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## Chapter - 8

### Cell — Structure and Functions

- **Cell:** The smallest structural and functional unit of an organism, which is typically microscopic and consists of cytoplasm and a nucleus enclosed in a membrane.
  - All organisms are made of smaller parts called organs.
  - Organs are made of still smaller parts. The smallest living part of an organism is a 'cell'.
  - Cells were first observed in cork by Robert Hooke in 1665.
  - Cells exhibit variety of shapes and sizes.
  - Number of cells also varies from organism to organism.
  - Some cells are big enough to be seen with the unaided eye. Hen's egg is an example.
  - Some organisms are single-celled, while others contain large number of cells.
  - The single cell of unicellular organisms performs all the basic functions performed by a variety of cells in multicellular organisms.
  - The cell has three main parts, (i) the cell membrane, (ii) cytoplasm which contains smaller components called organelles, and (iii) the nucleus.
  - **Cell membrane:** The basic component of a cell. The cytoplasm and nucleus are enclosed within cell membrane. There is an outer thick layer in cells of plants called **cell wall**.
  - **Cytoplasm:** The jelly-like substance present between the cell membrane and the nucleus. Various organelles present in the cytoplasm are:
    - (i) Mitochondria
    - (ii) Plastids (present only in plant cell)
    - (iii) Endoplasmic reticulum (ER)
    - (iv) Ribosome
    - (v) Lysosome
    - (vi) Vacuole
    - (vii) Golgi body
    - (viii) Centrosome (present only in animal cell).
  - **Nucleus:** Nucleus is separated from cytoplasm by a nuclear membrane. It is generally spherical in the centre of the cell.
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- **Nuclear membrane:** Nucleus is separated from the cytoplasm by a membrane called the nuclear membrane.
  - **Nucleolus:** Nucleus contains a still smaller round body known as nucleolus.
  - **Chromosomes:** Nucleus contains thread-like structures called chromosomes. These carry genes and help in inheritance or transfer of character from the parents to the offsprings
  - Cells without well organised nucleus, i.e. lacking nuclear membrane, are called prokaryotic cells.
  - Plant cells differ from animal cells in having an additional layer around the cell membrane termed cell wall.
  - Coloured bodies called plastids are found in the plant cells only. Green plastids containing chlorophyll are called chloroplasts.
  - Plant cell has a big central vacuole unlike a number of small vacuoles in animal cells.
  - **Size of cells:** The size may be as small as a millionths of a metre or may be as large as a few centimetres. Size of the cells has no relation with the size of the body of the animal or plant. It is related to its function.
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