

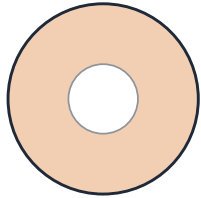
Exercise walk-through

9.3

Blood vessels

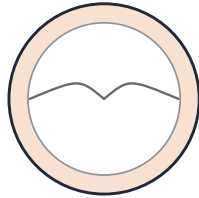
IGCSE Biology

Blood vessels



artery

thick muscular,
elastic wall;
narrow lumen;
high pressure



vein

thin wall;
wide lumen;
has **valves**;
low pressure



capillary

wall one cell
thick; lets
substances be
exchanged

■ **arteries** – thick, away
at high pressure

■ **veins** – thin, wide,
valves , back

■ **capillaries** – one
cell thick; exchange

Main: **aorta** / **vena**
cava , pulmonary, renal.

What the blood is carrying, and what defends it

Red blood cells

Red blood cells
haemoglobin

carry oxygen using the red pigment
. No nucleus, and a biconcave shape –
both give more room and more surface for oxygen.

Phagocytes

Phagocytes

carry out **phagocytosis** : they
surround and digest pathogens.

Lymphocytes

Make **antibodies**
cells behind.

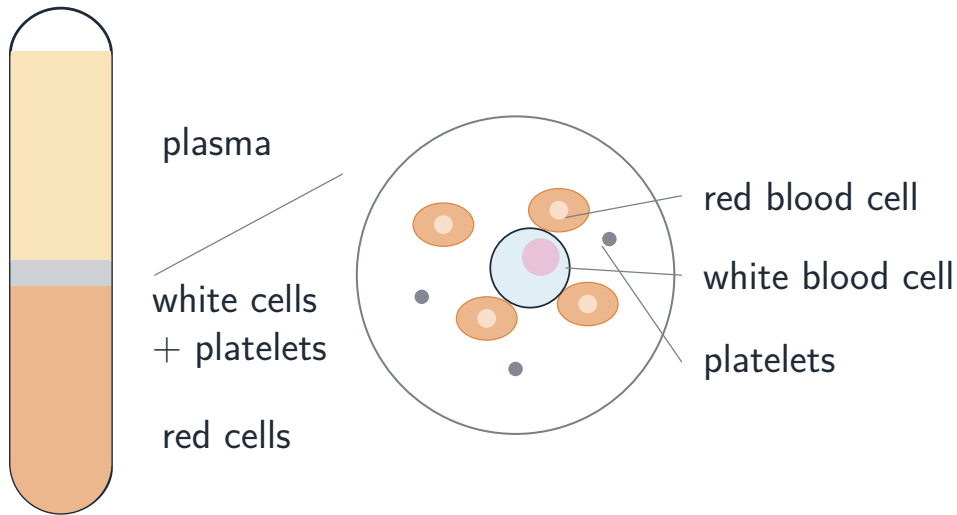
shaped to one antigen, and leave memory

Capillaries

One cell thick and very narrow, giving a large **surface**
area and a short diffusion distance – the whole point of
the circulation.

Every structure here is a shape that fits a job. Say the feature *and* the job it serves.

Blood



- **red cells** – carry O_2 via **haemoglobin**
- **white cells** –
defence
- **platelets** –
clotting
- **plasma** – carries
everything else

Defence and clotting

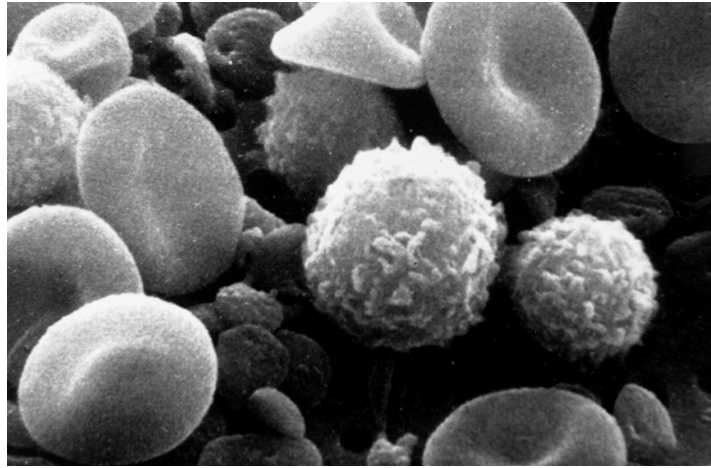
white blood cells

phagocytes engulf
pathogens ; lympho-
cytes make antibodies

clotting

fibrinogen →
fibrin threads
trap cells & seal the wound

Blood, continued



Real blood cells under an electron microscope: red cells (discs), white cells and platelets

Exercises 2.1·2.2

2.1 State which vessel carries blood away from the heart. [1]

2.2 State why veins have valves. [1]

Exercises 2.1·2.2

2.1 State which vessel carries blood away from the heart.

[1]

2.1

- blood away from the heart is carried by an **artery**

2.2 State why veins have valves.

[1]

2.2

- veins have valves to stop low-pressure blood **flowing backwards**

Exercise 3.1

3.1 A capillary is well adapted for exchange because its wall is:

[1]

☐

A thick and muscular

B one cell thick

C full of valves

D very elastic

Exercise 3.1

3.1 A capillary is well adapted for exchange because its wall is:

[1]

☐

A thick and muscular

B one cell thick

C full of valves

D very elastic

3.1 B

- a capillary wall is **one cell thick**, so the exchange distance is short
- A and D are arteries; C is veins

Exercise 3.2 (a)

3.2 Arteries carry blood at high pressure.

(a) Explain how the artery wall is adapted to high pressure.

[2]

Exercise 3.2 (a)

3.2 Arteries carry blood at high pressure.

(a) Explain how the artery wall is adapted to high pressure.

[2]

(a)

- a **thick, muscular and elastic** wall
- to **withstand the high pressure**

Exercise 3.2 (b)

3.2 Arteries carry blood at high pressure.

(b) Name the artery that carries blood from the heart to the body.

[1]

Exercise 3.2 (b)

3.2 Arteries carry blood at high pressure.

(b) Name the artery that carries blood from the heart to the body.

[1]

(b)

- the artery to the body is the **aorta**