Serum VS. Plasma

Serum is the liquid fraction of whole blood that is collected after the blood is allowed to clot. The clot is removed by centrifugation and the resulting supernatant, designated serum, is carefully removed using a Pasteur pipette.

Serum preparation

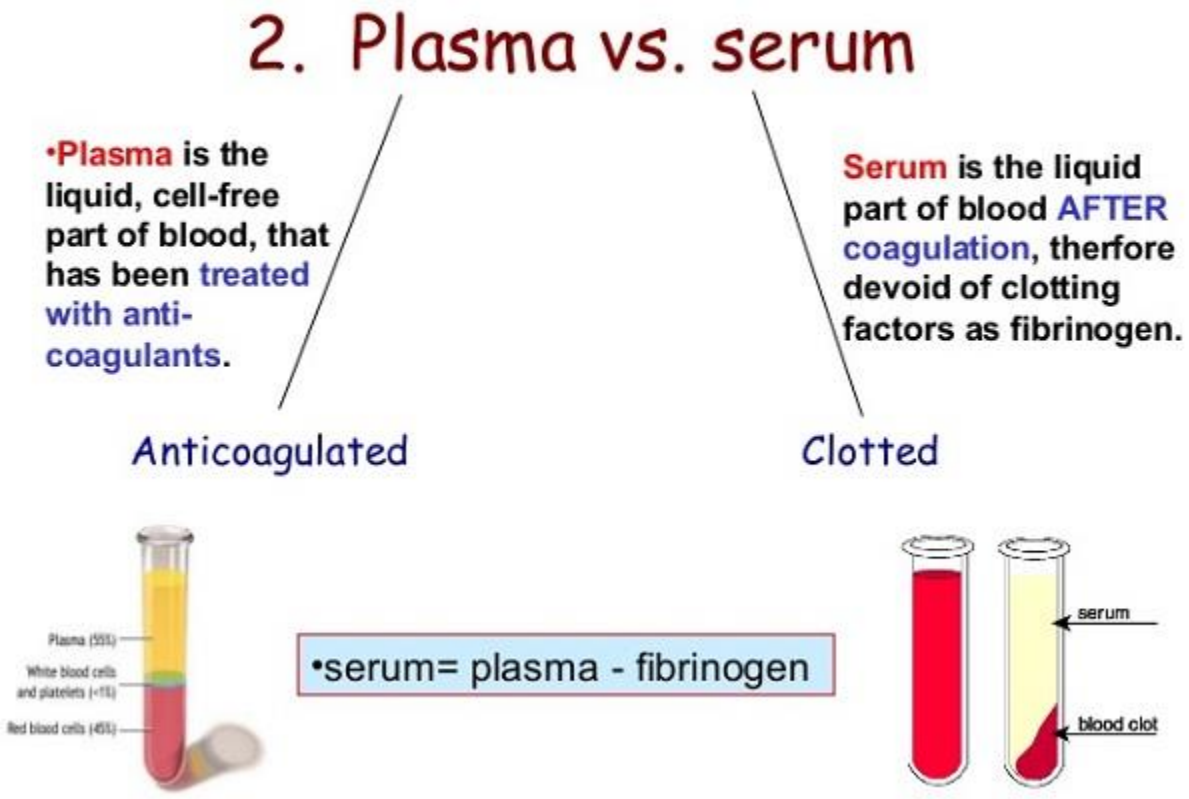
Collect whole blood in a covered test tube. After collection of the whole blood, allow the blood to clot by leaving it undisturbed at room temperature. This usually takes 15–30 minutes. Remove the clot by centrifuging at 1,000–2,000 x g for 10 minutes in a refrigerated centrifuge. The resulting supernatant is designated serum. Following centrifugation, it is important to immediately transfer the liquid component (serum) into a clean polypropylene tube using a Pasteur pipette. The samples should be maintained at 2–8°C while handling. If the serum is not analyzed immediately, the serum should be stored at –20°C or lower. It is important to avoid freeze-thaw cycles because this is detrimental to many serum components.

Plasma is produced when whole blood is collected in tubes that are treated with an anticoagulant. The blood does not clot in the plasma tube. The cells are removed by centrifugation. The supernatant, designated plasma is carefully removed from the cell pellet using a Pasteur pipette.

Plasma preparation

Collect whole blood into commercially available anticoagulant tubes e.g., EDTA tube. Cells are removed from plasma by centrifugation for 10 minutes at 1,000–2,000 x g using a refrigerated centrifuge. The resulting supernatant is designated plasma. Following centrifugation, it is important to immediately transfer the liquid

component (plasma) into a clean tube using a Pasteur pipette. The samples should be maintained at 2–8°C while handling. If the plasma is not analyzed immediately, the plasma should be stored at –20°C or lower. It is important to avoid freeze-thaw cycles.



Serial Dilutions

Two-fold serial dilutions

A two-fold dilution reduces the concentration of a solution by a factor of two that is reduces the original concentration by one half. A series of two-fold dilutions is described as two–fold serial dilutions.

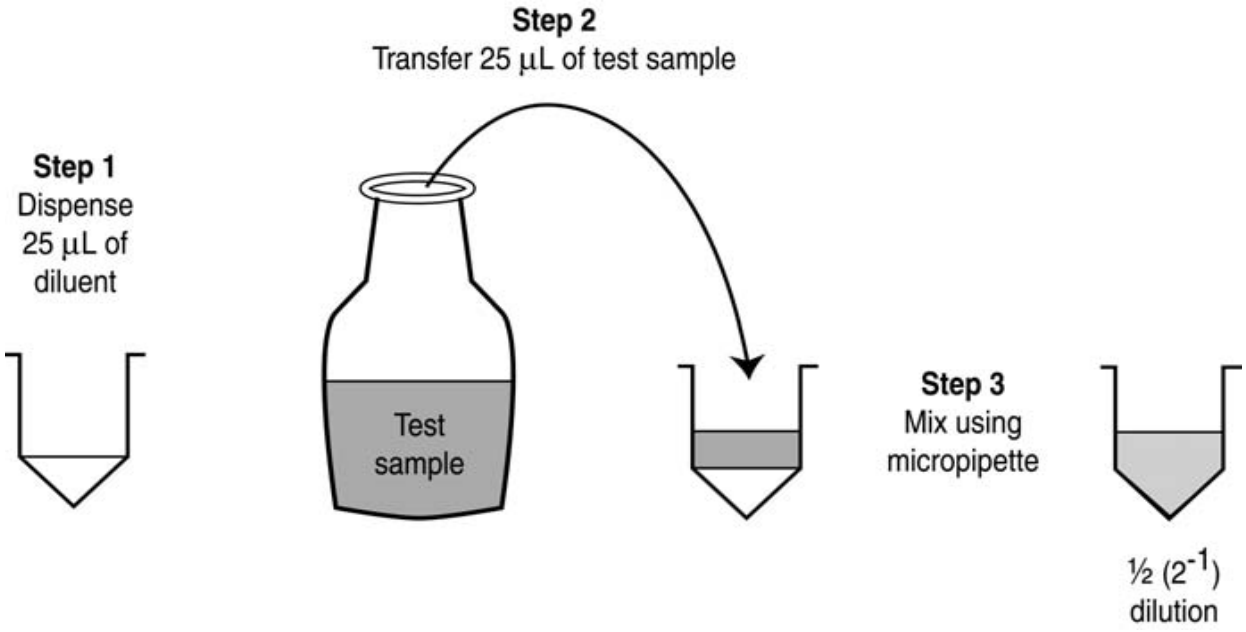
A two-fold dilution

Step 1. Use the micropipette to dispense 25 µL of diluent to the first well.

Step 2. Use the micropipette to transfer 25 µL of the test solution to the first well.

Step 3. Use the micropipette to mix by drawing up the liquid and expelling it again. Carry out this action twice.

Step 4. The well now contains 25 µL of the original test solution diluted by one half in a total volume of 50 µL.



A two–fold dilution

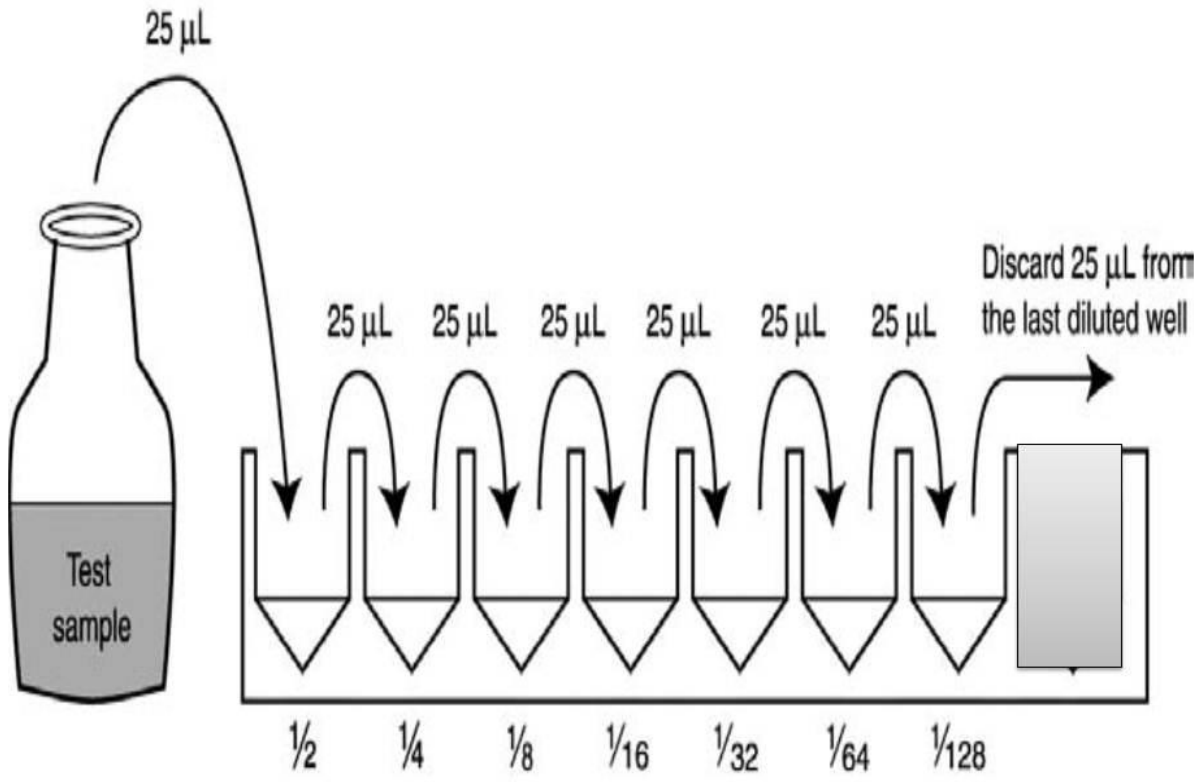
Two-fold serial dilutions

Step 1. Use the micropipette to dispense 25 µL of the diluent to all the wells across a row of a microwell plate.

Step 2. Use the micropipette to transfer 25 µL of the test solution to the first well and mix. This is the first two-fold dilution.

Step 3. Use the micropipette with the same tip to carry out a second two-fold dilution.

Step 4. Continue the series of two-fold dilutions until the second last well of the microwell plate.



Two-fold serial dilutions

Ten-fold serial dilutions

A ten–fold dilution reduces the concentration of a solution by a factor of ten that is to one-tenth the original concentration. A series of ten-fold dilutions is described as ten-fold serial dilutions.

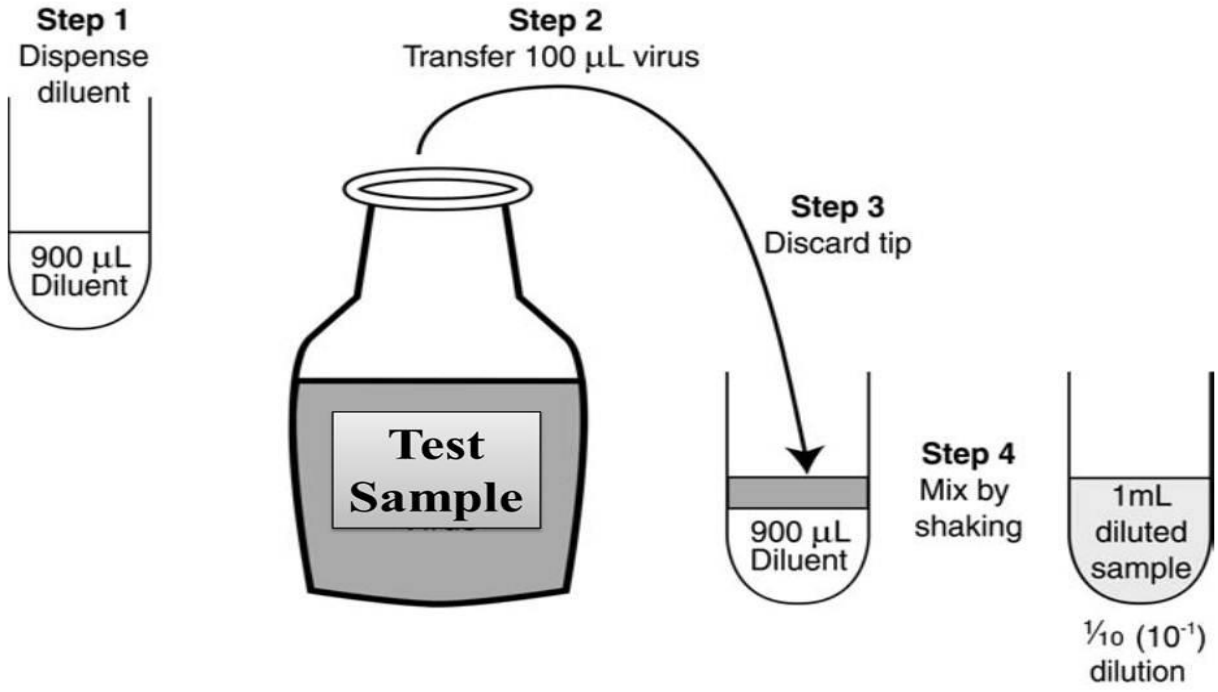
A ten-fold dilution

Step 1. Use a micropipette to dispense 900 µL of the diluent to glass tube.

Step 2. Use a micropipette to transfer 100 µL of the test solution to the first well. Discard the tip.

Step 3. Mix by shaking by hand or using a vortex mixer.

Step 4. The well now contains 100 µL of the original test solution diluted by one tenth in a total volume of 1000 µL.



A ten-fold dilution

Ten-fold serial dilutions

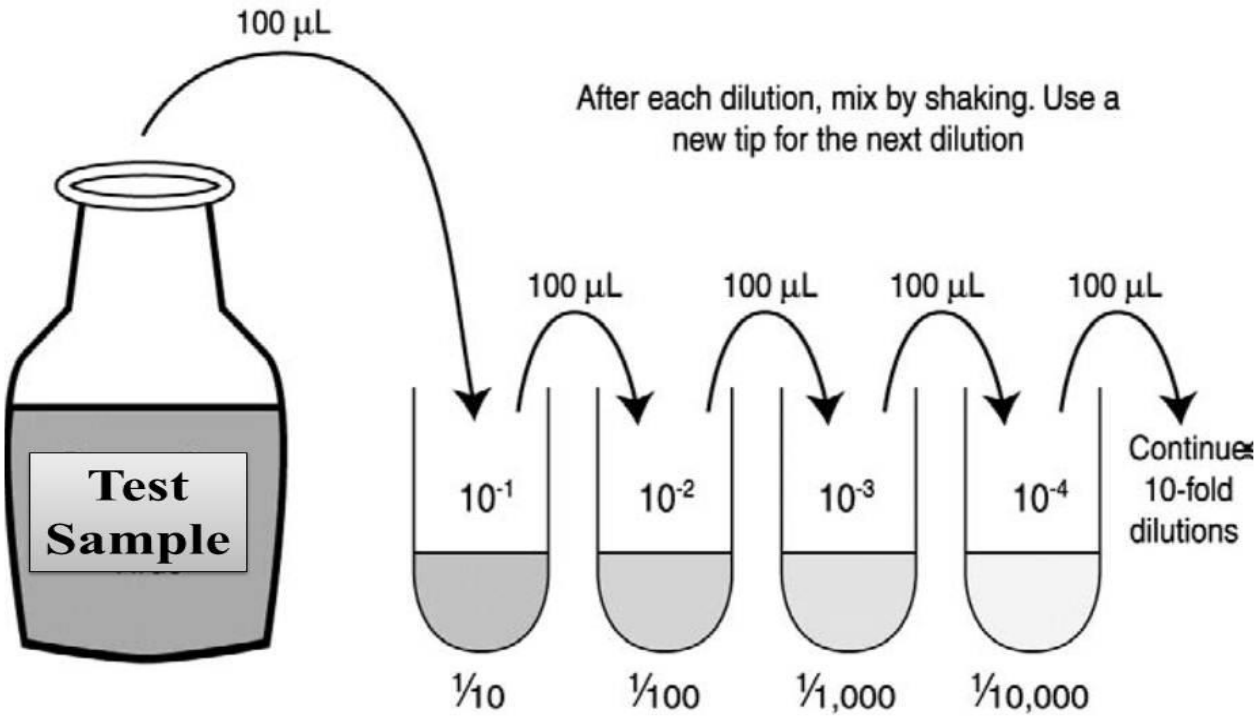
Step 1. Set up the sterilized glass test tubes in a rack. Label each tube clearly to indicate the dilution of its contents after the ten-fold serial dilution has been carried out.

Step 2. Use a micropipette to dispense 900 µL of the diluent to all the labeled sterile tubes.

Step 3. Use a micropipette to transfer 100 µL of the test solution to the first tube and mix. This is the first ten-fold dilution.

Step 4. Use a micropipette with new sterile tip to carry out a second tenfold dilution.

Step 5. Continue the series of ten-fold dilutions until the last tube.



Ten-fold serial dilutions