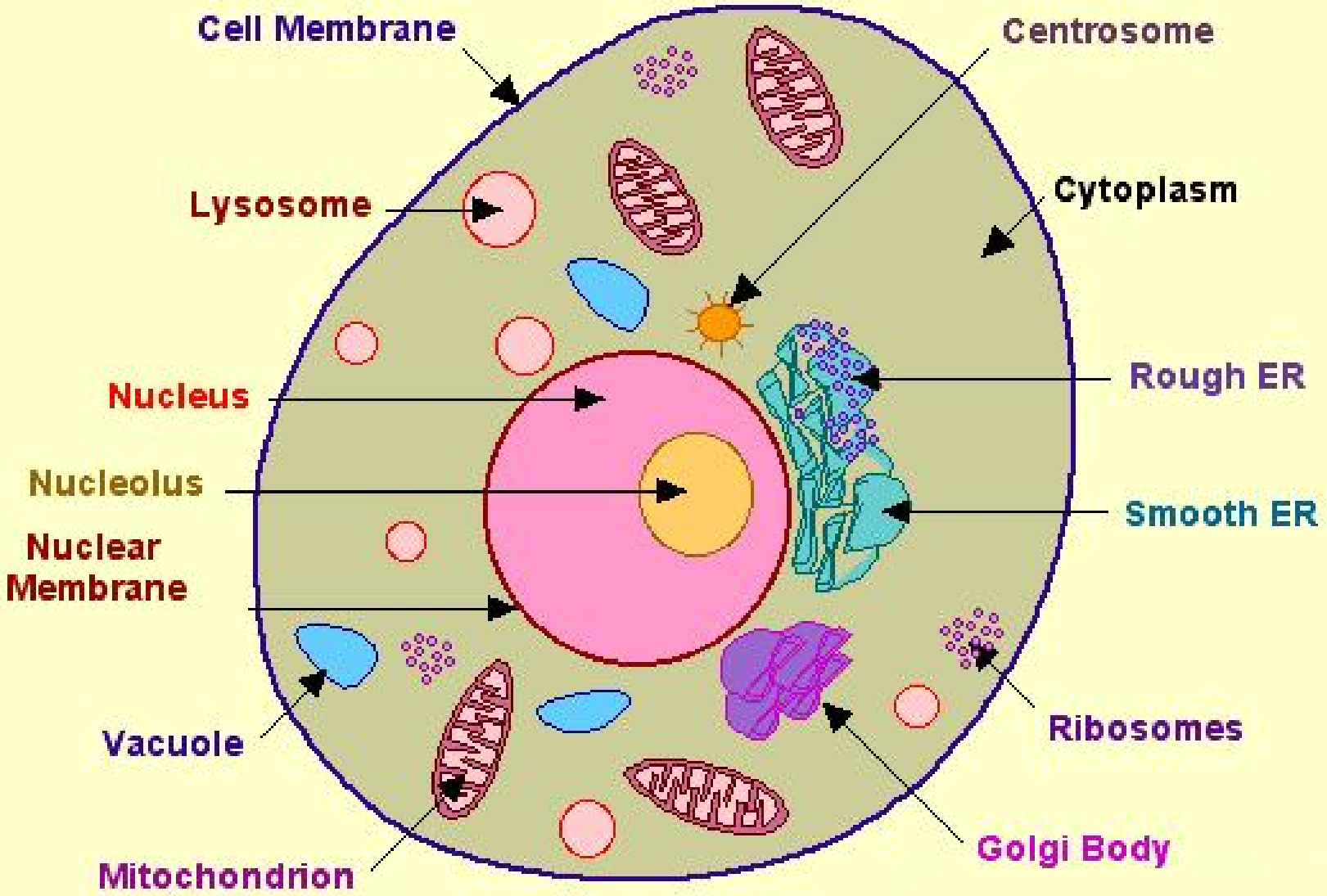
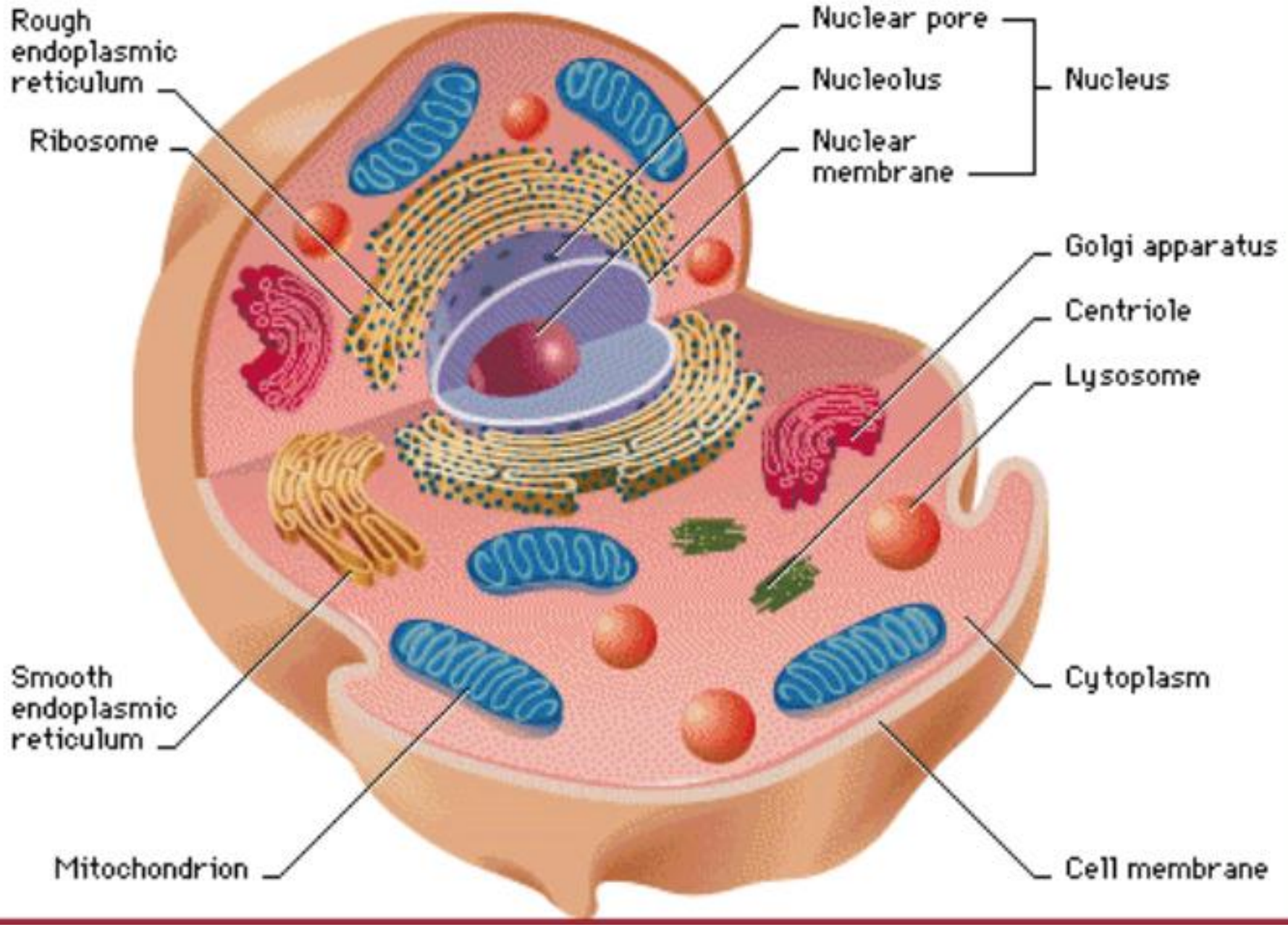
Cross-Section of an Animal Cell

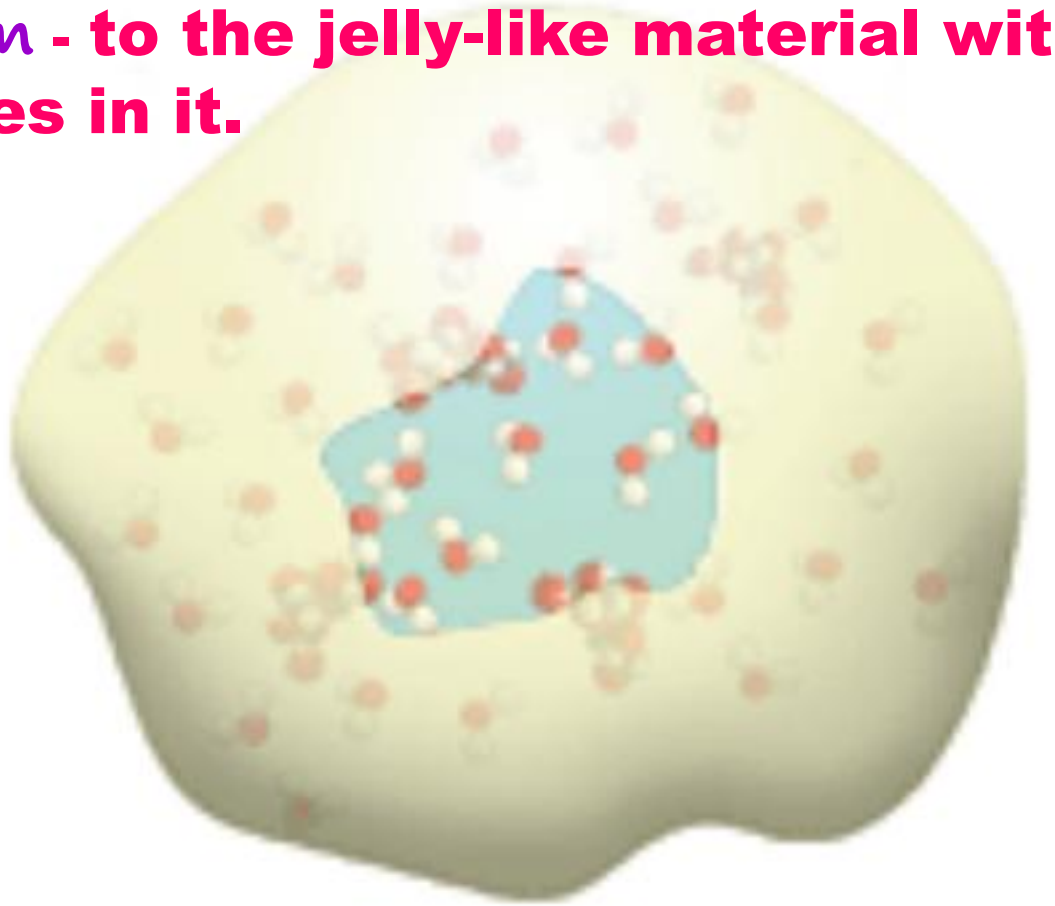



Rough endoplasmic reticulum
Ribosome
Nuclear pore
Nucleolus
Nuclear membrane
Nucleus
Golgi apparatus
Centriole
Lysosome
Smooth endoplasmic reticulum
Mitochondrion
Cytoplasm
Cell membrane

Cytosol

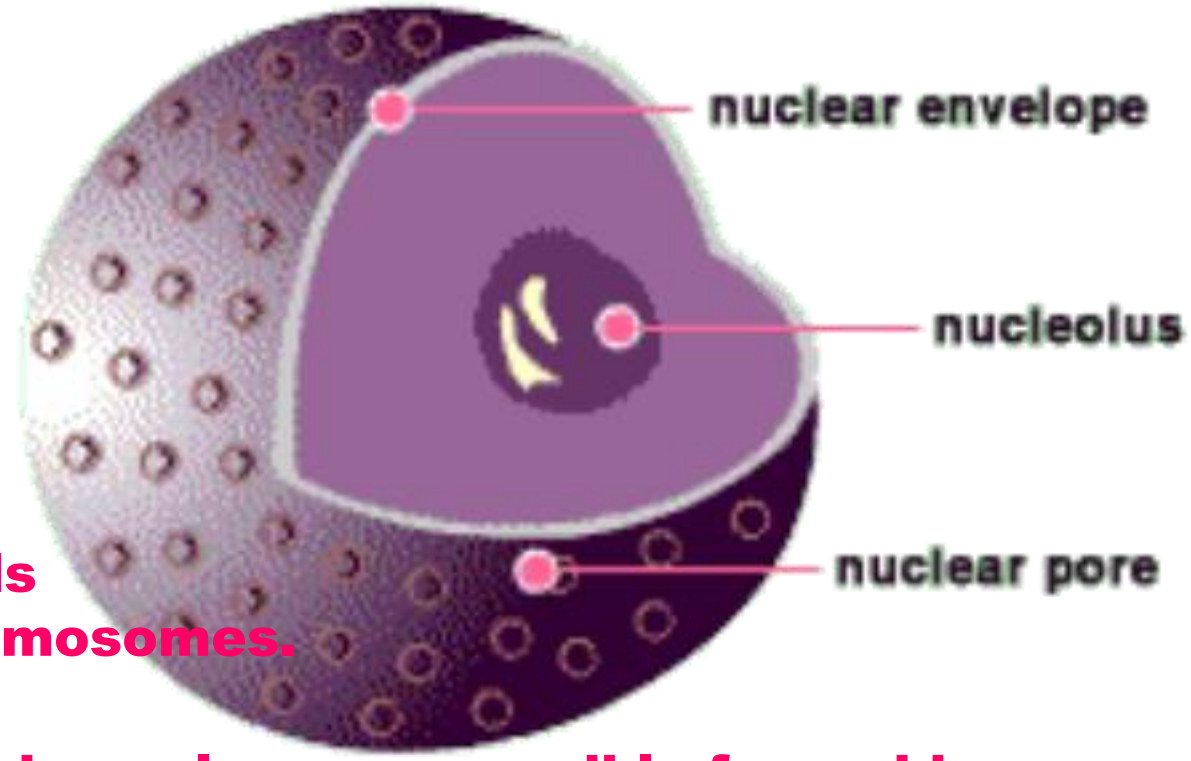
- **soluble part left in cytoplasm withoit the organelles**
- **consists of water and dissolved substances**

Cytoplasm **- to the jelly-like material with organelles in it.**



Nucleus

- is the control center of the cell.
- the largest organelle in the cell
- it contains the DNA of the cell. The DNA of all cells is made up of chromosomes.



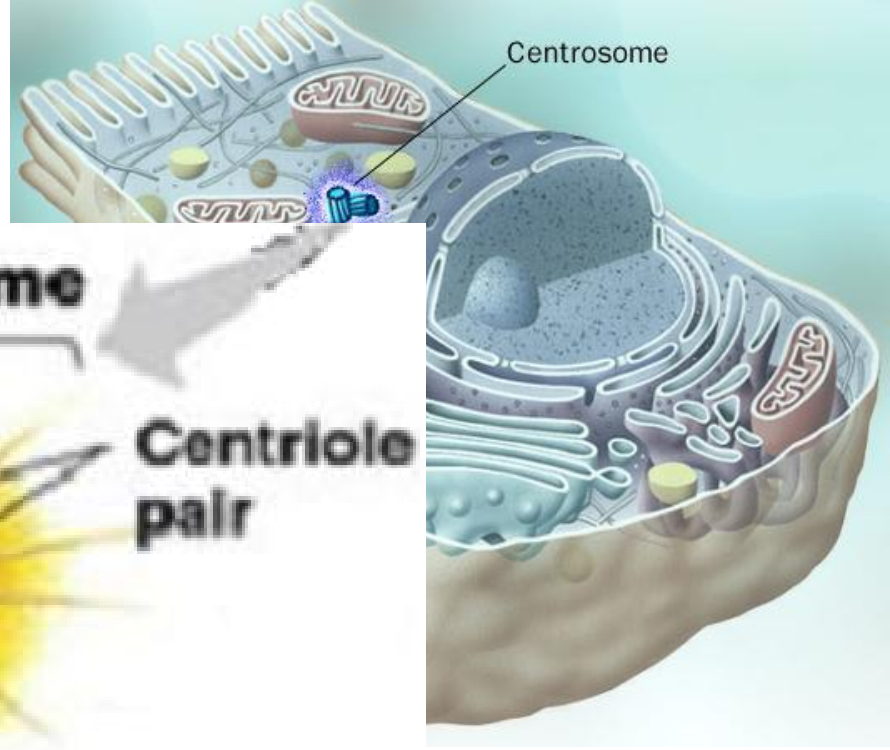
Nucleolus - found inside nucleus; responsible for making ribosomes

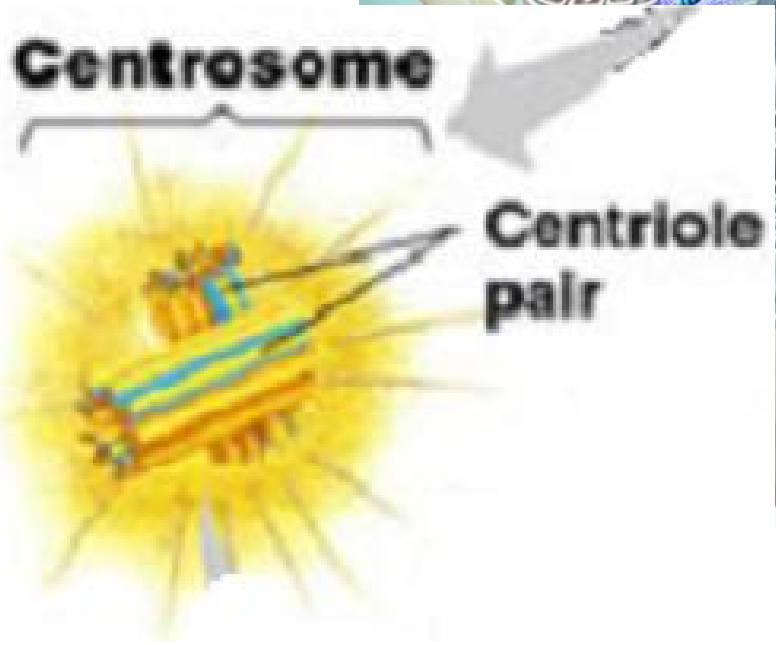
NUCLEAR MEMBRANE/ENVELOPE – surrounds nucleus

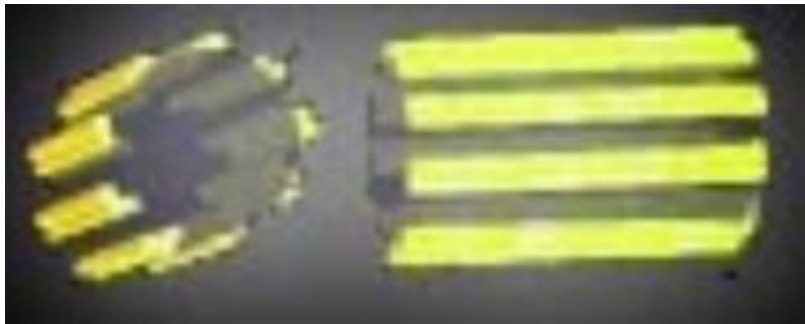
Nuclear pores - circles on the surface of the nucleus
- pores are where ribosomes are found
- regions where other materials move in and out of the cell.

CENTROSOME

- where microtubules are made
- divides and moves to opposite sides of the dividing cell
- present only in animal cells
- microtubule organizing center



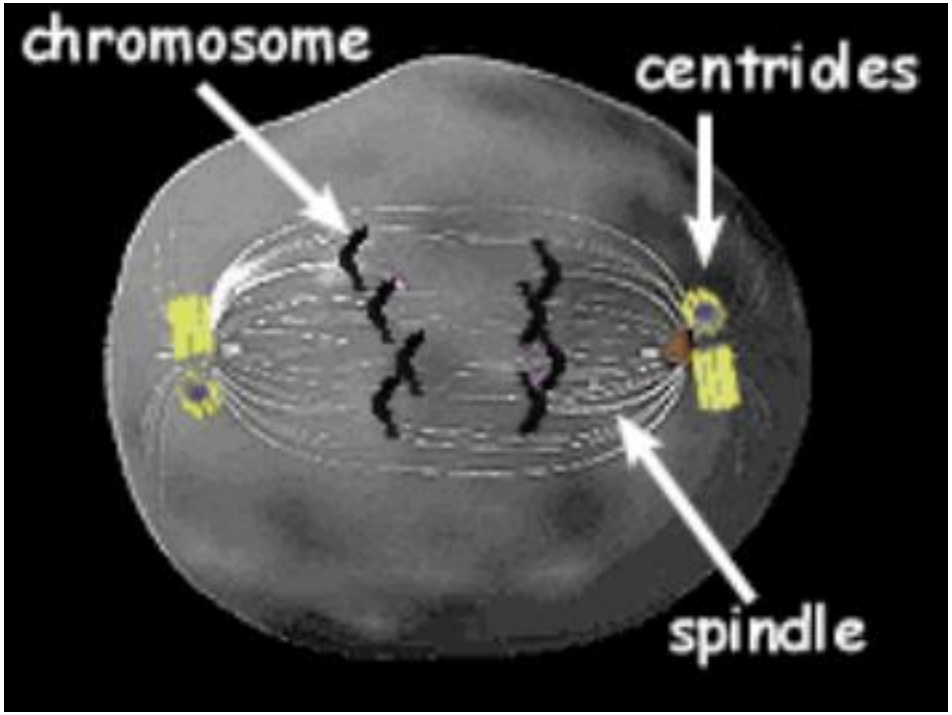




Centrioles

- are arranged such that one is perpendicular to the other.

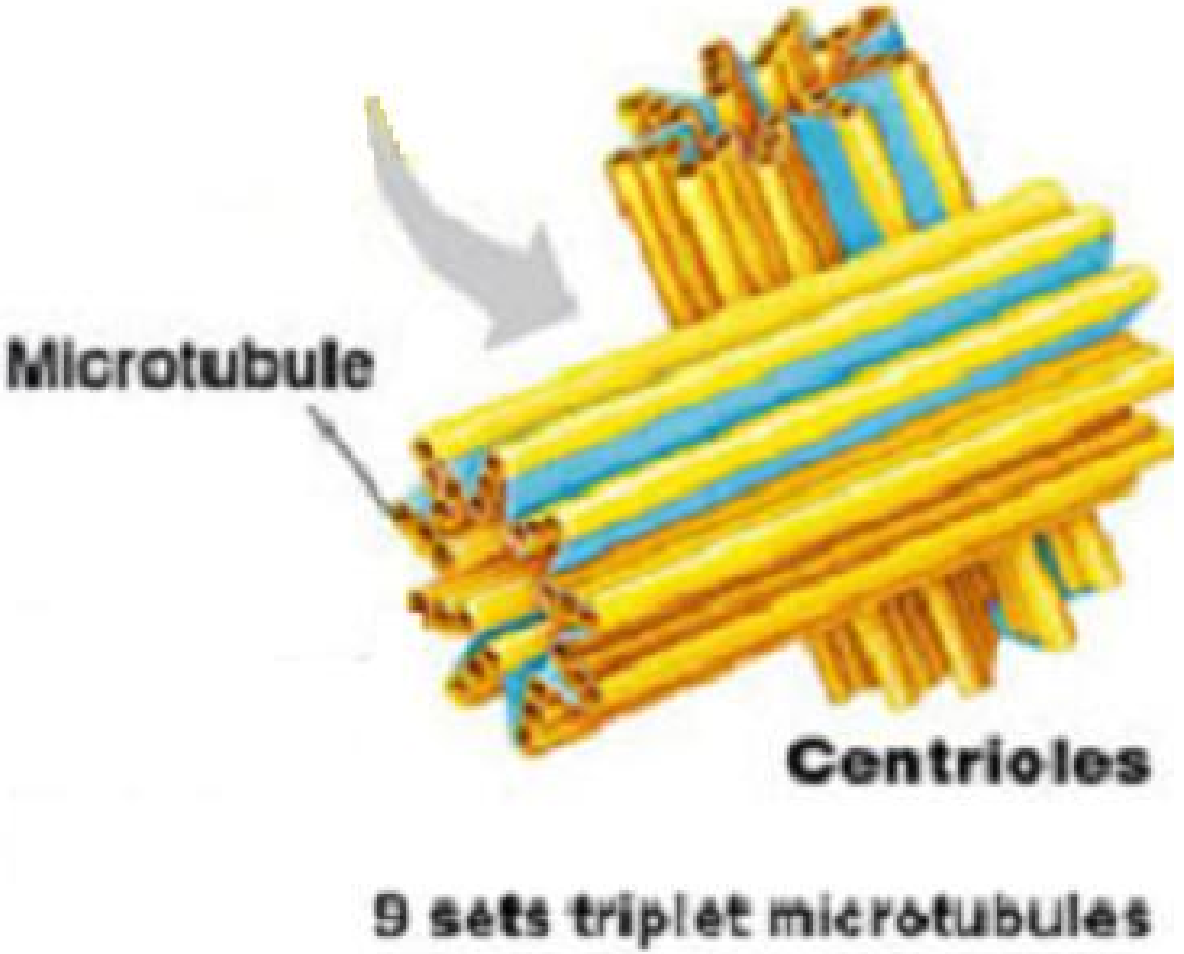
During animal cell division, the centrosome divides and the centrioles replicate (make new copies). The result is two centrosomes, each with its own pair of centrioles. The two centrosomes move to opposite ends of the nucleus, and from each centrosome, microtubules grow into a "spindle" which is responsible for separating replicated chromosomes into the two daughter cells.



MICROTUBULES

- **shaped like soda straws**

- gives shape to the nucleus and cell



Mitochondria

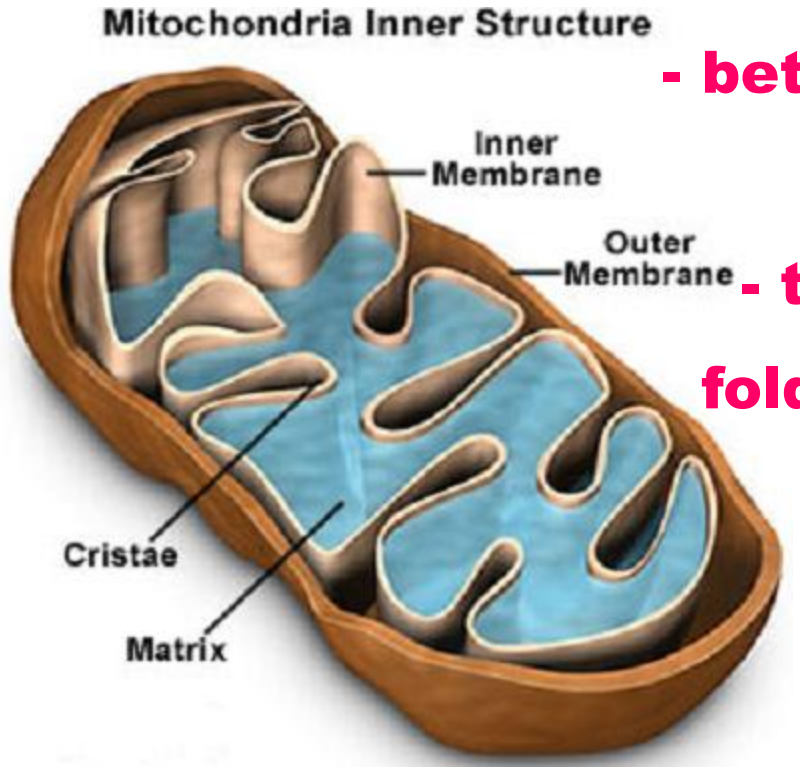
-membrane-enclosed organelles

- converts potential energy of food molecules into ATP

- consists of the following:

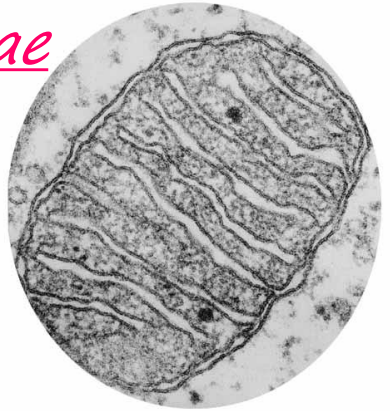
- an *outer membrane* that encloses the entire structure

-an *inner membrane* that encloses a fluid-filled matrix



- between the two is the *intermembrane* space

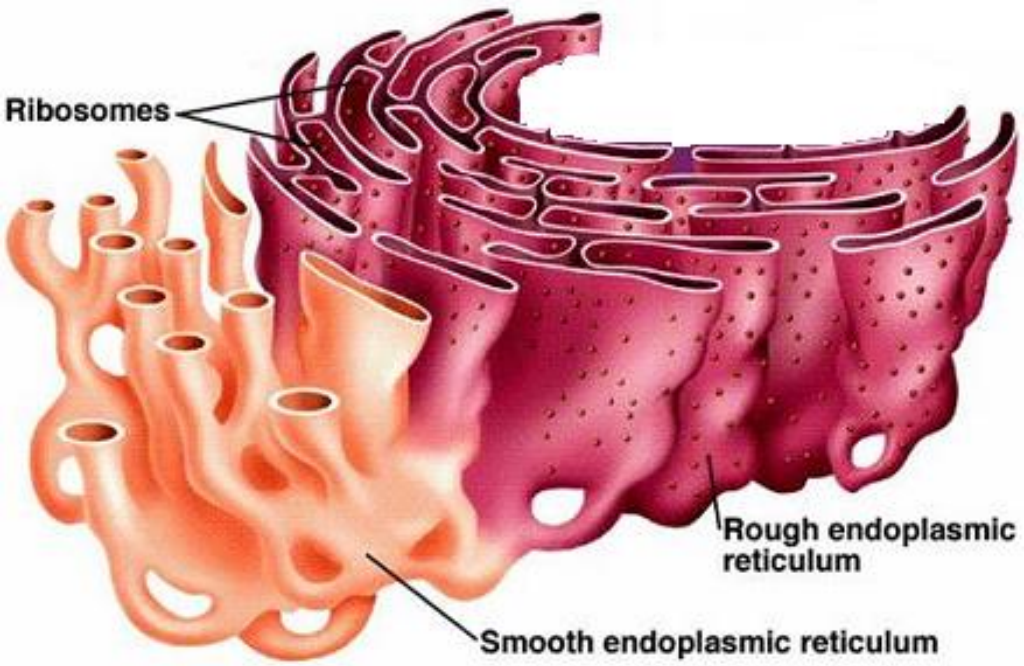
- the inner membrane is elaborately folded with shelflike *cristae* projecting into the *matrix.*



Endoplasmic reticulum

(ER)- a network of membranes throughout the cytoplasm of the cell

-where most protein synthesis occurs in the cell. *(ROUGH ER)*

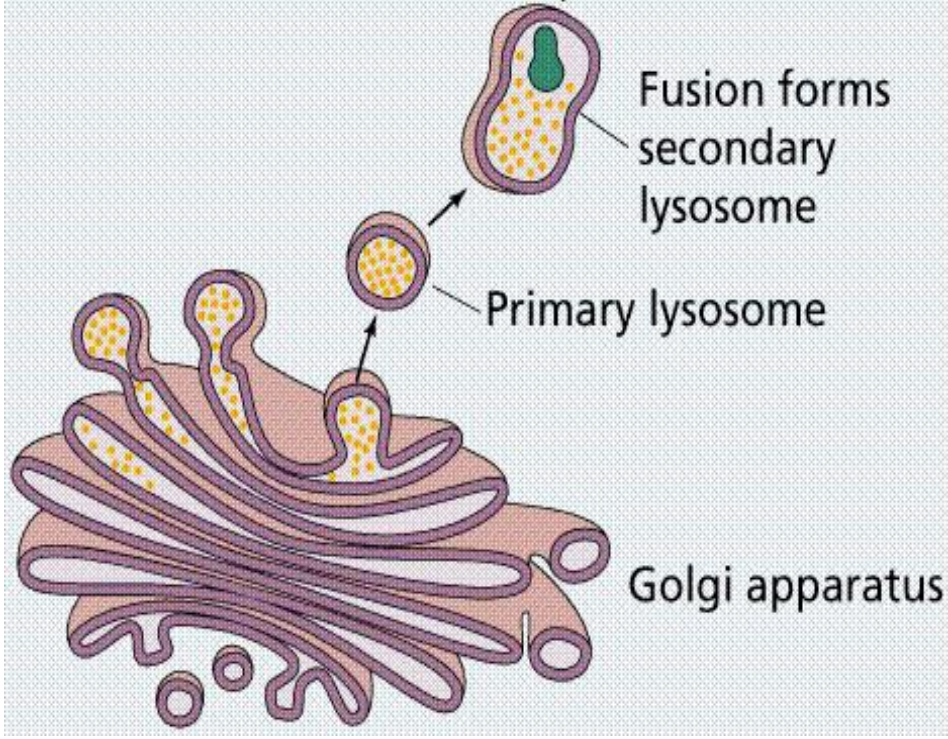


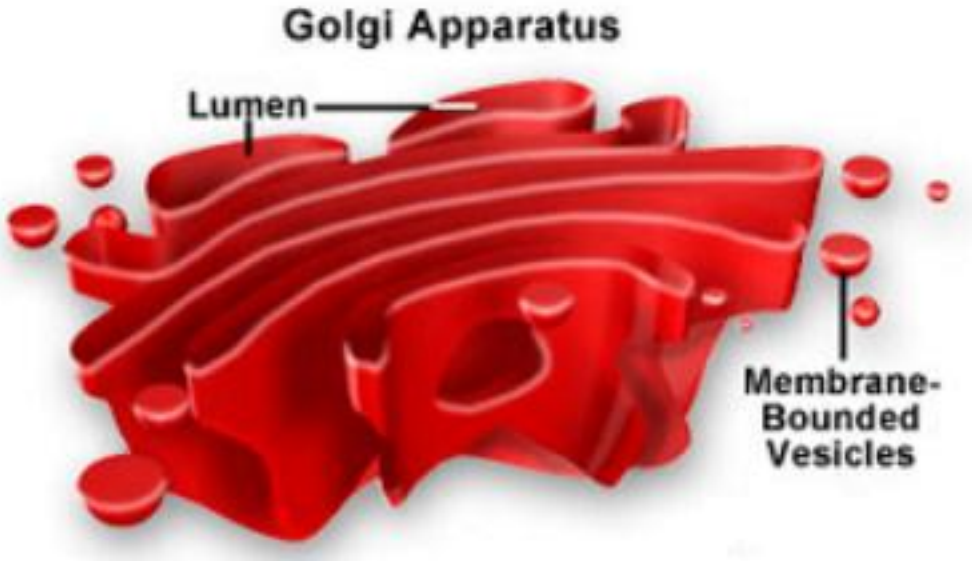
smooth endoplasmic reticulum

- **synthesize lipids in the cell**
- **helps in the detoxification of harmful substances in the cell.**

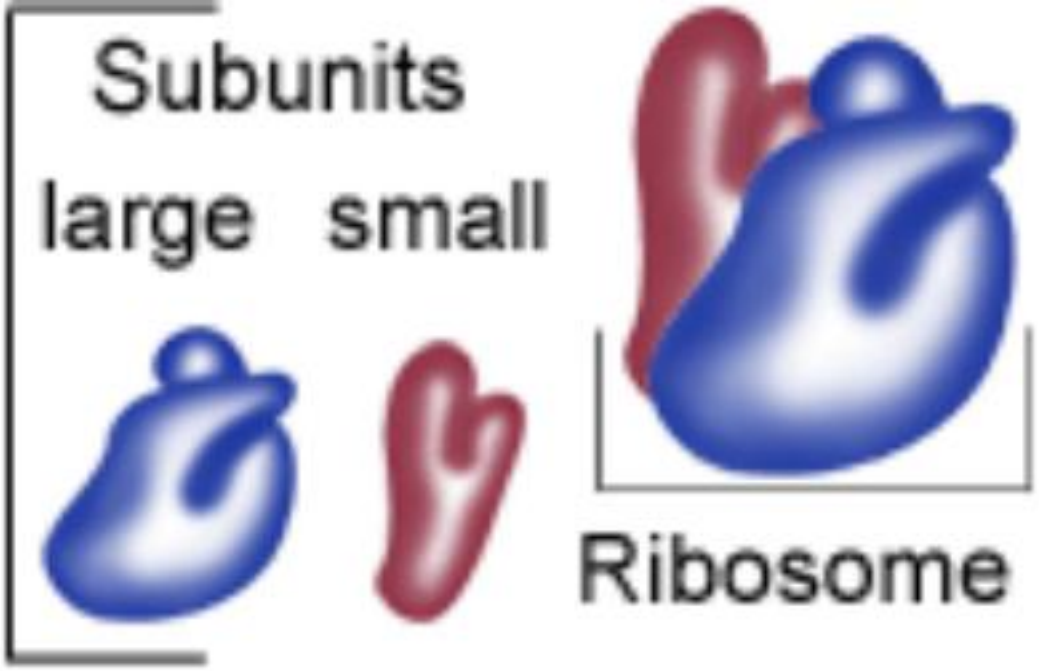
Golgi complex

-responsible for sorting and correctly shipping the proteins produced in the ER. (important step in protein synthesis)





If the Golgi complex makes a mistake in shipping the proteins to the right address, certain functions in the cell may stop.

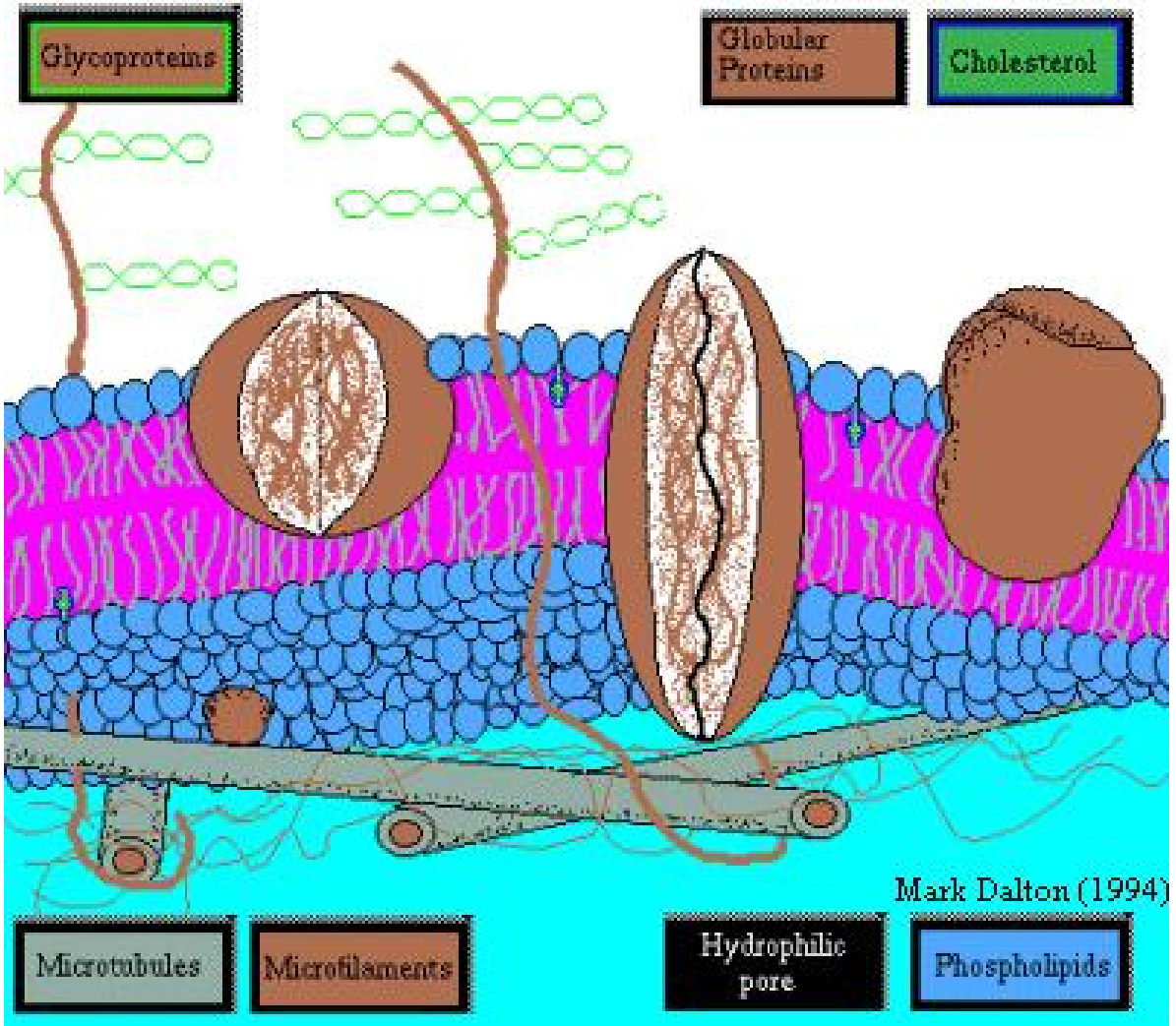


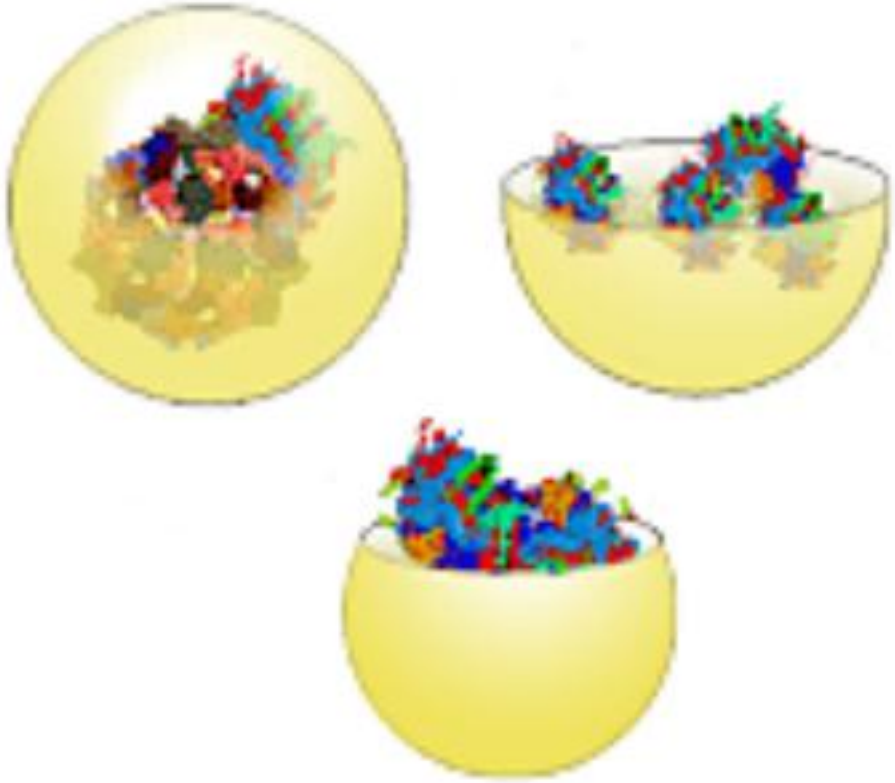
Ribosomes

-help in the synthesis of proteins.
-necessary for protein synthesis in the cell

Some ribosomes are found in the cytoplasm, but most are attached to the endoplasmic reticulum. While attached to the ER, ribosomes make proteins that the cell needs and also ones to be exported from the cell for work elsewhere in the body.

The fluid mosaic model describes the structure of the plasma membrane. and one of the most useful is the Fluid-mosaic model. In this model the membrane is seen as a bilayer of phospholipids in which protein molecules are embedded.



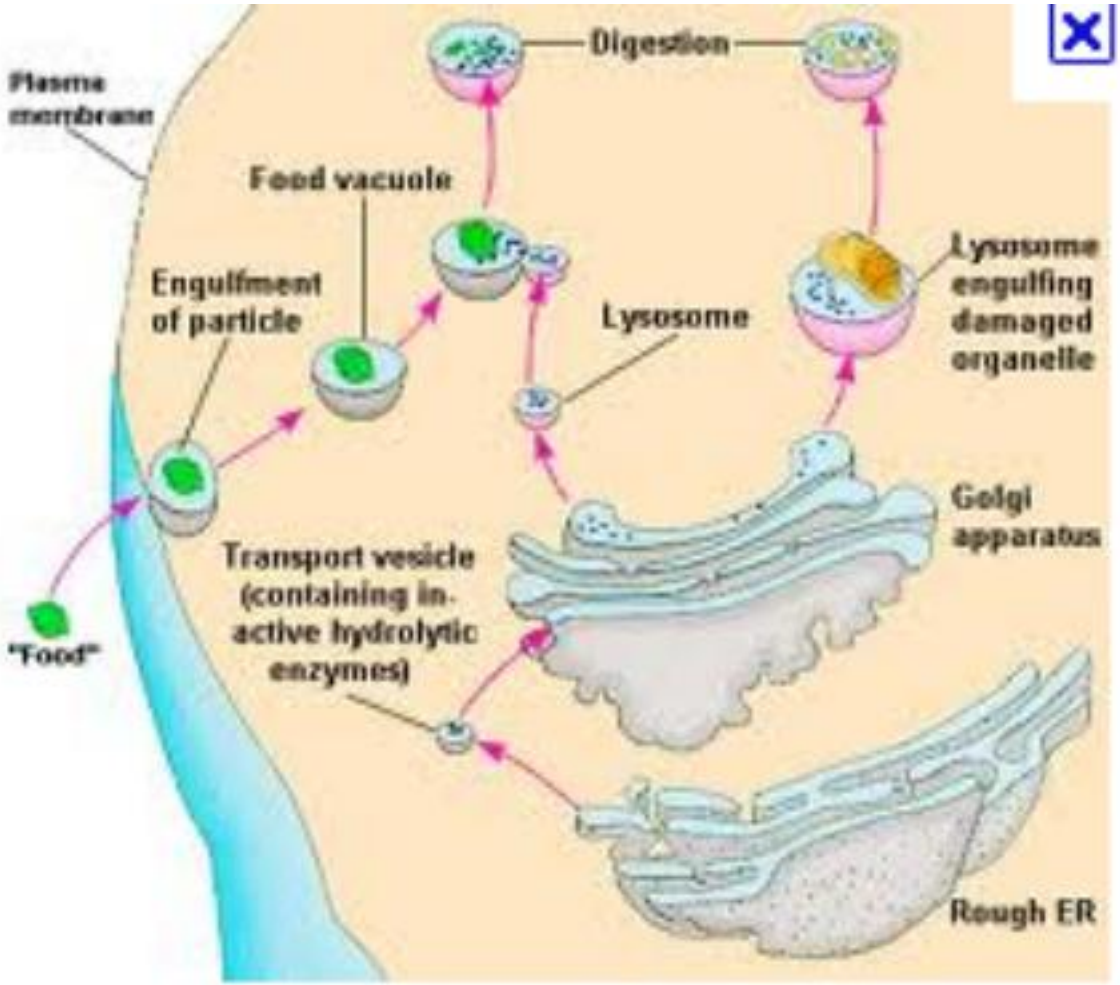


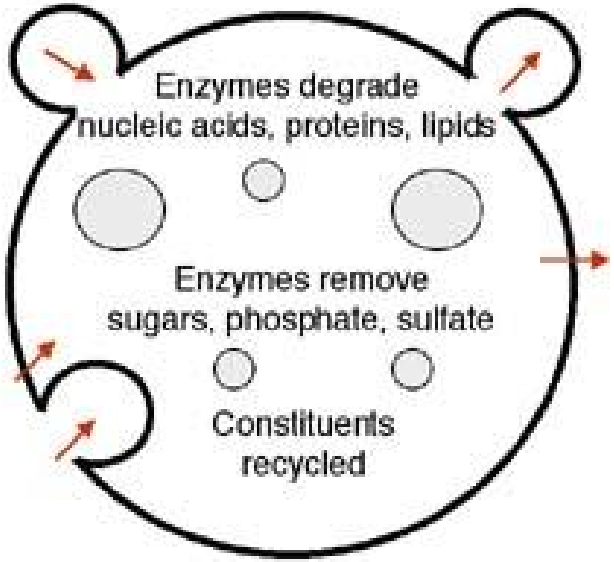
Vesicles

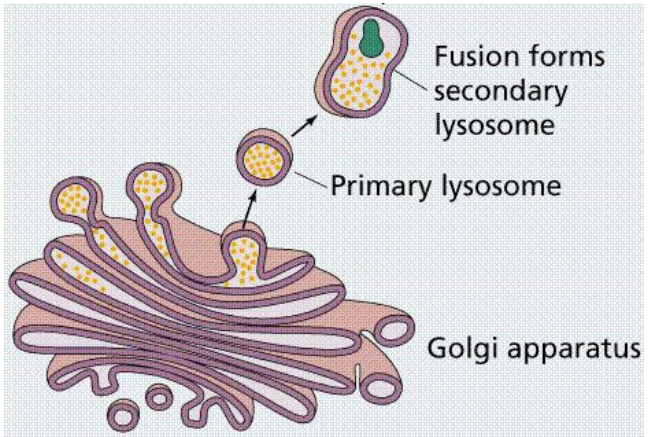
-literally means "small vessel"
-helps store and transport products produced by the cell.
-transport and delivery vehicles like our mail and Federal Express trucks
-deliver materials to parts of the cell and others transport materials outside the cell

Lysosomes

- function as the cell's recycling compartment.





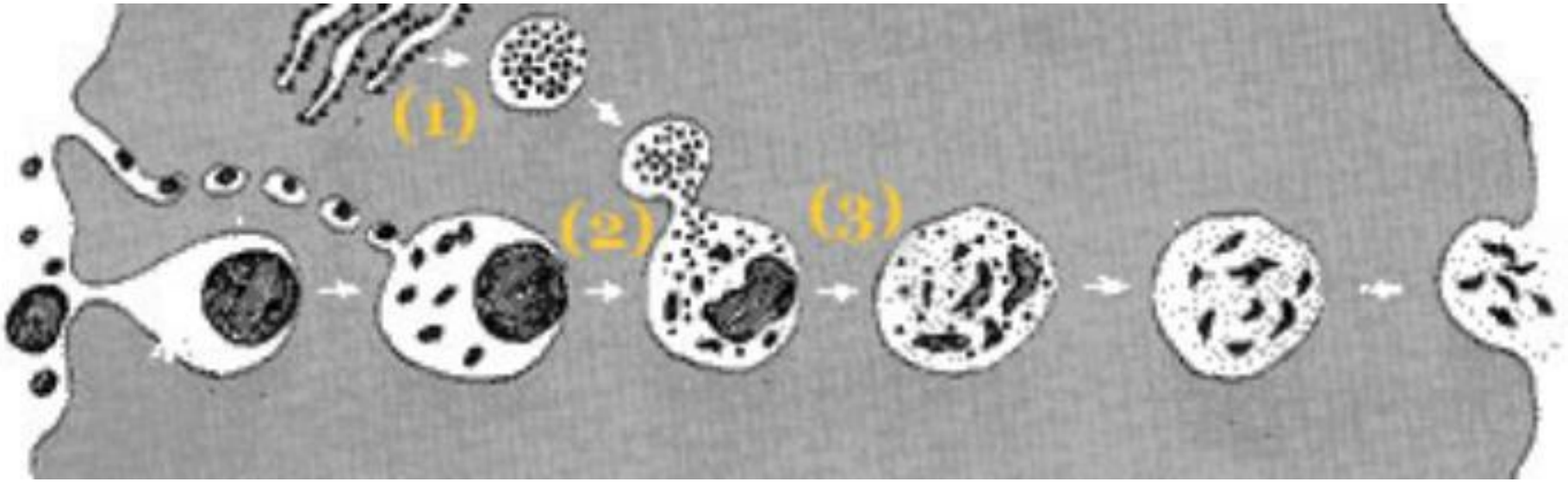


Steps in lysomal formation

(1) The ER and Golgi apparatus make a lysosome

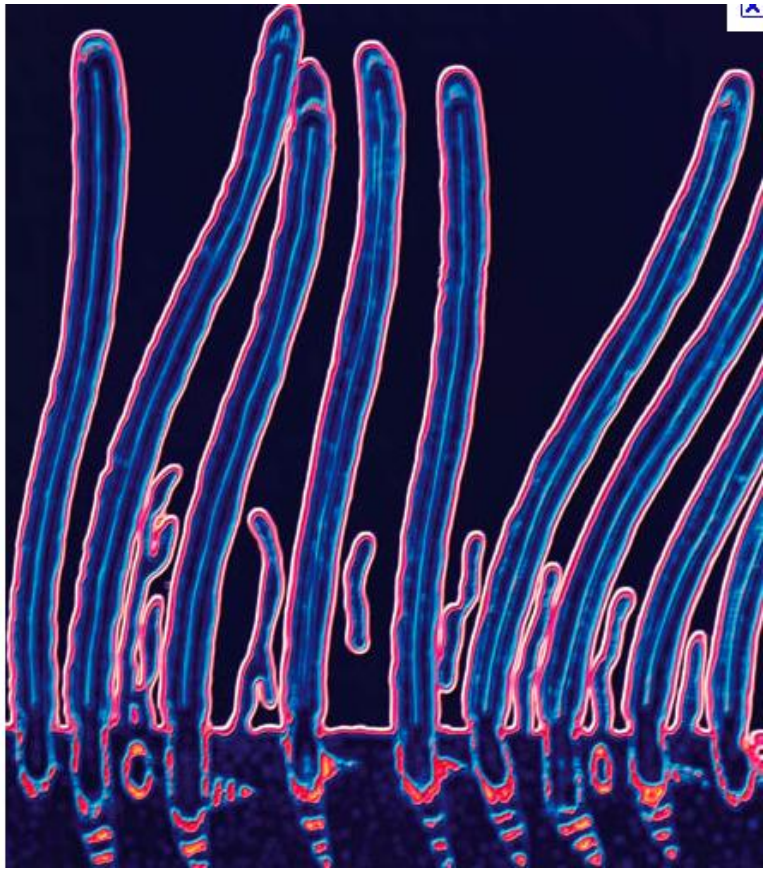
(2) (2) The lysosome fuses with a digestive vacuole
(3) Activated acid

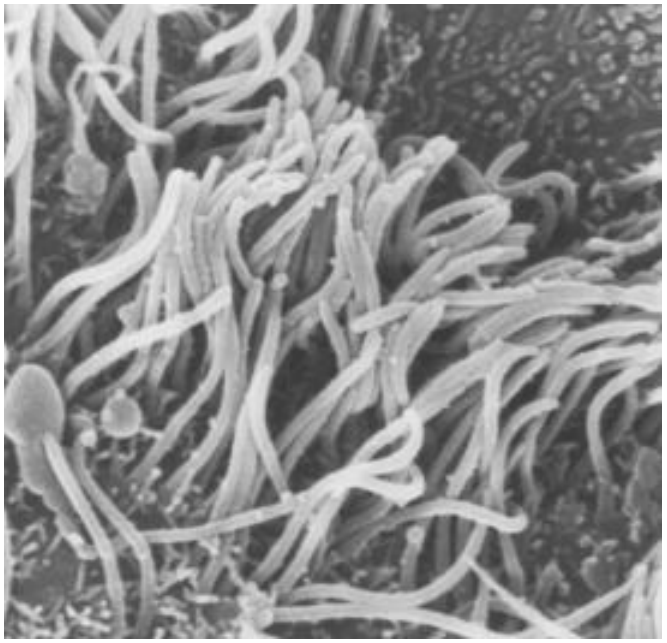
(3) hydrolases digest the contents



•*cilia*

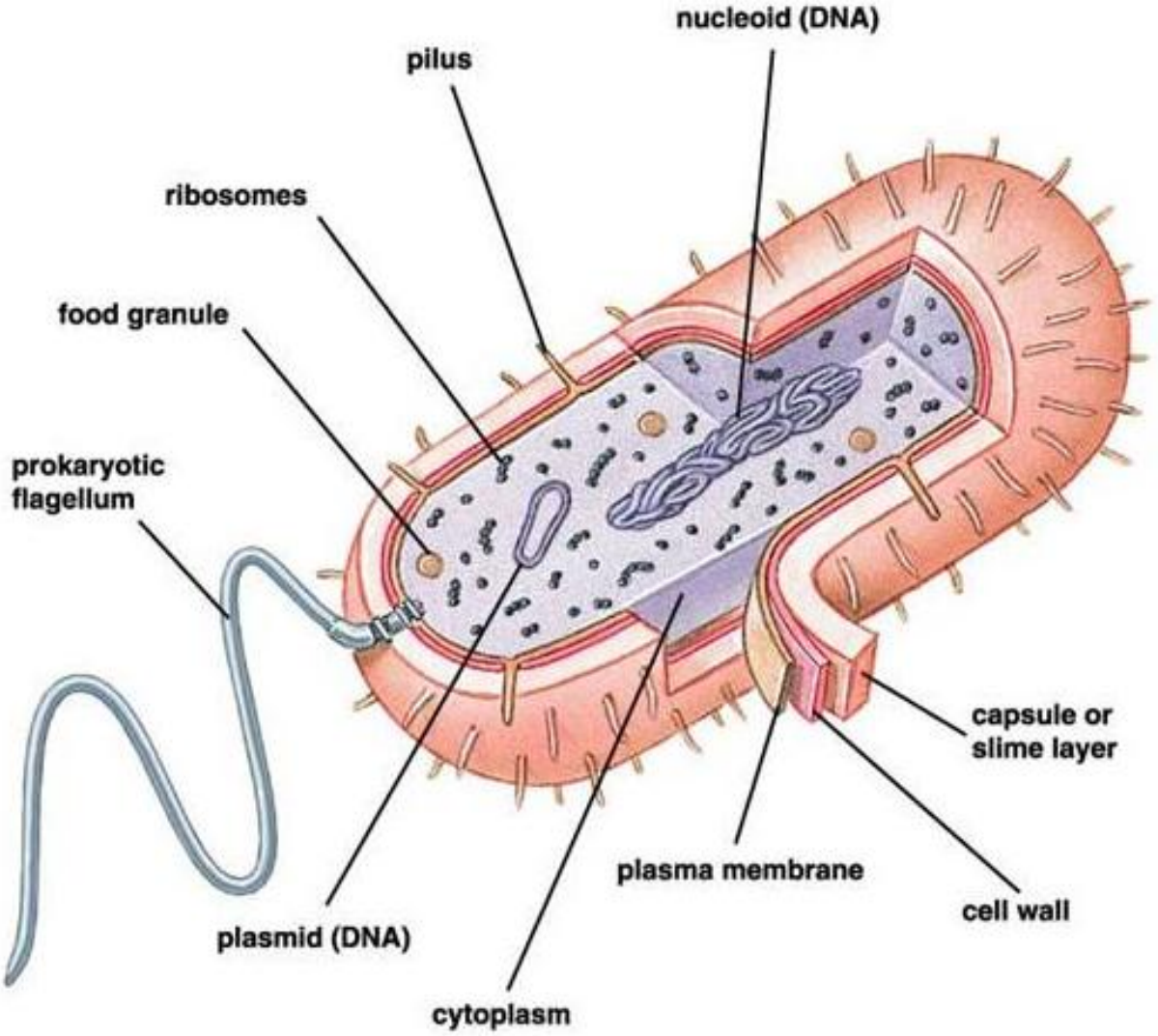
- are thread-like projections of certain cells that beat in a regular fashion to create currents that sweep materials along

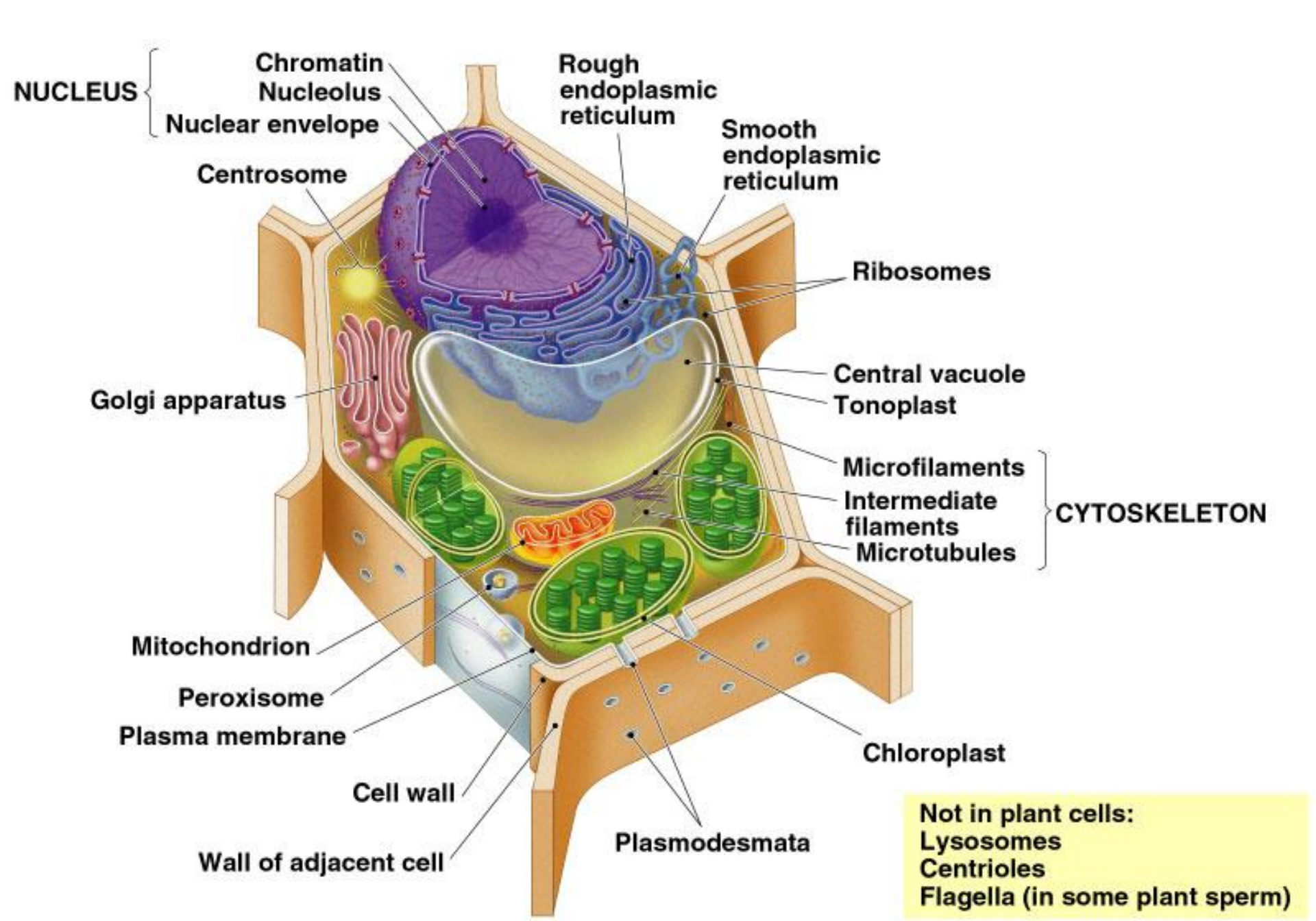


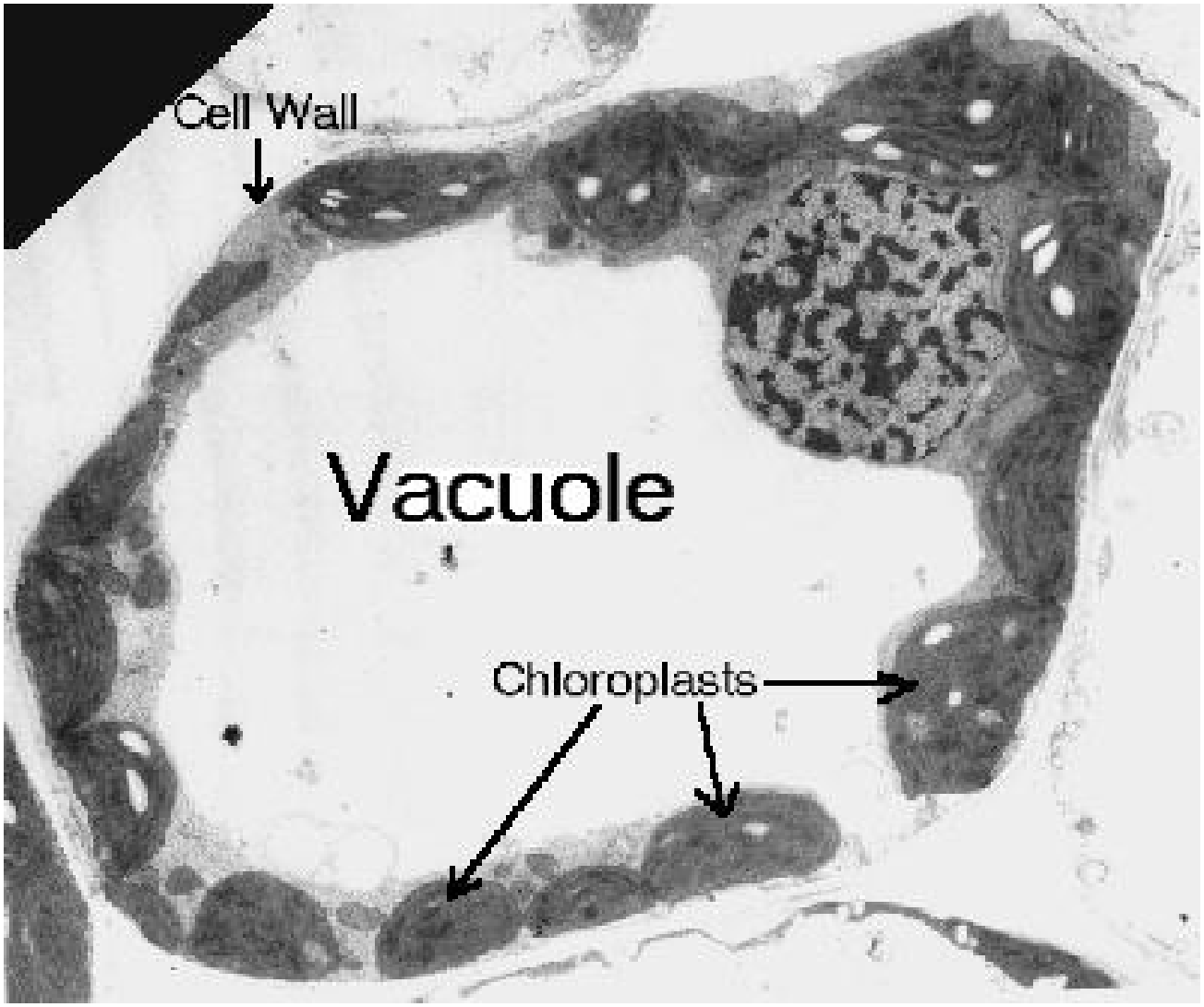


Flagella

- may extend to the rear of a cell and push it forward by snakelike wriggling, or stick out in front and draw it along.






Cell Wall
Vacuole
Chloroplasts

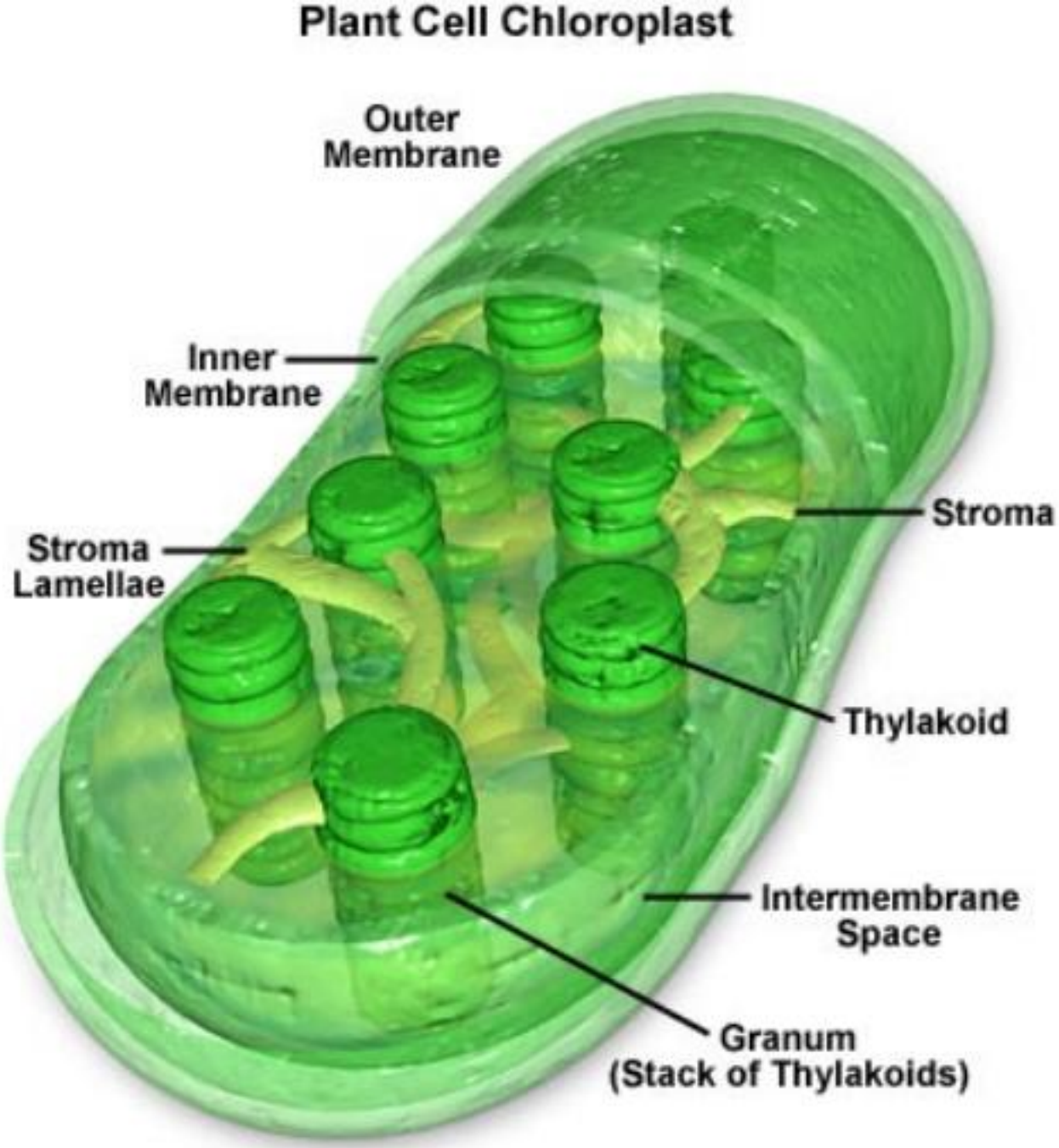
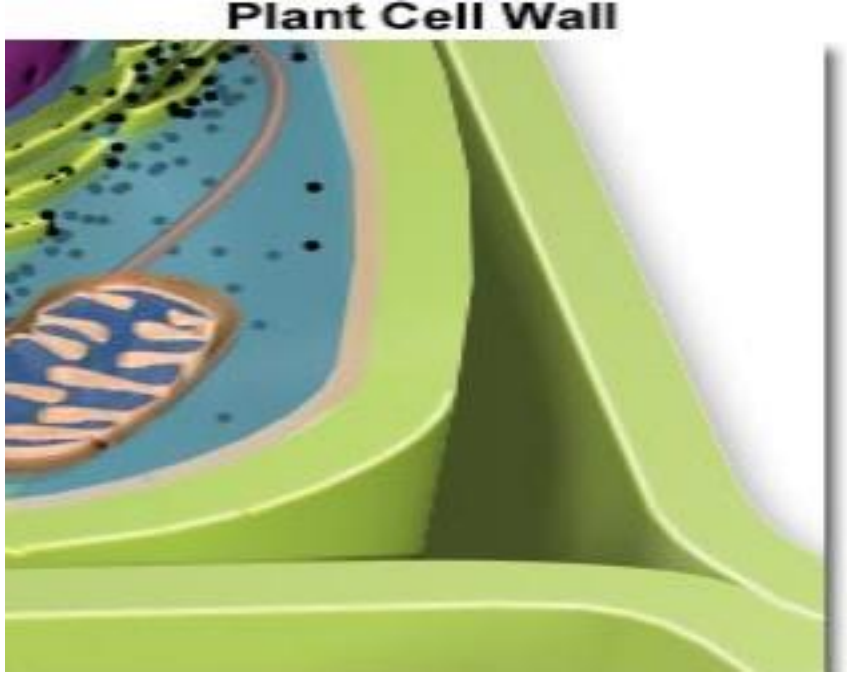

Plant Cell Chloroplast
Outer Membrane
Inner Membrane
Stroma
Stroma Lamellae
Thylakoid
Intermembrane Space
Granum (Stack of Thylakoids)

Figure 1

Chloroplast

-cell organelle in which photosynthesis takes place
-light energy of the sun is converted into chemical energy.
- found only in plant cells not animal cells The chemical energy that is produced by chloroplasts is finally used to make carbohydrates like starch, that get stored in the plant.
-contain tiny pigments called *chlorophylls*
- Chlorophylls are responsible for trapping the light energy from the sun.



cell wall

-protects the cellular contents
-gives rigidity to the plant structure;
-provides a porous medium for the circulation and distribution of water, minerals, and other small nutrient molecules;
-and contains specialized molecules that regulate growth and protect the plant from disease.
-formed from fibrils of cellulose molecules, embedded in a water-saturated matrix of polysaccharides and structural glycoproteins. .

Plasmodesmata

-special openings for entrance of materials which are used to communicate and transport materials between plant cells because the cell membranes are able touch and therefore exchange needed materials.

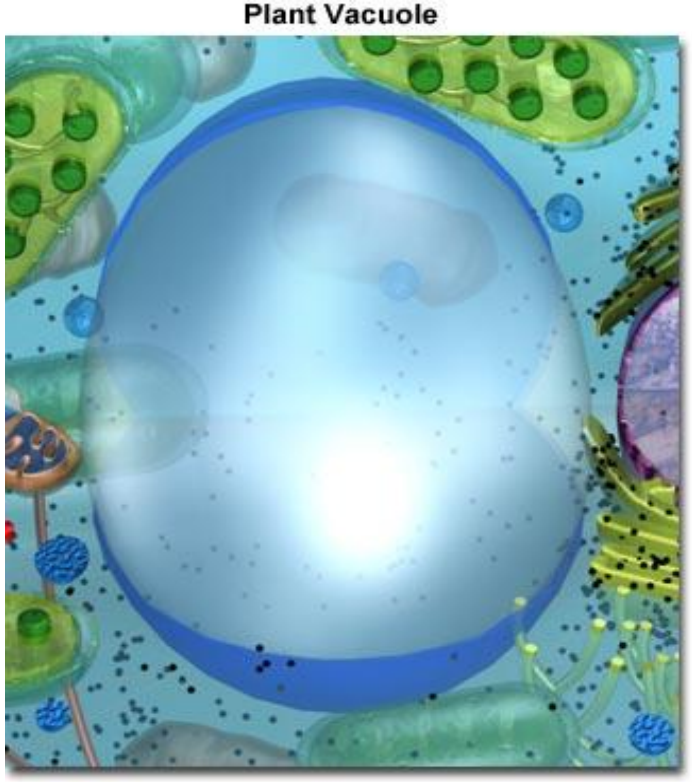
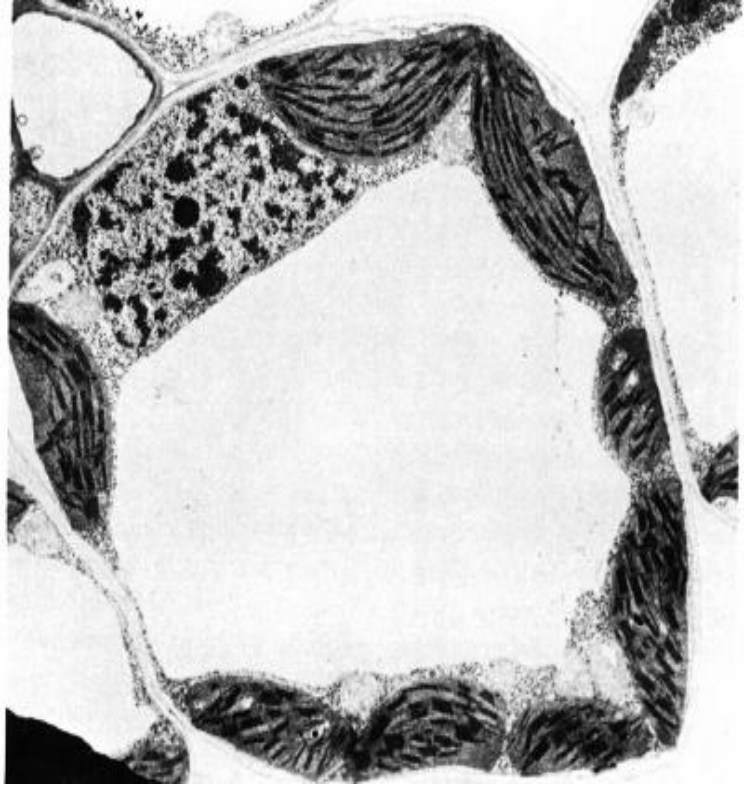
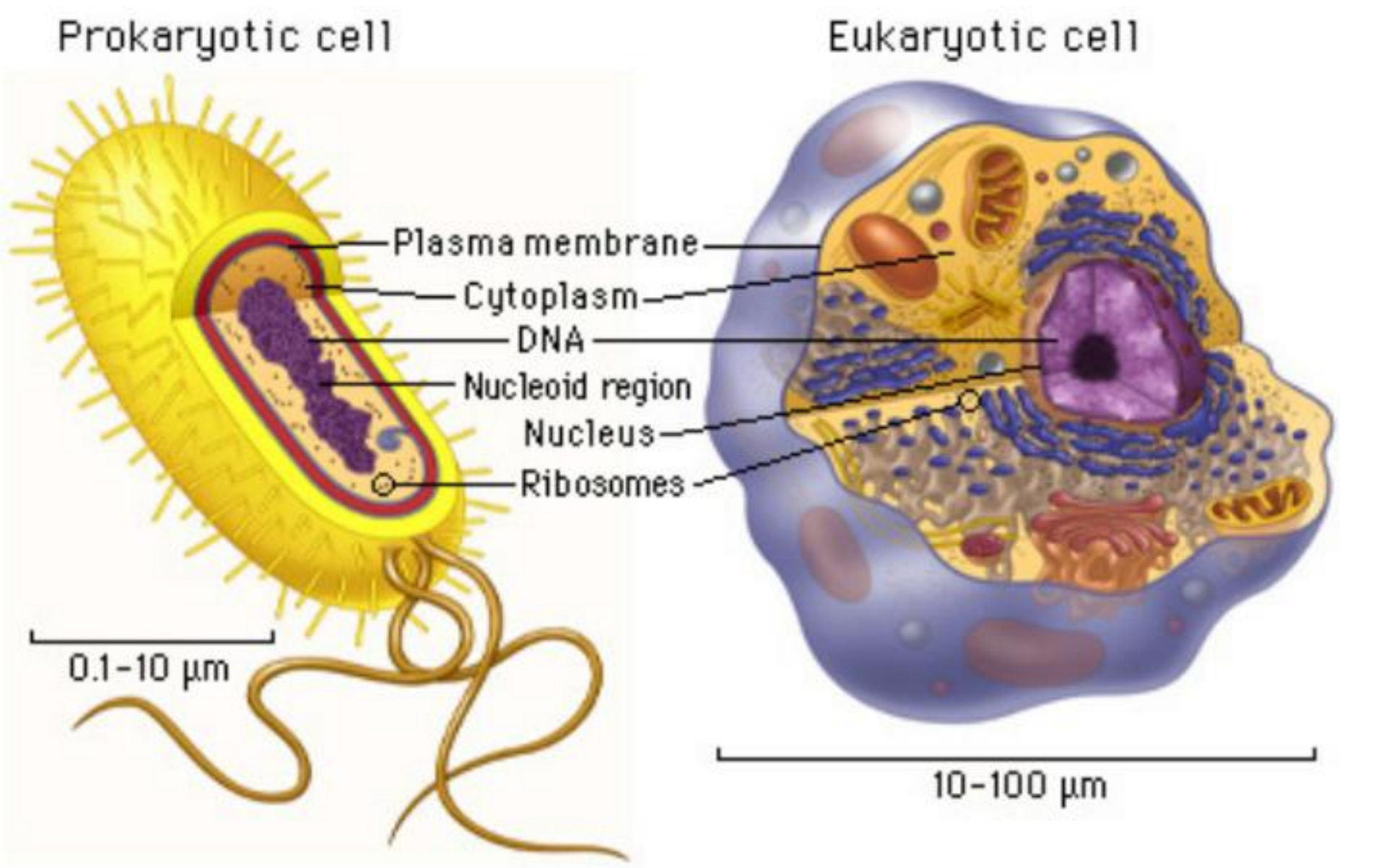


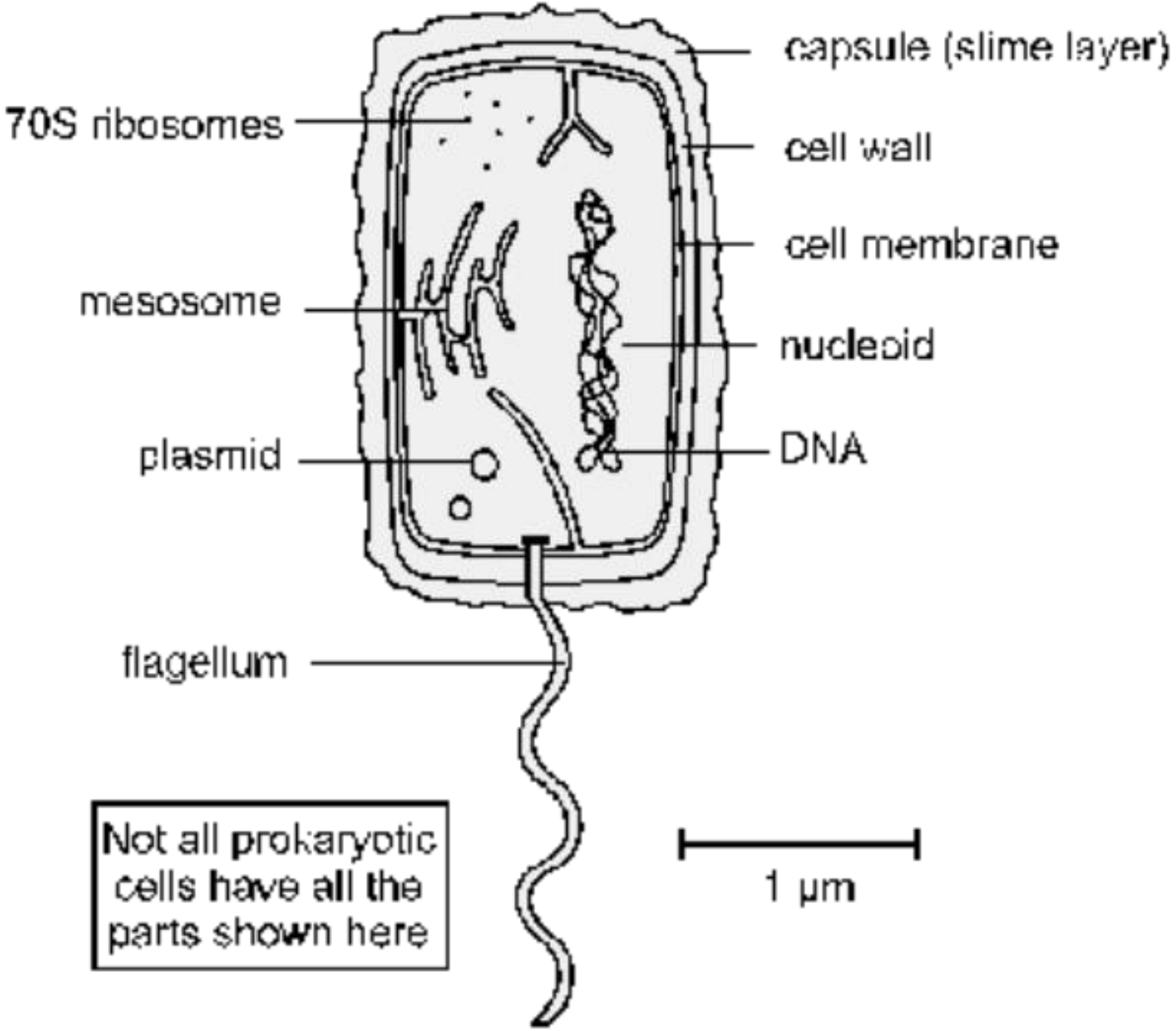
Figure 1



Vacuoles and vesicles are storage organelles in cells. Vacuoles are larger than vesicles. Either structure may store water, waste products, food, and other cellular materials. In plant cells, the vacuole may take up most of the cell's volume.

The membrane surrounding the plant cell vacuole is called the tonoplast.


Prokaryotic cell
Eukaryotic cell
Plasma membrane
Cytoplasm
DNA
Nucleoid region
Nucleus
Ribosomes
0.1–10 µm
10–100 µm


capsule (slime layer)
70S ribosomes
cell wall
cell membrane
mesosome
nucleoid
plasmid
DNA
flagellum
Not all prokaryotic cells have all the parts shown here
1 µm