

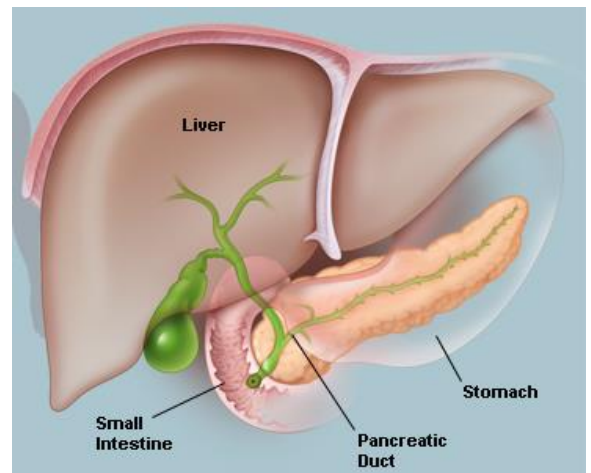


LECTURE 2: PANCREAS & BILIARY PASSAGES

□ Objectives:

At the end of this lecture, you should identify & describe the histological features of:

1. **Exocrine pancreas.**
2. **Intrahepatic biliary passages.**
3. **Extrahepatic bile ducts.**
4. **Gall bladder.**

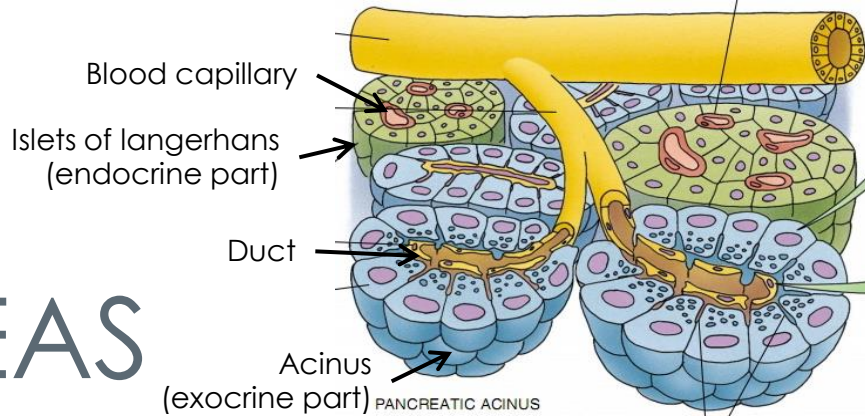


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PANCREAS



- **Stroma** [the background]
 - Capsule, septa, and reticular fibers.
- **Parenchyma**
 - The pancreas is a **MIXED** gland:
 - **Exocrine part** (acini & ducts): produces **digestive pancreatic enzymes**.
 - **Endocrine part** (islets of Langerhans): produces **hormones** [will be discussed in endocrine block]

Notes:

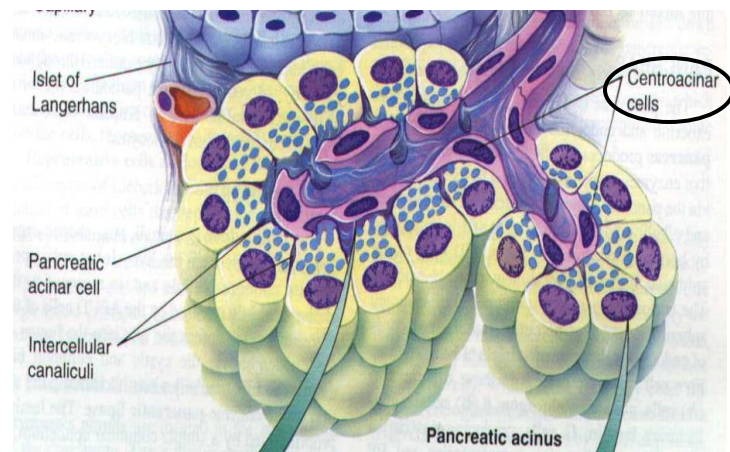
- Mixed gland: endocrine & exocrine

- exocrine: needs ducts (blue part in the pic. It looks like the water)

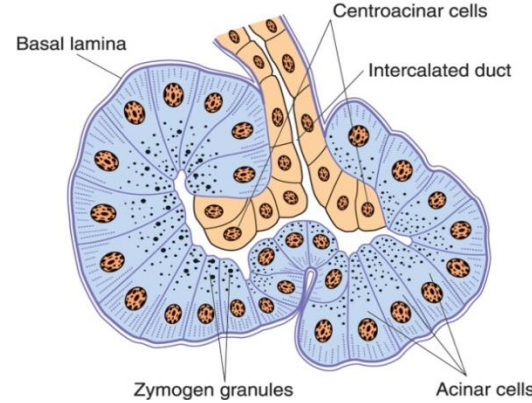
- endocrine: secretes into the blood directly (green part in the pic. It looks like "islands")

❖ Pancreatic Acini:

- They are serous acini secreting a thin fluid rich in *digestive pancreatic enzymes*.
- **Centroacinar cells**. Their nuclei appear in the center of the acini. They *represent the beginning of the ducts*.
- NO myoepithelial cells around the acini. [the acini will not be "squeezed" like in salivary glands]

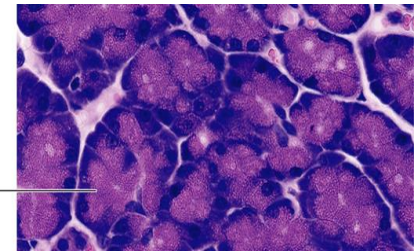


EXOCRINE PANCREAS

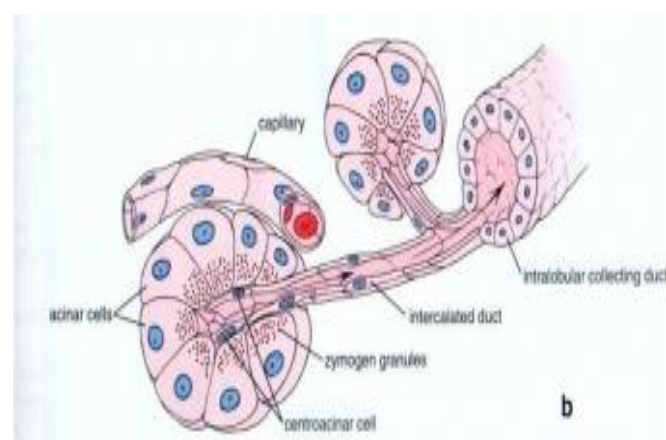
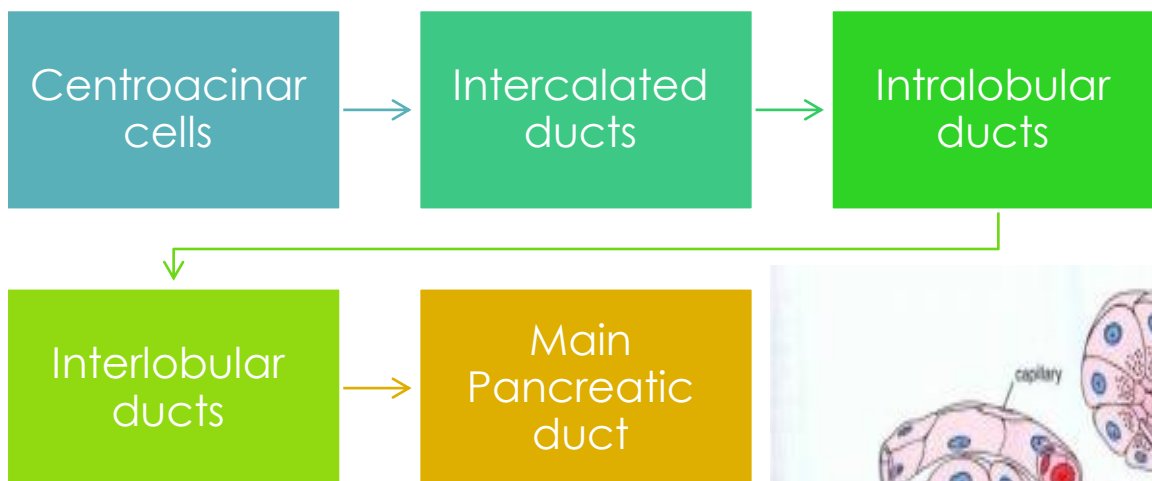


❖ Pancreatic Acinar Cells:

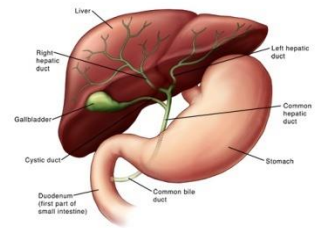
- ❑ **Shape:** Pyramidal
- ❑ **Nuclei:** Basal
- ❑ **Cytoplasm:**
 - Basal part: **Basophilic** (due to abundant rER)
 - Apical part: **Acidophilic** (due to secretory granules)



❖ Duct System:

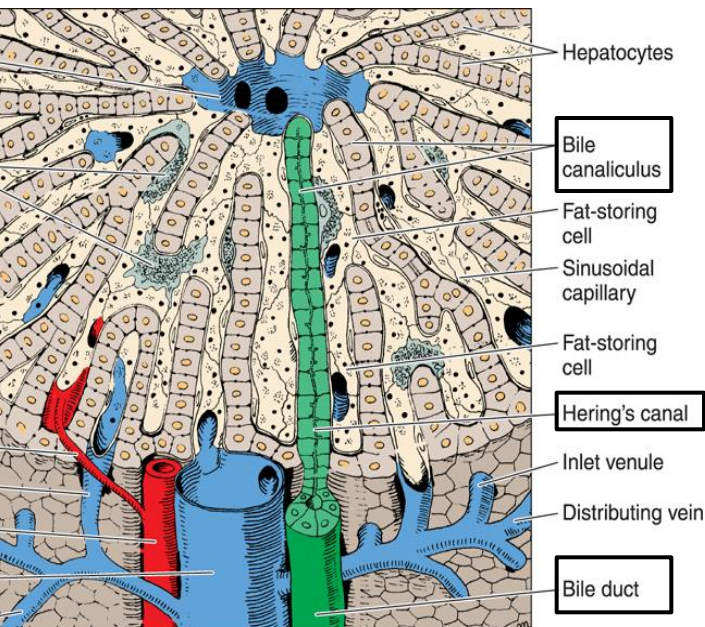


BILIARY PASSAGES



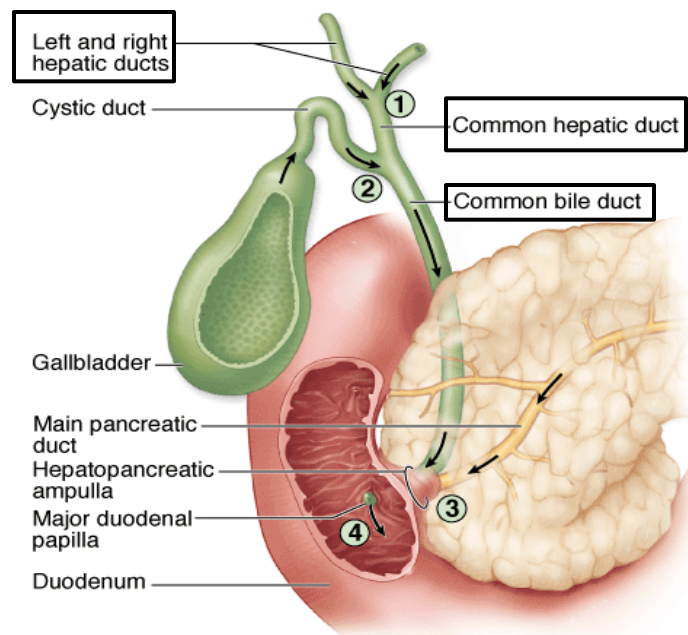
❖ Intrahepatic passages:

- 1- **Bile canaliculi.**
- 2- **Bile ductules [canals of Hering].**
- 3- **Interlobular bile ducts.**



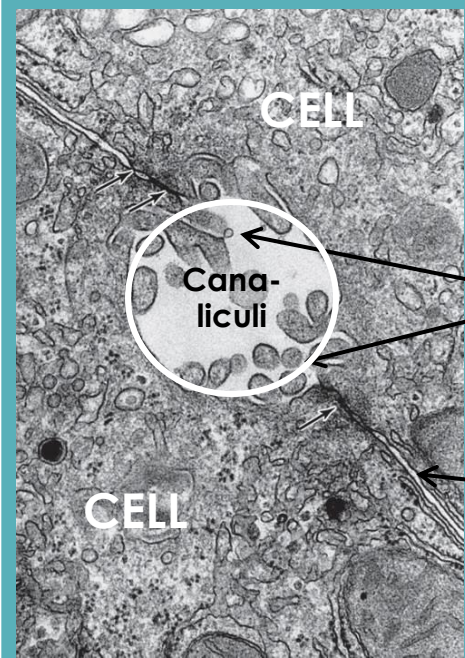
❖ Extrahepatic passages:

- 4- Right & left Hepatic ducts.
- 5- **Common hepatic duct.**
- 6- **Common bile duct.**



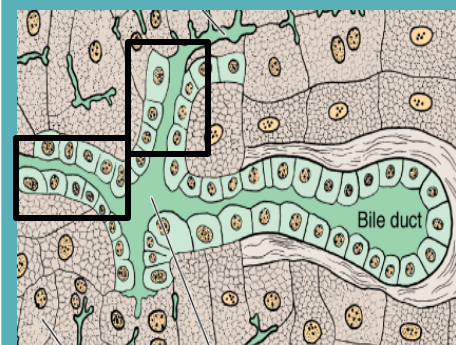
- Notes:
- Words associated with the liver: bile & hepatic
 - The canaliculi are not made from tubules, they are made from the walls of adjacent cells.
 - Interhepatic: inside the liver
 - Extrahepatic: outside the liver
 - “Bile duct” in the photo above is the interlobular bile duct
 - The portal area is the area that contains the bile duct, hepatic artery, and portal vein

1) Bile Canaliculi



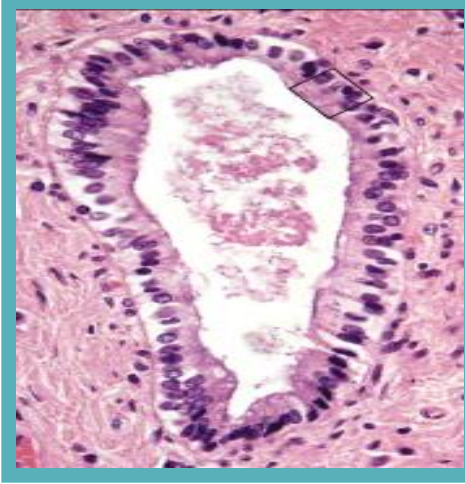
- ❖ **Narrow channels** located between hepatocytes, limited only by the cell membranes of 2 hepatocytes.
- ❖ *They are the first portions of the bile duct system.*
- ❖ **Microvilli** project from the hepatocyte into the bile canaliculi, thus increasing the surface area.
- ❖ **Tight junctions** between the cell membranes of the 2 hepatocytes prevent leakage of bile.

2) Bile Ductules [Canals of Hering]



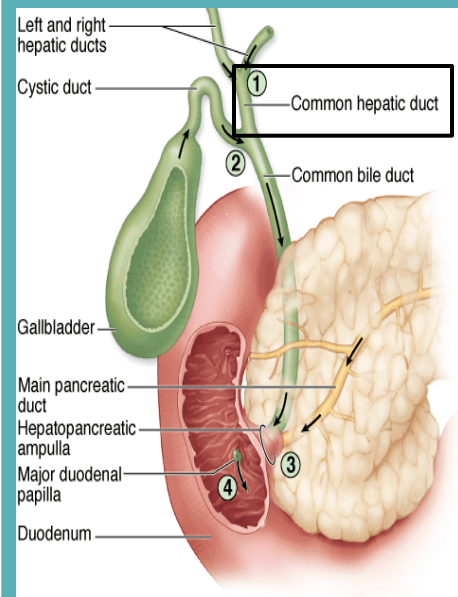
- ❖ Near the peripheral portal areas, bile canaliculi empty into bile ductules composed of cuboidal epithelial cells called **cholangiocytes**.
- ❖ After a short distance, these ductules collect and end in the interlobular bile ducts in the portal areas.

3) Interlobular Bile Ducts



- ❖ Are in the portal areas.
- ❖ Lined by simple cuboidal epithelium (becomes simple columnar epithelium near the porta hepatis).
- ❖ Interlobular bile ducts merge to form larger ducts, which eventually unite to form the right and left hepatic ducts.

4) Common Hepatic Duct

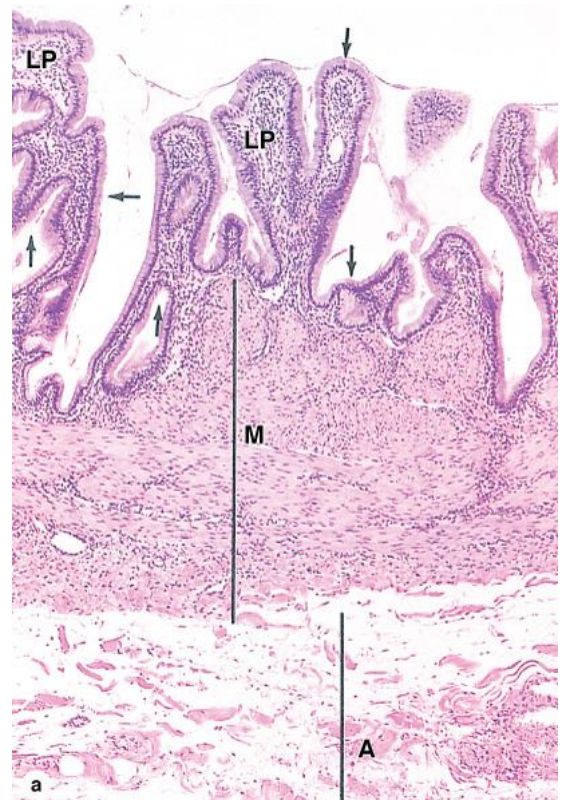


- ❑ *Formed by:* union of the right & left hepatic ducts. It joins the cystic duct, arising from the gallbladder, *forming:* the common bile duct.
- ❑ Similar in structure to the wall of gall bladder and other Extrahepatic bile ducts.
- ❖ **Mucosa:**
 - Simple columnar epithelium.
 - Lamina propria.
- ❖ **Muscularis:** bundles of smooth muscle fibers in all directions.
- ❖ **Adventitia**

GALL BLADDER

A saclike structure that **stores, concentrates and releases bile**. Its wall is formed of:

- ❖ **Mucosa:** highly folded.
 - Simple columnar epithelium.
 - Lamina propria: **contains mucous glands** in the neck of gall bladder.
- ❖ **Muscularis:** bundles of smooth muscle fibers oriented in all directions.
- ❖ **Serosa or adventitia**



Summary

What are the Intrahepatic passages?

- 1-Bile canaliculi.
- 2-Bile ductules (canals of Hering).
- 3-Interlobular bile ducts.

What are the Extrahepatic passages?

1. Right & left Hepatic ducts.
2. Common hepatic duct.
3. Common bile duct.

Bile Canaliculi between hepatocytes are limited by?

- cell membranes of 2 hepatocytes

What is the first portion of biliary system?

Bile Canaliculi

What is the function of microvilli of hepatocytes?

- increasing the surface area.

What part of bile canaliculi prevents leakage of bile?

- Tight junctions between the cell membranes of the 2 hepatocytes

What is cholangiocytes?

- cuboidal epithelial cells lining bile ductules (Canals of Hering)

Summary

What is the lining of interlobular bile ducts?

- simple cuboidal epithelium (becomes simple columnar epithelium near the porta hepatis).

Where is the beginning of pancreatic duct?

Centroacinar cells

Where can we find myoepithelial cells ?

Salivary glands (No myoepithelial cells in Pancreas)

MCQs

Q1- What is the name of the cuboidal epithelial cells that are found in the bile ductules?:

- a) hepatocytes
- b) porta hepatis
- c) cholangiocytes
- d) islets of Langerhans

Q2- What is the type of epithelium that lines most of the Interlobular Bile Ducts?

- a) simple cuboidal
- b) simple Squamous
- c) Stratified Squamous
- d) simple Columnar

Q3- the union of the right & left hepatic ducts give rise to?

- a) cystic duct
- b) Common Hepatic Duct
- c) common bile duct
- d) pancreatic duct

Q4- what is the outer most layer in the funds of the gall bladder?

- a) adventitia
- b) Muscularis
- c) submucosa
- d) Serosa

Q5- what part of the pancreas secretes digestive pancreatic enzymes?

- a) Exocrine part
- b) capsule
- c) reticular fibers
- d) Endocrine part

Q6- what is the shape of the Pancreatic Acinar Cells?

- a) Columnar cells
- b) cuboidal cells
- c) Squamous cells
- d) Pyramidal cells

Q7- What is the first portion of the pancreatic duct System?

- a) Intercalated ducts
- b) Centroacinar cells
- c) Intralobular ducts
- d) Interlobular ducts

Q8- Where can we find cholangiocytes ?

- a) Bile canaliculi.
- b) Bile ductules (canals of Hering).
- c) Interlobular bile ducts.
- d) Bile duct

1-c
5-a

2-a
6-d

3-b
7-b

4-d
8-b