EXPERIMENT NO.: 13 **DATE:**

AIM: TO FIND OUT BLOOD GROUP OF OWN BLOOD SAMPLE.

REQUIRMENT: Blood group detection kit [antisera kit], glass slides, Permanent Marker Pen, 70% alcohol, Cotton swabs.

THEORY

- The surface of the erythrocyte contains some glycoprotein and glycolipids that can act as antigen.These antigens are known as isoantigens or agglutinogens.
- Based on the presence or absence of various isoantigens blood is categorized in to different blood groups. More than 100 isoantigens that can be detected on the surface of red blood cells and according to that total of 35 human blood group systems are now recognized by the International Society of Blood Transfusion (ISBT).
- The two most important ones are: ABO and the RhD antigen; they determine someone's blood type (A, B, AB and O, with +, − or Null denoting RhD status).

➢ **ABO blood groups:**

- The ABO blood groups is based on two glycolipids isoantigens called A and B.

Blood Group	Antigens present	Antibodies present
A	A Antigen	Anti-B
B	B Antigen	Anti-A
AB	A and B Antigens	No antibodies
O	Neither Antigens	Anti-A and Anti-B

- The above four ABO bloods types results from the inheritance of various combination of three different genes known as ***I gene:***
    a) I^A codes for the A antigen
    b) I^B codes for the B antigen.
    c) ***i*** codes for neither A nor B antigen.
- Each inherits two I-genes alleles, one from mother side and one from father side.
- The six possible combinations genes of mother and father produce four blood types:
    i) $I^A I^A$ or $I^A i$ produces type A blood.
    ii) $I^B I^B$ or $I^B i$ produces type B blood.
    iii) $I^A I^B$ Produce type AB blood.
    iv) ***ii*** produce type O blood.

➢ **Child blood type estimate table**

		Father's Blood Type			
		A	**B**	**AB**	**O**
Mother's Blood Type	**A**	A/O	A/B/AB/O	A/B/AB	A/O
	B	A/B/AB/O	B/O	A/B/AB	B/O
	AB	A/B/AB	A/B/AB	A/B/AB	A/B
	O	A/O	B/O	A/B	O

➢ **Rh Blood groups:**

- Rh antigen first find out in to Rhesus monkey so it is known as Rh blood groups.
- People whose blood have Rh antigen is known as Rh positive (+).
- People whose blood have not Rh antigen is known as Rh negative (-).
- According to Rh positive and Rh negative ABO blood group further divided in to eight types:

1. A+ve blood group
2. B+ve blood group
3. AB+ve blood group
4. O+ve blood group
5. A-ve blood group
6. B-ve blood group
7. AB-ve blood group
8. O-ve blood group

- If Rh- person receive Rh+ blood, their immune system start to make anti-Rh antibodies that will remains in the blood and during the second transfusion the previous formed anti-Rh antibodies will cause hemolysis of donated blood and cause severe reaction. Example:

BLOOD TYPE COMPATIBILITY:

		Donor Blood Type							
		A+	**A-**	**B+**	**B-**	**AB+**	**AB-**	**O+**	**O-**
Recipient Blood Type	**A+**	√	√	X	X	X	X	√	√
	A-	X	√	X	X	X	X	X	√
	B+	X	X	√	√	X	X	√	√
	B-	X	X	X	√	X	X	X	√
	AB+	√	√	√	√	√	√	√	√
	AB-	X	√	X	√	X	√	X	√
	O+	X	X	X	X	X	X	√	√
	O-	X	X	X	X	X	X	X	√

PRINCIPLE

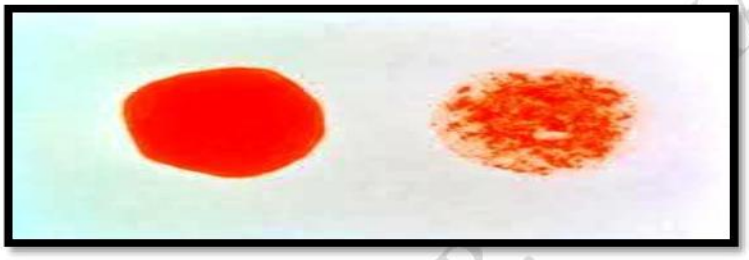
Compatibility between the blood groups of donor and recipient determines the success of a blood transfusion. The AB0 and Rh blood groups are looked at while conducting the test. In a diagnostic lab, Monoclonal antibodies are available for A, B and Rh antigen. Monoclonal antibody against Antigen A (also called Anti-A), comes in a small bottles with droppers; the monoclonal suspension being **BLUE** in color. Anti-B comes in **YELLOW** colour. Anti-D (monoclonal antibody against Rh) is **COLORLESS**. All the colour codes are universal standards. When the monoclonal antibodies are added one by one to wells that contain the test sample (blood from patient), if the RBCs in that particular sample carry the corresponding Antigen, clumps can be observed in the corresponding wells. A drop of blood is left without adding any of the antibodies; it is used as a control in the experiment. The monoclonal antibody bottles should be stored in a refrigerator.

PROCEDURE

1. Take neat and clean four glass slides, Mark A, B, and D on three slide top middle part respectively. Use fourth slide to mix the blood withantisera.
2. Sterilize the ring finger with spirit using cotton swab.
3. Prick the finger using lancet/pricking needle.
4. Discard the first drop of blood.
5. Put blood drop on Slide A, Slide B and Slide D at the center.
6. Take the Anti-A (blue) bottle, re-suspend the content and use the dropper to place a drop of the Anti-A in the Slide A. Place the bottle back in ice.

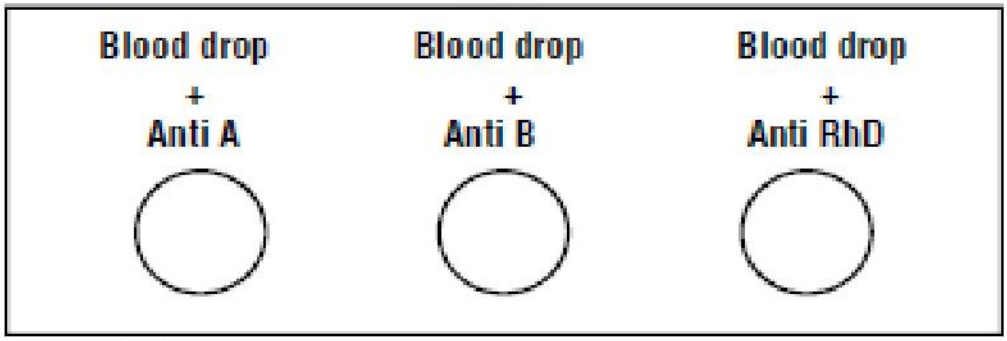
7. Take the Anti-B (yellow) bottle, re-suspend the content and use the dropper to place a drop of the Anti-B in the Slide B. Place the bottle back in ice.
8. Take the Anti-D (colorless) bottle, re-suspend the content and use the dropper to place a drop of the Anti-D in the Slide D. Place the bottle back in ice.
9. Take a fourth slide, mix the Slide A, Slide B and Slide D blood drops with Anti-A, Anti-B and Anti-D solution respectively using alternate corner of the fourth slide. So, it prevent the mixing of one slide solution with the other slide solution.
10. After mixing, wait for a while to observe clumps.

DIAGRAM



No clumping Clumping

OBSERVATION



Slide No. A: **Blood+Anti serum A** **Clump/No Clump**

Slide No. B: **Blood+Anti serum B** **Clump/No Clump**

Slide No. D: **Blood+Anti serum D (Rh Factor)** **Clump/No Clump**

RESULT

Blood group of own blood sample is _____

SIGNATURE OF TEACHER