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Blood Physiology and its Functions

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Description

Blood is a bodily fluid found in the circulatory systems of humans and other vertebrates. It carries metabolic waste products away from the cells while also delivering essential elements like nutrition and oxygen to the cells. Floating in blood plasma are the blood cells that make up blood. Plasma, which makes up 55% of blood fluid, comprises proteins, carbohydrates, mineral ions, hormones, carbon dioxide (plasma is the primary medium for excretory product transfer), and blood cells themselves. Plasma is 92% water by volume and contains other substances as well. The primary protein in plasma, albumin, controls the blood's colloidalosmotic pressure. Red Blood Cells (also known as RBCs or erythrocytes), White Blood Cells (also known as WBCs or leukocytes), and platelets make up the majority of the blood cells (also called thrombocytes). Red blood cells are the most numerous cells in the blood of vertebrates.

These have haemoglobin, a protein that contains iron and speeds up the transfer of oxygen by reversibly binding to this respiratory gas and boosting its solubility in blood. Contrarily, the majority of the extracellular transport of carbon dioxide occurs as the bicarbonate ion in plasma. When the haemoglobin in the blood of vertebrates is oxygenated, it is bright red, and when it is not, it is dark red. The heart pumps blood through blood arteries to transport it throughout the body. In animals with lungs, arterial blood carries oxygen from the air that is inhaled to the body's tissues, while venous blood transfers carbon dioxide, a waste product of cellular metabolism, from the tissues to the lungs to be expelled. Blood-related medical terminologies sometimes start with hemo- or hemato-, which are derived from the Greek word (haima) for "blood". Given its origin in the bones and the presence of fibrinogen, which has the potential to form molecular fibres, blood is regarded as a specialised type of connective tissue in terms of anatomy and histology.

Functions

Blood performs many important functions within the body, including:

- Supply of nutrients including glucose, amino acids, and fatty acids (dissolved in the blood or bound to plasma proteins, such as blood lipids) and supply of oxygen to tissues (bound to haemoglobin, which is carried in red cells).
- Elimination of waste products such urea, lactic acid, and carbon dioxide
- Immunological processes, such as the movement of white blood cells and the use of antibodies to identify foreign objects
- Coagulation, the process by which blood is changed from a liquid to a semisolid gel to halt bleeding after a blood vessel is ruptured.
- Messenger activities, including as hormone transfer and tissue damage signalling
- Controlling the body's internal temperature
- Hydraulic actions

The typical density of blood, which makes up 7% of an adult's body weight, is 1060 kg/m^3, which is extremely similar to the density of pure water, which is 1000 kg/m^3. The blood volume of a typical adult is around 5 litres (11 US points), or 1.3 gallons, and is made up of plasma and formed components. Red blood cells (erythrocytes) and white blood cells (leukocytes), as well as platelets—cell fragments involved in clotting—are the two types of blood cells or corpuscles that are created. Red blood cells make up around 45% of whole blood by volume, plasma about 54.3%, and white blood cells about 0.7%.

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