

# MODULE 1- HAND OUT

## CELL -STRUCTURE &FUNCTION

Things around us can be classified into two main groups. They are

a) **Non-Living Things** : Eg: Soil, Rock, Air, Water etc...,

b) **Living Things**: Eg: Plants and Animals

Basic Functions Performed by Living organisms are:-

\* They need food (digestion)    \* They respire    \* They excrete    \* They reproduce

\* They show growth and movement    \* They respond to their environment

**Different sets of organs perform these functions.** For eg: The various stages of digestive process is performed by various organs like buccal cavity, salivary gland, stomach, pancreas, liver, intestine etc.

These organs are made up of still small and simple structures.

These simple structures are called **cells**

*Cells can be compared to bricks of a building*

Bricks are assembled to make different types of buildings

Cells are assembled to make the body of every organism

**Cell is the basic structural and functional unit of an organism**

### ***DISCOVERY OF THE CELL***

Robert Hook in 1665, observed a thin slice of cork under a magnifying device. Cork is a part of the bark of a tree. He observed them as “**Honey comb**” like structures and called them as *cells or cellulae* .Cell is a Latin word for ‘a little room’.

In 1674 Anton Van Leeuwenhoek studied living cells for the first time.

The cells are microscopic .They need to be enlarged or magnified by a microscope. But some cells like egg of hen, duck, ostrich are single celled and are big enough to be seen by the unaided eye.

## **Organism show variety in cell number, shape, size**

### **a) Diversity in cell number**

Number of cells varies from organism to organism. Based on the number of cells, organisms can be classified into **two** types: i) unicellular organism    ii) multi cellular organism

**Unicellular organism** – Single celled organisms are called unicellular organism

Eg: amoeba, paramecium, yeast, bacteria etc.

**Multi cellular organisms** – Organisms made of more than one cell are called multicellular organisms

Eg: plants, animals

In unicellular organisms all life processes are carried out by single cell. They capture and digest food, respire, move and reproduce.

In multicellular organisms these functions are carried out by group of specialized cells forming different tissues which in turn form various organs and constitute the body of the organism.

### **b) Diversity in cell shape**

Different cells have different shapes. Some have definite shape and some have indefinite shape.

#### ***a) Cells that can change its shape***

Ex: (a) Amoeba

\* It has no definite shape. It keeps on changing its shape.

\* The change in shape is due to the formation of pseudopodia. (Pseudo = false; Podia = feet)

Pseudopodia are the projections protruding out from the body. It helps in food capturing and movement.

(b) Human WBC :- White Blood Cells in the human body also can change its shape

**WBC is a cell whereas Amoeba is a full-fledged organism**

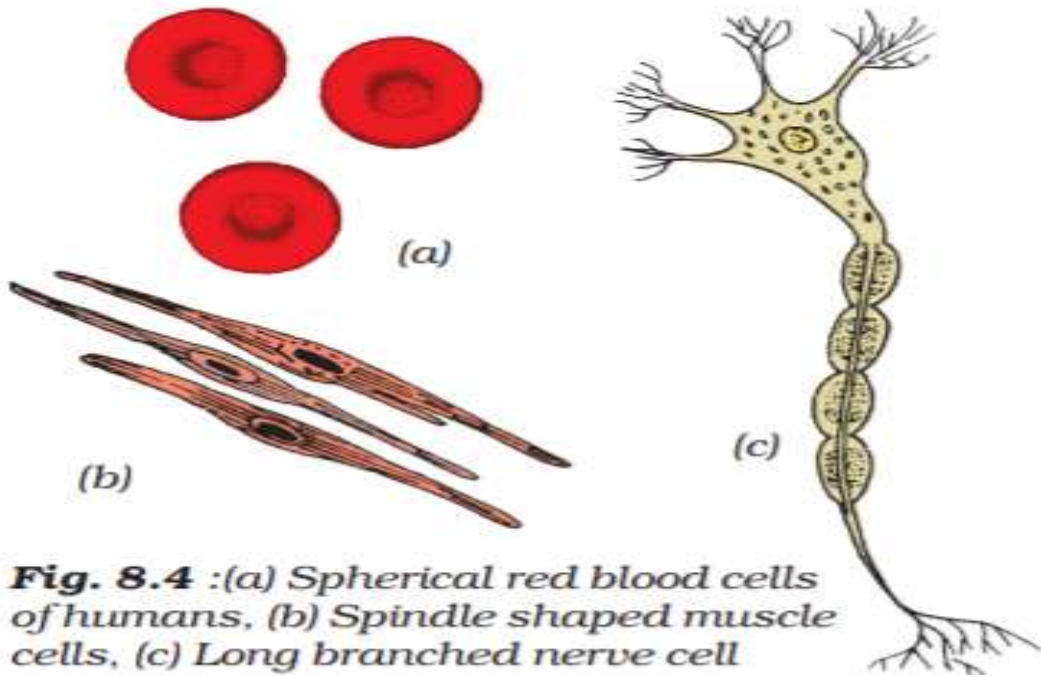
#### ***b) Cells with specific shape***

In multicellular organisms different cells have different shapes. The different shapes are related to their specific function.

Generally cells are round, spherical Eg: RBC. It carry respiratory gases like O<sub>2</sub> & CO<sub>2</sub>

Some cells are spindle shape (long, pointed at both ends) eg; muscle cells. It contracts &relaxes, helps in movement.

Some cells are long and branched. Eg; Nerve cell or neuron. The nerve cell receives and transfers messages thereby helping to control and coordinate the working of different parts of the body. **It is the longest animal cell**



**Fig. 8.4 :** (a) Spherical red blood cells of humans, (b) Spindle shaped muscle cells, (c) Long branched nerve cell

**c) Diversity in cell size**

The size of a cell may vary from a micrometer to a few centimeters.

Most of the cells are microscopic in size. But some cells like egg of hen, duck, and ostrich are single celled and are big enough to be seen by the unaided eye.

**The smallest cell is Bacteria (Mycoplasma–0.1mm)**

**Largest Cell is Egg of an Ostrich (170 mm x 130 mm)**

**The size of the cells does not depend upon the size of the body of the organism.** It is related to its function. For example, the nerve cells both in an elephant and a rat are long and branched. They perform the same function, transferring messages.

Body of an organism is composed of various organs system that perform various functions like digestion, respiration, excretion, reproduction etc. Each organ system has many organs that perform different functions. Each organ is made up of smaller parts called tissues. A tissue is a group of similar cells performing a specific function.



So the cell in a living organism is the basic structural unit.

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