

BIOCHEMISTRY of BLOOD

BCH 471

[Practical]



Course Outline

	Title of the Experiments
1	Separation of plasma and serum from whole blood
2	Separation of main proteins in plasma and serum
3	Determination of plasma enzymes (Lactate dehydrogenase)
4	ABO blood grouping and Rh groups
5	Hemolysing agents and detection of blood
6	Hemoglobin, anemia.
7	Glucose-6-phosphate dehydrogenase deficiency, sickle cell test
8	Determination of iron serum
9	Estimation of serum bilirubin (total and direct)
10	Coagulation time and Prothrombin time, HCT and ESR
11	Complete blood cell count

Marks Distribution

	Marks	
Report	5 Marks	
Quiz	7 Marks	
Activity	1 mark	
Research and Discussion	2 Marks	
Final	Practical	10 Marks
	Theoretical	5 Marks
Total	30 Marks	

How to write a scientific report?

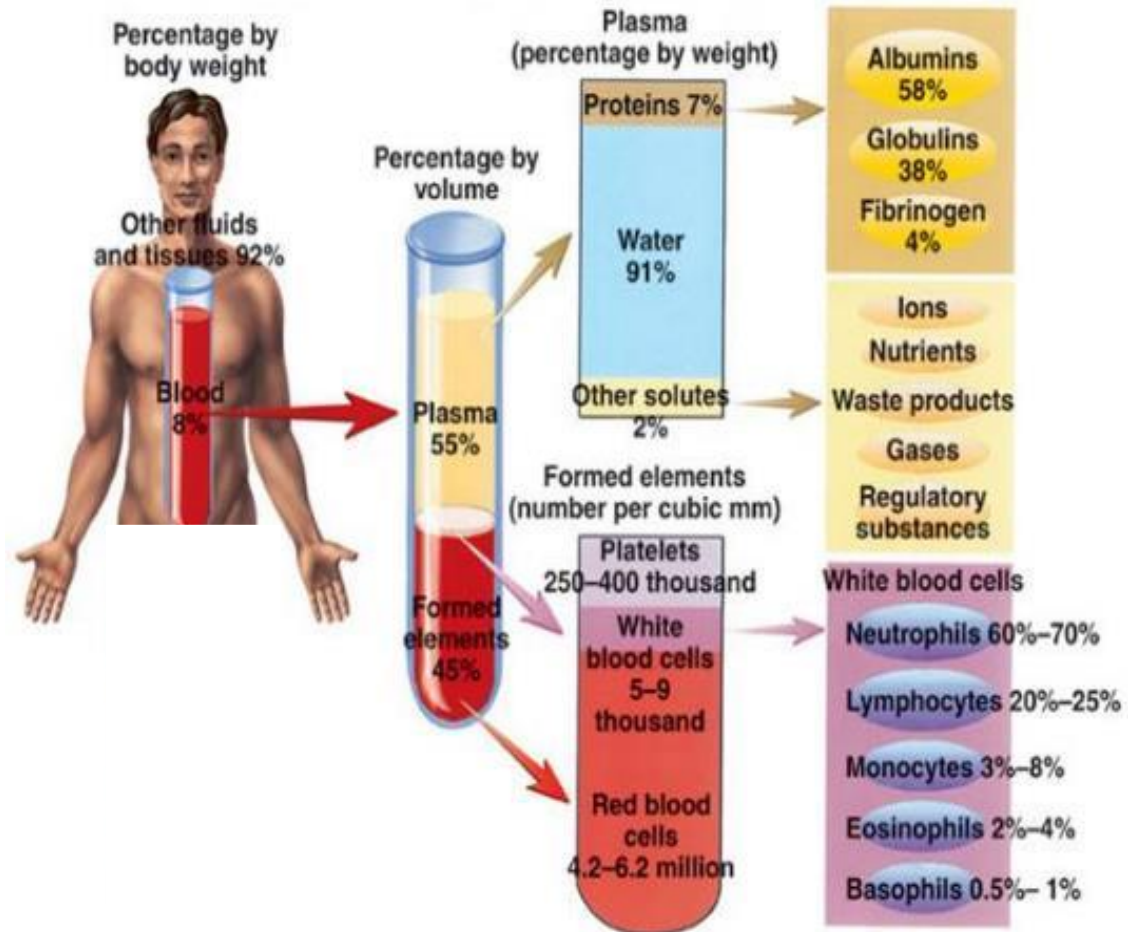
- **The laboratory reports should contain the following sections:**
 - Title
 - Objectives
 - Brief Introduction [**Theoretical background information**]
 - Materials and Methods [**As seen in the lab sheet**]
 - Principle
 - Results [**Tables and Calculations**]
 - Discussion
 - In this section you are required to explain your results and make conclusions by comparing your results to expected values.
 - Even if you obtained unexpected results, the discussion section is the section to justify or explain the reasons why you have obtained such results.

Lab Safety



- You must wear a lab coat and hand gloves.
- Open toed shoes must not be worn because they cannot protect you against chemical spills.
- Long hair should be tied back to avoid any interference with the experiment.
- In case of acid or base contact with your skin, wash it with large amount of clean, cold water and inform the instructor immediately.
- Do not eat, drink, or chewing gum in the laboratory.
- Do not depart from the lab leaving an experiment unattended. If you need to leave the lab you must inform your instructor before leaving the lab.
- You must wash your hands with soap after finishing the experiment.
- After finishing the experiment clean all glassware, and work bench.

Blood composition



Other names to blood cells

Red blood cells (erythrocytes)

White blood cells (leukocytes)

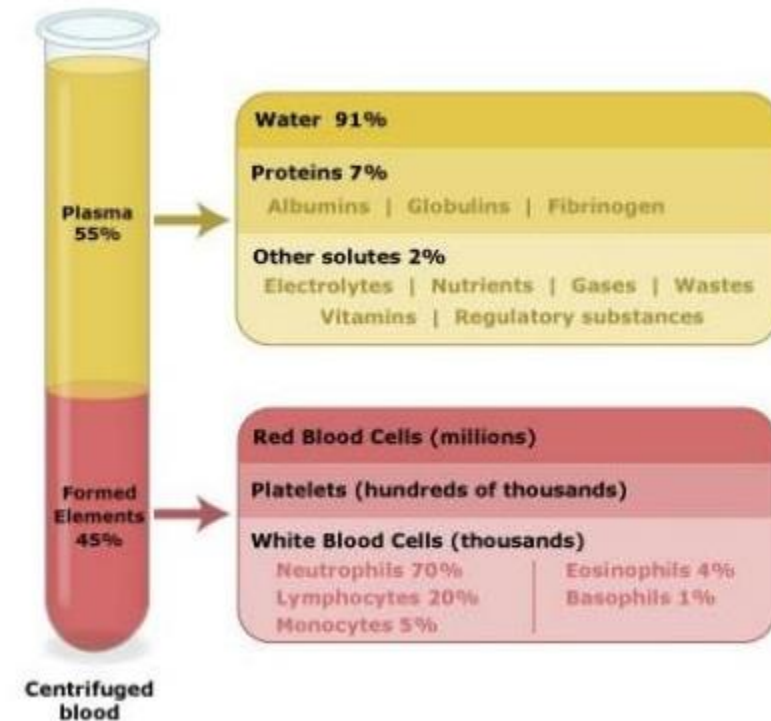
Platelets (thrombocytes)

Site of production

bone marrow

Plasma & Serum

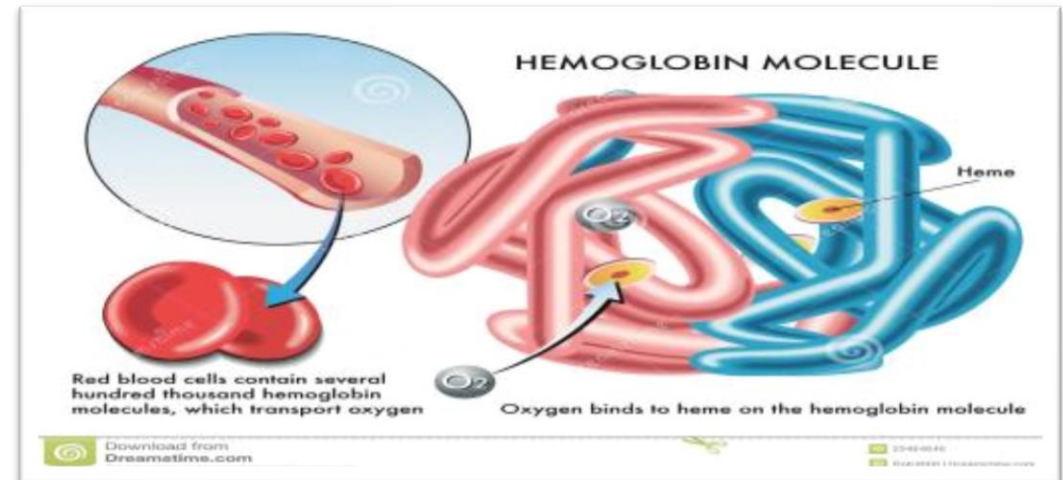
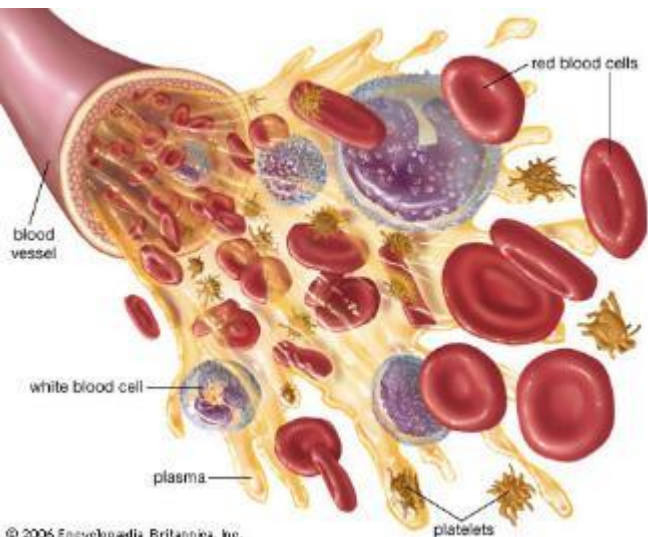
- **Plasma** is the liquid portion of blood, it constitutes about 55 % of blood volume.
- 90% of plasma is water
- It contains:
 - Albumin (most abundant protein, act as a transporter and regulator)
 - Globulins (act as transporters and some as antibodies)
 - Fibrinogen (responsible, in part, for the clotting of blood)
- **Serum** resembles plasma in composition but lacks the coagulation factors.
(Serum = Plasma – clotting factors)



Red blood cells (RBC)



- Red blood cells contain hemoglobin, a complex iron-containing protein that carries oxygen throughout the body and gives blood its red color.
- They live for approximately 120 days in the circulatory system and are eventually removed by the spleen.



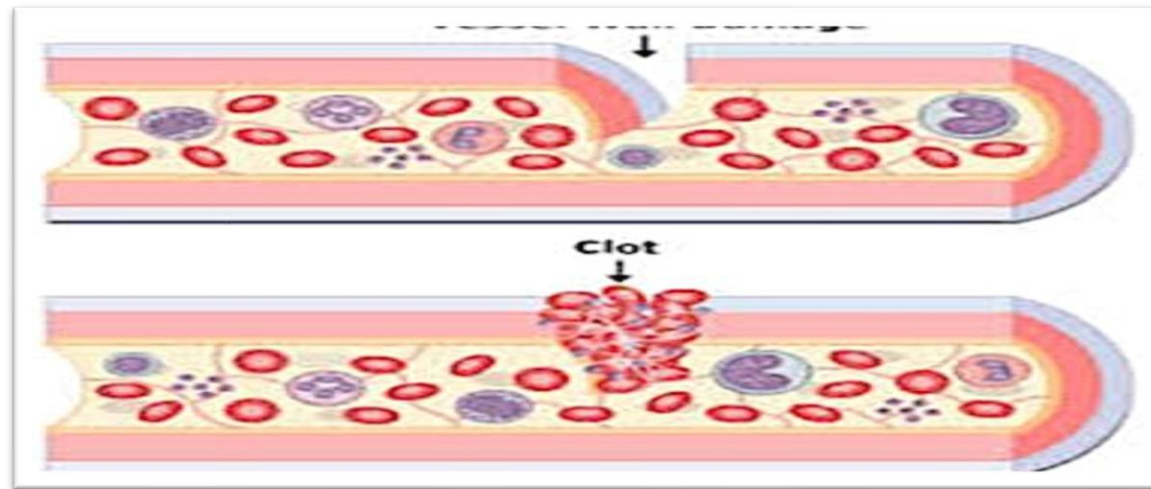
White blood cells (WBC)

- They are responsible for protecting the body from invasion by foreign substances such as bacteria, fungi, and viruses.
- Types of WBCs:
 - **Granulocytes**
 - Neutrophils
 - Eosinophils
 - Basophils
 - **Agranulocytes**
 - Monocytes
 - Lymphocytes
- **WBC** have short life span of **5 – 21 days**.



platelets

- They are very small cellular components of blood that help the clotting process by sticking to the lining of blood vessels.
- They survive in the circulatory system for an average of 9-10 days before being removed from the body by the spleen.



Blood functions

