

Biology

- Biology is a natural science concerned with the study of life and living organisms, plants and animals
- Study of plant is called **Botany** and study of animal is called **Zoology**. Zoology and botany are collectively called biology the term **Biology** was coined by **Lamarck** and **Treviranus**.
- The scientist who gave his thought for the first time about the life of plants and animals was **Aristotle**. That's why he is known as the *Father of biology*. He is also known as the *Father of Zoology*.
- **Theophrastus** is known as *Father of Botany*.

The cell

- The cell is the basic structural and functional unit of all non living organism. It is the smallest unit of life and is often called the building block of life
- The branch of Biology which deals with the study of cell, is called **Cytology**.
- **Robert Hooke** coined the term cell when he saw honey comb-like structure in the section of cork. However, he only discovered *cell wall*.
- The first living cell was discovered by **Leeuwenhoek**.

Know It!

- The largest known cells are unfertilized **ostrich egg** shells (size 6 inch diameter).
- The smallest cell is of **PPLO** (mycoplasma gallisepticum-size(0.1-0.3 m).
- Human Nerve cells is the **longest animal cell**.
- Largest acellular plant *Acetabularia* is 10 cm and animal Amoeba, is 1mm.
- The largest human cell is the **female ovum** and the smallest human cell is the **red blood cell**.

Types of cells

These are two types

1. **Prokaryotic cells** -These are primitives cell, lacking a nucleus and most of the other cell organelles, e.g. bacteria cell.
2. **Eukaryotic cells** - These have nucleus and membrane bound cell organelles. These are present in unicellular and multicellular plant and animal cells.

Cell organelles, their Discovery and functions

Cell organelle	Discoverer	Function
Mitochondria	Koiker (1880), named by C Benda	Powerhouse of cell
Chloroplast	Schimper (1885)	Photosynthesis
Endoplasmic reticulum	Porter (1945)	Protein packaging, detoxification and steroid synthesis
Golgi complex	Camillo Golgi (1898)	Glycosylation of lipids and proteins
Ribosome	Palade (1955) in animal and Robinson (1953) in plants	Protein synthesis
Lysosome	De Duve (1955)	Digestion of extracellular material, suicidal bags
Centrosome	T Boveri (1888)	Organisation of spindle fibre
Nucleus	Robert Brown (1831)	Control synthesis
Nucleolus	Fontana (1781)	Ribosome synthesis
Chromosome	Waldeyer (1888)	Inheritance of characters from parent to offspring

Deoxyribonucleic Acid (DNA)

- It is a long polymer made from repeating units called **nucleotides**.
- Each nucleotide consists of a nucleoside (i.e., nitrogenous base and deoxyribose sugar) and a phosphate group, joined together by ester bonds.
- It has four bases, i.e. adenine, guanine, cytosine and thymine.
- Adenine and guanine are the purine bases; cytosine and thymine are pyrimidine bases.

DNA was discovered by James D Watson and Francis Crick, who got noble prize for this discovery

Ribonucleic Acid (RNA)

- It is also made up of a long chain of nucleotides.
- Each nucleotide consists of a nitrogenous base, a ribose sugar and a phosphate group.
- It contains uracil in place of thymine.

RNA is of three types

1. mRNA (messenger RNA)
2. rRNA (ribosomal RNA)
3. tRNA (transfer RNA)

- These three take part in protein synthesis.