



Fourth stage

Blood transfusion

Cross Matching

Assistant Lecturer

Mohammed Sami Abdul Ameer

**Washing red blood cells
and preparation of its
(suspension).**

Prepare red blood cells suspension.

3% Red Blood Cell Concentration in Saline

Between 2-5% cell suspension provides optimum antigen concentration for the tube method for red blood cells typing. To make sure your suspension is within this range use reagent red cells for comparison.

HOW TO OBTAIN THIS SUSPENSION?

- Washing Red Blood Cells before Making the 3% Suspension The purpose of washing the red blood cells is to remove plasma, micro aggregates, cytokines, and unwanted antibodies that may interfere with antigen-antibody reaction.

Methods of preparing Washed RBC:

- ❖ Good Technique when washing and making a 3% cell suspension involves the following
Place 1 to 3 drops of blood in the tube Aim the tip of the saline bottle towards the center of the tube and forcibly squirt saline into the tube.

- Fill the tube 3/4 full of saline (there will be less splattering in the centrifuge)
- Centrifuge long enough spin to pull most of cells into a button in the bottom of the tube.
- Decant the saline completely.
- Shake the tube to resuspend cell button before washing the cells again. It will depend on the procedure being done as to how many washings are going to be done.





Cross-Matching





Antiglobulin

INTRODUCTION

- Cross-matching is one of the most important serological procedure pertaining to blood group serology and is the fundamental procedure responsible for safe blood transfusion basically.
- Cross-matching is an antigen-antibody reaction, a correct interpretation of which is the most essential preliminary step in the practice of safe transfusion of blood.

CONTINUE...

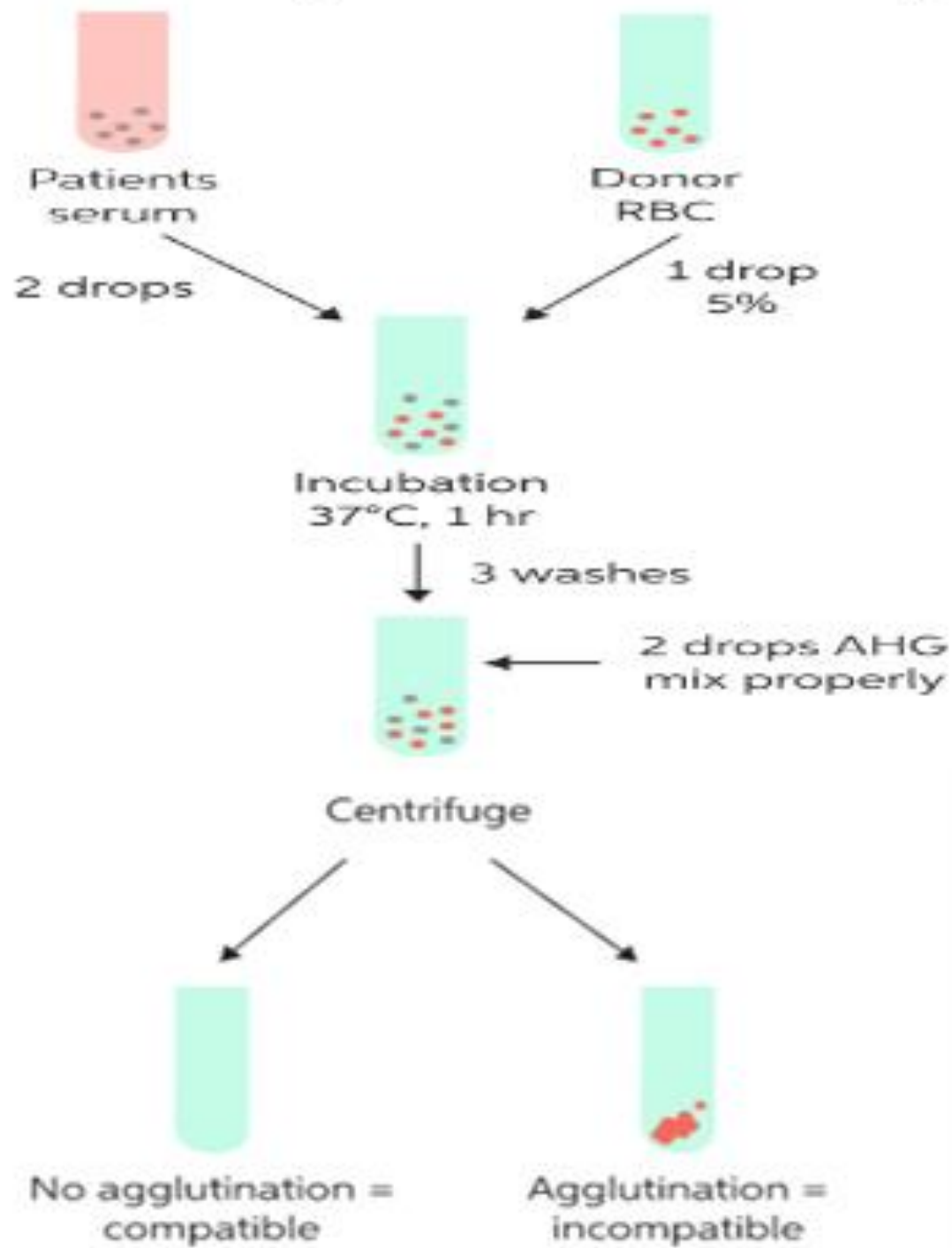
- By cross-matching we are able to detect the atypical and clinically significant antibody mostly IgM and IgG present in recipient serum or in donor serum, also by autocontrol we are able to detect auto-antibody in patient himself
- Cross match test is carried out to ensure that there are no antibodies present in patients serum that will react with donor cells when transfused.
- Unless there is an urgent need for blood, a cross-match must be preformed for red cell transfusion.

FUNCTIONS OF CROSS-MATCH

- It is final check of ABO compatibility between the donor and patient.
- It may detect the presence of an antibody in the patient's serum which will react with an antigen on donor red cells.
- To ensure that patient/ recipient is supplied with a compatible unit of antigen negative blood.
- To prevent hemolytic transfusion reaction.
- To detect immunologic auto antigen and auto antibody, and blood to be issued has to be processed accordingly.

All this done with sole aim for safe transfusion of blood.

Anti-human globulin crossmatching



Crossmatch

Compatible

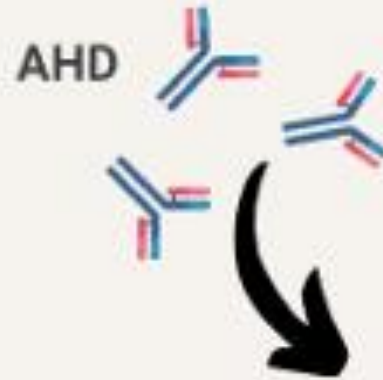
Recipient's serum



Incubate at 37 degrees F for 1 hour



Add AHD, then Centrifuge



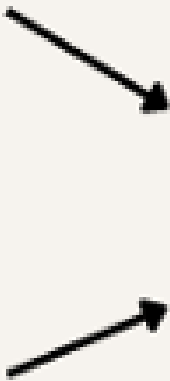
No agglutination
Compatible



Donor's red blood cells

Incompatible

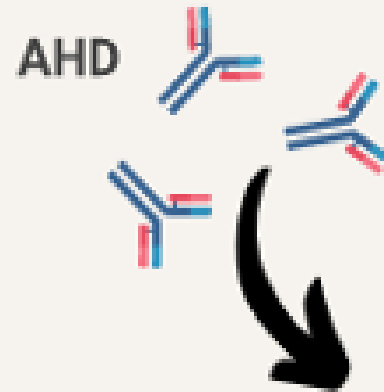
Recipient's serum



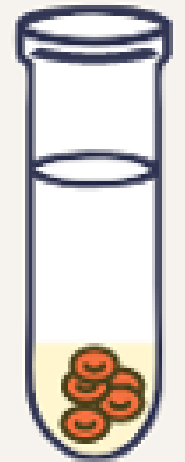
Incubate at 37 degrees F for 1 hour



Add AHD, then Centrifuge



Agglutination
Incompatible



Donor's red blood cells

Cross match testing procedures had been divided into two parts.....

- ❖ Major cross match.
- ❖ Minor cross.

Principle of cross match

- Major Cross Match: It involves testing the donor's red cells with recipient's serum to determine the presence of any antibody which may cause hemolysis or agglutination of donor red cells. This is more important than minor cross match.
- Minor Cross Match: It involves testing of donor's plasma with recipient's red cells to determine the presence of any antibody which may cause hemolysis or agglutination of recipient's red cells.

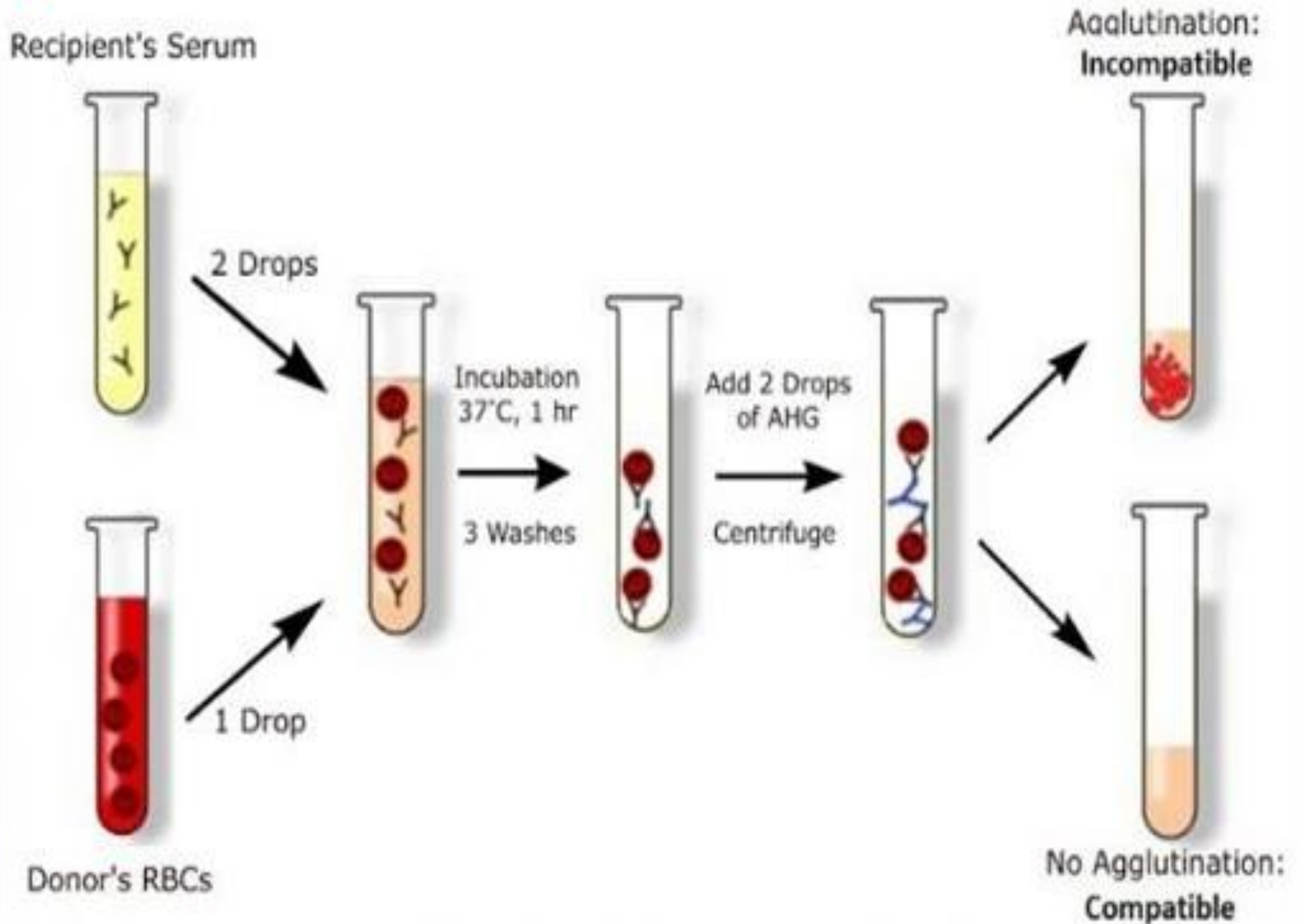
Major Cross Match

Donor Red Cells + Patient Serum

Minor Cross Match

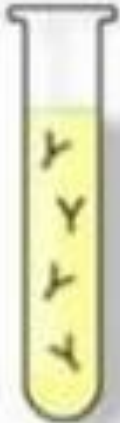
Patient Cells + Donor Serum

Major Cross Match



Minor Cross Match

Donor's Serum



2 Drops



Incubation
37°C, 1 hr

3 Washes



Add 2 Drops
of AHG

Centrifuge



Agglutination:
Not Compatible



1 Drop



No Agglutination:
Compatible



Recipient's RBCs

Procedure

- label the tube as major/minor cross-match with donor number & patient ID.
- Using a micropipette add 1 volume of 2-5 % red cell suspension to the labeled tube and 2 volume of serum to the same tube.
- Mix the tube well and centrifuge at 1000RPM for 1 min.

CONTINUE..

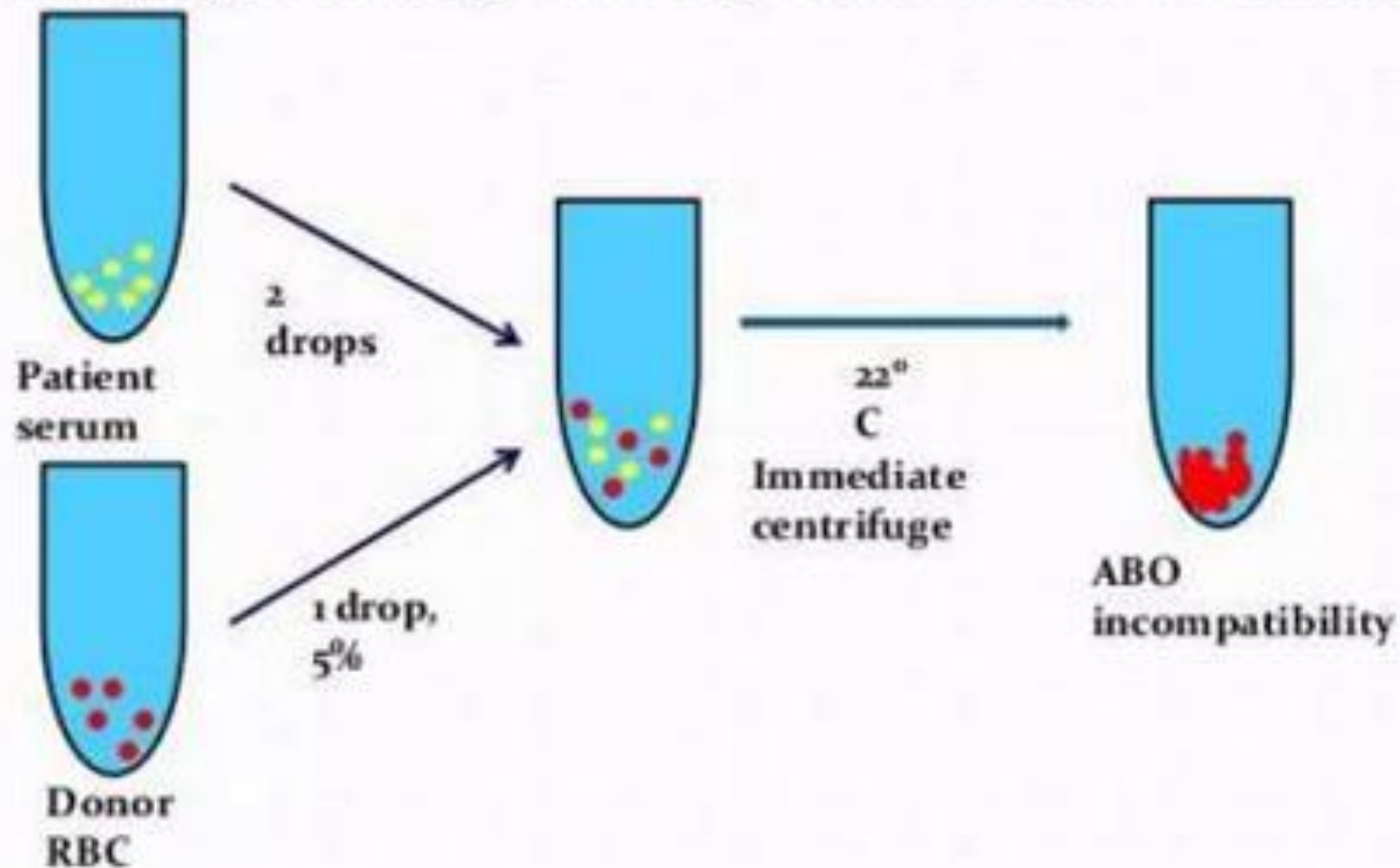
➤ Gently shake and observe for agglutination or hemolysis

NO agglutination or hemolysis: Compatible.

Agglutination or hemolysis seen : Incompatible.

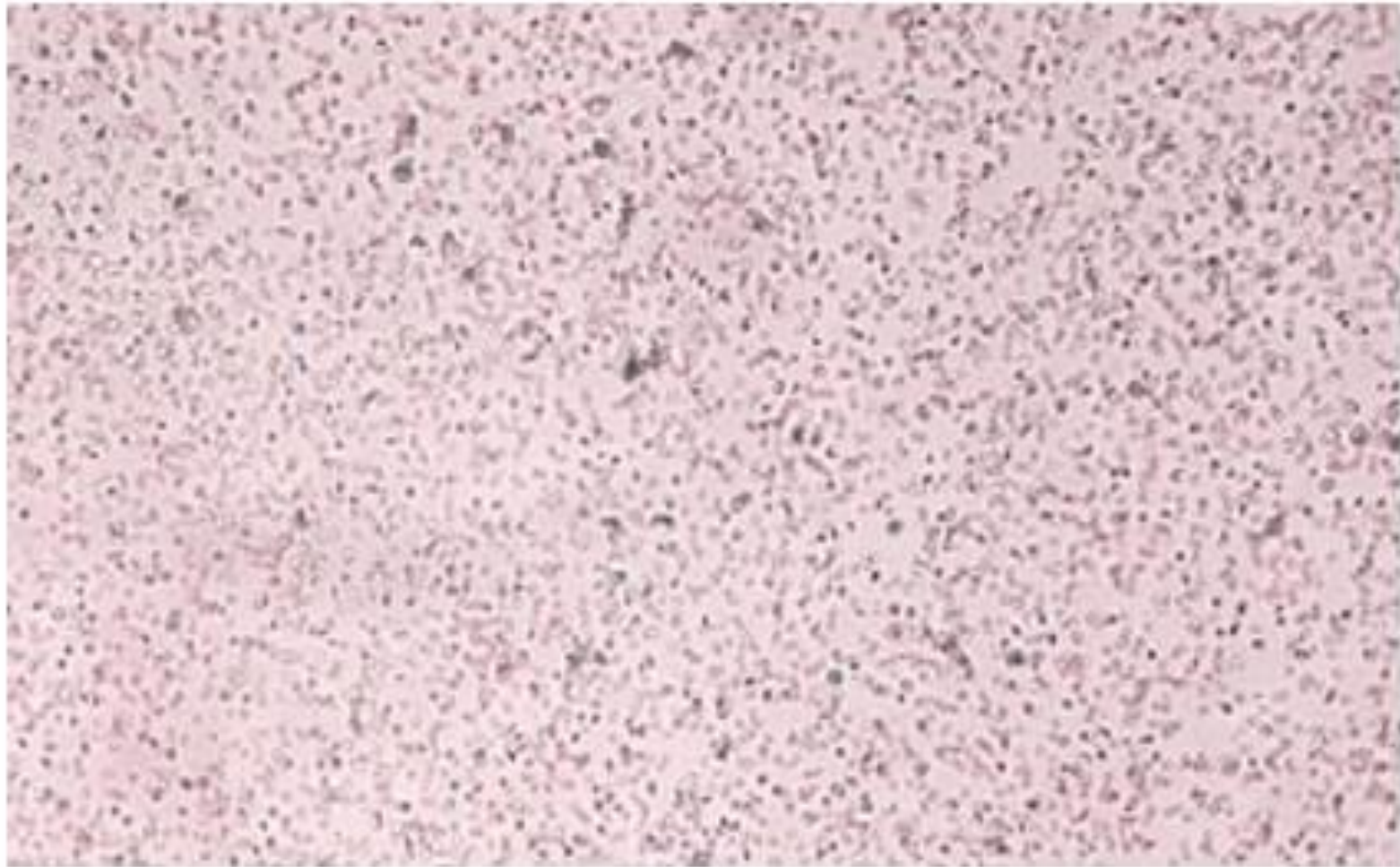
Immediate spin technique

- ✓ Detects only IgM antibody, reactive at 22°C.
- ✓ Clinically significant IgG antibody reactive at 37°C not detected

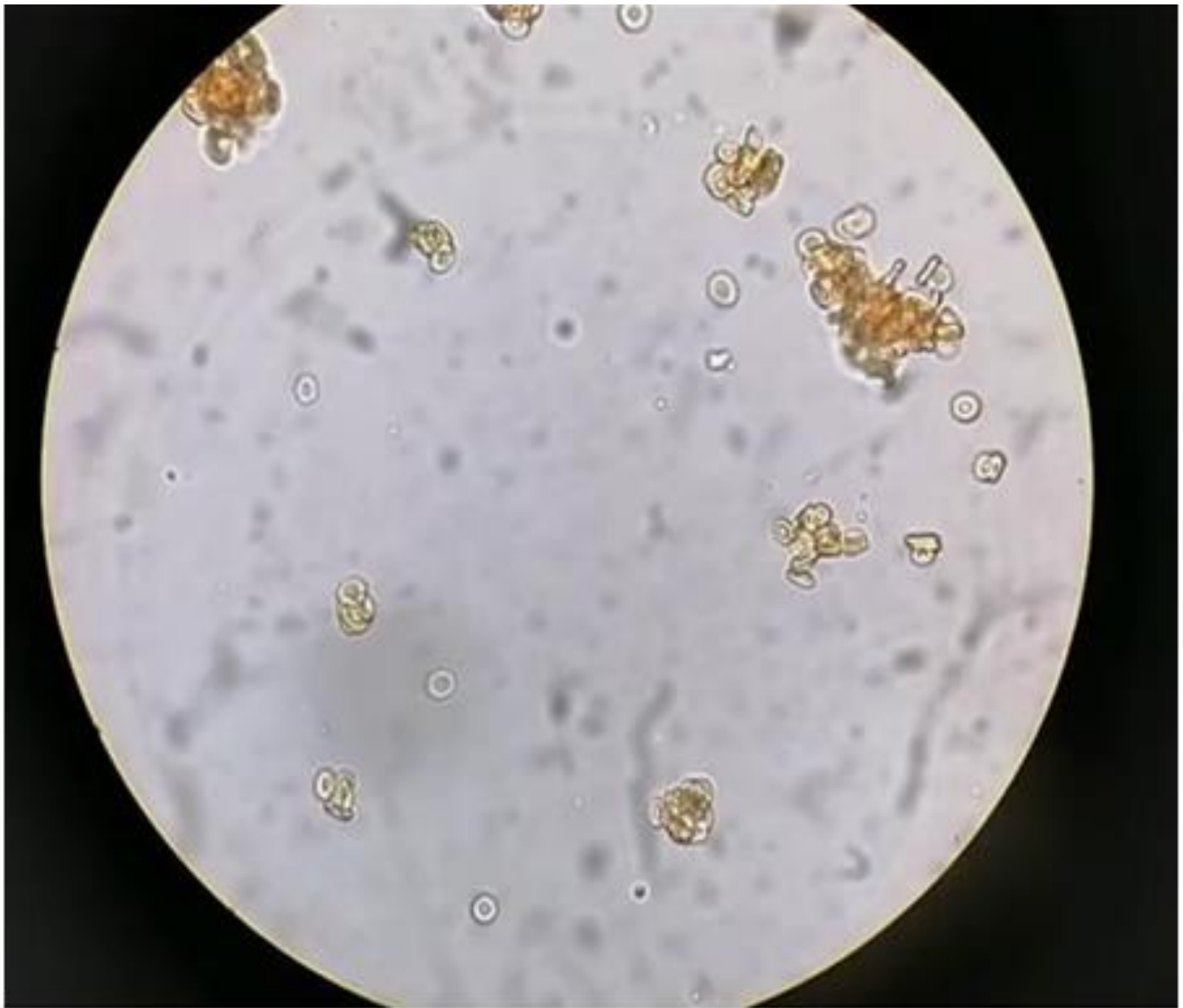




NO agglutination or hemolysis: Compatible



NO agglutination or hemolysis: Compatible



Agglutination or hemolysis seen : Incompatible

Thank you