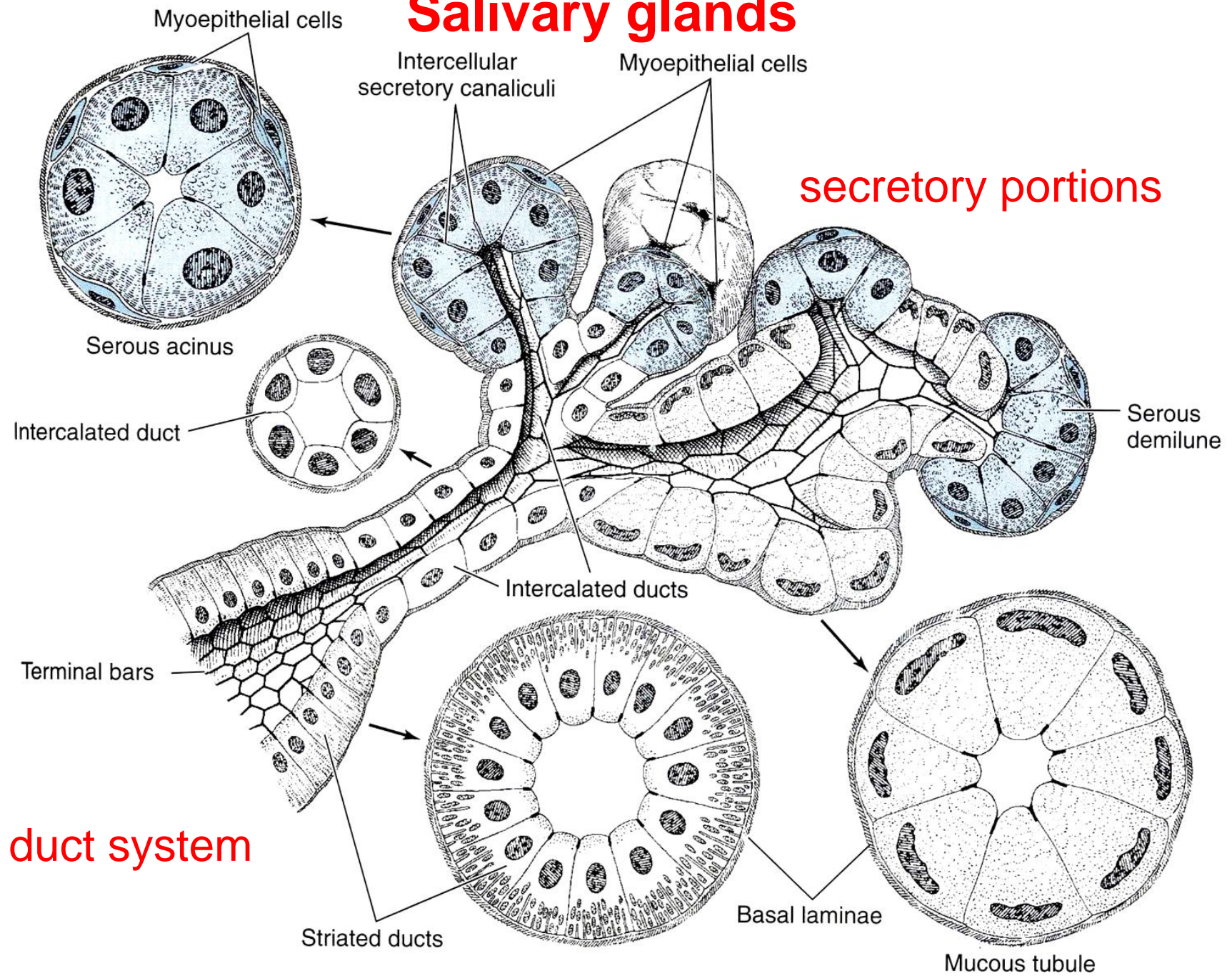
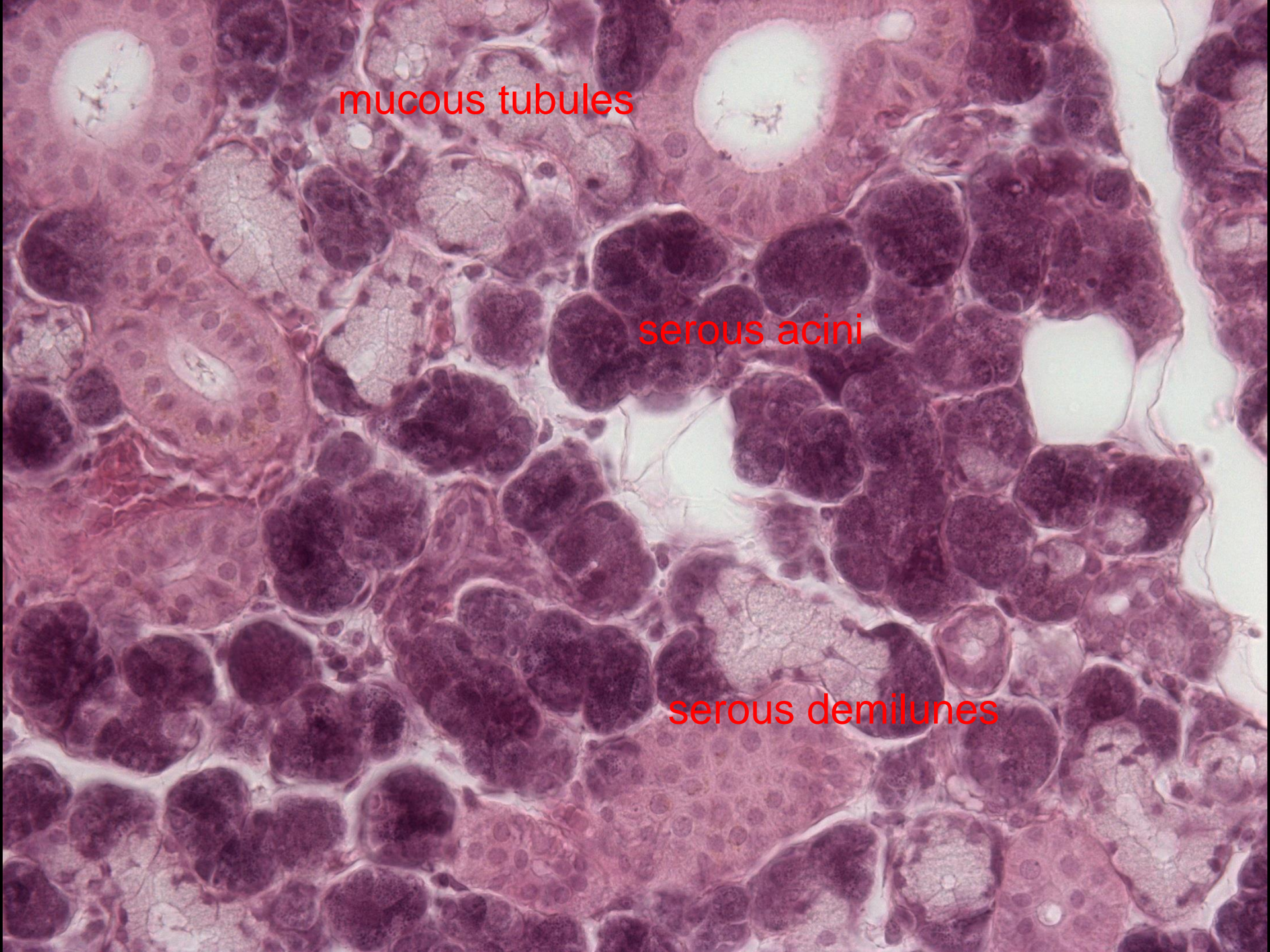


**Glands associated to the
digestive tube
(salivary glands, pancreas, liver,
bile ducts)**

Salivary glands

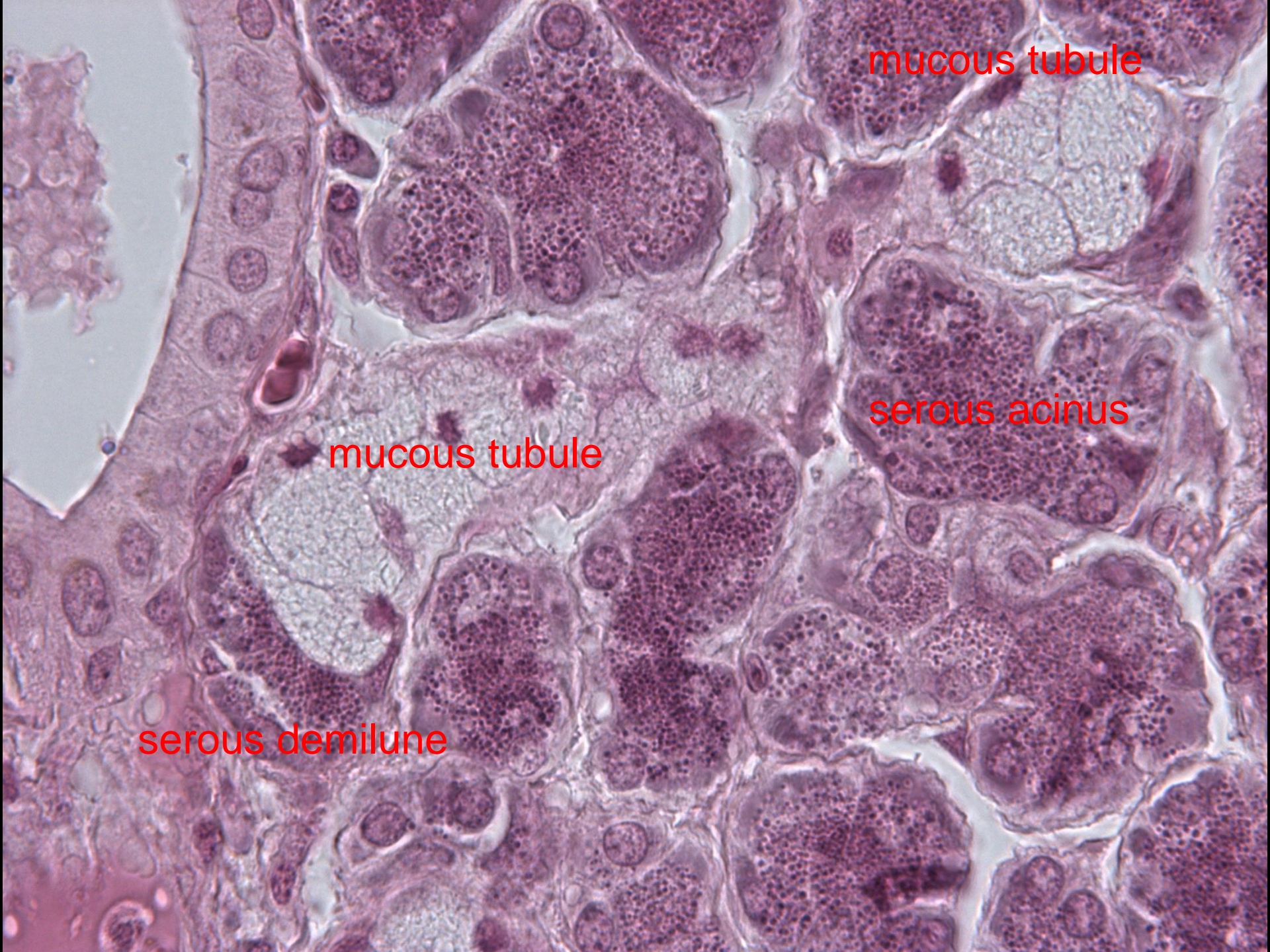




mucous tubules

serous acini

serous demilunes

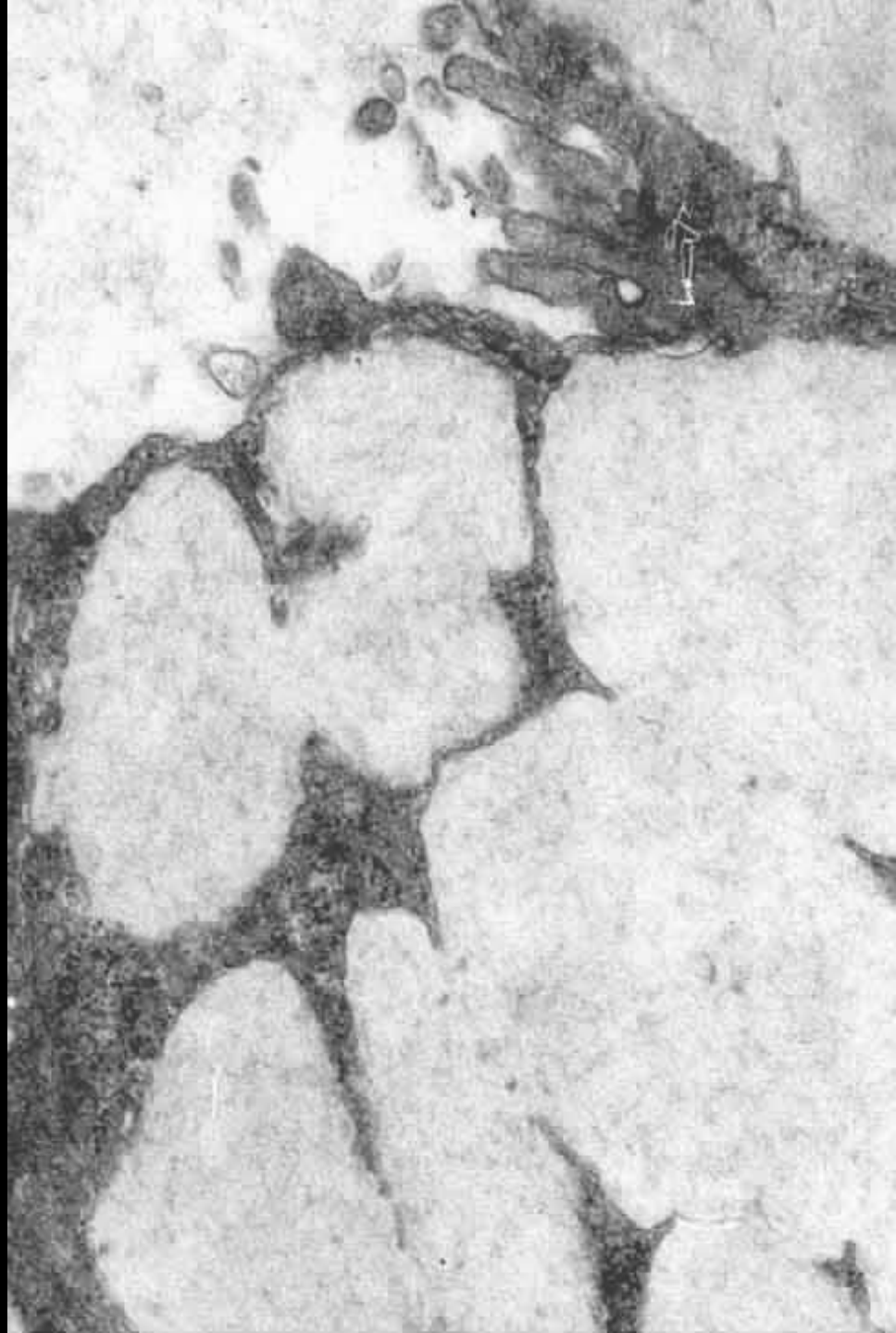
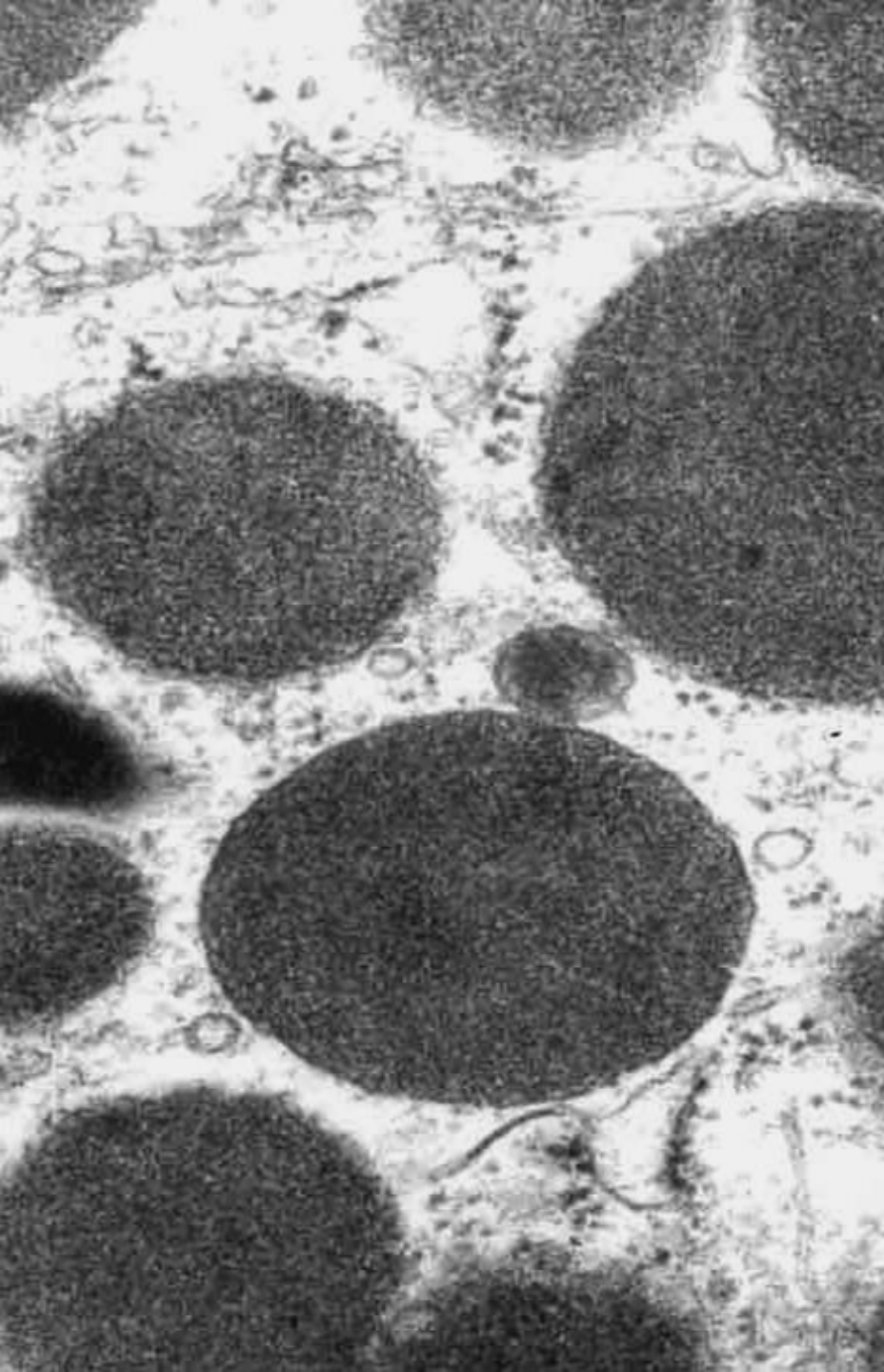


mucous tubule

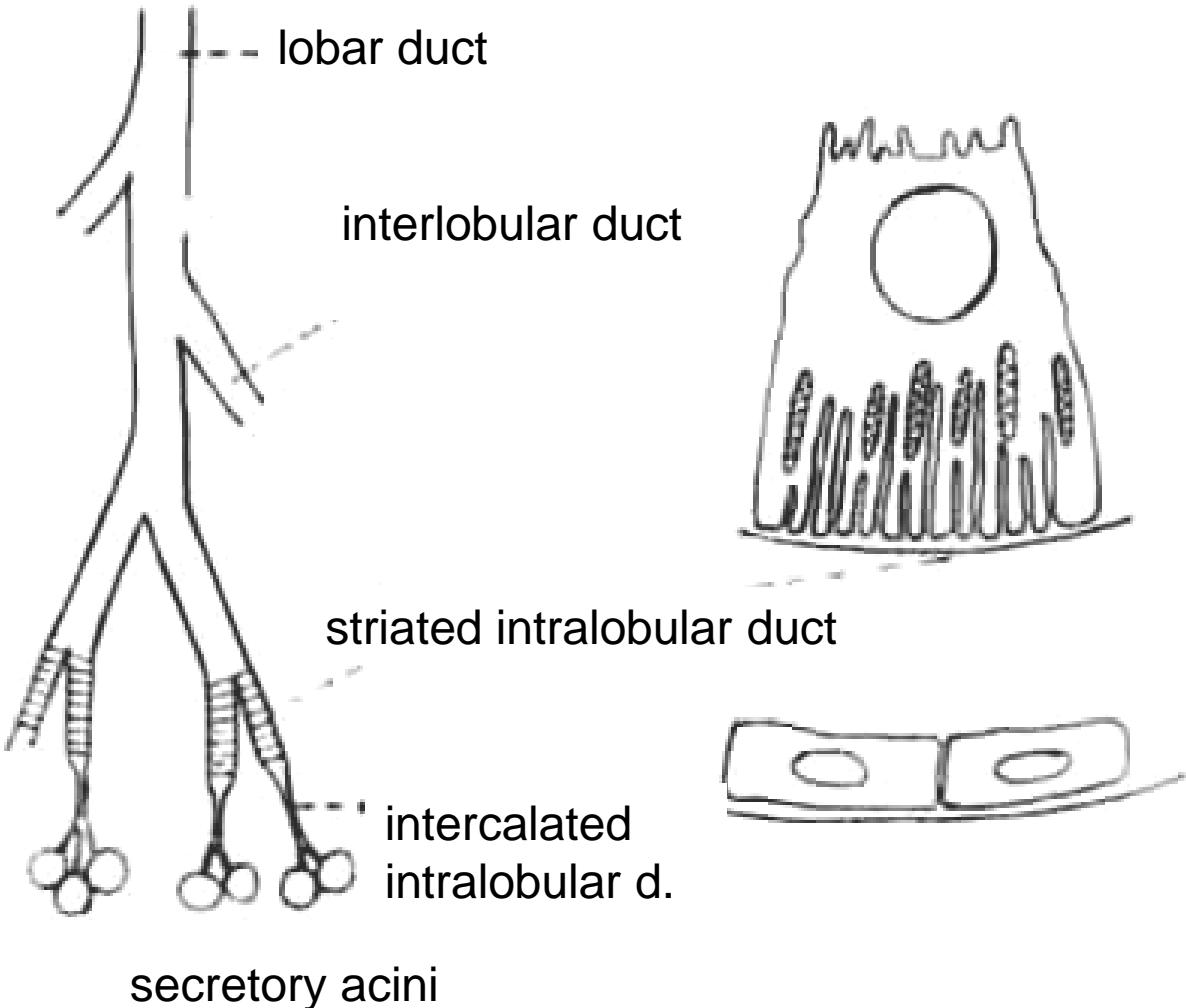
serous acinus

mucous tubule

serous demilune



DUCTS OF LARGE SALIVARY GLANDS



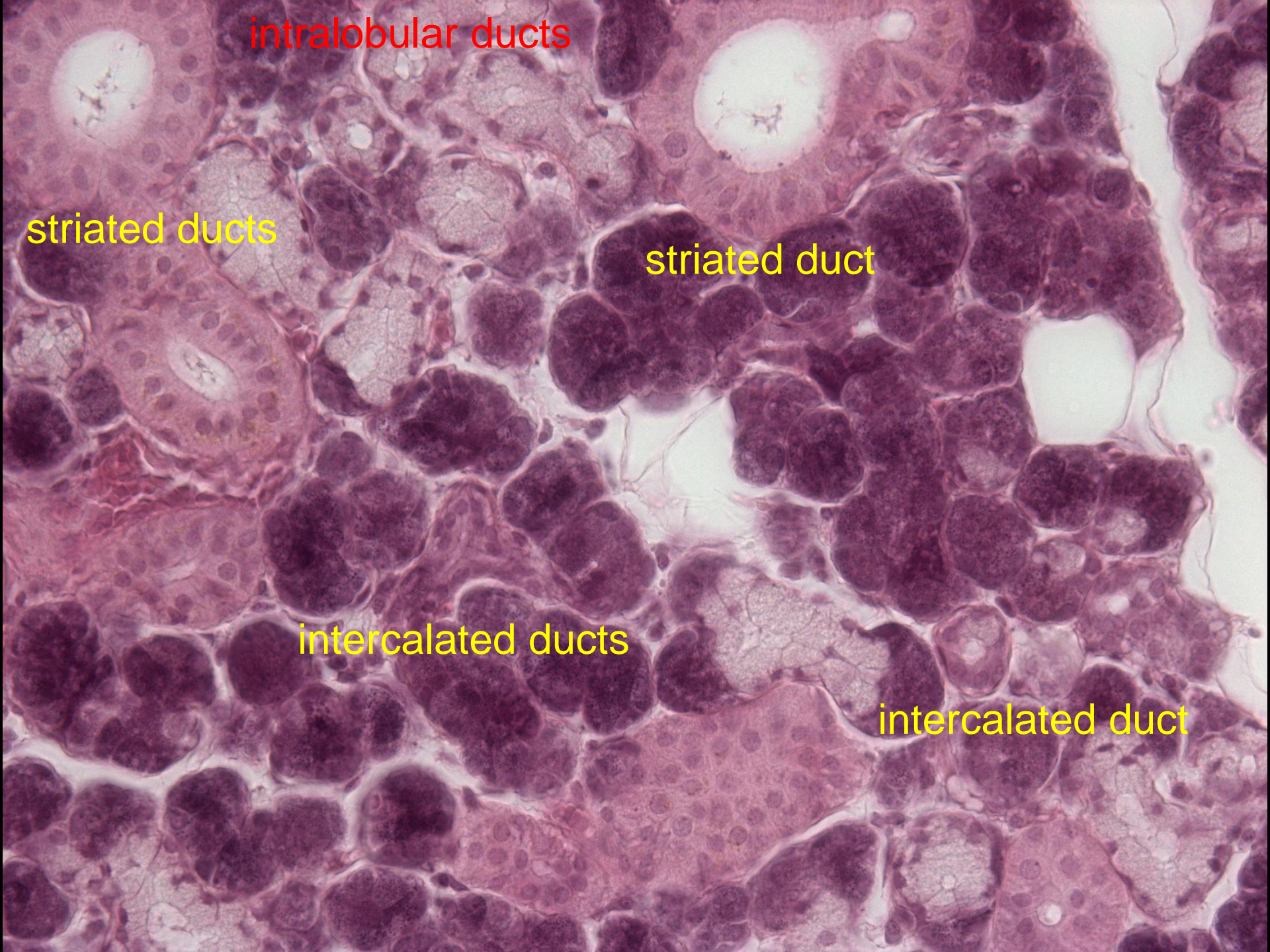
intralobular ducts

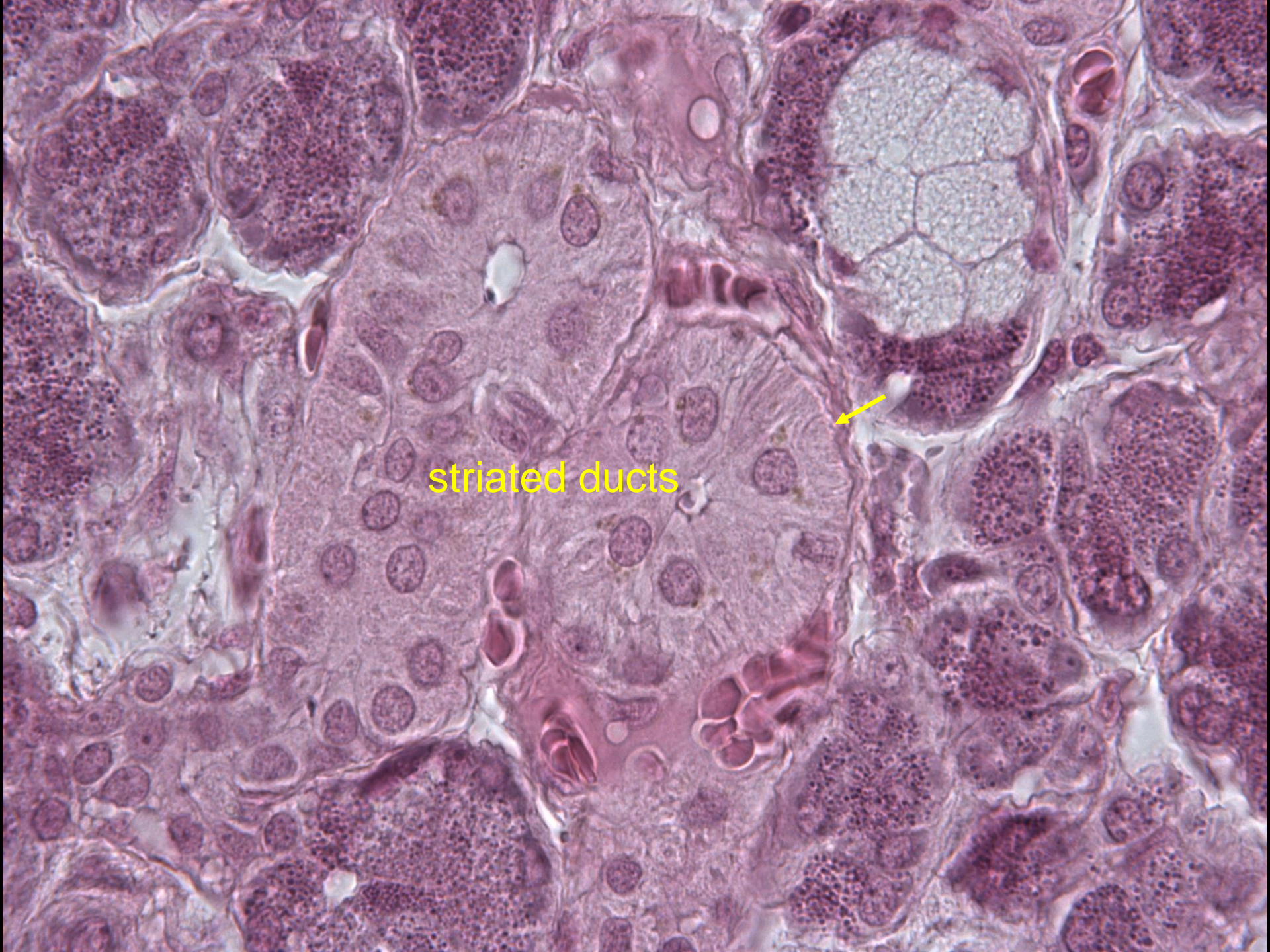
striated ducts

striated duct

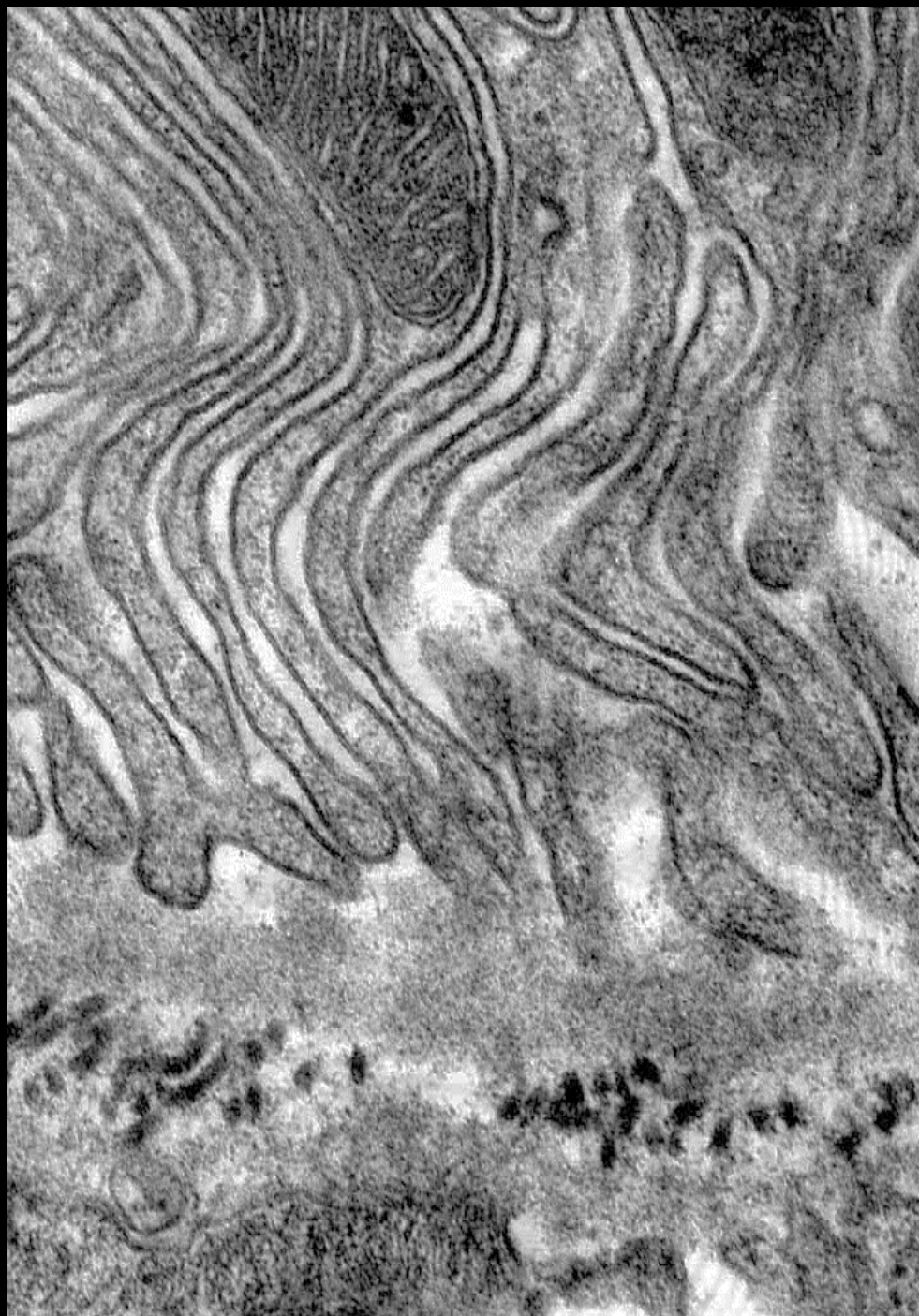
intercalated ducts

intercalated duct

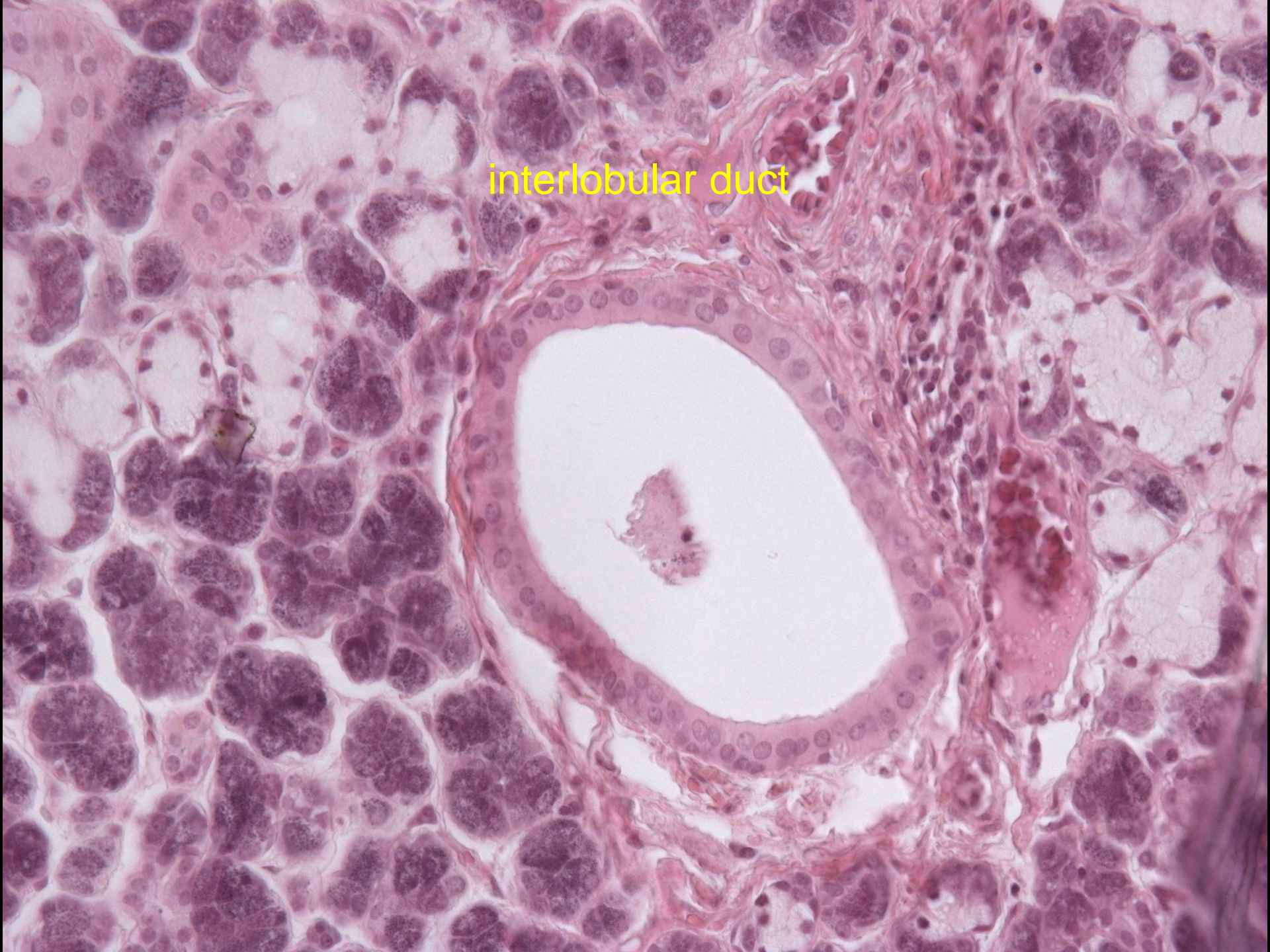




striated ducts



interlobular duct

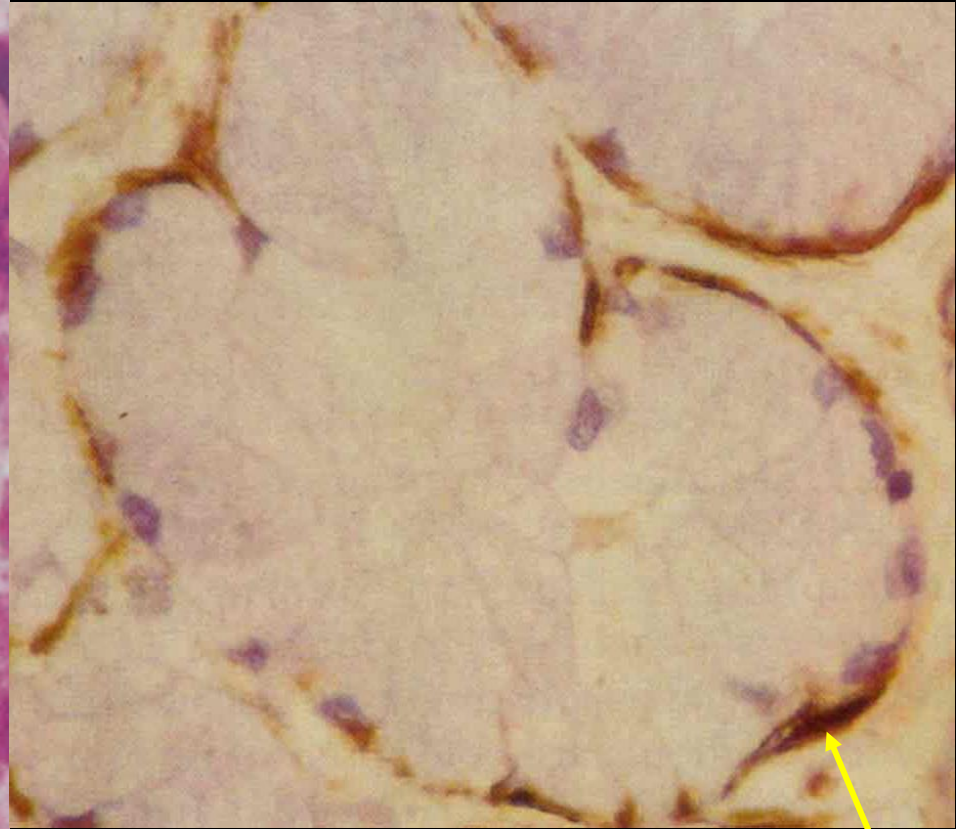
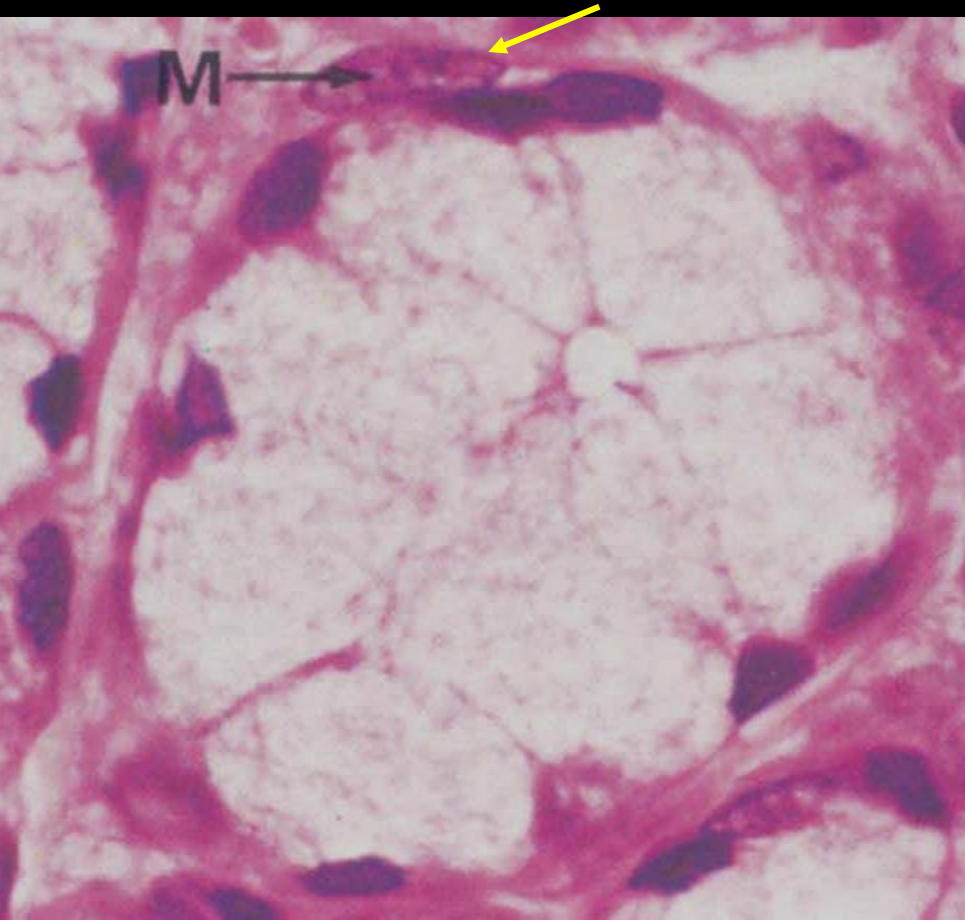




lobar duct



myoepithelial cells



immunohistochemistry - actin

Salivary glands

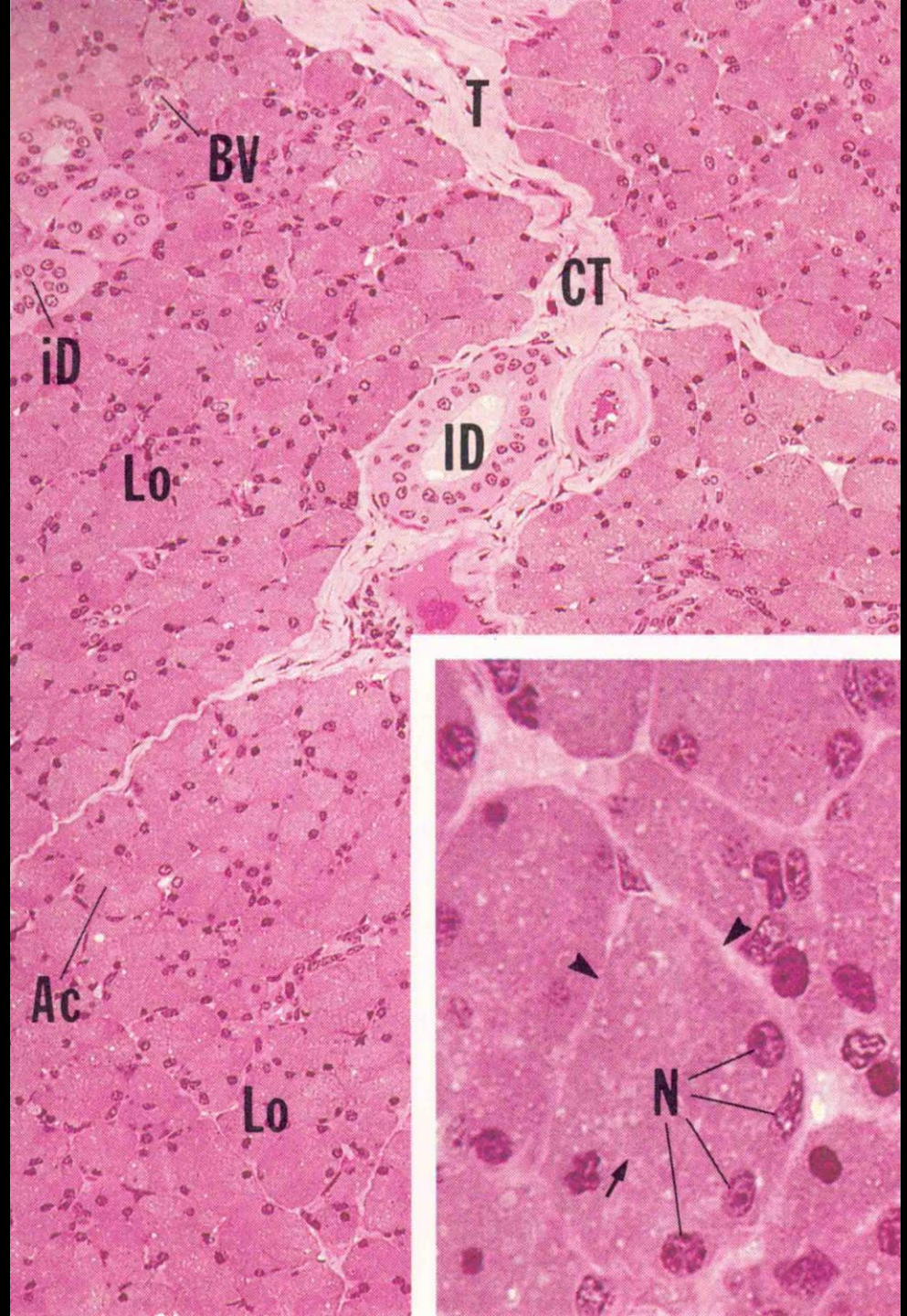
a/ large - compound

- parotid (gl. parotis) – acinar, **serous**
- submandibular (gl. submandibularis) – tuboacinar, **seromucous with prevailing serous component**
- sublingual (gl. sublingualis) - tuboacinar, **seromucous with prevailing mucous component**

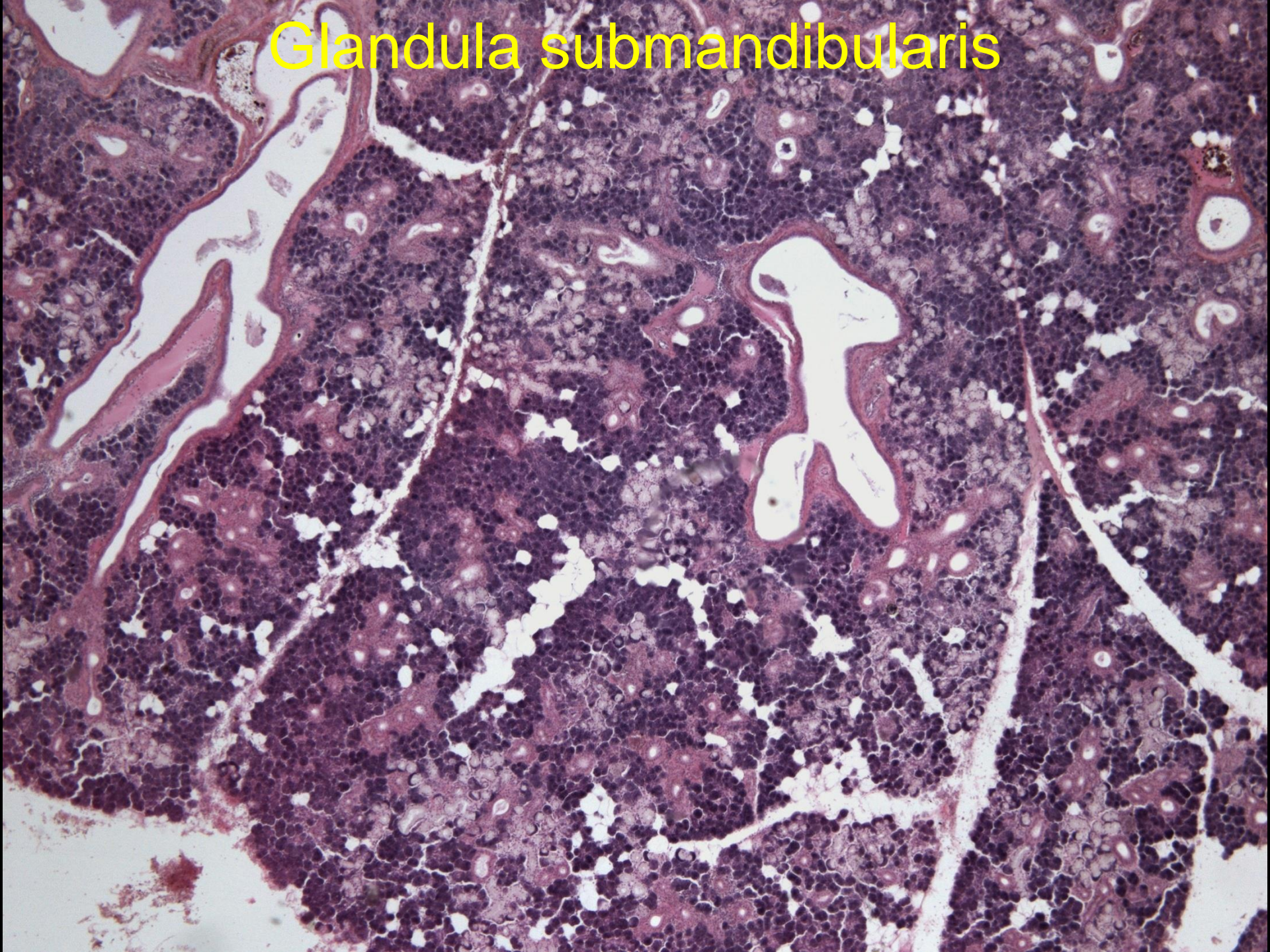
b/ small - branched

- gl. labiales, gl. buccales, gl. retromolares, gl. apicis linguae – tuboacinar, **seromucous**
- gl. palatinae, Weber's glands of tongue – tubular, **mucous**
- Ebner's glands of tongue – acinar, **serous**

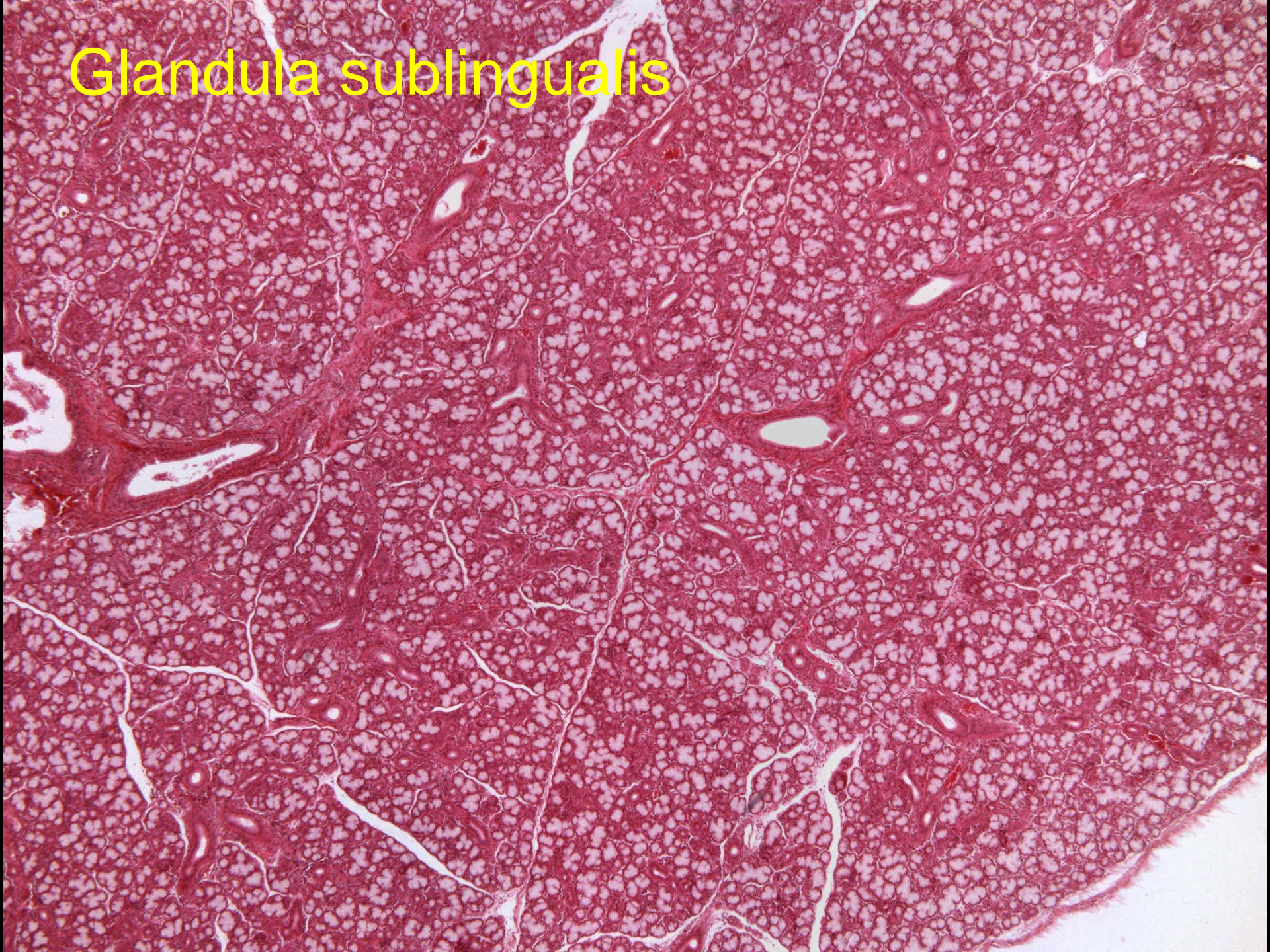
Glandula parotis



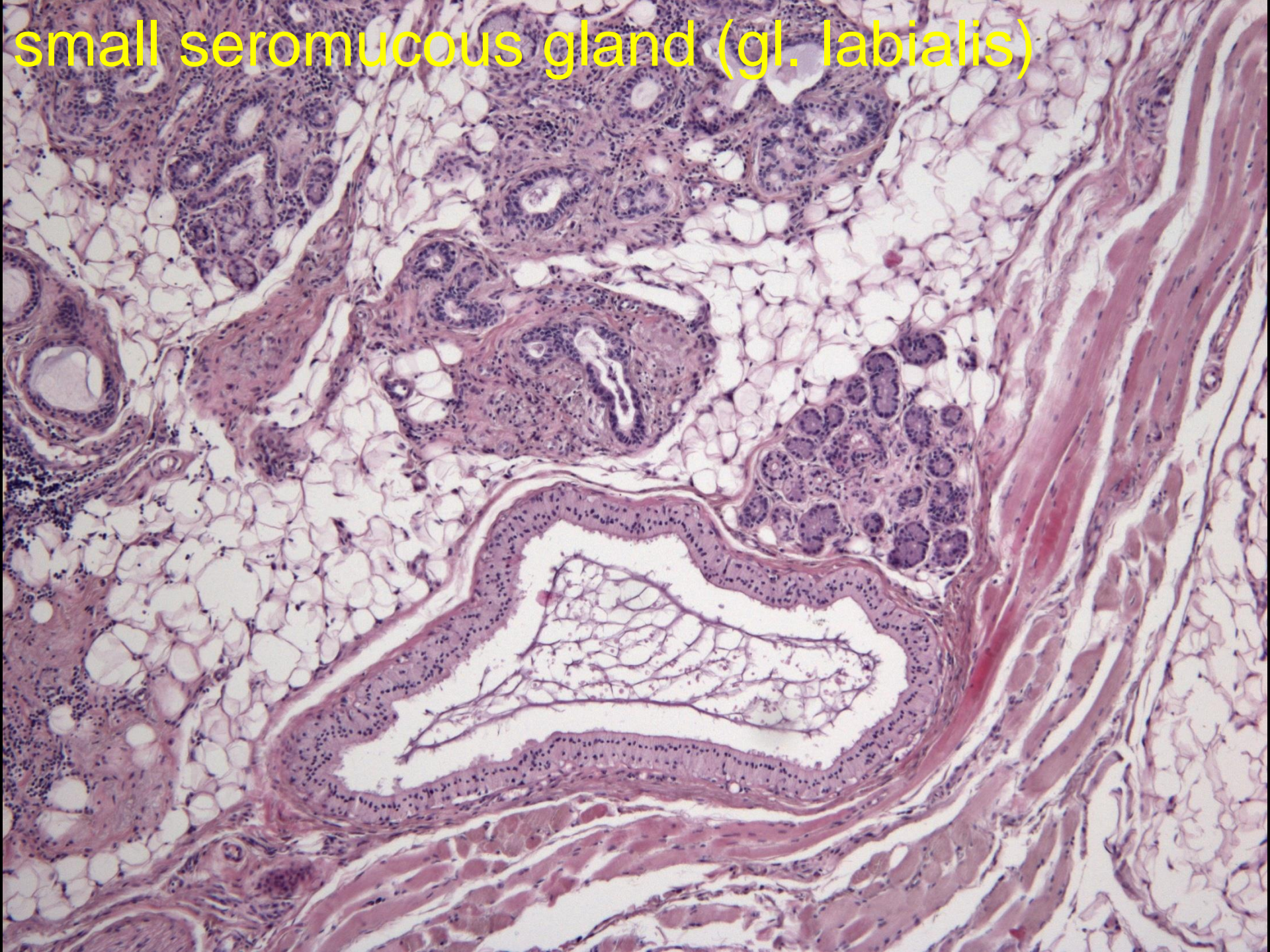
Glandula submandibularis



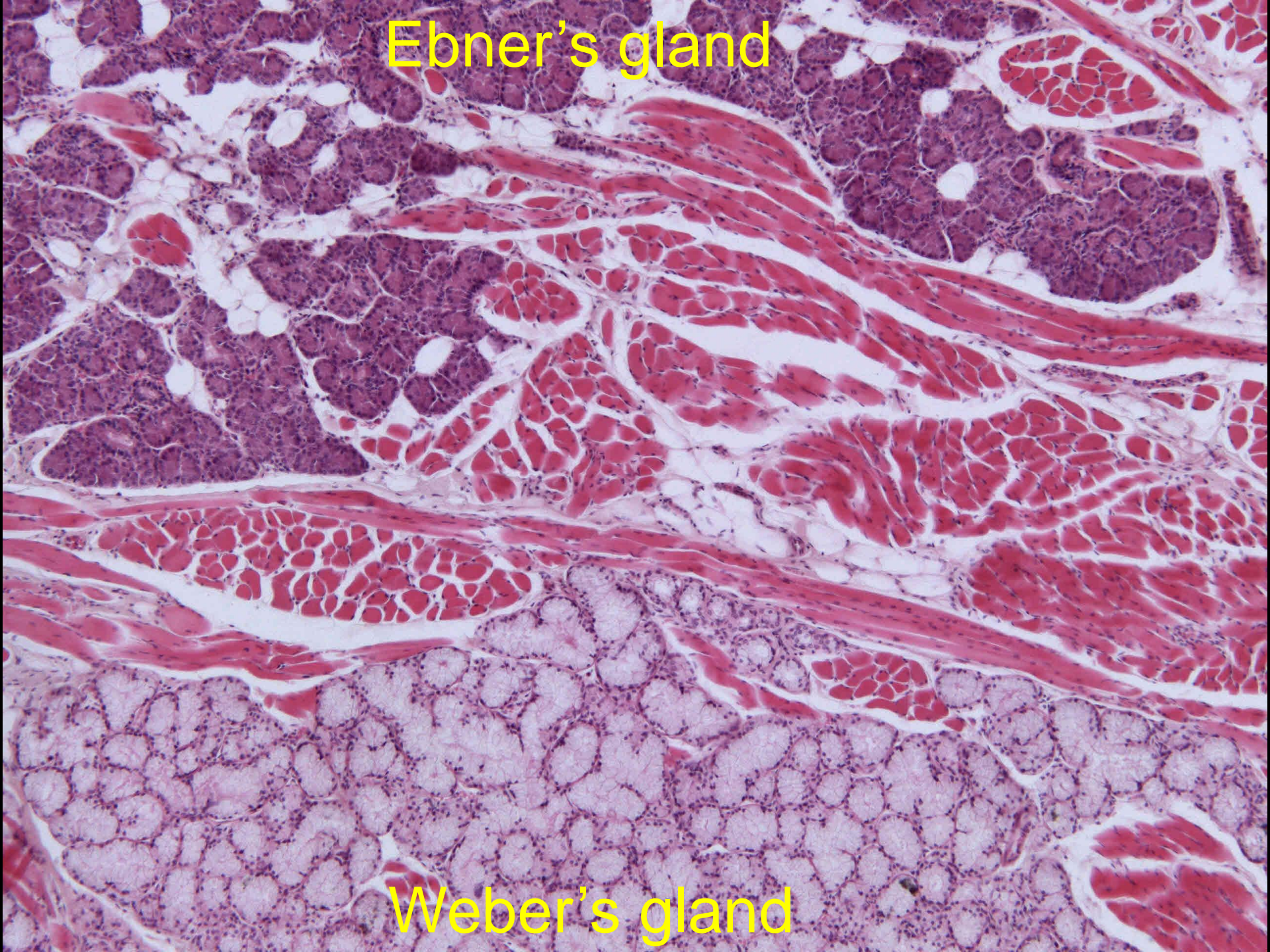
Glandula sublingualis



small seromucous gland (gl. labialis)



Ebner's gland

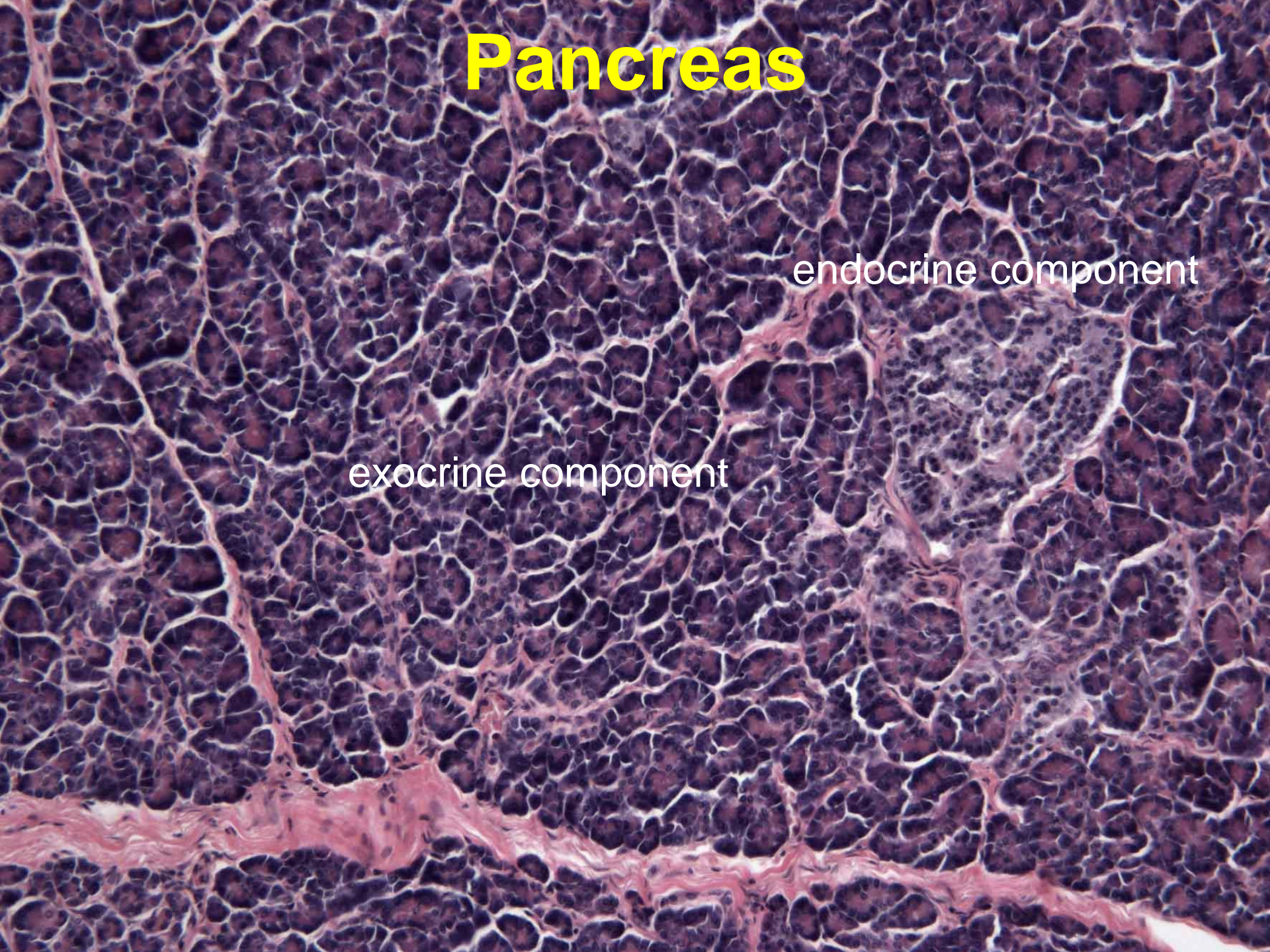


Weber's gland

Pancreas

endocrine component

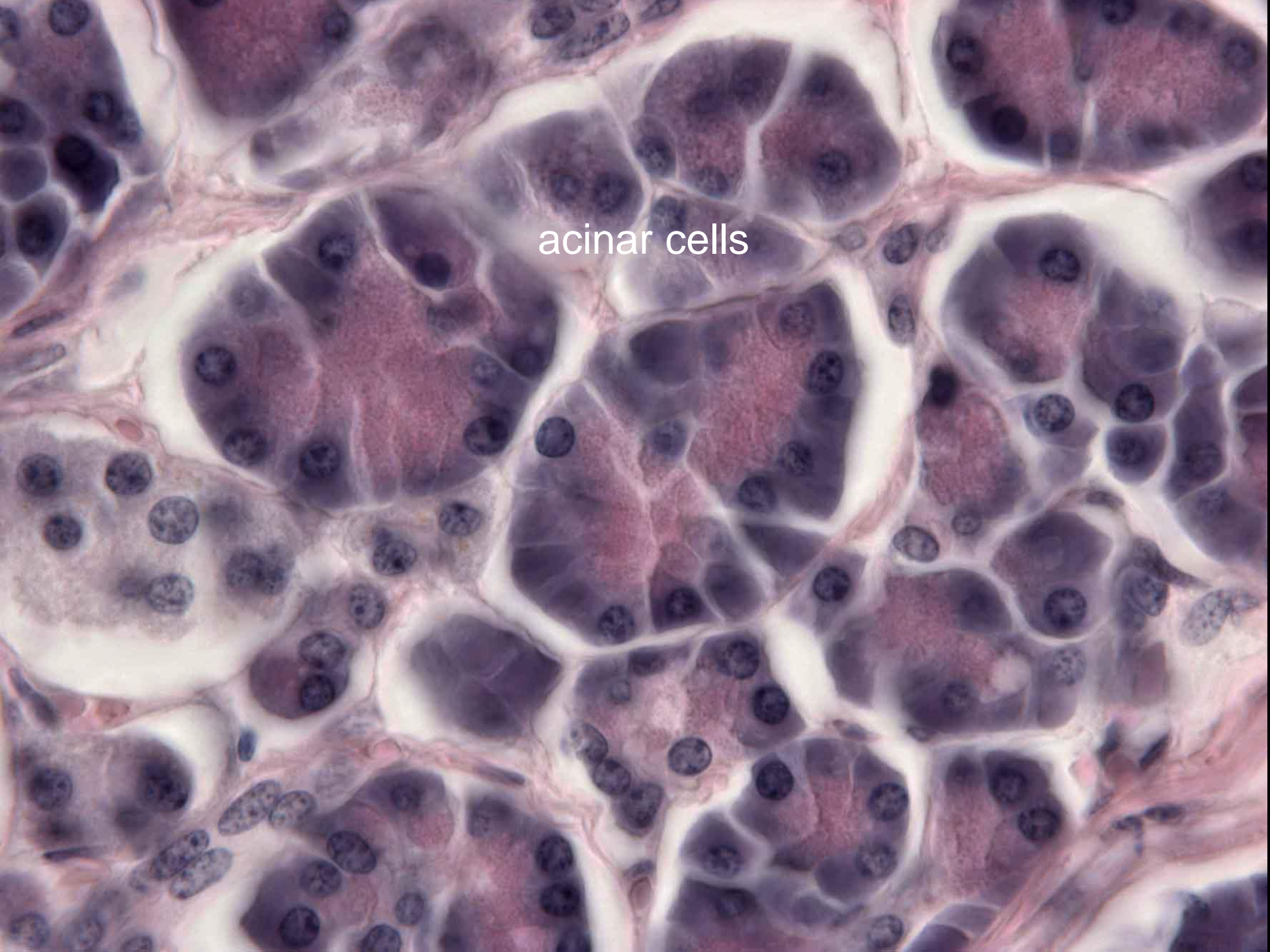
exocrine component



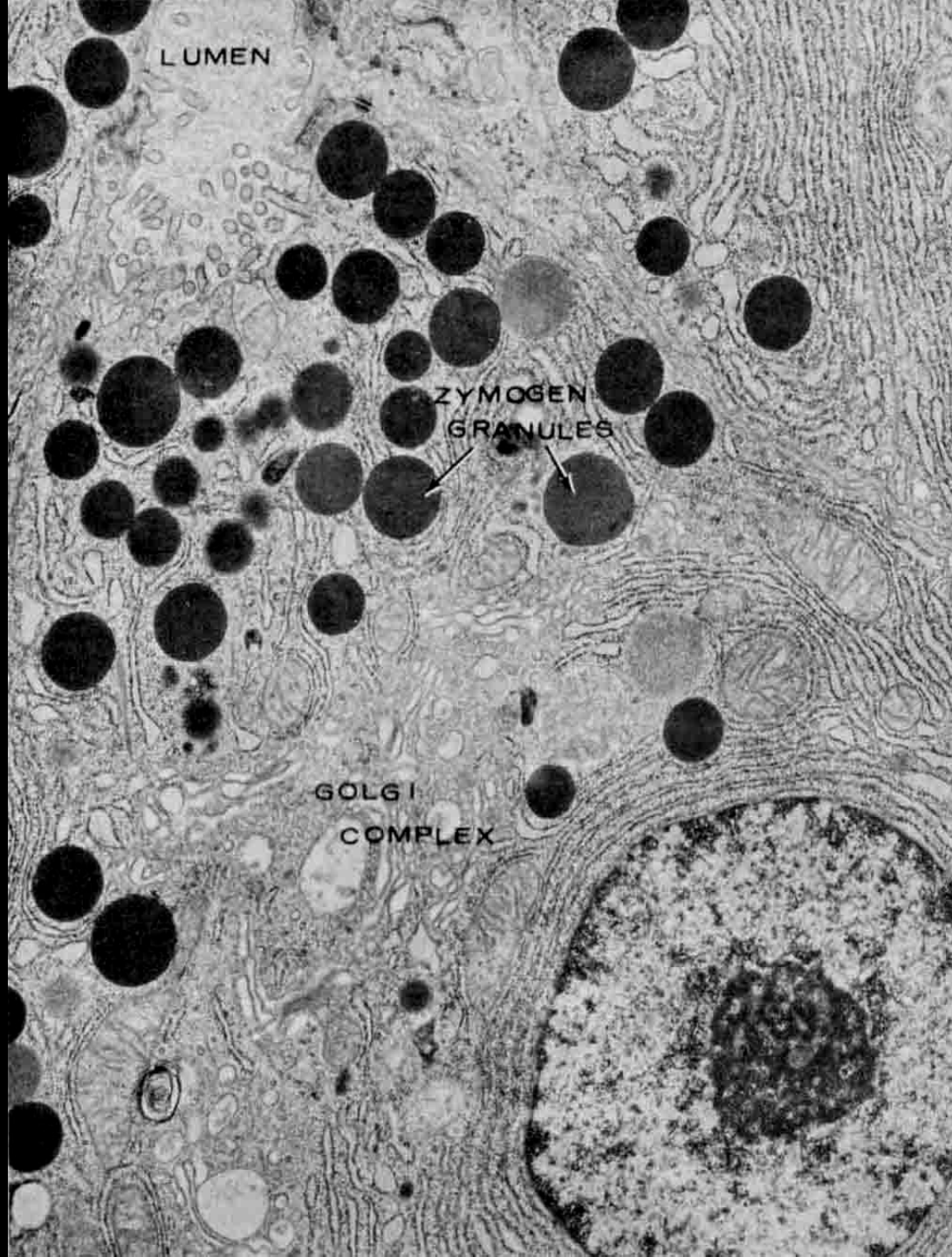


exocrine component

compound alveolar (acinar) gland, pure serous



acinar cells



LUMEN

ZYMOGEN
GRANULES

GOLGI
COMPLEX



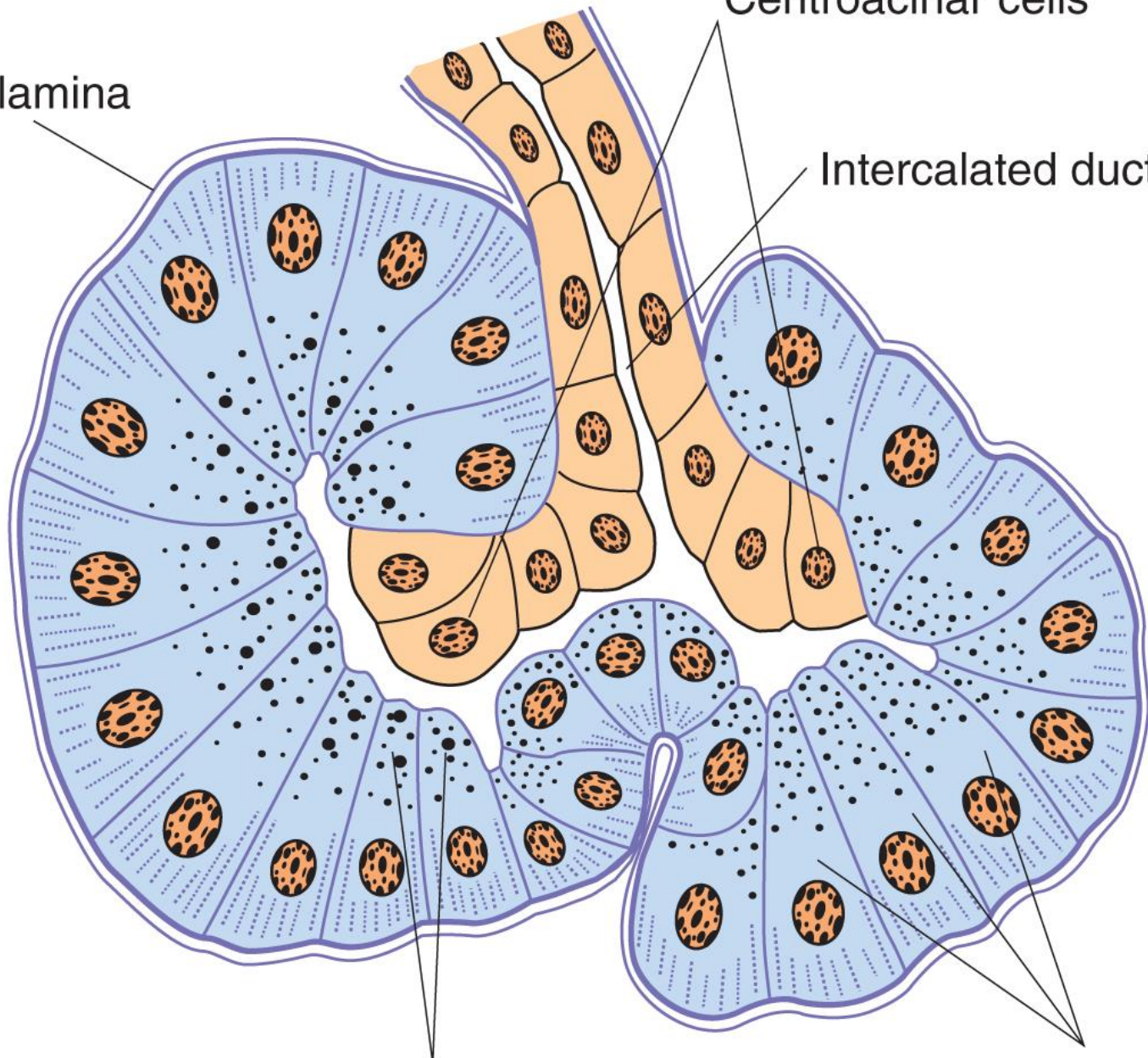
centroacinar cells

This is a high-magnification light micrograph of a glandular tissue section, likely from the pancreas. The image displays numerous acini, which are the secretory units of the gland. Each acinus is composed of a cluster of cells with a characteristic arrangement: a central region containing centroacinar cells, which are smaller and have a more rounded, centrally located nucleus, and a peripheral region of larger, more columnar cells. The acini are separated by thin layers of connective tissue. The overall appearance is that of a highly organized, secretory epithelium.

Basal lamina

Centroacinar cells

Intercalated duct

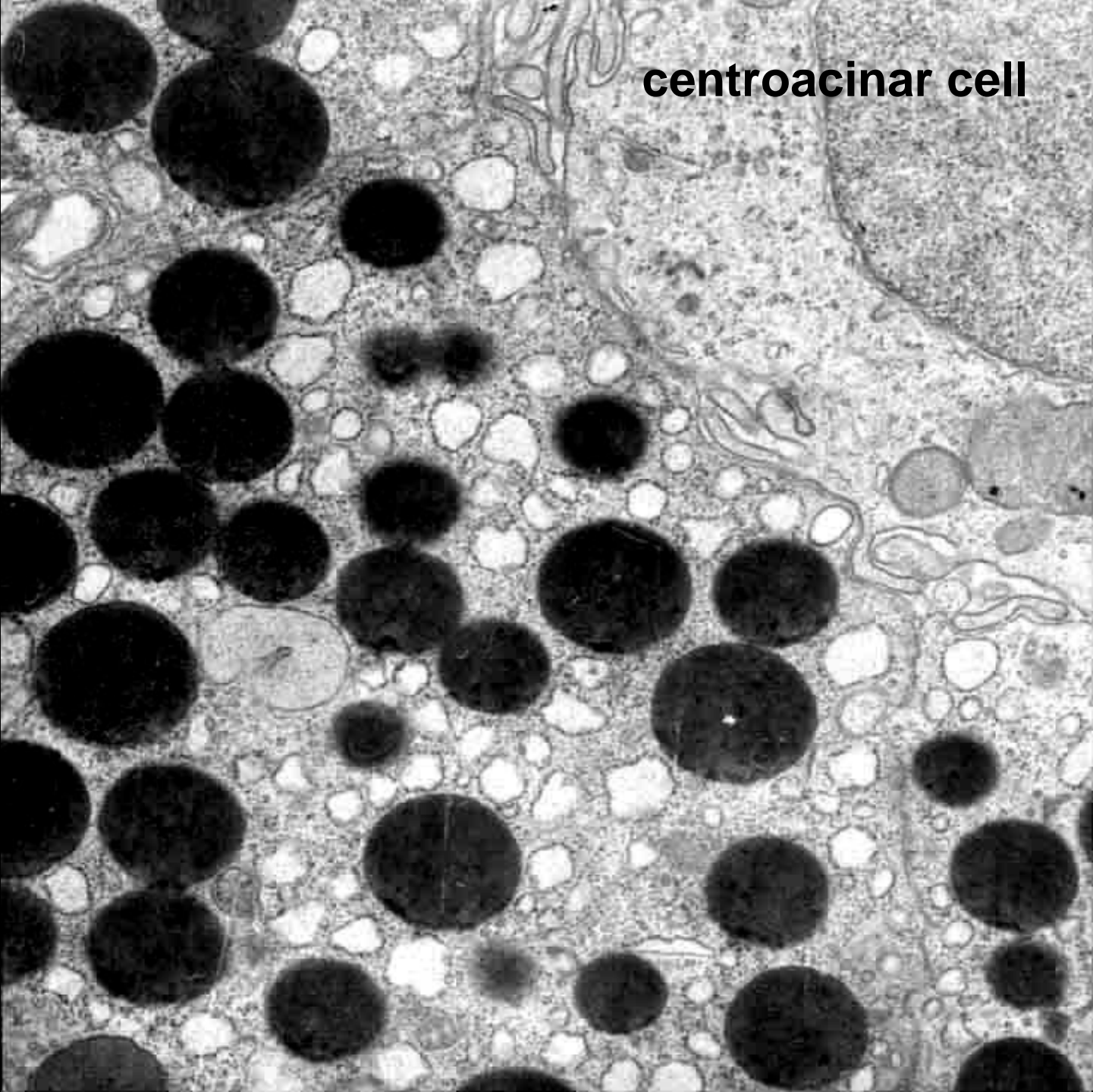


Zymogen granules

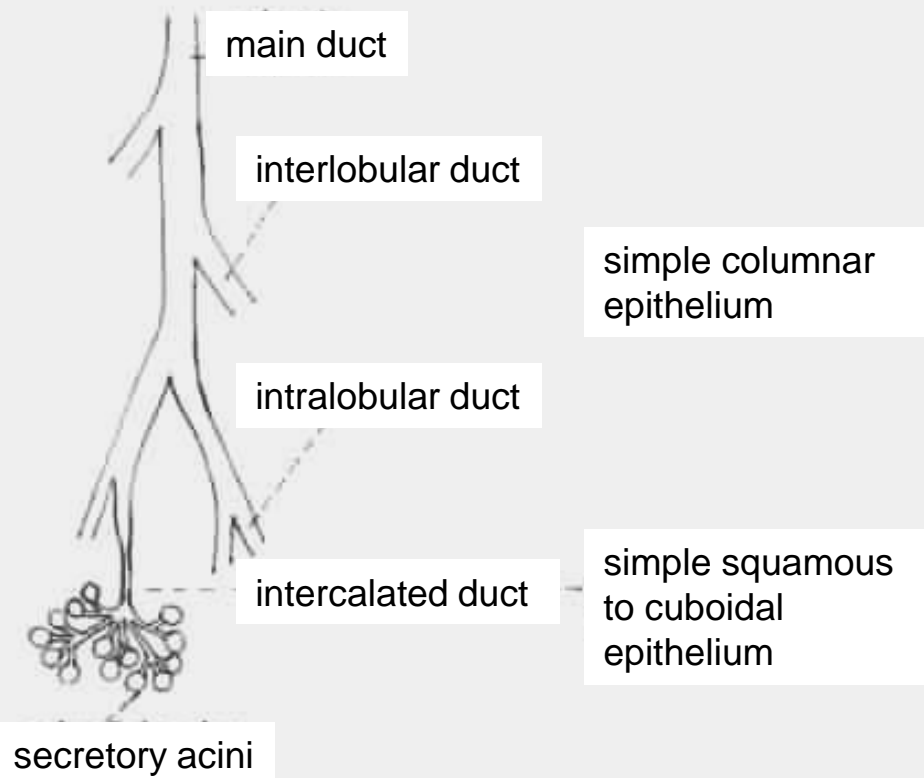
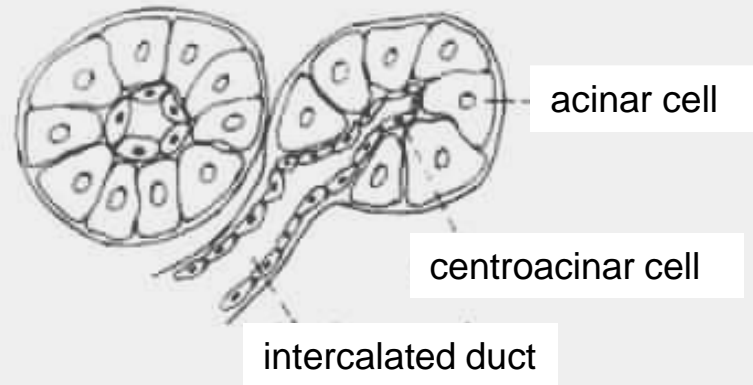
Acinar cells

b

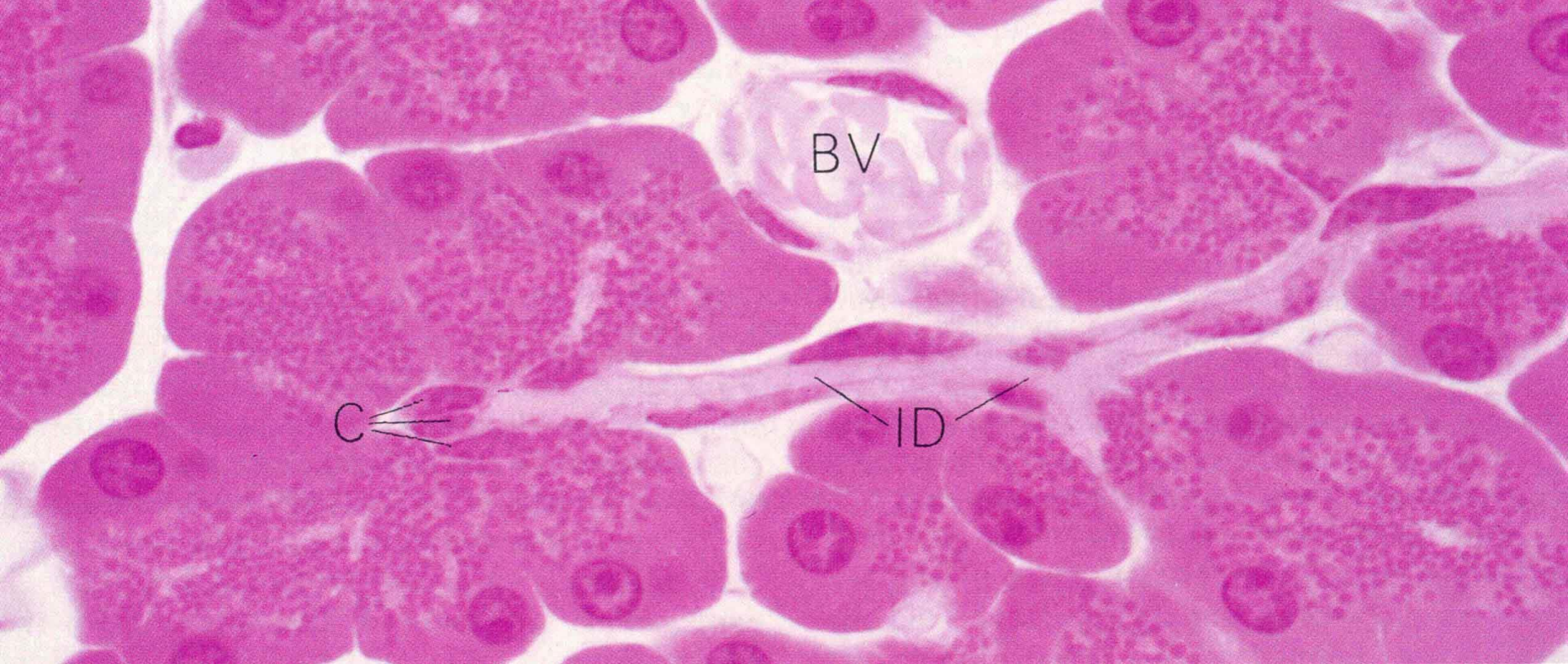
centroacinar cell

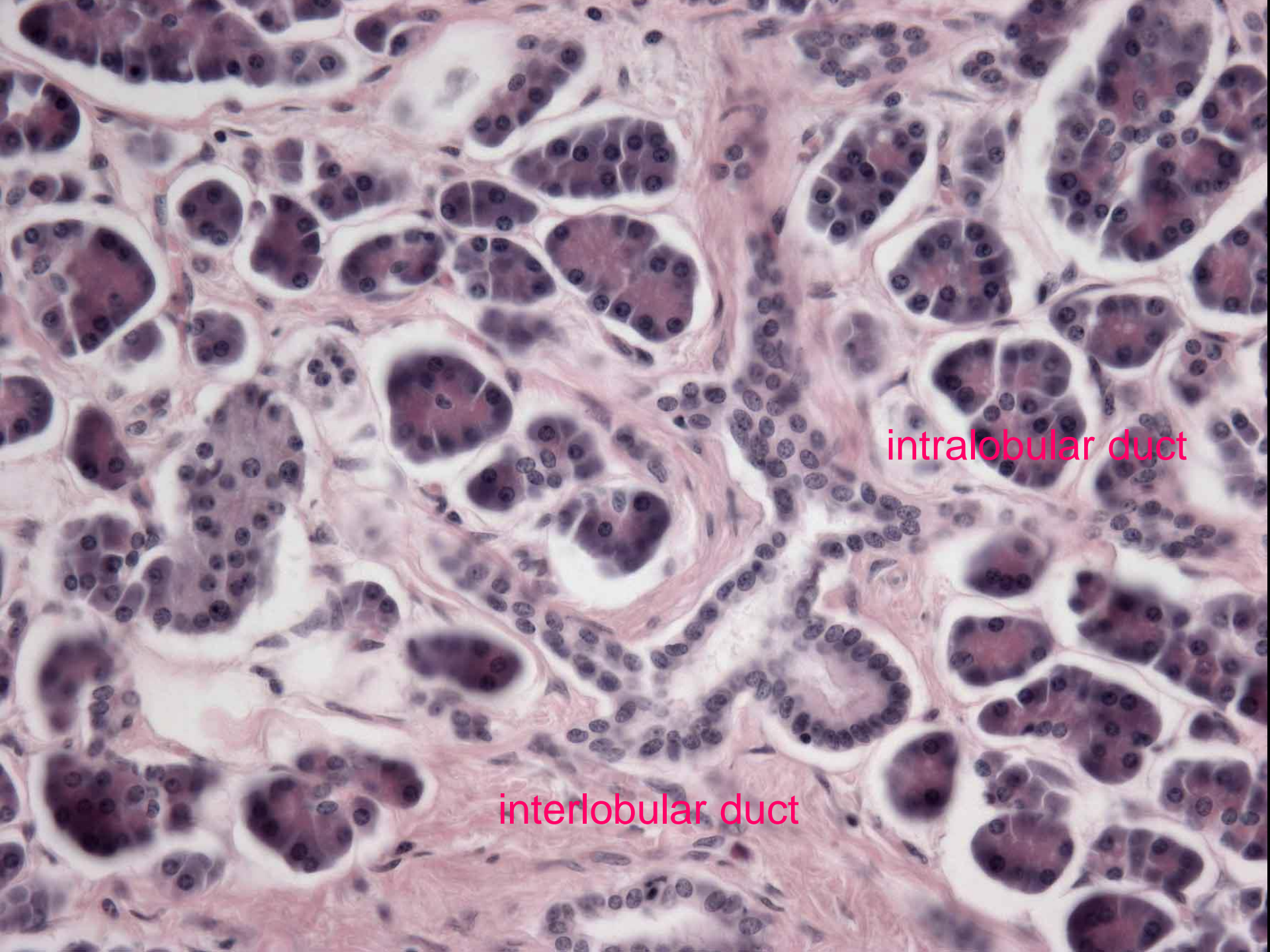


Ductal system



intercalated duct





intralobular duct

interlobular duct



larger interlobular duct

Exocrine pancreatic secretions

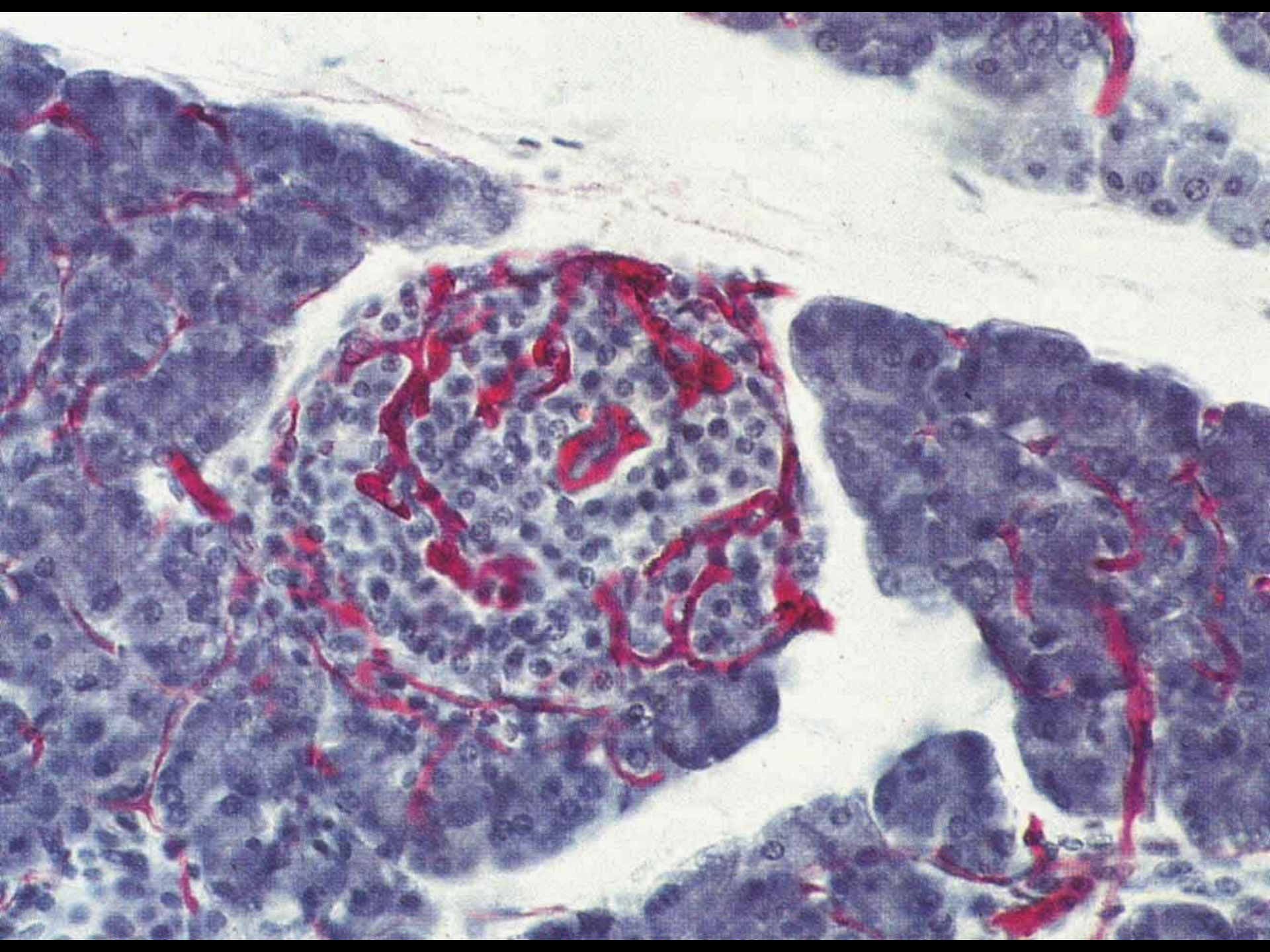
- water, ions (bicarbonate)
- trypsinogen
- chymotrypsinogen
- carboxypeptidase
- ribonuclease
- deoxyribonuclease
- triacylglycerollipase
- phospholipase A2
- elastase
- amylase

Secretion control:

secretin (S-cells) ▲ water, ▲ bicarbonate, ▼ enzymes
cholecystokinin (I-cells) ▲ enzymes, ▼ water

A histological micrograph of a pancreatic islet (Langerhans' islet). The islet is a cluster of endocrine cells, appearing as a lighter, more densely cellular area in the center, surrounded by the darker, more acinar exocrine tissue of the pancreas. The islet contains various types of endocrine cells, including alpha, beta, and delta cells, which are responsible for the production and secretion of hormones like insulin and glucagon. The surrounding exocrine tissue consists of acinar cells with prominent nuclei and granular cytoplasm, arranged in a lobular pattern.

endocrine component
Langerhans' islet

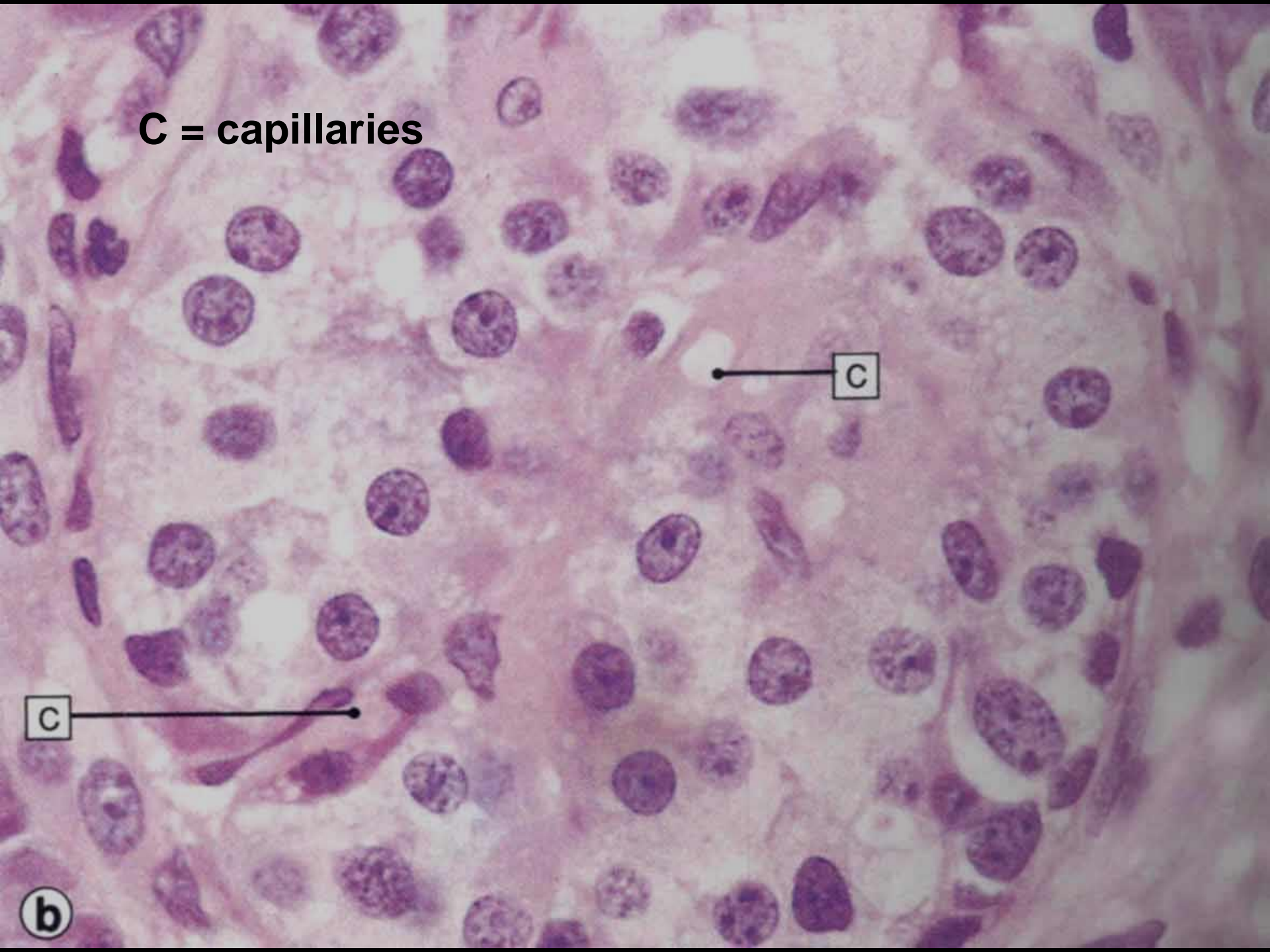


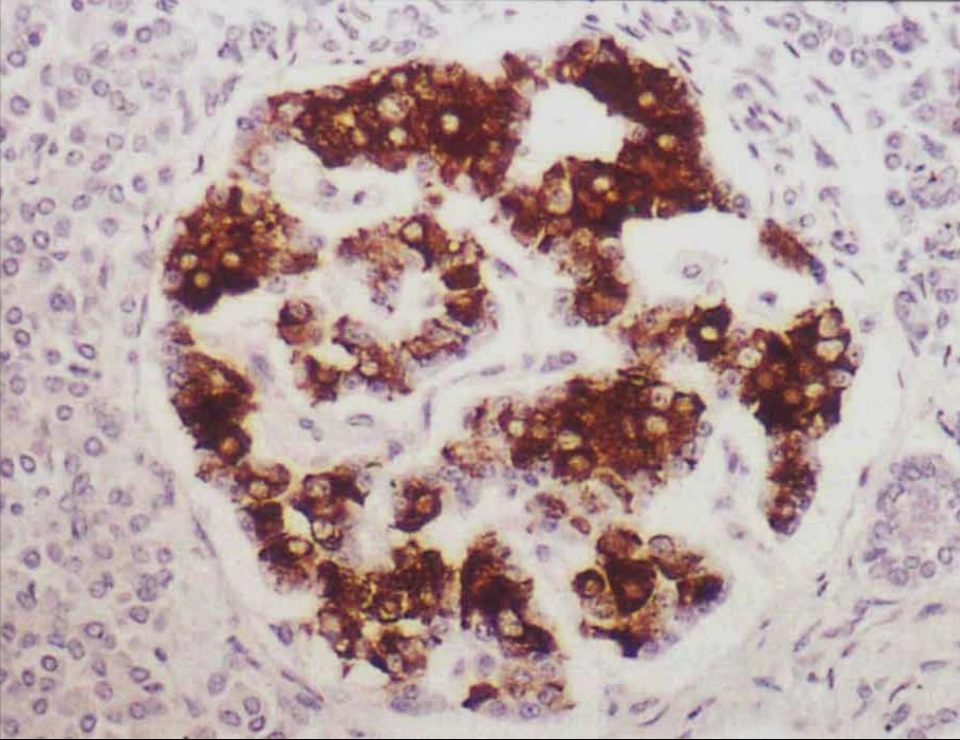
C = capillaries

C

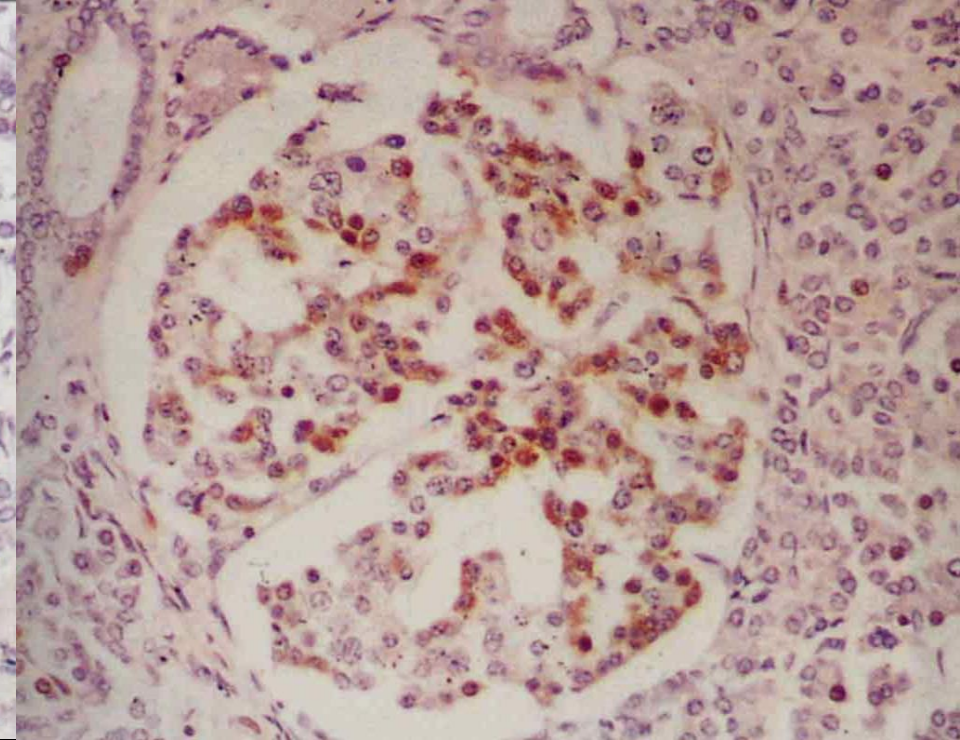
C

b

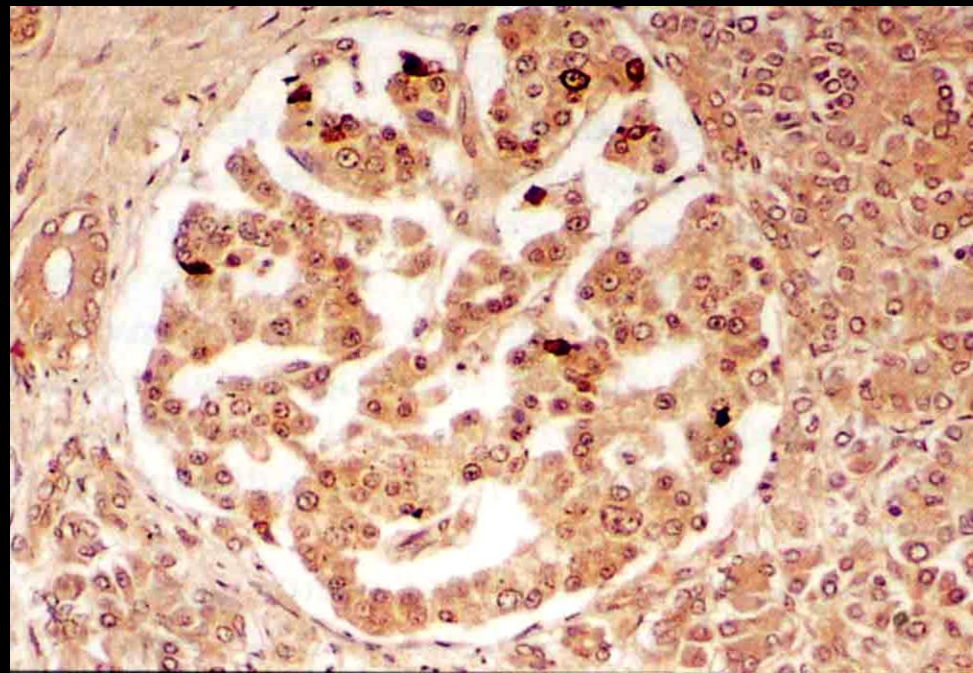




**B cells
approx. 70 %
centrum, clusters**








**A cells
to 20 %
periphery,
sheets**



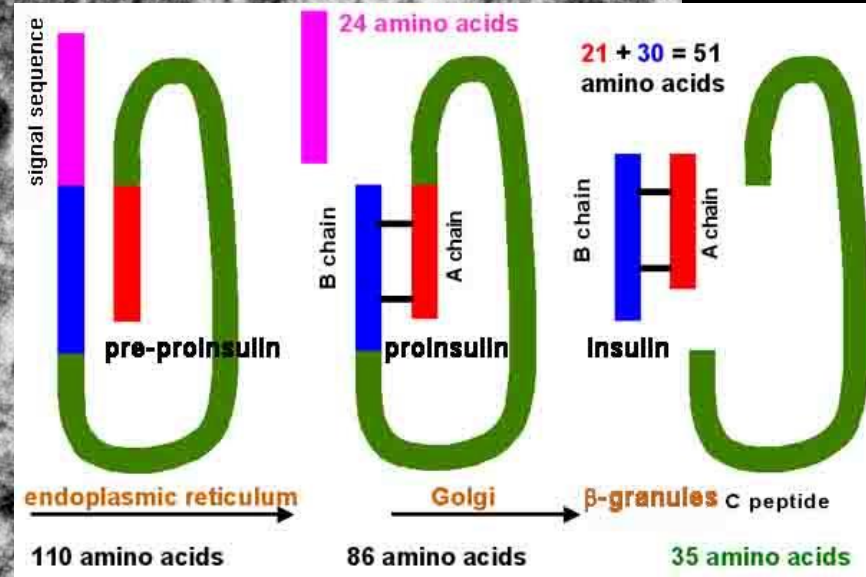
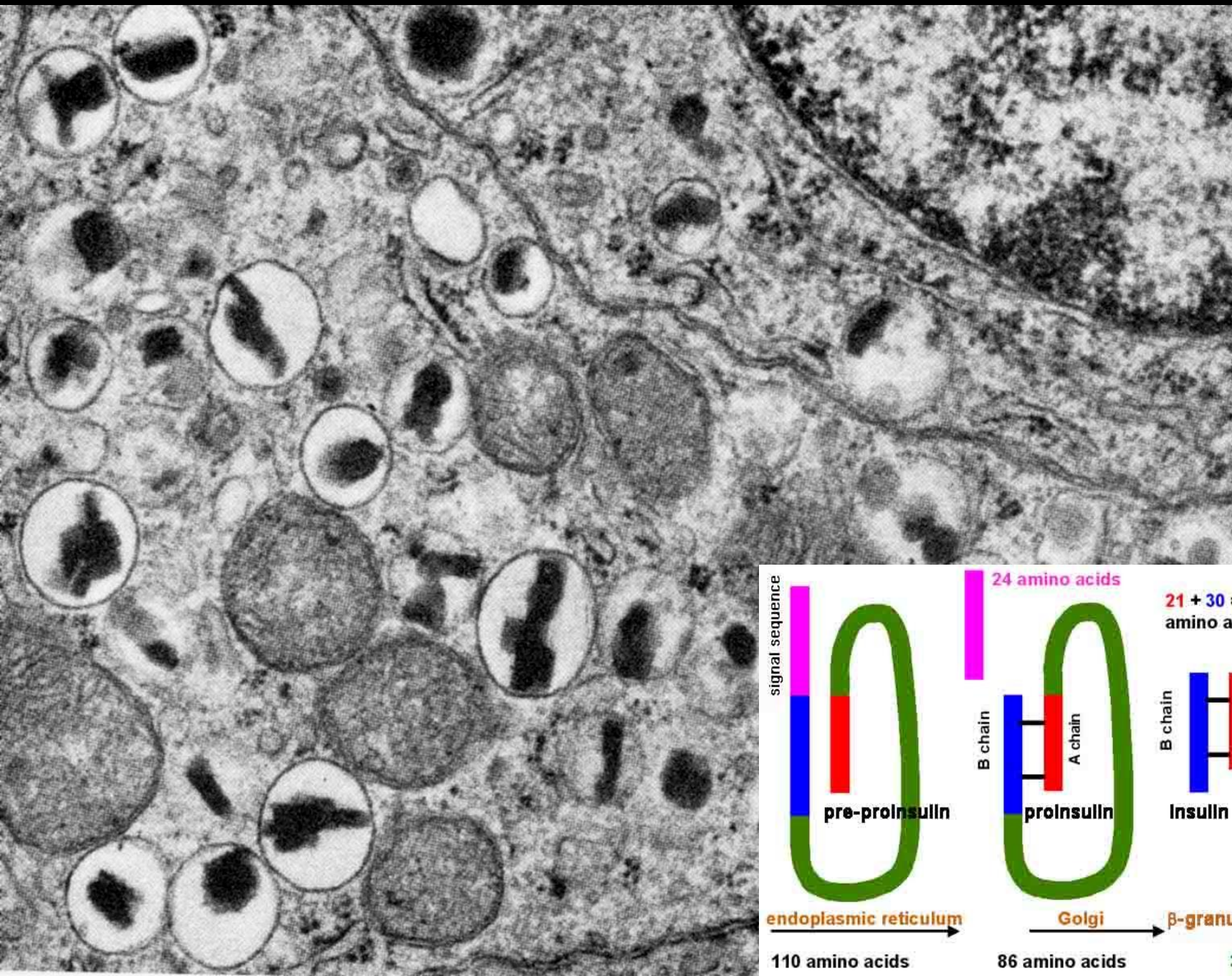
**D cells
to 5 %
scattered**

Langerhans' islets

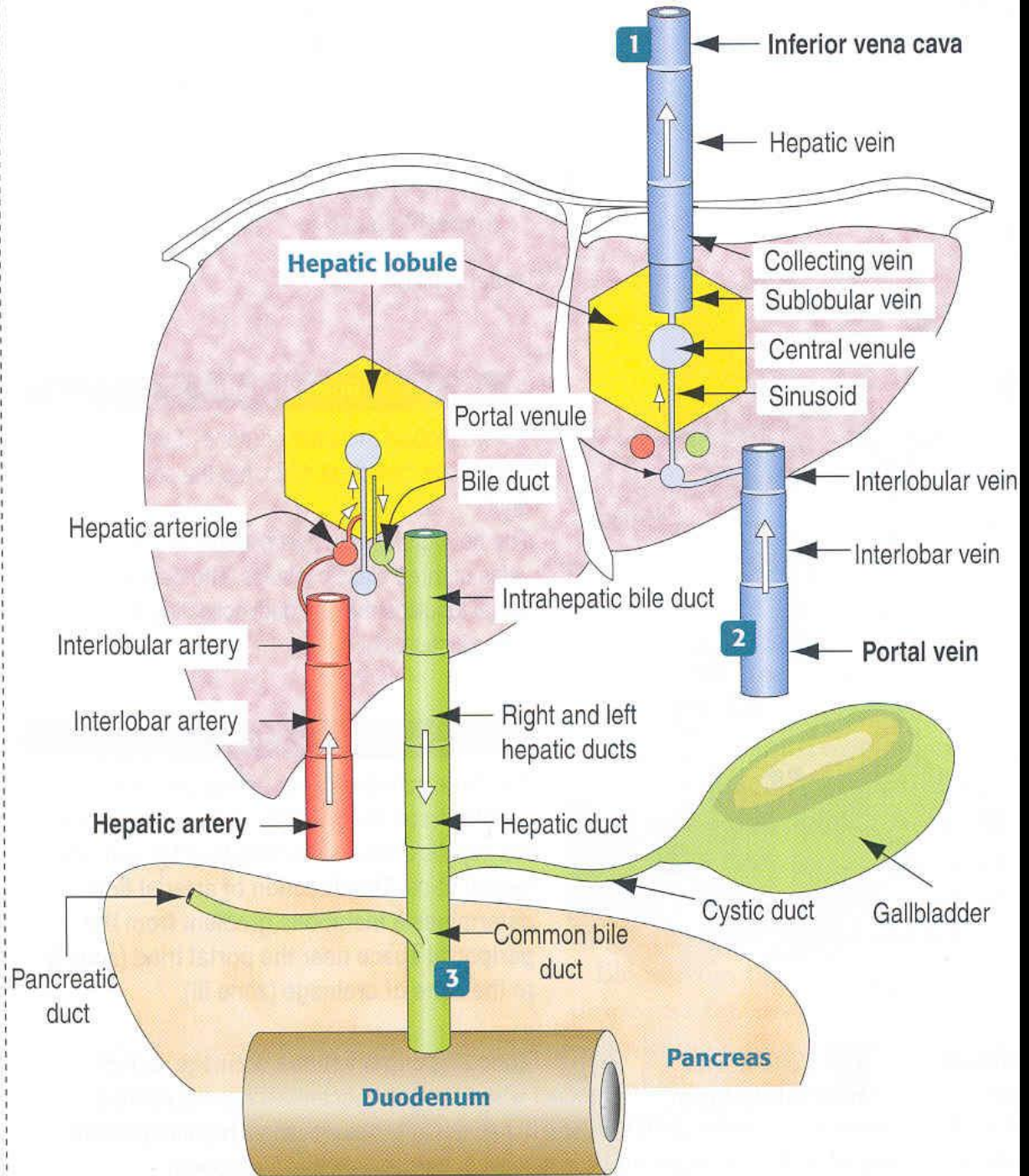
cell	granule structure	hormone
A		glucagon
B	 	insulin
D		somatostatin
F		pancreatic polypeptide

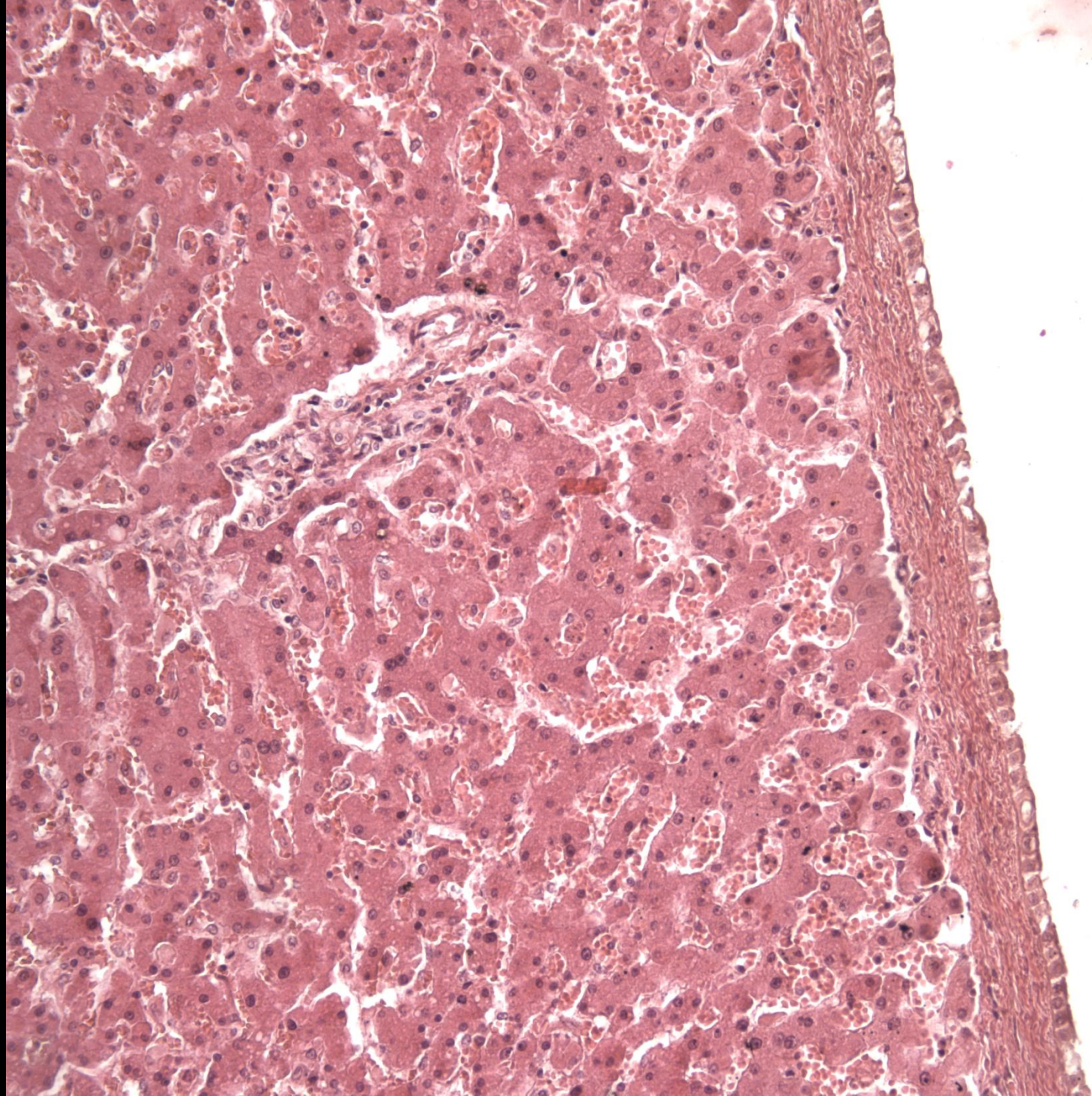
E (ghrelin), EC (substance P), D₁ (VIP)

B cell



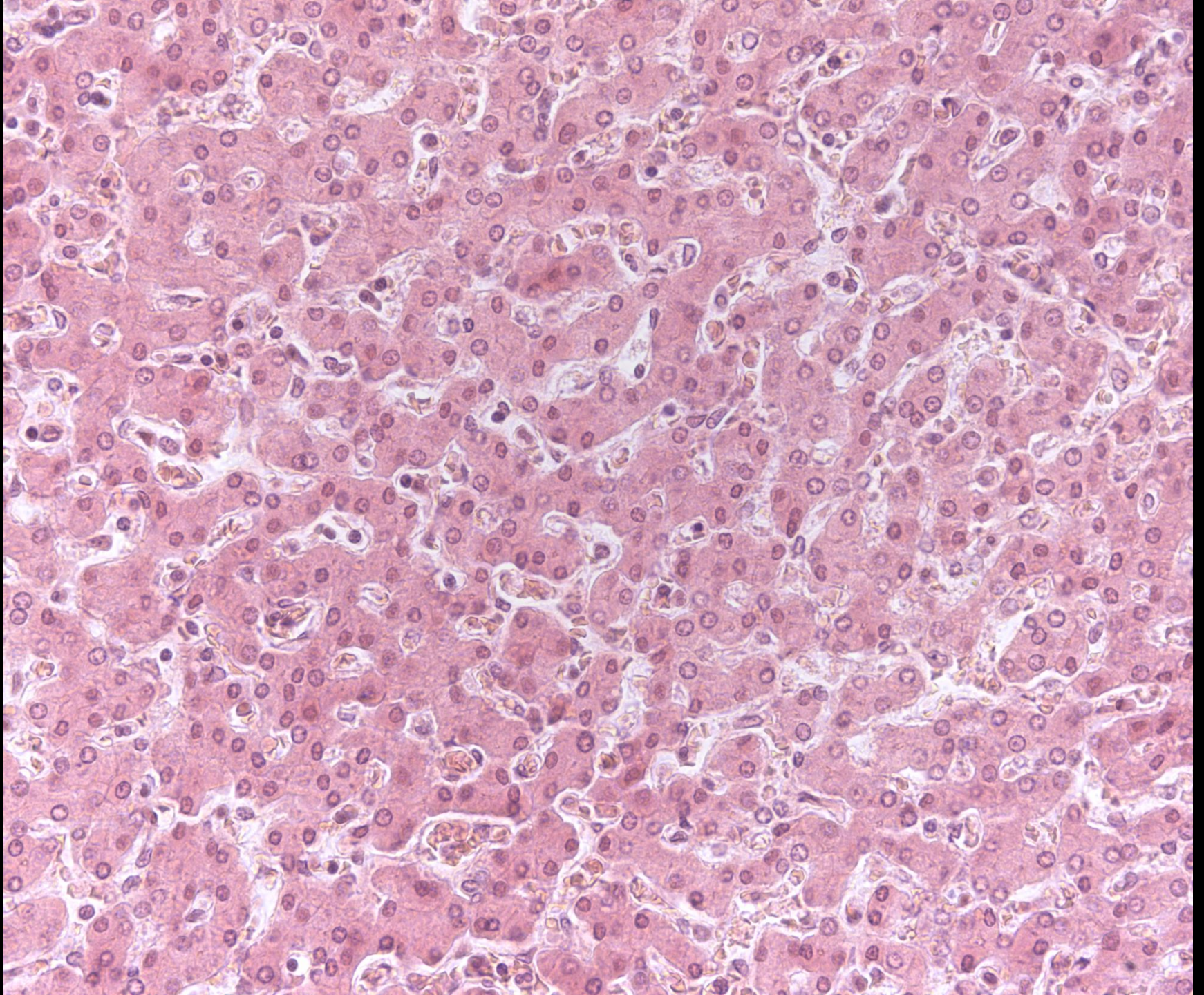
Liver (iecur, hepar)

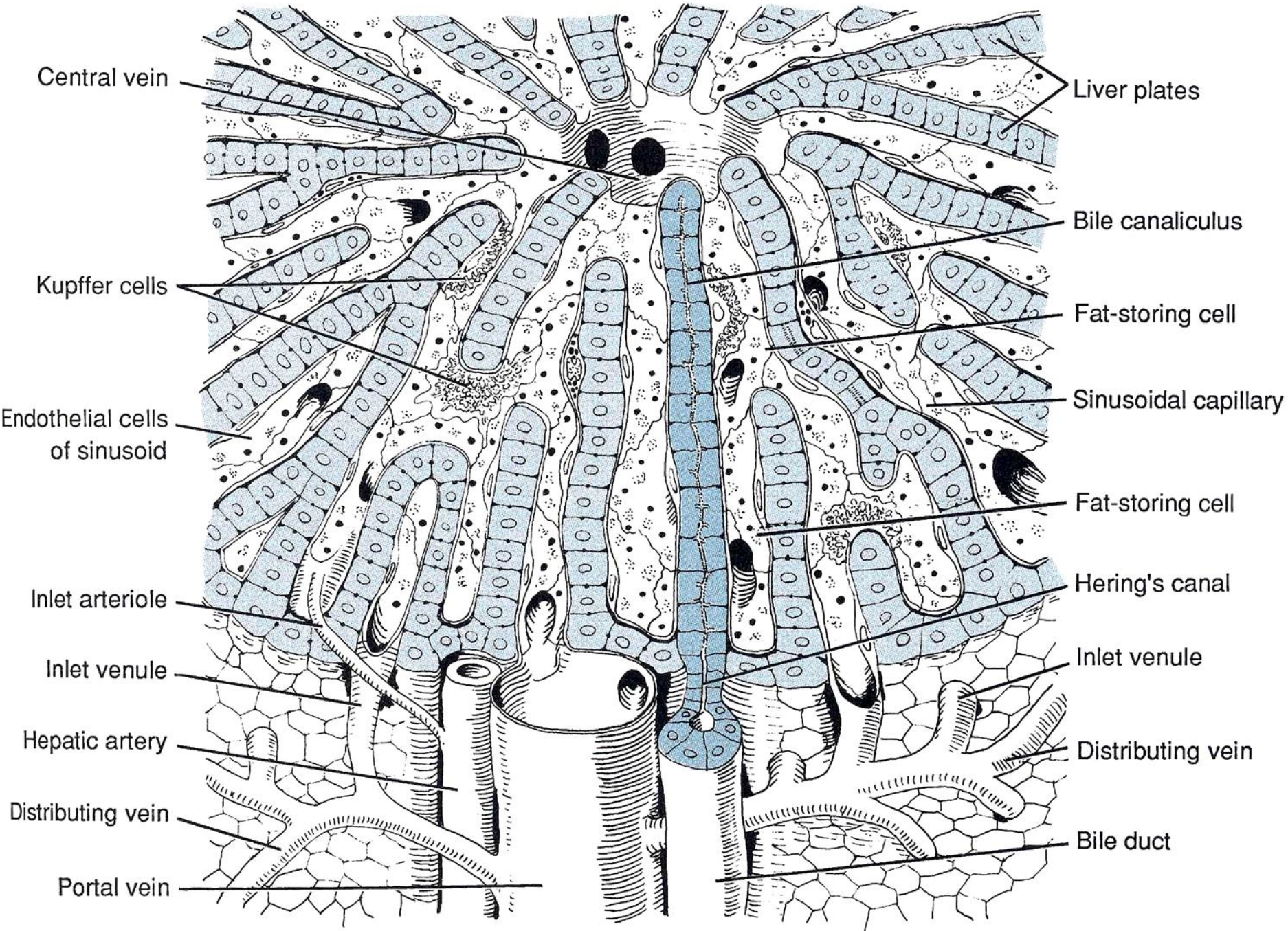




Trabecular epithelium







Central vein

Liver plates

Bile canaliculus

Kupffer cells

Fat-storing cell

Sinusoidal capillary

Endothelial cells of sinusoid

Fat-storing cell

Hering's canal

Inlet arteriole

Inlet venule

Inlet venule

Distributing vein

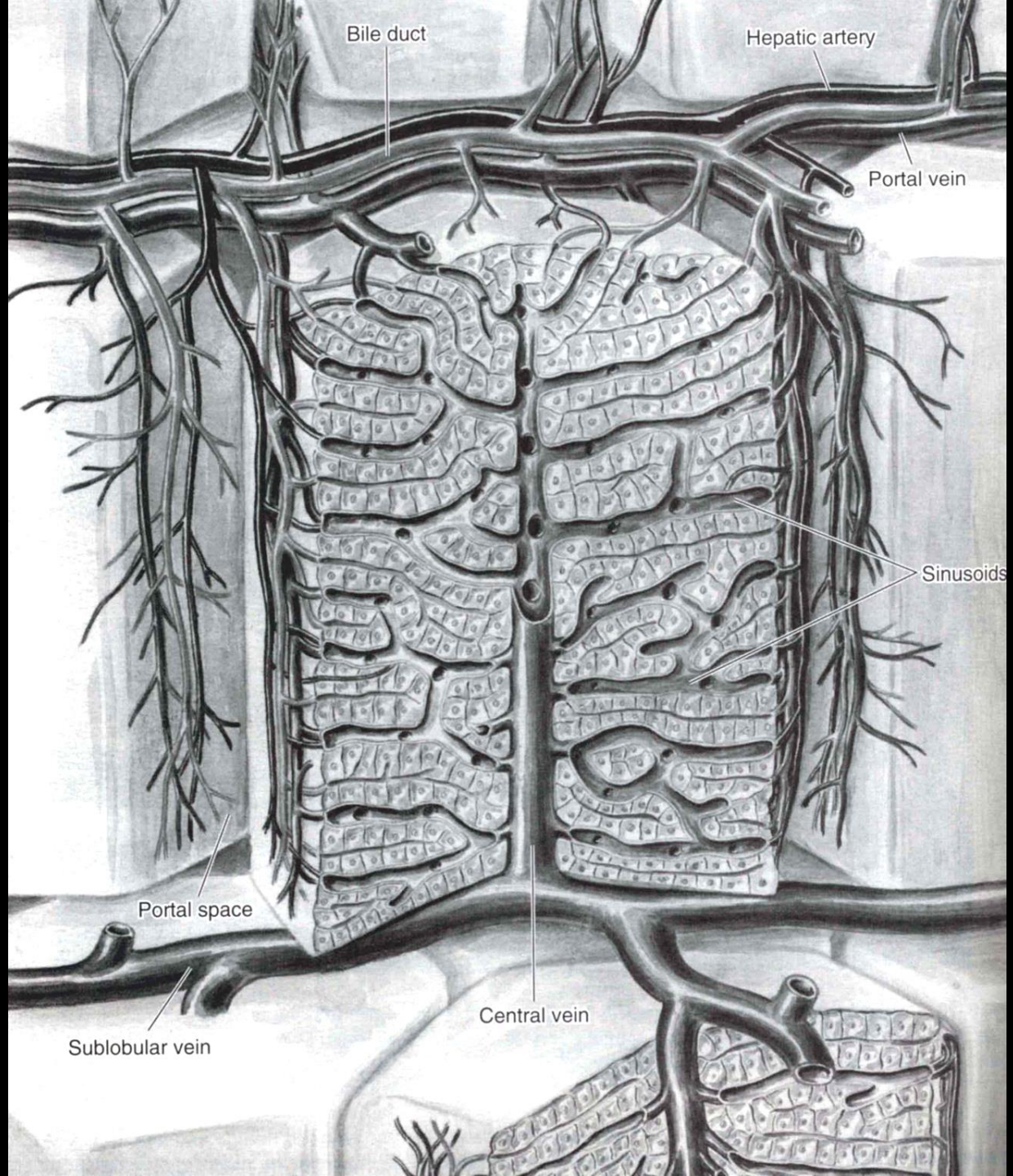
Hepatic artery

Bile duct

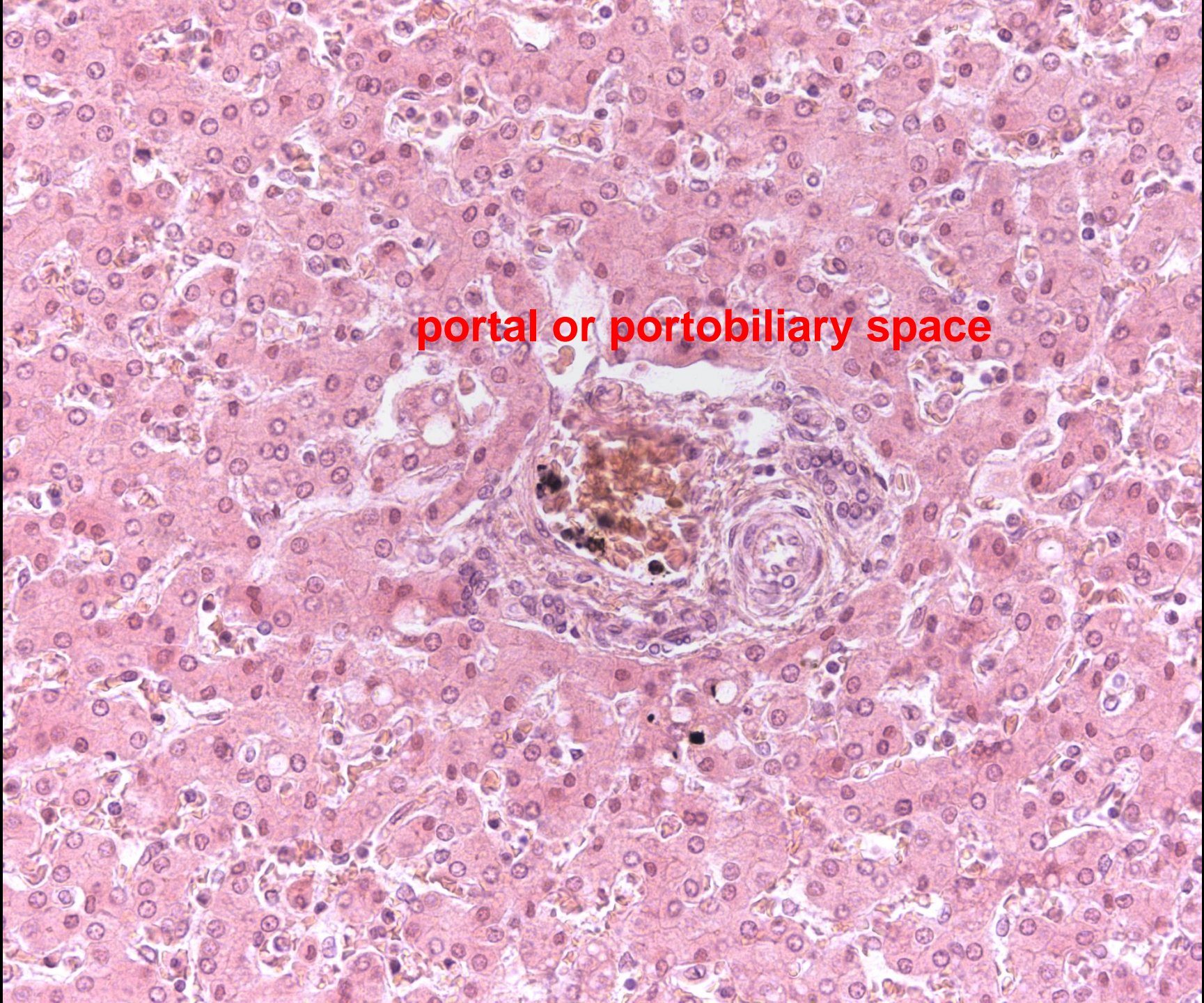
Distributing vein

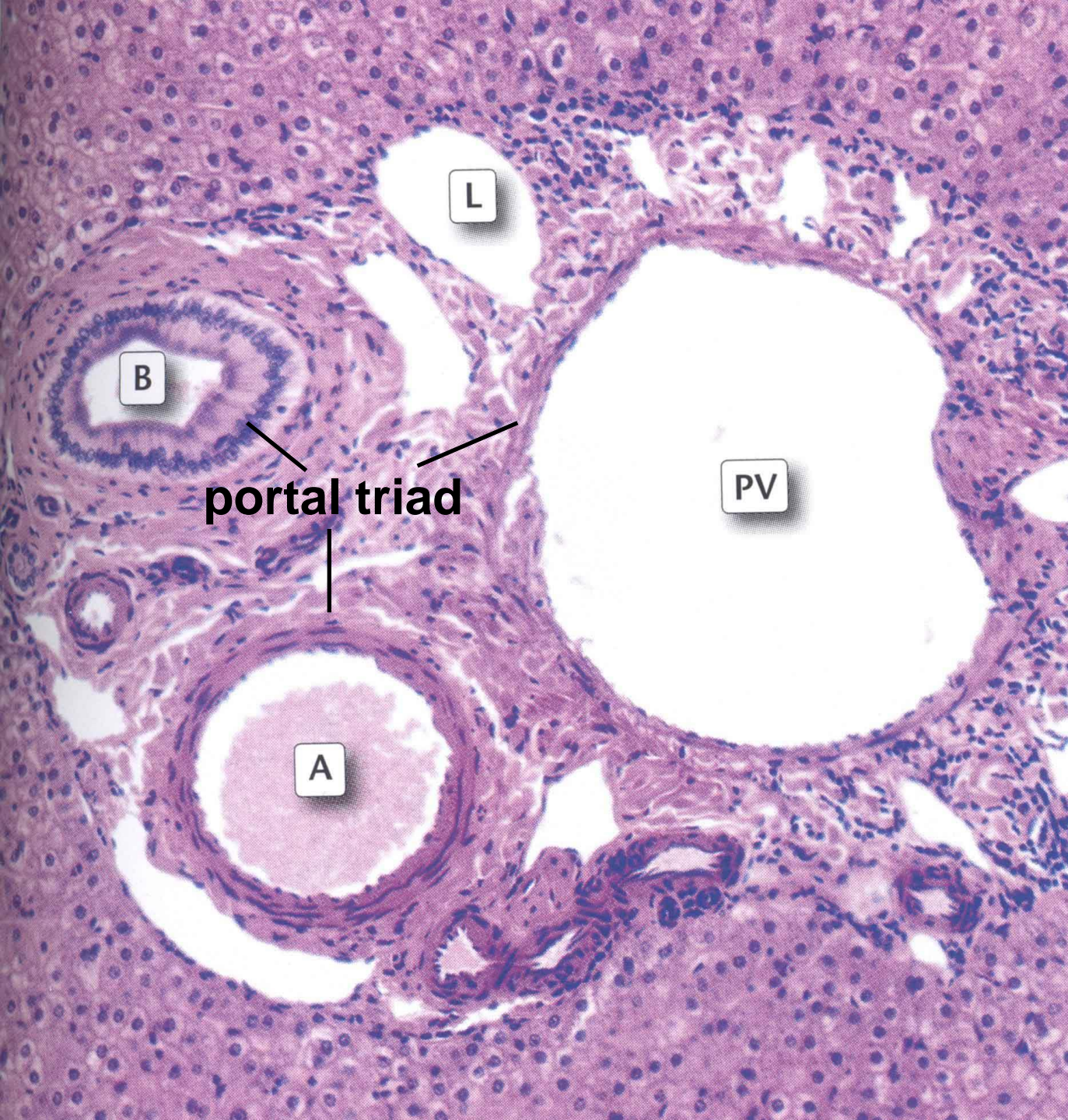
Portal vein

Blood supply



portal or portobiliary space





portal triad

B

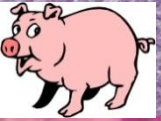
A

PV

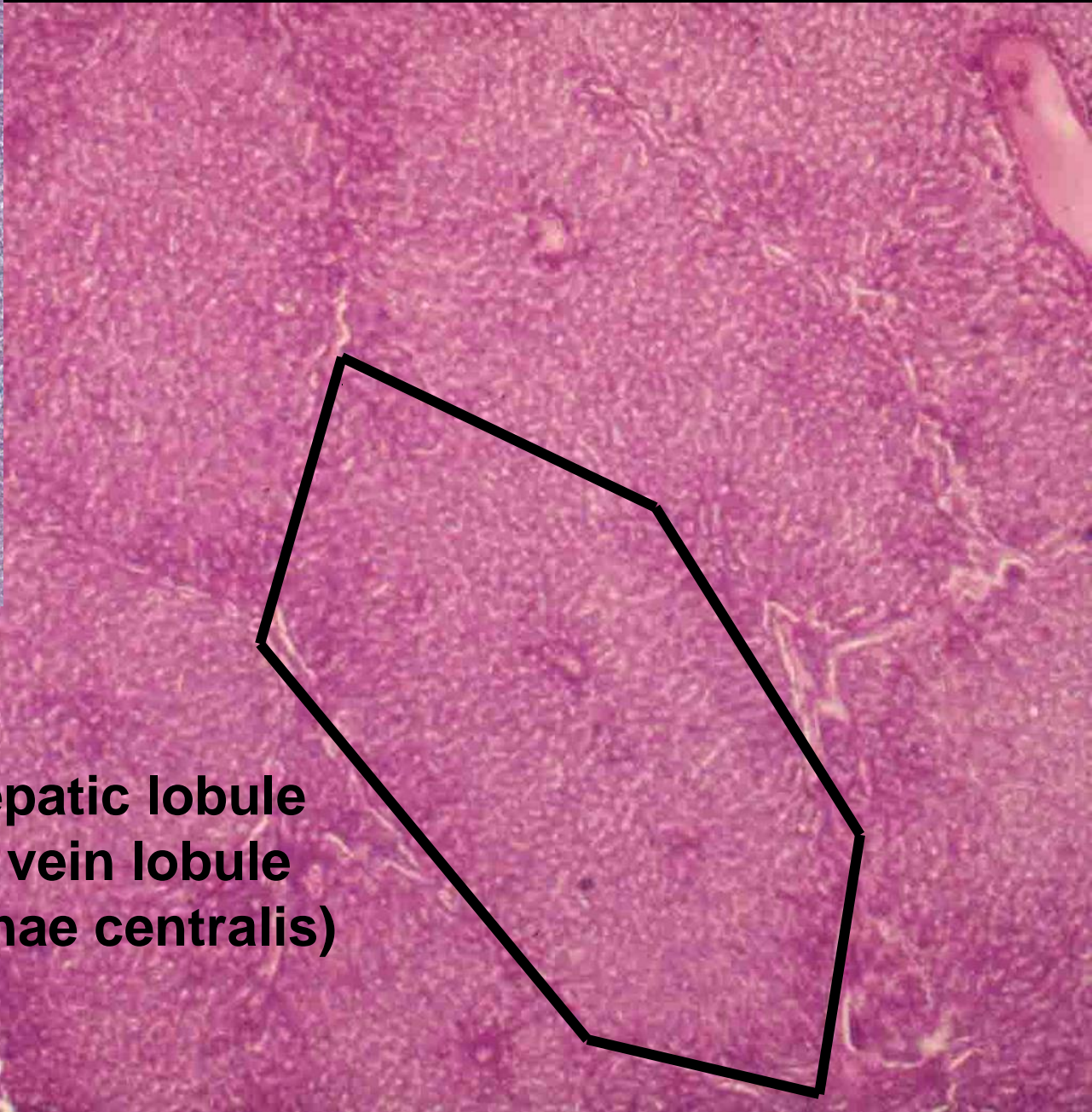
L



central vein

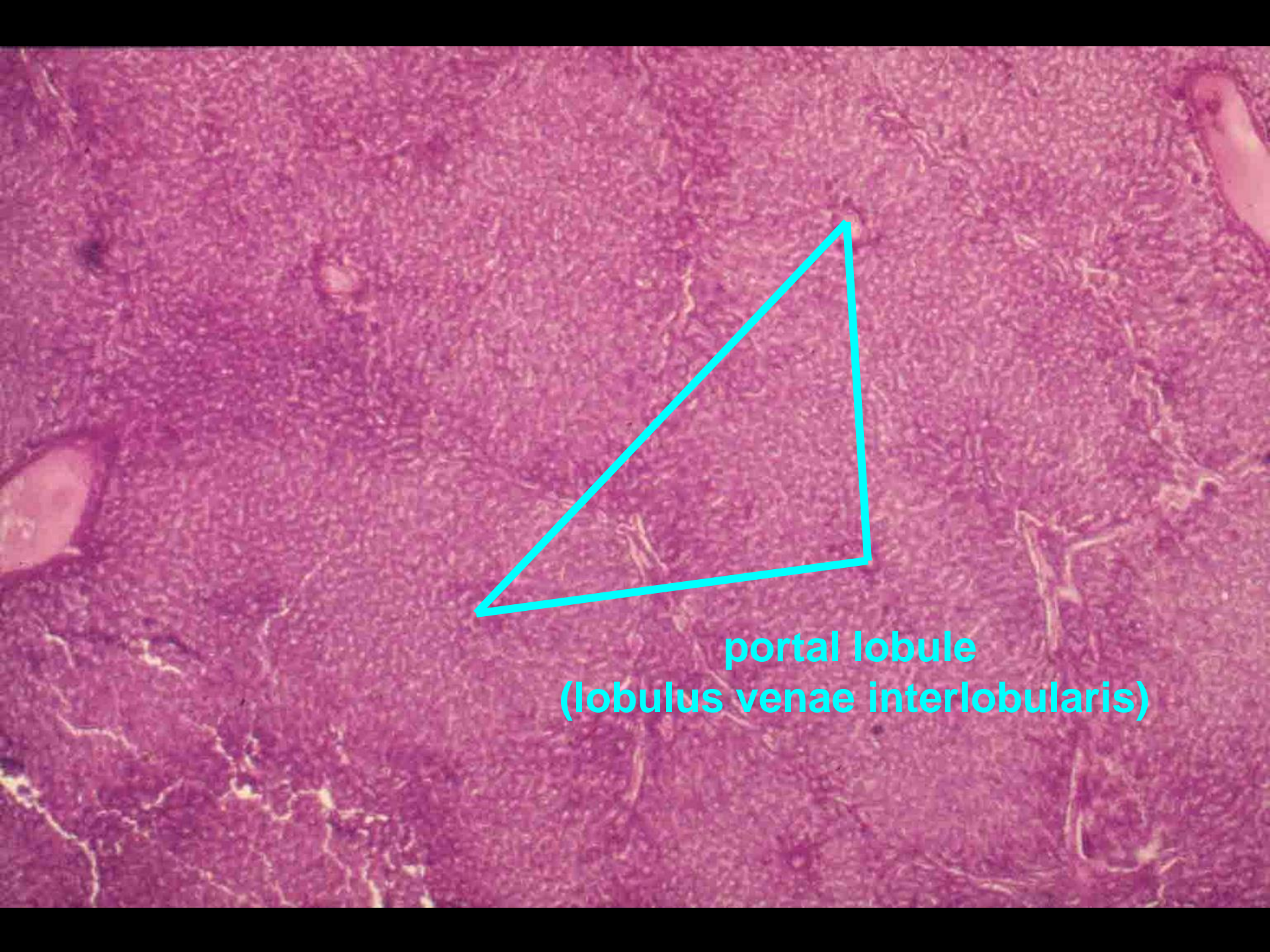


**classic hepatic lobule
or central vein lobule
(lobulus venae centralis)**



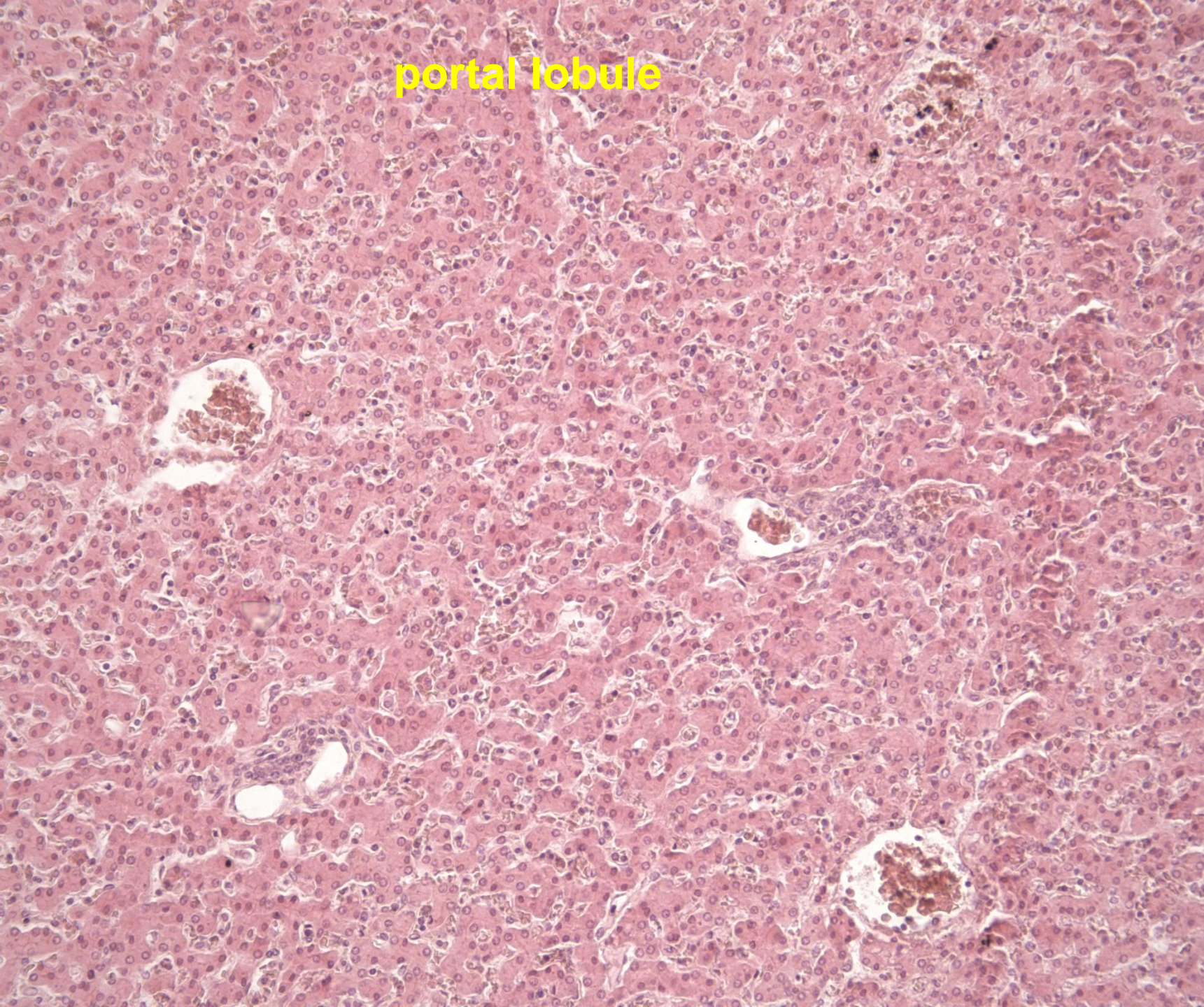
hepatic lobule



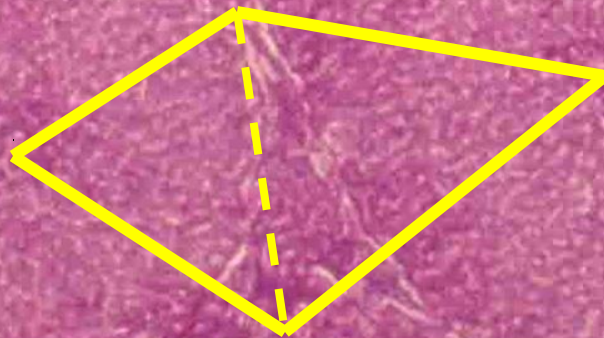


**portal lobule
(lobulus venae interlobularis)**

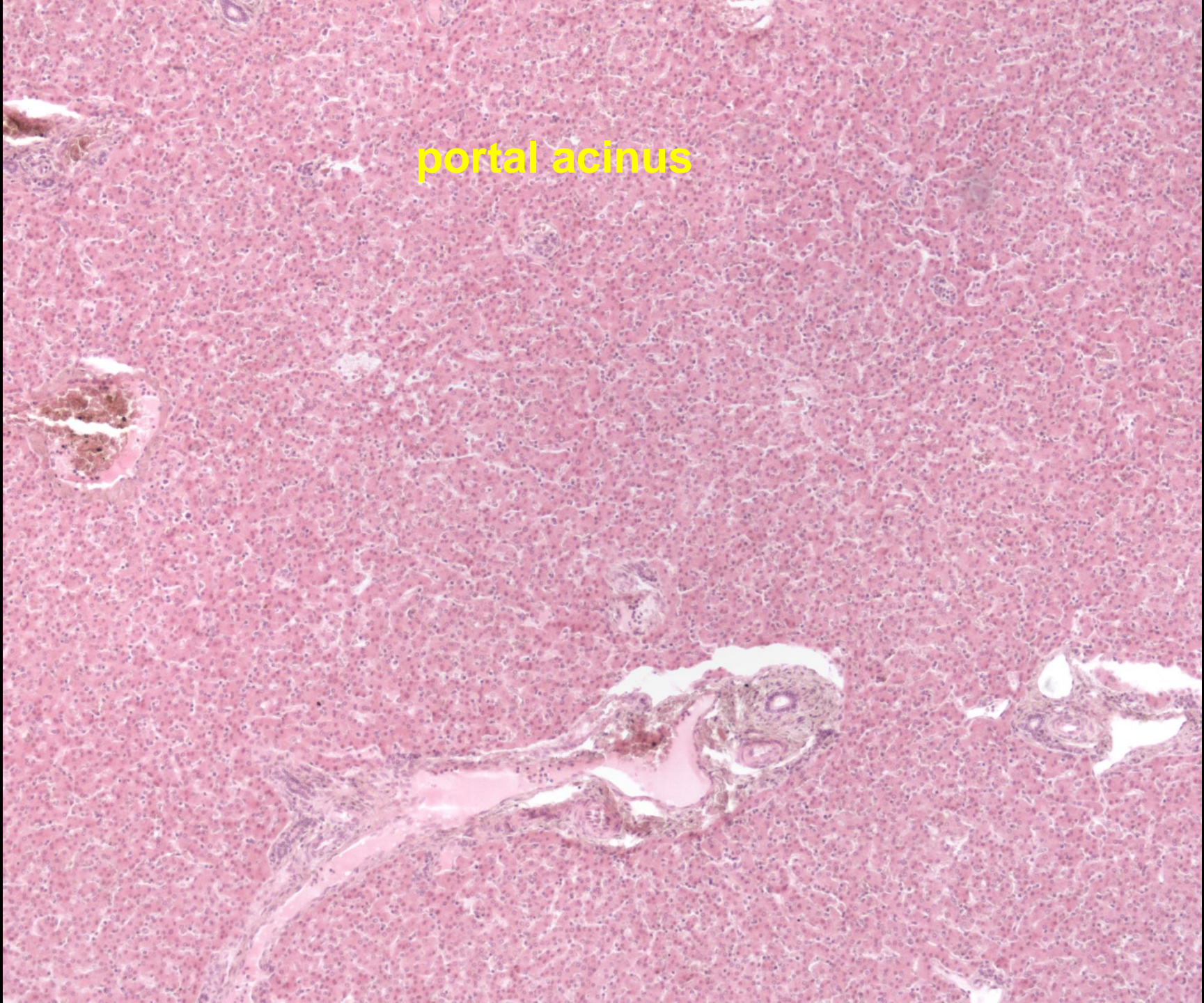
portal lobule



**portal acinus
(acinus venae circumlobularis)**



portal acinus



a CLASSIC HEPATIC LOBULE

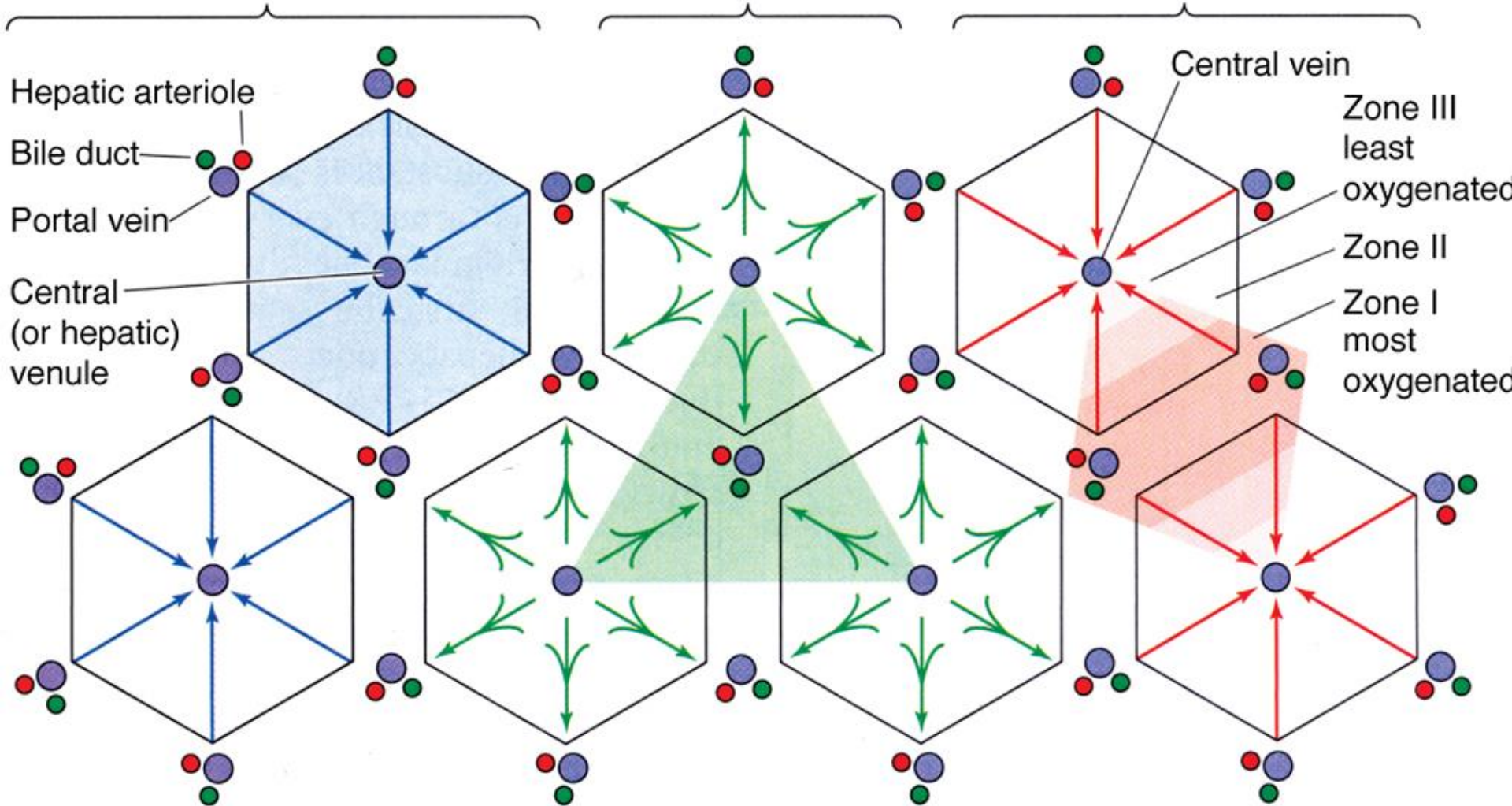
Drains blood from the portal vein and the hepatic artery to the hepatic or the central vein

b PORTAL LOBULE

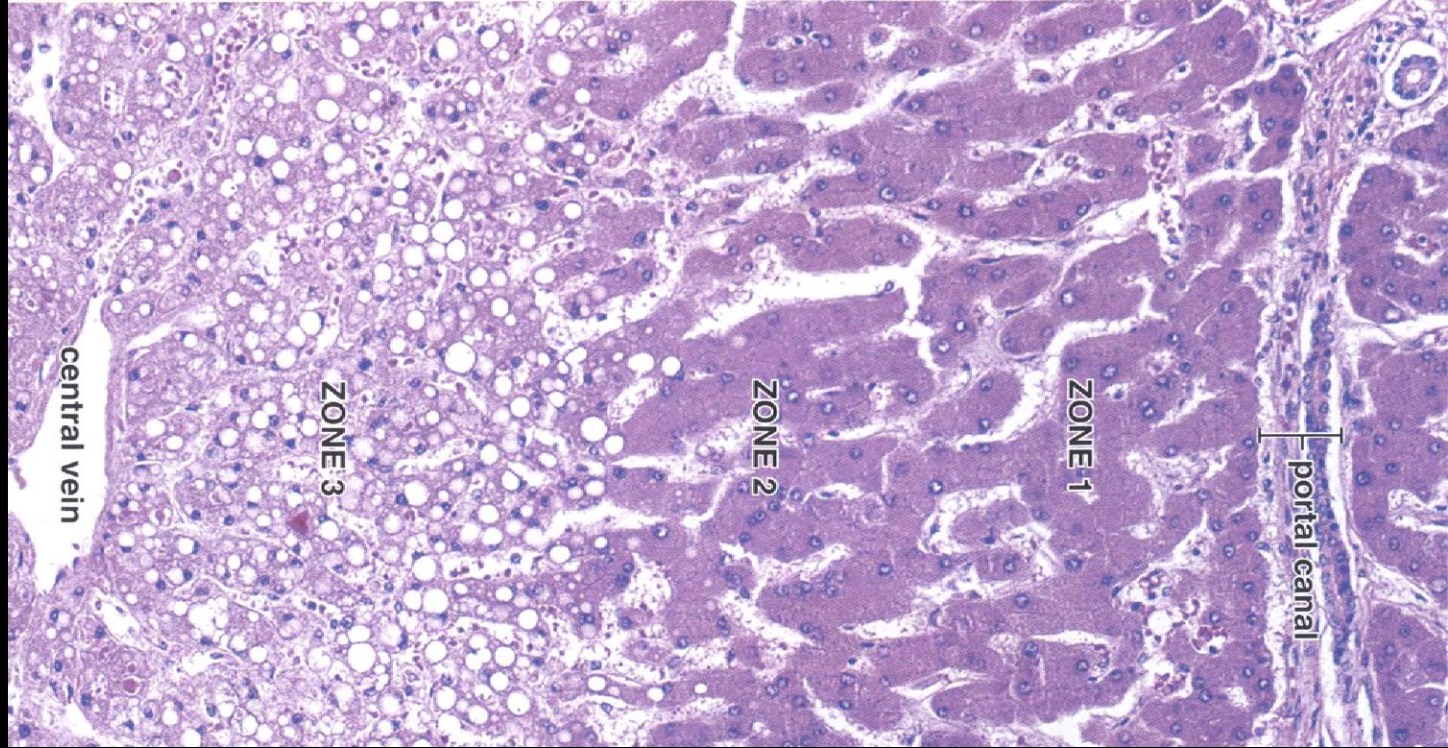
Drains bile from hepatocytes to the bile duct

c PORTAL ACINUS

Supplies oxygenated blood to hepatocytes



hypoxic damage to classic hepatic lobule



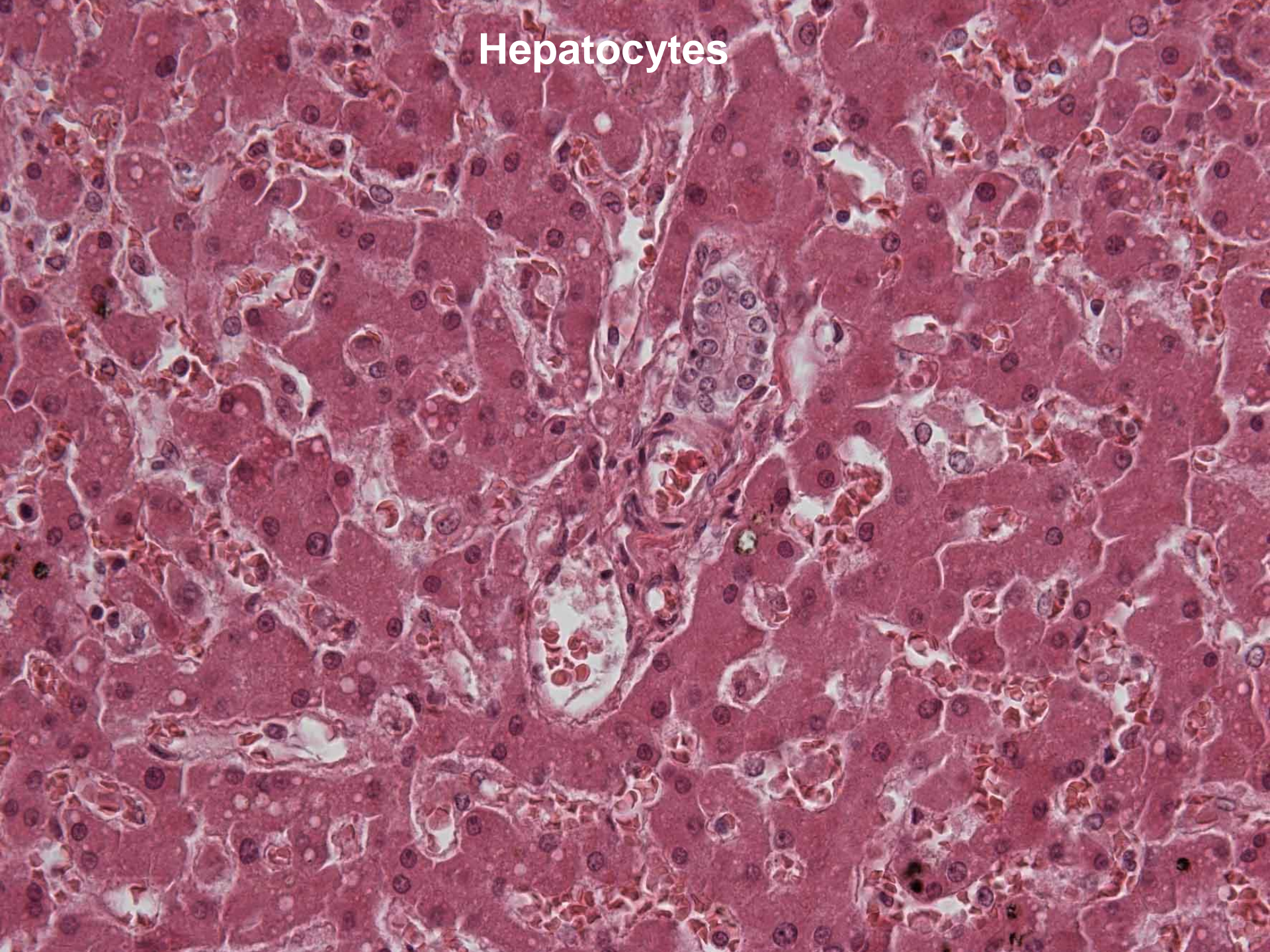
Pawlina, W.: Histology. A Text and Atlas, Wolters Kluwer 2016.

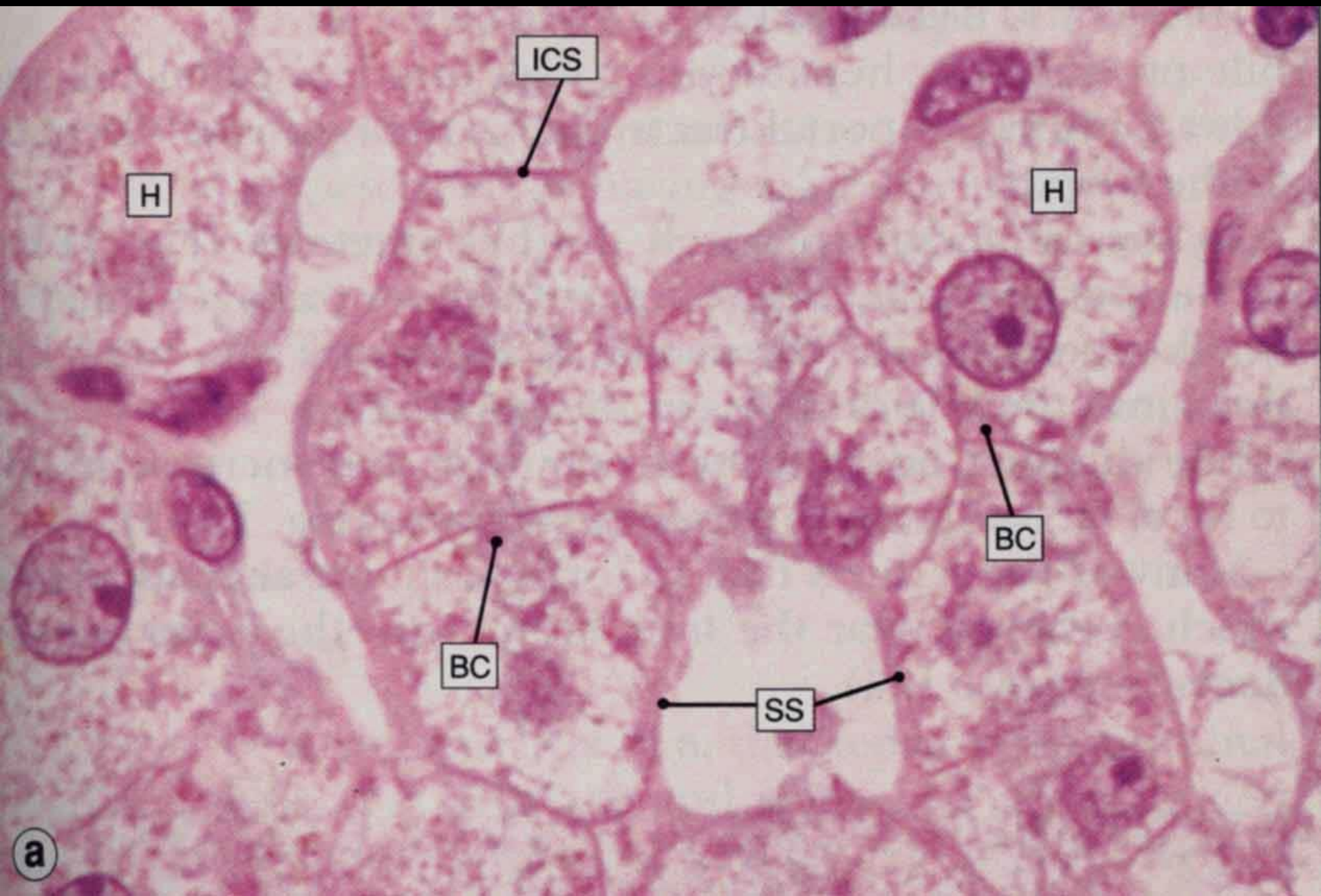
Sarma, V., Janmeda, P.: Protective assessment of Euphorbia neriifolia and its isolated flavonoid against N-nitrosodiethylamine-induced hepatic carcinogenesis in male mice: A histopathological analysis. Toxicology International 21 (1), 2014: 37-43.

toxic damage to classic hepatic lobule



Hepatocytes





H

ICS

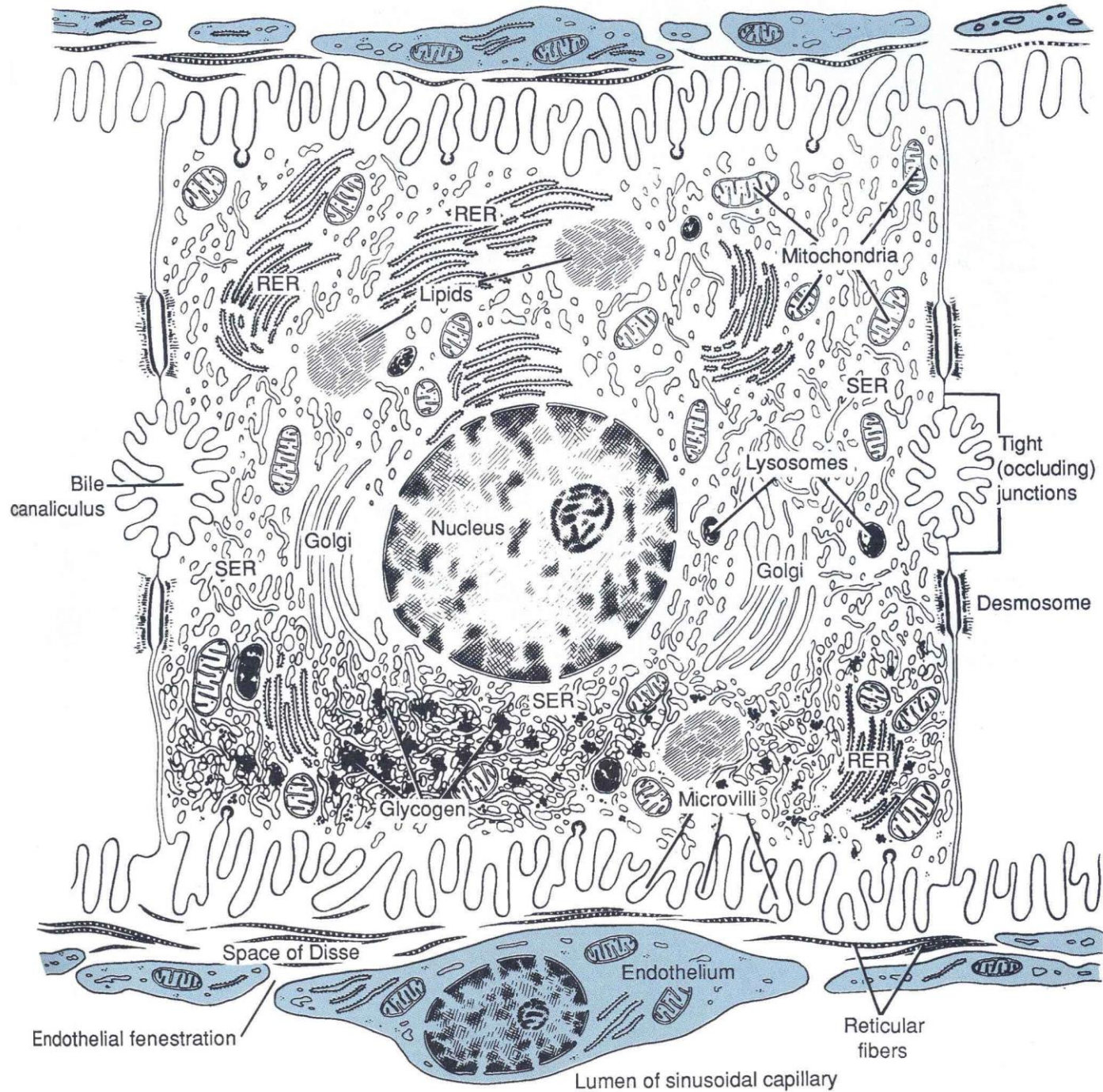
H

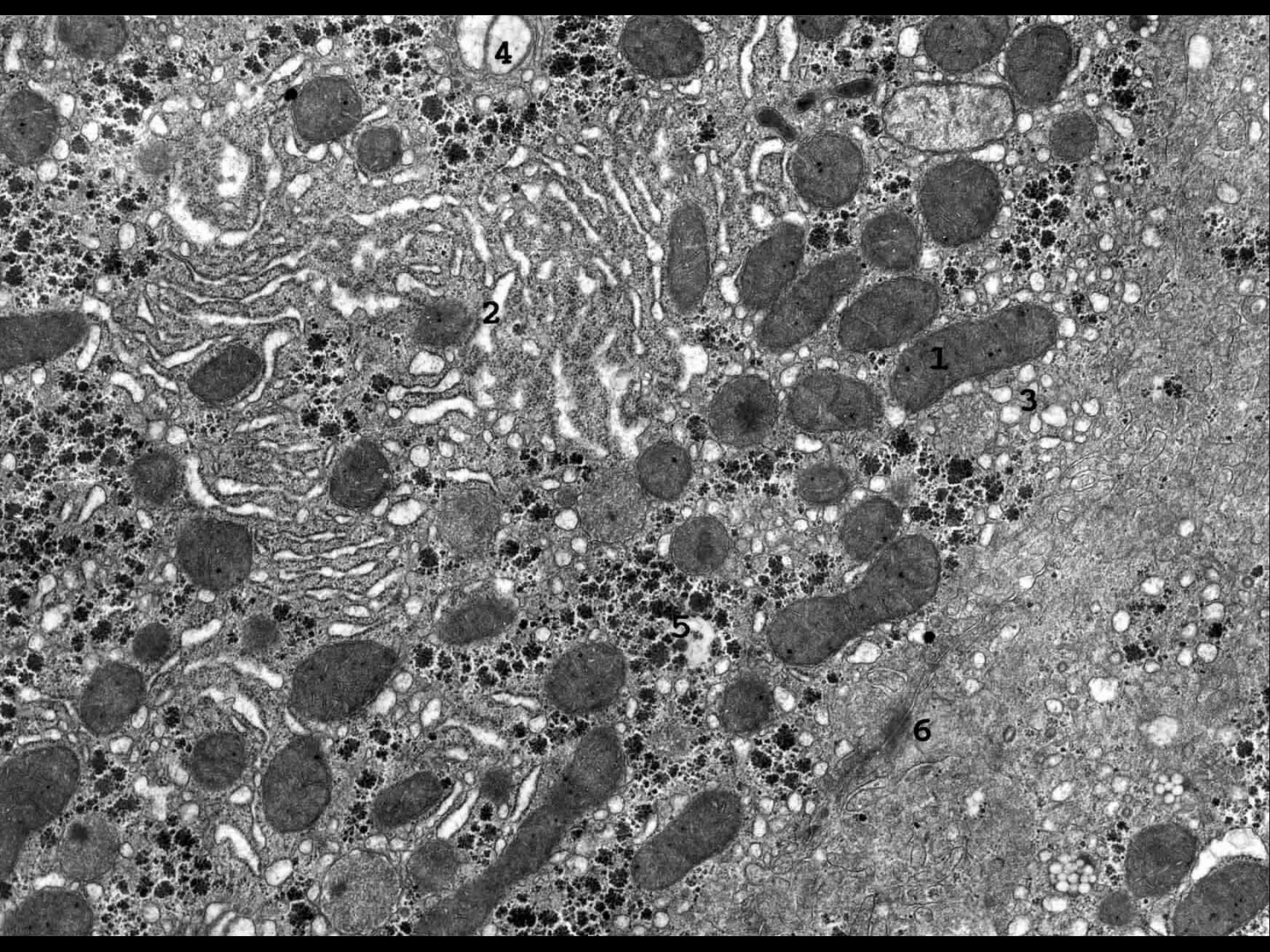
BC

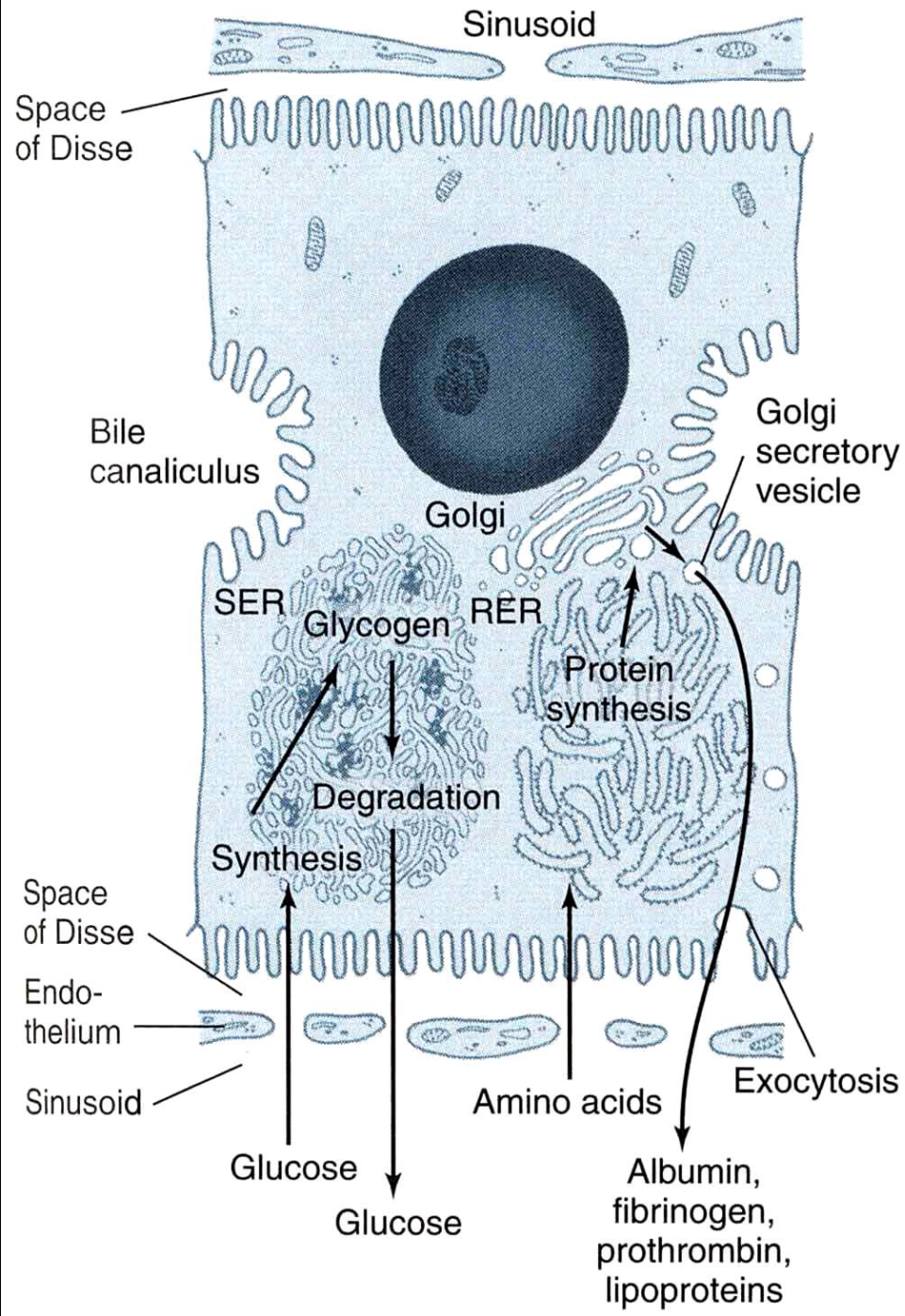
BC

SS

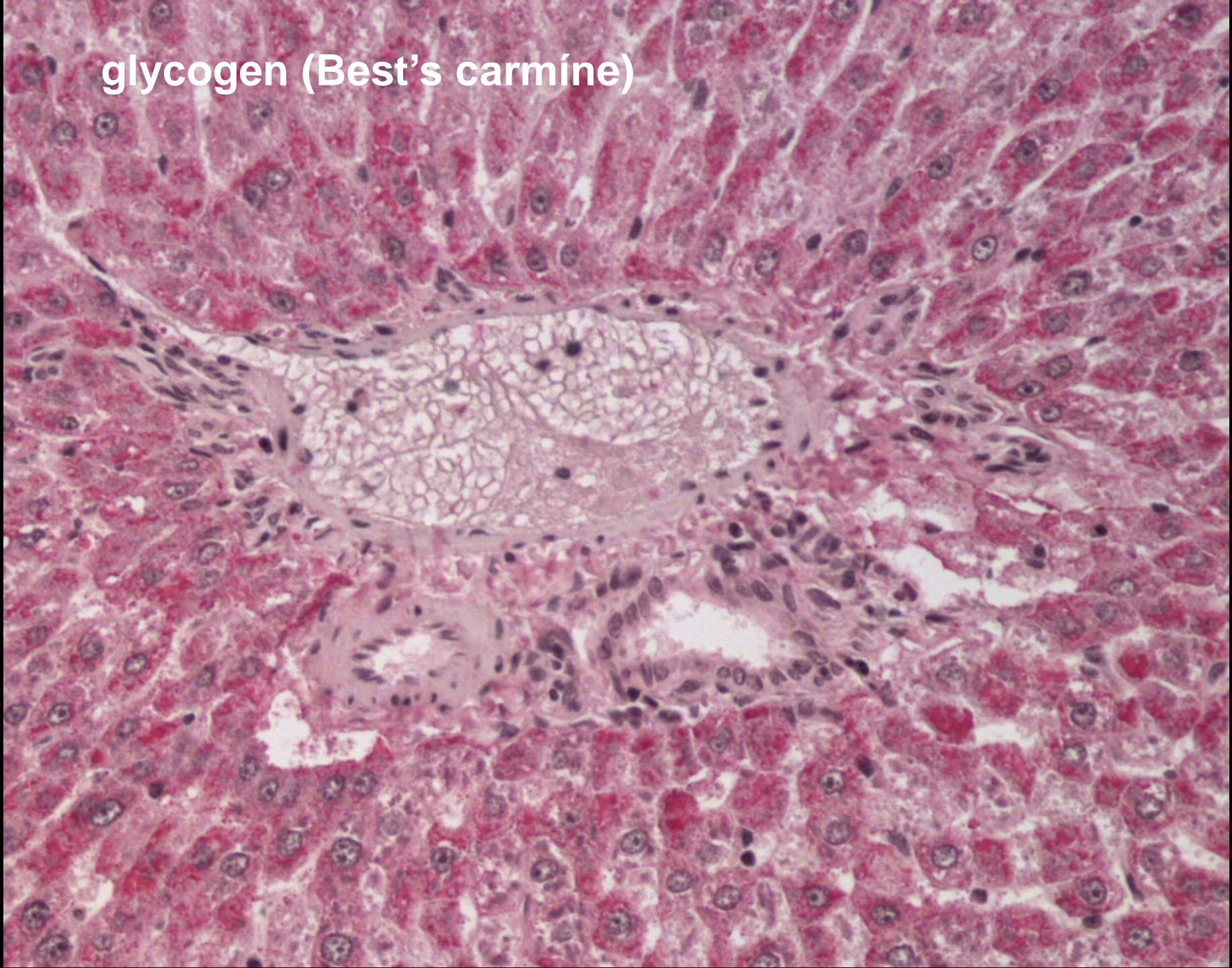
a



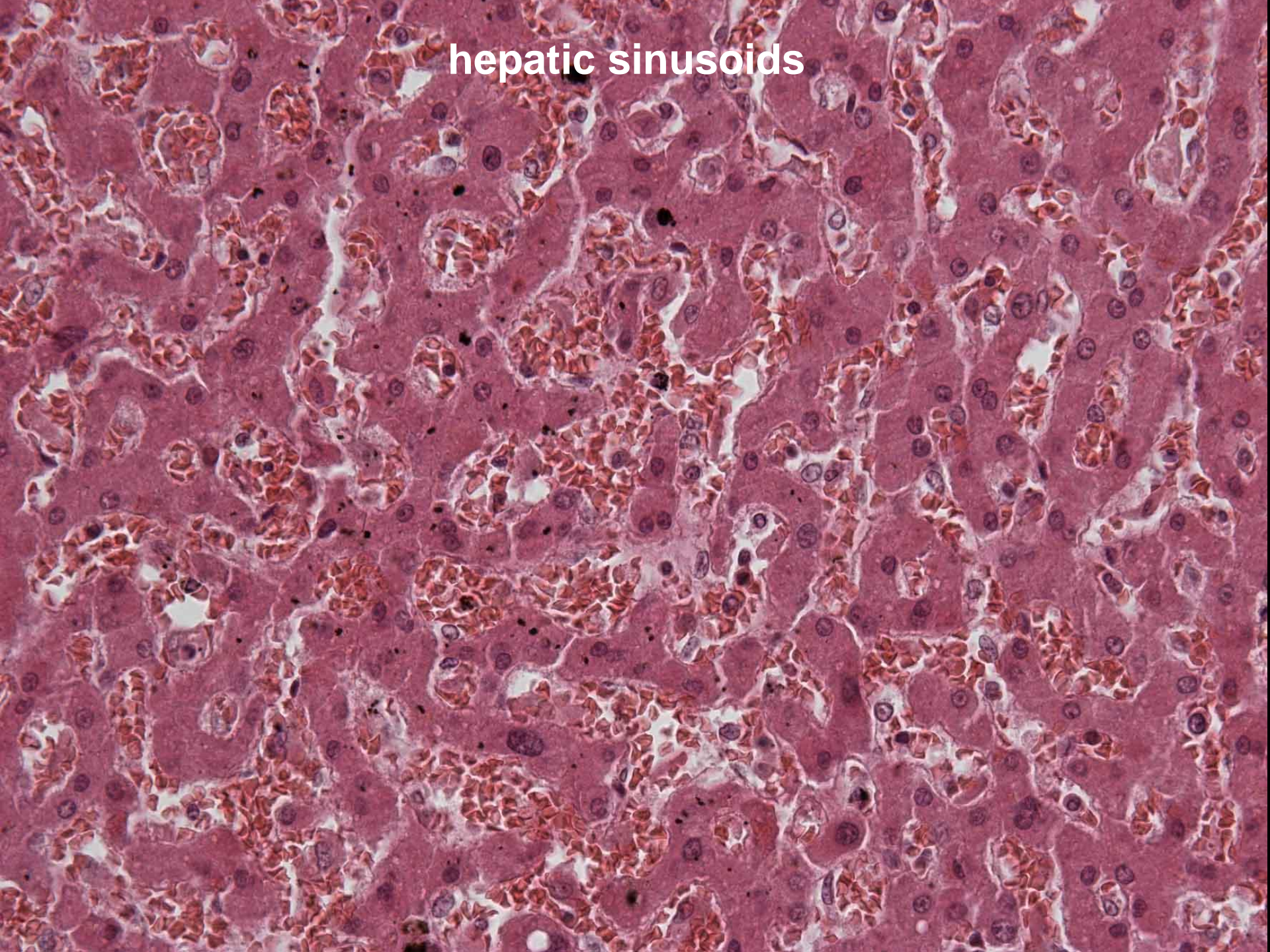


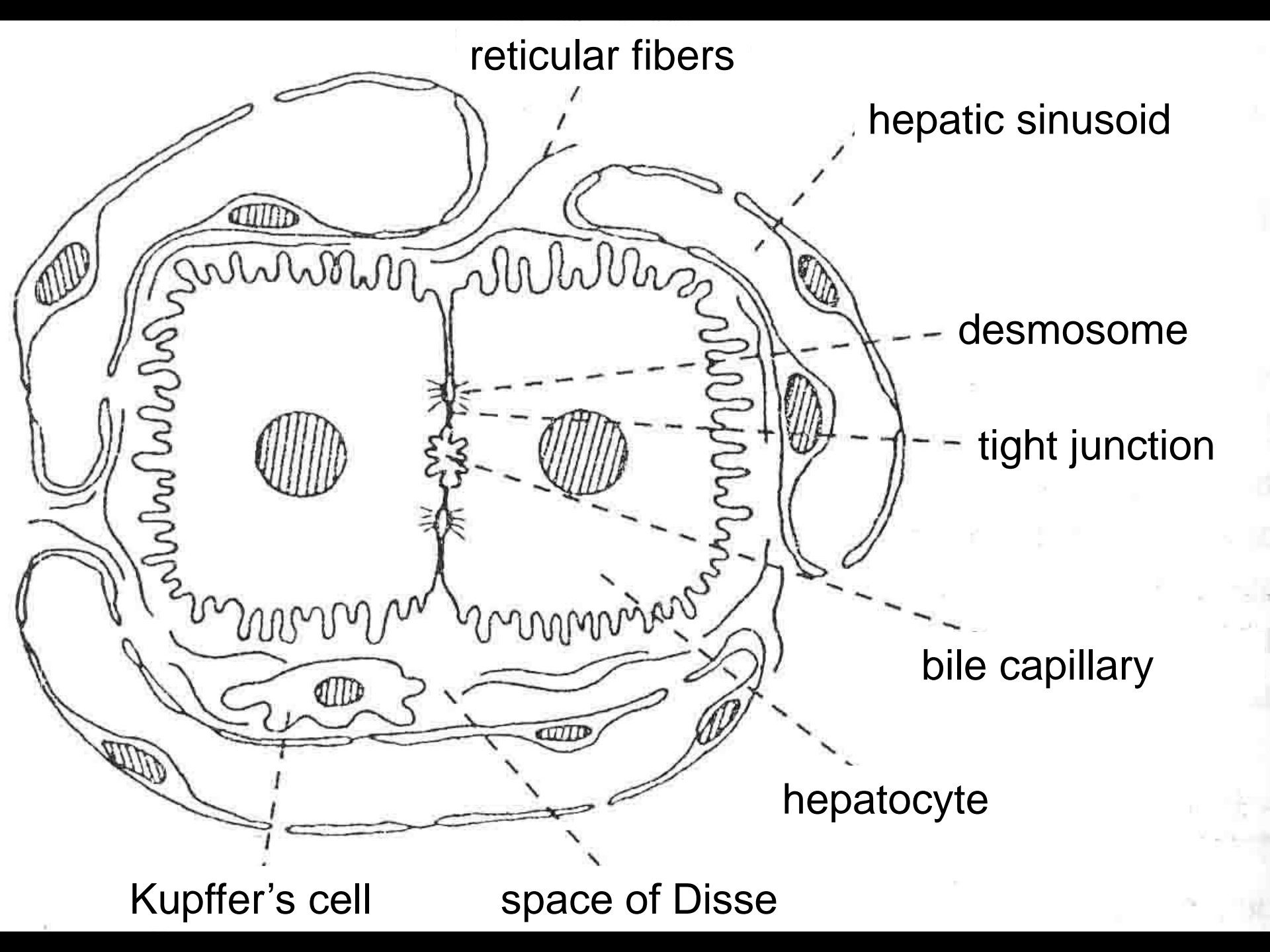


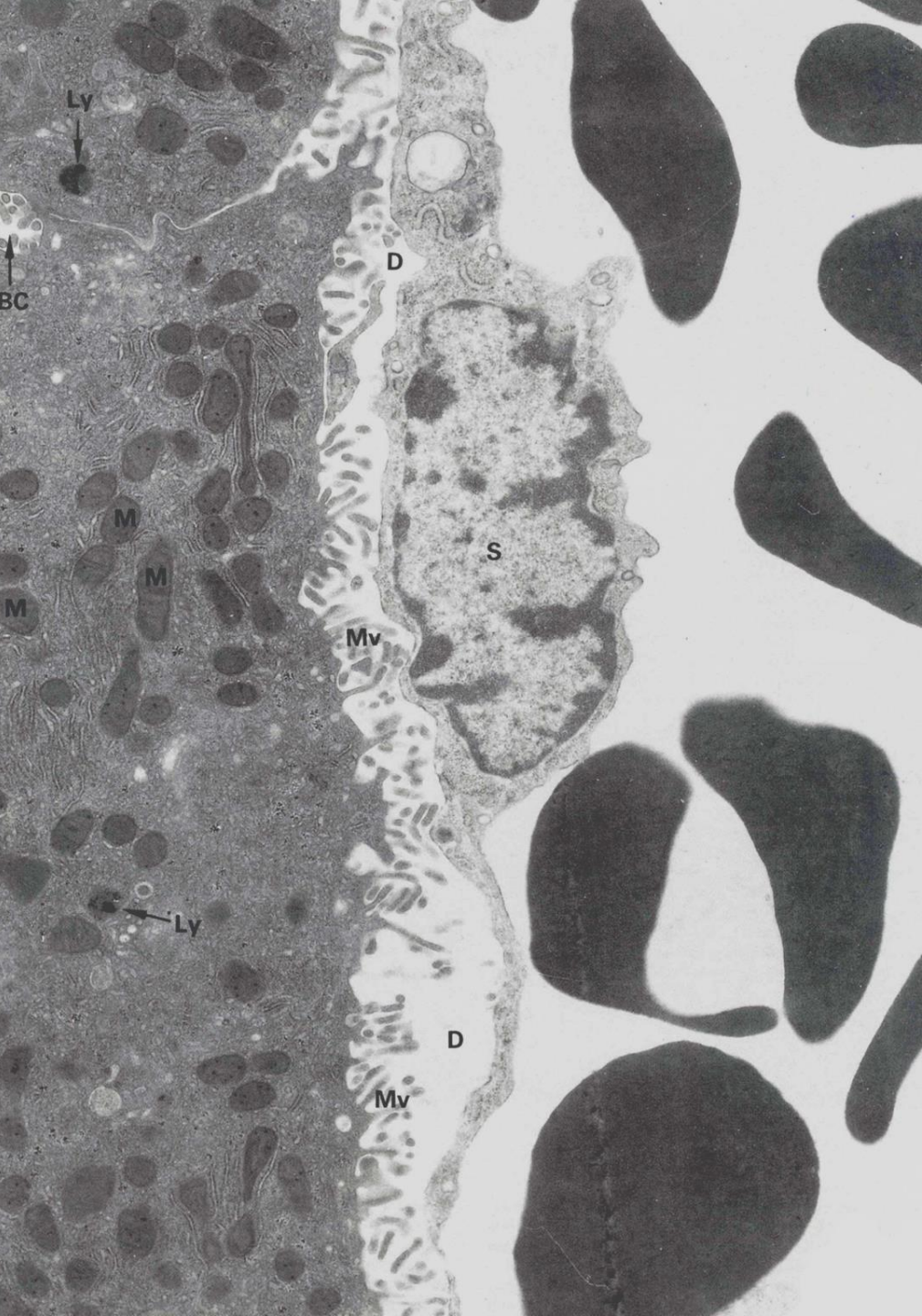
glycogen (Best's carmine)



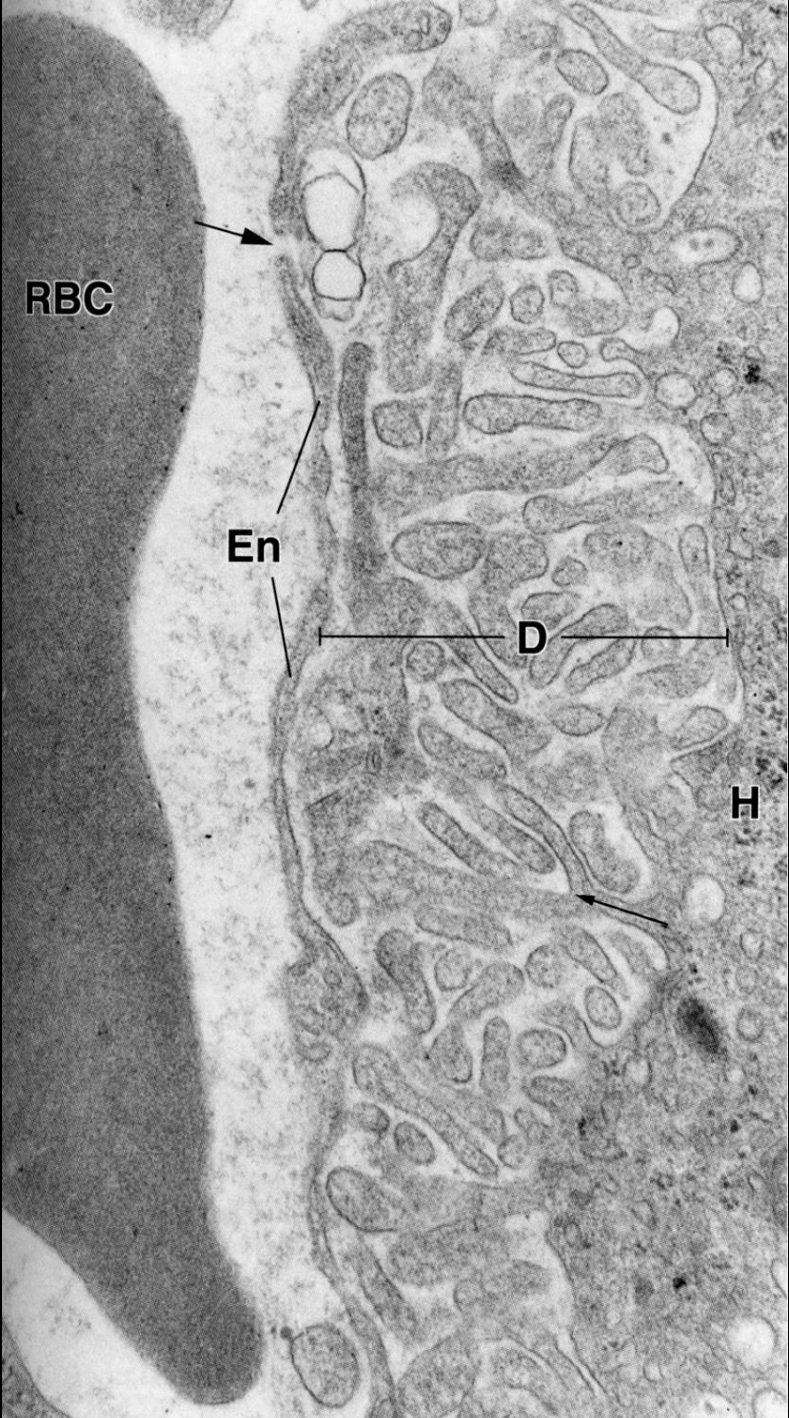
hepatic sinusoids



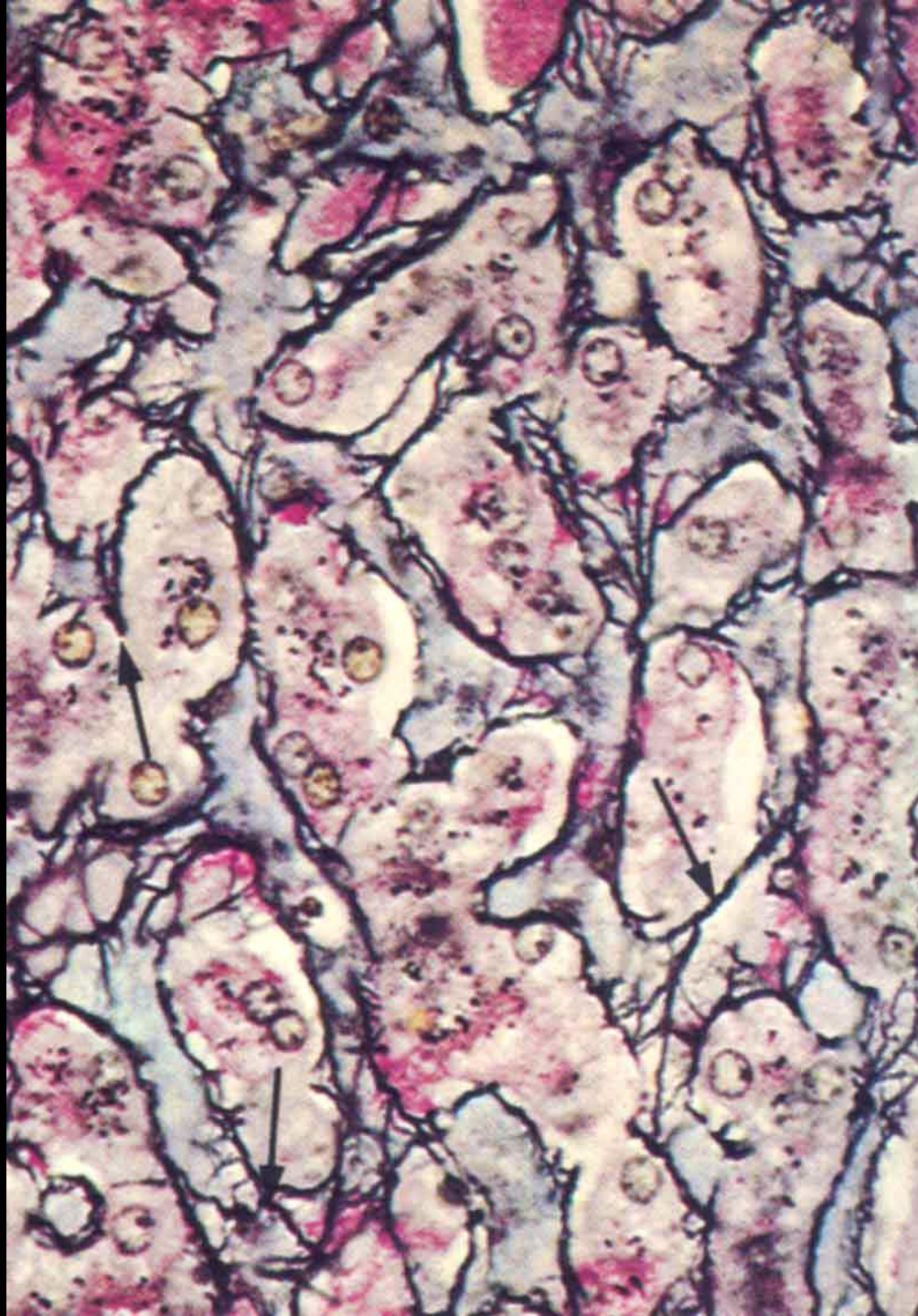




space of Disse

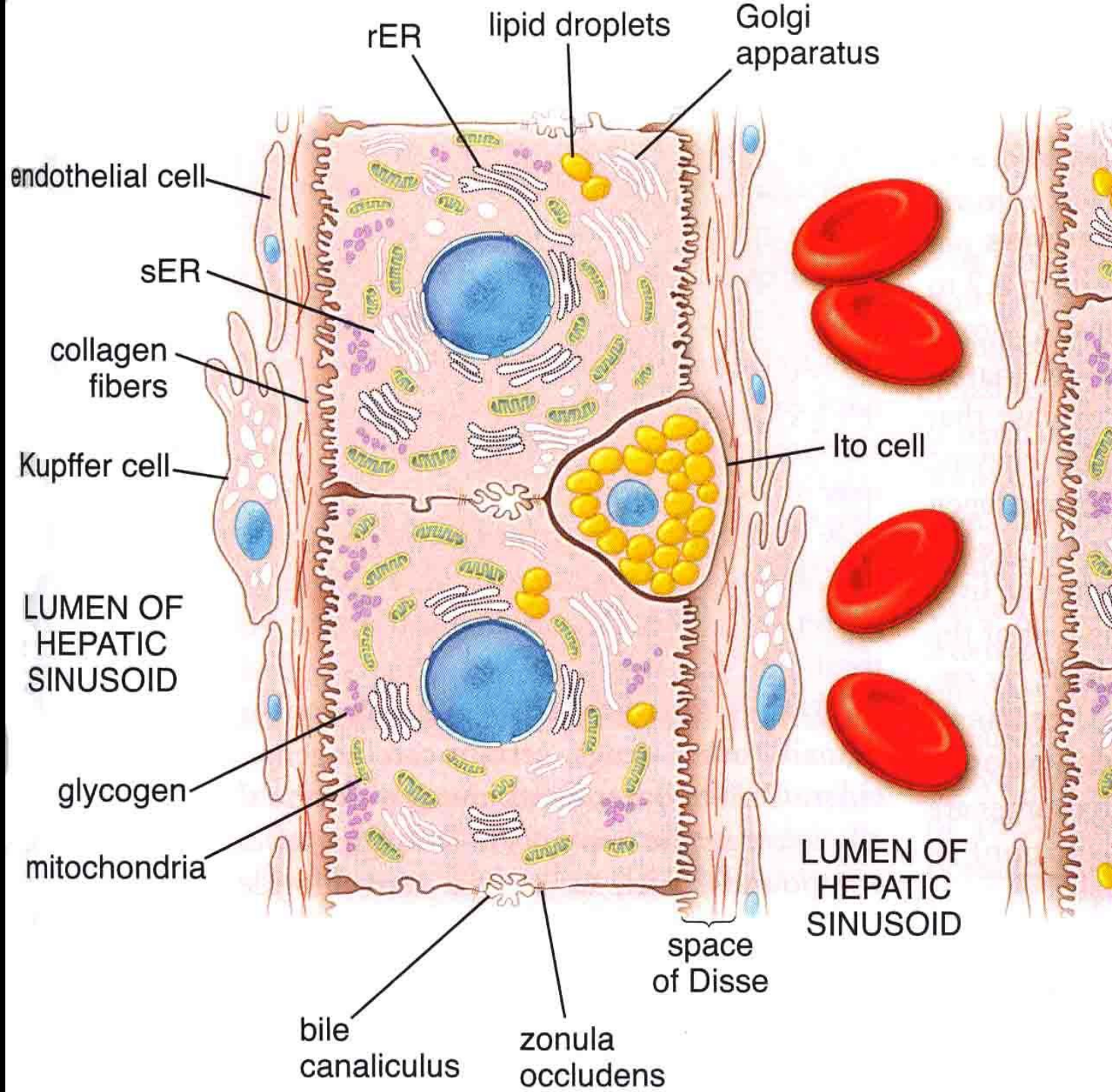


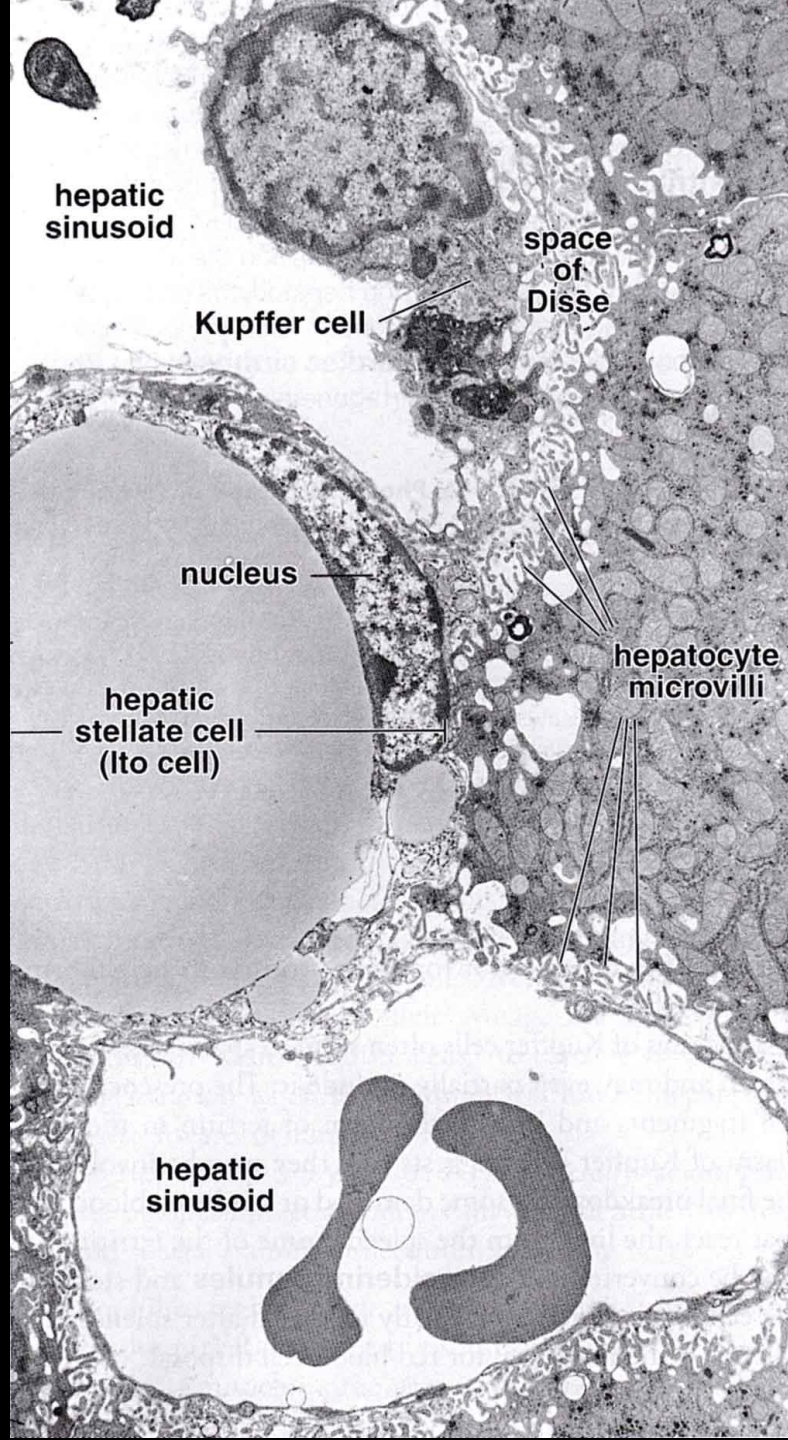
**reticular
fibers
impregnation**



Ito cells (hepatic stellate cells)

- vitamin A
- lipids
- contractile
- ECM production
- inflammatory activation





hepatic sinusoid

space of Disse

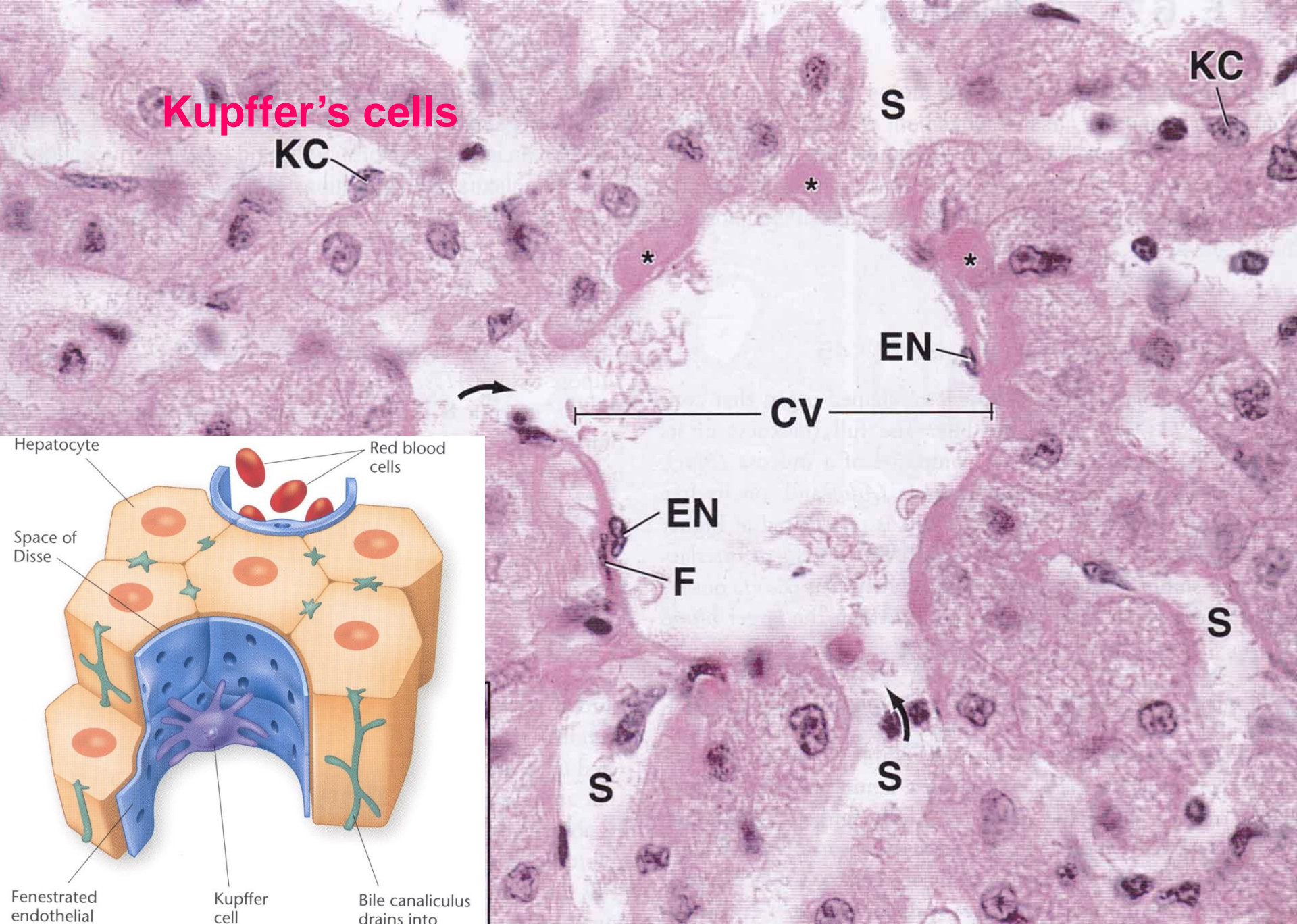
Kupffer cell

nucleus

hepatic stellate cell (Ito cell)

hepatocyte microvilli

hepatic sinusoid



Bile ducts, Gallbladder

Bile canaliculi

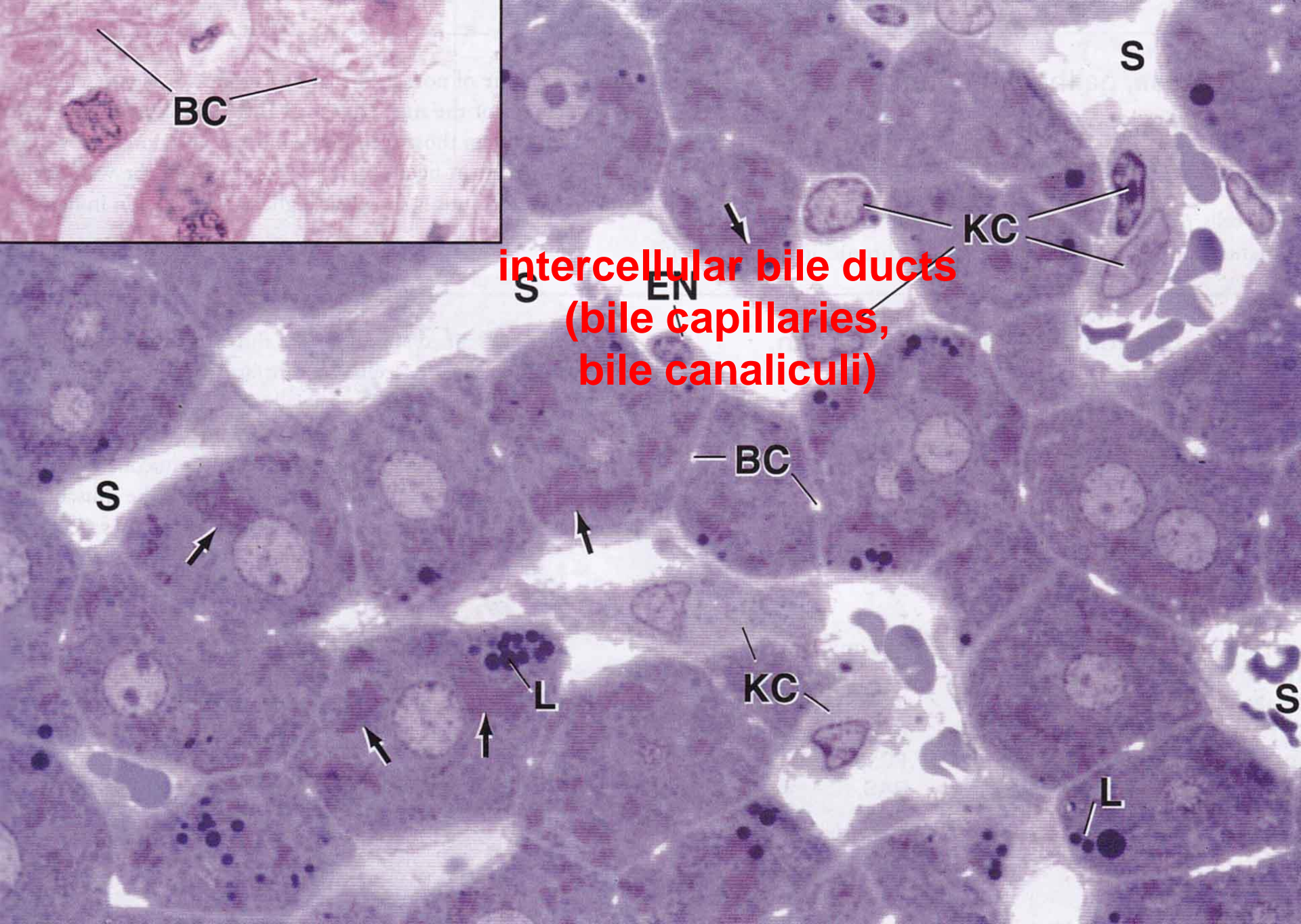
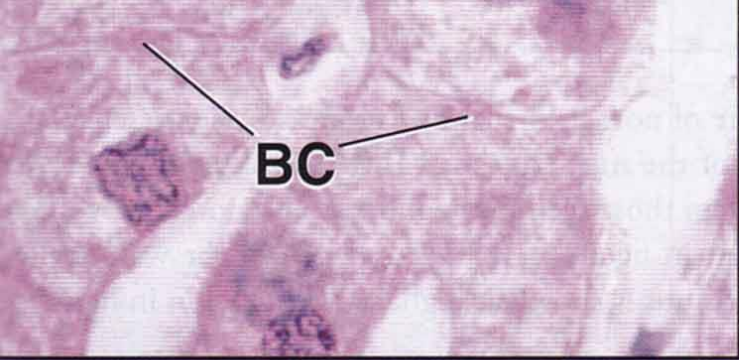


Bile ductule

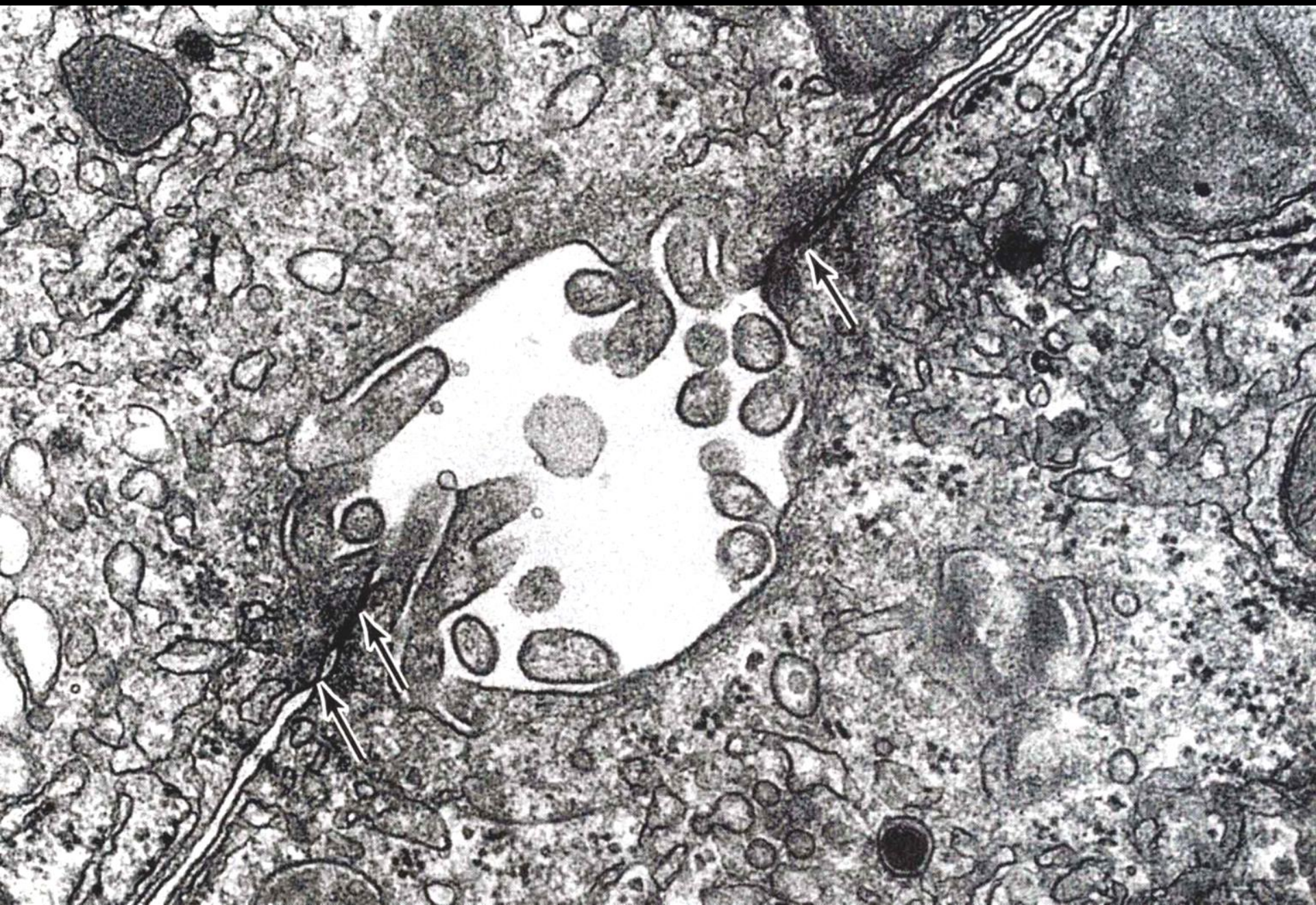
Hepatocytes

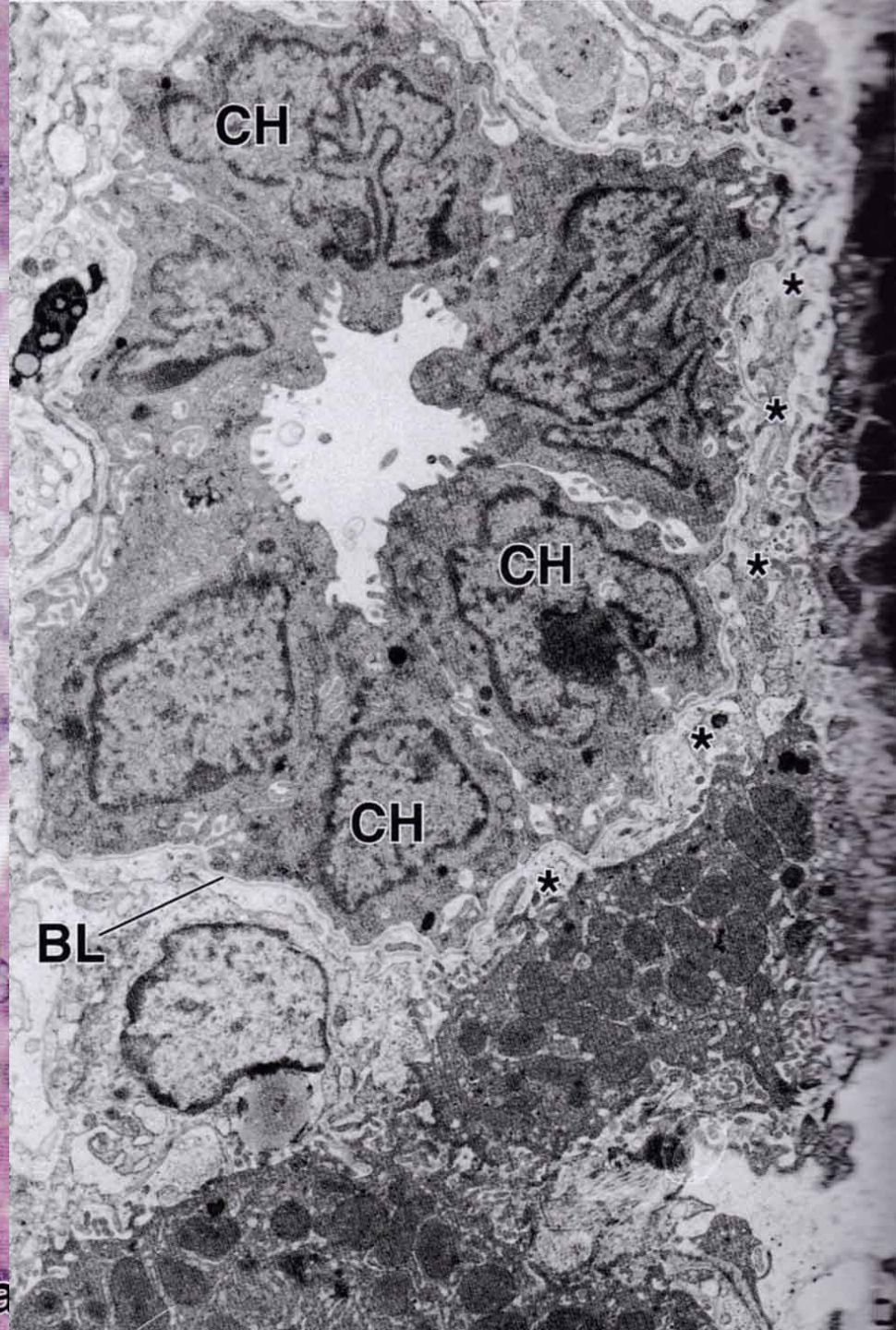
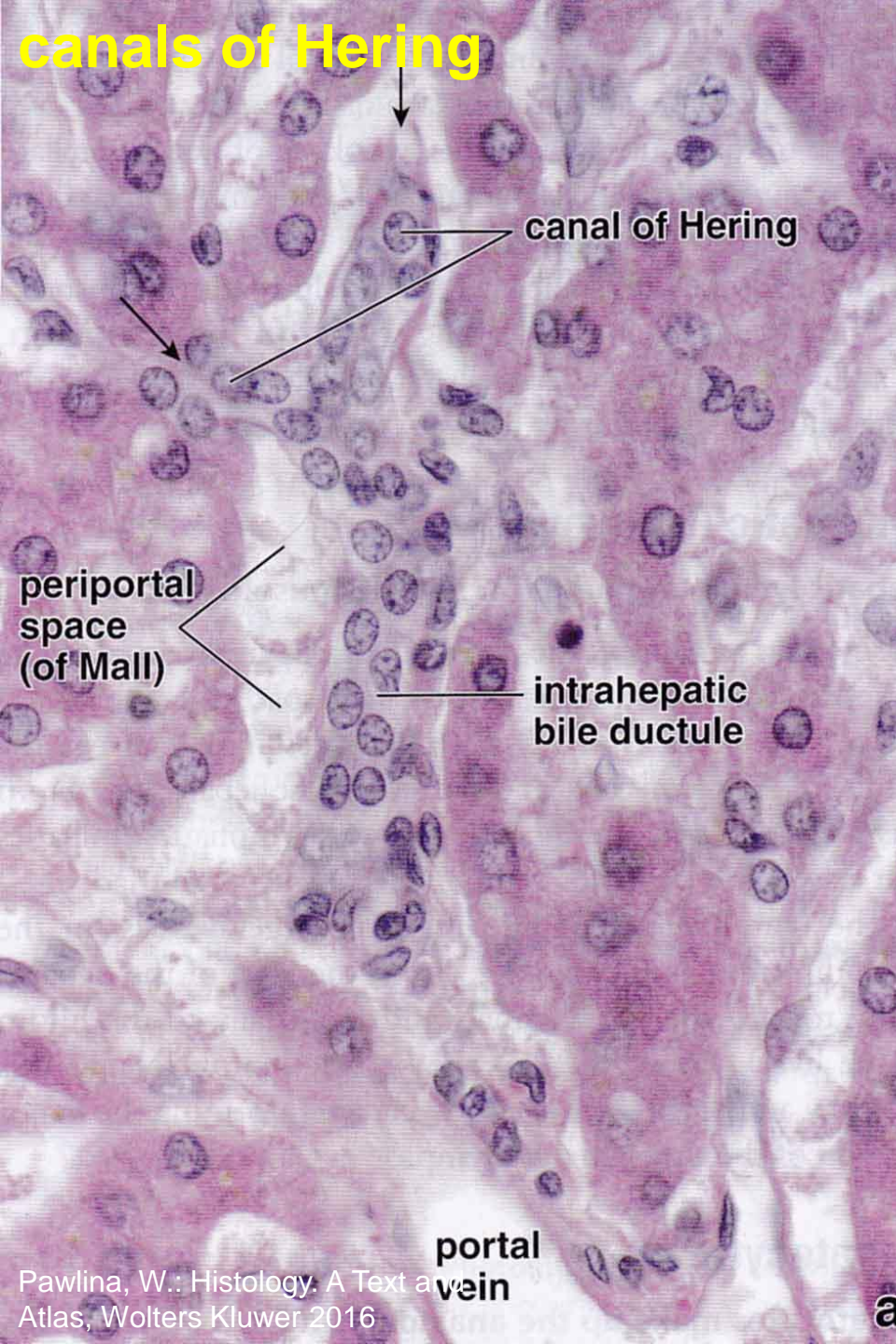
Bile canals
of Hering

Cholangiocytes

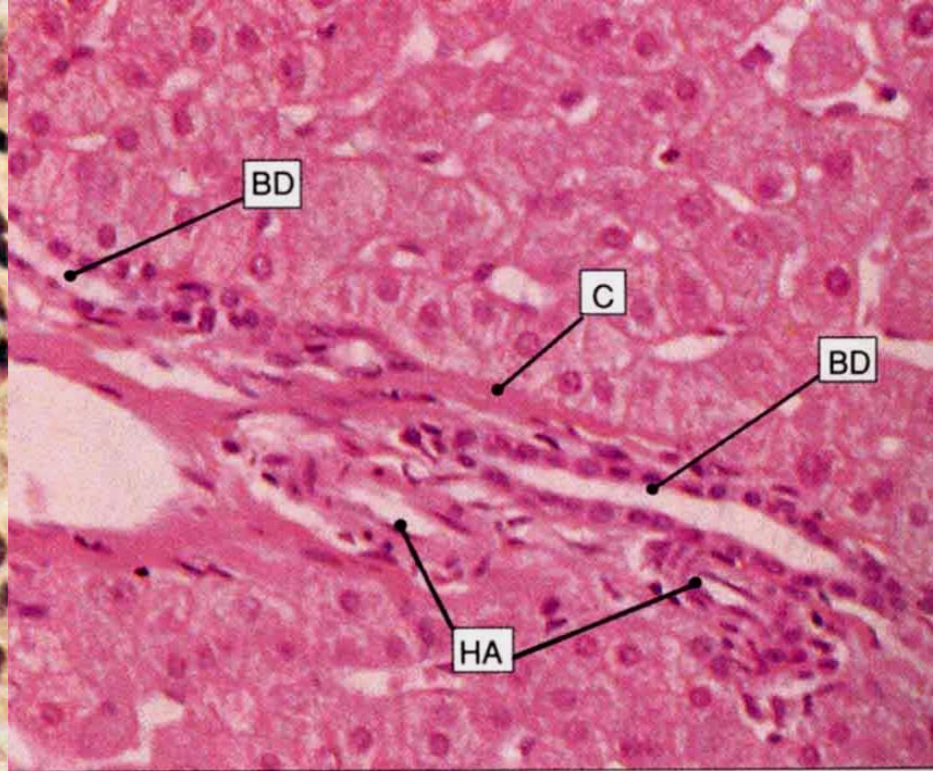
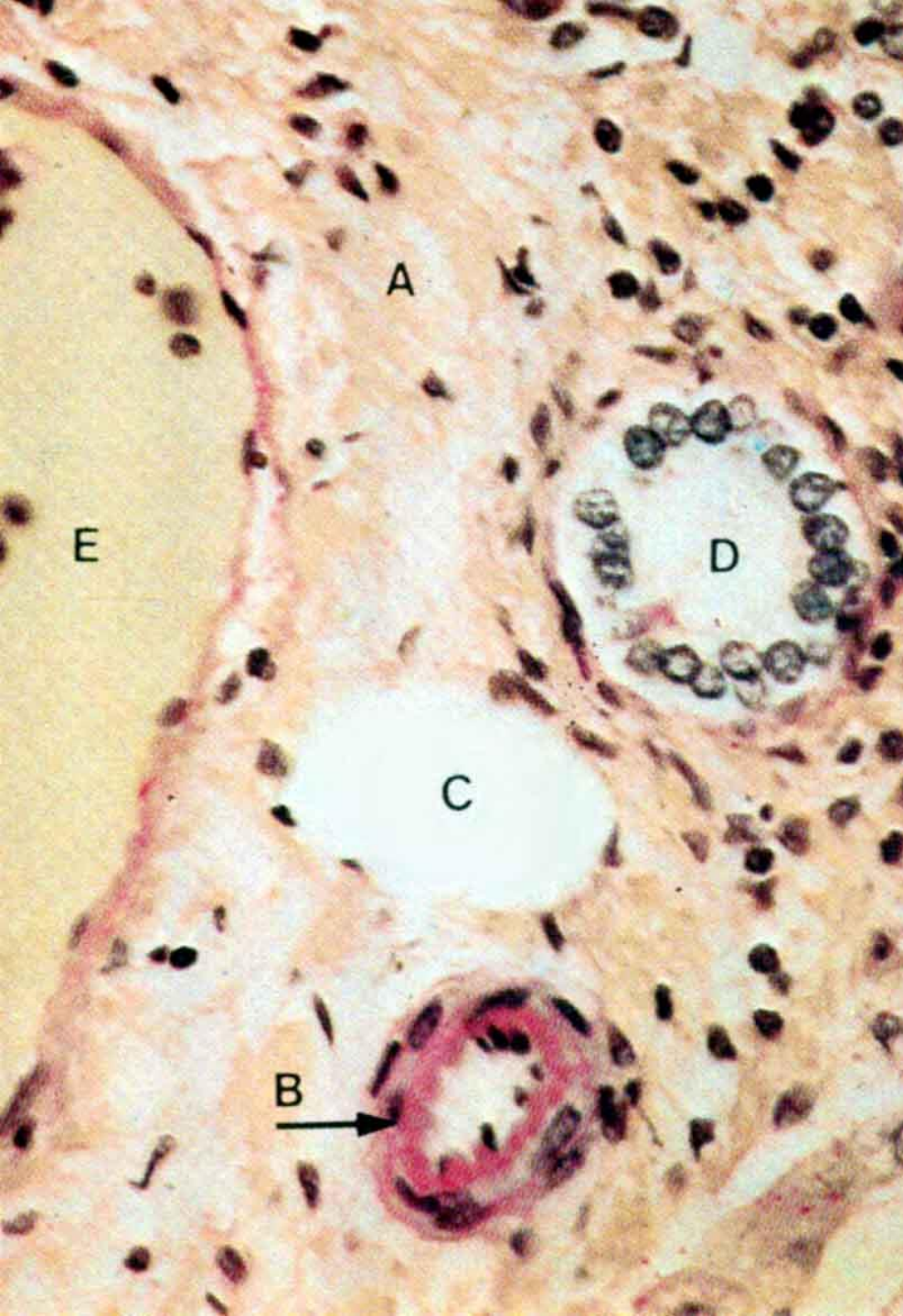


arrows = tight junctions





Interlobular bile ducts

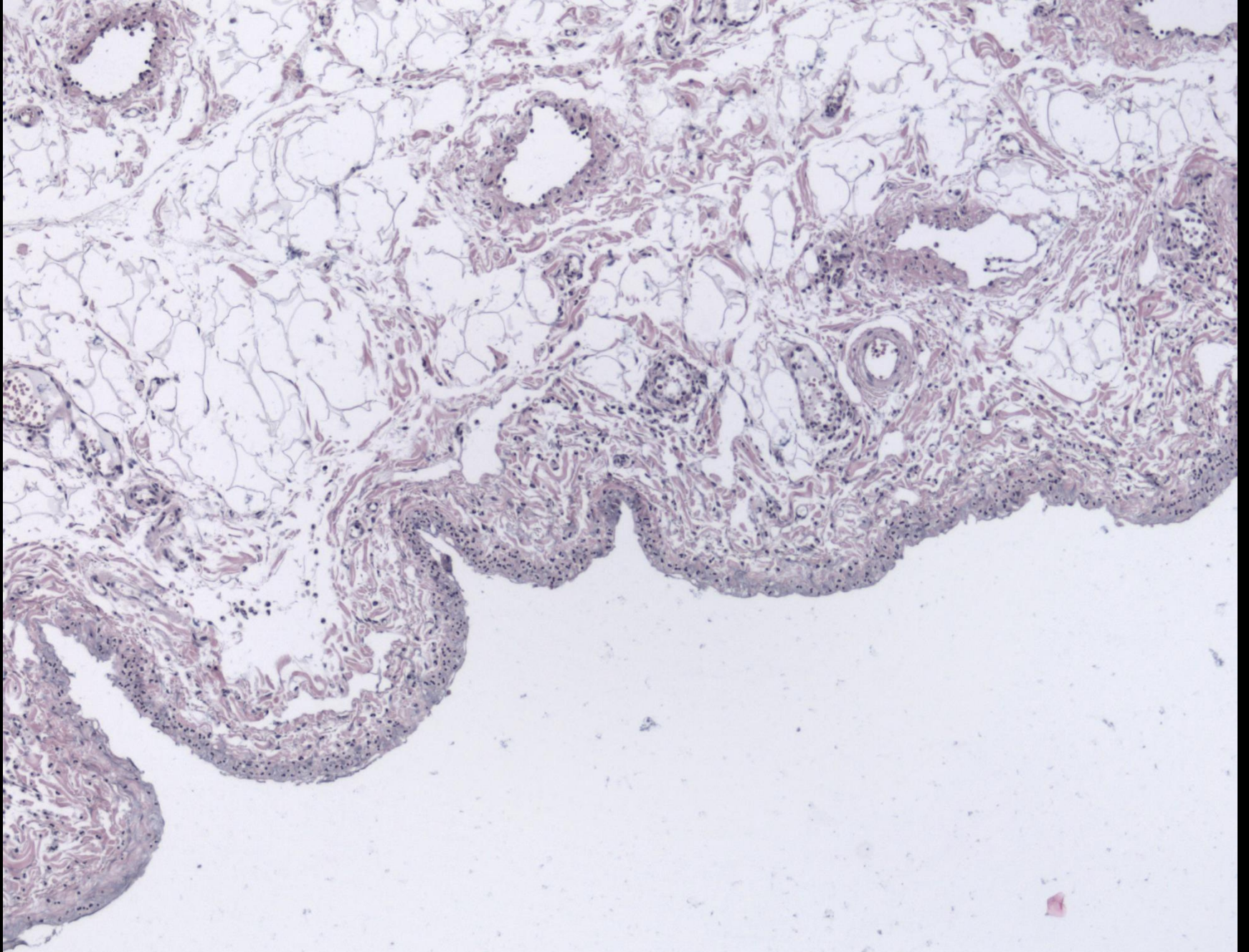


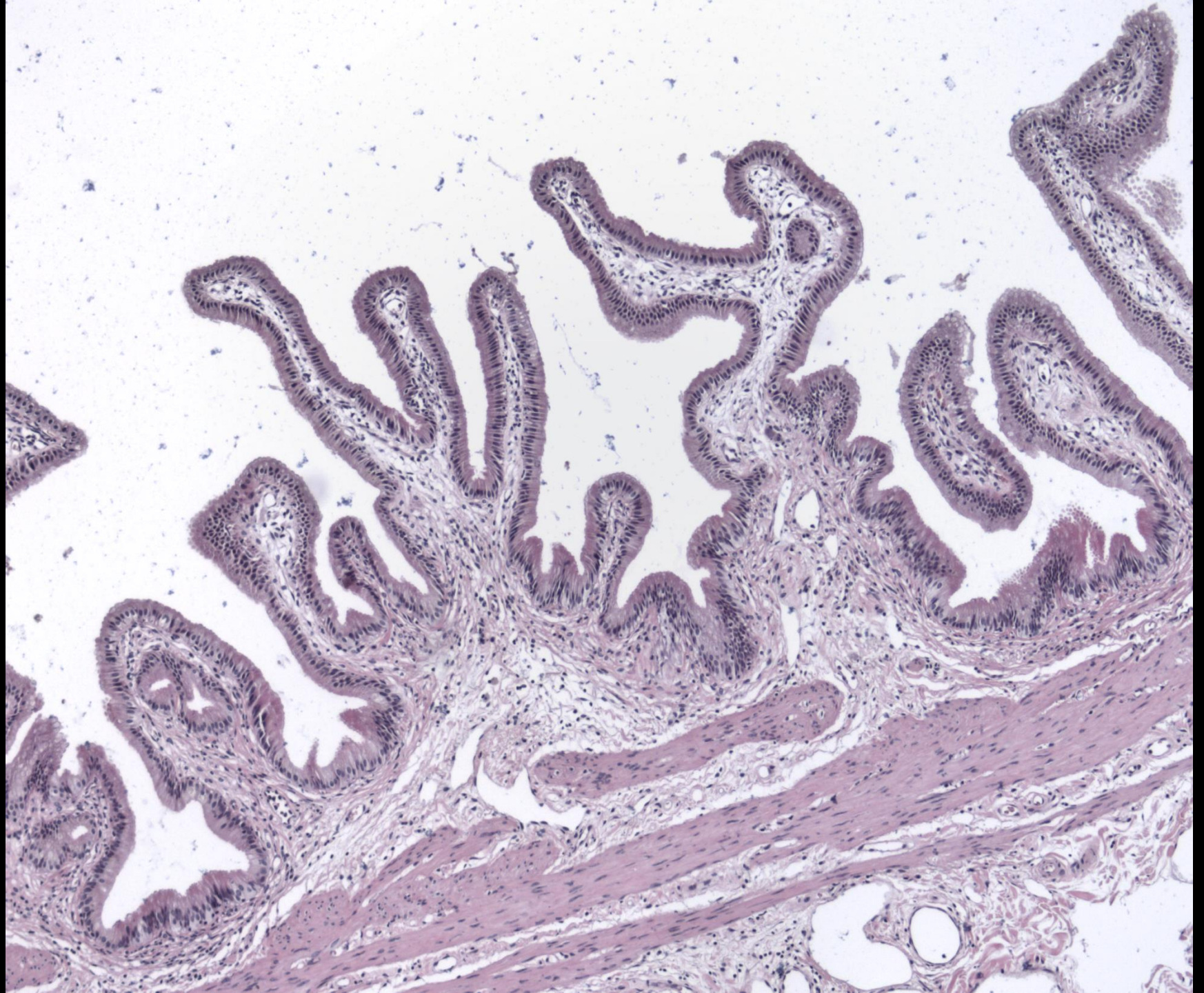
larger intrahepatic bile duct

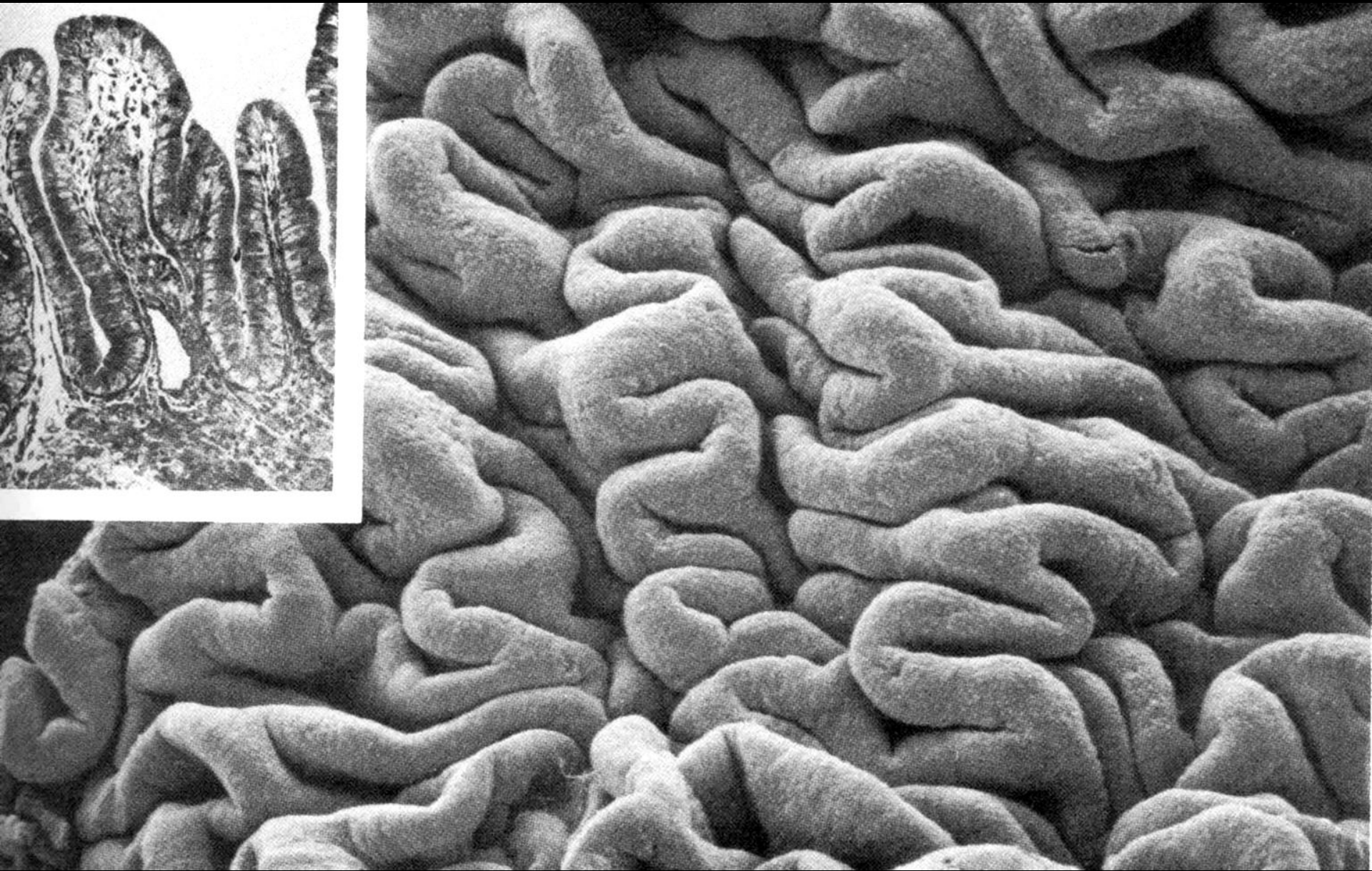
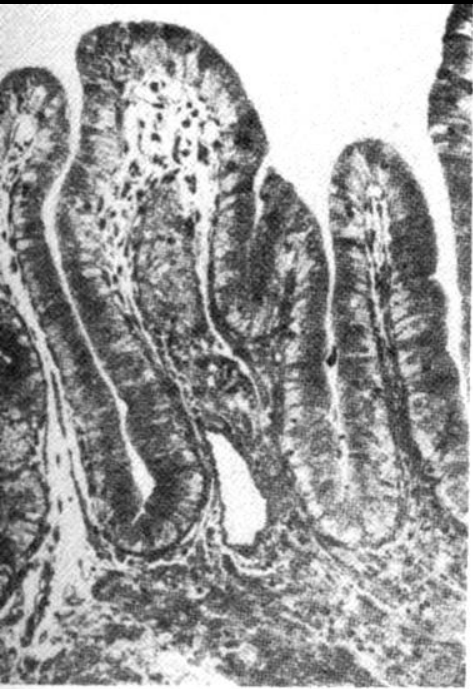


Gallbladder (vesica fellea)











Rokitansky-Aschoff
sinuses



