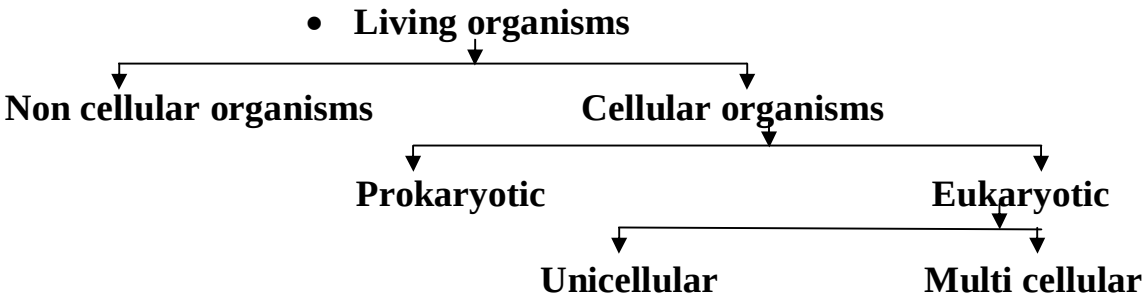
The Garden International School
Sherpur, Patna

Class – IX (Science)

- **The fundamental Unit of Life .**

SUMMARY

- **Cell –** It is the structural and fundamental unit of living organisms.
- **Discovery of Cell –** Cell was discovered by Robert Hook (1665). He took a thin slice of cork and named small boxes present in it as cell.
- **Anton van** Leeuwenhoek observed the first living call as bacterial cell.
- **Cell Theory –** It was proposed by Jacob Matthias schleiden and Theodor Schwann.
- **Main points of cell theory –**
  a. All organisms are composed of cells.
  b. New cells arise from pre-existing cells.
  c. Cell is the structural and functional unit of living organisms.
  d. Every organism – Starts its life from a single cell living organisms.



- **Prokaryotes –**
  a. Unicellular
  b. Smaller in size
  c. Lack of membrane bounded organelles
  d. Lack of well defined nucleus
  Ex. – Bacteria , Spirogyra etc.
- **Eukaryotes –**
  a. Unicellular / Malt cellular
  b. Larger in size

c. Membrane bounded organelles present

d. Well defined nucleus is present

Ex. – Amoeba , Hydra etc.

- **Shape of cell – Variable**
- **Size of cell –**

Prokaryotes – From 1 to 10 km (appr)

The smallest cell in Human beings – RBC

The largest cell in Human beings – OVUM

The largest cell in Human Beings – Nerve cell

- **Functional Region of cell –**

a. Cell membrane , cell wall

b. The nucleus

c. The cytoplasm

A. The cell membrane –

It is made up of phospholipids –

Function –

- It helps in exchange of materials.
- Gaseous exchanges take place by diffusion.
- Exchange of water take place by osmosis.
- It protects the cell.
- It gives definite shape.
- It helps in movement.

Cell wall – Present in plant cell.

Function

- It is made of cellulose.
- It helps is exchange of materials.
- It provides rigidity.
- It protects the cell.

- **Diffusion –** The process of intermixing of substances from higher concentration to lower concentration is called diffusion.
- **Osmosis –** The movement of water molecules through a semi permeable membrane is called osmosis.
- **Types of osmosis –**
  a. Endosmosis – Entrance of water molecules into the cell.
  b. Exosmosises – exit of water molecules from cell to surrounding.
- **Plasmolysis –** The process of contraction of the contents of the cell away from the cell wall due to exosmosises is called plasmolysis.

B. The nucleus – If was discovered by Robert Brown.

- **Nucleus consists following parts –**
  a. Nuclease membrane – It helps in exchange of materials between nucleuplasm and cytoplasm.
  b. Chromatin material – These are thread like entangled materials.
    - Chromosome is made up of DNA and protein.
    - Chromosomes carry genes which are responsible for heritance.
  c. Nucleoplasm - Viscons fluid containing important materials.
  d. Nucleolus – Protein synthesis.

C. The cytoplasm – Viscons flnsd surrounded by cell membrane. It contains many organelles.

- **Protoplasm –** cytoplasm containg nuclens is called protoplasm. It consists essential matirials that support life.
- **Important cell Organelles –**

1. Endoplasmic reticulum –

- It is a net work of membrane beund tubes and shects.
- It has two types of surfaces
  _ RER – It synthesises protein
  _ SER – It synthesises Lipid

2. Golgi apparatus – It is membrane – bounded fluid filled vesicles.

- It involves is the formation of vacuoles lysosomes et.
- It involves is the storage, processing and packaging of materials.

3. **Lysosome –**
    - It is also known as suicidal bog of the cell.
    - It consists digestive enzymes.
4. **Mitochondria –** It produces energy by cellular respiration so, it is also called power home of the cell.
    - It stores energy is the form of ATP so ATP is known as energy currency of the cell.
5. **Plastids –** It is only present in plant cells.

    Types of plastids –

    a. Chromoplast – Provides other than green colour.

    b. Chloroplast – Provides green colour .

    c. Leucoplast – storage of food it is colourless pigment.
6. **Vacuols –** It consists essential substances. Plant cell consists single large vacude. Membrance of vacuole is called tonoplast and fluid is called cell sop.
7. **Centrosome –** it is only present animal cell. It involves in division.

Cell division.

The process by which new cell is made is called cell division.

Type of cell division –

A. Mitosis – it is found in somalic cells.
- Number of chromosome is equal to punctual cell.
- Two daughter cell are produced.

B. Meiosis – It is found in reproducetive cell.
- Number of chromosome in daughter cells is half of parental cell.
- Four daughter cells are produced.

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