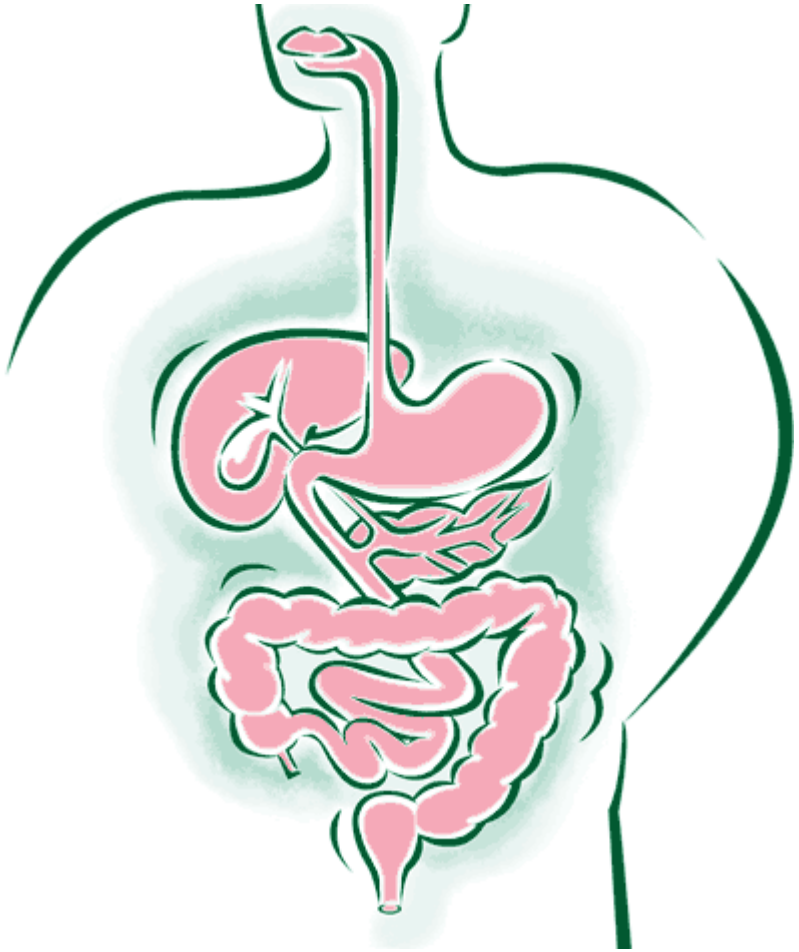
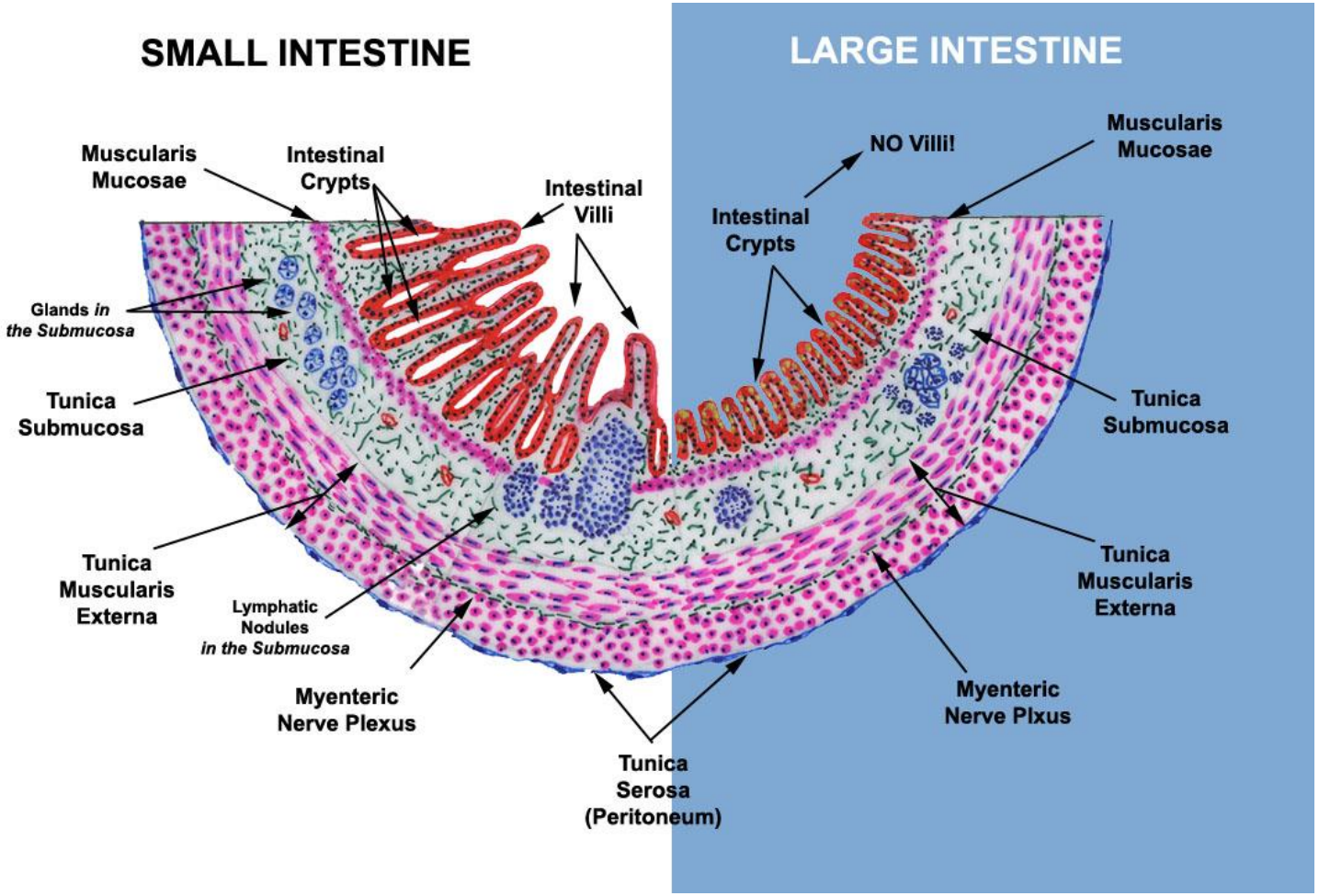
GIT - 3

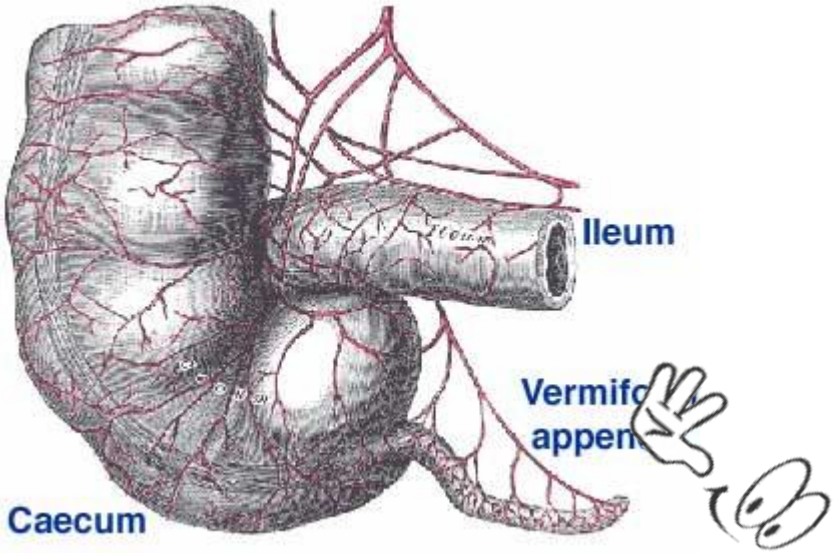


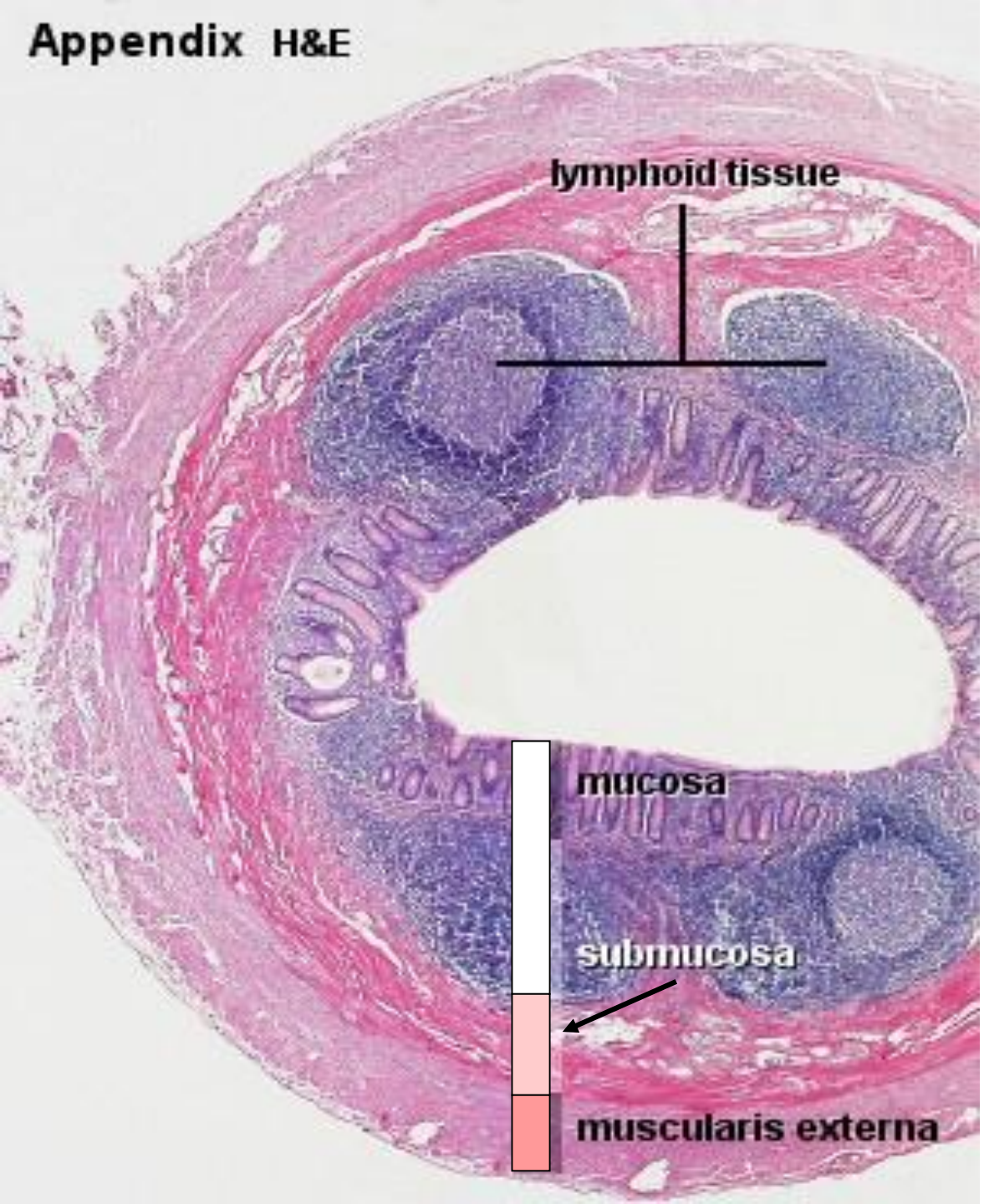
General architecture of small and alrge intestine



appendix vermiformis

1. **Tunica mucosa**: *no villi, rare and shallow crypts*
   - simple columnar epithelium,
   - lamina propria – reticular connective tissue, lymphatic follicles
   - lamina muscularis – thin, discontinuous.
2. **Tela submucosa** – loose collagen c.t. with adipocytes
3. **Tunica muscularis externa** – thin
4. **Serosa**.




Appendix H&E
lymphoid tissue
mucosa
submucosa
muscularis externa

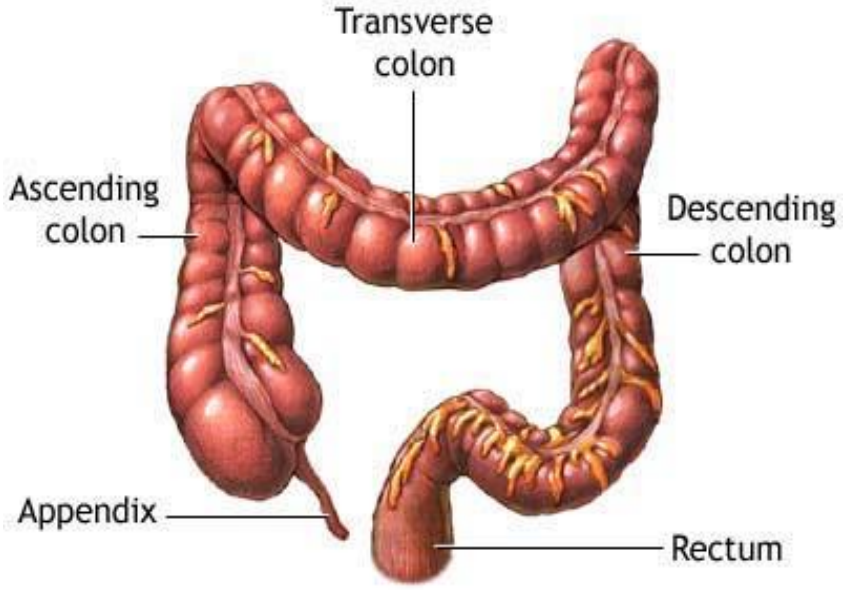

Appendix H&E
crypts of Lieberkühn
muscularis mucosae
lymphoid tissue

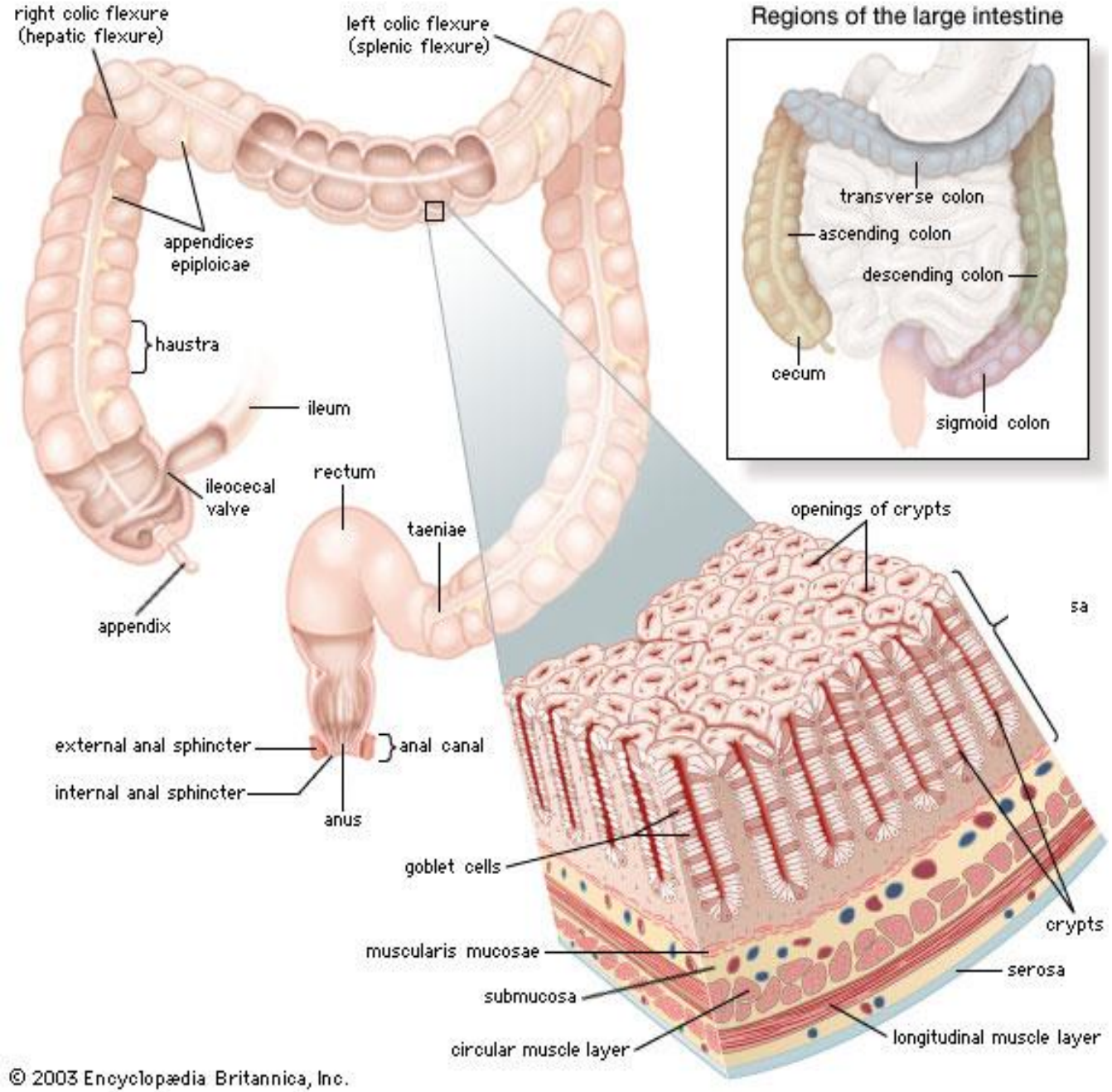

20 µm

Intestinum crassum

3 parts:

- ***caecum*** + ***appendix***,
- ***colon (ascendens, transversum, descendens, sigmoideum)***,
- ***rectum*** + ***canalis analis***.





1. Mucosa - crypts

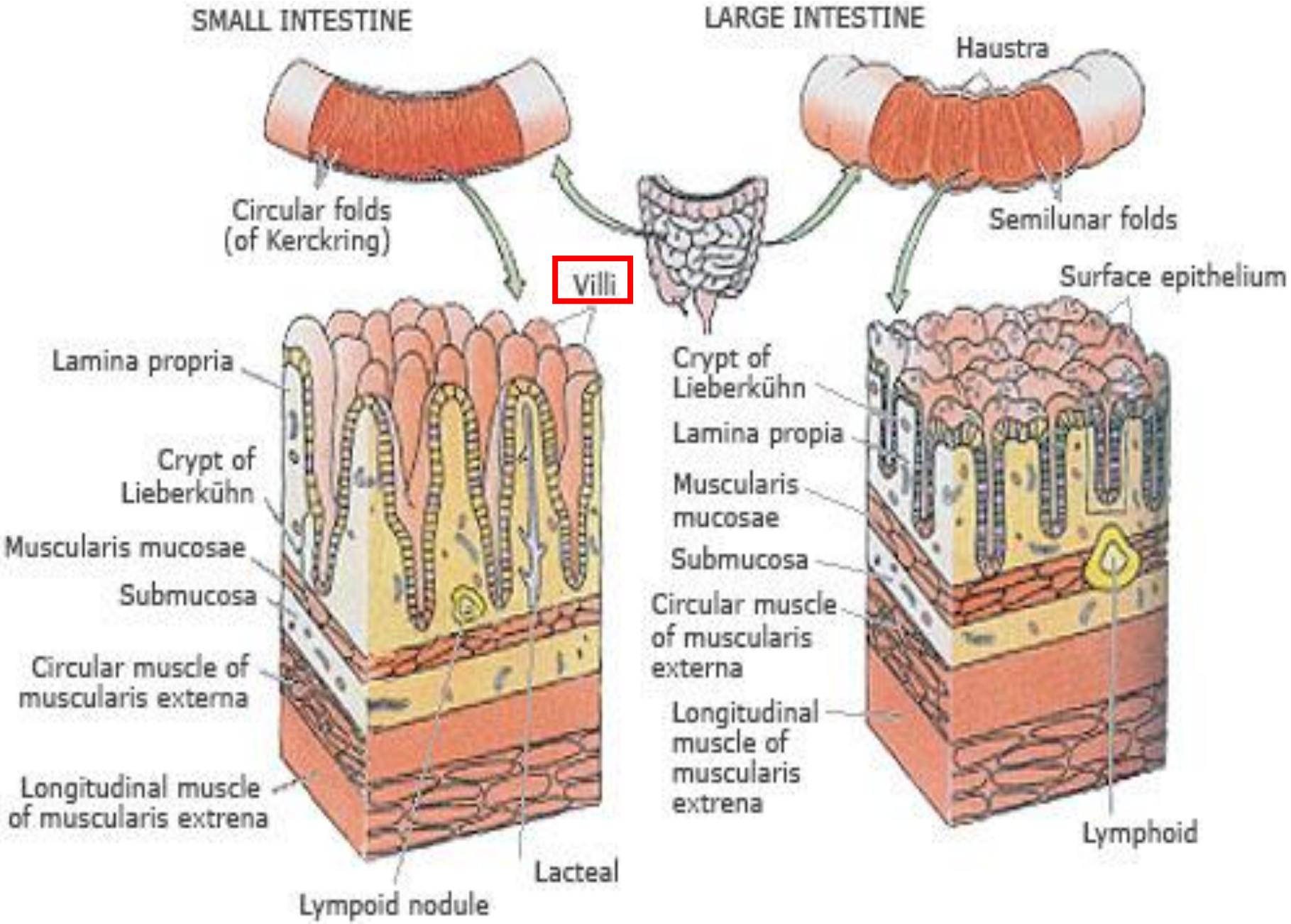
- simple columnar epithelium
- l. propria – reticular c.t.
- l. muscularis – smooth muscle

No villi

2. Submucosa

3. Muscularis externa

4. Serosa


SMALL INTESTINE
LARGE INTESTINE
Haustra
Circular folds
(of Kerckring)
Semilunar folds
Villi
Surface epithelium
Lamina propria
Crypt of
Lieberkühn
Muscularis mucosae
Submucosa
Circular muscle of
muscularis externa
Longitudinal muscle
of muscularis extrena
Lympoid nodule
Lacteal
Crypt of
Lieberkühn
Lamina propia
Muscularis
mucosae
Submucosa
Circular muscle
of muscularis
externa
Longitudinal
muscle of
muscularis
extrena
Lymphoid

Intestinum crassum

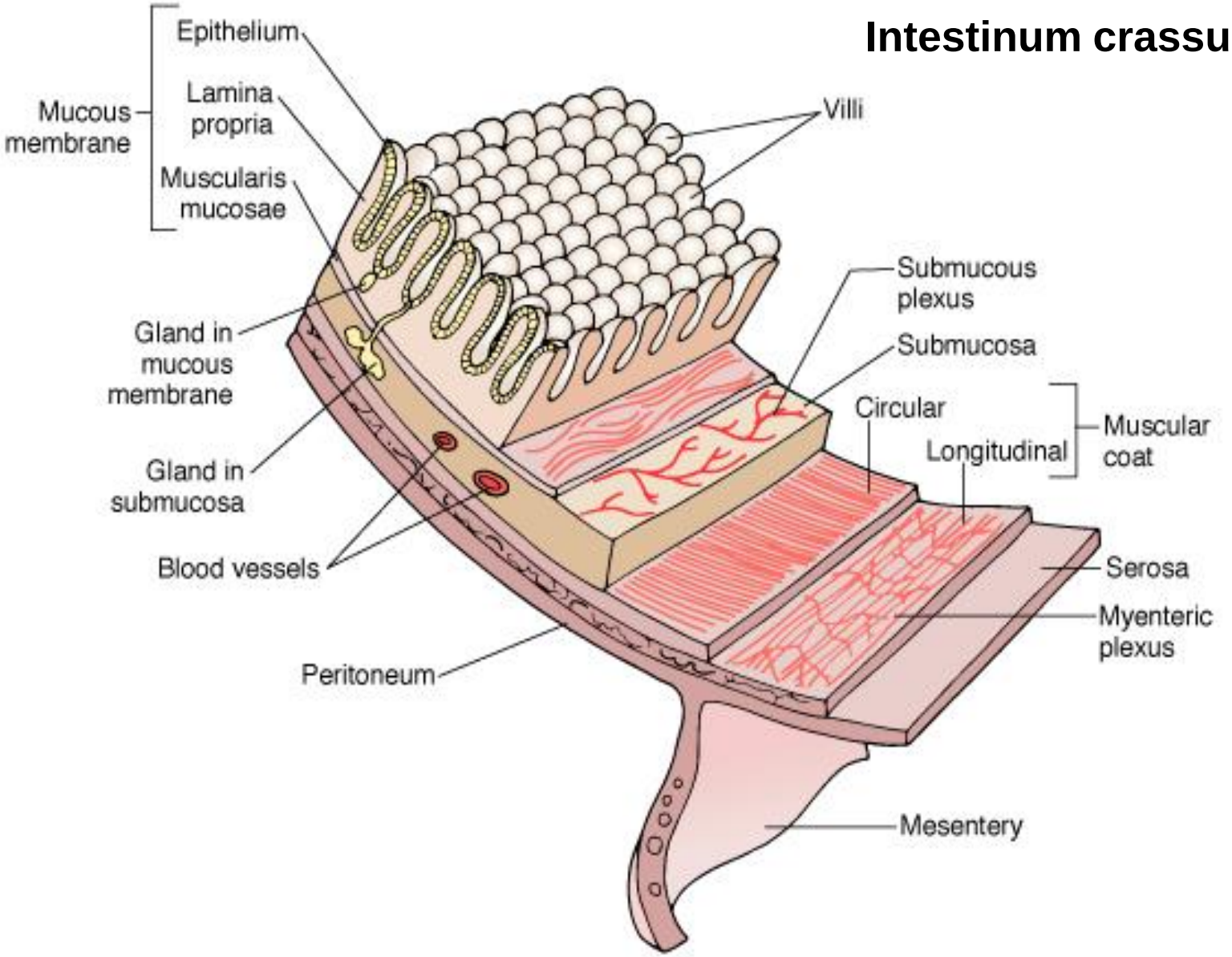
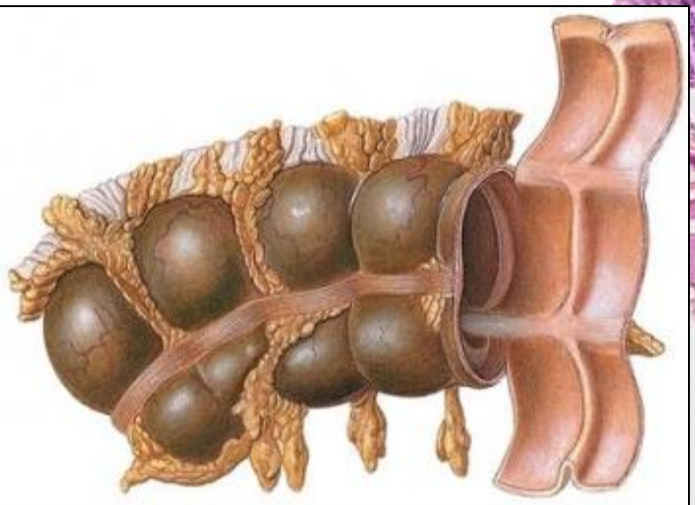
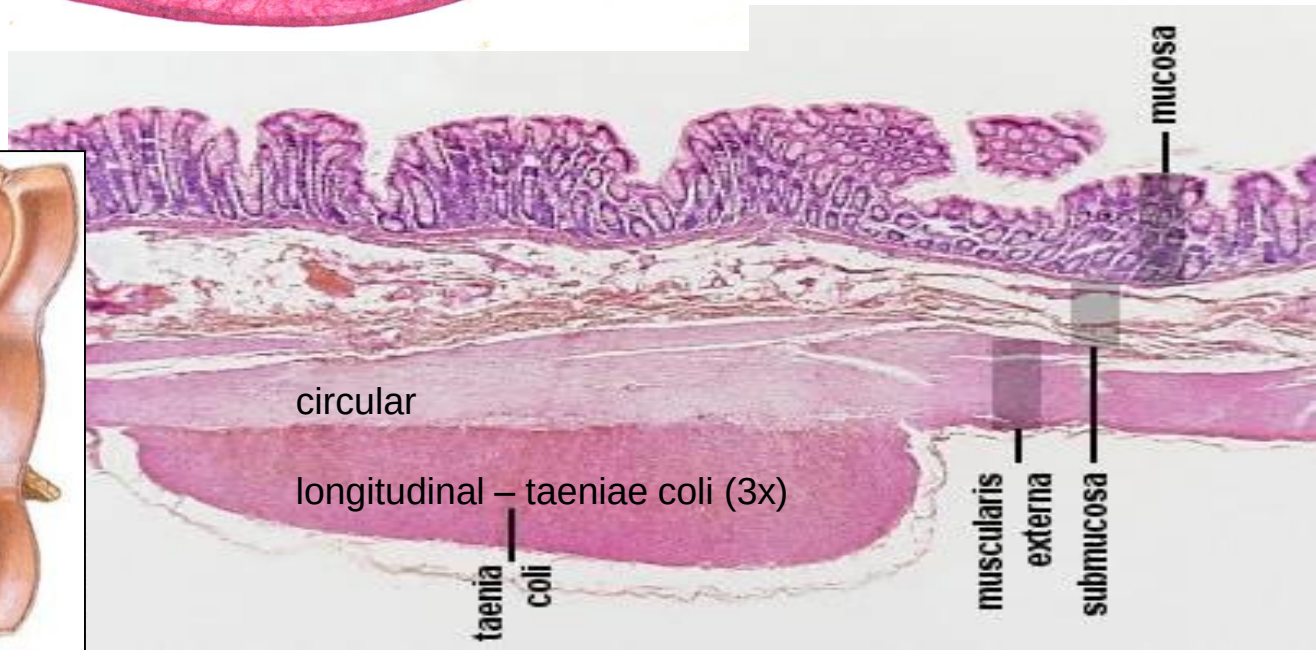


Figure 38-6 Diagram of the four main layers of the wall of the digestive tube: mucosa, submucosa, muscular, and serosa (below the diaphragm).

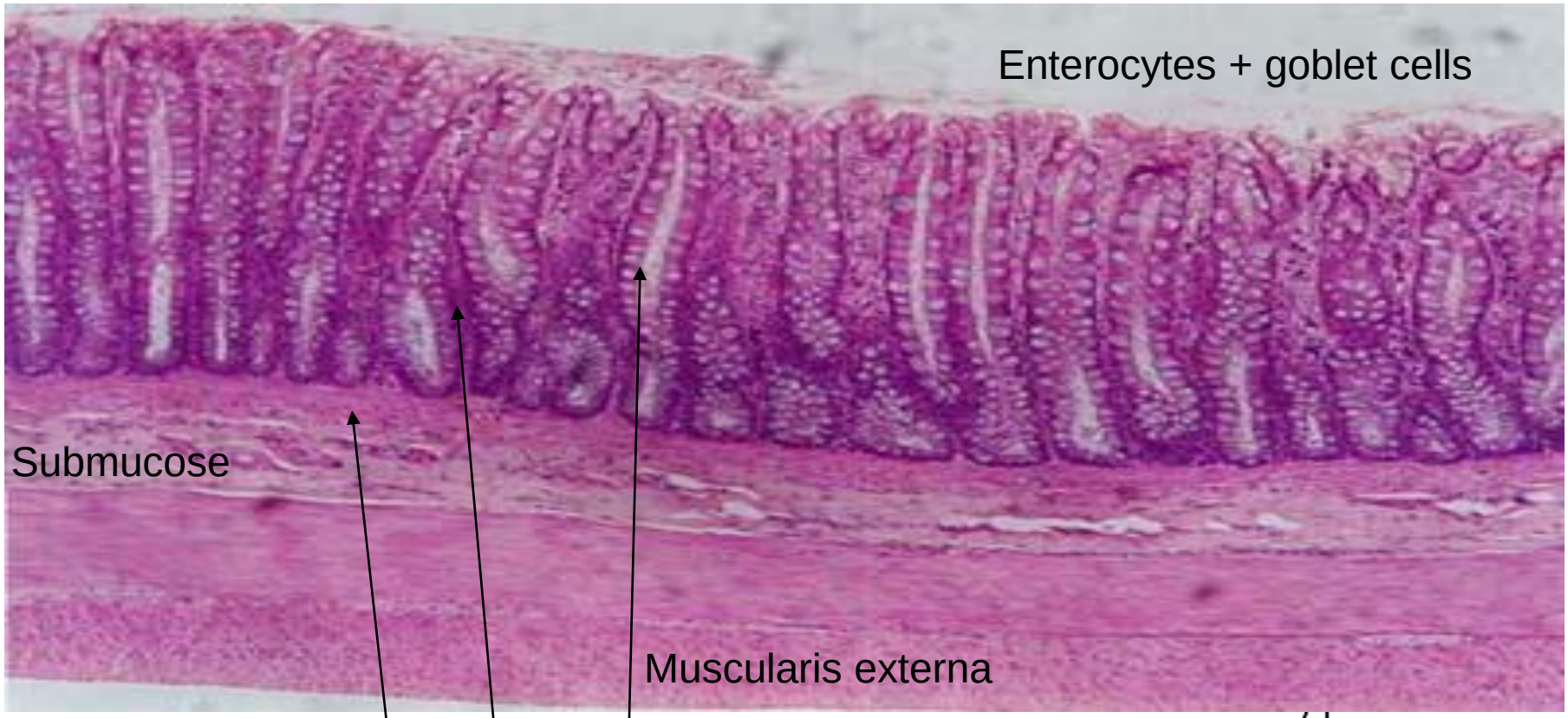
Intestinum crassum

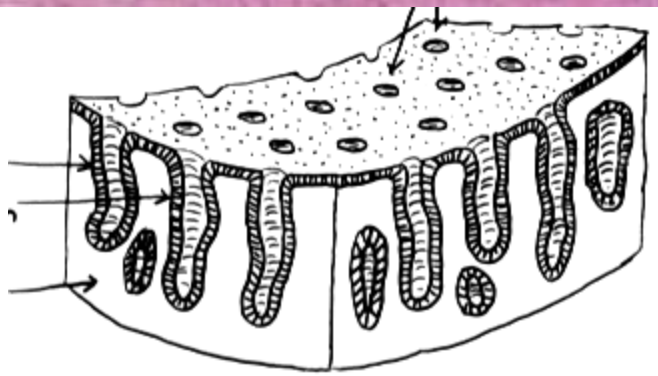
Serosa-
appendices epiploicae
adipose tissue



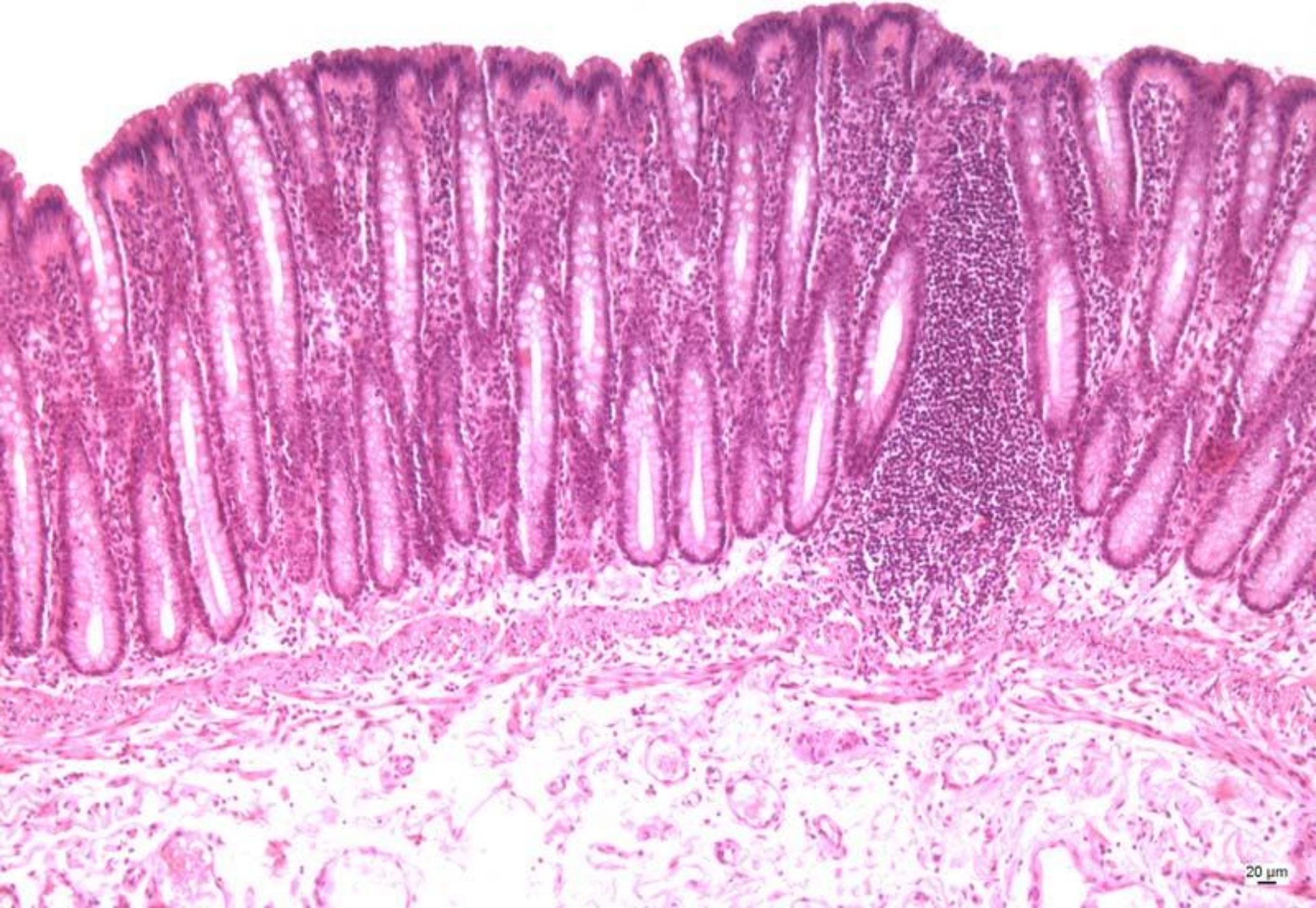


Intestinum crassum

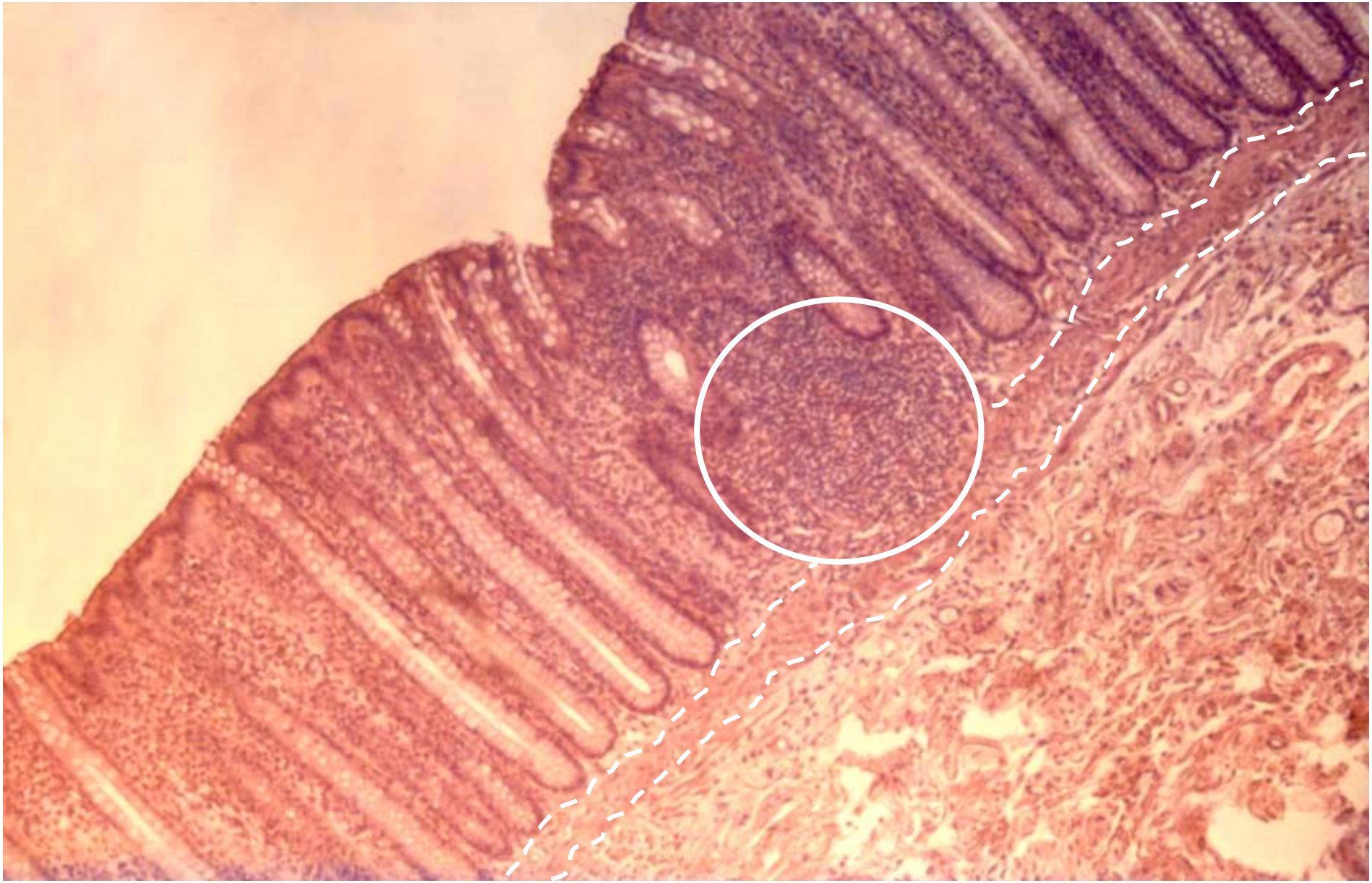




Intestinum crassum (HE)

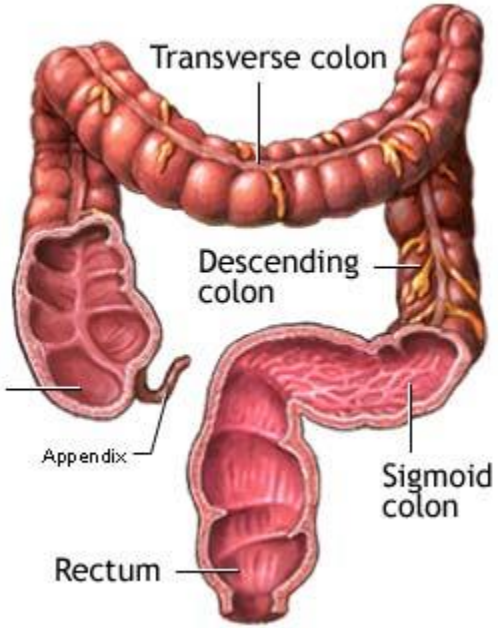


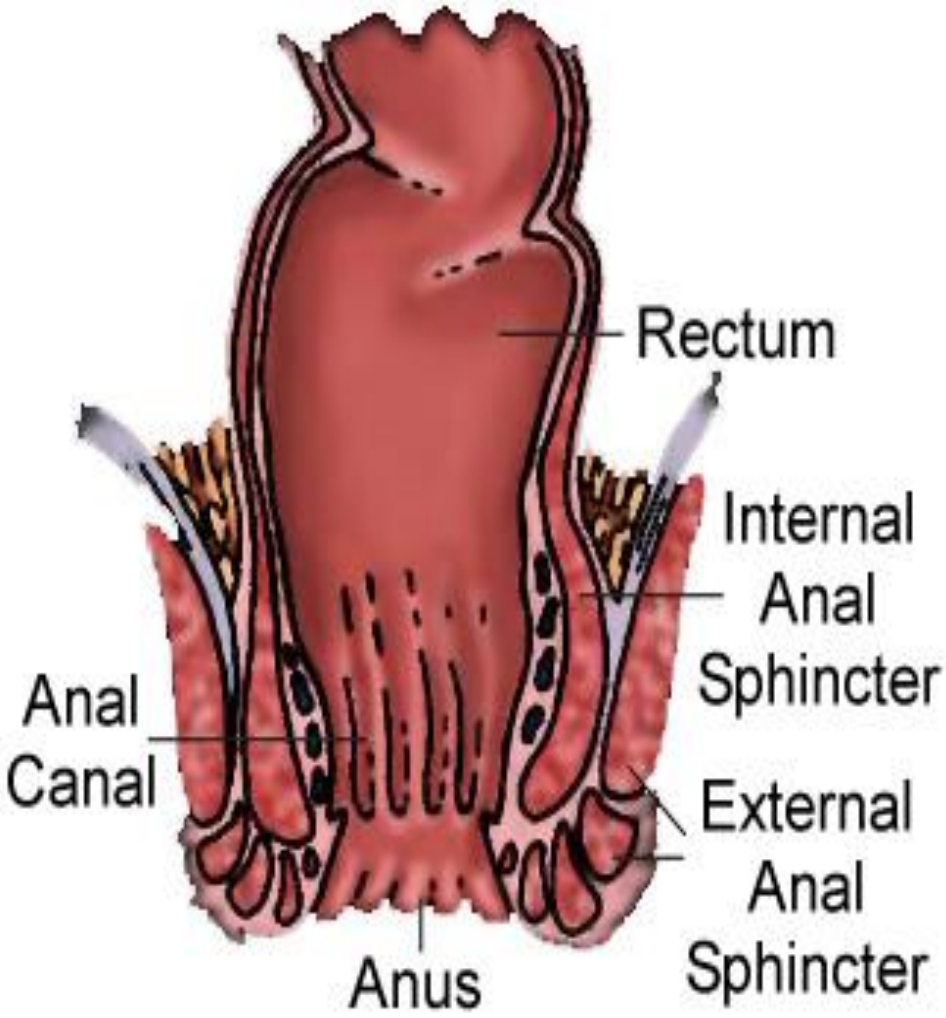
Intestinum crassum



Rektum – ampulla + canalis analis

Ampulla – like colon





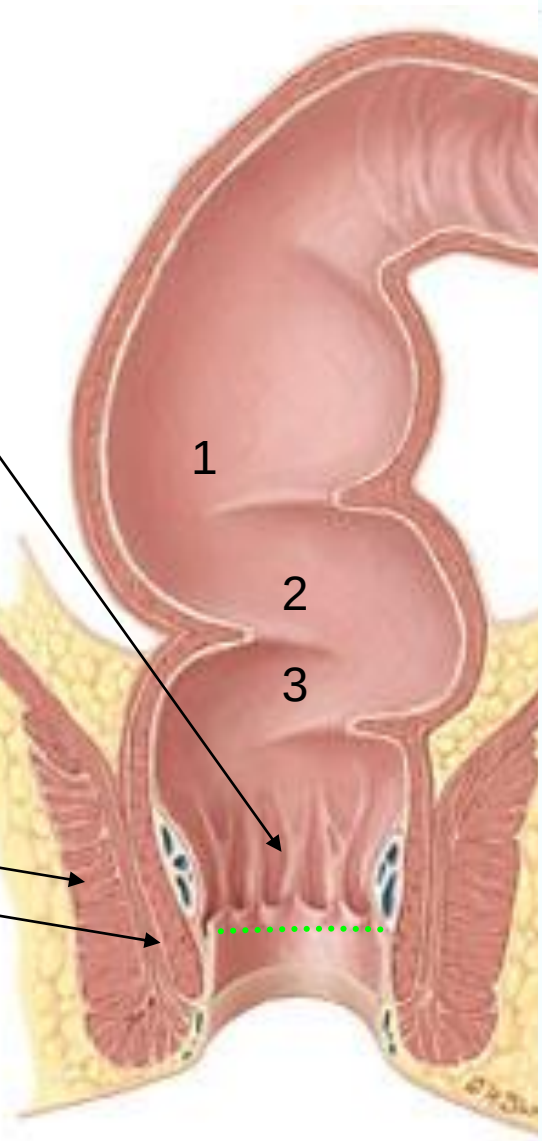
Canalis analis

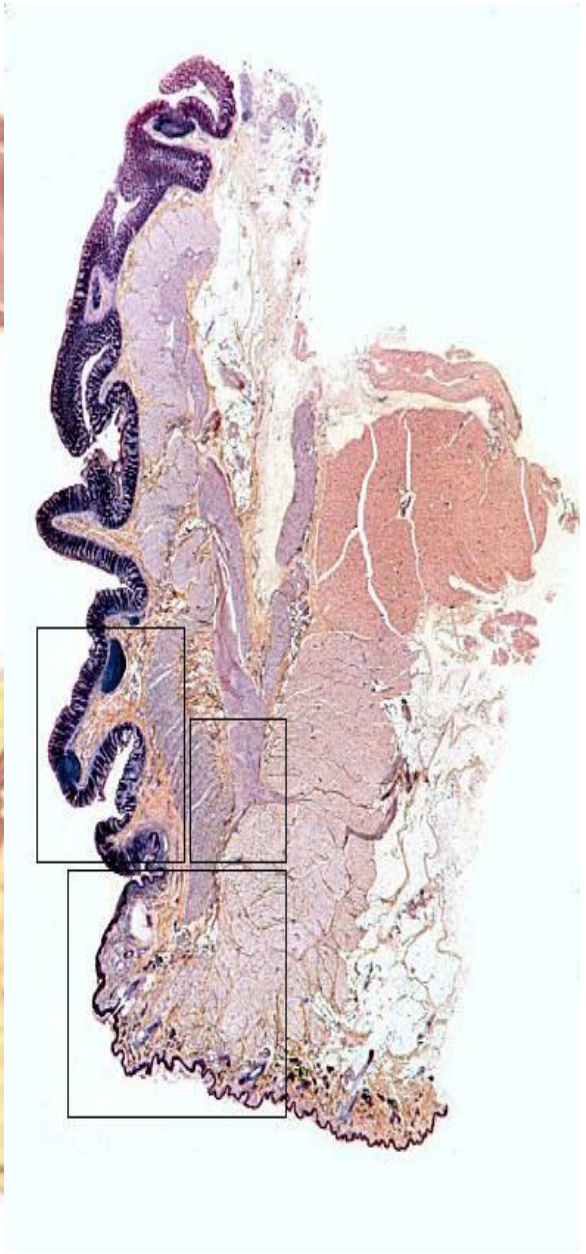
Plicae transversales (1, 2, 3)

5-10 columnae rectales
+ sinus et valvulae anales

m. levator ani

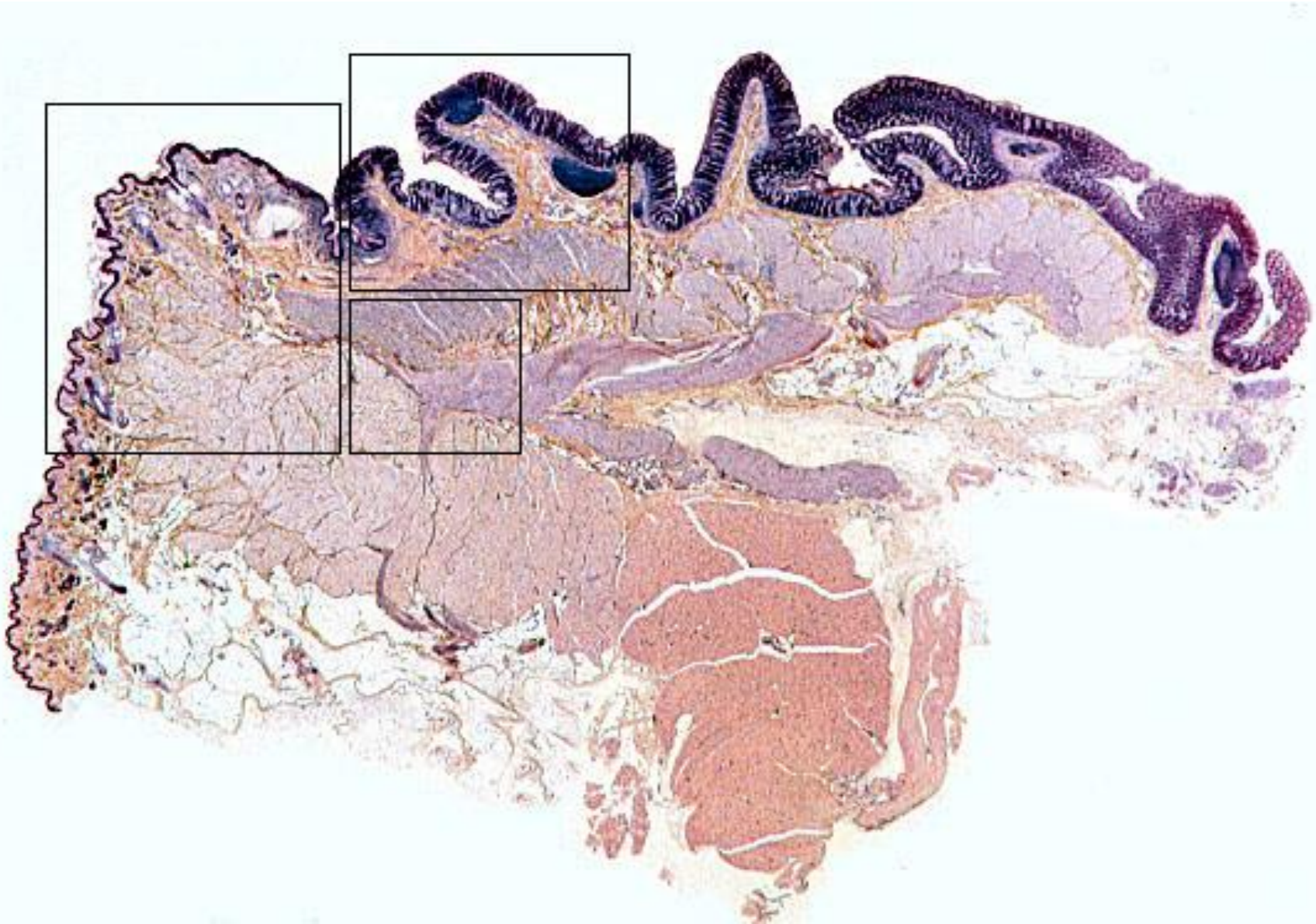
M sphincter ani:
ext.
int.



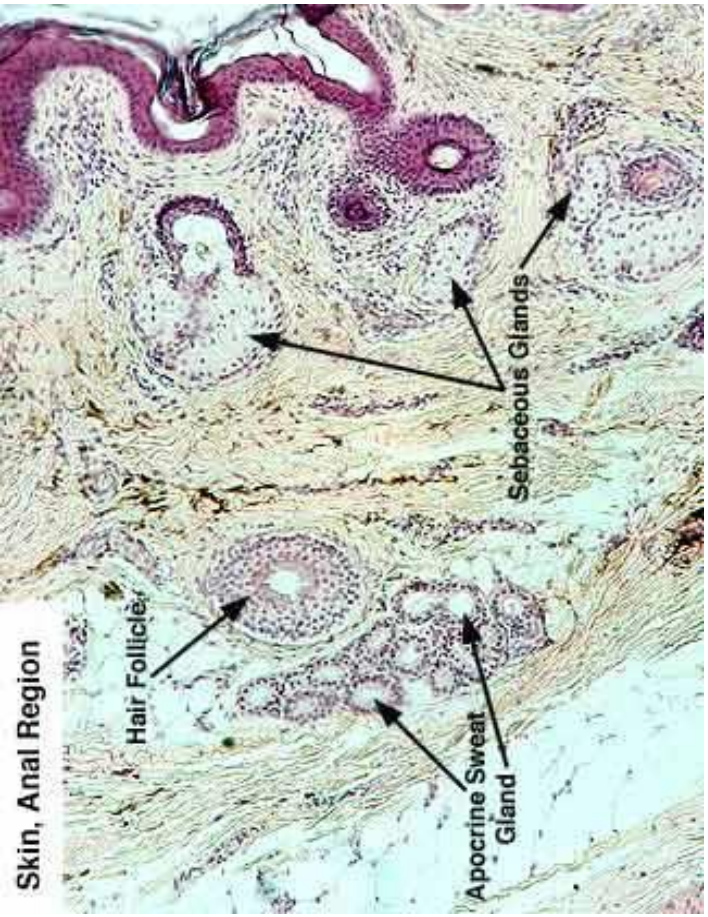


Local histology of anal canal

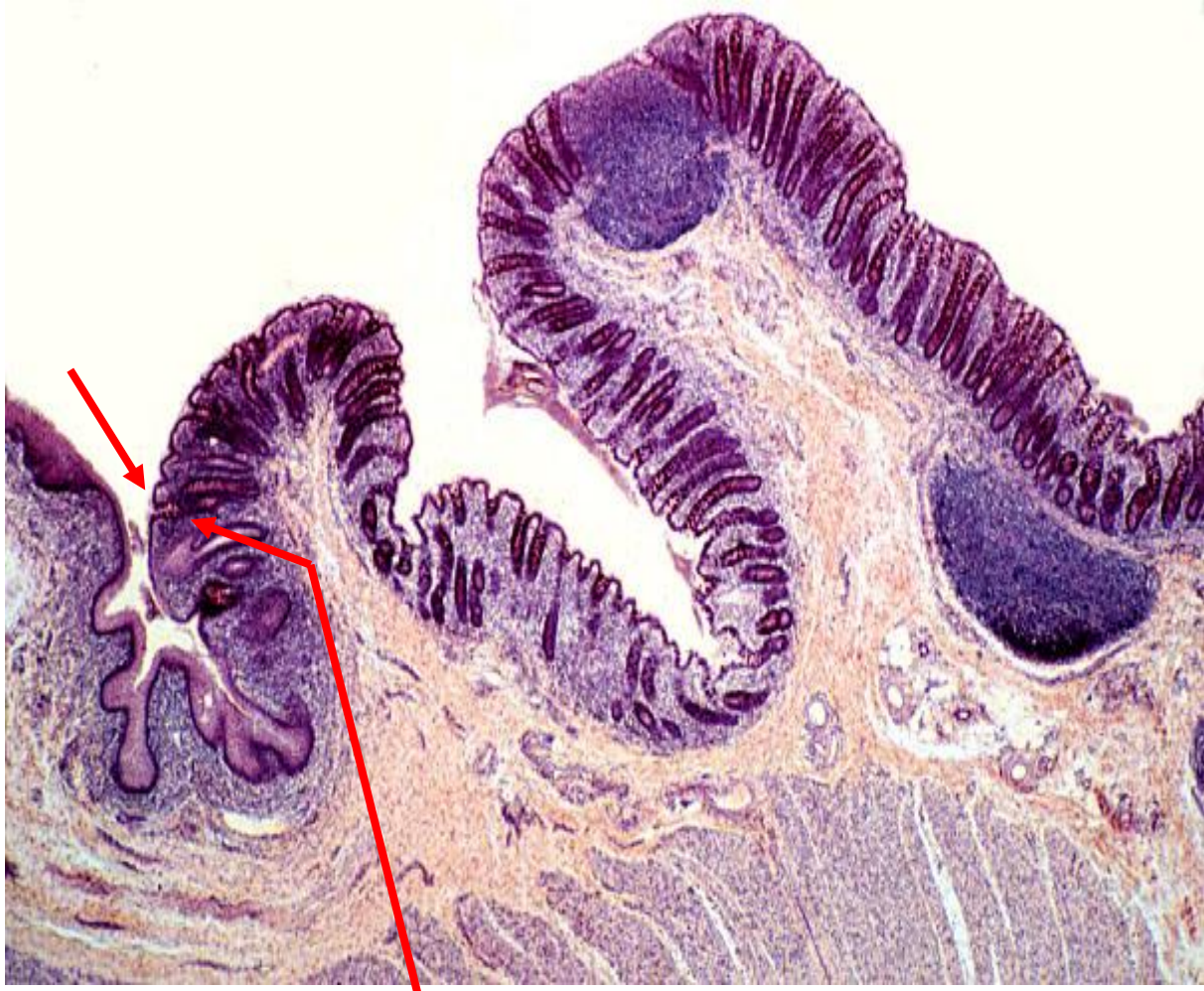
Zona hemorhoidalis	**Zona intermedia**	**Zona cutanea**
Mucosa - simple columnar ep. - lamina propria - reticular c.t.	- stratified squamous ep. - lamina propria (loose collagen c.t.)	Skin - epidermis - dermis + adnexa + pigment cells
- lamina muscularis	--	--
Submukóza	+	--
Muscualris externa: smooth	smooth (m. sphincter int.)	skeletal (m. sphincter ext.)
Adventitia	+	--



Canalis analis



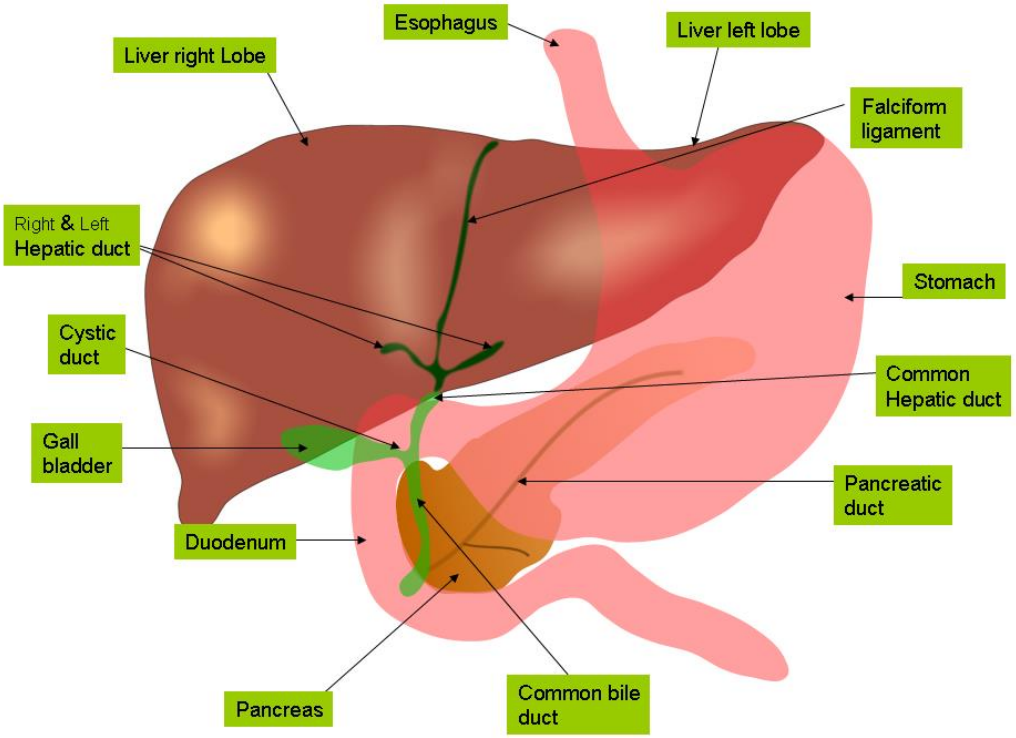
zona cutanea



zona intermedia

zona hemorhoidalis

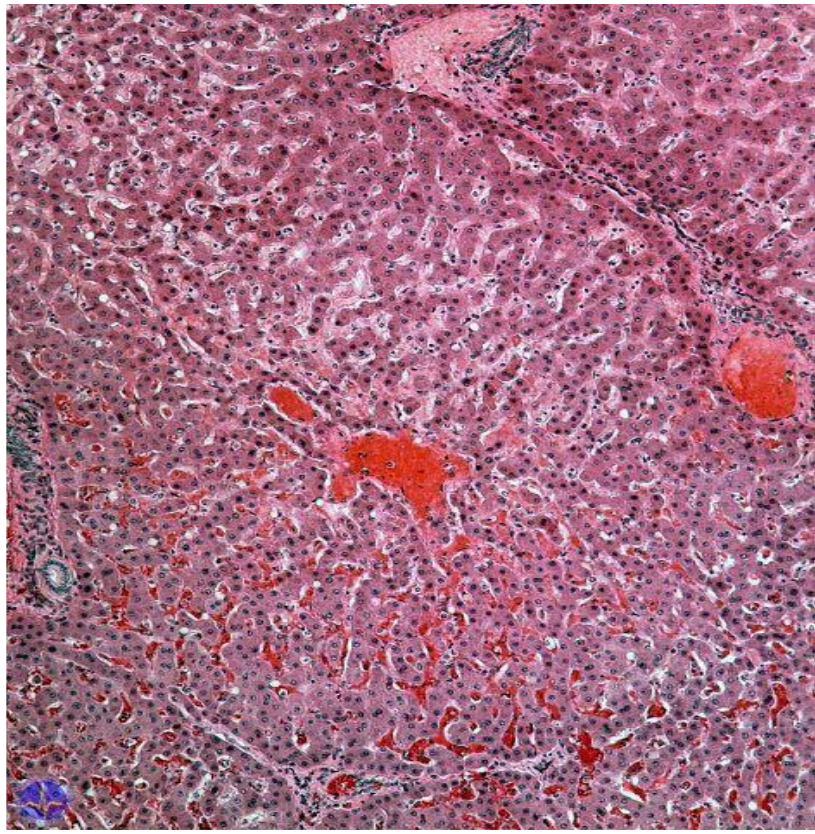
Liver (hepar)



- **Connective tissue**

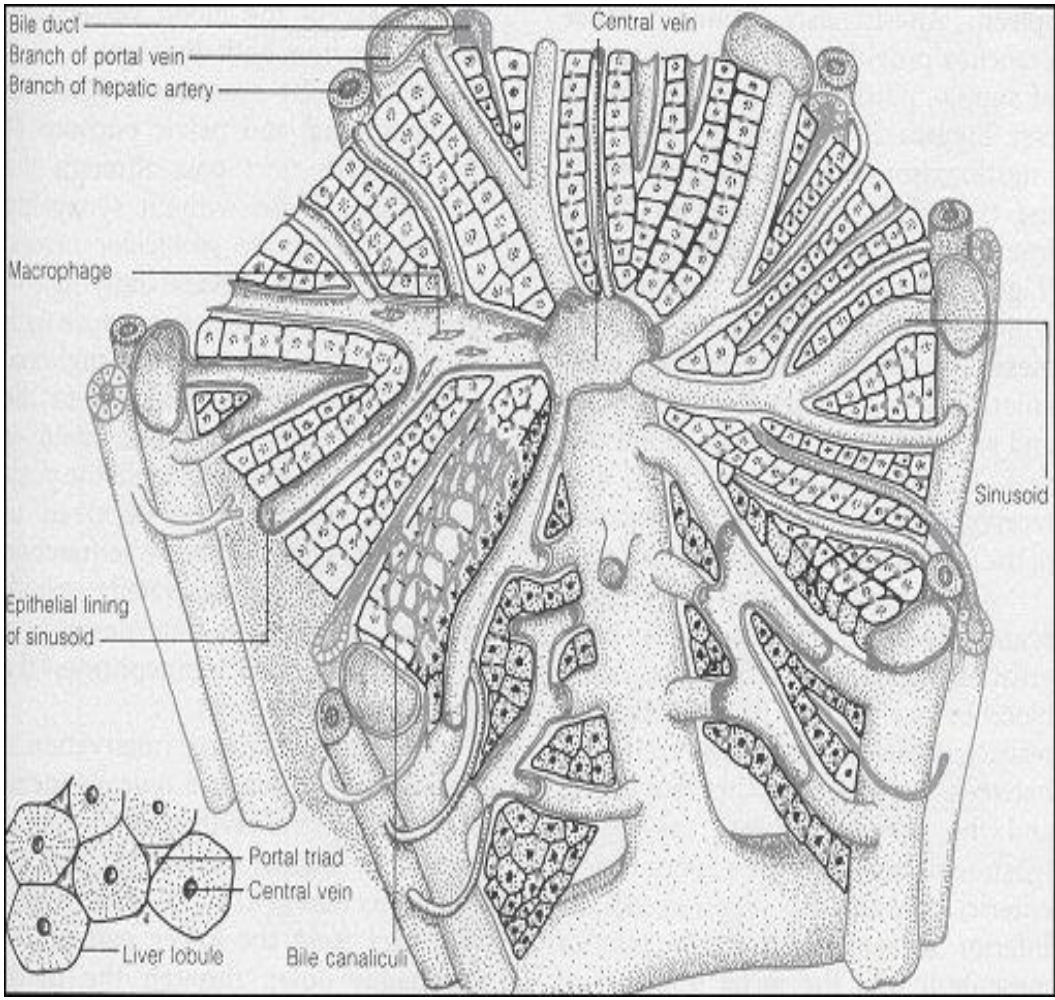
capsula fibrosa hepatis (Glissoni) + serosa

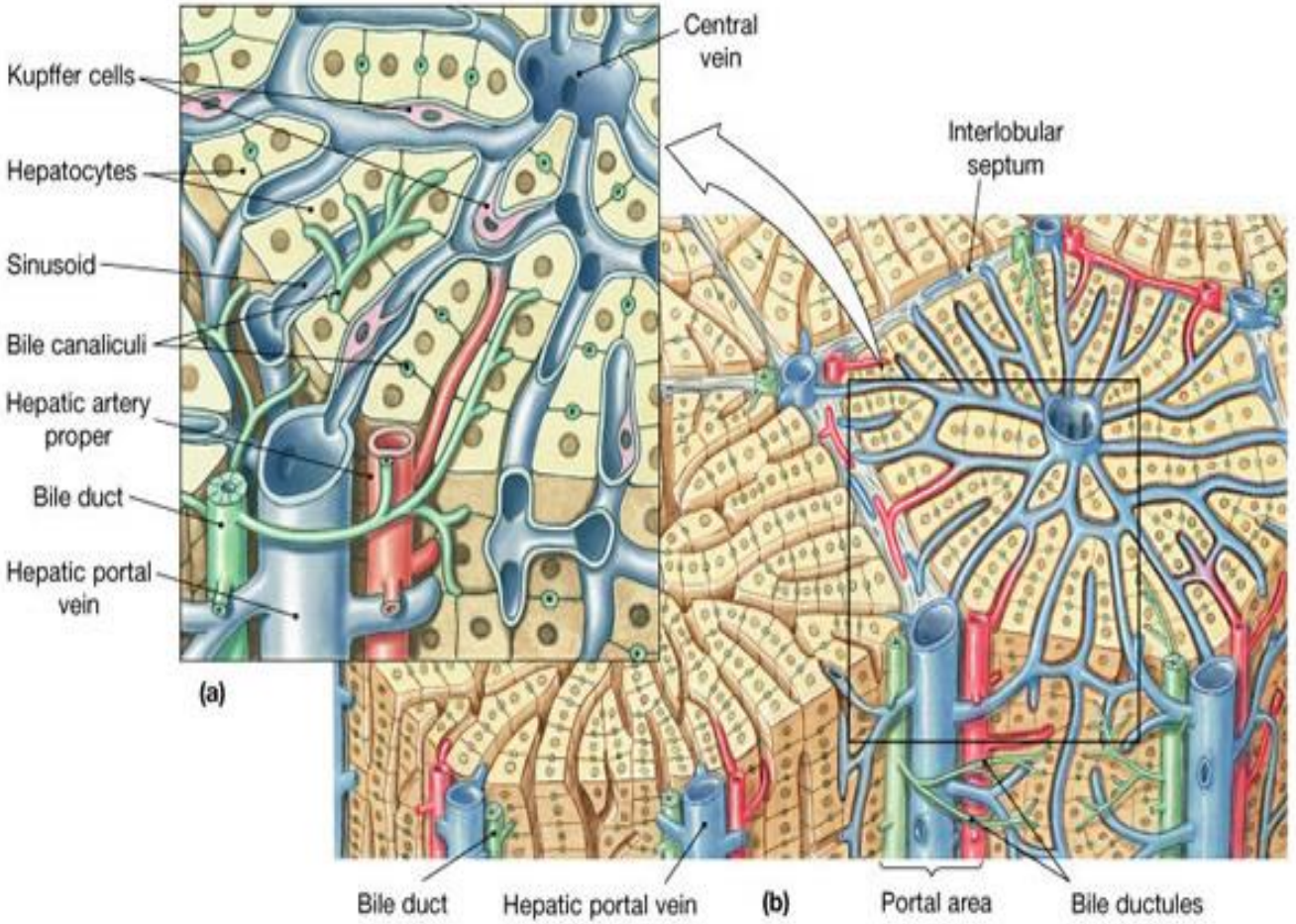
- **Liver parenchyma** – cords of hepatocytes – define liver lobuli



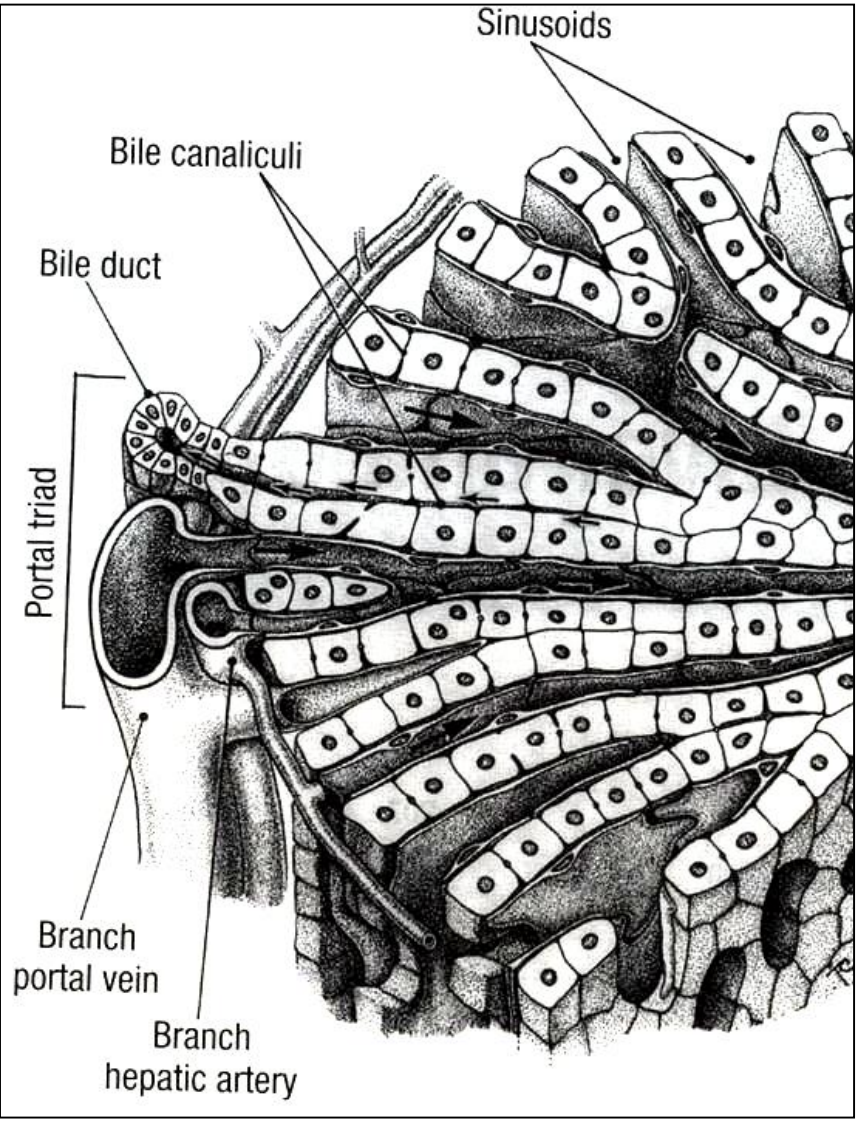
Lobulus venae centralis (hepatic, liver lobulus)

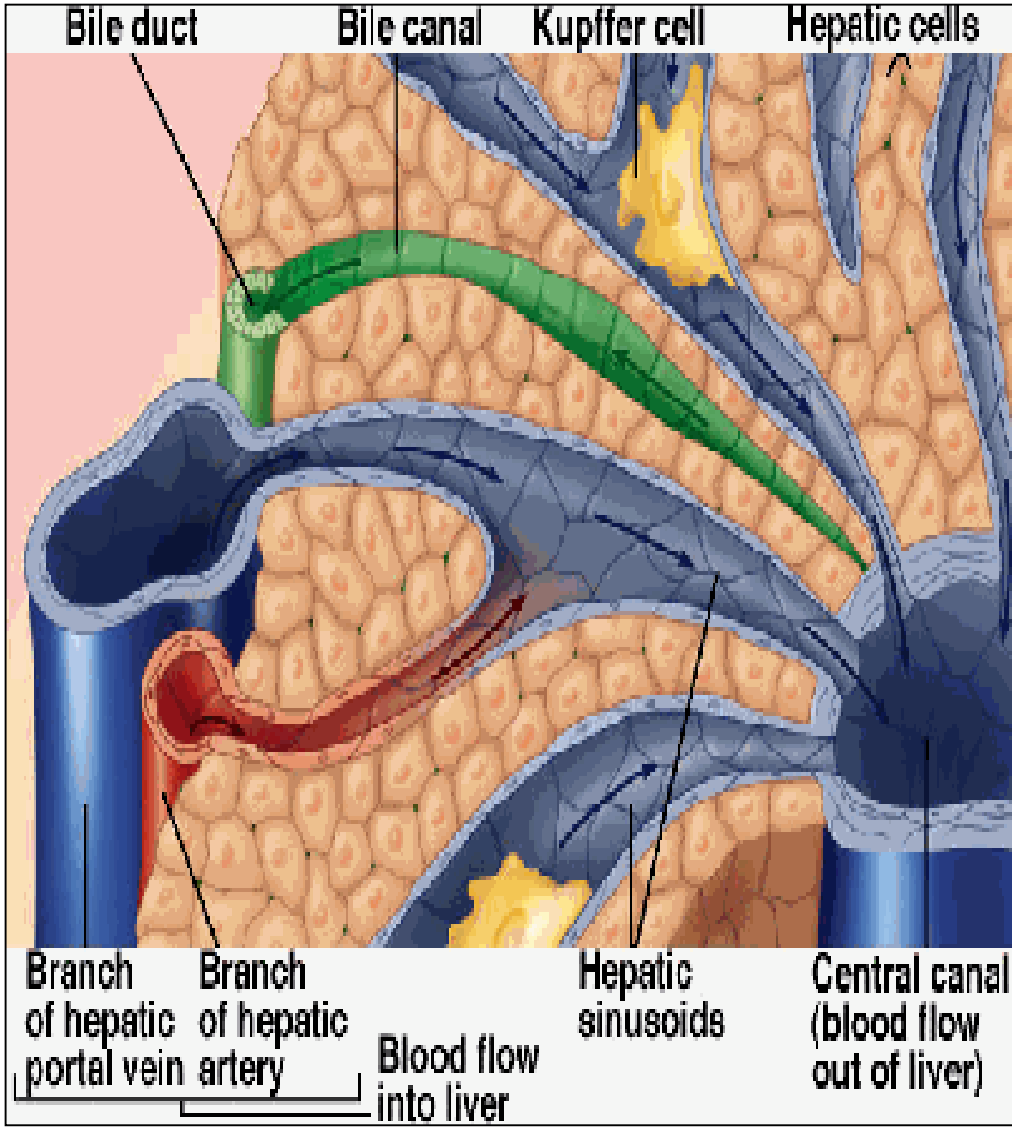
- Polygonal
- Vena centralis – in axis
- Cords of hepatocytes arranged radially
- Hepatic sinusoids
- Bile capillaries





„sheets“ (*3D*) – „cords“ (*2D*) of hepatocytes

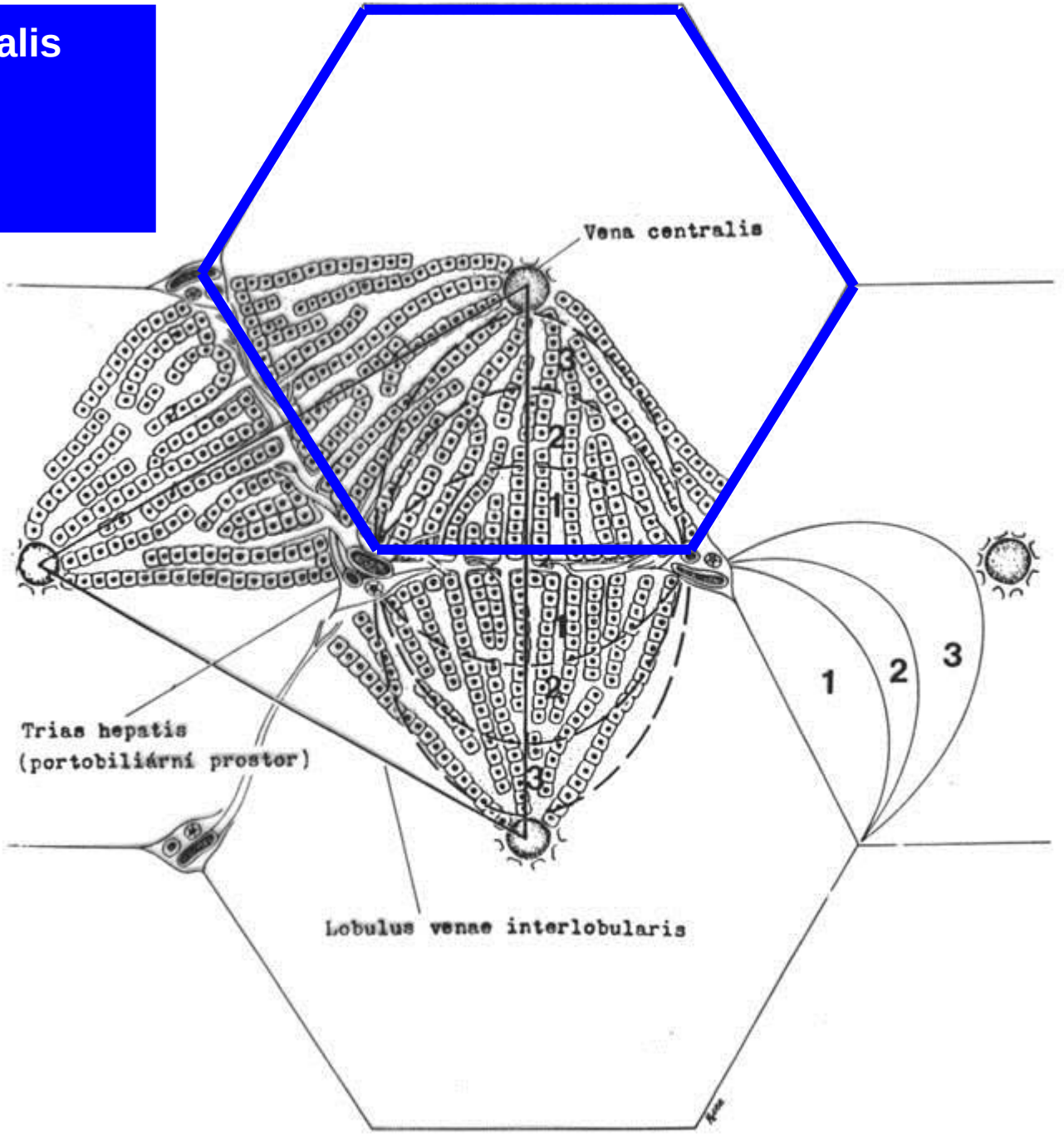


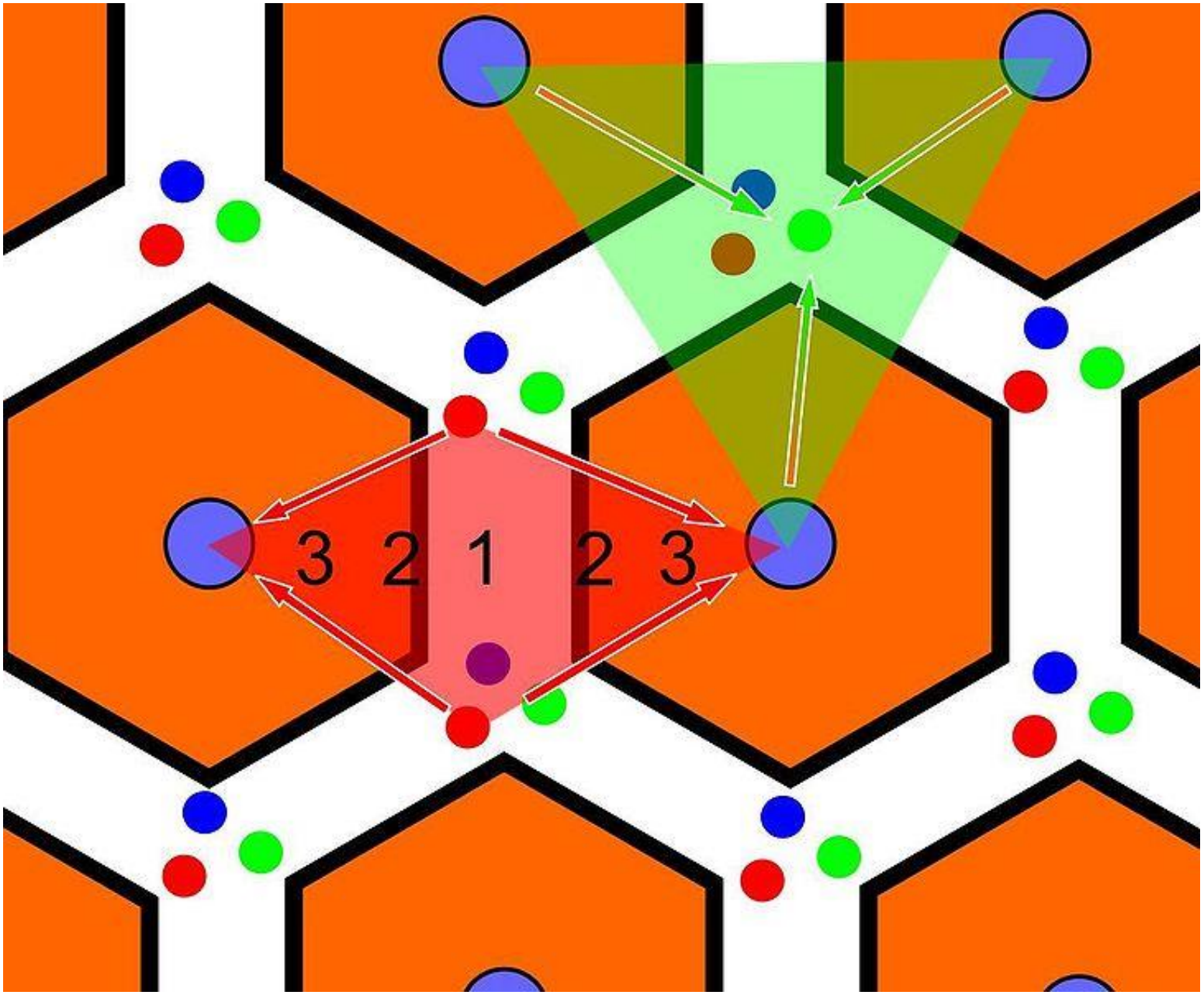


Lobulus venae centralis

=

Structural unit




3 2 1 2 3

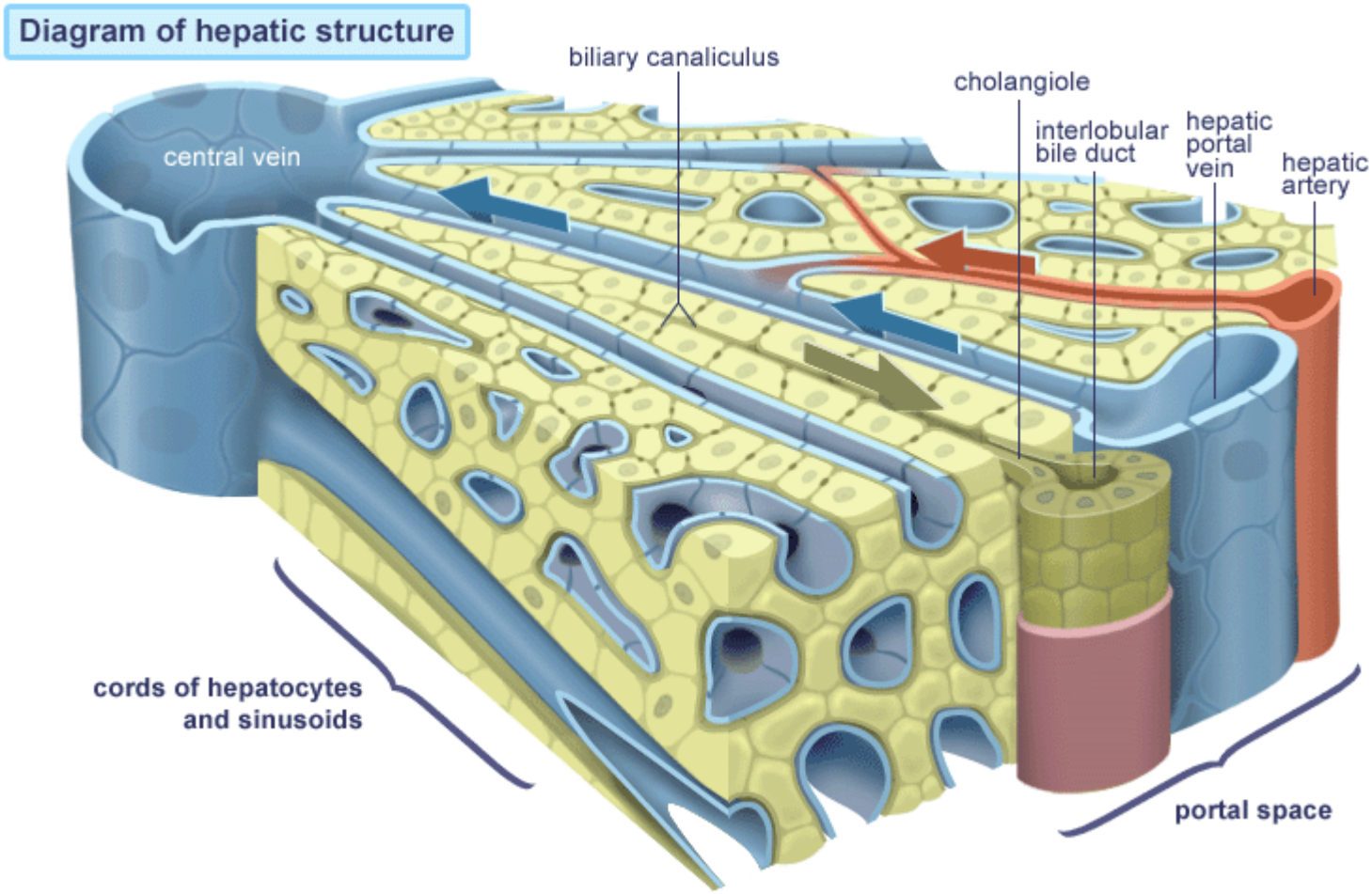
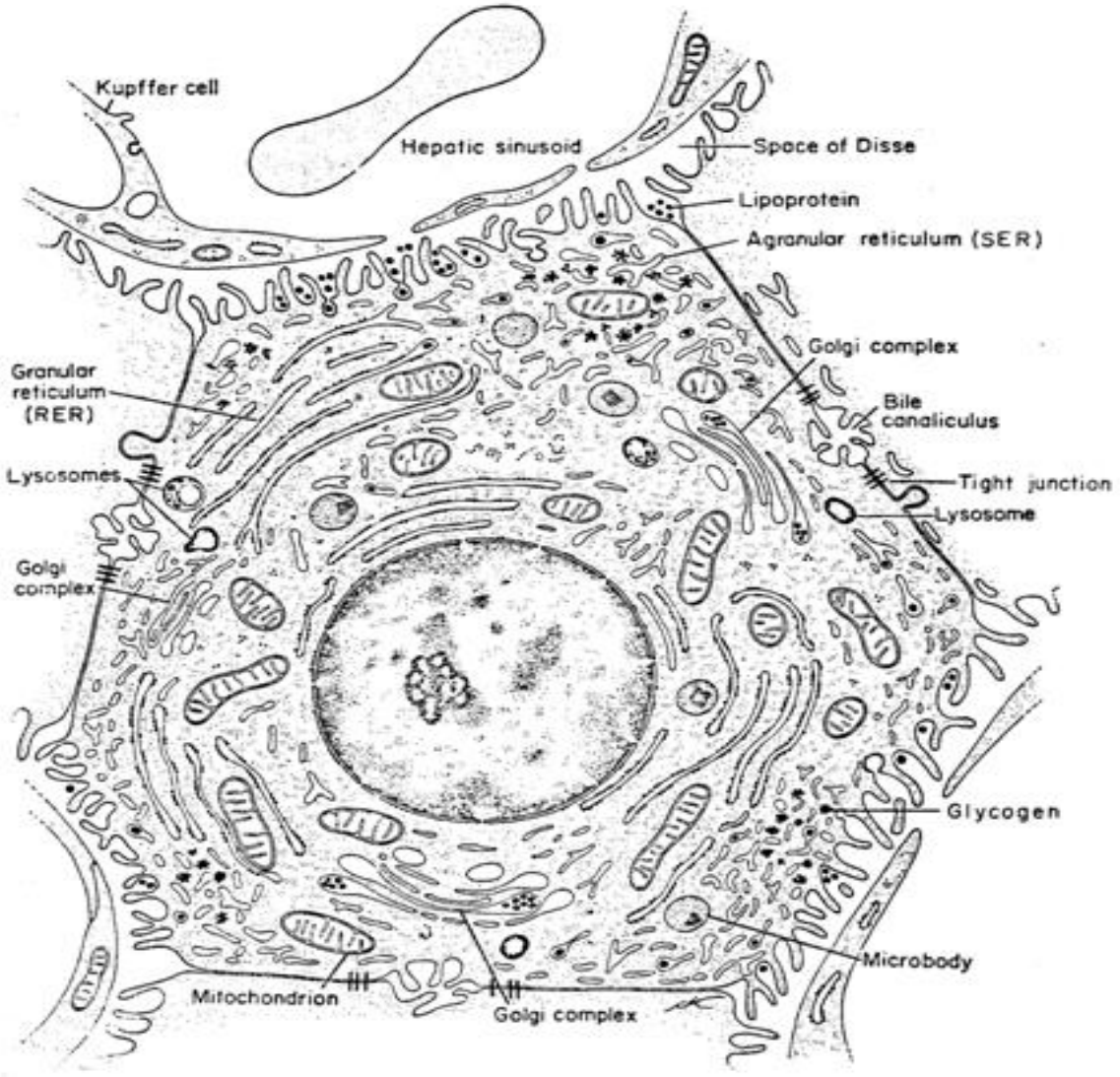
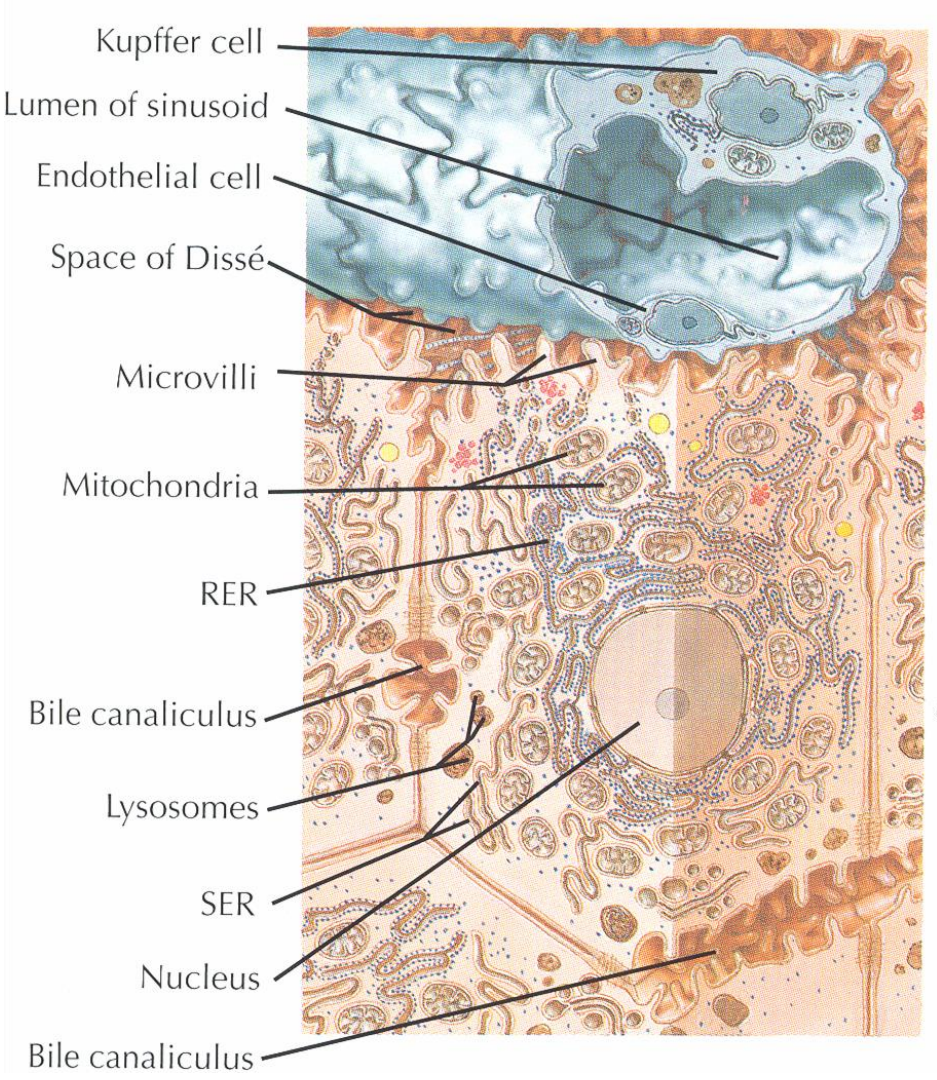
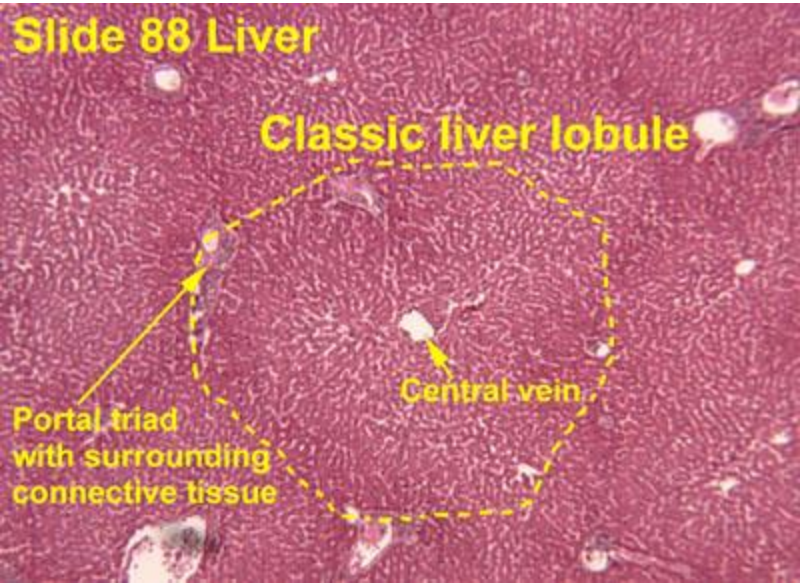


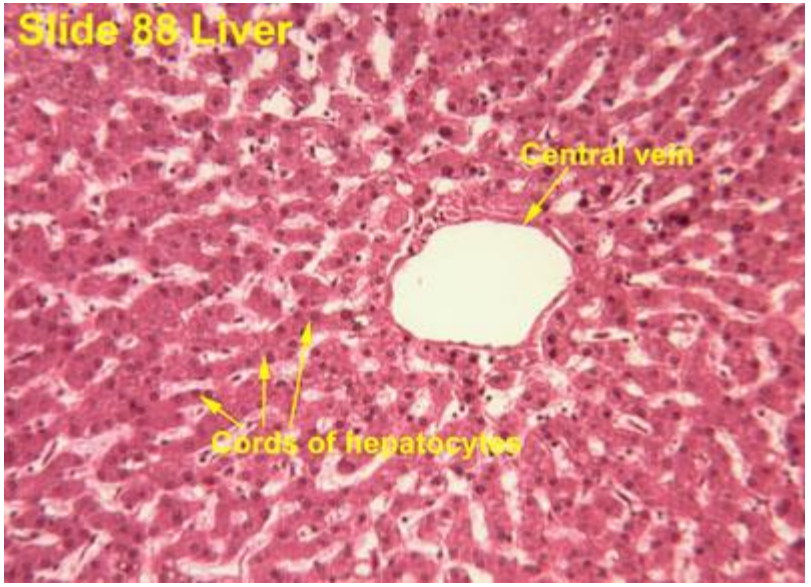
Diagram of hepatic structure
biliary canaliculus
cholangiole
interlobular bile duct
hepatic portal vein
hepatic artery
central vein
cords of hepatocytes and sinusoids
portal space

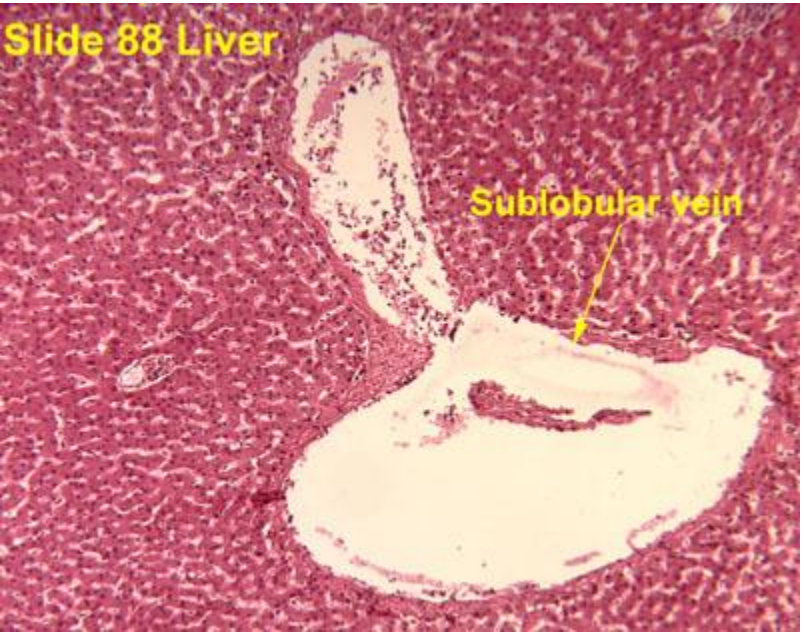
Jaterní buňka (hepatocyt)

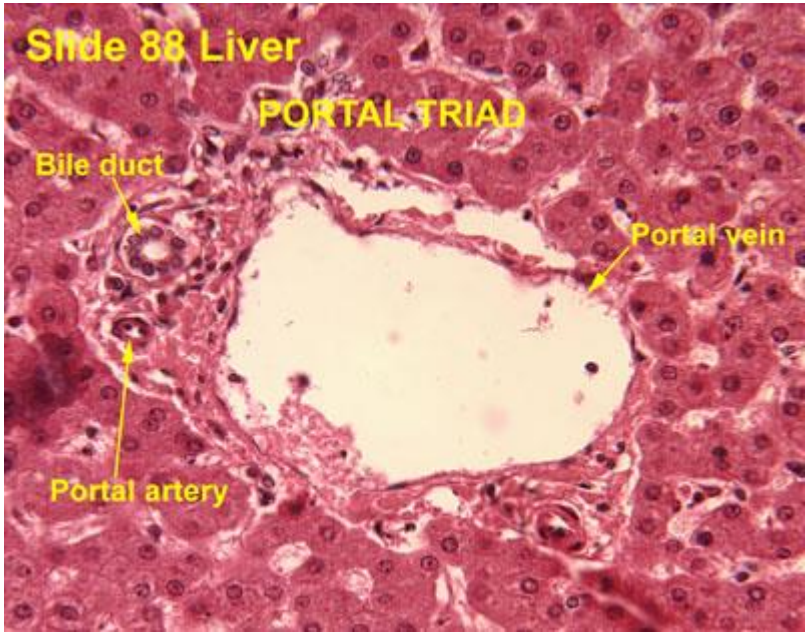



Kupffer cell
Lumen of sinusoid
Endothelial cell
Space of Dissé
Microvilli
Mitochondria
RER
Bile canaliculus
Lysosomes
SER
Nucleus
Bile canaliculus

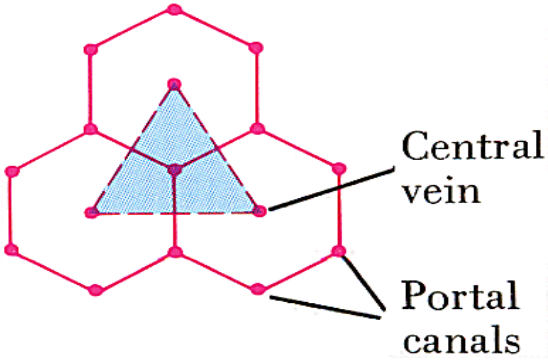

Slide 88 Liver
Classic liver lobule
Central vein
Portal triad
with surrounding
connective tissue

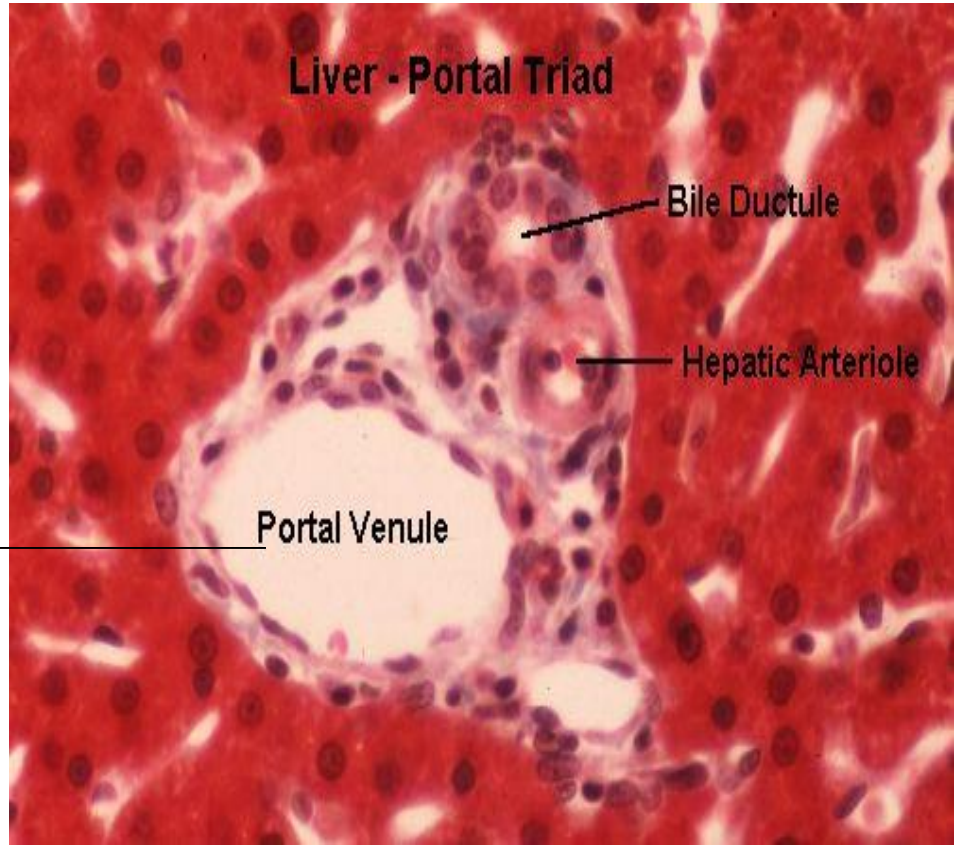

Slide 88 Liver
Central vein
Cords of hepatocytes


Slide 88 Liver
Sublobular vein


Slide 88 Liver
PORTAL TRIAD
Bile duct
Portal vein
Portal artery

area periportalis (Glissoni)



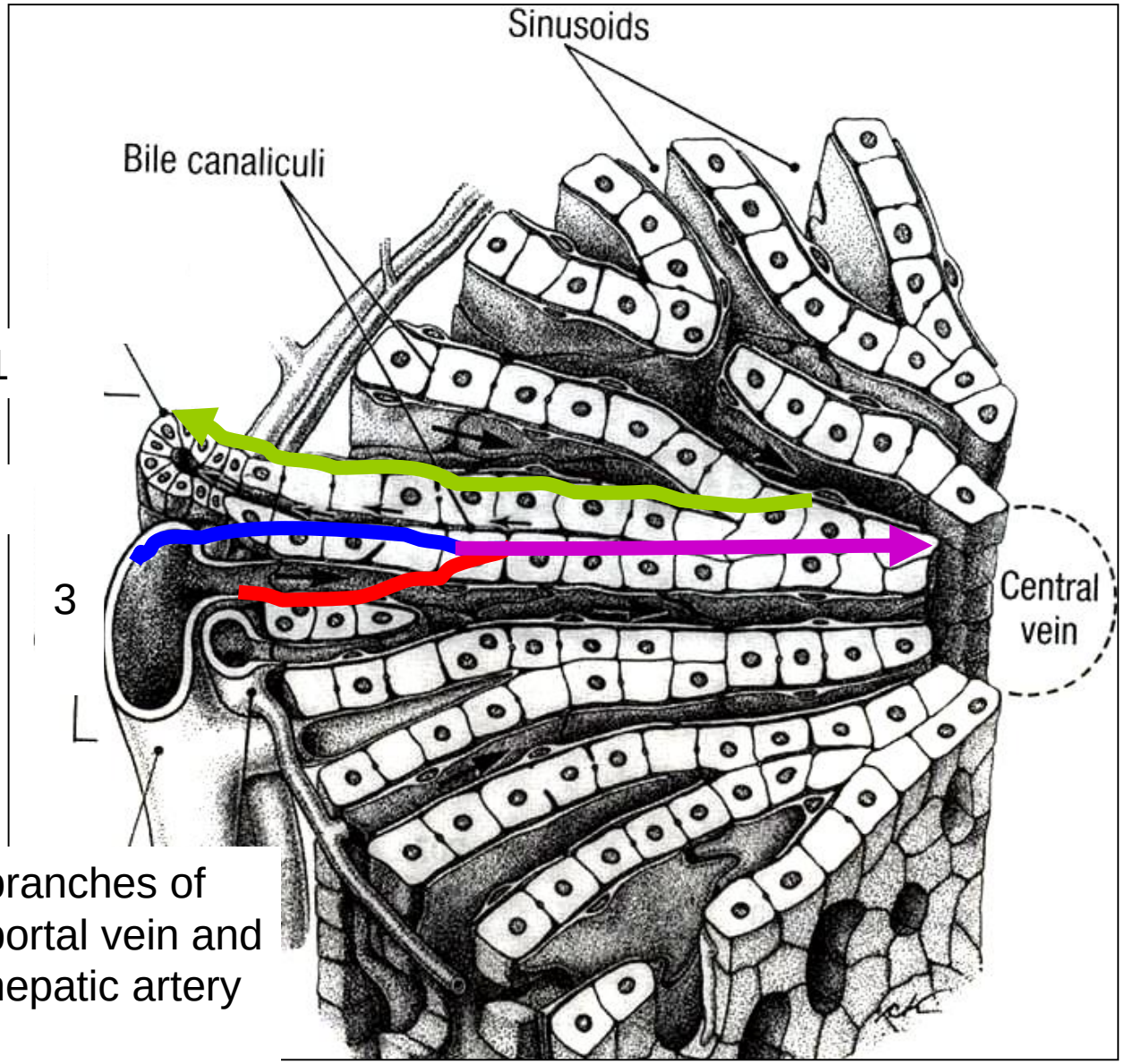


Portal triad (Glissoni):

Interlobular
Bile duct – 1

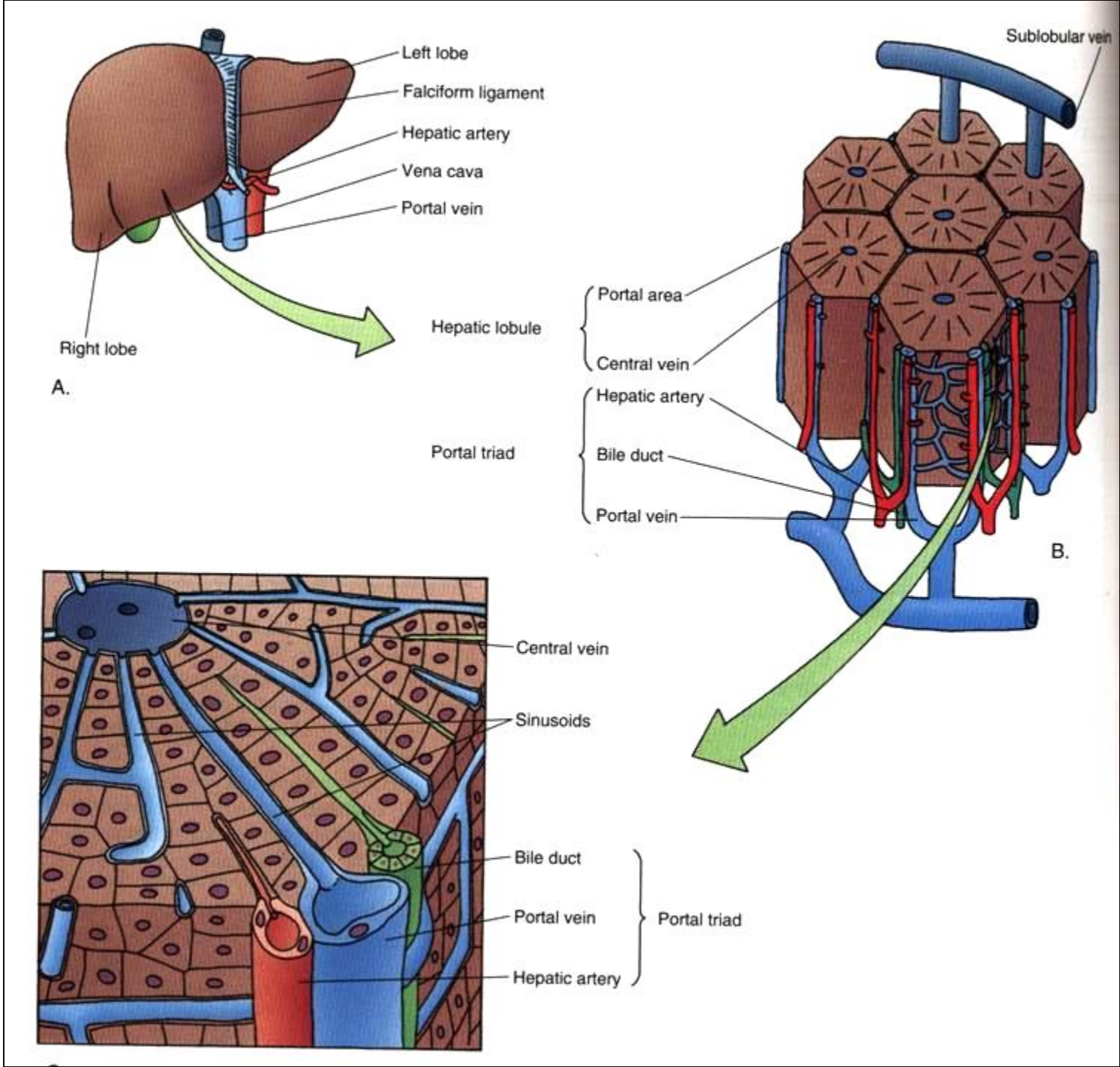
Vein – 2

Artery – 3

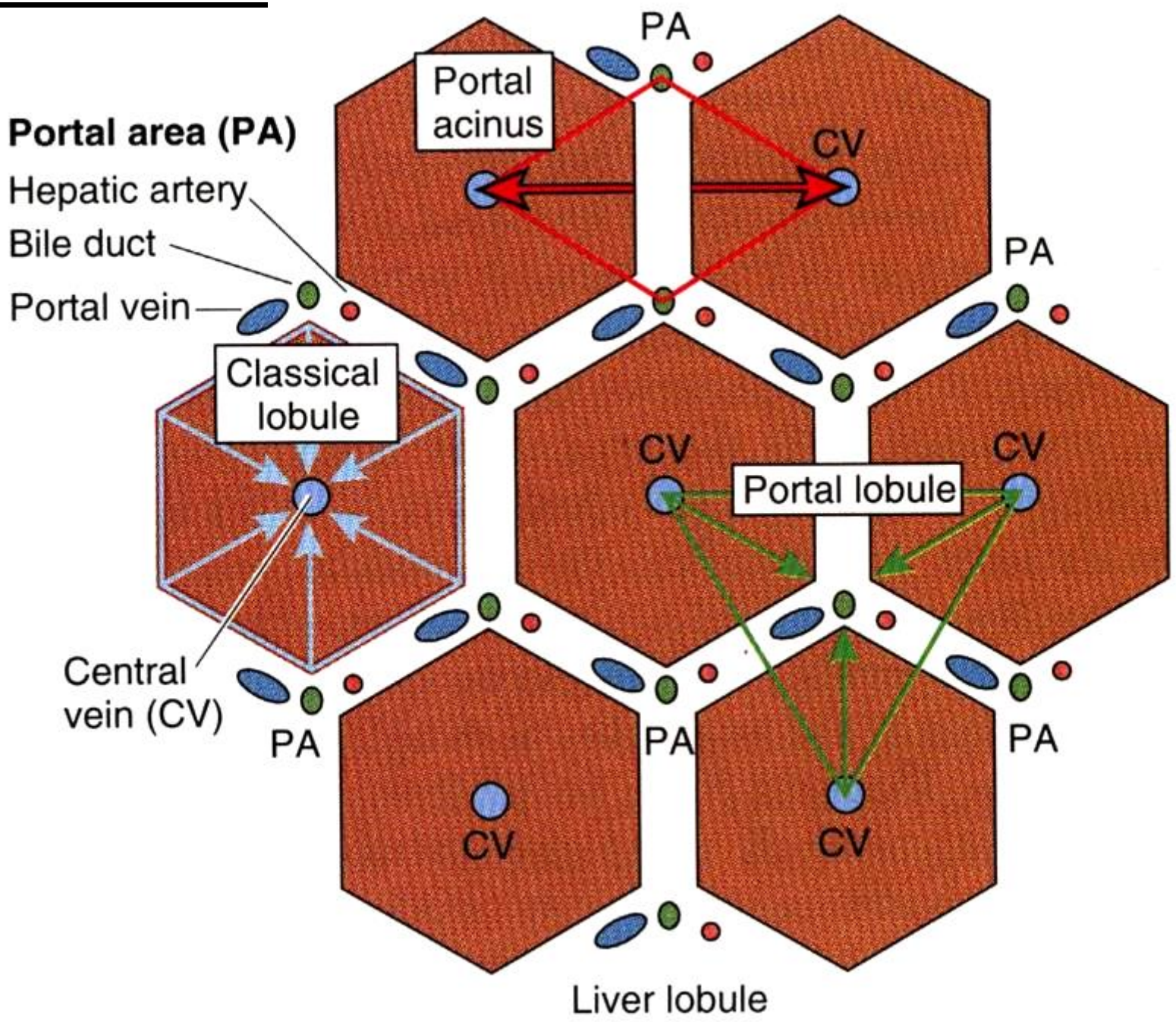


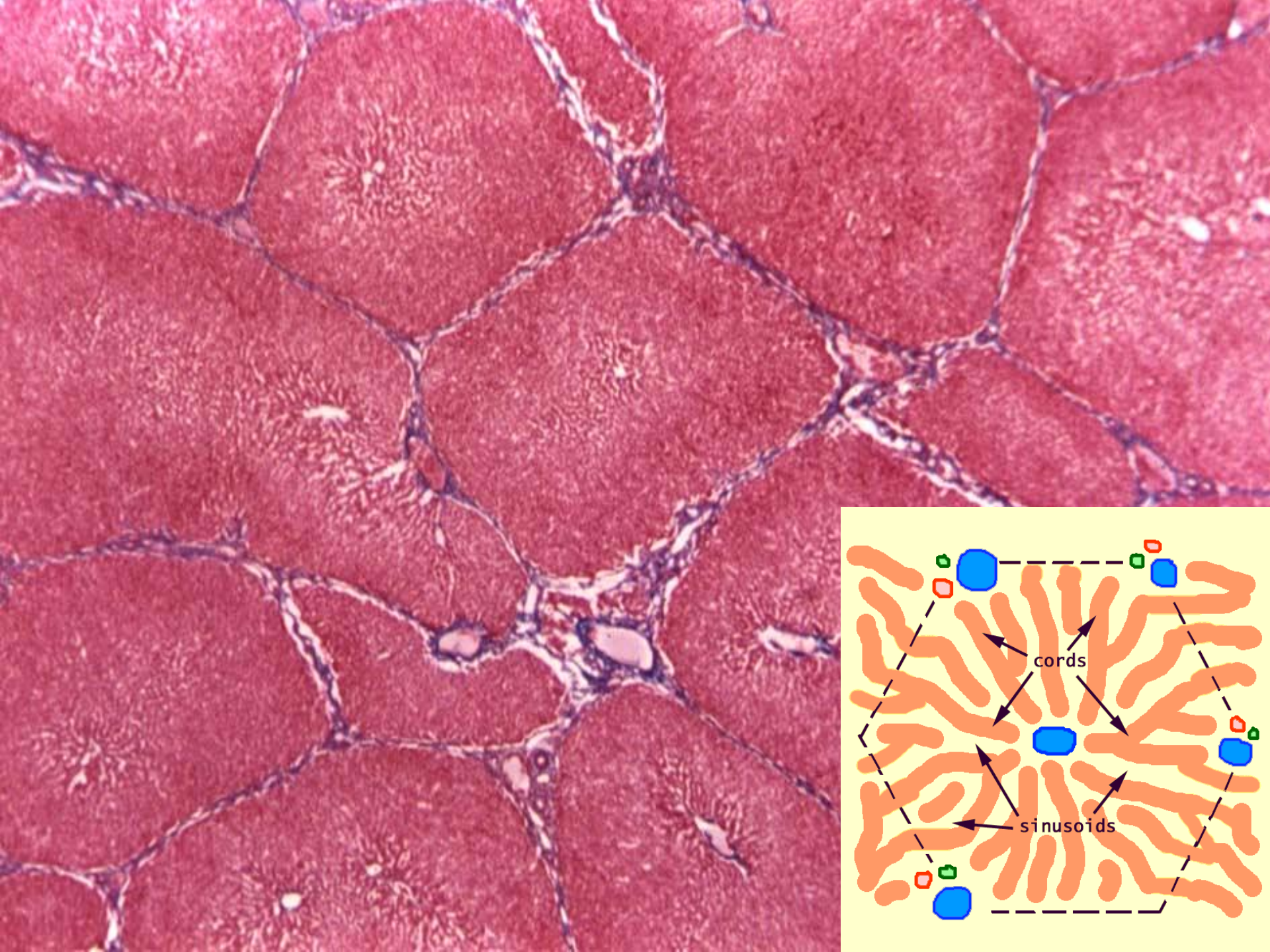
branches of portal vein and hepatic artery

Circulation in liver

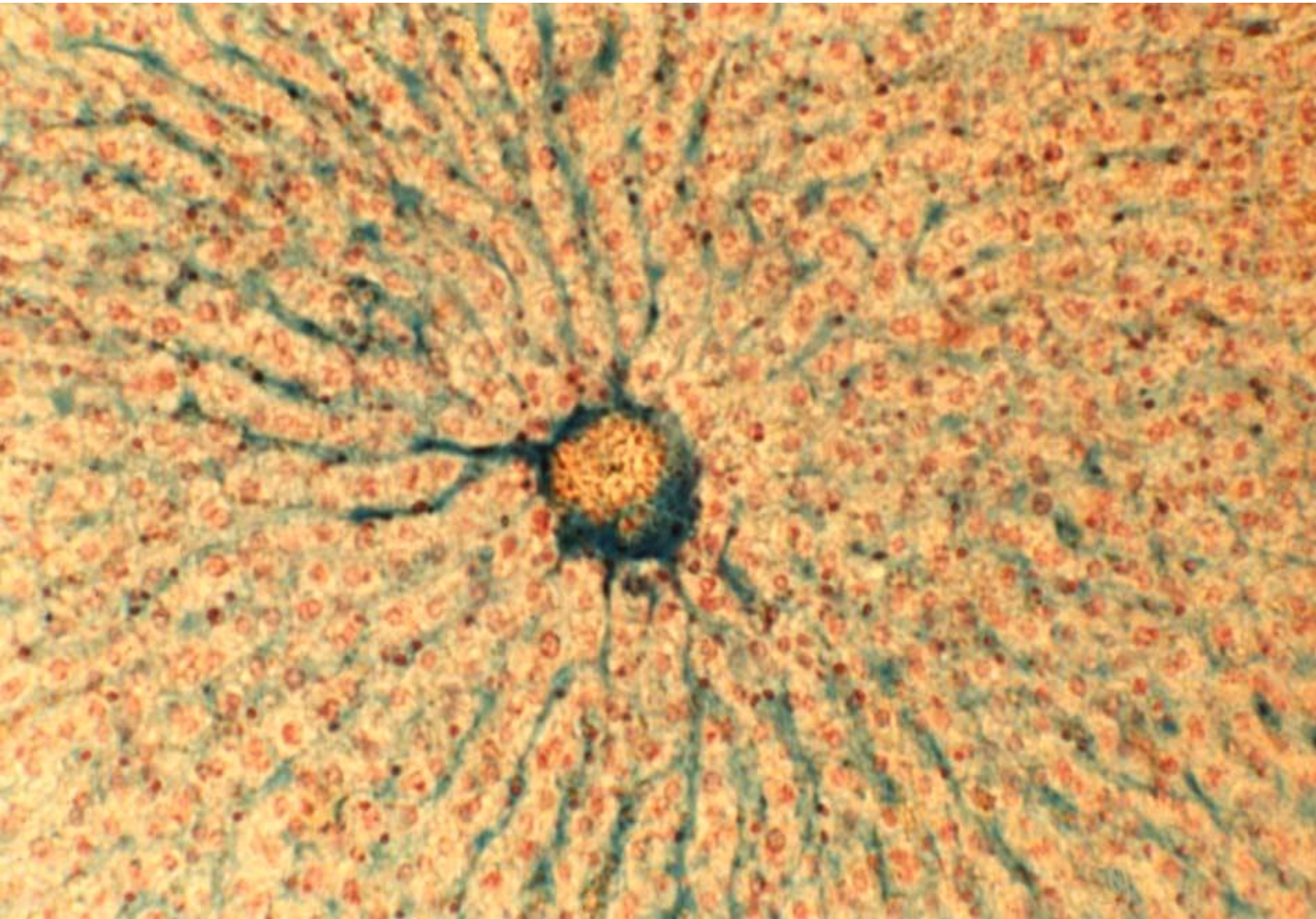


Portal acinus

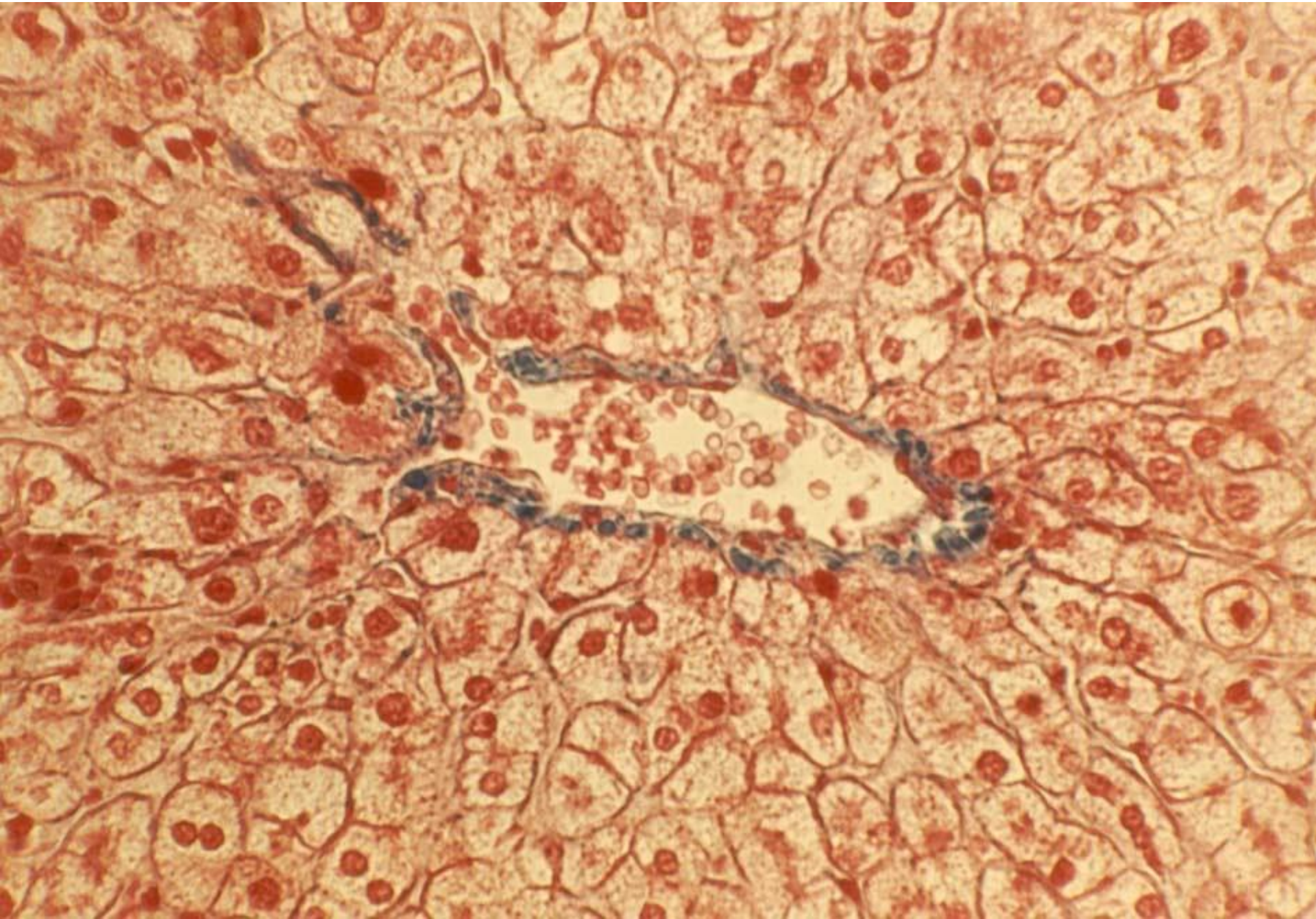



cords
sinusoids

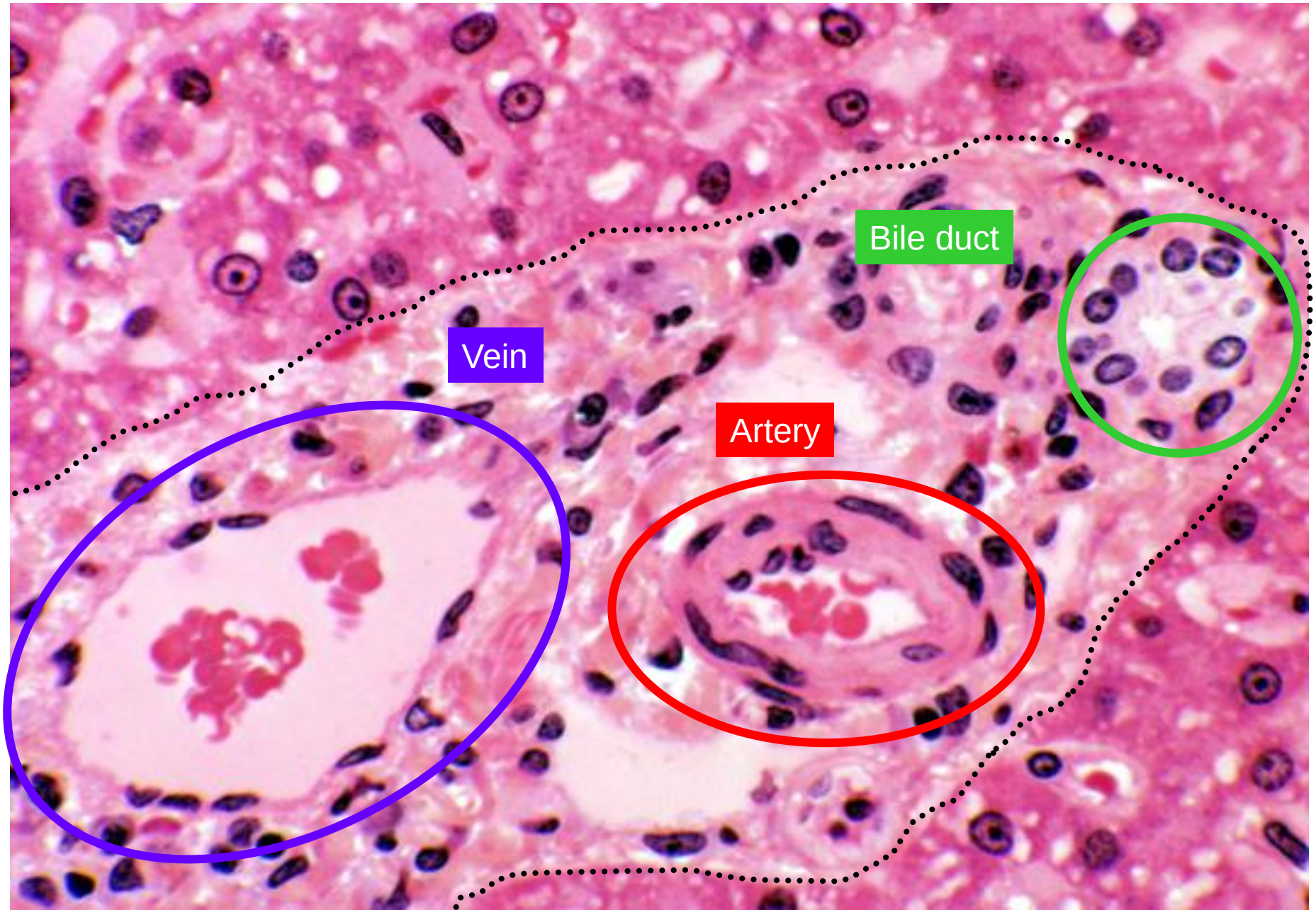
Sinusoids

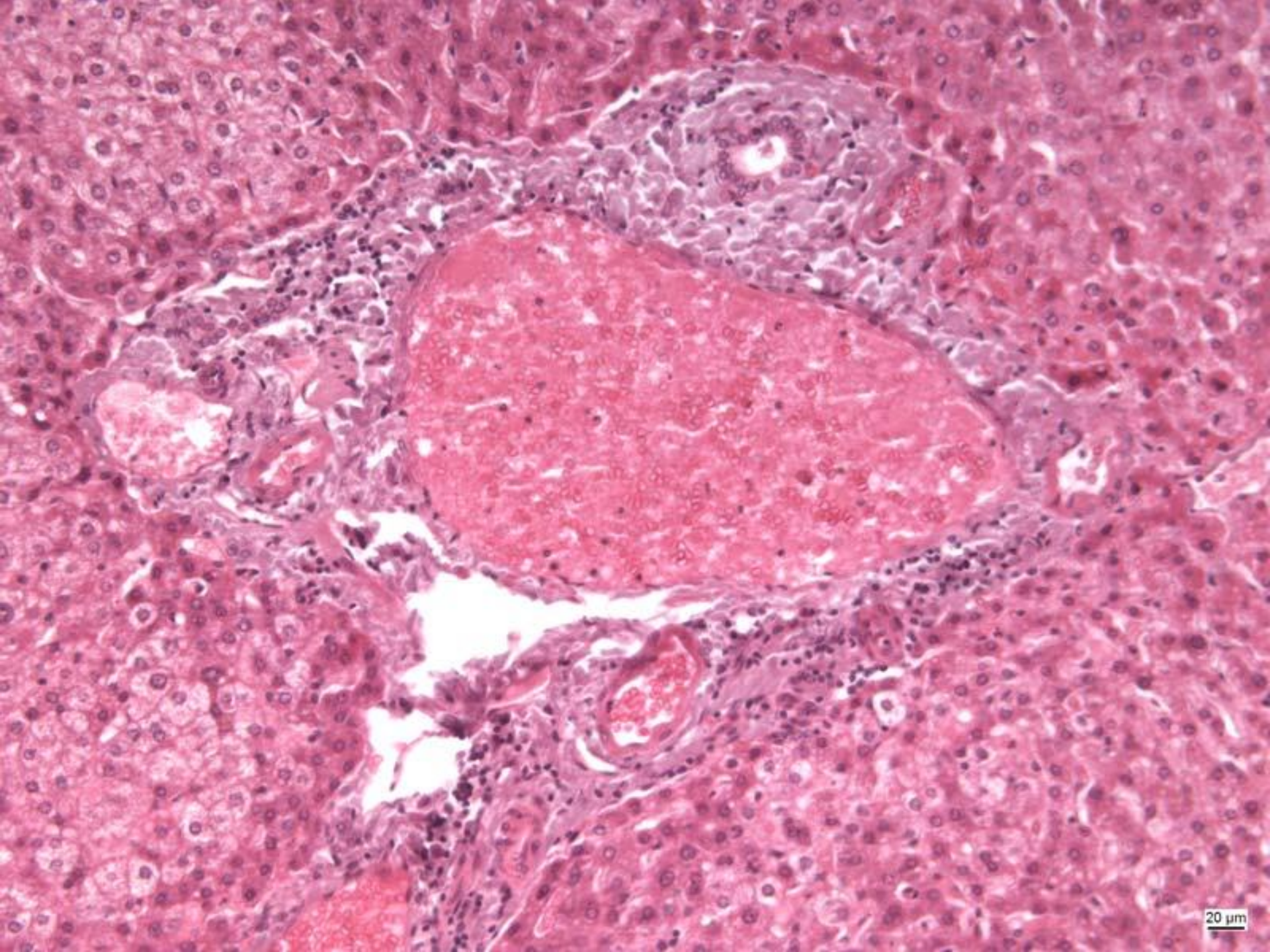


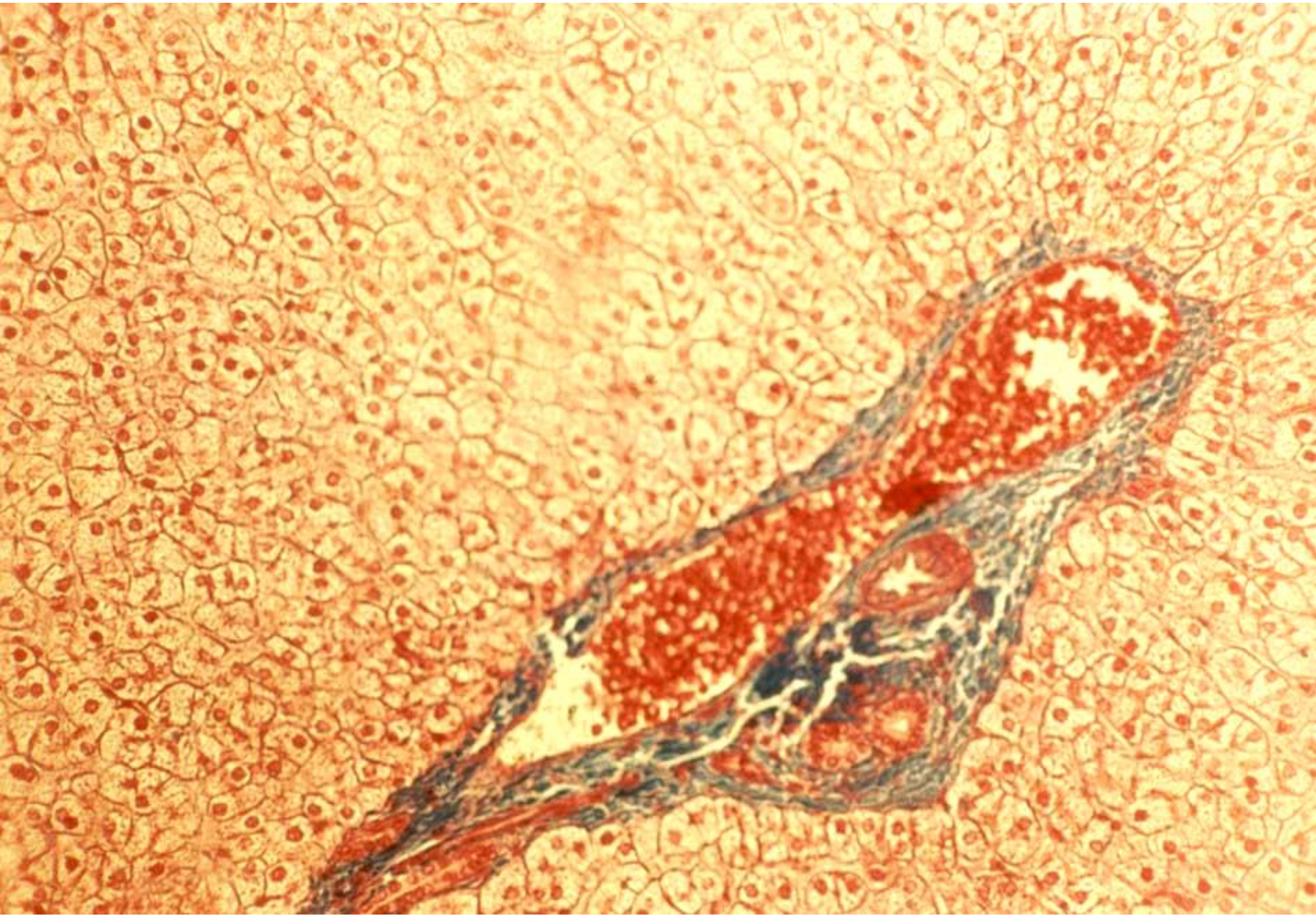
Vena centralis - AZAN



Trias hepatis in area periportalis

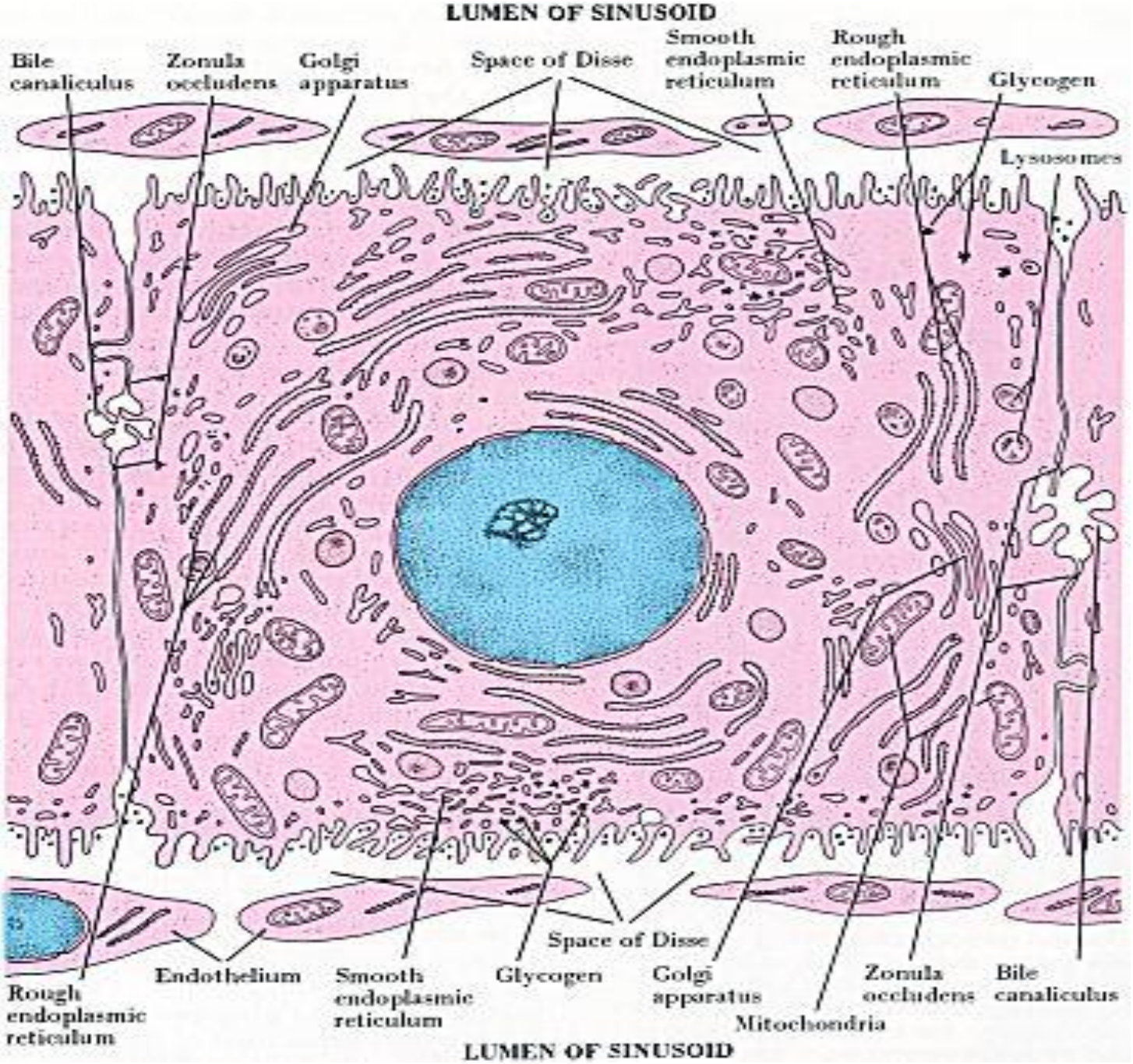



20 µm

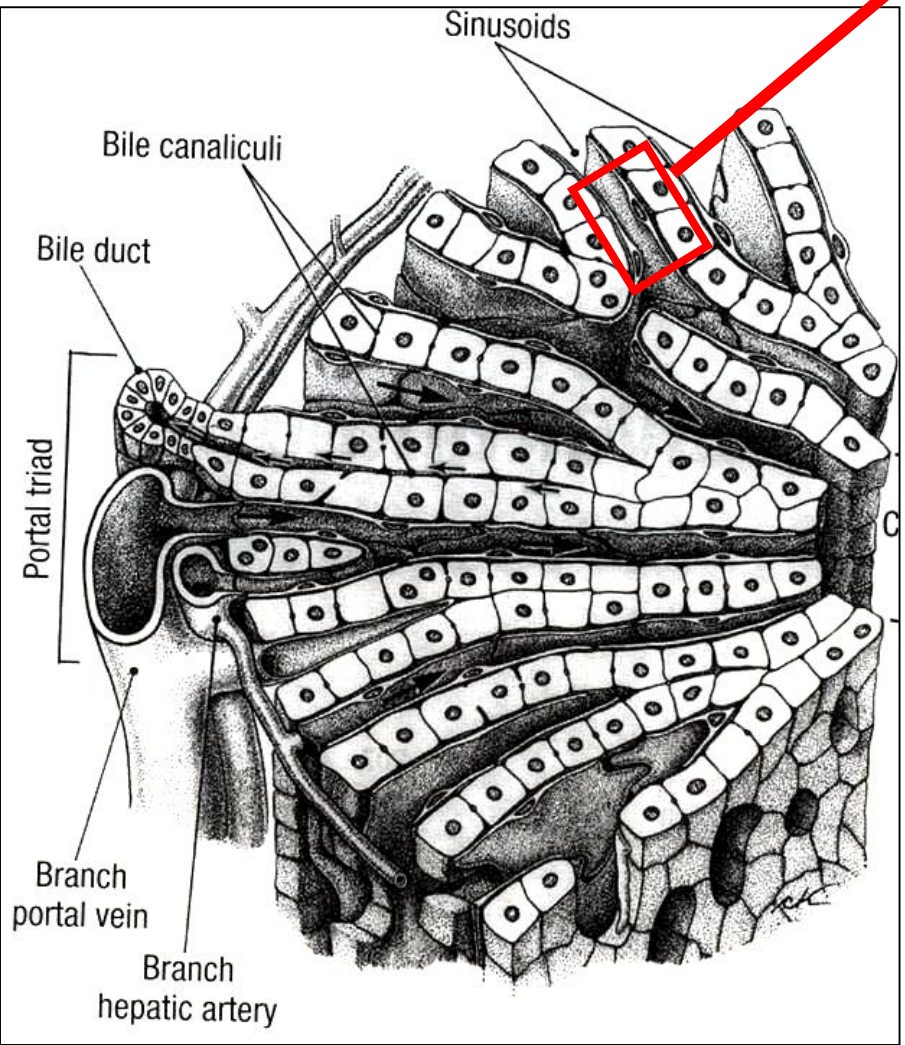


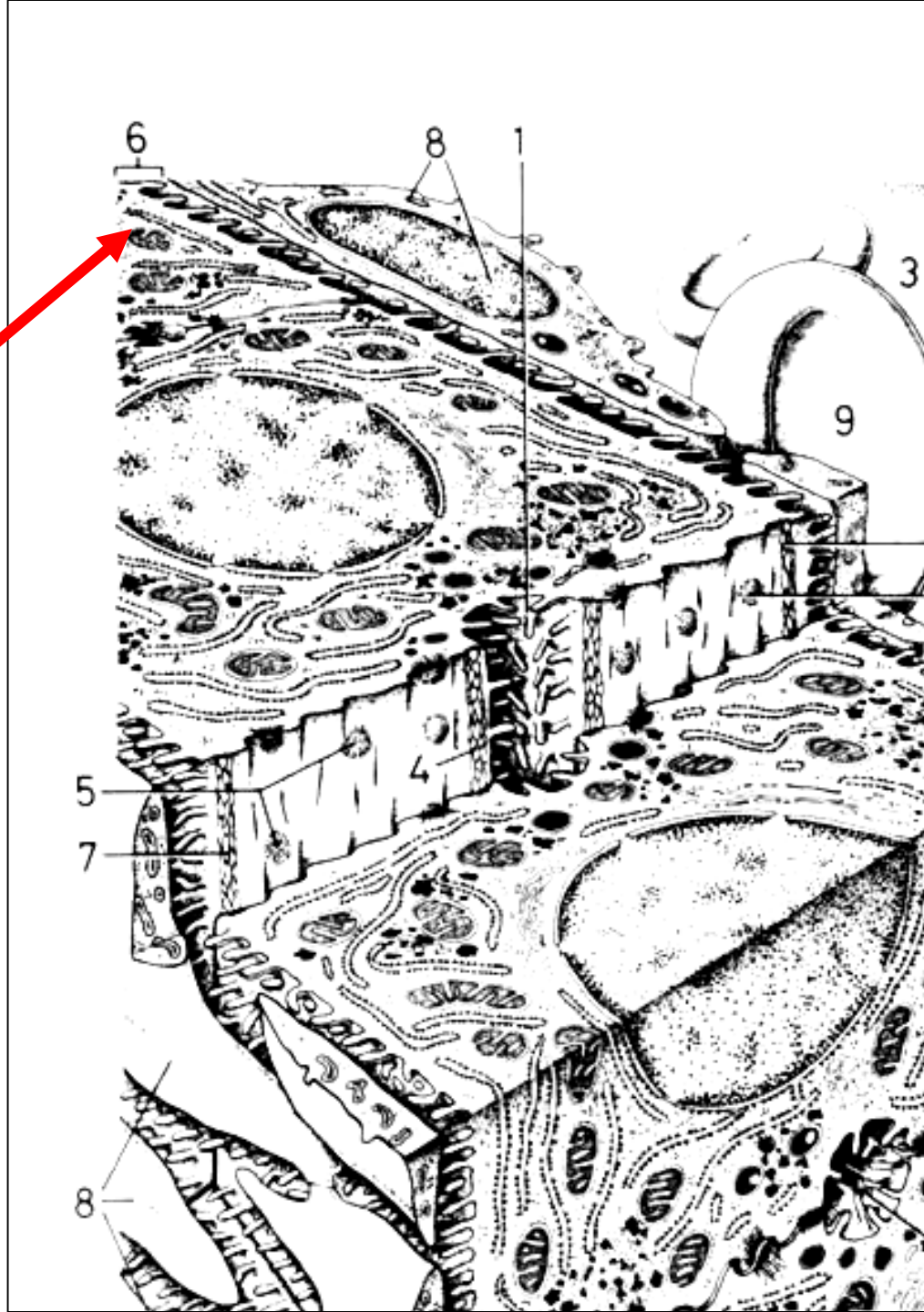
Sinusoids

- Modified blood capillaries – radially from periphery to v. centralis
- Fenestrated wall
- Endothelium and Kupfer cells
- lamina basalis absent
- Perisinusoidal space (Dissé) – between sinusoid wall and hepatocytes

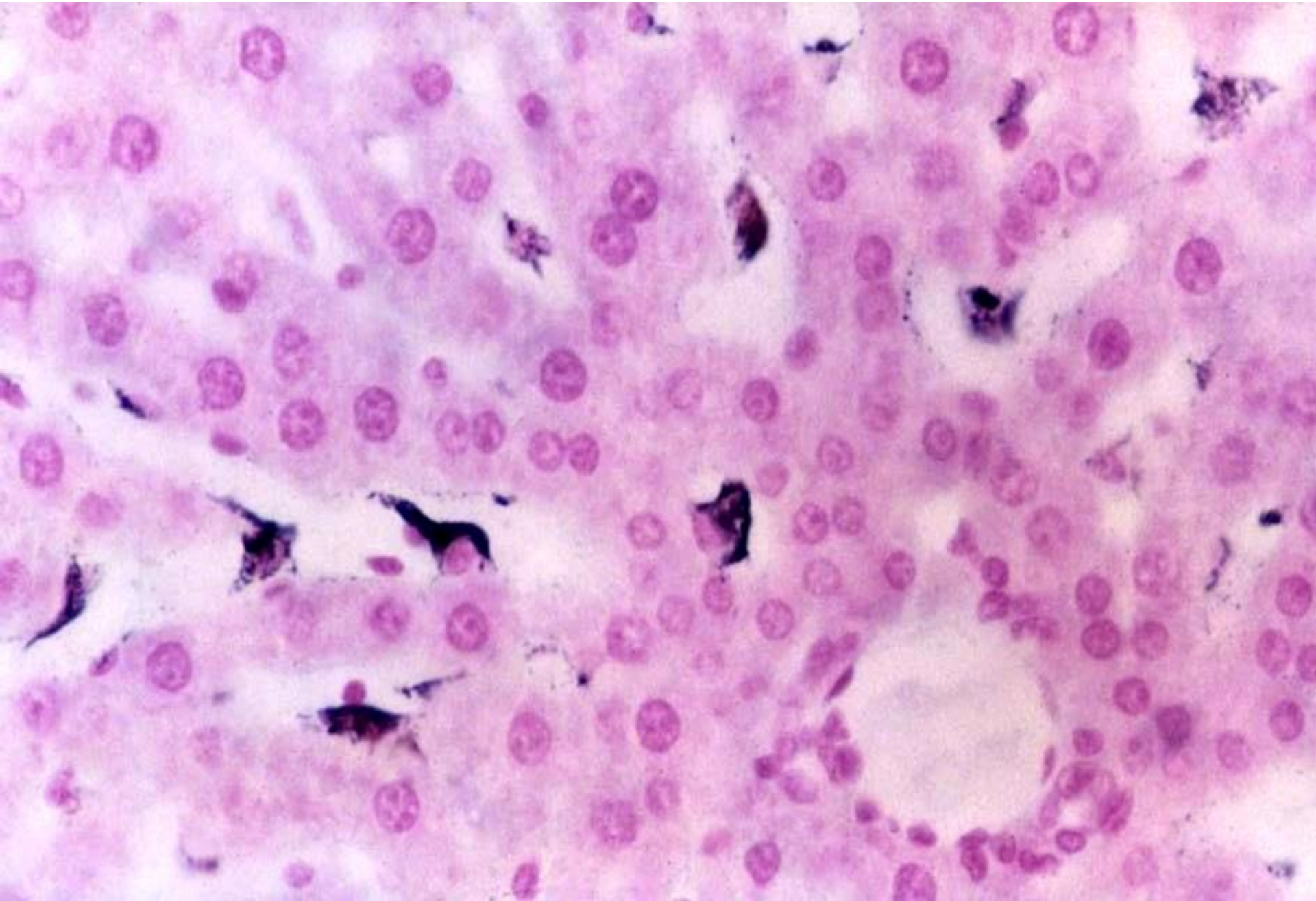

LUMEN OF SINUSOID
Bile canaliculus
Zonula occludens
Golgi apparatus
Space of Disse
Smooth endoplasmic reticulum
Rough endoplasmic reticulum
Glycogen
Lysosomes
Space of Disse
Endothelium
Rough endoplasmic reticulum
Smooth endoplasmic reticulum
Glycogen
Golgi apparatus
Mitochondria
Zonula occludens
Bile canaliculus
LUMEN OF SINUSOID

Intercellular bile duct (bile capilary))

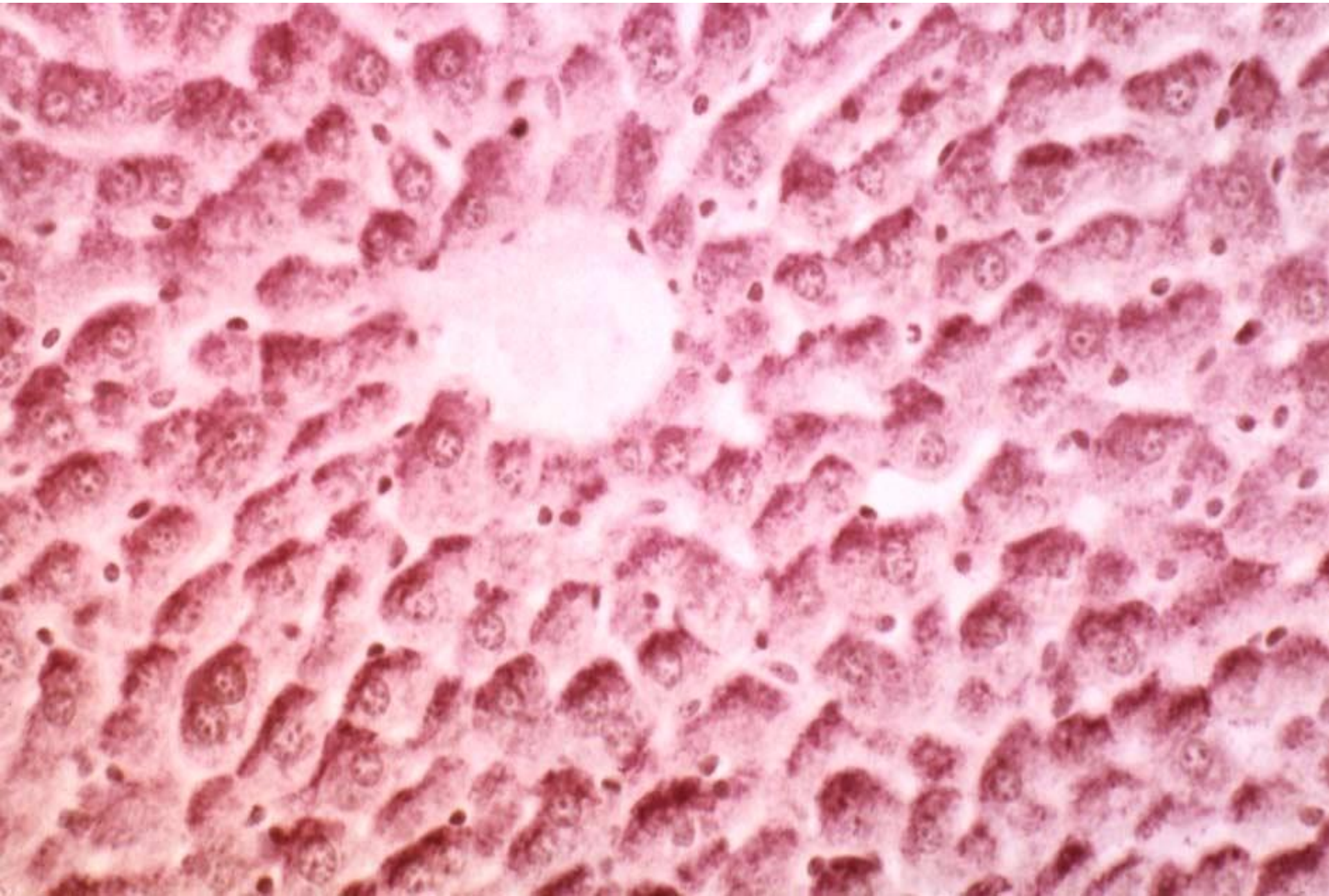




Sinusoids – Kupffer cells



Hepatocytes – glycogen (PAS)



Bile ducts

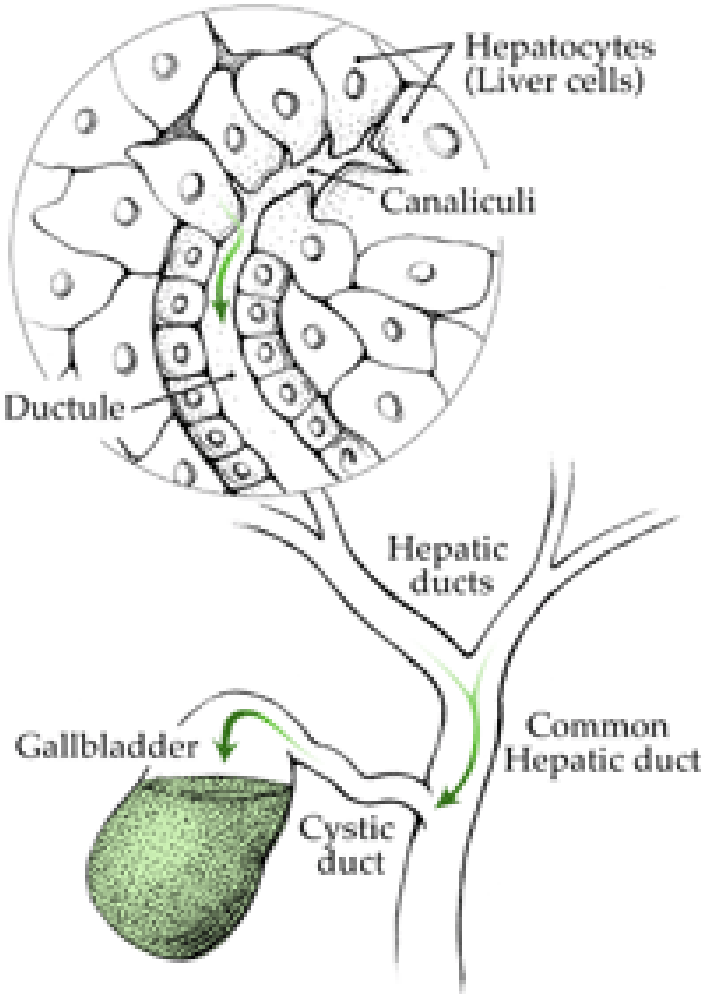
intrahepatic

- Bile capilaries (ducts)
- Canals of Hering
- Interlobular ducts
- Lobar ducts

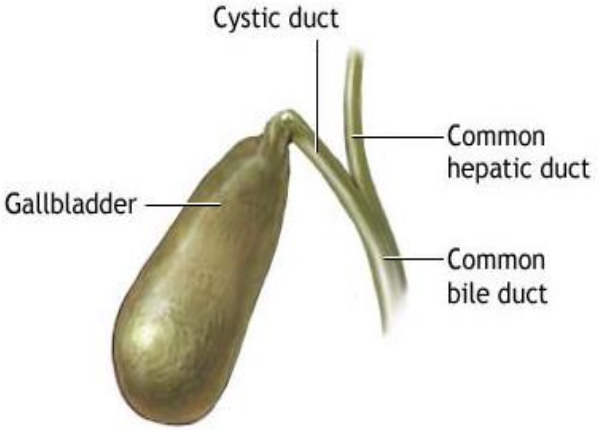
  (ductus hepaticus dex. et sin.)

extrahepatic

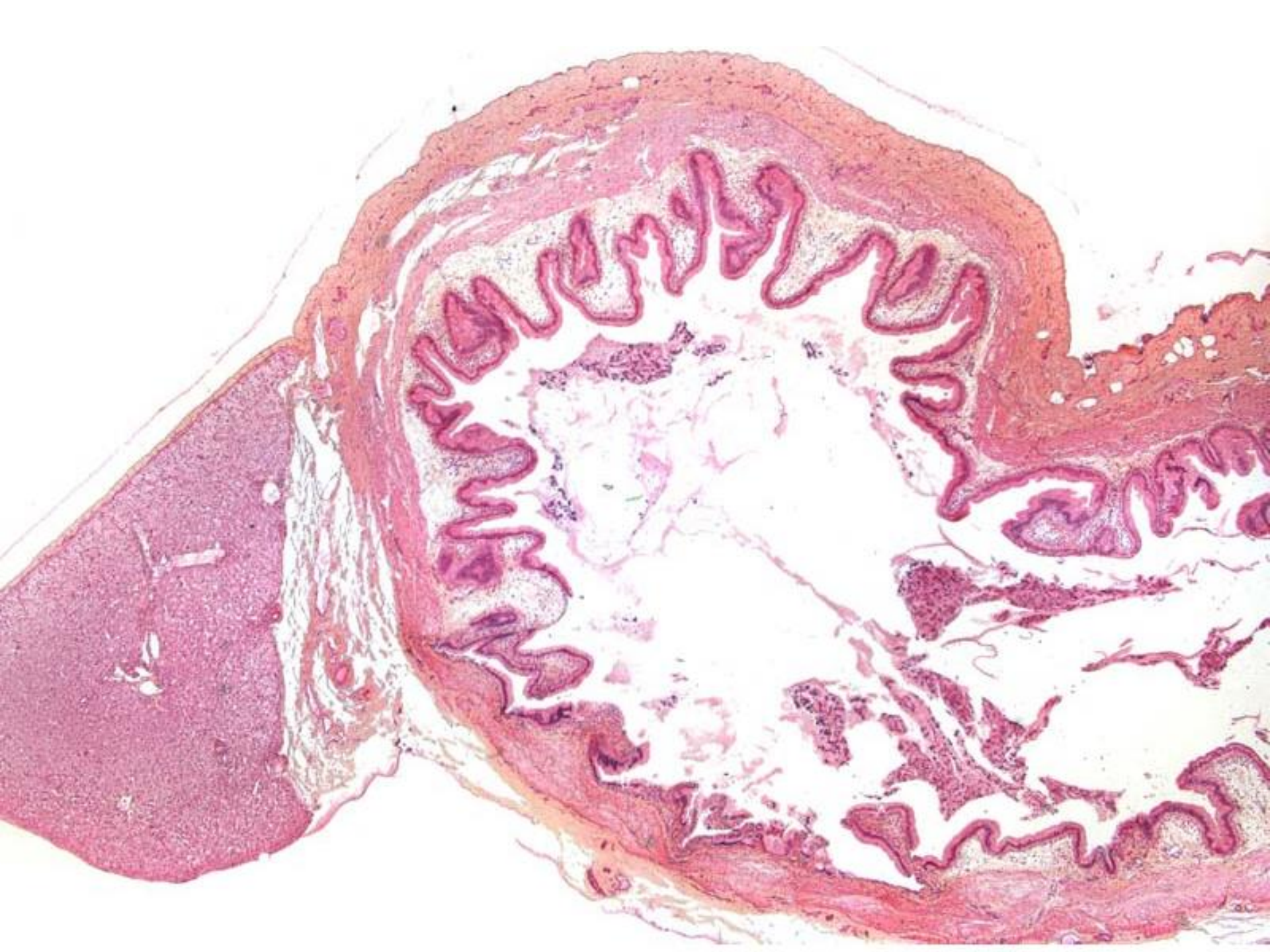
- ductus hepaticus
- ductus cysticus
- ductus choledochus



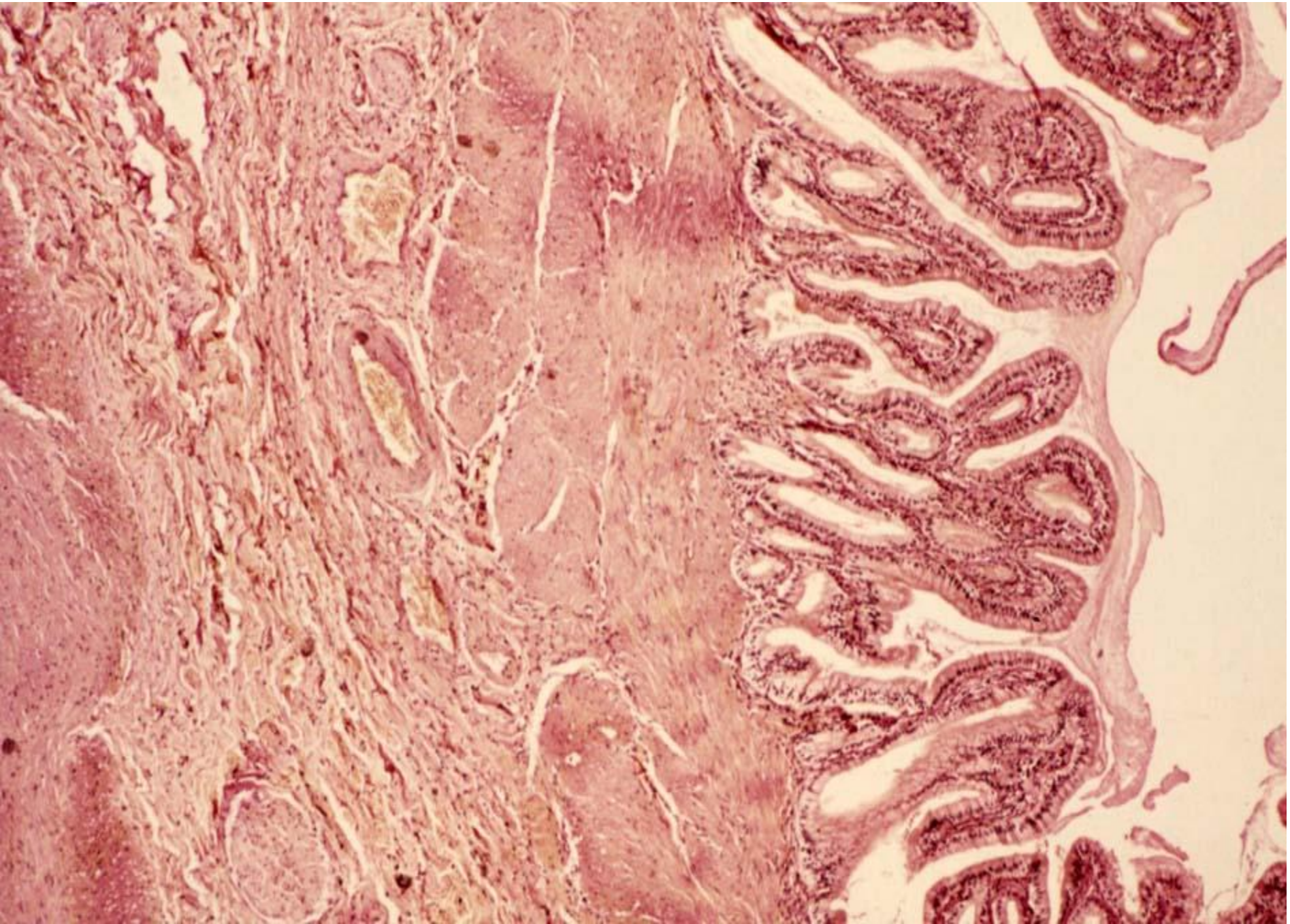
Gall bladder (vesica fellea)



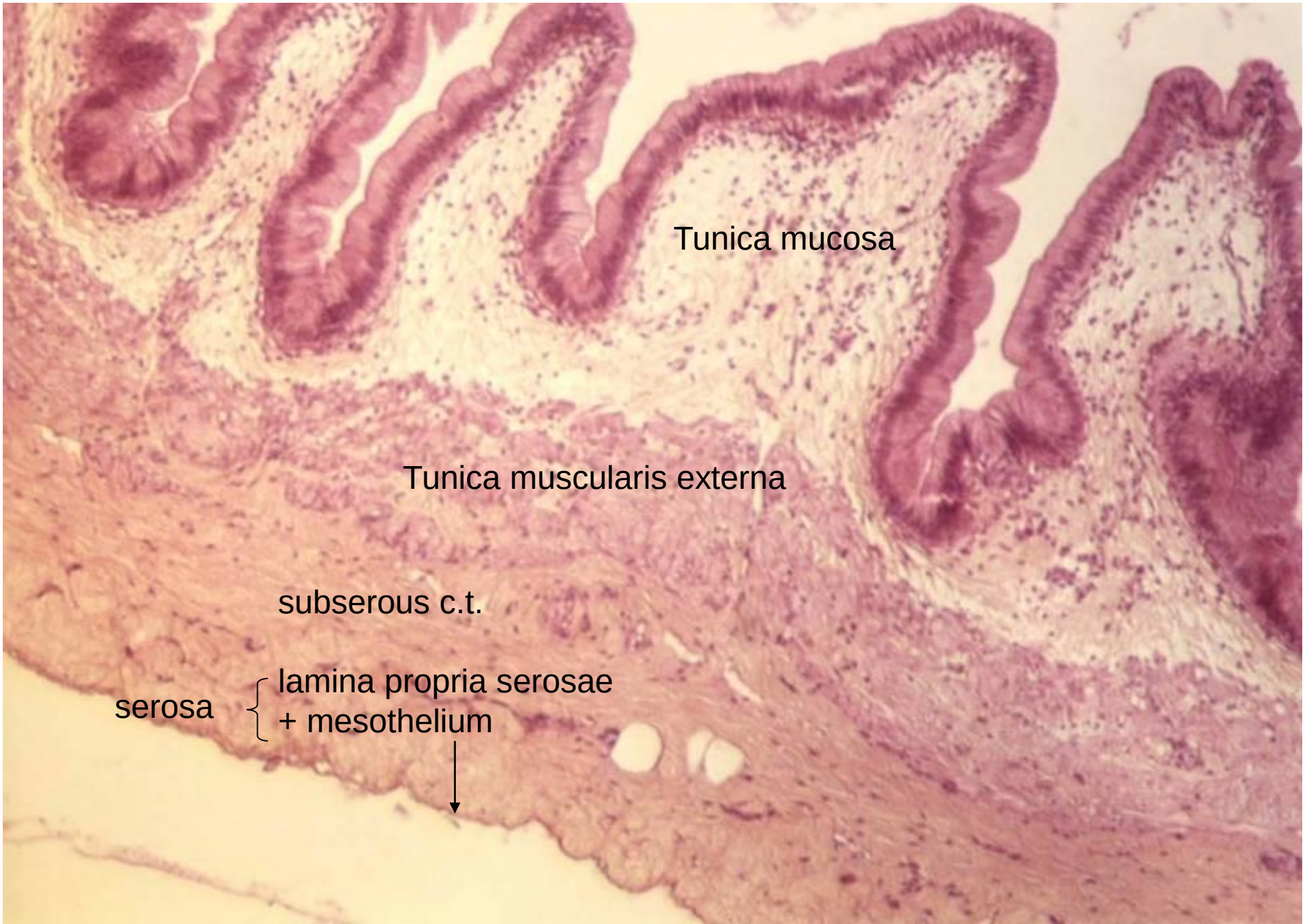
- mucosa
  - Folded
  - Simple columnar epithelium
  - lamina propria
  - Lamina muscularis absent
- Submucosa – fibromuscular layer
- Muscularis externa well developed
- Dominant subserous connective tissue (subserosa)
- Adventicia (liver) or serosa (free surface)



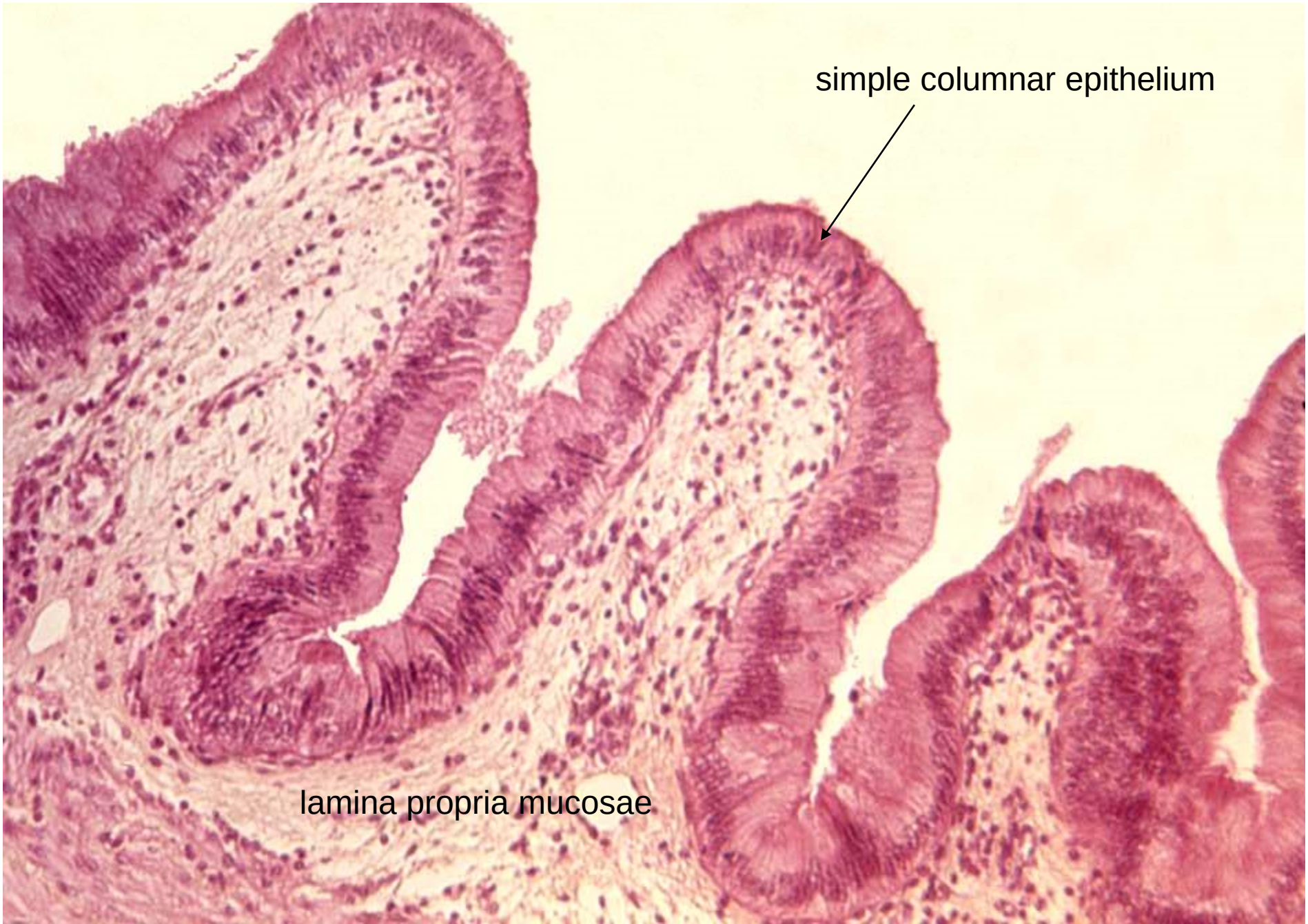
Vesica fellea



Vesica fellea



Vesica fellea – folds of mucosa



Pancreas

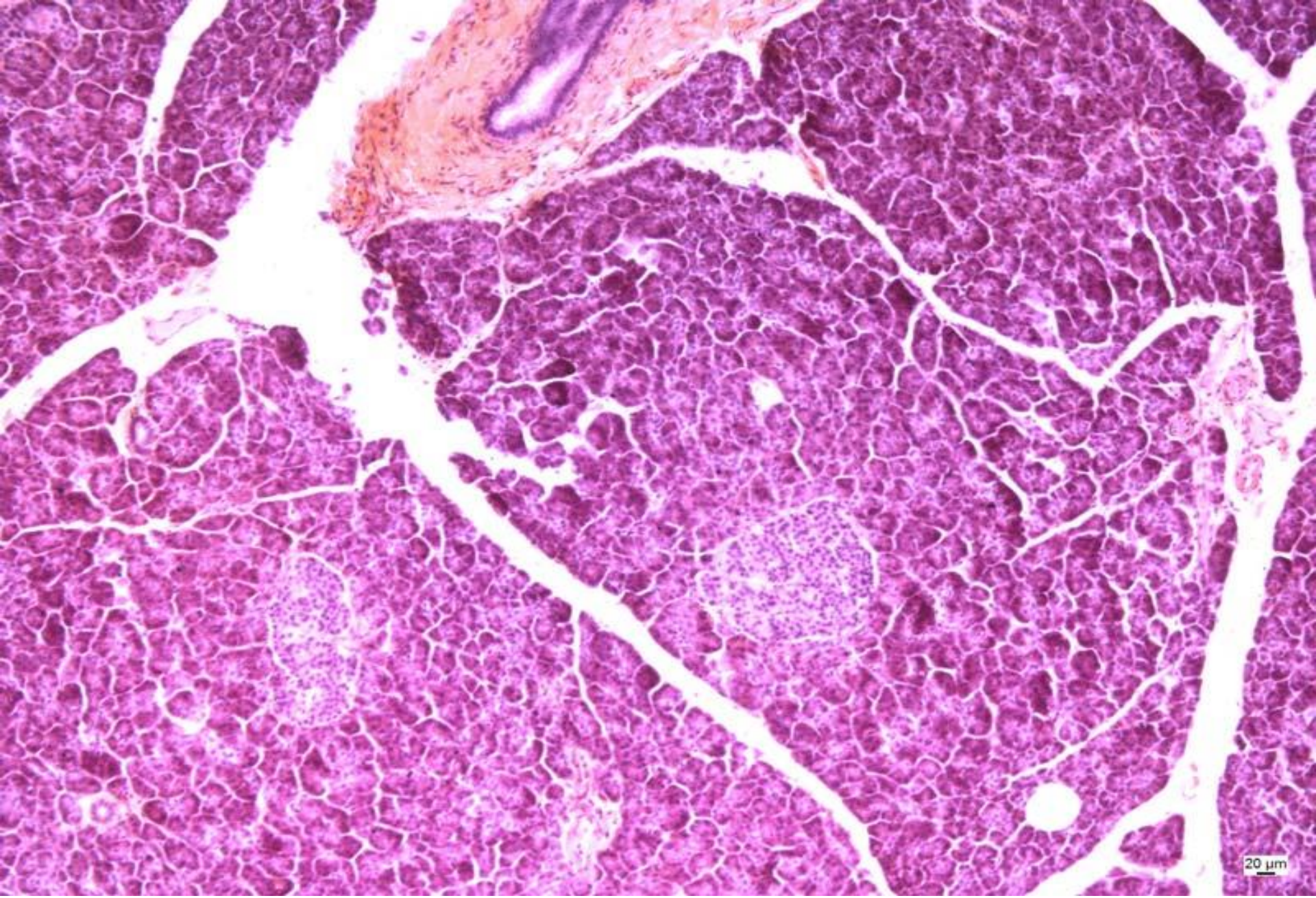
- Connective tissue cover (capsula fibrosa, septa)
- Parenchyma:

exocrine:

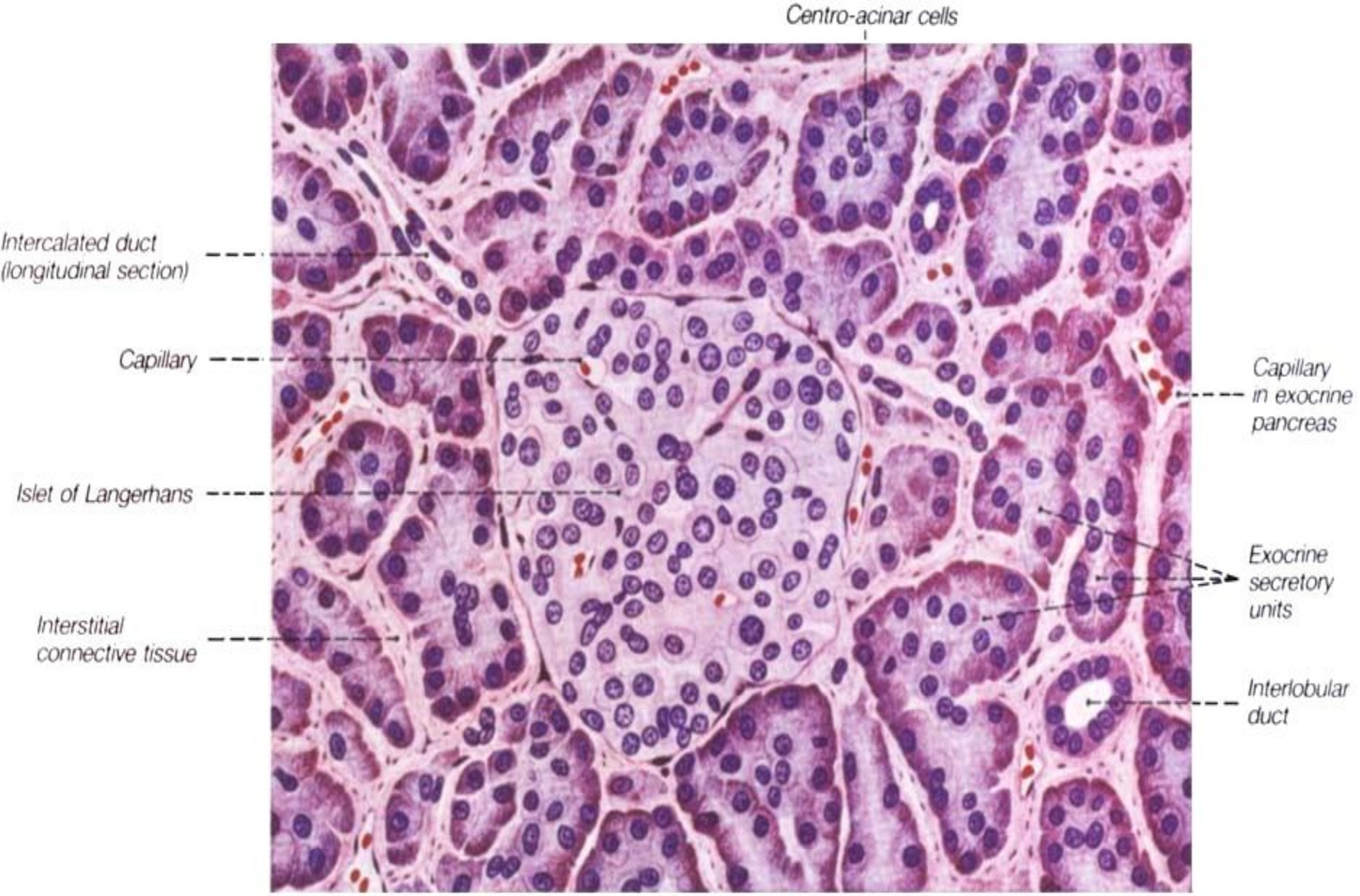
- serous acini (serous and centroacinar cells)

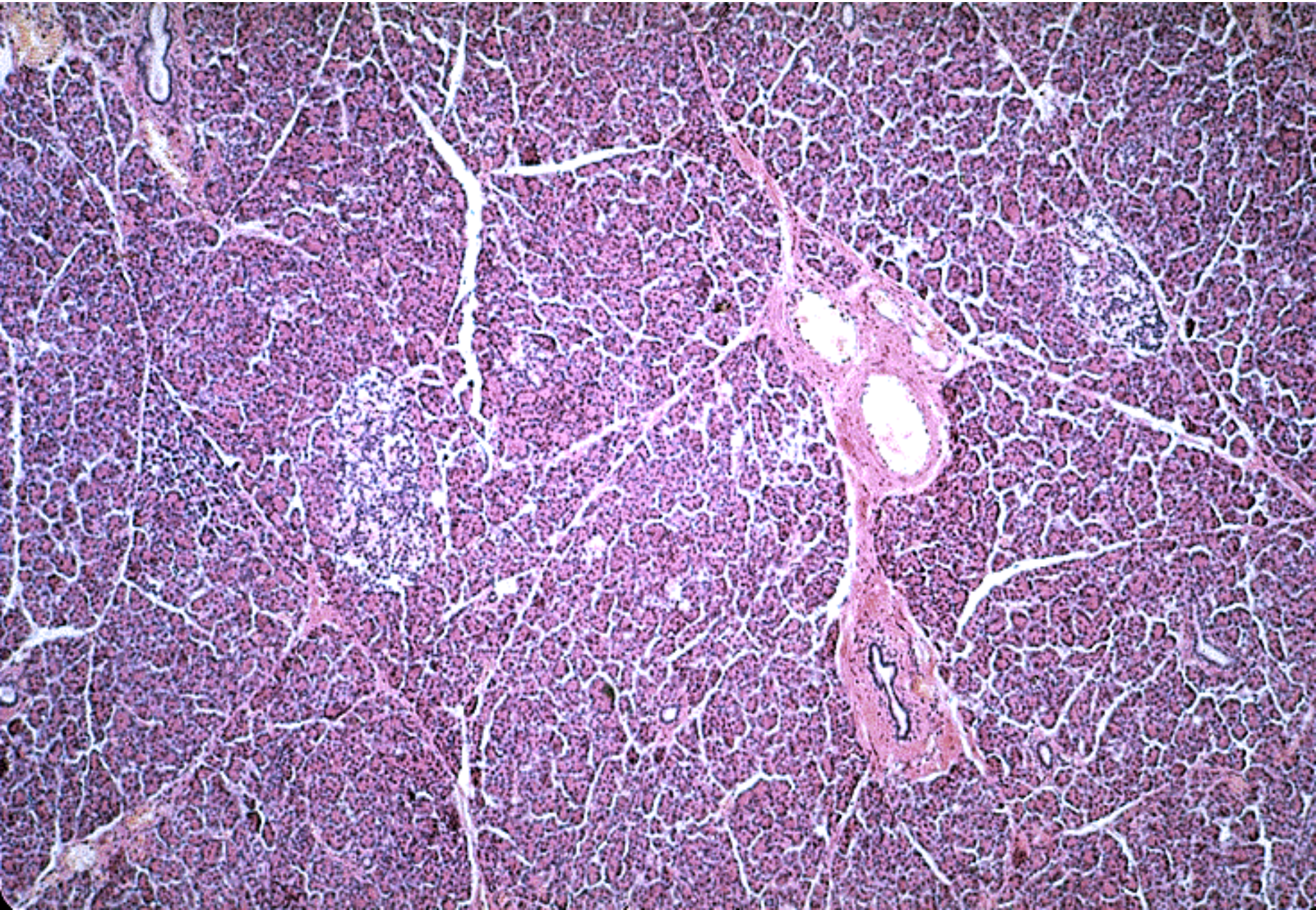
- ducts: intercalated, intra- and interlobular, main (ductus pancreaticus major et accessorius)

endocrine: islets of Langerhan(cells: A – glucagon, B – insulin, D – somatostatin, PP – pancreatic polypeptide)

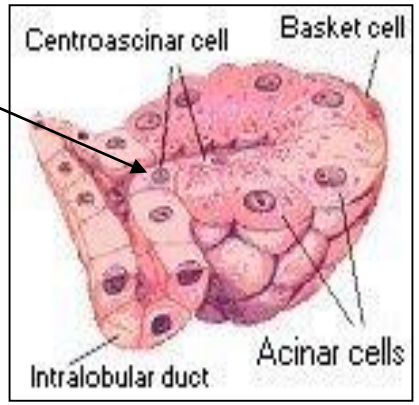


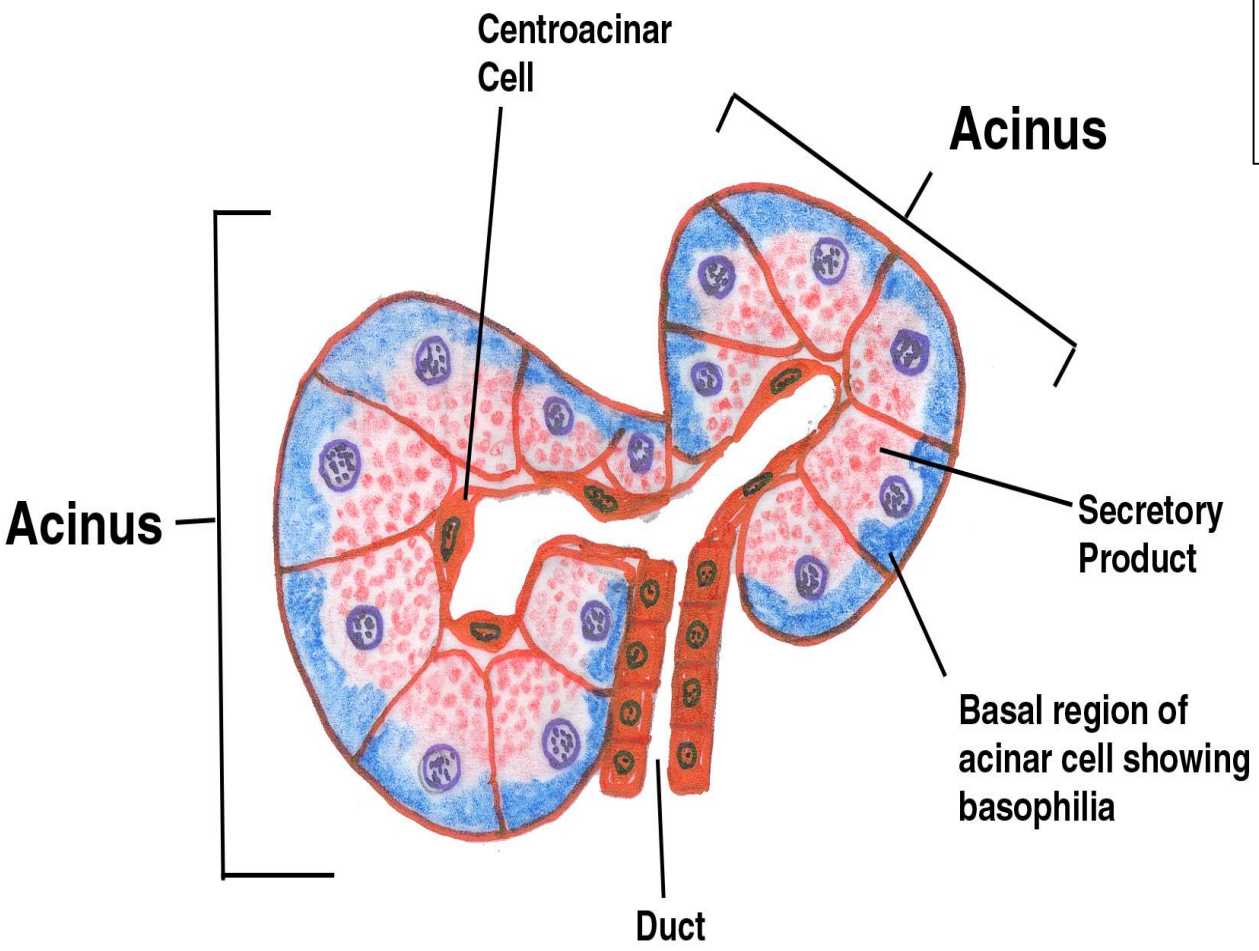
tubuloacinar gland, pancreatic juice /1.5 l/ is a clear alkaline fluid which contains the precursors of enzymes – trypsin, chymotrypsin, lipase, amylase..


Centro-acinar cells
Intercalated duct (longitudinal section)
Capillary
Islet of Langerhans
Interstitial connective tissue
Capillary in exocrine pancreas
Exocrine secretory units
Interlobular duct

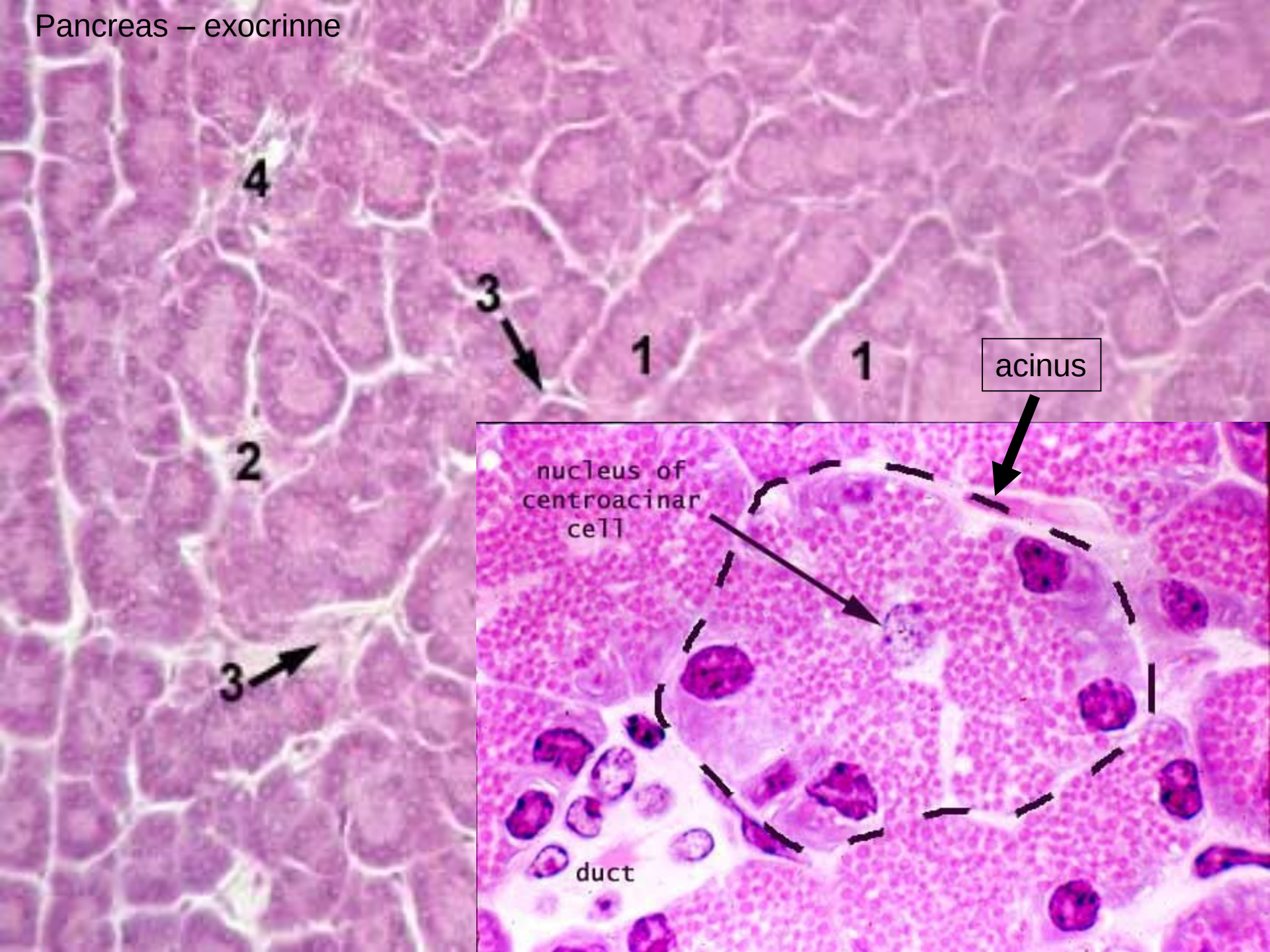


Pancreatic acinus + intercalated duct

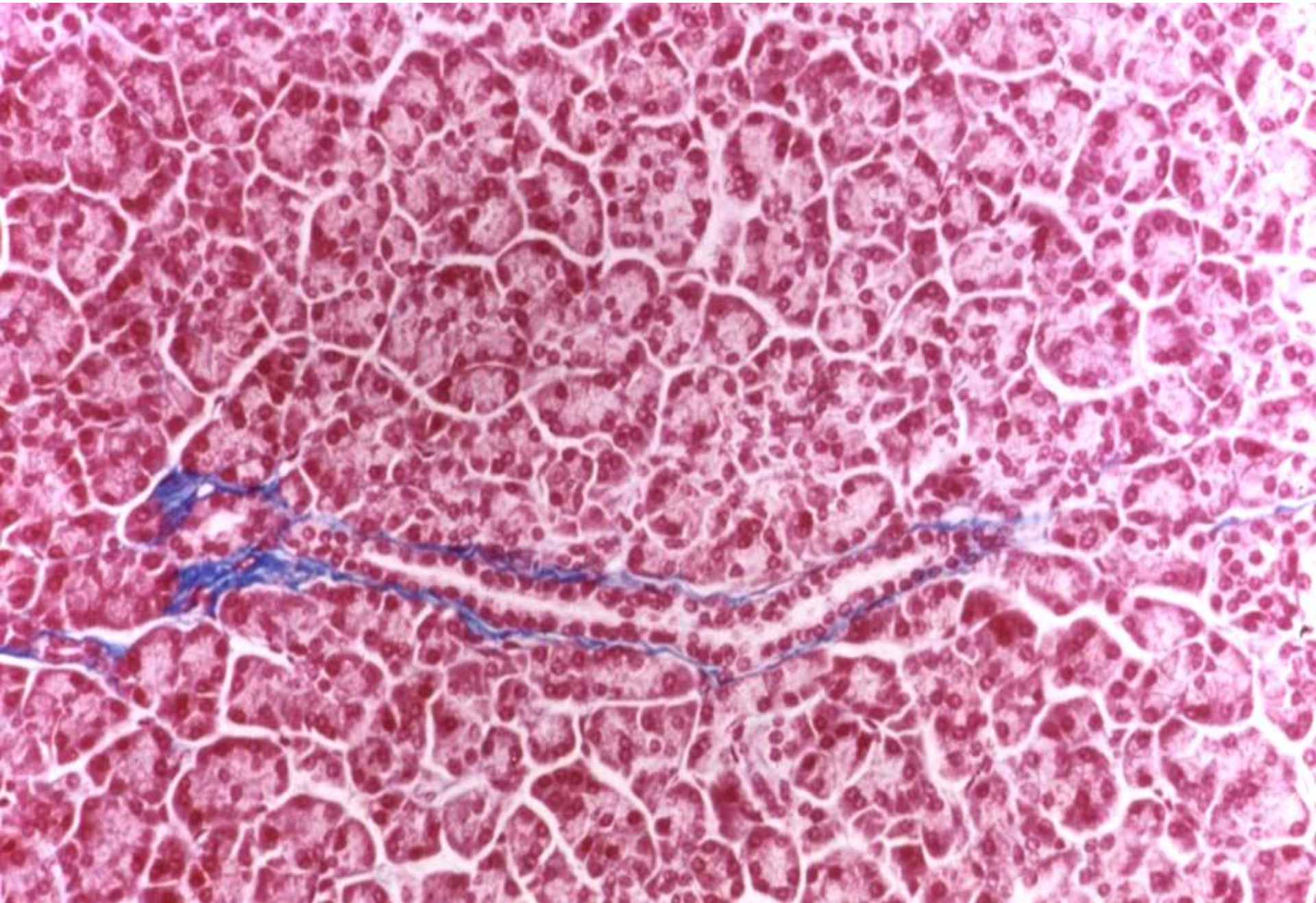




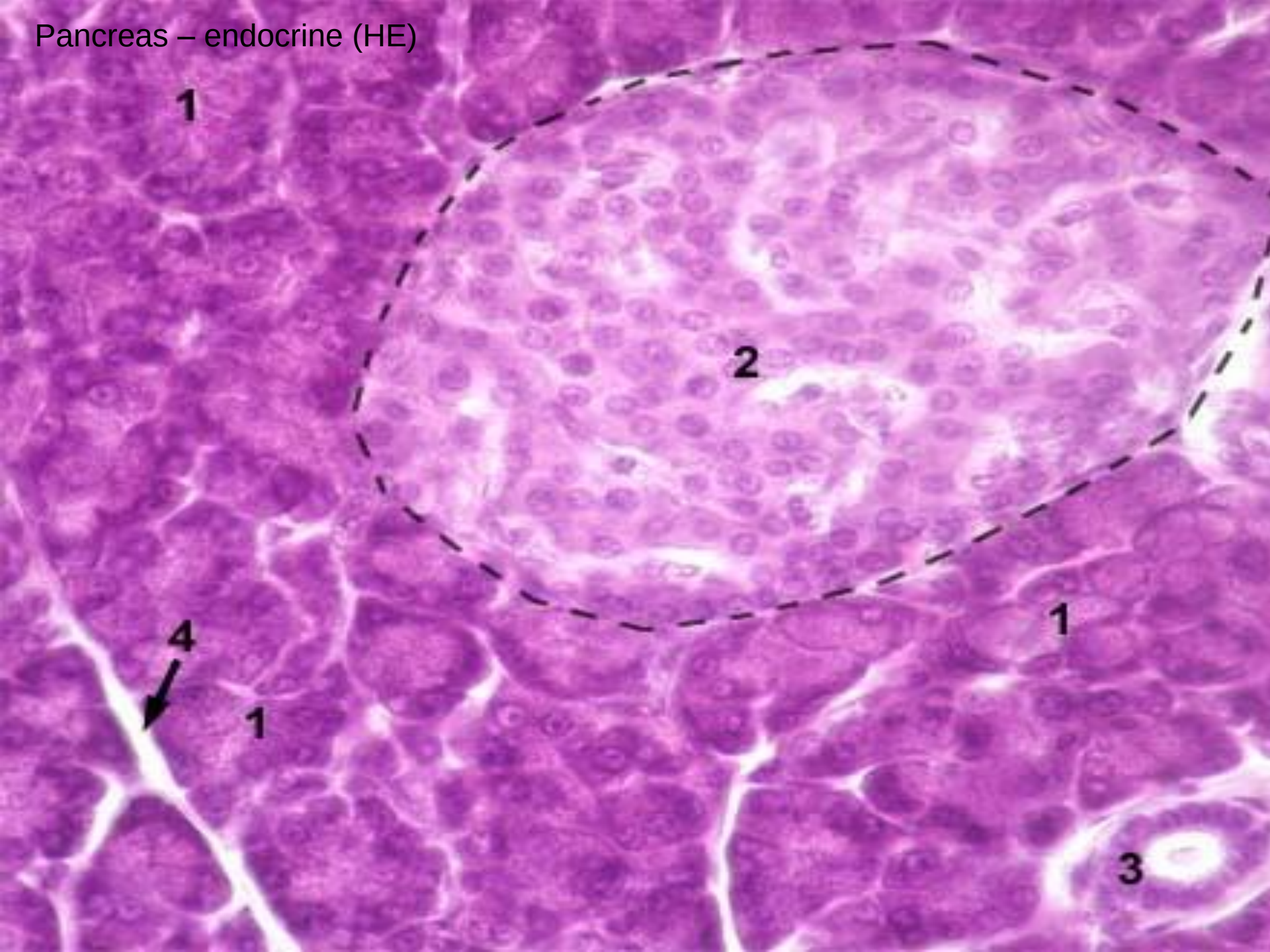
Pancreas – exocrinne



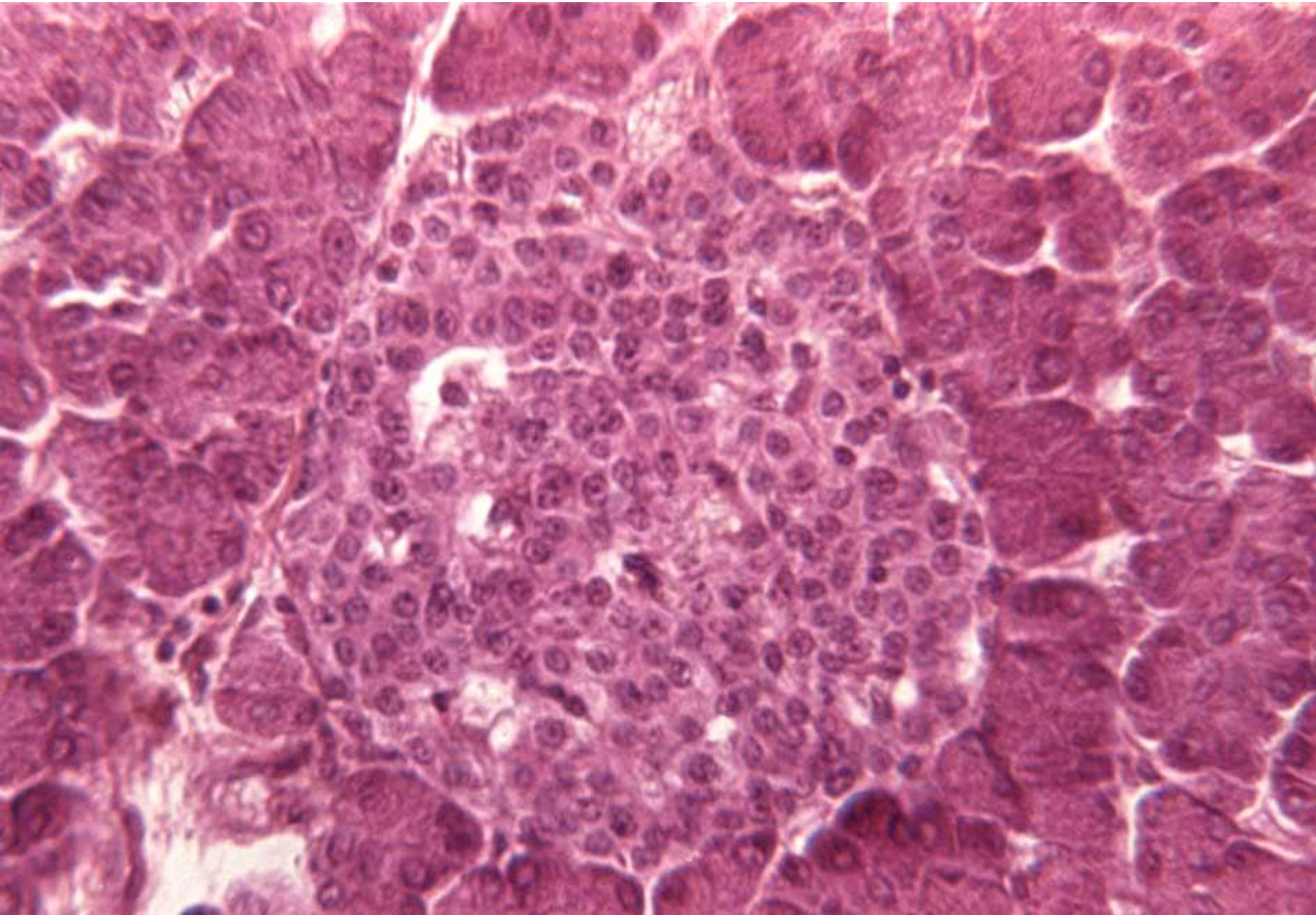
Pancreas – exocrinne (Mallory)



Pancreas – endocrine (HE)



Pancreas – endocrine (HE)



GIT - III

Slides:

17. Intestinum crassum (HE)
18. Appendix (HE)
19. Anus(HE)
20. Hepar(HE)
21. Hepar (AZAN)
22. Vesica fellea (HE)
23. Pancreas (HE)

Atlas EM:

Bile duct (10)