



Lecture No.: 13

Date: 17th April, 2020

CORE CONCEPT OF  
Group C -Microbiology

SUBSIDIARY PART 1  
Paper - 1

## ULTRASTRUCTURE OF PLANT CELL [ PART - 1 ]

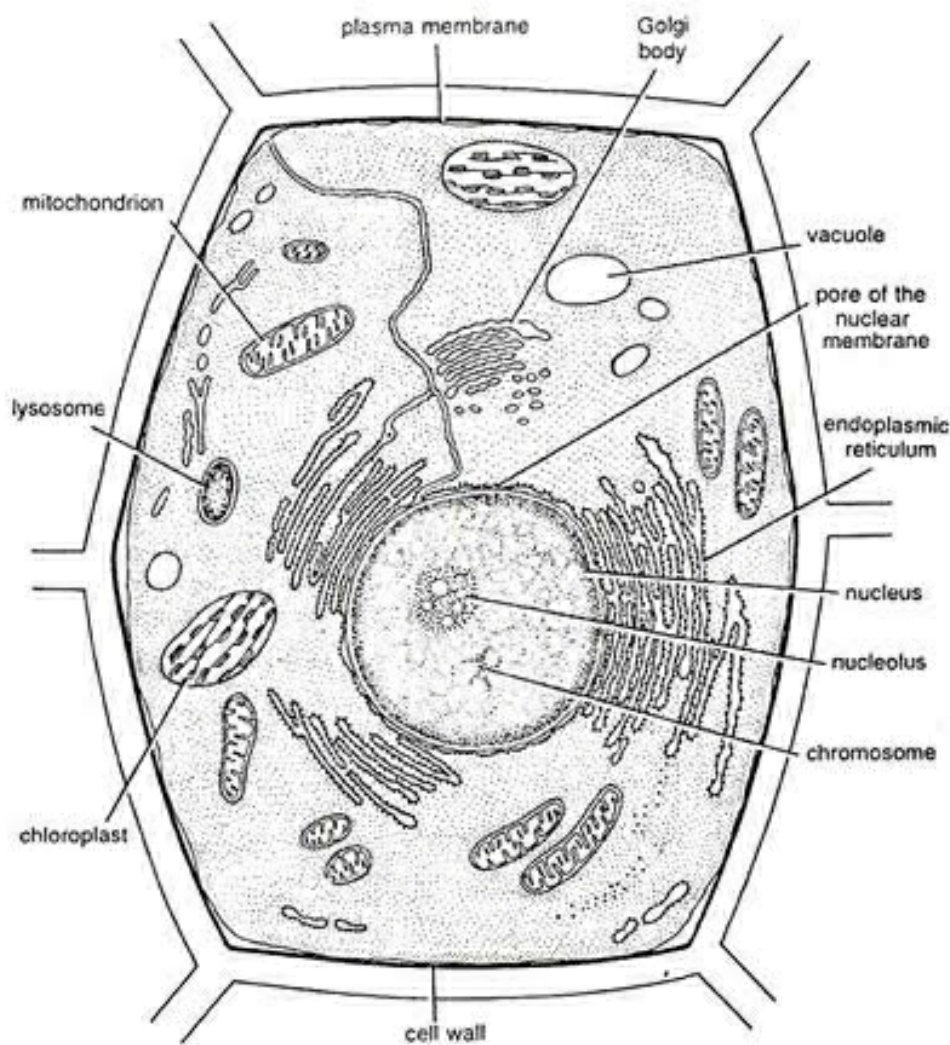
The term cell was first used by Robert Hooke 1665. A cell is basic unit of life and also as the structure and function in plants and animals. In other words cell is the basic structural and functional unit of all the living organisms.

1. Cell wall-cell wall is the outermost layer of the plant cell. It is the secretory product of the protoplast. Although a rigid cell wall is typical to almost all the plant cells, naked protoplasts are found in some thallophytes.

The cell wall is made up of at least three layers -

(a) The intercellular substance called middle lamella.

(b) Primary cell wall and



Ultrastructure of a plant cell covered by cell wall.



(c) Secondary cell wall.

It regulates the flow of material into and out of the cell. Provide rigidity and support to the organs and maintains cell shape and size.

2. Plasma membrane : It is a double membraned living boundary of the protoplast, in which each membrane is a unit membrane. In plants, it is just below the cell wall. The plasma membrane is selectively permeable. It provides surface charge to the cells. Controls osmoregulation. Transport of metabolites across the membrane by certain carriers.

3. Protoplast : This term was proposed by Hanstein 1880. Protoplast is a common term used for all the living and non-living components of the cell.

(a) Protoplasm : It was introduced by J.E.Purkinje (1840). It is the physical basis of life. Water is its main constituent (80%). Latter on proteins 15% then carbohydrates, lipids and other mineral salts. It shows streaming movement known cyclosis.

It has two components -

(i) Nucleus

(ii) Cytoplasm

(i) Nucleus : It was discovered by Robert Brown (1831). It is the controlling centre of the cell. Cells may be uninucleate or binucleate or multinucleate. The multinucleate cells of plants are called Coenocytic. Outermost layer of nucleus is called nuclear membrane. It is a double layered lipoprotein membrane. Each unit membrane is thick about 75 Å. The outer nuclear membrane is continuous with endoplasmic reticulum. Nucleoplasm is matrix of the nucleus more dense than cytoplasm. Nucleolus is made up of a granular network called nucleolonema. Nucleolus is the site of assembly of ribosomes. The function of nucleolar DNA is synthesis of rRNA. The light staining regions of chromatin are genetically active while the dark staining regions are genetically inert.

(ii) Cytoplasm : It is the protoplasmic mass of the cell leaving aside the nucleus. It is a granular or viscous translucent fluid having different cell-organelles.

Plastid : They contain pigments and are found only in plants. They are of three types -



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1. Chloroplast - Green, take part in synthesis of food.
  2. Chromoplast - Red, yellow, orange or brown, give colour to various organs.
  3. Leucoplast - Colourless, help in storage of food.

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