

Ministry of Higher Education
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University of Ishik
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Practical Animal physiology Lab. 3 (4th Grade)

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▶ Objective:

The objective of these laboratory students at the end of these lab. Should be able to know what are blood groups ,cross matching and their procedures.

Blood groups and matching



Blood groups and matching

*Experiments with blood transfusions have been carried out for hundreds of years. Many patients have died and it was not until 1901, when the Austrian **Karl Landsteiner** discovered human blood groups, that blood transfusions became safer. He found that mixing blood from two individuals can lead to blood clumping. The clumped RBCs cause toxic reactions. This can be fatal.*

✓ There are a number of different blood group systems, with the International Society of Blood Transfusion recognizing up to **30** major group systems. The two main blood group systems are ABO antigens and RhD (*Rhesus*) antigens. It is essential to know blood group of a person if he is encountered by anyone of the following circumstances:

1. Blood transfusions

2. Paternity disputes

3. Medico-legal problems

4. Organ transplantations

- ✓ Blood group is determined by the presence or absence of specific antigens (proteins) on the surface of red blood cells (RBC). The ABO blood typing system groups your blood into one of four categories:
 - ▶ **Group A:** RBCs contain A antigens and the plasma has anti-B antibodies.
 - ▶ **Group B:** RBCs contain B antigens and the plasma has anti-A antibodies.
 - ▶ **Group AB:** The red blood cells have both A and B antigens, however there are no antibodies.
 - ▶ **Group O:** This time the plasma contains both types of antibodies but neither type of antigen.

✓ Then, there is the Rh factor blood grouping system:

- ▶ **Rh⁺**: People with Rh-positive blood have Rh antigens on the surface of their red blood cells.
- ▶ **Rh⁻**: People with Rh-negative blood do not have Rh antigens.

✓ Crossmatching

- ▶ *Crossmatching is the final step in pretransfusion testing. It is commonly referred to as compatibility testing. Serum from the patients is mixed with red blood cells from the donor. If clumping occurs, the blood is not compatible; if clumping does not occur, the blood is compatible.*
- ▶ **Note:**
- ▶ O blood type is called the **universal donor**. Why?
- ▶ AB blood type is called the **universal recipient**. Why?

✓ Procedure

- ▶ Obtain a clean slide, a Hema-tag (with circles), and 3 toothpicks.
- ▶ Dangle the hand down to increase the flow of blood in the fingers.
- ▶ Clean the fingertip with 70% alcohol (usually ring or middle finger).
- ▶ With the help of the sterile lancet, pierce the fingertip and place one drop of blood in each of the cavities.
- ▶ Add one drop of antiserum into each cavity
- ▶ 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.

✓ References:

- ▶ <https://www.youtube.com/watch?v=LL27zN8tF1Y>
- ▶ https://en.wikipedia.org/wiki/Precursor_cell
- ▶ <https://www.youtube.com/watch?v=cWhvnTuexlo>
- ▶ <https://www.google.iq/search?q=what+is+blood+group+system&oq=what+is+blood+gr&aqs=chrome.2.0j69i57j0l4.7770j0j4&sourceid=chrome&ie=UTF-8>
- ▶ <https://www.youtube.com/watch?v=vG-B0Ht0gRk>

Thank you

The background features abstract, overlapping geometric shapes in various shades of blue, ranging from light sky blue to deep navy blue. These shapes are primarily located on the right side of the frame, creating a modern, layered effect against the white background.