- The harmful substances are broken down by hepatocytes into less harmful substances that then re-enter the blood.
- The blood runs to the central vein, the central vein from all the liver lobules form the hepatic vein
- Cells called kupffer cells are attached to the walls of the sinusoids. They remove bacteria and break down old red blood cells.
- The bile duct is connected to the central vein by tubes called canaliculi.

The kidneys and excretion

One of the main functions of the kidney is to excrete waste products. They also regulate water potential of the blood.

- Blood enters the kidney through the renal artery and then passes through capillaries in the cortex of the kidneys.
- As the blood passes through the capillaries, substances are filtered out of the blood and into long tubules that surround the capillaries. This process is called ultrafiltration.
- Useful substances are reabsorbed into the blood from the tubules in the medulla and cortex – this is called selective reabsorption.
- The remaining unwanted substances pass along the tubules, then along the ureter and into the bladder, where they're expelled as urine.
- The filtered blood leaves the kidney through the renal vein.

Blood is filtered at the start of the nephrons

The long tubules and bunch of capillaries where the blood is filtered are called nephrons – there are around one million nephrons in each kidney.

- Blood from the renal artery enters smaller arterioles in the cortex.
- Each arteriole splits into a structure called glomerulus – a bundle of capillaries looped in a hollow ball called the bowman's capsule.
- This is where ultrafiltration takes place.
- The arteriole that takes blood to the glomerulus is called the afferent arteriole, and the arteriole that takes blood away from the glomerulus is the efferent arteriole.
- The efferent arteriole is smaller in diameter than the afferent arteriole, so the blood in the glomerulus is under high pressure. This high pressure forces liquid and small molecules into the bowman's capsule.
- The liquid and small molecules pass through three layers to get into the bowman's capsule and enter the nephron tubule – the capillary wall, a membrane (called the basement membrane) and the epithelium of the bowman's capsule. Larger molecules like proteins and red blood cells stay in the blood.
- The liquid and small molecules can now filtrate. They pass along the rest of the nephron tubule and useful substances can be re absorbed along the way.
- Finally, the filtrate flows through the collecting duct and passes out of the kidney along the ureter.