Plant and Animal Tissues

Plant Tissues

On the basis of the dividing capacity, plant tissues are of two types:

- **Meristematic**
- **Permanent**
- **Meristematic Tissues -** Consist of actively-dividing cells. Meristematic tissues are of three types:
- **Apical Meristem -** Present at the growing tips of stems and roots. Their function is to increase the length of stems and roots
- **Intercalary Meristem -** Present at the base of leaves or internodes.They are useful for the longitudinal growth of plants
- **Lateral Meristem -** Present on the lateral sides of the stems and roots. they help to increase the thickness of stems and roots.

Permanent Tissues - Formed from meristematic tissues; lose the ability to divide.

Permanent tissues are divided into two categories:

- **Simple Permanent -** Consist of only one type of cells.Types of simple permanent tissues:

1. **Parenchyma -** Composed of unspecialised living cells with relatively thin cell walls
2. **Collenchyma -** Composed of living and elongated cells with cell walls irregularly thickened at the corners
3. **Sclerenchyma -** Composed of long, narrow, and thick-walled cells. This tissue is made up of dead cells and there are no intercellular spaces.

4. **Protective tissues -** Epidermis and cork

- **Complex Permanent -** Made up of more than one type of cells. Types of complex permanent tissues:

1. **Xylem –** Conducts water and minerals from the roots to the different parts of the plant. It is composed of four different types of cells – Tracheids, vessels, xylem parenchyma, and fibres

2. **Phloem –** Conducts food material from the leaves to the different parts of the plant. It is composed of four different types of cells – Sieve tubes, companion cells, phloem parenchyma, and phloem fibres

- **Animal Tissues**

Animal tissues are classified into four types based on the functions they perform:

- Epithelial
- Connective
- Muscular
- Nervous
- **Epithelial Tissues -** Form the covering of the external surfaces, internal cavities, and organs of the animal body. Various types of epithelial tissues:
- **Simple Squamous Epithelium -** Single layer of flat cells that are located in Lining of the mouth, oesophagus, lung alveoli, etc.
- **Cuboidal Epithelium -** Consists of cube-like cells that are located in

lining of kidney tubules and ducts of the salivary glands

- **Columnar Epithelium -** Consists of elongated or column-like cells. They are located in the inner lining of the intestine and gut.
- **Glandular Epithelium -** Consists of multicellular glands
- **Connective Tissues -** Specialised to connect various body organs

Various types of connective tissues:

- **Areolar Tissue -** Found in the skin and muscles, around the blood vessels, nerves, etc.
- **Adipose Tissue -** Acts as the storage site of fats; found between the internal organs and below the skin; acts as an insulator for the body
- **Dense Regular Connective Tissue -** Main components are tendons and ligaments; tendons connect muscles to bones, while ligaments connect two bones together
- **Skeletal Tissue -** Main components of skeletal tissues are cartilage and bone. Cartilage consists of cartilage cells arranged in fluid filled space called lacunae. In this various salts of calcium and phosphorus are present which makes the bones hard and strong.
- **Fluid Tissue -** Blood and lymph are the connective tissue present in animals. Blood consists of matrix called plasma in which blood cell (RBC, WBC, platelets). Lymph can be described as the blood without RBCs.
- **Muscular Tissues -** Main function of muscular tissues is to provide movement to the body

Muscular tissues are of three types:

- **Striated Muscles or Skeletal Muscles or Voluntary Muscles -** Cells are cylindrical, un-branched, and multinucleate
- **Smooth Muscles or Involuntary Muscles -** Cells are long, spindle-shaped, and possess a single nucleus
- **Cardiac Muscles or Involuntary Muscles -** Cells are cylindrical, branched, and uninucleate
- **Nervous Tissues -** Present in the brain, spinal cord, nerves
- **Neuron -** Cells of the nervous tissue
- A neuron consists of a cell body, an axon, and a dendrite