

Important Word Roots

Erythrocyte • Erethros = Red • Cyte = Cell	Agglutinate • Glutin = to Glue
Rh Factor (+/-) • Named for being studied in R hesus Monkeys	RBC = Red Blood Cell

What are blood types?

There are **3 alleles**, or genes, for blood type:

- **A**
- **B**
- **O**

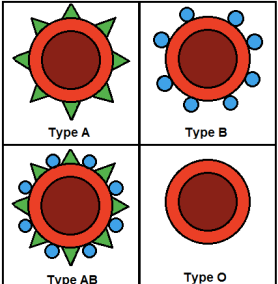
Blood Types ★

AA or AO = Type A
 BB or BO = Type B
 OO = Type O
 AB = Type AB

Since we have 2 genes, there are 6 possible combinations but only **4 blood types, A, B, AB, O**.

Surface Proteins

Surface **proteins** & **carbohydrates**, on the surface of RBC's determine blood type.



Antibodies in the Plasma				
	Group A	Group B	Group AB	Group O
Red blood cell type				
Antibodies in Plasma			None	
Antigens in Red Blood Cell	A antigen	B antigen	A and B antigens	None

ABO Blood Group

- Type A** blood has A antigens on red blood cells and anti-B antibodies in the plasma.
- Type B** blood has B antigens on red blood cells and anti-A antibodies in the plasma.

Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.

Type A blood

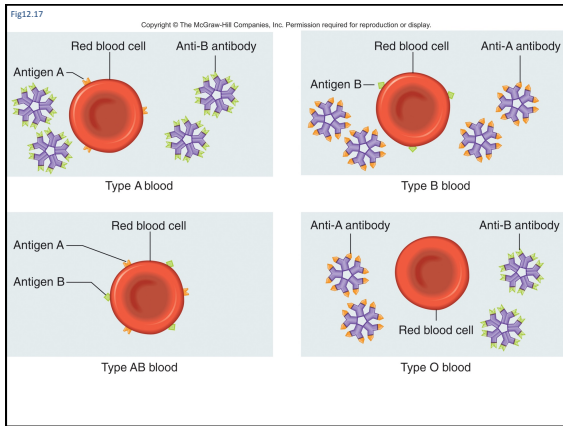
Type B blood

ABO Blood Group

- Type AB** blood has both A and B antigens, but no antibodies in the plasma.
- Type O** blood has neither antigen, but both types of antibodies in the plasma.

Type AB blood

Type O blood




How common is your blood type?

TYPE	DISTRIBUTION	RATIOS	
O +	1 person in 3	38.4%	46.1%
O -	1 person in 15	7.7%	
A +	1 person in 3	32.3%	38.8%
A -	1 person in 16	6.5%	
B +	1 person in 12	9.4%	11.1%
B -	1 person in 67	1.7%	
AB +	1 person in 29	3.2%	3.9%
AB -	1 person in 167	0.7%	

<http://www.bloodbook.com/type-facts.html>

Rh Factors

- Scientists sometimes study **Rhesus monkeys** to learn more about the human anatomy because there are certain similarities between the two species.

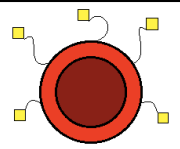


A+ A-
B+ B-
AB+ AB-
O+ O-

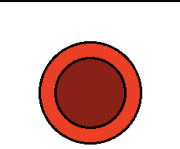
<http://www.fi.edu/biosci/blood/rh.html>

Rh Factors

- The **presence** of the protein, or **lack** of it.
 - If your blood contains the protein, your blood is said to be Rh **positive** (Rh+).
 - If your blood does not contain the protein, your blood is said to be Rh **negative** (Rh-).



Rh (+) Positive



Rh (-) Positive

A+ A-
B+ B-
AB+ AB-
O+ O-

Blood Transfusions

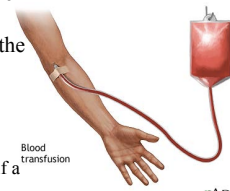
Background: When RBCs carrying one or both antigens are exposed to the corresponding antibodies, they **agglutinate**; that is, **clump together**.

- People usually have antibodies against those red cell antigens that they lack.

	Anti-A	Anti-B	Anti-AB	A cells	B cells	O cells
A						
B						
AB						
O						

Blood Transfusions

- **What:** A **blood transfusion** is a procedure in which blood is given to a patient through an intravenous (IV) line in one of the blood vessels to replace blood lost.
 - Lost during surgery or a serious injury.
 - A transfusion also may be done if a person's body can't make blood properly because of an illness.
 - Required after loss of 40% of blood or more



Blood transfusion
©ADAM

Blood Transfusions

Who can give you blood?

- TYPE O** blood are called **Universal Donors**
 - They can give blood to any blood type.
 - They do not have any surface antigens that recipients blood cells will attack.
- TYPE AB** blood are called **Universal Recipients**
 - They can receive any blood type.
 - They do not have antibodies in their blood to attack donor blood.

Rh + → Can receive + or -
Rh - → Can only receive -

What Blood Can a Patient Receive?

Quick game - random patients
 Can't be bothered about high score lists and other fancy stuff? Play as many times as you like with randomly selected patients!

Mission based game
 Want a bigger challenge, missions, achievements and a chance to end up at the high score list? Then this is the choice for you!

Quick game - same patients
 Each time you play, the three patients are always the same ones, as are their blood types. Just like the old blood typing game!

Helpful Review Videos

Posted on the Webpage

Homework: Game with Handout

ABO:
 - Antigen: marker
 - Antibody Ig immix

Blood Types
