

HiPer[®] Blood Grouping Teaching Kit

Product Code: HTI008

Number of experiments that can be performed: 100

**Duration of Experiment:
Protocol: 15 minutes**

Storage Instructions:

- The kit is stable for 12 months from the date of manufacture
 - Store Anti A, Anti B and Anti RhD at 2-8°C
- Other kit contents can be stored at room temperature (15-25°C)

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Aim:

To determine the blood group and Rh factor of an individual.

Introduction:

Blood grouping is the classification of blood based on the presence or absence of two inherited antigenic substances on the surface of red blood cells (RBCs). The ABO and Rh are the major, clinically significant and the most important of all the blood group systems. The ABO blood group system was first discovered by Karl Landsteiner in 1900. The human ABO blood group system is divided into the following four major groups depending on the antigen present on the surface of their red blood cells:

1. "A" group
2. "B" group
3. "AB" group
4. "O" group

Table 1: ABO Blood Group System

Antigens on the surface of Red Blood Cells	Antibodies in the Serum	ABO Blood Group	Genotype
A	Anti B	A	AA or AO
B	Anti A	B	BB or BO
A and B	Neither Anti A nor Anti B	AB	AB
Neither A nor B	Anti A, Anti B, Anti AB	O	OO

The associated Anti A and Anti B antibodies usually belong to IgM class of immunoglobulins.

The Rhesus system (Rh) is the second most important blood group system in humans. The most significant and immunogenic Rhesus antigen is the RhD antigen. The individuals carrying the Rh antigen are considered to have positive blood group whereas those individuals that lack this antigen are considered to have negative blood group.

Principle:

The ABO and Rh blood grouping system is based on agglutination reaction. When red blood cells carrying one or both the antigens are exposed to the corresponding antibodies they interact with each other to form visible agglutination or clumping. The ABO blood group antigens are O-linked glycoproteins in which the terminal sugar residues exposed at the cell surface of the red blood cells determine whether the antigen is A or B. Blood group A individuals have A antigens on RBCs and anti-B antibodies in serum. Similarly, blood group B individuals have B antigens on RBCs and anti-A antibodies in serum. Blood group AB individuals have both A and B antigens on RBCs and neither anti-A nor anti-B antibodies in serum. Whereas, blood group O individuals have neither A antigens nor B antigens, but possess both anti-A and anti-B antibodies in serum. The Rh antigens are transmembrane proteins in which the loops exposed on the surface of red blood cells interact with the corresponding antibodies.

Kit Contents:

HiPer® Blood Grouping Teaching Kit enables rapid identification of ABO blood group and Rh factor depending upon the antigen present on the surface of red blood cells.

Table 2: Enlists the materials provided in this kit with their quantity and recommended storage

Sr. No.	Product Code	Materials Provided	Quantity	Storage
			100 expts	
1	TKC104	Anti A Sera	5 ml	2-8°C
2	TKC105	Anti B Sera	5 ml	2-8°C
3	TKC106	Anti RhD Sera	5 ml	2-8°C
4	TKC109	Cavity slide	10 Nos.	RT
5	TKC125	Disposable Mixing Stick	300 Nos.	RT
6	TKC108	Blood Lancet	100 Nos.	RT

Materials Required But Not Provided:

Reagents: 70% Alcohol/ Spirit

Other requirements: Cotton

Storage:

HiPer® Blood Grouping Teaching Kit is stable for 12 months from the date of manufacture without showing any reduction in performance. Store the Anti A Sera, Anti B Sera and Anti RhD Sera at 2-8°C. Other contents can be stored at room temperature (15-25°C).

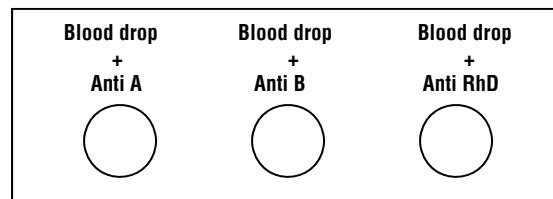
Important Instructions:

1. Before starting the experiment the entire procedure has to be read carefully.
2. Always wear gloves while performing the experiment.
3. Ensure the slide is clean and dry prior to use.
4. Do not allow the antisera reagent dropper to touch the blood sample.
5. The result of the reaction should be interpreted immediately after mixing.
6. Avoid intermixing of the antisera reagents while performing the experiment as it may give false result.

Procedure:

1. Dangle the hand down to increase the flow of blood in the fingers.
2. Clean the fingertip to be pierced with spirit or 70% alcohol (usually ring or middle finger).
3. With the help of the sterile lancet, pierce the fingertip and place one drop of blood in each of the cavities.

4. Add one drop of antiserum into each cavity as shown below:



- Mix each blood drop and the antiserum using a fresh mixing stick.
- Observe agglutination in the form of fine red granules within 30 seconds. Anti RhD takes slightly longer time to agglutinate compared to Anti A and Anti B.

Note: Proper care should be taken while disposing the lancet and mixing sticks.

Observation and Result:

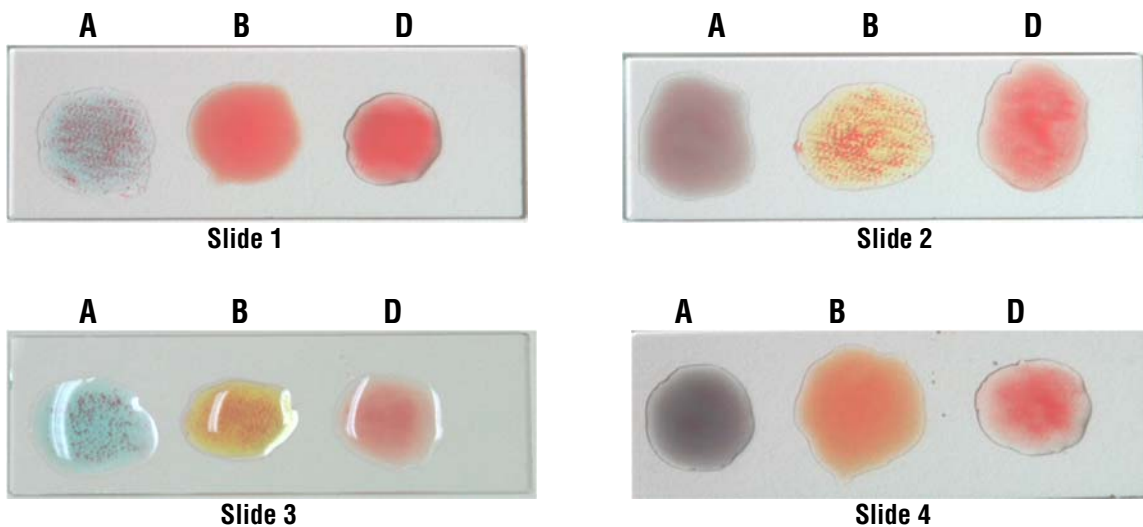


Table 3: Determination of blood group and Rh factor based on agglutination seen

Sr. No.	Anti A	Anti B	Anti RhD	Blood Group
Slide 1	✓	✗	✓	A +ve
Slide 2	✗	✓	✓	B +ve
Slide 3	✓	✓	✓	AB +ve
Slide 4	✗	✗	✓	O +ve

✓ : Agglutination
 ✗ : No agglutination

Interpretation:

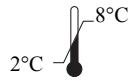
- If agglutination is observed when blood is mixed with Anti A reagent, then the individual is said to have blood group “A”.
- If agglutination is observed when blood is mixed with Anti B reagent, then the individual is said to have blood group “B”.
- If agglutination is observed when blood is mixed with Anti A and Anti B reagent, then the individual is said to have blood group “AB”.
- If no agglutination is observed when blood is mixed with Anti A and Anti B reagent, then the individual is said to have blood group “O”.
- If agglutination is observed when blood is mixed with Anti RhD reagent, then the individual is said to have “+ve” Rh factor.
- If no agglutination is observed when blood is mixed with Anti RhD reagent, then the individual is said to have “-ve” Rh factor.

Troubleshooting Guide:

Sr.No	Problem	Possible Cause	Solution
1.	False positive result	The antisera reagents mix with each other	Ensure that the antisera reagents are added properly onto the respective cavity without spilling to the sides
		Incubated for a longer time	The results should be read within the time period mentioned in the brochure
2.	No agglutination observed	Antisera not stored under proper conditions	Ensure that the antisera is stored in refrigerator (2-8°C)

Technical Assistance:

At HiMedia we pride ourselves on the quality and availability of our technical support. For any kind of technical assistance, mail at mb@himedialabs.com



Storage temperature



Do not use if package is damaged



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