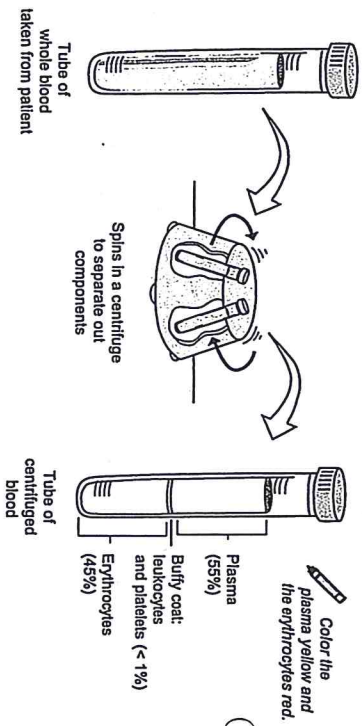


Description

Blood is a specialized type of connective tissue because it contains cells, fibers, and a liquid ground substance. It is composed of two major parts: plasma and formed elements. The plasma is a straw-colored fluid that contains mostly water, proteins, and other solutes. The formed elements consist of the following blood cells and cell fragments scattered in the plasma: erythrocytes (red blood cells), leukocytes (white blood cells), and thrombocytes (platelets).

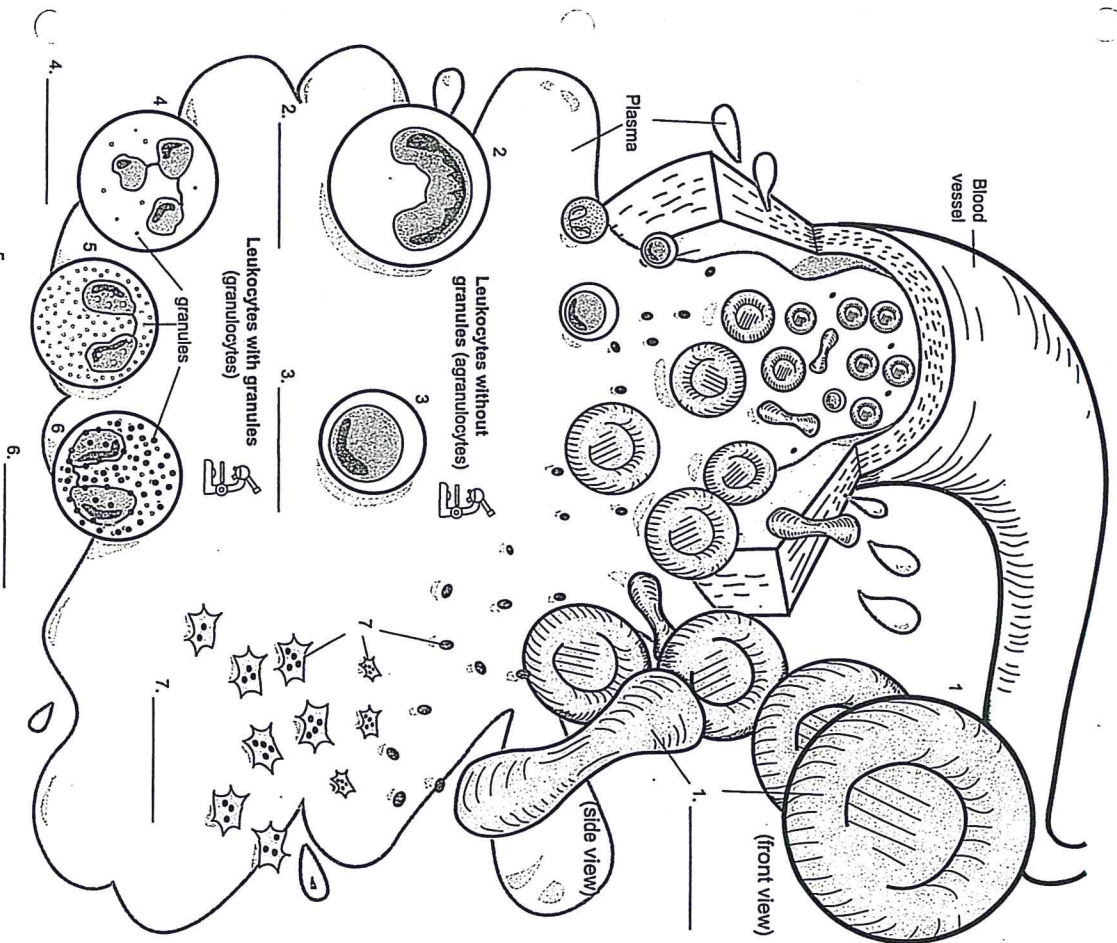
Formed Elements of Blood

Cell	Description	Function
Erythrocytes (red blood cells)	Comprise 99.9% of all blood cells; biconcave discs; no nucleus in mature cell; filled with the protein hemoglobin	Transport O ₂ from lungs to body cells Transport CO ₂ from blood to lungs
Leukocytes (white blood cells)	Less than 0.1% of all blood cells; 5 different types; some have granules in cytoplasm, others do not; nucleus present in all types	Fight against pathogens such as bacteria and viruses
Thrombocytes (platelets)	Less than 0.1% of formed elements; cell fragments; no nucleus; contain enzymes	Involved in blood clotting



Key to Illustration

- 1. Erythrocytes (red blood cells)
- 2. Leukocytes (white blood cells)
- 3. Lymphocyte
- 4. Neutrophil
- 5. Eosinophil
- 6. Basophil
- 7. Thrombocytes (platelets)



BLOOD—Leukocytes

Ranking the Leukocytes from Most Common to Least Common

Description

Leukocytes (white blood cells, or WBCs) are divided into two groups: granulocytes and agranulocytes. The granulocytes all contain granules in the cytoplasm of the cell and include neutrophils, eosinophils, and basophils. The agranulocytes have no granules in the cytoplasm and include monocytes and lymphocytes.

The general function of all leukocytes is to defend against various pathogens such as bacteria and viruses.

Study Tip

To rank the leukocytes from most common to least common, use the following mnemonic: **Never Let Monkeys Eat Bananas**. This gives you the correct order: **N**eutrophils, **L**ymphocytes, **M**onocytes, **E**osinophils, and **B**asophils.

Features and Functions of WBCs

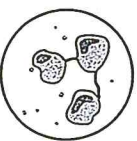
Granulocyte	Features / Comments	Functions
Neutrophil	Nucleus has 3–5 lobes; contains least amount of granules; named after the fact that granules are <i>neutral</i> —do not stain well.	Phagocytic cell; engulfs bacteria and debris in tissues.
Eosinophil	Nucleus usually has 2 lobes; large granules that stain brightly; named after dye used to stain granules— <i>eosin</i> dye.	Phagocytic cell; fights parasitic infections; engulfs anything labeled with antibodies; reduces inflammation.
Basophil	Nucleus usually masked by deep purple/blue granules; contains the most granules; named after the basic stain used to stain granules— <i>hematoxylin</i> .	Assists in damaged tissue repair by releasing histamine from granules.
Agranulocyte	Features / Comments	Functions
Lymphocyte	Round nucleus takes up nearly entire cell volume; slightly larger than RBC.	Part of immune response; defend against pathogens or toxins.
Monocyte	Largest WBC; nucleus varies from horseshoe to kidney shape; nucleus takes up about half of cell volume.	Phagocytic cell; engulfs pathogens and debris in tissues.

BLOOD—Leukocytes

Ranking the Leukocytes from Most Common to Least Common



Neutrophil



60–70 % of all WBCs

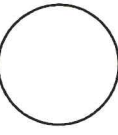


My Drawing of the WBCs

Lymphocyte



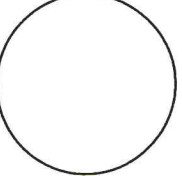
20–25 % of all WBCs



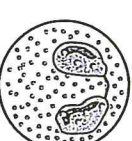
Monocyte



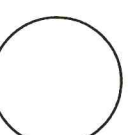
3–8 % of all WBCs



Eosinophil



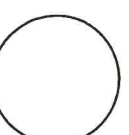
2–4 % of all WBCs



Basophil



0.5–1.0 % of all WBCs



Use the following mnemonic to rank leukocytes from most to least common:

**Never
Let
Monkeys
Eat
Bananas**

