R. J. COLLEGE of Arts, Science & Commerce (AUTONOMOUS)

(Hindi Vidya Prachar Samiti's RAMNIRANJAN JHUNJHUNWALA COLLEGE of Arts, Science & Commerce)
Opposite Ghatkopar Railway Station, Ghatkopar (West), Mumbai 400086, Maharashtra, INDIA.
Website: www.rjcollege.edu.in Email: rjcollege@rjcollege.edu.in Tel No: +91 22 25151763 Fax No: +91 22 25150957

Affiliated to UNIVERSITY OF MUMBAI II NAAC Re-Accredited 'A' Grade (CGPA: 3.50)

Department of Biotechnology

On Job Training Completion Report

This is to certify that Sharvari . D . Borkar. has completed On Job Training at

M.S. Desai Memorial Parel clinico Pathology Laborat

Date of Commencement	Date of Completion	Total Number of Days	Total Number of Hours completed in OJT
19th Jan 2024.	19th Feb 2024.	23 days.	60 HRS + 32 HRS

Name of the Guide/ PI/ Incharge : Girish Desai

Phone Number of Guide/ PI/ Incharge : 9820423770

Email Address of the Guide/ PI/ Incharge : girishd01@hotmail.com

Ramniranjan Jhunjhunwala College ★ Ghatkopar, Mumbai-86 ★ NAAC Re-Accredited "A" Grade

Girish Desai

Signature of Guide/ PI/ Incharge

Rgupta 22-03-24

M. S. Desai Memorial
Parel Clinico Pathology Laboratory,
20, Bhuvaneshwar, Dr. V. K. Valimbe Road,
Parel, Mumbai - 400 012.

Stamp

NAME: - **SHARVARI DASHRATH BORKAR**

CLASS: - MSc. 1 BIOTECHNOLOGY

ROLL NO. :- 428

TOPIC: - ON JOB TRAINING REPORT (WRITE UP)

NAME OF LABORATORY:- **M.S. DESAI MEMORIAL LABORATORY**

DATE:- 19th JANUARY 2024 TO 19th FEBRUARY 2024

The on job training I attended was at M.S DESAI MEMORIAL PATHOGLOGY LAB, in Parel. The training was conducted under the supervision of Girish Desai Sir and his fellow co-workers who were there to guide me throughout the training period one month (93 hours). The experience I had while working with them was the stepping stone towards the path I wish to take in the future.

I was introduced to many techniques such as Basic Phlebotomy, routine pathology techniques like stool routine, urine routine and also complete blood count, along with the biochemistry and operation under the guidance of respective technician.

I had started my off the training with the observation in the hematology department, where I was introduced to the complete blood count (CBC), reticulocytes count, separation of plasma and serum, erythrocyte sedimentation rate (ESR) test, Differential count, ABO blood group test and skin scrapping test for the micro-organisms (animals).

1. **COMPLETE BLOOD COUNT**:

A complete blood count (CBC) is a blood test. It's used to look at overall health and find a wide range of conditions, including anemia, infection and leukemia. A complete blood count test measures the following:

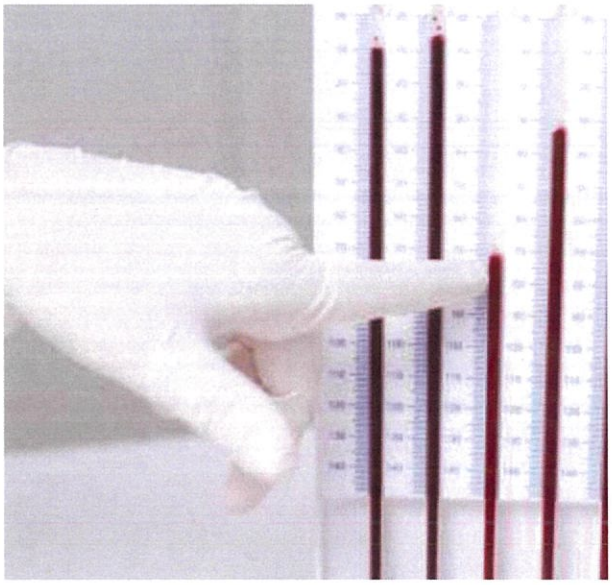
- Red blood cells, which carry oxygen
- White blood cells, which fight infection
- Hemoglobin, the oxygen-carrying protein in red blood cells
- Hematocrit, the amount of red blood cells in the blood
- Platelets, which help blood to clot

A complete blood count can show unusual increases or decreases in cell

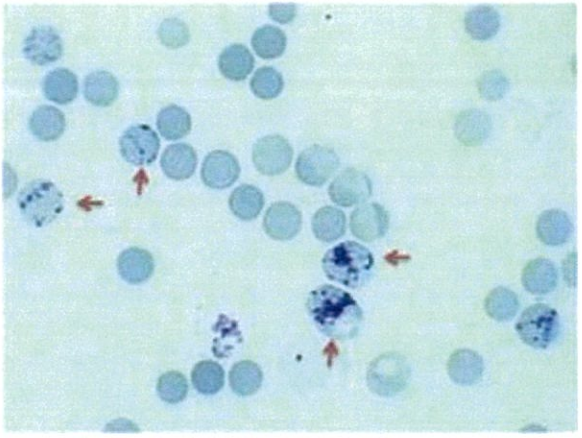
counts.

2. Erythrocyte Sedimentation Rate (ESR)

An erythrocyte sedimentation rate (ESR) is a blood test that that can show if you have inflammation in your body. Inflammation is your immune system's response to injury, infection, and many types of conditions, including immune system disorders, certain cancers, and blood disorders. Erythrocytes are red blood cells. Normally, red blood cells sink slowly. But inflammation makes red blood cells stick together in clumps. These clumps of cells are heavier than single cells, so they sink faster. It may be a medical condition causing inflammation.



3. Reticulocyte count:-

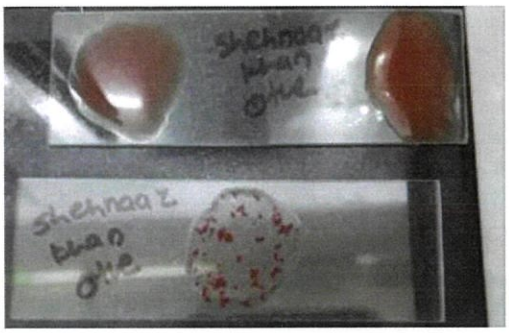


Reticulocytes are red blood cells that are still developing. They are also known as immature red blood cells. Reticulocytes are made in the bone marrow and sent into the bloodstream. A reticulocyte count (retic count) measures the number of reticulocytes in the blood. If the count is too high or too low, it can mean a serious health problem, including anemia and disorders of the bone marrow, liver, and kidneys.

Other names: retic count, reticulocyte percent, reticulocyte index, reticulocyte production index, RPI

4. **ABO blood group test**:

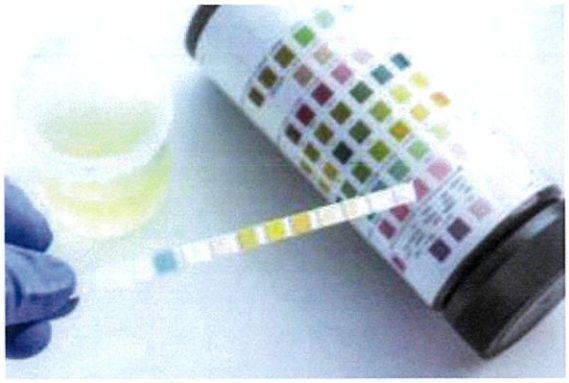
Blood typing is a method to tell what type of blood you have. The test to determine your blood group is called ABO typing. Your blood sample is mixed with antibodies against type A and B blood. Then, the sample is checked to see whether or not the blood cells stick together. If blood cells stick together, it means the blood reacted with one of the antibodies.



Then I was given to run the samples for CBC and preparing the slides for the differential count (where a slide is prepared to count the WBCs and platelets) and gram staining them to observe under the microscope in oil immersion. Later I was moved to observe **the urine stool analysis** and do the respective tests for them followed by observation of biochemistry machine **Erba EM 200** under the guidance of technician.

5. **URINE ANLYSIS:**

Urinanalysis (UA) contains an array of laboratory tests performed on urine and a frequently used tool in childhood cancer diagnostics. A part of a urinalysis can be performed by using so-called urine dipsticks, in which the test results can be read as color changes.



The tests performed under urinanalysis were **colour, appearance, reaction (checking the pH), specific gravity, bile salt bile pigment test (BSBP), sugar, ketone, occult blood test(OBT){checking for the presence of blood in urine}, albumin**.

6. **STOOL ANALYSIS**:-

A stool test looks for pathogens (bacteria, viruses, parasites) in your poop that can make you sick. Stool tests can also look for other signs, like hidden blood, that signal something's wrong. Healthcare providers can use stool tests to check for a wide range of gastrointestinal (GI) issues, including infections and cancers. Your healthcare provider might recommend a stool test if you develop symptoms like: mucus, blood, undigested food particles, micro-organisms.

7. **Erba EM 200:-**

EM 200 is known to be a fully automated machine, with random access and with discrete clinical chemistry analyzer that would enhance the productivity along with a proper turnaround time. Moreover, it is known to have a throughput of about 200 photometric tests per hour and it has 400 tests/hr. The End Point Reactions: Used in sample of Glucose, Triglycerides, Bilirubin Total Cholesterol, Albumin, Uric Acid, Bilirubin Direct, Total Protein, Calcium, Magnesium. Further Kinetic Reactions include: SGOT, SGPT, CK, Amylase, Lipase, CK MB, GGT, LDH ALP, ACP, Two With Point Rate Reactions in the following: Urea, Creatinine.

I have also been introduced to the machines like electrolyte analyzer. The work was challenging, and I learned about the work and gained more confidence in myself. It was a valuable experience. From my internship at Desai Lab, I was able to get a better understanding of how the lab works. I enjoyed working with the team to devise and implement different skills. But, I still have a long way to go in understanding the psychological aspects of laboratory equipment, and I require to build up my public speaking skills as well. I am thankful to staff and also to my professors for giving us opputtunitise to experience this wonderful training for our career.

NAME: - **SHARVARI DASHRATH BORKAR**
CLASS: - MSc. 1 BIOTECHNOLOGY
ROLL NO. :- 428

TOPIC: - KAYOTYPING REPORT (WRITE UP)

We were given the great opportunity to experience the animal tissue culturing course by our college RAMNIRANJAN JHUNJHUNWALA COLLEGE OF ARTS, SCIENCE AND COMMERCE in Ghatkopar and by the our head of department of biotechnology Dr. Sucheta Golwalkar. This ATC course was conducted by Dr. Possam .

Dr. Possam is a very well experienced professor who has a lot experience in the field karyotyping and is also cancer survivor. She has immense knowledge was willing to share it with us students and giving us valuable lessons on karyotyping by taking lectures and practical for further understanding of the topic.

The course was started off with the lectures on what is karyotyping, what we would be doing in the practical and is the outcome or results we should be expecting after the practical. She had also explained about the CO2 incubator. We were also taught about identifying the chromosomes, with help of the arms of chromosomes and the stages at which the chromosomes are separated. The stages include prophase, metaphase, anaphase, and telophase.

Karyotyping is the process of pairing and ordering all the chromosomes of an organism, thus providing a genome-wide snapshot of an individual's chromosomes. Karyotypes are prepared using standardized staining procedures that reveal characteristic structural features for each chromosome. Clinical cytogeneticists analyze human karyotypes to detect gross genetic changes—anomalies involving several megabases or more of DNA.

Karyotypes can reveal changes in chromosome number associated with aneuploid conditions, such as trisomy 21 (Down syndrome). Careful analysis of karyotypes can also reveal more subtle structural changes, such as chromosomal deletions, duplications, translocations, or inversions. In fact, as medical genetics becomes increasingly integrated with clinical medicine, karyotypes are becoming a source of diagnostic information for specific birth defects, genetic disorders, and even cancers.

Also we were given detailed knowledge about the diseases or chromosomal disorders such as 22q11.2 (22Q) deletion syndrome and other microdeletion syndromes, Down syndrome, Klinefelter syndrome, Mosaicism , Trisomy 13 and 18 ,Williams syndrome. Ma'am had also told us about some cases she had personally came across, one of which that caught my attention was that a

women in her late 30s had 7 miscarriages, when the tests were done of both the woman and her husband. The reason was found that the husband had chromosomal abnormalities on chromosome 21 which was causing for the unborn child's death.

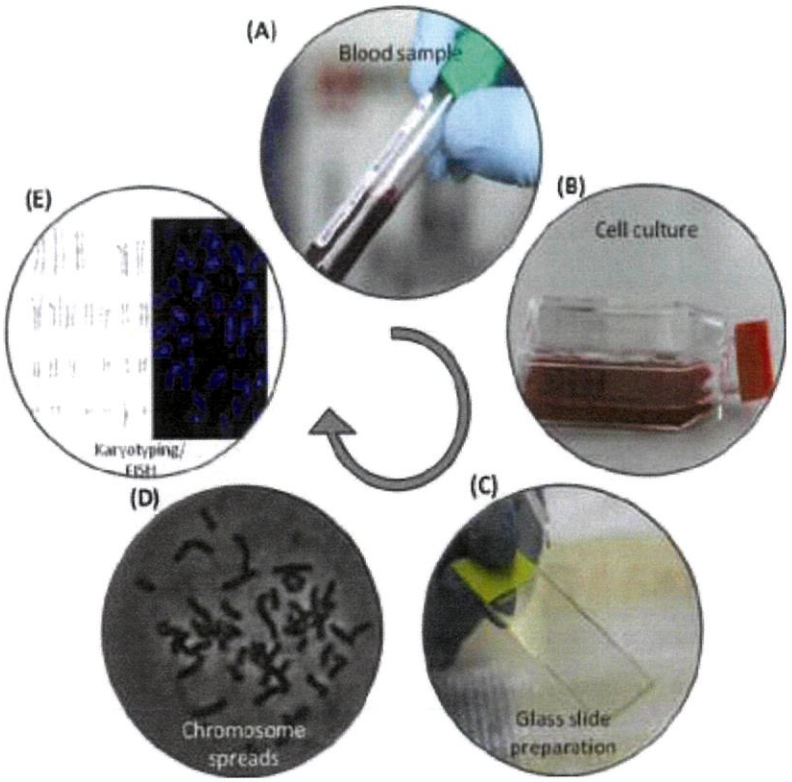
Then we were also showed how to identify a chromosome looks like after banding and were given worksheets ~~for~~ helping to identify and personally checked by Possam ma'am. Chromosome banding is the process of staining chromosomes to help researchers better understand and identify their structural composition. The term "chromosome banding" refers to the tagging and identifying of chromosomes by giving the appearance of various colored bands on stained chromosomes.

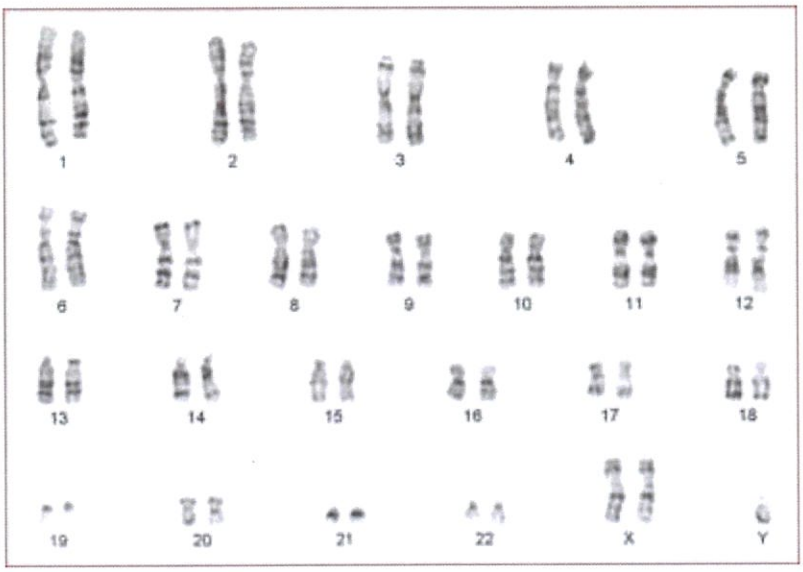
Banding patterns are chromosomal patterns of bright and dark transverse bands. These bands identify where genes are located on a chromosome. The bright and dark bands are visible when the chromosome is stained with a chemical solution and examined under a microscope. Because stains create patterns of bands down the length of the chromosome, staining of chromosomes is also known as the "banding technique." According to one or more banding techniques, a band is the region of a chromosome that may be easily distinguished from its neighboring sections by appearing lighter or darker.

The principle used for the practical was that the T lymphocytes from peripheral blood are induced to divide using a plant lectin, phytohemagglutinin. The maximum mitotic index is reached at 72 hours of culture. The culture is treated with colcemid to arrest cells at metaphase. The cells are harvested using the standard hypotonic treatment and fixation. Clinical indications include diagnosis of congenital abnormalities and genetic counseling of parents with congenitally abnormal infants, sex chromosome abnormalities, and habitual abortion studies. We were provided with the blood sample of a person for this course. Plating was done by following this procedure using syringes, materials and 1 and 11 ml vials were used.

Then keeping the vials in CO_2 incubator for 72 hours, followed TERMINATION in this we had separated the cells and plasma to be separated by adding chilled KCl. Then we had done fixation of the chromosomes by add fixative (1:3 glacial acetic acid: methanol) with simultaneous mixing of the pellet. Later after adding the fixative the tubes were kept for incubation of around 20 to 25 days. The slides were prepared,2-3 washes are given with fixative till the pellet becomes white and after staining the slides plain Giemsa and see under the microscope. If adequate no. of good quality metaphases are achieved the it is a successful culture otherwise it's a failure. A few phases were seen on the slides.

The new experience was given to us I would like to thank all the teachers who were supportive throughout this journey and also Possam ma'am for giving us such wonderful opportunity to enhance and grow our skills.





An image showing the chromosomes after banding