



भारतीय प्रौद्योगिकी संस्थान गुवाहाटी Indian Institute of Technology Guwahati

Online workshop



Environmental Genomics and Genome Editing

February 23rd – 27th 2021

Conducted by:
Centre for the Environment, IIT Guwahati



Workshop Coordinator
Prof. Utpal Bora
Dept. of Biosciences & Bioengg.
Centre for the Environment

Organized by:
Knowledge Incubation for TEQIP
Centre for Educational Technology
URL: <http://www.iitg.ac.in/cet>

ABOUT THE EVENT

Environmental genomics is an interdisciplinary field that brings together knowledge on the past and the present organisms and ecosystems, through the analysis of the gene sequences, genomes, metagenomes, transcripts, transcriptomes and metatranscriptomes. Environmental genomics provides a wealth of information on the taxonomy and diversity of current and fossil organisms, their phylogeny and evolution. It also focusses on their potential and ability to adapt and acclimatize, their functional traits and their interaction with the biotic and abiotic factors of the environment. Metagenomics is extensively used to study microbial communities in various area of research including animal health, human biology, food and agriculture, etc. The application of metagenomics in ecology and environmental research helps in understanding the microbial composition and diversity indicating well-being or vulnerabilities of an ecosystem.

In modern biology, genome editing is one of the most promising technologies for radical transformation of human kind. The Nobel Prize in Chemistry 2020 was awarded to Emmanuelle Charpentier and Jennifer A. Doudna for development of genome editing tool, CRISPR/Cas9. With advent of genome editing tools like ZNF, TALEN and most importantly CRISPR-Cas9, there has been an unprecedented development primarily in curing genetic disease of human and improving productivity of crops. In the same time, the world is facing impending threats from environmental degradation and ecological loss. Application of genome editing technologies in ecology and ecological research will help to address the problems of conservation.

The workshop is designed for faculty members and young researchers to give them an overview of state-of-the-art genomic and genome editing technologies. This workshop aims to make the participants learn key concepts, familiarize them with the developments in techniques and tools and make them aware of the scopes and potential applications of these technologies in ecology and environmental research. The five-day workshop will include theoretical lectures on metagenomics and genome editing along with a hand-on-training on metagenomics data analysis with bioinformatics.

CONTENTS OF THE WORKSHOP

- Fundamentals of metagenomics
- State-of-the-art and applications of metagenomics in ecology and environmental research
- Fundamentals of genome editing technologies
- State-of-the-art and applications of ZFN, TALEN and CRISPR-CAS9 genome editing tool
- Applications of genome editing tools in ecology and environmental research
- Bioethics and Intellectual Property Rights for genome editing
- Hand-on-training on metagenomics data processing and analysis using bioinformatics and other computational tools

Topics to be covered

- Pedagogy Session emphasized on environmental science education.
- Tools and techniques for metagenomics.
- Introduction to analysis of metagenomics data.
- Metagenomics and infectious diseases.
- Metagenomics and ecosystem biology.
- Genome Manipulation: Natural & Artificial.
- Genome editing tools in environmental health research.
- Engineering brand new proteins for environmental applications
- CRISPR, ZFN and TALEN: Basics & Applications.
- Processing of raw metagenomics data.
- Metagenomics data assembly.
- Metagenomics data retrieval and analysis tools.
- Functional annotations of metagenomics data.
- Biosafety and IPR issues in metagenomics.
- Ethical concerns of Genome Editing.

LIST OF INSTRUCTORS/SUBJECT EXPERTS:



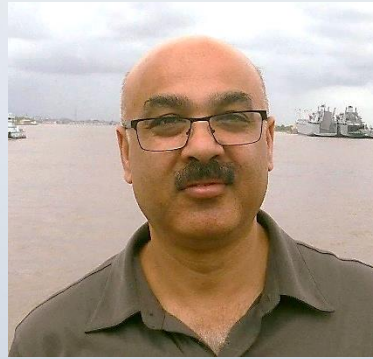
Prof. Utpal Bora
Department of Biosciences and Bioengineering
IIT Guwahati



Prof. Ananthakrishnan Srinivasan
Department of Physics
IIT Guwahati



Prof. Ranjan Tamuli
Department of Biosciences and Bioengineering
IIT Guwahati



Dr. Jayanta Biswa Sarma
Centre for the Environment
IIT Guwahati,
National Health Service
United Kingdom



Dr. Dinesh Kumar
ICAR-Indian Agricultural Statistics Research
Institute
New Delhi



Dr. Mir Asif Iquebal
ICAR-Indian Agricultural Statistics Research
Institute
New Delhi

ELIGIBILITY

The event is open to Faculty members and students with background of Biotechnology/Biomedical/Bioprocess/Chemical/Civil/Environmental engineering/Food technology/Bioinformatics/Zoology/Botany and allied fields from TEQIP mapped Institutions/Engineering Colleges/ATUs. Participation is also open to Faculty members and Research Scholars from non-TEQIP-III institution upon submission of a fee as described in the brochure.

MODE OF EVENT

Online

REGISTRATION FEE

Registration fee is free for participants from TEQIP-III mapped institutions.

For participants from non-TEQIP-III institutions, a registration fee of 2950 INR (2500 INR + 18% GST) is charged. The fee has to be deposited through a demand draft drawn in favor of Registrar, IIT Guwahati, Guwahati, Assam 781039. DD must reach IITG by 17/02/21 for consideration.

IMPORTANT DATES

The last date for the receipt of duly sponsored application:

Scanned copy (by email): ~~12/02/21~~ **Extended till 20/02/21**

Hard copy must reach by: ~~17/02/21~~ **Extended till 21/02/21**

DD for registration fee (non-TEQIP-III institutions) must reach by:

~~17/02/21~~ **Extended till 21/02/21**

Intimation of selection: 18/02/21 **Extended till 22/02/21**

SELECTION CRITERIA

Selection will be based on First cum first served basis. For participants from non-TEQIP-III selection is subject to the deposition of prescribed fee.

Issue of the participation certificate is subjected to satisfactory attendance of the participant in the workshop.

ADDRESS FOR CORRESPONDENCE

Workshop Coordinator: Prof. Utpal Bora

Centre for the Environment/Department of Biosciences & Bioengineering

Indian Institute of Technology Guwahati

Guwahati- 781 039

<https://www.iitg.ac.in/ubora/>

Application Form

1. Name (block letters):

2. Sex: Male Female

3. Category: General Reserved

4. Highest Academic Qualification:

5. Specialization:

6. Designation & pay scale:

7. Name of the organization:

8. Experience:

(a) Teaching:

(b) Industrial:

9. Address for communication:

Pin code:

Mobile No.:

E-mail:

10. DD details (for non-TEQIP-III institutions)

Bank

DD No.

Please register me for the online workshop on “**Environmental Genomics and Genome Editing**” to be held at IIT Guwahati.

I am sending an advance copy of this application by email to the coordinator of the course.

I undertake to send the Hard copy signed by the Head of my Institution.

Place:

Date:

Signature of the applicant

E-mail the scanned copy of this form and DD to- egenomedit@gmail.com

SPONSORSHIP / NOMINATION CERTIFICATE

Prof/Dr./Mr./Ms./Mrs./.....

.....

is an employee of our institute and his/her application is hereby sponsored/nominated. The applicant is permitted to attend the online workshop **“Environmental Genomics and Genome Editing”** organized by IIT Guwahati during 23/02/21 to 27/02/21 if selected.

I also certify that our institute/college, is/is not under the “Institution List” of 3rd phase of TEQIP Project of MHRD.

Date

Signature of Authority

Designation

Official Seal

Selected participants will be informed by e-mail. The duly sponsored/nominated application form should be mailed to:

Prof. Utpal Bora

Center for the Environment

Indian Institute of Technology, Guwahati

North Guwahati, Guwahati-781 039, Assam

Ph. No. 0361-258 3204

Email: ubora@iitg.ac.in

ABOUT TEQIP

TEQIP conceived in pursuance of the NPE-1986 (revised in 1992) by Govt. of India as a long term program to be implemented in different phases. After successful execution of TEQIP II, TEQIP III starts from 2017-18 as Central Sector Scheme with a focus on the Low Income States, Northeast, Hill States and Islands. The third phase of TEQIP is also special in a way that it incorporates twinning arrangements between mentee & mentor institutions with an emphasis on Focused Training (PT) and Focused Interventions from IITs in terms of deliverables and accountability. KIT, established at IIT Guwahati under 2nd phase of TEQIP is a focal point for training Faculty, Staff and students from TEQIP-III institutions in Knowledge Engineering, Content Creation, Improving Teaching, Pedagogy & administrative skills in identified niche areas/disciplines.

ABOUT KIT

KIT (**K**nowledge **I**ncubation **C**ell for **TEQIP**) at IIT Guwahati functions as a multi-disciplinary as well as interdisciplinary Innovation Incubation Centre with a focus to impart Knowledge, infusing innovation and leading a path to achieve academic excellence. Its activities are in the area of improving quality of technical education, incubator of Innovative Ideas; implementer of contemporary pedagogy practices and development of Learning Content in Technical institutions while mentoring them.

ABOUT IIT GUWAHATI

SNAP OF CAMPUS

IIT Guwahati campus is spread over a sprawling 785 hectares plot of green land on the north bank of the river Brahmaputra around 25 km from the heart of the city. With hills and vast open spaces, the campus provides an ideal setting for training.

Website: https://www.iitg.ac.in/env/teqip_ub