**11th May, 2020 JESUS AND MARY SCHOOL AND COLLEGE MODULE 1**

**CLASS – IX**

**BIOLOGY**

**CHAPTER – The Cell**

**EXPLANATION OF THE CELL:**

Cell was discovered by Robert Hooke in 1665, who named that for its resemblance to cells inhabited by Christian monks in a monastery. Living cell, however was seen for the first time by Anton van Leeuwenhoek (1632-1732), with his improved microscope.

The cell (from Latin cella, meaning “Small room”) is the basic structural, functional and biological unit of all known organisms. A cell is the smallest unit of life. Cells are often called the **“building blocks of life.”**The study of cells is called **Cell Biology, Cellular Biology or Cytology**.

**Cell Theory:**

Cell theory was first developed in 1839 and was given by **Matthias Schleiden**and **Theodor Schwann**. The main points of cell theory are:

1. Cell is the unit of structure of all living beings.
2. Cell is the unit of function of all living beings.
3. All living cells arise from pre-existing cells.

**Size of the cells:**

The cells are microscopic and their size varies between 10 µm and 100 µm. The smallest cells are those of PPLO (Pleuro pneumonia like organisms) whose size may vary between 0.1 and 0.4 µm. The largest cell is the egg of ostrich measuring about 15 cm in its outer diameter. The longest animal cell is the nerve cell (one meter long). The longest plant cell is the sclerenchymatous fibre of *Boehmeria nevia* (about 55 cm long).

**Types of Cells:**

The cell is a fundamental component of our modern definition of life and living things. Cells are regarded as the basic building blocks of life and are used in the elusive definition of what it means to be “alive”. All living organisms can be sorted into one of the two groups depending on the fundamental structure of their cells. Thus, two types of cells are found in the organisms: eukaryotic and prokaryotic depending on whatever cells contain membrane – bound organelles or not. Their genetic materials are enclosed by a nuclear envelope or not.

1. **Explanation of Prokaryotic Cells:**

Cells in which mitochondria, chloroplast and nuclear membrane are absent are called Prokaryotic cells. Prokaryotes include bacteria and cyanobacteria (blue green algae). They are simpler and smaller than eukaryotic cells. Prokaryotic cells are the most primitive cells. They do not have definite nucleus.

1. **Explanation of Eukaryotic Cells:**

It is believed that eukaryotes have been evolved from the prokaryotes. They have been characterised by the presence of nuclear membrane. Plants, animals, fungi, protozoa and algae are all Eukaryotic. They are found in all plants and animals. Cells in which nucleus and membrane bound organelles are present are called eukaryotic cells. They contain organelles like mitochondria bounded by membrane and are located in the cytoplasm. They contain a definite nucleus and chromatin bodies are enclosed by a nuclear membrane.

**Differences between Prokaryotic and Eukaryotic Cells:**

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| --- | --- | --- |
| **S.No.** | **PROKARYOTIC CELL** | **EUKARYOTIC CELL** |
| **1.** | Nuclear material is not enclosed by nuclear membrane. It is called nucleoid. | Nuclear material is enclosed by nuclear membrane to form a distinct nucleus. |
| **2.** | There is no nucleolus. | One or more nucleoli occur inside the nucleus. |
| **3.** | Membrane bound organelles like mitochondria, golgi bodies and lysosomes are absent. | Membrane bound organelles are present. |
| **4.** | 70S type ribosomes are found. | 80S type ribosomes are found. |
| **5.** | There is no meiosis, gamete formation or true fertilization.  | Meiosis, gamete formation and true fertilization occur in most cases of sexual reproduction. |

**PROTOPLASM:**

The living content of the cell that remains surrounded by the cell membrane is called Protoplasm. The term protoplasm was given by Purkinje. Huxley called it “physical basis of life”. The Protoplasm in eukaryotic cells is divisible into ground substance called **“cytoplasm”**, (present between the cell membrane and the nuclear membrane) and **“nucleoplasm”**, (present inside the nucleus).

**WORKSHEET -1**

**EXERCISES:**

1. **Answer the following question:**
2. Who coined the term cell?
3. Who observed the living cells for the first time?
4. What is a cell?
5. Give any four differences between Prokaryotic and Eukaryotic cells?
6. Explain Cell Theory?
7. Write the name of the largest animal cell (with regard to size)?
8. Write the name of the longest plant cell (with regard to size)?
9. Explain the types of cells?
10. State the characteristics of cells?
11. What is the location of the cytoplasm?
12. **Fill in the blanks**:
13. The largest cell in the animal kingdom is that of \_\_\_\_\_\_ egg.
14. Cells arise from \_\_\_\_\_\_\_ cells.
15. Cell theory was proposed by \_\_\_\_\_\_\_ and \_\_\_\_\_\_\_.
16. Protoplasm inside the nucleus is called \_\_\_\_\_\_\_.
17. The smallest cell is \_\_\_\_\_\_\_\_.

**NOTE: Please do this work in your old copies which will be checked when the school reopens. Please consider this important.**

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