

LIVER & SPLEEN

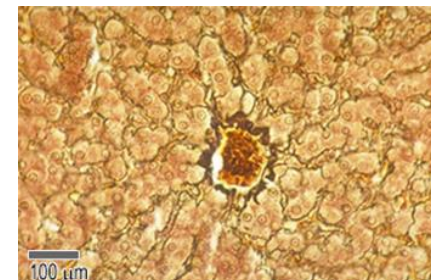
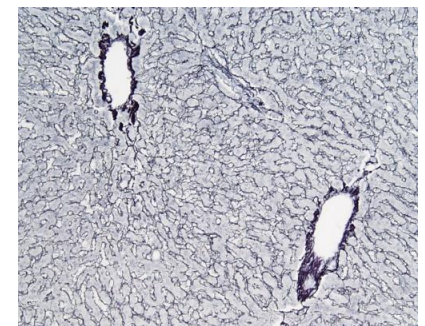
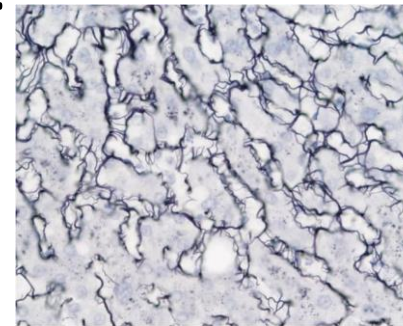
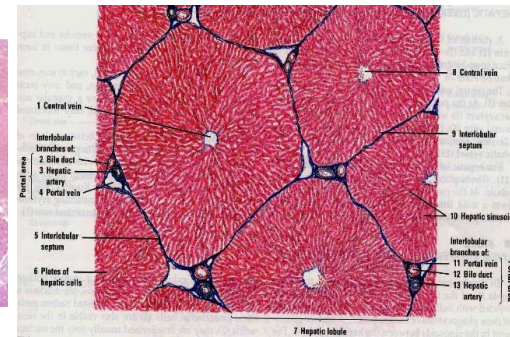
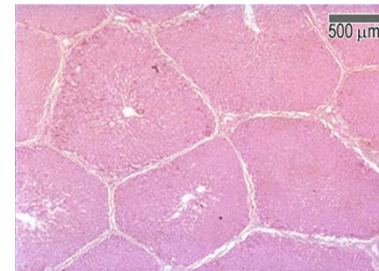
Objectives: By the end of this lecture, the student should be able to describe:

1. The histological structure of **liver** with special emphasis on:
 - Classical hepatic (liver) lobule.
 - Hepatocytes.
 - Portal tract (portal area).
 - Hepatic (liver) blood sinusoids.
 - Space of Disse (perisinusoidal space of Disse)
 - Bile canaliculi.
2. The histological structure of **spleen** with special emphasis on:
 - White pulp.
 - Red Pulp.

LIVER

Pig's liver

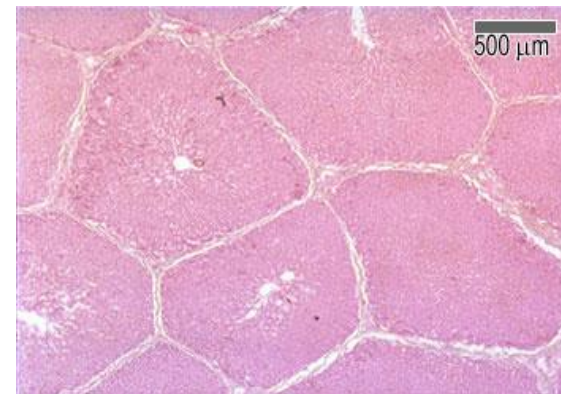
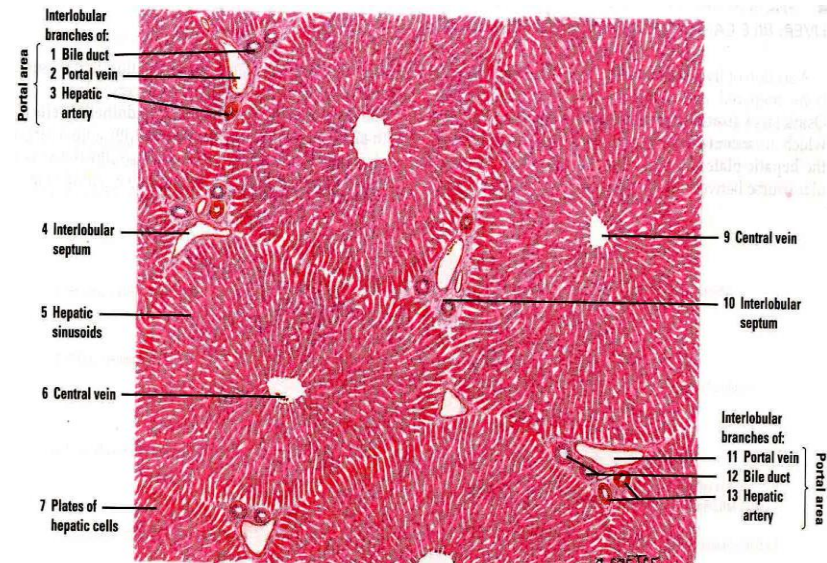
- 1- Stroma:
 - a- Capsule: Glisson's Capsule.
 - b- Septa (absent in human) & Portal areas (Portal tracts).
 - c- Network of reticular fibers.
- 2- Parenchyma; Classical liver (hepatic) lobules.



CLASSICAL LIVER LOBULE (classical hepatic lobule)

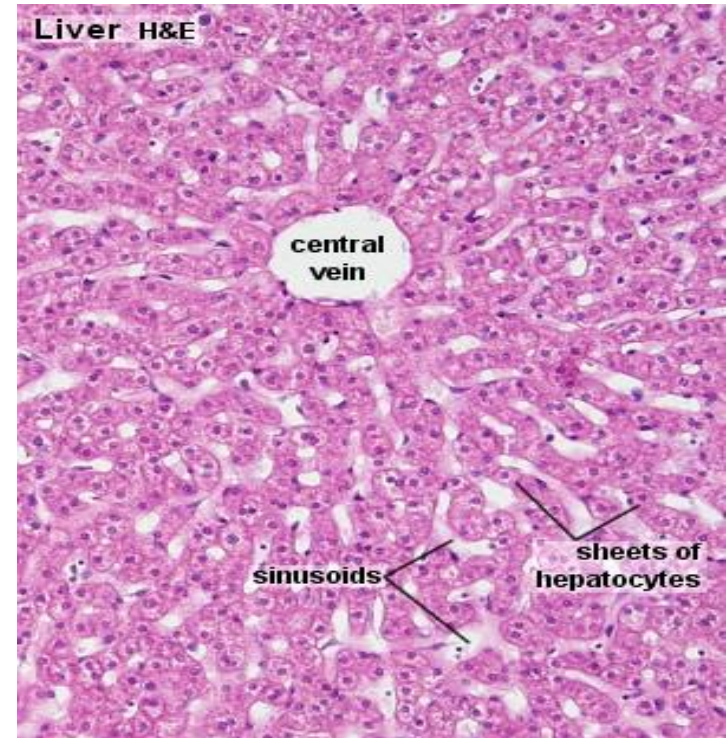
- It is formed of a **polygonal mass** of liver tissue, bounded by interlobular septa with portal areas at the **periphery** & central (centrolobular) vein in the **center**.

Human liver



Contents of the Classic Liver Lobule

- 1- Anastomosing **plates of hepatocytes**.
- 2- Liver blood sinusoids (**hepatic blood sinusoids**): In between the plates.
- 3- **Spaces of Disse** (perisinusoidal spaces of Disse).
- 4- **Central vein**.
- 5- **Bile canaliculi**.



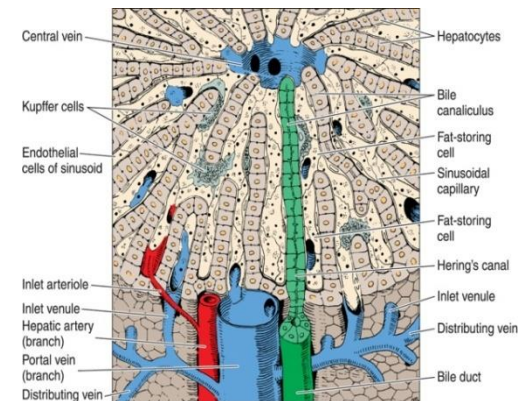
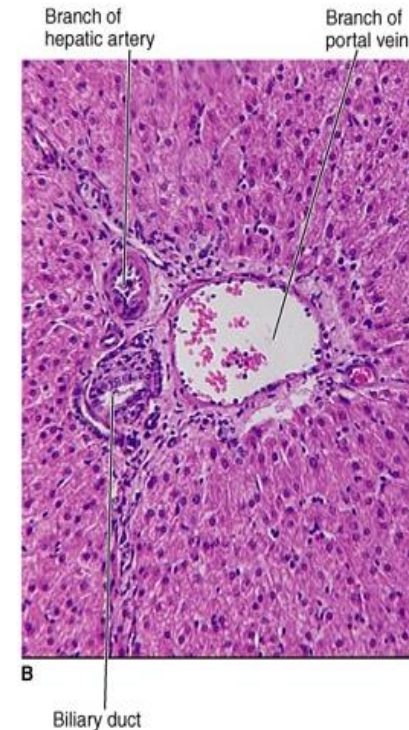
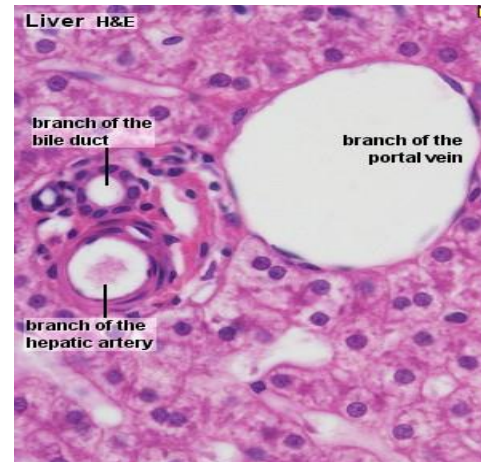
Borders of the Classical Liver Lobule

- 1- Septa: C.T. septa (e.g. in pigs).
- 2- Portal areas (Portal tracts) (Portal triads):

Are located in the corners of the classical hepatic lobule (usually 3 in No.).

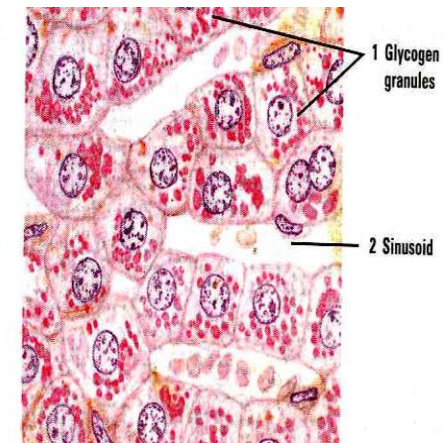
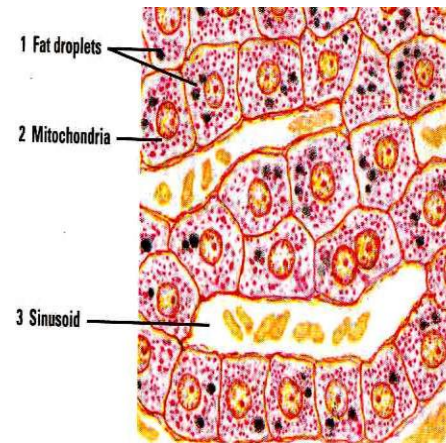
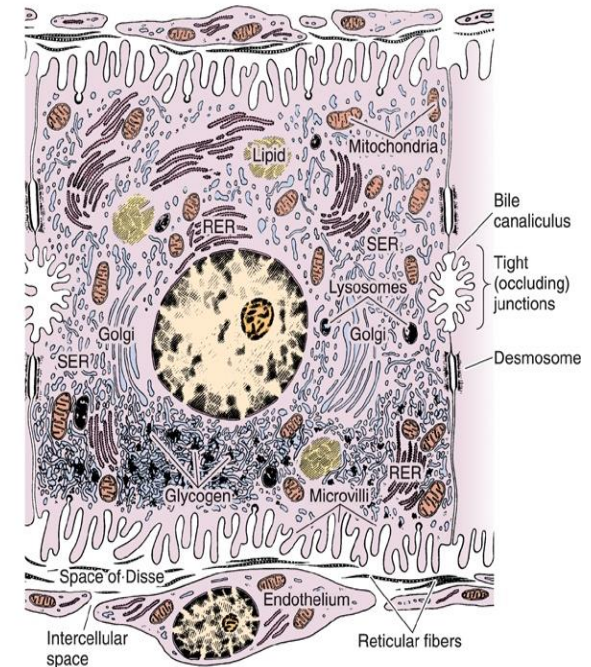
Contents of portal area:

- a- C.T.
- b- Bile ducts (interlobular bile ducts).
- c- Venule (Branch of portal vein).
- d- Arteriole (Branch of hepatic artery).



Hepatocytes (LM)

- Are grouped in interconnected plates.
- Liver sinusoids are located in the spaces between these plates.
- Are polyhedral in shape.
- Nucleus: 1 or 2, vesicular with prominent nucleoli.
- Cytoplasm: acidophilic.



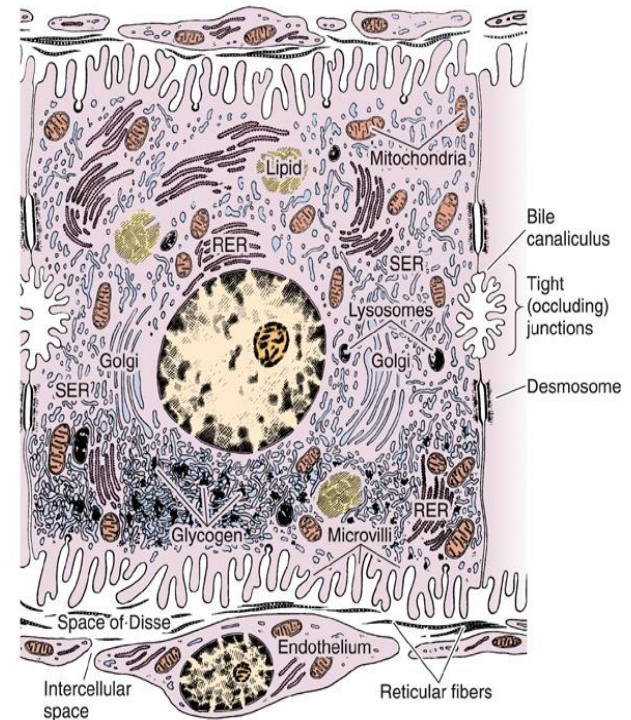
Hepatocytes (EM)

Organelles:

- 1- Mitochondria: +++++
- 2- ER (sER & rER): abundant.
- 3- Golgi complex.
- 4- Lysosomes.
- 5- Peroxisomes.

Inclusions (Deposits):

- 1- Glycogen
- 2- Lipid (few droplets).
- 3- Lipofuscin (old age)



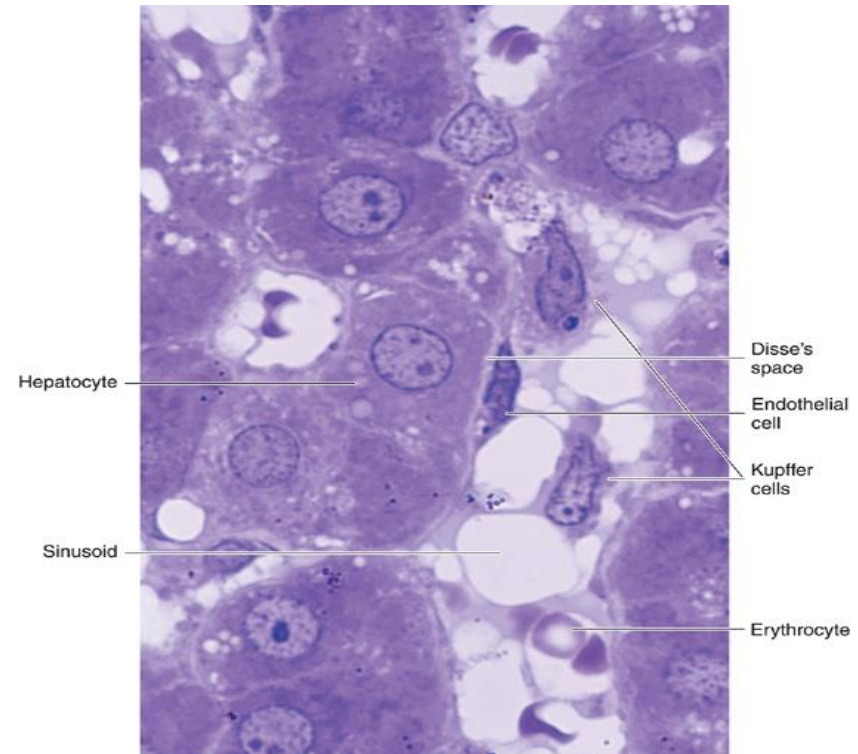
Liver Blood Sinusoids

(1) Endothelial Cells:

- Fenestrated & discontinuous
→ free passage of plasma.
- Basal lamina is absent.

(2) Kupffer Cells:

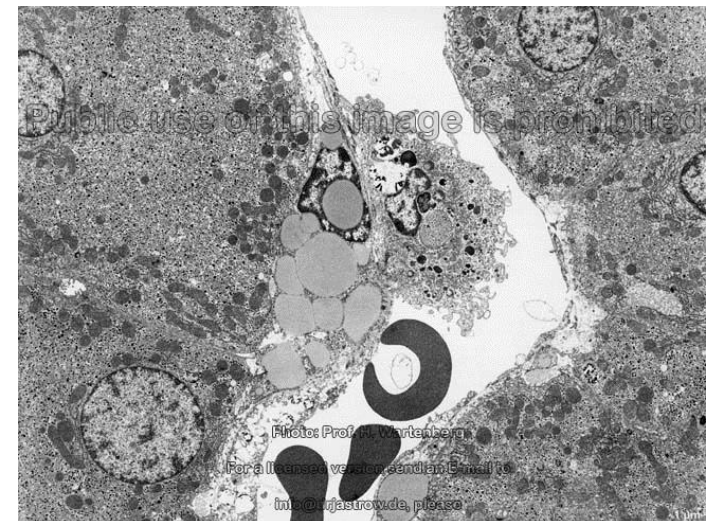
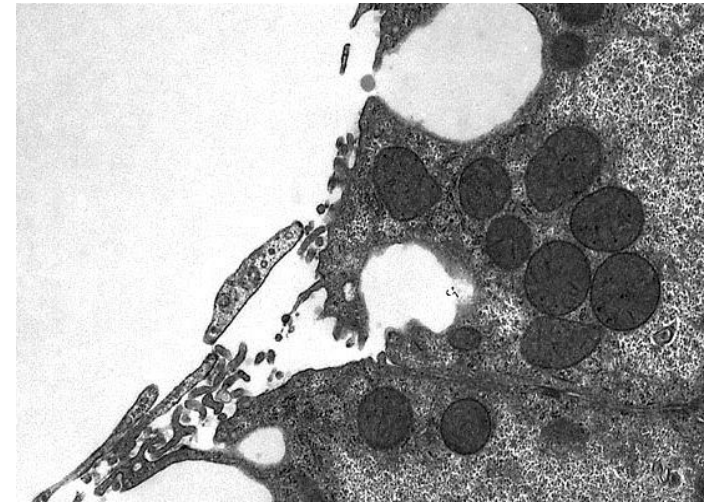
- Are macrophages.
- Are found on the luminal surface of the endothelial cells.
- Function: phagocytosis.



Space of Disse (Perisinusoidal Space)

Contents:

- 1- Microvilli of hepatocytes.
- 2- Plasma of blood.
- 3- Hepatic stellate cells (Ito cells)
(Fat-storing cells):
 - contain vitamin A-rich lipid.
 - form reticulin (reticular fibers).
- 4- Reticular fibers:
(type III collagen).
- 5- Natural Killer (NK) cells.



SPLEEN

Stroma of Spleen

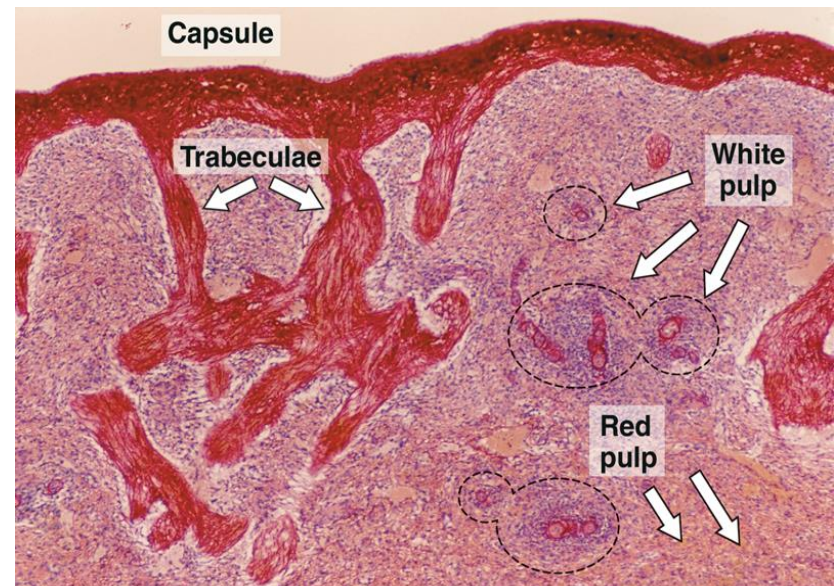
1- Capsule:

- is covered by visceral layer of peritoneum; mesothelium
- Is formed of fibromuscular C.T. (Dense fibrous C.T. + SMCs (smooth muscle cells).

2- Trabeculae:

Are irregular, incomplete, divide the spleen into intercommunicating compartments (lobules).

3- Reticular C.T.



Parenchyma of Spleen

(A) White pulp.

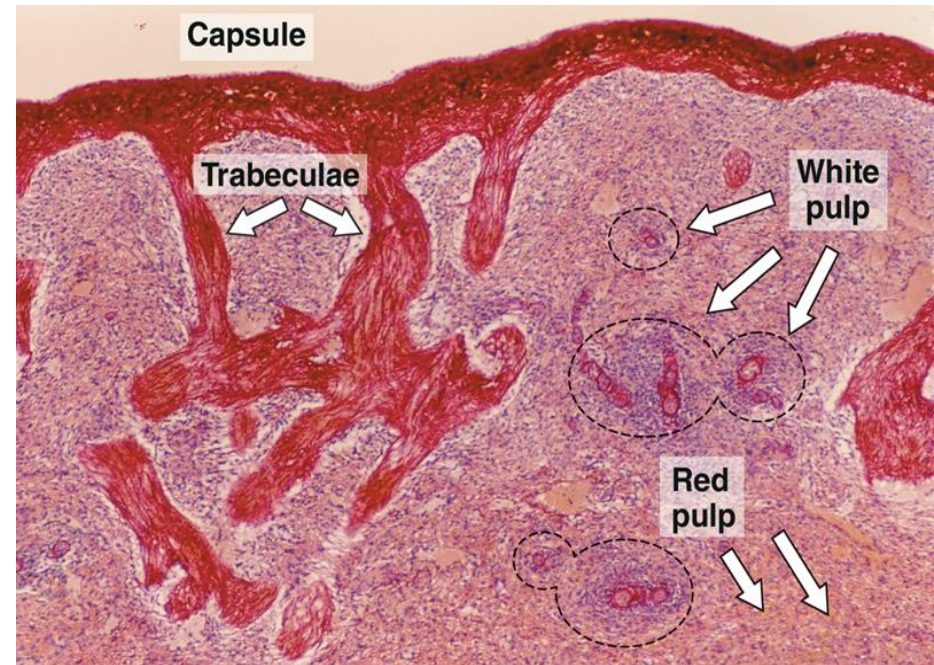
(B) Red pulp.

N.B.

No cortex,

No medulla,

No afferent lymphatic vessel.

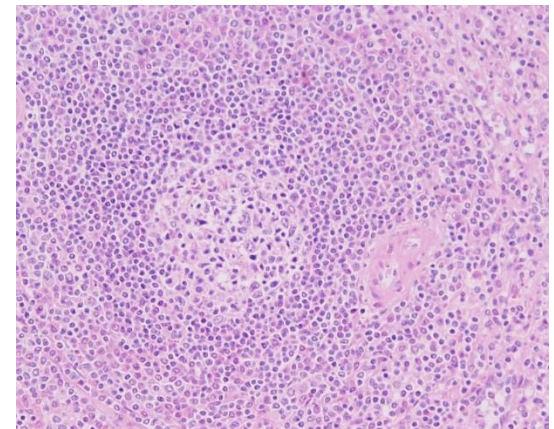
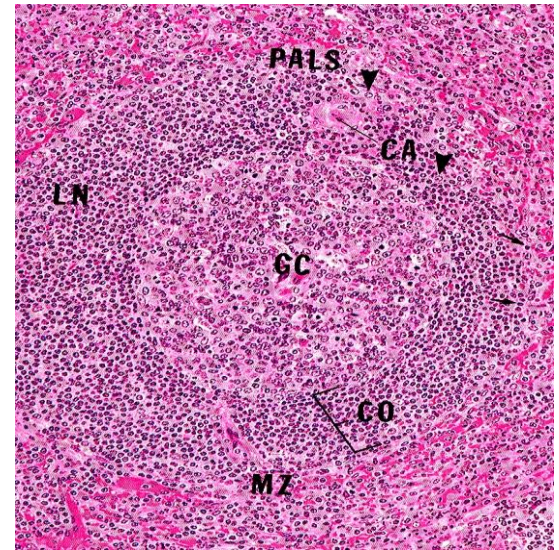


Parenchyma of Spleen

White Pulp:

- 1- Periarterial lymphatic sheaths (PALS): housing T lymphocytes.
- 2- Lymphoid follicles (with germinal centers): housing B lymphocytes.

N.B. Both 1&2 have the acentrically located central artery (central arteriole) (follicular arteriole).



Parenchyma of Spleen

(B) Red pulp:

1- Splenic (pulp) cords:

Extravasated blood cells,
plasma cells, macrophages &
reticular cells and fibers.

2- Splenic blood sinusoids:

Are lined with elongated
fusiform endothelial cells with
large intercellular spaces &
supported by discontinuous,
circular basement membrane.

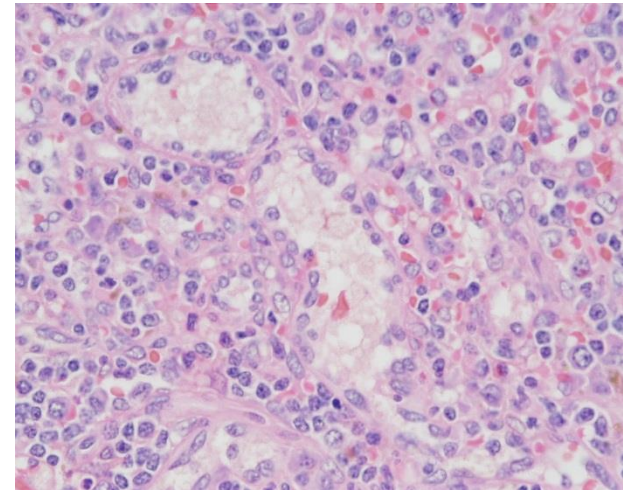
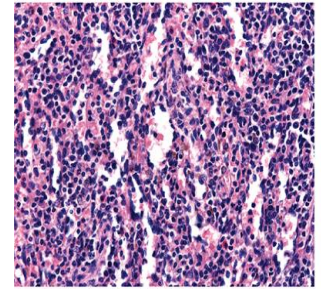
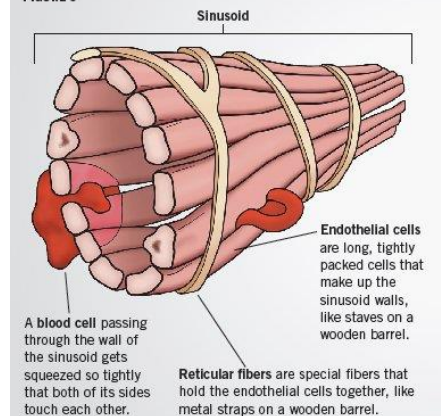


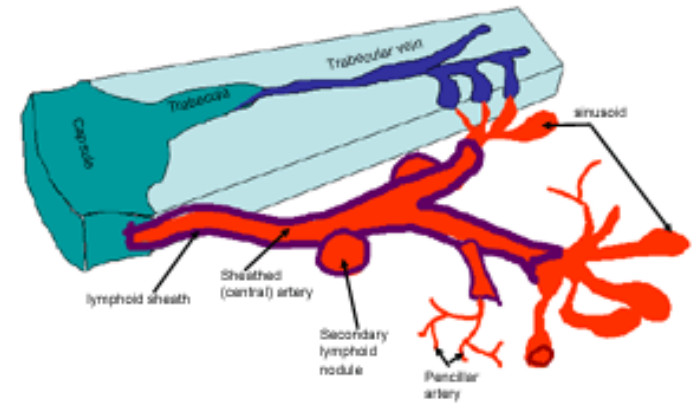
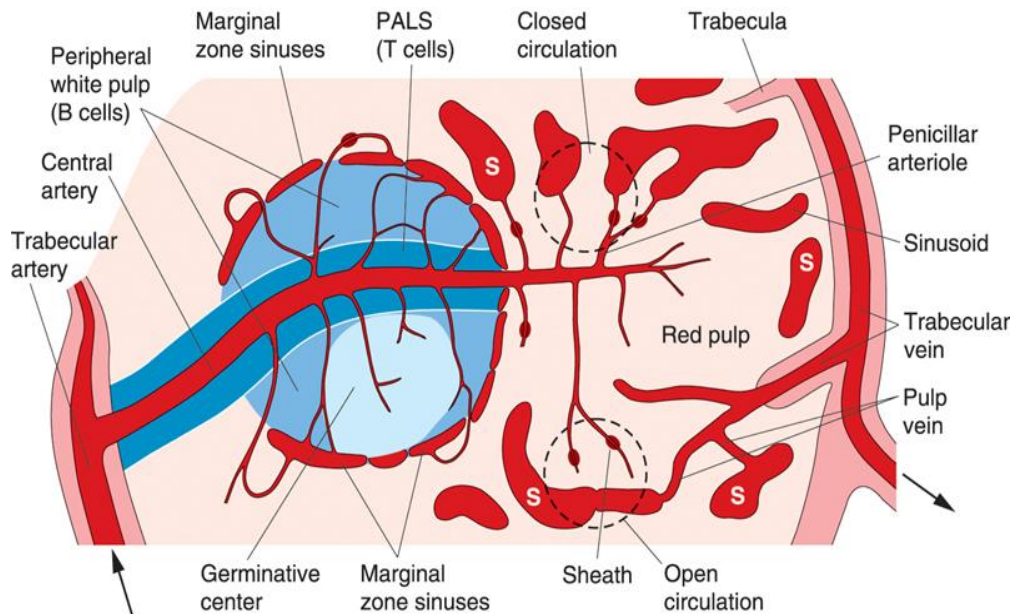
FIGURE 3



Cells of parenchyma of spleen

- 1. Lymphocytes.
- 2. Plasma cells.
- 3. Macrophages.
- 4. Blood elements (RBCs, leucocytes and blood platelets).

Splenic Microcirculation



BEST WISHES