



HISTOLOGY

Summary: Lectures (4 & 5)
(Liver, Spleen, Pancreas, & Biliary Passages)

This work contains all the contents of lectures 4 & 5 with their very important notes only.

Nada Alouda
Asma Al-Mohizea



Color Guide:

- **Black: Slides.**
- **Red: Important.**
- **Green: Doctor's notes.**

GIT Block – 432 Histology Team

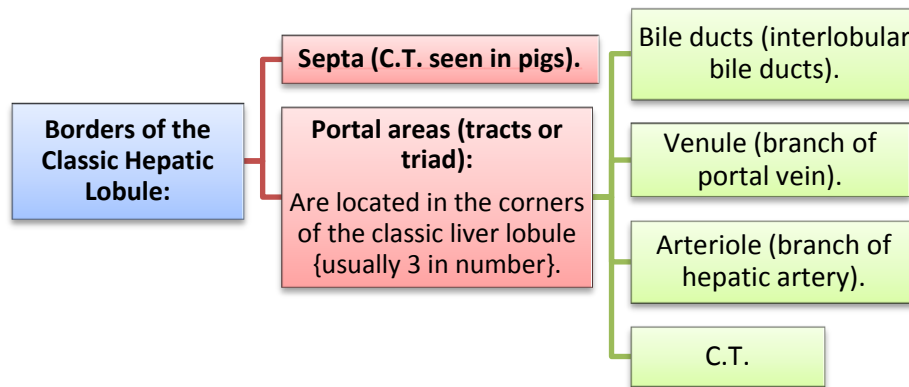




Summary

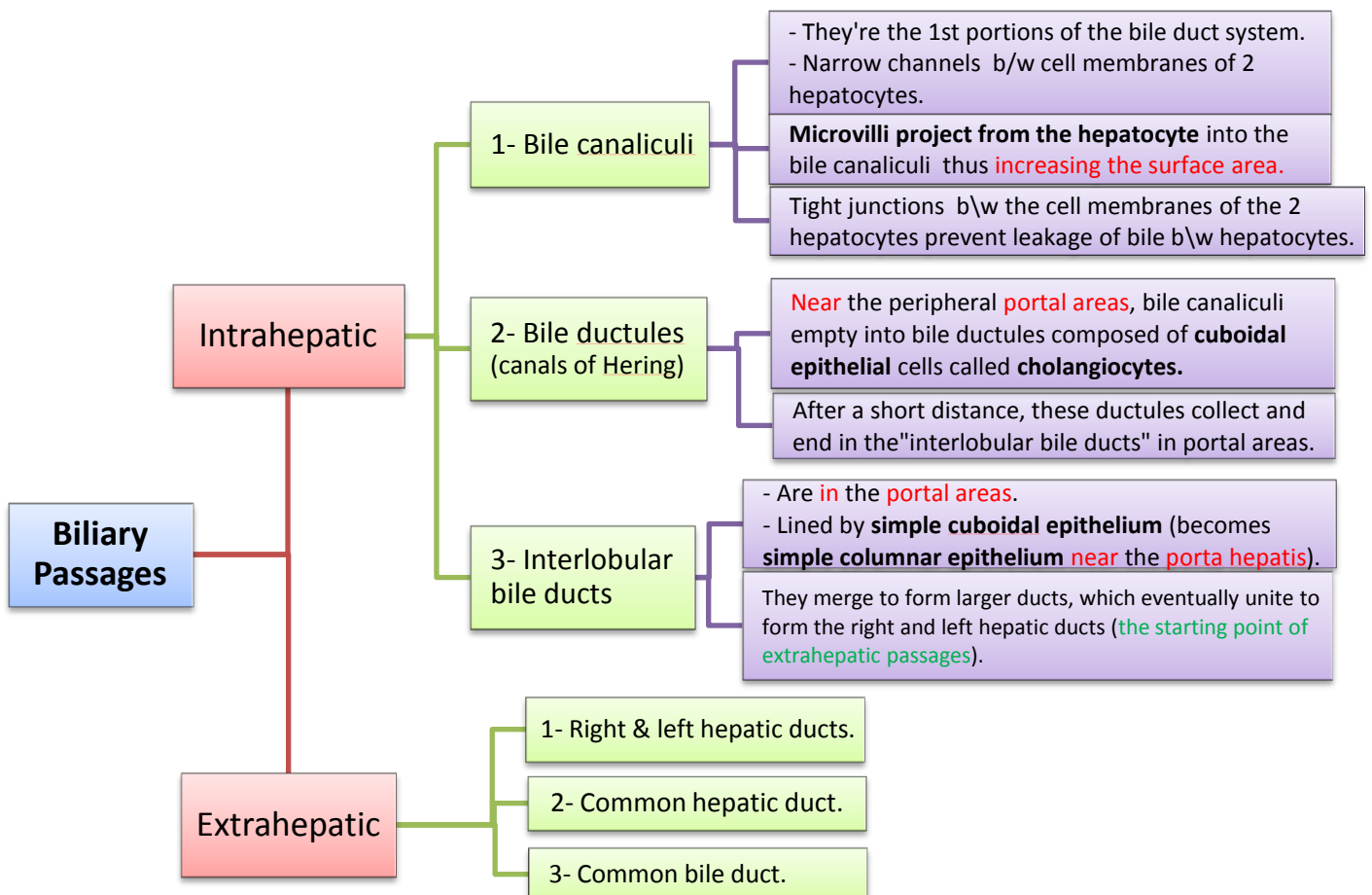
Layers		Liver	Spleen	Pancreas (is a mixed gland)
Stroma (Non-functioning part)	Capsule	Glisson's capsule.	<ul style="list-style-type: none"> Is covered by visceral layer of peritoneum; mesothelium. Occasionally contains smooth muscle cells. 	Present.
	Septa (Trabeculae)	<ul style="list-style-type: none"> Septa are absent in human (they are seen in abnormal human liver & pigs' liver). Portal areas (tracts or triad). 	Irregular.	Present.
	Network of Reticular Fibers	Present.	Reticular C.T.	Present.
Parenchyma (Functioning cells)	The Basic Unit(s)	Classic liver (hepatic) lobules.	<ol style="list-style-type: none"> White pulp. Red pulp. 	<ol style="list-style-type: none"> Exocrine part. Endocrine part.
	Its Features	<ul style="list-style-type: none"> Polygonal mass of liver tissue. Portal areas at the periphery. Central (centrolobular) vein in the center. 	<ul style="list-style-type: none"> No cortex. No medulla. No afferent lymphatic vessel (because spleen filters blood not lymph). 	<ul style="list-style-type: none"> Exocrine part (acini & ducts): Produces digestive pancreatic enzymes. Endocrine part (islets of Langerhans): Produces hormones.
	Its Contents	<ol style="list-style-type: none"> Hepatocytes. Liver sinusoids (hepatic blood sinusoids): <ol style="list-style-type: none"> Endothelial cells: - Fenestrated & discontinuous → free passage of plasma. - Basal lamina is absent. Kupffer cells: are macrophages for phagocytosis. Are found on the luminal surface of the endothelial cells. Spaces of Disse (perisinusoidal spaces of Disse): <ol style="list-style-type: none"> Fat-storing cells (Ito cells): Contain Vit A-rich lipid & form reticulin. Reticular fibers (type III collagen). Plasma of blood. Microvilli of hepatocytes. Central vein. Bile canaliculi. 	<ul style="list-style-type: none"> White pulp: <ol style="list-style-type: none"> Periarterial lymphatic sheaths (PALS): housing T lymphocytes. Lymphoid nodules with germinal centers: housing B lymphocytes. N.B. both 1 & 2 have the * acentrically located central artery (central arteriole). Red pulp: <ol style="list-style-type: none"> Pulp (splenic) cords: extravasated blood cells, plasma cells, macrophages & reticular cells & fibers. Blood sinusoids: are lined with elongated fusiform endothelial cells with large intercellular spaces & supported by discontinuous, circular basement membrane. 	<ul style="list-style-type: none"> Exocrine pancreas: <ol style="list-style-type: none"> Pancreatic acini: <ol style="list-style-type: none"> They are serous acini: secreting a thin fluid (serous) 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 its secretions). Duct system: <ol style="list-style-type: none"> Centroacinar cells. Intercalated ducts (low cuboidal). Intralobular ducts (not prominent). Interlobular ducts. Main pancreatic duct.

* Acentric = not in the center.



Cells: Hepatocytes and Pancreatic Acinar Cells

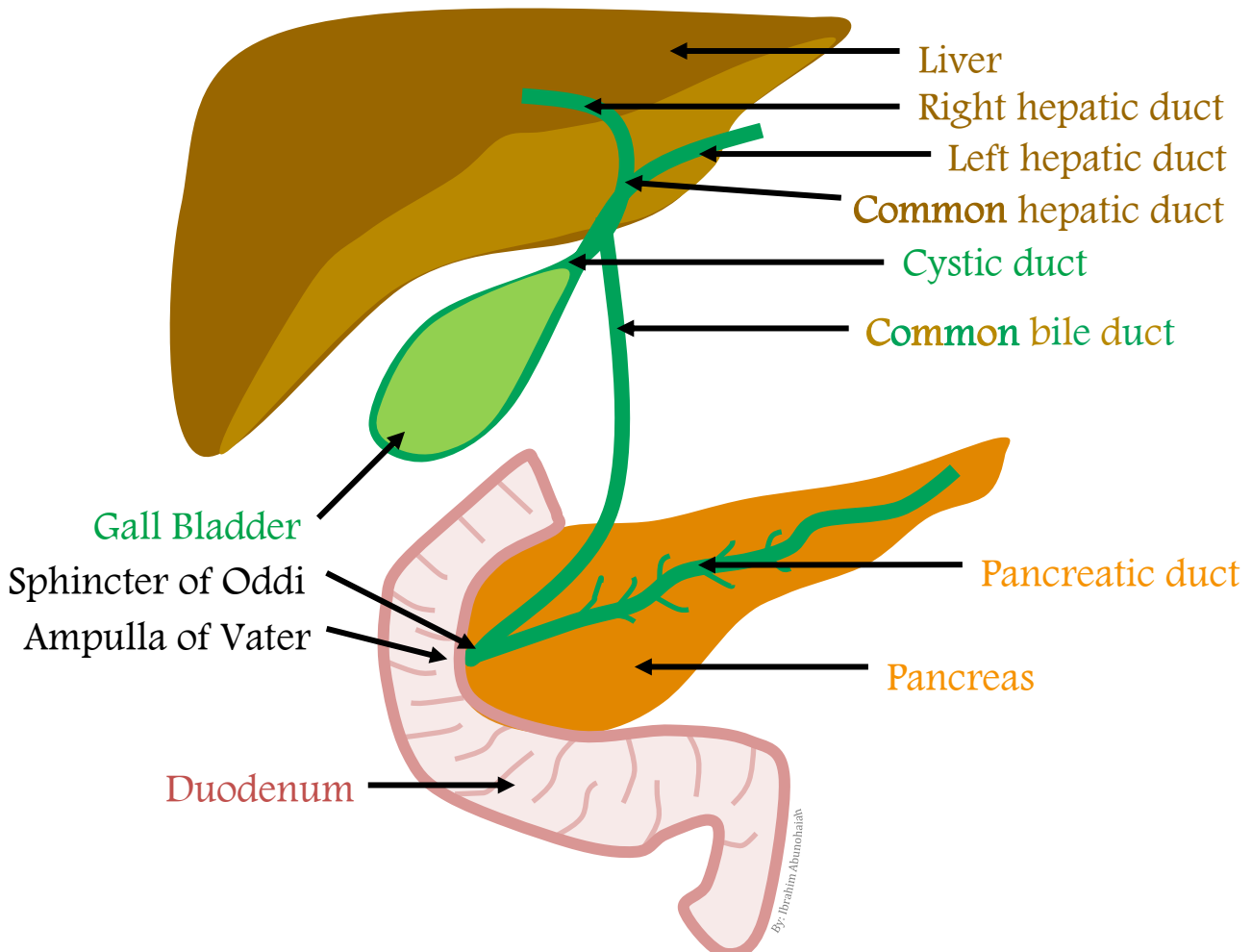
Features (E/M)	Hepatocytes	Pancreatic Acinar Cells
General Architecture	<ul style="list-style-type: none"> Are grouped in interconnected (anastomosing) plates. Liver sinusoids are located in the spaces between these plates. 	Rose-shaped.
Cell Shape	Are polyhedral in shape.	Pyramidal in shape.
Nucleus	1 or 2, vesicular with prominent nucleoli.	Nuclei are basal.
Cytoplasm	<p>Acidophilic.</p> <ul style="list-style-type: none"> Organelles: <ol style="list-style-type: none"> Mitochondria ++++ sER & rER are abundant. Golgi complex. Lysosomes. Peroxisomes. Inclusions (Deposits): <ol style="list-style-type: none"> Glycogen. Lipid (few droplets). Lipofuscin (old age). 	<ul style="list-style-type: none"> Basal part: Basophilic (due to abundant rER). Apical part: Acidophilic (due to secretory granules).



Extrahepatic Passages and Gall Bladder

The wall		Common hepatic duct & other extrahepatic bile ducts	Gall bladder
Description		Common hepatic duct is formed by union of the right & left hepatic ducts. It joins the cystic duct, arising from the gall bladder, forming the common bile duct. It's similar in structure to the wall of gall bladder & other extrahepatic bile ducts.	A sac-like structure that stores, concentrates and releases bile.
1- Mucosa	Epithelium:	Simple columnar.	<ul style="list-style-type: none"> Mucosa is highly folded. Simple columnar (NO goblet cells).
	Lamina propria:	C.T.	Contains mucus glands in the neck of gall bladder .
2- Muscularis		Bundles of smooth muscle fibers in all directions.	
3- Adventitia \ Serosa		Adventitia (C.T.).	Adventitia (in the attached parts to the liver) \ Serosa in fundus of gall bladder (in the unattached parts).

The diagram below shows extrahepatic passages



By Ibrahim Abumohabbah



Questions

- 1- Portal hypertension resulting from increased sinusoidal resistance classically seen in liver cirrhosis is due to loss of:
- Sinusoidal fenestrations.
 - Basal lamina.
 - Liver trabeculae.
 - Myoepithelial cells.
- 2- Space of Disse (perisinusoidal space) contains:
- Ito cells (fat-storing cells).
 - Kupffer cells.
 - Type III collagen (reticulin).
 - a+c.
- 3- All of these structures are absent in the spleen except for:
- Cortex.
 - Trabeculae.
 - Afferent lymphatic vessels.
 - Medulla.
- 4- Which one of the following statements about the pancreas is true?
- Myoepithelial cells line the acini.
 - Contains fenestrated sinusoids.
 - Centroacinar cells marking the beginning of ducts.
 - Has no afferent lymphatic vessels.
- 5- The sequence of the biliary tree is:
- Canaliculi → Ductules → Interlobular ducts → Hepatic ducts → Common hepatic duct → Common bile duct.
 - Ductules → Canaliculi → Interlobular ducts → Hepatic ducts → Common hepatic duct → Common bile duct.
 - Canaliculi → Ductules → Interlobular ducts → Hepatic ducts → Cystic duct → Common bile duct.
 - Canaliculi → Ductules → Intrahepatic ducts → Hepatic ducts → Common hepatic duct → Common bile duct.

Answers:

1	2	3	4	5
a	d	b	c	a



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

432histologyteam@gmail.com



Histology Team Leaders:

Nada Alouda

Faisal Alshuwair

Best of luck!