About the course

Plant transformation is a powerful tool to insert engineered genes into the plant genome that enables the development of crops with desired traits such as improved yield, drought tolerance, disease resistance, etc. The first step is the delivery of selected genes into the plant cells through *Agrobacterium*-mediated transformation, and then entire plants can be regenerated from single transformed cells or tissue through plant tissue culture techniques. The specific protocol varies depending on the crop genotypes, *Agrobacterium* strains, explant, cloning vectors, and culture conditions.

Plant transformation has been widely applied in many areas, including functional genomics, overexpression, RNAi silencing, and gene editing. An efficient transformation system is required for trait dissection and crop improvement programs. At ICRISAT, we have developed transformation protocols for dryland crops, including groundnut, pigeonpea, and chickpea (Sharma et al., 2006). These transformation protocols will help in trait dissection, candidate gene discovery, and trait improvement programs.

BioNcube, a BIRAC-Bio incubator of International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) call applications for a hands-on training program on “Plant transformation”. ICRISAT is an International non-profit agricultural research institute with state-of-the-art facilities for Agri-biotechnology research and product translation.

BioNcube features state-of-the-art plant transformation facilities comprising the transformation facility, Molecular biology laboratory, Biosafety Level 2 greenhouses, and regular greenhouses. The training course is being organized from **16-18 November** at BioNcube of ICRISAT, Patancheru, Hyderabad, India-502 324.
## Lectures
- Introduction to plant transformation and its application in crop improvement
- Overview of various genetic engineering technologies
- Applications of tissue culture in genetic engineering and gene editing
- Regulatory overview on various issues related to plant transformation such as biosafety guidelines, and regulatory, IPRs, ethical and societal concerns

## Practical sessions
- Handling and laboratory setup, including sterilization and aseptic techniques for plant transformation
- Preparation of stock solutions and nutrient media
- Cover all stages of Agrobacterium-mediated transformation in groundnut and chickpea
- Rooting, acclimatization of tissue culture-raised plants and transfer to the glasshouse
- Molecular analysis of the transformed plants- DNA isolation, gel electrophoresis and PCR

This workshop will expose the participants with the basic knowledge, along with skills and techniques of plant transformation and its applications. The workshop comprises both lectures and hands-on laboratory practical by key experts. We hope that, all the participants at the end of this program, learn about various aspects of plant transformation that helps in setting up the relevant transformation system in their own lab.
Objective

• Cover basic workflow of plant transformation.
• To acquaint participants to the principles of plant tissue culture and genetic transformation.
• Strategies to confirm transgenic and gene edited lines.
• Demonstration on functional validation tools for transgenic and gene edited plants.
• Understand the regulatory aspects of plant transformation technologies.

Resource persons/trainers

Resource persons for this course would be from National and International Research organizations.

Course fees

• Students/Postdoc
  INR 10,000 (without accommodation)
  INR 19,000 (with accommodation)

• Scientist/Faculty
  INR 13,000 (without accommodation)
  INR 22,000 (with accommodation)

• Industry
  INR 35,000 (with accommodation)

Accommodation

The participants will be accommodated in the Guest House/Hotel during the course of the training. The cost of any additional stay (beyond the dates of training) would be at trainees own expense. Information on extended stay needs to be given in advance.

Course language

All course notes and lectures will be in English. Therefore, participants should have a good knowledge of English and of the appropriate technical terms of Plant transformation technology.

Venue

The venue for the training program is BioNcube, ICRISAT Campus, Patancheru, Hyderabad.

More information

Additional information on the course will be provided to all the participants who are selected for admission to the course.

BioNcube @ ICRISAT

BioNcube is a BIRAC-Bio incubator supporting Ag-biotech innovation, development, and applications of broad range of biotechnological solutions spreading across various domains from basic research to product translation. Agribiotech start-ups incubated in BioNcube, have access to the scientific knowledge of ICRISAT, biotechnology laboratories with state-of-the-art equipment, and infrastructure such as plant genotyping, phenotyping and transgenic facilities, glasshouses, plug-and-play modular labs, molecular biology lab, analytical lab, transformation facility, contained fields etc. The value proposition of the BIRAC- Bio incubator is to link business incubation to translation and support ag-biotech start-ups from proof-of-concept stage through to technology translation and commercialization that will further benefit farming communities.

Application

Applications are invited from researchers who are familiar with basic plant tissue culture techniques and want to learn plant transformation applications in agriculture using the most recent and advanced systems. The application can be accessed from the following link.

https://forms.office.com/r/bKtCDnfBkN

The completed application should be submitted through the link or sent to bioncube@cgiar.org with copy to wricha.tyagi@cgiar.org; P.Sudhakarreddy@cgiar.org; and k.yogendra@cgiar.org.

The due date for applications is 10th November 2022.
# Hands-on training program on Plant Transformation Methods

**Application Form**

**Title (Dr/Mr/Ms/Mrs)**

**Gender (M/F)**

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## Educational Qualifications (Ph.D./Postdoc/Young Scientist/any other)

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How did you find about the training (Restrict to 100 words)

Describe your responsibilities and job description: (Restrict to 300 words)

How will this training help you? (Restrict to 300 words)

Full Name of Applicant: ___________________________ Date: ___________________________ Signature: ___________________________

Remarks and Recommendations of the Host Organization (Please state clearly the strong and weak points about applicant and how this training will be useful for your organization/country)

Date: ___________________________ Signature: ___________________________ Place: ___________________________

Name of Forwarding Authority: ___________________________ Seal: ___________________________