

Cells of Liver

There are 4 basic cell types that reside in the liver:

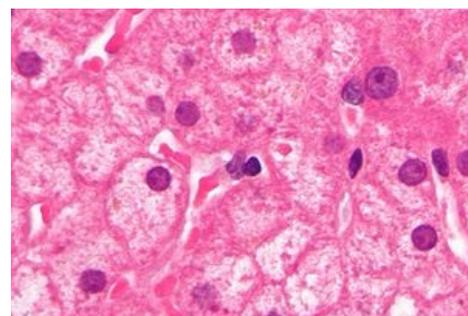
1. the hepatocyte
2. the stellate fat storing cell
3. the Kupffer cell
4. the liver endothelial cell.

These so-called resident cells control many of the key functions in the liver, as well as its response to injury.

Hepatocyte

Hepatocytes make up about 80% of the cells in the liver.

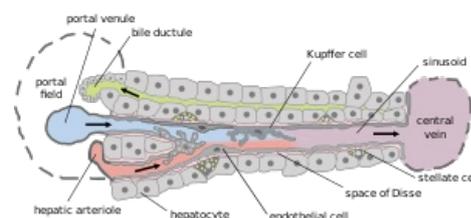
- are large polyhedral **epithelial cells**, with large round centrally located nuclei (2 or more)
- grouped in interconnected plates that are arranged into thousand of small polyhedral lobules
- store glucose in the form of glycogen , also vitamin B12, folic acid and iron
- participate in the turnover and transport of lipids.
- synthesize some of the plasma proteins (albumin, α and β globulins, prothrombin, fibrinogen
- metabolize/detoxify fat
- participate in the turnover of steroid hormones.
- regulates cholesterol level
- secrete bile (up to 1 liter per day)



hepatocyte in HE

ITO Cells

Ito cells (stellate cells) are cells of mesenchymal origin located in the **perisinusoidal space** of the liver lobules. Their cytoplasm contains large lipid droplets used to store **vitamin A**. Under certain pathological circumstances, e.g. after injury, alcohol damage or infection, Ito cells can differentiate into **myofibroblast-like cells** and **synthesize excessive amounts of extracellular matrix**, especially collagen type I and III. Thereby they cause **fibrotization of the liver**. Ito cells are also significantly involved in **liver regeneration**.



Schematic representation of the structure of the liver lobule. It's cells are labeled as "stellate cells".

Links

Related Articles

- Liver
- Liver Fibrosis
- Liver Regeneration

Liver as a histological preparation:

- Collection of histological specimens (1. LF UK)/Digestive system
- Liver (SFLT)

References

- LÜLLMANN-RAUCH, Renate. *Histologie*. 1. edition. Praha : Grada, 2012. 576 pp. ISBN 978-80-247-3729-4.
- MESCHER, Anthony L - JUNQUEIRA, Luiz Carlos Uchôa. *Junqueira's Basic Histology*. 12. edition. United States : McGraw-Hill Education - Europe, 2009. 480 pp. ISBN 9780071630207.
- VÁLEK, Vlastimil - KALA, Zdeněk, et al. *Maligní ložiskové procesy jater : diagnostika a léčba včetně minimálně invazivních metod*. 1. edition. Praha : Grada, 2006. ISBN 80-247-0961-9.

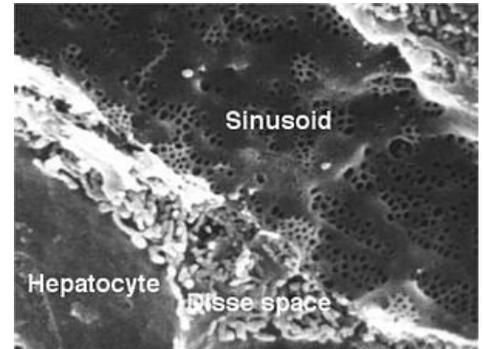
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Kupffer Cells

- specialized stellate macrophages
- adhere to the sinusoidal endothelium (in the lumen of the sinusoid), mainly near portal areas (=portal triads)
- clear the blood of ingested bacterial pathogens that may enter portal blood from the gut
- remove aged erythrocytes and free heme for re-use
- act as antigen-presenting cells in adaptive immunity
- secrete cytokines and chemokines that recruit and expand the population of other proinflammatory cells in the liver.

Sinusoidal Endothelial Cells

- form the wall of the blood vessels (sinusoids) that carry blood throughout the liver
- form a single layer with spaces between each cell known as fenestra, that allow an efficient flow of essential materials to pass from the blood to
- hepatocytes and vice versa
- are rich in lysosomal enzymes needed for degrading endocytosed material



Endothelial Cells of Liver