



ANRF sponsored three days workshop on
Molecular strategies for heterologous gene expression and protein purification

March 17 – 19, 2025



Course Director

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Organized by
Division of Plant Biotechnology
ICAR- Indian Institute of Pulses Research (IIPR)
Kalyanpur, Kanpur, India. 208024
<https://iipr.icar.gov.in>

About the course and Institute

ICAR-Indian Institute of Pulses Research (IIPR) invites applications for a three day workshop on Molecular strategies for heterologous gene expression and protein purification from March 17-19, 2025 at ICAR-IIPR, Kalyanpur, Kanpur, and Uttar Pradesh.

Functional genomics has emerged as a key area with the availability of enormous amount of genome sequencing data surfacing every day with the advent of Next Generation Sequencing technologies. Functional annotation of the newly discovered genes has become a vital part to uncover their biological functions. In order to do so, molecular techniques like gene isolation, gene cloning, development of expression vectors, and transformation of suitable host systems to express the gene and study its effect on the phenotype have become essential. Further protein isolation from the transformants and purification of the proteins for structural and biochemical studies has also been challenging. It is extremely important to train the researchers for the effective deployment of these techniques in their research programs. The academicians also require exposure to such functional genomics tools for teaching students and young research scholars. This 3-days training program covers the basics and details of gene cloning, hands-on experience in designing the vectors and construct development, delivery into a plant or bacterial cells, detection of the transformed plants and cells using various approaches. Protein isolation and purification from *E.coli* cells using the induced and un-induced cultures will be demonstrated.

The ICAR-IIPR has >20 years of rich experience in recombinant DNA technologies, transgenic development, characterization of the transgenics and has recently ventured into the genome editing of pulse crops. The institute has well-trained human resources, state of art facilities and laboratory infrastructure to carry out genome editing research and training.

Objective

- ❖ Acquaint the participants with basic and advanced knowledge of molecular strategies for gene expression in different host systems including model plants and microbes.
- ❖ Impart hands-on skills to develop gene cloning techniques such as Gateway cloning, use of TRBO vectors for transient expression in *Nicotiana benthamiana*.
- ❖ Further to impart training on expression of genes in *E.coli* and understand the protein purification techniques such as Affinity chromatography and ion-exchange chromatography.

Modules

Module - I	Module - II
Transient expression and protein purification using high efficiency plant based TRBO vector system.	Protein expression and purification in <i>E. coli</i> .

Resource persons

Resource persons from IISc Bengaluru, IIT-Kanpur, IIIT-Allahabad, BITS Pilani, Hyderabad, ICAR-IIPR, CSJM University, Kanpur and any subject matter specialists across India.

Topics at glance

Lectures	Hands-on sessions
<ul style="list-style-type: none">❖ Basics of gene cloning❖ Codon usage analysis and codon optimization for crop plants.❖ Functional genomics approaches using Arabidopsis as a model plant and the Floral dip transformation.❖ Introduction to TRBO vectors and transient expression of genes in <i>Nicotiana benthamiana</i>.❖ Molecular approaches for expression of genes in <i>E.coli</i>❖ Genome editing as a functional genomics tool.❖ Agrobacterium and Biolistic methods of plant transformation of crop plants: Pros and Cons.	<ul style="list-style-type: none">❖ Gene isolation using PCR❖ Purification of the PCR products.❖ Gateway cloning in to the entry and destination vectors❖ Plasmid isolation, restriction enzyme digestion, purification❖ Ligation into destination vector❖ Bacterial transformation and protein purification.

Eligibility and How to apply

The scientists/faculty working in the public/ private organization are eligible. The applications forwarded by the competent authority will only be considered. Preference will be given to the participants working in the area of functional genomics. A maximum of 25 participants will be selected by a screening committee. Eligible and enthusiastic candidates may submit their application form in the prescribed proforma via e-mail to "anrf3dayworkshop@gmail.com".

Note: The participants are encouraged to carry their own laptops for the training program.

Course Details

No course fee is applicable for the workshop. All course notes and lectures will be in English. Therefore, participants should have a good knowledge of English and of the appropriate technical terms used in the molecular biology training course

Venue, Accommodation & Travel

The venue of the workshop is Conference room and Division of Plant Biotechnology, ICAR- Indian Institute of Pulses Research, Kanpur, India. Boarding and lodging for all the selected participants will be provided in the ICAR-IIPR guest house on twin sharing and on payment basis. Participants have to bear the travel expenses and no TA/DA will be provided.

Duration

The 3 days workshop is scheduled from March 17-19, 2025. The participants are required to reach ICAR-IIPR by the evening of March 16 and can plan their return journey after 18:00 hours on March 19, 2025.

Important Dates

Last date of receipt of applications: **February, 28, 2025**

Intimation for selected candidates: **March 5, 2025**

How to reach venue

ICAR-IIPR is located at about 10 km from Kanpur Central Railway Station. Taxi and auto services are available from railway station to the institute. Kanpur Airport (KNU) is 15 km away from the institute.

Contact information

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[Application form](#)

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Title (Dr/Mr/Ms/Mrs)	Gender (M/F)
First Name	
Middle Name	
Family Name	
Designation/Job title	
Organization (with address) State/Province; City; Postal/Zip Code; Country	
Date of Birth (age in years)	
Email (give primary and alternate email, if available)	
Mobile No.	
Phone No.	
Whether Accommodation required	Yes/No

Educational Qualifications (Post graduation onwards)			
Degree	Year	Subject(s)	University/Institute
Career summary			
Designation	From-to	Nature of research & responsibilities	University/Institute

How did you find about the training (Restrict to 100 words)			
Email	Social Media	Through Institute/Organization	Friends

Full Name of Applicant.....

Date..... Signature.....

Remarks and Recommendations of the parent organization

.....

..... Date..... Signature.....

Place.....

Name of Forwarding Authority.....

Seal.....