





LYMPHATIC SYSTEM

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Agenda

- Types of lymphoid tissue**
- Structure of Non capsulated lymphatic nodule**
- Structure of Lymph node**
- Structure of Tonsils**
- Structure of Spleen**
- Structure of Thymus gland**



ILOs

- Differentiate between types of lymphoid tissue**
- Identify structure of Non capsulated lymphatic nodule**
- Identify structure of Lymph node and Tonsils.**
- demonstrate the structure of Spleen and Thymus gland**



Lymphatic system

❖ **Lymphatic system includes:**

A. The lymph vessels.

B. The lymphatic organs.

I. Primary lymphatic organs:

-Bone marrow.

-Thymus

II. Secondary lymphatic organs:

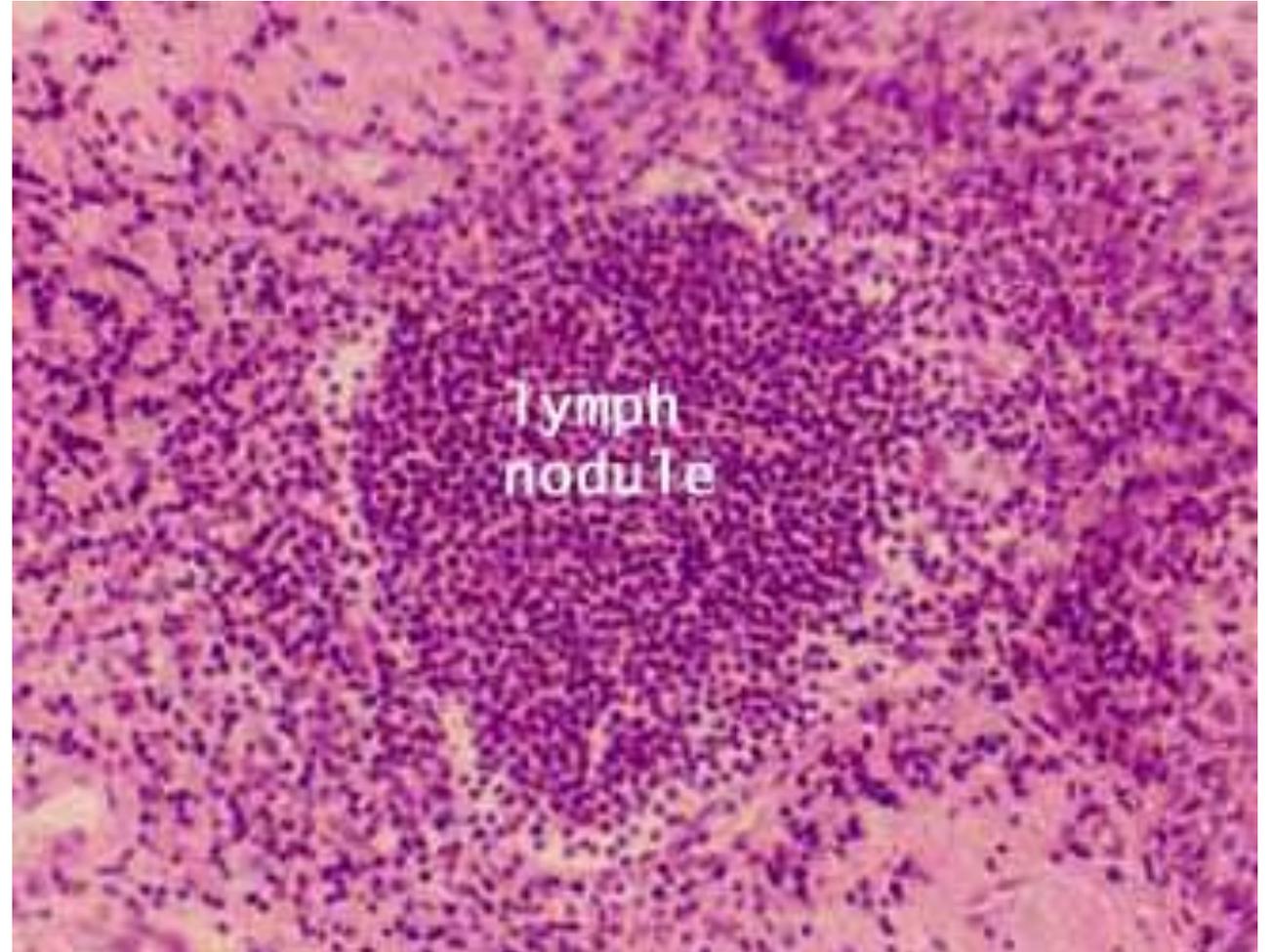
-Lymph node

-Spleen

-Tonsils

LYMPHATIC FOLLICLE (NODULE)

- **It is the structural and functional unit of the lymphoid tissue.**
- **Basophilic mass of lymphoid tissue which is:**
 - **Rounded, oval or pyramidal in shape.**
 - **Large or small in size.**
 - **Is not surrounded by capsule.**

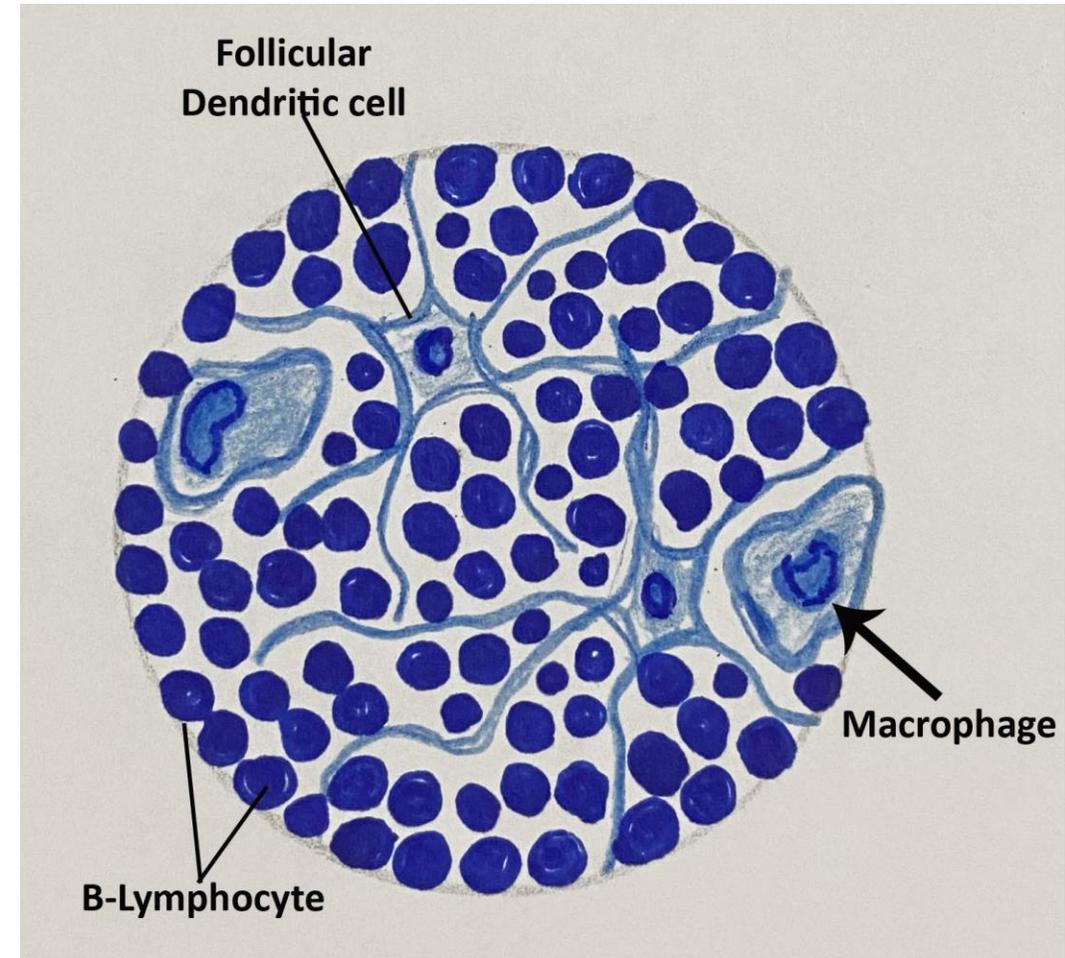




NON CAPSULATED LYMPHATIC FOLLICLE (NODULE)

The cells forming it :

- 1- Small lymphocytes;** mainly B lymphocytes and few T lymphocytes.
- 2- Macrophages** (few number).
- 3- Dendritic reticular cells** (they are non phagocytic, but facilitate production of antibodies by B-lymphocytes).





NON CAPSULATED LYMPHATIC FOLLICLE (NODULE)

Types of lymphatic follicle:

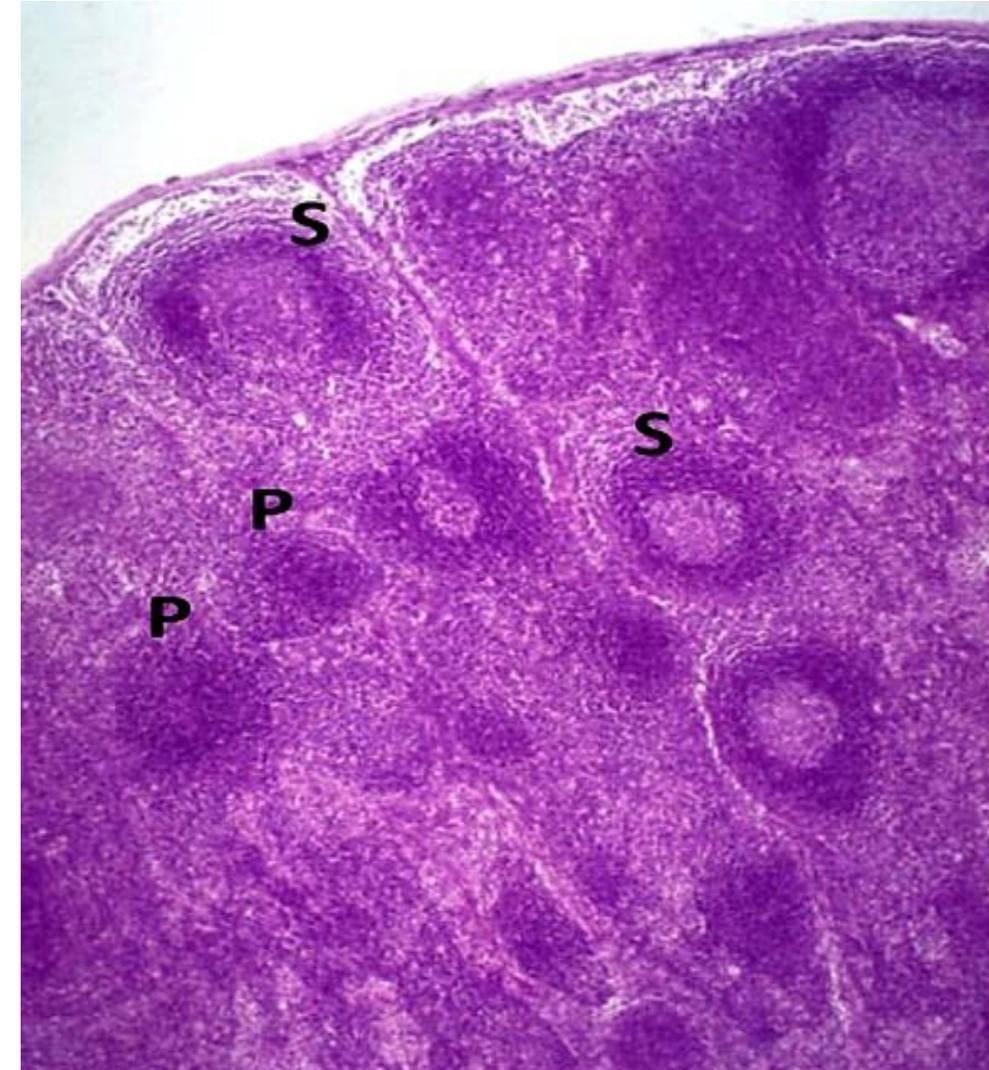
A- Primary follicle:

Without germinal center.

B- Secondary follicle:

- with germinal center.

- The germinal center is pale central area which is formed as a result of exposure to infection or antigens, so the small B- lymphocytes (have dark nuclei) develop into activated medium-sized lymphocytes (have pale nuclei) which aggregate in the center of the primary follicle.



1- LYMPH NODE

Histologically is formed of 1- Stroma 2- Parenchyma 3- Sinuses

I- Stroma: is formed of the following:

A- Capsule:

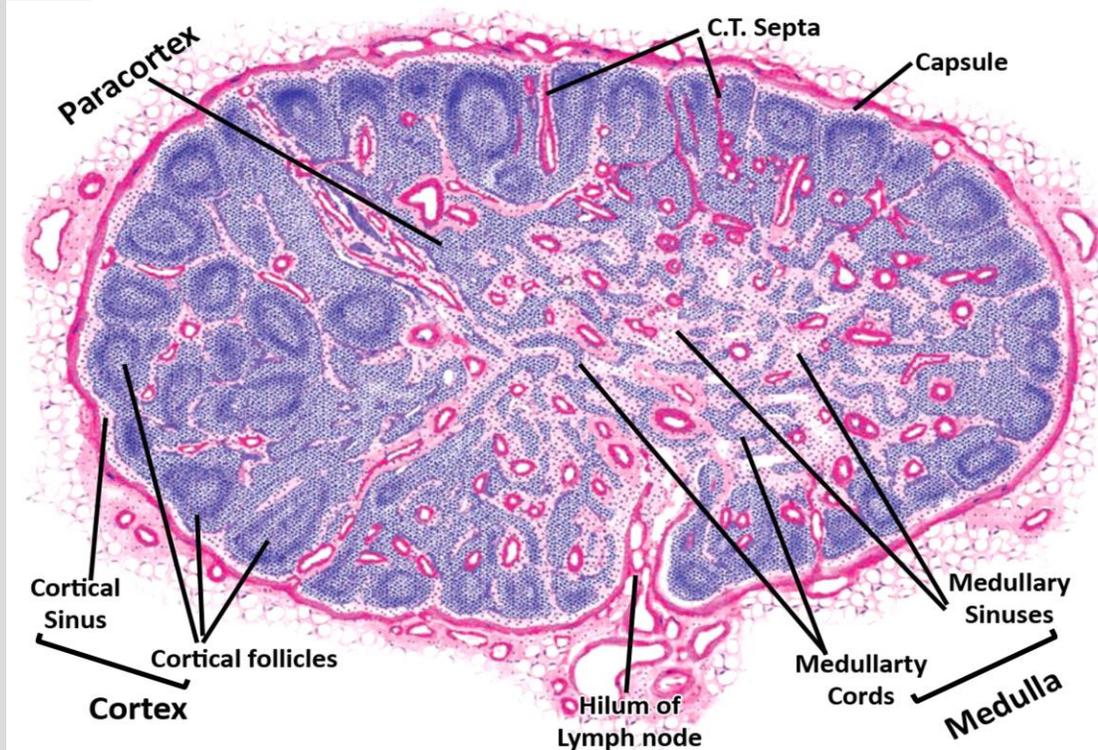
- Dense C. T fibers.
- is penetrated by afferent lymphatic.

B- Trabeculae:

- Arise from the deep surface of the capsule.
- They are regular in the cortex and divide it into cortical compartment.
- In the medulla, they branch and anastomose dividing it into irregular areas.

C- Reticular fibers:

- Form network holding the parenchymal cells in its meshes.



II- Parenchyma:

□ The cortex:

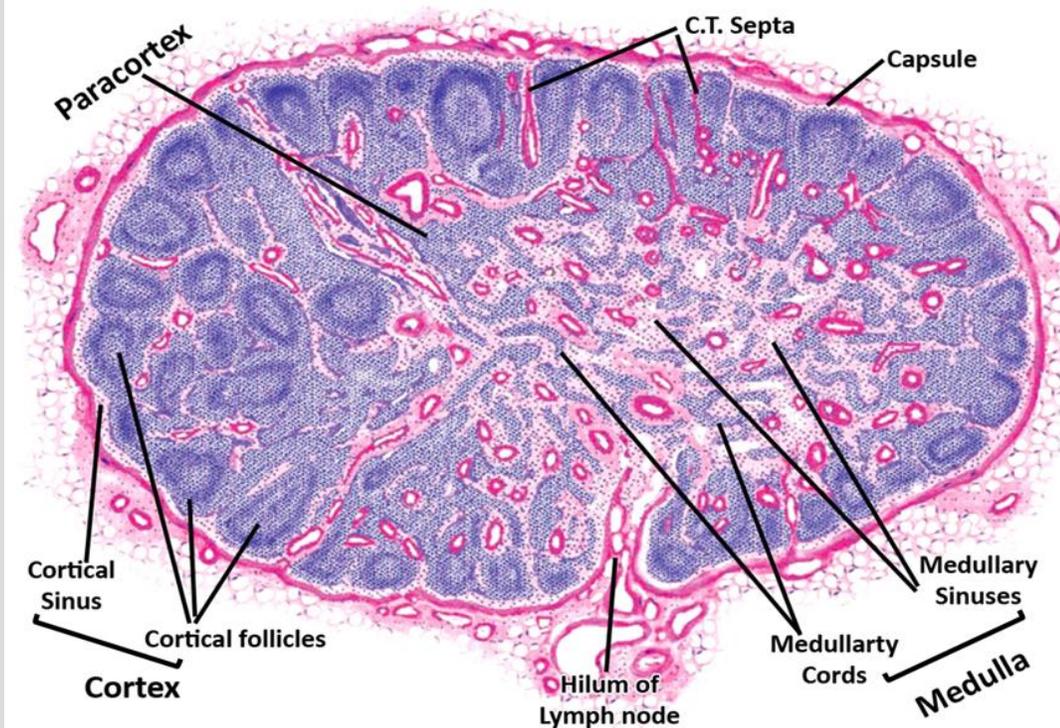
- It is formed of lymphatic follicles.
- The follicles are either primary or secondary.

□ The medulla:

- It is formed of irregular medullary cords which are separated by medullary lymph sinuses.
- Structure of cords is similar to that of the cortical lymphoid follicles, but contains **more plasmablasts and plasma cells.**

Thymus Dependant Zone:

- The zone rich in T-lymphocytes.
- The region between the cortex and medulla.

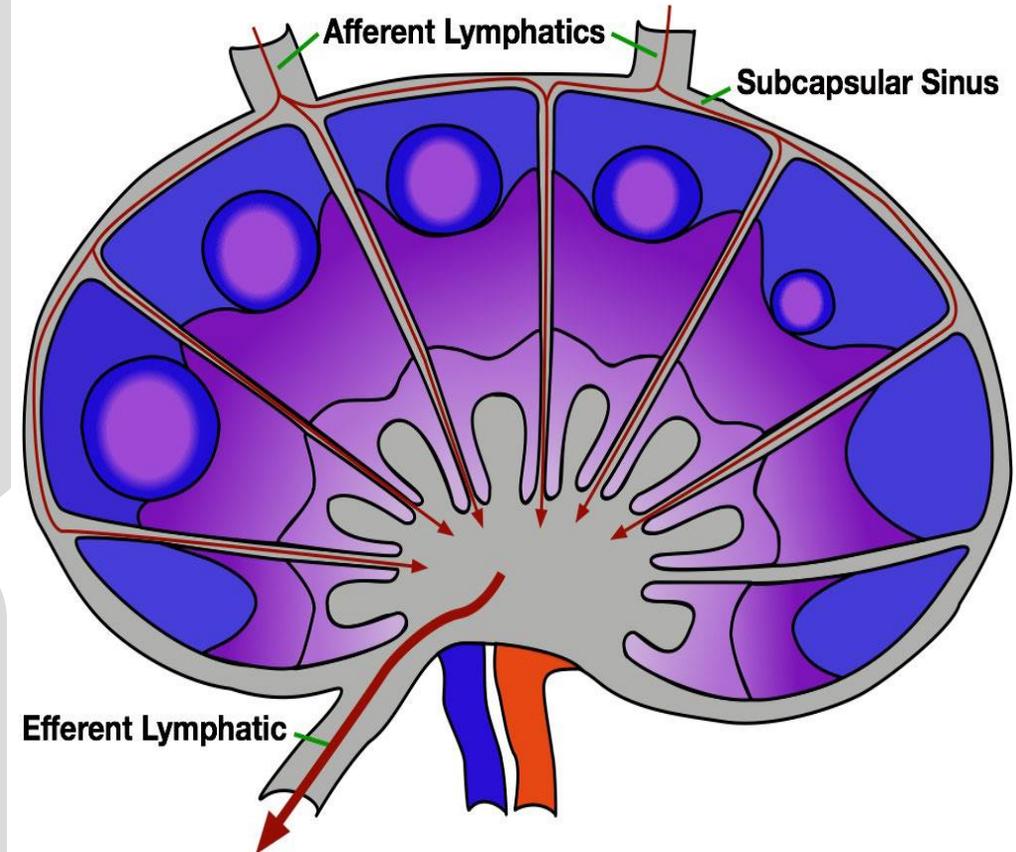


III- Lymph sinuses of lymph node

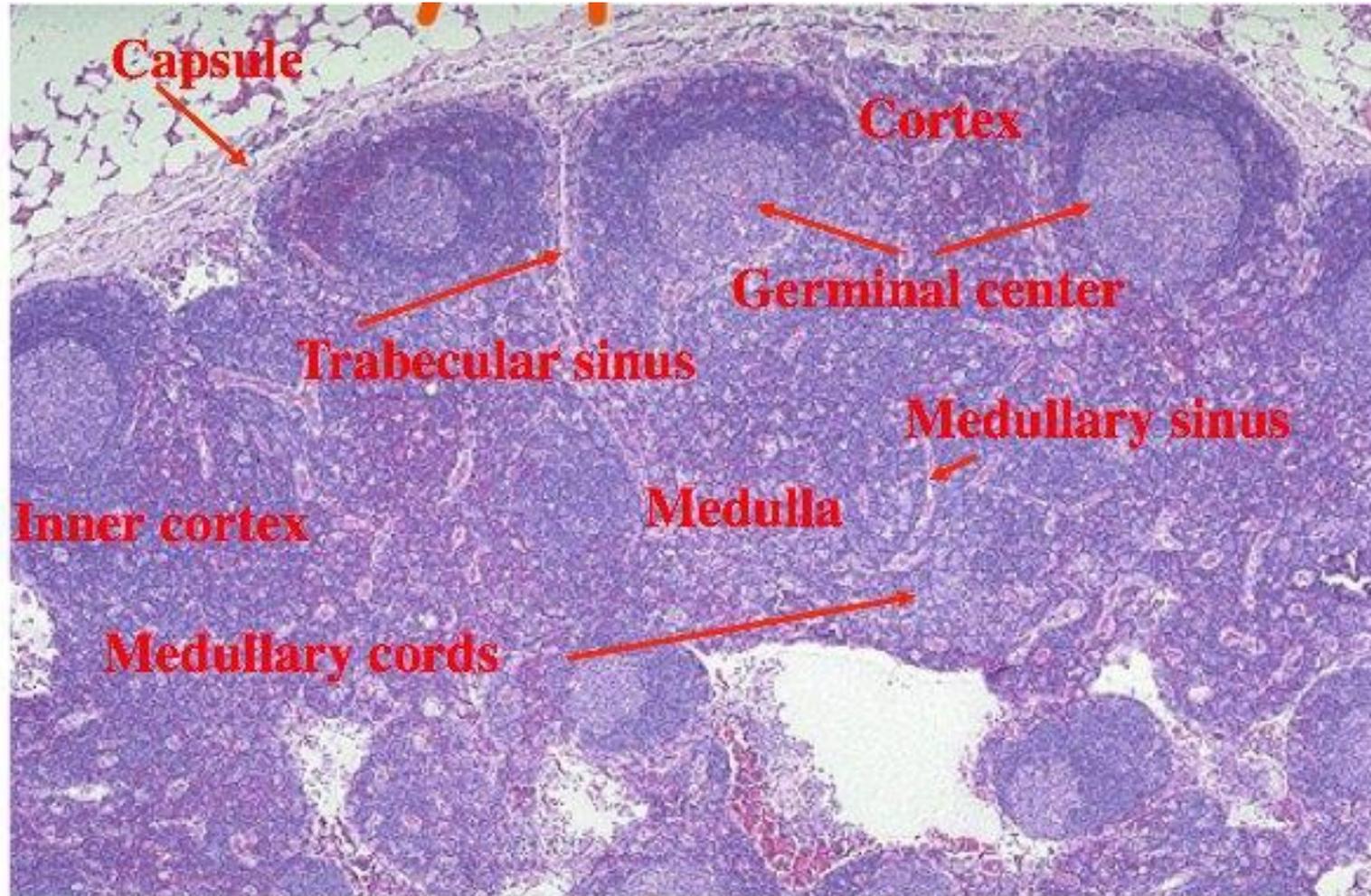
- They are lined with endothelium without basement membrane.
- They contain lymph, lymphocytes and macrophages.
- They are responsible for filtration of lymph by macrophages, during its passage from afferent to efferent lymphatics.

Function of lymph node:

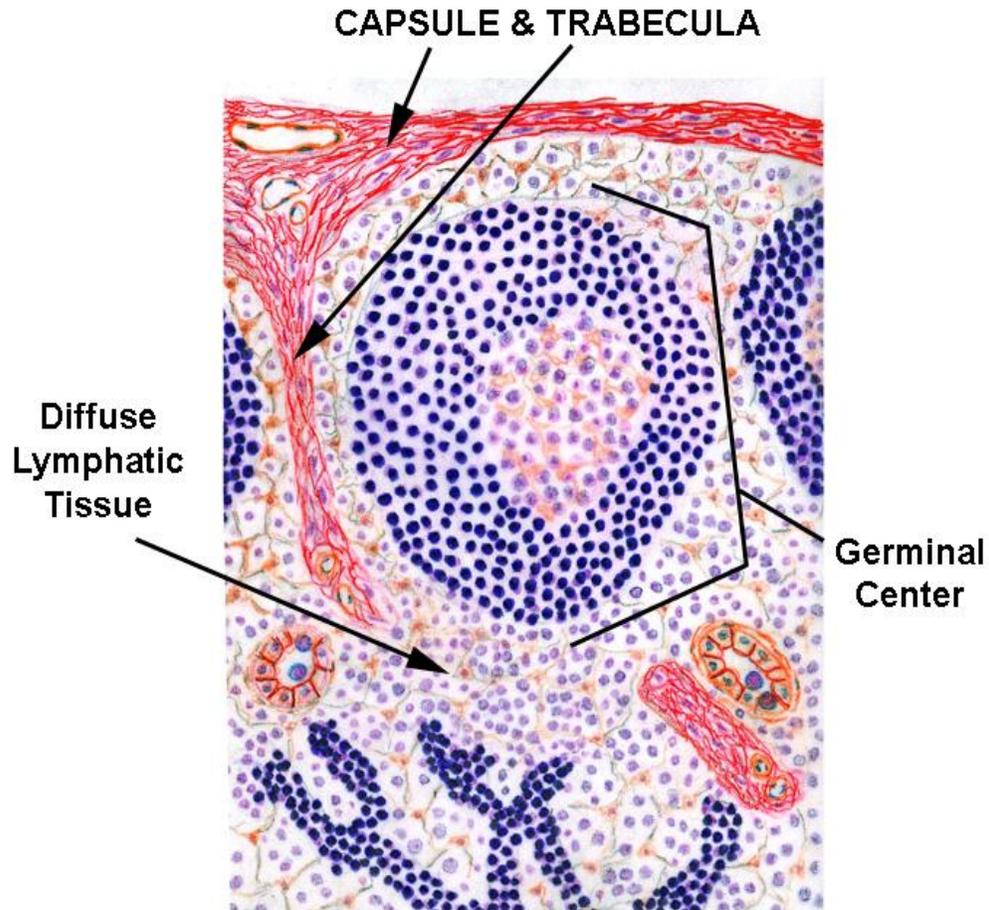
- 1- Filtration of lymph by the macrophages of lymph sinuses.
- 2- Humoral immunity by B- lymphocytes.
- 3- Cell mediated immunity by T- lymphocytes.



LYMPH NODE



2- SPLEEN



Histological structure:

The spleen is composed of stroma and parenchyma.

I- Stroma:

a- Capsule:

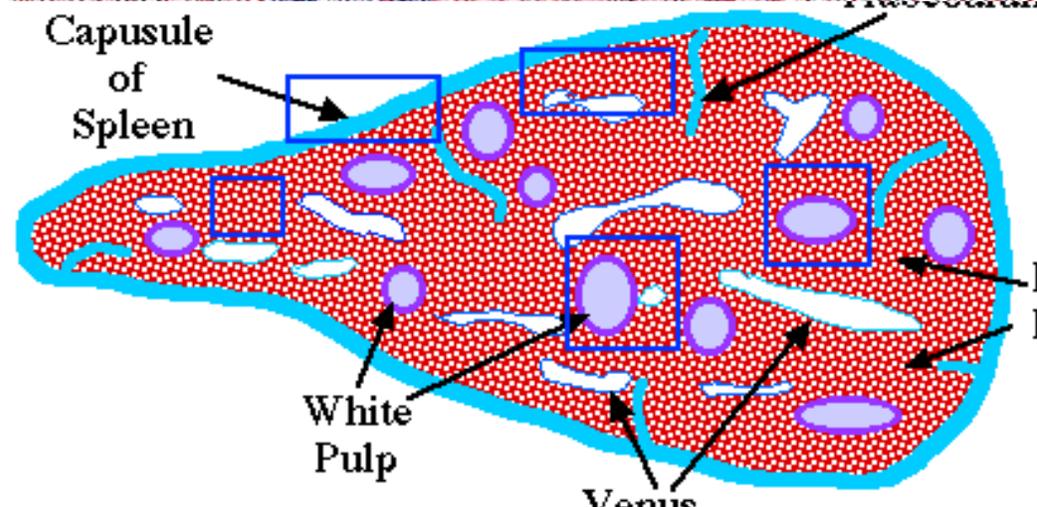
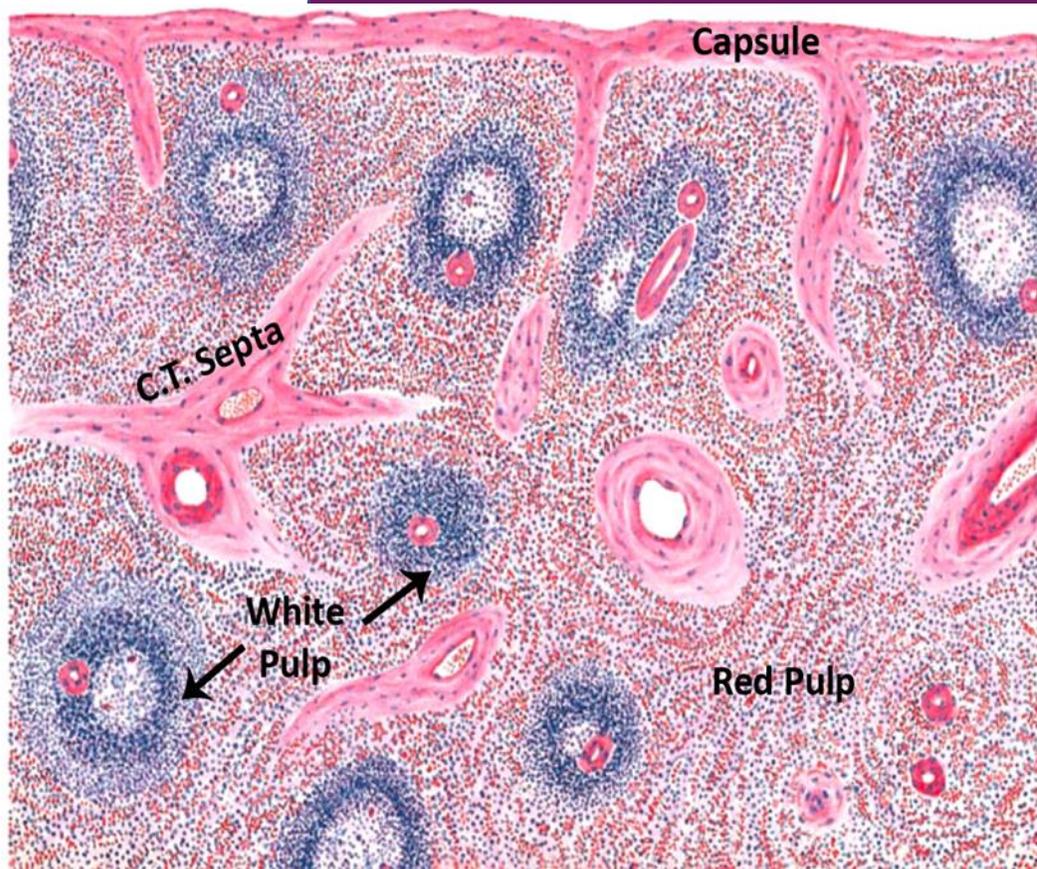
- Thick fibrous C. T. containing **smooth muscle fibers**.
- Is not penetrated by afferent lymphatic.
- Is covered by peritoneum.

b- Trabeculae:

- Fibrous C. T. containing smooth muscle fibers.
- Divide the spleen into incomplete intercommunicating splenic lobules.

c- Reticular network.

2- SPLEEN



II- Parenchyma:

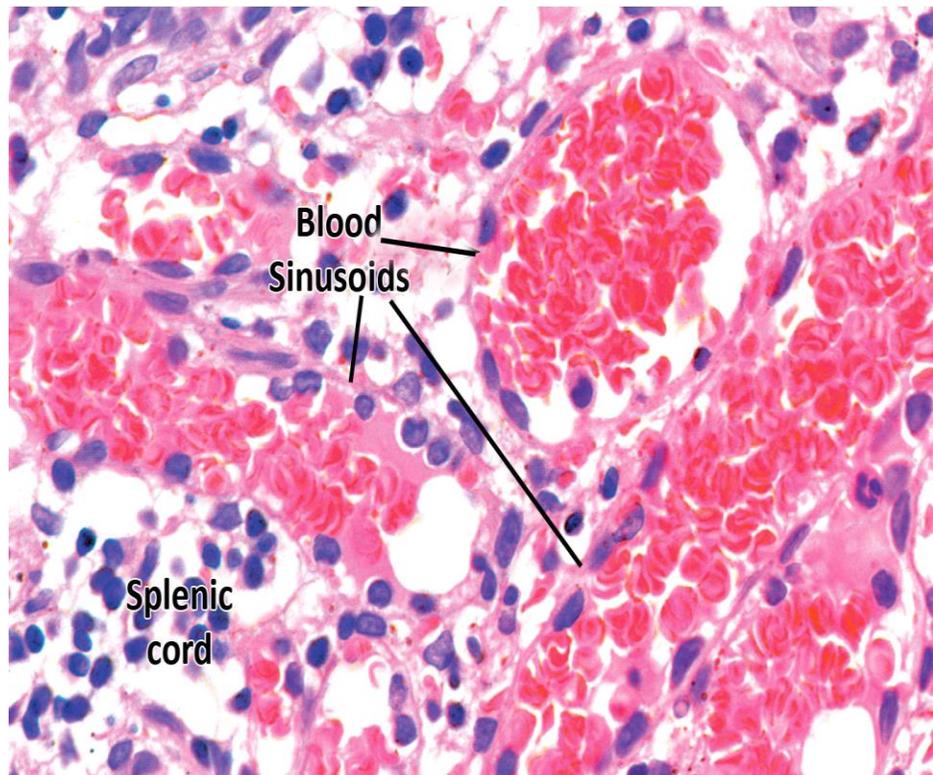
- It is formed of splenic lobules (white pulps and red pulps).
- Each splenic lobule includes:

A- White pulp: (Malpighian corpuscle):

-lymphatic follicle with central artery of white pulp which is eccentric in position. They scattered all over the spleen.

Thymus Dependant Zone:

- The zone rich in T-lymphocytes.
- Periarteriolar lymphatic sheath surrounding the central arteriole.



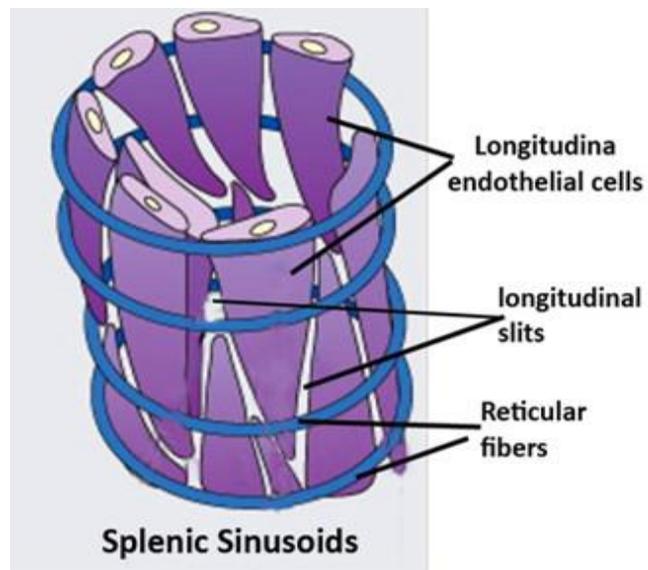
B- Red pulp:

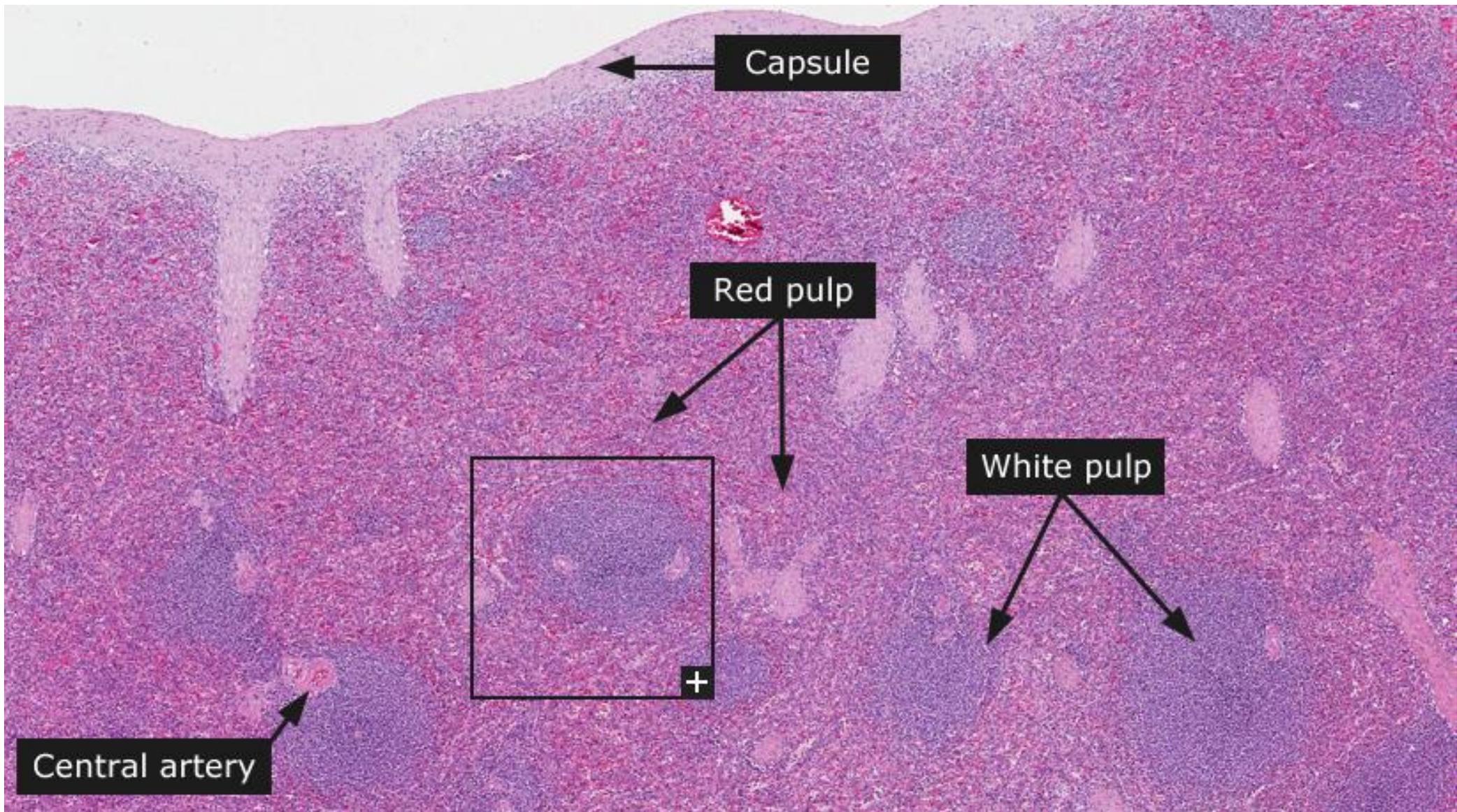
Splenic cords:

-They are irregular branching and anastomosing masses of diffuse lymphatic tissue mixed with **blood cells** (RBCs + all types of leucocytes) + macrophages.

- The red pulps occupy the areas between the white pulps.

- The splenic cords separated by blood sinusoids which are surrounded by macrophages called **littoral cells**, responsible for filtration of blood.







THANKYOU!

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References

- **Junqueira LC, Carneiro J: Junqueira's Basic Histology. Text and Atlas, fourteenth edition, Copyright © 2016 by McGraw-Hill Education.**
- **Student medical histology book, Mansoura university.**