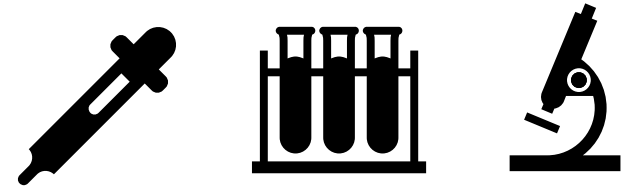
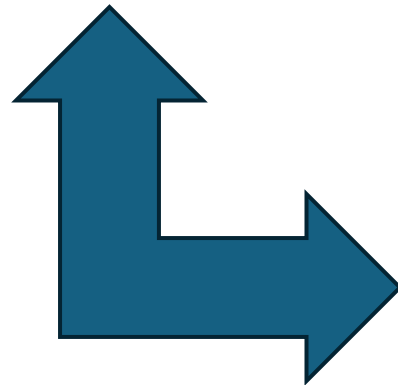
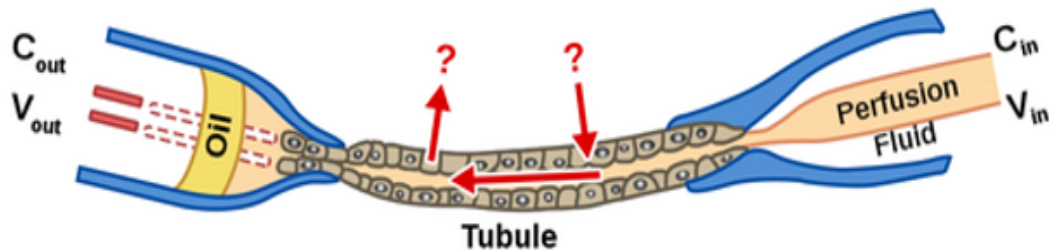


▲ Tubule Reabsorption Experiment

The aim of this experiment is to measure the volume of liquid being reabsorbed through the epithelial walls of renal tubule during the filtration process in the kidney.

The overall principle is to perfuse the tube on one end with a saline solution and measure the resulting volume collected at the other end. The difference in volume would tell if the perfusate gained or lost volume traveling along the length of the tubule. In the experiment, the lost volume would go into the bathing saline surrounding the tubule, but in real life it would be reabsorbed back into the body.

Using micromanipulators and a microscope, thin pipettes are inserted into both ends of the tubule. One pipette will inject the perfusate saline and the other, the collecting pipette, is filled with a red-dyed light oil to facilitate seeing the meniscus marking the division between the oil and the perfused saline coming out of the tubule.



Lab experiments to study reabsorption



However, because it is difficult to measure accurate such small volumes of liquid, the measurement of volumes will be made using a radioactive agent included in the perfusate saline and unable to be reabsorbed by the tubule.

If we know the final volume collected in the collection pipette V_{out} , the initial and final concentrations of radioactive compound C_{in} and C_{out} , using the simple equivalence $C_{in} * V_{in} = C_{out} * V_{out}$ we can deduce the initial volume V_{in} necessary to reach a V_{out} of 1 nanoliter in the collection tube. Then simply by subtracting the collected volume V_{out} from the entering volume V_{in} , we can measure how much volume was lost in traveling the tubule, sometimes called the reabsorption rate R.

To calculate these concentrations C_{in} and C_{out} , the radioactivity of the compound in the sample is measured using a liquid scintillation counter.