A training report on

Blood analysis in pathology

Submitted to

Atmiya University

In partial fulfillment of the requirements for the degree of

Bachelor of Science in Biotechnology

By

Khushi Sauda

(2020-2023)

Under the supervision of

Mr. Hitesh Gajera

Sanket pathology lab, Rajkot, Gujrat.

Department of Biotechnology

Atmiya University, Rajkot, Gujarat - 360005

DECLARATION

I hereby declare that the work incorporated in the present training report entitled “Blood Analysis In Pathology Lab" which being is submitted as a partial fulfilment of the Degree of Bachelor of Science in Biotechnology, is carried out by me during academic year 2020-23. The information and articles referred from authors, journals and library are duly acknowledged. I further declare that this training report written by me has not been previously submitted to this or any other College/Institute/University for any Certificate Diploma/ Degree.

Date: 31 March 2023

Place: Rajkot

Student’s sign

ACKNOWLEDGMENTS

- I take this opportunity to thank everyone, who made my training possible. All the people that I have worked with, have contributed to my learning process during all these months. I am highly indebted to all the people who have spared their valuable time for my training and help me develop my insight for all the techniques.
- During the stay at “Sanket Laboratory" my superiors and colleagues have helped me grow intellectually as well as professionally and also provided a congenial environment to work with. It has been a great gusto to have known and worked with the Sanket Laboratory.
- On the first place I would like to record my gratitude to Mr. Hitesh Gajera - my training guide under whose supervision, guidance and advice I have completed my training in a successful way.
- He showed interest to teach me and enriched my growth in this field. I thank the HR department of Sanket Laboratory who could recognize my abilities and gave me a chance to work with such a prestigious group. I am also indebted to Mr. Hitesh Gajera for all the effort that he has made to make the training period an easy heartfelt thanks to Atmiya University, who made my transition from a student life to professional life a remarkable one.
- To all the other trainees who were with me during training period, I would also thank them.
- Because of them I could have an overview of the work that was going on in their respective department, thus broadening my knowledge. I take this occasion to express my love and thanks to my family who have supported me in every possible manner.

Introduction

- 1st section - Reception
- 2nd section - Blood Collection Room
- 3rd section - Microbiology
- 4th section - Hematology

PLAIN TUBE

EDTA TUBE

GLUCOSE TUBE

Blood Grouping

❑ Introduction:

- There are four main blood groups (types of blood) – A, B, AB and O. Each group can be either RhD positive or RhD negative, which means in total there are eight main blood groups.

❑ Principle:

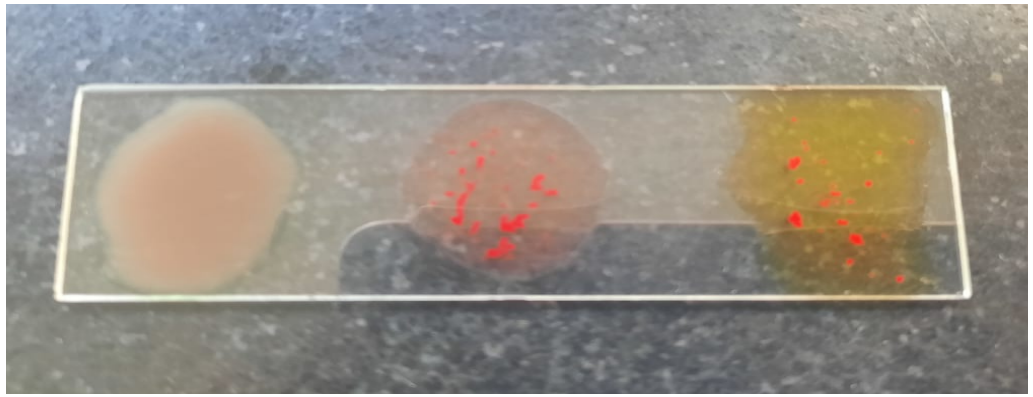
- The ABO and Rh blood grouping system is based on agglutination reaction. When red blood cells carrying one or both the antigens are exposed to the corresponding antibodies they interact with each other to form visible clumping.

❑ Procedure:

- Take a clean slides and labeled a ,b and d.
- Place a drop of blood in the slide.
- Add equal amount of anti a, anti b and anti d antisera to each drop of blood and mix thoroughly by using mixing stick.
- The slides are gently rocked for two minutes and observed the results.

❑ Result:

- Agglutination was observed in B and Rh panel this indicates the blood group of the patients is B positive.



RBC And WBC Count

❑ Principle:

- The test is important because RBCs contain hemoglobin, which carries oxygen to your body's tissues. The number of RBCs you have can affect how much oxygen your tissues receive. Your tissues need oxygen to function. It's also known as an erythrocyte count.
- Having a higher or lower number of WBCs than normal may indicate an underlying condition.
- There are five major types of white blood cells: neutrophils, lymphocytes, eosinophil, monocytes, basophils.

- **Procedure:**
  - Collect blood sample.
  - Add blood sample to EDTA test tube.
  - Place the on blood mixing rotor for 5-10 minutes.
  - Place the test tube in the biometer for results.
  - Read the result on screen of biometer machine.

- **Result:**
  - The count of RBC and WBC was low. Therefore, this shows that there are infections in the body.

Malaria Test

❑ Principle:

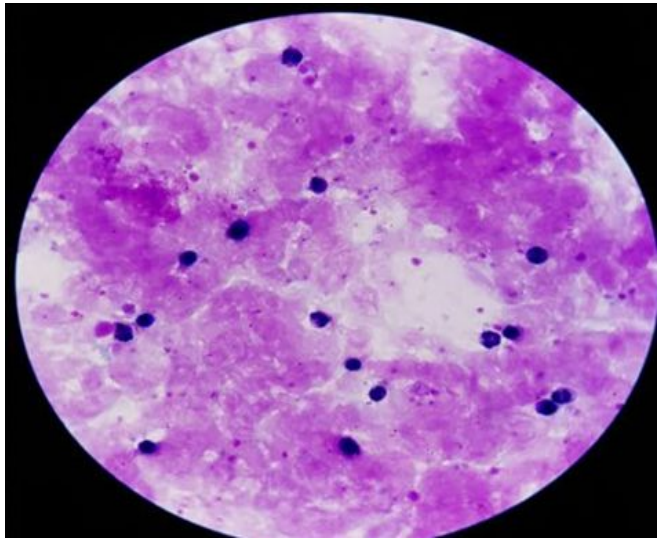
- Malaria is caused by the Plasmodium parasite. The parasite can be spread to humans through the bites of infected mosquitoes. There are many different types of plasmodium parasite, but only 5 types cause malaria in humans.
- *Plasmodium falciparum*
- *Plasmodium vivax*
- *Plasmodium ovale*
- *Plasmodium malariae*
- *Plasmodium knowlesi*

❑ Procedure:

- Touch the blood drop with a clean slide.
- Using the another slide, spread the blood drop.
- Gently squeeze the patient's finger again, and touch the edge of a clean slide to the newly formed blood drop.
- Take this slide and hold the edge that has the blood drop at an -45° angle against the surface of the first slide. Wait until the blood completely spreads along the edge of the second slide.
- While holding the second slide at the same angle, rapidly and smoothly push the slide forward.
- Write the identification number on the slide. Wait until the thick film is completely dry before staining it.

❑ Result:

- By examining blood smear under the microscope dark purple colored cells were observed. This indicates the presences of malaria parasite in the patient’s blood.



WIDAL TEST

❑ PRINCIPLE:

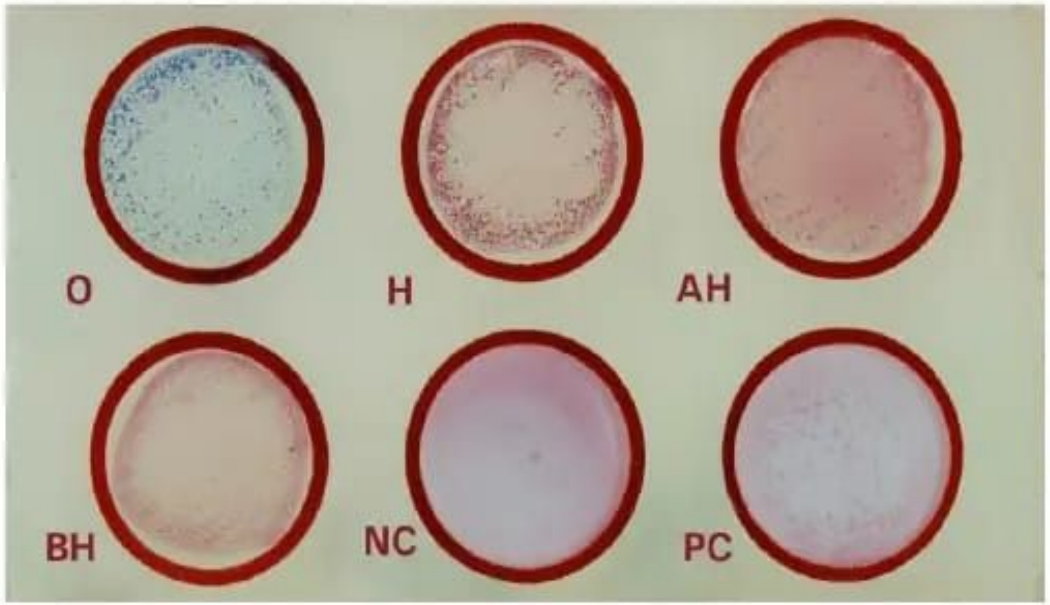
- The main principle of widal test is that if antibody is present in patients serum, it will react with respective antigen in the reagent and gives visible clumping on the test card and agglutination in the tube. The antigens used in the test are “H” and “O” antigens of *Salmonella Typhi* and “AH” and “BH” antigens of *Salmonella Paratyphi*.

❑ Procedure:

- Place one drop of positive control on one reaction circles of the slide.
- Pipette one drop of Isotonic saline on the next reaction circle. (-ve Control).
- Pipette one drop of the patient serum tube tested onto the
- Add one drop of Widal TEST antigen suspension ‘H’ to the first two reaction
- circles. (PC & NC).
- Add one drop each of ‘O’, ‘H’, ‘AH’ and ‘BH’ antigens to the remaining four
- reaction circles.
- Mix contents of each circle uniformly over the entire circle with separate mixing sticks.
- Rock the slide, gently back and forth and observe for agglutination microscopically within one minute

❑ Result:

- Clump formation is observed O, H, PC. Therefore, this indicates the presence of *Salmonella typhi.*



HIV Test

❑ Principle:

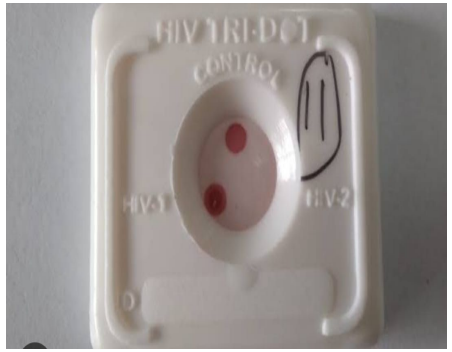
- The HIV Tridot is a visual rapid sensitive and accurate immunoassay for the differential detection of HIV-1 & HIV-2 antibodies in human serum or plasma. As the patients sample pass through the membrane, HIV antibodies, if present, bind to the immobilized antigens. Synthetically prepared HIV 1 & 2 antigenic peptides are immobilized at two different locations on the nitrocellulose membrane. Conjugate(protein A) is added which binds to the Fc portion of the fixed antibodies to give distinct pinkish purple (red) dots against a white background. Internal control has antihuman gamma immobilized, which binds any antibodies in patients sample to give a visible reaction.

❑ Procedure:

- Bring all the reagents and specimens to room temperature (25-30°C) before beginning the test.
- Add 3 drops at buffer solution to the center of the device. Allow it to soak.
- Held the dropper vertically and add 1drop of patients sample (serum or plasma) using the sample dropper provided. Use separate dropper for each specimen. Allow it to soak.
- Add 5 drops of buffer solution.
- After it had soaked, add 2 drops of protein A & conjugate directly from the conjugate vial. Again allow it to soak.
- Add 5 drops of buffer solution and read result.

❑ RESULT:

- Two dots were seen on the control and HIV-1 panel. Therefore, this indicates the presence of HIV-1 virus in the patient's body.



CONCLUSION

Students learn to use scientific tools and conventions during laboratory experiences. For example, they learn how to use scientific equipment correctly and safely, make observations, take measurements, and carry out well-defined scientific procedures by understanding nature of science. Also learned about the various tests for the detection of the different viruses.


thank
you