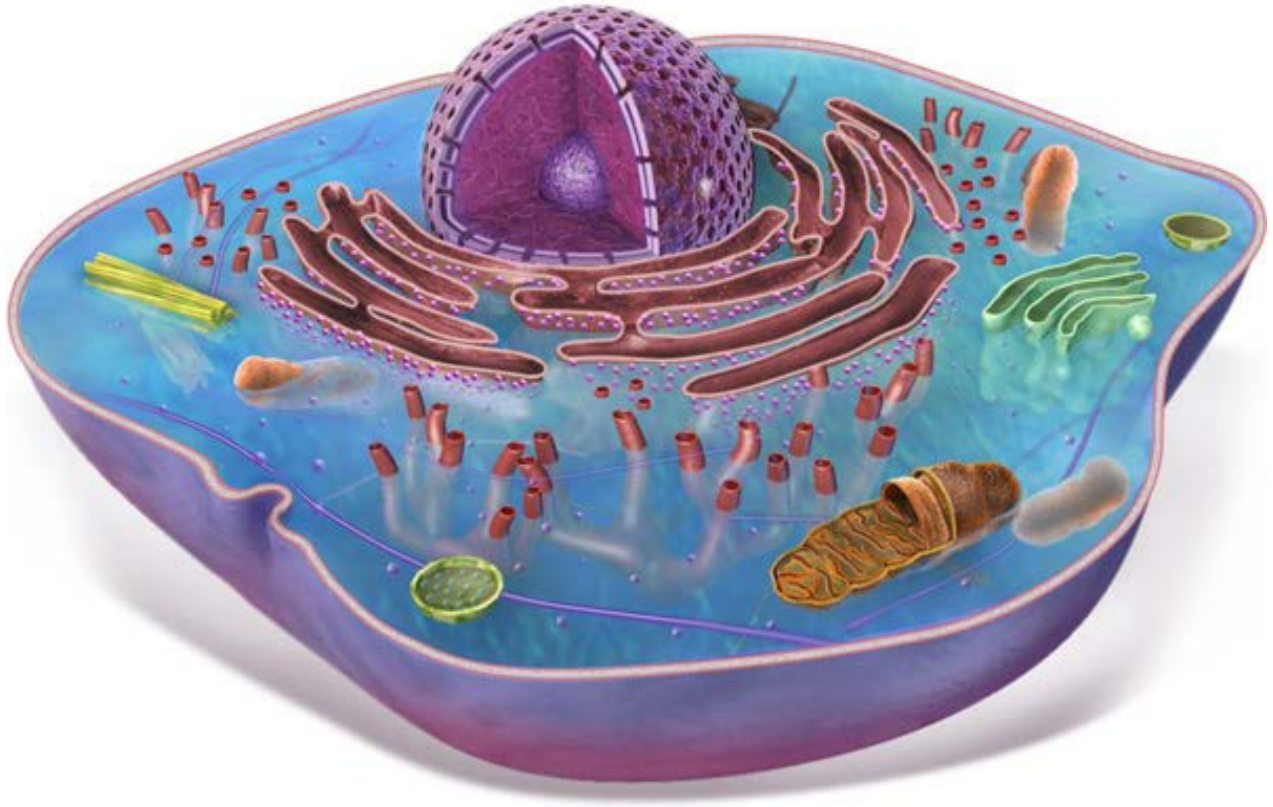
# ~ Animal Cell ~




Presentation by,

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- **Cell**
- The cell is the structural & functional unit of life. Its also considered as basic unit of biological activity.
- The concept of cell was organize from the contribution of Schleiden & Schwann in 1938.

**Chemical Composition in Cell of normal man (Weight 65 kg)**

| Constituents | Percent (%) | Weight in kg. |
|---|---|---|
| Water | 61.6 | 40 |
| Protein | 17.0 | 11 |
| Lipid | 13.8 | 9 |
| Carbohydrate | 1.5 | 1 |
| Minerals | 6.1 | 4 |

- **Types of Cell**
- The cells of living kingdom may be divided in to two categories –

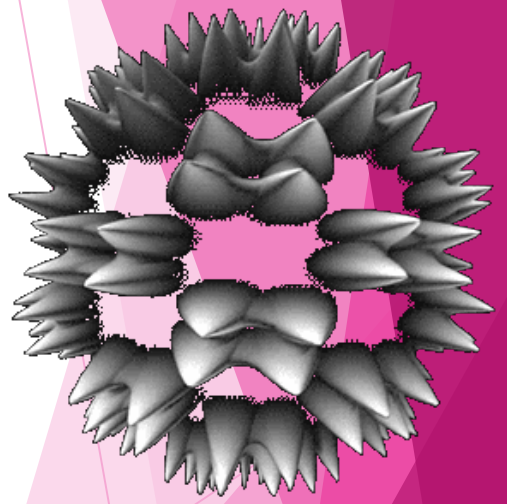
    1. Prokaryotic Cell
    2. Eukaryotic Cell

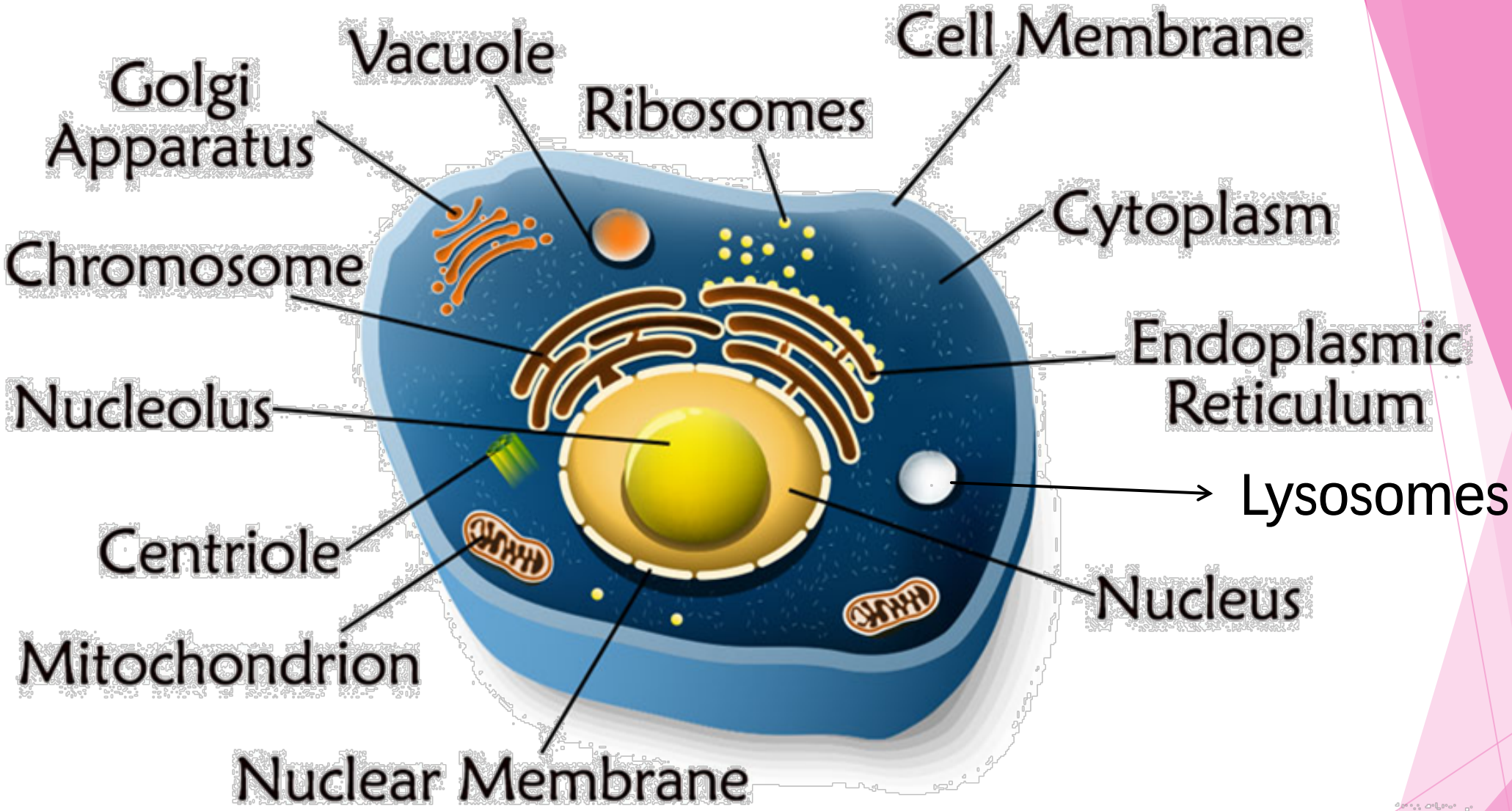
- **Prokaryotic Cell:** (Greek : pro - before; karyon - nucleus) lack a well defined nucleus and possess relatively simple structure.

  Ex. Bacterial Cell.

- **Eukaryotic Cell:** (Greek: eu - true; karyon - nucleus) possess a well defined nucleus and are more complex in their structure and function.

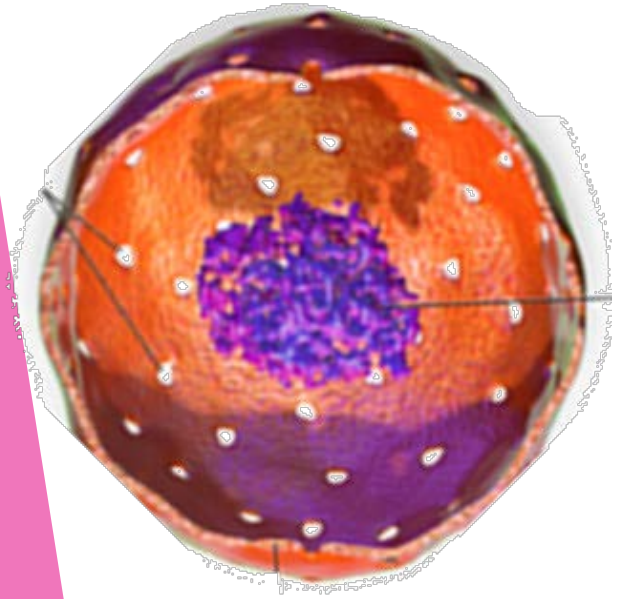
  Ex. Animal & Plant cell.

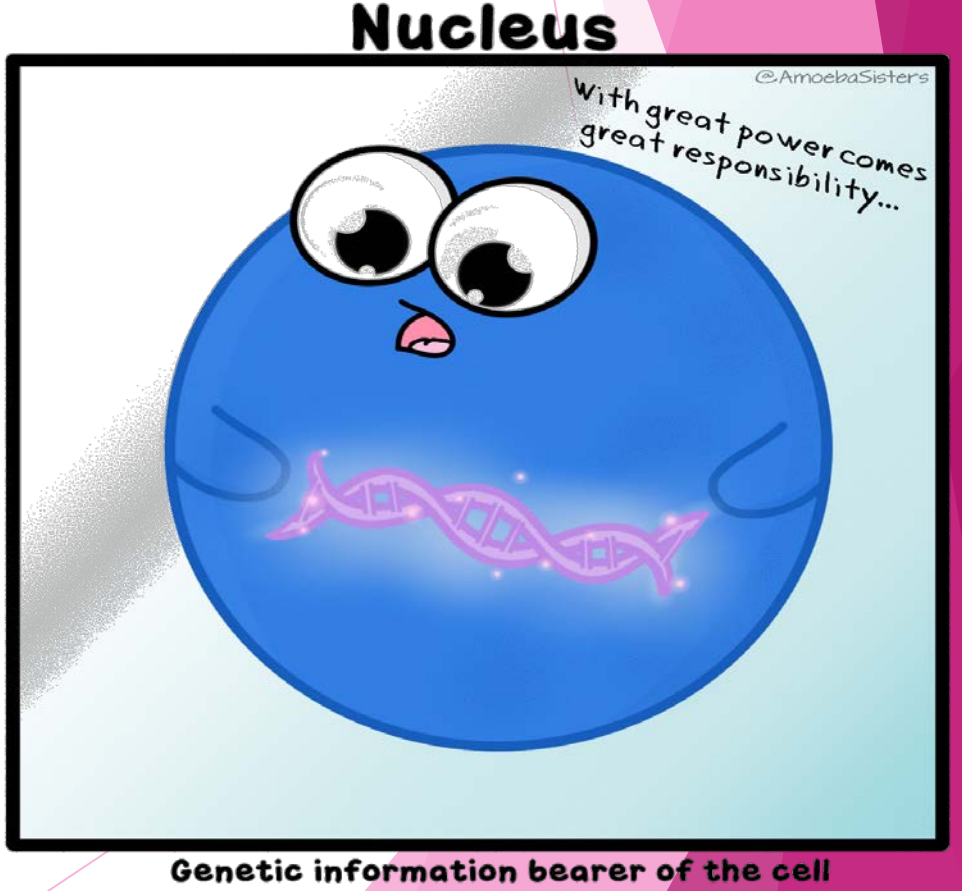



Golgi Apparatus
Vacuole
Ribosomes
Cell Membrane
Cytoplasm
Chromosome
Endoplasmic Reticulum
Nucleolus
Lysosomes
Centriole
Nucleus
Mitochondrion
Nuclear Membrane

- **Animal Cell**

- **Nucleus –**
- Nucleus is largest cellular organelle surrounded by double membrane nuclear envelope.
- The outer membrane nucleus is continuous with the membranes of endoplasmic reticulum.
- Nucleus contains Deoxyribonucleic acid (DNA)

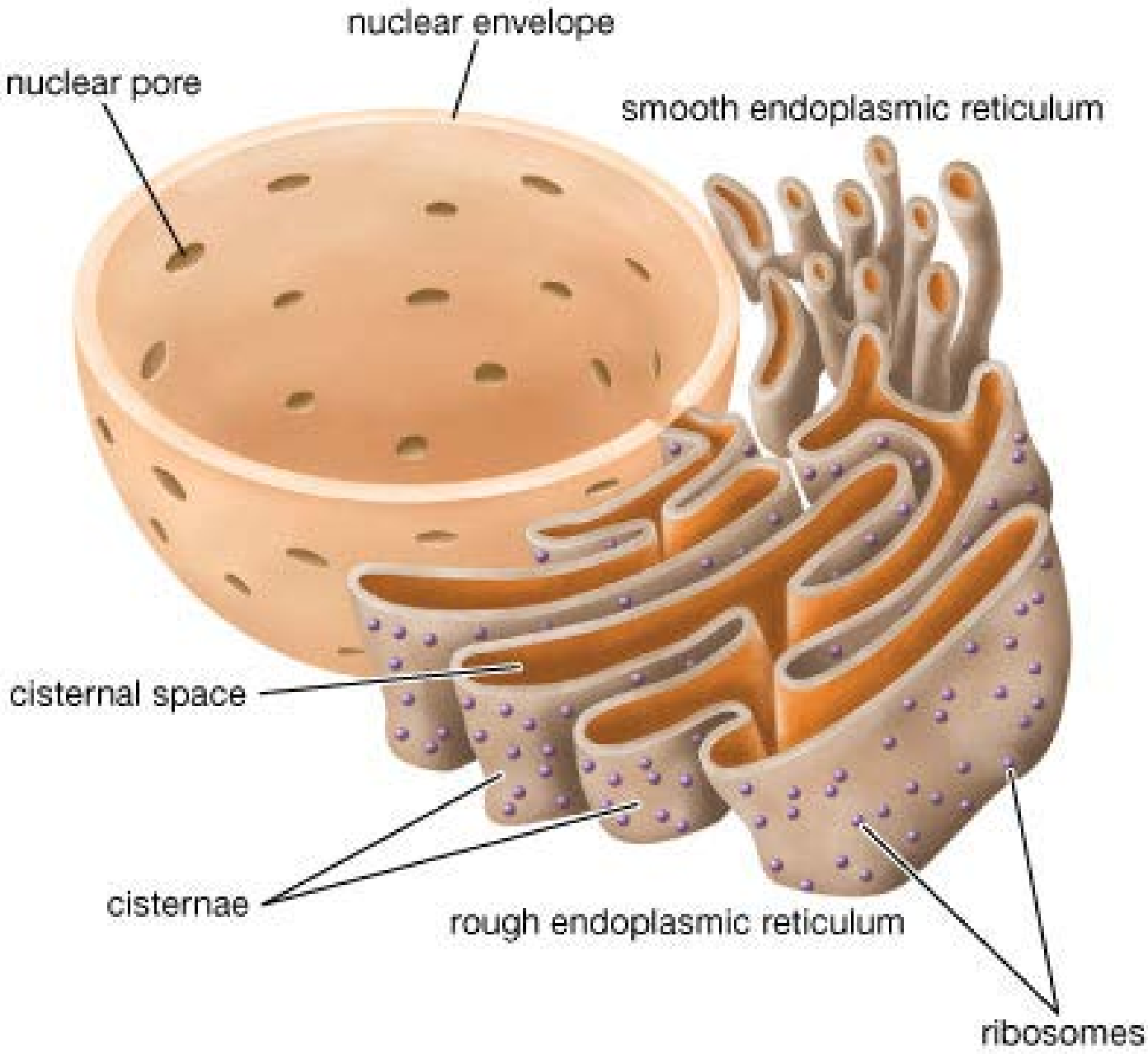




- **Mitochondria -**
- The mitochondria (Greek'. mitos - thread; chondros - granule) are the centers for the cellular respiration and energy metabolism. They are regarded as the power houses of the cell with variable size.
- Mitochondria are rod-like or filamentous bodies, usually with dimensions of 1.0 x 3 µm. About 2,0O0 mitochondria, occupying about 1/5th of the total cell volume, are present in a typical cell.
- The internal chamber of mitochondria is referred to as matrix.

- **Endoplasmic reticulum -**
- ER have thread-like structures extend from the nuclear pores to the plasma membrane.
- The network of membrane enclosed spaces that extends throughout the cytoplasm constitutes endoplasmic reticulum (ER).
- A large portion of the ER is studded with ribosomes to give a granular appearance which is referred as rough endoplasmic reticulum.
- Ribosomes are the factories of protein biosynthesis. During the process of cell fractionation, rough ER is disrupted to form small vesicles known a microsomes.

## Endoplasmic reticulum

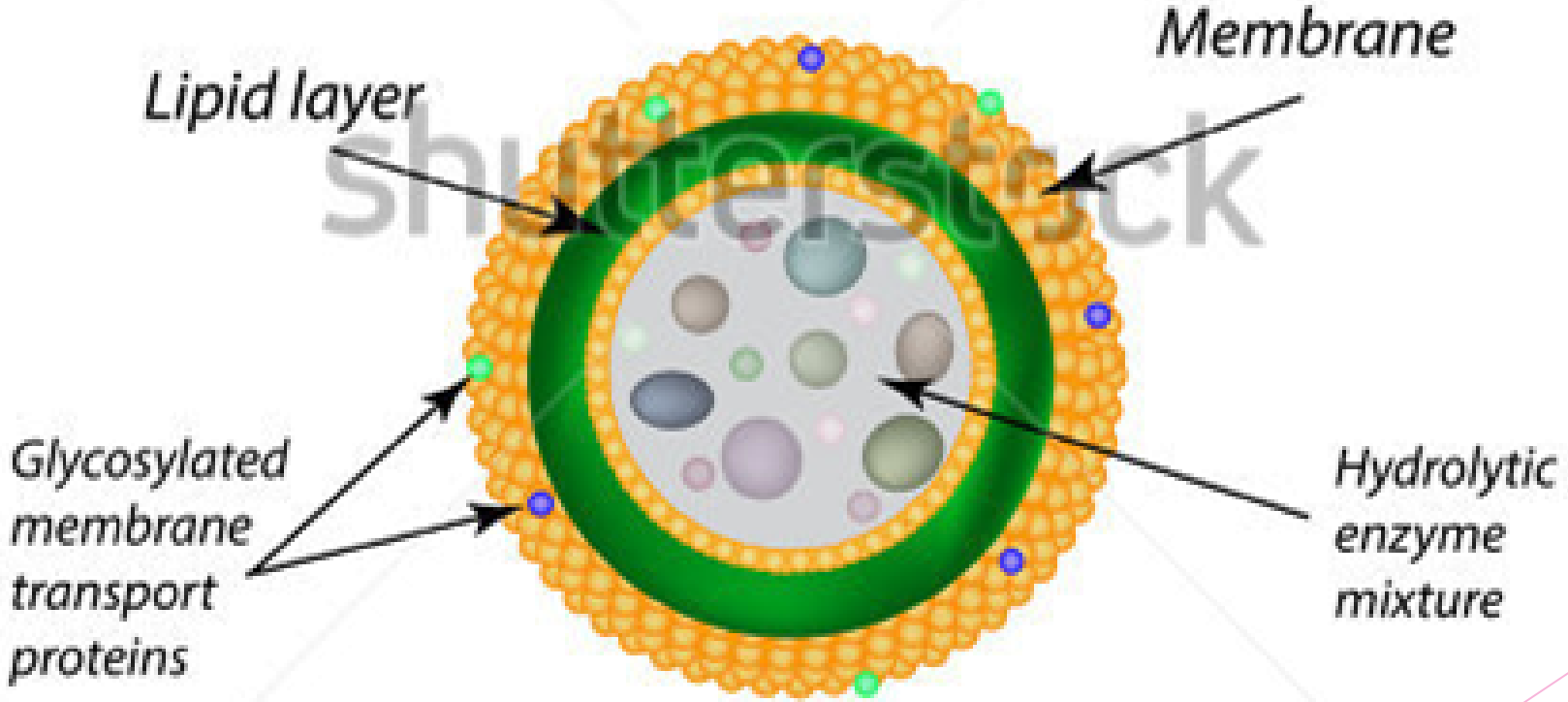


- **Golgi apparatus -**
- Eukaryotic cells contain a unique cluster of membrane vesicles known as dictyosomes.
- The newly synthesized proteins are handed over to the golgi apparatus which catalyse the addition of carbohydrates, lipids or sulfate moieties to the proteins. These chemical modifications are necessary for the transport of proteins across the plasma membrane.
- Golgi apparatus are also involved in the membrane synthesis, particularly for the formation of intracellular organelles (e.g. peroxisomes, lysosomes).

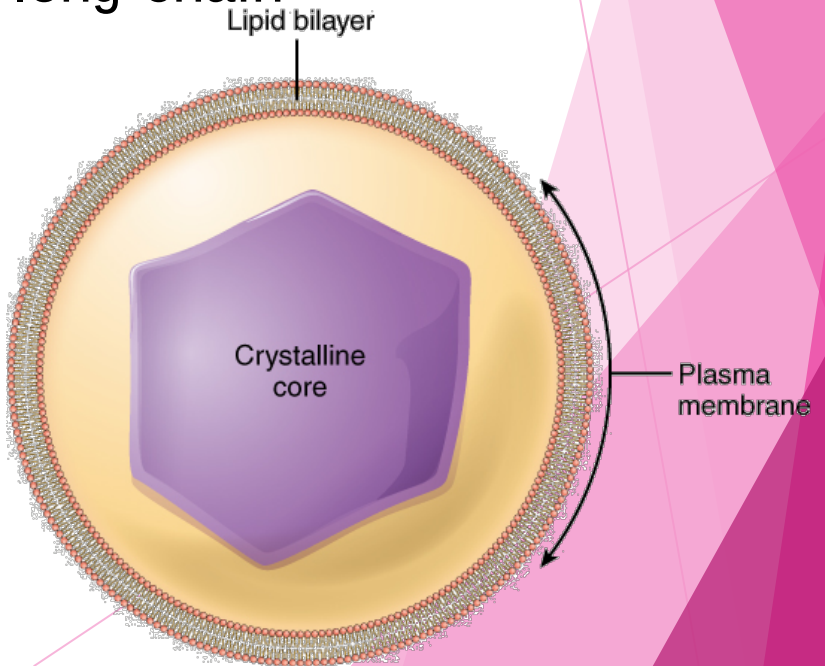
- **Lysosomes -**
- Lysosomes are spherical vesicles enveloped by a single membrane. Lysosomes are regarded as the digestive tract of the cell, since they are actively involved in digestion of cellular substances namely as proteins, lipids, carbohydrates and nucleic acids.
- Lysosomes enzymes are categorized as hydrolases. These include the following enzymes( with substrate in brackets)

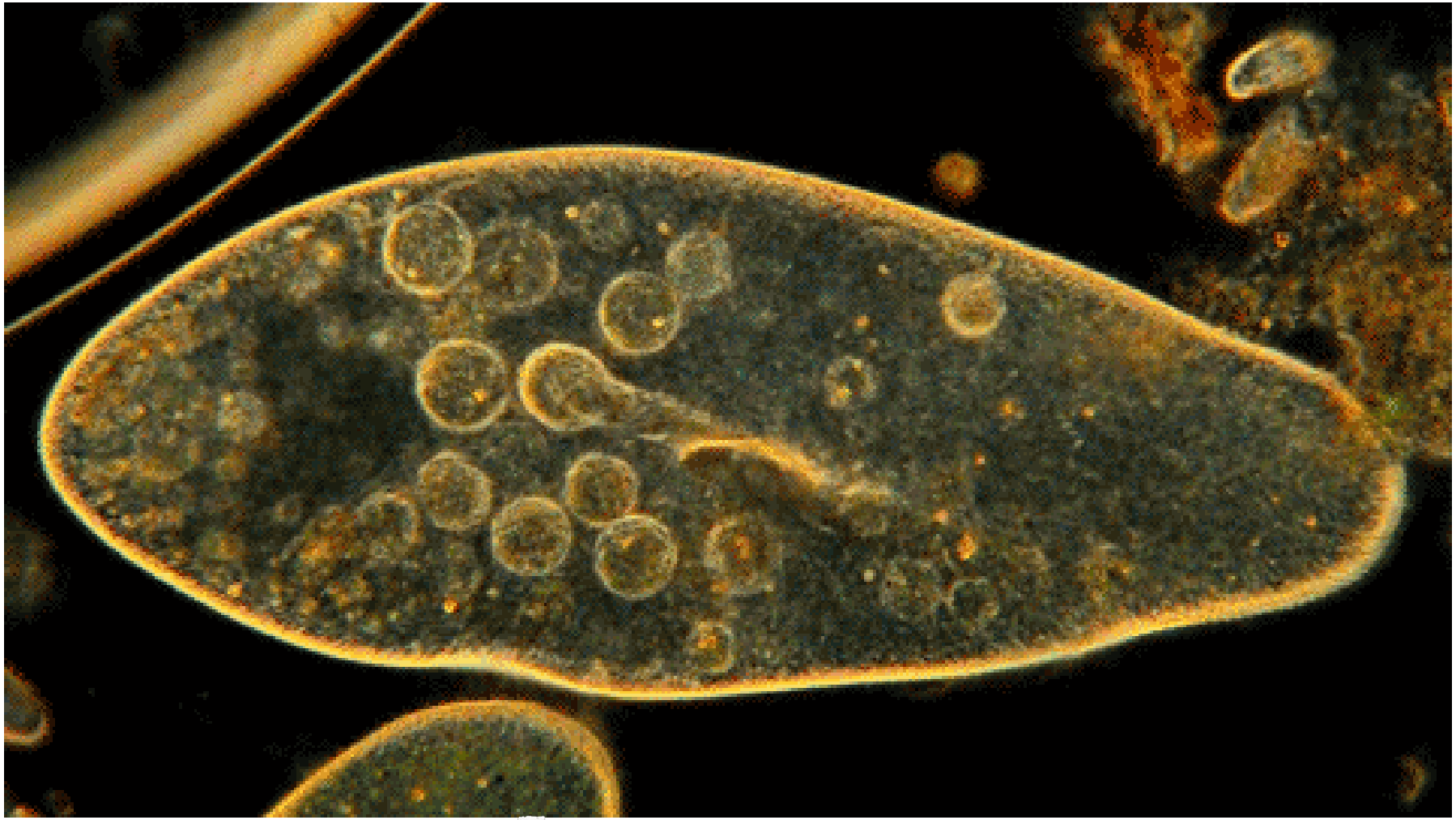
  a-Glucosidase( glycogen), Cathepsins( proteins), Lipases (lipids), Ribonucleases (RNA)

# Lysosome


Membrane
Lipid layer
Glycosylated membrane transport proteins
Hydrolytic enzyme mixture

- **Peroxisomes**
- Peroxisomes, also known as microbodies, are single membrane cellular organellees. They are spherical or oval in shape and contain the enzyme catalase. Catalase protects the cell from the toxic effects of $H_2O_2$, by converting it to $H_2O$ and $O_2$.
- Peroxisomes are also involved in the oxidation of long chain fatty acids .
- Synthesis of plasmalogens and glycolipid.






THANK
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