

The Fundamental Unit of Life

CHAPTER 5



ANSWERS

Topic 2

1. Differences between plant cells and animal cells are as follows:

S. No.	Character	Plant cells	Animal cells
(i)	Cell wall	Present outside the plasma membrane.	Absent. The outermost covering is plasma membrane.
(ii)	Plastids	Present	Absent
(iii)	Vacuole	Single large central vacuole	Many small vacuoles
(iv)	Centriole	Absent	Present
(v)	Nucleus	Generally eccentric	Generally centric
(vi)	Mitochondria	Less in number	More in number
(vii)	Golgi body	Many and scattered	Single and near the nucleus

2. Differences between prokaryotic and eukaryotic cells are as follows:

S. No.	Character	Prokaryotic cell	Eukaryotic cell
(i)	Occurrence	Found in Kingdom Monera : bacteria, blue-green algae and Mycoplasma.	Found in Kingdom Protista, Fungi, Plantae and Animalia.
(ii)	Nucleus	Incipient nucleus called nucleoid is present. No nuclear membrane and nucleolus.	A true nucleus is present. Nuclear membrane and nucleolus is present.
(iii)	Chromosome	Single chromosome	More than one chromosome
(iv)	Membrane bound cell organelles	Absent	Present
(v)	Ribosomes	70S type	80S type
(vi)	Centrioles	Absent	Present
(vii)	Size	Small sized (1–10 μm)	Large sized (5–100 μm)
(viii)	Cyclosis (Streaming movement of cytoplasm)	Absent	Present

3. The plasma membrane acts as a mechanical barrier

to the protoplasm which regulates transport of materials into and out of cell, maintaining the identity of the cell. In case of rupturing of the plasma membrane, the protoplasmic contents will get dispersed in the surrounding medium and thus the cell will disintegrate.

4. In the absence of Golgi apparatus, the following problems will arise:

- (i) The secretory activities of the cell will cease to occur.
- (ii) The broken membranes like those of lysosomes, cell wall, plasma membrane, etc. will not get repaired.
- (iii) In case of sperms, acrosome formation will not take place, causing inability of sperms to enter the egg.

5. Mitochondrion is known as the power house of the cell, because it is the site of cellular respiration where energy in the form of ATP (adenosine triphosphate) is generated as a result of oxidation of carbohydrates and fats (lipids).

6. Smooth endoplasmic reticulum (SER) helps in the manufacturing of lipids which are important for the formation of cell membrane. Ribosomes are the site for protein synthesis. The manufactured proteins are then sent to different places in the cell depending upon the need.

7. *Amoeba* acquires its food through endocytosis. Endocytosis involves the invagination of a small region of plasma membrane and ultimately forming an intracellular membrane bound vesicle. This process is generally involved in the ingestion of food materials. Intake of solid particles by a cell through its cell membrane is called phagocytosis or cell eating. In this process, cell membrane of *Amoeba* puts up protoplasmic processes around the food particle. The processes join and fuse to form phagosome.

8. Osmosis involves the passive flow of water or any other solvent from a region of higher water concentration to a region of lower water concentration through a semi-permeable membrane.

9. (i) Water gathers in cup B and C because in both the situations there is difference in the concentration of water in the trough and water in the potato cup. Hence, endosmosis

(i.e. water enters into the cell) takes place as the potato cells act as a semi-permeable membrane.

(ii) Potato cup A is necessary in the experiment as a 'control' for providing comparison among the situations created in potato cups B, C and D. It indicates that the potato cavity alone does not induce any movement of water.

(iii) In case of cup A, water does not gather in hollowed out portions. This can be explained as follows. For osmosis to take place, a concentration gradient is necessary to develop between the two solutions on either side of a semi-permeable membrane (in this case potato strip). Here, water is present

only on one side i.e., in trough whereas the other side i.e., side of the potato cup is empty. Water will enter in potato cup only when endosmosis will take place. Hence, the hollowed out portion of A remained empty. In cup D cells become dead due to boiling, hence semipermeability of membrane is lost so no osmosis will take place in it.

10. Mitosis is a type of cell division which is required for growth and repair of body and meiosis is involved in the formation of gametes. Meiosis is a reduction division through which the number of chromosomes are maintained in a organism.



