Curriculum For

Certificate Training Programme in

Cell Culture Techniques in Cytogenetics

Certificate Program

SRI AUROBINDO UNIVERSITY

SAIMS HOSPITAL CAMPUS, Indore Ujjain, State Highway, Bhawrasla, Indore, Madhya Pradesh 453555

Course Overview

Title: Cell Culture Techniques in Cytogenetics

Education: Certificate Program

Eligibility: MD (Pathology, Biochemistry, Microbiology) or DNB (Pathology, Biochemistry, Microbiology) and M.Sc. any disciples of Life Science and PhD.

Intake Capacity: 5 Fellows

Duration: 3 months

Food/Accommodation: Not provided

Vacation: No vacation

Timings: Monday to Friday (9:00 AM – 4:30 PM)

Attendance Requirement: Minimum 80%

Registration: Online application with eligibility verification

Goals: The Cell Culture Techniques in Cytogenetics Certificate Program is a skill-based, technical course tailored for students of life sciences, medical, and paramedical fields who aspire to pursue careers in cytogenetics.

Program Description

This specialized program equips participants with the knowledge and skills required for clinical genetic diagnostics. Trainees will develop competence in:

- Cell culture processes
- Slide preparation
- Microscopic analysis of peripheral blood and bone marrow samples
- Chromosome analysis
- Fluorescence In-Situ Hybridization (FISH) for cytogenetic abnormalities
- Digital imaging, interpretation, and report preparation

Theoretical foundations are reinforced through hands-on practical classes. Trainees will gain expertise in advanced diagnostic techniques and interpretations, preparing them to excel in diagnostic labs and medical colleges nationwide.

Program Objectives

1. **Understanding Core Concepts:**

- Introduces fundamental principles of cytogenetics, focusing on the human genetics and pathology relevant to chromosomal diagnostics.

2. **Mastering Techniques:**

- Provides hands-on training in cytogenetic techniques such as karyotyping and Fluorescence In-Situ Hybridization (FISH) applications for identifying structural variations.

3. **Clinical Relevance:**

- Focuses on the role of cytogenetics in diagnosing genetic disorders, with emphasis on chromosomal abnormalities in oncology, hematology, and congenital conditions.

4. **Ethics and Legal Aspects:**

- Covers ethical considerations and legal implications in cytogenetic diagnostics to prepare participants for professional responsibilities and challenges.

Techniques Learned

- Sample culture setup for peripheral blood and bone marrow samples
- Sample harvesting and slide preparation
- GTG banding for karyotyping
- FISH methodology for specific chromosomal abnormalities (e.g., leukemia panels, microdeletion syndromes, X/Y aneuploidy, and SRY gene deletion)
- Probe selection, hybridization, and signal interpretation for FISH and molecular techniques
- Reporting patterns and clinical correlation

Program Structure

1. **Module 1: Introduction to Cytogenetic Diagnostics**
    - Basic human genetics and human cytogenetics
    - Overview of cytogenetics and its clinical relevance
    - Applications of molecular techniques in cytogenetics
2. **Module 2: Cytogenetic Techniques**

- Sample culture setup for peripheral blood and bone marrow
- GTG banding and karyotyping
- FISH methodology: probe selection, hybridization, analysis, and interpretation

3. **Module 3: Practical Training**
    - Hands-on lab sessions in cytogenetics
    - Interpretation of data (e.g., FISH)
    - Report preparation and clinical correlation

Assessment and Certification

- **Assessment:**
    - Multiple-choice quizzes and assignments after each module
- **Certification:**
    - Participants successfully completing the course will be awarded a certificate in *Cell Culture techniques in Cytogenetics*, signifying their proficiency in this specialized field.

Learning Outcomes

Upon completion of the program, participants will be able to:

- Participants will gain exposure to the Genetic Clinic during patient interviews and sample collection/receipt processes at Sri Aurobindo Medical College and PG Institute, Sri Aurobindo University, Indore