

MODULE 2 L01

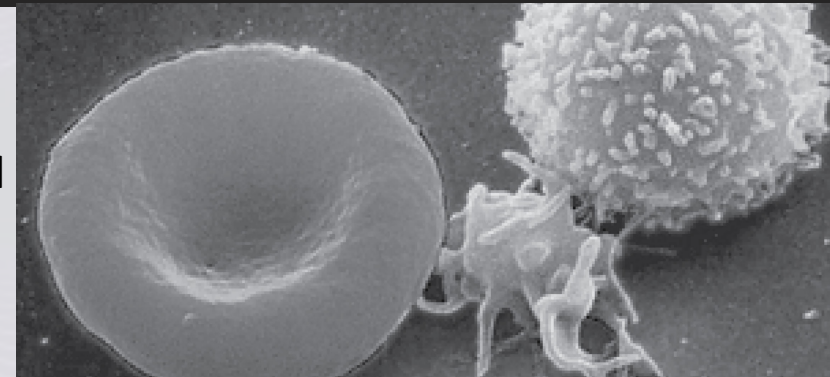
Whole Blood

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1. Whole Blood Composition

- Definition:
 - ❖ Specialized fluid connective tissue
 - Distributes nutrients, oxygen, and hormones to cell
 - Transports metabolic wastes → kidneys
 - Transports → immune cells



- Composition:

- A. Plasma

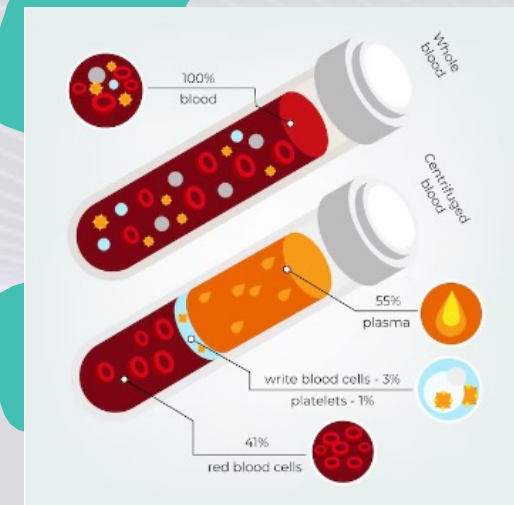
- Liquid matrix of blood
 - Density ↑ than water
 - Contains:
 - Dissolved proteins
 - Dissolved solutes

- B. Formed elements

- Blood cells
 - Red blood cells (RBCs)
 - Leukocytes (WBCs)
 - Cell fragments
 - Platelets

Suspended in plasma

Whole blood

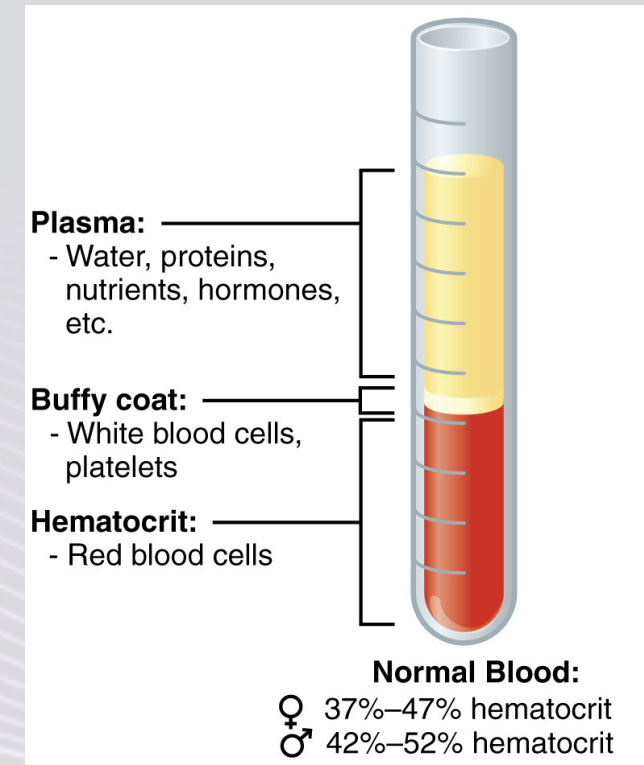


Whole Blood Characteristics

- Characteristics:
 - ❖ Sticky
 - ❖ Cohesive
 - ❖ Resistant to flow
 - Viscosity:
 - ❖ Water = 1.0
 - ❖ Plasma = 1.5
 - ❖ Whole blood = 5.0
 - Blood pH:
 - ❖ Alkaline = ranges from 7.35-7.45
 - Temperature:
 - ❖ 38°C
 - ❖ 100.4 ° F
 - Blood volume:
 - ❖ Normally
 - Male = 5-6 liters
 - Female = 4-5 liters
 - ❖ Hypovolemic = low
 - ❖ Normovolemic = normal
 - ❖ Hypervolemic = high
- Determine viscosity

A. Plasma

- Contributes:
 - ❖ 55% of whole blood volume
 - ❖ 92% of water in the plasma volume
- Composition varies:
 - ❖ Cardiovascular system region
 - ❖ Sampled body area
 - ❖ Ongoing activity
- Plasma content:
 - ❖ Water
 - ❖ Proteins
 - Albumins (60%)
 - Globulins (35%)
 - Fibrinogen (4%)
 - Regulatory proteins (<1%)
 - ❖ Other solutes
 - Electrolytes
 - Organic nutrients
 - Organic wastes



Differences Between Plasma and Interstitial Fluid

- Plasma ~ interstitial fluid
- Two main differences:
 - ❖ Concentrations of dissolved gases
 - O_2 – higher in plasma than interstitial fluid
 - CO_2 – higher in interstitial fluid than plasma
 - ❖ Concentrations of dissolved proteins
 - Plasma contain significant quantities of dissolved proteins
 - Interstitial fluid does not