Important Word Roots

Erythrocyte	Agglutinate
• Erethros = Red • Cyte = Cell	• Glutin = to Glue

Rh Factor (+/-)	RBC = Red Blood Cell
• Named for being studied in Rhesus Monkeys	

What are blood types?

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

- A
- B
- O

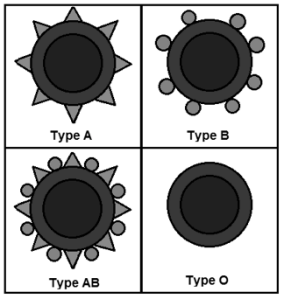
Blood Types ☆

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.



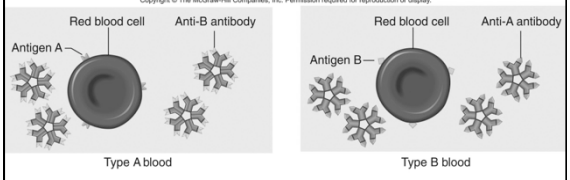
Antibodies in the Plasma

In the plasma, the fluid that RBC's circulate in, there are antibodies that can detect foreign blood

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

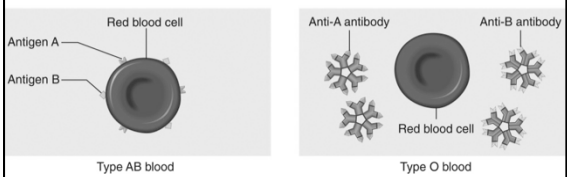
ABO Blood Group

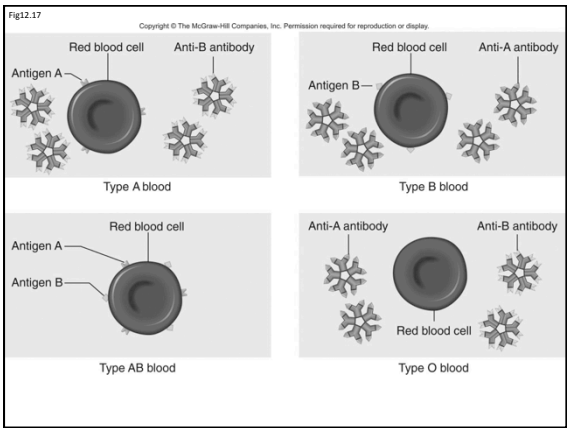
- ***Type A*** *blood* has A antigens on red blood cells and anti-B antibodies in the plasma.
- ***Type B*** *blood* has B antigens on red blood cells and anti-A antibodies in the plasma.



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.





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

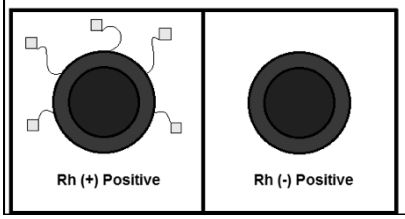
- Scientists sometimes study **Rhesus monkeys** to learn more about the human anatomy because there are certain similarities between the two species.

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-).

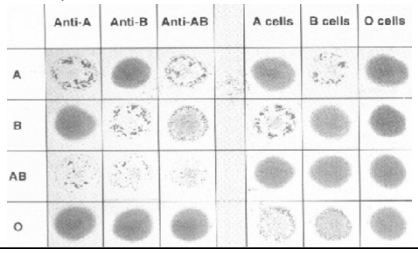


A+ A-
B+ B-
AB+ AB-
O+ O-

Blood Transfusions

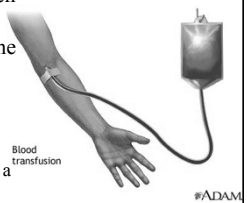
Background: When RBCs carrying one or both antigens are exposed to the corresponding antibodies, they agglutinate; that is, clump together.

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



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



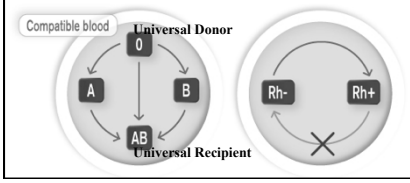
Blood Transfusions

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?

Helpful Review Videos

Posted on the Webpage

Homework: Game with Handout