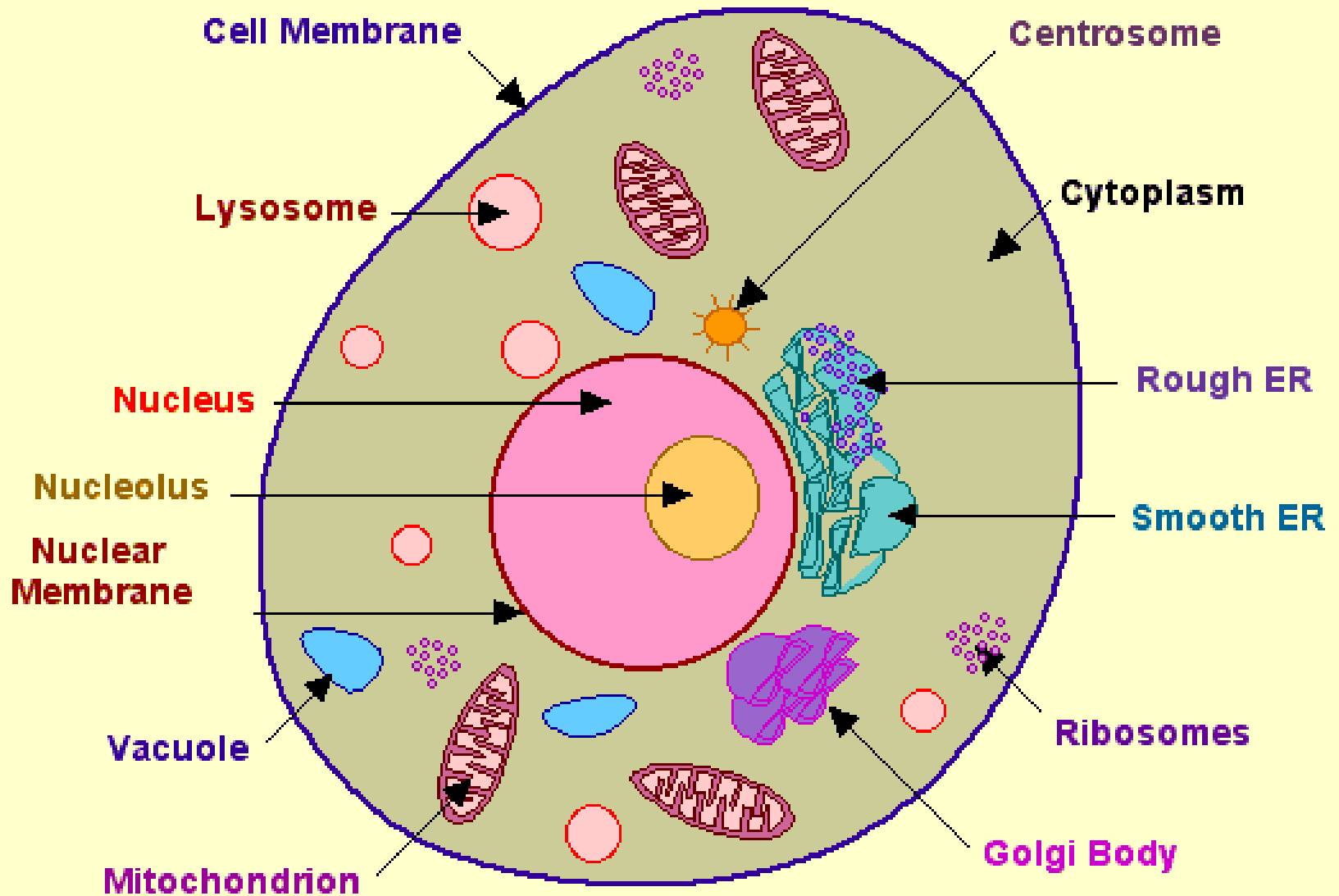
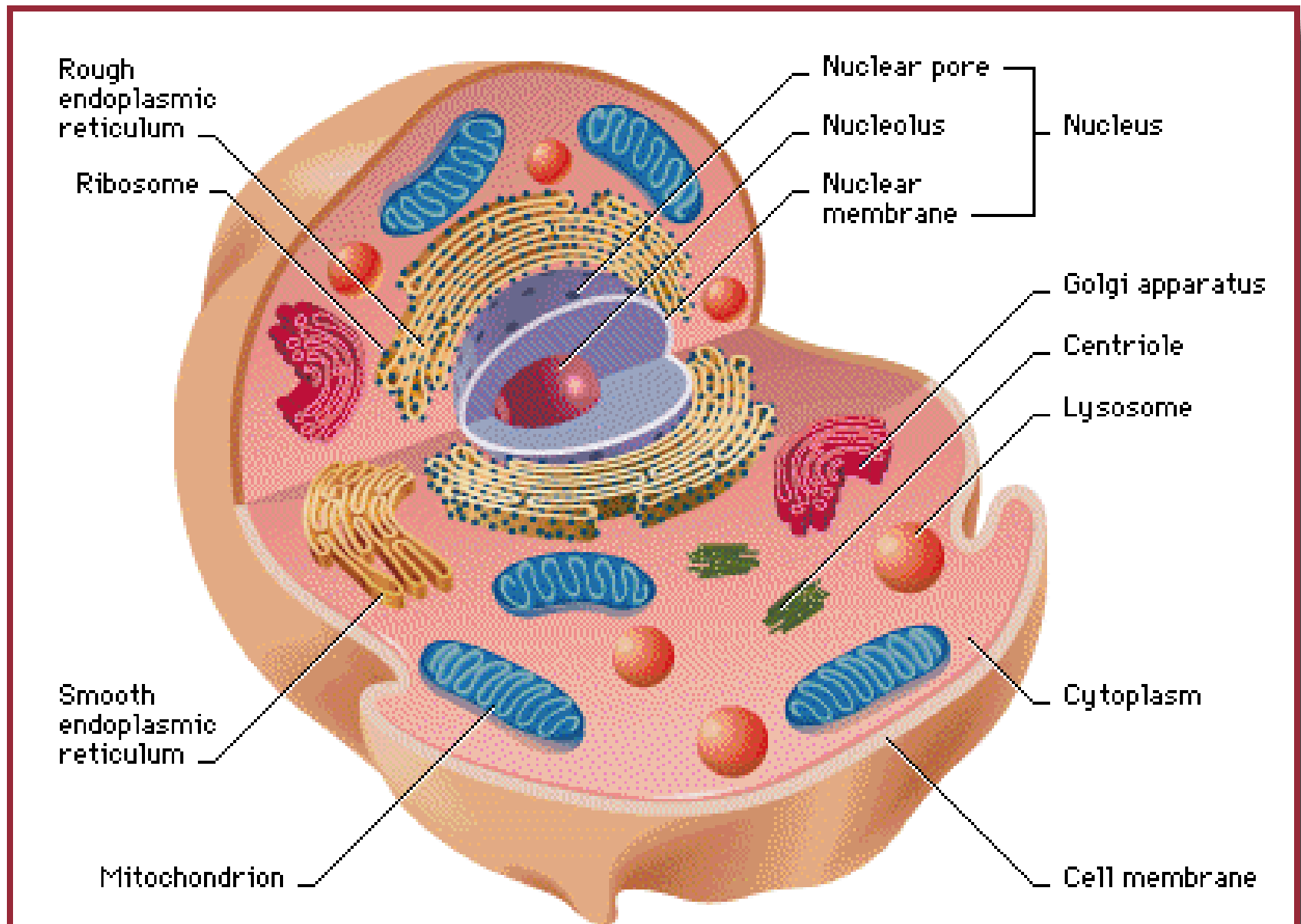


Cross-Section of an Animal Cell





Eukaryotic Animal Cells

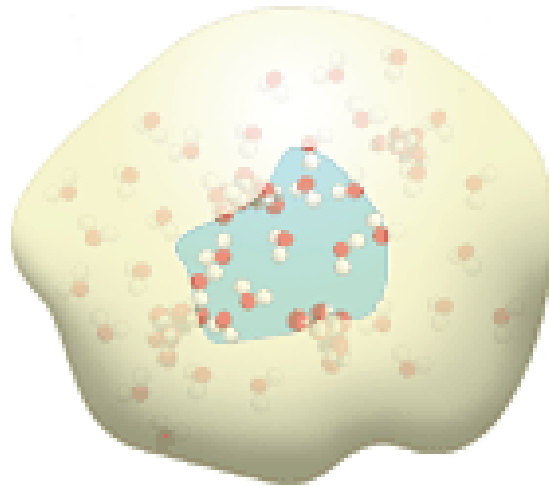
"Cell (biology)," Microsoft® Encarta® Encyclopedia 99.

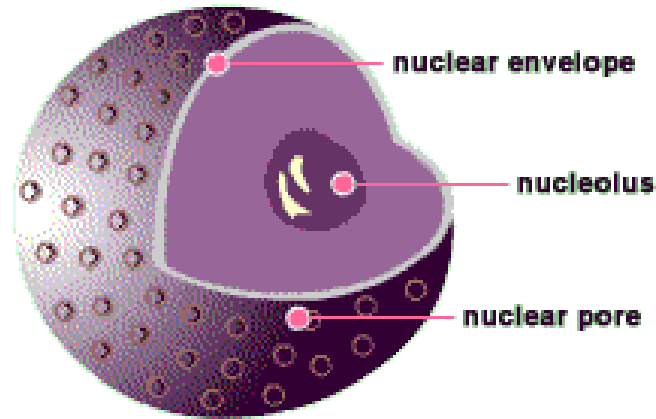
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Cytosol

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

If the organelles were removed, the soluble part that would be left is called the **cytosol**. It consists mainly of water with dissolved substances such as amino acids in it.





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

DNA (Deoxyribonucleic Acid) contains all the information for cells to live, perform their functions and reproduce.

Inside the nucleus is another organelle called the *nucleolus*. The nucleolus is responsible for making ribosomes.

The circles on the surface of the nucleus are the nuclear pores. These are where ribosomes, and other materials move in and out of the cell.

Mitochondria

Mitochondria are membrane-enclosed [organelles](#) distributed through the cytosol of most eukaryotic cells. Their main function is the conversion of the potential energy of food molecules into ATP.

Every type of cell has a different amount of mitochondria.. There are more mitochondria in cells that have to perform lots of work, for example- your leg muscle cells, heart muscle cells etc. Other cells need less energy to do their work and have less mitochondria.



Mitochondria Inner Structure

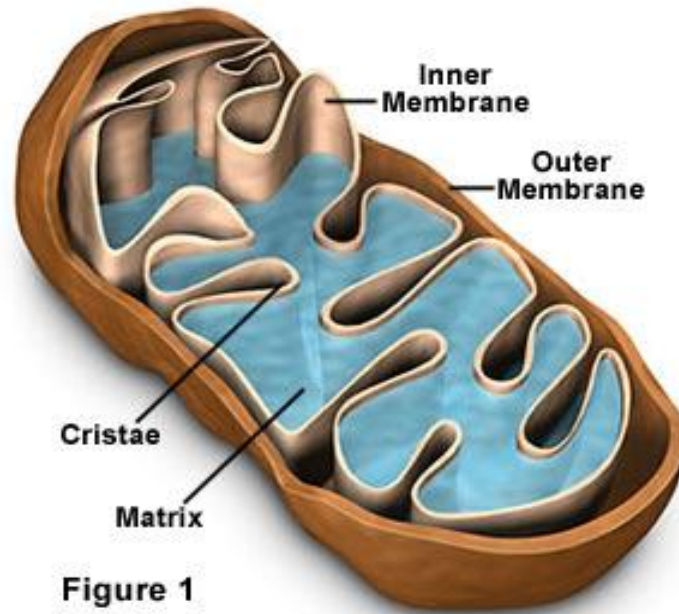


Figure 1

Mitochondria have:

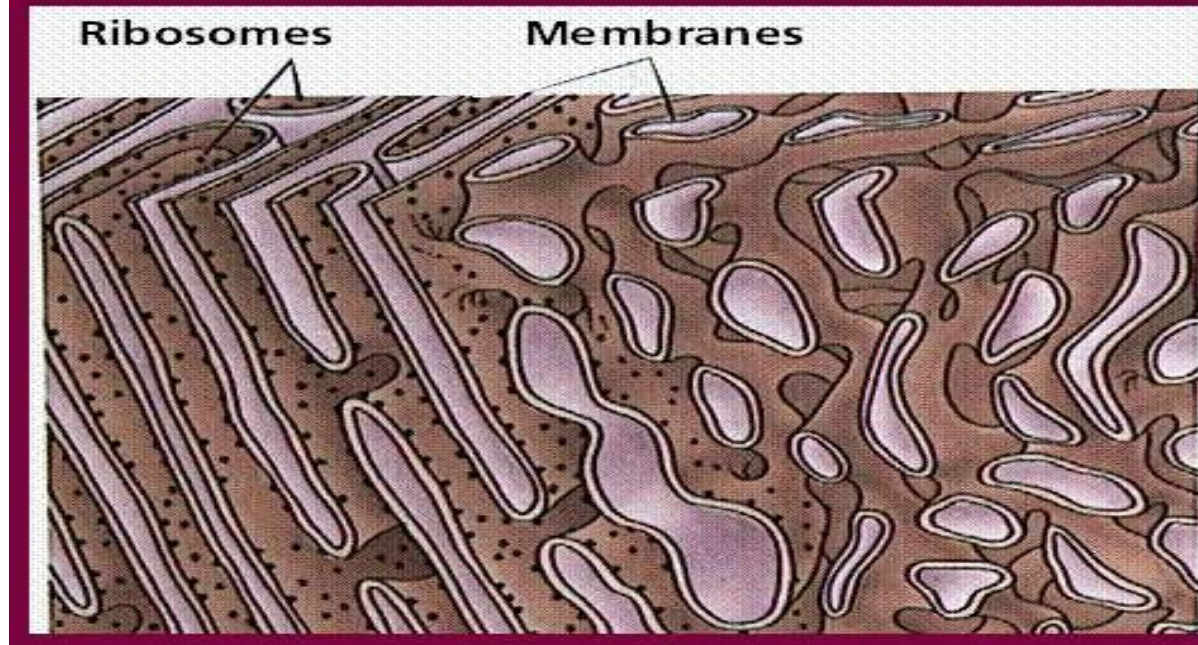
an **outer membrane** that encloses the entire structure

- 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.

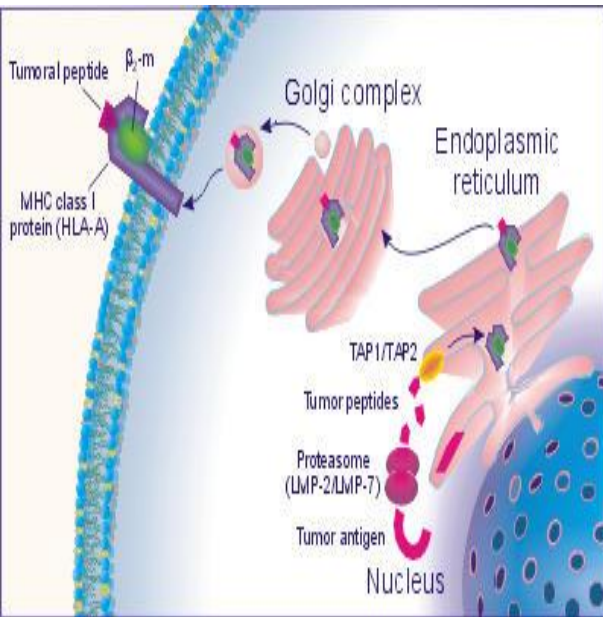
The Endoplasmic Reticulum



Endoplasmic reticulum (ER)- It is a network of membranes throughout the cytoplasm of the cell. There are two types of ER.

When ribosomes are attached it is called rough ER and smooth ER when there are no ribosomes attached.

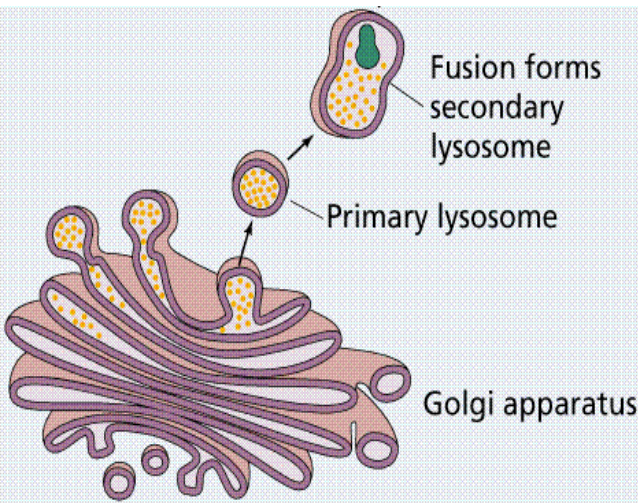
The rough endoplasmic reticulum is where most protein synthesis occurs in the cell. The function of the smooth endoplasmic reticulum is to synthesize lipids in the cell. The smooth ER is also helps in the detoxification of harmful substances in the cell.



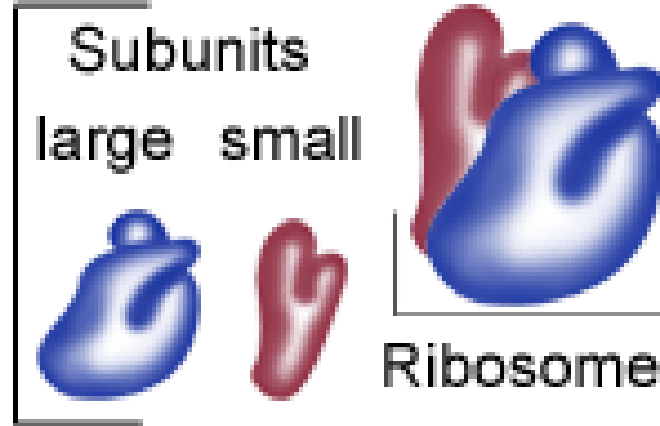
Golgi complex- It is organelle in the cell that is responsible for sorting and correctly shipping the proteins produced in the ER.

Just like our postal packages which should have a correct shipping address, the proteins produced in the ER, should be correctly sent to their respective address.

In the cell, shipping and sorting done by the Golgi complex. It is a very 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.



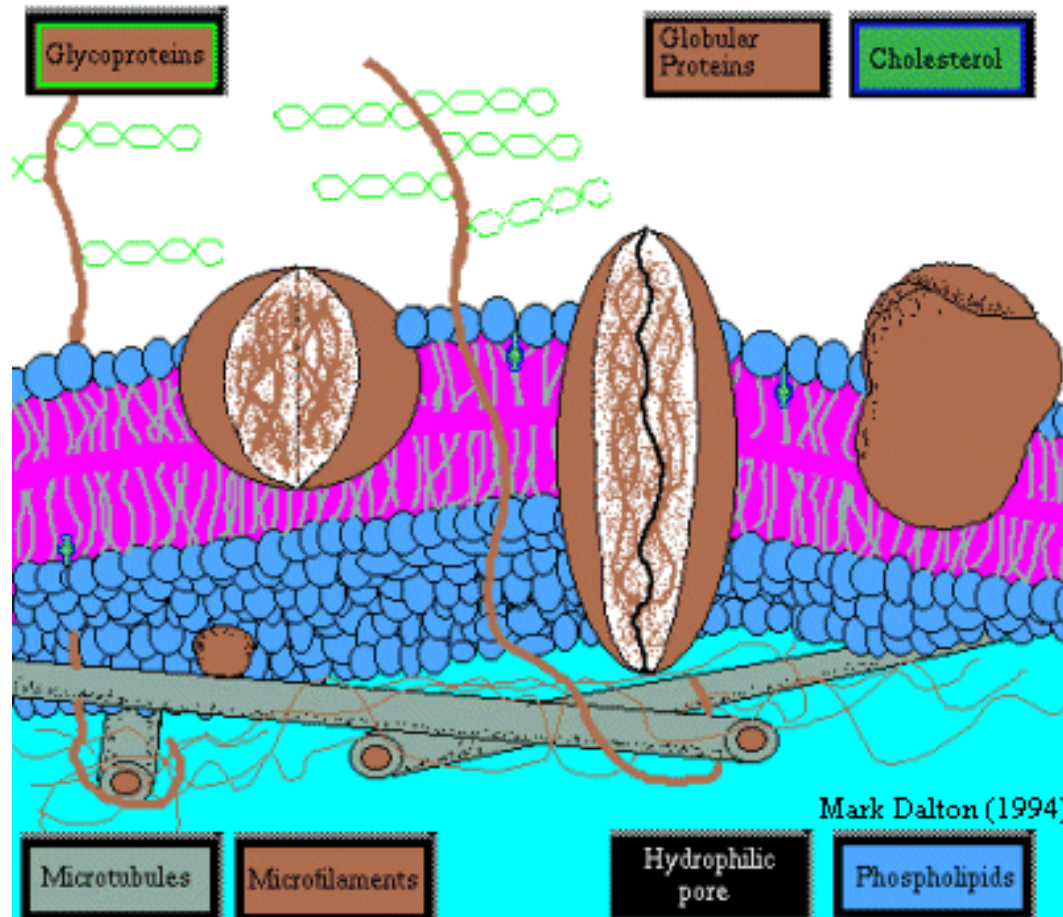
Ribosomes- Organelles that help in the synthesis of proteins. Ribosomes are made up of two parts, called subunits.

They get their names from their size. One unit is larger than the other so they are called large and small subunits.

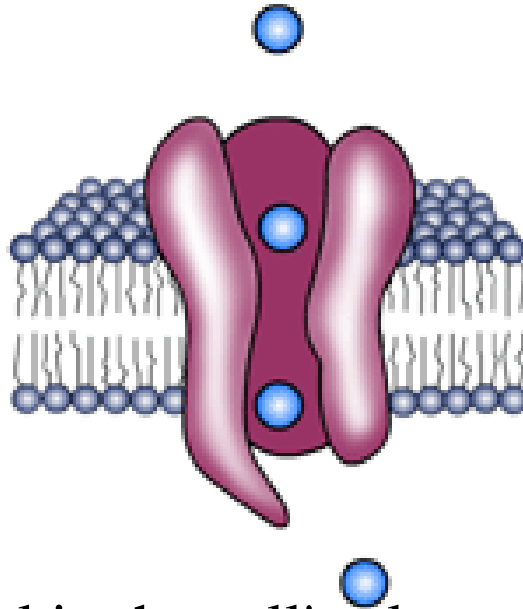
Both these subunits are necessary for protein synthesis in the cell. When the two units are docked together with a special information unit called messenger RNA, they make proteins.

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.

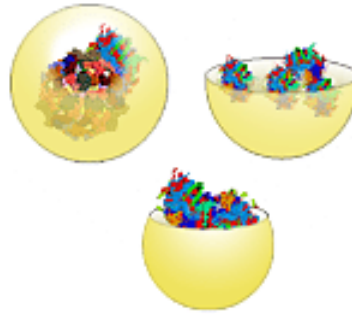
The **fluid mosaic model** describes the structure of the plasma membrane. Different kinds of cell membrane models have been proposed, and one of the most useful is the Fluid-mosaic model. In this model the membrane is seen as a bilayer of phospholipids in which protein molecules are embedded.



An illustration of the Fluid mosaic model



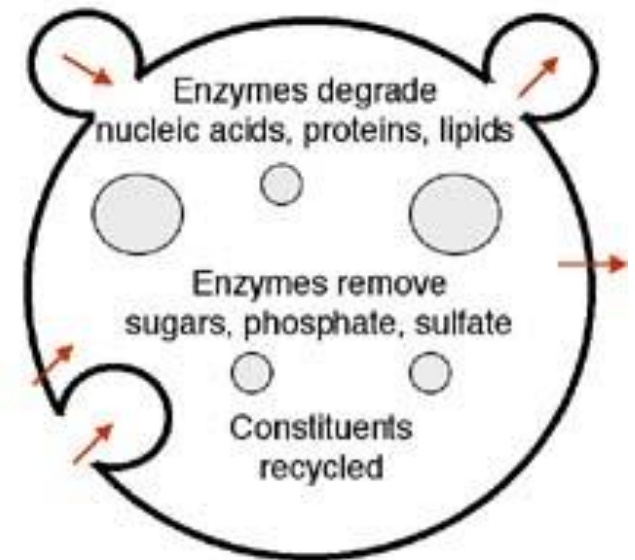
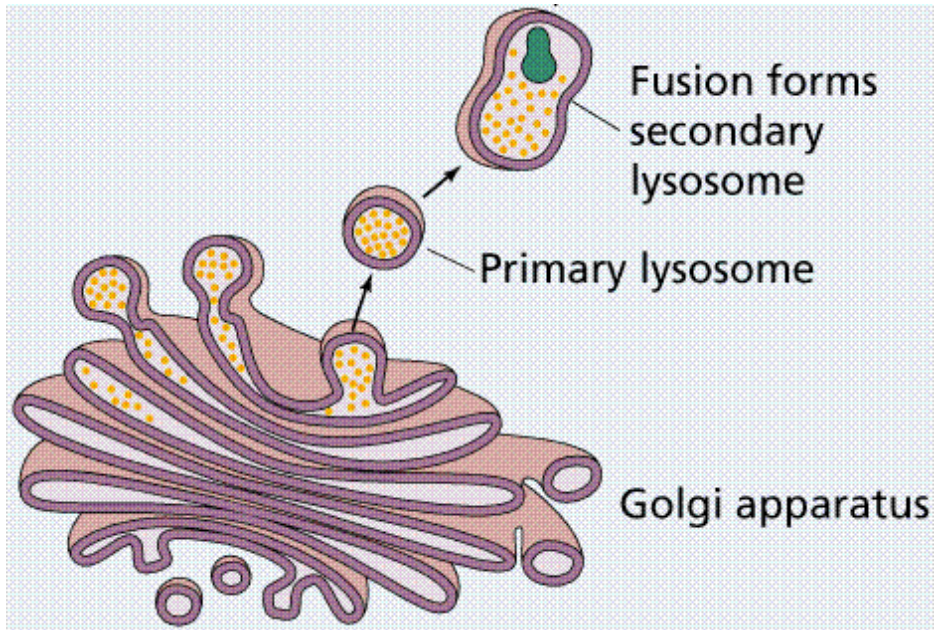
Channels/pores- A channel in the cell's plasma membrane. This channel is made up of certain proteins whose function is to control the movement of food and water into the cell. These channels are made up of certain proteins.



Vesicles- This term literally means "small vessel". This organelle helps store and transport products produced by the cell. The vesicles are the transport and delivery vehicles like our mail and Federal Express trucks. Some vesicles deliver materials to parts of the cell and others transport materials outside the cell in a process called exocytosis

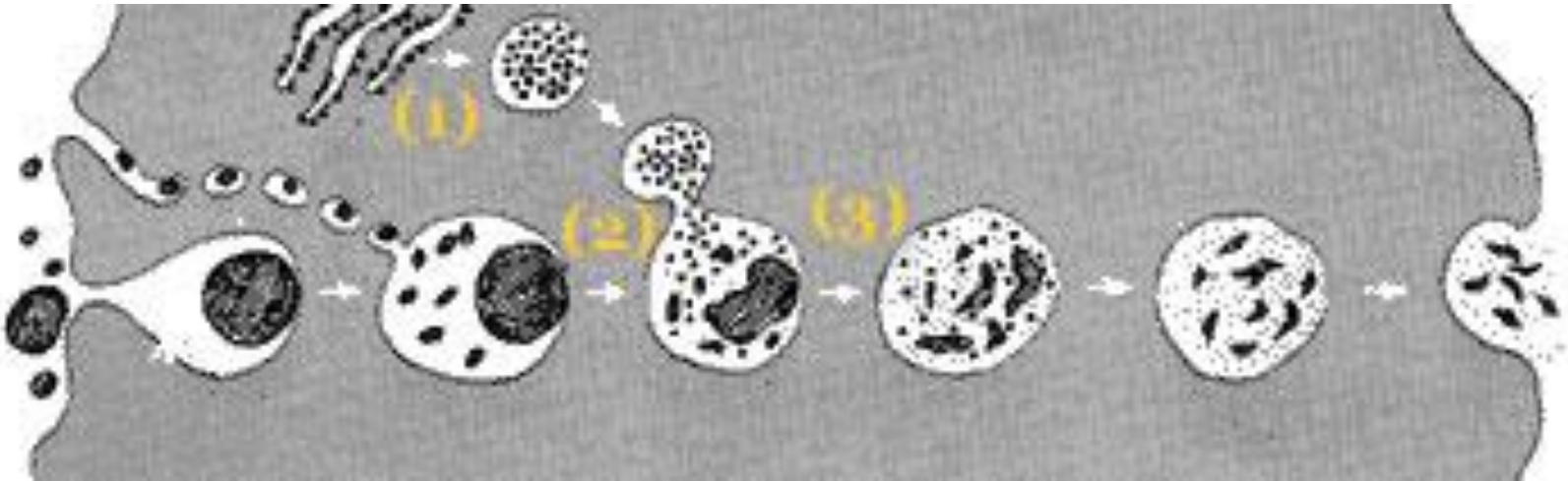
Lysosomes function as the cell's recycling compartment.

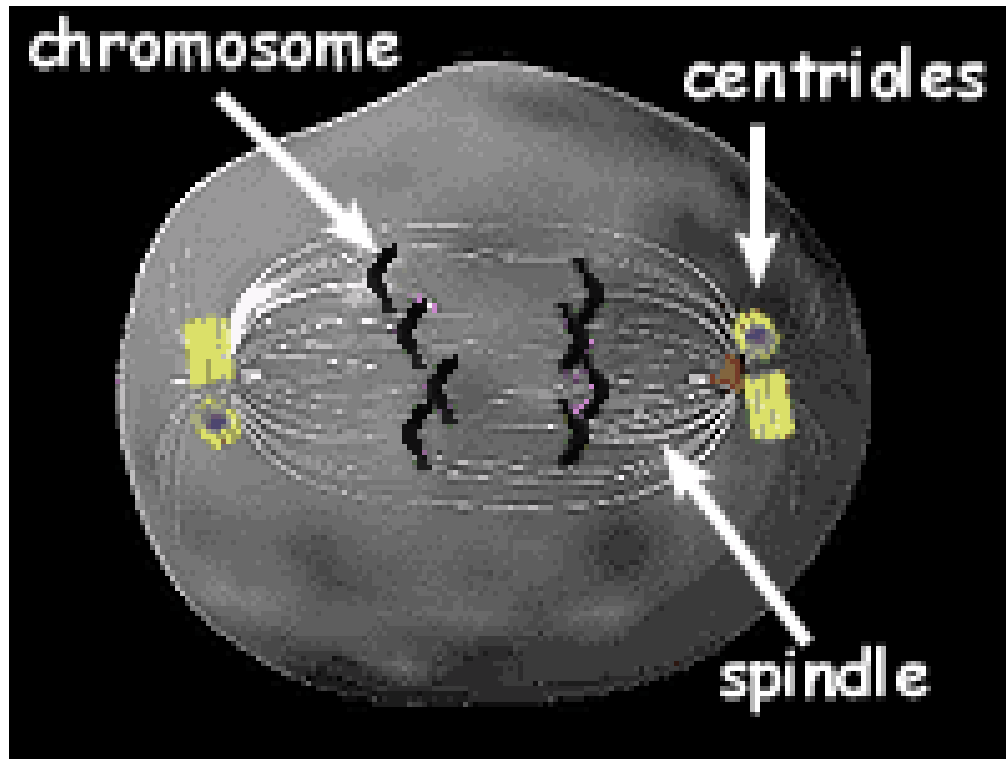
Lysosomes receive cellular and endocytosed proteins and lipids that need digesting. The metabolites that result are transported either by vesicles or directly across the membrane.



Steps in lysosomal formation

- (1) The ER and Golgi apparatus make a lysosome
- (2) The lysosome fuses with a digestive vacuole
- (3) Activated acid hydrolases digest the contents





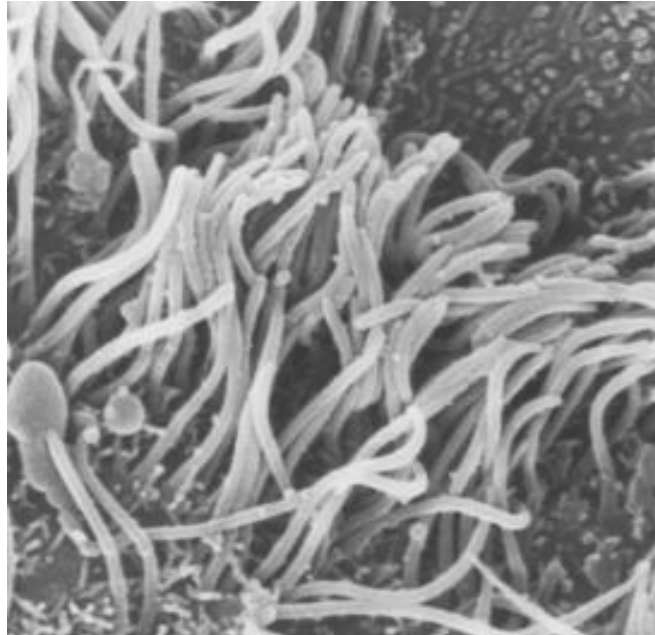
The centrosome, also called the "microtubule organizing center", is an area in the cell where microtubules are produced.

Within an animal cell centrosome there is a pair of small organelles, the centrioles, each made up of a ring of nine groups of microtubules. There are three fused microtubules in each group.

The two 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.

• **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.

We humans possess both flagella and cilia. Each sperm cell is propelled by a trailing flagellum that accelerates the little torpedo forward in its quest to fertilize an egg.

