

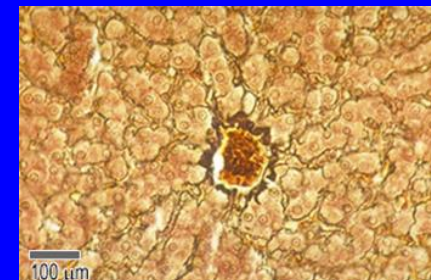
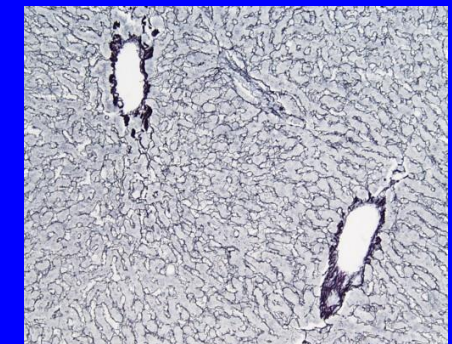
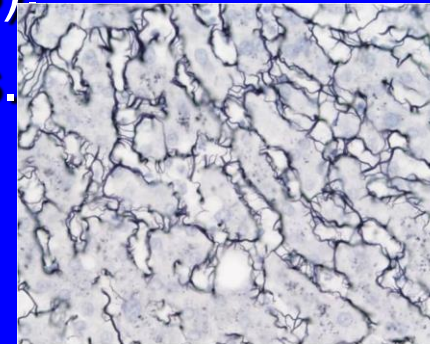
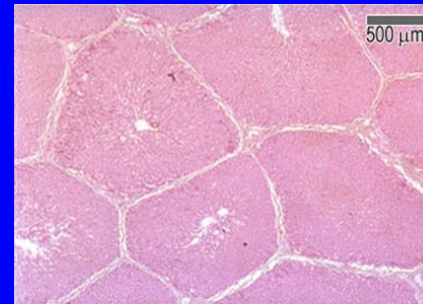
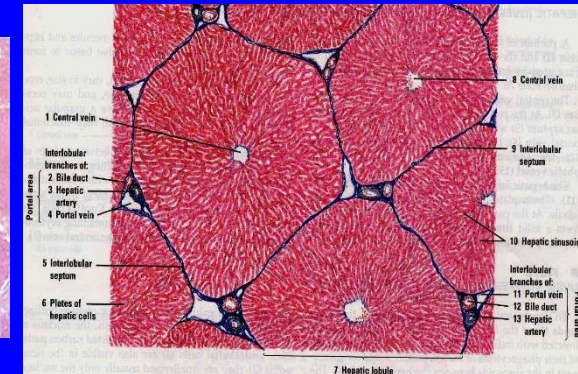
# LIVER & SPLEEN

**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:

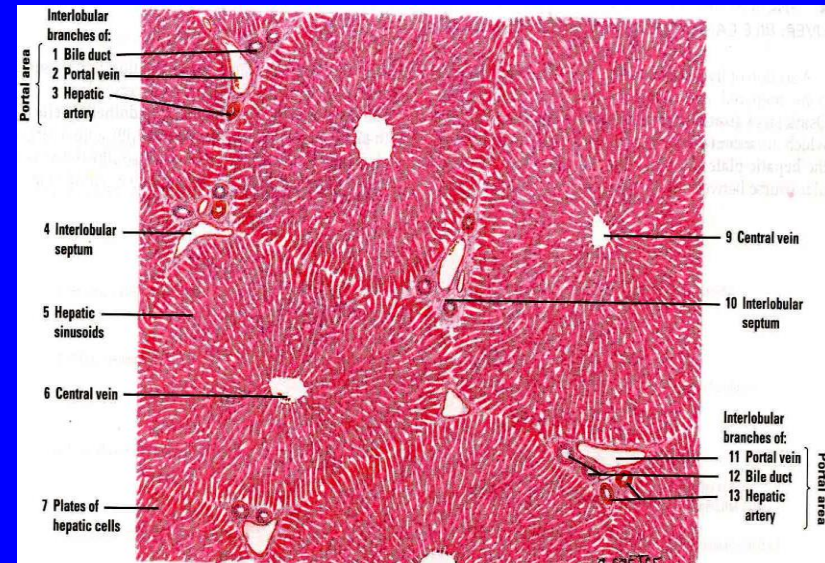
- a- Capsule: Glisson's Capsule.
- b- Septa (absent in human) & Portal areas (Portal tracts)
- c- Network of reticular fibers.

## 2- Parenchyma; Classical liver (hepatic) lobules.

# CLASSICAL LIVER LOBULE (classical hepatic lobule)

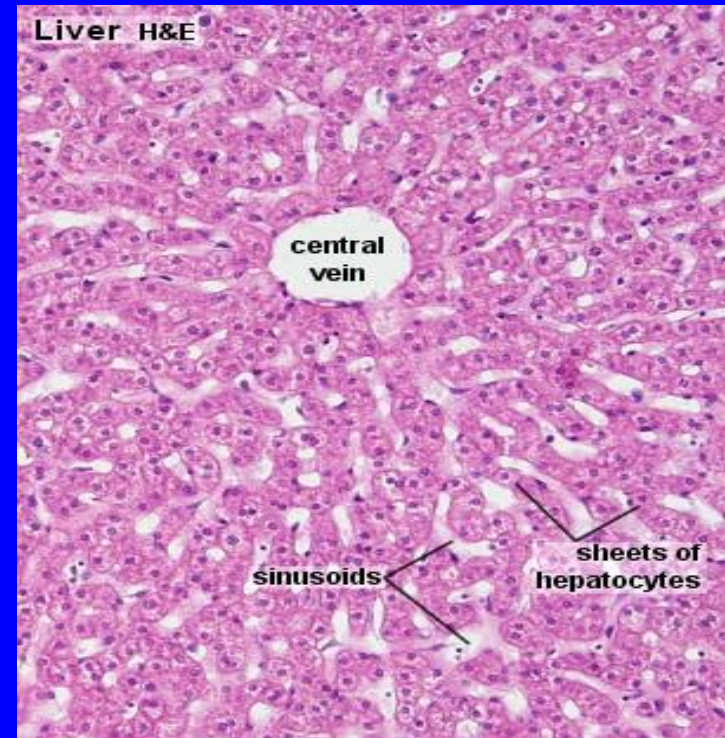
- It is formed of a **polygonal mass** of liver tissue, bounded by interlobular septa with portal areas at the **periphery** & central (centrolobular) vein in the **center**.

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**.

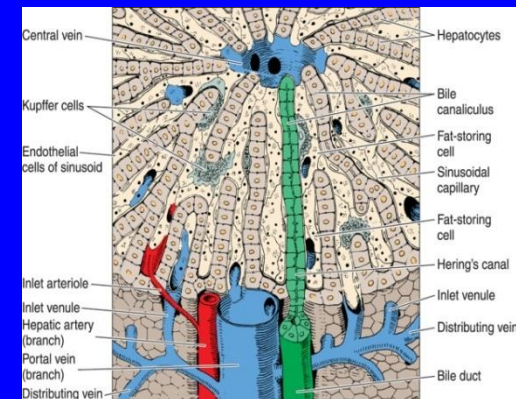
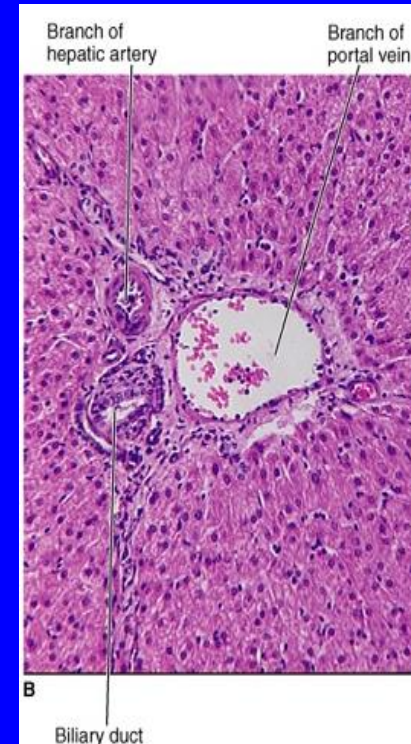
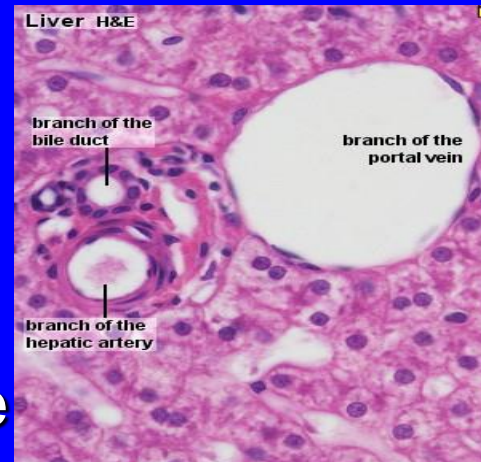


# Borders of the Classical Liver Lobule

- 1- **Septa:** C.T. septa (e.g. in pigs).
- 2- **Portal areas** (Portal tracts):  
Are located in the corners of the classical hepatic lobule (usually 3 in No.).

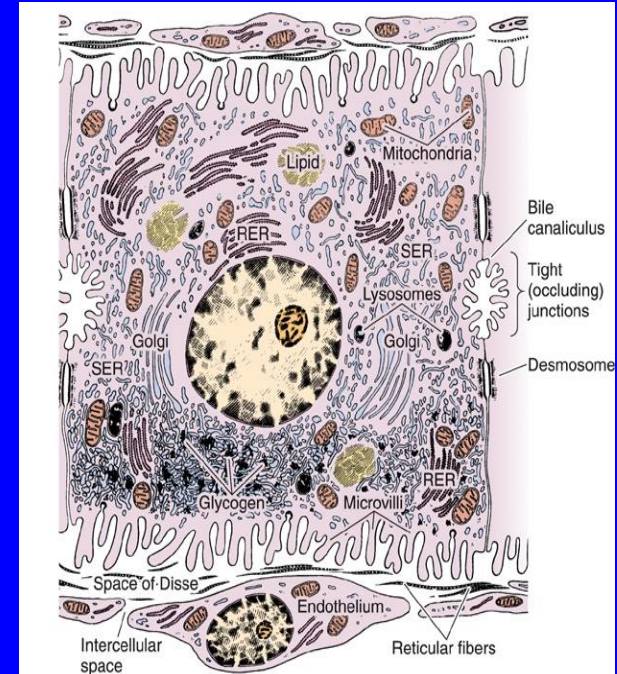
## Contents of portal area:

- 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.



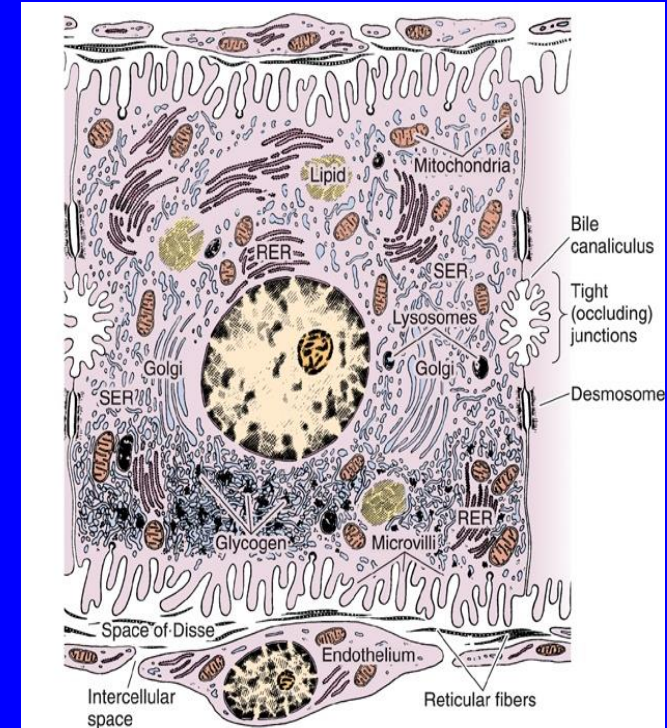
# Hepatocytes (EM)

## 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)



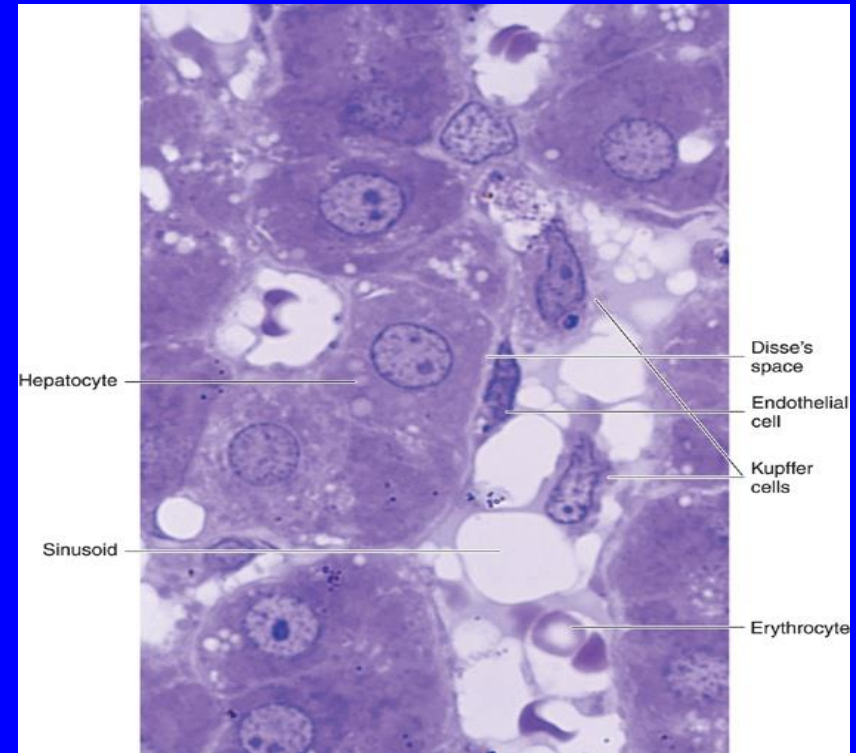
# Liver Blood Sinusoids

## (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:

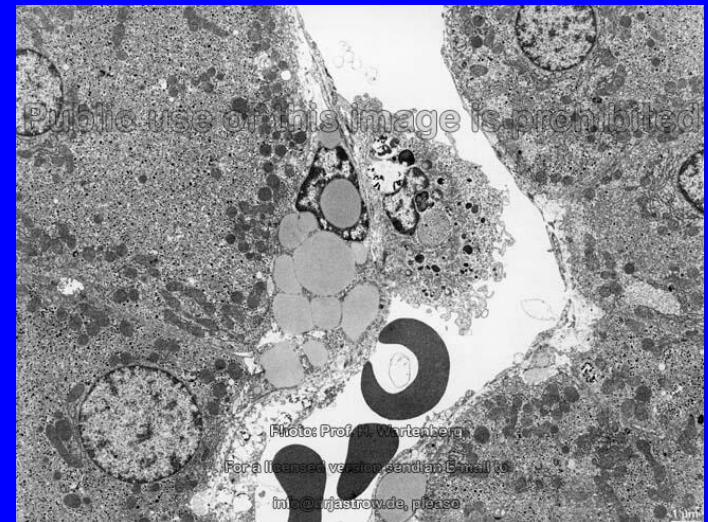
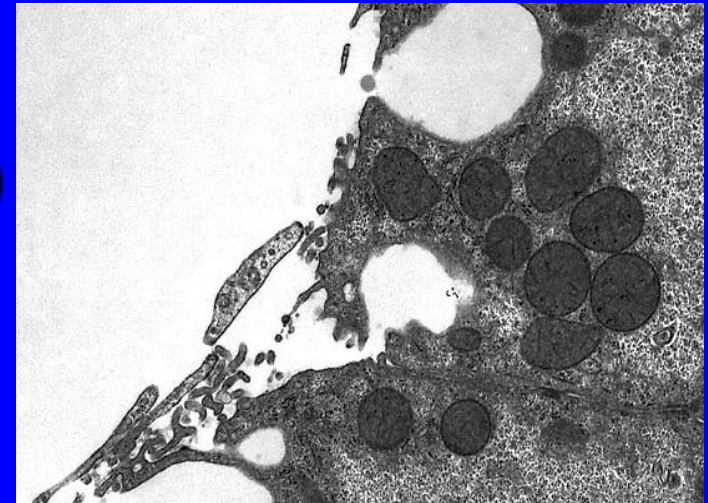
### 1- Fat-storing cells (Ito cells) (Hepatic stellate cells):

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

### 2- Reticular fibers: (type III collagen).

### 3- Plasma of blood.

### 4- Microvilli of hepatocytes.



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# SPLEEN

# Stroma of Spleen

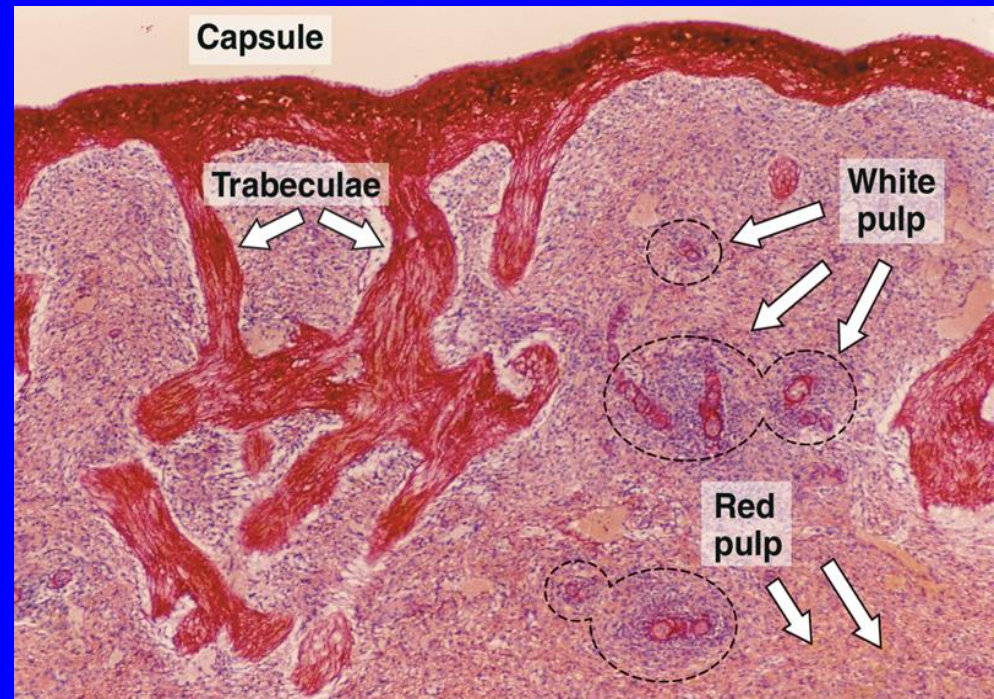
## 1- Capsule:

- 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).

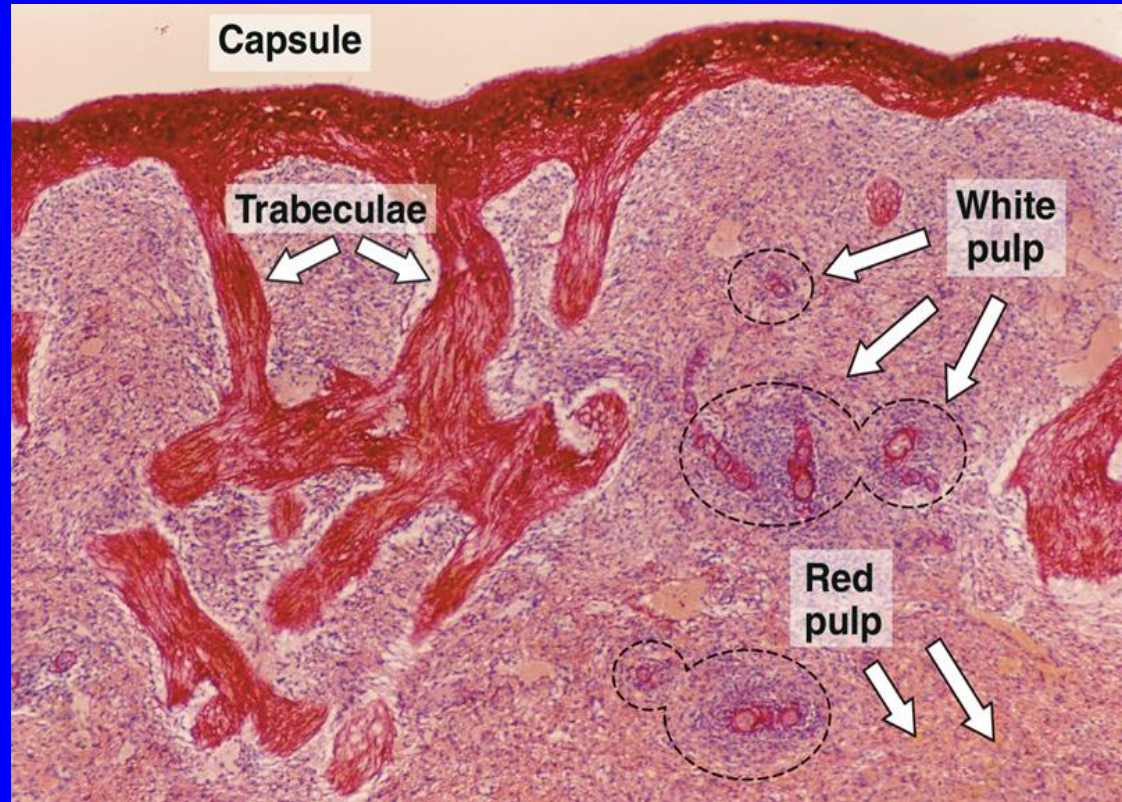
## 3- Reticular C.T.



# Parenchyma of Spleen

**(A) White pulp.**

**(B) Red pulp.**



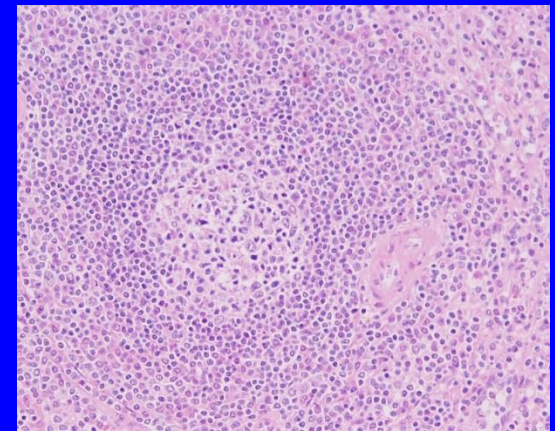
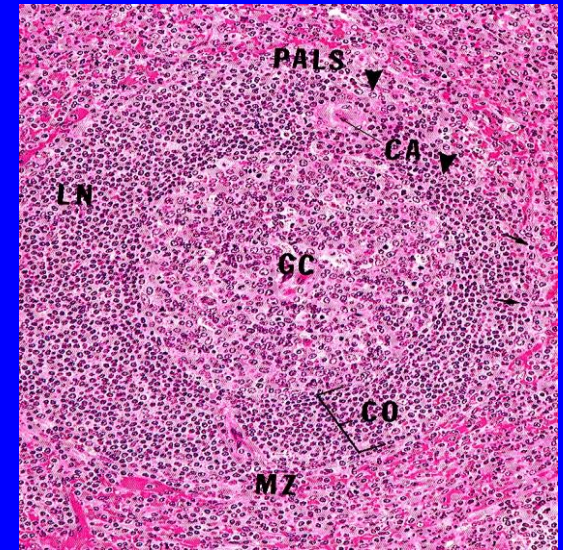
N.B. No cortex,  
No medulla,  
No afferent lymphatic vessel.

# Parenchyma of Spleen

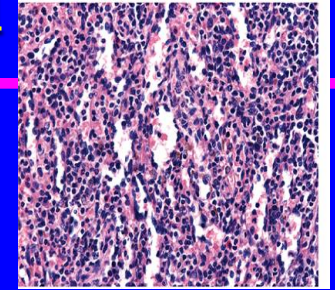
## White Pulp:

- 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



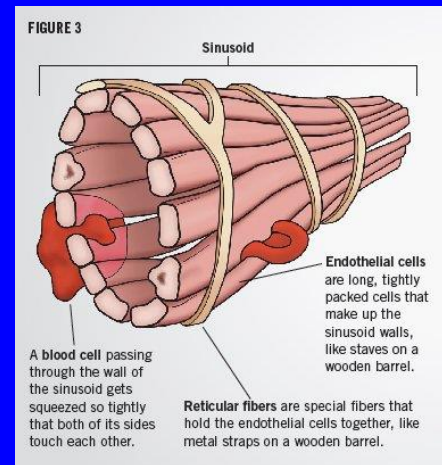
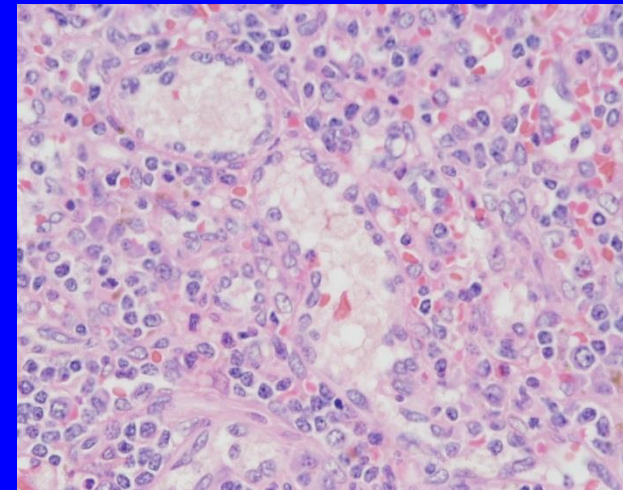
## (B) Red pulp:

### 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.

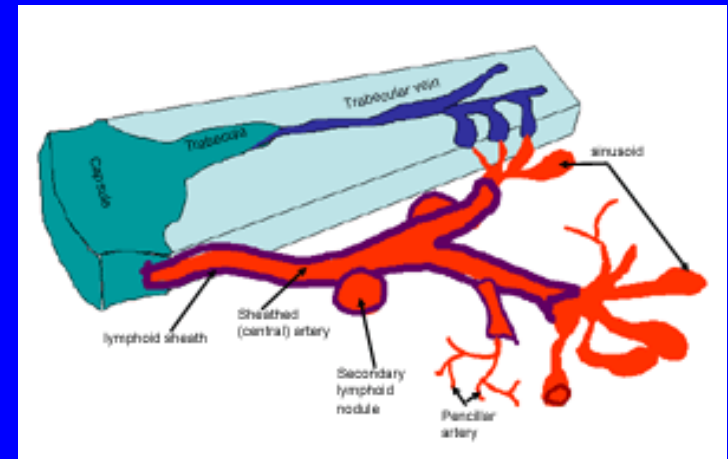
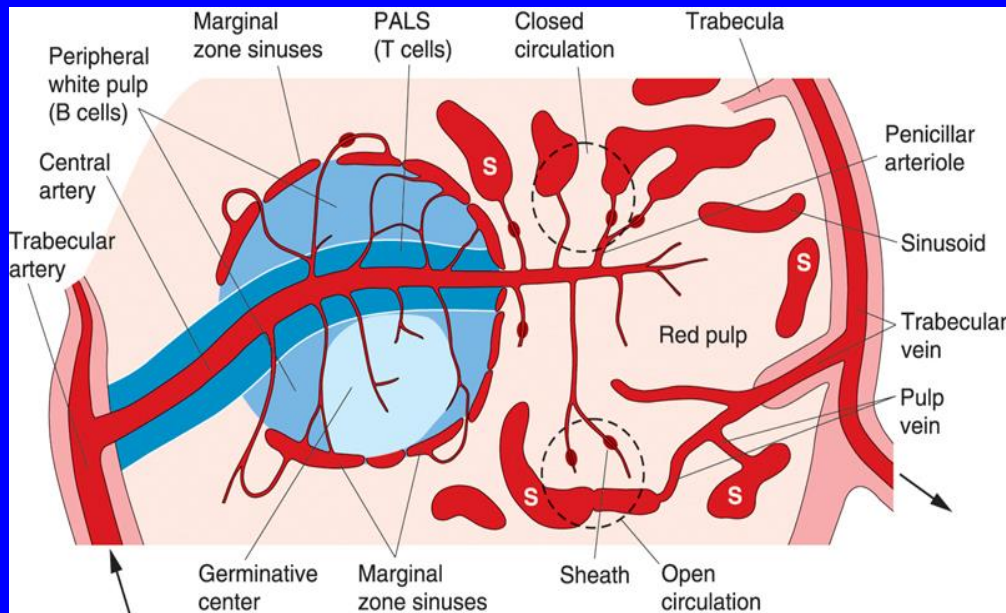


# Cells of parenchyma of spleen

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

# Splenic Microcirculation





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**BEST WISHES**