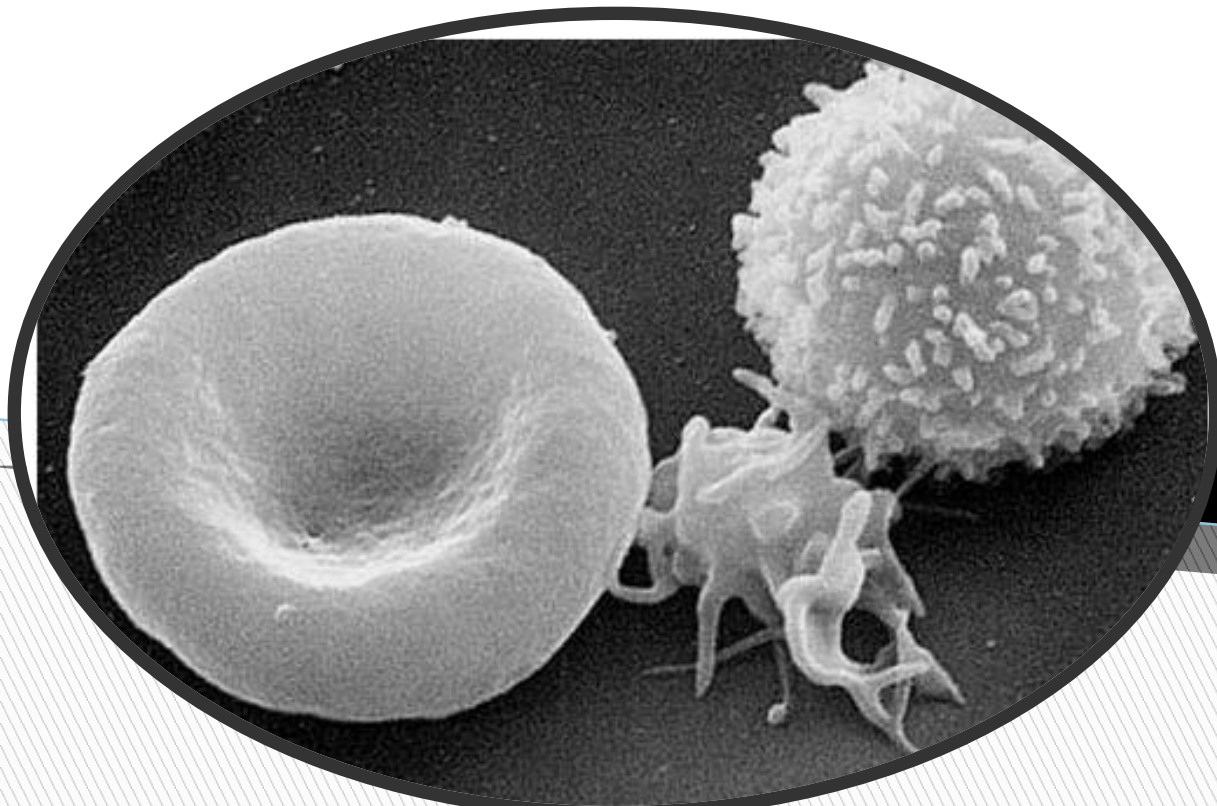


# PHYSIOLOGY LAB





# Colorimetric determination of Hemoglobin (Hb) by Haemometer

## □ Principle :

- Determine the Hemoglobin content through destruction of RBC to get the Hb out by ACID or DISTALL WATER using Haemometer.
- Hemoglobin formation takes place in the developing red cells in bone marrow.



Percentage  
scale



Gram  
scale

MARIENFELD  
LABORATORY GLASSWARE

# Steps



Brownis-3  
h color  
appear

HCL  
(0.1)  
5 drops

HCL  
(0.1)  
Add drops  
till match  
standard tube



# calculations

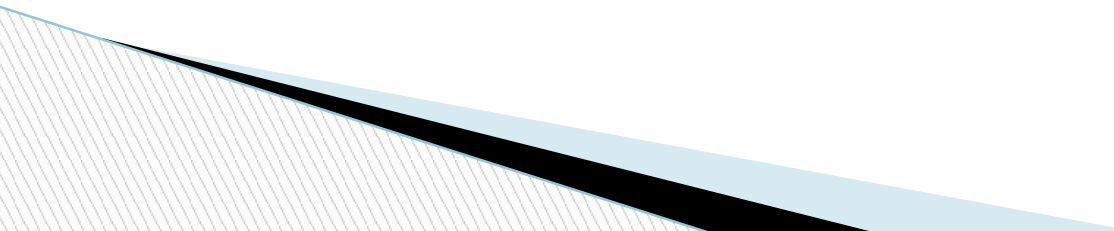
- 1 gm  $\longrightarrow$  6.9%
- Normal values in human:
- 



83-107%

93-118%

# Blood groups

- Foreign RBC may clump together in the form of large aggregates agglutination.
  - That agglutinated RBC are haemolysed releasing a large amount of Hb into plasma .
- 

Agglutinogens

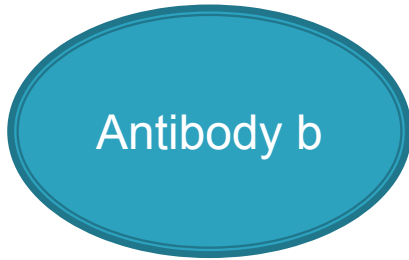
Agglutinins

**Antigen**

antibodies

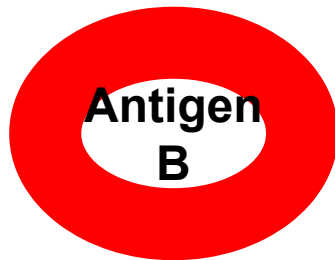
A or B or O

a or b




Agglutinate

Agglutinate





- If the RBC have **antigen A** the corresponding plasma must have **antibody b and not a**
  - If the RBC have **antigen B**, the corresponding plasma must have **antibody a and not**
  - RBC with both **A and B antigen** are present in plasma which has **no antibody** at all
  - Also, RBC contain **antigen O** accompany plasma has both **antibodies a and b**
- 

Blood group

Cell antigens

Plasma antibody

A

A

b

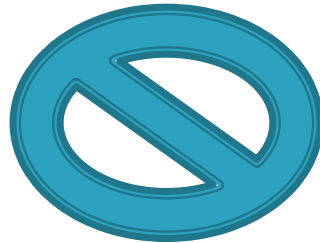
B

B

a

AB

A  
B



O

O

a and b



**Antigen A**



**Antigen B**



**Group A**



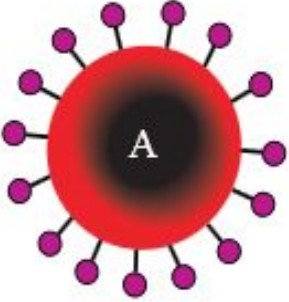
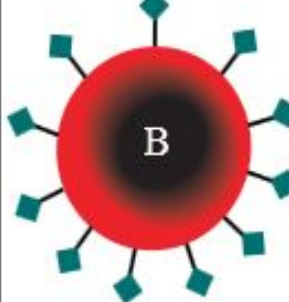
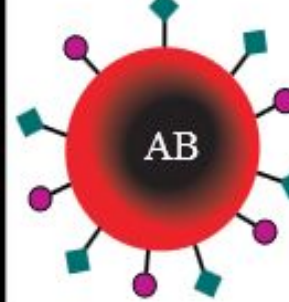
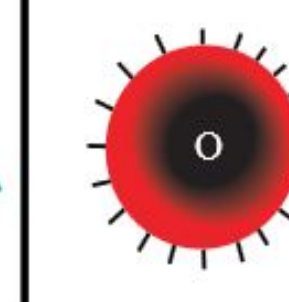
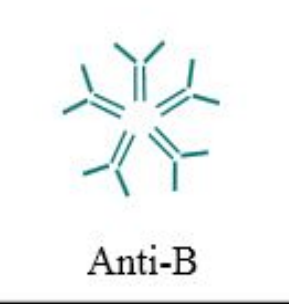
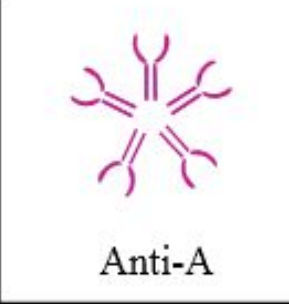
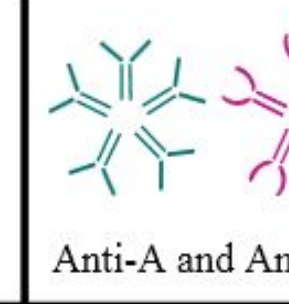


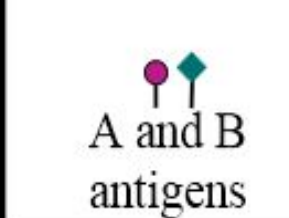
**Group AB**



**Group B**



**Group O**

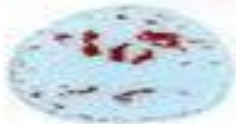
	Group A	Group B	Group AB	Group O
Red blood cell type	 <p>A</p>	 <p>B</p>	 <p>AB</p>	 <p>O</p>
Antibodies in Plasma	 <p>Anti-B</p>	 <p>Anti-A</p>	<p>None</p>	 <p>Anti-A and Anti-B</p>
Antigens in Red Blood Cell	 <p>A antigen</p>	 <p>B antigen</p>	 <p>A and B antigens</p>	<p>None</p>

# Result of transfusion from donors into recipients

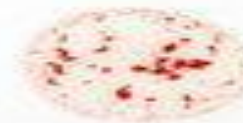
Donor's RBC				Recipient's plasma
O	B	A	AB	
-	-	-	-	AB
-	-	-	+	
-	-	+	+	O
-	+	+	+	

No agglutination

There is agglutination



**A**



**B**



**AB**



**O**



# ABO Blood Reactions

Blood type

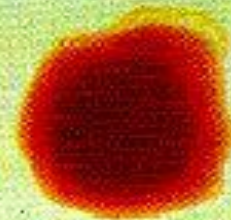
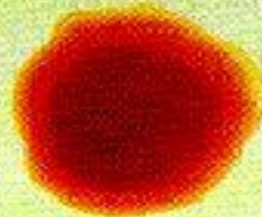
A

B

AB

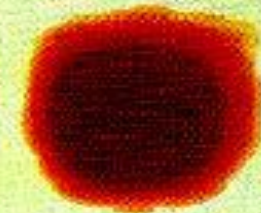
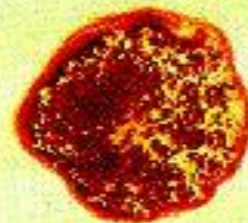
O

Anti-A



Anti-A

Anti-B



Anti-B

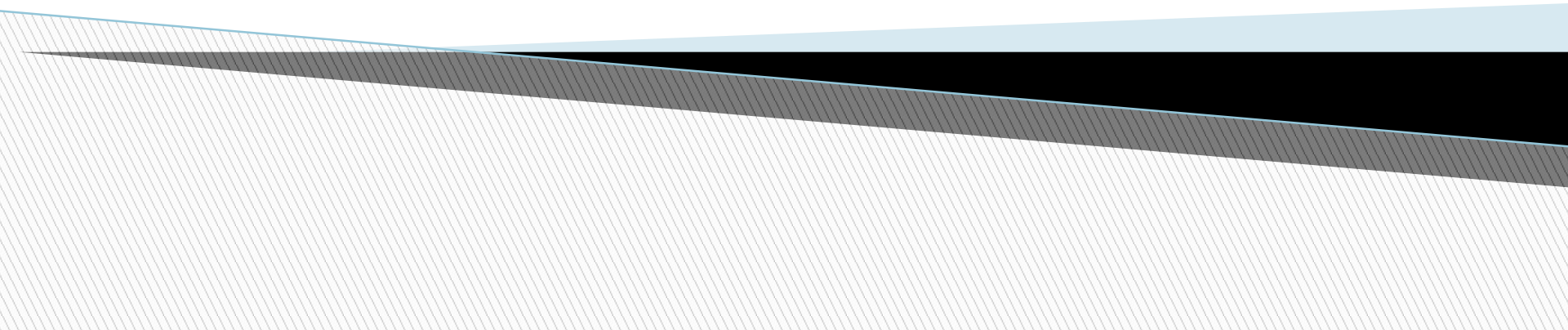
# Site of danger in blood transfusion

- Is that the RBC of the donor which may agglutinate inside the body of the recipient by antibody in plasma of the recipient.
- RBC of the recipient are not affected by the antibodies of the donor. this is because antibodies in the injected plasma of the donor are :



1. Diluted by the recipient plasma
2. Neutralized by the free water soluble antigens present in the recipient's blood and tissue fluids and which are produced by the daily destruction of about 1% of his RBC

# Osmotic behavior of blood



# Osmosis

Low  
concentration of  
water

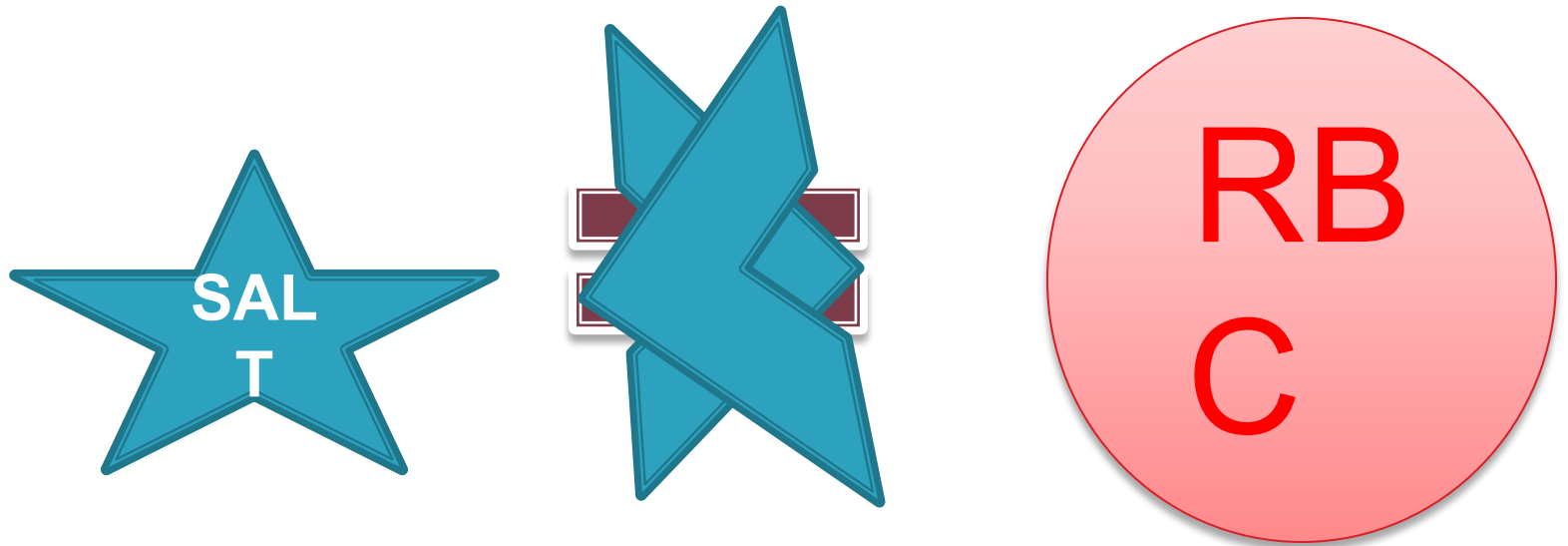


High  
concentration  
of water

**Isotonic solution with normal size (0.9 % NaCl)**

Hypotonic solution : Ruptured (0.18 % NaCl)

Hyper tonic solution : shrunk (10% NaCl)



**Isotonic:** Solute concentrations are equal inside and out.

Cells maintain normal shape.



Place in hypotonic solution.

**Hypotonic solution:** Solute concentration is lower outside the cell.



Cells swell and may even rupture because water is taken into the cell.

Place in hypertonic solution.

**Hypertonic solution:** Solute concentration is higher outside the cell.



Cells shrink because water exits the cell.

# **:Tools**

A-3 test tubes

B- slides

C-cover

D-dropper

# PROCEDURE

Mix , take drop on  
a slide , cover it  
and examine



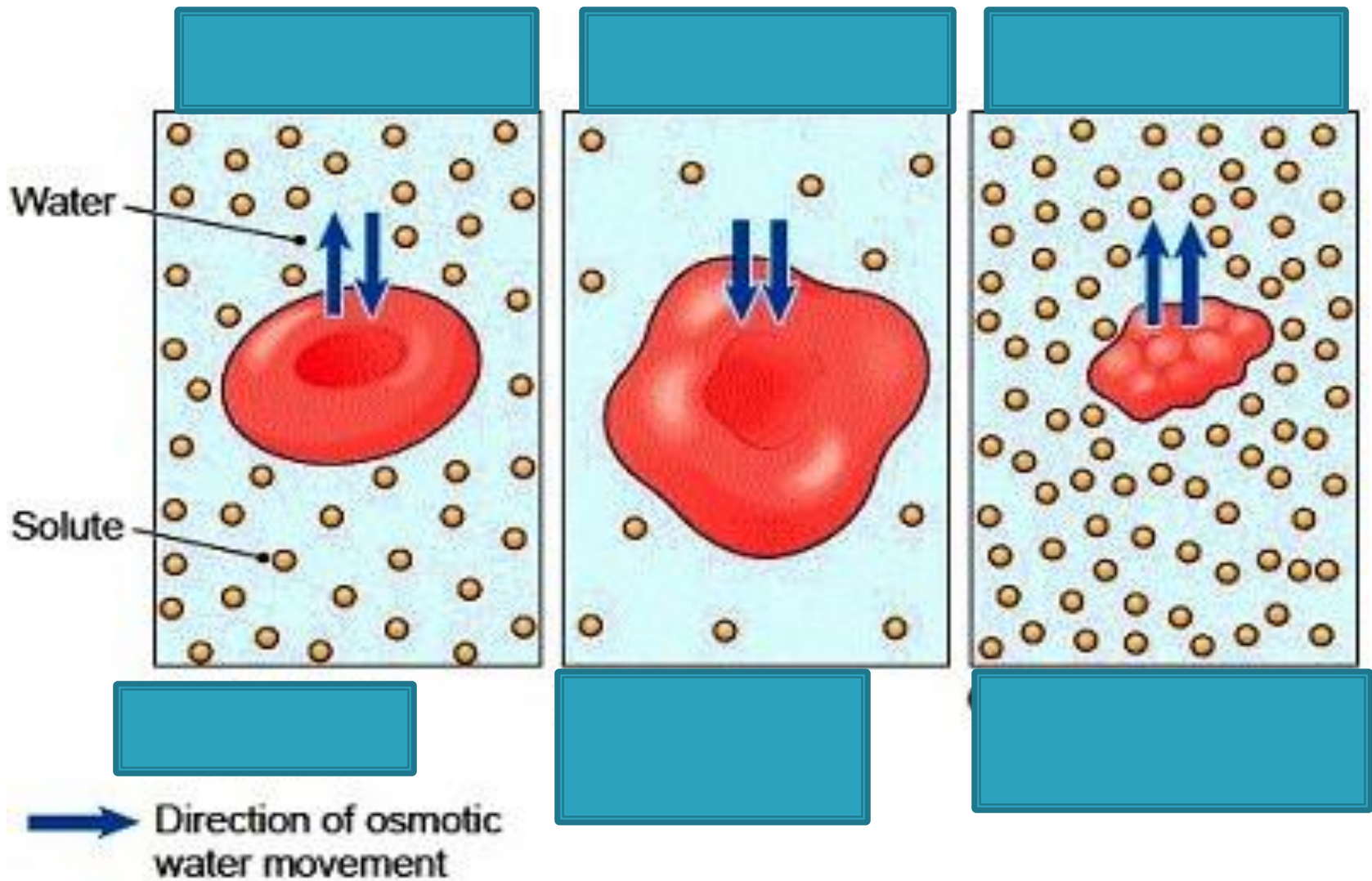
0.9 % NaCl



10.0 % NaCl



0.18 % NaCl



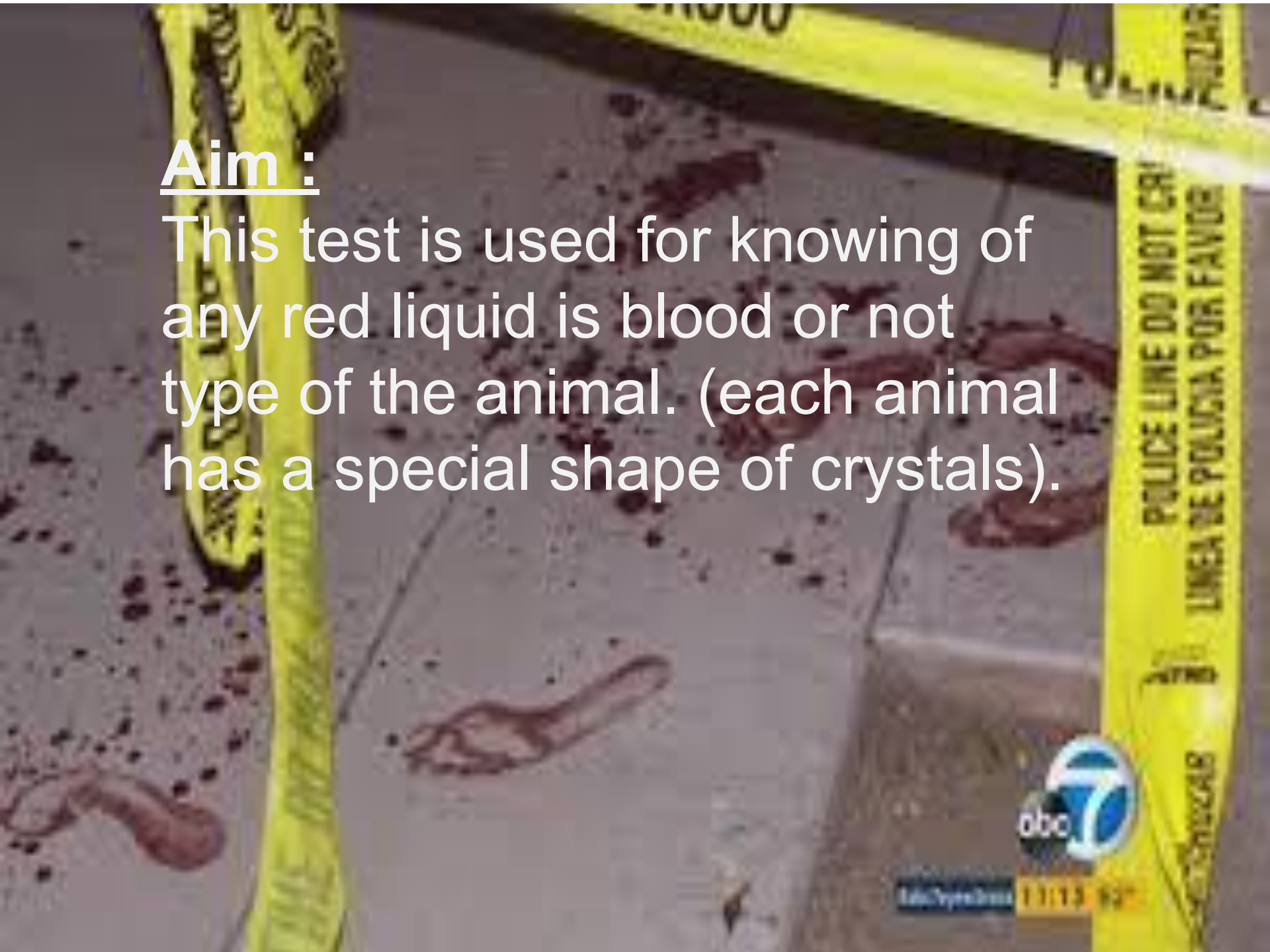


# Haemin crystal



Aim :

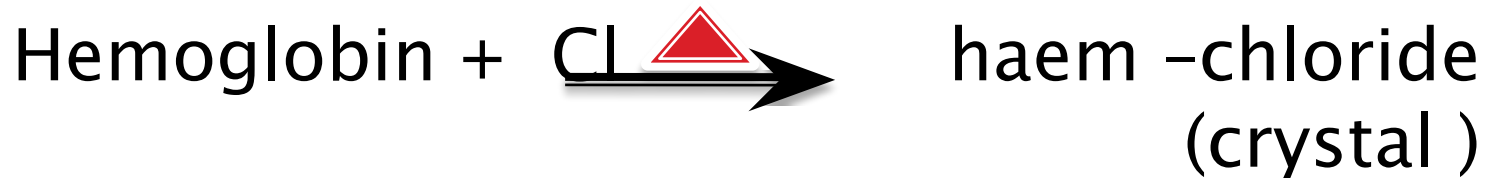
This test is used for knowing of any red liquid is blood or not type of the animal. (each animal has a special shape of crystals).



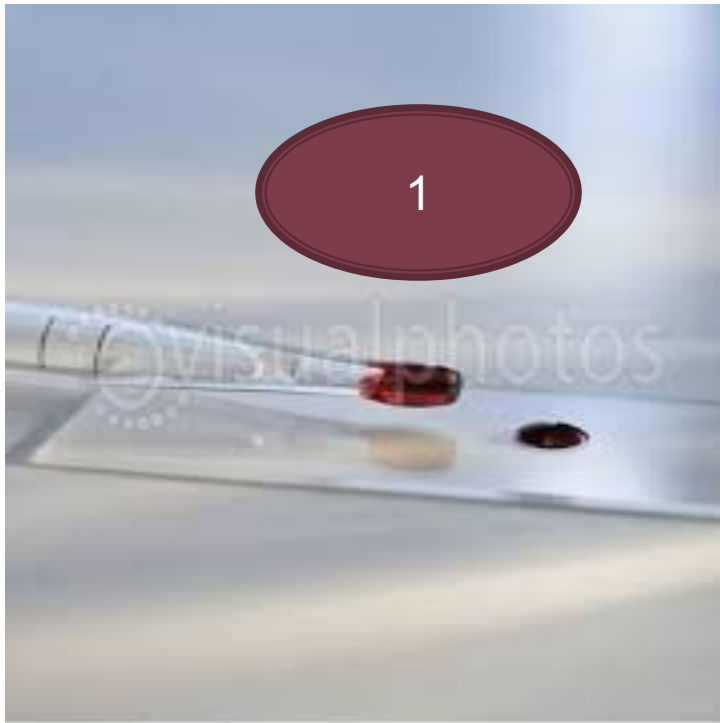
□ **Principle :**

- Blood is composed of haem and globine .
- To determine the shape of haemin crystals we must first get out the haem inside the RBCs by a glacial acetic acid (decompose the RBC)

□ what produce the brownish color



# Procedure



4



Till the blood  
turn brown

5



6

Examine under  
microscope





# We can also find different type of crystal

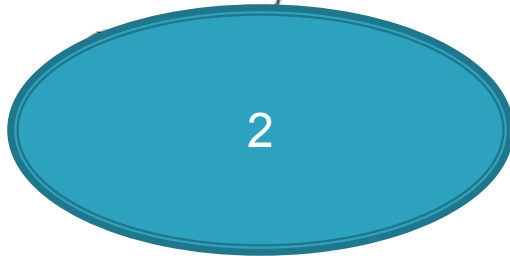
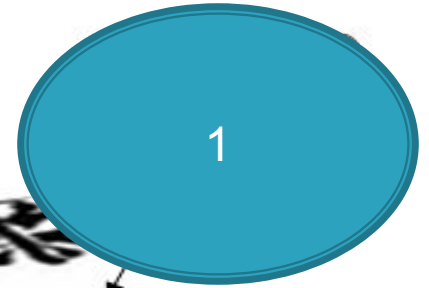
Do you know  
what is that  
????

Salt  
crystal



# QUIZ

under microscope





# Powered to you by :Ruthless

