

(Human Blood)

Blood: is fluids pumped by the heart that circulates throughout the body via the arteries, veins, and capillaries.

An adult man of average size normally has about 5.6 liters of blood. Although blood appears to be red liquid, it is composed of yellow liquid called **plasma** and billions of cells.

(Blood=Cells+plasma)

Plasma: is a clear, straw-colored liquid portion of the blood in which the other cells are suspended.

Serum :is the extra cellular portion of blood after adequate coagulation is complete.

In laboratory, they can be separated and measured to help with the diagnosis and monitoring of diseases.

Components of plasma

- Plasma =water +proteins dissolved substances
- It is 90-92 percent water
- Plasma is a transporting medium for cells and a variety of substances vital to the human body.
- Importantly, plasma contains proteins for blood clotting and defending the body against infection.

Preparation/Separation of plasma

The blood is mixed with an appropriate amount of anticoagulant like:-

--Heparin,

--Oxalate

--Ethylene Di-amine Tetra Acetic acid(EDTA)

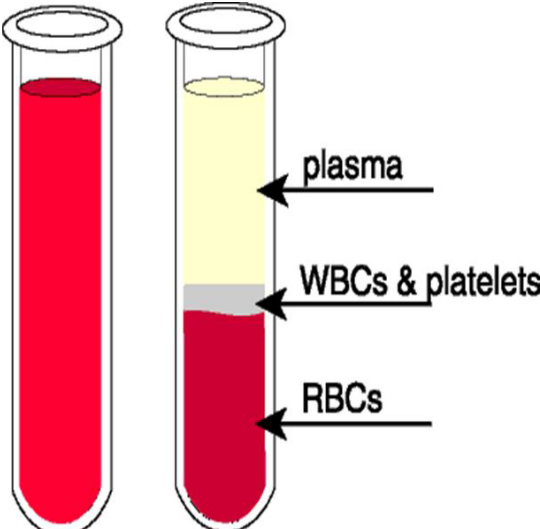
This preparation should be mixed immediately and thoroughly to avoid clotting.

2. The solution is then centrifuged for 5-10 minutes at 2000-2500 rpm.

3. The supernatant fluid is then separated and then labeled properly.

(Human Blood)

Component	Percent
Water	~92
Proteins	6-8
Salts	0.8
Lipids	0.6
Glucose (blood sugar)	0.1



(With anticoagulant)

Plasma proteins

- Albumins=60%
- Globulins=35%
- Fibrinogen=4%
- The other 1% of blood protein content=regulatory proteins, lipoproteins, iron-binding proteins

Components of Serum

- Blood serum is about 90% water with dissolved proteins, minerals, hormones, and carbon dioxide and is an important source of electrolytes
- In blood, the serum is the blood plasma with the fibrinogens removed i.e. (Serum =Plasma –Clotting factors)

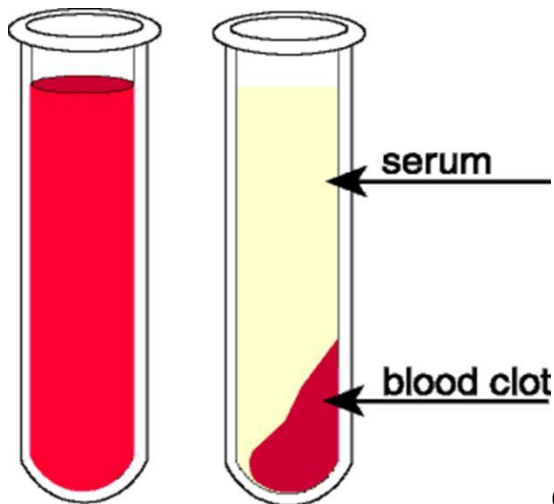
Preparation/Separation of Serum

- The blood is allowed to clot at room temperature for 15 to 30 minutes.
- When the blood has clotted completely, it is rimmed or ringed with an applicator stick,
- Then centrifuged for 5-10 minutes at 2,500 revolutions per minute (rpm).

BIOCHEMISTRY

(Human Blood)

- Finally, the supernatant fluid is then separated making use of a Pasteur pipette, and labeled accordingly.



(No anticoagulant)

Differences between Plasma and serum

No.	PLASMA	SERUM
1	Fluid obtained when anti-coagulated blood has been centrifuged	Fluid obtained when coagulated blood has been centrifuged
2	Anti-coagulants are needed for separation	Anti-coagulants are not needed
3	Fibrinogen is present in plasma	Fibrinogen is absent
4	Does not need "standing"; it could be centrifuged as soon as it has been mixed thoroughly.	Serum takes a long time to prepare
5	Plasma is delivered to the patients who lack blood cells	Serum is the most preferred part of blood used in checking blood groups and diagnosis of diseases