International Hands-on Training on
Genome Editing Technologies

Photo: L Vidyasagar, ICRISAT

14-25 October 2019
ICRISAT, Patancheru, Hyderabad, India

ICRISAT
INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS

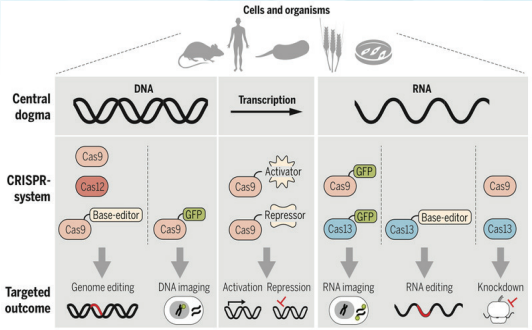
BioNcube
A BIRAC-BioNEST Incubator @ ICRISAT

APAARI

Asia-Pacific Consortium on
APCoAB
Agricultural Biotechnology and Bioresources

CGIAR
RESEARCH PROGRAM ON
Grain Legumes and Dryland Cereals

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and Asia-Pacific Association of Agricultural Research Institutions (APAARI) under its programme on Asia Pacific Consortium on Agricultural Biotechnology and Bioresources (APCoAB) jointly announce to organize an International Hands-on Training on "**Genome Editing Technologies**". ICRISAT is an International non-profit agricultural research institute with sate of art facilities on agri-biotechnology research supporting innovation, development and applications of broad range of biotechnological solutions spreading across various domains from basic research to product translation. Under the aegis **BioNcube, a BioNEST Ag-biotech incubator ICRISAT** and APCoAB programme of APAARI the training course is being organized during October 14 - 25, 2019 at ICRISAT, Patancheru, Hyderabad, India-502 324.



Courtesy: Google

About the course

The global human population projected to exceed more than 9 billion by 2050 requiring crops with higher quality yields with multiple beneficial traits. Advanced breeding technologies like genome editing offers the potential to transform science at an astonishingly rapid rate for precise editing of the genomes for advancing the both basic and applied research and potentially can pole vault crop and livestock breeding programs without any adverse impact on the native phenotypes. Genome editing technologies have revolutionized the process of making DNA-level changes and the implications of this technology reach far beyond standard molecular biology applications. This introductory 10 –day comprehensive training program is ideal for researchers who are looking for a balanced theoretical *vs* hands-on introduction to gene editing. The program is structured as a combination of lectures and discussions with a hands-on laboratory instructions and technology demonstrations for helping the participants stay ahead imparting both theory and practical aspects of CRISPR based genome editing technologies. The course will walk you through a basic gene editing workflows, from design and synthesis of target specific guide RNAs (gRNAs), delivery of gRNAS in plant cells, detection through to analysis of gene editing efficiencies. Our experienced team and resource persons have designed a comprehensive training workshop comprised of both lectures and hands-on laboratory work at our state-of-the-art facility at ICRISAT. This is a great opportunity to interact and benefit from the expertise of our scientists and collaborators across the globe and sectors, as they help you design your first genome editing experiments. It is envisaged that at the end of the workshop, participants will be able to design their own experimental workflows.

About ICRISAT

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) is a non-profit, non-political organization that conducts agricultural research for development in Asia and sub-Saharan Africa with a wide array of partners throughout the world. Covering 6.5 million square kilometers of land in 55 countries, the semi-arid tropics have over 2 billion people, and 644 million of these are the poorest of the poor. ICRISAT and its partners help empower these poor people to overcome poverty, hunger and a degraded environment through better agriculture. ICRISAT is headquartered in Hyderabad, Telangana, India, with two regional hubs and four country offices in Sub-Saharan Africa. It belongs to the Consortium of Centers supported by the Consultative Group on International Agricultural Research (CGIAR).

BioNcube @ ICRISAT

BioNcube is a BioNEST Ag-biotech 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 **BioNEST**, have access to the scientific knowledge of ICRISAT, biotechnology laboratories with state-of-the art equipments, and infrastructure such as plant genotyping, phenotyping and transgenic facilities, glasshouses, greenhouses, plug-and-play modular labs, molecular biology lab, analytical lab, transformation facility, contained fields etc. The value proposition of the **BIRAC-BioNEST Ag-biotech 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.

About APAARI

APAARI is a membership-based, apolitical and multi-stakeholder inter-governmental regional organization. It is bridging national, regional and global stakeholders to bring about collective change in agri-food systems with a vision to strengthen research and innovations for sustainable agricultural development in Asia and the Pacific. APAARI's wide network of members and partners comprises of national agricultural research institutes (NARIs) and organizations (NAROs), CG centres, Association of International Research and Development Centres for Agriculture (AIRCA), universities, extension service providers, civil society organizations, the private sector, farmers and rural communities.

Course objectives

- Equip participants with fundamental knowledge of genome editing techniques.
- Acquaint the participants with bioinformatics tools for guide-RNA designing and CRISPR/Cas9 constructs designing.
- Improve skills in high-throughput techniques for genome editing applications.
- Understand the ethics and biosafety of gene editing technologies.
- Detailed course guide containing all lecture materials, laboratory protocols, troubleshooting tips and more to help you get started right away.

Photo: ICRISAT

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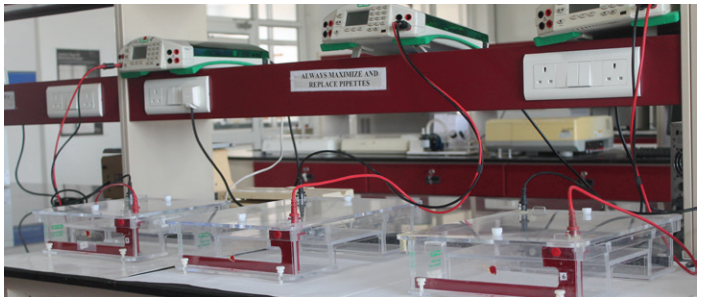
Lectures

- Genome editing as a tool for enhancing disease resistance in Crops
- Editing of crop genomes for trait development: new directions and challenges
- Editing rice-genome with CRISPR/Cas9: to improve agronomic traits for increased productivity
- Editing centromeres to produce haploid plants
- CRISPR tools mediated genome engineering of stem cells and mice/CRISPR tool
- Development of sustainable and globally competitive livestock industry through genome editing
- Concerns of gene-edited products – regulatory, IPRs, ethical, societal

Practical sessions

- Bioinformatics tools for genome editing
- Strategy, cloning of the guideRNA (s) and Cas9 in to the plant expression vector
- Gateway cloning for the CRISPR/Cas9 vectors
- Agrobacterium transformation for the CRISPR/Cas9 recombinant plasmids by electroporation
- Complete demonstration on development of the gene edited plants through agrobacterium mediated transformation
- Molecular analysis of the gene edited plants
- Indels identification and analysis

Photos: ICRISAT







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Resource persons/trainers

Resource persons for this course would be from ICRISAT. Additional faculty will be drawn also from National and International Research organizations as well as from industries.

Course fees

No bench fees will be charged. However, participants will have to bear the cost of travel (including visa fee) from their own organizations or other funding agencies.

The following shall be funded by the organizers:

Lecture and course materials, Lab and field visits, Breakfast/tea/lunch/dinner, Accommodation

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 used in the Genome editing training course.

Venue

The venue of the conference is Platform for Translational Research on Transgenic Crops (PTTC) building, ICRISAT Campus, Patancheru, Hyderabad, India.

About the Hyderabad

Hyderabad was established in 1591 AD by Muhammad Quli Qutb Shah. The city has the famous Hussain Sagar lake, which was built in 1562 AD near the center of the city. It is historically known as a city of pearls, and is one of the most popular pearl and diamond trading centers. It is a world-famous city for the ancient structures such as Charminar and Golconda Fort, and the modern Hitech City and Ramoji Film City. It is highly popular for the delicious Hyderabadi biriyani. It is also called agricultural capital of India, and houses many ICAR institutes (DOR, DRR, DSR, CRIDA and NAARM) and ICRISAT.

Climatic conditions

October is a pleasant time in Hyderabad and the expected temperature will be around 25-31°C during the day and 19 - 24°C at night.

Transportation

Rajeev Gandhi International Airport in Hyderabad, India is about 40 km (27.3 miles) and transport from the airport to the Guest House and back will be provided by ICRISAT.

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.

More information

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


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Application

Applications are invited from researchers who are familiar with basic molecular and cell biology techniques and want to learn genome editing applications in agriculture using the most recent and advanced CRISPR system. While previous experience in genome editing is not required, it is expected that the participants have fundamental knowledge and working experience on molecular biology and transformation tools. The completed application should be sent to Dr Pooja Bhatnagar-Mathur, Course coordinator, Email: p.bhatnagar@cgiar.org with copy to Dr Kiran K Sharma, E-mail: k.sharma@cgiar.org and Dr Rishi Kumar Tyagi, E-mail: rishi.tyagi@apaari.org.

The due date for applications is 10 Sept 2019.

Dr Pooja Bhatnagar-Mathur

Principal Scientist & Theme leader

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International Training Course on

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Application Form

Affix Recent Passport size Photograph

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	
Nationality	
Date of Birth (age in years)	
Address (as in passport) State/Province; City; Postal/Zip Code; Country	
Passport No.	
Date of Issue of Passport	
Date of Expiry of Passport	
Email (give primary and alternate email, if available)	
Mobile No.	
Phone No.	
Fax No.	

Educational Qualifications (Ph.D./Postdoc/Young Scientist/any other)			
Degree	**Year**	**Subject(s)**	**University/Institute**

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……