

# CELL STRUCTURE & FUNCTIONS

# INTRODUCTION

Things around us

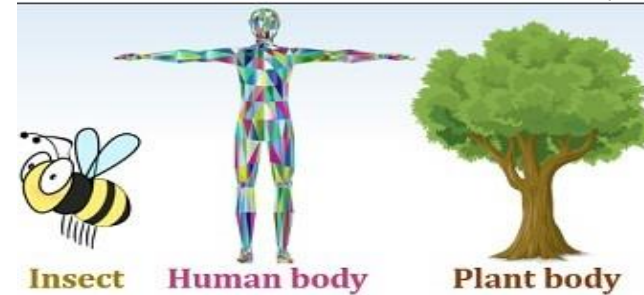
## Non-Living Things

Eg: Soil, Rock, Air, Water etc...,



## Living Things

Eg: Plants and Animals



Basic Functions Performed by Living Organisms:

- \* They need food
- \* They respire
- \* They excrete
- \* They reproduce
- \* They show growth and movement
- \* They respond to their environment

**Different sets of organs perform these functions.**

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

What are those structures?

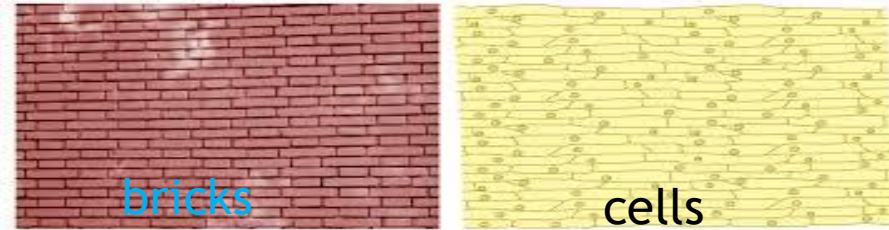
Those structures are called

**cells**

# CELL

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

*Cells can be compared to bricks of a building*



- Bricks are assembled to make different types of buildings

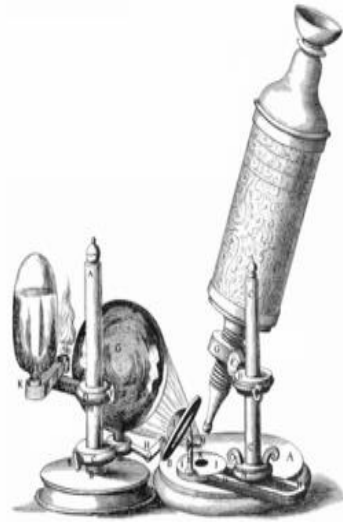


Cells are assembled to make the body of every organism



# THE DISCOVERY OF THE CELL

Cells in  
Cork



- Robert Hooke – English physicist
- Looked at thin slices of plant tissue – cork
- Found “little chambers” in the cork
- Called these “chambers” cells.

- Anton van Leeuwenhoek
- Used a simple microscope
- He was the first person to use a microscope to study nature.



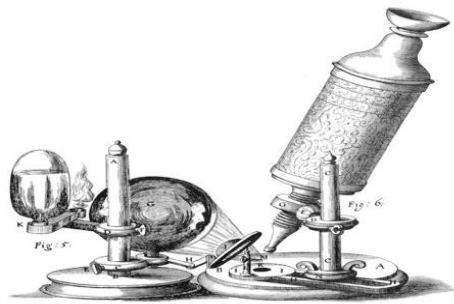
- He was the first to see tiny living organisms in a drop of water.

# STUDY OF CELL

*How do we observe and study living cells?*

\* by using **microscope**

**Microscope is the instrument used to magnify objects.**



Ancient Microscope



Modern Microscope

Stains or dyes are used to colour the parts of the cell to study its detailed structure.

Eg: \* Methylene Blue

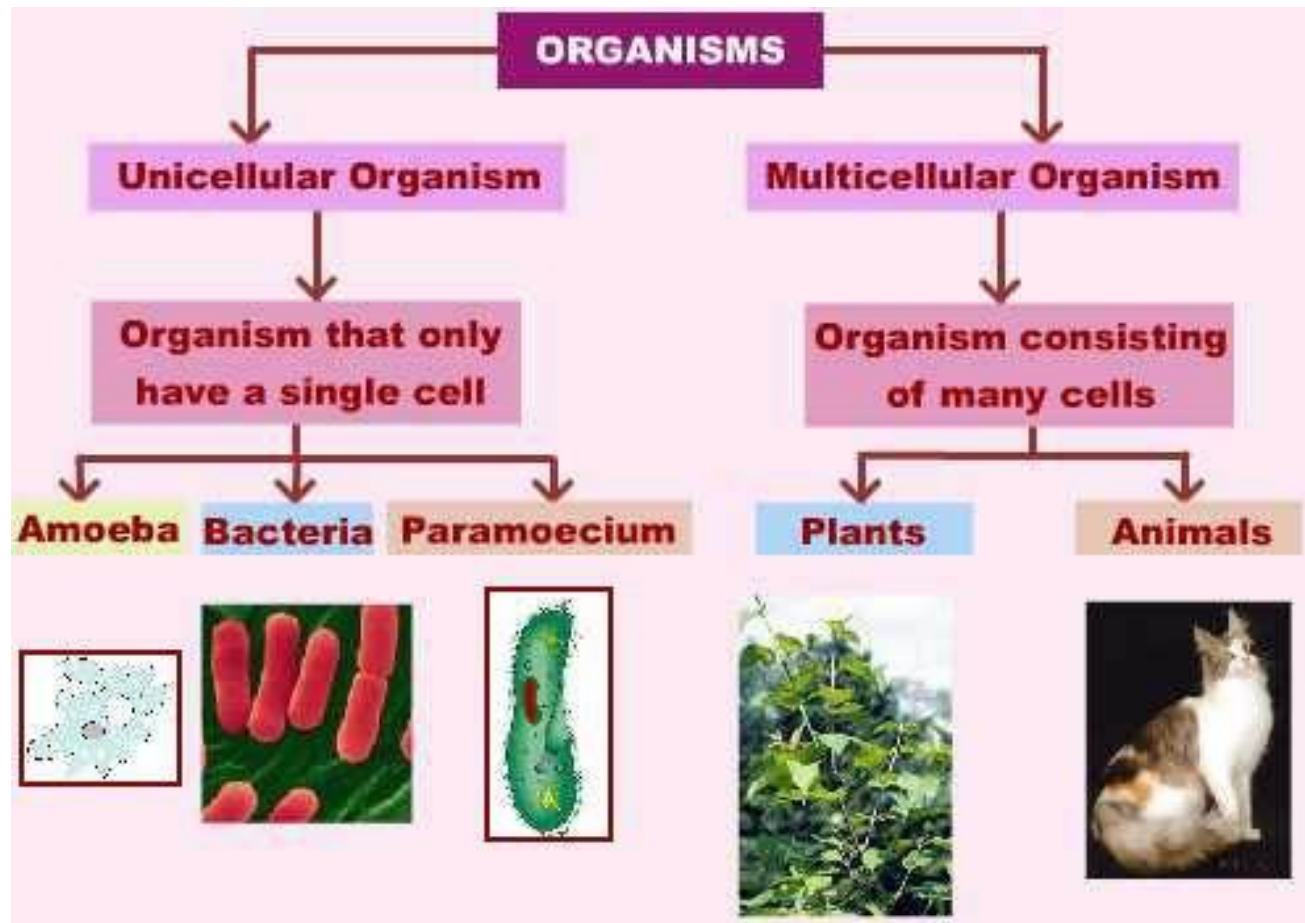
\* Iodine Solution

\* Safranin

# DIVERSITY IN CELL NUMBER

Number of cells varies from organism to organism

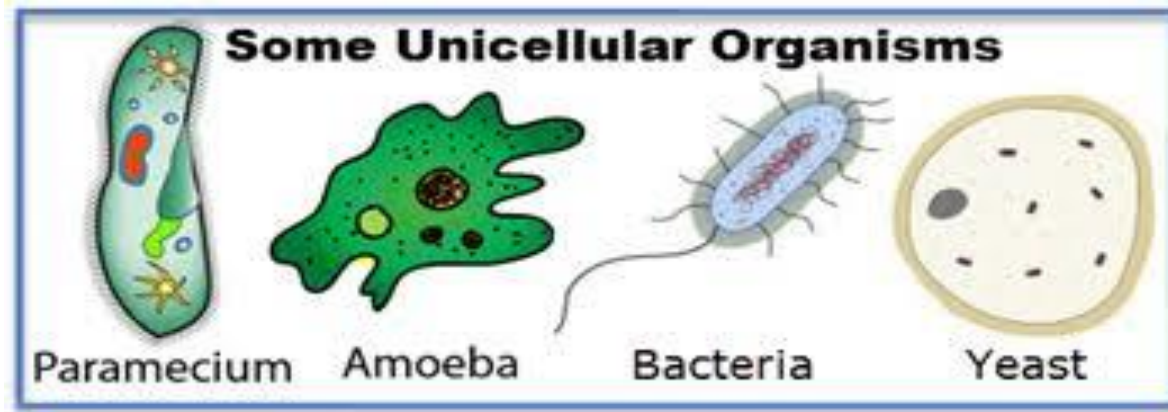
*Based on the number of cells, organisms can be classified into **two** types*



*Do unicellular organism perform all functions like multicellular organism?*

**YES**

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

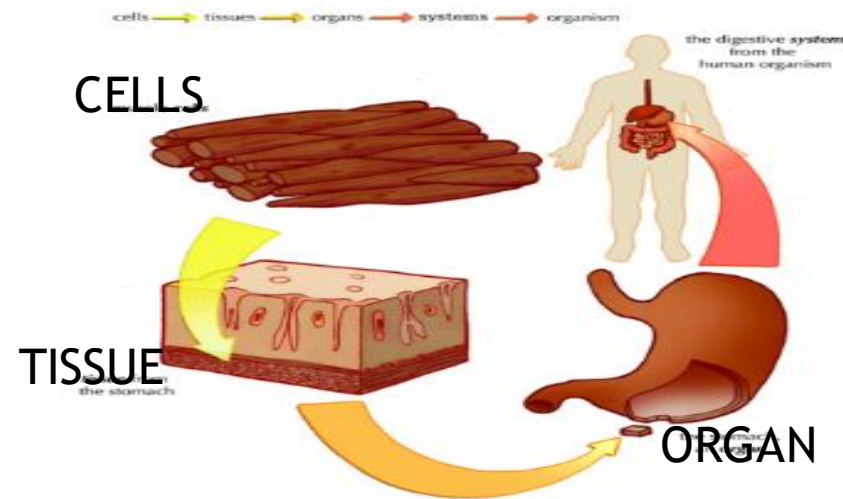
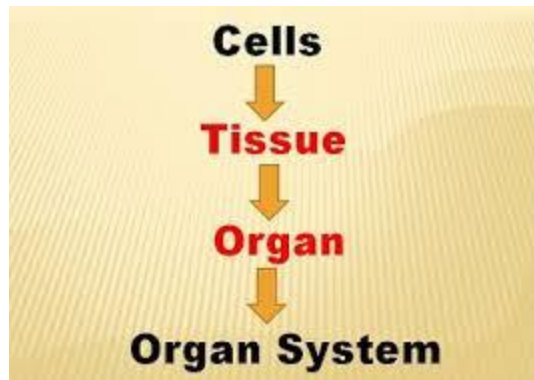


In multicellular organisms these functions are carried out by group of specialized cells forming different tissues which in turn form various organs and constitute the body of the organism.

Level of Organization  
Cells with a purpose!

## Levels of Cellular Organization

IN MULTICELLULAR ORGANISM



Tissue : It is a group of similar cells performing a specific function  
Organ: Group of similar tissues performing a specific function

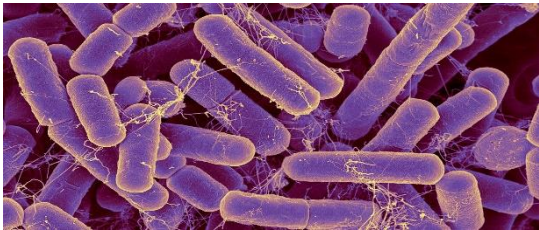


# DIVERSITY IN CELL SHAPE

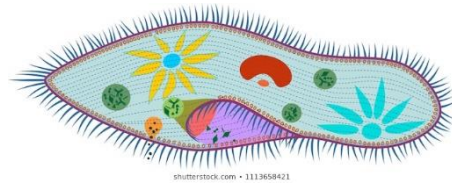
Different cells have different shapes. Some have definite shape and some have indefinite shape

## *Cells with definite shape*

Eg: Bacteria



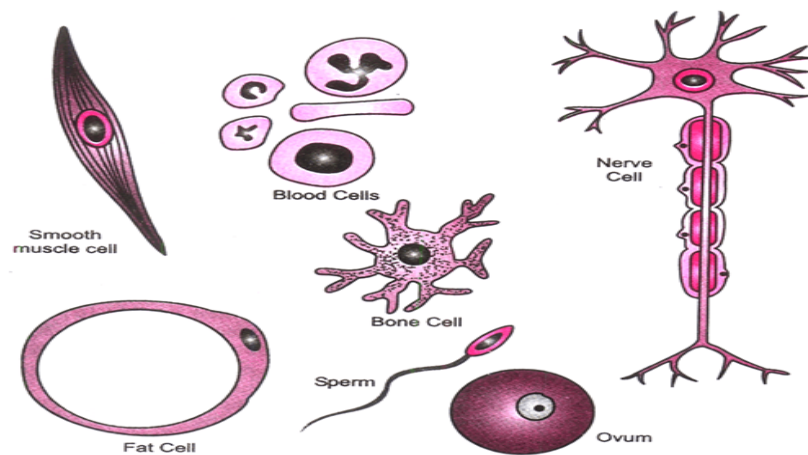
Paramecium



Euglena

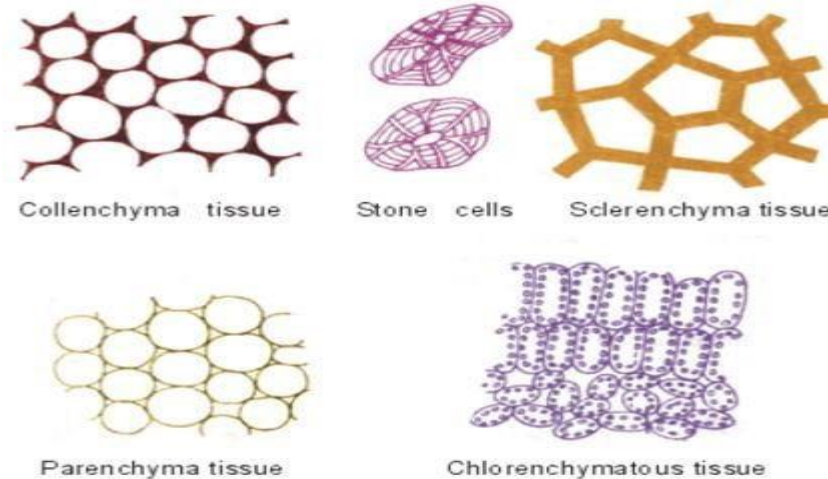


## Different types of animal cells



**Figure : VARIOUS CELLS FROM THE HUMAN BODY**

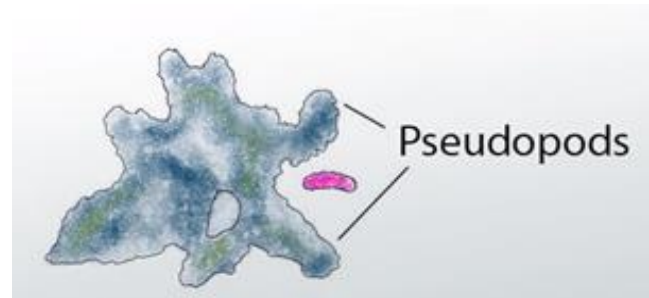
## Different shapes of plant cells



## *Cells with indefinite 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.

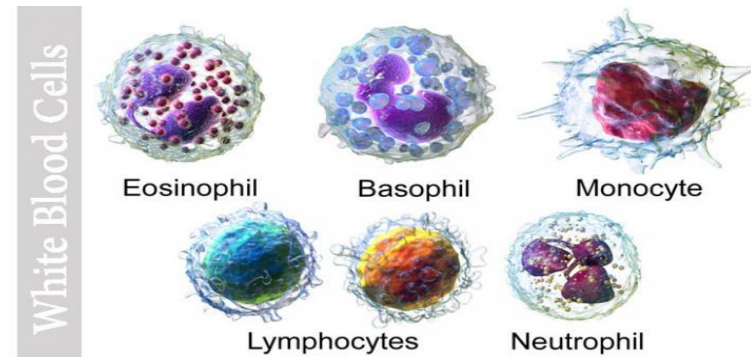


### (b) Human WBC

White Blood Cells in the human body also can change its shape.

Note:

WBC is a cell  
whereas  
Amoeba is a full fledged  
organism

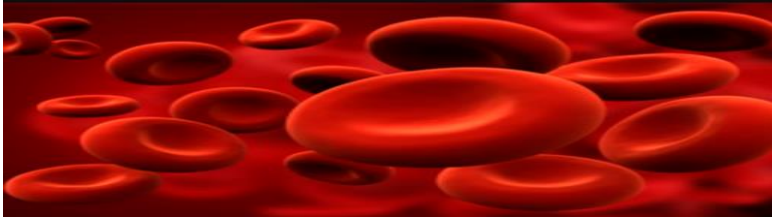


# Different shapes of cells

## i) Round, Spherical Cell

Eg: RBC

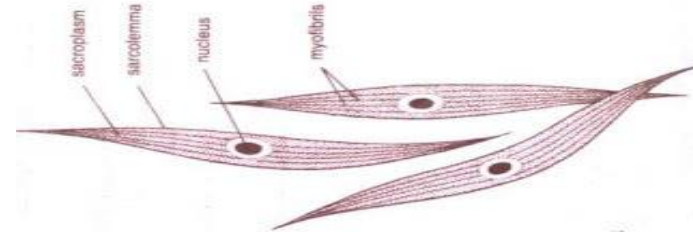
Function: It carry respiratory gases like O<sub>2</sub> & CO<sub>2</sub>



## i) Spindle shape(long and pointed at both ends)

Eg : Muscle cell

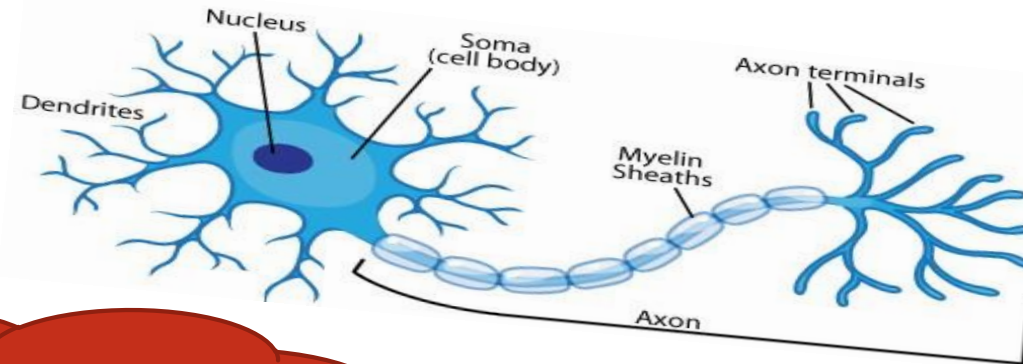
Function: It contracts &relaxes, helps in movement



## iii) Long and branched

Eg : Neuron

Function : Receives &transfers messages. It helps to control & co-ordinate the working of different parts of the body



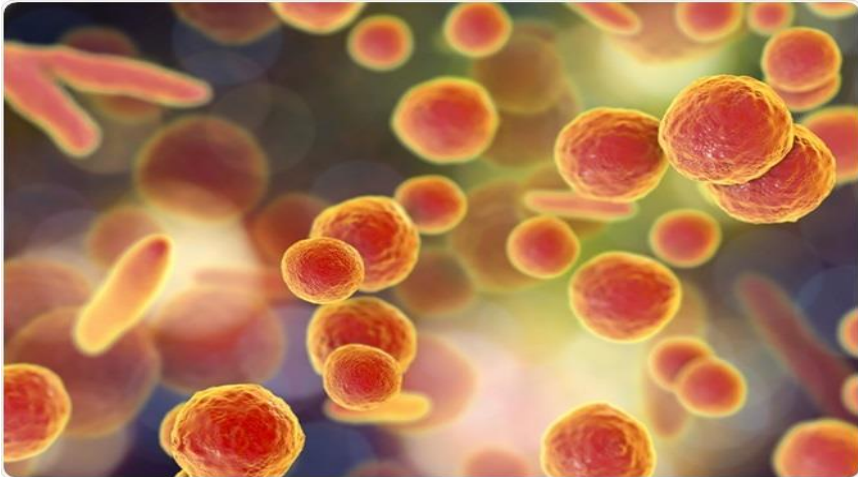
Shape of a cell is modified according to its function

## *Size of a Cell*

The size of a cell may vary from a micrometer to a few centimeters.  
Most of the cells are microscopic in size.

### **Smallest Cell**

Mycoplasma( Bacteria – 0.1mm)



### **Largest Cell**

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.

# SUMMARY

- \* All organisms are made of smaller parts called organs.
- \* Organs are made of still smaller parts called cells.
- \* Cells are the basic structural and functional unit of the body.
- \* Cells were first observed in cork by Robert Hook.
- \* Number of cells varies from organism to organism.
- \* Cells exhibit variety of shapes and sizes.

*Thank you!!!*

*Shreeja T.M  
TGT (Chem/Bio)  
AETS, Mysore.*