ICAR SPONSORED HANDS-ON TRAINING

# DNA Sequencing Using Ion Torrent NGS Platform and Data Analysis

22nd – 31st January 2024

**REGISTRATION FORM**

**Name**

**Occupation**

**Affiliation**

**Address**

**Mobile No and Email**

**Education Qualification**

**Sex**

**Experience in the Field (if any)**

**Reason for Attending**

**Forwarded by HOD/PI/Head of Institution**
**(In-Service candidates only)**

**Signature of Applicant**

## PROGRAM DIRECTOR

Dr. Ravishankar C.N.
Director
ICAR-CIFE, MUMBAI

## COURSE DIRECTOR

Dr. Aparna Chaudhari
Principal Scientist &
In-charge NGS Facility

## COURSE COORDINATORS

Dr. Pavan Kumar
Senior Scientist

Dr. Kiran Rasal
Scientist (SS)

## FISH GENETICS AND BIOTECHNOLOGY DIVISION

**For Details Please Contact**

**Dr. Aparna Chaudari**
**aparnac@cife.edu.in**
**ngslab@cife.edu.in**
**Website: www.cife.edu.in**

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# DNA Sequencing Using Ion Torrent NGS Platform and Data Analysis

22nd- 31st January 2024

Organised By

ICAR -Central Institute for Fisheries Education
(Deemed University)
Panch Marg, Versova
Mumbai - 400061

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# DNA Sequencing Using Ion Torrent NGS Platform and Data Analysis

NGS technologies have revolutionized the field of genomics by enabling high-throughput, cost-effective, and rapid sequencing of DNA and RNA. Ion Torrent NGS platform is a robust. cost effective and rapid technology which has stood the test of time. It works on the principle of detection of hydrogen ion released during incorporation of new nucleotide in the growing DNA template. The system offers flexibility of chip sizes and data output ranges from 0.3-15 Gb, and the maximal read length is 400 bp. It is especially useful for metagenomics, mitogenomics, shallow transcriptome sequencing, microbial and viral whole genome sequencing. Previously unculturable and unidentified microbes can now be identified from their natural habitat by amplicon based 16s rRNA gene targeted metagenomics. Shotgun metagenomics has the dual benefit of analysing the biodiversity and bioprospecting of novel genes/ sequences for various applications. This technique has been effectively used to identify new proteins, enzymes, and biochemical pathways, novel antibiotic resistance genes and industrial enzymes. Massive amounts of raw sequence data require sophisticated computational methods for analysis. The key steps include data pre-processing, alignment, variant calling, and interpretation. Several computational tools are available to characterise biodiversity, resolve the taxonomic ambiguity, develop molecular markers, and identify the novel genes and functions. This training is designed to impart hands-on training on DNA sequencing using Ion Torrent platform and downstream data analysis.

## Course Content

- Genome organization
- Basis of DNA sequence variation
- Evolution of sequencing technologies
- DNA library preparation and quality assessment
- Sequencing using Ion torrent NGS platform and data generation
- Sequence analysis and quality check
- Mapping and assembly of reads
- Metagenomics and metabarcoding
- Analysis of transcriptome
- SNPs: Discovery and applications
- Mining of NGS data for SSR markers
- NGS data submission and retrieval
- Mitogenomics
- Phylogenomics

**Dates:** 22$^{nd}$ - 31$^{st}$ Jan 2024

**Training Fee:** No Fee

**Maximum Participants:** 25

**Eligibility:** Assistant Professors, Scientists

**Last Date of Application:** 10$^{th}$ Jan 2024

**Travel Allowance:** Participants will be paid to and fro journey to the maximum of AC II Tier by rail. In case of travel by air, the difference will be borne by the participant.

**How to Apply:** Please use the format of the registration form provided alongside and email your application to ngslab@cife.edu

## About ICAR-CIFE

ICAR-Central Institute of Fisheries Education (Deemed University) is India's only national fisheries university. It is a premier institution dedicated to promoting higher fisheries education through generation of high quality human resource, high end research in both basic and applied aspects, generation of appropriate technologies and their dissemination. CIFE alumni constitute the country's present leadership in this sector.

Fish Genetics and Biotechnology Division has been working in the area of molecular genetics and genetic engineering since over two decades. In recent years, we have developed species specific DNA barcodes and delimited monogenean parasites, crustaceans, molluscs, elasmobranchs and teleosts with confirmatory nuclear markers. The Division has also unravelled mitochondrial genome of mahseer fishes for species delineation, developed microsatellites and mined SNPs for a number of species. The Division has good expertise in transcriptome analysis for trait linked genes, alleles and markers, and has developed molecular interventions for use in aquaculture including vaccines, facilitation of captive maturation and breeding, and nanodelivery of molecules.