

# Blood chapter checklist bio202

[Science](#), [Chemistry](#)



1. Describe the important components and major functions of blood. - Blood performs a number of functions dealing with: - Substance distribution - Regulation of blood levels of particular substances - Body protection - Blood transports: - Oxygen from the lungs and nutrients from the digestive tract - Metabolic wastes from cells to the lungs and kidneys for elimination Hormones from endocrine glands to target organs - Blood maintains: - Appropriate body temperature by absorbing and distributing heat - Normal pH in body tissues using buffer systems Adequate fluid volume in the circulatory system - Blood prevents blood loss by: - Activating plasma proteins and platelets - Initiating clot formation when a vessel is broken - Blood prevents infection by: - Synthesizing and utilizing antibodies - Activating complement proteins - Activating WBCs to defend the body against foreign invaders

2. Specify the composition and functions of plasma. - Blood plasma contains over 100 solutes, including: - Proteins — albumin, globulins, clotting proteins, and others - Nonprotein nitrogenous substances — lactic acid, urea, creatinine - Organic nutrients — glucose, carbohydrates, amino acids - Electrolytes — sodium, potassium, calcium, chloride, bicarbonate - Respiratory gases — oxygen and carbon dioxide

3. Describe the structure, function, and production of platelets. - Platelets are fragments of megakaryocytes with a blue-staining outer region and a purple granular center - Their granules contain serotonin,  $Ca^{2+}$ , enzymes, ADP, and platelet-derived growth factor (PDGF) - Platelets function in the clotting mechanism by forming a temporary plug that helps seal breaks in blood vessels - The stem cell for platelets is the hemocytoblast - The sequential developmental pathway is hemocytoblast, megakaryoblast, promegakaryocyte,

megakaryocyte, and platelets 4. List the characteristics and functions of red blood cells. - Biconcave discs, anucleate, essentially no organelles - Filled with hemoglobin (Hb), a protein that functions in gas transport - Contain the plasma membrane protein spectrin and other proteins that: - Give erythrocytes their flexibility Allow them to change shape as necessary - Erythrocytes are dedicated to respiratory gas transport - Hemoglobin reversibly binds with oxygen and most oxygen in the blood is bound to hemoglobin - Hemoglobin is composed of the protein globin, made up of two alpha and two beta chains, each bound to a heme group - Each heme group bears an atom of iron, which can bind to one oxygen molecule - Each hemoglobin molecule can transport four molecules of oxygen 5. Describe the structure of hemoglobin and indicate its functions. - Hemoglobin reversibly binds with oxygen and most oxygen in the blood is bound to hemoglobin - Hemoglobin is composed of the protein globin, made up of two alpha and two beta chains, each bound to a heme group - Each heme group bears an atom of iron, which can bind to one oxygen molecule Each hemoglobin molecule can transport four molecules of oxygen - During cell death, Heme and globin are separated and the iron is salvaged for reuse - Heme is degraded to a yellow pigment called bilirubin - The liver secretes bilirubin into the intestines as bile - The intestines metabolize it into urobilinogen - This degraded pigment leaves the body in feces - Globin is metabolized into amino acids and is released into the circulation 6. Blood typing is important because if a blood transfusion occurs where the blood types are incompatible the hosts will form antibodies recognizing the foreign substance and destroy it. Each blood type identifies the natural antigens that the host carries allowing

for a safe transfusion. O blood types do not carry any antigens and therefore can be given to a person of any other blood type. AB blood types carry both and therefore can take from any other blood type. Rh positive persons can take from anyone who is either positive or negative whereas Rh negative persons can only have Rh negative blood of their body will reject the transfusion sensing the Rh as a foreign substance.

7. White Blood Cells consist of granulocytes and agranulocytes. There are 3 main types of leukocytes. Neutrophils, Eosinophils and Basophils. Neutrophils make up 60-70 percent of the WBC's and are the bacteria slayers. The Eosinophils attack parasites in the body. The basophils make histamine and assist in vasodilatation. Agranulocytes consist of two main groups. Lymphocytes and Monocytes. Lymphocytes make up approximately 25% of the WBC's. There are 3 types of lymphocytes; T-Cells, B-Cells, and Natural Killer Cells. T-cells function in attacking infection whereas B-Cells function in activating antibodies. Natural Killer cells hunt out and destroy bad cells.

8. When a blood vessel is damaged the first response is vascular spasm. The platelets then create a plug to stop anymore blood loss. The present blood then coagulates. After the coagulation phase prothrombin forms thrombin which catalyzes fibrogen to turn to fibrin forming a mesh to begin healing.