**GREENWOOD PUBLIC SCHOOL, DD NAGAR, GWALIOR**

**OUR MOTTO- DEVELOPMENT WITH DELIGHT**

**Session (2020-2021)**

**Class: IX**

**Subject:** **Biology**

**Chapter 5**

**The fundamental unit of life**

1. All the living organisms are made up of fundamental unit of life called" cell".

2. The cell is a Latin word for "a little room"

3. The scientist Robert Hooke saw a little room in the cork( the bark of tree) resembled the structure of a honeycomb. The use of the word "cell" to describe these units used till this day in Biology as "cell biology."

4.The compound Microscope consist eye piece, objective lens and condenser to observe a cell after putting a drop of safranin and methylene blue.

5.The scientist Leeuwenhoek saw free living cells in the pond water for the first time.

6. The scientist Robert Brown discovered the nucleus in the cell.

7 The cell theory states that all the plants and animals are composed of cells, it was proposed by Schleiden and Schwann.

8.The cell theory was future expanded by Virchow by suggesting that" all cells arise from the pre-existing cells."

9. The cells differ in size shape structure.Types of cells -onion cells ,smooth muscle cells, blood cells, bone cells ,fat cells ,nerve cells ,ovum,sperm etc .Each kind of cells performs specific functions.

10.A single cell may constitute a whole organism as in Amoeba, Paramecium and Bacteria; these are called as unicellular organisms. Whereas in multicellular organisms(Human beings) division of labour is seen.

11.The feature in almost every cell is same: Plasma membrane, nucleus and cytoplasm.

12. Plasma membrane: it is the outermost over covering of the cell.

:it is called as selective permeable membrane( because it prevents movement of some materials)

:It help in diffusion and osmosis.

:Diffusion: movement of substance from the high concentration to low concentration.

Osmosis: it is the passage of water from the region of high water concentration to a region of low water concentration through a selective permeable membrane.

a.The cell gains water , if the medium surrounding the cell has a higher water concentration (hypotonic solution) than the cells.

b. The cell maintained the same water concentration as the cell (isotonic solution), water crossess the cell membrane in both directions.

c.The cell losses water ,if medium has lower water concentration ( hypotonic solution) than the cell.

13.The cell engulfs food is called endocytosis and ejects solid is called exocytosis. Amoeba acquires food through endocytosis and excretion of solid is called exocytosis.

14.The cell wall is a rigid outer covering composed of cellulose. It provide structural strength to plant cells. When a living cells loses water, there is shrinkage of contents of a cell away from the cell wall .This phenomenon is called as plasmolysis .The cell wall permit the cells of plants ,and bacteria to withstand very dilute(hypotonic) external media without bursting.

15.The nucleus it is a dark coloured, spherical or oval ,dot like structure near the centre of cell called nucleus. Nucleus play a central role in cellular activity/ reproduction .The chromatin material gets organised into chromosome. The chromosome contain information for inheritance of features from parents to next generation in the form of DNA.

16.In some organisms like Bacteria nucleus is not covered by nuclear membrane. Hence it is called as prokaryotes( Pro= primitive; karyon=nucleus) .The organisms with cells having a nuclear membrane are called eukaryotes.

17. Difference between prokaryotes and eukaryotes.

Prokaryotes --size small (1 to 10 um) .Nuclear region :not well defined and not surrounded by a nuclear membrane and known as nucleoid .Chromosome single .Membrane bound cell organelles are absent. example is bacteria, blue green algae.

Eukaryotes :size large 5 to 500um

Nuclear region:well defined and surrounded by a nuclear membrane

Chromosome more than

Membrane bounded cell organelles present

Example for plant cell and animal cells.

18Cell organelles:every cell has fluid matrix is called cytoplasm.The nucleus and cytoplasm is together called as protoplasm .The protoplasmic term was coined by Purkinje. It has important cell organelles :endoplasmic reticulum ,Golgi apparatus, lysosome, mitochondria plastids and vacuole

19.Endoplasmic reticulum:(ER) it is a large network of membrane bound tubules and vesicles .There are two type of Endoplasmic reticulum rough endoplasmic reticulum(RER) it looks rough because ribosomes are attached to its surface. They are the site of protein synthesis smooth endoplasmic reticulum( SER) it look smooth because ribosome are not attached to its surface.They are the sites of fat molecules synthesis.

21. Lysosomes,,: They contain membrane- bound sacs with powerful digestive enzyme to digest the worn- out cell organelles. When the cell gets damaged, lysosomes may burst and the enzyme digest their own cell, hence called as" suicidal bags"of cell .It is a waste disposal system of the cell.

22 Mitochondria:it is covered by a double membrane .Outer membrane is very porous and the inner membrane is deeply folded. These folds create a large surface area for ATP molecules synthesis. ATP is the energy currency of the cell, hence the mitochondria are called as the power house of the cell . Mitochondria have their own DNA, ribosome therefore they can make their own proteins.

23Plastids :They are present only in plant cells they are two type chromoplast( coloured plastics chloroplast green pigment and useful in photosynthesis and also contain various other pigment like yellow orange )Leukoplast( white or colourless plastid store material such as oil protein and fats etc.) Plastids are also covered by a double membrane. The matrix is called stroma, seat for enzymatic action .Plastids have their own DNA and ribosomes therefore they are make their own protein.

24.Vacuoles: ye storage sac for solid or liquid contents .They are small in size in animals while plants have large, may occupy 50- 90% of the cell volume. Helps to provide turgidity and rigidity to the cell. Many substances like amino acids ,sugars, organic acid and proteins are stored in vacuoles. In Amoeba food vacuole is specialised to play an important role.

25.It is the fundamental structural unit of living organisms, the help in respiration obtaining nutrition and clearing waste material or forming a new protein.

Difference between animal cell and plant cell

Animal cell : 1) -cell wall absent

2)Plasma membrane is the outer layer which provides turgidity to the cell.

3)Vacuoles are small in size

4)Plastics are absent

5)Nucleus lies in a centre.

Plant cell ::: 1) cell wall present

2)Cell wall is the outer layer which gift is 80 and rigidity to the

3)vacuoles are big in size

4)Plastids are present

5)Nucleus lies on one side.