CORPUSCULAR ELEMENTS OF BLOOD

Scientific supervisor: **Asatullayev Rustamjon Baxtiyarovich**
Student: **Abdunabiyeva Sangina**

Abstract: *Blood is a vital fluid in the human body, responsible for transporting oxygen, nutrients, hormones, and waste products while also playing a crucial role in thermoregulation and immunity. It consists of plasma, red blood cells, white blood cells, and platelets, each performing essential functions. This article explores the composition of blood, the factors contributing to its color and odor, the role of hemoglobin in oxygen transport, and the classification of blood types based on marker proteins. Additionally, it highlights the significance of platelets in clotting and the impact of blood disorders such as anemia. Understanding blood's composition and functions is critical for medical science, diagnostics, and treatment of hematological diseases.*

Keywords: *Blood composition, hemoglobin, red blood cells, white blood cells, platelets, blood types, anemia, oxygen transport.*

On average, the human body contains 5.6 liters of blood, circulating at a speed of three full circles per minute. The circulation of large volumes of blood is very important, since the blood carries the oxygen, nutrients, hormones and other substances they need to the cells, and also removes waste products formed during the metabolic process.

In addition, blood is involved in thermoregulation, removing heat from internal organs**.** Almost half of the blood volume is plasma - a mixture of water and various proteins. The most numerous blood cells are erythrocytes (red blood cells), which carry oxygen. Blood also contains platelets, which help clot the blood, and different types of leukocytes (white blood cells).

Blood is a mixture of various compounds. The substances it contains dictate its color, and some of them contribute to its characteristic slightly metallic odor. The infographic shows some of these substances, as well as which ones determine a person's blood type.

The smell of blood.

The compound that gives human blood a characteristic metallic odor is **trans-4,5-epoxy-(E)-2-decenal**. The metallic odor of metals and the odor of blood appears upon contact with the skin in large part due to the compound **oct-1-ene-oh**, which is produced by the reaction between oxidized skin lipids and iron in hemoglobin.

Blood color.

Hemoglabin is a protein found in the blood, made up of smaller parts called hemes. Hemes contain iron (Fe), and their structure gives the blood a red color if there is oxygen in the heme. Venous blood is also red, not blue. When bleeding, the blood turns brown as hemoglobin is oxidized to methohemoglobin.

Hemoglabin has the ability to bind oxygen, and the main function of red blood cells is to bind oxygen in the lungs and transport it to the tissues of the body.

Blood groups.

A person inherits one of several forms of the gene responsible for the marker proteins (antibodies) of red blood cells. This may be a marker A, B, AB or none of them (blood type O). If foreign markers enter the blood, an immune reaction will be triggered, and plasma antibodies will attack these markers.

Blood type A

In people with blood type A, red cells have markers A, and the plasma contains antibodies against markers B.

Blood type B

In people with blood type B, the red blood cells have B markers, and the plasma contains antibodies against A markers.

Blood type O

In people with blood type O, the red blood cells have no markers, and the plasma contains antibodies against both marker A and marker B.

Red blood cells.

Red blood cells have the appearance of biconcave crimson discs. They contain large amounts of hemoglobin protein, rich in iron.The lifespan of red blood cells is about four months.

White blood cells.

White blood cells perform protective functions.

Some of them (lymphocytes) fight bacteria, viruses and parasites. Others remove waste products and foreign materials. Some white blood cells last only a few days, others live and function for many years.

Platelets.

Platelets are irregularly shaped and are formed from precursor cells in the bone marrow. They plug small tears in the vascular walls and ensure blood clotting. Platelets only have a lifespan of about a week, but they are constantly being replaced with new ones, and there are millions of them in the blood at any given time.

Blood disease.

Disruption of red blood cells inevitably affects all organs and tissues. Two common blood disorders—iron deficiency anemia and pernicious anemia—are associated with insufficient vitamin B12 intake.

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