

Chapter 26 - Blood

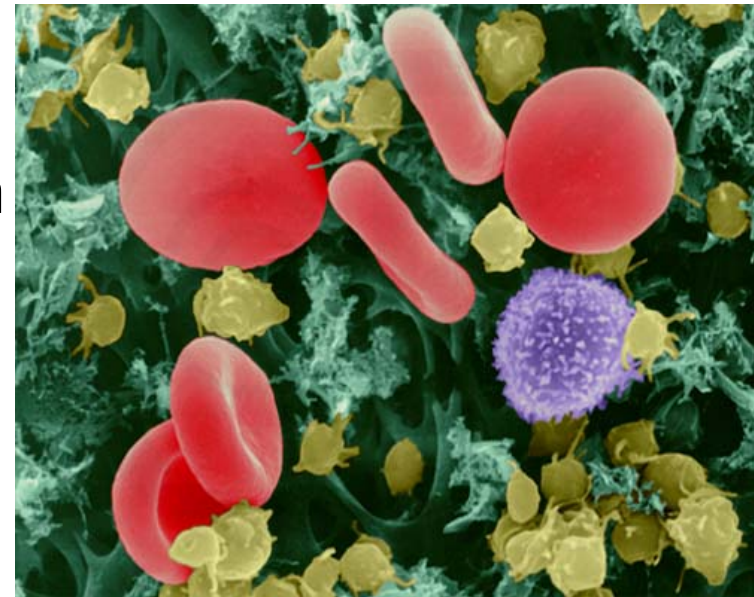
Blood is a tissue made up of 4 parts,

Plasma - liquid part

Red Blood Cells - carry Oxygen

White Blood Cells - defense

Platelets - clotting



PLASMA

The role of plasma is to **transport** dissolved substances around the body.

Examples of transported substances are

Digestion - glucose, amino acids, vitamins

Wastes - Carbon dioxide, Urea

Hormones - Insulin

Antibodies

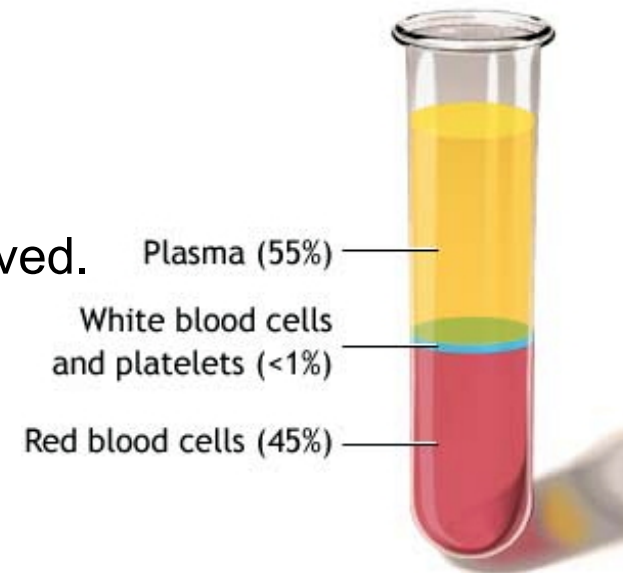
Plasma also carries **heat** and helps maintain our 36.9°C temperature.

Plasma carries 2 types of **proteins**,

1. Antibodies

2. Blood Clotting Proteins

Serum is plasma with the clotting proteins removed.



Red Blood Cells

These are also known as Erythrocytes.

They are made in the bone **marrow** of bones such as ribs, arms, and legs.

They are **bi-concave** discs. This gives a large surface area.

They are very small, have **no nucleus** and **no mitochondria**.

Your body makes 3 million of these cells every second.



The cells contain **haemoglobin**.

Oxygen is attracted to this iron-rich chemical and carried around the body.

Haemoglobin is a purple colour but turns red when oxygen is added.
(Called oxy-haemoglobin)

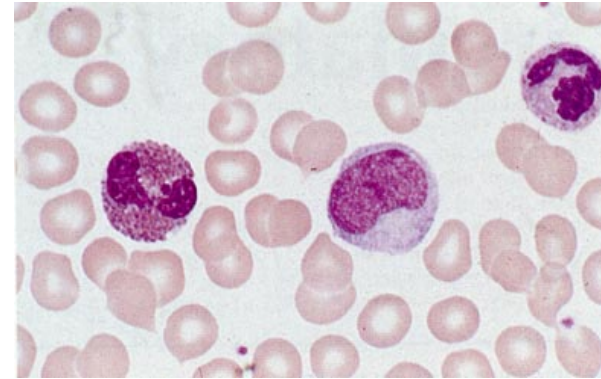
Haemoglobin is broken down and iron stored in the **liver**. It's used to make new haemoglobin.

White Blood Cells

These cells have a nucleus but no definite shape.

They are also formed in the bone **marrow** but then move to the **spleen** to mature.

They protect the body **against disease**.



There are two main types -

1. **Lymphocytes** - 25% of white blood cells.
These produce antibodies that attack invaders.
When mature they are stored in the tonsils and other lymph nodes.
2. **Monocytes** - 5% of white blood cells.
These **engulf** (eat) microorganisms - like an amoeba does.
These are also known as **macrophages**.

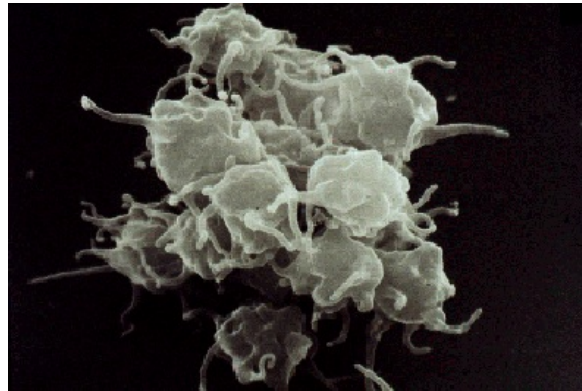
The other 70% are normal phagocytes (engulf bacteria).

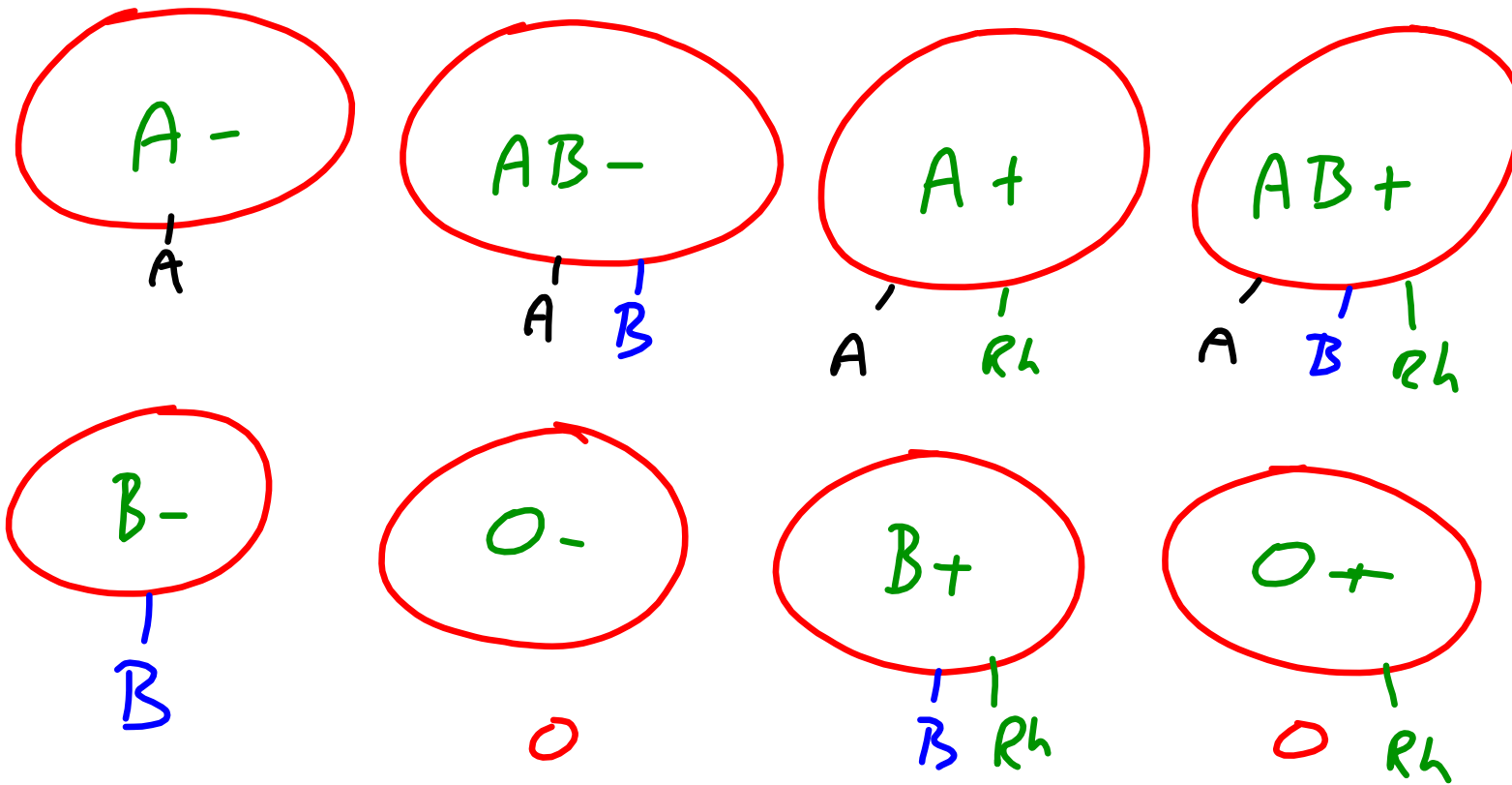
Platelets

Platelets are broken cell **fragments** - like smashed plates. Like Red blood cells, they have **no nucleus** and are made in the **marrow**. They help **form blood clots** by sticking to chemical nets.

Clots have **2 functions** -

1. They reduce blood loss
2. They stop microorganisms getting into the body.





Blood Types

There are around 400 different ways of labelling blood types. We learn two of them.

Most red blood cells have a complex carbohydrate and protein on their outer membrane. Depending on the types they have attached they can be called A, B, AB or O. O means that they have no chemicals attached at all.

	Rh+ (85%)	Rh-	%
A	A+	A-	31%
B	B+	B-	11%
AB	AB+	AB-	3%
O	O+	O-	55%

Blood type O can be given to any of the other blood types.

It is called the **universal donor**. Another type is the **Rhesus factor**. If a person is Rh- but is given Rh+ blood they will get clotting. Even a Rh- mother's body can attack an unborn child with Rh+ blood and cause brain damage or death.