Bhagirathi Bal Shiksha Sadan Sec School

III week

Class - IX

Subject - Science

Topic - Fundamental Unit of life - cell.

:: Concept Mapping ::

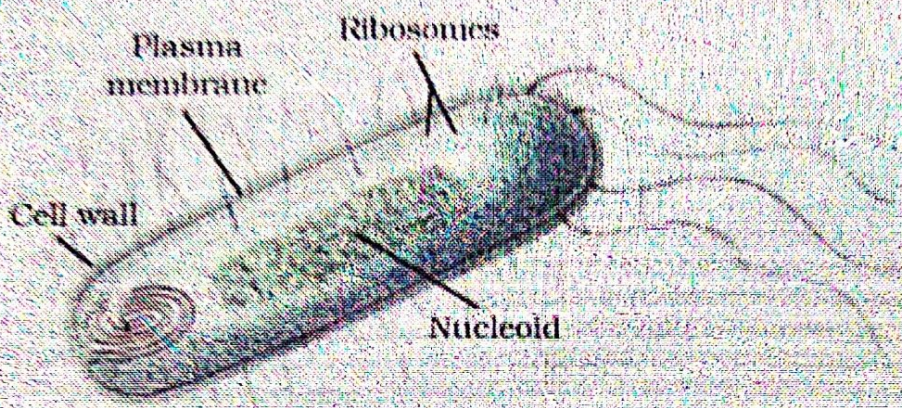
Type of organism

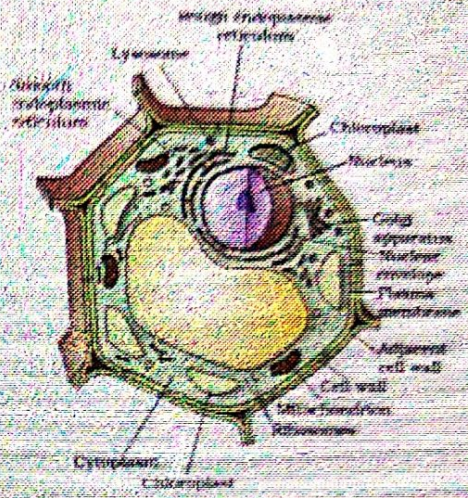
- **Unicellular**
  one celled. e.g Amoeba, Paramecium, bacteria
- **Multicellular**
  many celled. eg - man, cow, dog, fungi, Plant

Cell — Type of cell →
- Prokaryotic
- Eukaryotic
  - Plant Eukaryotic
  - Animal Eukaryotic

Components of cell

- Cell wall (In Plants)
- Cell membrane/ Plasma membrane (both in plants and animals)
- Nucleoid (In Prokaryotes) or Nucleus (In Eukaryotes)
- cytoplasm
  - Endoplasmic Reticulum
    - Rough ER
    - Smooth ER
  - Golgi Apparatus
  - Lysosomes
  - mitochondria
  - vacuoles
  - Plastids (only in Plants)
    - Chromoplast
    - Leucoplast
    - Chromo-Plast
  - centrioles





Cell Shape : Cells are of variable shapes and sizes. Their shape is according to the function. Generally cells ae spherical but they may be elongated (nerve cell). branched (pigmented), discoidal (RBC). Spindle- shaped (muscle cell) etc.

Squamous Epithelium

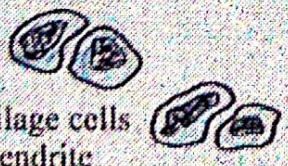
Trachea

Columnar Cells from the Stomach

Smooth Muscle Fibres from the Intestine

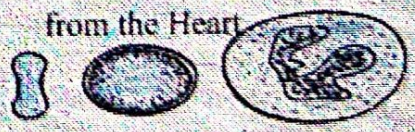
Striped Muscle Fibres

Muscle Fibres from the Heart



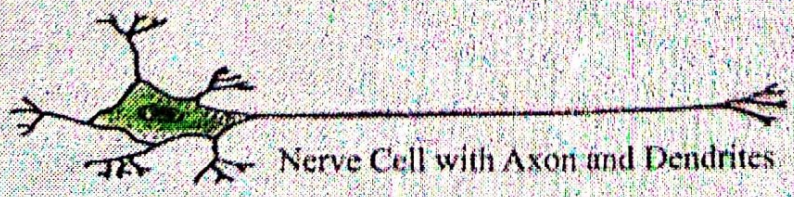
Cartilage cells
Dendrite

Bone Cell



Red Blood Cells or Erythrocytes

White Blood Cell



Nerve Cell with Axon and Dendrites

Sperm

Ovum

Different kinds of cell found in the human body

At. A. Glance

- All living forms are composed of microscopic units as cells.
- A cell is a basic, structural and functional unit of all life forms.
- study of structure and composition of cell is called cytology.
- Cell was first discovered and observed by Robert Hooke in a thin dead slice of cork in 1665.
- first free living cell was discovered by A.V. Leeuwenhoek in 1674.
- Its consistency differs under different conditions. It exists in sol-gel states.

Plant cell	Animal cell
1. It contains chloroplasts for Photosynthesis.	1. No chloroplasts are found.
2. It has cell wall to maintain structure and rigidity.	2. No cell wall is present.
3. Lysosomes are not present	3. Lysosomes are present.
4. It has limited movement.	4. cells can move around.
5. It has one large central vacuole.	5. It has very small or no vacuole.

Cell Size: — 1. Size of cell is variable depending up the type of organism.

2. The largest size of cell is ostrich egg (15cm long, 13cm wide and 1.4kg of wight).
3. The longest cell is nerve cell (4ft to 1m).
4. Smallest cells so far known are mycoplasma.

Components of Cell: — There are three basic components of cell :—

(i) Plasma membrane
(ii) Nucleus
(iii) cytoplasm

(i) Plasma membrane / cell membrane :—

(a) It is selectively permeable in nature.
(b) It is also called Plasma lemma.
(c) It is the limiting boundary of each cell which separate the cytoplasm from its surroundings.
(d) It is found in both plant as well as animal cells.
(e) It is made up of Proteins and lipids.
(f) It is flexible and broken and reunited.
(g) Singer and Nicholson gave the Fluid mosaic model of Plasma membrane.

Functions of Plasma membrane: —

(a) It regulates the movement of molecules inside and outside the cell.
(b) It helps in maintaining the distinct composition of the cell.

- Cell Wall: — • It is the outermost covering of the plant cells.
- It is absent in animal cells.
- cell wall is rigid, strong, thick, Porous and non-living structure. It is made up of cellulose and hemicellulose. cell walls of two adjacent cells are joined by a layer called middle lamellae and microscopic channels called plasmodesmata for transport.

Functions of Cell Wall: — (i) It provides definite shape to the cell.
(ii) It provides strength to the cell.
(iii) It is permeable and allowes entry of molecules of different sizes.

- Nucleus: — Nucleus is the most important cell organelle which directs and controls all its cellular activities. So it is called as 'Headquarter' of the cell.

- It was discovered by Robert Brown in 1831.
- In Eukaryotic cell, a well defined nucleus is present while in Prokaryotes, a well defined nucleus is absent.
- It has double layered Covering called as nuclear membrane. It is porous in nature.
- Besides nuclear membrane, nucleus also contains nucleolus, chromatin etc. chromatin made up of DNA and Protein that ultimatly Condense and form chromosome.
- chromosomes transmit hereditary information for the cell to function, grow and reproduce.

Function of Nucleus:—

(a) It Controls all metabolic activities of the cell and regulates the cell cycle.
(b) It helps in transmission of hereditary characters from parents to their off springs.

Assignment to do

Q NO1:- Name the largest cell of living world.
Q NO2:- Define cell & give example of cell.
Q NO3:- write a short note on Nucleus.
Q NO4:— Differentiate between unicellular and multi-cellular organism.
Q NO5:- what are functions of Vacuoles?
Q NO6:- Expand the following:- ATP. DNA. RNA.
Q NO7:- Nucleus in the cell is discovered by.....
Q NO8:- Chromosomes are made up of nucleic acid and ----.
Q NO9:- write the names of plastids found in plant cell
Q NO10:- Distinguish between Plant cell and animal-cell.