X_Biology_ Life Processes (Transportation)_Handout 3

MODULE 3/4

White Blood Corpuscles (WBC/ LEUKOCYTES) Slide 1

- They are round or irregular shaped, having a nucleus and are large enough to be visible under the microscope. They are larger than the RBC.
- They are the first line of defence and fight with pathogens to protect us from diseases.
- Some WBCs make antibodies to fight against infection, thus providing immunity in our body.

FUNCTIONS

- They act as a defence system in our body.
- WBC in the blood is much smaller in number than red blood cells.
- There are several varieties of WBC performing specific functions such as-

  Neutrophils attack the invading bacteria and engulf them.
  Lymphocytes produces antibodies which protect the body against antigen and thus provide immunity against infection.
  Basophils secrete anticoagulant called heparin which prevents clot within the blood cells.
  Eosinophils also assist in defence mechanism of the body by becoming active against specific antigens.

Blood platelets/ THROMBOCYTES

- They are tiny, oval or circular, colourless cells and are made in the bone marrow. They lack nucleus.

Functions

They help in the coagulation of blood (clotting of blood) in a cut or wound, due to which bleeding stops and prevents loss of pressure. Clotting of blood is the body's defence system to combat bleeding.

THE BLOOD VESSELS AND THEIR FUNCTIONS Slide 2

Arteries

- Take blood away from the heart (Oxygenated blood), except pulmonary artery.

- Blood in them is under high pressure so that blood flows quickly to all parts of the body to supply the much-needed oxygen.
- They deliver blood to every organ.
- Thick, muscular wall; small lumen. To be protected from injury, they are seen to be deep seated.

Veins

- Take blood to the heart (deoxygenated blood) except pulmonary vein.
- Blood is under low pressure so vein doesn't need to be very strong.
- Here blood is returning from every organ.
- Relatively thin walled; large lumen.
- Valves prevent the blood from flowing back in the wrong direction.

Capillaries Slide 3

- They have very thin cell walls (one cell thick) so that substances can diffuse easily.
- Carries blood close to every cell in the body, to allow exchange of supplies.
- They supply oxygen and food to every cell and bring back wastes like carbon dioxide.

THE LYMPHATIC SYSTEM Slide 4

The lymphatic system is another type of fluid transportation system. Its components are:

1. Lymph 2. Lymphatic capillaries 3. lymphatic vessels 4. Lymph Nodes.

LYMPH

- Lymph is extra cellular fluid similar in composition to blood plasma.
- t is derived from blood plasma as fluids pass through capillary walls at the arterial end.
- It is devoid of RBC and so is pale yellow.

LYMPHATIC CAPILLARIES

- Lymphatic capillaries are tiny, thin-walled micro vessels located in the spaces between cells that drain and process extracellular fluid. The lymph capillaries, begin in the tissue spaces as blind-ended sacs.

Their unique structure permits lymph to flow into them but not out.

LYMPHATIC VESSELS

- They are thin-walled having valves that carry lymph.
- They collect lymph from tissues throughout the body.
- The lymphatic vessels, unlike blood vessels, **only carry fluid away from the tissues**.

LYMPH NODES

- Lymph nodes are lymph organs and are important for the proper functioning of the immune system.
- They produce lymphocytes that engulf and destroy the microbes and pathogens from the lymph passing through them. Thus, they enhance the immune system.

PATH OF Lymph

Slide 5

- The plasma from the blood capillaries diffuses into the tissue spaces.
- The lymph nourishes the tissues.
- From here the lymph now moves into the lymphatic capillaries, the pores of which are bigger than the blood capillaries.
- The lymphatic capillaries carry the lymph, join to form vessels and from there the vessels drain the lymph to the collecting ducts.
- As they move in the vessels, they cross the lymph nodes, that clean the lymph of microbes.
- The collecting ducts empty the lymph into the subclavian veins, found below the collar bones.
- These join the superior vena cava and finally pour the lymph along with the blood into the right auricle.

FUNCIONS OF LYMPHATIC SYSTEM

Slide 6

- Lymph facilitates absorption of fats and fat- soluble nutrients back to the circulatory system.
- It removes excess fluids from body tissues and maintains the balance of fluid between the blood and tissues.
- It forms part of the body's immune system and helps defend against bacteria and other microbes, by producing immune cells like lymphocytes and other antibody cells.

Source: NCERT Science text book and Google.