

The Circulatory System

The circulatory system of a mammal is a closed, double circulation and a heart with two atria and two ventricles. From the heart, blood gets pumped into arteries, these then split up into smaller vessels called arterioles, from which blood passes into capillaries. From there the blood travels through veins back to the heart.

Blood Plasma

This is clear and yellowy in colour and it carries:

- Leucocytes - White Blood Cells
- Thrombocytes - Platelets
- Erythrocytes - Red Blood Cells
- CO₂ - Some in the form of hydrogencarbonate ions
- hormones
- digested food
 - glucose
 - amino acids
 - fatty acids
 - glycerol
 - vitamins
- urea
- mineral ions
- fibrinogen

Along with all these it also distributes heat around the body.

White Blood Cells - Leucocytes

There are two types of leucocytes:

- Granulocytes are membrane-bound enzymes which engulf bacteria.
- Agranularcytes produce anti-bodies and anti-toxins (see the [immune system](#) for more details).

Red Blood Cells - Erythrocytes

These are in a biconcave shape for a better surface area to volume ratio and are flexible to get through capillaries.

1mm³ of blood = 5,000,000 Red Blood Cells

- Haemoglobin + O₂ = Oxyhemoglobin
- No nucleus is needed.
- Carbonic anhydrase is what carries CO₂ in the red blood cell.

The Heart



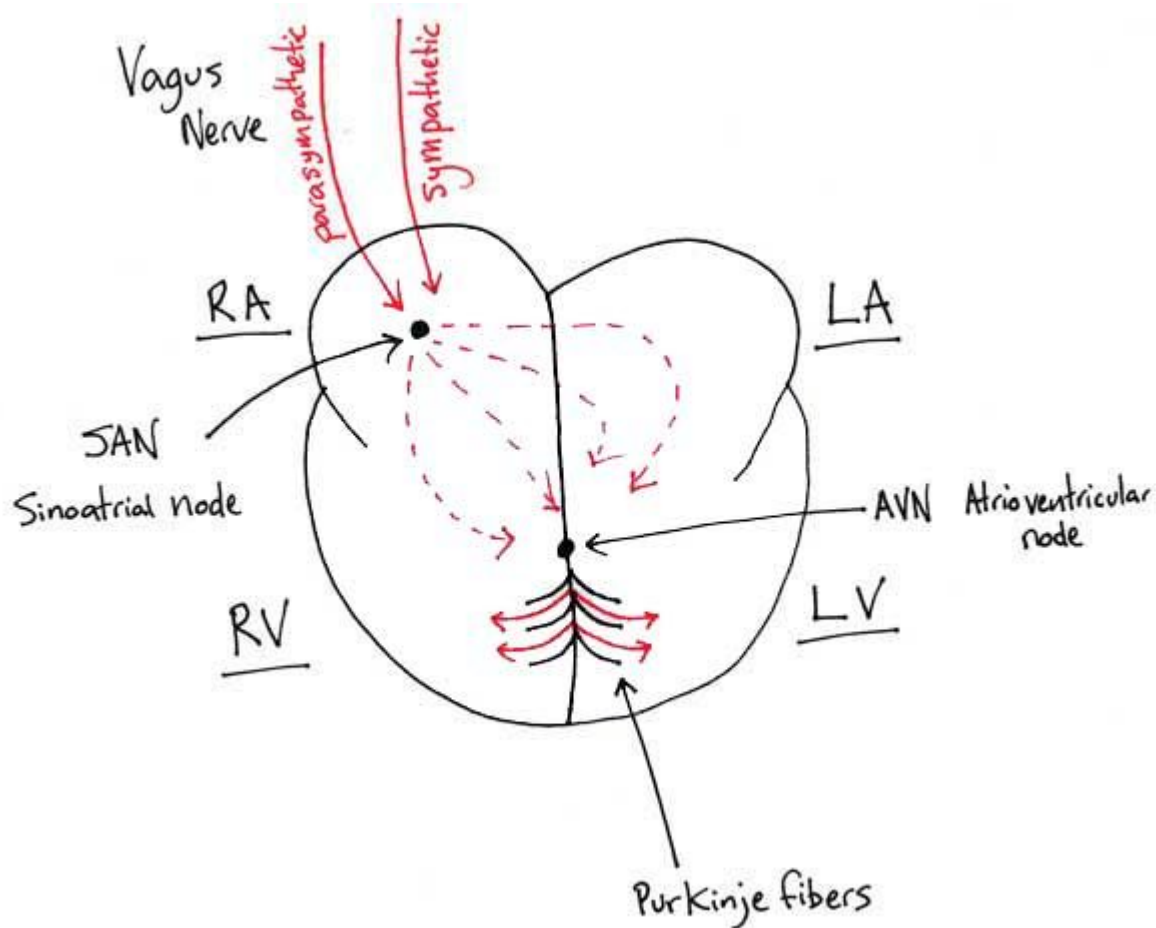
Inside of the Heart.

Remember, remember the 5th of ... No, Remember Right is Left on the heart!

The heart, part of the circulatory system, pumps blood around the body through, arteries, veins and capillaries. The heart is made of thick muscle which does not tire.

Speed Control

The heart muscle is myogenic (the heart beat is initiated from within the muscle itself, and not from nervous stimulation).



Speed control of the Heart.

Cardiac Output = Volume Pumped x Number of beats

Signals from the brain reaching the heart through the Vagus nerve enter the SAN, Sinoatrial node, this is the impulse generating (pacemaker) tissue located in the right atrium of the heart. From there signals get set across the heart to the AVN, Atrioventricular node, and then across the ventricles via the Purkinje fibers. The speed of the heart is controlled by the sympathetic nerve, from the spinal cord and vagus nerve, from the brain. Stimulation of the sympathetic nerve speeds up the heart and stimulation of the vagus nerve slows it down, they are both controlled brain which reacts to the CO₂ content.