

# Histology of the Lymphatic System

# Lymphatic System

- Consists of lymphatic organs, tissue, cells, lymph, and lymph vessels
- It is a part of the immune system
- Organs include:

Thymus

Tissues in the form of MALT

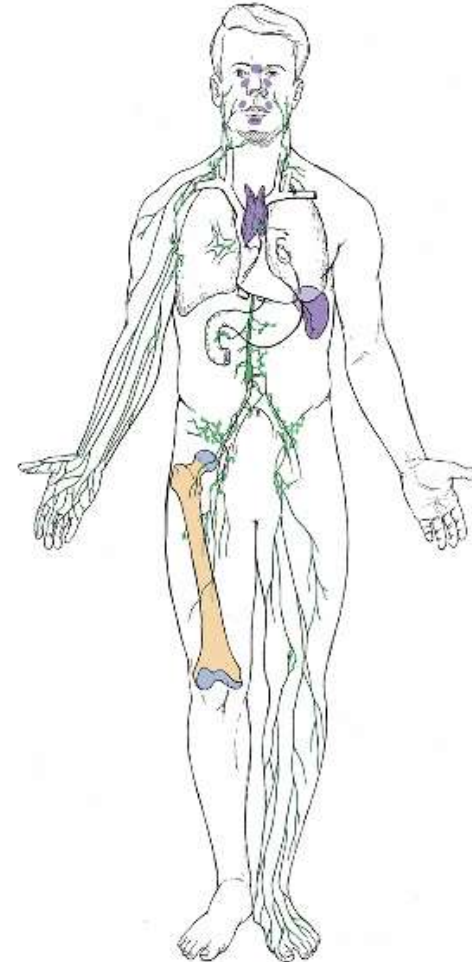
Tonsils

Peyer patches

Appendix

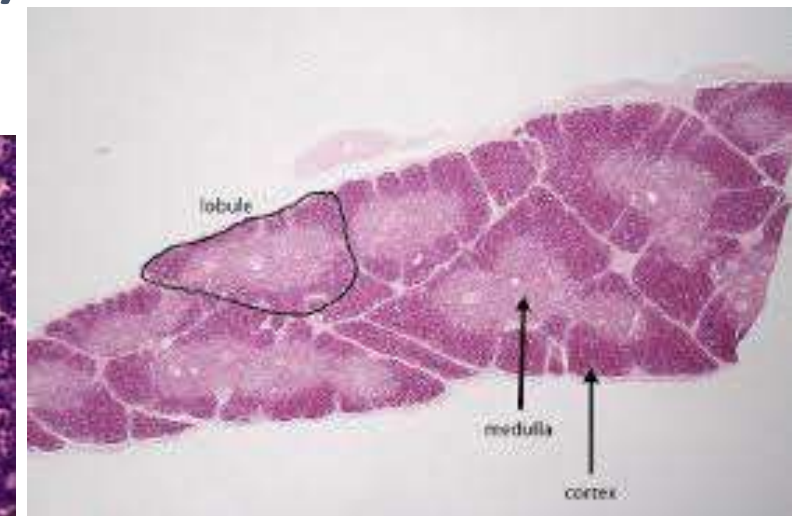
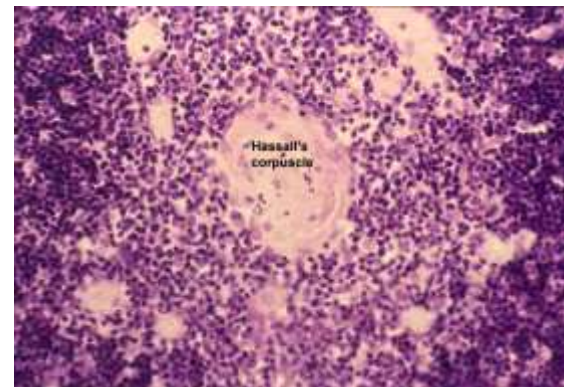
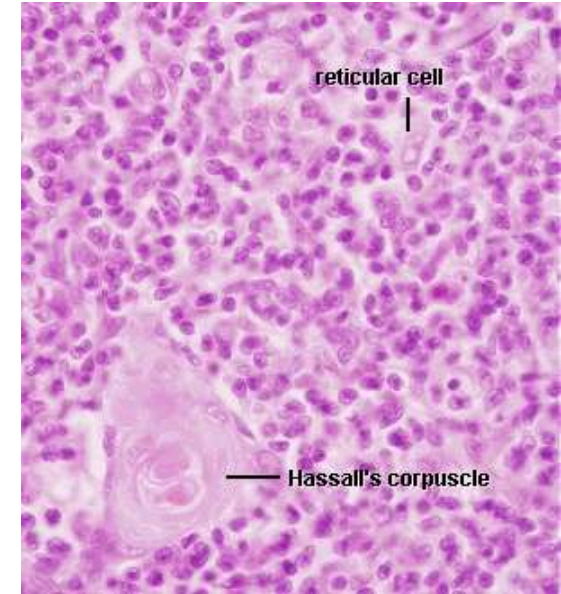
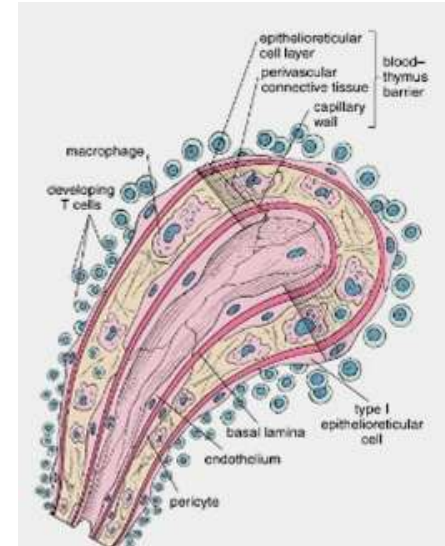
Lymph nodes

Spleen



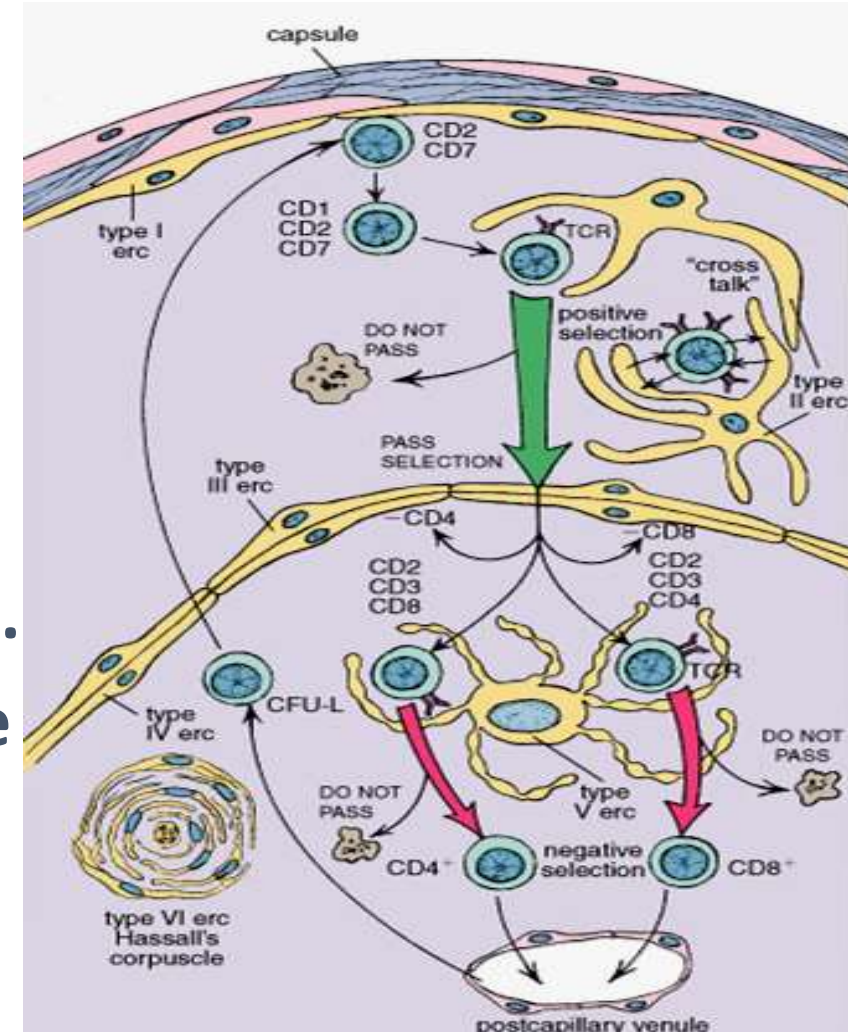
# Thymus Gland

- Location
- Development and Growth
- Structure
  1. Capsule and lobules
  2. Cortex (T-Cell precursor (lymphoblast), Reticuloepithelial cells, abundant Macrophages)
  3. Medulla ( T-Cells, Hassall corpuscles)
  4. Thymic blood barrier



# T-Cells Differentiation

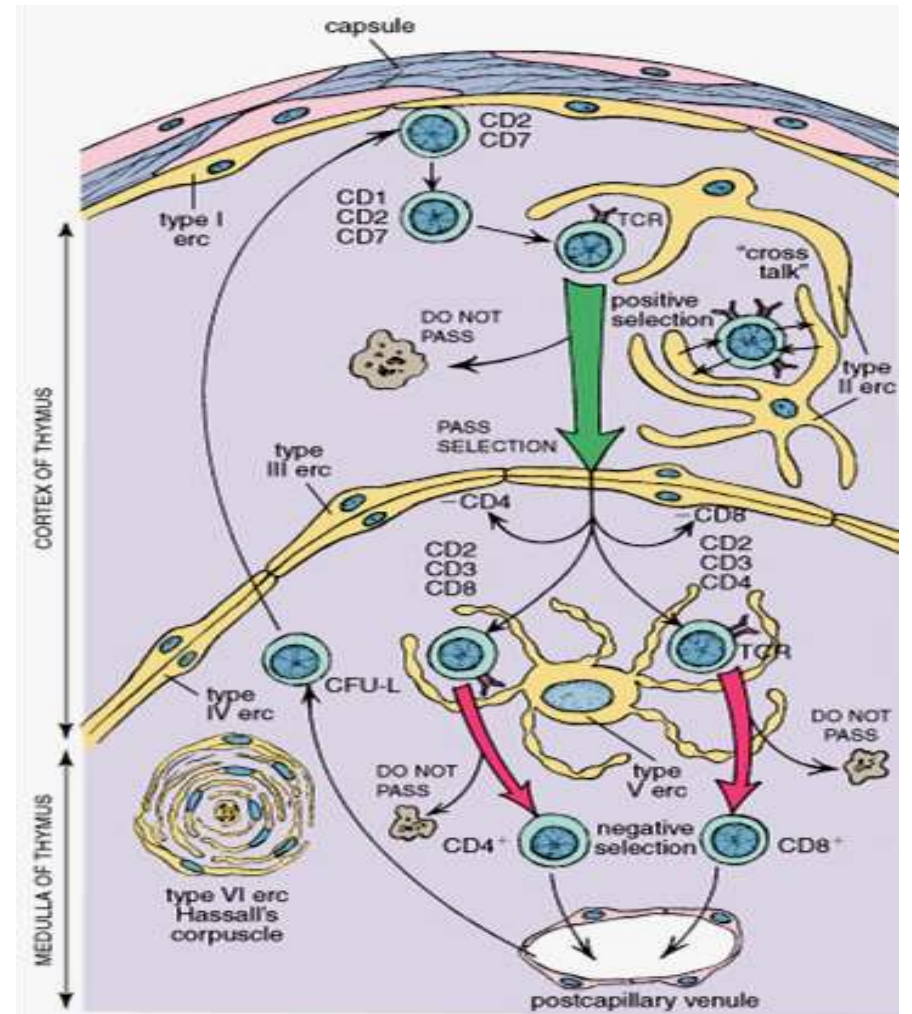
- It is the site of terminal differentiation, maturation, and selection of T-lymphocytes
- No receptors on the cell surface of precursor cells
- In the cortex, they divide by mitosis and present to MHC molecules on thymic epithelial cells (TECs).
- Cells that interact with MHC molecules will survive (+ve selection) and pass to the medulla, others will die by apoptosis and will be eliminated by macrophages





# T-Cells Differentiation Cont.,

- In the medulla, cells are attached to self-antigens bound to class I and II MHC on the surface of TECs, dendritic cells, and macrophages, if accepted they will die (-ve selection) and other cells will continue the maturation
- Positive and negative selections
- Mature T-cells with receptors leave the thymus via capillaries or efferent lymphatic



# Tonsils

- They belong to MALT but considered organs because they are partially encapsulated
- Tonsils are covered by epithelium
- They include:
  1. Palatine tonsils
  2. Pharyngeal tonsils
  3. Lingual tonsils
  4. Tubal tonsils
- Waldeyer's ring

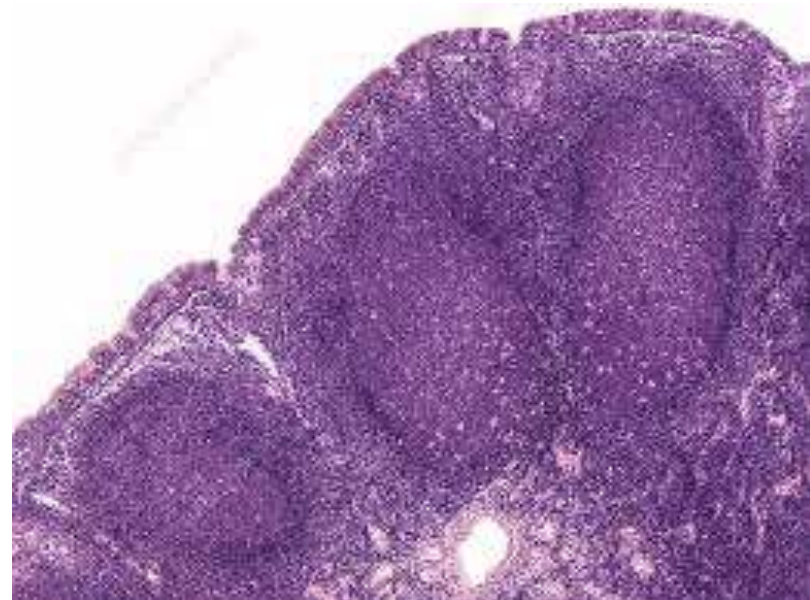
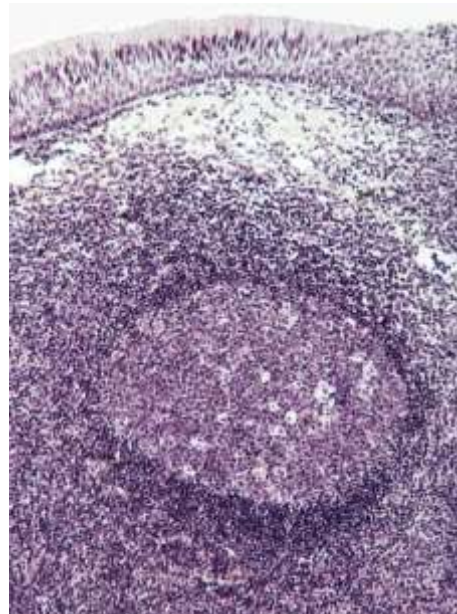
# Palatine Tonsils

- A pair of them located in the oropharynx lodged between the palatoglossus and palatopharyngeus and the superior constrictor
- Covered by stratified squamous epithelium
- 10-20 crypts in each one
- A Sheet of lymphatic nodules and free lymphocytes below the mucosa
- A dense capsule separates it from the subjacent tissues



# Pharyngeal Tonsil

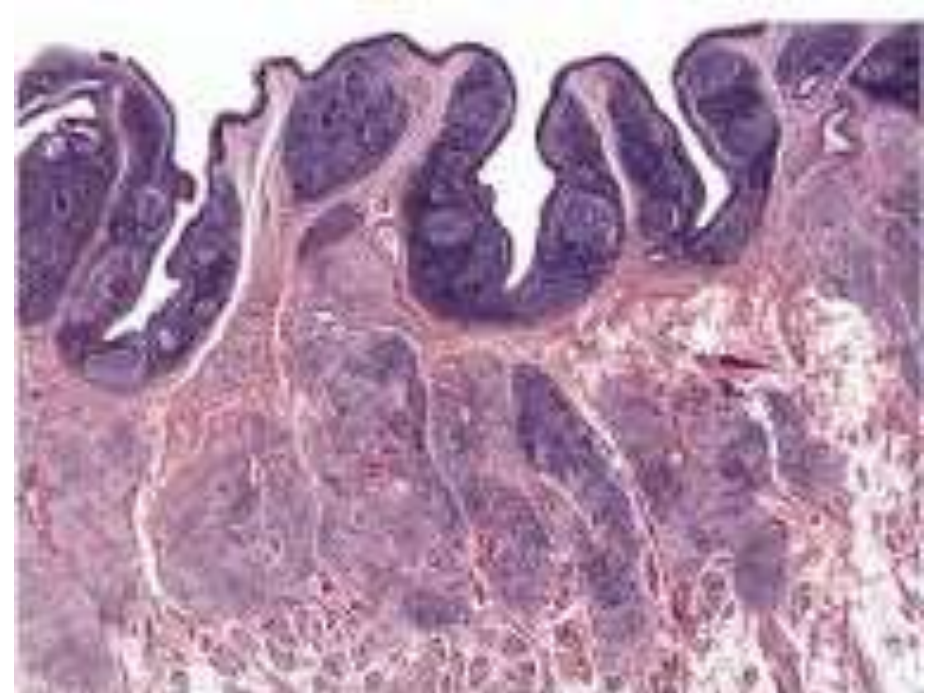
- One in the nasopharynx covered by pseudostratified columnar epithelium
- Form a thin sheet of lymphoid nodules and diffuse lymphocytes
- No crypts
- Very thin capsule
- Adenoid



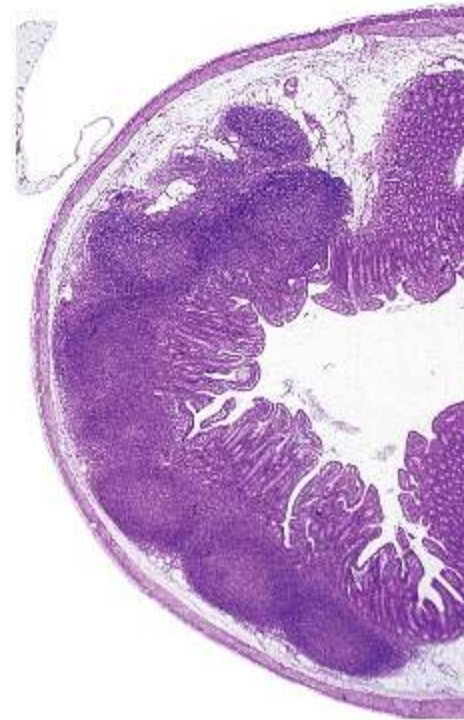


# Lingual Tonsils

- They are multiple small ones at the base on the tongue
- Covered by stratified epithelium
- One crypt for each tonsil

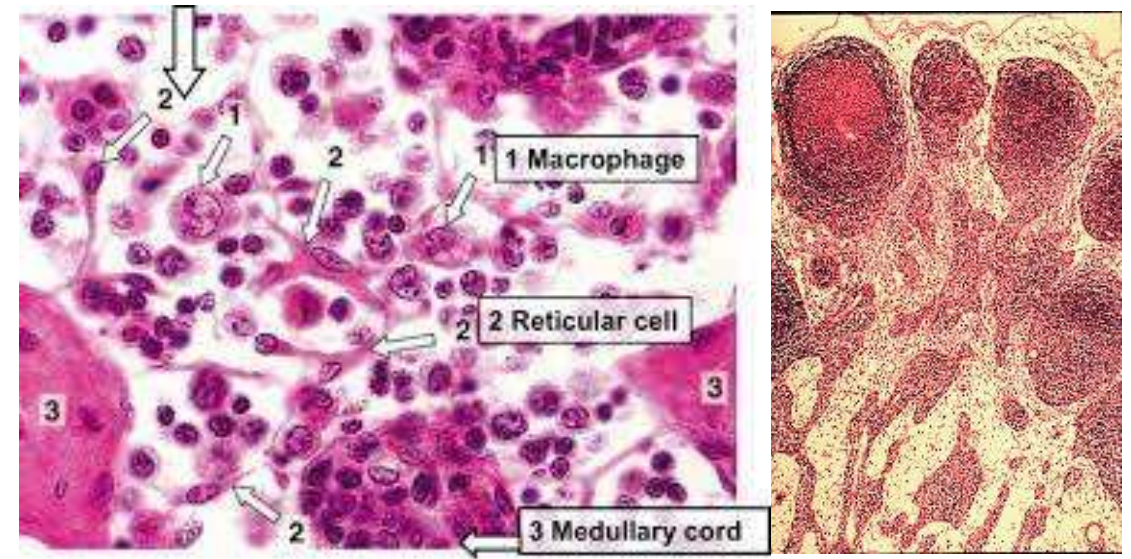
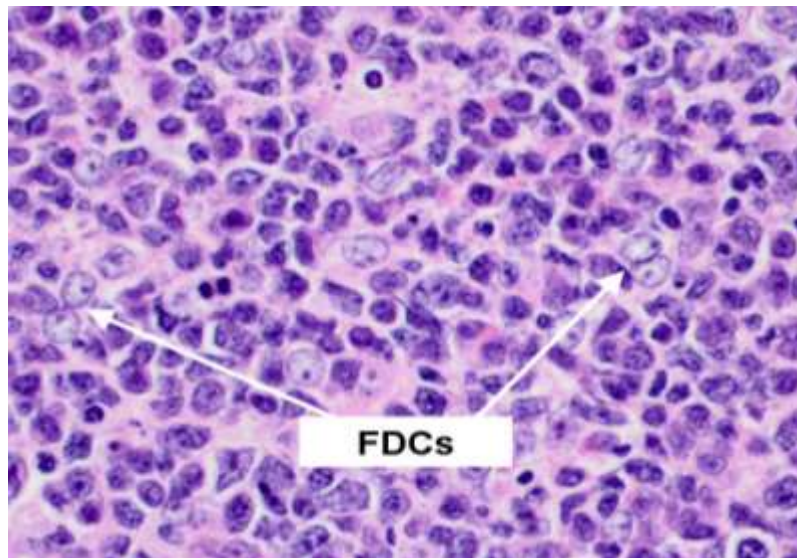
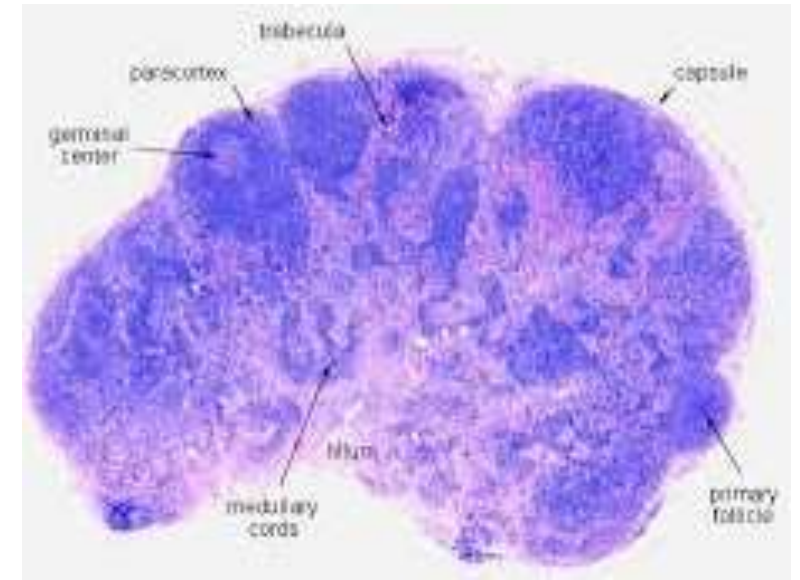


# Appendix



# Lymph Node

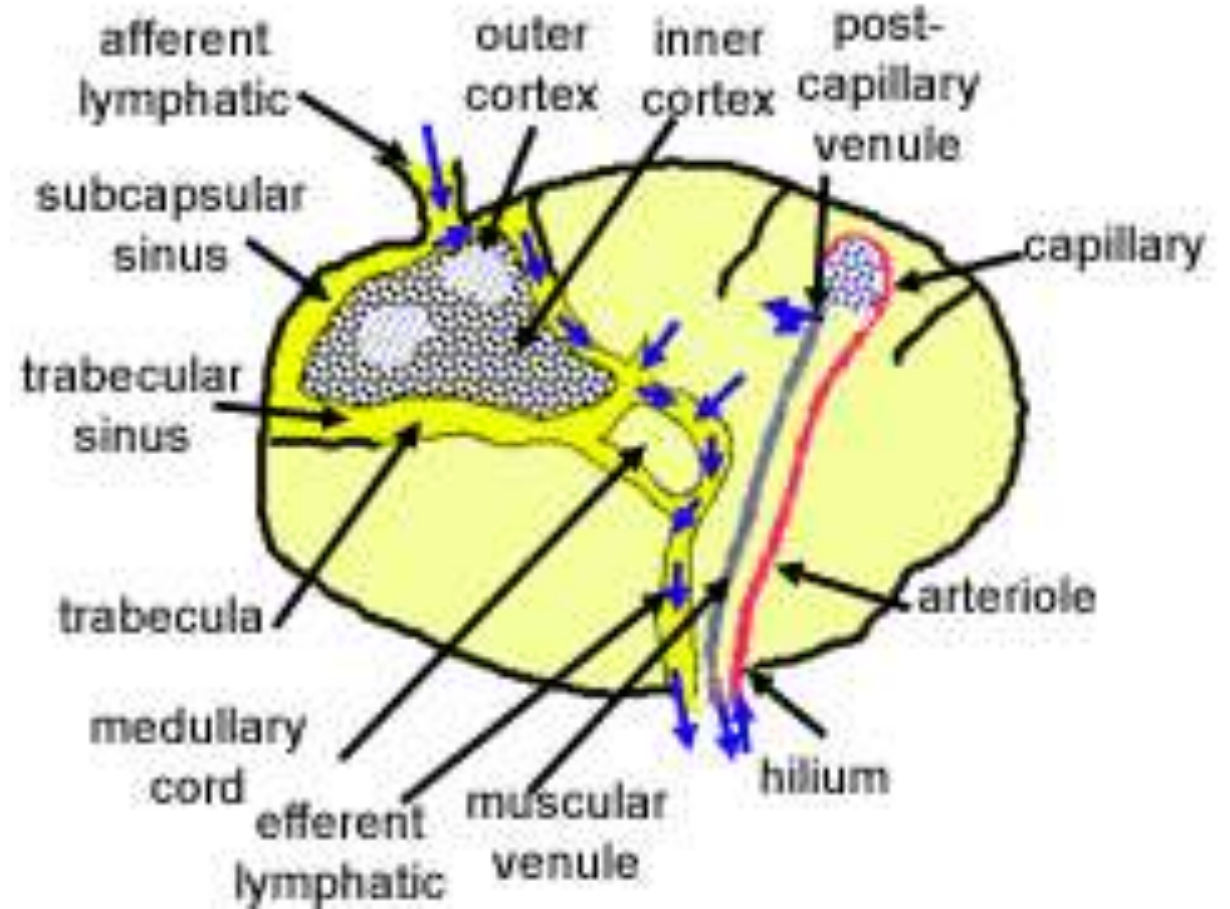
- Shape
- Structure
- Cortex
- Medulla
- Cells





# Lymph Node Cont.,

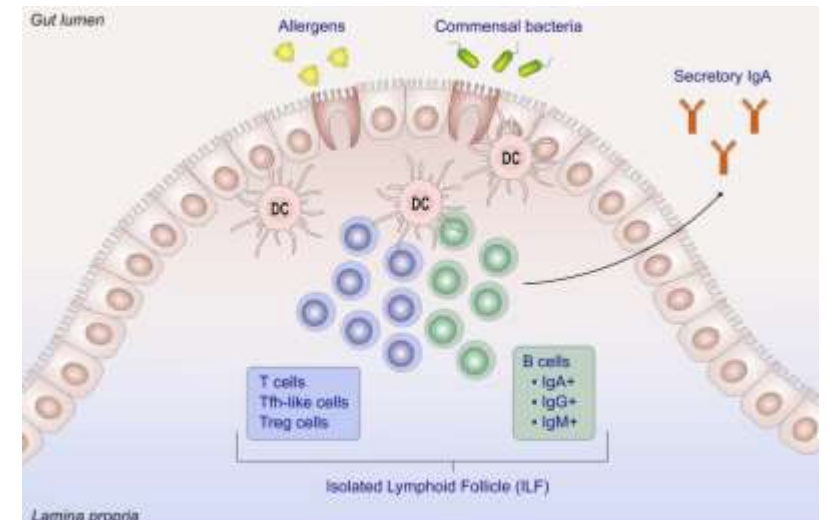
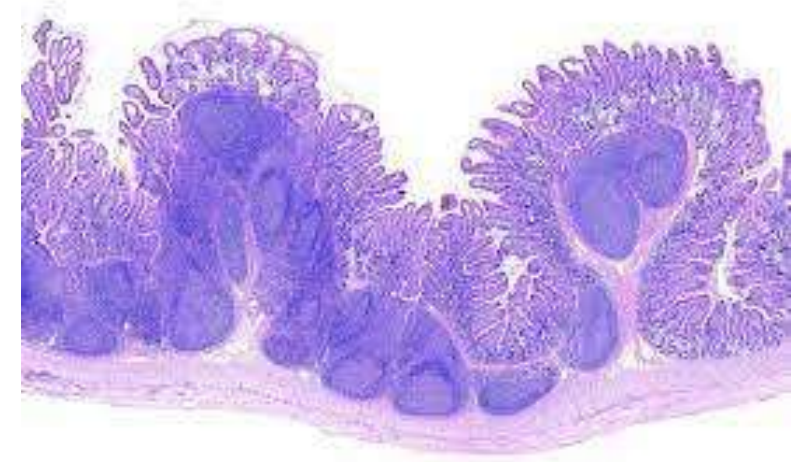
- Lymph circulation





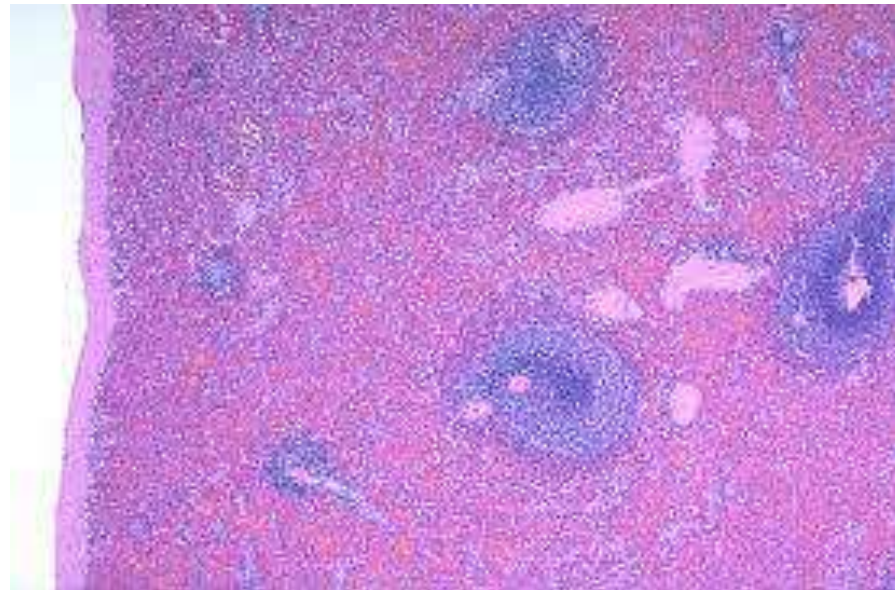
# Peyer Patches

- A collection of lymphoid follicles in the lamina propria of the ileum
- It made of a collection of B lymphocyte
- It has a role in immunity by attacking antigens or other particles
- **M-cells** between the columnar enterocytes has a role in this process



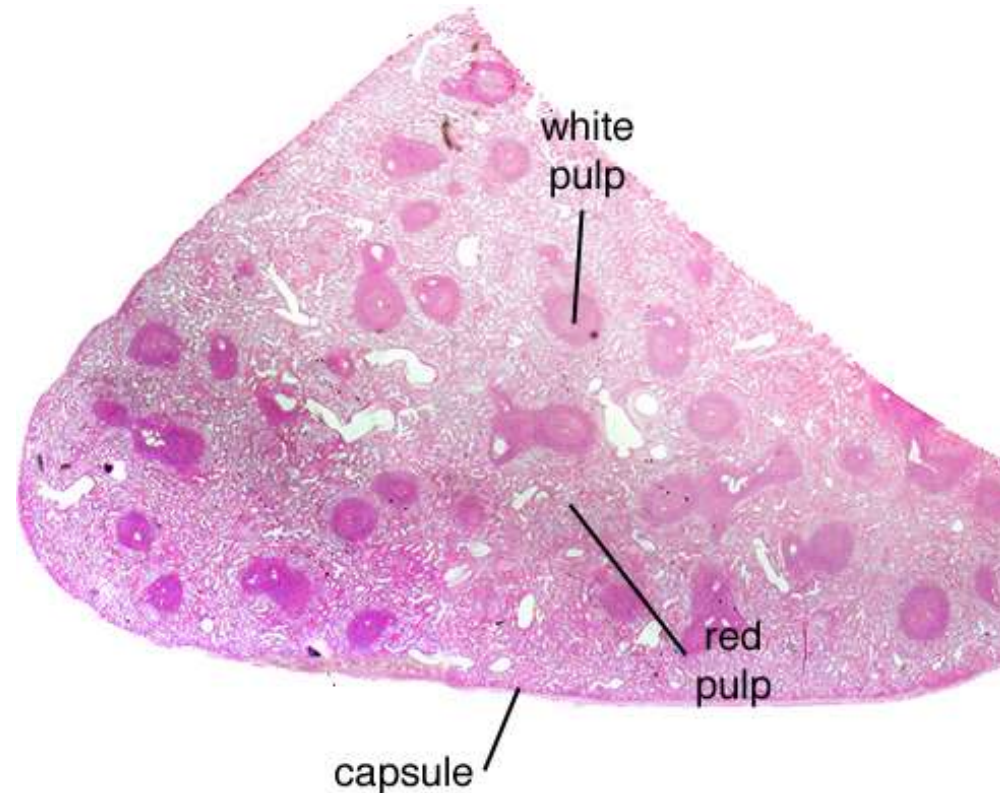
# The Spleen

- Largest lymphoid organ
- Contains of large number macrophages
- It is a blood filter
- Structure: capsule, trabeculae, splenic pulp



# Splenic pulp

- Spleen composed of a network of reticular tissue with reticular cells, lymphocytes, other blood cells, macrophages and APCs
- White pulp
- Red pulp





# White Pulp

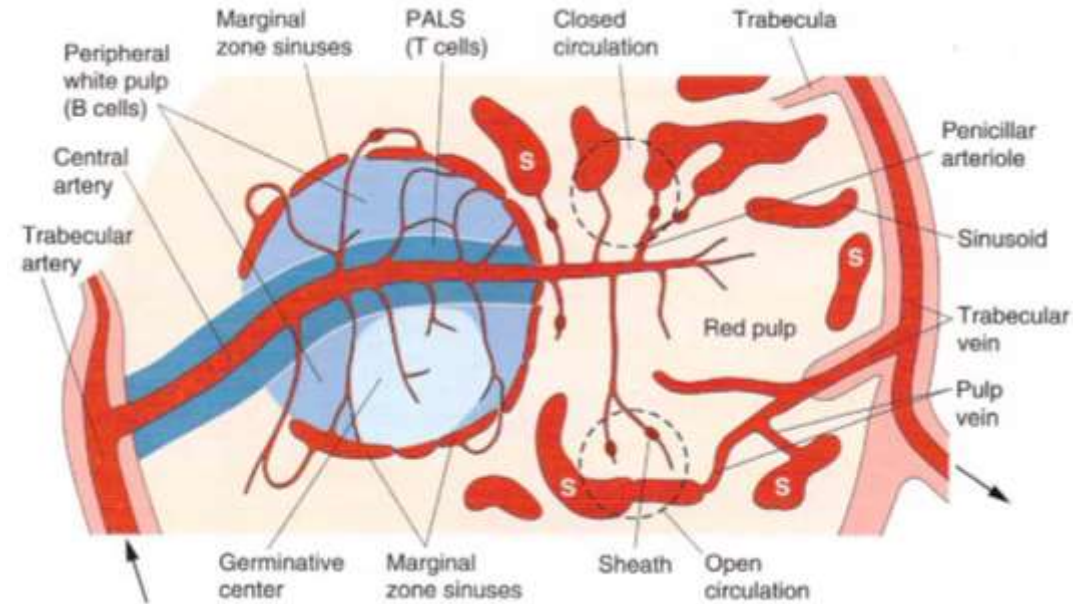
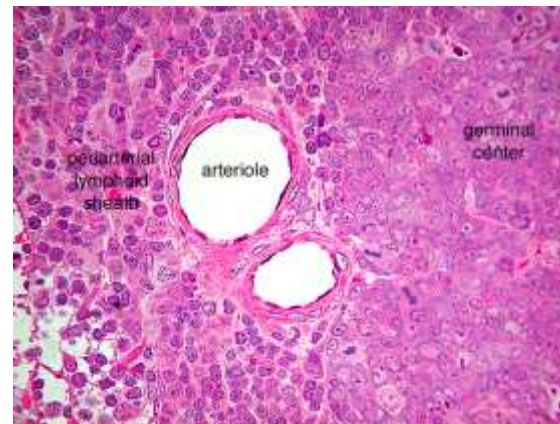
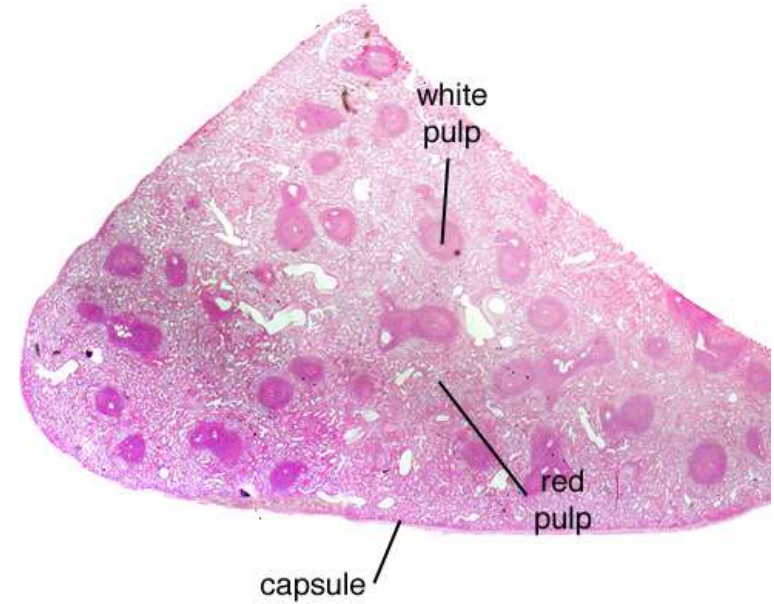
Blood supply

Periarterial lymphatic sheath (PALS)

Lymphoid nodule

Marginal zone

Penicillar arteries





# Red Pulp

- Splenic cords are supported by reticular fibers and contain T-cells, B-cells, macrophages, plasma cells, and many blood cells.
- Splenic sinusoids (**Sava cells**)
- Closed circulation
- Open circulation

