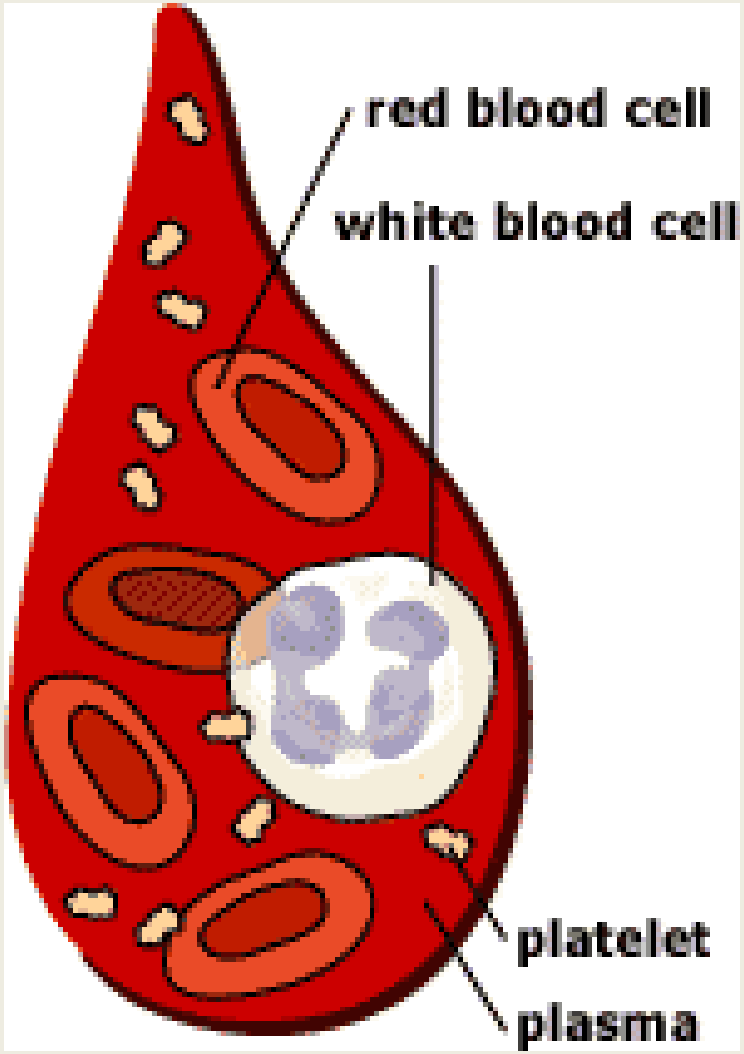
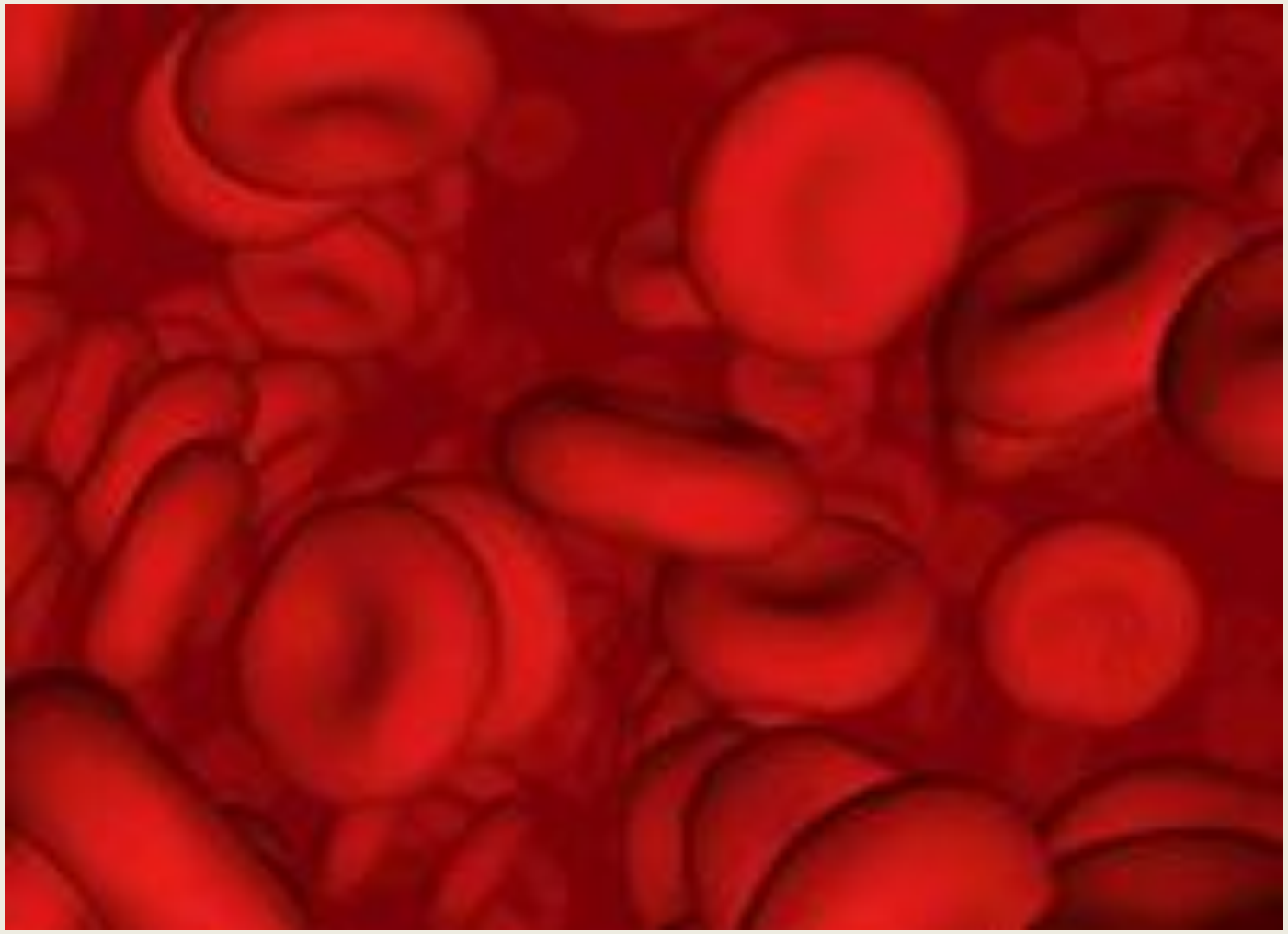
Blood Types

What is blood made up of?



Red Blood Cell



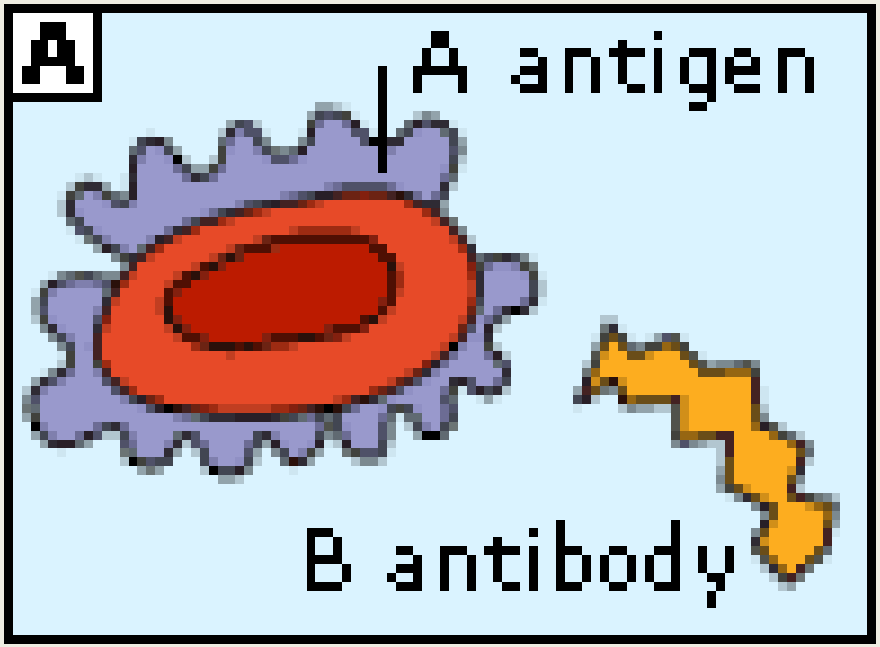
How is your blood type determined?

- Your blood type is established before you are born, by specific genes inherited from your parents.
- These two genes - one gene from your mother and one from your father-determine your blood type by causing proteins called **Antigens** to exist on the surface of all of your red blood cells.

Blood Types

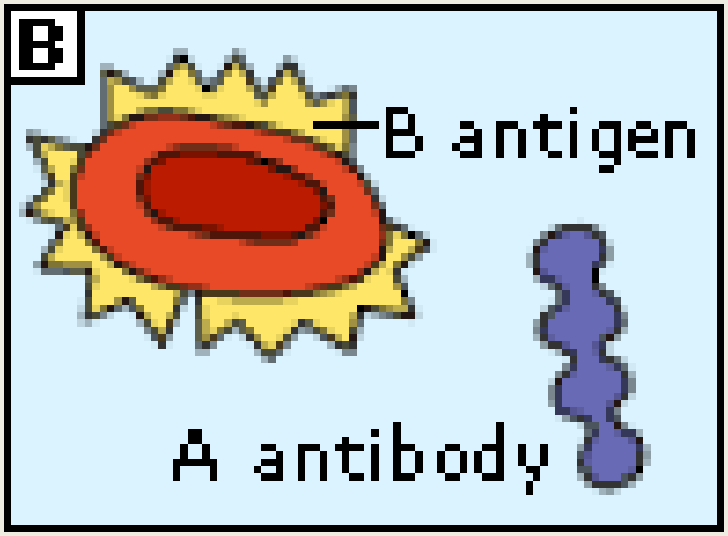
AA or AO = Type A
BB or BO = Type B
OO = Type O
AB = Type AB

What are Blood Types?



- **Blood Type A**
  - If you have type A blood, you have A antigens on the surface of your red blood cells and B antibodies in your blood plasma

Blood Type B

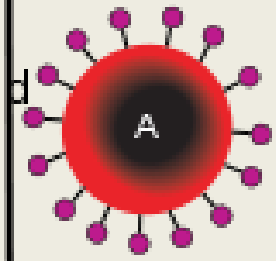
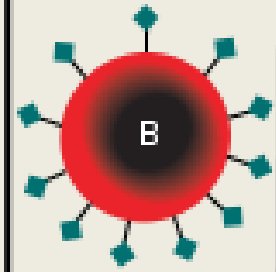
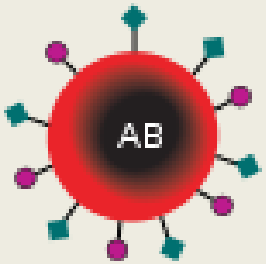
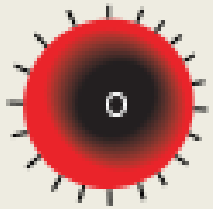


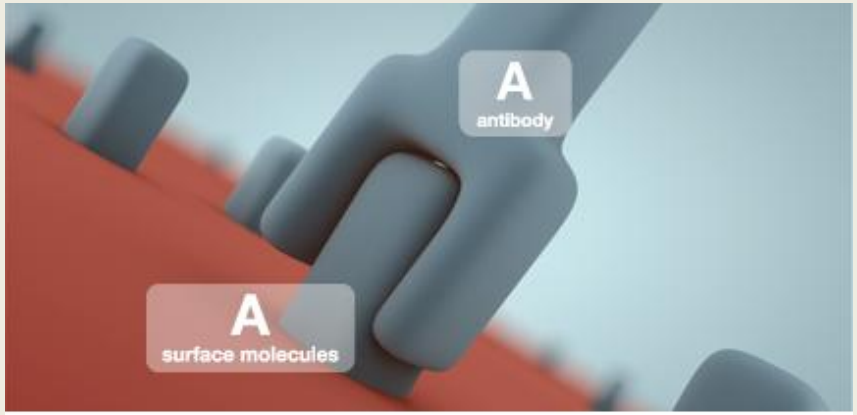
- If you have Type B blood, you have B antigens on the surface of your red blood cells and A antibodies in your blood plasma

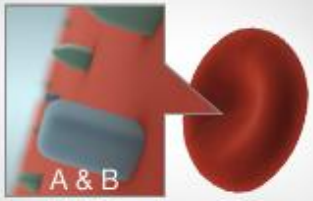
What happens if you add A antibodies to type A blood?

- Try it.
- This is what happens if someone with Type B blood gets a transfusion with Type A blood.
- What might you see in the test tube?

Other ways to represent antigens and antibodies.

	Group A	Group B	Group AB	Group O
Red blood cell type				
Antibodies present	 Anti-B	 Anti-A	None	 Anti-A and Anti-B
Antigens present	A antigen	B antigen	 A and B antigens	None

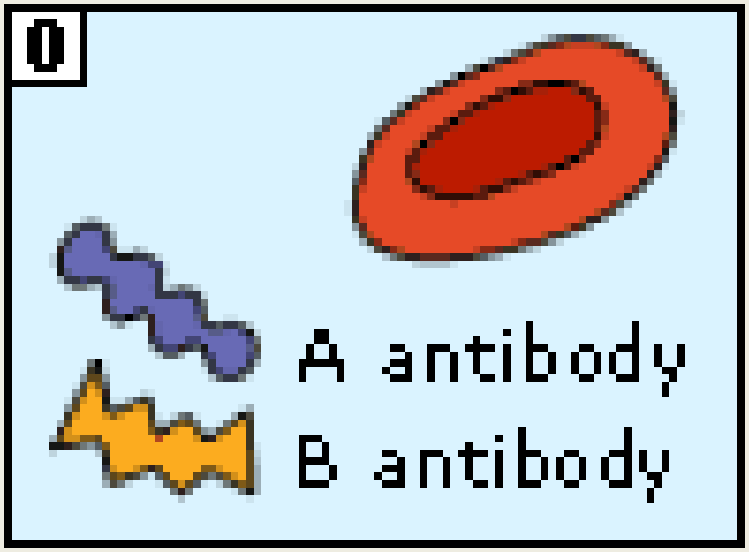


blood type	red blood cell surface molecules	plasma antibodies
type A		 B only
type B		 A only
type AB		neither
type O		 both

Blood Type AB

- If you have AB blood type, you have both A and B antigens on the surface of your red blood cells and no A or B antibodies at all in your blood plasma

Blood Type O

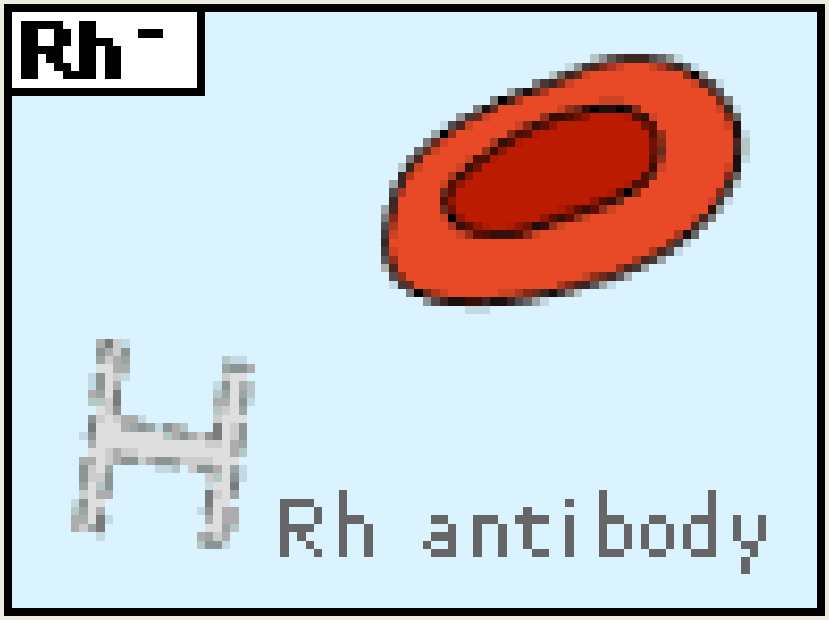


- If you have O blood type, you have neither A or B antigens on the surface of your red blood cells but you have both A and B antibodies in your blood plasma

What happens if you add B antibodies to type AB blood?

- Try it!

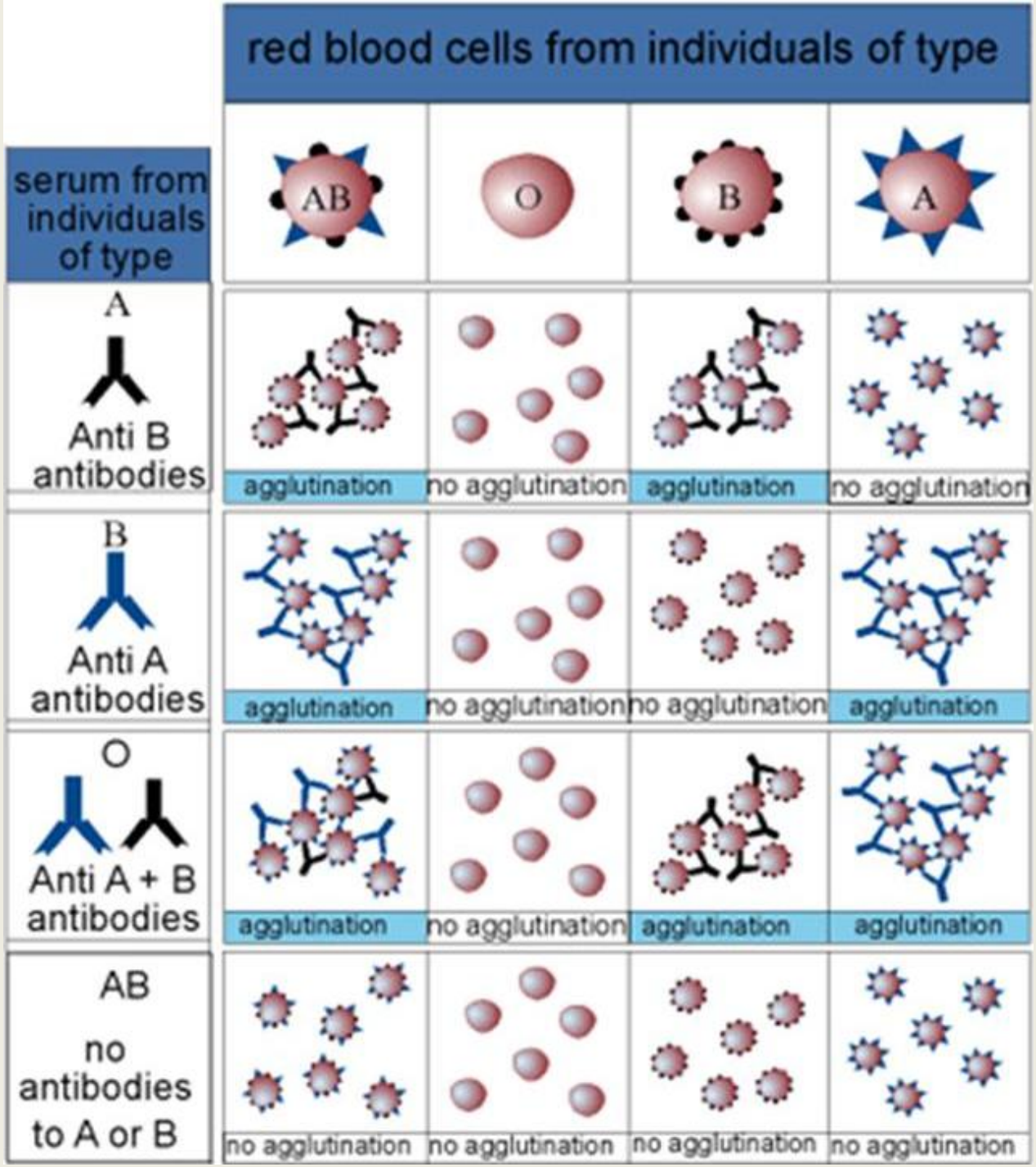
Rh factor

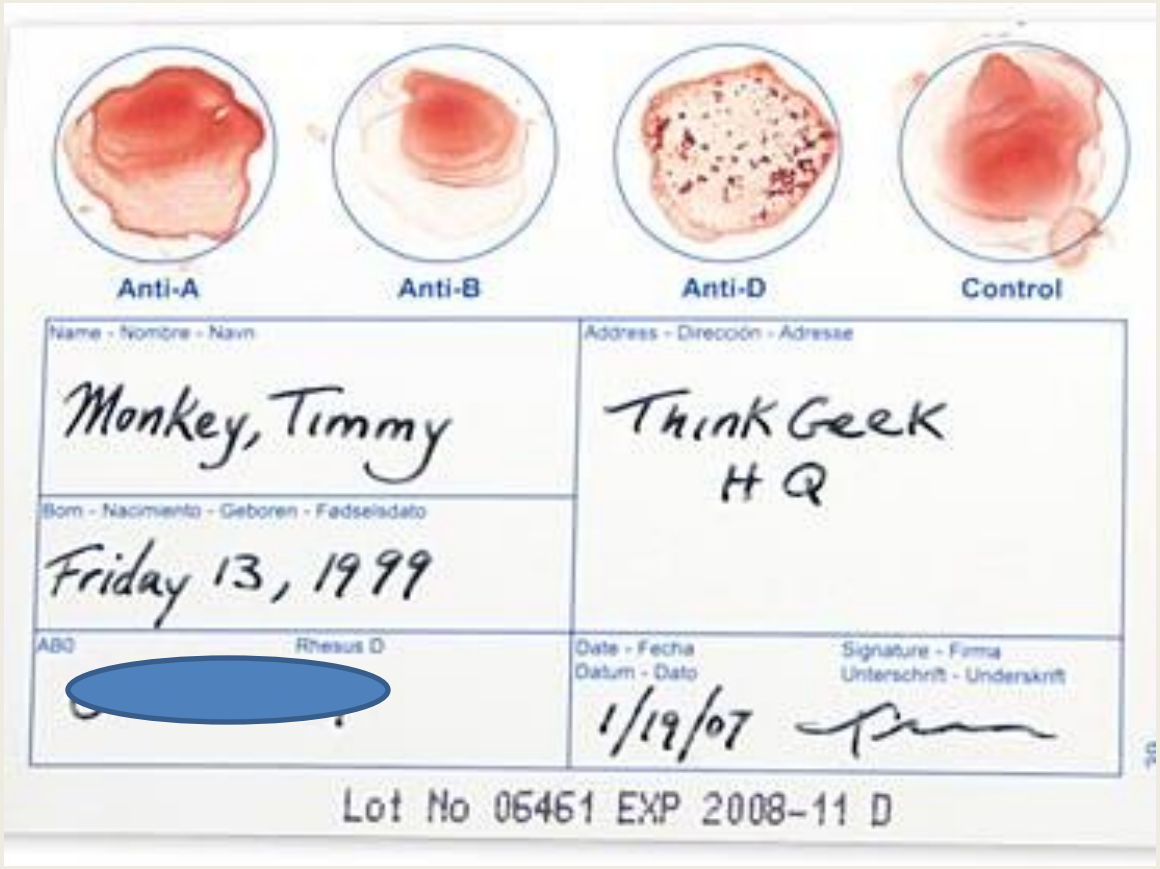


How do you find out blood types?

1. Mix the blood with three reagents
    1. A antibodies
    2. B antibodies
    3. Rh antibodies

    2. Which mixtures agglutinated?


red blood cells from individuals of type
serum from individuals of type
AB
O
B
A
A
Anti B antibodies
agglutination
no agglutination
agglutination
no agglutination
B
Anti A antibodies
agglutination
no agglutination
no agglutination
agglutination
O
Anti A + B antibodies
agglutination
no agglutination
agglutination
agglutination
AB
no antibodies to A or B
no agglutination
no agglutination
no agglutination
no agglutination


Anti-A
Anti-B
Anti-D
Control
Name - Nombre - Navn
Monkey, Timmy
Address - Dirección - Adresse
Think Geek
HQ
Born - Nacimiento - Geboren - Fødselsdato
Friday 13, 1999
ABO
Rhesus D
Date - Fecha
Datum - Dato
1/19/07
Signature - Firma
Unterschrift - Underskrift
Lot No 06461 EXP 2008-11 D

The Crime Scene

- A small pool of blood and a weapon was found near a garbage dumpster. After examining the area, the CSI on the scene discovered a body in the garbage dumpster and identified him as Earnest “One-Eyed” Earl. Earl had a wound to his chest that will be analyzed by the medical examiner.
- The CSI tested blood samples from the blood pool and the weapon at the crime scene. It was determined that it was human blood, but he needs to know the blood type to help identify if it was from the victim or the person who murdered him. He has come up with three suspects that either knew the victim or were seen in the area before the body was discovered. He would like to question them further while he waits for DNA test results.