

Tissues

Synopsis

- A group of cells that are similar in structure and work together to perform a particular function is called a tissue
- Most of plant tissues that are supportive are dead but provide mechanical strength whereas most of the animal tissues are living. Plant tissues can be classified as meristematic and permanent tissues. Meristematic tissues are classified as apical (tip of stem and roots), lateral (girth of stem and root), intercalary meristems (internodes).
- Cells formed by meristematic tissue lose the ability to divide and form a permanent tissue, which is termed as differentiation
- Permanent tissues, which consist of similar types of cells are called simple permanent tissues. Parenchyma, collenchyma and sclerenchyma are some examples.
- Parenchymatous cells are usually loosely packed with intercellular spaces (Chlorenchyma - performs photosynthesis, Aerenchyma - provides buoyancy).
- The flexibility in plants is due to collenchyma. The cells of the tissue have very little intercellular spaces.
- Sclerenchymatous tissue makes the plant hard and stiff due to the presence of lignin.
- Epidermal layer of leaf consists of pores called stomata which are enclosed by two kidney shaped cells called guard cells. Stomata help in transpiration and exchange of gases.
- Older plants have a chemical called suberin in their walls that makes them impervious to gases and water.

- Complex tissues are made up of more than one type of cells. Xylem and phloem are complex tissues. Xylem consists of tracheid's, vessels, xylem parenchyma and xylem fibres.
- It transports water and minerals vertically. Phloem is made up of sieve tubes, companion cells, phloem fibres and phloem parenchyma. It transports food from leaves to other parts of the plant.
- The protective tissues in animal body are epithelial tissues. Cells in skin, lining of mouth, alveoli, etc. are some examples. The cells of these tissues are tightly packed with no intercellular spaces.
- Simple squamous epithelium (flat) is present in oesophagus and lining of the mouth. Stratified squamous epithelium (many layers) is present in skin. Columnar epithelium is present in the inner lining of the intestine. Ciliated columnar epithelium (have cilia) is present in the respiratory tract. Cuboidal epithelium is present in the lining of kidney tubules, etc.
- The cells of connective tissues are loosely spaced in a jelly like matrix. Blood and bones are connective tissues.
- Blood has a fluid matrix called plasma which consists of RBC/ WBC and platelets
- Two bones are connected by ligaments that are very elastic. Tendons are fibrous tissues, which connect bones to muscles.
- Cartilages have widely spaced cells. Structures in the nose, ear and trachea are cartilaginous tissue.