Glands associated with digestive tract

Liver

Pancreas

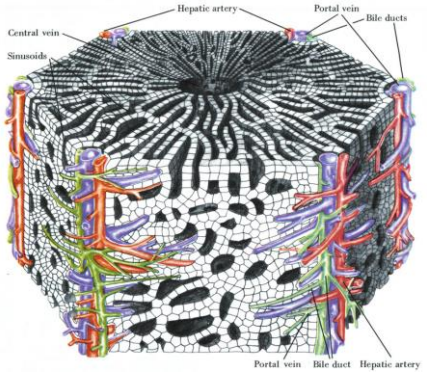
Gallbladder

- **Liver**
- **Is largest organ in the body its weight about (1.5kg).**
- **Is located in the upper right side of the abdominal cavity.**
- **Is composed of four lobes; covered by peritoneum and capsule of connective tissue send network branched septa into liver tissue to form liver lobules.**
- **Liver lobules**
- **One way to describe the organization of liver pranchyma and stroma is classical liver lobules, hexagonal in shape.**

Each lobule is composed of :

Central vein in center of the lobule.

- **Portal triad at periphery**
- **is an area of connective tissue located at the connection of 3 lines of hexagonal shape composed of :**
- **Hepatic artery**
- **Bile duct**
- **Branches of portal vein.**
- **Area near portal triad well supplied by oxygen & nutrients**
- **Area near central vein not well supplied**



- **STROMA OF LIVER**:
- **Connective tissue (Glisson's) capsule**
- **Thick at hilum**
- **Blood vessels & ducts surrounded by connective rissue**
- **Reticular fibers surround & supports liver cells & sinosuoids**
- **Parenchyma of liver:**
- **Are hepatocytes**
- **Which are liver cells arranged in cords or plates from center to periphery .Cells are separated by**
- **Hepatic sinusoids**

.Discontinuous endothelium; rest on discontinuous basal lamina or have no basal lamina.

- **Macrophages Phagocytic cells that called (kupffer cells)are found.**
- **Network of reticular fibers as (supporting fibers) are found between endothelium of sinusoids and plates of hepatocytes.**

Hepatocytes

- **Polyhedral, polygonal cells.**
- **Have large nucleus centrally located, prominent nucleoli are found.**
- **The cytoplasm shows variable appearance depends on their functional activity.**

The acidophilic cytoplasm have granular appearance in H and E section.

About 2000 mitochondria/ cell in cytoplasm,

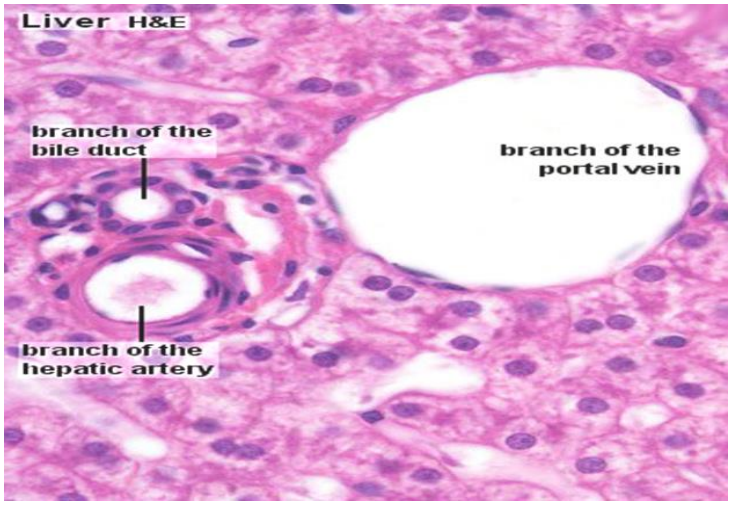
peroxisomes 200-300/ cells ,

free ribosomes, rough and smooth endoplasmic reticulum;

Golgi complexes are large and active,

glycogen and lipid

droplets are found in cytoplasm.



Space of Disse (perisinusoidal space):

It is a space between sinusoidal endothelium, and hepatocytes plates.

- **Main site of transferred material between blood and hepatocytes.**
- **It contains :**
- **1- Reticular fiber.**
- **2- fat-storing cells Ito cell(Lipocytes).**
- **NORMAL ITO CELLS:**
- **Are star shaped cells.**
- **Store vitamin A.**
- **Regulate the diameter of sinusoidal lumen.**
- **Secretion extra-cellular matrix.**
- **Secretion growth factor.**
- **CHRONIC LIVER DISEASE –**
- **Ito cells acquire the features of myofibroblasts**
- **Cells found close to damaged hepatocytes**
- **Play a major role in fibrosis**
- **Alcoholic liver disease**

- **Bile path way:**
- **Hepatic cells secret daily about (500-10000)ml of bile.**
- **Bile is composed of, bile pigments; bile salts, Ions water, cholesterol.**
- **The bile is transporting through duct system:**
- **Bile canalaculi: tubular space limited by plasma membrane of 2 hepatocytes have microvilli.**

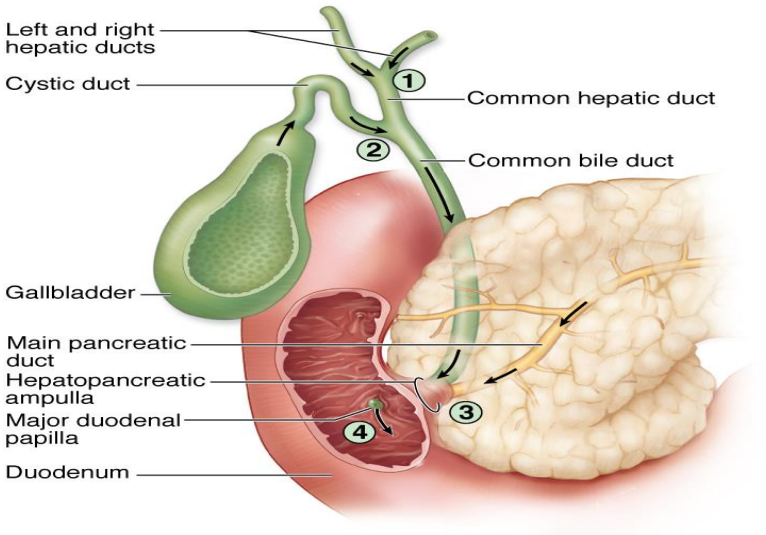
. Then Bile ductules (Hering canal) that is lined by low cuboidal cells called cholangiocytes

Bile ducts : in portal triad is lined by cuboidal epithelium.

- **Right and left hepatic duct s lined by tall columnar epithelium.**

Leaves liver as common hepatic duct: tall columnar epithelium.

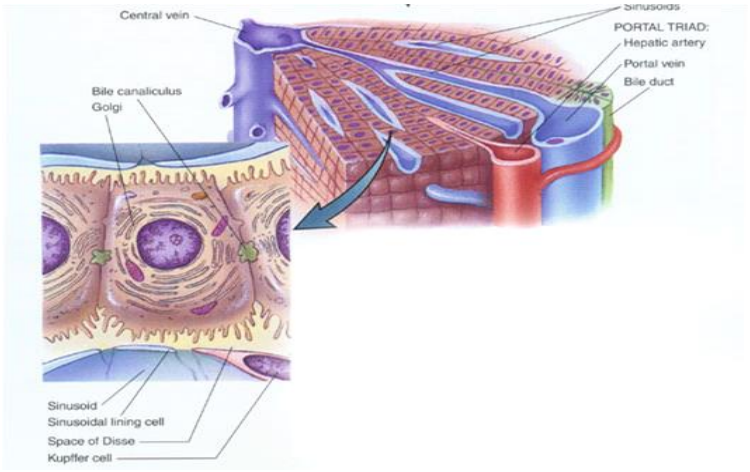
- **Join with cystic duct of gallbladder.**
- **Then form common bile duct is tall columnar epithelium.**
-



-
-
- **How can material transport through liver cells (hepatocytes) ?**

Hepatocytes have 3 sides:

- **Sinusoidal surface: 70% it is covered by microvilli and extend into space of disse.**
- **Canalicular surface: 15% bile drain from hepatocytes to canaliculi.**
- **Intercellular surface: 15% between adjacent hepatocytes. Have cell – to – cell communication.**

- 

- **Some of the function of liver:**
- **Detoxi fication of metabolic weaste products.**
- **Synthesis of bile.**
- **Metabolism of carbohydrate , protein & fat.**
- **Storage of vitamin (A,D,B,B_4,B_{12}).**
- **Destruction of aged RBC,and synthesis of fibrinogen.**