



قسم الكيمياء الحيوية
Biochemistry Department
College of Science - King Saud University

471 BCH

BIOCHEMISTRY OF BLOOD

[Practical]

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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	Hemolysing agents and detection of blood
4	Determination of plasma enzymes (Lactate dehydrogenase)
5	Prothrombin time and coagulation time
6	ABO blood grouping and Rh groups
7	Hemoglobin, anemia, HCT and ESR
8	Determination of iron serum
9	Glucose-6-phosphate dehydrogenase deficiency, sickle cell test
10	Estimation of serum bilirubin (total and direct)
11	Red and white blood cell count
12	Electrophoretic separation of serum proteins

Mark Distribution

	Marks	
Conducting the experiment	1 Mark	
Report	6 Marks	
Quiz	8 Marks	
Final	Practical	10 Marks
	Theoretical	5 Marks
Total	30 Marks	

Final exam date:

Sunday 3 / 4 / 1438 H – 1 / 1 / 2017

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**]
 - Results [**Tables and Calculations**]
 - Discussion
 - In this section you are required to describe of what happened in the experiment [**Principle**] , 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.
 - Questions

Safety in the Lab



- 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 handle broken glassware with your bare hands.
- Do not eat, drink, or chewing gum 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.

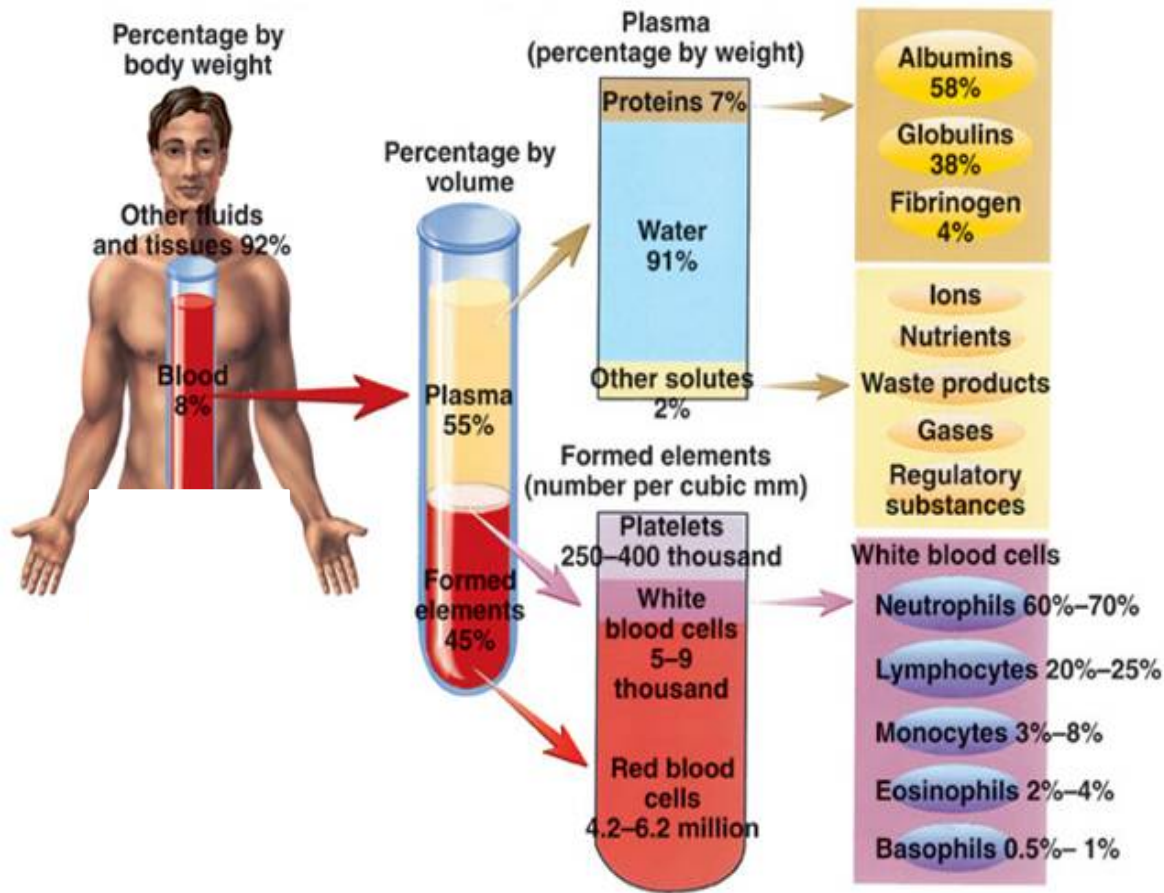
<http://www>

Download of ALL the lectures and Lab sheet from website :

<http://fac.ksu.edu.sa/naljebrin>

Good Luck

BLOOD COMPOSITION



Other names to blood cells

Red blood cells (erythrocytes)

White blood cells (leukocytes)

Platelets (thrombocytes)

Site of production

bone marrow

PLASMA & SERUM

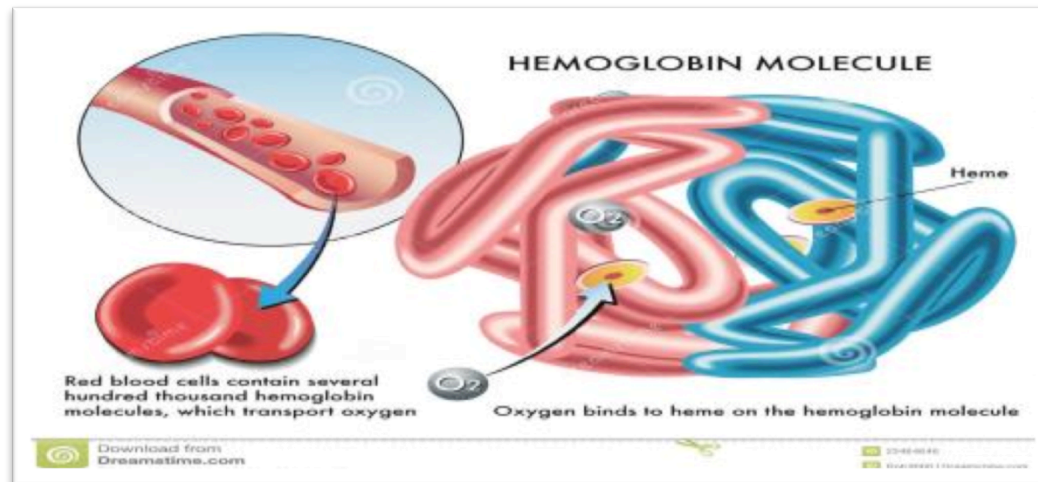
- Plasma is the liquid portion of blood, it constitutes about 55 % of blood volume.
- 90% of plasma is water
- It contains:
 - Albumin (most abundant protein, act as a transporter and regulator)
 - Globulins (act as transporters and some as antibodies)
 - Fibrinogen (responsible, in part, for the clotting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

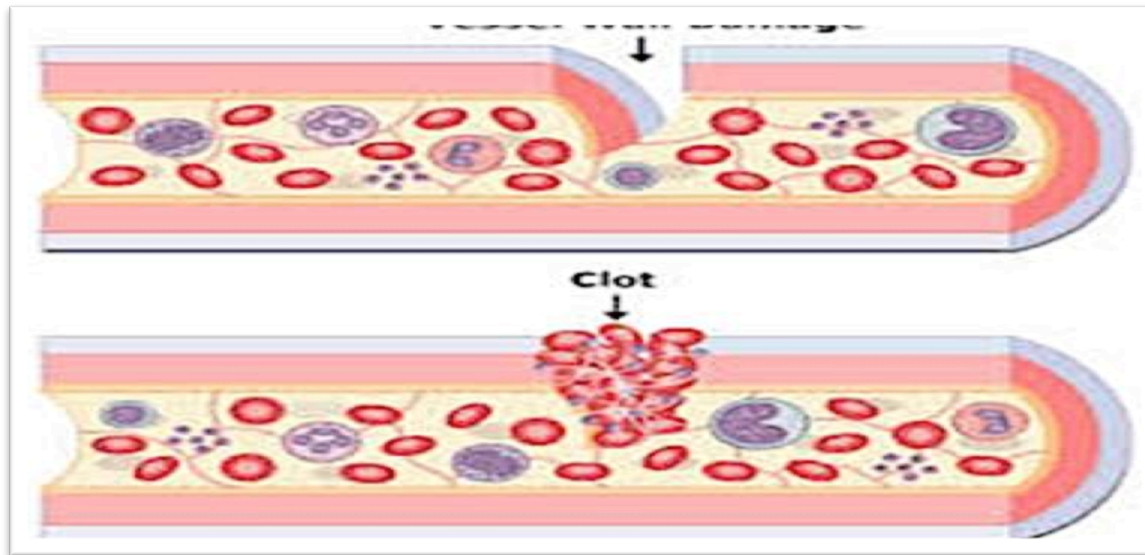


- **Agranulocytes**

- Monocytes
- Lymphocytes

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

Transportation

Gases

Nutrients

Waste products

Hormones

Metabolites

Regulation

pH

Osmotic pressure
(water content of
cells)

Temperature

Protection

Protect against
infections

Clot formation