

# Development of the liver and gallbladder

The **liver** is established in the 3rd week of embryonic development as an outgrowth of the endodermal lining of the caudal part of the foregut growing into the *transverse septum*. Growing epithelial cells come into contact with the bed of vv. vitellinae and vv. umbilicales, which give the foundation to the hepatic sinusoids. Hematopoietic and Kupffer cells, together with liver stromal cells, arise from the mesoderm of the septum transversum. The epithelial lining of the bile ducts is of endodermal origin, the rest of their wall is again from the *transverse septum* mesoderm.

## Division of the hepatic lobe

Shortly after formation, the hepatic lobe begins to divide into the cranial hepatica part and caudal cystic part.

### Hepatic part

The hepatic part is the upper, larger part of the hepatic bud. It grows into the mesenchyme of the septum transversum, the caudal part of which forms the ventral mesogastrium and divides it into the ventral *hepatic falciform ligament* and the dorsal *omentum minus*. The mesodermal cover of the septum transversum forms the visceral peritoneum on the liver, with the exception of a small cranial area fused with the part of the septum transversum forming the center of the tendineum of the diaphragm, the so-called area nuda hepatis. Up to the 10th week, the liver grows rapidly, which is greatly contributed by the hemopoietic function of the liver. The growth of the liver is one of the reasons for pushing the intestinal loop into the umbilical coelom and creating a physiological umbilical hernia from the 6th to the 10th week of development.

### Cystic part

Cystic part is the lower, smaller part of the hepatic bud growing into the lower edge of the ventral mesogastrium. It gives rise to extrahepatic bile ducts (ductus hepaticus, ductus cysticus + gallbladder, ductus choledochus). The mesodermal cover of the transverse septum around the ductus choledochus forms the ligamentum hepatoduodenale. Extrahepatic bile ducts are first formed as a solid epithelial column, which is later luminized by a mechanism of vacuolization and cell degeneration. The choledochus duct is first located ventral to the foregut, but due to the rotation of the duodenum, it later reaches behind it.

## Liver function during embryonic development

1. Hematopoiesis - From the 6th week of development, bone marrow is gradually replaced, at birth there are only small islands of hematopoietic tissue.
2. Bile formation - From the 12th week of development, when the extrahepatic bile ducts are already formed.

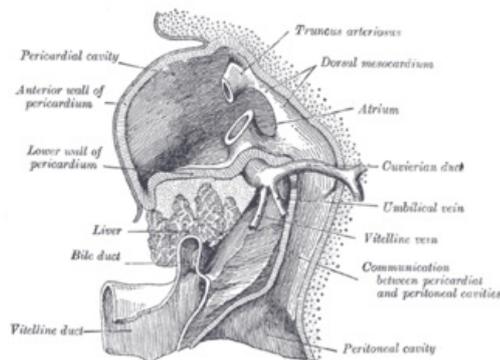
## Links

### Related articles

- Gut development
- Development of body cavities, mesenteries and diaphragm
- Development of the stomach and duodenum

### References

- SADLER, Thomas W.. *Langmanova lékařská embryologie*. 1st Czech edition. Praha : Grada, 2011. pp. 414. ISBN 978-80-247-2640-3..
- MOORE, Keith L - PERSAUD, T. V. N. *Zrození člověka*. 1. edition. Praha : ISV, 2002. pp. 564. ISBN 80-85866-94-3..



Developing intestines in a 3 mm long human embryo