

A BRIEF REPORT ON DST-STUTI SPONSORED SEVEN DAYS HANDS ON TRAINING PROGRAMME ON “ADVANCED MOLECULAR BIOLOGY TECHNIQUES” HELD FROM 1ST TO 7TH DECEMBER, 2022

The Department of Science & Technology under the aegis of Synergistic Training Programme Utilizing the Scientific & Technological Infrastructure (DST-STUTI), sponsored one week Hands on training programme on Advanced Molecular Biology techniques, which was organized from 01st to 07th December-2022, by the Department of Biosciences (DST-FIST) and Integral Information & Research Centre (IIRC), Integral University, Lucknow in collaboration with Jamia Hamdard University, New Delhi as a project management unit (PMU). The DST-STUTI Scheme is intended to provide training to human resource and its capacity building through open access to science and technology infrastructure across the country in departments funded under various DST schemes like DST-FIST, PURSE, SATHI. This event is aimed at providing hands-on training and sensitization of the state-of-the-art equipment and ensuring transparent access of science and technology facilities. Moreover, it will enable the budding researchers and professionals to develop better understanding and familiarization with the available resources/scientific equipment supported by the Govt. of India. The workshop was attended by all the graduate, post-graduate, research scholars and faculty members.

Honourable Prof. S. W. Akhtar, founder and Chancellor of Integral University was the Chief Patron, Dr. Syed Nadeem Akhtar, Pro-Chancellor and Prof. Javed Musarrat, Vice-Chancellor were the Patrons of this workshop. The Co-Patrons were Prof. Suhel Parvez, Coordinator DST-STUTI, PMU Jamia Hamdard, New Delhi; Prof. Mohd. Haris Siddiqui, Registrar, Integral University; Prof. Abdul Rahman Khan, Controller of Examinations, Integral University and Prof. Syed Misbahul Hassan, Director, IIRC, Integral University, Lucknow. The workshop Convener was Dr. Snober S. Mir, Head, Department of Biosciences, Integral University.

The primary objective of workshop was to impart both theoretical and practical knowledge of molecular techniques used for addressing research problems as well as their applications in agriculture, molecular medicine and detection and characterization of infectious organisms. The different techniques of molecular biology including Animal Tissue culture Techniques, Staining, Nucleic acid extraction, cDNA preparation , quantification, RT-PCR, HPLC and FTIR were covered during the workshop in a systematic manner. Moreover, the workshop aimed to enhance the knowledge on the most efficient use of materials, reagents and interpretation of the results.

In order to prepare the participants for the hands on practical sessions, the resource persons delivered a series of introductory lectures on Advanced Techniques in Molecular Biology. The topics covered in the lecture sessions were relevant to the needs of the participants and covered the fundamental principles and procedures required for molecular biology techniques. Fourteen invited speakers who are eminent scientists from prominent institutions in the country were invited to deliver talks covering myriad applications during these seven days.

The workshop started with the inaugural function at central auditorium of Integral University on 1st December, 2022. The inaugural function was attended by many distinguished dignitaries viz; **Dr. Jayant Krishna, Chief Executive Officer, Foundation for Advancing Science and Technology, New Delhi as the chief guest; Prof. Mohd Akram from Jamia Hamdard University (PMU) as guest of honour; Dr. Manoj Prasad, Senior Scientist /J.C.Bose Fellow from National Institute of Plant Genome Research, New Delhi and Prof. Sanjay Batra, Chief Scientist from CSIR-CDRI as the keynote speakers.** Inaugural function commenced with the welcome address by **Dr. Snober S. Mir, Head, Department of Biosciences, Integral University, Lucknow.** Dr. Mir welcomed the esteemed guests and the participants in the lush green campus of Integral University and assured them of spending a productive week in the campus. **Prof. Syed Misbahul Hasan,** Director, Integral Information and Research Center (IIRC), Integral University introduced the participants to the overarching role of IIRC in research and development and gave a thorough overview of the research facilities available within the university.

Guest of Honour **Prof. Mohd Akram,** addressed the audience and explained the role of Jamia Hamdard as project management unit in attaining the objectives of DST-STUTI program. The inaugural address proceeded with the captivating words of our esteemed **Chief Guest, Dr. Jayant Krishna,** wherein he emphasized on the need of transformation in science and technology over the entire globe which ultimately can lead to good innovations and fruitful research.

The session was followed by release of souvenir and presenting mementos to all the dignitaries. **Dr. Jahanarah Khatoon, Organizing Secretary** presented a vote of thanks and expressed her gratitude to the Chief Patron, Patrons, Chief Guest, dignitaries, participants and members of Integral University Fraternity for making the event successful.

The vast arrays of topics covered by the different invited speakers from the Day 1 to the Day 7 of the workshop include:

- **“ Impact of Automation in Drug Discovery and Development”** by **Prof. Sanjay Batra & “ Applications of Genomic research and its application in Crop Improvement”** by **Dr. Manoj Prasad** on the Day 1 of the workshop.
- **“ Applications of RNAi in Agricultural sciences”** by **Prof. Sangeeta Saxena,** Head, Department of Biotechnology, BBAU, Lucknow & **“ Neural Development and Neurodegeneration: Role of microRNAs”** by **Dr. Sanjay Yadav,** Additional Professor & Head, Department of Biochemistry, AIIMS, Raebareli.
- **“ Nuclear Magnetic Resonance Spectroscopy: A versatile tool of Biology”** by **Dr. Neeraj Sinha,** Head, Molecular Diagnostics and Phenome Research Unit, Centre of Biomedical Research (CBMR), SGPGIMS, Lucknow & **“ Genetic toxicology and regulatory requirements”** by **Dr. Alok Kumar Pandey,** Principal Scientist, CSIR-IITR, Lucknow.

- **Electrophysiology as a screening tool for brain plasticity”** by **Dr. Ashok K. Datusalia**, Assistant Professor, Department of Pharmacology and Toxicology, NIPER, Raebareli & a special session on new techniques regarding protein and molecular biology by **Dr. Arun Kumar Rawat** from Thermofischer Scientific, Lucknow.
- **Risk Prediction in Complex Diseases by Genetic and Epigenetic Biomarkers and Newer Treatment Strategies** by **Prof. Monisha Banerjee**, Director, Institute of Advanced Molecular Genetics & Infectious diseases, Lucknow University & **“ICMR funding opportunities in molecular biology and health sciences”** by **Dr. Heena Tabassum**, Scientist and Program officer, ICMR, New Delhi.
- **“Microbial Interventions for Improving Sustainable Crop Productivity in Stressed Soils”** by **Dr. Puneet Singh Chauhan**, Principal Scientist, CSIR-National Botanical Research Institute, Lucknow & **“Marker based Fingerprinting for Authentication and Standardization of Functional Food and Botanical Drugs: HPLC-ELSD/mass-based Strategies”** by **Dr. Karuna Shanker**, Senior Scientist, CSIR-CIMAP, Lucknow.
- **“Addressing Disease Complexity via the Malaria Parasite and Human Host Genome”** by **Dr. Saman Habib**, Chief Scientist, CSIR-CDRI, Lucknow & **“Good Laboratory Practices: A Quality System in Science”** by **Prof. AB Pant**, Senior Principal Scientist, CSIR-IITR, Lucknow.

The workshop was attended by 30 participants which included Assistant professors and research scholars from different institutions namely Jamia Millia Islamia, New Delhi; Dr. Ram Manohar Lohia Avadh University, Ayodhya; Aligarh Muslim University, Aligarh; Chhatrapati Shahu Ji Maharaj University, Kanpur; Ganesh Shankar Vidyarthi Memorial Medical College, Kanpur; King George's Medical University, Lucknow; Bappa Sri Narain Vocational P.G. College (KKV), Lucknow; Central University of South Bihar (Gaya), Amity University, Lucknow; Shobhit University Gangoh, Saharanpur etc.

The valedictory of the 7 days training program was conducted on 7th December, 2022 in the presence of distinguished Chief Guest, Dr. Huma Mustafa, Joint Director at Council of Science and Technology, UP and Guest of Honour, Dr. Saman Habib, Chief Scientist and Professor at CSIR-CDRI, Lucknow. Dr. Mohd Ikram Ansari, Organising Secretary provided a brief report of the activities during the seven days of the training. He welcomed and thanked the invited guests for gracing the programme and concluded by wishing the participants good luck for their future endeavours. Dr. Mustafa congratulated Integral University and the organising committee members for successful completion of the workshop. Dr. Habib appreciated the workshop for giving researchers a platform to raise their queries related to research. The participants were asked to provide feedback about the training program and given certificate of participation. The valedictory ended with the vote of thanks delivered by the organising secretary, Dr. Jahanarah Khatoon.

At the end of the workshop, questionnaires were distributed to the participants to get their feedback of the training methodology, training materials and to get views on how to improve workshop in future. Overall, the participants were positive in their feedback and considered the workshop to have met its objectives. The participants considered the schedule of the workshop and technical arrangement of the practical sessions to be well organized. Their enthusiasm and interest was apparent from their 100% attendance on all days, presence throughout the long working hours, constant interactions and zeal to know more. Even the refreshment break and Lunch provided on all days was enjoyed by them. In fact, they expressed the desire to attend more workshops on several topics to master the skills for becoming good researchers. They were also taken for a tour to the prominent heritage sites to witness the rich culture and traditions of Lucknow.






A HANDS ON TRAINING PROGRAM ON ADVANCED MOLECULAR BIOLOGY TECHNIQUES

1st to 7th DECEMBER 2022

UNDER THE AEGIS OF
SYNERGISTIC TRAINING PROGRAM
UTILIZING THE SCIENTIFIC AND
TECHNOLOGICAL INFRASTRUCTURE (STUTI)

ORGANISED BY

DEPARTMENT OF BIOSCIENCES
(DST-FIST SPONSORED)
& INTEGRAL INFORMATION & RESEARCH CENTER
INTEGRAL UNIVERSITY, LUCKNOW

In Collaboration With

JAMIA HAMDARD (DST STUTI PMU) NEW DELHI

ABOUT THE PROGRAM

The aim of the training program is to provide doctoral students, postdoctoral fellows and young faculty members with an advanced understanding of the strategies and techniques used in molecular biology research. The practical exposure would include:

1. Methods of Gene quantification and analysis using real time PCR
2. Qualitative and quantitative analysis of constituent components using High performance liquid chromatography (HPLC)
3. Application of cell culture techniques and Imaging
4. Microbes as a tool for gene amplification and engineering
5. FTIR spectroscopy : Basics and Instrumentation

ABOUT THE UNIVERSITY

Integral University is a NAAC-accredited state private university founded in 2004 and authorized by the UGC according to sections 2(f) and 12(B) of the UGC act 1956. The university is also approved by MCI, PCI, BCI, INC, CoA, NCTE, UPSMF. The University is recognized as a Scientific and Industrial Research Organization (SIRO) by Department of Scientific and Industrial Research (DSIR) Ministry of science and technology. It boasts of an exquisite atmosphere and an intellectually active and lively setting conducive to nurturing academic endeavors. The university is devoted to knowledge generation, dissemination, and management to prepare students academically and intellectually to address corporate business concerns.

ABOUT THE DEPARTMENT

The Department of Biosciences at Integral University has been a fountainhead of research and teaching activities aimed at multidisciplinary understanding of modern biology. The department has the distinction of receiving extramural grants from various funding agencies like DST, DBT, ICMR and IUPACSTI which helped us develop necessary research infrastructure. It is supported by the DST-FIST grant that enabled us to upgrade our instrumentation facility. The major areas of research in the department are Clinical Biochemistry, Cancer Biology, Nanomedicine, Molecular immunology etc. Our students have qualified various competitive examinations like NET/GATE and undertaken training (doctoral and post-doctoral) in reputed institutes both at national and international levels.

WORKSHOP DETAILS

ELIGIBILITY
Ph.D. Fellows/ faculty members/ Industry Persons who are actively involved in R&D

Duration : 7 days

No. of participants : 30

Free fooding and lodging (if required) will be provided.

Candidates should send their CV and recommendation letter duly forwarded by their Supervisor/mentors/Head of the Department.

INSPIRING EXCELLENCE



Recognitions & Approvals



CHIEF-PATRON		PATRONS	
			
Prof. S.W. AKHTAR FOUNDER & CHANCELLOR Integral University, Lucknow	Dr. SYED NADEEM AKHTAR PRO-CHANCELLOR Integral University, Lucknow	Prof. JAVED MUSARRAT VICE-CHANCELLOR Integral University, Lucknow	
CO-PATRONS			
			
Prof. (Dr.) SUHEL PARVEZ Coordinator, DST-STUTI Project Management Unit, Jamia Hندية, New Delhi	Prof. MOHD. HARIS SIDDIQUI Registrar Integral University, Lucknow	Prof. ABDULLA RAHMAN KHAN Controller of Examinations Integral University, Lucknow	Prof. SYED MISBAHUL HASSAN Director, Integral Information System Center - Integral University, Lucknow
ORGANIZING COMMITTEE			
CONVENER			
Dr. SNOBER S. MIR Head, Department of Biosciences Integral University, Lucknow			
ORGANIZING SECRETARIES			
Dr. JAHANARAH KHATOON Assistant Professor, Department of Biosciences Integral University, Lucknow		Dr. MOHD. IKRAM ANSARI Assistant Professor, Department of Biosciences Integral University, Lucknow	

REGISTRATION LINK
<https://rb.gy/x4ejo6>



SCAN QR
CODE FOR
REGISTRATION

**Date Extended
Till-
22nd Nov., 2022**

LAST DATE FOR REGISTRATION : 15th November, 2022




INTEGRAL UNIVERSITY
LUCKNOW - INDIA

INCUBATED BY
Scientific & Industrial Research Corporation (SIRC)
by the Ministry of Science & Technology,
Govt. of India


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THE K.P. KHANDELWAL MERIT
for the best
INNOVATION & RESEARCH
PROJECTS

YOUR
Future
Choice


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MINISTRY OF SCIENCE AND TECHNOLOGY



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A HANDS ON TRAINING PROGRAM ON ADVANCED MOLECULAR BIOLOGY TECHNIQUES

1st to 7th DECEMBER 2022

CHIEF-PATRON		PATRONS		
 Prof. S.W. AKHTAR FOUNDER & CHANCELLOR Integral University, Lucknow	 Dr. SYED NADEEM AKHTAR PRO CHANCELLOR Integral University, Lucknow	 Prof. JAVED MUSARRAT VICE CHANCELLOR Integral University, Lucknow		
CO-PATRONS				
 Prof. SUHEL PARVEZ Coordinator, DST-STUTI Project Management Unit, Jamia Hamdard, New Delhi	 Prof. MOHD. HARIS SIDDIQUI Registrar Integral University, Lucknow	 Prof. ABDUL RAHMAN KHAN Controller of Examinations Integral University, Lucknow	 Prof. SYED MISBAHUL HASSAN Director, Integral Information & Research Center Integral University, Lucknow	
CHIEF GUEST		GUEST OF HONOUR		
 Dr. JAYANT KRISHNA Chief Executive Officer Foundation for Advancing Science and Technology, New Delhi	 Prof. MOHD. AKRAM Professor Department of Preventive and Social Medicine School of Postgraduate Education Jamia Hamdard, New Delhi			
CONVENER		ORGANIZING SECRETARY		
 Dr. SNOBER S. MIR Head Department of Biosciences Integral University, Lucknow	 Dr. MOHD. IKRAM ANSARI Assistant Professor Department of Biosciences Integral University, Lucknow	 Dr. JAHANARA KHATOON Assistant Professor Department of Biosciences Integral University, Lucknow		

KEYNOTE SPEAKERS				
 Dr. Sanjay Batra Chief Scientist Molecular and Process Chemistry Division CSIR Central Drug Research Institute Lucknow	 Dr. Manoj Prasad Staff Scientist VI J. C. Bose National Fellow National Institute of Plant Genome Research New Delhi	 Dr. Saman Habib Chief Scientist J. C. Bose National Fellow Molecular Structural Biology Division CSIR Central Drug Research Institute Lucknow		
INVITED SPEAKERS				
 Dr. A.S. Pant Chief Scientist Systems Toxicology & Health Risk Assessment CSIR Indian Institute of Toxicology Research Lucknow	 Dr. Sangeta Saxena Head Dept. of Biotechnology BIRU, Lucknow	 Dr. Heeraj Sinha Head Centre of Biomedical Research ICMR, IISPGMS Campus, Lucknow	 Dr. Monisha Banerjee Director Institute of Advanced Molecular Genetics & Infectious Diseases ICMR, Central Intra Advanced Studies Lucknow University, Lucknow	 Dr. Sanjay Yadav Head, Department of Biochemistry AIMS, Raebareilly
 Dr. Alok Kumar Pandey Principal Scientist CSIR Indian Institute of Toxicology Research Lucknow	 Dr. Heena Tabassum Scientist & Program officer ICMR, New Delhi	 Dr. Puneet Singh Chauhan Principal Scientist CSIR National Botanical Research Institute Lucknow	 Dr. Karuna Shanker Principal Scientist CSIR Central Institute of Medicinal & Aromatic Plants, Lucknow	 Dr. Ashok K. Duttalia National Institute of Pharmaceutical Education & Research, APJKTU, Raebareilly

Different sessions from Day 1 to Day 7 of the workshop have been summed up in the following report:

Day 1,

INAUGURAL FUNCTION:

The workshop started with the inaugural function at central auditorium of Integral University on 1st December, 2022. The inaugural function was attended by many distinguished dignitaries viz; Dr. Jayant Krishna, Chief Executive Officer, Foundation for Advancing Science and Technology, New Delhi as the chief guest; Prof. Mohd Akram from Jamia Hamdard University (PMU) as guest of honor; Dr. Manoj Prasad, Senior Scientist /J.C.Bose Fellow from National Institute of Plant Genome Research, New Delhi and Prof. Sanjay Batra, Chief Scientist from CSIR-CDRI as a keynote speakers. Inaugural function commenced with the welcome address by Dr. Snober S. Mir, Head, Department of Biosciences, Integral University, Lucknow. Dr. Mir emphasized on the importance of DST-STUTI as a Government of India sponsored flagship program in capacity building and dissemination of knowledge among the researchers residing in different regions within the country. She urged the delegates to forge networks and build long lasting collaborations by interacting with resource persons during the entire workshop. Dr. Mir welcomed the esteemed guests and the

participants in the lush green campus of Integral University and assured them of spending a productive week in the campus.

Prof. Syed Misbahul Hasan Director, Integral Information and Research Center (IIRC) , Integral University introduced the participants to the overarching role of IIRC in research and development and gave a thorough overview of the research facilities available within the university. Prof. Hasan discussed about the various sophisticated instruments at IIRC for analysis and research which will help the participants in skill development and training.

Guest of Honour Prof. Mohd Akram, Jamia Hamdard University, New Delhi addressed the audience and explained the role of Jamia Hamdard as project management unit in attaining the objectives of DST-STUTI program. Prof. Akram discussed two different objectives of this program, first is to train the researchers, post doctoral fellows, young scientists and faculty members in using sophisticated instruments and second is to train high school and intermediate students to develop their interest in science. He appreciated the efforts that Integral University has made in developing good infrastructure for promotion of research and expressed desire to continue the Hub and Spoke Partnership between Jamia Hamdard and Integral University for DST-STUTI Programmes in future too.

Dr. Manoj Prasad, Scientist VII & J. C. Bose National Fellow, National Institute of Plant Genome Research, New Delhi enlightened the audience with his motivating words and asked the participants and students in the audience to develop passion in their own fields of research . He acknowledged Integral University for their continued progress in the field of research. He emphasised on the fact that private universities like Integral University have become hubs of good research and should be encouraged to reverse brain drain.

Prof. Sanjay Batra, Chief Scientist, CSIR-CDRI, Lucknow echoing the sentiments of previous speakers urged the students to develop scientific temper and nurture the culture of curiosity. He motivated the students to take part in such skill development programs which will help in opening avenues for their better future. He encouraged the participants to visit CSIR-CDRI and other institutes to get a comprehensive view of how research methodology can be used to address complex problems.

The inaugural address proceeded with the captivating words of our esteemed Chief Guest, Dr. Jayant Krishna, Chief Executive Officer, Foundation for Advancing Science and Technology, New Delhi. Dr. Krishna emphasized on the need of transformation in science and technology over the entire globe which ultimately can lead to good innovations and fruitful research. He emphasised that proper implementation of science and technology policies will enhance the ease of doing research which will be important for making an impact in the field of science globally. He also pointed out the need to fix impediments to progress in research in the context of India like meagre budgetary allocation for research and less collaborative research. He impressed upon the participants to forge scientific collaborations and upgrade their skills consistently in order to get counted as Next Generation Leaders. The session was followed by release of souvenir and presenting mementos to all the dignitaries. Dr. Jahanarah Khatoon, Organizing Secretary presented a vote of thanks and expressed her gratitude to the Chief

Patron, Patrons, Chief Guest, dignitaries, participants and members of Integral University Fraternity for making the event successful.

Technical Session

The inaugural function was followed by the worthy presentations of two invited speakers viz. **Prof. Sanjay Batra**, Chief Scientist, CSIR-CDRI, Lucknow and **Dr. Manoj Prasad**, Senior Scientist at National Institute of Plant Genome Research, New Delhi.

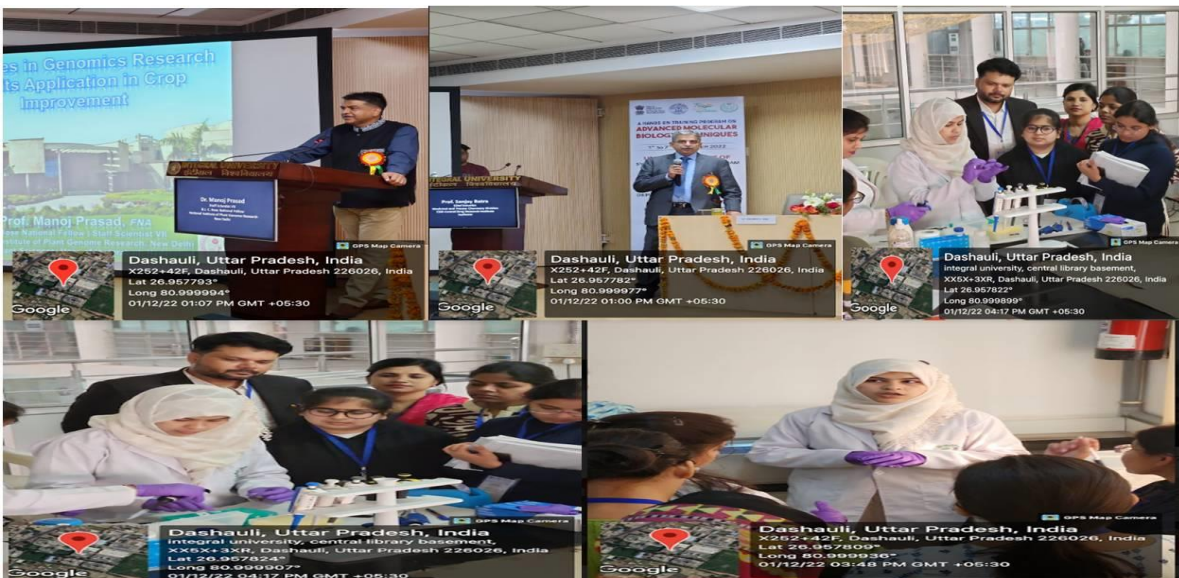
Prof. Sanjay Batra delivered a talk on the topic “**Impact of Automation in Drug Discovery and Development**”. He enlightened the delegates with the growing impact of automation on different facets of drug discovery and design. Prof. Batra explained how emerging technologies are enabling laboratory automation to occur on a large scale, with a less prohibitive price tag, and discussed the potential of smart labs to significantly transform the R&D environment. He concluded that automation has been a ground-breaking technology that has driven progress in many sectors including science.

Second speaker, **Dr. Manoj Prasad**, presented a very informative lecture on “**Applications of Genomic research and its application in Crop Improvement.**” His talk emphasised on the development of novel set of markers and its application for genetic and comparative mapping, molecular genetic diversity studies, cloning of genes or quantitative trait loci (QTLs) leading to sequencing and annotation of large genomic DNA fragments for a variety of traits in crop species. Dr. Prasad suggested that plant molecular biology has the potential to initiate a new Green Revolution for sustainable agriculture to meet the needs of a fast-growing human population worldwide.

After the invited lectures, the delegates were given hands on training on RNA isolation, purification and quantification in two groups lead by Dr. Amita Dubey, Dr. Shahida Hameed, Ms. Mushfa Khatoon (Group-A) and Dr. Mohd. Ikram Ansari, Ms. Sana Parveen, Ms. Smita Rai (Group-B).



Glimpses of Inaugural ceremony: release of souvenir by the dignitaries, memento presentation to the chief guest.



Day 1: Presentation by keynote speaker Dr. Manoj Prasad and Dr. Sanjay Batra, hands-on-training on RNA isolation, purification and quantification

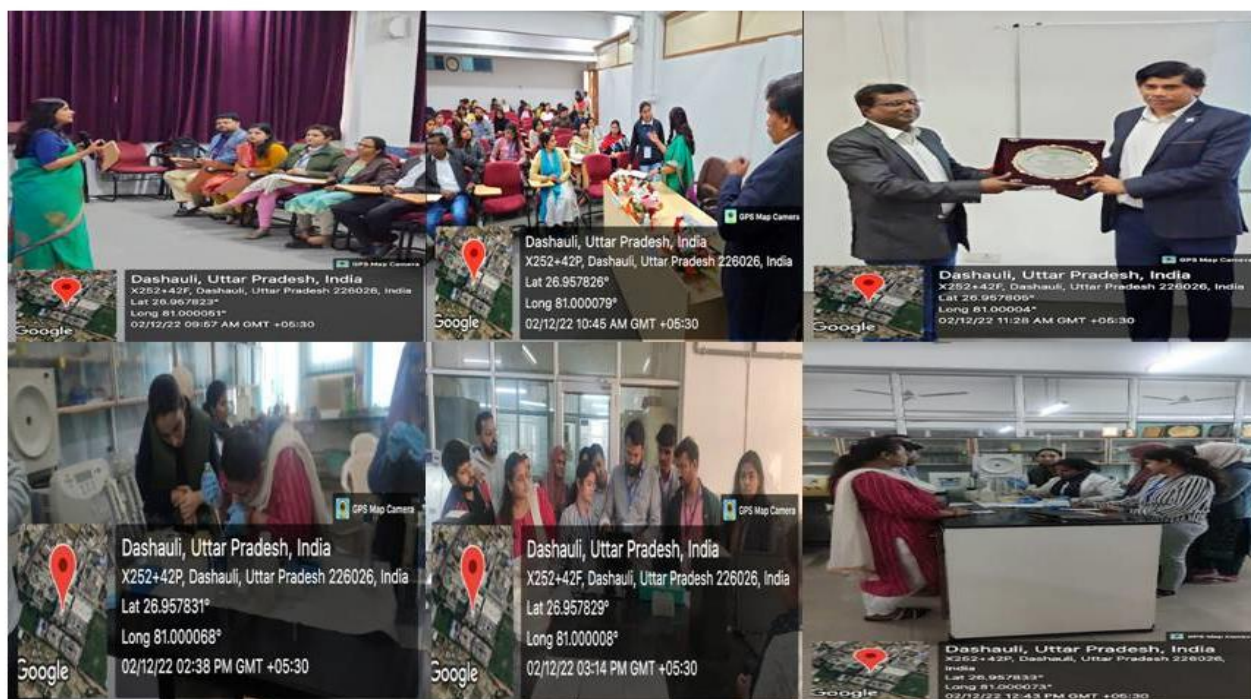
Day 2,

The invited speakers for the Day 2 were Prof. Sangeeta Saxena, Head, Department of Biotechnology, BBAU Lucknow and Dr. Sanjay Yadav, Additional Professor and Head, Department of Biochemistry, AIIMS, Raebareli.

Prof. Sangeeta Saxena discussed the “ **Applications of RNAi in Agricultural sciences**” . She delved upon the importance of RNA interference (RNAi) as an efficient tool for targeted gene silencing. She also stated that RNAi is now utilized across multiple biological disciplines to determine gene function and also being used for therapeutic interventions to downregulate the expression of genes involved in disease pathogenesis. She explained her recent research on the role of miRNA(s) in *Carica papaya* leaf juice which is utilised for accelerating blood platelet count during dengue fever and in-silico search for potential siRNA sequences in developing geminivirus resistant papaya crop.

Dr. Sanjay Yadav delivered a talk on “ **Neural Development and Neurodegeneration: Role of microRNAs**” . His research team has identified set of miRNAs and proteins deregulated in Parkinson’s disease (PD) patients. He discussed that neurodegenerative diseases are late-onset disorders that affect neural function and integrity. He stated that ‘ although most attention has been focused on the genetic underpinnings of familial disease, mechanisms are likely to be shared with more predominant sporadic forms, which can be influenced by age, environment, and genetic inputs.’ He also discussed on emerging roles of miRNAs in age-associated events impacting long-term brain integrity and neurodegenerative diseases.

After the lectures, the participants were given hands on training on cDNA synthesis using RT-PCR in two groups lead by Dr. Amita Dubey, Dr. Shahida Hameed, Ms. Mushfa Khatoun (Group-A) and Dr. Mohd. Ikram Ansari, Ms. Sana Parveen, Ms. Smita Rai, (Group-B).



Day 2: Presentations by invited speakers Prof. Sangeeta Saxena and Dr. Sanjay Yadav and hands-on-training on cDNA synthesis using RT-PCR.

Day 3,

The invited speakers for the Day 3 were Dr. Neeraj Sinha, Head, Molecular Diagnostics and Phenome Research Unit, Centre of Biomedical Research (CBMR), SGPGIMS, Lucknow and Dr. Alok Kumar Pandey, Principal Scientist, CSIR-IITR, Lucknow.

Dr. Neeraj Sinha discussed the role of “**Nuclear Magnetic Resonance Spectroscopy: A versatile tool of Biology**”. He emphasized on finding a fast, reliable, and reproducible approach for an accurate analysis of complex mixtures which is crucial for the food and beverages, pharmaceuticals, cosmetics, and agrochemical industries. Dr. Sinha stated that ‘with advancements in the last 10 years, some new avenues have appeared for NMR, making it the only tool available for addressing some biological questions’.

Dr. Alok Kumar Pandey’s talk provided quick theoretical insight to “**Genetic toxicology and regulatory requirements**”. He discussed genotoxicity and battery of assays designed to evaluate potential genotoxicants. He also incorporated several valuable laboratory protocols such as the COMET assay, Ames test, micronucleus and chromosomal aberration assays. These permit the detection of a spectrum of genetic end-points ranging from gene mutations in bacteria, DNA and chromosomal damage in various cell types of different live forms.

The lecture session was followed by hands-on-training on Animal tissue culture techniques involving media preparation, *in vitro* maintenance and cryopreservation of cell lines and cell counting through haemocytometer by Dr. Irfan Ahmad Ansari, Mrs. Mahima Verma, Mr. Abdullah Hassan (Group-A) and Dr. Sabihur Rahman, Ms. Sana Parveen, Ms. Sheerin Fatma (Group-B).



Day 3: Interactive sessions by invited speakers Dr. Neeraj Sinha and Dr. Alok Kumar Pandey and hands-on-training on Animal tissue culture techniques.

Day 4,

The invited speakers for the Day 4 were **Dr. Ashok K. Datusalia**, Assistant Professor, Department of Pharmacology and Toxicology, NIPER, Raebareli and **Dr. Arun Kumar Rawat** from Thermofisher Scientific, Lucknow.

Dr. Ashok K. Datusalia gave presentation on “**Electrophysiology as a screening tool for brain plasticity**”. He explained the role of electrophysiology in understanding the electrical activity of living neurons and the molecular and cellular processes that govern their signalling. He added that neurons communicate using electrical and chemical signals so electrophysiology techniques listen to these signals by measuring electrical activity, allowing scientists to decode intercellular and intracellular messages. Dr. Ashok also stated that ‘plasticity within the neuronal networks of the brain underlies the ability to learn and retain new information and yoga can enhance brain function’.

Special session was conducted by the resource person, **Dr. Arun Kumar Rawat** from **Thermofischer Scientific, Lucknow**. In his presentation, he discussed new techniques regarding protein and molecular biology and gave an insight into the workflow of Western Blotting, cell culture techniques and Luminex Cytokine multiplex assay along with role of small benchtop equipments.

After this session, the hands-on-training was commenced by Dr. Snober S. Mir, Mr. Mohd. Arif, Ms. Sana Parveen (Group-A) and Dr. Sabihur Rahman, Dr. Manzar Alam, Mr. Parvez Ahmad (Group-B) who basically introduced the delegates with the various techniques

involved in checking cell viability, determination of ROS, measuring mitochondrial membrane potential and DAPI staining.



Day 4: Interactive sessions by invited speakers Dr. Ashok K. Datusalia and Dr. Arun Kumar Rawat and hands-on-training on Animal tissue culture techniques.

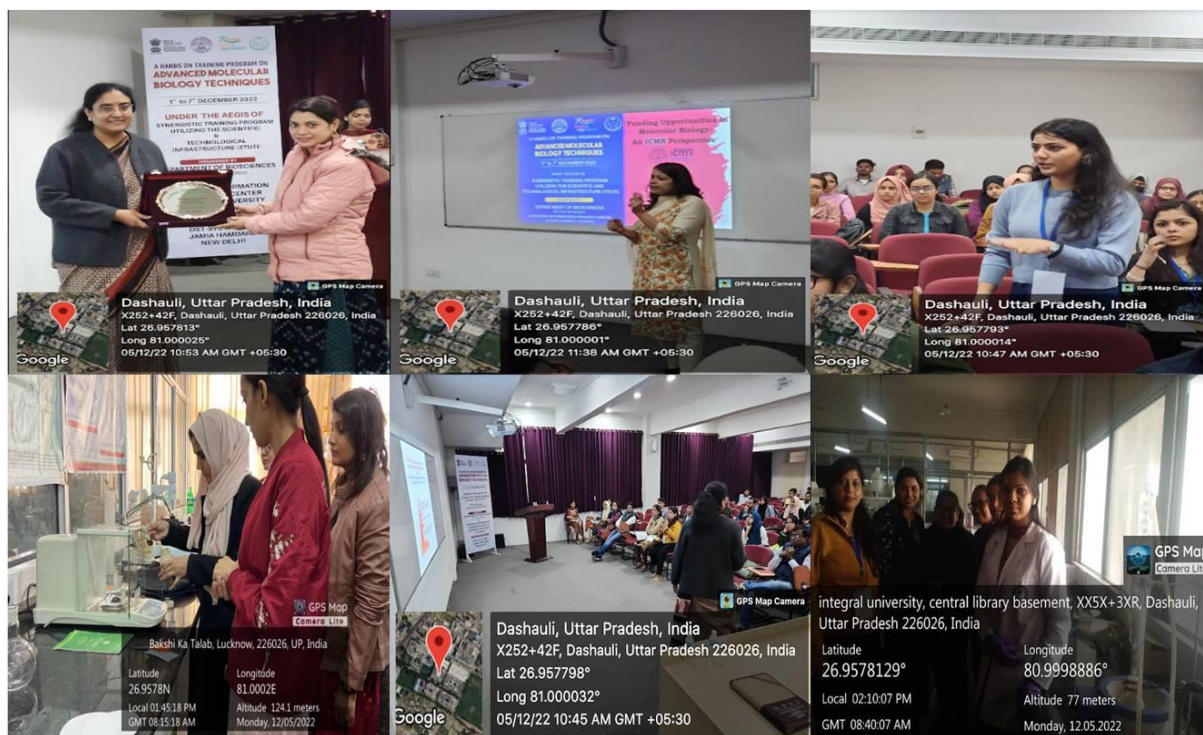
Day 5,

The invited speakers for the Day 5 were **Prof. Monisha Banerjee**, Director, Institute of Advanced Molecular Genetics & Infectious diseases, Lucknow University and **Dr. Heena Tabassum**, Scientist and Program officer, ICMR, New Delhi.

Prof. Monisha Banerjee delivered a detailed lecture on “**Risk Prediction in Complex Diseases by Genetic and Epigenetic Biomarkers and Newer Treatment Strategies**”. She stated that predictive diagnostic tests are not possible in case of complex polygenic diseases like Type 2 Diabetes Mellitus, Cervical Cancer and Pulmonary Diseases like COPD and Asthma. The genetic studies have shown considerable variation amongst various ethnic populations around the world which makes it essential to perform the genetic association studies/SNP analyses in individual populations. Therefore, genetic/epigenetic biomarkers are the best option for risk prediction in complex diseases.

Dr. Heena Tabassum delivered a detailed lecture on “**ICMR funding opportunities in molecular biology and health sciences**”. She stated that division of Basic Medical Sciences, Indian Council of Medical Research potentially caters to the demand of increasing funding requirements in the several sub-fields of cellular and molecular biology. She laid emphasis on different ways to make projects viable for funding and made the participants aware of how ICMR provides prospects for a bright future through integrative funding opportunities to young and established researchers in the country.

The presentations were followed by plant extract preparation using Soxhlet apparatus by Dr. Jahanarah Khatoon, Ms. Swati Saxena, Ms. Smita Rai (Group-A) and Dr. Farina Mujeeb, Mr. Akhtar Husain, Mr. Ayush Saxena (Group-B).



Day 5: Interactive sessions by invited speakers Prof. Monisha Banerjee and Dr. Heena Tabassum; hands-on-training on plant extract preparation.

Day 6,

The invited speakers for the Day 6 were **Dr. Puneet Singh Chauhan**, Principal Scientist, CSIR-National Botanical Research Institute, Lucknow and **Dr. Karuna Shanker**, Senior Scientist, CSIR-CIMAP, Lucknow.

Dr. Puneet Singh Chauhan delivered a lecture on title “**Microbial Interventions for Improving Sustainable Crop Productivity in Stressed Soils**”. He discussed that food and energy security will improve as the mitigation of climate change progresses in which microbes play a major role in enhancing economy by limiting food and energy security risks. He told that microbial interventions improves plant growth by increased production of plant growth regulators, metabolites and conversion of atmospheric nitrogen into ammonia, etc., by direct and indirect ways. He also added that plant interaction with microbes also provides resistance against biotic components (pathogens) through induced systemic resistance (ISR) and systemic acquired resistance (SAR).

Dr. Karuna Shanker delivered talk on “**Marker based Fingerprinting for Authentication and Standardization of Functional Food and Botanical Drugs: HPLC-ELSD/mass-based Strategies**”. He discussed marker based fingerprinting of some common functional foods and botanical drugs where HPLC-PDA and LC-MS approaches are applied.

He stated that the marker compounds may be used in identification of herbal materials, set specifications for raw materials and standardization of botanical preparations during all aspects of manufacturing processes. He also told that HPLC analysis for marker compounds may provide additional information in the form of chromatographic fingerprints.

The post-lunch technical session began with the demonstration of HPLC technique by Dr. Zeeshan Rafi, Mr. Parvaiz Ahmad, Ms. Pooja Mishra and Mr. Mohd. Waiz in two separate groups.



Day 6: Interactive sessions by invited speakers Dr. Puneet Singh Chanhan and Dr. Karuna Shanker and hands-on-training on HPLC technique.

Day 7,

Technical Session:

The 7th day of the workshop started with practical training session on FTIR based assays by Dr. Shom Prakash Kushwaha, Assistant Professor, Department of Pharmacy as the resource person for this technical session, where he introduced the particular technique to the participants.

The practical session was followed by two invited lectures by guest speakers Dr. **Saman Habib**, Chief Scientist, CSIR-CDRI, Lucknow and **Prof. AB Pant**, Senior Principal Scientist, CSIR-IITR, Lucknow. The session started with the talk of Dr. Saman Habib on topic “**Addressing Disease Complexity via the Malaria Parasite and Human Host Genome**”. Dr. Saman gave a detailed account of malaria biology with particular reference to molecular analysis of parasite plastid (apicoplast) function. She emphasized on the importance of parasite evolutionary studies in disease biology. In her talk, she discussed the transcription and translation mechanism in the apicoplast and mitochondria of malarial parasite *P. falciparum* on one hand and simultaneously shed light on the relation of human

genetic factors and susceptibility to malaria disease in India. Moreover, she enlightened the audience with the results of novel experiments of ongoing research in her laboratory.

Prof AB Pant, Senior Principal Scientist, CSIR-IITR, Lucknow delivered a talk on “**Good Laboratory Practices: A Quality System in Science**” wherein he discussed the various principles and purpose of GLP in a very elaborative manner. During his talk, he motivated the researchers to perform their duties to the set quality assurance standards. Further he explained the procedure involved right from the SOP, test items/systems used to generate data, outlines for toxicity studies as well as preparation of dose formulation. He also made the audience understand the differences between the terms GMP and GLP. He explained that Good Manufacturing Practice (GMP) applies to the entire drug manufacturing process while Good Laboratory Practice (GLP) applies to the quality and safety testing phase.

The workshop ended with the valedictory programme.

Valedictory Programme:

The valedictory program started with the brief report of activities during the seven days of training by Dr. Mohd Ikram Ansari, Organising Secretary of the workshop. He welcomed and thanked the invited guests gracing the programme and concluded by wishing the participants good luck for their future endeavours.

Dr. Huma Mustafa, Joint Director at Council of Science and Technology, UP was the Chief Guest for the valedictory function. She congratulated Integral University and the organising committee members for successful completion of the workshop. She emphasised the importance of this workshop in the present scenario where training programmes are very much required in capacity building and placement of students in reputed companies across the globe.

Dr. Saman Habib, Chief Scientist and Professor at CSIR-CDRI, Lucknow, being Guest of Honour, thanked the organisers for inviting her to the workshop. She appreciated the workshop for making students familiar with the advanced molecular techniques and for giving them a platform to raise their queries related to research. She further addressed the need of practical knowledge as a prior requirement for being a good mentor.

Dr. Uma Shankar praised the Integral University for being the best private university in Uttar Pradesh and congratulated the team biosciences for organising such a wonderful workshop.

Dr. Huma Mustafa, Dr. Saman Habib and Dr. Uma Shankar distributed certificates of participation to the participants in the Workshop.

All the participants gave their feedback and shared their experiences during seven days of the workshop. They all appreciated the presentations given by the invited speakers, training sessions by the experts, the hospitality and the management by the team.

The valedictory function concluded with a vote of thanks by the organising secretary Dr. Jahanarah Khatoun. She appreciated the efforts of participants for their presence and keen

interest in the workshop and acknowledged the contribution of DST, Jamia Hamdard, and Integral fraternity who were instrumental in making the training program successful.



Day 7: Interactive sessions by invited speakers Dr. Saman Habib and Prof AB Pant ;certificate distribution to the delegates; feedback by the participants.



FEEDBACK FORM

DST-STUTI Sponsored Workshop (1st-7th Dec 2022) on Advanced Molecular Biology Techniques

Department of Biosciences & IIRC, Integral University, Lucknow

Jamia Hamdard, New Delhi

S. No.	Content	1	2	3	4	5	6	7	8	9	10
1	The overall grading of the programme with reference to the relevance of course, module/ content etc.										✓
2	The overall grading of the facilities provided by the Institute for hostel, mess, class, rooms, canteen etc.										✓
3	The overall grading of the faculty members conducting the training										✓
4	How do you rate the overall training methodology?										✓
5	How far the field visit is relevant & related to your research study.										✓
6	The usefulness of this training in your current role.										✓
7	The usefulness of this training in future work/job you may handle.										✓
8	How far have you benefited from interaction with the fellow participants of the training?										✓
9	How far the course material supply is relevant & related to the training curriculum.										✓
10	The overall grading of the process of training.										✓
11	Your recommendation to your peers/colleagues for the training programme.										✓

Signature: Yashika Singh
Date: 05/12/2022
Email: singh.yashika@gmail.com
Phone: 9826197381

FEEDBACK FORM

DST-STUTI Sponsored Workshop (1st-7th Dec 2022) on Advanced Molecular Biology Techniques

Department of Biosciences & IIRC, Integral University, Lucknow

Jamia Hamdard, New Delhi

S. No.	Content	1	2	3	4	5	6	7	8	9	10
1	The overall grading of the programme with reference to the relevance of course, module/ content etc.										✓
2	The overall grading of the facilities provided by the Institute for hostel, mess, class, rooms, canteen etc.										✓
3	The overall grading of the faculty members conducting the training										✓
4	How do you rate the overall training methodology?										✓
5	How far the field visit is relevant & related to your research study.										✓
6	The usefulness of this training in your current role.										✓
7	The usefulness of this training in future work/job you may handle.										✓
8	How far have you benefited from interaction with the fellow participants of the training?										✓
9	How far the course material supply is relevant & related to the training curriculum.										✓
10	The overall grading of the process of training.										✓
11	Your recommendation to your peers/colleagues for the training programme.										✓

Signature: Dr. Jahanara Khatoon
Date: 05/12/2022
Phone: 9826197381

Certificates distributed among the participants on workshop completion and feed back submitted by them.

