Chapter 2: Cell the unit of life

Good morning Students
The following lesson is of Class 8 for the subject of Biology; Topic - Plant and animal cells which is covered in Chapter 2 titled 'Cell: The unit of life starting on Page No 7 of your text book titled 'Concise Biology - Selina Publications and is being submitted to you on 18.11.2024
This voice is of Nidhi Rana.
Dear students Kindly open Page No 17 of your text book as we will discuss the differences between plant and animal cells. Various points of differences between plant and animal cells are given in Table 2.2 on Page No 17, which we are going to discuss one by one.

1. Plant cells have a definite cell wall made up of cellulose whereas animal cells donot have a cell wall
2. Centrosome is present in animal cell, whereas plant cells donot have centrosome and centrioles
3. In plant cells vacuoles are prominent, may be one or more in number, however in animal cells vacuoles are small and temporary
4. Plant cells contain plastids, whereas animal cells do not contain plastids.
5. Plant cells are usually larger in size than animal cells with distinct boundaries.

6. In animal cell the cytoplasm is denser and more granular than the cytoplasm of plant cell.
7. In animal cell the cytoplasm fills almost the entire cell whereas in plant cell only a thin lining of cytoplasm is present which is mostly pushed to the periphery.

Now children let us talk about the protoplasm

Protoplasm is the total living substance in an organism, a translucent fluid somewhat colourless greyish or brownish, that is contained in the cells Protoplasm includes both cytoplasm and the nucleus.

Composition of protoplasm The chemical composition of protoplasm varies from cell to cell. Common elements present in protoplasm include Carbon, hydrogen, oxygen, nitrogen, sulphur, iron and phosphorous which are present in the form of specific compounds like - water, proteins, fats carbohydrates and mineral salts.

The exact composition of protoplasm cannot be found because when we remove protoplasm from cell of an organism, then it ceases to be protoplasm ie. it no longer remains the living substance

Prokaryotic and Eukaryotic cells

Based on internal structures, the cells can be broadly categorized into two major types Prokaryotic and Eukaryotic cells.

Children please look at Table 2.3 showing the

difference between Prokaryotic and Eukaryotic cells Let us discuss these differences one by one.

1. Prokaryotic cells contain a primitive nucleus which is not well defined, whereas eukaryotic cells have a well defined nucleus with a nuclear membrane, known as 'True nucleus'.
2. The chromatin material in prokaryotic cells is represented by a single length of DNA i.e. deoxyribonucleic acid molecule.
   In eukaryotic cells several lengths of genetic material i.e. chromosomes may be present which further may contain DNA wound around certain proteins.
3. Prokaryotic cells contain small ribosomes whereas eukaryotic cells have larger ribosomes.
4. Prokaryotic cells do not contain the membrane bound organelles like mitochondria, golgi apparatus, endoplasmic reticulum, chloroplast etc. Eukaryotic cells contain all these membrane bound organelles.

Examples of prokaryotic cells - bacteria, blue green algae or cyanobacteria

Examples of Eukaryotic cells - Euglena, Amoeba and all plant and animal cells.

Now before going further, let us recapitulate what we have done by means of a short test. Children listen to the questions carefully now.

Q1 Name one cell organelle present only in Plant cell and any one cell organelle present only in animal cell.

Q2 Name the following -
(i) Total living substance of a cell.
(ii) Cells that possess a True nucleus

Now you may pause the audio for 3 minutes to write the answers to the above questions in the notebook.

3 minutes break is over children. First listen to the correct answers of the questions being asked to you.

A1 Cell wall is present only in plant cell
Centrosome is present only in animal cell.

A2 (i) Protoplasm is the total living substance of a cell.

ii Eukaryotic cells possess True nucleus.

Now children let us resume the topic and understand that - every activity of a living organism is the outcome of the cellular activities i.e. activities occuring in a cell

Some examples of cellular activities are as follows-

i When the cells grow in size and increase in number it leads to growth of the organism.

2. Repair of an injured part of body [For eg- a fractured bone] or regeneration of a lost part [For eg the tail of a lizard] is due to cell division

3. Movement of body [while running, swimming, flying etc] is due to contraction and relaxation of muscles (contractile cells) Flow of blood in blood vessels and passage of food in gut is all possible only because of muscle contractions

4. Movement in plants eg. drooping of leaves closing of stomata, bending of stem towards light and root towards water etc are all due to activities of cells

5 Feeding and nutrition involves many steps like - chewing, swallowing, secretion of enzymes absorption of digested food, storage of excess digested food etc Each of these step is the result of cellular activities and is being performed by a specific kind of body cells.

6 Movement and circulation of blood and other body fluids is the outcome of contraction of muscles cells of heart and other parts.

7 Respiratory gases i.e. O_2 and CO_2 are transported in the various body parts by Red blood cells.

8 White blood cells protect us from disease causing germs by releasing antibodies and antitoxins in the body.

9. All the sensations i.e. sensation of touch, pain etc is through sensory cells in the body.

10 We maintain our normal body temperature by sweating during summers, which is further the activity performed by cells of sweat glands

11. Animals reproduce and thus produce their young ones Reproduction is the outcome of fertilization of egg (female) cells and sperms (male cells)
12. In plants root cells absorb water and nutrients and stem cells conduct them to various parts of the plant.
13 Sunlight is trapped by chlorophyll containing cells of the plants to perform photosynthesis
14. Insects are attracted towards flowers by their colour or nectar. Colour is contained in petals or to be more specific - cells of the petals and nectar is present in nectaries
15 Mango seed produces mango plant, and similarly hen's egg produces a hen. This is because all organisms inherit some genetic characteristics from their parents The type of genes present in the egg (female) cells and the sperm (male) cells will determine the characteristics present in the zygote i.e. the single cell from which all organisms start their life.

To conclude children - There is no such activity in the body of an organism which is not carried out by the cells. However different cells are specialised to perform particular functions

This finishes with the chapter children. I hope you all have understood the structure and functioning of the various cell organelles Now I will give you some home assignment questions. All students are required to write the answers to these home assignment questions in the notebooks

Home assignment questions are as follows -

Q1 Do the following 'Review questions' given at the back exercises of the chapter - 2

B Very short answer type
Q No 3 and 4

C Short answer type
Q No 1 and 2

D Long answer type
Q No 5

E Structured Application Type
Q No 1.