

## DEPARTMENT OF BIOTECHNOLOGY

### RESEARCH PROJECTS

Research efforts in the thrust areas of the department reflect in sponsored research grants of ~ ₹ 90 million from premier funding agencies of Govt. of India namely: Department of Biotechnology (DBT), Science and Engineering Research Board (SERB), Department of Science & Technology (DST) and Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy (AYUSH), All India Council for Technical Education (AICTE) and Indian Council for Medical Research (ICMR).

### ONGOING PROJECTS

Sr. No.	Title of the Project	Duration	Funding Agency	Sanctioned Fund (Lakh)	Investigator/s
1	Evaluation of the production strategies, nutritional value and therapeutic properties of probiotic Seabuckthorn juice	2021-2023	Department of Science & Technology, Govt. of India and Academy of Scientific Research and Technology (ASRT), Egypt.	12 Lakh (from Indian Scientist only; Separate for Egypt Scientist)	<b>PI:</b> Prof. Pammi Gauba, . Ashwani Mathur (India) jointly with Prof. Shoby El-Sohaimy, ARID Lands Cultivation Research Institute, SARTA City, Egypt
2	Nose to brain delivery of surface-modified drug loaded PLGA nanoparticles for management of Trigeminal Neuralgia.: Delhi, Grant Value: INR lakhs, ()	2020-2023	ICMR	40.6	<b>PI:</b> Dr. Shweta Dang; <b>Co-PI:</b> Dr. Pammi Gauba. Co Pi: Dr. Amit Tyagi, INMAS,
3	Evaluation of the heavy metals content in market	2017-2021	AYUSH	41.1	<b>PI:</b> Dr. Pammi Gauba

	samples of plant raw drugs used in Ayurveda.				
4	Application of customized PGPM based formulations for reclamation of soil permeated with Organophosphate pesticide residues.	2017-2020	DBT	62.1	<b>PI:</b> Dr. S Krishna Sundari <b>Co-PI:</b> Dr. Sudha Srivastava
5	Investigating microRNAs as the Next Generation Therapeutic Targets in Diabetic Cardiomyopathy.	2018-2021	SERB-DST	40	<b>PI:</b> Dr. Vibha Rani
6	Developing Functional bacterial cellulose composites as immobilization matrix	2019-2021	Council of Science and Technology U.P	6.6	<b>PI:</b> Dr. Garima Mathur <b>Co-PI:</b> Prof Pammi Gauba
7	Targeting biofilm formation by inhibiting Cysteine biosynthesis pathway enzymes in ESKAPE pathogens with natural products.	2021-2024	DST,	42.30	<b>PI:</b> Dr. Vibha Gupta/ Dr Prerna Diwan/Dr. Rakesh Kumar Gupta
8.	Exploring efficacy of plants and microbes for remediation of E-Waste Contaminated Soil.	2020-2023.	Ministry of Forest and Environment,	47.93	<b>PI:</b> Prof. Pammi Gauba, <b>Co-PI:</b> Dr. Shweta Dang.
9.	Building integrated pipeline for cancer genome analysis: Role of mobile genetic elements in cancers.	2017-2020	DBT	29.38	<b>PI:</b> Dr. Kamal Rawal <b>Co-PI:</b> Dr. Sanjay Gupta
10.	Potentially novel carbohydrases (cellulase and related enzymes) for waste management from cultivable bacteria and functional metagenomic library of North East India biodiversity hotspot	2017-2020	DBT	22.21	<b>PI:</b> Dr. Indira P. Sarethy

## COMPLETED PROJECTS

1	Screening of native microbes with tannase ability, production of tannase and gallic acid using alternate growth substrate.	2012-2015	DBT	19.44	<b>PI:</b> Dr. S Krishna Sundari
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2	Development of inhibitors to target glyoxylate and methylcitrate cycles essential for persistence of <i>Mycobacterium tuberculosis</i> .	2015-2018	ICMR	34	<b>PI:</b> Dr. Vibha Gupta <b>Co-PI:</b> Dr. Chitranjan Rout
3	Identification of cellular targets of Chikungunya virus non-structural proteins.	2016-2019	ICMR	34.1	<b>PI:</b> Dr. Sanjay Gupta <b>Co-PI:</b> Dr. Reema Gabrani
4	Stage Specific microRNAs profiling from developing chick embryonic heart.	2012-2016	DBT	42.4	<b>PI:</b> Dr. Vibha Rani
5	Effect of Curcumin on Cardiac hypertrophy.	2012-2016	DBT	32.9	<b>PI:</b> Dr. Vibha Rani
6	Ability of select PGPM strains to remediate organophosphate pesticides commonly applied in agriculture.	2013-2015	DBT	6.59	<b>PI:</b> Dr. S Krishna Sundari
7	Development of a biocatalyst for the removal of nitrogen and sulphur from diesel.	2014-2016	DBT	24.9	<b>PI:</b> Dr. Nidhi Gupta <b>Co-PI:</b> Dr. Sanjay Gupta
8	Nanoparticles based amperometric biosensor for detection of thyroid dysfunctioning.	2014-2017	DST	37.3	<b>PI:</b> Dr. Sudha Srivastava <b>Co-PI:</b> Dr. Vibha Gupta
9	Development of a biocatalyst for dearomatization of diesel	2013-2015	DBT	23.53	<b>PI:</b> Dr. Nidhi Gupta, <b>Co-PI:</b> Dr. Sanjay Gupta/Dr. D.K. Adhikari (Indian Institute of Petroleum, Dehradun).
10	Formulation of Microbial Consortia with Parallel biofertilizer and biocontrol properties.	2010-2014	DBT	57.39 (JIIT: 24.22)	<b>PI:</b> Dr. S Krishna Sundari <b>Co-PI:</b> Dr. Reena Singh (TERI, New Delhi)

11	Designing a nanoparticle based glucose biosensor.	2009-2012	AICTE	8.4	<b>PI:</b> Dr. Sudha Srivastava
12	Purification of Chikungunya Virus nsP3 Protein for Peptide Based Inhibitor and Structural Studies.	2013-2016	DBT	68.6	<b>PI:</b> Dr. Sanjay Gupta
13	Development for reagents for simple immunochemical tests for the detection of Chikungunya infection.	2014-2017	DBT	141 (JIIT: 18.2)	<b>PI:</b> Dr. Sanjay Gupta (For JIIT)
14	Viral-viral and viral-host protein interactions in Chandipura virus mediated encephalitis.	2010-2013	DST	35	<b>PI:</b> Dr. Sanjay Gupta <b>Co-PI:</b> Dr Reema Gabrani
15	Mapping viral host protein interactions of Chikungunya virus (CHIKV viral-host interactions).	2009-2012	AICTE	15.45	<b>PI:</b> Dr. Sanjay Gupta
16	Structural Biology of Cyse from pathogenic organisms - Potential for rational drug design.	2013-2017	DBT	44.11	<b>PI:</b> Dr. Vibha Gupta
17	Mapping of the interactions among Chikungunya virus proteins (CHIKV viral-viral interactions).	2008-2011	DBT	23	<b>PI:</b> Dr. Sanjay Gupta <b>Co PI:</b> Dr Reema Gabrani
18	Upgradation of comparative and functional genomics lab.	2008-2009	AICTE	7	<b>PI:</b> Dr Sanjeev Sharma <b>Co-PI:</b> Dr. Sanjay Gupta
19	Nanoparticle based Drug delivery system of some antiepileptic drugs for brain drug delivery through nasal route.	2011-2014	DBT	25	<b>PI:</b> Dr. Shweta Dang <b>Co PI:</b> Ms. Manisha Singh, Dr. Javed Ali (Jamia Hamdard, New Delhi)
20	Development and evaluation of green tea catechins based intravaginal nanoemulsion gel for the treatment of urinary	2013-2016	DBT	23.35	<b>PI:</b> Dr. Shweta Dang <b>Co PI:</b> Dr.

	tract infections.				Reema Gabrani, Dr. Javed Ali (Jamia Hamdard, New Delhi)
21	Cardio-protective properties of Curcumin: Molecular Interaction of Cardiac Transcription Factors.	2009-2012	DST	19.9	PI: Dr. Vibha Rani
22	Studies on the Phylogenomics and Population Genomics of Indian Drosophila.	2014-2017	DST	34.01	PI: Dr. Sujata Mohanty
23	Scientific documentation (digitization) of selected Indian medicinal plants ( <i>Salacia reticulata</i> and <i>Andrographis paniculata</i> ) used for anti-diabetic activity	2008-2011	Ayush	7	PI: Dr. Rachana
24	Inferring the Origin, Population Structure and Demographic History of <i>Drosophila malerkotliana</i> with Population Genomic Approach.	2007-2010	DST	7.44	PI: Dr. Sujata Mohanty
25	Biotechnological solution for attaining longer shelf life and portability of microbial inoculum	2015-2016	Trident GreenTech Pvt. Ltd., Andhra Pradesh	19	PI: Dr. S Krishna Sundari
26	Identification of cellular targets of Chikungunya virus non-structural proteins.	2016-2019	ICMR	34.1	PI: Prof. Sanjay Gupta/ Prof. Reema Gabrani

### STUDENT'S EXTRAMURAL PROJECTS

1	Development PLGA nanoparticles loaded with donepezil and memantine for brain drug delivery through	2017-2020	BioCARE -DBT	26	PI: Ms. Atinderpal Kaur Mentor: Dr. Shweta Dang
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	nasal route in Alzheimer's disease.				
2	Studies on production of therapeutically important saponins using <i>in-vitro</i> culture of <i>Bacopa monnieri</i> .	2014-2018	DST	19.61	<b>PI:</b> Ms. Pragya Bhardwaj <b>Mentor:</b> Dr. Ashwani Mathur
3	Rational Structure-based development of potent inhibitors targeting mycobacterial cysteine biosynthetic pathway: in silico and experimental drug design against <i>M. tuberculosis</i> CysE.	2015-2018	DST	15.95	<b>PI:</b> Mrs. Sunita Gupta <b>Mentor:</b> Dr. Vibha Gupta
4	Bioprospection of microorganisms from selected niche habitats (soil/rock) for antimicrobial products.	2014-2019	ICMR	21.67	<b>PI:</b> Mrs. Nidhi Srivastava <b>Mentor:</b> Dr. Indira P Sarethy
5	Analysis of Chikungunya virus nsP3 protein micro/macro interactors.	2018-2021	DST- (WOS- A)	20	<b>PI:</b> Ms. Ipsita Nandi <b>Mentor:</b> Dr. Sanjay Gupta
6	Identification of peptide/protein binders of Chikungunya Virus.	2015-2019	DST- Inspire	21.9	<b>PI:</b> Ms. Garima Agarwal <b>Mentor:</b> Dr. Sanjay Gupta
7	Structure, function and inhibition of isocitrate lyases of <i>Mycobacterium tuberculosis</i> .	2016-2021	DST - Inspire	21.9	<b>PI:</b> Ms. Monika <b>Mentor:</b> Dr. Vibha Gupta
8	Fabrication of nanotechnology based point-of-care device for thyroid disease diagnosis.	2016-2021	DST - Inspire	21.9	<b>PI:</b> Rahul <b>Mentor:</b> Sudha Srivastava
9	Nanotechnology based vaccine development against Hepatitis E virus.	2015-2020	DST - Inspire	21.9	<b>PI:</b> Dibya Rani <b>Mentor:</b> Sudha Srivastava
10	Differential expression pattern of miRNAs in rice root during Cr(VI) stress.	2015-2018	DST	33	<b>Young Scientist:</b> Dr. Sonali Dubey <b>Mentor:</b> Dr. Vibha Rani

11	Nanotechnology based vaccine development against Hepatitis E virus.	2015-2020	DST - Inspire	21.9	<b>PI:</b> Ms. Dibya Rani <b>Mentor:</b> Sudha Srivastava
12	Genomics of diverse Wolbachia species in Indian Drosophila and to study host-symbiont interactions	2017-2021	CSIR-JRF	16.81	<b>PI:</b> Ms. Kopal Singhal <b>Mentor:</b> Dr Sujata Mohanty
13	PLGA Nanoparticles for Baclofen and Lamotrigine: Nose to brain delivery	2019-2021	CSIR-SRF	7.12	<b>PI:</b> Mr. Kuldeep Nigam <b>Mentor:</b> Dr Shweta Dang
14	Investigating microRNAs and Matrix metalloproteinases as therapeutic target in glucose induced cardiac stress	2018-2020	CSIR-SRF	9.1	<b>PI:</b> Mr. Sharad Saxena <b>Mentor:</b> Dr. Vibha Rani
15	Cardioprotective Effects Of Curcumin Against Drug Induced Toxicity	2018-2020	CSIR-SRF	9.1	<b>PI:</b> Ms. Aditi Jain <b>Mentor:</b> Dr. Vibha Rani
16	Deciphering the host interactions of Chandipura virus matrix protein	2014-2015	ICMR-SRF	3	<b>PI:</b> Mr. Sreejith Rajasekharan <b>Mentor:</b> Dr. Sanjay Gupta