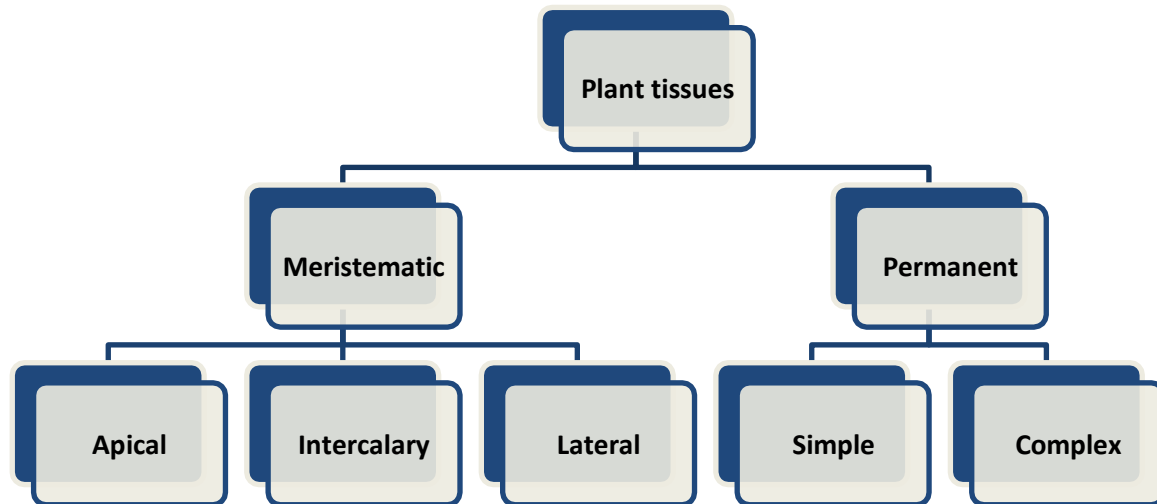


Chapter 6 - Tissues

Tissue – Many cells come together to perform certain functions. These cells are known as tissue. All multi cellular organisms have tissues which perform specific functions and form specific organs.



Meristamatic tissue

1. Ever dividing cells
2. They are present near root tips, shoot tips, cambium and also known as meristem.
3. Meristematic cells have large amount of nucleus material.
4. The cells have few or no vacuoles.
5. Cells have no intercellular spaces between them.

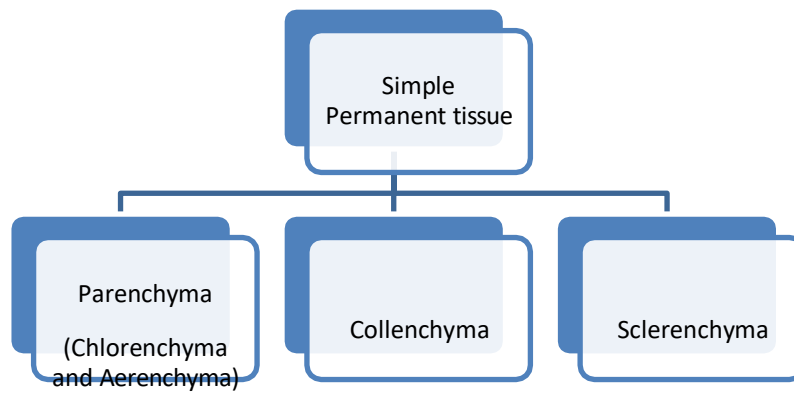
Types of meristems-

1. Apical Meristem- present at root tip shoot tip. Increase in length.
2. Intercalary meristem – Nodes and internodes Increase in length, regeneration of leaves and flowers.
3. Lateral meristem – In cambium, girth thickness

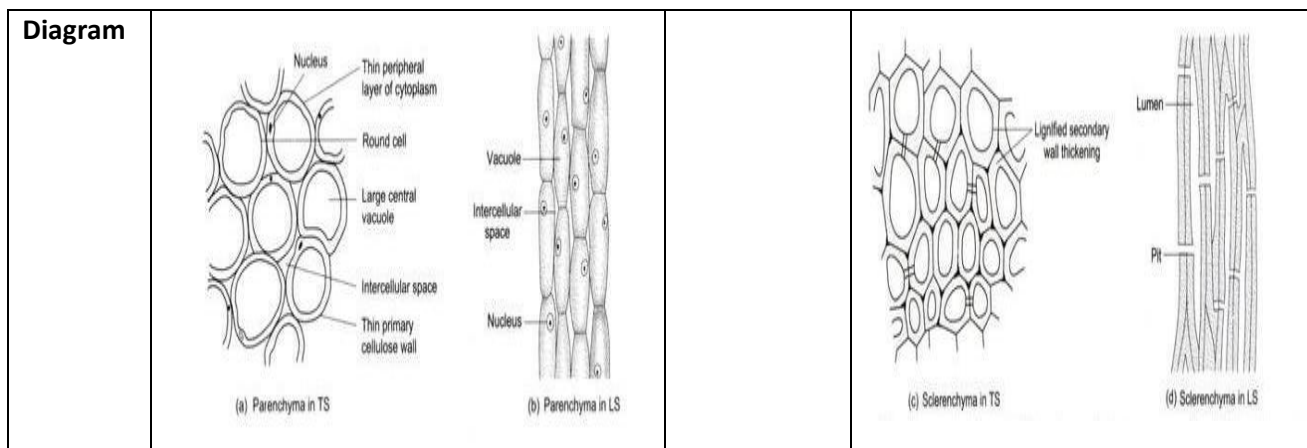
Permanent Tissue – Tissue which consist of differentiated cells and perform a specialized function

E.g. Protective tissue (Cork)

I. Simple Permanent tissue- Tissue which is made up of similar cells that perform similar functions.



Characte rs	Parenchyma	Collenchyma	Scelrenchyma
Cells	Cells are isodiametric. Many cells may store starch, oil granules. Few cells develop chlorophyll and perform photosynthesis. (chlorenchyma). In aquatic plants, special type of parenchyma develops and is known as aerenchyma .	Cells are elongated.	Dead cells form this mechanical tissue.
Wall	Cell wall is thin.	Cell wall is unevenly thickened generally at the corners. It is composed of pectin and cellulose.	Wall thickening is uniform. It is of lignin.
Strength	It provides turgidity to the softer organs.	It provides both mechanical strength and flexibility.	It provides hardness and mechanical strength during stress conditions.
Occurenc e	It forms the packing tissue of plant organs.	It occurs hypodermally in dicot stems and leaves only.	Present in husk of coconut
Lumen	-	Lumen or cell cavity is wide.	Lumen or cell cavity is narrow.

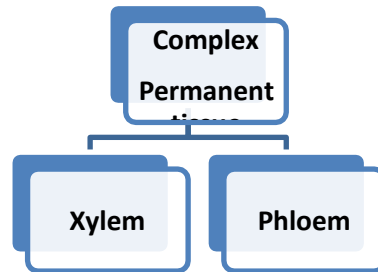


* **Protective tissue** : A layer of cells. Performing role of additional protection.

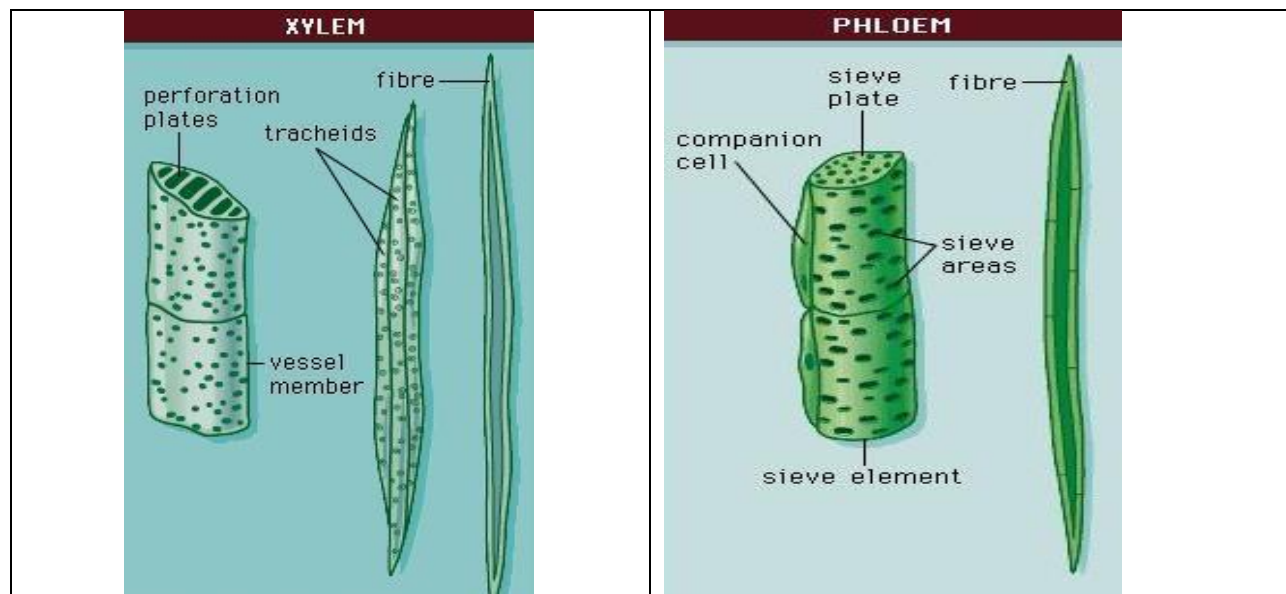
e.g cork (They show suberin thickenings that makes them impervious to gases and water.

* On desert plants epidermis has thick waxy coating of CUTIN on its outer surface which helps them to retain water.

II. Complex tissue:- Tissue which are made up of different cells which perform similar function

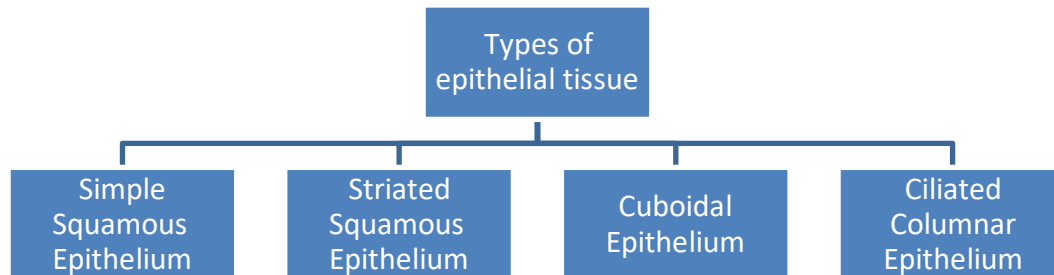


Xylem	Phloem
Components - Tracheids, Xylem parenchyma, Xylem fibres	Components- Sieve tube elements, companion cells, phloem fibres, phloem parenchyma
Transport of water and minerals	Transport of food
Movement of water in one direction only	Movement of materials in both directions
Conducting channels or tracheary elements are tracheids and vessels.	Conducting channels are sieve tubes.
Three of the four elements in xylem are dead (tracheids, vessels and fibres). Only xylem parenchyma is living.	Three of the four elements in phloem are living (sieve tubes, companion cells and phloem parenchyma). Only phloem fibres are dead.
In addition to conduction, xylem provides mechanical support to the plant. The parenchyma stores food and help in the sideways conduction of water. The fibres are mainly supportive.	There is little mechanical function of phloem.



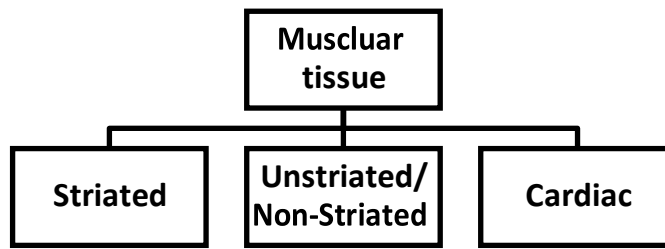
1) Epithelial tissue -

- 1) Tissues that form outer covering of the body. They also cover mood organs and cavities within the body.
- 2) It covers the skin, alimentary canal, lungs etc.
- 3) Its function are -
 - a) They protect the underlying cells from drying, injury, bacterial and chemical effect.
 - b) They help in water nutrient absorption.
 - c) They help in waste elimination.
 - d) Some cells are secretory in function.



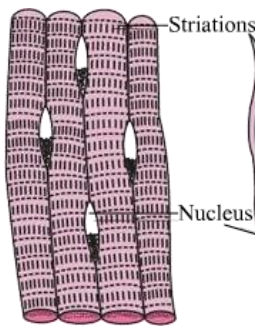
Simple squamous epithelium	Striated Squamous epithelium	Cuboidal epithelium	Ciliated columnar epithelium
Extremely thin and flat cells	Cells are arranged in layers	Cube shaped cells providing mechanical support	Long, epithelial cells, help in absorption and secretion
e.g. lining of blood vessels	e.g. skin and epithelial cells	e.g. lining of kidney tubules	Inner lining of intestine

II) Muscular Tissue

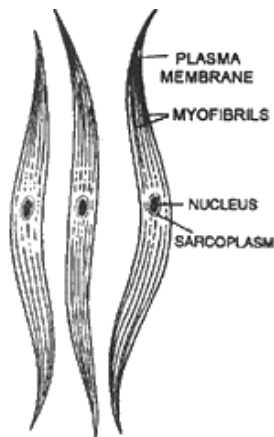


I. Striated -

- 1) Skeletal or voluntary muscles i.e they help in movement of bones in the body.
- 2) Cells are long, cylindrical, non-tapering , unbranched.
- 3) Transverse alternate light and dark bands are seen.
- 4) Cells are multinucleated.



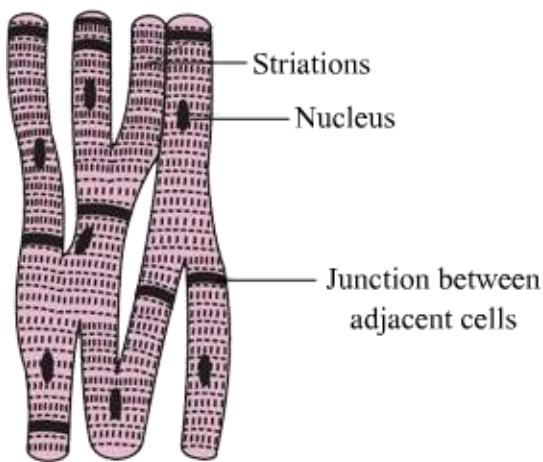
II. Unstriated/Non-Striated Muscles-



Nonstriated muscle fibres

- 1) Smooth, involuntary muscles (found internally)
- 2) Cells are long and have pointed ends.
- 3) Cells do not show striations.
- 4) Cells are uni-nucleate.

III. Cardiac Muscles-

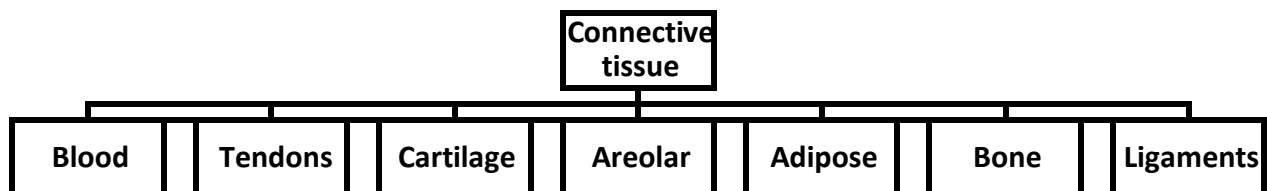


Cardiac muscle diagram

- 1) Present exclusively in heart.
- 2) Cells are cylindrical and branched.
- 3) Cross – striations are observed.
- 4) Cells are uninucleate.

III. Connective tissue -

- 1) Tissue that binds, supports and packs together different organs of the body.
- 2) The cells of this tissue are embedded in a medium called matrix.



Comparison both cartilage and Bone

Cartilage	Bone
It forms few parts of the body skeleton.	It formed whole body skeleton.
The solid matrix is composed of sugar and proteins (chondrin).	The solid matrix is composed of calcium and phosphorus compounds and the protein ossein.
Soft and Flexible in nature.	Hard, strong and non-flexible
Present at the tip of nose, external ear.	Forms the whole bone structure i.e. skeleton.

***Areolar** – found between skin and muscles around blood vessels, nerves and in bone marrow. It fills the space inside the organs, supports internal organs and helps in repair of tissue.

Comparison between Tendon and ligament

<u>Tendon</u>	<u>Ligament</u>
Rough and inelastic	Strong but elastic
Fibres that connect bones to muscles.	Fibres that connect bone to bone.
They are strong.	They are flexible.

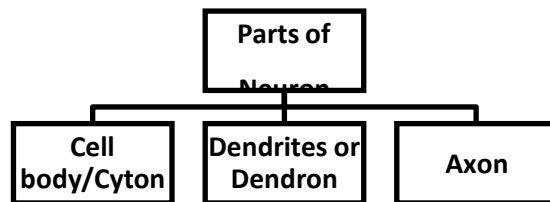
BLOOD –

- 1) A type of connective tissue with a fluid matrix.
- 2) Matrix is known as Blood plasma and contain proteins, salts and hormones.
- 3) The cell which constitute blood are known as corpuscles.
- 4) The types of blood cells are –
 - a) RBC (Red blood corpuscles) or erythrocytes
 - b) WBC (White blood cells) or leucocytes
 - c) Platelets (Thrombocytes)
- 5) Blood flows to all parts of the body and carry oxygen, CO_2 , digested food, hormones and waste materials.

***Adipose** – These store fat in our body below skin and between internal organs cell are filled with fat globules. It acts as insulator due to storage of fat.

NERVOUS TISSUE.

- 1) Tissue present in brain, spinal cord and nerves.
- 2) Cells of this tissue are known as Neurons.
- 3) They are highly specialized to conduct impulses.
- 4) Main parts of Neuron are-



- A) Cell body which consists of nucleus and cytoplasm. It is also called as cyton.
- B) Dendrites or Dendron – that arise from the cell body or cyton.
- C) Axon – single elongated fibre that ends in many branches.

*Axon carry forward the nerve impulse while dendrites receive the impulses.

Structure of Neuron

