"Investing in Africa's Future"

COLLEGE OF HEALTH, AGRICULTURE & NATURAL SCIENCES
DEPARTMENT OF BIOMEDICAL AND LABORATORY SCIENCES

NSLS 201 BLOOD BANK I PRACTICAL

END OF FIRST SEMESTER FINAL EXAMINATIONS

NOVEMBER 2022

LECTURER: Mr S. Banhwa

DURATION: 3 HOURS

INSTRUCTIONS

1. Answer ALL questions
2. Write your student number on the answer sheet
3. Use Answer Sheets Provided
4. Begin your answer for Each Question on a New Page
5. Credit is Given for Neat Presentation
6. You may use the tables provided in the SOPs to write your answers

1) **TM** who is a blood donor visited the National Blood Services of Zimbabwe for a blood donation.

   a) You are provided with his blood samples labelled **TM** and you are required to carry out ABO and RH blood grouping on the sample. [45]
   b) Suggest further tests if any. [5]

2) You are provided with a sample labelled **P** and you are required to carry out Antibody Screen on the sample. Suggest any further tests. [50]

Blood Bank NSLS 201 Standard Operating Procedures

Procedure name: Antibody Screen / detection method

1. Label 3 tubes SI, SII and Acc
2. Put 2 drops of patient's serum in each of the tubes in step 1 above.
3. Add 1 drop of 2-5 % red blood cell suspension as follows:
    a. Screen cells SI into tube labelled SI
    b. Screen cells SII into tube labelled SII
    c. Patient / donor own cells into tube labelled Acc
4. Centrifuge at 3000 rpm for 15 seconds, check for haemolysis /agglutination. Record results in ***Table 1***
5. **If negative** in step 4 above, add 2 drops of LISS
6. Incubate for 15 minutes at 37° C
7. Centrifuge at 3000 rpm for 15 seconds, check for haemolysis/agglutination. Record results in ***Table 1.*** Proceed to step 8 if results are negative in step 7.
8. Wash the cells three times with normal saline
9. Add 2 drops of polyspecific AHG serum to washed cells
10. Centrifuge at 3000 revolutions per minute (pm) for 15 seconds
11. Read and record your results in ***Table 1***
12. If negative, add 1 drop of OSC to each tube
13. Centrifuge at 1 000 rpm for 30 seconds and read visually. Record results in ***Table 1***

Table 1: Antibody screen results

Patient / Sample	**Acc**				**SI**				**SII**				**Antibody screen test Result**
	RT-IS	**LISS 37ºC**	**AHG**	**OSC**	**RT-IS**	**LISS 37ºC**	**AHG**	**OSC**	**RT-IS**	**LISS 37ºC**	**AHG**	**OSC**	

ABO Blood Grouping Procedure for each patient or donor

1	Label 3 tubes as follows: • Tube 1- anti-A • Tube 2- anti-B • Tube 3- anti-AB
2	Add 2 drops of anti-A, anti-B and anti-AB to each of the labelled tubes in step **1** above (front group).
3	Add 1 drops of 2-5% (0.2ml/10ml -0.5ml/10ml) cell suspension to each tube containing anti-A, anti-B and anti-AB.
4	Label 4 more tubes: • Tube 4- A cells • Tube 5- B cells • Tube 6-O Cells • Tube 7-ABOAcc
5	Add two drops of donor or patient serum or plasma to each tube labelled A cells, B, O cells and ABOAcc cells.
6	Add one drop of the respective blood grouping cells to tubes labelled A cells, B cells, O cells and ABOAcc cells.
7	Mix contents of the tubes by gently tapping the base of each tube with your finger
8	Leave all the 6 tubes at approximately 25^{o}C for 5 minutes
9	Centrifuge at 3 000 revolutions per minute for 15 seconds
11	Take out the 7 tubes from the centrifuge and place them in the rack in same positions as before centrifuging
12	Read results macroscopically by tapping gently the base of each tube, looking for either agglutination or haemolysis. Grade as shown in table 4
13	Record results in the ABO Blood Group Record Sheet (Table 2) as follows: a. Positive (+) if there is agglutination or haemolysis b. Negative (-) if there is no agglutination or haemolysis c. Weak positive (+w) ***Refer to table 4 for grading of agglutination reactions***
14	Read microscopically for tubes where agglutination or haemolysis is NOT seen as follows: a. Pipette 1 drop of sample from the negative tube and place the drop on a clean glass slide b. Put cover slip c. Read using x10 or x20 microscope objective lens
15	Interpret ABO Blood group results as shown on Table 3.

Table 2: ABO Blood Group Record Sheet

Patient / Sample identification	Tube 1 Anti-A	Tube 2 Anti-B	Tube 3 Anti-AB	Tube 4 A_1 cells	Tube 5 B cells	Tube 6 O cells	Tube 7 ABOAcc cells	ABO blood group

Table 3: Interpretation of ABO Blood grouping results

Tube 1 Anti-A	Tube 2 Anti-B	Tube 3 Anti-AB	Tube 4 A_1 cells	Tube 5 B cells	Tube 6 O cells	Tube 7 ABOAcc	ABO blood group
+	-	+	-	+	-	-	A
-	+	+	+	-	-	-	B
+	+	+	-	-	-	-	AB
-	-	-	+	+	-	-	O

Table 4: Grading Agglutination reactions

Grade	**Description**		
	erythrocyte aggregates	**Erythrocytes**	**Supernatant**
Negative	None	free floating	
Mixed field	Few isolated	mostly free-floating	red
Weak	Tiny and barely visible macroscopically	many free	turbid and reddish
1+	few small just visible macroscopically	many free	turbid and reddish
2+	Medium size	some free	Clear
3+	Several large	some free	clear supernatant
4+	All combined into one solid		clear

Procedure name: Rh Typing method

1. Label two tubes, D and Alb
2. Add two drops of anti-D and two drops 22% Bovine serum albumin to tubes labelled D and Alb respectively.
3. Add one drop of 3% red blood cells suspended in saline to both tubes.
4. Centrifuge at 3000 revolutions per minute for 15 seconds and read macroscopically and microscopically if negative.
5. If negative, test for Weak Rh D by performing steps 5 to 13 of the A**ntibody screen method.**
6. **Record ALL results in Table 5 below**

Table 5: Rh Blood Group Results

Patient / Sample	Anti-D	22% Bovine Albumin	Rh group

Key to abbreviations and other terms

Abbreviation	Meaning
Acc	Auto-control for Coombs test
AHG	Anti-human globulin reagent sera
LISS	Low ionic strength solution
Negative	No haemolysis / agglutination seen
OSC	Group O Rh Positive IgG sensitised red blood cells
Positive	Haemolysis / agglutination seen
Rpm	Revolutions per minute
RT-IS	Room temperature immediate spin
SI	Selectogen I antibody screen cells
SII	Selectogen II antibody screen cells
ABOAcc	Auto control cells used in ABO blood grouping