

Determination of Blood Type in a Cohort of College Students

Kayla Caliboso¹, Keawe Dunne¹, Pashyn Morimoto¹, Shawnea Pagat¹, Rebecca Romine¹;
¹University of Hawaii West Oahu

Abstract

Introduction: Blood typing is used to determine antigens present on erythrocytes.

Methods: Twelve subjects participated in the lab. Each subject obtained their own blood sample and determined their blood type using an agglutination test kit.

Results: The most common blood type in the class was O+ at 34%.

Conclusion: Blood typing is essential to many medical procedures and is critical to blood transfusions and emergency situations. At the conclusion of the lab procedures it was determined O+ was the most common blood type.

Introduction

The intent of this laboratory procedure was to identify specific blood types from a cohort of 12 college subjects. This procedure identified a blood type based on the ABO blood group. The four types are A, B, AB, and O. These blood types contain specific cell markers known as antigens and consequently antibodies are produced. Rhesus (Rh) factor, the D antigen, is considered the second most significant blood group system. Any of the four ABO blood groups can be either Rh- or Rh+.¹

Incompatibility of blood types can cause serious health concerns including erythroblastosis and hemolysis. Identifying a patient's blood type is essential for medical cases requiring a transfusion.¹ Blood typing during this procedure was determined using a blood test card and antibody serum.

Methods

- A disposable lancet was used to prick subject's middle finger to obtain a small drop of blood
- A drop of blood was placed onto each of the sections labeled "blood" on the blood card
- Used lancets were disposed of into a sharps container and the finger was cleaned and bandaged
- A drop of Anti-A serum was placed in the section labeled "Anti-A" on the blood card, this step was repeated for the Anti-B and Anti-D serum
- The drops of blood were stirred together with the designated Anti serum, each with a separate plastic toothpick
- The blood card was gently tilted from left to right to further mix each sample
- If the mixture appeared to be granular, agglutination occurred

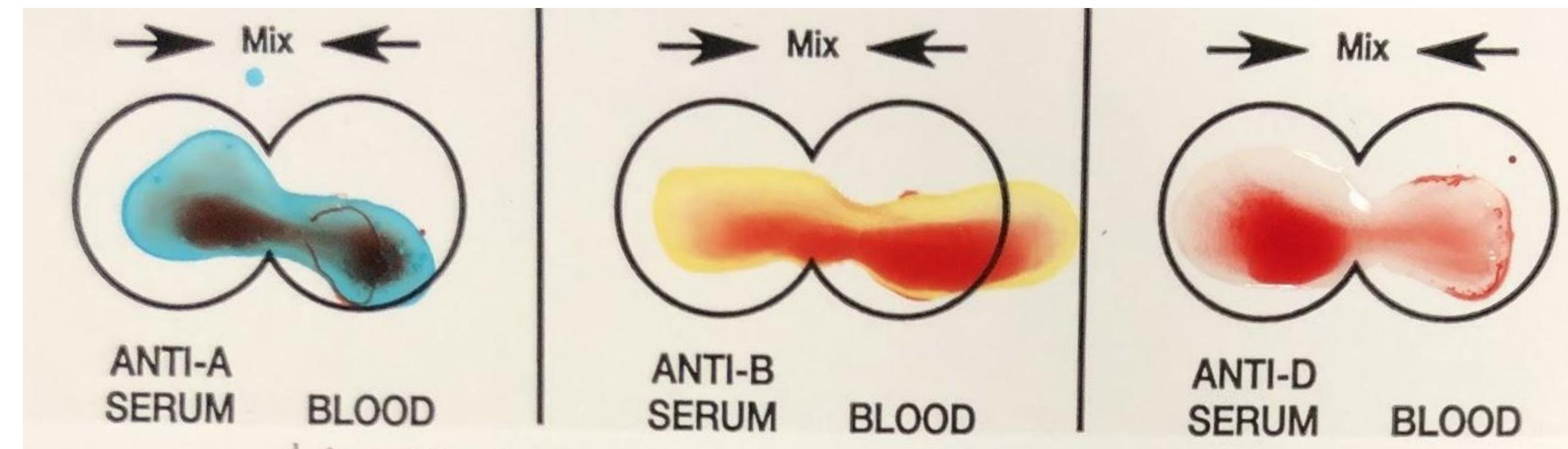


Figure 1. Blood typing card with blood and antibody serum used to visually observe agglutination of antigens. The blood type O+ was identified for this student within the Spring 2020 PHYL 142L class.

Results

- Twelve students from the Spring 2020 PHYL 142L participated in the experiment. The average age for subjects was 21 years of age. Eleven subjects were female and one was male. Three of the subjects identified as Native Hawaiian, seven as Filipino, one as Japanese, and one as Pacific Islander
- The most common blood type was O+ at 33.3%
- Blood types AB+, AB-, or A- were not present in the study

Table 1. Identified blood types for all subjects and percentage of each blood type found.

Blood Type	N	Percent
Type A+	3	25.0%
Type B+	1	8.3%
Type B-	1	8.3%
Type O+	4	33.3%
Type O-	3	25.0%

Blood Types for PHYL 142L Spring 2020

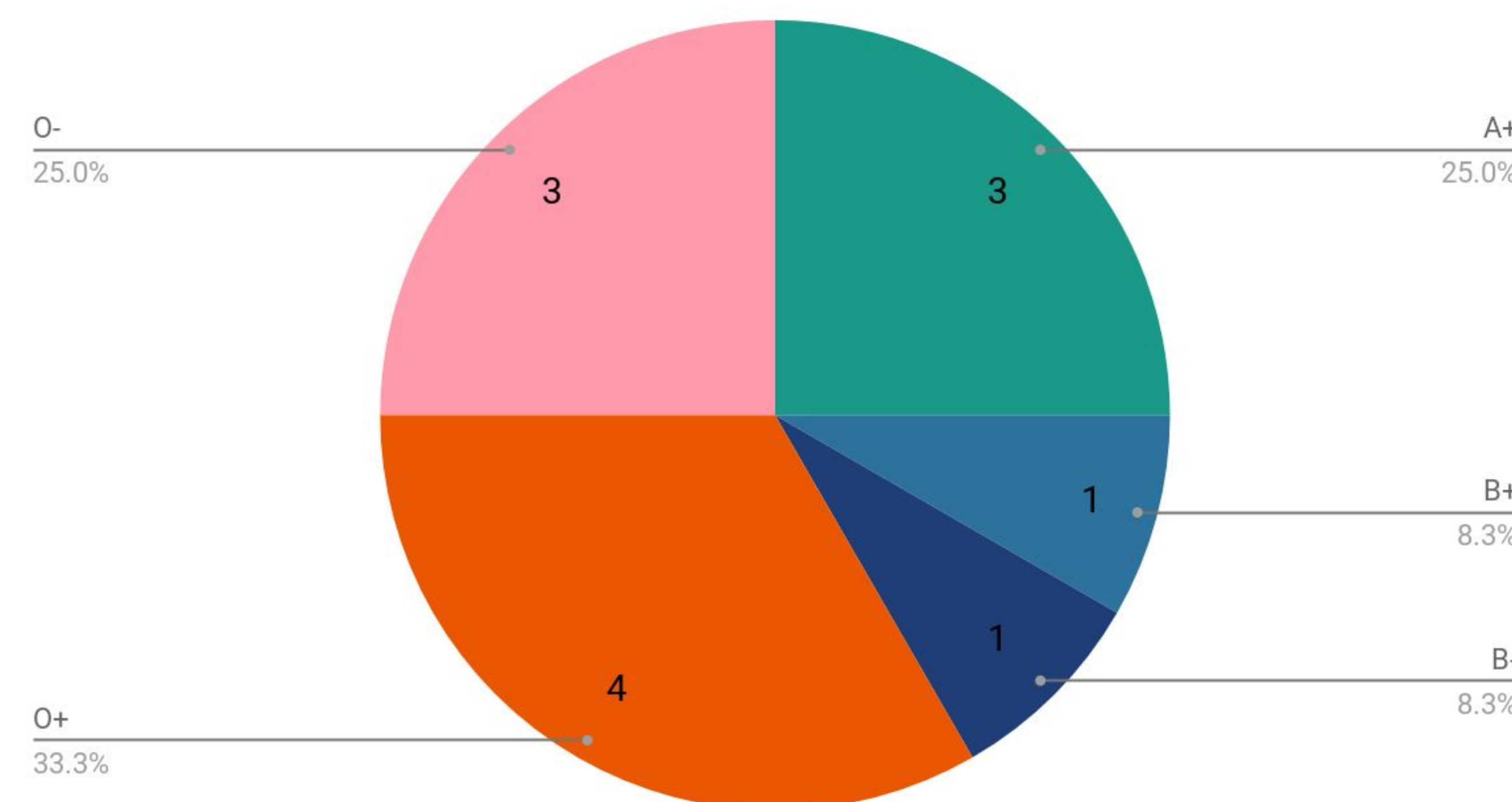


Figure 2. Percentage of each blood type within the Spring 2020 PHYL 142L class.

		Donor's blood type							
		O-	O+	B-	B+	A-	A+	AB-	AB+
Recipient's blood type	AB+	✓	✓	✓	✓	✓	✓	✓	✓
	AB-	✓		✓		✓		✓	
	A+	✓	✓			✓	✓		
	A-	✓				✓			
	B+	✓	✓	✓	✓				
	B-	✓		✓					
	O+	✓	✓						
	O-	✓							

Figure 3. Blood transfusion compatibility chart, displaying which blood donors can donate to which recipients.²

Discussion

- Majority of subjects within the Spring 2020 PHYL 142L class had the blood type O+
- The most common blood type in the United States is O+ at 38% which is similar to data found through this experiment³
- According to state data, blood types O and A are most common among Native Hawaiians, blood type O is most common among Filipinos, and blood type A is most common among Japanese⁴
- Rh- blood is uncommon in Hawaii and in the Spring 2020 PHYL 142L class⁴
- In blood transfusions, doctors must be careful to ensure that patient and donor have compatible blood types to prevent transfusion reactions¹
- Limitations included having small sample sizes for gender and ethnic groups

Conclusions

- Blood typing is a significant medical tool
- Knowing a patient's blood type is critical for a successful blood transfusion
- 12 subjects participated in the experiment to test for their blood type
- O+ was the most common blood type

References

1. Marieb, E.N., & Hoehn, K. (2019). *Human Anatomy and Physiology* (Eleventh). Hoboken, NJ: Pearson Education
2. *Blood donor compatibility chart*. (2018). Retrieved from <https://www.science.org.au/curious/people-medicine/why-are-some-blood-types-incompatible-others>
3. What is the most common blood type? (2016, March 11). Retrieved April 9, 2020, from <https://www.sandiegobloodbank.org/what-most-common-blood-type>
4. Blood Bank of Hawaii. (2011, July). Blood Bank of Hawaii Circulate. Retrieved April 9, 2020, from https://www.bbh.org/wp-content/uploads/2013/07/2011_07_circulate.pdf