



B.Pharm Semester 1

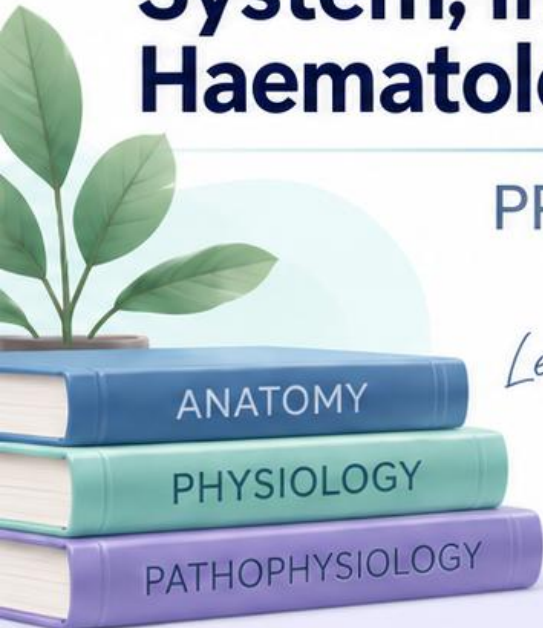
Human Anatomy, Physiology and Pathophysiology I

Unit 03

Body Fluids, Blood, Lymphatic System, Inflammation and Haematological Disorders

PPT Notes

Learn the Science Behind Life



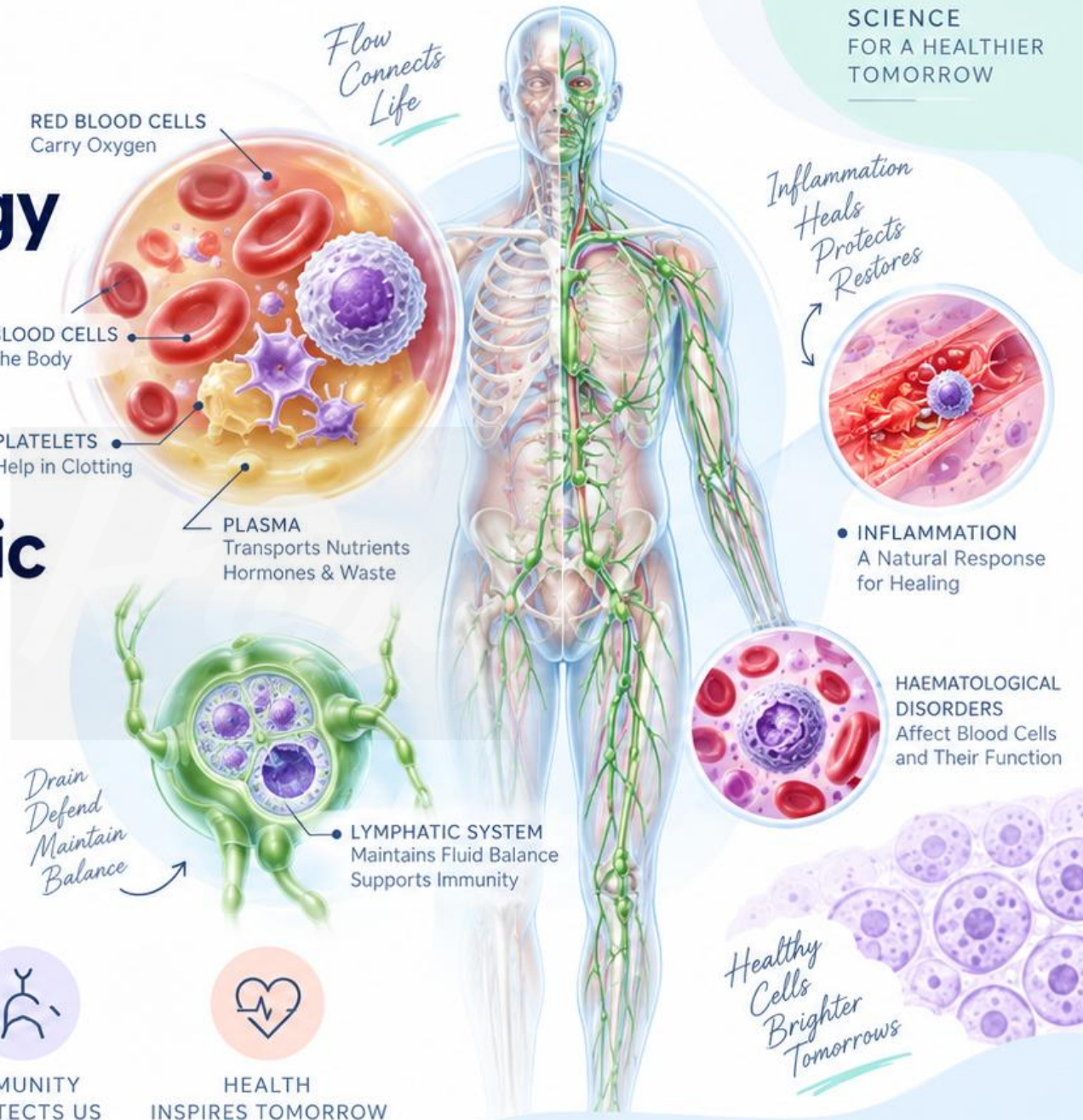
BLOOD
SUSTAINS LIFE



IMMUNITY
PROTECTS US



HEALTH
INSPIRES TOMORROW



SCIENCE
FOR A HEALTHIER
TOMORROW

STUDY | UNDERSTAND | APPLY | GROW

BODY FLUID COMPARTMENTS

① INTRACELLULAR FLUID (ICF)

- Found within cells.
- Largest component of total body water.
- Contains water and dissolved substances inside cells.

② CAPILLARY EXCHANGE

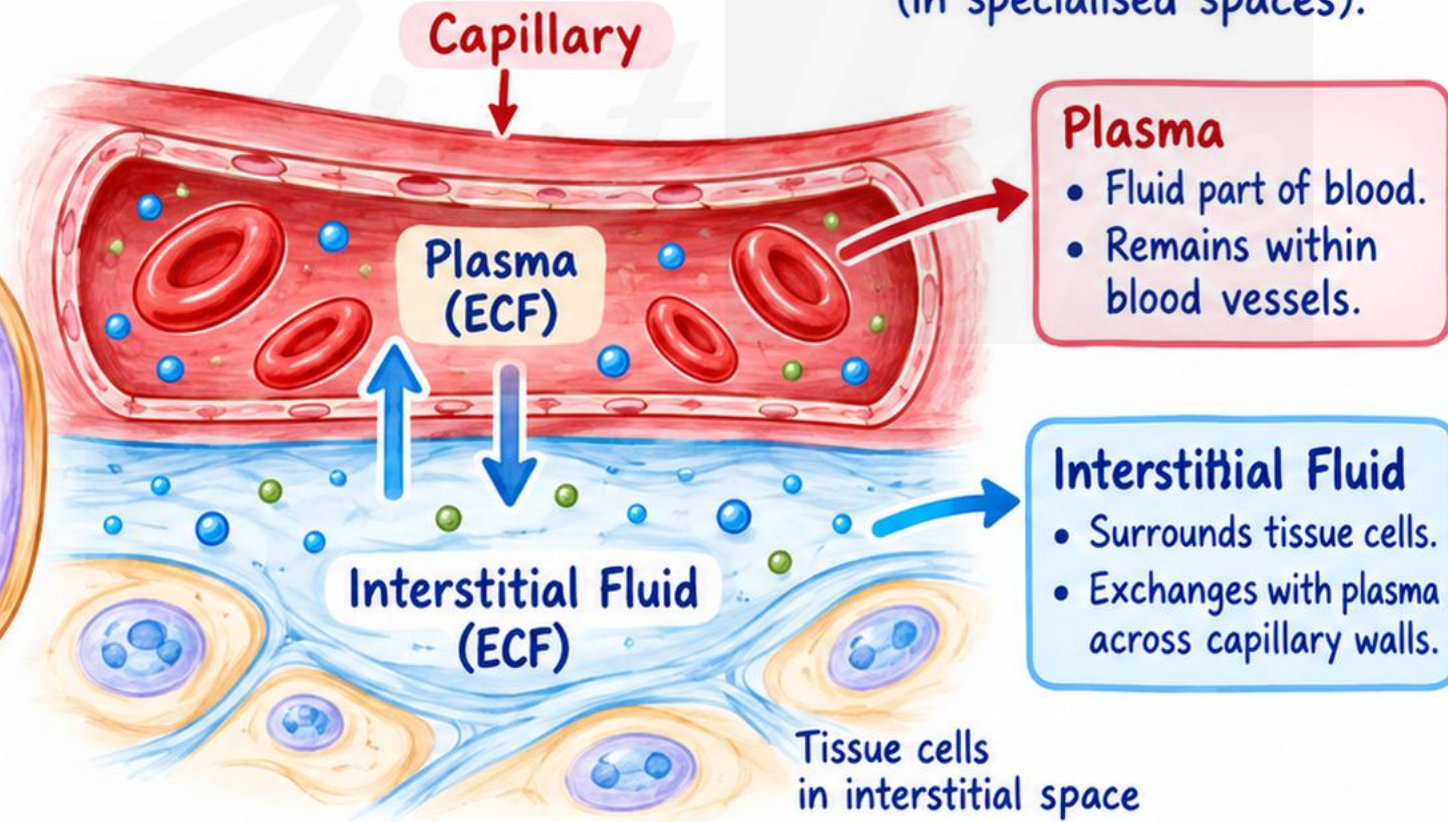
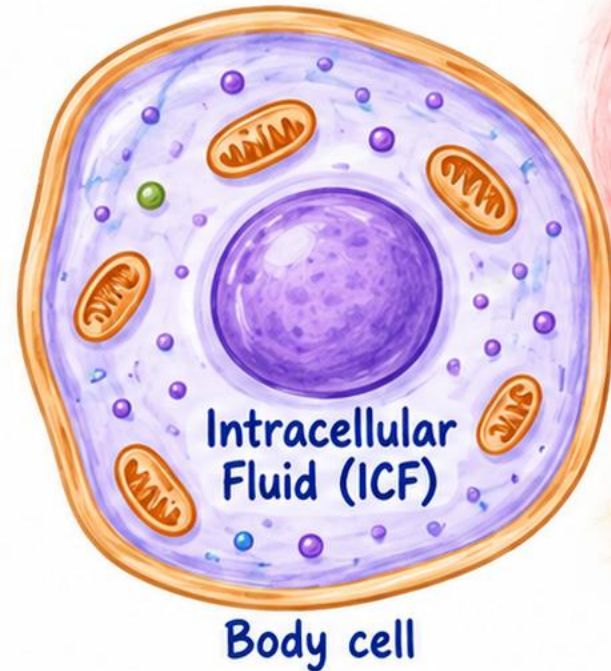
- Water and small solutes move between plasma and interstitial fluid across capillary walls.

③ EXTRACELLULAR FLUID (ECF)

- Found outside cells.
- Divided into plasma, interstitial fluid and transcellular fluid (in specialised spaces).

④ NET EFFECT

- Continuous exchange maintains fluid balance and supports normal cell function.
- Each compartment has specific roles but they are interconnected.



Plasma

- Fluid part of blood.
- Remains within blood vessels.

Interstitial Fluid

- Surrounds tissue cells.
- Exchanges with plasma across capillary walls.

Fluids move between plasma $\rightleftharpoons$ interstitial fluid (across capillaries) and between interstitial fluid $\rightleftharpoons$ intracellular fluid (across cell membranes).

SPECIALIZED BODY FLUIDS

LYMPH

- **Location:** Lymphatic vessels and lymph nodes
- **Function:** Transports immune cells (e.g. white blood cells) and helps in defence against pathogens.

SYNOVIAL FLUID

- **Location:** Synovial cavities of joints (e.g. knee)
- **Function:** Lubricates joints, reduces friction and allows smooth movement.

CEREBROSPINAL FLUID (CSF)

- **Location:** Brain and spinal cord (ventricles and subarachnoid space)
- **Function:** Cushions and protects the central nervous system.

SEROUS FLUIDS

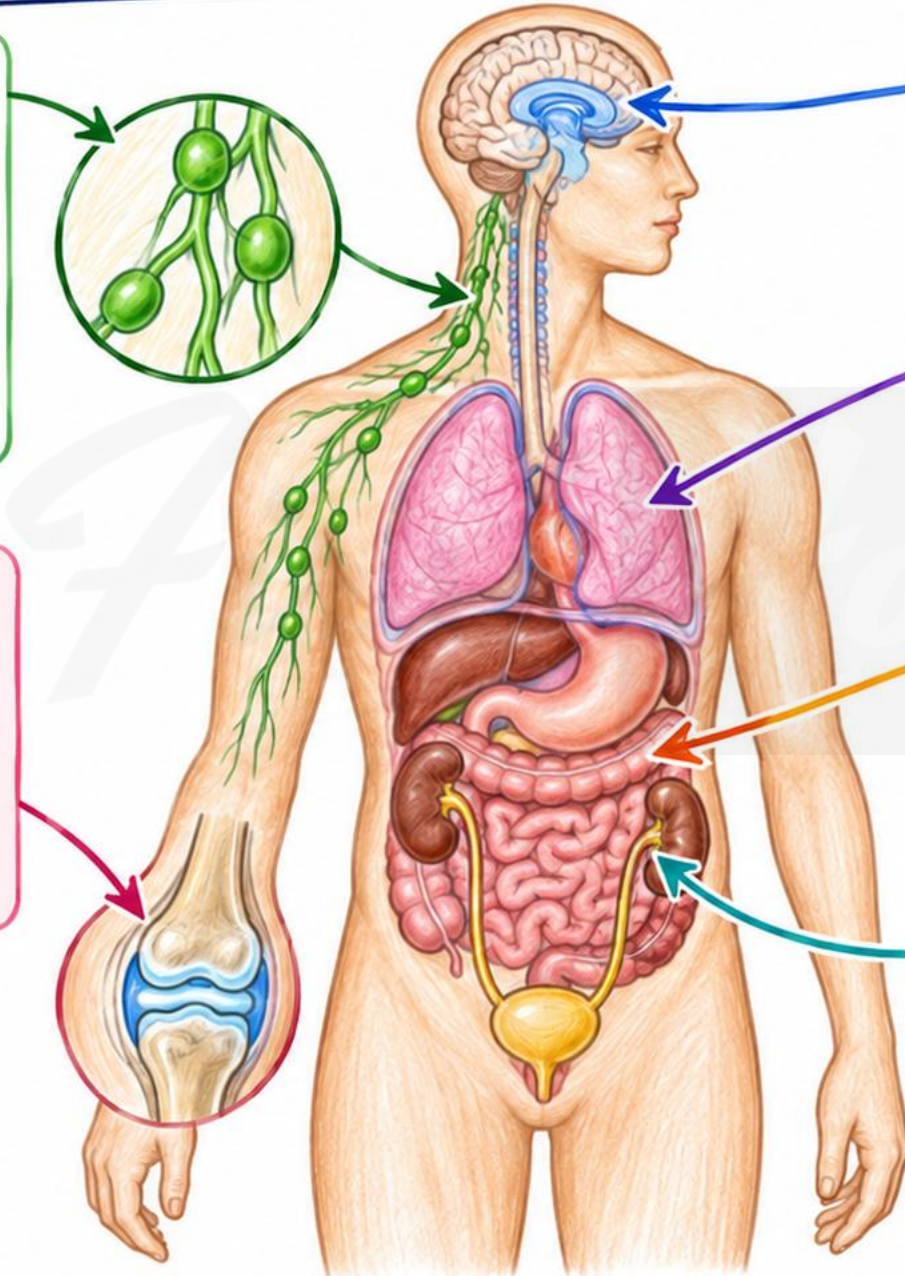
- **Location:** Serous cavities (e.g. pleural cavity around lungs)
- **Function:** Lubricates organs and reduces friction between surfaces.

GASTROINTESTINAL FLUIDS

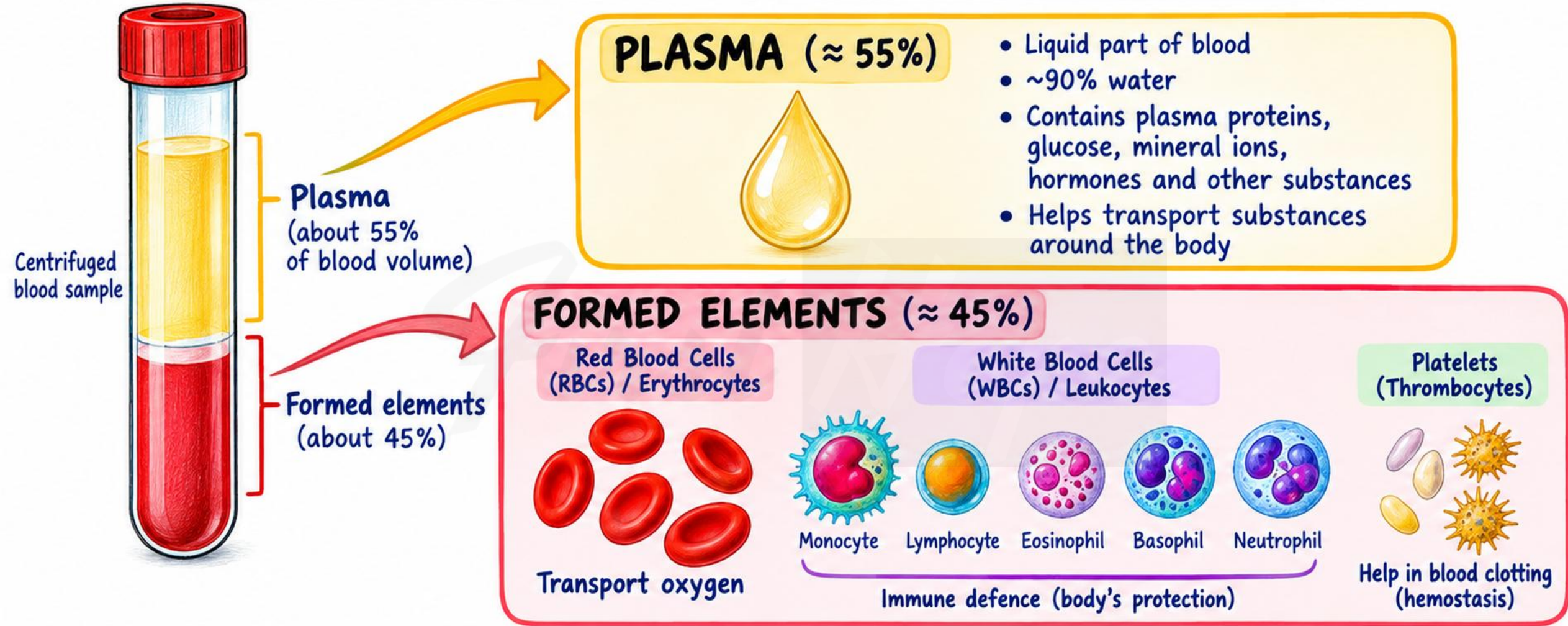
- **Location:** Saliva (mouth), gastric juices (stomach), pancreatic juices, bile and intestinal fluids.
- **Function:** Involved in the digestion and absorption of nutrients.

URINE

- **Location:** Produced by kidneys; excreted via the urinary system.
- **Function:** Eliminates waste products and excess substances; helps maintain electrolyte balance and regulate blood pressure.



BLOOD: COMPOSITION AND FUNCTIONS



FUNCTIONS OF BLOOD

1 Transport

Carries oxygen, nutrients, hormones and wastes.

2 Regulation

Helps maintain fluid, electrolyte and hormone balance.

3 Protection

White blood cells defend against infection.

4 Hemostasis

Platelets help in blood clotting to prevent blood loss.

5 Heat distribution

Helps distribute heat around the body.

PLASMA

Liquid component of blood that carries water, electrolytes, nutrients, hormones, waste products and plasma proteins throughout the body.

1

Water



Main constituent (~90%).
Dissolves and carries
substances throughout
the body.

2

Electrolytes



Help maintain fluid balance,
acid-base balance and support
regulation of body temperature.

3

Nutrients, Hormones and Wastes



Transport nutrients to tissues,
hormones to target organs, and
carry metabolic wastes for excretion.

4

Plasma Proteins

Main types: albumin, globulins and fibrinogen.

Albumin



- Most abundant plasma protein.
- Maintains colloid (oncotic) pressure, helping to keep fluid within blood vessels.
- Also transports various substances.

Globulins

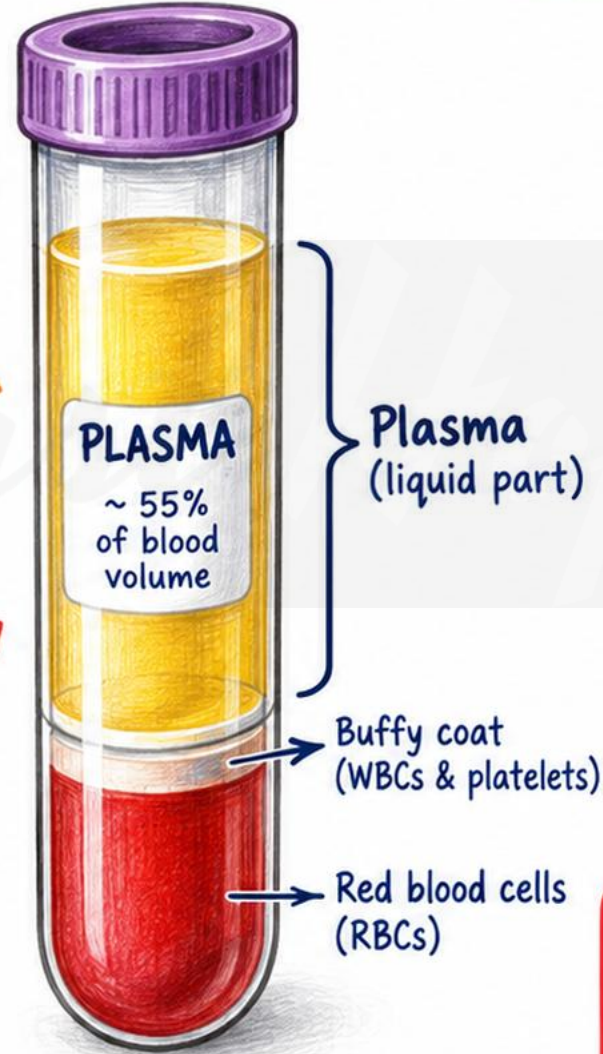


- Include immunoglobulins (antibodies).
- Help in immune defence.
- Also transport other substances (e.g. hormones, lipids).

Fibrinogen



- A clotting protein.
- Converted to fibrin during blood clotting, helping to form a clot and prevent blood loss.



Plasma
(liquid part)

Buffy coat
(WBCs & platelets)

Red blood cells
(RBCs)



CAUTION:

Abnormal levels of plasma proteins (e.g. low albumin or fibrinogen) can affect fluid balance and clotting. Interpretation is clinician-directed and context-specific.

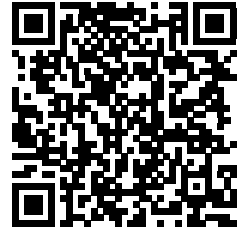


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