# The Fundamental Unit Of Life
# Cell Organelles

## ❖ Cell organelles (Ribosomes, Lysosomes, Vacuoles):-

**Ribosomes:** They are the smallest cell organelles, without a membrane, present freely or attached to the RER. Present both in cytoplasm as well as inside nucleus where it is called nucleolus. Ribosomes are present in all cells.

**Functions :** They are the site of protein synthesis in the cell.

**Introduction:**

(i)Ribosomes are found in both prokaryotic and eukaryotic cells. In prokaryotes, they are found in the cytoplasm in free form, called **monosomes.** Ribosomes are the smallest organelles in the cell.

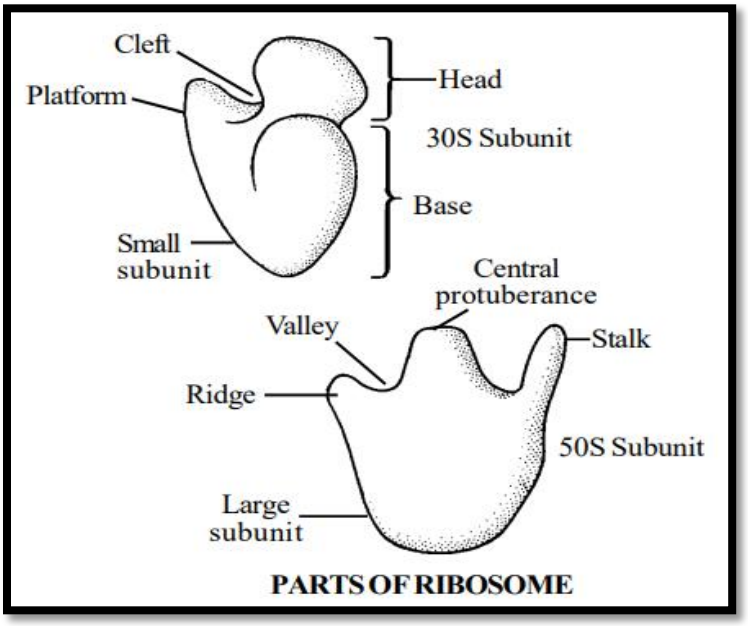
**Historical Account :**

(i)In plant cells ribosomes were first of all observed by **Robinson** and **Brown** (1953). In animal cells these are called **Palade particles,** observed by **Palade** (1955).

**Ultrastructure :**

(i)Ribosomes are dense, spherical and granular particles. These are also known as **RNP particles** (Ribonucleoprotein particles.)

(ii) Ribosomes occur freely in the matrix or remain attached to the endoplasmic reticulum. Also with in chloroplast, mitochondria and nuclei. Thus called organelle with a **organelle**.



PARTS OF RIBOSOME

(iii) Each **ribosome** is made up of two subunits, a smaller subunit and larger subunit.

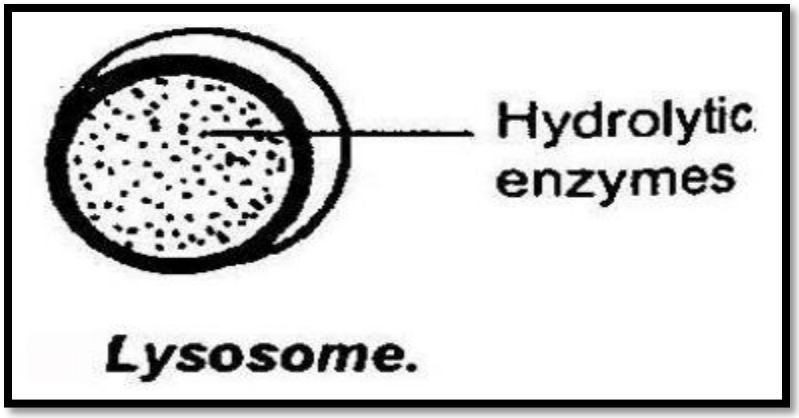
(iv) Two subunits of ribosomes are attached with the help of $Mg^{2+}$ ions.

(v) Many ribosomes may be associated with mRNA to form **polyribosomes.**

**q Functions of Ribosomes:**

(vi) Ribosomes play an important part in the protein synthesis. Ribosomes are the **'protein factories'** of the cell.

**Lysosomes: They** are small sized enzyme containing vesicles which are bounded by a single membrane. These bodies contain hydrolytic enzymes (digestive enzymes). These are also known as "suicidal bags" or "digestive bags".




**Functions :**

(i) They help in intercellular and intra cellular digestion of food particles

(ii) They cause digestion of worn out cell organelles.

(iii) They destroy foreign substances.

(iv) They help in the digestion of bones by digesting cartilage.

**Introduction :**

(i) Lysosomes are generally found in the cytoplasm of animal cells. Lysosomes exhibit polymorphism.

**Historical Account :**

(i)The term **lysosome** was introduced by **de Duve** in 1955.

**Ultrastructure :**

(i) It is also called **demolition squads, scavengers, cellular house keepers and suicide bags.**

(ii)Lysosome are simple tiny spherical sac like structures evenly distributed in the cytoplasm.

(iii) Lysosome is small vesicle surrounded by a **single membrane** and contains powerful enzymes.

**q Functions of Lysosomes :**

(i) Lysosomes serve as interacellular digestive system, hence called **digestive bags**.

(ii)Lysosomes also remove the worn out and poorly working cellular organelles by digesting them to make way for their new replacement.

**Vacuoles :** These are cytoplasmic inclusions. They are clear fluid filled or gas filled spaces. The vacuole is covered from outside by a covering called tonoplast. In animal cells, vacuoles are smaller in size and lesser in number as compared to plant cells.

**Functions :**

(i) They help in the storage of food, water and other waste substances.

(ii) Contractile vacuole help in the elimination of excess water from the cell.

**Introduction :**

(i) Vacuoles serve as temporary storehouse for many of the cell's solutes and macromolecules,

**Ultrastructure :**

(ii) Vacuoles - The Vacuoles are liquid filled spaces in the cell.

(iii) Each vacuole remains surrounded by a membrane called tonoplast.

**q Functions of Vacuoles :**

(i) Vacuoles help to maintain the osmotic pressure in a cell (osmoregulation).