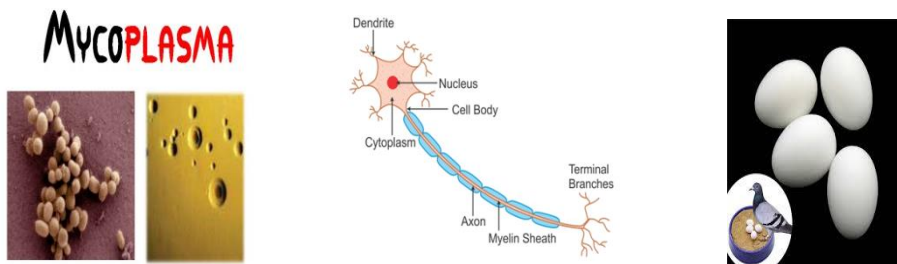


The Cell

Cell is basic unit of life. Cells are the smallest structures capable of basic life processes, such as taking in nutrients, expelling waste and reproducing. All living things are composed of cells. Some microscopic organisms, such as bacteria and protozoa, are unicellular, meaning they consist of a single cell. Plants, animals, and fungi are multicellular; that is, they are composed of a great many cells.

Cells vary considerably in size, shape and internal composition. The smallest cell, a type of bacterium known as a mycoplasma, measures 0.0001 mm in diameter, other cells have lengths with several meters e.g.: nerve cells and some cells can be seen with naked eye e.g.: egg of birds.



Along with their differences in size, cells present in different shape, (spherical shape, rod shape, elongated, flatted...etc). In multicellular organisms, shape is typically tailored to the cell's job. For example, flat skin cells pack tightly into a layer that protects the underlying tissues from invasion by bacteria.

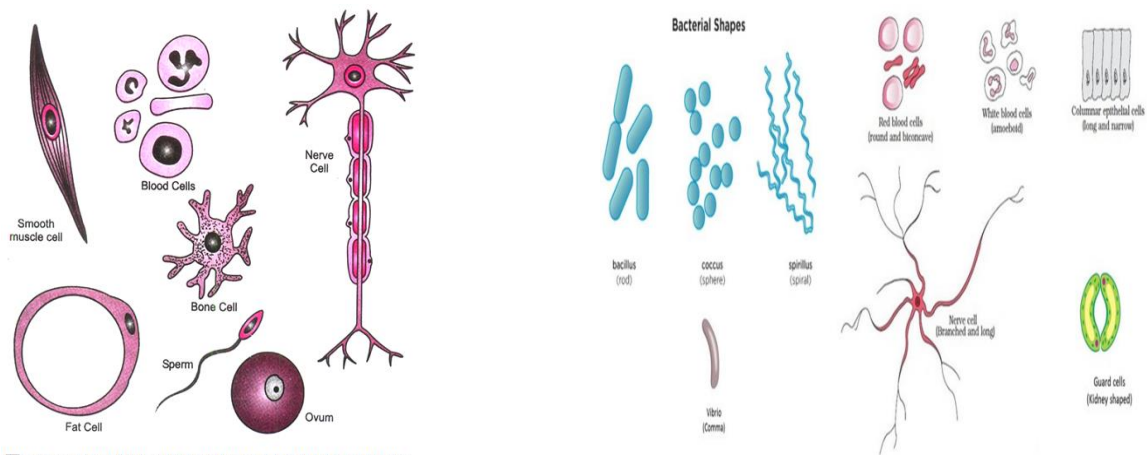
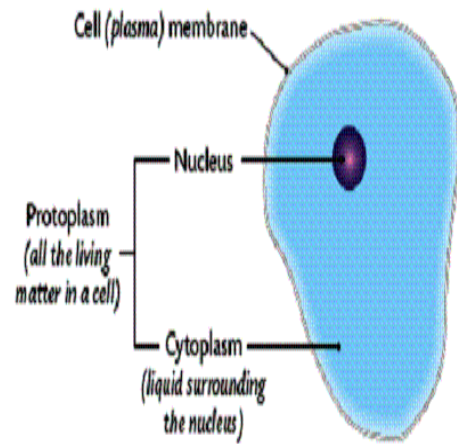
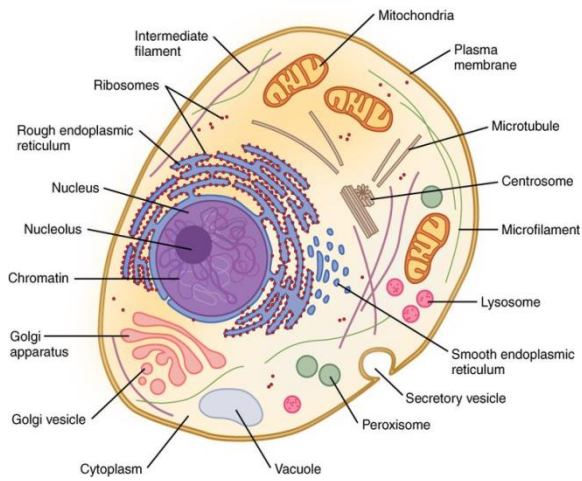


Figure : VARIOUS CELLS FROM THE HUMAN BODY

The cell consists of a mass of protoplasm surrounded by a plasma membrane. The protoplasm is differentiated into two main parts, the inner mostly central part called nucleus and the outer part that surrounds the nucleus called cytoplasm.



The Structure of Cytoplasm: Cytoplasm is a complex fluid containing a various cellular organelles and inclusions, and surrounded by the plasma membrane.

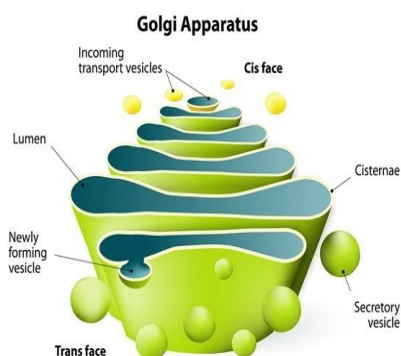
- 1- **Organelles:** these are the specialized parts of the cell such as (endoplasmic reticulum, Golgi complex... etc)
- 2- **Inclusions:** these are non living constitutes of cells such as (secretary granules, glycogen ...etc).

Organelles:

- 1- **Mitochondria:** most cells contain mitochondria which are a double membrane bound organelle; the main function of mitochondria is to provide the energy for the cell.

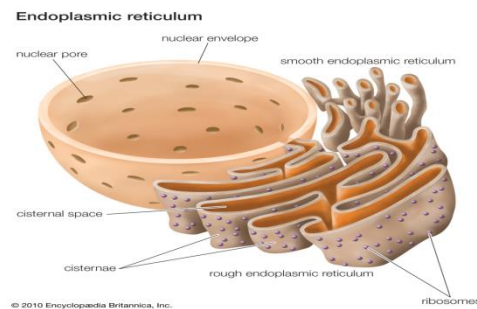


- 2- **Golgi complex:** they are flatted sacs, play an important role in storage and synthesis of secretary granules.

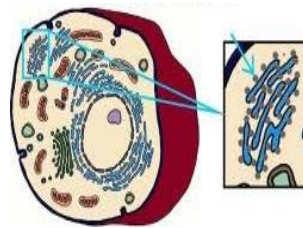


3- **Endoplasmic reticulum (ER):** are sites of **lipid** and **carbohydrate** synthesis and they are of two types :

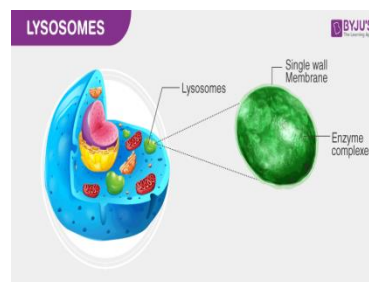
- a- **The rough ER:** it's granular (appears rough due to the presence of ribosome on the membrane surface).
- b- **The smooth ER:** it's non-granular (the ribosome are absent).



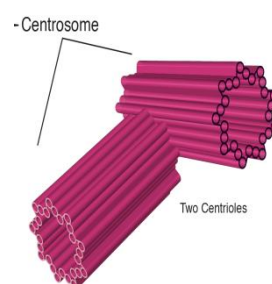
4- **The ribosome:** are the most essential organelles in cells, they play an important role in protein synthesis, It may be located on endoplasmic reticulum, or are free in cytoplasm.



The lysosomes: these are membrane bounded organelles which contain a hydrolytic enzyme, it is important in the digestion process inside the cell.



The centrosome: consists of two centrioles located near the nucleus, it plays a role in cell division.



The Nucleus:

It is the most important part of the cell as it performs the metabolic activity of the cell, it is usually spherical in shape or it occur in different shapes such as (kidney, ovoid, flatted and elongated shape).

