10. CELL AND CELL ORGANELLES

Q 1) Who am I?

a. I am ATP producing factory.

Ans. Mitochondria

b. I am single layered, but maintain cellular osmotic pressure.

Ans. Vacuole

c. I support the cell, but I am not the cell wall. I have a body resembling net.

Ans. Endoplasmic reticulum

d. I am the chemical factory of the cell.

Ans. Chloroplast present in the plant cell are known as chemical factory because they are useful to synthesize carbohydrates. Ribosomes synthesize proteins so are known as chemical factory.

e. Leaves are green because of me.

Ans. Chloroplast

Q 2) What would have happened? If……

a. RBCs had mitochondria.

Ans. 1) The oxidation process is continuously carried out by mitochondria which also form energy within a cell. 2) Much amount of energy is not required by RBCs because they lack almost every piece of cell machinery. The RBCs, allowing lesser

quantity of hemoglobin to be transported, as mitochondria would occupy space in RBCs. This will lead to lesser transport of oxygen by RBCs throughout the body.3) As mitochondria is the powerhouse of the cell it would consume oxygen for cellular respiration. It will decrease the oxygen carrying potential of these cells.

b. There had been no difference between mitochondria and plastids.

Ans. 1) Mitochondria is termed as the power house of the cell where as plastids are known as the kitchen of the cell. 2) Plastids occur only in plant and algae cells but mitochondria are found in all eukaryotic cells. Plastids synthesize carbohydrates by using solar energy and chlorophyll. 3) If there had been no difference between mitochondria and plastids, animal's cell would also have varied colours just like the plant cells, and their particular functions will not occur.

c. Genes had been absent on the chromosomes.

Ans.1) Each gene contains a specific portion on a chromosome.2) Because genes provide instructions for making proteins, and proteins provide the structure and function of each cell in the body, thus we understand that for all the characteristics one inherits the genes are responsible. 3) If genes would be absent on the chromosomes then there will be no transfer of hereditary information from parents to their offsprings. Genes have the

information for process of protein synthesis, no protein synthesis nor any cellular processes, that take place in nucleus will take place. 4) The genes standardize and control cell activities and so multicellular organization would not take place if genes on chromosomes are absent.

d. Plasma membrane had not been selectively permeable.

Ans.1) The entry of all molecules into the cell would occur if the plasma/cell membrane was entirely permeable. 2) The entry of toxins, virus, unwanted elements etc., that may harm the cell would also enter in it. 3) In similar way, it is troublesome for the cell to survive if impermeable.4) Selective important molecules from the surroundings are taken as all are not produced. 5) If the disposal of waste materials does not occur it will result in cell toxicity. 6) Osmosis may not take place and cells can get damaged.

e. Plants lacked anthocyanin.

Ans. 1) If Anthocyanin was absent in plants, parts of plants would lack red, blue or purple color. 2) Anthocyanin are naturally occurring compounds, that attracts insects for pollination and dispersal of seeds. It is also engaged in protection against the harmful effects of UV rays in plants. 3) If Anthocyanin is absent then parts of plants will appear dull. Also shortage of these pigments in flowers, affect the color, causes lack of pollination as the insects are not attracted to the flowers. 4) The

absorption of light by plants including these pigments would be hampered.

Q 3) Who is odd man among us? Give reason.

a. Nucleolus, mitochondria, plastids, endoplasmic reticulum

Ans. Nucleolus. Nuclelus is not a cell organelle in the cytoplasm while others organelles contain the mitochondria, plastids and endoplasmic reticulum are in cytolpasm.

b. DNA, Ribosomes, Chlorophyll

Ans. Chlorophyll (Chlorophyll is required for photosynthesis and DNA , Ribosomes are required for protein synthesis.)

Q 4) Give functions.

a. Plasma membrane

Ans. 1) Plasma membrane permits the entry of useful substances required by cell, and avoid entry of harmful substances. 2) Homeostasis in the plasma membrane balances effects of outer surroundings and does not let occur any change in the cellular environment. It carries out process like endocytosis exocytosis, diffusion and osmosis, protection in the animal cells as it is an outer covering .

b. Cytoplasm

Ans.1) Cytoplasm is responsible for cellular chemical reactions. It contains cell organelles. 2) The cytosol that is a part of cytoplasm

contains important substances such as amino acids, glucose, vitamins, etc., that are required by the cell, other than cell organelles.

c. Lysosome

Ans. 1) They help in digestion of proteins and fats. 2) They help in destroying and digest the viruses, bacteria called as Autolysis, worn out organelles and debris is known as Autophagy. 3) They also digest proteins and fats.

d. Vacuole

Ans. 1) It stores metabolic by product and end products such as proteins, water and glycogen. 2) Maintain the osmotic pressure of cell. 3) Till food get digested food is stored in the vacuole in Amoeba. While in animal cells vacuoles store waste products and food. 4) For the plant cells the vacuoles are filled with cell sap and give properties of turgidity and rigidity to the cells.

e. Nucleus

Ans. 1) It is responsible to control all metabolic activities of the cell. 2) The chromosomes which are present in nucleus have genes that transmits the heredity characters from parents to next generations.

Q 5) Who gives me the color? (Select the correct option.)

Column 'A'	Column 'B'
a. Red tomato	1. Chlorophyll
b. Green leaf	2. Carotene
c. Carrot	3. Anthocyanin
d. Violet	4. Lycopene

Ans.

Column 'A'	Column 'B'
a. Red tomato	Lycopene
b. Green leaf	Chlorophyll
c. Carrot	Carotene
d. Violet	Anthocyanin

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