

Centre of the Cell's 'STEM Pod' Challenge

The Liver

The liver has 3 main roles...

1. It **cleans** your blood

Once our blood receives vitamins and nutrients from the small intestine, it first stops at the liver for the cleaning process, before it goes to the rest of the body. The liver removes something called 'toxins' from the blood. Toxins are produced as by-products from when our digestive system breaks down food. Too much toxin in the blood can be harmful to us, so our liver removes it.

2. It produces **bile**

Bile is a thick, yellowish 'juice' which gets sent to the small intestine where it is used to help breakdown fat into really tiny pieces. Now that the fat pieces are small, it can move out of the small intestine, into the blood.

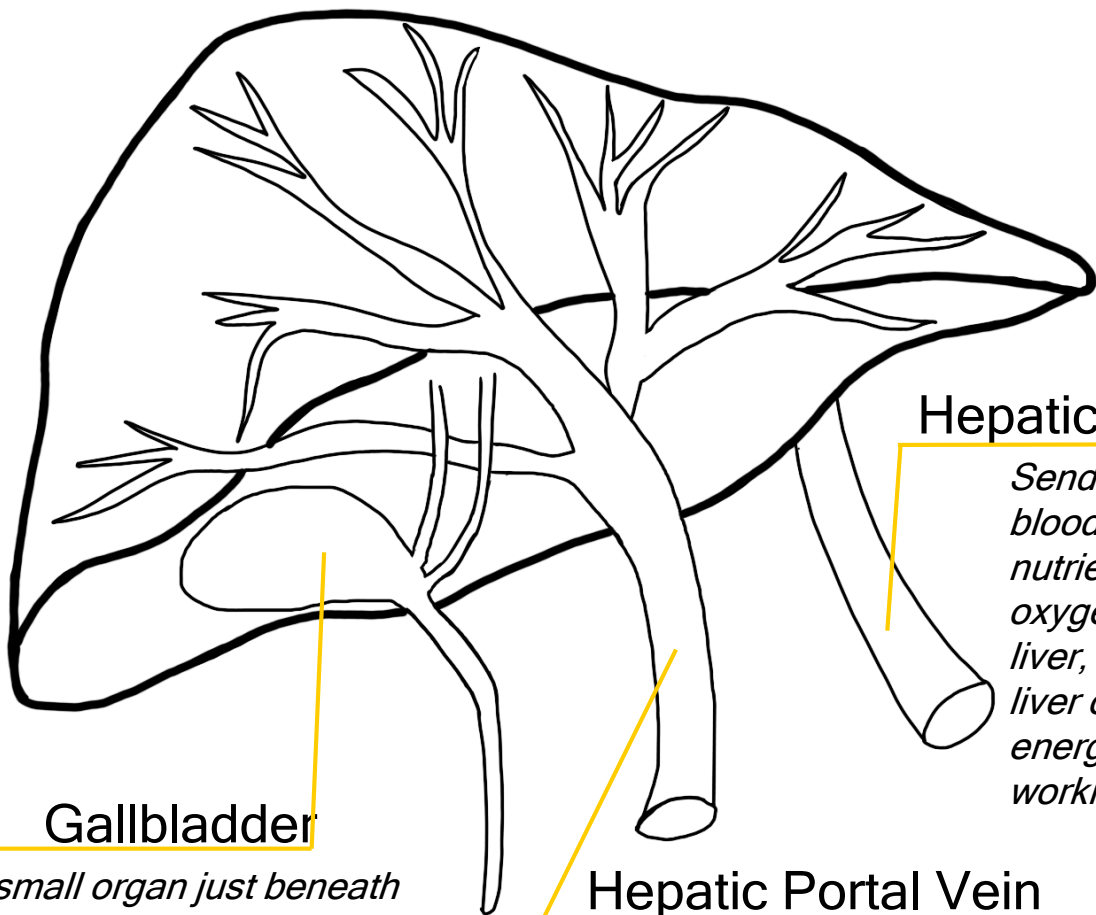


3. It **stores** energy

Our body gets a lot of its energy in the form of a sugar called 'glucose'. Sometimes we have too much glucose in our body, but it would be a waste to just get rid of it. So, our liver stores the glucose and keeps it safe. If we're ever in a situation where we need energy desperately, our liver can just release the stored glucose!

The Structure of the Liver

The liver is actually the largest internal organ in the human body. In an adult, it's about the size of a football! The liver is shaped like a half-moon, and is found next to the stomach and small intestine. It has a red-brown colour, and has a spongy texture.



Gallbladder

A small organ just beneath the liver where bile is stored before it is released into the small intestine.

Hepatic Artery

Sends clean blood full of nutrients and oxygen into the liver, so the liver can make energy to keep working.

Hepatic Portal Vein

Sends blood full of nutrients and toxins into the liver to be 'cleaned'.

You can print out this worksheet, or trace the image to colour in the liver!

Let us know how your
challenge goes on social media
@CentreoftheCell!

Bile-Fat activity

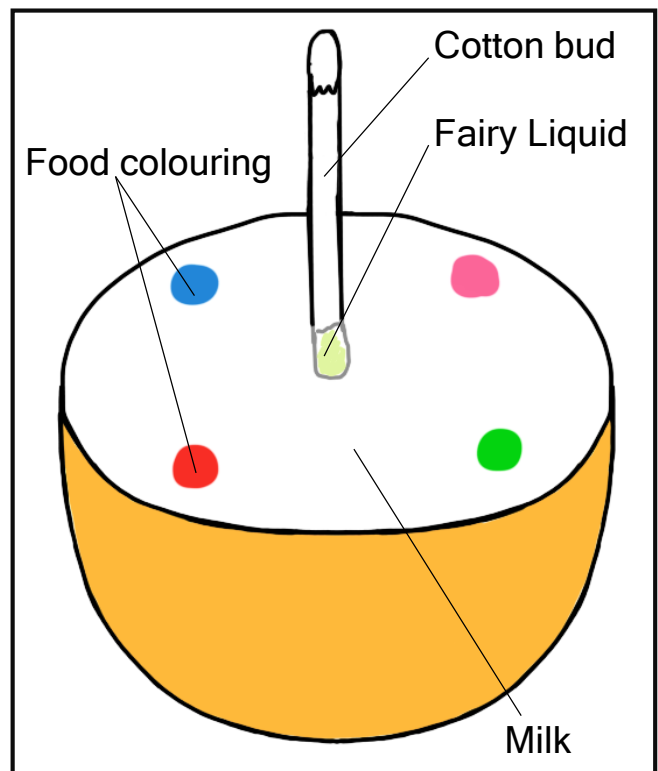
In this activity, you will do an experiment that will show you how bile interacts with fat to break it down.

What you will need:

Bowl, milk, food colouring (1-4 different colours), cotton bud, washing up liquid.

Instructions:

1. Fill your bowl with some milk.
2. Add drops of food colouring in the milk at different points, but make sure to avoid the middle!
3. Dip your cotton bud into some washing up liquid
4. Place the tip of the cotton bud covered in washing up liquid in the middle of the bowl of milk. Hold the cotton bud still!



What should you see? The drops of food colouring should automatically start swirling around, without you having to even move the cotton bud!

Why? Washing up liquid contains a protein that is also found in bile. This protein helps break down fat. So, in this experiment the protein is breaking down the fat in the milk, causing the food colouring to move about.

Let us know how your
challenge goes on social media
@CentreoftheCell!