Whole Blood Composition

Blood composition can be divided up into three fractions, obtained by centrifugation. The first consists of red blood cells, which have hemoglobin and transport oxygen from the alveolus throughout the entire body. The majority of blood is in the second fraction, which is blood plasma. Blood plasma is the liquid component that holds blood cells in suspension. Plasma contains water, electrolytes and proteins. The most abundant plasma protein is albumin, which regulates osmotic pressure by affecting fluid transfer in capillaries. Albumin is too large to move through the capillary membrane, so it stays within the capillary keeping plasma concentration high enough to retain fluid. The second prominent plasma protein is the antibody, a protein that recognizes and binds to the antigens of foreign cells. It either neutralizes the target directly, or signals other immune cells to eliminate the foreign cell. The third major plasma protein is fibrinogen, which is involved in blood clot formation. A normal coagulation cascade activates prothrombin by converting it into thrombin. Thrombin then activates fibrinogen by converting it into insoluble fibrin strands which are cross-linked to form a blood clot. Fibrinogen is produced in the liver by hepatocytes.The final fraction of blood is called the buffy coat, which contains two major cell types. Platelets assist in blood clotting, and white blood cells (leukocytes) circulate the blood looking for foreign pathogens to attack.

PLAY PICMONIC

Characteristics

Plasma

Plasma-TV

Blood plasma is the majority of blood volume. It suspends the rest of the components in fluid and contains water, electrolytes and proteins.

Electrolytes And Other Solutes

Electric-lights

Many electrolytes and other solutes are essential components that make up plasma.

Proteins

Proteins

Proteins are another essential component of plasma. Proteins include albumin, fibrinogen, and globulins.

Albumin

Album-man

Albumin is one of the plasma proteins that helps regulate osmotic pressure by being too large to diffuse out of capillaries and maintaining plasma concentration to prevent water from osmotically diffusing out of capillaries.

Fibrinogen

Fiber-jam

Fibrinogen is activated to fibrin by thrombin. Fibrin helps blood clot by cross-linking and connecting platelets.

Globulins

Goblins

Globulins are also plasma proteins, but they are immune proteins that recognize and bind foreign antigens as part of the process of neutralizing foreign bodies in the blood.

Water

Water

Water is a large component of blood just as it is the entire human body.

Formed Elements

Crowd of blood cells

Formed elements include white blood cells and red blood cells.

Buffy Coat

Buff-guy in Coat

The buffy coat is the third fraction of blood that contains mostly platelets and white blood cells.

White Blood Cells (WBC)

White-mac-man

White blood cells, or leukocytes, circulate in the blood looking for foreign pathogens to attack and destroy.

Platelets

Plates

Platelets help blood clot by aggregating at sites of damage.

Red Blood Cells (RBC)

RBC-girl

Red blood cells have hemoglobin, used to bind oxygen, and carry oxygen to tissues in the body. They also help return some carbon dioxide back to the lungs for exhalation.