

The Ins and Outs of Blood

Created by: Caitlin King

Blood: A type of tissue in the body, it is comprised of millions of different types of cells. Primary functions include delivering oxygen, nutrients, getting rid of waste, and helping to fight against viruses or bacteria that enter our bodies.

Fun Fact: The scientific prefix for blood is “hema”-meaning “blood” in Greek. Combined with “-tology” (the study of) you get *hematology*, the study of blood. Looks familiar? East Bay offers a class about the functions and different parts of blood! Immunology, or the study of the immune, is also a class offered that is dedicated to the function of white blood cells and your entire immune system!

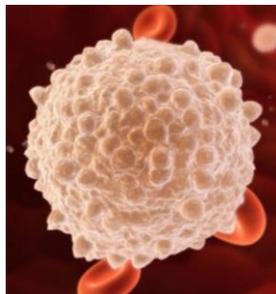
Blood can be broken down into four different categories:



Red blood cells: These are the cells in charge of transporting oxygen (by binding to a compound called hemoglobin) throughout the entire body and are made in your bones. Often in the shape of a disk that’s been pinched in the middle, arteries carry blood with oxygen and veins carry blood without oxygen back through your body to collect more. What’s the difference?

Arterial blood: Meaning blood from your arteries, it looks like a bright crimson

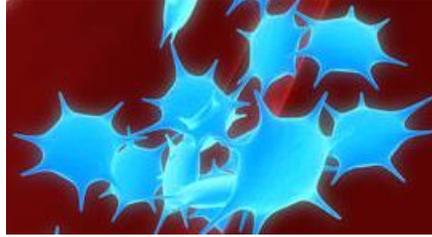
Venus blood: Meaning blood from your veins, it looks like a dark wine



White blood cells: Similar to the look of a spiky, white tennis ball, these cells are in charge of your body’s immune system. They help to defend against pathogens (anything that can cause disease) by fighting off and sometimes eating foreign matter. Also made in the bones, white bloods might not be numerous, but they have a wide reach throughout all your organs.

The Ins and Outs of Blood

Created by: Caitlin King



Platelets: Miniscule dots that can push out little tentacles, these cells oversee clotting. That means when you get a cut or injury, it's their job to stick around the wound and close it by forming a mesh at the site so it doesn't get infected. So now you know where that scab came from a couple days later!

Plasma: The liquid form of blood, this substance helps to carry your cells throughout your body. It allows things like proteins, nutrients, water and sugar to travel to all your organs.

Fun Fact: Did you know that red blood cells carry NO DNA? That's right! Red blood cells contain no genetic material, all your DNA is carried in your white blood cells. So next time you watch that crime show, and they tell you they got DNA from red blood cells, you can shake a finger at them!

Red blood cells can be further categorized by what type of letters is used.

But first some important key terms:

Antigen: A substance that can cause an immune response, like having an allergy

Antibody: Attacks the foreign substance in your body to keep the body healthy; linked with white blood

Group	A	B	AB	O
Red Blood Cell Type				
Antigens Present	 Antigen A	 Antigen B	 Antigen A & B	None
Antibodies Present	 Anti-B	 Anti-A	None	 Anti-A & Anti-B

A: Contains A antigens and B antibodies; this means they can accept blood that is A or O (because there are no antibodies to fight it), but will fight B type blood

B: Contains B antigens and A antibodies; this means they can accept blood that is B or O (because there are no antibodies to fight it) but will fight A type blood

The Ins and Outs of Blood

Created by: Caitlin King

AB: Contains A and B antigens with no antibodies; this means they can accept A, B, or O blood without worrying about blood being attacked. Their nickname is **universal plasma donors** since anyone can accept their antibody free plasma.

O: Contains no antigens but has A and B antibodies; this means O can **only** accept O blood. Their nickname is the **universal red cell donor** since anyone can accept O red blood cells.

Rh: A special factor often included with the types as + or -, depending if they have the factor or not. Rh negative people can only accept blood that is Rh negative, while Rh positive people can accept both types.

If the *wrong* type of blood is given to a person it can cause what's called **hemolysis**, where the body goes into shock and blood starts attacking one another, resulting in blood clots or even the body shutting down.

CHECK TIME! True or False

- _____ The study of blood is called Hematology
- _____ White blood cells make up most of the blood
- _____ Platelets oversee carrying oxygen to the body
- _____ Blood in your arteries is bright red
- _____ Plasma is a liquid form of blood that carries water
- _____ Antigens fight off pathogens in the body after a response with white blood
- _____ A blood contains A antigens
- _____ O blood is nicknamed as the universal blood donor
- _____ Rh positive people can only receive Rh positive blood
- _____ It is okay to give people any type of blood no matter the letter

Answers: T, F, F, T, T, F, T, T, F, F

Don't know your blood type? You can always find out through your doctor or when you donate blood!

References:

The following resources were referenced in the creation of this handout: [One blood's page on definition of blood](#), [Red cross's page on blood types](#), [The Franklin Institute's page picture of red blood cell](#), [Gadget review's page picture of white blood cell](#), [HealthTap's page picture of platelets](#), [Amazon's S3 picture of ABO Blood Group System](#).