Cambrian Public School

Kanke Road , Ranchi

Session : 2020-21

Class IX

Subject Biology

Chapter :05: The Fundamental Unit of Life

Assignment II

CYTOLOGY

1. The study of structure of cell and its organelles is called cytology.
2. The study of structure and functions of cell and cell organelles is called cell biology.

Definitions of Cell

1. The smallest unit of life is called cell.
2. The smallest structural and functional unit of life is called cell.
3. Cell is the fundamental structural and functional unit of living organisms.
4. Cell is the mass of protoplasm surrounded by a living membrane called plasma membrane and it contains a nucleus, which control all the activities of the cell.

HISTORY

1. The term 'cell' was first introduced by Robert Hooke in his book *Micrographia* in the year 1665.
2. Anton Von Leewenhoek first saw and described a live cell in 1670-74.
3. Robert Brown first discovered the nucleus in 1831.
4. Purkinje 1839 named the jelly like substance of the cells as protoplasm.
5. Rudolf Virchow 1855, first explained that cells divided and new cell are formed from pre- existing cells. [*omnis cellula e cellula*]
6. Electron microscope was discovered by Knoll and Ruska in 1940.

CELL THEORY

In 1838, Maithias Schleiden, a German botanist and Theodore Schwann 1839, British Zoologist together formulated the cell theory. According to this theory : -

- All living organism are composed of cells and product of cell.
- Cells are basic unit of life .
- All cells contain hereditary material nucleic acid.
- All cell arise from pre existing cell.

TYPES OF CELL

There are two basic types of the cells on the basis of nucleus structure

I) Prokaryotic cell and II) Eukaryotic cell

Prokaryotic cells again can be divided into

- Mycoplasmas (without cell wall)
- Bacteria (with cell wall)

Eukaryotic cells can also divided into

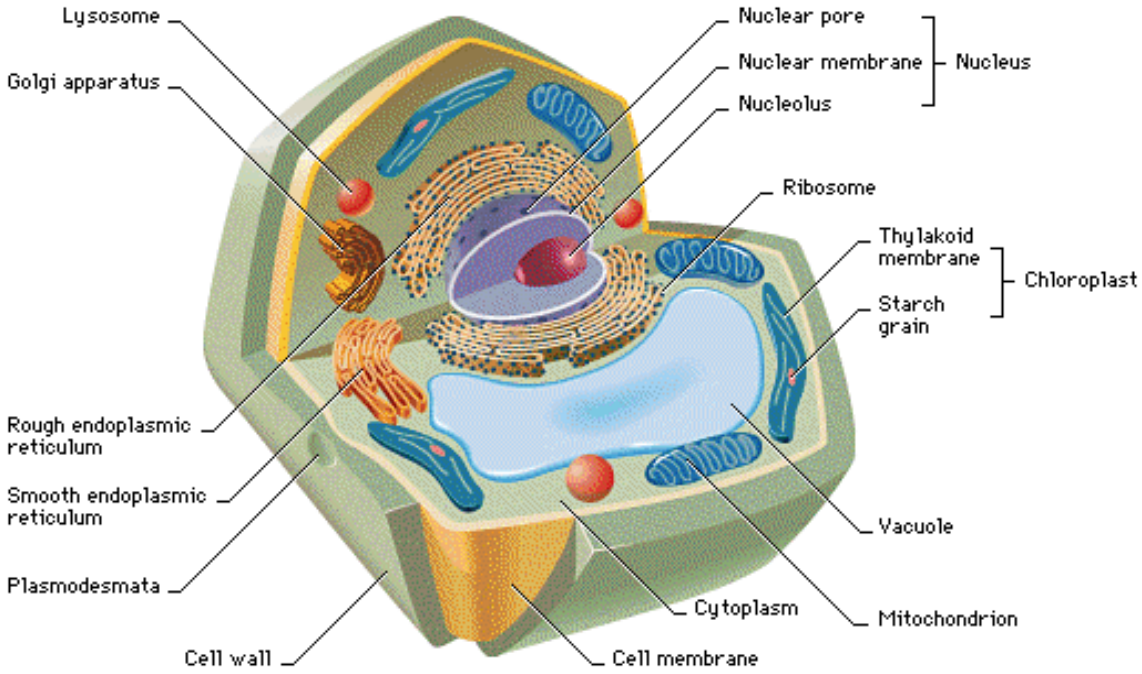
- Animal cell (without cell wall)
- Plant cell (with cell wall)

Differences between prokaryotic and eukaryotic cells

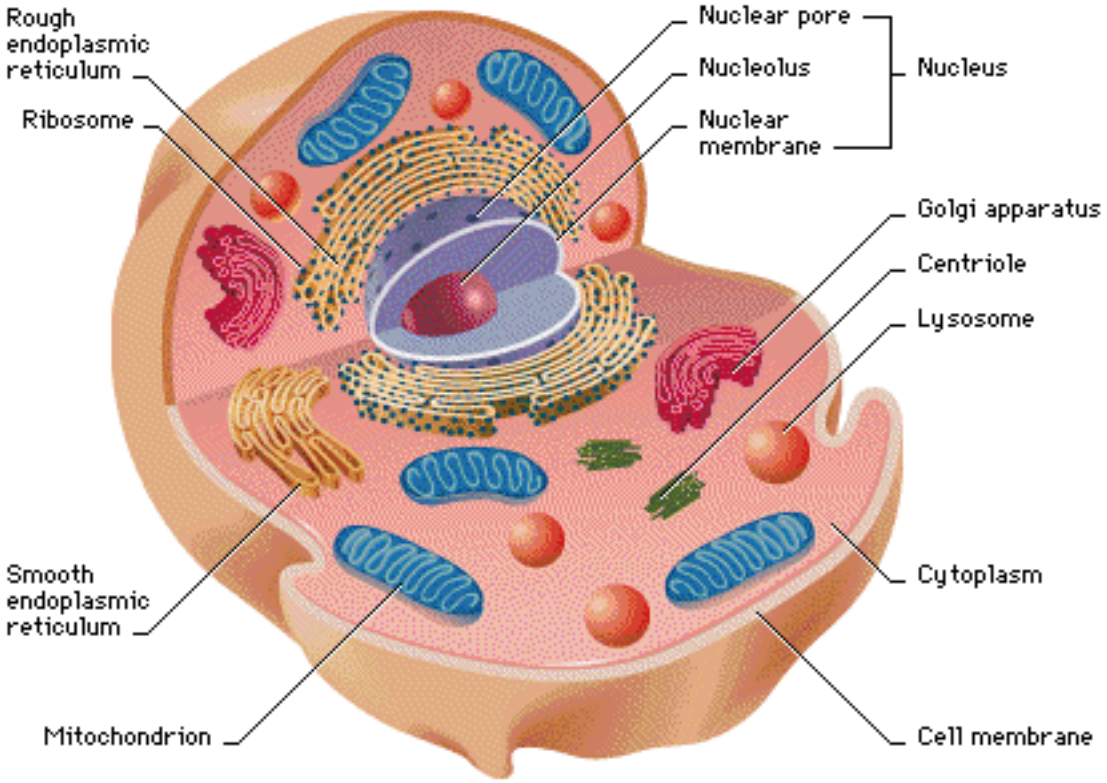
PROKARYOTIC CELL	EUKARYOTIC CELL
Generally smaller in size (1-10 µm)	Generally larger in size (5 µm to 100 µm)
Nucleus not surrounded by any membrane known as nucleoid	Nucleus surrounded by double nuclear membrane
Membrane bond cell organelles are absent	Cell organelles are present. e.g., Mitochondria,Golgi-body, Chloroplast, lysosomes, etc.
Ribosome 70s type	Ribosome 80s type
Contain single chromosome	Contains more than one chromosome.
e.g. Mycoplasmas, Bacteria , Cynobacteria, etc.	e.g. all animal and plant cells.

Differences Between Plant Cell and Animal cell

PLANT CELL	ANIMAL CELL
Cell wall present	Cell wall absent
Plastids present	Plastids absent
Large vacuoles present	Vacuoles generally absent or very small
Centrioles absent	Centrioles present
Lysosomes uncommon	Lysosomes common
Nucleus generally acentric	Nucleus generally centric
Storage material is starch grains	Storage material is glycogen granules



PLANT CELL



ANIMAL CELL

Some important terms :

PROTOPLAST

All the content inside cell wall called protoplast or protoplasm with plasma membrane is called protoplast.

PROTOPLASM

The living material present inside the plasma membrane is called protoplasm.

CYTOPLASM

The protoplasm between plasma membrane and nuclear membrane is called cytoplasm

SARCOPLASM

The protoplasm of muscle cells or fibres

HYLOPASM or CYTOSOL

The pure liquid of protoplasm in which cell organelles lie embedded with the nucleus is called hyloplasm.

HYDROPLASM

The liquid present inside the plant cell vacuoles

Assignment :

1. Who coined the term ‘cell in which year?
2. Name the scientists who proposed the cell theory.
3. Name the non living component of plant cell.
4. Who gave the idea that cell arise from pre existing cells?
5. What do you mean by sarcoplasm or hyaloplasm.
6. Differentiate between animal cell and plant cell.
7. How does prokaryotic cell differ from eukaryotic cell?
8. What is cell ? Why is cell called the structural and functional unit of life?
9. Differentiate between protoplasm and cytoplasm.
10. Draw a well labeled diagram of animal cell .
11. Draw a typical plant cell and show location of nucleus in it.
12. Draw the structure of any prokaryotic cell or bacteria.