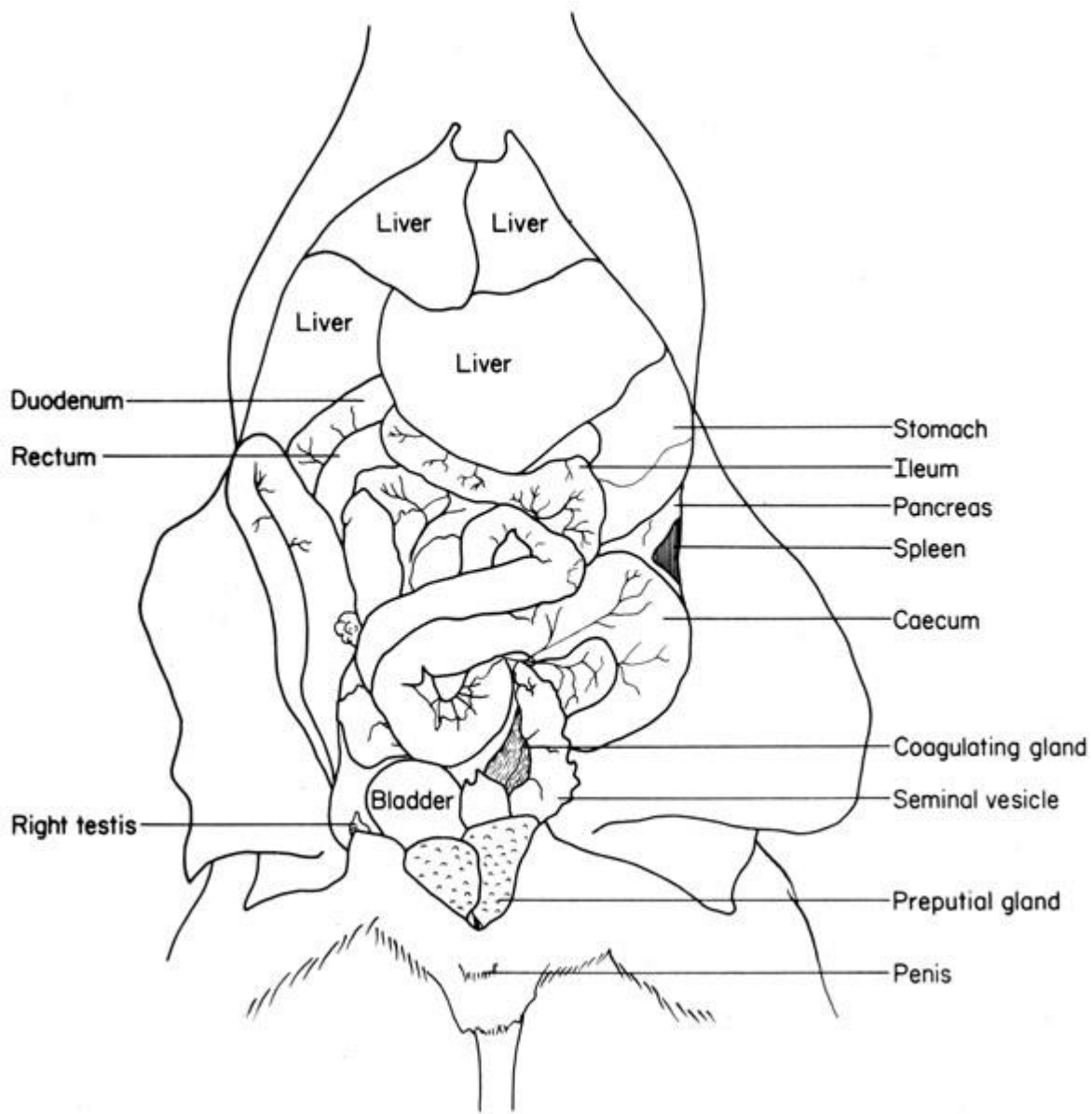
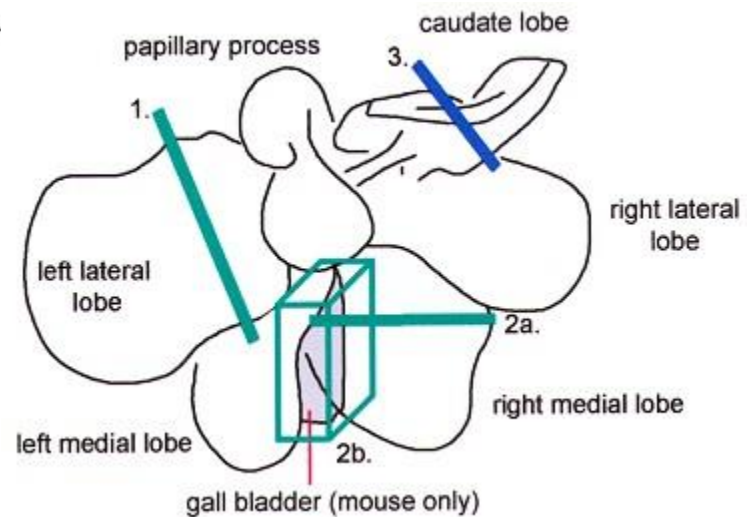
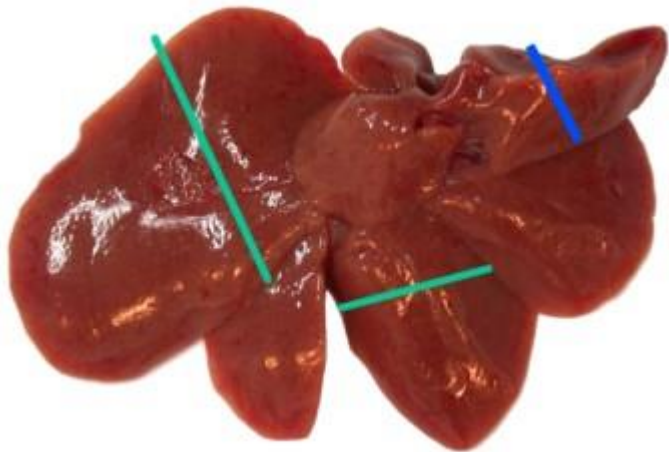
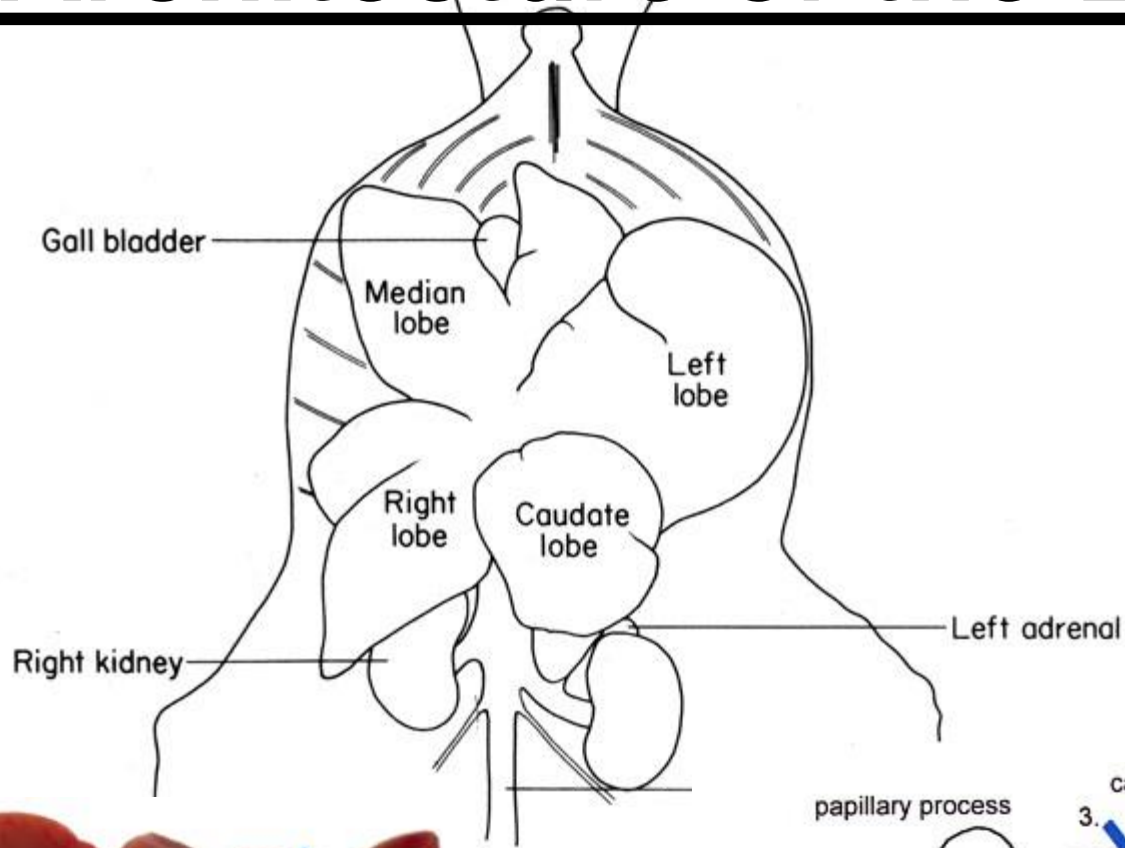


Pathology of the liver due to parasitic infection



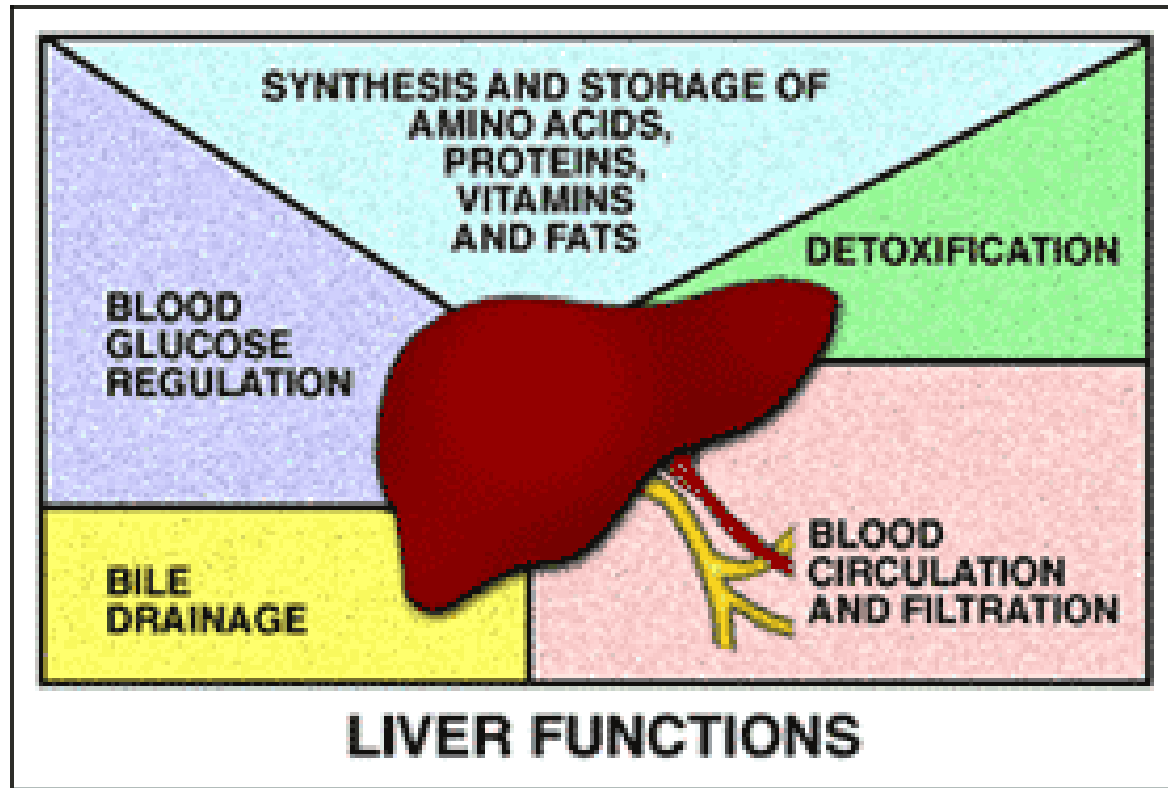
Architecture of the Liver



-The liver is the largest gland in the body

-The liver lies in the abdominal cavity, in contact with the diaphragm

-Fundamental roles of the liver:

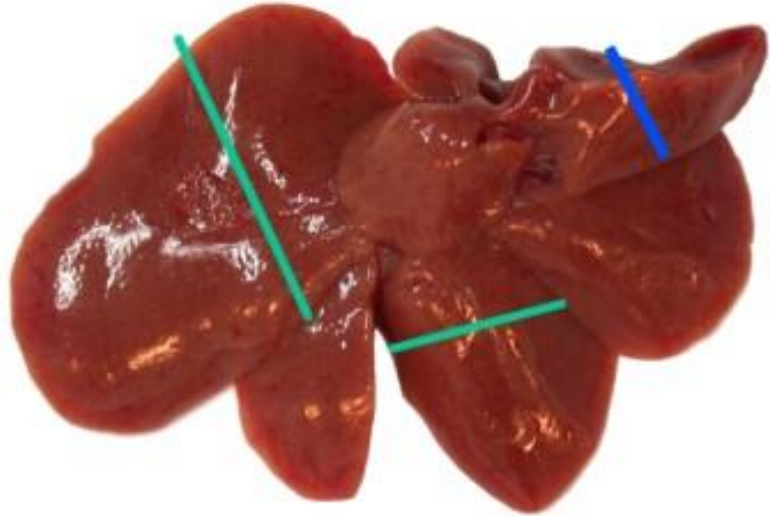


-Fundamental roles of the liver:

Vascular functions, including formation of lymph and the hepatic phagocytic system.

Metabolic functions in control of synthesis and utilization of carbohydrates, lipids and proteins.

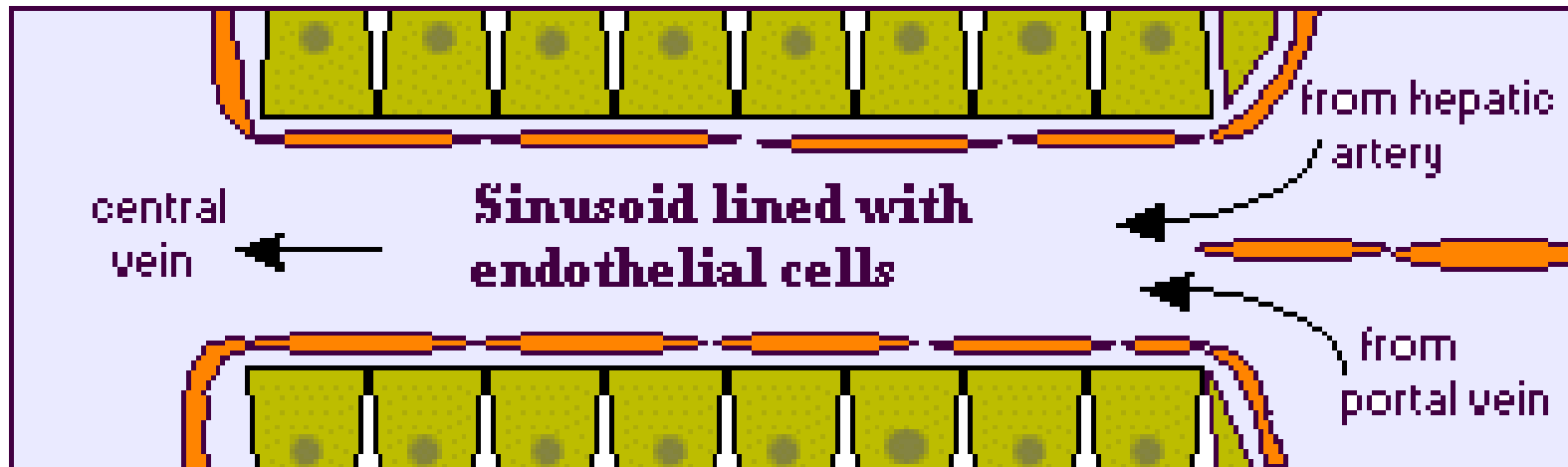
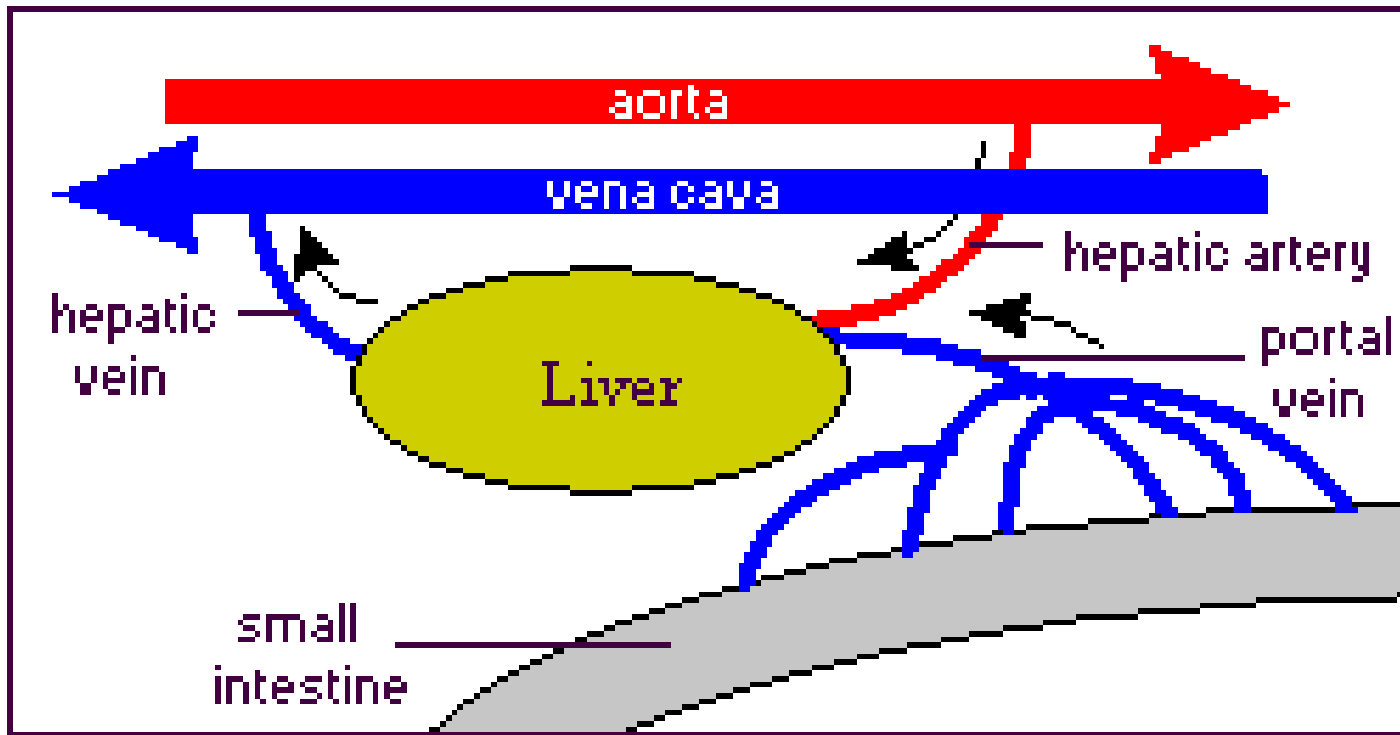
Secretory and excretory functions, particularly with respect to the synthesis of secretion of bile.



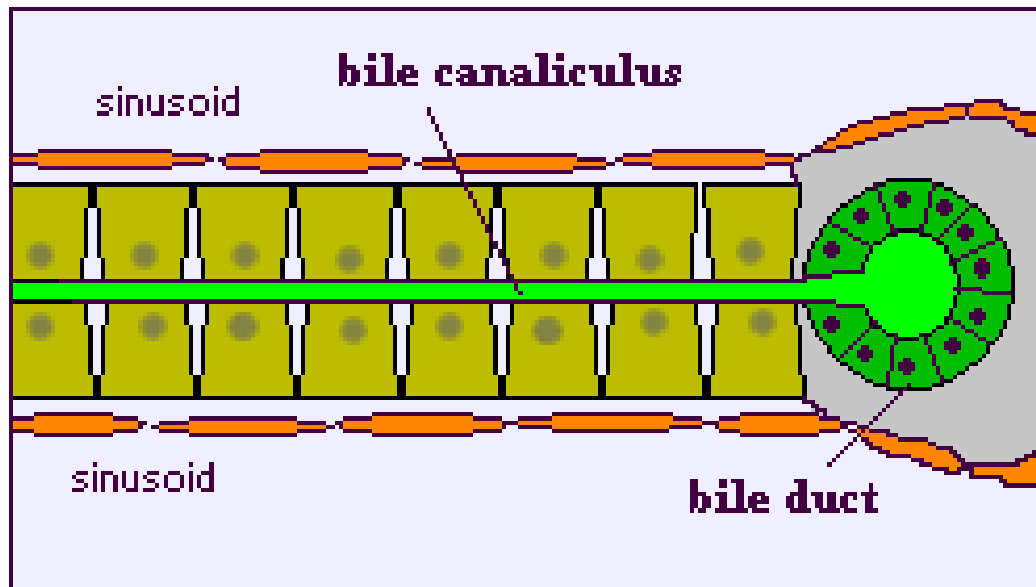
The Hepatic Vascular System

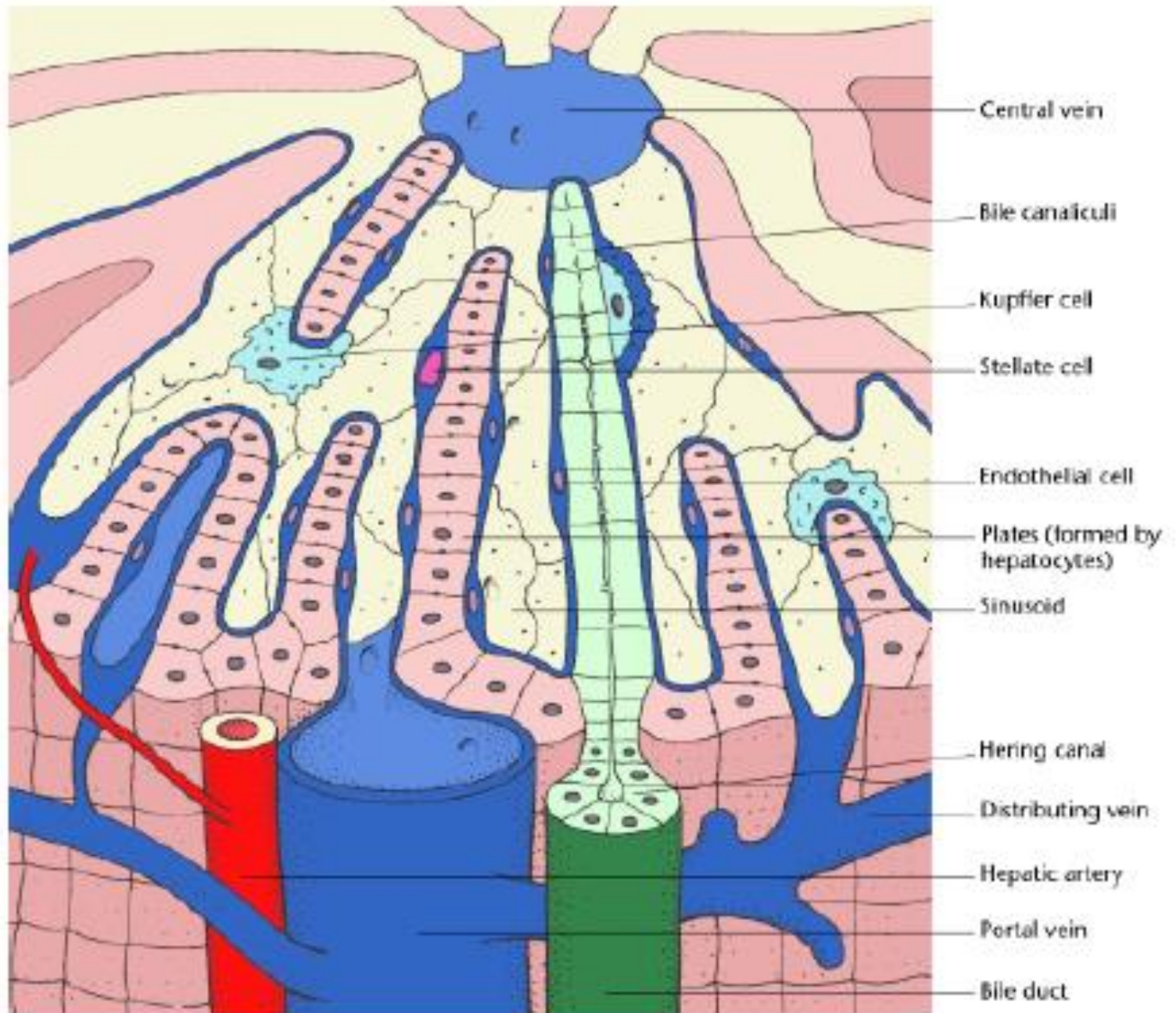
- Roughly 75% of the blood entering the liver is venous blood from the **portal vein**.
- The remaining 25% of the blood supply to the liver is arterial blood from the **hepatic artery**.

- Blood flows through the sinusoids and empties into the central vein of each lobule.
- Central veins coalesce into hepatic veins, which leave the liver and empty into the vena cava.



The biliary system is a series of channels and ducts that conveys bile (a secretory and excretory product of hepatocytes) from the liver into the lumen of the small intestine.



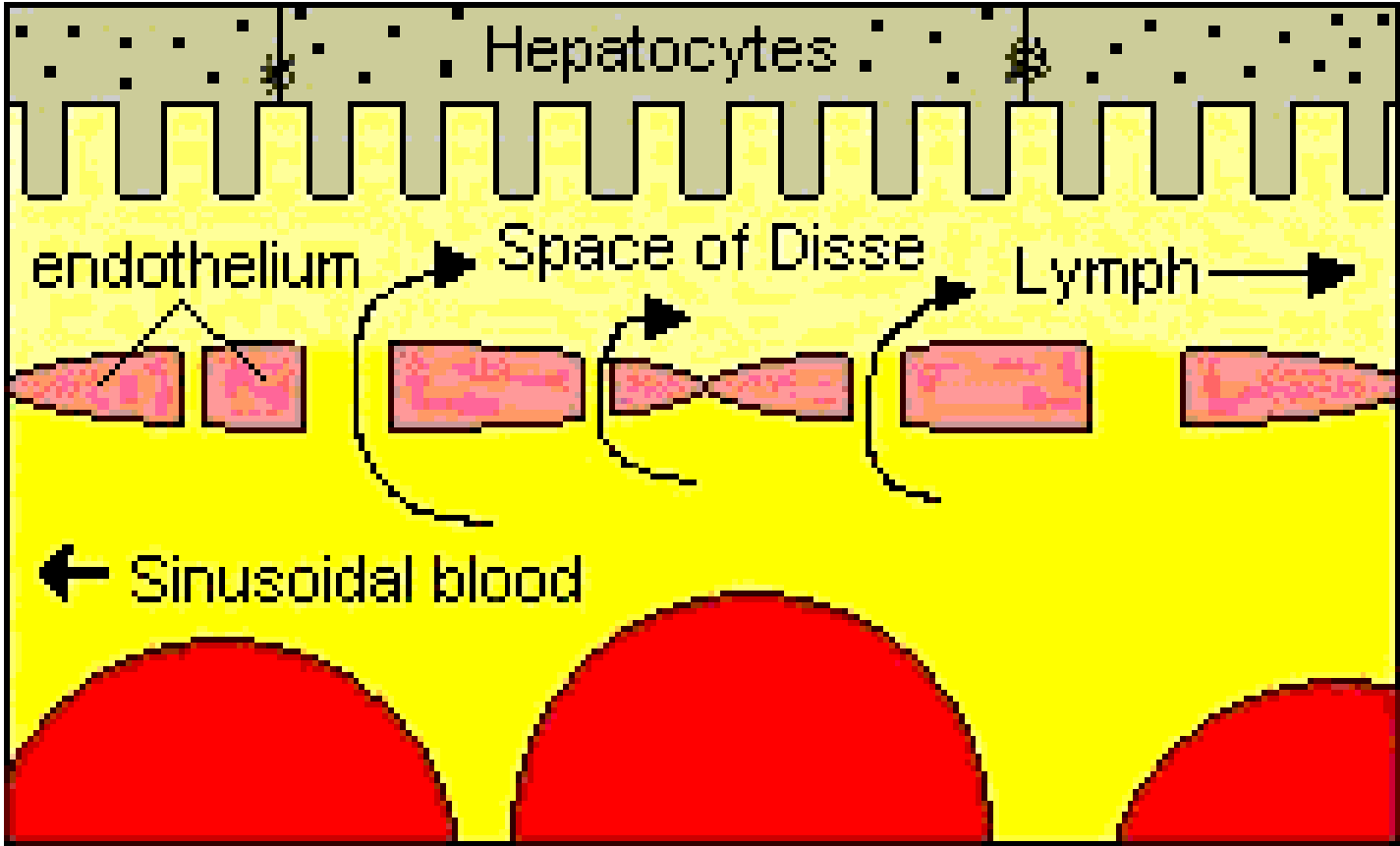


Formation of Lymph in the Liver

Approximately half of the lymph formed in the body is formed in the liver. Due to the large pores or fenestrations in sinusoidal endothelial cells, fluid and proteins in blood flow freely into the space between the endothelium and hepatocytes (the "space of Disse"), forming lymph.

Lymph flows through the space of Disse to be collected in small lymphatic capillaries associated with portal triads (the reason they are not called portal tetrads is because these lymphatic vessels are virtually impossible to identify in standard histologic sections), and from there in the systemic lymphatic system.





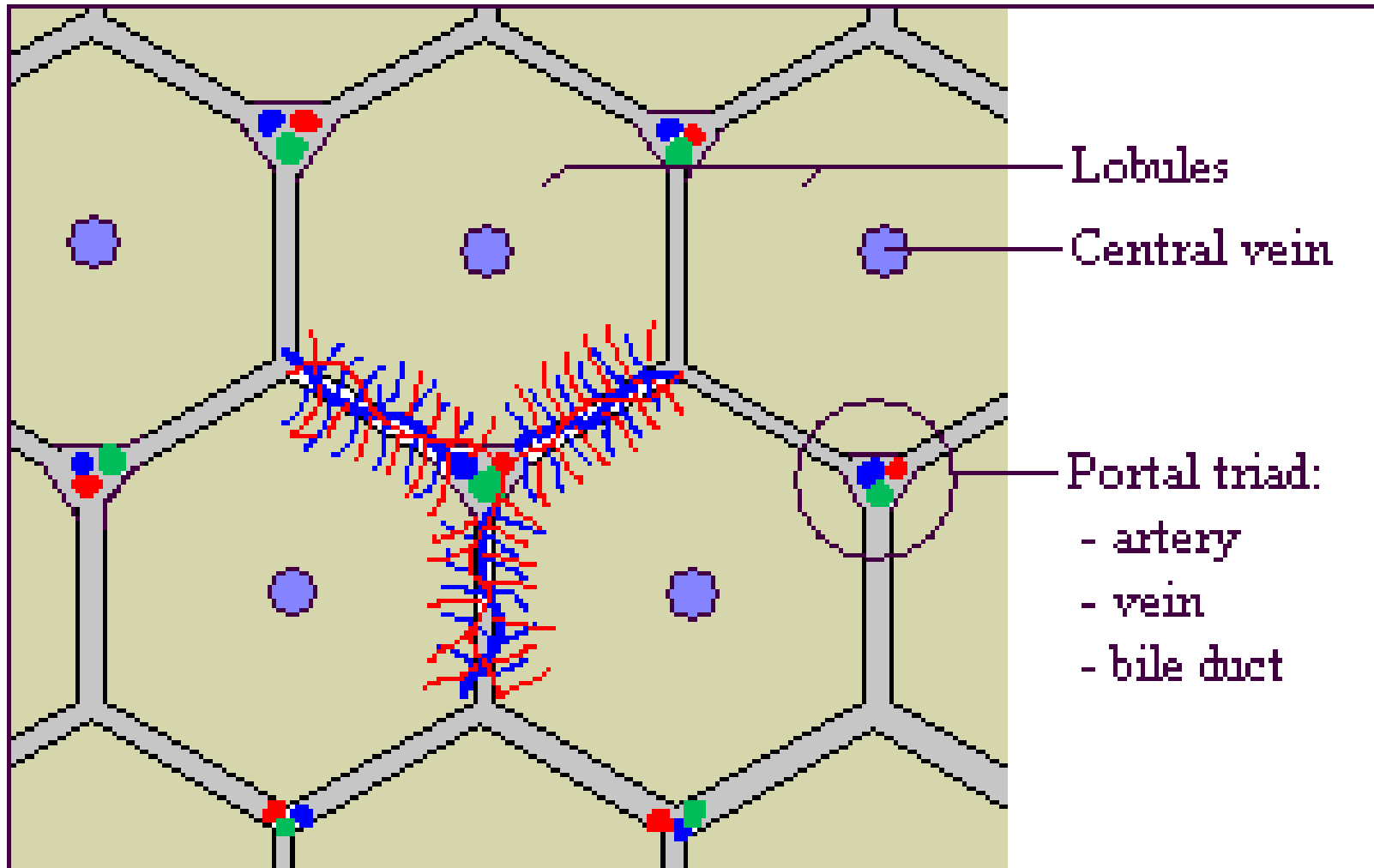
The hepatic lobule is the structural unit of the liver.

-It consists of a roughly hexagonal arrangement of plates of hepatocytes radiating outward from a central vein in the center.

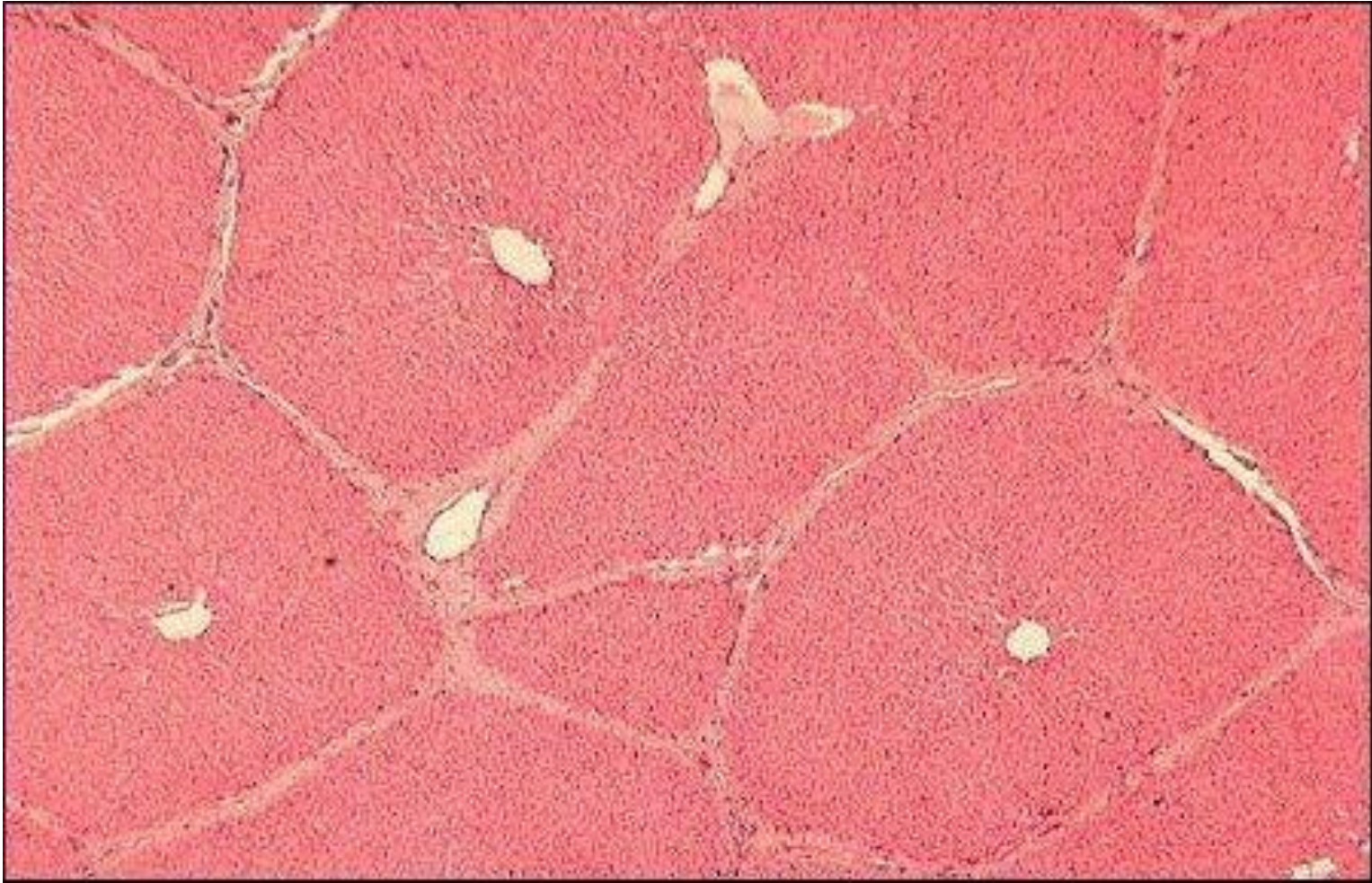
-At the vertices of the lobule are regularly distributed portal triads, containing a **bile duct** and a terminal branch of the **hepatic artery** and **portal vein**.

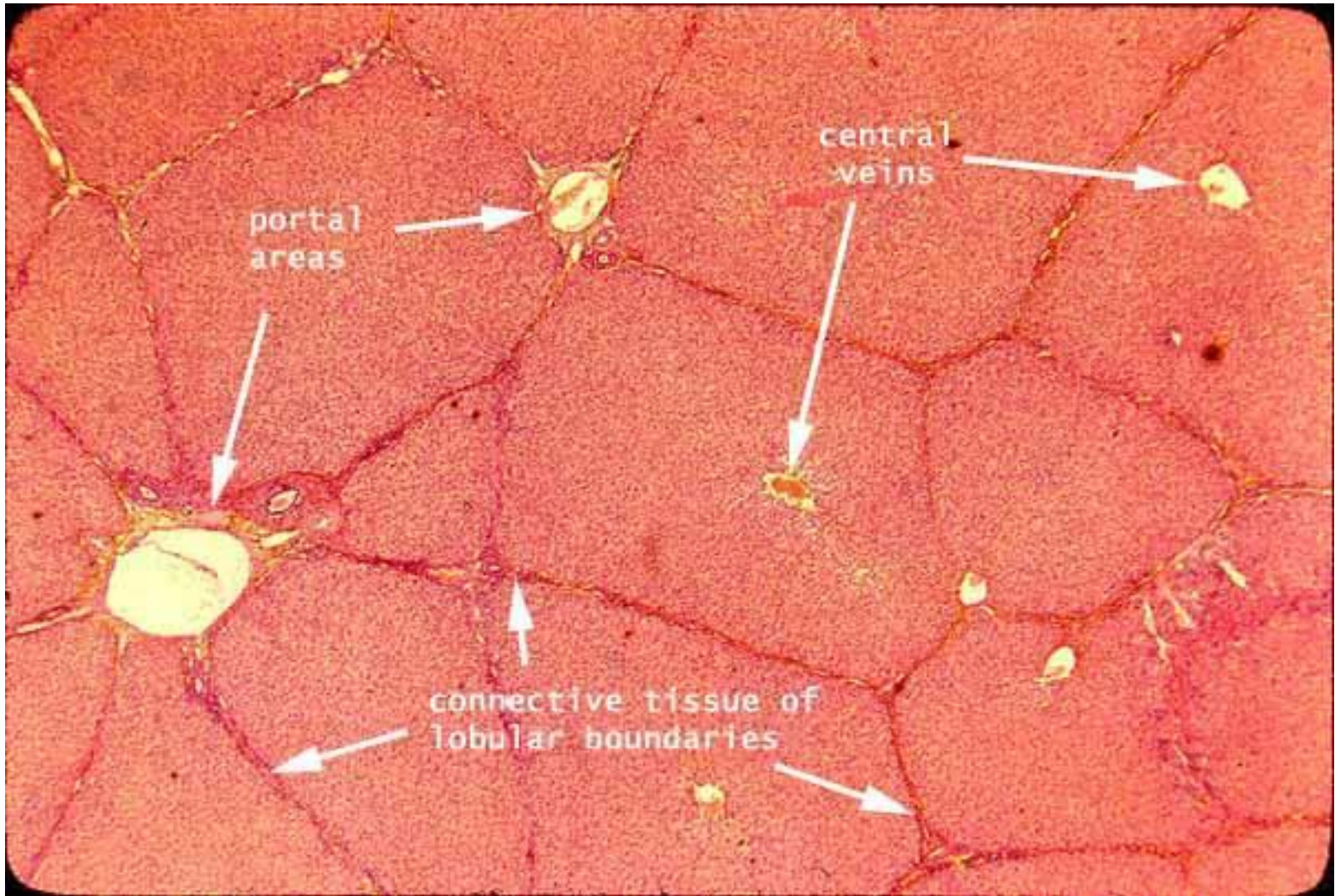
-Within each lobule, **hepatocytes** are arranged into **hepatic cords** separated by adjacent **sinusoids**.

Architecture of the Hepatic Parenchyma

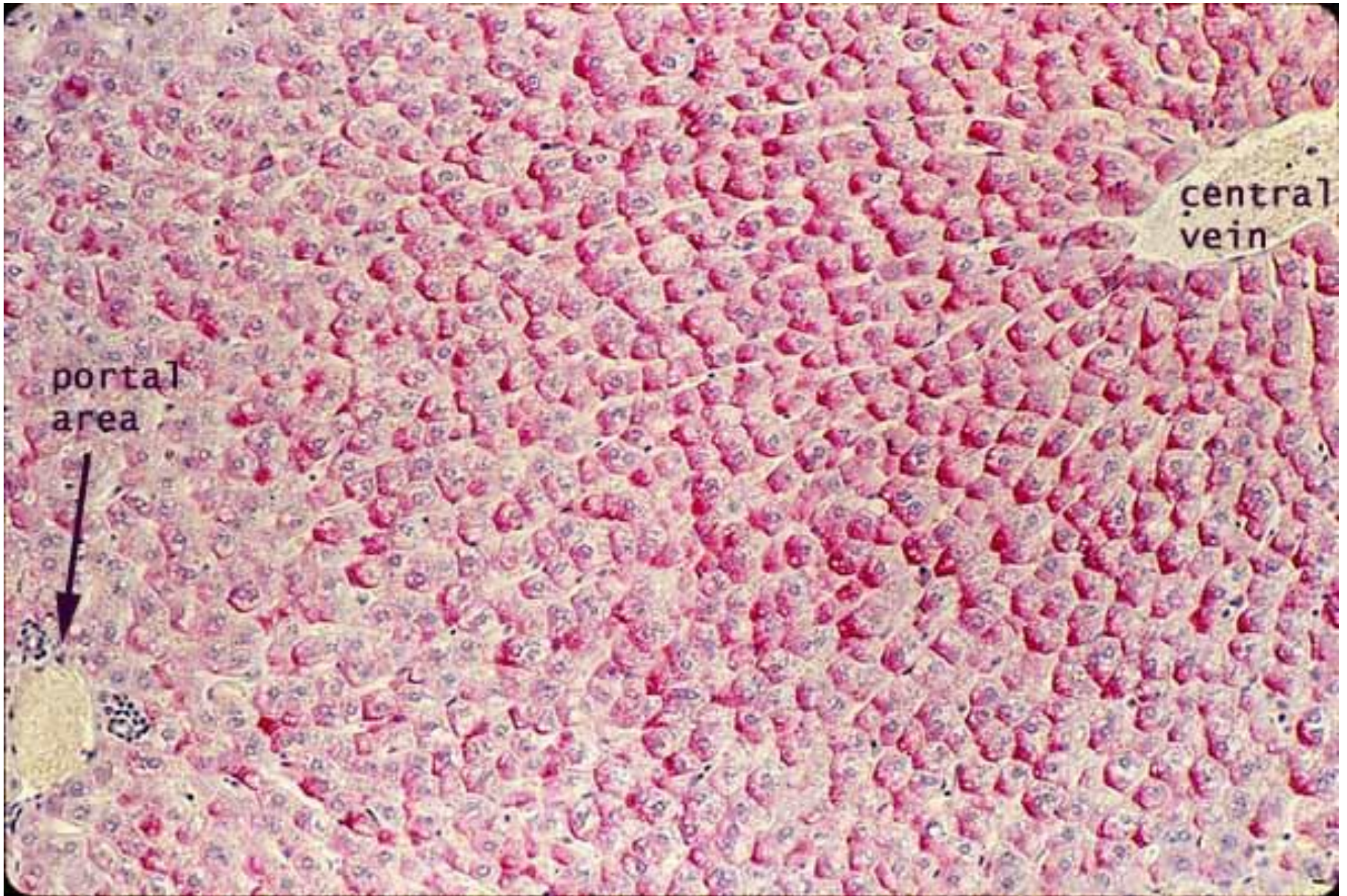


Hepatic Histology: The Lobule

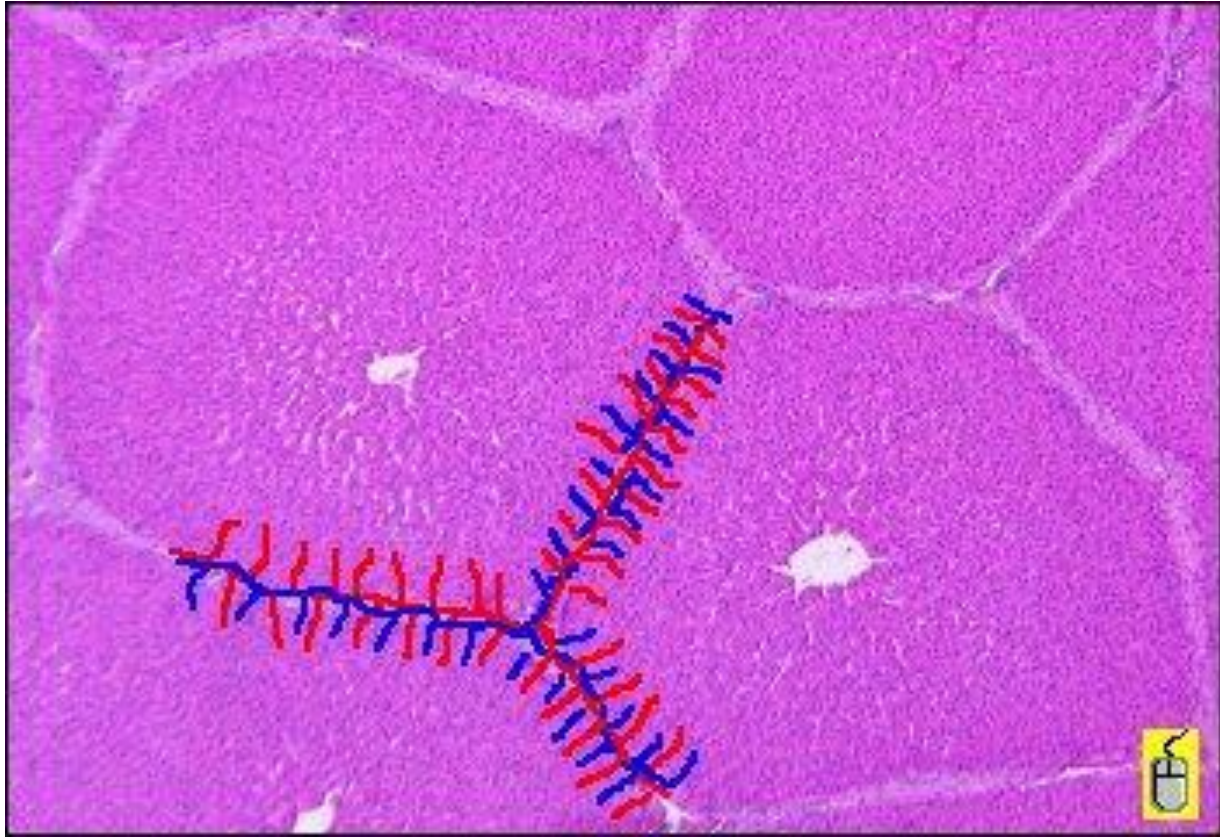


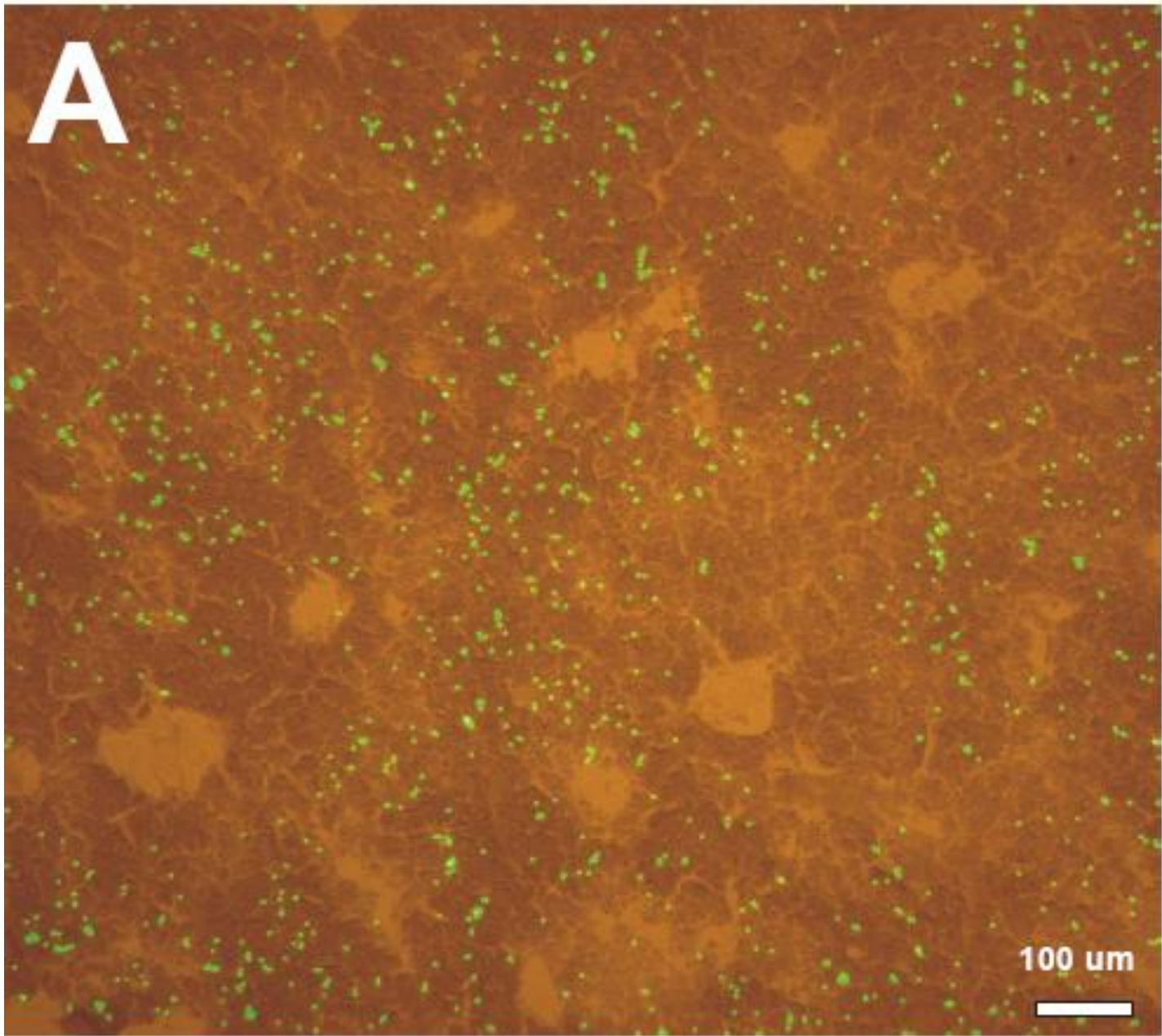






The acinus is the functional unit of the liver and is roughly divided into zones that correspond to distance from the arterial blood supply - those hepatocytes closest to the arterioles (zone 1 below) are the best oxygenated, while those farthest from the arterioles have the poorest supply of oxygen. This arrangement also means that cells in the center of the acinus (again, zone 1) are the first to "see" and potentially absorb blood-borne toxins absorbed into portal blood from the small intestine.

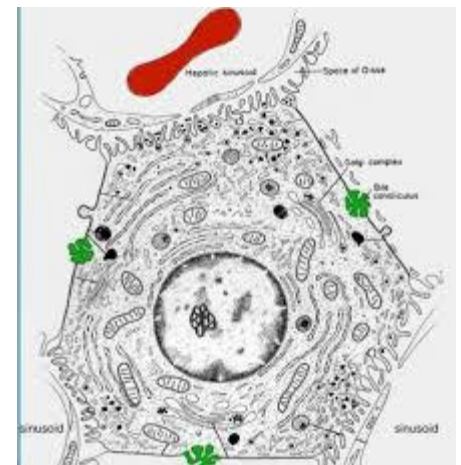
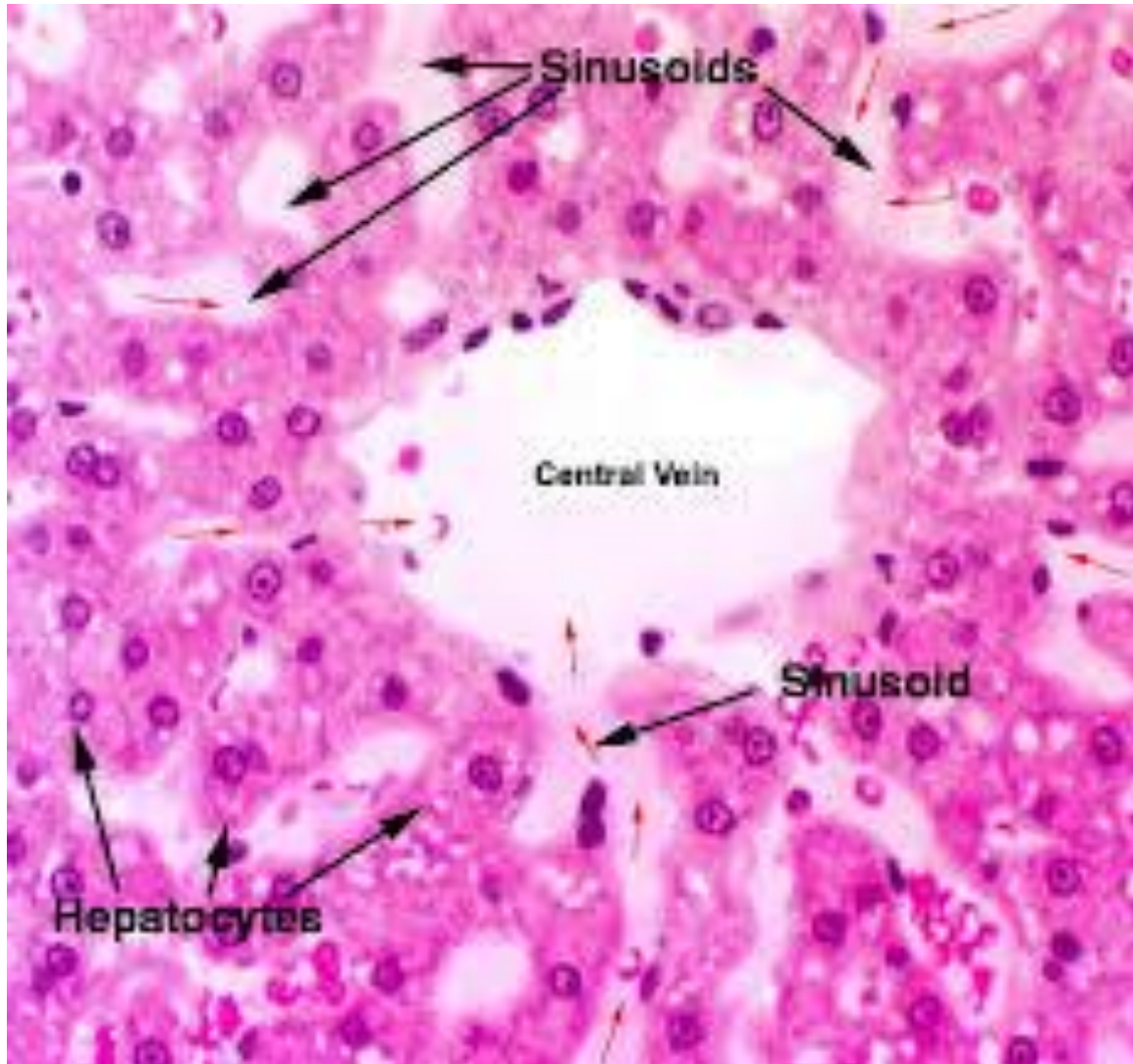




Hepatocytes are the chief functional cells of the liver and perform an astonishing number of metabolic, endocrine and secretory functions.

- Roughly 80% of the mass of the liver is contributed by hepatocytes.
- The cells are polygonal in shape and their sides can be in contact either with sinusoids (sinusoidal face) or neighboring hepatocytes (lateral faces).
- Hepatocyte nuclei are distinctly round, with one or two prominent nucleoli. A majority of cells have a single nucleus, but binucleated cells are common.

Hepatic Histology: Hepatocytes



Some pathological changes

Apoptosis

Hepatocytic vacuolation

Fatty change (steatosis)

Hyaline change

Pigmentation

Hyperplasia of Kupffer cells

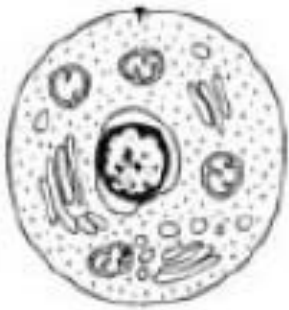
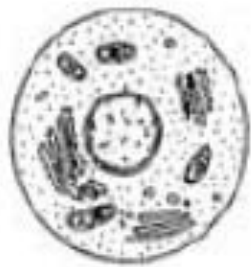
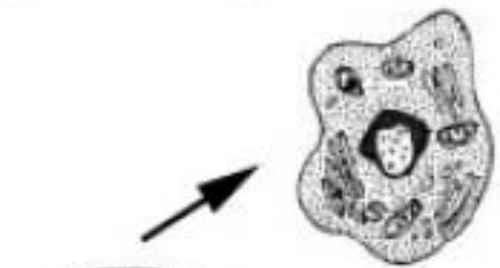
Others....like Granuloma

Apoptosis
(cell shrinks, chromatin condenses)

"Budding"

Apoptotic Bodies
are phagozytosed;
no inflammation

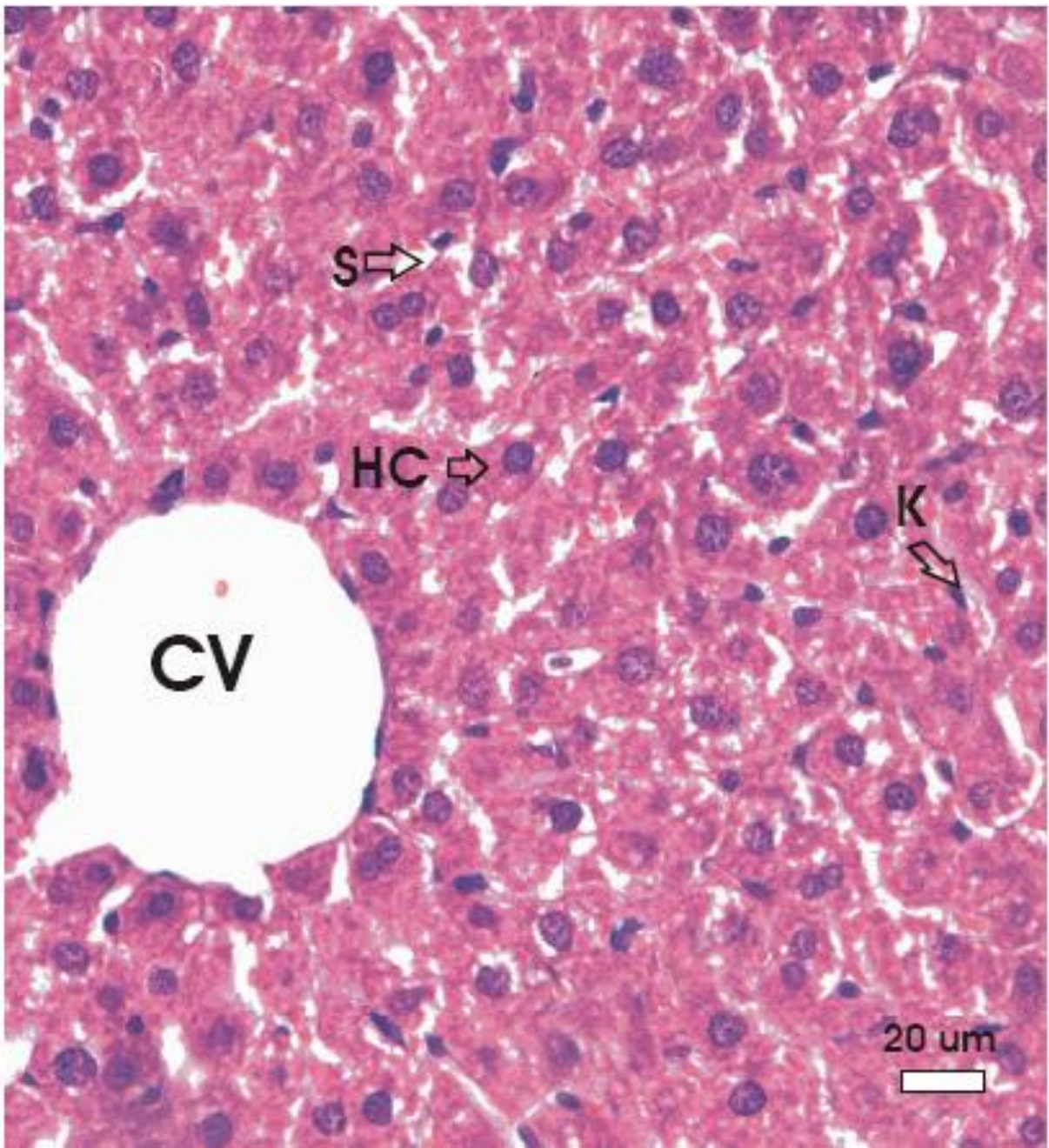
**Viable
Cell**

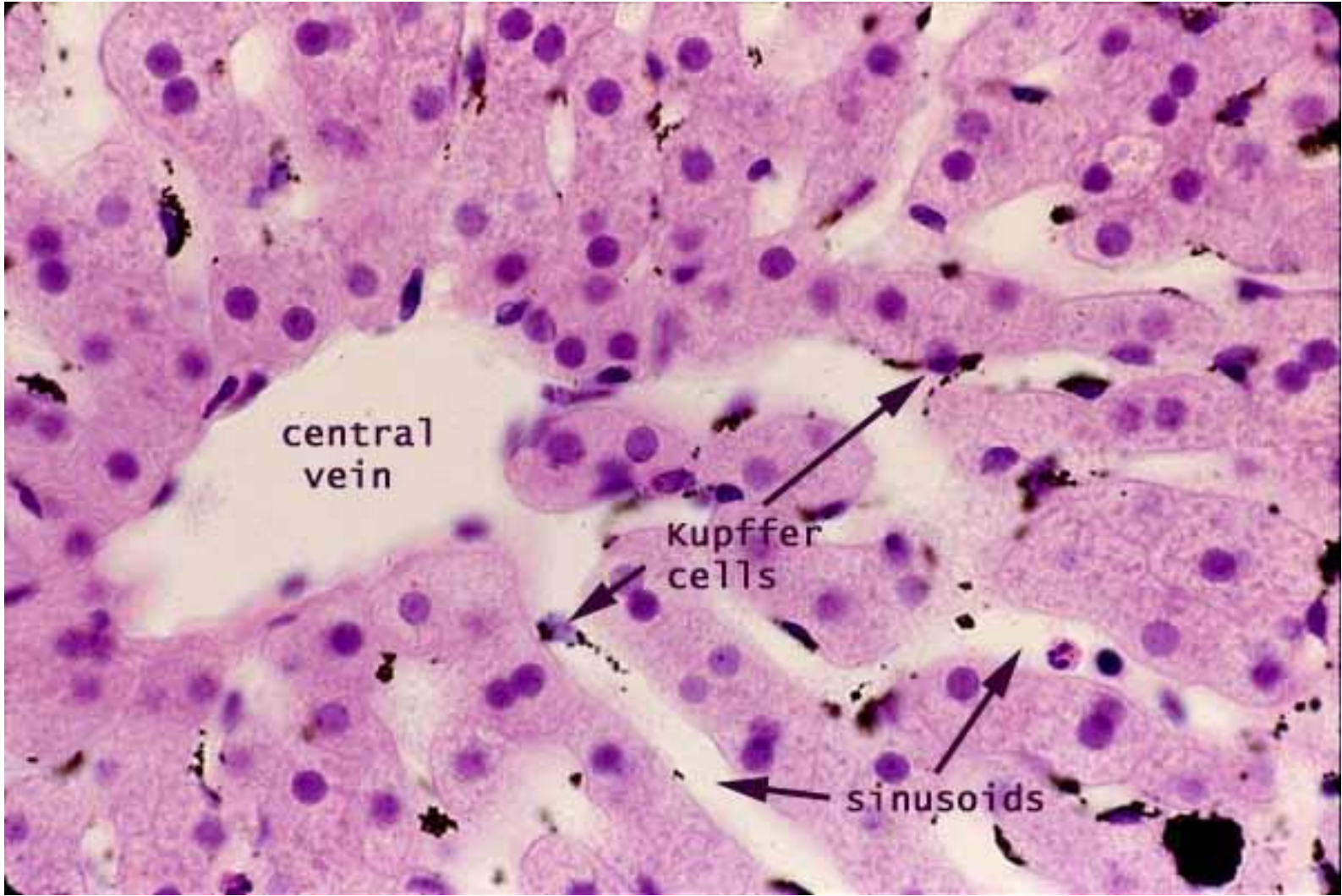


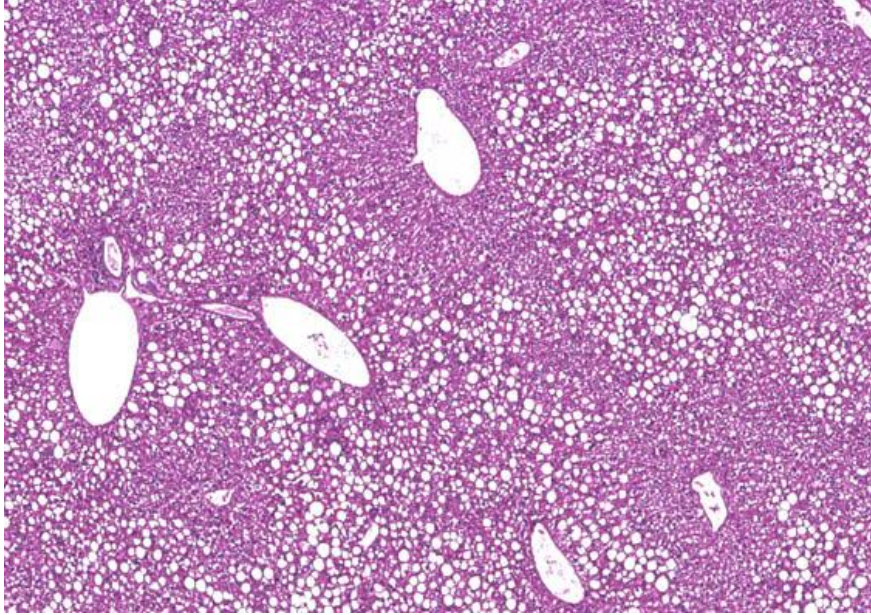
Necrosis
(cell swells)

Cell becomes leaky,
blebbing

Cellular and nuclear
lysis causes inflam-
mation

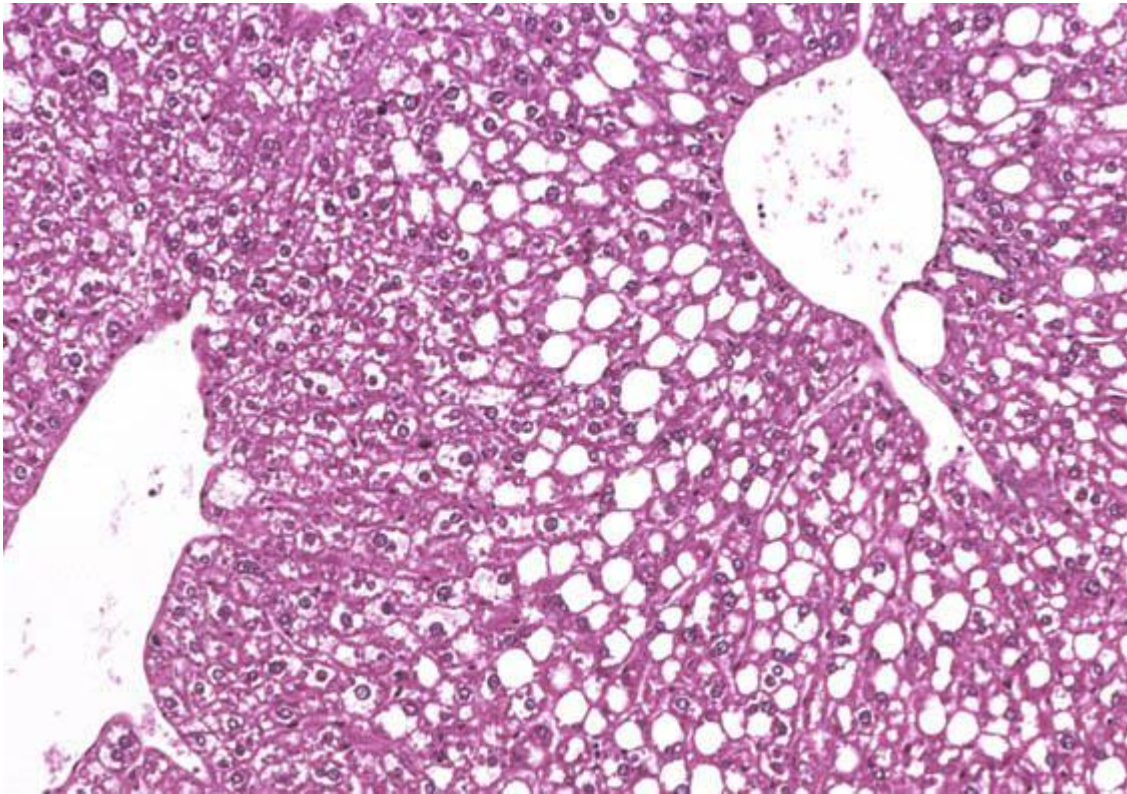


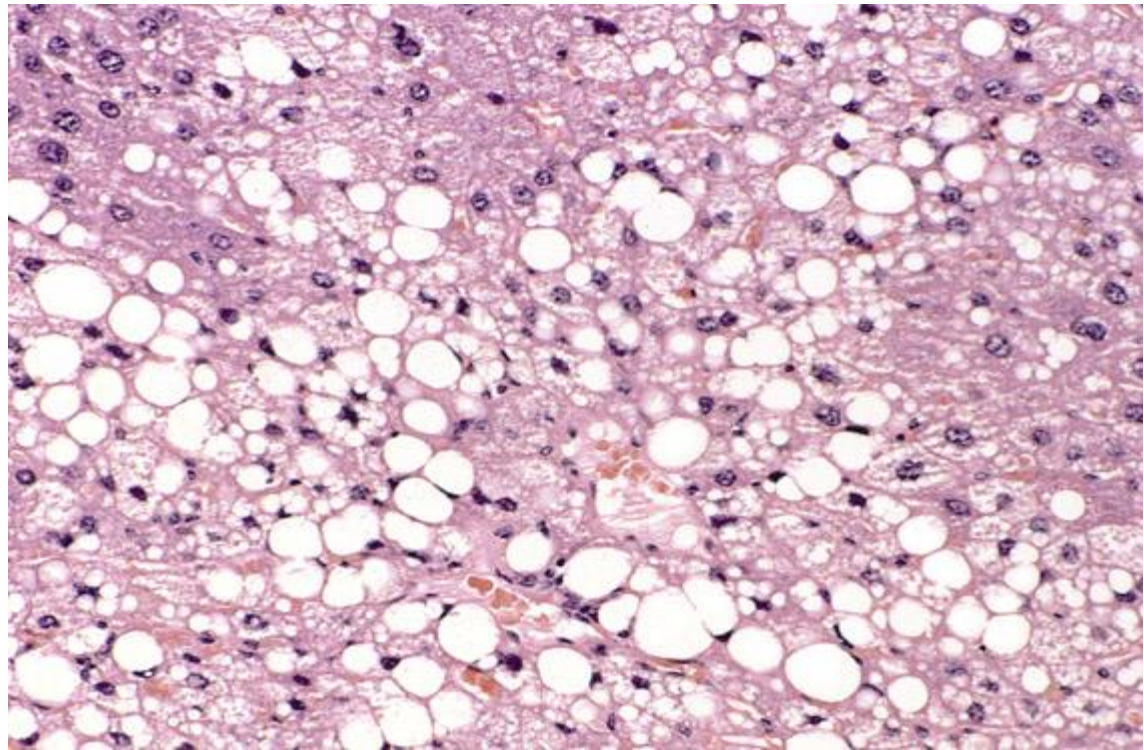
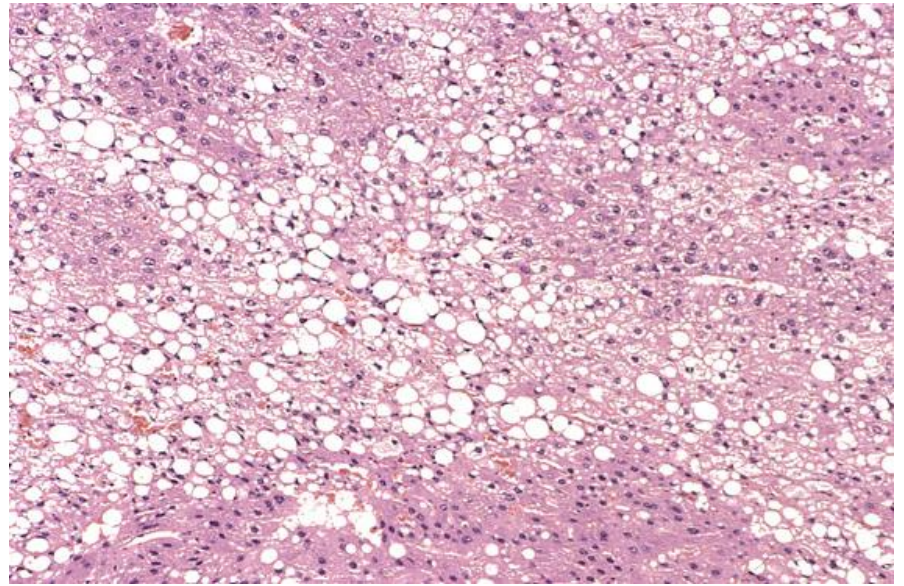
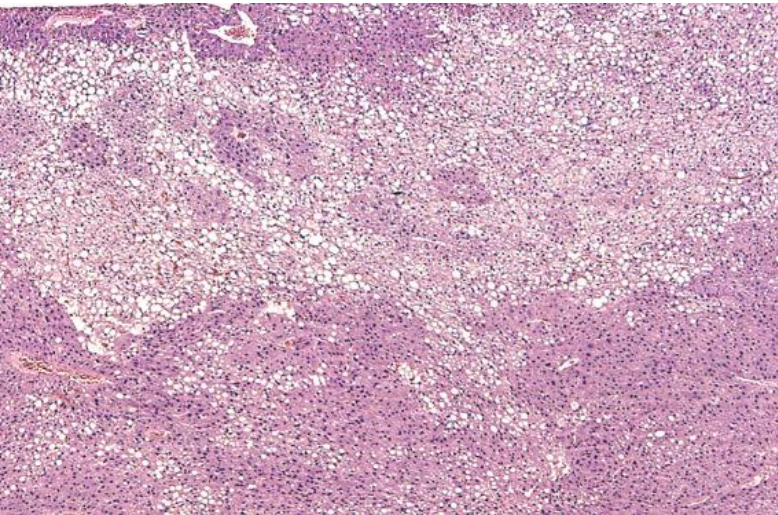


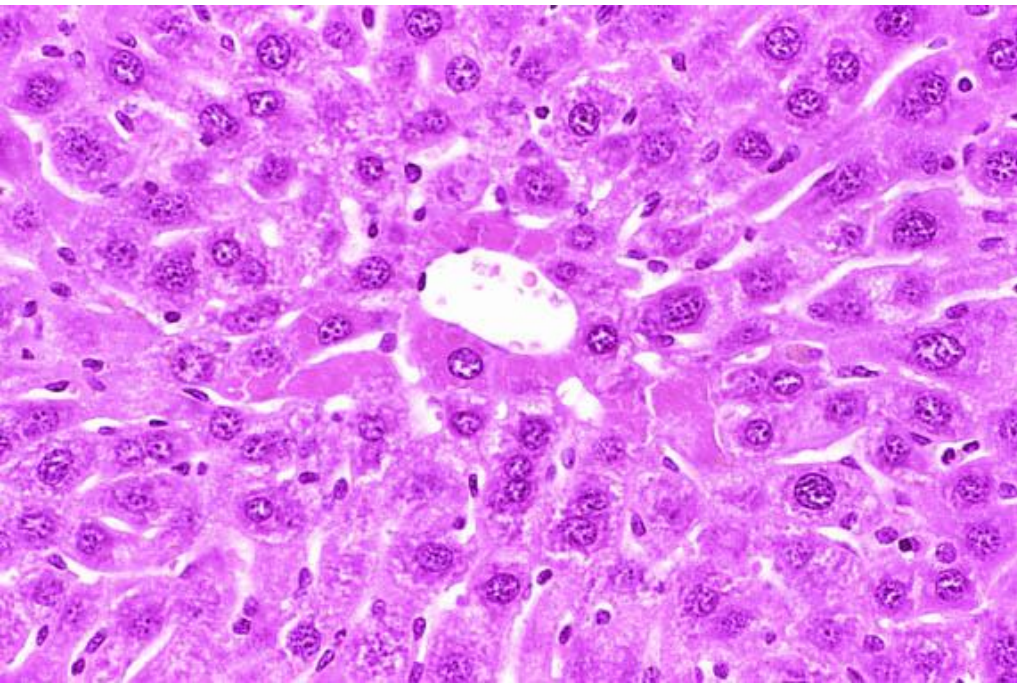


Fatty change

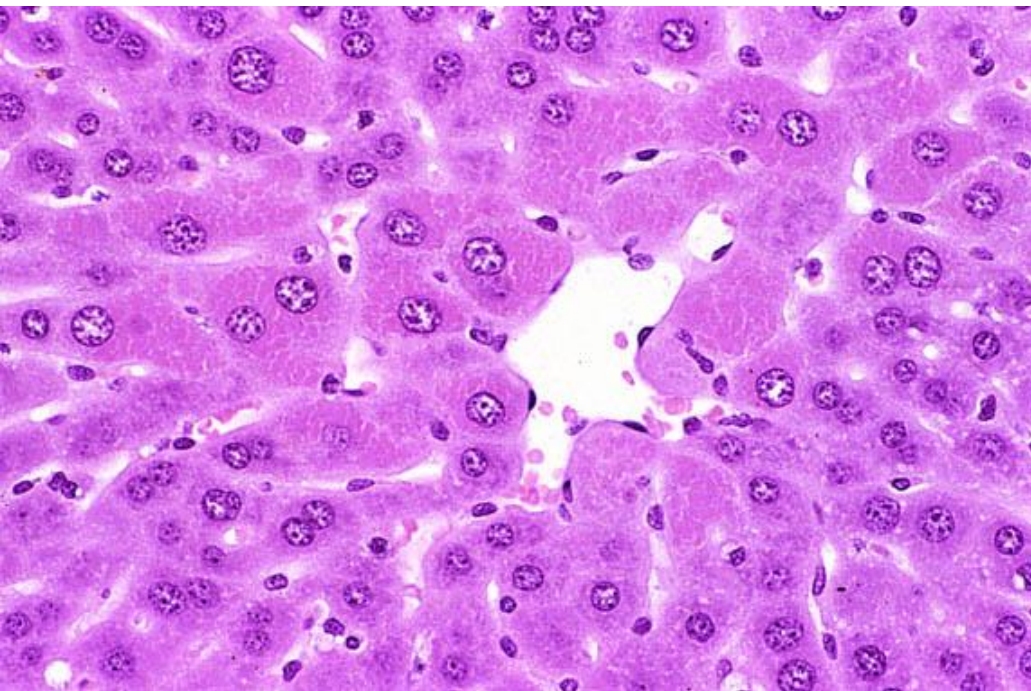
Deposition of fat in the hepatocyte cytoplasm often displaces the hepatocyte nucleus to the periphery of the cell.

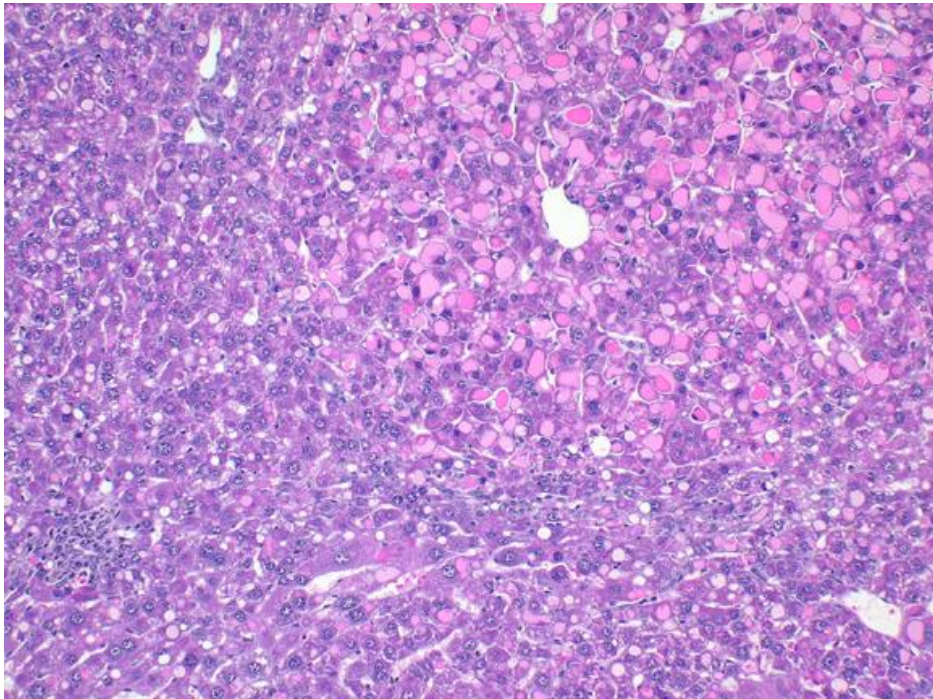




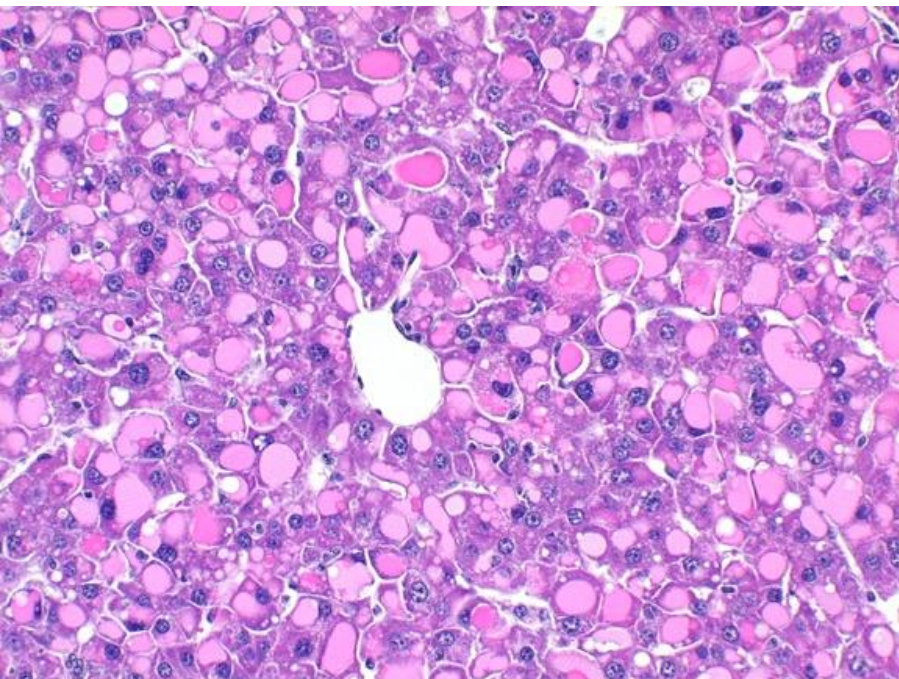


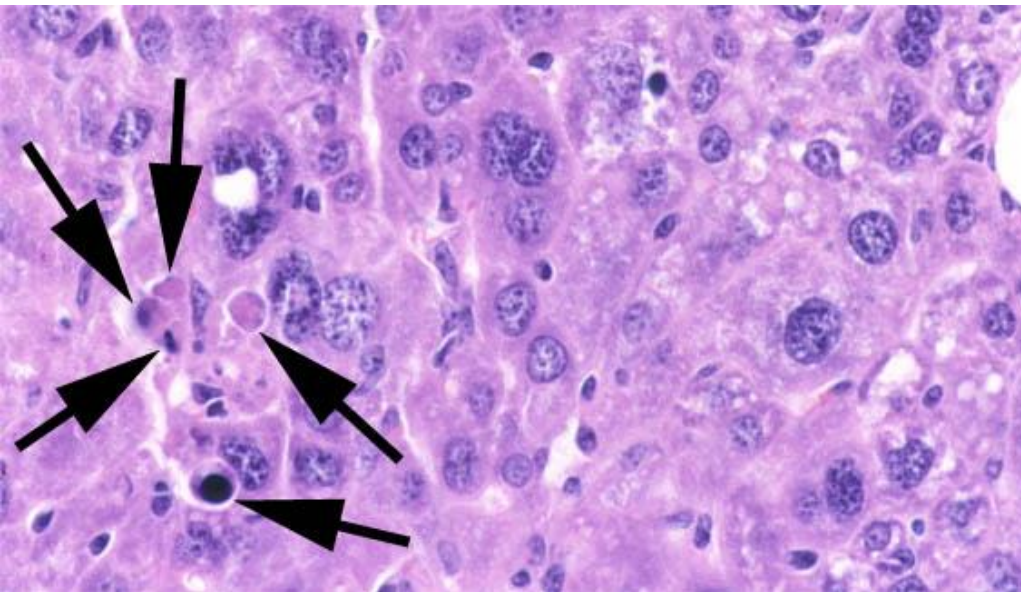
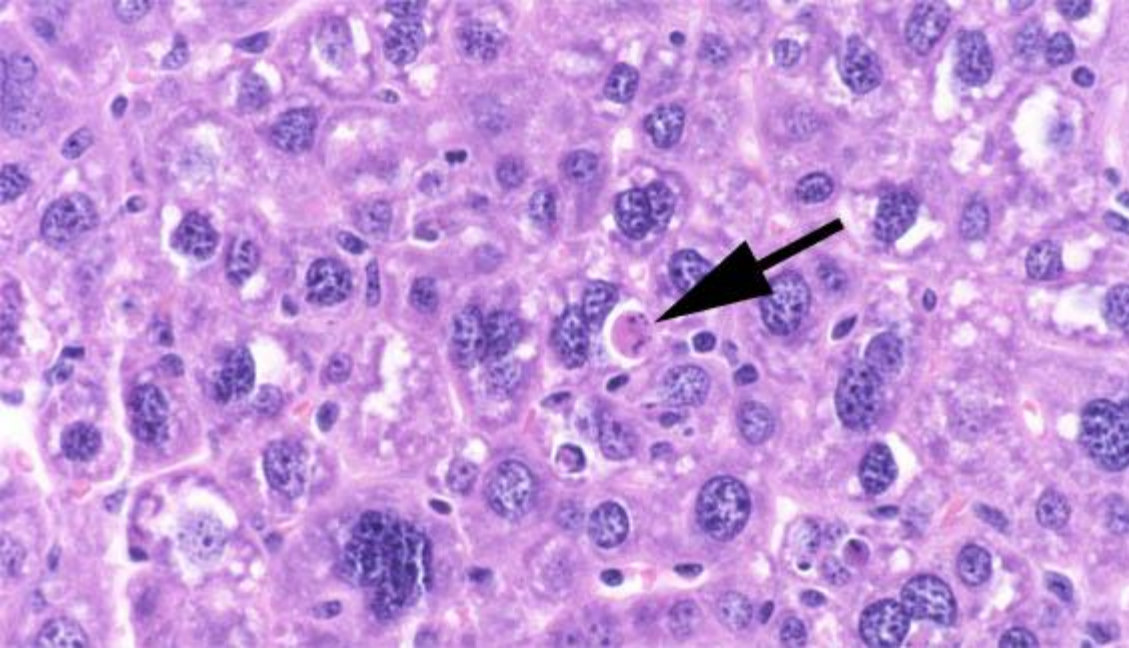
Hyaline change



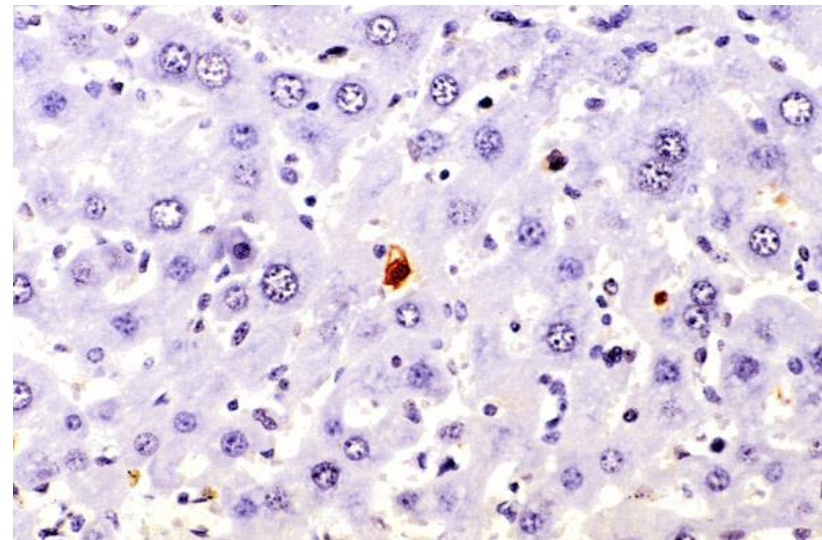


Hyaline bodies

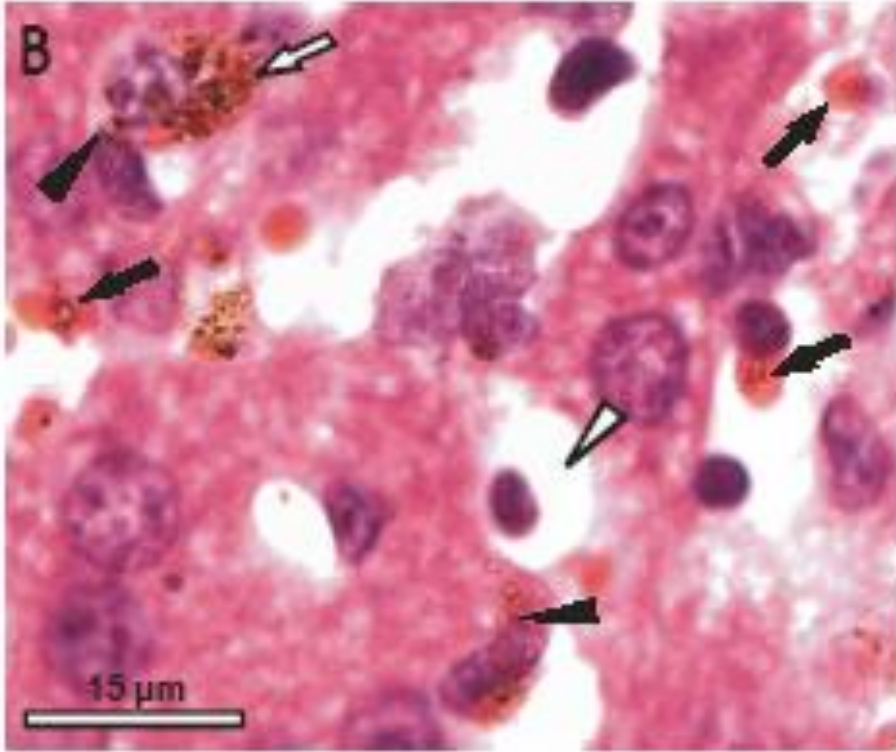
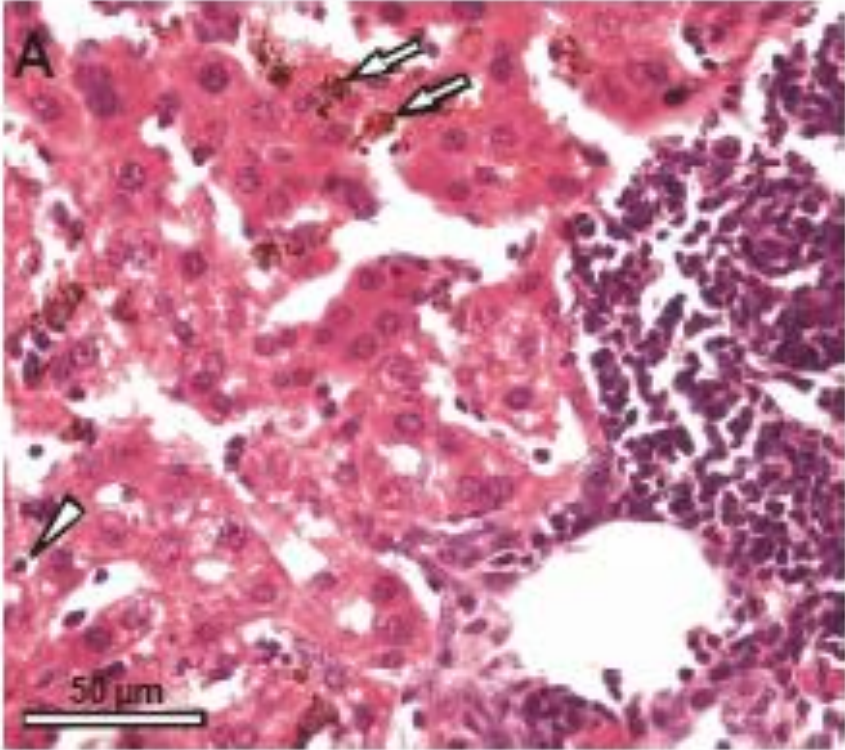




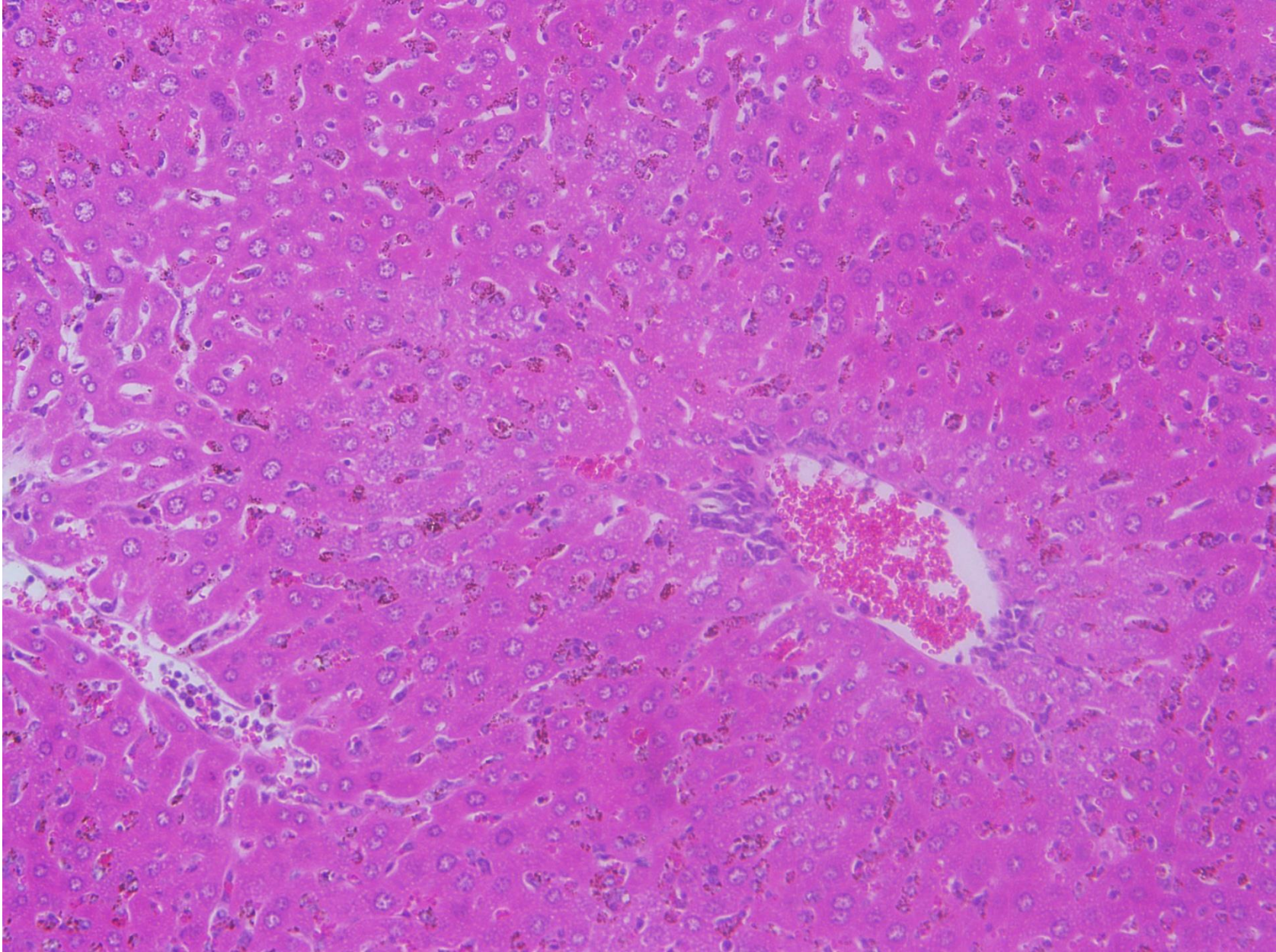
Apoptotic bodies

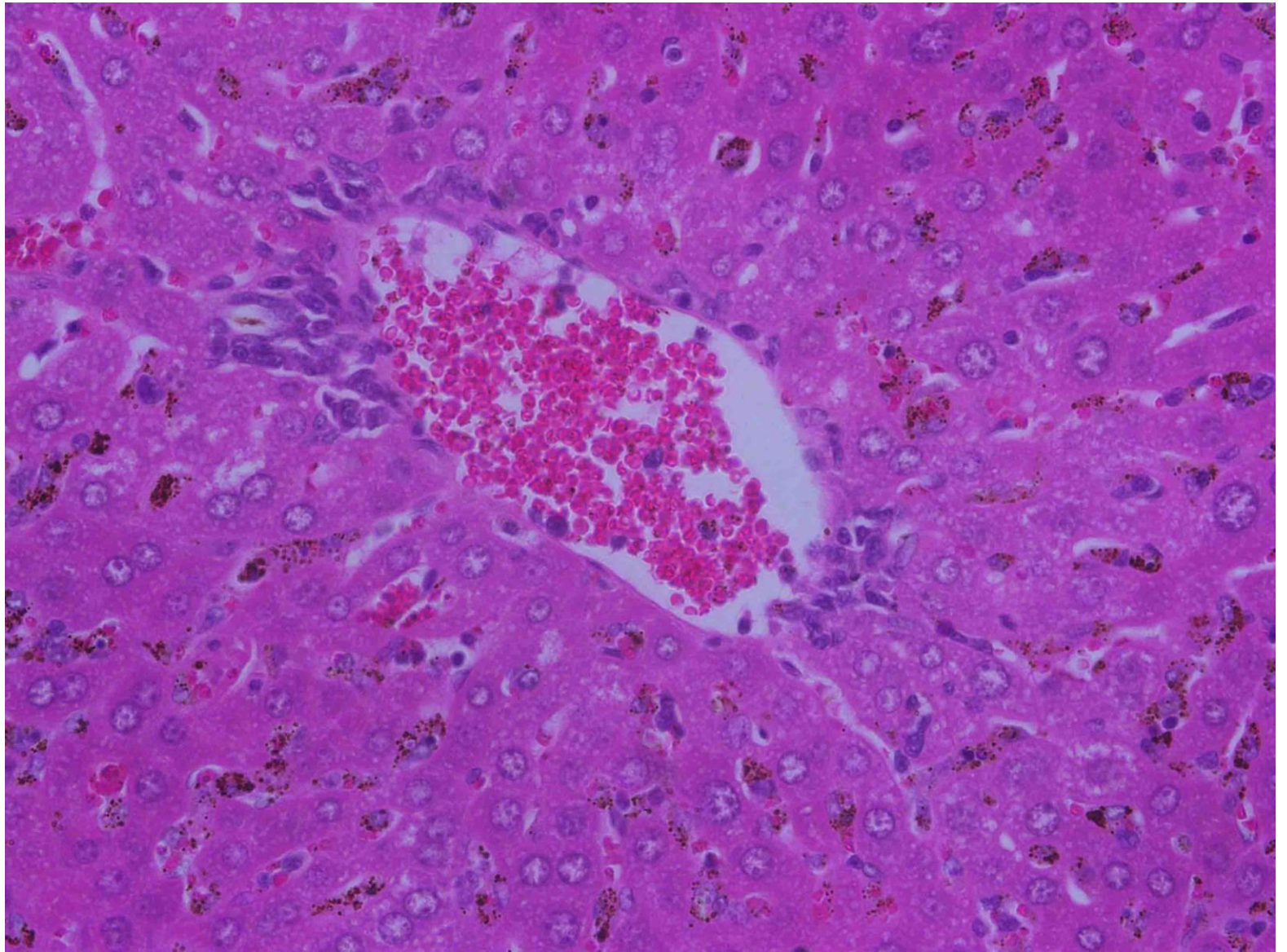


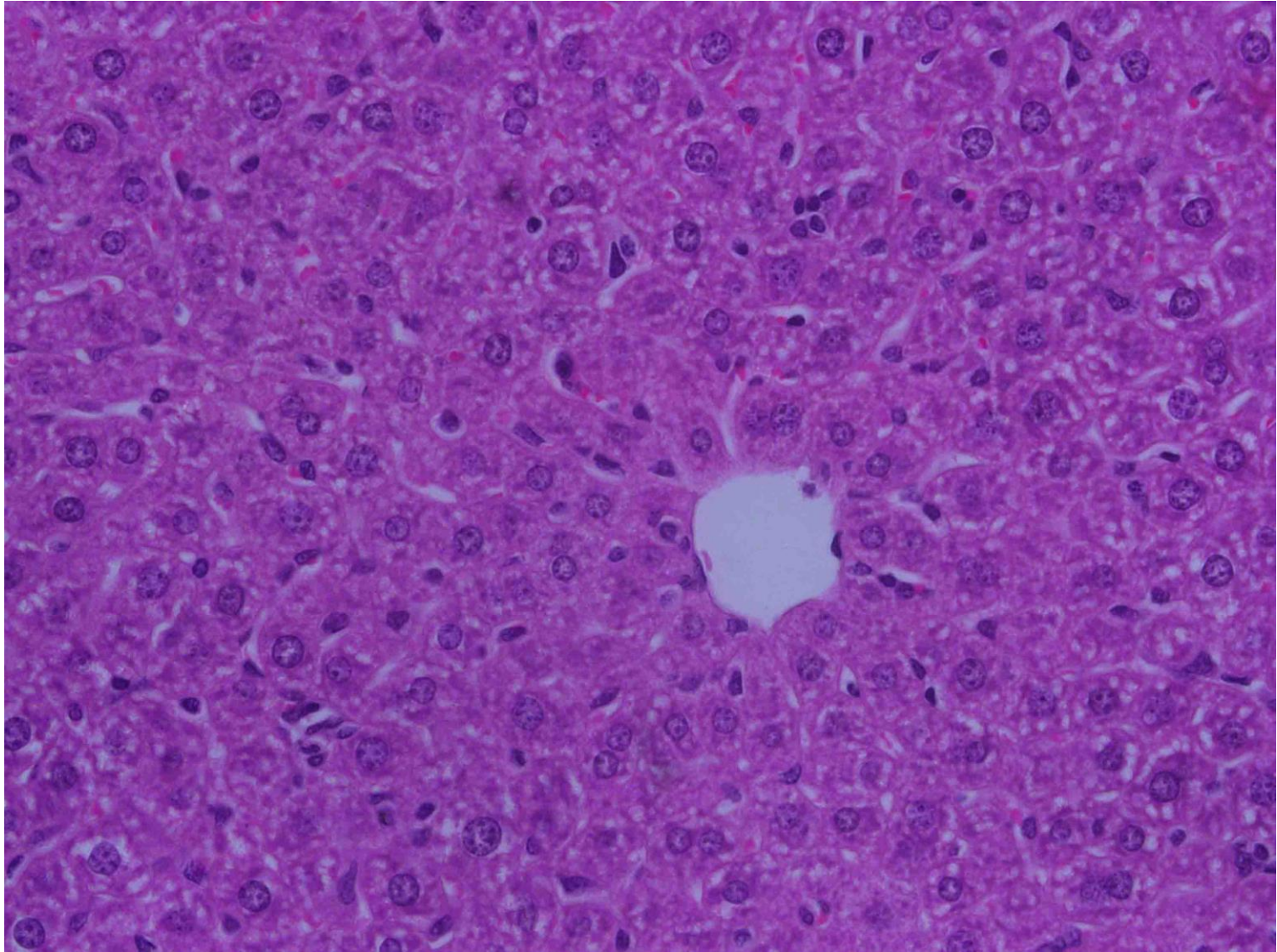
Malaria pigment

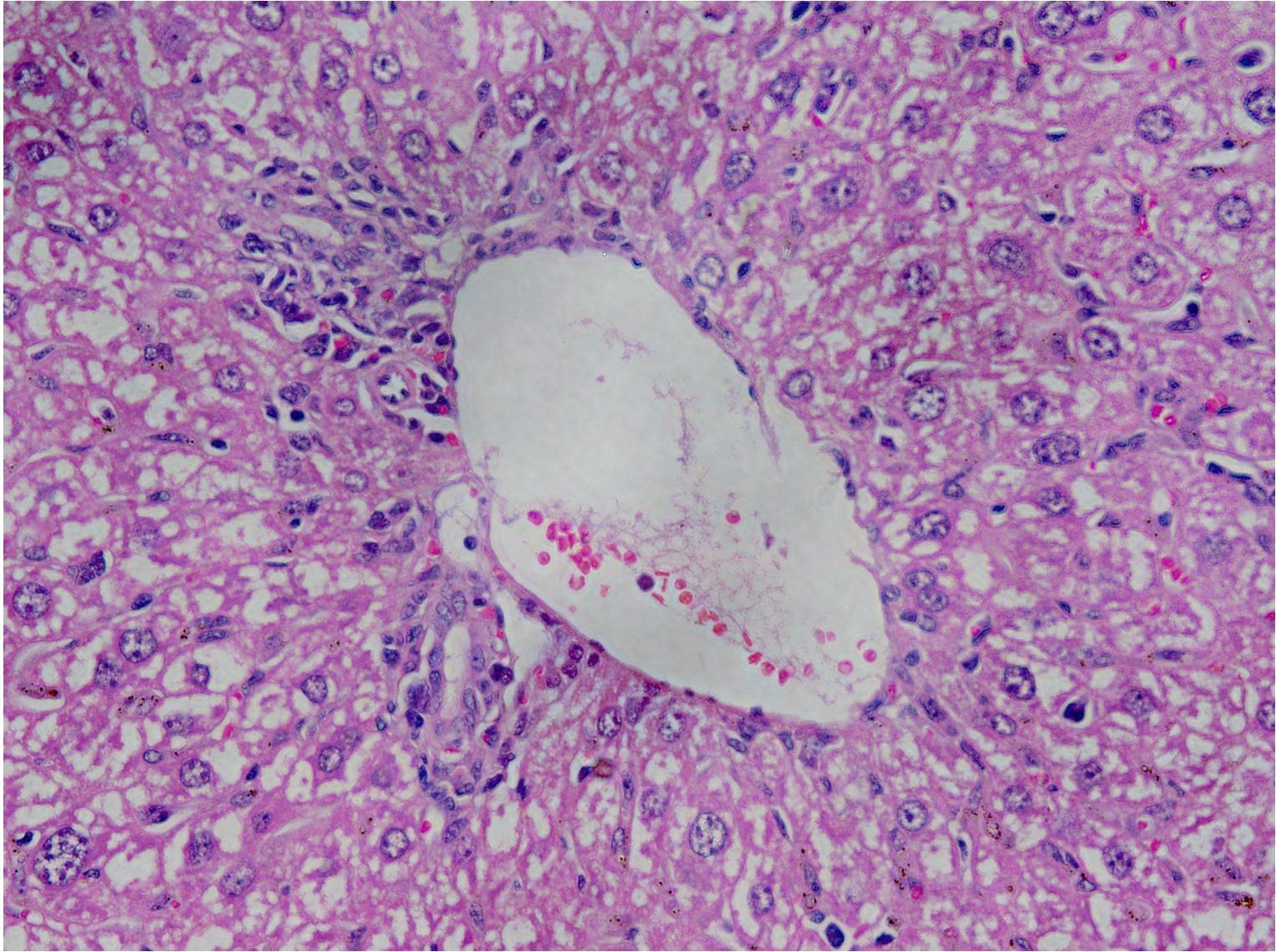


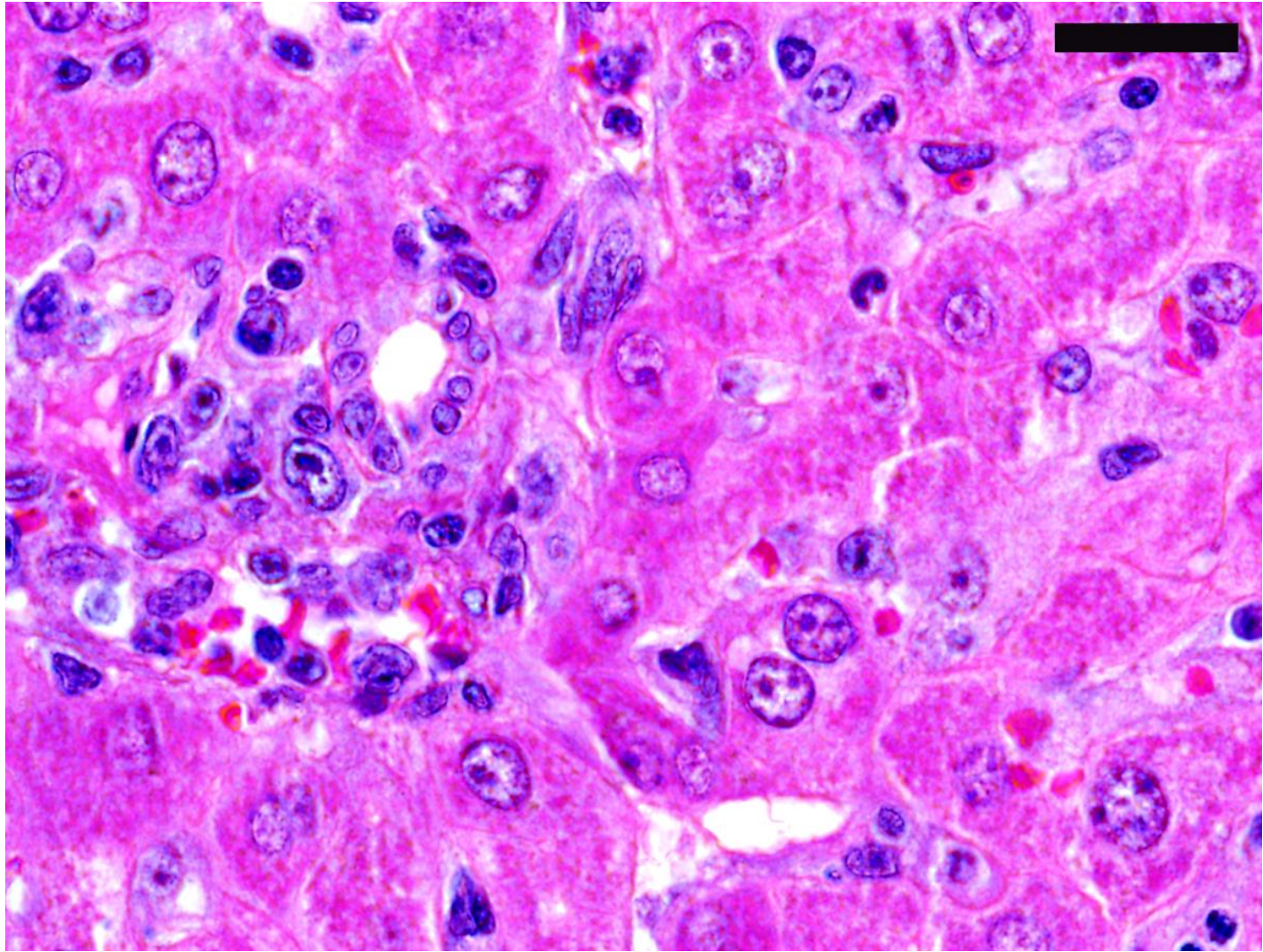
Inflammation











Proliferating hepatocyte

