

- 17 Cirrhosis of the liver can result from long-term liver damage. Alcohol or other toxins can cause this damage.

Scientists have suggested that cirrhosis can be detected by taking samples of body fluids and testing them for two different molecules: C-reactive protein and copeptin.

The liver produces these two molecules, and increased levels can indicate liver damage due to cirrhosis.

Different bodily fluids from a patient suspected of having cirrhosis were tested for C-reactive protein and copeptin.

Fig. 17.1 is a graph of the results.

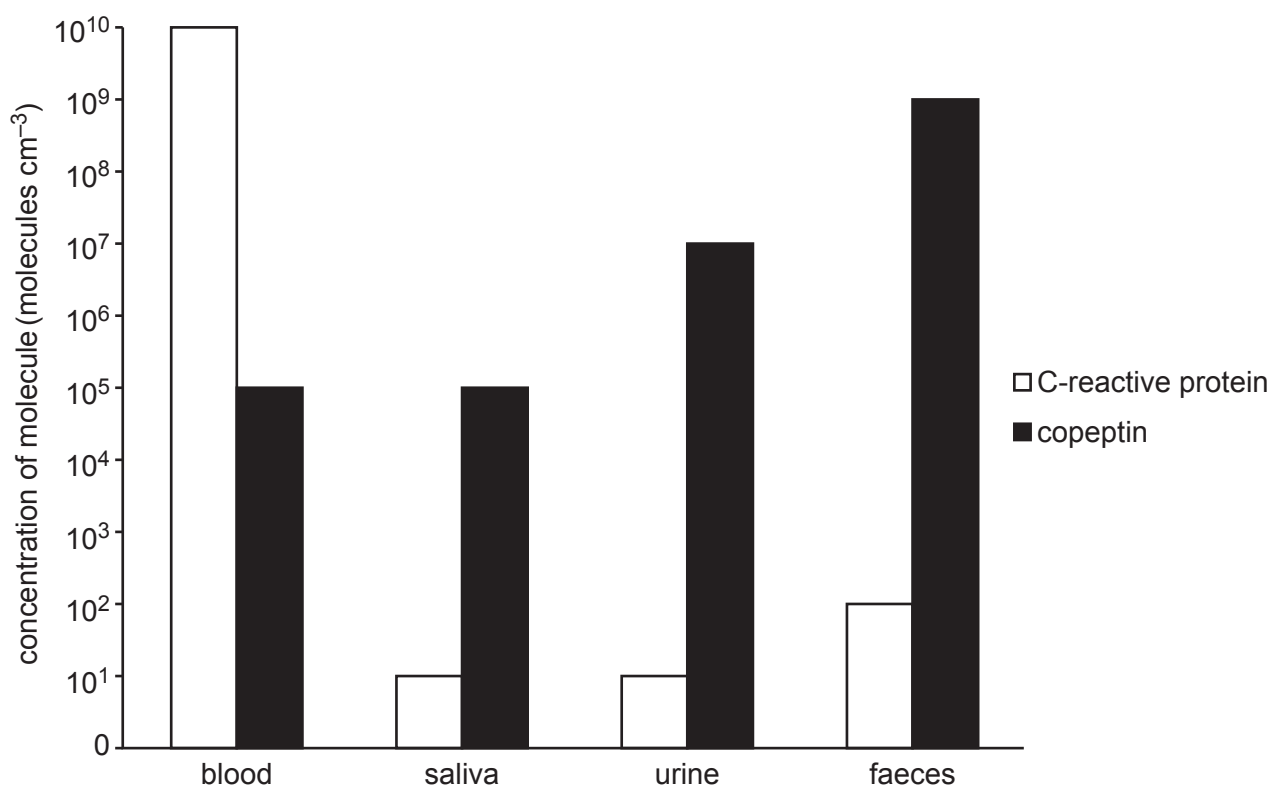


Fig. 17.1

- (a) Different bodily fluids have different concentrations of the different molecules.
- (i) Calculate the order of magnitude by which concentration of copeptin in the **faeces** is higher than the concentration of C-reactive protein in the **saliva**.

Show your working.

Answer = ..... molecules cm<sup>-3</sup> [2]

- (ii) Suggest why blood and faeces have the highest concentrations of C-reactive protein and copeptin.

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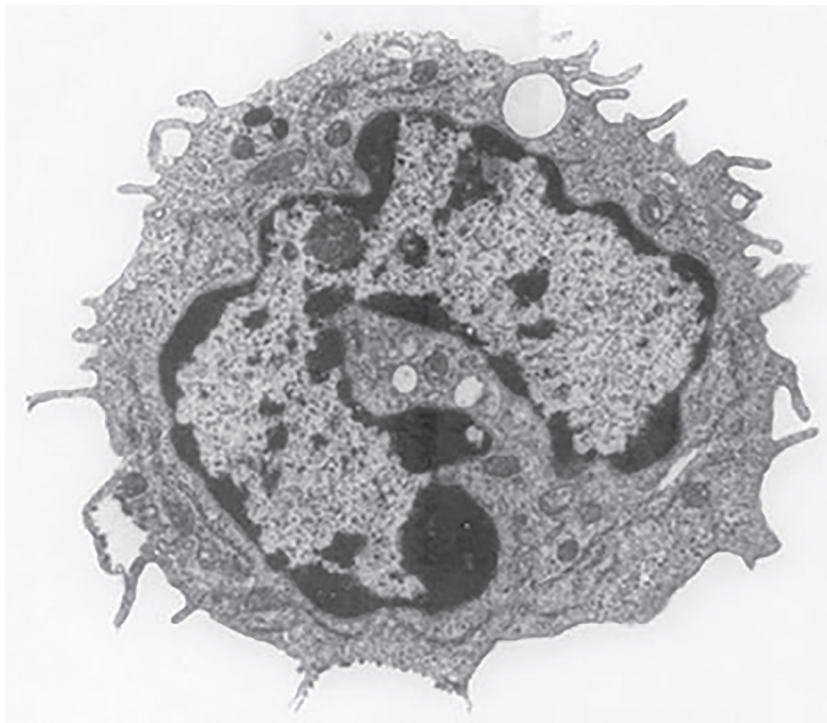
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..... [2]

(b) Fig. 17.2 is an image of a Kupffer cell from the liver.



4µm

Fig. 17.2

- (i) The diameter of the Kupffer cell in the image is 9.1 cm. Assuming it is spherical, calculate the actual volume of this cell.

Give your answer to **four** significant figures. Show your working.

Answer = ..... [3]

(ii) Which type of microscope has been used to obtain this image? Explain your answer.

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