

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.

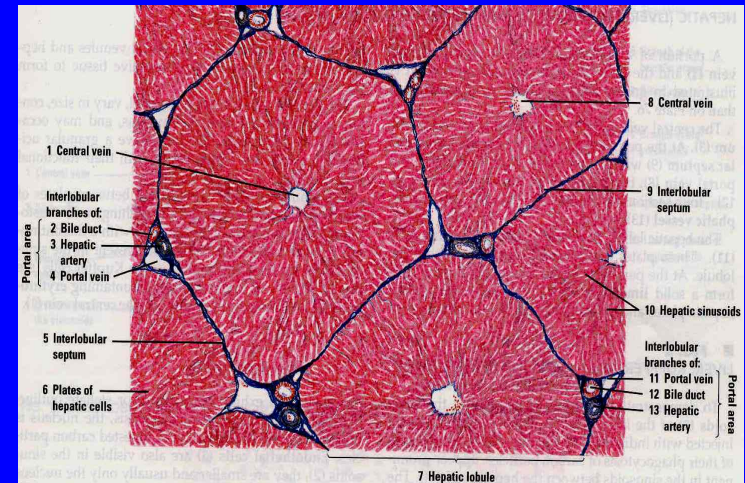
LIVER

1- Stroma:

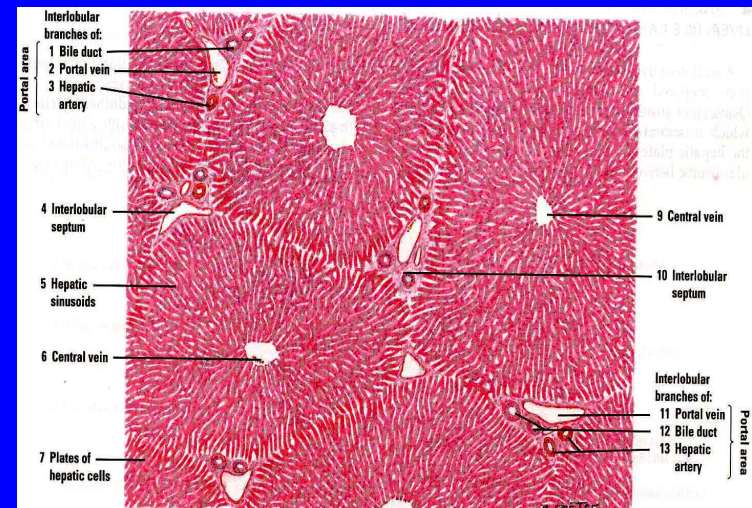
- a- Capsule: Glisson's Capsule.
- b- Septa (absent in human) & Portal areas (Portal tracts).
- c- Network of reticular fibers.

2- Parenchyma: Classical liver (hepatic) lobules.

Pig's liver



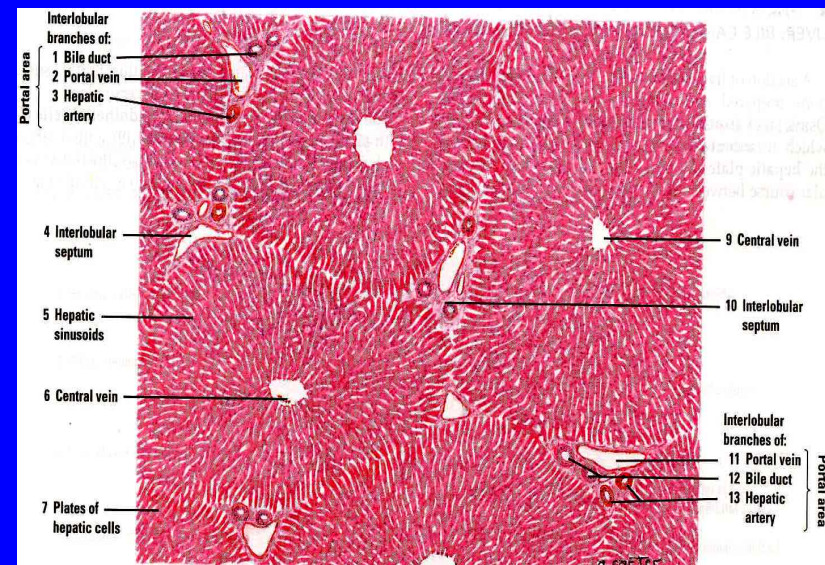
Human liver



CLASSICAL LIVER LOBULE (classical hepatic lobule)

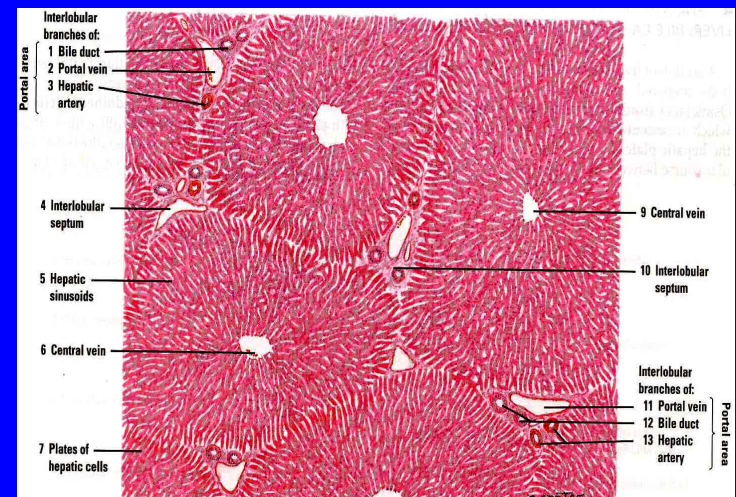
It is formed of a polygonal mass of liver tissue, bounded by interlobular septa with portal areas at the periphery & central (centrolobular) vein in the center.

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**.

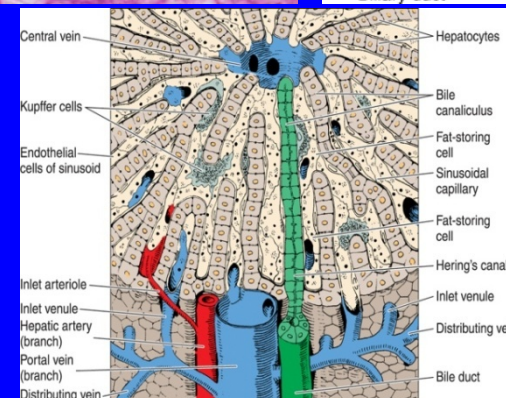
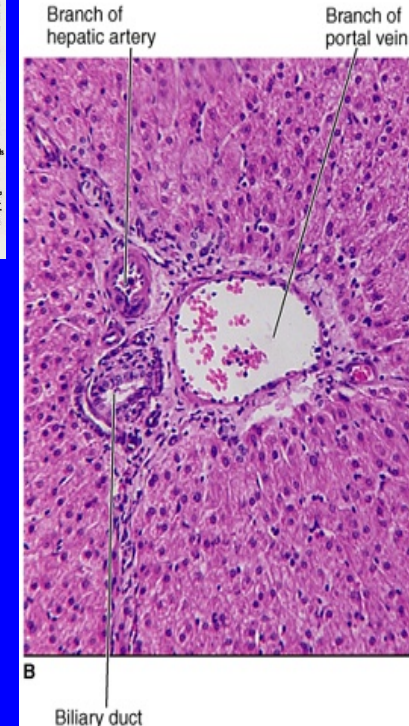
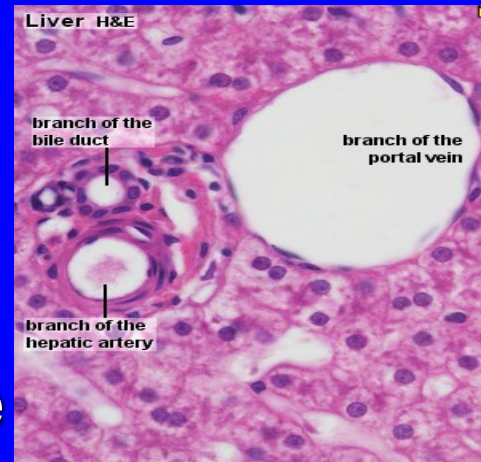
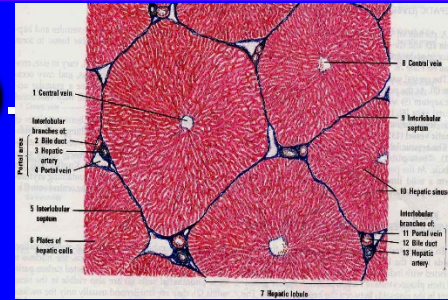


Borders of the Classical Liver Lobule

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



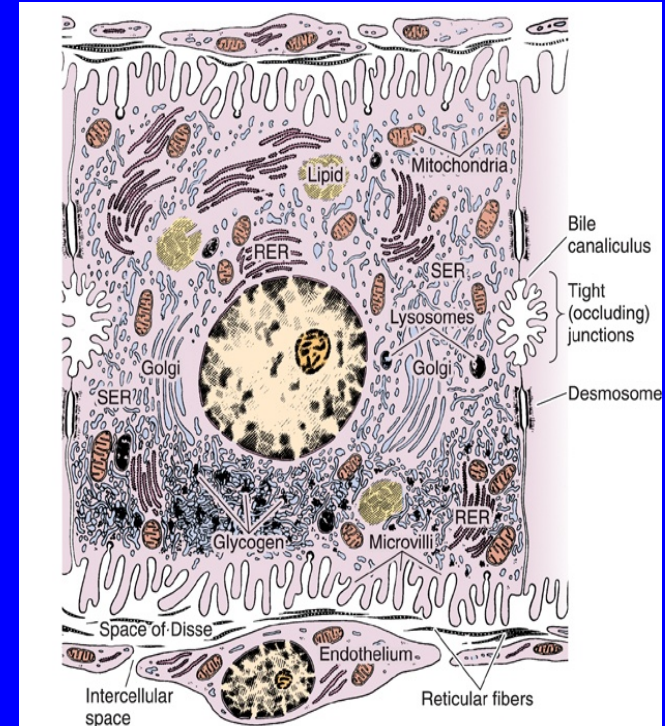
Hepatocytes (EM)

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)



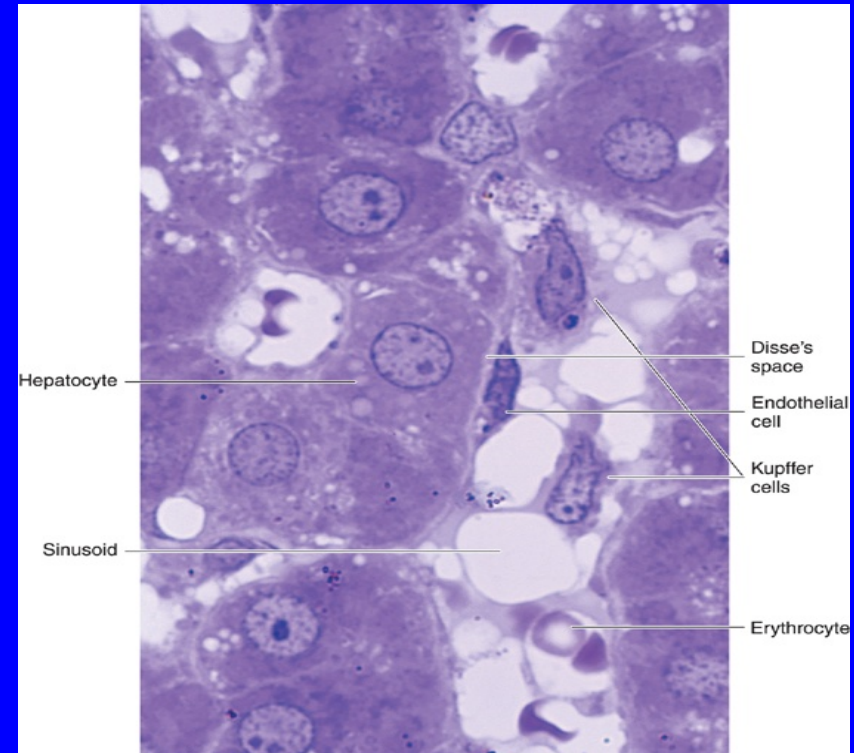
Liver Blood Sinusoids

(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:

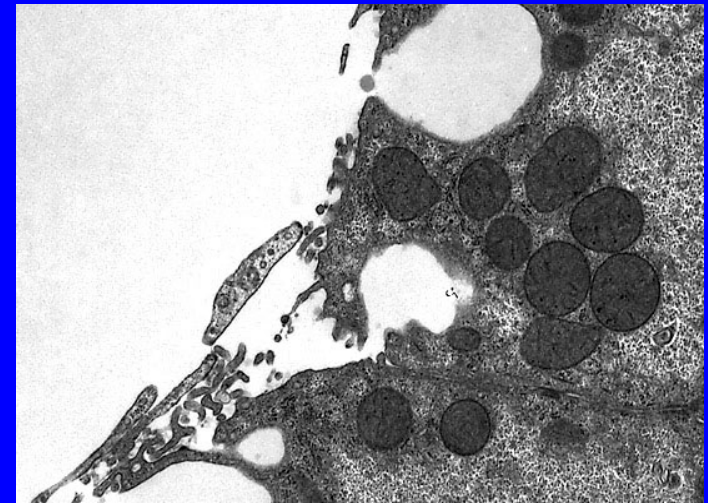
1- Fat-storing cells (Ito cells) (Hepatic stellate cells):

- contain vitamin A-rich lipid.
- form reticulin.

2- Reticular fibers: (type III collagen).

3- Plasma of blood.

4- Microvilli of hepatocytes.



SPLEEN

Stroma of Spleen

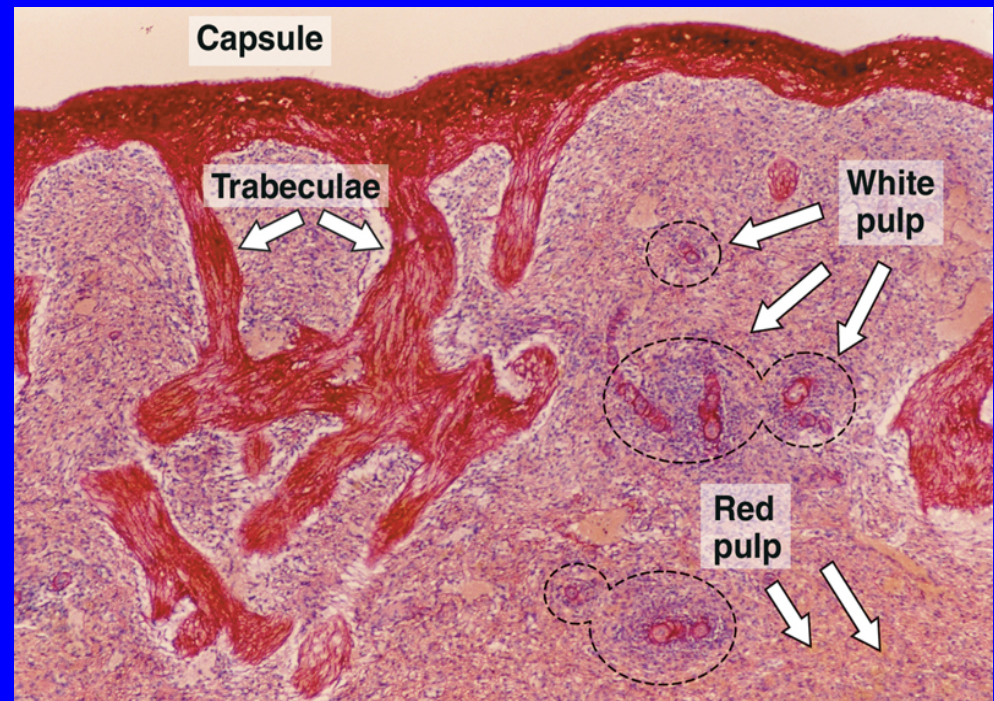
1- Capsule:

- 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).

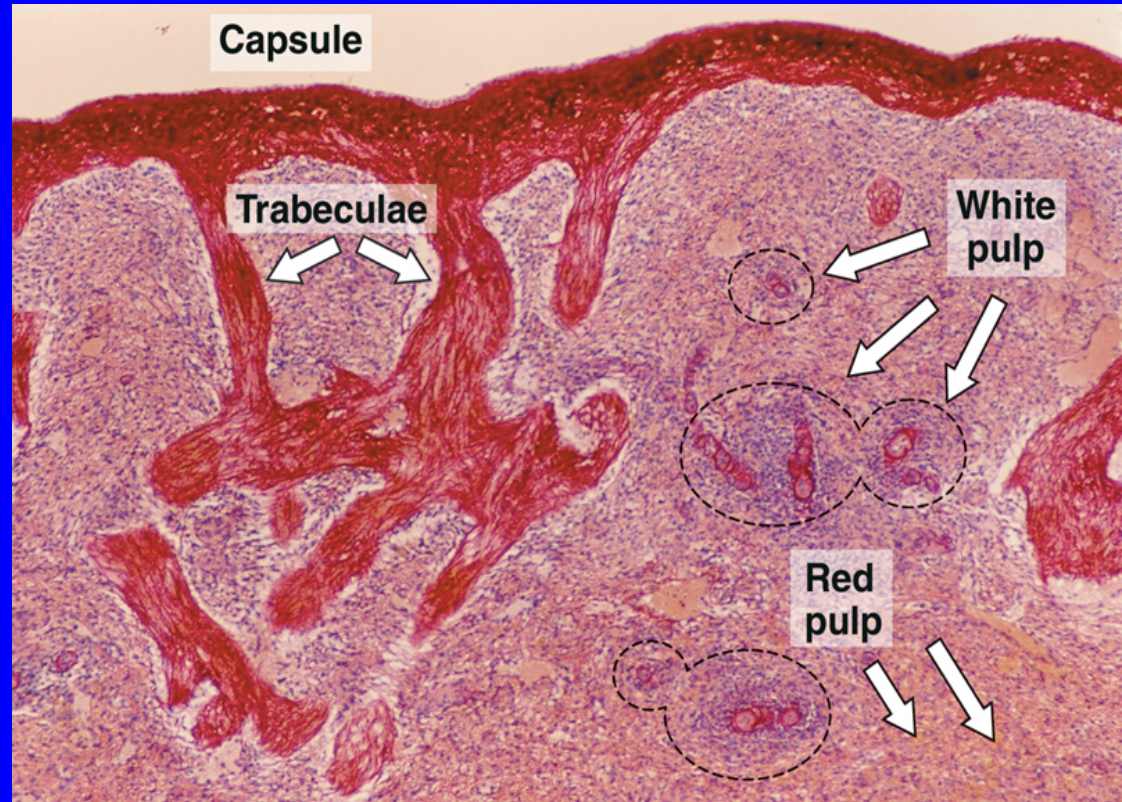
3- Reticular C.T.



Parenchyma of Spleen

(A) White pulp.

(B) Red pulp.



N.B. No cortex,

No medulla,

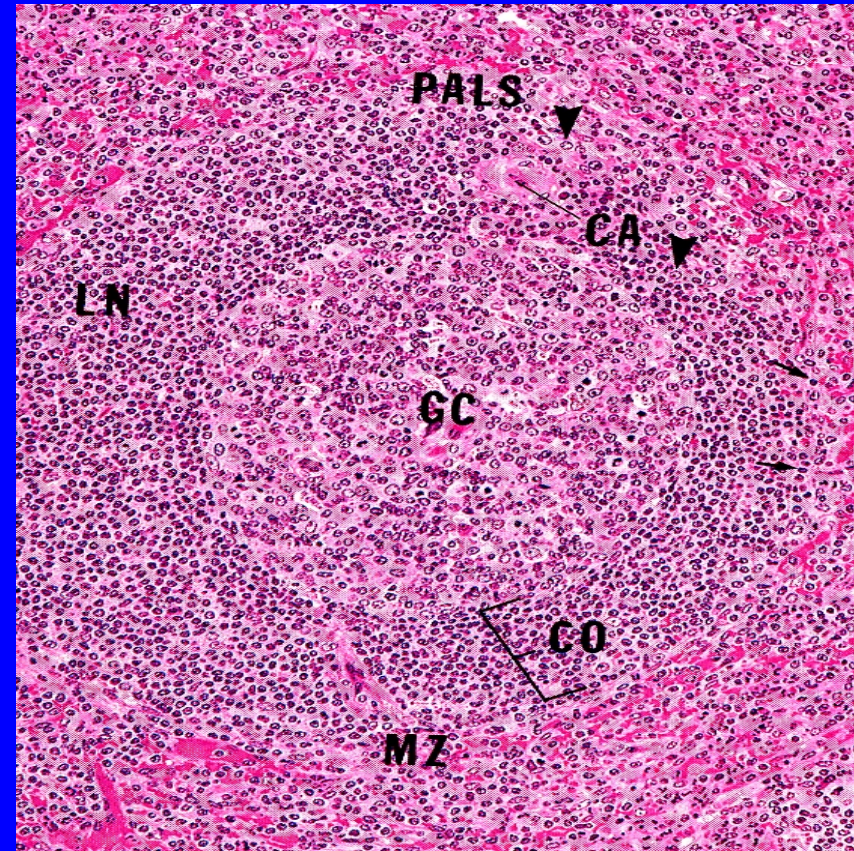
No afferent lymphatic vessel.

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

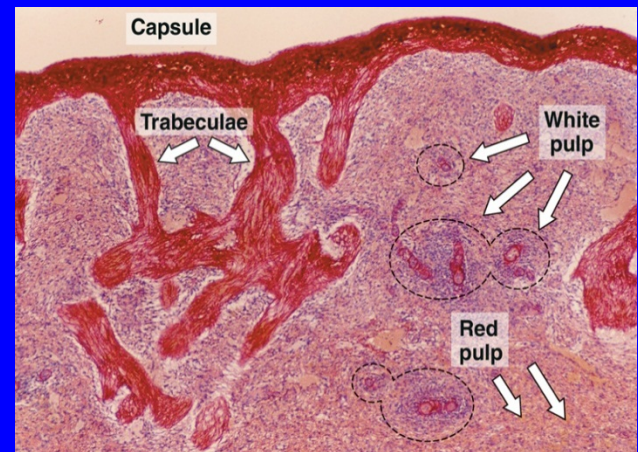
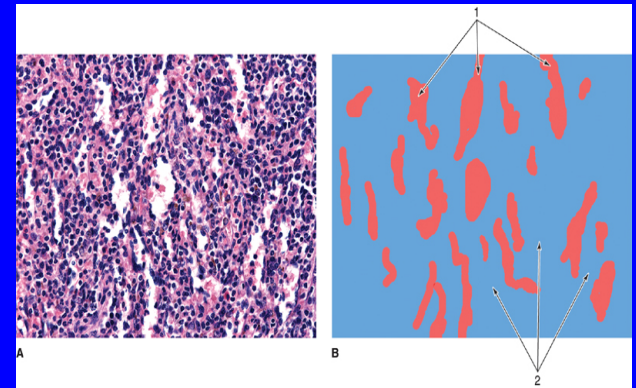
(B) Red pulp:

1- Splenic (pulp) cords:

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

2- Splenic blood sinusoids:

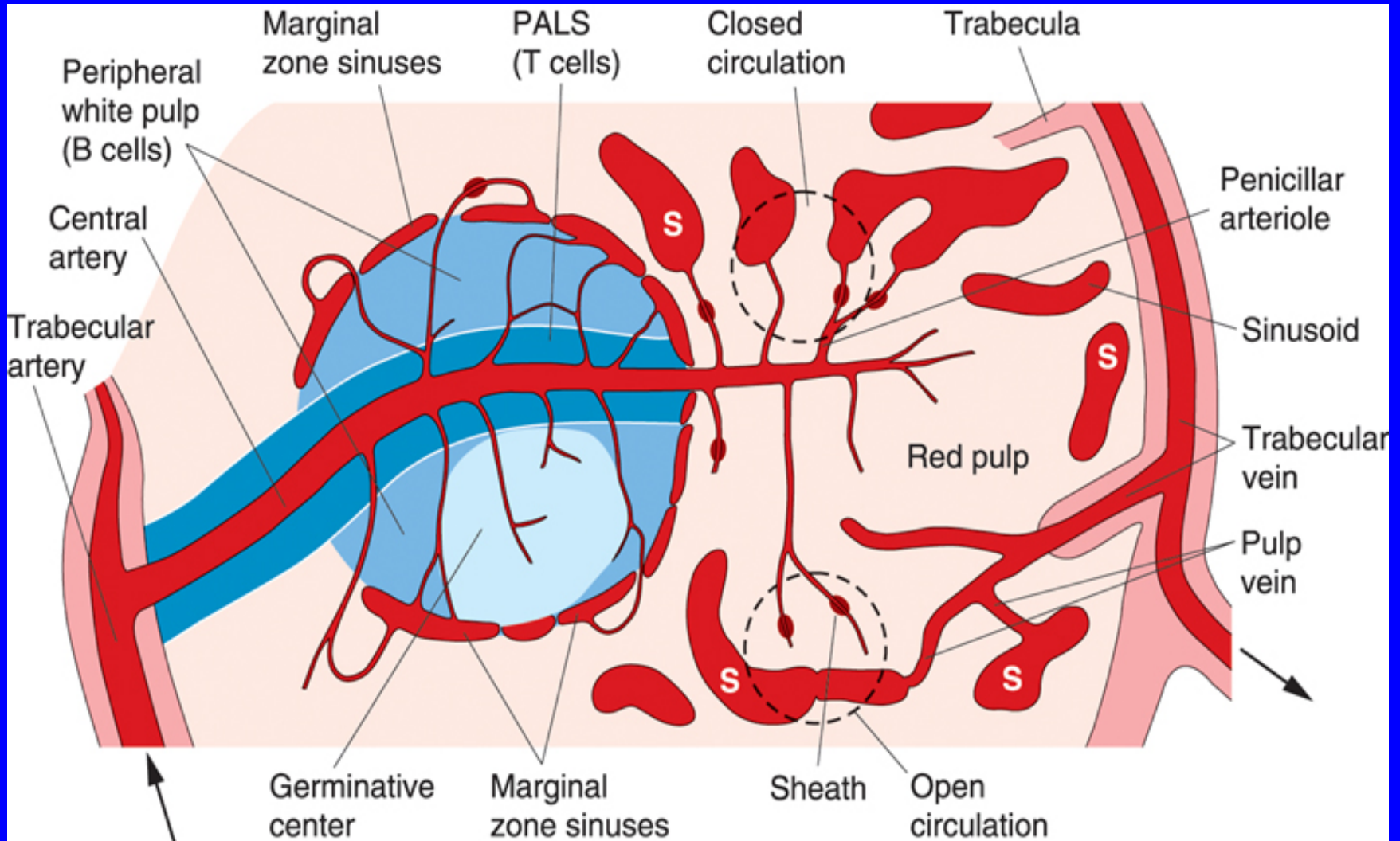
Are lined with elongated
fusiform endothelial cells
with large intercellular
spaces & supported by
discontinuous, circular
basement membrane.



Cells of parenchyma of spleen

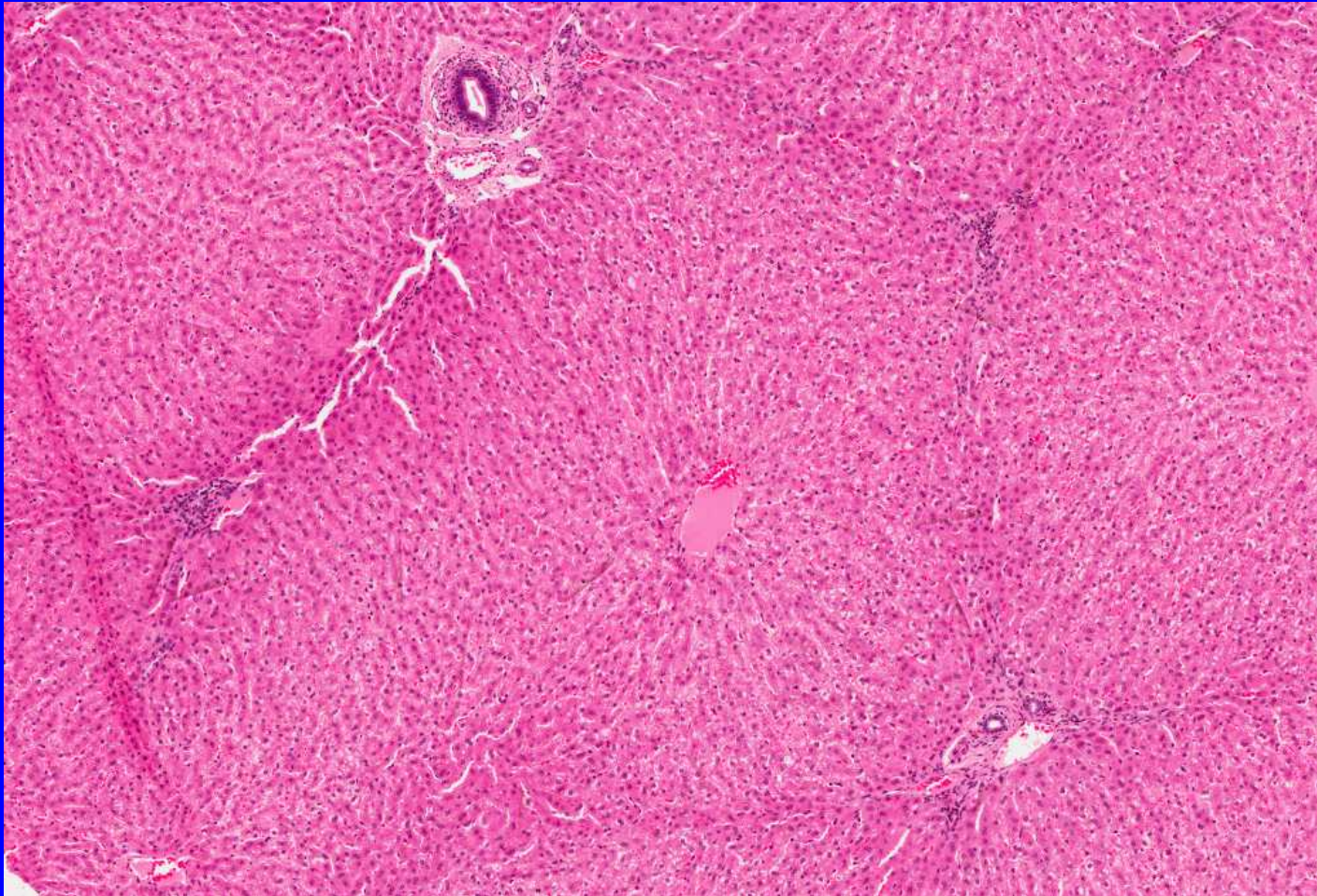
- 1. Lymphocytes (B- and T).
- 2. Plasma cells.
- 3. Macrophages.
- 4. Blood elements (RBCs, leucocytes and blood platelets).

Splenic Microcirculation

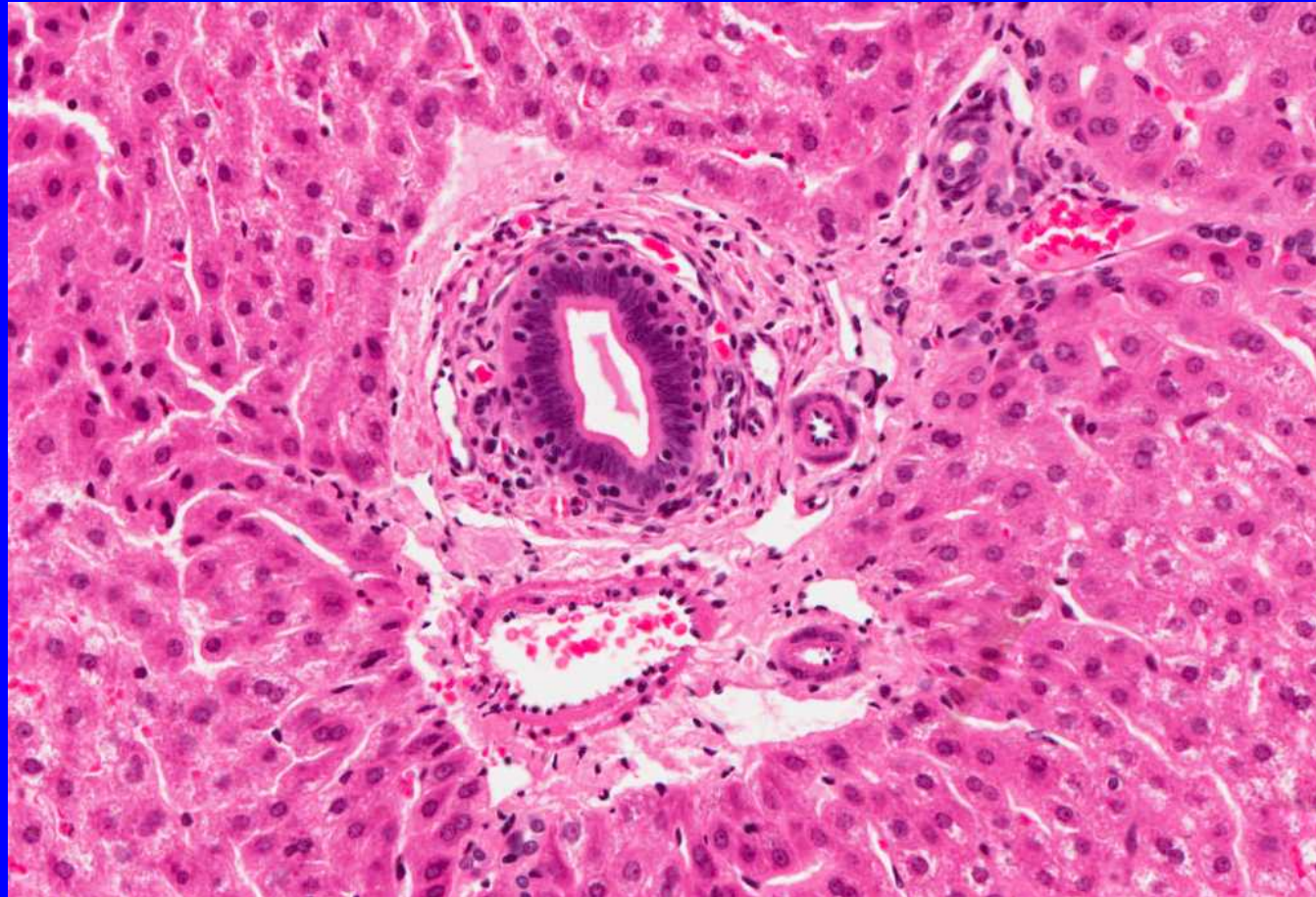


Liver, Pancreas, gall bladder and Spleen

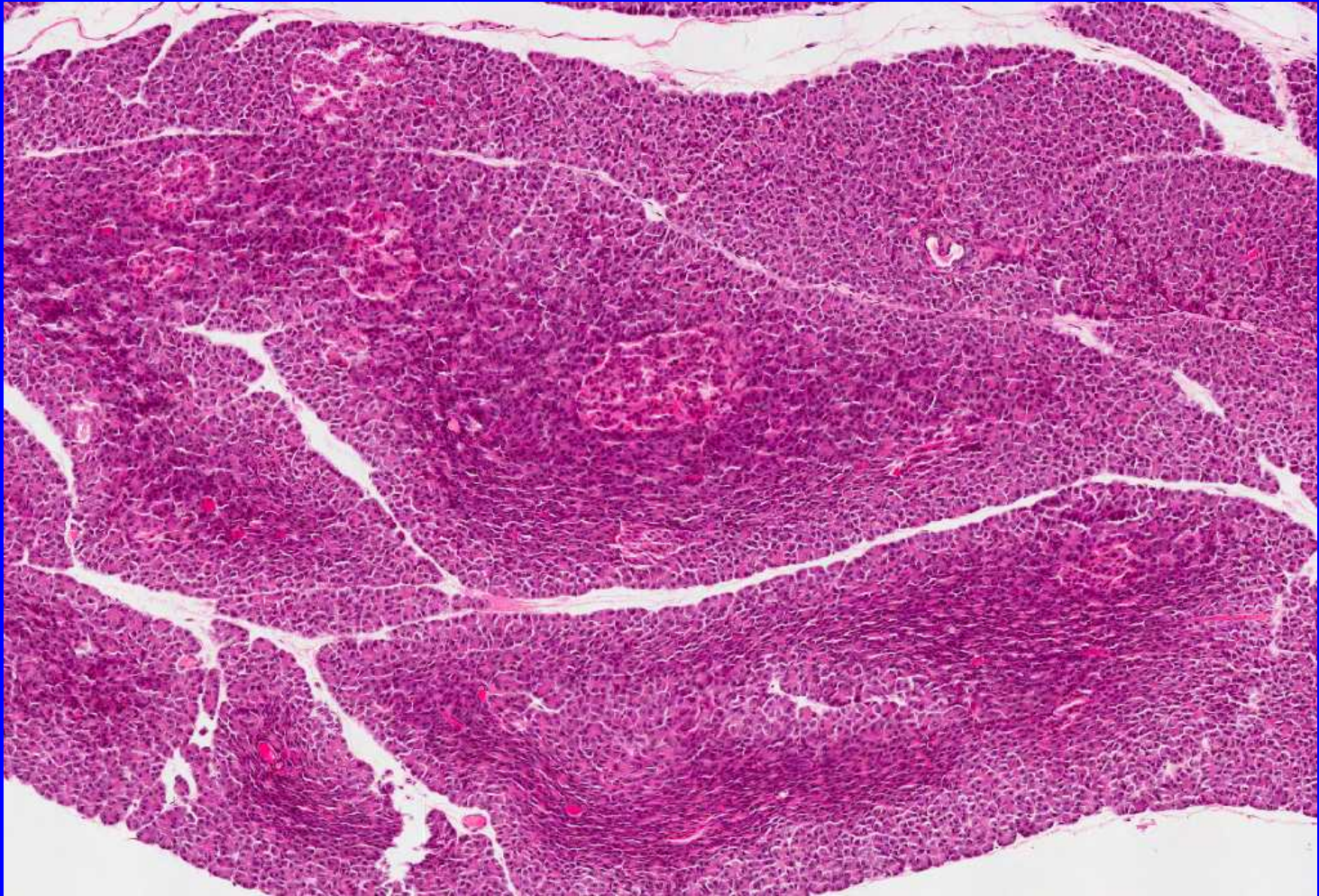
Practical Pictures



Liver (classic hepatic lobule)



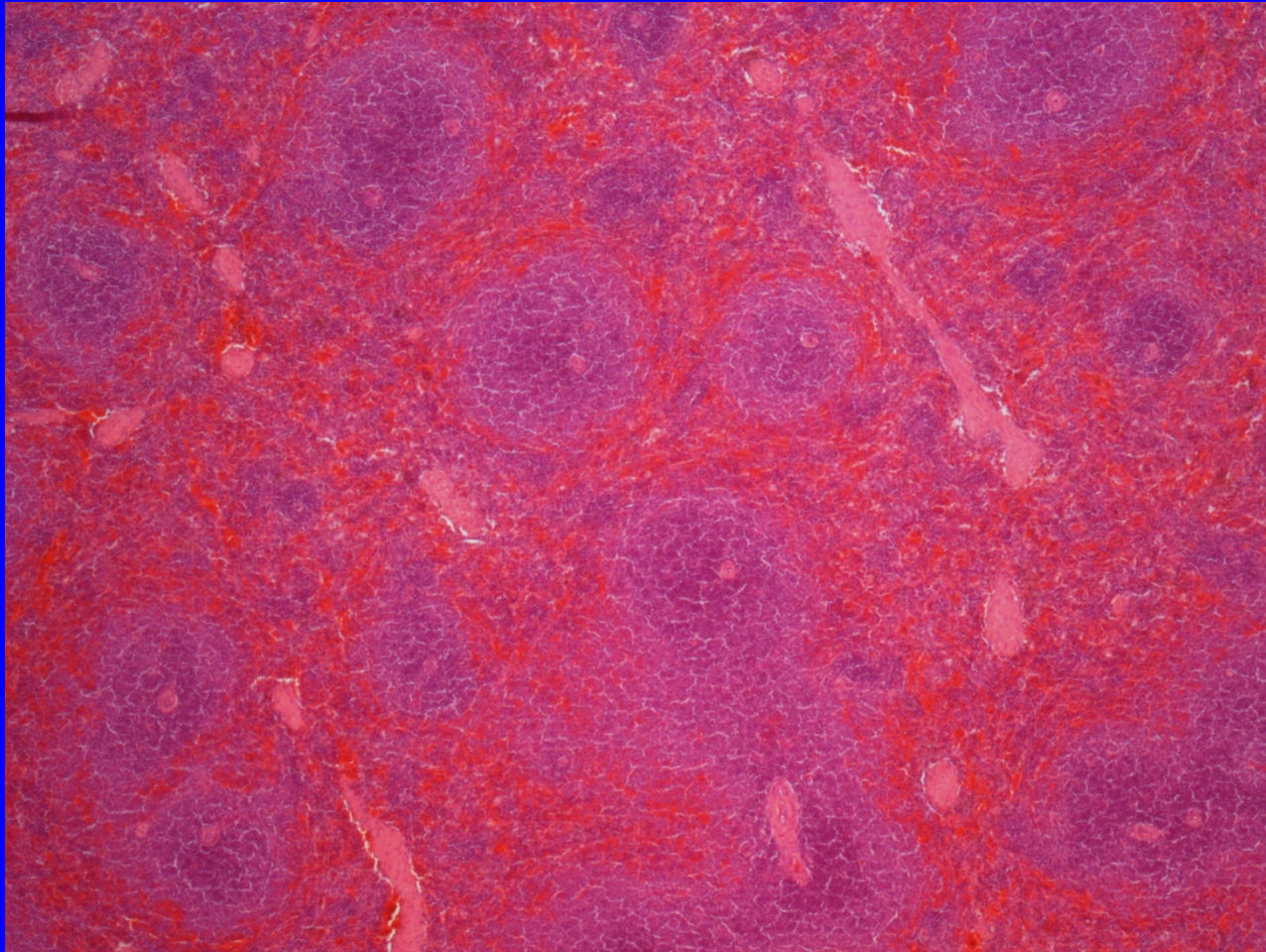
Liver (portal area)



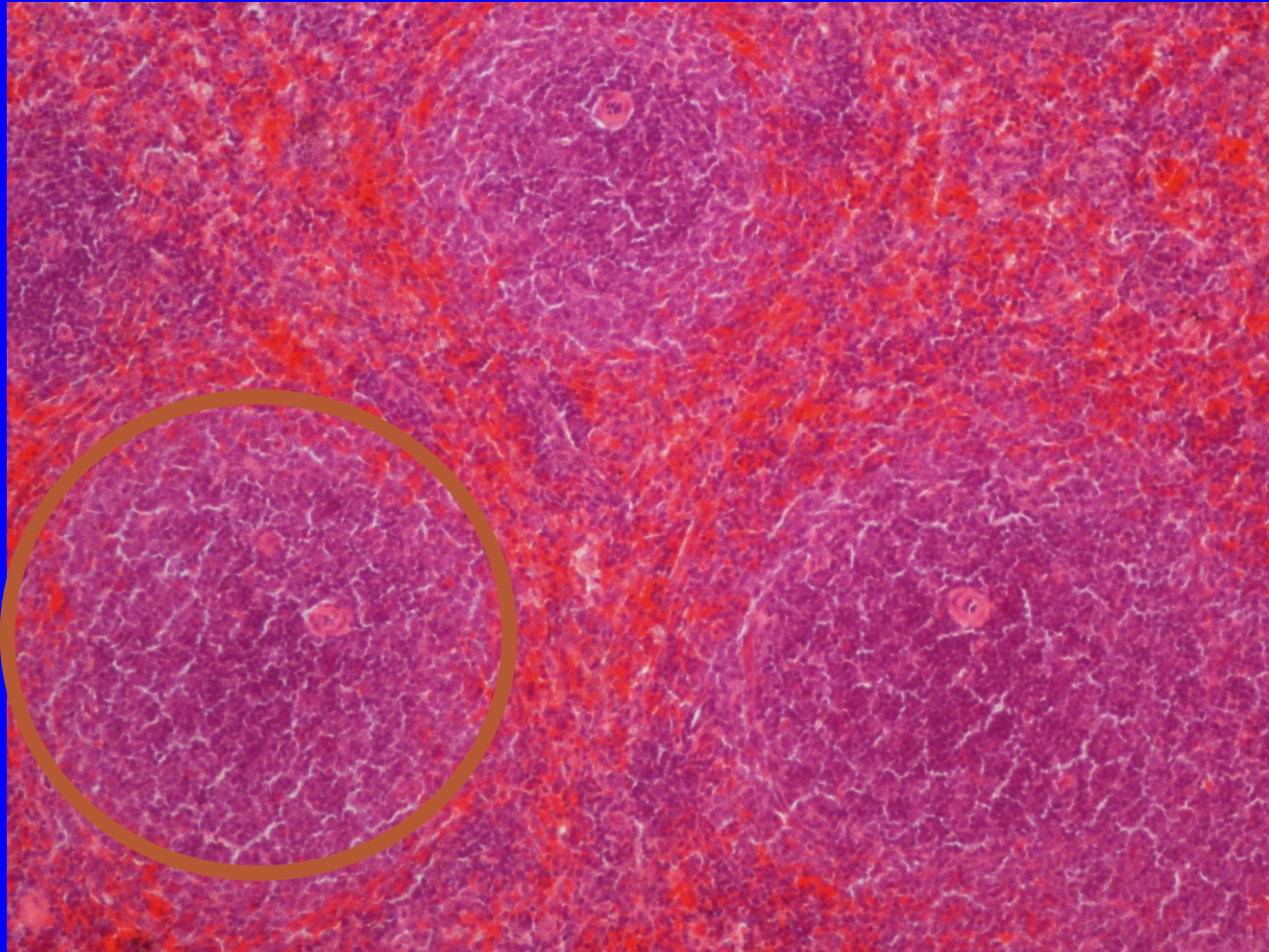
Pancreas (low power)



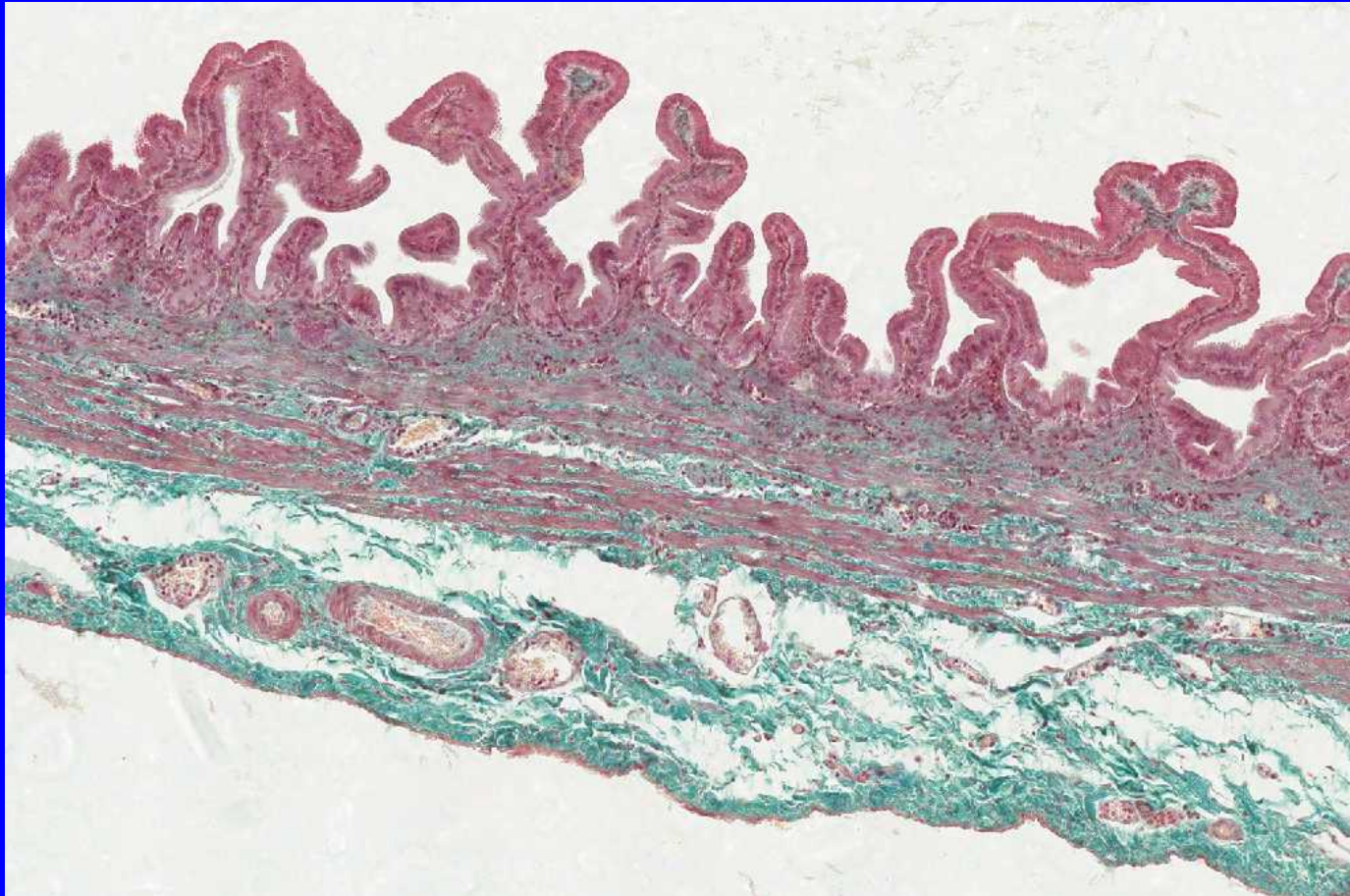
Pancreas (high power)



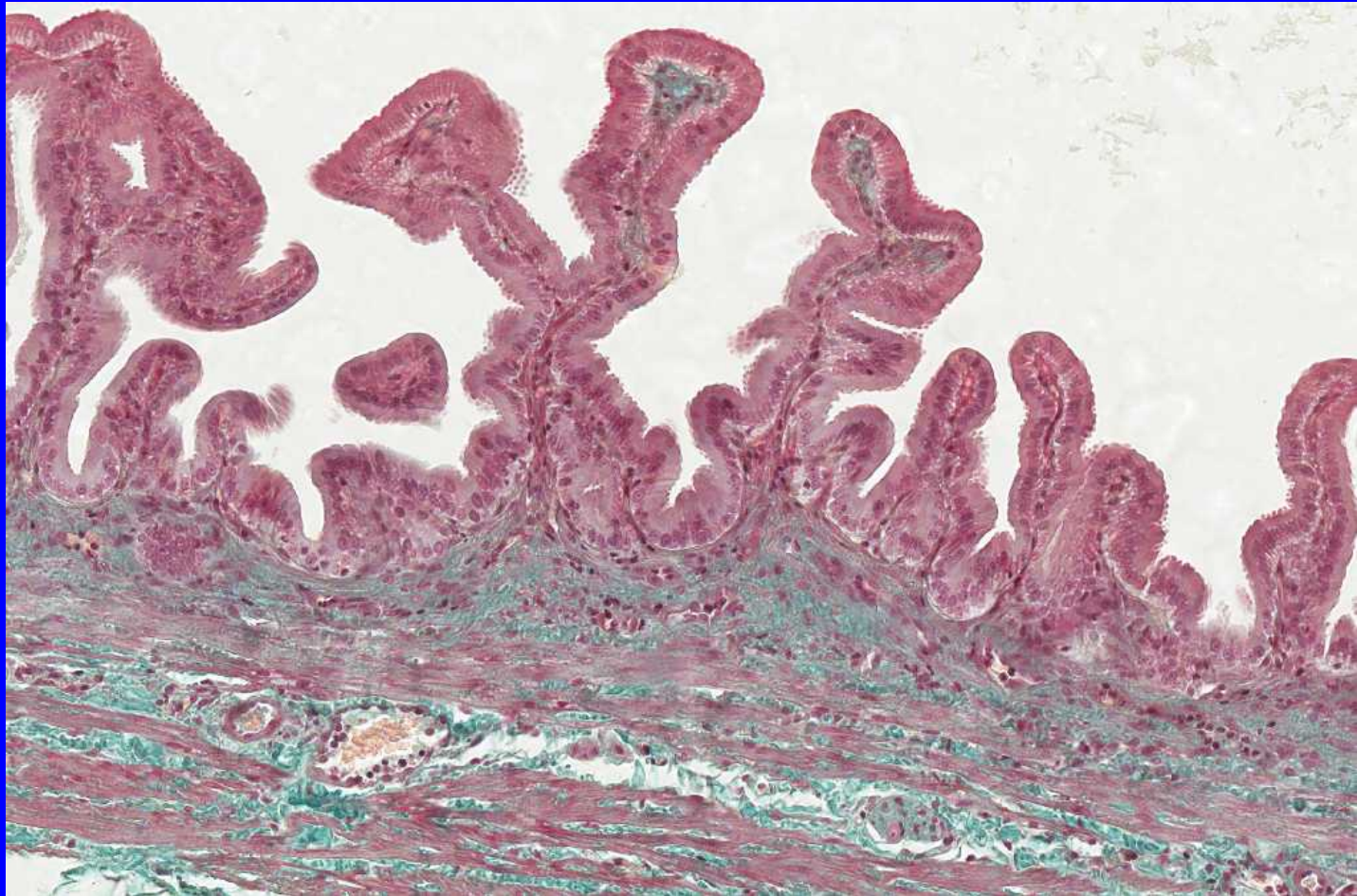
Spleen (low power)



Spleen (high power)



Gall bladder (low power)



Gall bladder (high power)

BEST WISHES