

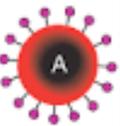
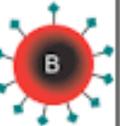
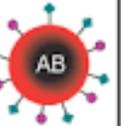
LABORATORY #10 -- BIOL 111

Blood typing—genetics and more!

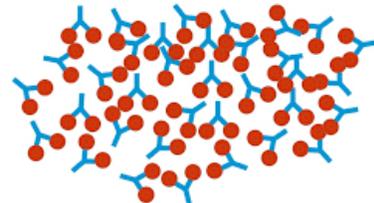
We have learned that blood type (also called ABO blood group) is controlled by one gene with 3 variations/alleles. The variations in phenotypes are A blood type, B blood type, AB blood type, and O blood type. A and B blood types reflect the presence of one of two types of molecules on the surface of red blood cells (RBCs). We will just refer to the molecules as the A antigen and B antigen. AB blood type shows both antigens together on RBCs, O blood type shows neither antigen on RBCs.

Medical providers need to know a patient's blood type in cases in which the patient might act as a donor or recipient of RBCs. This is due to the unusual phenomenon of an immune response against “foreign” RBCs. Antibodies produced in the liquid portion of the blood can clot the RBCs of another type if given in a transfusion. Blood types must be compatible for safe transfusions. Mistakes in matching blood types will cause fatal blood clots.

Study/review the table below. Discuss with your lab group the features of each blood type in terms of RBC antigens and antibodies produced.

	Group A	Group B	Group AB	Group O
Red blood cell type				
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

Agglutination: The action of an antibody when it cross-links multiple antigens producing clumps of antigens



Today we will determine our own blood type (1-2 people/table), and think about the genetics behind expression of a particular blood type, and the compatible blood types for donating and receiving blood. You will use provided solutions which can detect the presence of the A-antigen and B-antigen with a single drop of blood. The solutions cause an agglutination (clumping/clotting) reactions if either the A or B antigen is detected. (or in the case of type AB, both are detected). Don't worry---the reaction occurs outside your body (in vitro) and does not pose any health risk. ☺

Your instructor will give you information on safety in obtaining and disposing supplies used for blood typing. No student is to touch blood of another student. Please dispose all items used for blood typing in provided RED BIOHAZARD BAGS. Disinfect any spills of blood drops with disinfectant provided.

Procedure:

1. Carefully read all of steps of the instructions before you begin!
2. Prepare a blood typing card, placing the 2 blood type-detecting solutions (Serum A and Serum B) in the proper spots on the card.
3. Following the safety instructions of your instructor, disinfect, and puncture one of your finger tips. You will only need 2 decent sized drops of blood.
4. Squeeze your blood from your finger tip onto the spot opposite the serum drops.
5. Carefully, using a toothpick, mix the drop of blood and drop of serum A together.
6. Carefully, using a different/clean toothpick, mix the drop of blood and drop of serum B together.
7. Note how the blood mixtures look right away. They should be fairly smooth mixtures.
8. Gently rock the card back and forth for one minute.
9. Note changes in the blood mixtures. Do they remain smooth looking? Do they clump/clot/agglutinate?
10. Keep the card for observation and begin answering the questions.

****Consider becoming a regular blood donor! Your blood can/will save a life!**

Requirements Lab 10--Blood typing

Name _____

1.
 - A. (3pts) Sketch the outcome of one of the cards from your table. Label and indicate whether agglutination occurred with serum A, Serum B, neither, or both.

 - B. (2 pts) Based on the card you sketch, determine the blood type of the student.

2. (2 pts) Based on the blood type of the student, show all possible genotypes for this student for the I gene.

3. (2 pts) If a student has B blood type, who (which blood types) cannot receive her blood?
Why?

4. (4 pts) Show how 2 parents who do not have O blood type, could produce children with O blood type. (Make and describe a Punnett square.)

5. (1 pt) Why can people with O blood type donate to any other blood type?
Be specific!

6. (1 pt). Why can people with AB blood type receive blood of any other blood type? **Be specific!**