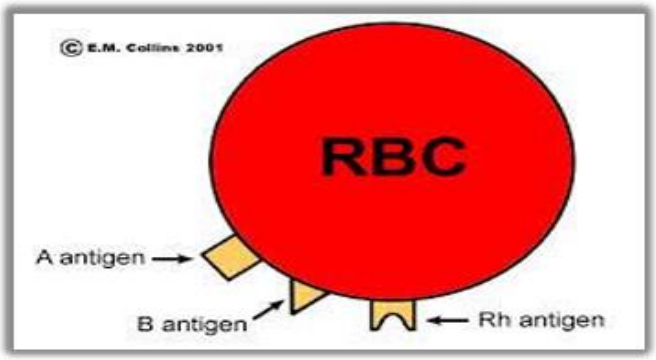
Blood Grouping

The ABO blood group system classifies blood types according to the different types of **antigens** in the red blood cells and **antibodies** in the plasma.

They use the ABO system alongside the RhD antigen status to determine which blood type or types will match for a safe red blood cell transfusion. There are four ABO groups: **A**, **B**, **AB**, and **O.**



ABO blood group:

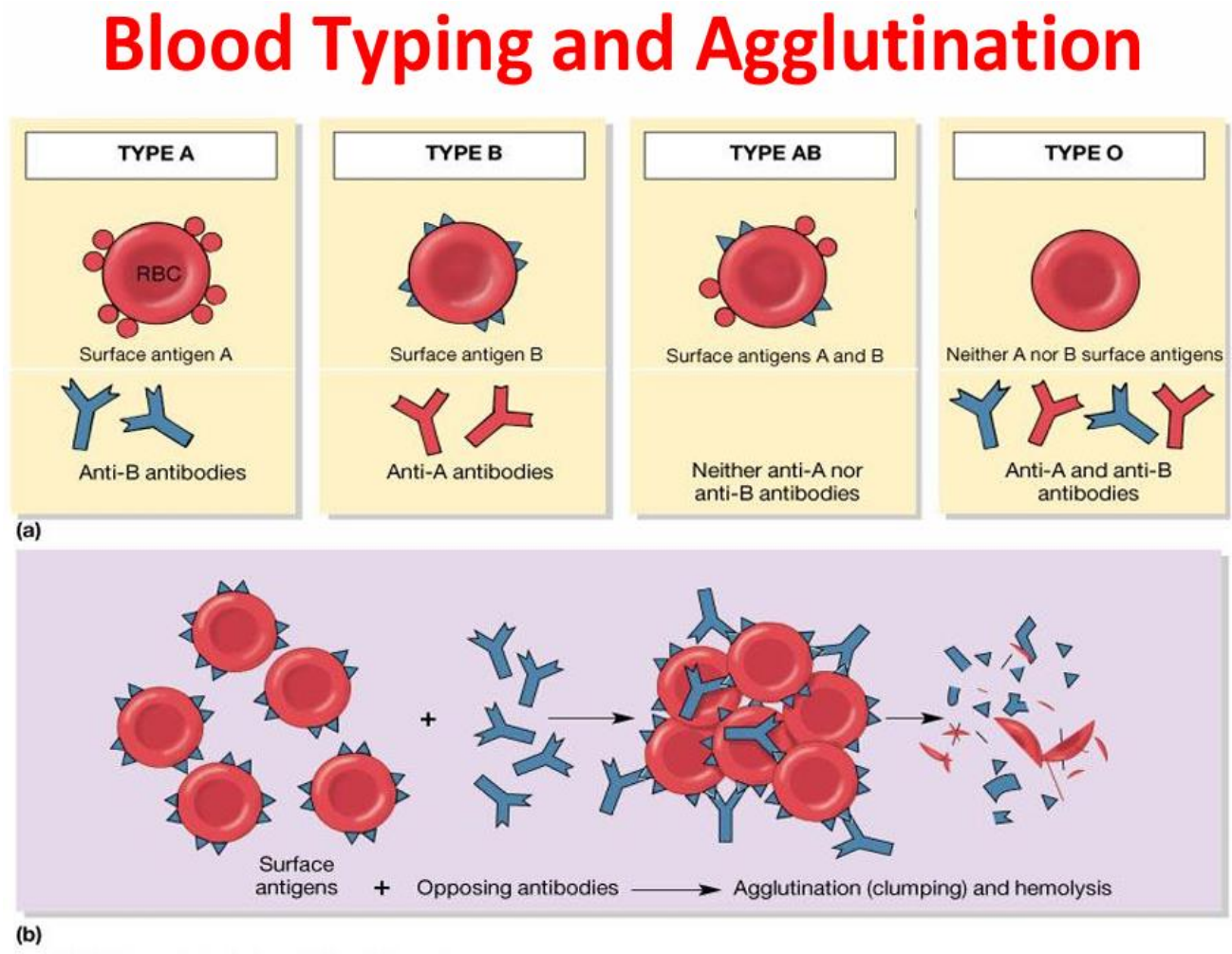
✓ **A and B antigens are found in:**

- Most cells: RBCs, WBCs and platelets
- In secretions: saliva, sweat, semen
- They are glycoproteins, complex oligosaccharides that differ in their terminal sugar

- **RBCs with A antigen = Type A blood**
- **RBCs with B antigen = Type B blood**
- **RBCs with neither antigens = Type O blood**
- **RBCs with both antigens = Type AB blood**

- To determine the individual's blood group. Four major types of blood groups:-

Type of Blood group	Type of Ag on RBCs	Type of Ab in the plasma
A	**A**	**B**
B	**B**	**A**
AB	**A&B**	**Non**
O	**Non**	**A&B**



➢ Working Principle

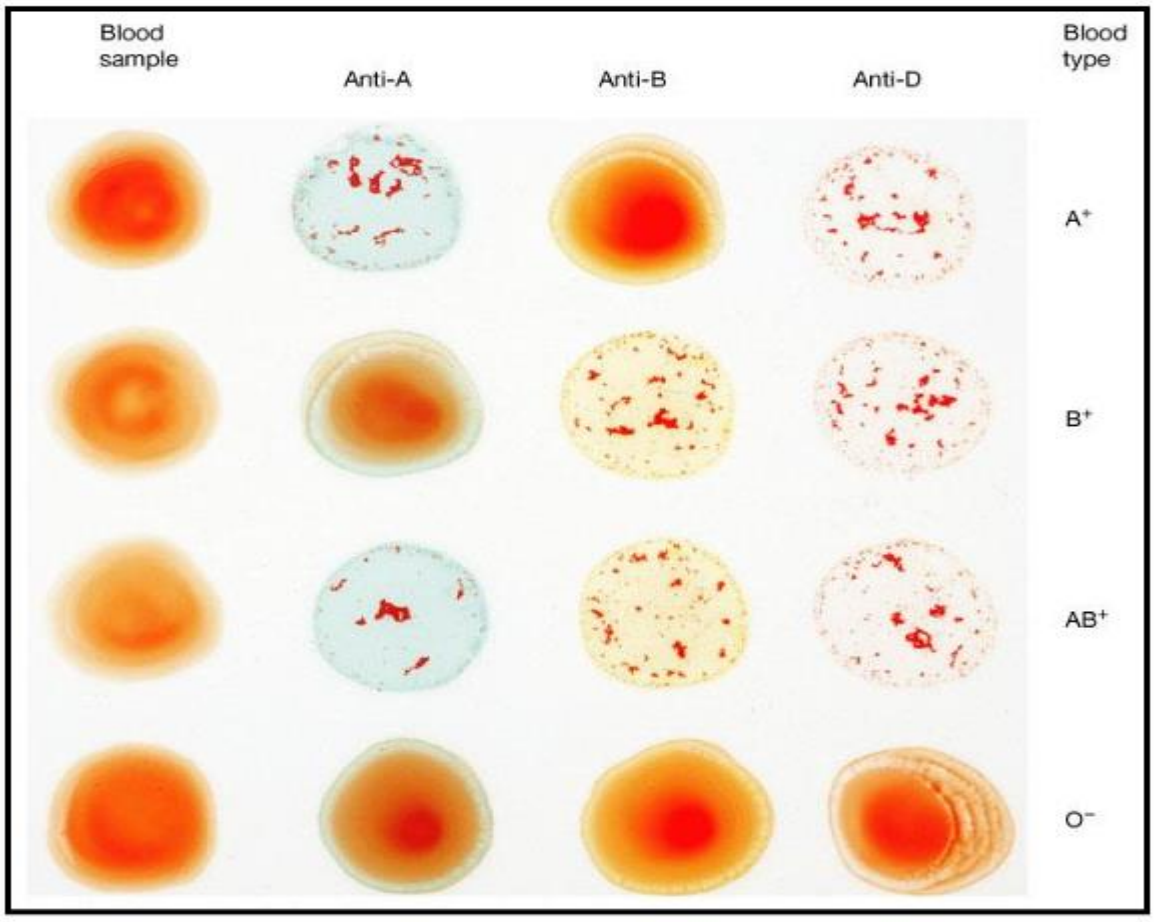
The method depends on the agglutination reaction between the agglutinogen (**antigen**) on the surface of the RBCs and the specific agglutinins (**antibodies**) present in the plasma.

➢ Procedure:

1. Three fresh blood drops dropped separately on a clean, dry slide

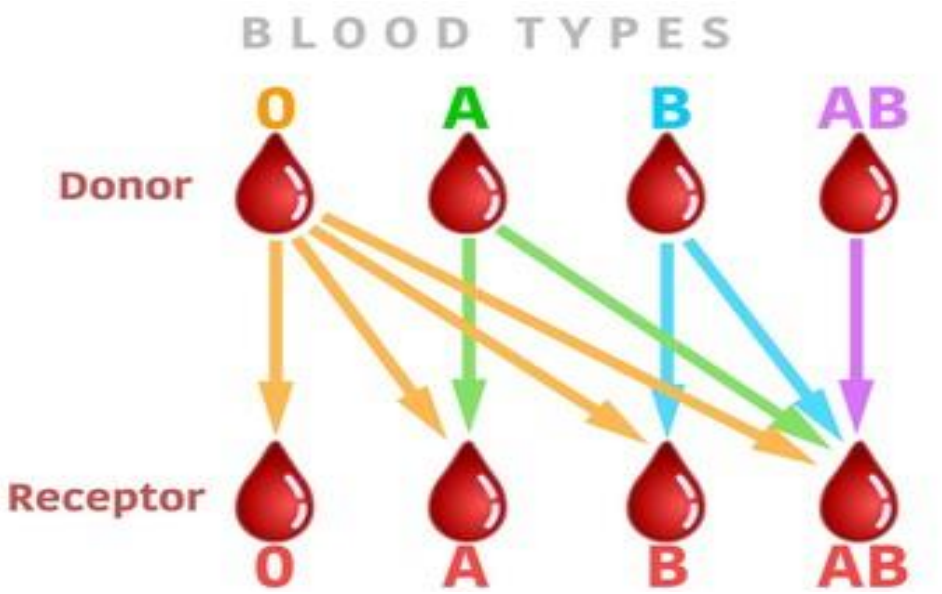
2. Put one drop on each blood drop from each anti-A, anti-B, and anti-D. Mix gently with wood sticks.

3. Notice the presence of the agglutination or its absence; read the blood group as follows:



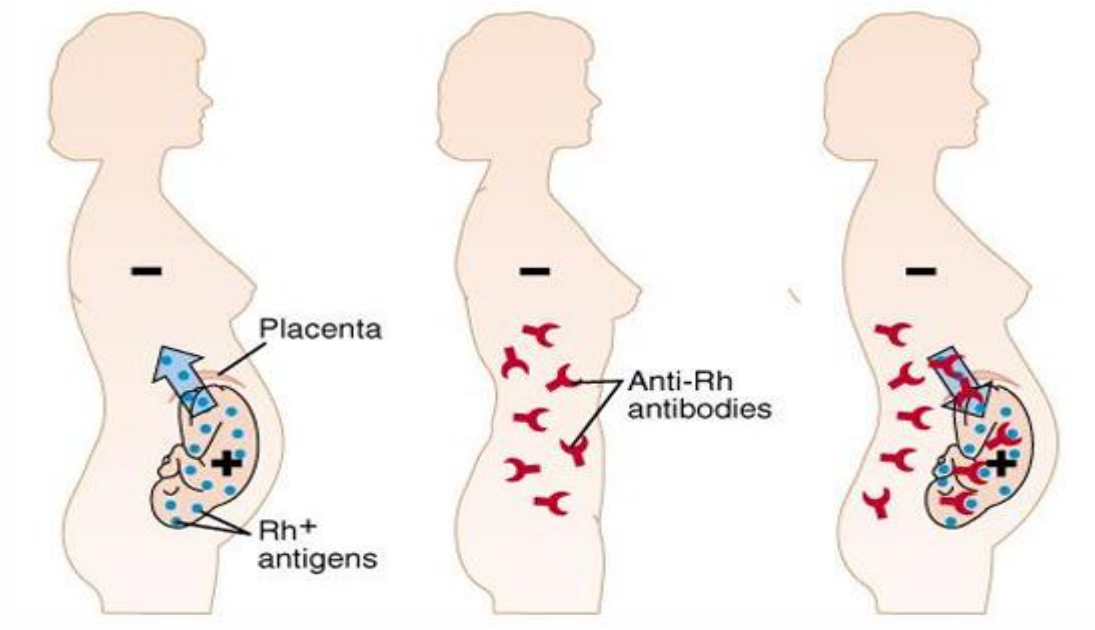
For Rh typing, agglutination by **anti-D in plasm** indicates that the individual is **Rh^{+ve}**, and the absence of agglutination denotes an **$Rh^{- ve}$** person.

Blood Group	Antigens	Antibodies	Can give blood to	Can receive blood from
AB	A and B	None	AB	AB, A, B, O
A	A	anti-B	A and AB	A and O
B	B	anti-A	B and AB	B and O
O	None	anti-A and anti-B	AB, A, B, O	O



➢ What is rhesus (RhD) factor testing?

- Determining your blood group will also assess your '**Rhesus (RhD) factor**.' You can be RhD positive or negative.
- Some red blood cells have Rh factor, the RhD antigen. If the red blood cells contain the RhD antigen, they are **RhD-positive**. If they do not, they are **RhD-negative**.
- **If you are RhD negative and your baby is RhD positive, your body may produce antibodies against your baby's blood. These antibodies can cross the placenta and destroy your baby's blood cells. This results in hemolytic disease of the fetus and newborn (HDFN).**
- This usually won't cause a problem for your first pregnancy but could affect future pregnancies with RhD-positive babies.
- If you are RhD negative, you will be offered an anti-D injection to stop your body from producing harmful antibodies, which will protect your baby.
- You will be offered the injection at 28 weeks and 34 weeks of pregnancy.
- The **anti-D injection** is safe for both you and your baby. You can also have the injection after your baby's birth. This can prevent any effects of having your baby's red cells in your body.



Mother's Rh factor	Father's Rh factor	Baby's Rh factor	Precautions
Rh positive	Rh positive	Rh positive	None
Rh-negative	Rh-negative	Rh-negative	None
Rh positive	Rh-negative	Could be Rh positive or Rh negative	None
Rh-negative	Rh positive	Could be Rh positive or Rh negative	Rh immune globulin injections