Hepatobiliary system and Pancreas

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Hepatobiliary System
Structural Unit of Liver
Hepatic Lobule

1. Central vein
2. Bile duct
3. Hepatic artery
4. Portal vein
5. Interlobular septum
6. Plates of hepatic cells
7. Hepatic lobule
8. Central vein
9. Interlobular septum
10. Hepatic sinusoids
11. Portal vein
12. Bile duct
13. Hepatic artery

Portal area
Hepatic Lobule
Hepatic Lobule
Portal Triad

- Interlobular connective tissue
- Hepatocytes
- Branch of portal vein
- Branch of hepatic artery
- Branch of bile duct
Interlobular Vein - branch of hepatic vein carries away deoxygenated blood

Cord of hepatocytes (liver cells)

Kupffer cell

Arteriole - branch of hepatic artery (brings oxygenated blood)

Interlobular vein - branch of hepatic portal vein (brings blood from gut)

Sinusoid

Bile canaliculus

Bile duct (takes bile to gall bladder)
"Classical" liver lobule: the unit drained by a central vein
Liver sinusoids & Space of Disse

- Sinusoid
- Bile canaliculi
- Space of Disse
- Kupffer cell
- Endothelial cell
- Sinusoid
- Endothelial cell
- Hepatocytes
- Kupffer cell
Liver sinusoids
Bile Canaliculi in Liver Lobule

- **Endothelial cells**
- **Central vein**
- **Bile canaliculi**

- 4 Hepatic plates
- 5 Bile canaliculi
- 6 Sinusoids
Kupffer cells in liver lobule

1. Interlobular septum
2. Endothelial cells
3. Kupffer cells
4. Bile duct
5. Sinusoids
6. Hepatic plates
7. Kupffer cells
Glycogen granules in Hepatocytes

Periodic acid-Schiff Stain for Glycogen
Reticular fibers in liver Lobule

- Collagen fibers in interlobular septum
- Portal vein
- Bile duct
- Nuclei of hepatocytes
- Hepatic plates
- Reticular fibers in wall of central vein
- Central vein
- Reticular fibers in wall of sinusoids
Kupffer cells
Liver Bile Canaliculi
Gall Bladder

- From Inner to outer: ONLY 3 Layers
- **Mucosa**-simple columnar epithelium + lamina propria rich in elastic fibres and blood vessels
- **Epithelium** is involved with absorption of water and therefore there is **microvilli** which gives brush border appearance to the epithelium under light microscope.
- **Muscularis mucosa and submucosa are absent**
- **Muscularis mucosa and Muscularis externa fuse.**
Gall Bladder

Mucosa is thrown into folds when GB is empty
Gall Bladder

Rokitansky-Aschoff sinuses
Gall Bladder

7 Mucosal folds
8 Diverticula, or crypts
9 Venule and arteriole
10 Smooth muscle fibers
11 Artery and vein
12 Serosa
Mucosal folds

smooth muscle
Gall Bladder

2. Fibromuscular layer- Muscularis Externa-Interlacing bundles of circularly arranged smooth muscle fibres with CT

3. Serosa/ Adventitia
Pancreas

- Intralobular duct
- Intercalated ducts
- Pancreatic acini
- Pancreatic islet
- Centroacinar cells
- Pancreatic acinar cells
- Venule
- Capillaries
- Arteriole
- Beta cells
- Alpha cells
Exocrine and Endocrine pancreas
Exocrine & Endocrine pancreas

1. Interlobular connective tissue
2. Blood vessel
3. Cells of pancreatic islet
4. Intercalated duct
5. Serous acini and zymogenic cells
6. Interlobular duct
7. Centroacinar cell
8. Pacinian corpuscle
9. Centroacinar cell
10. Blood vessel
11. Capillaries in pancreatic islet
Pancreas

- **Acinar cell**
- **Duct cell**
- **Enzymes (zymogen granules)**
- **Duct (going to the intestine)**

**Islet cells**

**Acinar cells**
Pancreatic Islet & exocrine part

- Intercalated duct
- Connective tissue capsule
- Pancreatic islet
- Centroacinar cells
- 5 Secretory acini
- 6 Capillaries
Pancreatic Islet

- Intercalated duct
- 4 Centroacinar cell in serous acinus
- 5 Connective tissue capsule
- Endocrine cells of pancreatic islet
- Capillaries
- 6 Centroacinar cell in serous acinus
Special stain for Pancreatic islet

1 Alpha cells
2 Capillary
3 Beta cells
4 Connective tissue capsule
5 Centroacinar cells
6 Serous acini
Exocrine & Endocrine Part
Islet of Langerhans
• What happens in Diabetes Mellitus?
MCQ

Kupffer cells in liver sinusoid function as which type of cells

• A. Nutritive
• B. Storage
• C. Phagocytic
• D. Supportive
MCQ

Bile canaliculi are lined by
• A Endothelium
• B Plasma membrane of adjacent hepatocytes
• C Cuboidal epithelium
• D. Stratified cuboidal epithelium
MCQ

Ito cells store which of the following vitamin?

• A. A
• B. B
• C C
• D D
MCQ

Which of the following cell is responsible for the secretion of glucagon in the islet of Langerhans?

• A Alpha
• B Beta
• C. Delta
• D F
Fill in the blank

• The space around the sinusoid is called
Fill in the blank

• The flow of blood in a classical liver lobule is from