

CORPUSCULAR ELEMENTS OF BLOOD

Asatullayev Rustamjon Baxtiyarovich

Trainee assistant at Samarkand State Medical University teacher:

O'rinboyeva Malikabonu Ulug'bek qizi

SamDTU, Stomatologiya fakulteti student:

Abstract: *Human blood is composed of plasma and essential corpuscular elements, including red blood cells (erythrocytes), white blood cells (leukocytes), and platelets (thrombocytes). Erythrocytes use hemoglobin to carry oxygen, leukocytes defend against infection, and platelets enable blood clotting. These cells are constantly replenished through hematopoiesis in the bone marrow and are vital for the body's normal function. A thorough understanding of the structure and function of these components is key to comprehending health, disease processes, and improvements in blood-related treatments.*

Keywords: *Blood cells, erythrocytes, leukocytes, thrombocytes, hematopoiesis, immuneresponse, oxygen transport, hemostasis.*

Introduction

Blood is a vital fluid in the human body that carries out many essential functions. It consists of a liquid part called plasma and several solid elements known as formed elements or corpuscles. These include red blood cells, white blood cells, and platelets, each having a specific structure and role.

1. Red Blood Cells (Erythrocytes)

Red blood cells are the most numerous cells in the blood. Their main role is to transport oxygen from the lungs to the body's tissues and to carry carbon dioxide back to the lungs for removal.

Structure: They have a unique biconcave shape, which increases their surface area and improves gas exchange. Mature red blood cells do not have a nucleus, allowing more room for hemoglobin, the protein that binds oxygen.

Function: Through hemoglobin, red blood cells efficiently pick up and release oxygen and carbon dioxide, supporting cellular respiration and energy production.

2. White Blood Cells (Leukocytes)

White blood cells play a major role in the immune system, defending the body against infections, foreign materials, and abnormal cells.

Types: There are different kinds of white blood cells with specialized tasks:

Neutrophils: Serve as the first responders to infection by engulfing and destroying harmful microorganisms.

Lymphocytes: Include B cells, which create antibodies, and T cells, which target and eliminate infected or cancerous cells.

Monocytes: Develop into macrophages and dendritic cells, which are vital for engulfing pathogens and presenting antigens to activate other immune cells.

Blood Components and Their Functions

Blood is composed of plasma and several formed elements, each playing a vital role in maintaining the body's normal functions. These formed elements include red blood cells, white blood cells, and platelets, which work together to sustain life and protect the body.

White Blood Cells (Leukocytes) – Continued

Eosinophils and Basophils are specialized white blood cells involved in immune defense.

Eosinophils help combat parasitic infections and play a role in controlling allergic reactions. Basophils release substances that trigger inflammation and allergic responses.

Function: Collectively, white blood cells coordinate the body's immune defenses — from identifying invading pathogens to initiating inflammation and building long-term immunity.

3. Platelets (Thrombocytes). Platelets are small, disc-shaped cell fragments formed from large bone marrow cells called megakaryocytes.

Structure: Although they are not complete cells, platelets contain granules packed with proteins and enzymes necessary for blood clotting.

Function: Their primary function is to stop bleeding by forming clots at injury sites. When a blood vessel is damaged, platelets quickly gather at the wound, interact with clotting factors in plasma, and create a stable plug to prevent further blood loss.

Hematopoiesis – Formation of Blood Cells:

All the formed elements of blood are created through a process known as hematopoiesis, which mainly takes place in the bone marrow. During this process, multipotent stem cells develop into different types of blood cells — red cells, white cells, and platelets — ensuring the body always has an adequate supply of each.

Conclusion:

The formed elements of blood are essential for human survival. Red blood cells handle gas exchange, White blood cells provide immune defense, and Platelets ensure blood clotting and wound healing.

Together, they support the circulatory system, protect against disease, and promote recovery after injury. Understanding these components deepens our knowledge of human physiology and the processes that maintain health.

Reference:

1. Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., & Walter, P. (2014) *Molecular Biology of the Cell* (6th ed.). Garland Science.
2. Hoffbrand, A. V., & Moss, P. A. H. (2016). *Essential Haematology* (7th ed.). Wiley-Blackwell.
3. Kumar, V., Abbas, A. K., & Aster, J. C. (2020). *Robbins and Cotran Pathologic Basis of Disease* (10th ed.). Elsevier.
4. Turgeon, M. L. (2017). *Clinical Hematology: Theory and Procedures* (6th ed.). WoltersKluwer.
5. Wintrobe, M. M. (2018). *Wintrobe’s Clinical Hematology* (14th ed.). Wolters Kluwer .
6. Hoffbrand, A. V., Moss, P. A. H., & Pettit, J. E. (2016). *Essential haematology*. John Wiley & Sons.
7. Rodak, B. F., Carr, J. H., & Fritsma, G. A. (2016). *Clinical hematology atlas*. Elsevier Health Sciences.
8. McKenzie, S. B. (2015). *Clinical laboratory hematology*. Pearson Education.
9. Turgeon, M. L. (2016). *Clinical hematology: Theory and procedures*. Wolters Kluwer Health.
10. Means, R. T. (2017). *Hematology*. Wolters Kluwer.
11. Kaushansky, K., Lichtman, M. A., Beutler, E., Kipps, T. J., Seligsohn, U., & Prchal, J. T. (2010). *Williams hematology*. McGraw-Hill Medical.
12. Greer, J. P., Arber, D. A., Glader, B., List, A. F., Means Jr, R. T., & Paraskevas, F. (2009). *Wintrobe's clinical hematology*. Lippincott Williams & Wilkins.
13. Tefferi, A., & Vardiman, J. W. (2008). Myeloproliferative neoplasms: 2007 updates on diagnosis, risk stratification, and management. *American Journal of Hematology*, 83(9), 716-728.
14. Jabbour, E. J., Kantarjian, H. M., & Cortes, J. E. (2015). Philadelphia chromosome-positive acute lymphoblastic leukemia: practical approaches to diagnosis and management. *Clinical Lymphoma, Myeloma & Leukemia*, 15(9), 537-548.
15. Rivière, I., Dunbar, C. E., & Sadelain, M. (2018). Stem cell transplantation immunology and immunotherapy. *Nature Medicine*, 24(2), 147-157.