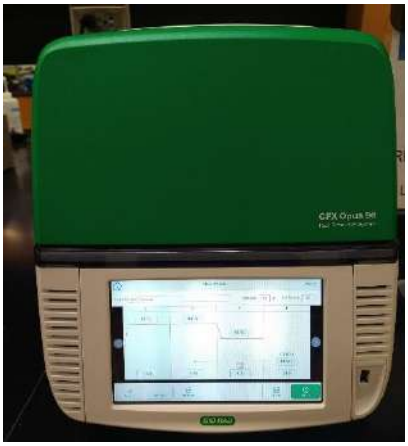
தமிழ்நாடு மத்தியப் பல்கலைக்கழகம்

CENTRAL UNIVERSITY OF TAMIL NADU

तमिलनाडु केन्द्रीय विश्वविद्यालय

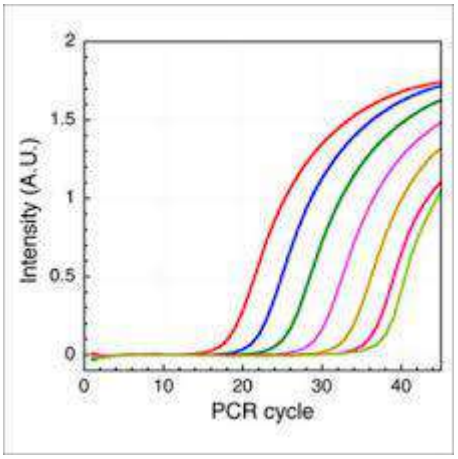
ESTABLISHED BY AN ACT OF PARLIAMENT IN 2009



Workshop on

‘Real-time PCR For Molecular Epidemiology’

February 05 & 06, 2024



About the Workshop

The Department of Epidemiology and Public Health at Central University of Tamil Nadu (CUTN) invites applications from individuals interested in attending a two-day workshop on ‘Real-time PCR for Public Health’ targeted to students, research scholars, and early-career faculty members in the fields related to Biological Sciences. The workshop provides knowledge and hands-on training related to real-time PCR such as its principle, technology, experimental design (assay design and controls), instrument operation, software, data analysis, and applications.

Real-time PCR is a powerful tool in molecular epidemiology, genetics, microbiology, and public health. It is used for the rapid and accurate detection, quantification, and monitoring of infectious agents such as bacteria, viruses, and fungi. Detection of infectious agents in clinical samples is essential for early diagnosis and timely response to outbreaks. Quantification of infectious agents in clinical samples aid in the assessment of disease severity and progression. Detection of microbial contaminants in the vaccine, food and water samples ensures the safety of these essential resources for human consumption. Screening of genetic mutations associated with increased susceptibility to certain diseases such as cancers enables assessment of the risk of facing the disease. Detection of antimicrobial resistance genes helps public health professionals track the emergence and spread of drug-resistant strains.

Who Can Attend?

The workshop is open to new and current users (students, research scholars and early-career faculty members) of real-time PCR machines for research and training. Apply for admission into the workshop by filling out the Google form (Click Here). However, the admission is subjected to the availability of slots. Available slots: 25.

Registration & Payment

Course Fee: Rs. 500/- for students and research scholars; Rs. 700/- for early-career faculty. Payments will be accepted on the first day of the workshop at the Department (i.e., on the spot). Accommodation is available for the participants at the Central University of Tamil Nadu (CUTN) Guest house, on a payment basis and upon request.

Coordinators and Contact Details

Prof. Dr. Natarajan Gopalan & Dr. Sujit Kumar Behera, Department of Epidemiology and Public Health, CUTN. Mobile: 87631 28252 (Dr. Behera). Email: ephcutn@gmail.com (Workshop specific e-mail).

Schedule

Day-1 (Classroom Instruction)	Time
Classroom Session I: ***Introduction to real-time PCR.*** *Conventional PCR versus Real-time PCR; Advantages of real-time PCR; Components and Chemistries of real-time PCR: DNA template, primers, fluorescent dyes and types of probes; Real-time detection of fluorescence.*	9.30 AM - 10.30 AM
Classroom Session II: ***Design and optimization of real-time PCR experiments.*** *Sample preparation (DNA/RNA extraction). Inclusion of experimental controls. Setting up of reactions and optimization of PCR.*	10.30 AM - 11.15 AM
Short Break	11.15 AM - 11.30 AM
Classroom Session III: ***Applications of real-time PCR in Public Health*** *(along with case studies) such as infectious disease surveillance (detection, quantification, and monitoring of pathogens), ensuring safety of food, water, and vaccines; genetic screening (SNP genotyping); analysis of gene expression..*	11.30 AM – 12.30 PM
Lunch Break	12.30 PM – 1.30 PM
Day-1 (Hands-on Training)	
Laboratory Session I: Collection of samples for pathogen detection. Preparation of DNA/cDNA samples for real-time PCR. Preparation of real-time PCR mixtures for detection and quantification of a bacterial pathogen (using ***SYBR Green****).*	1.30 PM – 2.30 PM
Laboratory Session II: Operation of BioRad CFX96 Opus real-time PCR instrument and run of real-time PCR.	2.30 PM - 3.45 PM
Laboratory Session III: Real-time PCR data analysis: Amplification plots, Determination of threshold cycle. Calculation of PCR efficiency. Melt-curve analysis. Normalization. Absolute versus Relative quantification.	3.45 PM – 4.30 PM

Day-2 (Classroom Instruction)	Time
Classroom Session IV: Design of Primers and Probes for real-time PCR. SNP Genotyping for allelic discrimination using Taqman Probes. Multiplex Real-time PCR. Digital PCR versus Real-time PCR.	9.30 AM - 11.00 AM
Short Break	11.00 AM - 11.15 AM
Day-2 (Hands-on Training)	
Laboratory Session IV: Preparation of real-time PCR mixtures for detection and quantification of a bacterial pathogen (using ***TaqMan Probes****).*	11.15 AM – 12.00 PM
Laboratory Session V: Instrument (BioRad CFX96 Opus) operation and run of real-time PCR.	12.00 AM – 12.30 PM
Lunch Break	12.30 PM – 1.30 PM
Laboratory Session VII: Real-time PCR data analysis: Determination of threshold cycle. Calculation of PCR efficiency. Absolute versus Relative quantification.	1.30 PM – 2.30 PM
Discussion (Q &A Session).	2.30 PM – 3.00 PM
Assessment (Quiz & Active Participation) & Distribution of Certificates.	3.00 PM – 4.00 PM
Conclusion of Workshop	4.00 PM – 4.30 PM