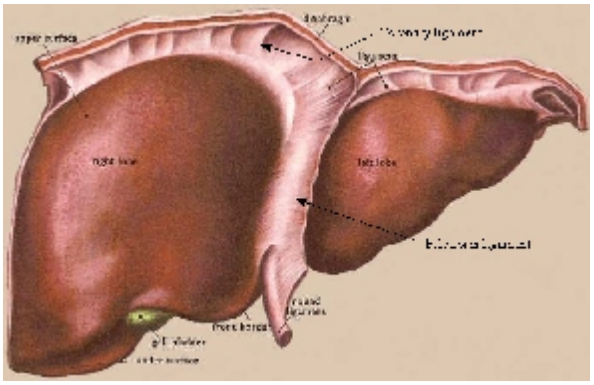
LIVER & PANCREAS

30 Apr 98, 25 April 00, 26 April 01, 24 April 02, 28 Apr 03, 26 April 04, 5 May 08, 29April09, 28Apr10, 2May11
Martini 5th: pp. 874-880, 6th: 902-907, 7th: 888-895, 8th: 901-910

Pancreas: (902) ("all secrete")
Secretory cells in acini, islets of Langerhans interspersed
Pancreatic juice carried by pancreatic duct, joins common bile duct at ampulla of Vater, sphincter of Oddi.

High HCO_3^- to neutralize acid
wide array of digestive juices
- trypsin — cuts btwn lysine & arginine
- lipase — hydrolyze fat's ester bond
- nucleases

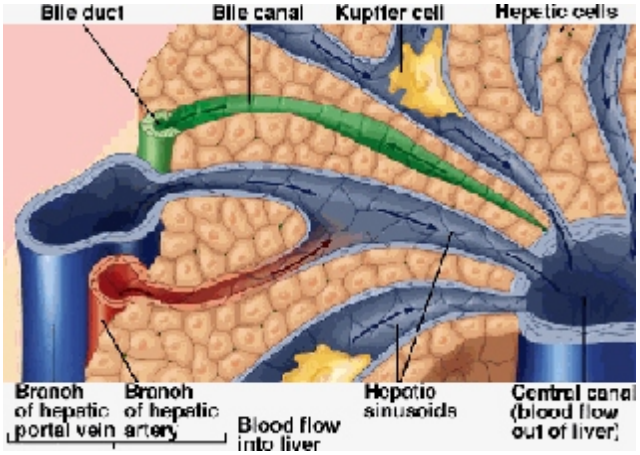


LIVER: Largest visceral organ, Anatomy: (p. 904)

R and L lobes	
falciform ligament	divides left and right lobes.
round ligament	remains of umbilical vein in falciform ligament
coronary ligament	fold of peritoneum, parietal to visceral, ties it to the diaphragm
bare area	not covered by peritoneum, against diaphragm
hepatic artery	delivers oxygenated blood
hepatic portal vein	delivers nutrient rich blood from small intestine
lesser omentum	suspends stomach from bottom of liver

Lobule: **(functional unit):** (P. 905)

Hepatic triad:	**hepatic artery** **hepatic portal vein** **bile duct**
bile canaliculus	collects bile, empty into bile duct
Sinusoids	flow past cords of **hepatocytes**
central vein	processed blood drains into **hepatic vein**
Kupfer cells	engulf pathogens, debris, store Fe.(part of RES)



FUNCTIONS: (p 907)

I. METABOLIC REGULATION

Regulates blood glucose	*insulin* induces synthesis, storage of glycogen. *Glucagon* causes it to break down to glucose.
lipid metabolism:	synthesizes, stores, releases fats (insulin stimulates lipid synthesis.)
amino acid metabolism	interconversion, transamination, deamination→ yielding NH_3 (toxic)
detoxification	urea synthesized from ammonia, etc toxins: poisons, drugs, alcohol (storage of lipid soluble toxins (DDT)) activate carcinogens...

II. HEMATOLOGICAL REGULATION

plasma protein synthesis	albumins, transport proteins, clotting proteins, complement proteins
hormone inactivation	especially steroid hormones
vitamin storage:	A and D stored here

III. SYNTHESIS OF BILE

bile salts	synthesis from steroids
excretion of bilirubin	(liver failure leads to accumulation of this yellow material = jaundice)

Bile stored in gall bladder where it is concentrated, excreted when fat rich meal taken.

Cholelithiasis ("bile stone") gall stones: crystals from concentrated bile, mostly cholesterol with Ca^{++} salts.
Lithotripter: focused ultrasound may break into small enough pieces to be excreted.

Pathology:
- **cirrhosis** — accumulation of scar tissue (makes it yellow), loss of function
- **jaundice** — bilirubin accumulated in body, turns patient yellow (esp conjunct)