Indian institute of Wheat and Barley Research, Karnal (Haryana). This Programme is fully residential and the participants are expected to stay in the accommodation made available by the ICAR-IIWBR.

**Venue**

Indian institute of Wheat and Barley Research, Karnal (Haryana). This Programme is fully residential and the participants are expected to stay in the accommodation made available by the ICAR-IIWBR.

**Weather**

Temperature: Maximum 25-30 ºC, Minimum 15-20 ºC, Normal clothing will be required. Some wet days can not be ruled out during the period.

**How to apply**

The application for participation may be filled online using CBP portal at www.iasri.res.in/cbp conveniently or please visit ICAR site http://www.icar.org.in/(Capacity Building Program link under Quick links). User has to create account on the CBP site and then using the login id enter into system to apply online for the training program. After filling the application, take a printout of the application and get it approved by the competent authority of the organization. Upload the scanned copy of application through the above portal or send by post.

**Last Date for receipt of nomination** : 16th August, 2017

**Date of Intimation of selection** : 5th September, 2017

**Addressed For Correspondence**

Dr. G.P. Singh  
Director  
ICAR-Indian Institute of Wheat and Barley Research  
Karnal-132001  
E-mail: director.iiwbr@icar.gov.in

Dr. Ratan Tiwari  
Principal Scientist  
ICAR-Indian Institute of Wheat and Barley Research  
Karnal-132001  
E-mail: Ratan.Tiwari@icar.gov.in

**Organizers**

**Course Coordinators:**

Dr. Sonia Sheoran  
Dr. Rajender Singh  
Dr. Pradeep Sharma  
Dr. Rekha Malik

**ICAR-Indian Institute of Wheat & Barley Research (ICAR-IIWBR)**  
Aggarsain Marg, Post Box-158, Karnal-132001, Haryana  
Telephone : 91-184-2209136 (Office)  
Director Cell : 91-184-2267490, 2209102  
FAX No. : 91-184-2267390  
E-mail : director.iiwbr@icar.gov.in
Introduction

Rapid developments in next generation sequencing (NGS) technologies over the last decade have opened up many new opportunities to explore the relationship between genotype and phenotype with greater resolution than ever before. NGS technologies have been available since last few years and are being widely used for de novo sequencing, whole genome sequencing, and transcriptome analysis as the cost of sequencing is reducing day by day. Plant breeders have begun to utilize NGS with increasing regularity to sequence large populations of plants, increasing the resolution of gene, SNPs, SSRs and QTL discovery therefore providing the basis for modelling complex genotype-phenotype relationships at the whole-genome level. The use of NGS technology for gene discovery in diverse populations, and helping to bridge the gap between the information that is available on model species about the genes and QTLs underlie plant phenotypes and the integration of this information into applied crop improvement.

Objective

The winter school intends to update with the knowledge of NGS based techniques coupled with its application to other systems, to develop crops with improved trait performance and to increase the efficiency of modern plant breeding. Both basic information on NGS as well as hands on training to utilize genome data post processing using computational tools will be imparted during the course programme.

Eligibility

Candidates will be selected out of the applications received from SAUs ICAR institutes, Central Agricultural University, Allahabad Agricultural Institute-DU, Agricultural Faculty of Aligarh Muslim University, Banaras Hindu University, Visva Bharati, Nagaland University and Krishi Vigyan Kendras. Participation will be limited to 25 persons of the rank of Assistant Professor and above or equivalent. Candidates below 40 years of age, interested in using NGS approach either in their own programme or ready to cooperate with the national network programme on crop improvement will be preferred for this course.

Course Content

The content of the course is designed to provide basic and advanced information on biotechnology, particularly focusing on mining and utilization of NGS genomic data information for genetic enhancement of wheat. Although main emphasis will be on NGS tools advancements for genomic selection, de novo genome assembly, RNA sequencing and genome annotations, marker-trait analysis, search and utilization of SSRs/SNPs derived markers for crop improvement. Besides introduction to different softwares to be utilized using computational analysis, phenotypic and genotypic data analysis and handling common window based packages will also be a part of the course. Candidates will get an opportunity to perform hands on exercise on Gene assembly, Gene annotation and mining SSRs and SNPs based markers for detection of traits/genes of agronomic importance in wheat. The course also provides a platform to the candidates to make 20 minutes presentation of their own ongoing work and to have a fruitful interaction with other participants/experts. Towards the end of the course, trainees will be required to submit a report on the experiences gained during the programme and also evaluation test will be conducted.

Faculty

The faculty will be experts in their respective areas concerning to the characterization of genes, computational biology, de novo assembly of genome, field phenomics and bioinformatics softwares. General topics will be dealt in by very experienced and learned scientists. Since Next Generation Sequencing (NGS) data analysis plays a major role in biotechnology research to achieve accelerated genetic gain in agricultural germplasm, the present program includes a 3 day special module on NGS data analysis right from quality check, genome assembly, annotation, transcriptome data analysis, genome-wide molecular marker discovery (SNP and SSR marker), gene regulatory network, pathway analysis, transcription factor analysis, micro RNA prediction and metagenomics. This module will be conducted by our collaborator/guest faculties from Centre for Agricultural Bioinformatics (CABIN), ICAR-Indian Agricultural Statistics Research Institute, New Delhi.

Course Language

Lectures and other oral presentations will be in English language. All the literatures, including lecture notes, laboratory manual and work books will also be in English.

Duration

The course is scheduled from October 3-12, 2017 (both days inclusive). Participants are expected to arrive at the ICAR-IWBR, Karnal, by the morning of October 3, 2017. They can leave after 16:00 hrs on October 12, 2017.

Course Fees

The Registration fees is ₹ 50.00 per participant. The payment shall be made by DD/E-payment in favor of ICAR-IWBR, Karnal (State Bank of India, IFSC code SBIN0000665, Account No. 10868324195 ) with intimation through E-mail. This fees is non-refundable.

General Information

Participants will be paid travel fare to and fro for the journey by train as per their entitlement for the class of travel restricted to the maximum of AC-III tier or bus or any other means of transport in vogue as the case may be. TA will be paid from the place of duty to the ICAR-IWBR and back by the shortest route. Organizers will make free board and lodging arrangements for the participants. The participants are advised not to bring family members with them. Also, participants are advised to make their return journey reservation at their end in advance as it will be difficult to get train reservation after their arrival.

Application form for Participation to the Winter School on “Harnessing NGS data for genetic enhancement in crops”

October 3-12, 2017

Institute at ______________________________

1. Full name (in block letter): ______________________________

2. Designation: ______________________________

3. Present employer and address: ______________________________

4. Address to which reply should be sent (in block letters) (Please mention email address and mobile number)

5. Permanent address: ______________________________

6. Date of Birth: ___________ 7. Sex: Male/Female

8. Teaching/research/professional experience (mention post held during last 3 years and number of publications): ______________________________

9. Marital status: Married/Unmarried: ______________________________

10. Mention if you have participated in any research seminar/ Summer/Winter School/Short Course, etc. during the previous years under ICAR/Other organizations

11. DD/E-transfer _______ Dated___________ of ₹ 50/- (Not Refundable) for registration of application:

12. Academic record

Examination passed: ______________________________

Subjects/ marks/ Subsidiary/ Year of passing: ______________________________

Class/ degree: ______________________________

Honours: ______________________________

Master's degree: ______________________________

Other certificates, Diplomas, degrees etc.: ______________________________

Signature of the Applicant ______________________________

Date ______________________________

Place ______________________________