

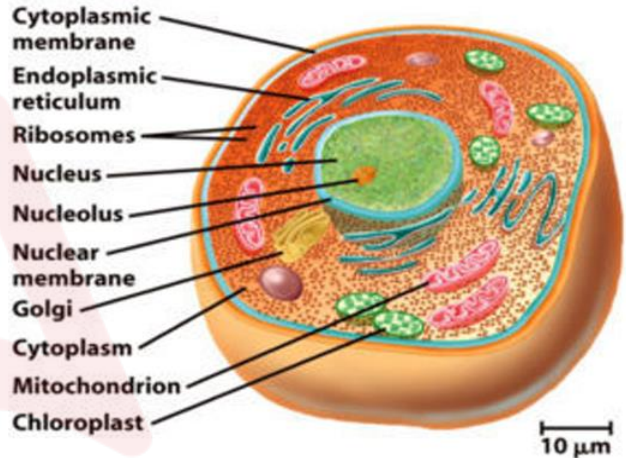
Quick Revision: Eukaryotic Cell & Its Components

Adda247
বাংলা

Quick Revision
EUKARYOTIC CELL & ITS COMPONENTS

Download Free PDF

...

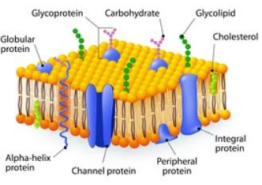
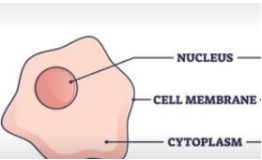
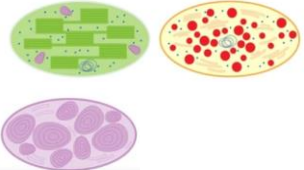

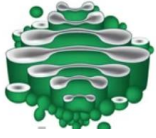





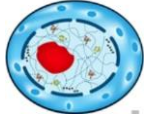

Definition of a Eukaryotic Cell

Eukaryotic cells are cells that comprise a nucleus that is membrane-enclosed and other organelles. Eukaryotic cells have an enclosed nucleus within a nuclear membrane and form large and complex organisms. Protozoa, fungi, plants and animals all have eukaryotic cells. They are classified under the kingdom Eukaryota.

Different Components of a Eukaryotic Cell

NAME	STRUCTURE	FUNCTION
<p>Cell Wall</p>	<p>Cell walls are present only in plant cells, bacteria, and some fungi. It is hard and rigid. It made up of Cellulose in plants and peptidoglycan in bacteria.</p>	<ul style="list-style-type: none"> ● Provides mechanical energy ● Used as a food reservoir ● It maintains the shape of the cells ● It is completely permeable.

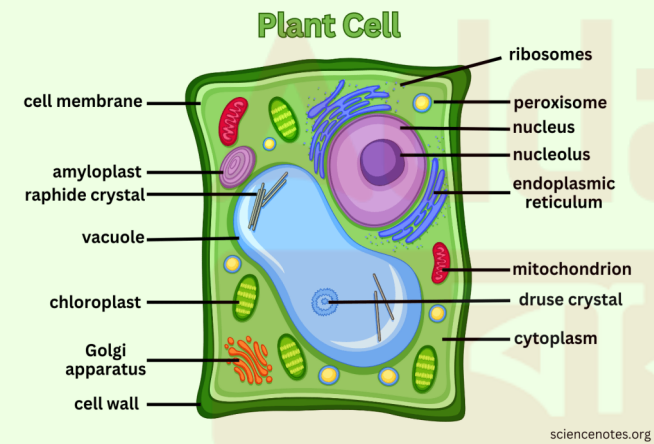
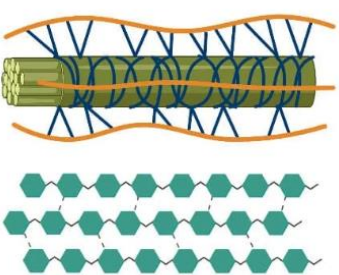
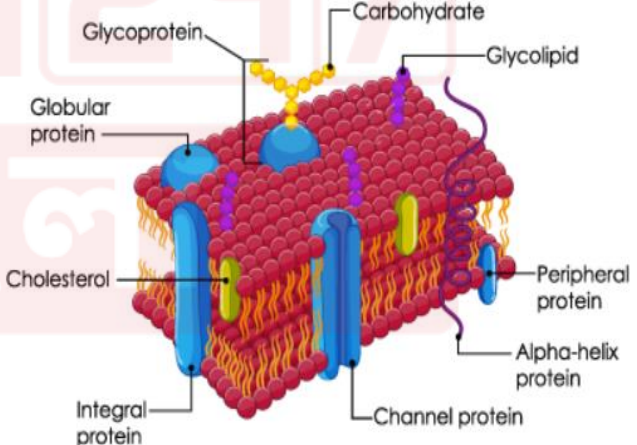
<p>Cell Membrane</p> 	<p>Present in both plant and animal cells.</p> <p>Made up of a bi-lipid layer and protein (Fluid Mosaic Model)</p>	<ul style="list-style-type: none"> ● Also called Plasma membrane. ● Provides shape, protects the inner organelles of the cell ● It acts as a selectively permeable membrane ● It permits the materials in and out of the cell as per the requirement.
<p>Cytoplasm</p> 	<p>It contains almost 90% water and many compounds (organic and inorganic).</p> <p>This is a colloidal, jelly-like viscous fluid inside the cell.</p>	<ul style="list-style-type: none"> ● It is the inner substance excluding the nucleus ● Responsible for the cell's metabolic activities. ● Fills the cell and holds the organelles ● Helps to move hormones
<p>Plastid</p> 	<p>It is a double membrane-bound organelle.</p> <p>Types of Plastid-</p> <ol style="list-style-type: none"> 1). Leucoplast –Colourless plastid; 2). Chromoplast –Coloured Plastid (blue, red, yellow); 3). Chloroplast – Green plastid 	<ul style="list-style-type: none"> ● Helps in the process of photosynthesis and pollination ● It imparts colour to leaves, flowers, fruits, stores starch, fats, and proteins ● Leucoplast helps in food storage in plants
<p>Endoplasmic Reticulum (ER)</p> 	<p>ER is a network of membranes.</p> <p>RER bears ribosomes and appears rough</p> <p>SER does not have ribosomes and appears smooth</p>	<ul style="list-style-type: none"> ● Makes the skeletal framework of the cell ● It involves detoxification ● Responsible for lipids and protein production
<p>Golgi Body</p> 	<p>It was discovered by Camillo Golgi in 1898.</p> <p>It originates from the Rough Endoplasmic Reticulum (RER) and consists of sacs like Cisternae and Vesicles.</p>	<ul style="list-style-type: none"> ● It is mainly involved in intracellular transport as well as secretion ● It has two faces. These are receiving face or cis face and trans face or supplying face.
<p>Mitochondria</p> 	<p>It has a double membranous structure.</p> <p>It is an autonomous body that contains its own DNA.</p>	<ul style="list-style-type: none"> ● “Power House’ of the cell ● The main site of cellular respiration ● Involved in storing energy in the form of ATP molecules. ● It can self-duplicate

<p>Ribosome</p> 	<p>Without a membrane Consist of two subunits – 60S and 40S in eukaryote both made up of RNA</p>	<ul style="list-style-type: none"> ● Involved in the synthesis of proteins. ● Provide space for protein synthesis ● Called the “Protein factory of cells”
<p>Lysosome</p> 	<p>Membrane-bound organelles Present in all animal cells and few plant cells Tiny circular single membrane-bound structures filled with digestive enzymes</p>	<ul style="list-style-type: none"> ● Helps in digestion removes wastes and digests dead and damaged cells. Henceforth, it is also called the “suicidal bags”. ● Helps in the autophagy process.
<p>Nucleus</p> 	<p>Covered by a double membranous nuclear membrane in a Eukaryotic Cell. Contains DNA, RNA, Protein, nucleolus, and Chromatin network.</p>	<ul style="list-style-type: none"> ● The brain of the cell ● Controls the activity of the cell ● It also assists in cell division and controls hereditary characteristics ● Synthesis RNA & protein
<p>Centrosome</p> 	<p>Made up of 4 elements: 1). Centrosphere 2). Kinoplasm 3). Astral ray 4). Centriole</p>	<ul style="list-style-type: none"> ● It plays a major role in organizing the microtubule and cell division. ● Centriole forms spindle fiber during cell division ● A cell has 1 centrosome and 2 centrioles
<p>Cytoskeleton</p>	<p>The structure consists of 3 types of fiber. These are- 1). Microfilaments 2). Microtubules 3). Intermediate Filaments</p>	<ul style="list-style-type: none"> ● Gives shape and support to the cell. ● It helps to form the vacuoles. ● It holds different cell organelles and is responsible for cell signaling ● It supports various intracellular movements
<p>Cilia and Flagella</p>	<p>These are the locomotory organs. Both Cilia and Flagella are assembled from specialized microtubules. But their length is different from each other.</p>	<ul style="list-style-type: none"> ● Allow organisms to move. ● Create currents in the aquatic medium to get food ● Animals under Porifera have flagella in their collar cells ● Cilia allow the movement of food or egestion in tunicates ● Cilia also assist in the internal transportation of eggs

Note:

Formation of Cell Wall: Biosynthesis of the cell wall begins during cell division during the cytokinesis phase with the formation of a cell plate in the center of the cell. Finally, the primary cell wall is formed by the accumulation of polymers of cellulose, hemicelluloses, lignin, suberin, and pectin.

Difference between Cell Wall and Cell Membrane

Cell Wall	Cell Membrane
<ul style="list-style-type: none">→ Only present in plant and bacteria cells→ Made up of cellulose→ Microvilli are absent→ Provides shape to cells→ Pinocytosis and phagocytosis do not occur.→ Metabolically inactive→ Function: it protects cells from the external environment, provides mechanical energy, and acts as a food reservoir	<ul style="list-style-type: none">→ Present in all kinds of cells→ It is composed of lipoproteins and carbohydrates (a lipid bilayer).→ Microvilli can be present→ Does not provide any shape to cells→ Takes part in pinocytosis and phagocytosis process→ Metabolically active→ Function: it helps in permeability, signal reception, cell division, reproduction, stabilizes cytoskeleton, etc.
<p>Plant Cell</p>  <p>scienotes.org</p>  <p>Cellulose</p>	

Some Interesting Facts

- ★ Biomembrane model: Danieli and Dabson proposed the biomembrane model.
- ★ Single membrane model: David Robertson proposed the single membrane model of the cell membrane in 1953.
- ★ Animal cells are generally smaller than plant cells. It is irregular in shape because of the absence of the external cell wall.
- ★ Ribosomes are known as the protein factory of the cell because they are tasked with proteins synthesis.
- ★ In case of ribosome, the word “rib” is taken from ribonucleic acid (RNA).
- ★ There are two different types of ribosomes. The 70s is found only in the prokaryotic cells and 80s is obtained in eukaryotic cells.
- ★ Lysosome is known as the cell’s garbage dumps because it breaks down waste materials and dispose of them or recycle them.

