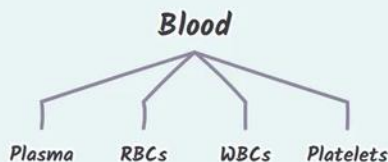


blood, lymph and a pump that cycles both, one loop for the lungs and one for the body

Blood, a connective tissue in fluid form

- * a fluid connective tissue made of a liquid matrix, plasma, carrying formed elements suspended in it
- plasma is about 90 to 92% water, carrying proteins, glucose, amino acids, hormones, and dissolved gases
- plasma proteins matter individually: fibrinogen clots, globulins fight infection
- albumins hold water inside the vessel by osmotic pressure

Blood, what it's made of

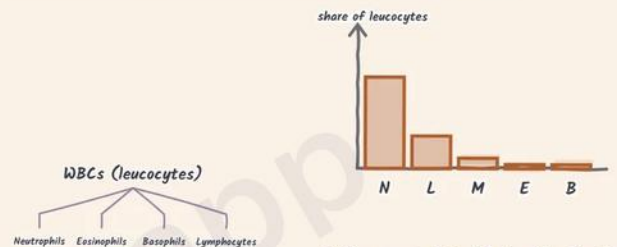


the four parts blood splits into. Plasma is the liquid matrix, the other three are formed elements suspended in it

Erythrocytes, the oxygen carriers

- the most abundant blood cell, formed in red bone marrow, biconcave to maximise surface area
- a mature mammalian RBC has **no nucleus**, more room to pack haemoglobin
- haemoglobin is the pigment that binds oxygen
- lives roughly 120 days, then destroyed in the spleen, the "graveyard of RBCs"

Leucocytes, four of the five types



four of the five leucocyte types. Monocytes are the fifth, a large phagocytic cell that also matures into a macrophage in the tissues

left to right N-L-M-E-B, drawn to the usual counts: neutrophils 60 to 65%, lymphocytes 20 to 25%, monocytes 6 to 8%, eosinophils 2 to 3%, basophils under 1%

What each leucocyte does

Neutrophils

the most numerous WBC, phagocytic, first responders to infection

Eosinophils

resist infection, and are strongly linked to allergic reactions

Basophils

release histamine, serotonin and heparin, the mediators of an inflammatory response

Lymphocytes

B and T cells, the two types responsible for the body's specific immune response

Platelets and clotting

- platelets, or thrombocytes, are cell fragments pinched off from large bone marrow cells called megakaryocytes
- a damaged vessel triggers a cascade of factors
- that finally converts fibrinogen into fibrin threads, trapping cells into a clot
- calcium ions are essential** at several steps of this clotting cascade

Lymph, the body's second fluid

- formed when plasma filters out of blood capillaries into tissue spaces, as interstitial fluid
- collected by a separate network of lymphatic vessels, drained back into the venous system
- carries digested fat from the small intestine, and returns proteins leaked from blood capillaries
- lymph nodes along the pathway trap and filter out foreign particles and pathogens
- a key checkpoint of the immune system