UNIT- 18
ORGANIZATION OF TISSUES

FLUID CONNECTIVE TISSUE:

- The blood and the lymph are the fluid connective tissues which link different parts of the body.
- The cells of the connective tissue are loosely spaced and are embedded in an intercellular matrix.

BLOOD

- Blood contains corpuscles which are red blood cells (**erythrocytes**), white blood cells (**leucocytes**) and **platelets**.
- In this fluid connective tissue, blood cell move in a fluid matrix called **plasma**.
- The plasma contains inorganic salts and organic substances.
- It is a main circulating fluid that helps in the transport of nutrient substances.

Red blood corpuscles (Erythrocytes):

- The red blood corpuscles are oval shaped, circular, biconcave disc-like cells and **lack nucleus** when mature (mammalian RBC).
- They contain a respiratory pigment called **haemoglobin** which is involved in the transport of oxygen to tissues.

White blood corpuscles (Leucocytes):

- They are larger in size, contain **distinct nucleus** and are **colourless**.
- They are capable of amoeboid movement and play an important role in body's defense mechanism.
- They engulf or destroy foreign bodies.

Types of WPC

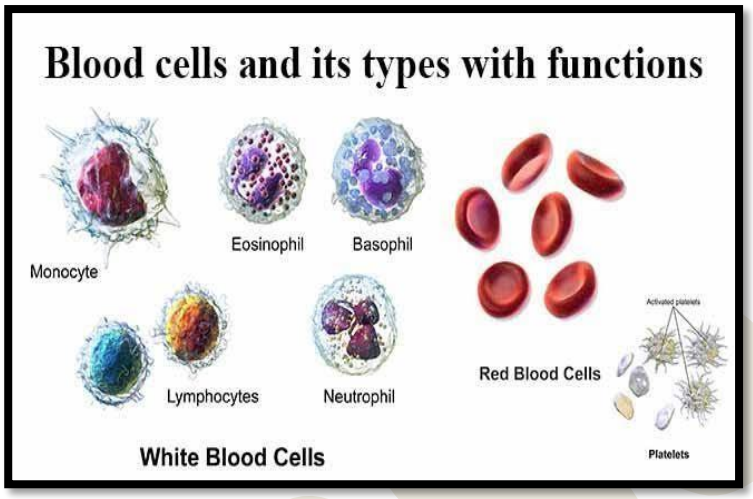
- ❖ **Granulocytes**
- ❖ **Agranulocytes**

Granulocytes

Granulocytes have irregular shaped nuclei and cytoplasmic granules. They include the **neutrophils**, **basophils** and **eosinophils**.

Agranulocytes

Agranulocytes lack cytoplasmic granules and include the **lymphocytes** and **monocytes.**



b. Lymph

- Lymph is a colourless fluid filtered out of the blood capillaries. It consists of plasma and white blood cells.
- It mainly helps in the exchange of materials between blood and tissue fluids.

Muscular Tissues

- Muscular tissues are made of muscle cells and form the major part of contractile tissue.
- They are composed of numerous **myofibrils**.
- Each muscle is made up of many long cylindrical fibres arranged parallel to one another.
- According to their structure, location and functions there are three main types of muscles: Skeletal muscle (or) striated muscle,
- Smooth muscle (or) non-striated muscle

Skeleton Muscle:

- These muscles are attached to the bones and are responsible for the body movements and are called skeletal muscles.
- They work under our control and are also known as **voluntary muscles**.
- The muscle fibres are elongated, cylindrical, unbranched with alternating dark and light bands, giving them the **striped** or **striated** appearance.
- They possess many nuclei (**multinucleate**). They occur in the biceps and triceps of arms and undergo rapid contraction.

Smooth muscle:

- These muscles are spindle shaped with broad middle part and tapering ends.
- There is a single centrally located nucleus (**uninucleate**).
- These fibrils do not bear any stripes or striations and hence are called **non-striated**.
- They are not under the control of our will and so are called **involuntary muscles**.
- The walls of the internal organs such as the blood vessels, gastric glands, intestinal villi and urinary bladder contain this type of smooth muscle.

Cardiac muscle:

- It is a special contractile tissue present in the heart.
- The muscle fibres are **cylindrical**, **branched** and **uninucleate**.
- The branches join to form a network called as **intercalated disc** which are unique distinguishing features of the cardiac muscles.
- The contraction of cardiac muscle isinvoluntary and rhythmic.

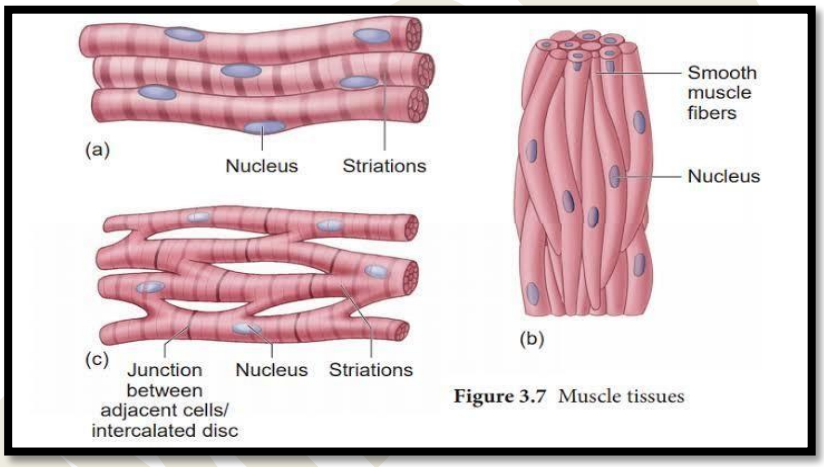


Figure 3.7 Muscle tissues

NERVOUS TISSUE

- Nervous tissue comprises of the nerve cells or neurons. They are the longest cells of the body.
- **Neurons** are the structural and functional units of the nervous tissue.
- The elongated and slender processes of the neurons are the nerve fibres. Each neuron consists of a **cell body** or **cyton**with nucleus and cytoplasm.
- The **Dendrons** are short and highly branched protoplasmic processes of cyton.
- The **axon** is a single, long fibre like process that develops from the cyton and ends up with fine terminal branches
- They have the ability to receive stimuli from within or outside the body and send signals to different parts of the body.