HISTOLOGY

Lecture 5: Biliary Passages and Pancreas

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Color Guide:

- Black: Slides.
- Red: Important.
- Green: Doctor's notes (Female).
- Orange: Explanation.

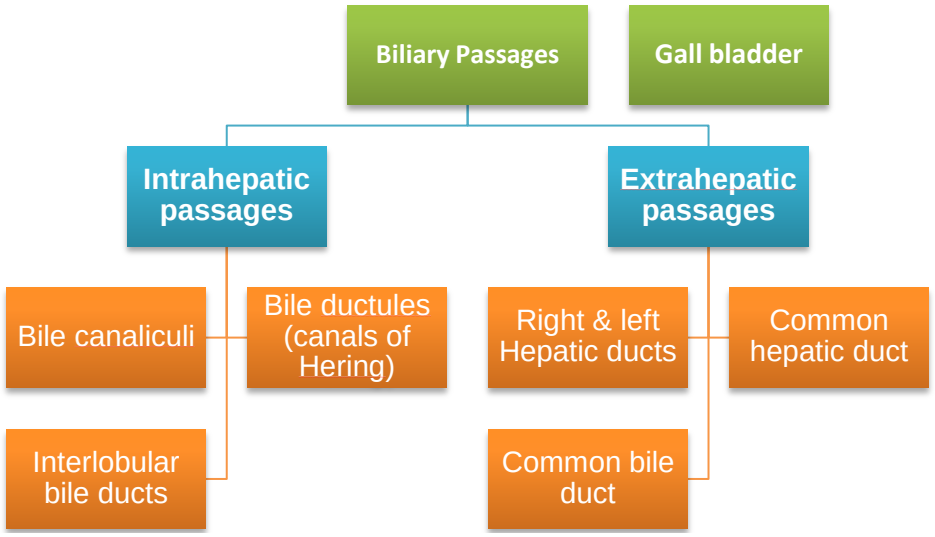
GIT Block – 432 Histology Team

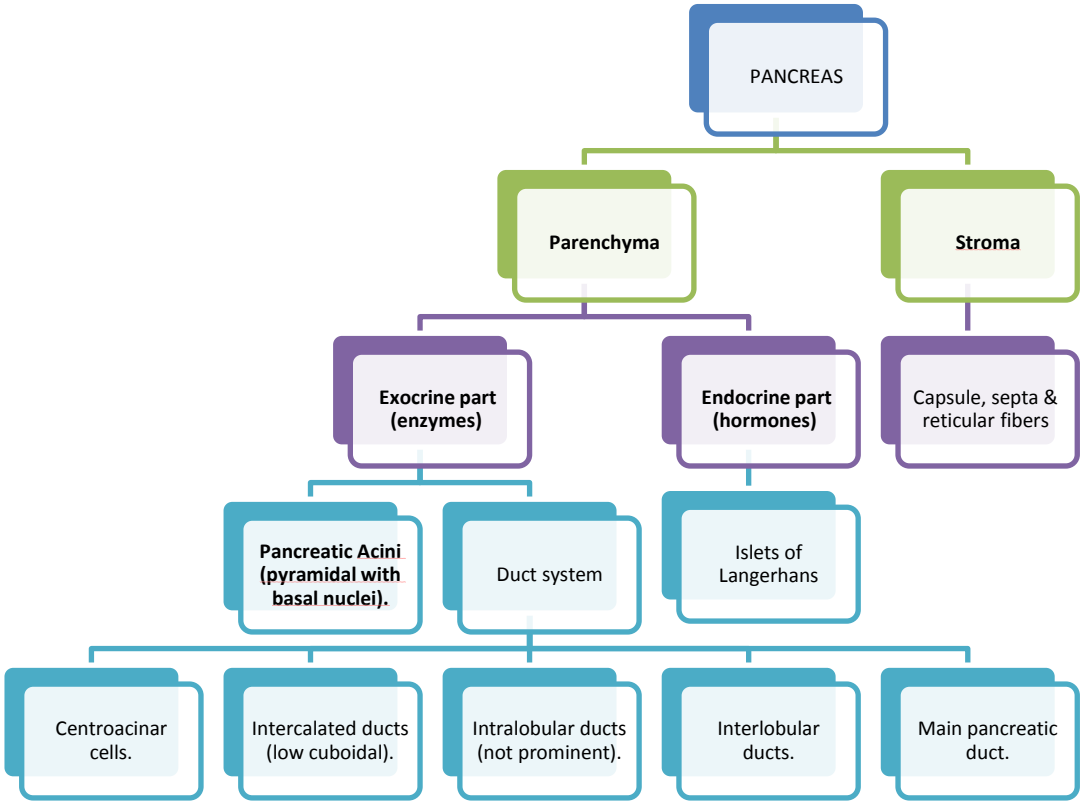
Objectives

The student should be able to identify & describe the histological features of:

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

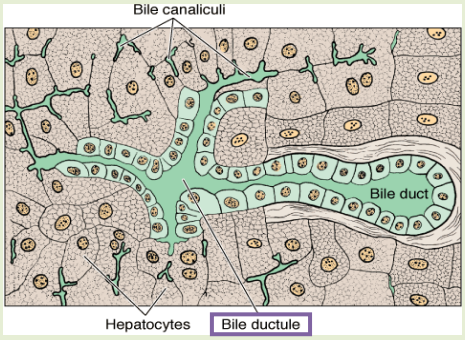
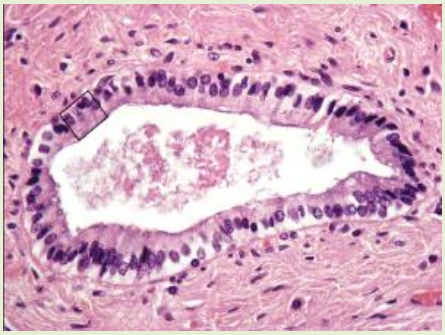
Mind Map

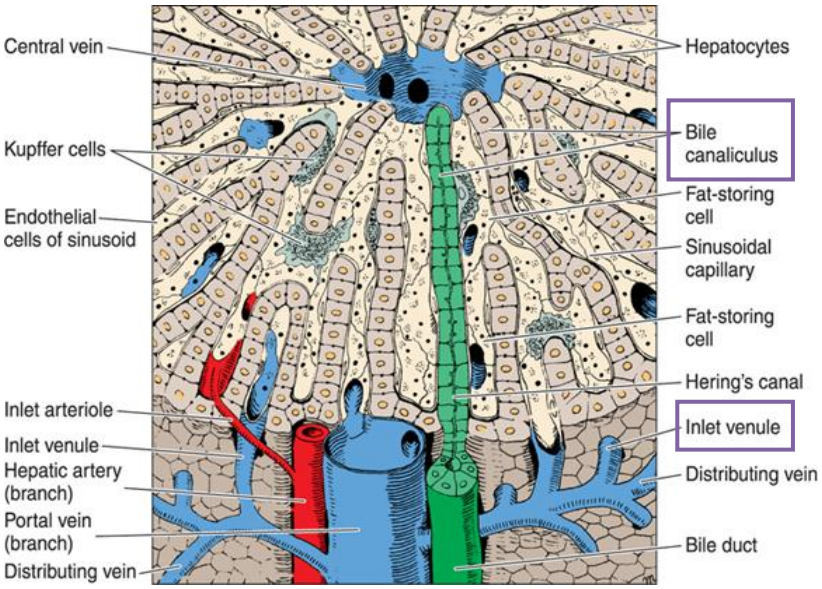


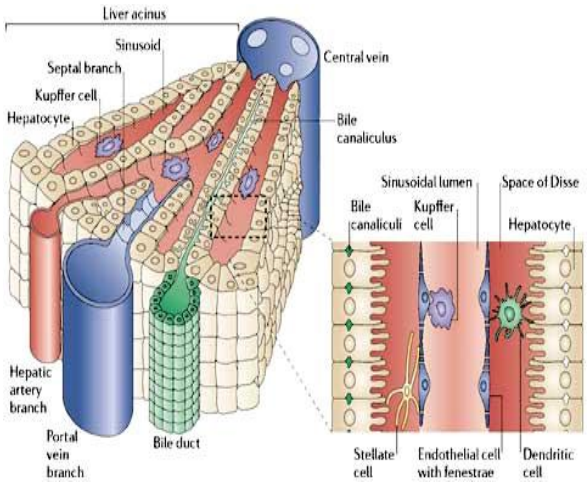


Biliary Passages

Intrahepatic Passages:

Bile Canaliculi	Bile Ductules (Canals of Hering)	Interlobular Bile Ducts
• **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 to prevent leakage of bile.	• 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. 	• 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**. 





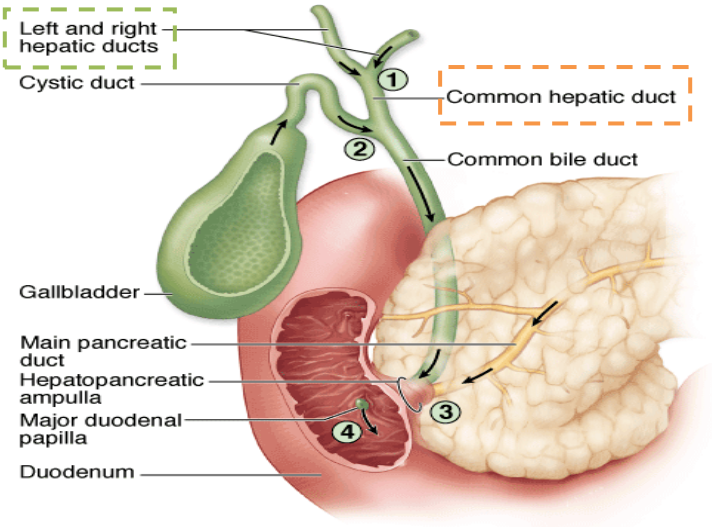
Tight junctions

Extrahepatic Passages:

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.

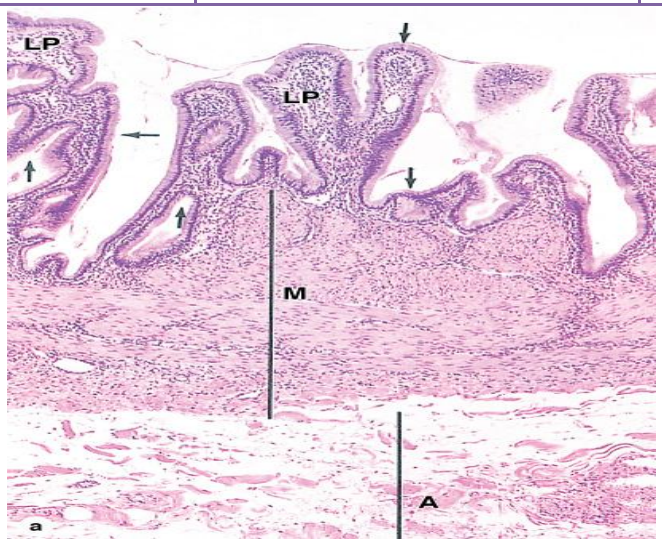
Mucosa	Muscularis	Adventitia
• Epithelium: Simple columnar. • Lamina propria: C.T.	• Bundles of smooth muscle fibers in all directions.	C.T.



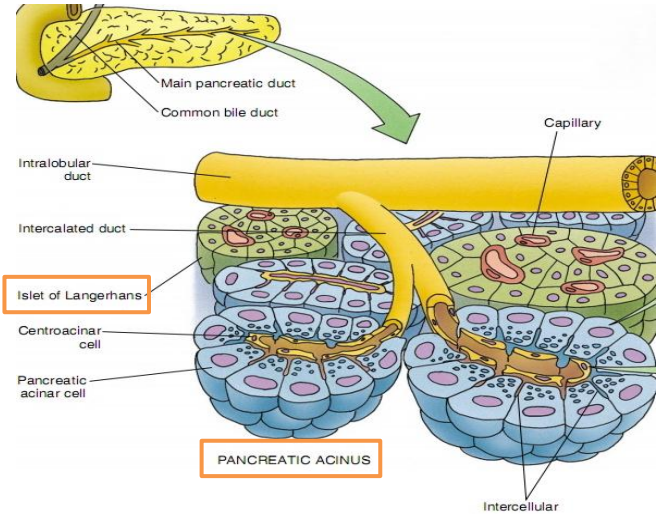
GALL BLADDER

A saclike structure that stores, concentrates and releases bile.

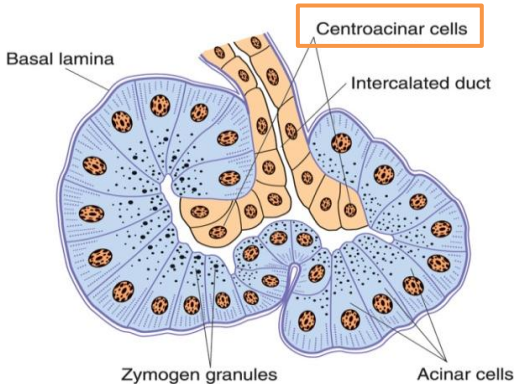
Mucosa	Muscularis	Serosa or Adventitia
Highly folded. • Epithelium: Simple columnar epithelium (no goblet cells). • Lamina propria: contains mucous glands in **the neck of gall bladder**.	Bundles of smooth muscle fibers oriented in all directions.	**Adventitia:** This layer which attached to the liver. **Serosa:** In the unattached region. (Fundus of gall bladder).



PANCREAS



- **Stroma:** capsule, septa & reticular fibers.
- **Parenchyma:** Pancreas is a **mixed** gland:
  A. **Exocrine part** (acini & ducts) (see image):
  Produce **digestive pancreatic enzymes**.
  B. **Endocrine part** (islets of Langerhans) (see image):
  Produces hormones (will be taken next block).

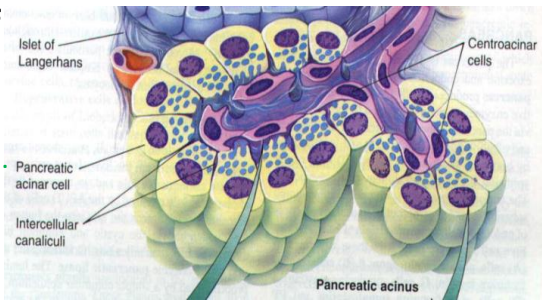


A. Exocrine Pancreas:

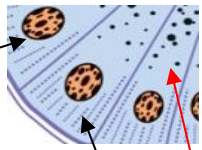
1) Pancreatic Acini:

- **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.

(Hormones will stimulate the secretions and release of pancreatic enzymes).

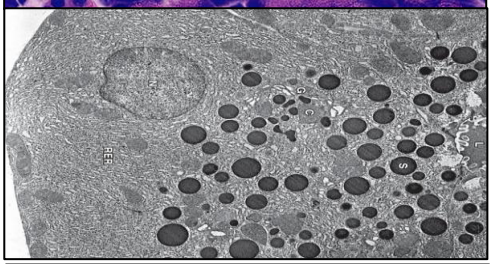


2) Pancreatic Acinar Cells:



- Pyramidal in shape.
- Nuclei are basal.
- Cytoplasm:
  - Basal part basophilic (due to abundant rER) (RER produce enzymes)
  - Apical part acidophilic (due to secretory granules)

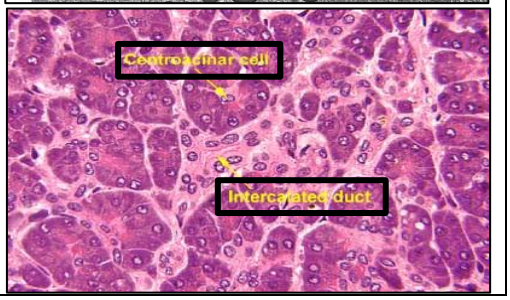
Rose-shaped

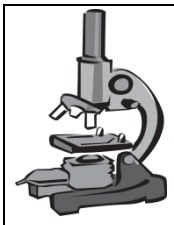


Basophilic = takes hematoxylin dye = Blue
Acidophilic = takes eosin dye (eosinophilic) = red

3) Duct System (acidophilic):

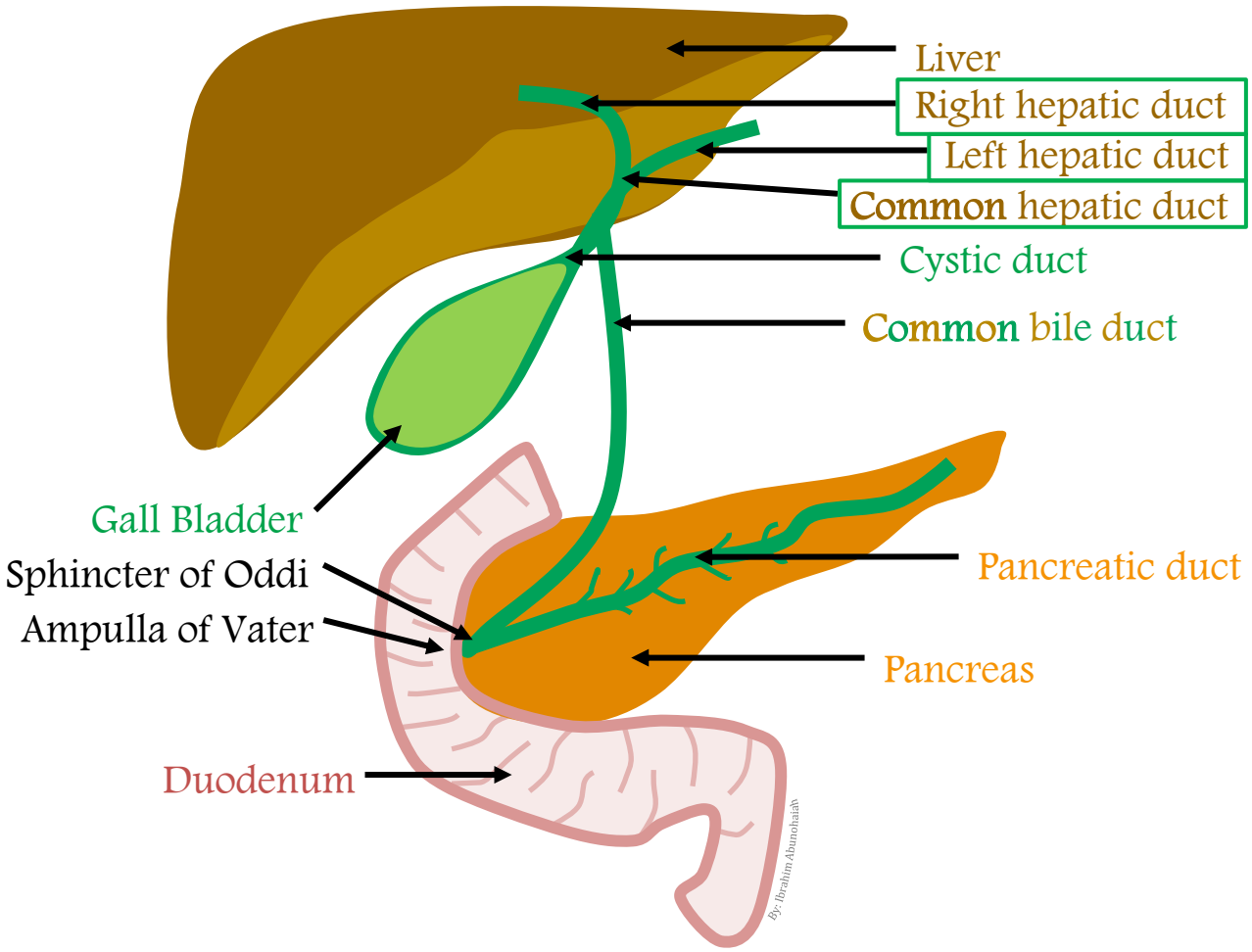
- Centroacinar cells.
- Intercalated ducts (low cuboidal).
- Intralobular ducts (NOT prominent).
- Interlobular ducts.
- Main pancreatic duct.





Summary

- **Biliary Passages**
  - **Intrahepatic**
    - 1- Bile canaliculi
      - Narrow channels b/w cell membranes of 2 hepatocytes.
      - Microvilli projected from the hepatocyte increases surface area.
      - Tight junctions prevents leakage of bile.
    - 2- Bile ductules (canals of Hering)
      - It is composed of **cuboidal epithelial** cells called **cholangiocytes.**
      - These ductules collect and end in the "3- interlobular bile ducts" in portal areas..
    - PORTAL AREA
      - 3- Interlobular bile ducts
        - Lined by **simple cuboidal epithelium** (becomes **simple columnar epithelium** near the porta hepatis).
        - They merge to form larger ducts, which eventually unite to form the right and left hepatic ducts (the starting point of extrahepatic passages).
  - **Extrahepatic**
    - Labeled in the diagram below:



The wall of **gall bladder** and all **extrahepatic bile ducts** have the same structure:

1- Mucosa: (highly folded in the gall bladder).

Epithelium: Simple columnar epithelium.

Lamina propria: (it contains mucous glands in the neck of gall bladder).

2- Muscularis: Bundles of smooth muscle fibers in all directions.

3- Adventitia.

Questions

Q1: Which one of the following is not present around the pancreatic acini?

A- Myoepithelial cells.
B- Glands.
C- Duct.

Q2: What is the shape of Pancreatic Acinar Cells?

A- Round.
B- Pyramidal.
C- Columnar.

Q3: The microvilli found on the surface of hepatocytes that project into bile canaliculi help to increase:

A. Bile salts.
B. Surface area.
C. Both.

Q4: The type of Gallbladder epithelium is:

A. Simple columnar epithelium.
B. Simple Cuboidal epithelium
C. Ciliated Columnar epithelium

Q5: The lining epithelium of Interlobular bile ducts in the portal triad is:

A. Simple cuboidal epithelium
B. Simple columnar epithelium
C. Ciliated Columnar epithelium

Q6: The lining epithelium of Interlobular bile ducts near porta hepatis is:

A. Simple cuboidal epithelium
B. Simple columnar epithelium
C. Ciliated Columnar epithelium

Answers:

1	2	3	4	5	6
A	B	B	A	A	B

If you have any questions or suggestions please do not hesitate to contact us on:

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Histology Team Leaders:

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Best of luck!