



AL-Mustaqbal University College

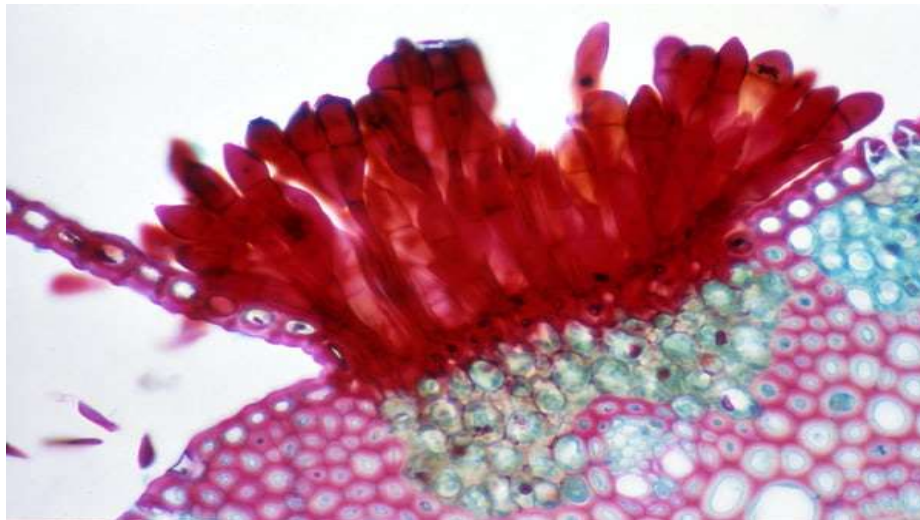
Pharmacy Department

First stage

Practical Histology

(Lymphatic system)

Lab 2



Lecturer: M.Sc. Noor Muhsen AL-Ammary

Lymphatic system

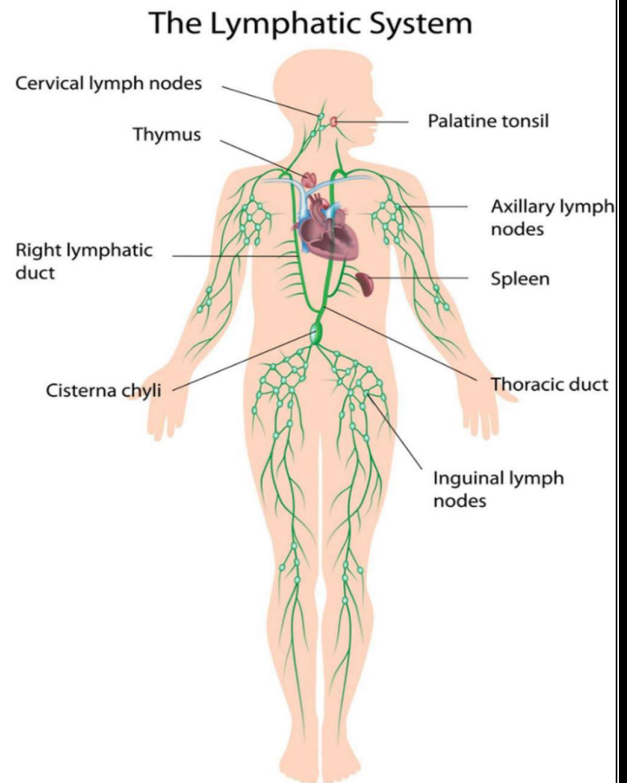
The **lymphatic system** consists of network of tissues, organs, lymph capillaries and lymph vessels that help to maintain the body's fluid balance & protect it from pathogens, can be thought of as an accessory to the circulatory system.

Major Accessory Lymphatic Organs

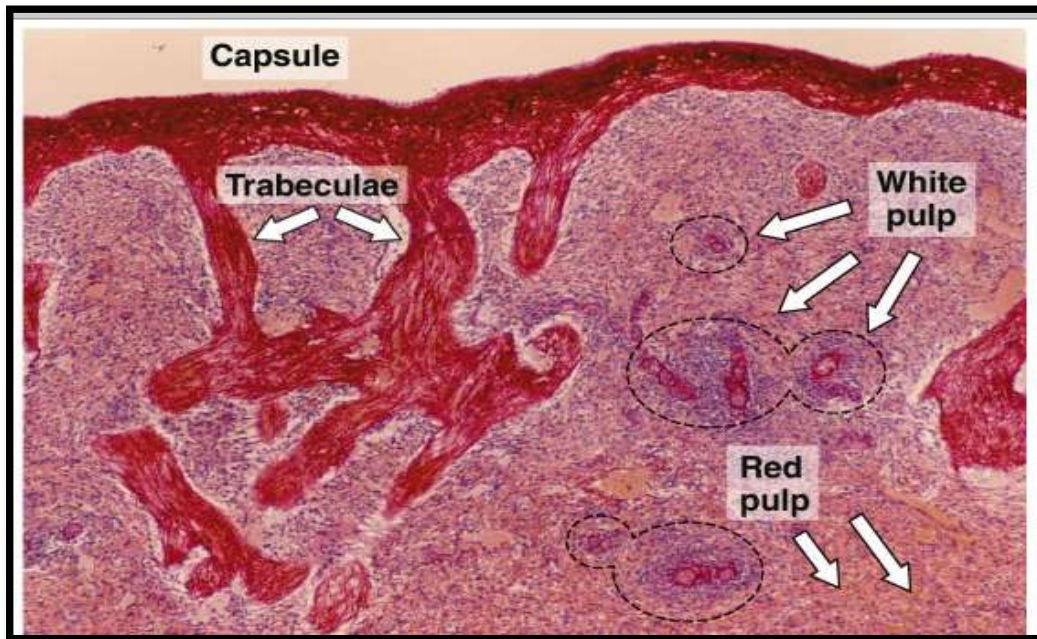
- Spleen – largest
- Thymus
- Tonsils
- Peyer's patches
- Appendix

Spleen: Largest of the lymphatic organs with a rich blood supply.

- Located below diaphragm in the left upper quadrant region of the abdomen.
- Ovoid in shape
- Surrounded by a connective tissue **capsule** of dense connective tissue from which emerge **trabeculae**, which divide the parenchyma, or **splenic pulp**, into incomplete compartments. White pulp consists of dark-staining lymphoid aggregations or lymphatic nodules that surround a blood vessel called the central artery. White pulp is located within the blood-rich red pulp. Red pulp, in turn, consists of splenic cords and splenic (blood) sinusoids.



- Inside is a network of interlacing fibers: red pulp packed with RBC's, white pulp crowded with lymphocytes, monocytes, and neutrophils.



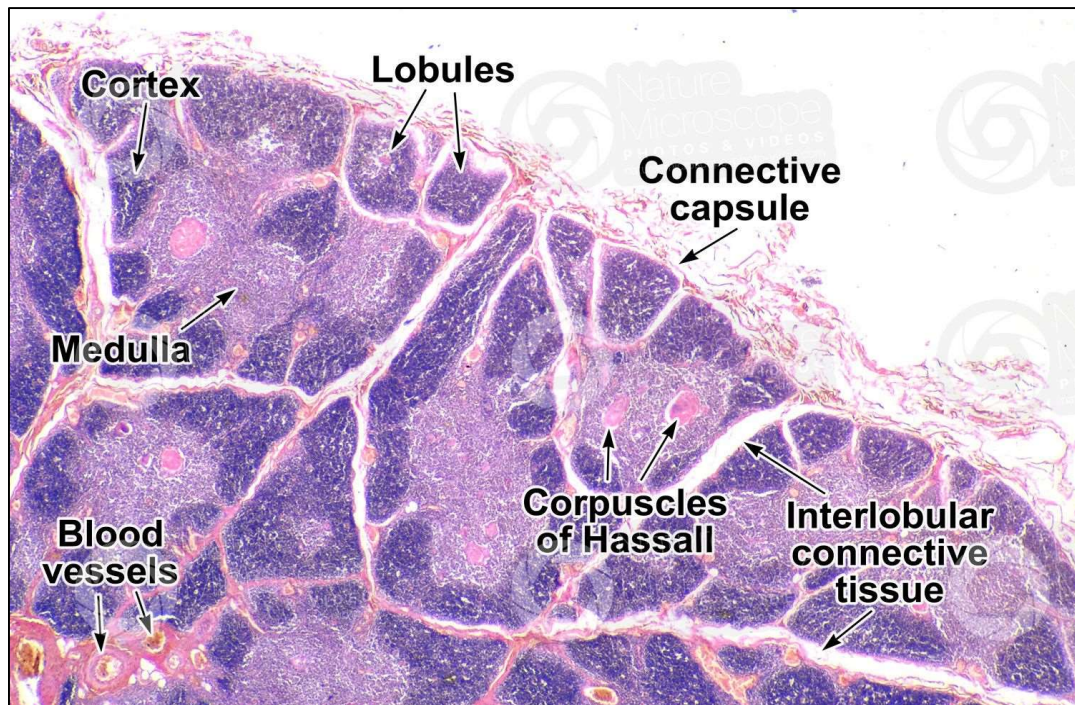
Section of spleen. The capsule is seen sending trabeculae to the interior of the organ. The red pulp occupies most of the microscopic field. Note the white pulp with its arterioles.

Performs several functions:

1. Defense: helps screen blood and removes pathogens and bacteria.
2. Hemopoiesis monocytes and lymphocytes are made here (before birth, RBC's also made here).
3. Erythrocyte and platelet destruction.
4. About 30-40 ml of blood are stored in the spleen. However, about 30% of all blood platelets of the body are stored in the spleen.

Thymus: Is a soft, lobulated lymphoepithelial organ located in the upper anterior mediastinum and lower part of the neck.

- Plays vital role in initial set up of body's immune system, source of lymphocytes before birth which circulate to spleen, nodes and vessels soon after birth it secretes a hormone that causes lymphocytes to develop into plasma cells.
- Largest when young, esp. puberty, then gets smaller and is replaced with fat.
- Secretes thymosin and thymopoietin which causes T lymphocytes to become immunocompetent.
- Lacks B cells (no follicles)
- Atrophies with age: prominent in newborns, stops growth by adolescence, degenerates by old age.



Lymph node

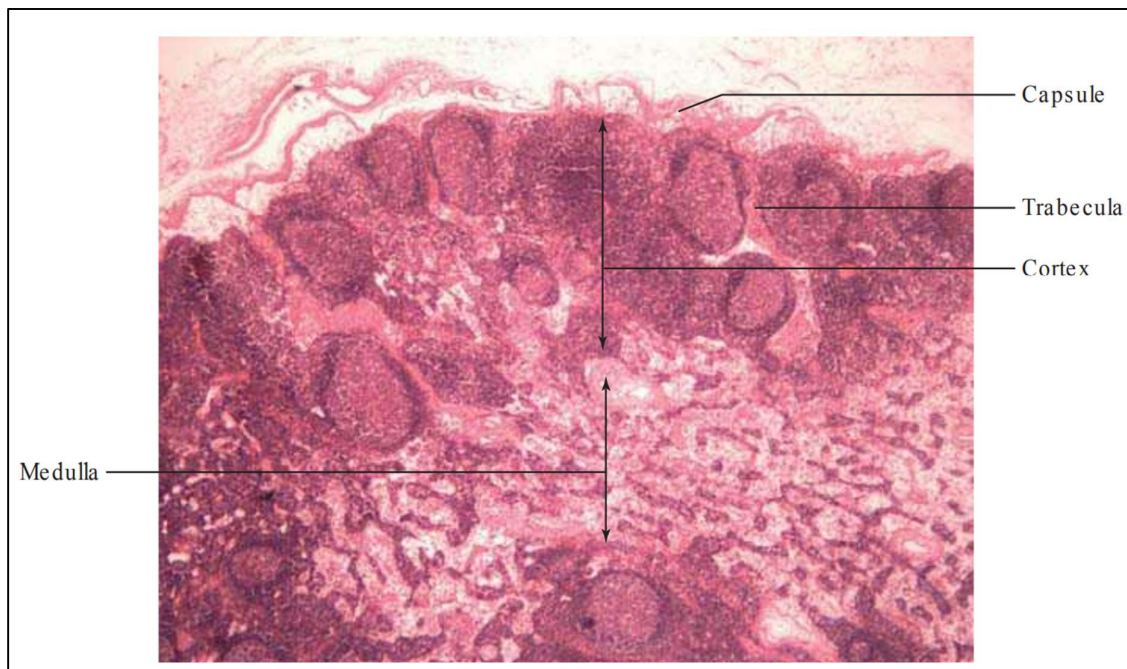
Lymph nodes are small lumps of tissue that contain white blood cells, which fight infection. They are part of the body's immune system and filter lymph fluid, which is composed of fluid and waste products from body tissues. Lymph nodes are located throughout the body, including the neck, armpits, groin, around the gut, and between the lungs.

A connective tissue **capsule** surrounds the lymph node, sending trabeculae into its interior to form incomplete compartments. A loose reticular tissue extends throughout the node. This consists of reticulate cells and fiber.

The lymph node is divided into two regions:

1- Cortex

2- Medulla



Islets of Langerhans, also called **islands of Langerhans**, irregularly shaped patches of endocrine tissue located within the **pancreas** that contain its endocrine (hormone-producing) cells. It's supported by reticulin fibers, and containing numerous fenestrated capillaries. There is a delicate capsule around each islet.

The islet cells are indistinguishable from each other in sections, but in fact three secretory cells types are present:

1. **alpha** - secrete glucagon,
2. **beta** - secrete insulin
3. **delta** - secrete somatostatin

The islets are supplied by up to three arterioles, which form a branching network of fenestrated capillaries, into which the hormones are secreted. The islet is drained by about six venules, which pass between the exocrine acini to the interlobular veins.

