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 || NAAC Re-Accredited 'A' Grade (CGPA: 3.50)

420

Department of Biotechnology

On Job Training Completion Report

This is to certify that Ojal Tiwari has completed On Job Training at

KEMT's laboratory.

Date of Commencement	Date of Completion	Total Number of Days	Total Number of Hours completed in OJT
19th December, 2023	22nd January, 2024	30 days	90 hours

Name of the Guide/ PI/ Incharge : Mr. Sawan Kumar Pal

Phone Number of Guide/ PI/ Incharge : 9768985271

Email Address of the Guide/ PI/ Incharge : palksawan@gmail.com

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

Rgupta 22-03-24

Signature of Guide/ PI/ Incharge

KEMT'S
Virar Homoeopathic Medical College's
Hospital & OPD
Maringi Bypass Rd; Aai Jivdani Apt; Virar (E).
Stamp

Sejal Tiwari
420

Report on On-the-Job Training Experience at Central Clinical & Pathological Laboratory

Submitted By: Sejal Tiwari (MSc-I)

Duration of Training: 19th December 2023 to 22nd January 2024

Training Venue: Central Clinical & Pathological Laboratory, Gaurangi Apt, Ground Floor, Pachpayri, Veer Savarkar Marg, Virar (East) 401305. Tat. Vasai, Dist. Palghar

Introduction:

My training at Central Clinical & Pathological Laboratory lasted from 19th December 2023 to 22nd January 2024. Various aspects of laboratory operations were covered in the training, such as quality control procedures, protocols for the microbiology department, and diagnostic procedures. As part of this training experience, I actively participated in diverse activities to enhance my knowledge and skills in clinical pathology. I understood how the microbiology laboratory contributes to infection control and surveillance programs during my observation and learning. Additionally, I had the opportunity to learn about quality control processes, ensuring diagnostic tests' accuracy and reliability. As a result of this exposure, I could better understand laboratory practices and their vital role in patient care.

Observations and Practical Work:

I closely observed daily laboratory calibrations during my training, including haematology analyzers, biochemistry analyzers, and spectrophotometers. This highlighted the importance of equipment accuracy for reliable test results. I also prepared control samples for various tests, including Haemoglobin Control Samples, Glucose Control Samples, Absorbance Control Samples, and Urea Control Samples. This hands-on experience highlighted the principles of precision, as any errors in control preparation could invalidate entire test runs. This aspect of the training taught me the importance of quality assurance in clinical laboratory settings.

One of the highlights of my training was the exposure to the microbiology department. Here, I learned about various microbiological techniques for identifying and characterizing pathogens. I actively participated in

preparing multiple culture media, including blood agar, MacConkey agar, and nutrient agar. I observed and assisted with the gram staining technique, a crucial step in differentiating bacteria for preliminary diagnosis. I also assisted in inoculating various samples (including blood, urine, and swabs) for bacterial and fungal analysis. This hands-on experience provided me with invaluable insights into the practical application of microbiology in clinical diagnostics.

This OJT significantly enhanced my understanding of laboratory procedures and their role in accurate patient diagnosis. I gained hands-on experience in sample collection, quality control and microbiology techniques. Understanding the importance of quality control and precision was a recurring theme throughout my training. The knowledge and skills acquired during this training will serve as a solid foundation for my future career endeavours in the healthcare sector.

I sincerely thank Dr Amit Kumar Meena, Mr Sawan Kumar Pal, and the entire Central Clinical & Pathological Laboratory staff for their mentorship and support throughout my training. Their patience and willingness to share knowledge made this an enriching experience.

Sejal Tiwari
420

Report on Theory and Protocols for Karyotyping

Submitted by: Sejal Tiwari (MSc - I)

Instructor: Mrs. Possam

Introduction:

This report explores karyotyping, a technique used to visualize and analyze chromosomes. It provides an overview of chromosome structure, the various applications of karyotyping, and a detailed protocol for preparing chromosomes from a leukocyte culture. The importance of karyotyping in diagnosing chromosomal abnormalities, genetic disorders, and cancers will be emphasized. As instructed by Mrs. Possam, this report studies the theoretical basis of karyotyping and the step-by-step process of preparing chromosomes for analysis, particularly focusing on the leukocyte culture method.

Theory:

A chromosome is a complex structure that contains genetic information in the form of genes. Karyotyping involves examining stained chromosomes to detect aberrations such as deletions, duplications, translocations, and numerical Abnormalities Karyotyping has a wide range of applications in medical diagnosis and research. It is useful for diagnosing congenital abnormalities, such as Down syndrome and Turner syndrome, and can provide essential information for treatment and management. Karyotyping also plays a crucial role in genetic counseling for families with a history of congenital disorders, enabling informed decisions about family planning. Additionally, it helps identify sex chromosome abnormalities that can impact development and fertility. In the field of cancer diagnosis and research, karyotyping helps detect chromosomal changes associated with specific cancers, aiding in diagnosis, prognosis, and guiding treatment options. Lastly, karyotyping is valuable in studying habitual abortions, as it can reveal chromosomal abnormalities that might be contributing to recurrent pregnancy loss.

Leucocyte Culture Procedure for Chromosome Preparation:

The leucocyte culture procedure is a widely employed method to prepare chromosomes for analysis. It comprises the following steps:

Principle: T lymphocyte division is initiated using phytohemagglutinin (PHA) to attain peak mitotic index after 72 hours of culture. Cells are subsequently arrested at metaphase using Colcemid, followed by harvesting, hypotonic treatment, and fixation.

Planting: A specialized culture medium containing RPMI 1640, supplemented with human or fetal bovine serum, and PHA is prepared. Blood is introduced to initiate the culture, followed by incubation for 72 hours. Colchicine is added at the 70th hour to halt cells at metaphase.

Termination: The culture is centrifuged, and the supernatant is removed. Hypotonic shock is induced using potassium chloride (KCl) to promote cell swelling and chromosome dispersion.

Fixation: Cells are fixed using a solution of glacial acetic acid and methanol, followed by refrigeration overnight.

Preparation of Slides: The next day, fixed cells are applied onto acidified chilled slides. Slides are heat-dried, stained with Giemsa, and examined under a microscope.

Banding Technique: Banding techniques, notably G-banding, facilitate the identification of individual chromosomes. G-banding involves treating chromosomes with trypsin and EDTA, followed by Giemsa staining, resulting in characteristic banding patterns crucial for identification.

This practical session provides hands-on experience and reinforces the theoretical basis of karyotyping. The importance of systematic technique and accurate analysis for diagnostic purposes is emphasized. Karyotyping remains an essential tool for understanding and diagnosing various genetic conditions.