

Blood grouping

Human blood grouping is based on the presence or absence of certain proteins, called antigens, on the surface of red blood cells. There are many different blood group systems, but the most well-known are the ABO and Rh systems.

ABO system: The ABO system is based on the presence or absence of two antigens, called A and B, on the surface of red blood cells. There are four blood types in the ABO system: A, B, AB, and O.

- Type A blood has only the A antigen on red blood cells
- Type B blood has only the B antigen on red blood cells
- Type AB blood has both the A and B antigens on red blood cells
- Type O blood has neither the A nor B antigen on red blood cells

▪ Rh system:

The Rh system is based on the presence or absence of another antigen, called the Rh factor, on the surface of red blood cells. If someone has the Rh factor, they are Rh-positive (Rh+), and if they do not have the Rh factor, they are Rh-negative (Rh-).

Other blood group systems:

- There are many other blood group systems that are less well known but still important for medical purposes, such as the Kell, Duffy, and Kidd systems. Each system is based on a different set of antigens and can be used for more specific matching in blood Transfusions or organ transplants.
- Blood grouping is important for blood transfusions and organ transplants, as a mismatch in Blood type can lead to a potentially life-threatening reaction by the recipient's immune System. Therefore, it is important to determine a person's blood type before any medical Procedures involving blood or blood products.

Rh factor

- The Rh factor is a type of protein that is present on the surface of red blood cells in most people. If a person has the Rh factor, they are Rh-positive (Rh+), and if they do not have the Rh factor, they are Rh-negative (Rh-).
- Rh factors are important in blood transfusions and in pregnancy. If an Rh-negative woman becomes pregnant with an Rh-positive foetus, there is a risk that her immune system will Recognize the Rh factor as foreign and produce antibodies against it. This is known as Rh

Sensitization and can cause haemolytic disease of the new born (HDN), a condition in which the mother's antibodies attack the baby's red blood cells, leading to anaemia and other Complications.

- To prevent Rh sensitization in a pregnancy, an Rh-negative mother may receive an injection of a medication called Rh immunoglobulin (RhIg) at certain points during the pregnancy and after delivery. RhIg works by binding to any Rh-positive foetal cells in the mother's bloodstream before they can stimulate her immune system to produce antibodies.
- In blood transfusions, it is important to match the Rh factor of the donor blood with the recipient's blood to prevent a similar immune response. For example, an Rh-negative person should receive Rh-negative blood to avoid developing antibodies against the Rh factor.
- Rh factors are just one aspect of blood grouping, which also includes the ABO blood group system and other less common blood group systems. Knowing a person's blood type and Rh factor is important for medical procedures involving blood or blood products to ensure compatibility and prevent complications.