

# ABO Blood Groups, Rh Factor and Paternity

Human blood can be grouped into one of four main groups O, A, B and AB. First discovered in 1901 by Nobel Laureate Karl Landsteiner, the blood grouping system is defined by specific antigens located on the surface of red blood cells.

The frequency of each blood group varies dynamically in ethnic populations throughout the world. For example, group B occurs at a frequency greater than 30% in select Japanese populations, while it is completely absent in the Aborigines.

Group O is the oldest of the blood groups and very common throughout the world. It is found in very high frequency among indigenous populations of Central and South America. It also occurs with relatively high frequency among Australian Aborigines and Western European populations. In the United States, group O is found at a frequency of 44%.

Group A is the second oldest blood group, first appearing around 25,000 to 15,000 B.C. It is found frequently in Central and Eastern Europe and tends to be the dominant group in Norway, Denmark, Austria, Armenia and Japan. Group A is found at a frequency of 42% in the United States.

Group B emerged between 15,000 and 10,000 B.C. as tribes migrated from Africa to Europe, Asia and the Americas and mingled with other populations. This group is found with a frequency of 25% in Chinese or Asian communities and in the United States at a frequency of 10%.

Group AB is the newest and rarest blood group, appearing between 500 and 1,000 years ago. It is believed to have occurred as a response to the mixing of existing blood groups on a major scale. It is found at a frequency up to 10% in populations in Japan, China and Pakistan. Group AB is present in US populations at a frequency of 4%.

Blood type antigens are inherited from the father and the mother. Depending on the blood types of the two individuals it is sometimes possible to exclude an alleged father, but not prove paternity. Blood typing, based on the ABO blood group system, is not an accurate method for determining paternity. It eliminates (excludes) only 30% of the entire male population from being the possible father. While useful in predicting possible paternity scenarios, it is not useful for a legal determination of paternity.

Rh type is inherited similarly to blood type groups. For example, if you are Rh positive, you can have genes for both Rh positive and Rh negative. If you are Rh negative, both of your genes are Rh negative.

## Summary of Possible Child Blood Types

Parent A Blood Type	Parent B Blood Type	Possible Child Blood Types
A	A	A, O
A	B	A, AB, B, O
A	AB	A, AB, B
AB	AB	A, AB, B
B	B	B, O
B	AB	A, AB, B
O	O	O
O	A	A, O
O	B	O, B
O	AB	A, B
Rh+	Rh-	Rh+, Rh-
Rh-	Rh-	Rh-
Rh+	Rh+	Rh+, Rh-

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