



## Background

In the last decade, advances in the molecular biology are coupled with genomic techniques resulted into huge biological data in the public domain. This has led to pre-requisite to acquire knowledge of computational biology to handle and analyze data suitably to interpret biological information. The recent advancement in biotechnology including genomics and bioinformatics has revolutionized biological research over the course of period. Now days, molecular biology field has been progressed from sequencing and mapping of fish genomes towards understanding genome functions specifically. Fish Genetics and Biotechnology Division of the ICAR-Central Institute of Freshwater Aquaculture (CIFA), Institute caters to genetic improvement through application of traditional and biotechnological tools for increasing fish production. Jayanti, the genetically improved rohu, product of conventional selective breeding. Genomics approaches, such as DNA marker technology, DNA cloning, RNA technology, spermatogonial stem cell culture techniques and proteomic tools have been developed by the division, which complement the traditional selection. Research on generating DNA linkage maps, mapping populations, EST databases, etc. to be served as genomic resources for detection of quantitative trait loci (QTL) and subsequently marker assisted selection (MAS) are taken up by the division on a priority basis. Besides, candidate gene approach of identifying and characterizing genes involved in reproductive processes of carps has been successful. The institute already ventured into whole genome sequencing of commercially important species like rohu and magur and it is underway.

However, although traditional techniques of isolation of genomic DNA from individual fishes for studying genes and their cloning has been now replaced with new high throughput next generation sequencing (NGS) technologies. Many researchers are facing difficulty in understanding the fish genomes because of lack of non-model aquaculture fish genome data as well as lack of knowledge about computational biology.

## About the Training

The 10 days training programme have been designed for getting knowledge from basic use of molecular biology for day to lab work and

computational tools towards high-end utility. Here, participants have an opportunity to understand fish genomics and new tools will be covered which are currently being utilized for genome characterization and annotation. This training will be helpful for participants to use computational tools for sequence analysis, phylogenetic study, protein modelling and high throughput data analysis.

## Course Contents

- # DNA/RNA isolation, Gel electrophoresis
- # PCR, Primer designing
- # Plasmid DNA isolation and RE digestion
- # Proteomics & its applications
- # Introduction to computational tools
- # Sequence analysis, MSA
- # CLC genomic work bench utility
- # Phylogenetic study (MEGA, CLC)
- # Protein modelling: homology & de novo
- # Molecular docking
- # Introduction to NGS tools & NGS platform
- # Molecular markers
- # NGS raw data cleaning using open source tools
- # Genome assembly tools
- # Allele mining & marker discovery (MISA tool)
- # SNP discovery (STACKS, GATK & SAMtools)
- # Transcriptome assembly
- # Structural & functional annotation (Blast2Go, Molquest etc)

In addition to above the training also covers invited lectures from expert in the field of genomics and bioinformatics from reputed institutes.

## Who can Apply ?

Project personnel, faculties, and researchers having basic knowledge on biology, biochemistry, genetics, computer science molecular biology and utility of computer and internet surfing. A total of 20 participants will be accommodated in this training. The selected candidates should bring their own laptop for hands-on practice of practical sessions of the training.

## Training Fees :

**Faculties and Project personnel: 5000/- ( Five thousand only)**

**Students (other than project fellow): 3000/- ( Three thousand only)**

**Note:** Training fees covered; training manual, kit, pen and folder/bag. Project fellow should produce bonafide certificate from their authority or PI of the project.

The food and accommodation charges will be paid by respective applicants for the said period separately. Accommodation will be provided to Faculty or students based on the request.

## How to apply?

The interested candidates can send duly filled format to the mail ID of training Director, fgbtcifa@gmail.com

Only, eligible and interested participants are requested to send their application in the given format to the Course Director along with training fees in the form of Demand Draft drawn in favour of 'ICAR Unit CIFA' payable at SBI, Kausalyaganga (8874), Bhubaneswar.

## Important dates

Last date of receipts of application: 15 March, 2019

Intimation to the selection participants: 16 March, 2019

## How to reach ?

The Institute is located at near to Uttara, P.O. Kausalyaganga, Bhubaneswar 751002, Odisha. It is about 10 km from Bhubaneswar Railway Station and 12 km from Biju Patnaik International Airport, Bhubaneswar.