

# Practical Physiology

## Blood groups and blood types

### ABO-Rh test



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## **What is blood type test?**

**This is a test that is done to figure out the type of blood type in a person or which blood group they belong in. Not all people have the same blood group as there are many different types, of which some are more commonly found than others.**

**If your blood group matches another person's, then you are said to be "compatible" and could receive or give each other blood when required.**

# Why is blood typing done?

**This procedure is usually done to know the type of blood group a person belongs to. Certain situations arise, such as:**

- When a person needs an organ transplant or blood transfusion, it is necessary that they know the blood group is compatible or not.**
- When women are pregnant, it is important to know if the mother's blood and the child's are compatible.**
- If you're donating blood, you need to know your type so doctors can give it safely.**

# Principle

**The ABO group:** Two of the different antigens on the red blood cells' surface is known as antigen A and B. The ABO system is based on which type of antigen is present on the RBC.

**The different types include:**

**Blood Type A** - The RBCs have only antigen A.

**Blood Type B** - The RBCs have only antigen B.

**Blood type AB** - The cells have both A and B antigens in them.

**Blood Type O** - Neither A or B antigen are present.

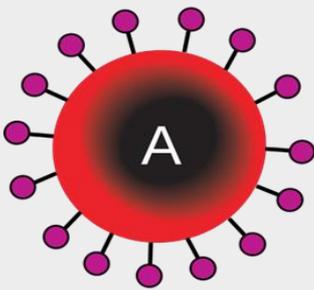
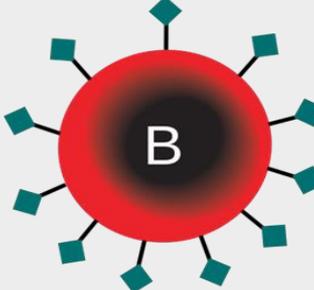
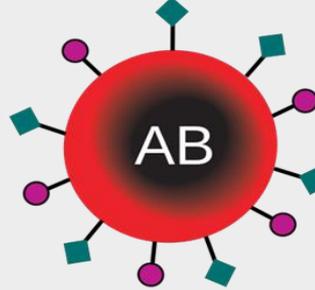
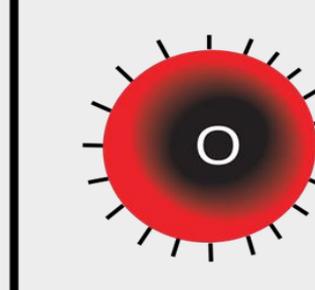
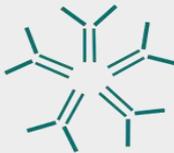
**In the plasma, there are antibodies against the antigens that aren't present in the RBCs.**

**If one is in the A blood group, you'll have antibodies to the antigen B.**

**If one is in the B blood group, you'll have antibodies to the antigen A.**

**If one is in the AB blood group, you'll not have antibodies to the antigen B or A.**

**If one is in the O blood group, you'll have antibodies to the antigen B and A.**

	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

Cell	A antigen	B antigen	A and B antigens	None
Red Blood				
Antigens in				

# **RH factor**

- In addition to antigens of ABO system, the red cells of humans also contain an additional antigen, called Rh antigen (or Rh factor).
- Persons whose red cells contain this additional antigen are called “Rh positive” ( Rh +) while those who lack this antigen are called “Rh negative” (Rh –).
- The Rh (D) antigen is not present in body fluids and tissues, but only on red cells.



Type	You can give blood to	You can receive blood from
<b>A+</b>	A+,AB+	A+,A-,O+,O-
<b>O+</b>	O+,A+,B+,AB+	O+,O-
<b>B+</b>	B+,AB+	B+,B-,O+,O-
<b>AB+</b>	AB+	Everyone
<b>A-</b>	A+,A-,AB+,AB-	A-,O-
<b>O-</b>	Everyone	O-
<b>B-</b>	B+,B-,AB+,AB-	B-,O-
<b>AB-</b>	AB+,AB-	AB-,A-,B-,O-

# Materials

1. Sterile blood lancet, sterile cotton/ gauze swabs, Alcohol and Toothpicks.
2. Clean, dry microscope slides.
3. Anti-A - Anti-B - Anti-D (anti-Rh).



# Determining Blood Type

- 1. Clean your finger with alcohol and let dry.**
- 2. Prick finger with lancet, near the tip but not too close to the nail.**
- 3. Use one slide for ABO typing and Rh factor. Place three drops of blood on the slide, add the appropriate typing serum, and determine blood type.**

# Observations and results

**It is essential that you should be able to distinguish between “agglutination” and “no agglutination”. The features of each are:**

- 1. If agglutination occurs, it is usually visible to the naked eye. The hemolysed red cells appear as isolated (separate), dark-red masses (clumps) of different sizes and shapes.**
- 2. There is brick-red coloring of the serum by the hemoglobin released from ruptured red cells.**



# ABO BLOOD GROUPING INTERPRETATION

## ANTI SERA TYPE

Anti-A



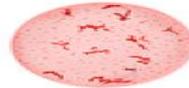
Anti-B



Anti-D



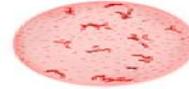
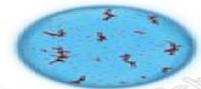
## BLOOD TYPE



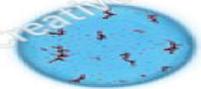
**O+ (O Positive)**



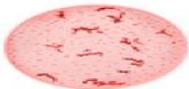
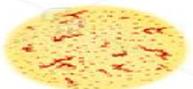
**O- (O Negative)**



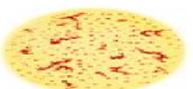
**A+ (A Positive)**



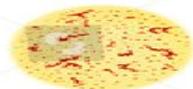
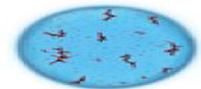
**A- (A Negative)**



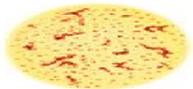
**B+ (B Positive)**



**B- (B Negative)**



**AB+ (AB Positive)**



**AB- (AB Negative)**

**Anti-A**

**Anti-B**

**Anti-D**

