

A training session report on
**Biotechnological Tools for Human
Welfare**

Under STUTI program funded by DST



In association with
Indian Institute of Technology, Gandhinagar
(Project Management Unit)



Coordinated by

Dr. Shalini Saxena

Department of Botany, Bareilly College, Bareilly

Uttar Pradesh

10th to 16th November 2022

Acknowledgement

On behalf of entire organizing committee, I convey my deep sense of gratitude for the encouragement and support received from multiple sources during the execution of this workshop since its beginning. First and foremost, I want to express my sincere gratitude and thanks to the Department of Science and Technology (DST) for such a wonderful initiative to conduct this type of program for academicians, professionals, and students. My sincere thanks to Prof. Emila Panda (Principal Investigator) and the PMU unit of IIT Gandhinagar for entrusting me with this project. The workshop was coordinated by **Dr. Shalini Saxena** (Asst. Professor, Dept. of Botany, Bareilly college, Bareilly). The workshop was conducted on the instrument funded under FIST program (Sanction No: SR/FST/LSI-359/2008 dated 02-07-2009) on the title '*Biotechnological tools for human welfare*'. Organizing team acknowledge the contribution of the all resource persons, training faculty members, in the implementation and the execution of the program to achieve the objectives of the project particularly.

I acknowledge the motivation and support of **Shri Dev Murti** (Chairman, Management committee), **Prof. O.P. Rai** (Principal, BCB), **Prof. Alok K. Khare** (Head, Dept. of Botany), **Prof. K. P. Singh** (Hon'ble Vice Chairman of M.J.P.R.U.), my departmental colleagues (**Dr. Asha Rani**, **Dr. Neeraj P. Malik**, **Dr. Gaurav**, and **Dr. Rajeev**), **Prof. A.K. Sharma** (Director, Pantnagar), **Prof. A.K. Garg** (Joint Director IVRI) and **Mr. Ashok Kumar**.

I also acknowledge contribution of all the project staff and staff of department of Botany without which these sessions could not have been possible.

Coordinator

Dr. Shalini Saxena

Summary

The goal of this training session is to popularize many biotechnological tools among students, faculty members, industry professionals, academicians through a week-long training workshop. The workshop was conducted at the Dept. of Botany, Bareilly College, Bareilly from 10th to 16th Nov 2022 and comprised of lectures as well as hands on training sessions. This initiative is funded by Department of Science and Technology, Govt. of India under the program STUTI (Synergistic Training Program Utilizing Scientific and Technological Infrastructure). This workshop is aimed to provide an insight into the functioning of UV Spectrophotometer, electrophoresis, Centrifuge, DNA isolation, Trinocular etc. The participants were introduced to the basic concept of Spectrophotometer, Gel electrophoresis, DNA isolation, Gene Silencing, Laminar air flow, Centrifuge. The focus of this workshop was to have a *coordination between theoretical and practical application of these biotechnological tools. Special emphasis was on hands on use of various equipments for demonstration/characterization by each participants and analysis of participant's samples.*

Introduction

Department of Botany, Bareilly College, Bareilly in collaboration with IIT Gandhinagar, Gujarat conducted 7 days long workshop on DST-FIST funded equipments/instruments (Spectrophotometer, Centrifuge, Electrophoresis Trinocular) in its campus for participants from various backgrounds such as post graduates, Ph.D., Asst. Professors, Post-Doctoral Fellow, and Industry persons were invited (**Annex-1**). The following workshop's activities took place from 10th to 16th November 2022 (**Annex-2 and 3**). This report provides a quick overview of both the lectures and technical sessions.

- Lecture Session

Dr. Shalini Saxena (Asst. Professor, Department of Botany, Bareilly College) provided the goals and objectives of the STUTI workshop in the inaugural session. **Prof. A.K. Sharma** (Director Biotechnological board of Uttarakhand), highlighted the basic concepts of biotechnology. In another lecture, she also explained the concept of m-RNA surveillance and concept of dosage compensation. **Prof. Dinesh K. Saxena** gave a talk on various instrument used in biotechnology lab like UV Spectrophotometer, BOD, Centrifuge, how to install sample in Spectrophotometer, Calibration methods. **Prof. Lalit Tiwari** and **Prof. Santosh Upadhyay** (Kumaun University), gave a lecture on biodiversity of Himalayan region and highlighted key points on the importance of medicinal plants Himalaya's in the economy of country. **Prof. Santosh Upadhyay** led a session on describing tools and techniques of biotechnology which are significant for gene therapy, gene banking, pharmaceutical products, etc. **Prof. Anamika Tripathi** visited the department of Botany. Gave a talk on E-waste management. **Dr. Ashish Chandran** highlighted the concept of Green Biotechnology, Blue Biotechnology, Red Biotechnology, Yellow Biotechnology, Grey Biotechnology, Gold biotechnology. **Prof. Alok Sriwastava** gave a talk on Phytoremediation methods, which have emphasis on the role of many plants like Sunflower, hemp, Groundnut in phytoextraction of many heavy metals like Cd, Zn, Pb, Hg, etc. **Prof. Arun Pratap Sikarevar** gave a lecture on on Neurosciences and provided a brief ideas, like Emotional quotient, Adaptational quotient. **Dr. Gaurav kumar** gave a talk on VIGS (Virus Induced Gene Silencing). **Dr. Vishwas** explained the technique of Poultry farming, about the plastic egg (myth).

- Technical Session

Hands on training on various instruments used in lab of biotechnology. On the day **One**, the participants were allowed to visit the labs of the institute. On the day **Two** session, **Prof. Dinesh K. Saxena** demonstrated the uses and principle of UV Spectrophotometer, Calorimeter and application of these different type of spectrophotometer. The participants were provided hands-on on the samples of the laboratory. On the day **Three**, all the participants were provided a visit to *Shri Ram Murti Smarak Institute of Medical Sciences*, Bareilly. The prime motive of the visit is to provide awareness among the participants on the advanced techniques used in while investigation of the diseases. On the day **Four**, **Dr. Tripla Verma** showed, DNA isolation from plant tissue and demonstration through gel electrophoresis for observation of DNA bands. On the day **Five**, **Prof. Huma Khan** demonstrated different types of community medicines, and other *Cyto*-histopathological laboratories. Prof. Tiwari (IART) demonstrated microbiological instruments, PCR, AAS (Atomic Absorption Spectrophotometer), and Incubators. On the day **Six**, all the participants were taken for a visit to ICAR-IVRI, Izzatnagar. The participants were allowed to interact with scientist of the institute and visit lab facilities. On the day **Seven**, valedictory session was organized in presence of honourable Vice Chancellor (Rohilkhand University, Bareilly), to provide certification to all the participants.

- Types of samples tested

The session for hands-on training was conducted on the specimens available from Botany as well as Biotechnology lab. Many plant samples were used for demonstration purpose.

Outcome of Workshop

The workshop attracted 58% male and 42% female participants from different institutes (**Figure 1**). About 32 participants attended the DST-STUTI training workshop on biotechnological tools for human welfare (10th to 16th Nov 2022). Throughout the sessions, participants raised many queries regarding the loading of the samples, principle of the equipments. The experts gave suggestions for possible solutions and invited participants to future collaboration (Pantnagar University, IVRT campus). Finally, the feedback from the participants were considered in the evaluation of the workshop (**Annex-4**). Majority of the participants were pleased with the training session and suggested that more workshop should be held in the future.



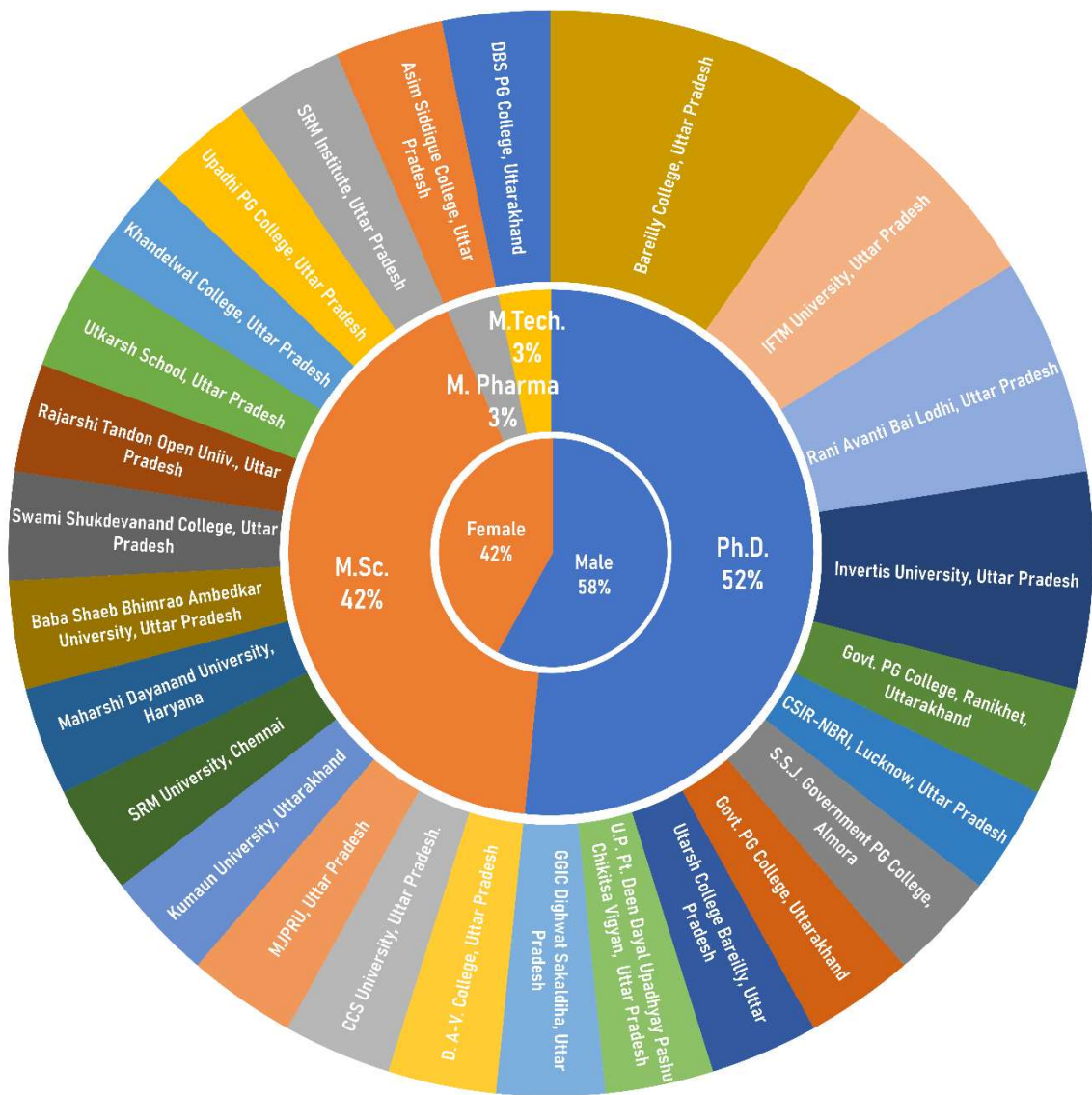





Figure 1: Participants registered for the training program from 26 different institutes.

Annex 1: Brochure for the program

Department of Science and Technology (DST)


Funded
STUTI PROGRAMME
(Synergistic Training Programme Utilizing the Scientific and Technological Infrastructure)

7 Days Workshop on
Biotechnological Tools for Human Welfare


10th November to 16th November 2022

Organized by
DEPARTMENT OF BOTANY
BAREILLY COLLEGE BAREILLY
(NAAC ACCREDITED 'A' GRADE COLLEGE)


in
COLLABORATION WITH IIT GANDHINAGAR, GUJRAT




President
Dr. Alok K.Khare
Incharge Deptt. of Botany



Co-Ordinator
Dr. Shalini Saxena
Asstt. Prof. Deptt. of Botany



Patron
Dr. O.P. Rai
Principal
Bareilly College, Bareilly



For Any Query Contact : 8006865859, 9719677151

Our Eminent Speakers



Dr. Somesh Yadav
Former Principal
Bareilly College, Bareilly



Dr. D.K Saxena
Professor Emeritus
Bareilly College
Bareilly



Prof. Alok Srivastav
Deptt. of Plant Science
M.J.P. Rohilkhand University, Bareilly



Prof. Anamika Tripathi
Hindu College
Moradabad



Dr. Tumul Singh
Head, Deptt. of Biotechnology
U.P. College, Varanasi



Prof. Lalit Tiwari
Kumaun University
Nainital (U.K.)



Prof. Anil Dwivedi
Gorakhpur University



Dr. Ashish Chandran
Feroze Gandhi College Rai Bareilly



Dr. Santosh Upadhyay
Deptt. of Biotechnology
Kumaun University Bhatnagar (U.K.)

Programme Schedule

<p>09:00 a.m. - 10:00 a.m. 10:00 a.m. - 11:30 a.m. 11:30 a.m. - 12:00 noon 12:00 noon - 01:30 p.m. 01:30 p.m. - 02:30 p.m. 02:30 p.m. - 05:00 p.m.</p>	<p>Assignment Collection Session 1st Lecture by Eminent Speakers Tea Break Lecture by Eminent Speakers Lunch Break Hands on Training on Various equipments / Instruments in different labs. Daily Feedback</p>
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05:00 p.m. - 05:30 p.m.

Principal Investigator (DST-STUTI)
Prof. Emila Panda
(IIT Gandhi Nagar)



Chief Patron
Shri. Dev. Murti
Secretary Management Com.
Bareilly College, Bareilly



Chief Guest
Prof. Bachan Lal
Vice Chancellor Cluster
Univ. of Jammu



Guest of Honour
Prof. R.C. Soti
Former Vice Chancellor
Punjab University



Patron
Prof. O.P. Rai
Principal
Bareilly College, Bareilly



President
Prof. Alok K.Khare
Incharge Deptt. of Botany

Co-Ordinator (DST-STUTI)
Dr. Shalini Saxena
Bareilly College, Bareilly



Co-Ordinator
Dr. Shalini Saxena
Deptt. of Botany

- Organising Committee -

Dr. Asha Rani
Dr. Narendra Pal Singh
Dr. Sanjay Singh

Dr. Rajeev Yadav
Dr. Gaurav Kumar
Dr. Ragib Hussain

Dr. Neeraj Pal Malik
Dr. Vinay Kumar

Annex 2: List of participants registered and their attendance during the workshop.

Sr. No.	Candidate Name	Gender	Educational Qualification	Email address	University/Institute
1	Sarvesh Suyal	Male	Ph.D. (Botany)	suyalsarvesh@gmail.com	DBS PG College Dehradun, Uttarakhand
2	Tayyaba khan	Female	M.Sc. (Biotechnology)	razatayyaba6@gmail.com	Asim Siddique Memorial Degree College, Badaun, Uttar Pradesh
3	Kamakshi Saxena	Female	Ph.D. (Botany)	kamakshr@srmist.edu.in	SRM Institute of Science and Technology, Modinagar, Uttar Pradesh
4	Gopal Dixit	Male	Ph.D. (Botany)	gopaldixit2k@yahoo.com	Upadhi PG College, Pilibhit, Uttar Pradesh
5	Nisha Dinkar	Female	Ph.D. (Animal Science)	nishadinkar@gmail.com	Khandelwal College of Management and Technology, Bareilly, Uttar Pradesh
6	Ravi Kumar Gangwar	Male	M.Sc. (Environmental Science)	ravi25388@gmail.com	Utkarsh School of Management and Technology, Bareilly, Uttar Pradesh
7	Keshav Shukla	Male	M.Sc. (Biotechnology)	keshavshukla1689@gmail.com	Invertis University, Bareilly, Uttar Pradesh
8	Ravindra Pratap Singh	Male	Ph.D. (Biotechnology)	dr.rpsingh82@gmail.com	Rajarshi Tandon Open University, Prayagraj, Uttar Pradesh
9	Mumtaz Hussain	Female	Ph.D. (Botany)	husainmumtaz786786@gmail.com	Swami Shukdevanand College Shahjahanpur, Uttar Pradesh
10	Mritunjay Rai	Male	M.Sc. (Zoology)	mraibbau2020@gmail.com	Baba Shaeb Bhimrao Ambedkar University Lucknow, Uttar Pradesh
11	Deepanshu	Male	M. Pharma	deepanshu.sindhvani@gmail.com	Maharshi Dayanand University, Rohtak Haryana
12	Kumud Gaur	Female	M.Sc. (Biotechnology)	kumudgaur6@gmail.com	SRM University, Chennai
13	Shyam Babu Gangwar	Male	Ph.D. (Botany)	sbshyam60@gmail.com	Kumaun University, Uttarakhand
14	Harshit Tiwari	Male	M.Sc. (Biotechnology)	harshitbly@gmail.com	Invertis University, Bareilly, Uttar Pradesh
15	Surender Pal Gangwar	Male	Ph.D (Zoology)	spgangwar2013@gmail.com	MJPRU, Bareilly, Uttar Pradesh
16	Sanjay Kumar	Male	M.Sc. (Biotechnology)	kumar_sanjay0206@gmail.com	CCS University, Meerut, Uttar Pradesh.
17	Amit Prakash Raghuvanshi	Male	Ph.D. (Botany)	amitvanshi@gmail.com	D. A-V. College, Kanpur, Uttar Pradesh
18	Smita Mishra	Female	Ph.D. (Botany)	smitamishradixit102@gmail.com	GGIC Dighwat Sakaldiha Chandauli, Uttar Pradesh
19	Munish Kumar	Male	Ph.D. (Zoology)	munish.kumar62049@gmail.com	U.P. Pt. Deen Dayal Upadhyay Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go-Ansundhan Sansthan, formerly Veterinary College, Mathura, Uttar Pradesh
20	Sameer chandra	Male	Ph.D. (Environmental Science)	sameerchandra1986@gmail.com	Utarsh College Bareilly, Uttar Pradesh
21	Arti Chauhan	Female	M.Sc. (Botany)	artipgcr@gmail.com	Govt. PG College, Ranikhet, Uttarakhand
22	Nisha	Female	Ph.D. (Botany)	nishaarya24@gmail.com	S.S.J. Government Post Graduate College Syalde Almora
23	Minakshi Singh	Female	Ph.D. (Zoology)	minakshisingh13@gmail.com	Bareilly College, Uttar Pradesh
24	Shalini Shankhdhar	Female	M.Sc. (Botany)	shankhdhar.shalini@gmail.com	
25	Shavaz khan	Male	M.Sc. (Botany)	shavazkhan775@gmail.com	
26	Sampurna Nand	Male	M.Sc. (Botany)	nandsam1005@gmail.com	CSIR-NBRI, Lucknow, Uttar Pradesh
27	Mahima	Female	Ph.D. (Botany)	mahima9089@gmail.com	Govt. PG College, Ranikhet, Uttarakhand
28	Akansha	Female	M.Sc. (Botany)	akansha678@gamil.com	Rani Avanti Bai Lodhi Government, Bareilly, Uttar Pradesh
29	Vidya Yadav	Female	M.Sc. (Botany)	vidhyayadav28@gmail.com	
30	Suman Shekhar	Male	M.Tech. (Bio-Engineering)	sumanshekhar@gmail.com	IFTM University, MORADABAD, Uttar Pradesh
31	Pavan Kumar Gautam	Male	Ph.D. (Chemistry)	pkgautam@iitita.ac.in	

Annex 3: Schedule date and activities during the workshop.

10th November 2022	Day 1	11th November 2022	Day 2
	08:30 Registration		09:00 Session I
	09:00 Inaugural Session		11:00 Break
	10:45 Tea Break		11:30 Expert Talk
	11:00 Session I		12:30 Lunch
	12:30 Lunch		14:00 Session II (Hands on)
	14:00 Session II		15:30 Tea Break
15:30 Tea Break	16:00 Lab visit		
16:00 Campus Visit			
12th November 2022	Day 3	13th November 2022	Day 4
	09:00 Session I		09:00 Session I
	11:00 Tea Break		11:00 Tea Break
	11:30 Expert Talk		11:30 Expert Talk
	12:30 Lunch		12:30 Lunch
	14:00 Session IIA		14:00 Session IIA
	15:30 Tea Break		15:30 Tea Break
16:00 Session IIB	16:00 Session IIB		
17:00 Discussion	17:00 Discussion		
14th November 2022	Day 5	15th November 2022	Day 6
	09:00 Session I		09:00 Session I
	11:00 Tea Break		11:00 Tea Break
	11:30 Expert Talk		11:30 Expert Talk
	12:30 Lunch		12:30 Lunch
	14:00 Session IIA		14:00 Session IIA
	15:30 Tea Break		15:30 Tea Break
16:00 Session IIB	16:00 Session IIB		
17:00 Discussion	17:00 Discussion		
16th November 2022	Day 7		
	9:00 Interactive session (Valedictory)		
	11:15 Tea Break		
	11.30 Closing remarks		

Annexure 4: Feedback summary

Sr. No	Content	% Rating
1	Overall grading of the program with reference to relevance of course, module/ content etc.	95% Rated on or above 8 points
2	Overall grading of the facilities provided by the institute, i.e., Hostel, Mess, Classrooms, Transport/infrastructure etc.	97% Rated on or above 8 points
3	Overall grading of the faculty members conducting the training	98% Rated on or above 8 points
4	How do you rate the overall training methodology	95% Rated on or above 8 points
5	How far the field visit is relevant and related to your research study	98% Rated on or above 8 points
6	Usefulness of this training in your current role	92% Rated on or above 8 points
7	Usefulness of this training in future work/job you may handle	98% Rated on or above 8 points
8	How far have you benefitted from interaction with the fellow participants of the training	97% Rated on or above 8 points
9	How far the course material supplied relevant and related to the training curriculum	97% Rated on or above 8 points
10	Overall grading of the process of training	98% Rated on or above 8 points
11	Your recommendation to your peers/ colleagues for the training Program	99% Rated on or above 8 points