

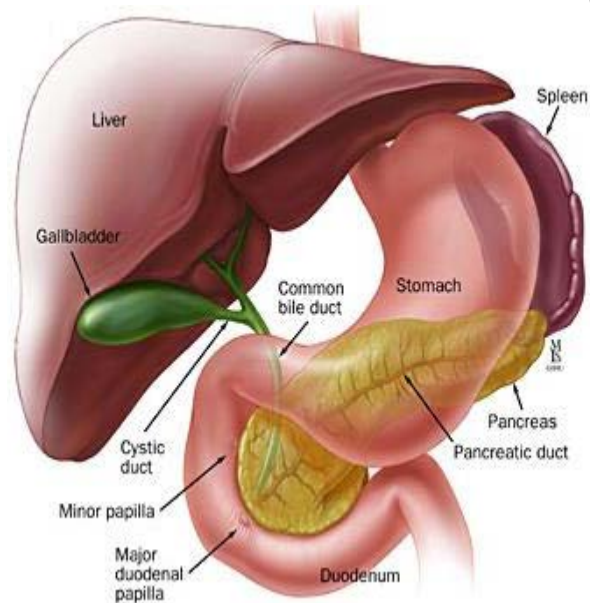


# LECTURE 5: Liver & Spleen

## ❑ Objectives:

At the end of this lecture, you should describe the histological structure of:

1. **Liver with special emphasis on the classic hepatic lobule**
2. **Spleen**



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# LIVER

## STROMA

1. **Capsule:** Glisson's Capsule
2. **Septa** (Absent in humans) & **Portal Areas** (Portal tracts)
3. **Network of reticular fibers**

## PARENCHYMA

Classic liver (hepatic) lobules

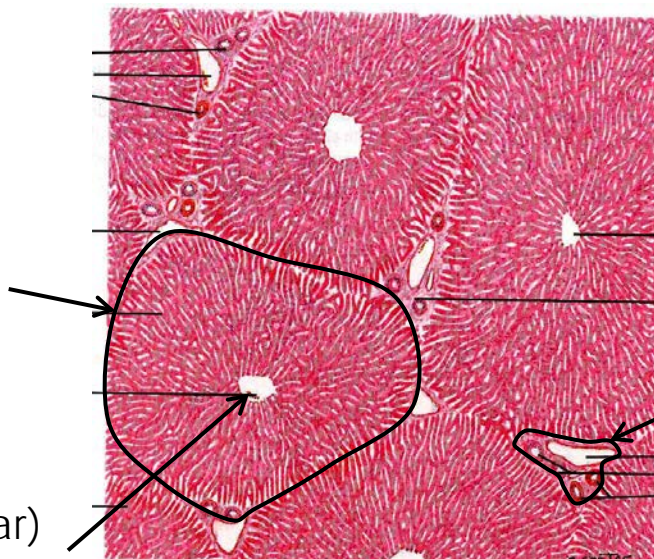
## CLASSIC LIVER LOBULE

❖ It is formed of:

1) **polygonal mass** of liver tissue

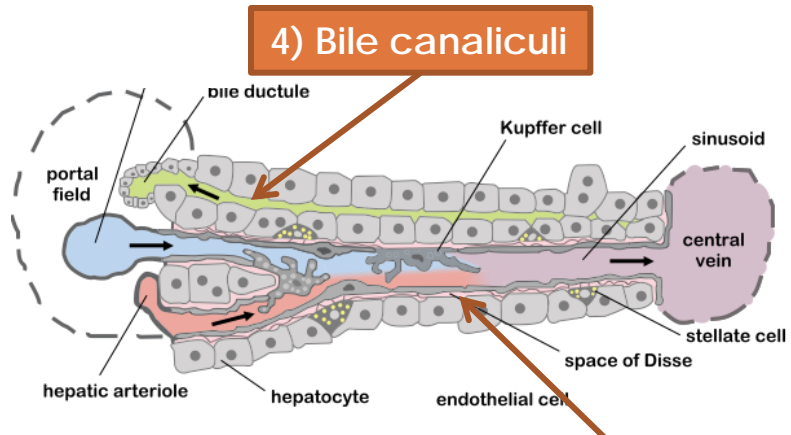
2) **central** (centrolobular) vein in the **center**.

3) **portal areas** at the **periphery**



# Classical Liver Lobule

## ❖ Contents:



1) Central vein

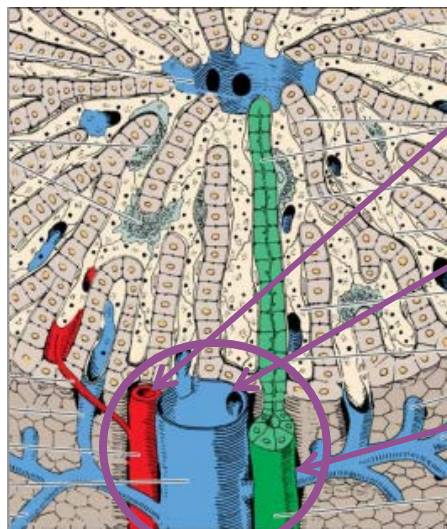
2) Anastomosing plates of hepatocytes

5) Spaces of Disse  
(perisinusoidal spaces of Disse)

3) Liver sinusoids (hepatic blood sinusoids) In between the plates

## ❖ Borders:

- Septa:** C.T. septa (Found in pigs. NOT found in humans)
- Portal Areas (portal tracts):** located in the corners of the classic hepatic lobules (usually 3 in number)



Arteriole (Branch of hepatic artery)

Venule (Branch of portal vein)

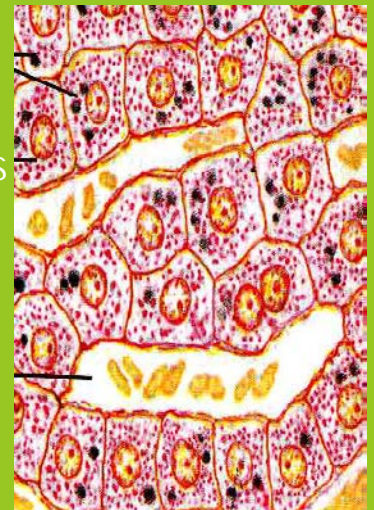
Bile ducts (interlobular bile ducts)

# Contents of the Classic Liver Lobule:

## HEPATOCTYTES

### LM:

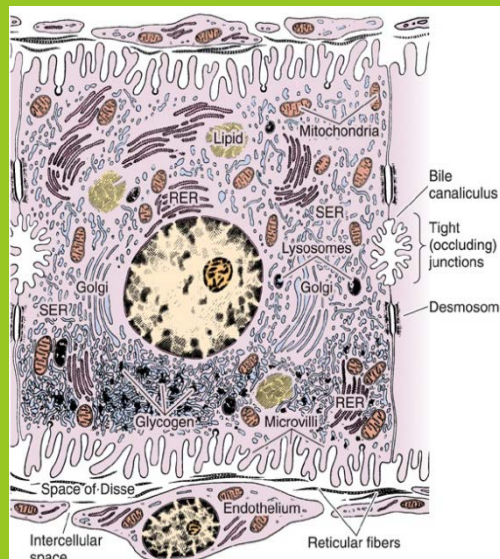
- Grouped in **interconnected plates**.
- **Liver sinusoids** are located in the spaces between these plates.
- Shape: **Polyhedral**
- **1 or 2 nuclei**: vesicular with prominent nucleoli.
- Cytoplasm: **acidophilic**.



### EM:

#### ❖ **Organelles:**

- Mitochondria
- Abundant ER
- Golgi complex
- Lysosomes
- Peroxisomes



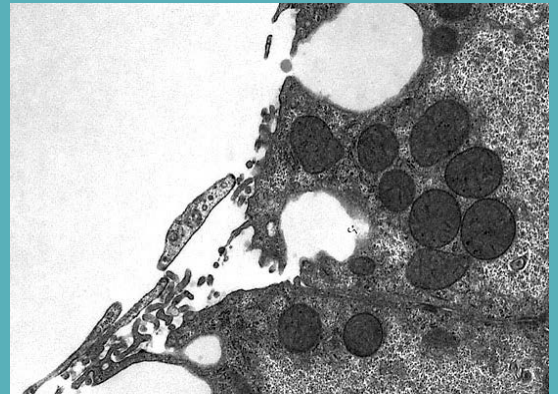
#### ❖ **Inclusions (Deposits):**

- Glycogen
- Lipid (few droplets)
- Lipofuscin (old age)

# Contents of the Classic Liver Lobule:

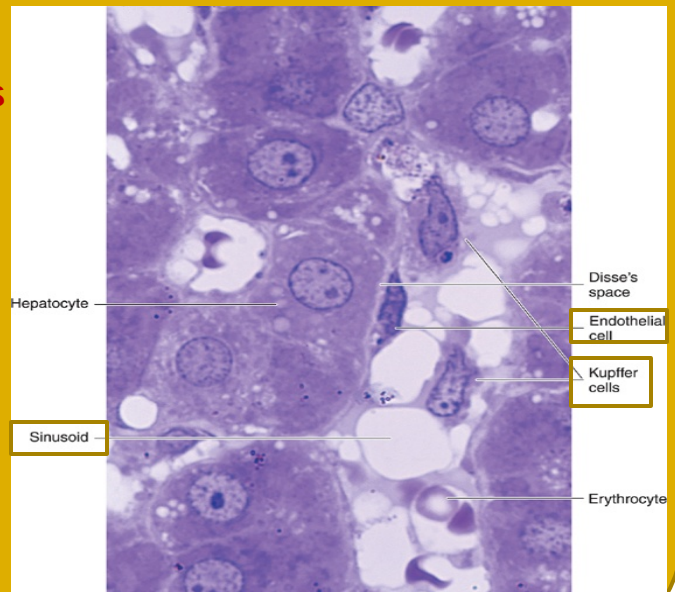
## SPACE OF DISSE (PERISINUSOIDAL SPACE)

- 1) Fat-storing cells (Ito cells):
  - contain **vitamin A-rich lipid**.
  - form **reticulin**.
- 2) Reticular fibers: (type III collagen)
- 3) Plasma of blood.
- 3) Microvilli of hepatocytes.

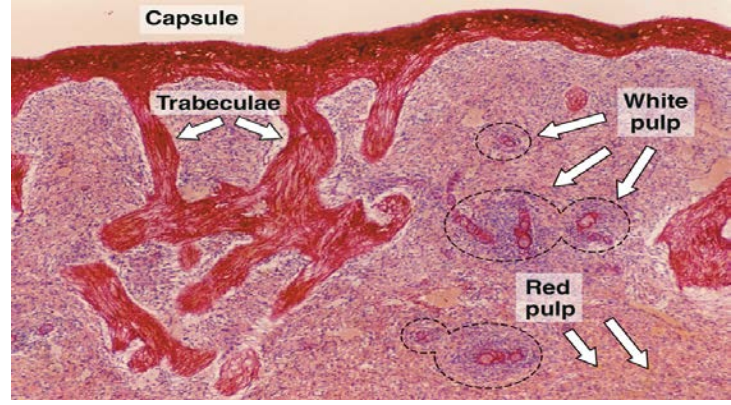


## LIVER SINUSOIDS

- 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**.



# SPLEEN



## Spleen

Stroma

Parenchyma

Capsule

Irregular  
Trabeculae

Reticular  
C.T.

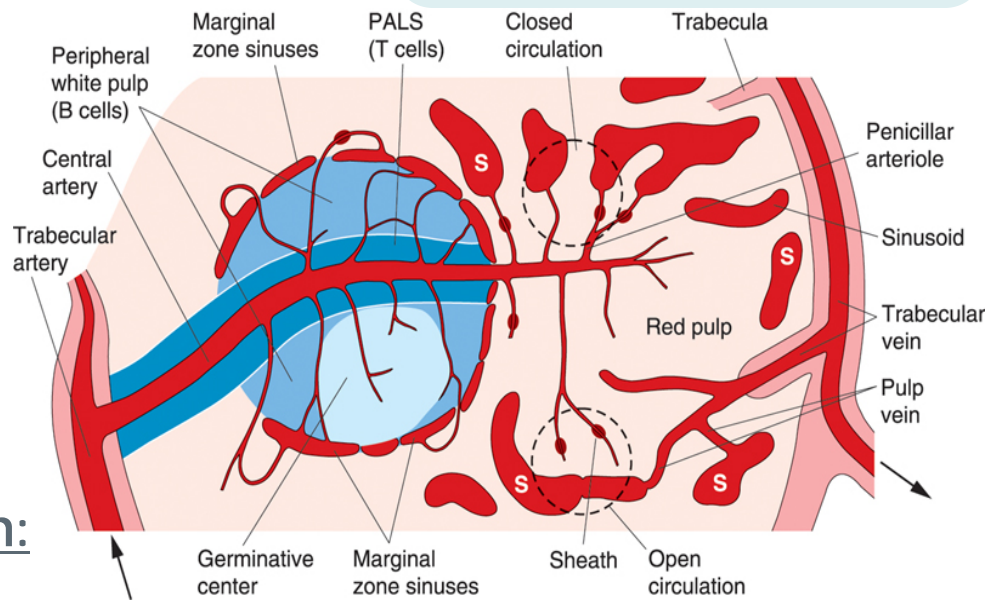
White  
Pulp

Red  
Pulp

- Is covered by visceral layer of peritoneum; mesothelium

- Occasionally contains smooth muscle cells

Note: NO cortex, NO medulla, NO afferent lymphatic vessel



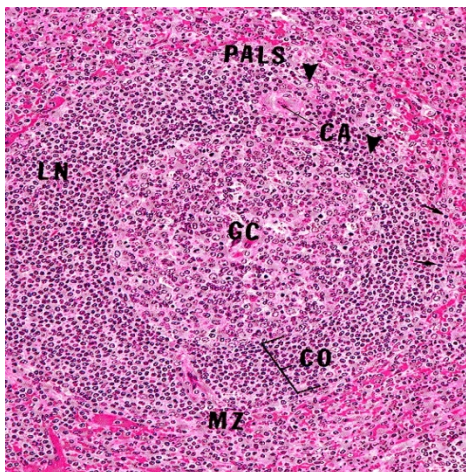
Splenic  
Microcirculation:

# Parenchyma of spleen

## White Pulp

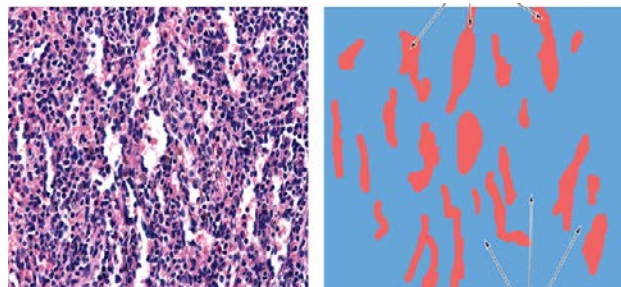
- 1) **Periarterial lymphatic sheaths (PALS):**
  - ❖ Housing T-lymphocytes
- 2) **Lymphoid nodules** (with germinal centers):
  - ❖ Housing B-lymphocytes

Note: Both 1 & 2 have the acentrally located central artery (central arteriole)



## Red Pulp

- 1) **Pulp (splenic) cords:**
  - ❖ Extravasated blood cells, plasma cells, macrophages, and reticular cells and fibers
- 2) **Blood sinusoids:**
  - ❖ Are lined with elongated fusiform endothelial cells with large intercellular spaces & supported by discontinuous, circular basement membrane.



# Summary

**What is the structure that is found in the center of hepatic lobule?**

- Central vein

**What are the Contents of the Classic Liver Lobule?**

- 1-plates of hepatocytes 2-hepatic blood sinusoids  
3-Spaces of Disse 4-Central vein 5-Bile canaliculi

**What type of cytoplasm is found in the Hepatocytes?**

- Acidophilic cytoplasm

**Where can we find Liver sinusoids?**

- in the spaces between Hepatocytes plates

**What types of Inclusions can we find in the hepatocytes?**

- 1- Glycogen 2- Lipid 3- Lipofuscin (old age)

**Describe the Endothelial Cells of Liver Sinusoids?**

- Fenestrated & discontinuous without basal lamina

**What is the name of the fat storing cells found in Space of Disse?**

- Ito cells

**What is the function of Ito cells?**

- contain vitamin A-rich lipid and form reticulin

**Give two features of spleen's capsule:**

- covered by mesothelium , contains smooth muscle cells (SMCs)

**Which part of spleen hosts B lymphocytes?**

- Lymphoid nodules



# MCQs

**1. Which one of these structures is absent in the human liver?**

- A- Glisson's Capsule
- B- Septa
- C- Portal areas
- D- Network of reticular fibers

**2. Which one of these is not part of the Contents of the Classic Liver Lobule**

- A- hepatocytes
- B- Spaces of Disse
- C- Central vein
- D- Portal vein

**3. Which one of these is not a part of the Contents of portal area**

- A- Branch of hepatic vein
- B- Branch of hepatic artery
- C- Branch of portal vein
- D- interlobular bile ducts

**4. what is the name of the macrophages in the liver Sinusoids**

- A- Tissue histiocytes
- B- Reticular cells
- C- Kupffer cells
- D- Microglia

**5. What type of collagen is found in Space of Disse**

- A- type I collagen
- B- type II collagen
- C- type III collagen
- D- type IV collagen

**6. Which of the following is part of the spleen's Parenchyma**

- A- cortex
- B- Red pulp
- C- medulla
- D- Trabeculae

1-b  
5-c

2-d  
6-b

3-a

4-c

# The histology team..

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- ❖ Felwa AlHarthi
- ❖ Razan AlDhahri
- ❖ Sara AlSeneidi
- ❖ Mojahed Otayef
- ❖ Abdulaziz AlSudairi
- ❖ Abdullah AlAtar
- ❖ Abdulmalik AlQahtani
- ❖ Abdullah AlJureys
- ❖ Omar AlDahas
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..Wishes you  
GOOD LUCK! 😊

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