

## 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.	2020-2023	ICMR	40.6	<b>PI:</b> Dr. Shweta Dang; <b>Co-PI:</b> Dr. Pammi Gauba. <b>Co Pi:</b> Dr AmitTyagi, INMAS,
3	Evaluation of the heavy metals content in market samples of plant raw drugs used in Ayurveda.	2017-2021	AYUSH	41.1	<b>PI:</b> Dr. Pammi Gauba

4	Application of customized PGPM based formulations for reclamation of soil permeated with Organophosphate pesticide residues.	2017-2022	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.	2018-2022	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.	Design and fabrication of amperometric biosensor for the detection of paraben	2021-2024	Department of Science and Technology, Government of India	34.77	<b>PI:</b> Dr. Ashwani Mathur; <b>Co-PI:</b> Prof. Pammi Gauba

### 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
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 tract infections.	2013-2016	DBT	23.35	<b>PI:</b> Dr. Shweta Dang <b>Co PI:</b> Dr. 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	<b>PI:</b> Dr. Vibha Rani
22	Studies on the Phylogenomics and Population Genomics of Indian Drosophila.	2014-2017	DST	34.01	<b>PI:</b> 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	<b>PI:</b> 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	<b>PI:</b> 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	<b>PI:</b> Dr. S Krishna Sundari
26	Identification of cellular targets of Chikungunya virus non-structural proteins.	2016-2019	ICMR	34.1	<b>PI:</b> Prof. Sanjay Gupta/ Prof. Reema Gabrani

27	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
----	--	-----------	-----	-------	----------------------------------

### STUDENT'S EXTRAMURAL PROJECTS (ONGOING)

1	Analysis of host interactors of Chikungunya virus non-structural Protein 1.	2019-2022	CSIR-SRF,	16.22	<b>PI:</b> Ritu Ghildiyal <b>Mentor:</b> Prof Reema Gabrani
2	Investigation of Indian Herbs as ACE2 and TMPRSS2 modulator in HCQ Induced Cardiotoxicity.	2021-2026	DST – Inspire	24.24	<b>PI:</b> Priyadarshini Gupta <b>Mentor:</b> Prof Vibha Rani
3	Ayurvedic herbal formulations in modulating gut microbiota which is associated with diabetic cardiomyopathy.	2019-2024	DST – Inspire	24.24	<b>PI:</b> Shivani Singhal <b>Mentor:</b> Prof Vibha Rani
4	<i>Syzygium cumini</i> polyphenols in drug induced cytotoxicity.	2019-24	CSIR-JRF	24.24	<b>PI:</b> Renu Bhadana <b>Mentor:</b> Prof Vibha Rani
5	Designing an alternative cancer therapy by study of anticancerous herbs for their potential mitocan activity.	2018-23,	NFST (Ministry of Tribal affairs),	22.082	<b>PI:</b> Geeta Swargiary <b>Mentor:</b> Dr Shalini Mani
6	To develop a millet-based fermented food product and assessment of its nutritional and functional properties.	2019-2024	DBT	24.60	<b>PI:</b> Rishibha Gupta <b>Mentor:</b> Dr Smriti Gaur

### STUDENT'S EXTRAMURAL PROJECTS (COMPLETED)

1	Development of PLGA nanoparticles loaded with donepezil and memantine for brain drug delivery through nasal route in Alzheimer's disease.	2017-2020	BioCARE-DBT	26	<b>PI:</b> Ms. Atinderpal Kaur <b>Mentor:</b> Dr. Shweta Dang
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



<b>10</b>	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
<b>11</b>	Genomics of diverse Wolbachia species in Indian Drosophila and to study host-symbiont interactions	2017-2021	CSIR-JRF & SRF	16.81	<b>PI:</b> Ms. Kopal Singhal <b>Mentor:</b> Dr. Sujata Mohanty
<b>12</b>	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
<b>13</b>	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
<b>14</b>	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
<b>15</b>	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
<b>16</b>	Bioprospection of Actinomycetes from Indian desert and antimicrobial activity of selected isolates	2012-2017	DST-INSPIRE	18.02	<b>PI:</b> A. Ibeyaima <b>Mentor:</b> Dr. Indira P. Sarethy.

विद्या ननु व्योमनिभः



**DEPARTMENT OF PHYSICS & MATERIALS SCIENCE &  
ENGINEERING  
RESEARCH PROJECTS**

Department of Physics and Materials Science and Engineering lays strong emphasis on the research in both the field of Physics: experimental and theoretical. Department used to receive research grants from various reputed government agencies namely; Defence Research and Development Organisation (DRDO), Department of Science & Technology (DST), All India Council for Technical Education (AICTE) and Science and Engineering Research Board (SERB). The approximate grant received currently is about Rs. 160 lakhs.

**ONGOING PROJECTS**

S. No.	Title of Project	Duration	Agency	Awarded Fund (INR)	PI
1	Partnership 2020: Leveraging US-India Cooperation in Higher Education to Harness Economic Opportunities and Innovation	2020-2021	University of Nebraska at Omaha	8.93	Prof. Anirban Pathak
2	Generation of Entangled Photons and its Applications to Quantum Computation and Information Processing	2019-2022	DST	40.00	Prof. Anirban Pathak
3	Designing of Devices and Protocols for Quantum Hacking, Random Number Generation and Secure Communication	2019-2022	DST	222.16	Prof. Anirban Pathak Dr. A. Verma
4	Design & Analysis of the Quantum Cryptographic Schemes that can be Implemented in the Metropolitan cities using Optical Resources	2019-2021	DRDO	40.91	Prof. Anirban Pathak Prof. P Chowdhury

**COMPLETED PROJECTS**

1	Investigation of Novel Heusler Alloy Thin films for Energy and Spintronic Applications	2018-2021	SERB	47.30	Dr. Himanshu Pandey
2	Experimental investigations on surface plasmon resonance based fiber optic refractive	2017-2020	DRDO	27.71	Prof. Navneet Kr. Sharma

	index sensors				
3	Structurally manipulated stannate nanostructures for magnetic and optoelectronic applications	2016-2019	DST	11.00	Dr. Sandeep Chhoker
4	Design and cryptanalysis of protocols of secure quantum communication	2016-2019	DRDO	34.07	Prof. Anirban Pathak
5	Entangled and other nonclassical state and their applications in the field of quantum computation and communication	2016-2019	DST	39.50	Prof. Anirban Pathak
6	Theoretical studies of higher order non-classicality and its applications	2011-2014	DST	12.75	Prof. Anirban Pathak
7	Investigations on Multifunctional Properties of alkaline earth and rare earth doped $\text{BFe}_{1-x}\text{TixO}_3$ solid solutions	2011-2014	DST	51.31	Prof. R. K. Dwivedi
8	Bistability due to intramolecular and inter-molecular charge transfer in different environments	2010-2014	DST	9.36	Dr. Papia Chowdhury
9	Synthesis and study of structural, dielectric, magnetic and magnetoelectric properties of multiferroic materials	2010-2014	DST	11.58	Dr. Manoj Kumar
10	Investigations on Multifunctional Properties in substituted Multiferroics	2010-2012	DRDO	16.12	Prof. R. K. Dwivedi
11	Modernisation of Physics and Material Science & Engineering Lab	2008-2011	AICTE-(MODROB)	7.00	Prof K.C.Mathur /R. K. Dwivedi
12	Theoretical study of single photon sources used in quantum computing	2006-2009	DST	2.16	Prof. Anirban Pathak

### STUDENT'S EXTRAMURAL PROJECTS

1	Study of isovalent and aliovalent ions substitution in $\text{BiFeO}_3$ multiferroic ceramics	2011-2016	DST	12.02	PI: Dr. Prakash Chandra Sati Mentor: Dr. Dr. Manoj Kumar
2	Synthesis and Characterization of Metal Oxide Nanostructures	2012-2017	DST	9.77	PI: Dr. Anshuman Sahai Mentor: Dr. Dr. Navendu Goswami

## DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

### RESEARCH PROJECT

HSS Department is growing in its research efforts in the thrust areas of the department through sponsored research grants.

#### ONGOING PROJECT

<b>Sr. No.</b>	<b>Title of the Project</b>	<b>Duration</b>	<b>Funding Agency</b>	<b>Sanctioned Fund (Lakh)</b>	<b>Investigator/s</b>
1	A Study on Financial Inclusion Initiatives and their Impact on Performance of Commercial Banks in Ghaziabad District	2018-2020	Indian Council of Social Science Research (ICSSR)	5.5	<b>PI:</b> Dr. Mukta Mani

**DEPARTMENT OF COMPUTER SCIENCE & INFORMATION  
TECHNOLOGY**  
**RESEARCH PROJECTS**

**COMPLETED PROJECTS**

Sr. No.	Title of the Project	Duration	Funding Agency	Sanctioned Fund (Lakh)	Investigator/s
1	Design and Development of a Cognitive System for Leukocytes Identification in Hematoxylin and Eosin (H & E) Stained Rat Skin Images	2017-2020	SERB-DST, India	Received: Rs. 24,79,632 (Rs. 23,19,400 (JIIT) + 1,60,232 (RTU, Kota)	<b>PI :</b> Dr. Mukesh Saraswat <b>Co-PI:</b> Dr. Harish Sharma Mr. Himanshu Mittal Mr. Raju Pal
2.	Psyche Monitoring and regulating System for e-counselling – Multimodal affect recognizer	2009-2012	AICTE	Rs. 12,65,000	<b>PI :</b> Dr. Krishna Asawa

**DEPARTMENT OF ELECTRONICS & COMMUNICATION**

**ENGINEERING**

**RESEARCH PROJECTS**

<b><u>ONGOING PROJECT</u></b>					
<b>Sr. No.</b>	<b>Title of the Project</b>	<b>Duration</b>	<b>Funding Agency</b>	<b>Sanctioned Fund (Lakh)</b>	<b>Investigator/s</b>
<b>1</b>	Development of Tunable Self-Powered Quantum Dot Based Photodetectors Using Low-Cost Solution Processed Method	2020-2022	SERB-DST, India	Allotted: Rs. 30,36,770  Recd.: 25,03,730	<b>PI :</b> Dr. Hemant Kumar
<b>2</b>	Transmit Antenna Cluster Selection Schemes to Reduce Feedback Bits for Next Generation Wireless Communication Systems	2020-2022	SERB-DST, India	Allotted: Rs. 17,36,390  Recd.: Rs. 10,50,940	<b>PI :</b> Dr. Ankit Garg
<b>3</b>	Exploration of Two Dimensional (2d) Materials Based Tamm Modes Localization for Bio-Sensing	2021-23	IRDPS, JIIT	Rs. 1,20,000	<b>PI:</b> Dr. Amit Kumar Goyal <b>Co PI:</b> Dr. Ajay Kumar
<b>4</b>	Modeling, Design and Simulation of sub-10 nm GaN-SOI FinFET for Label Free Bio-sensing and High-performance Analog/RF Applications	2021-23	IRDPS, JIIT	Rs. 70,000	<b>PI:</b> Dr. Ajay Kumar <b>Co PI:</b> Dr. Amit Kumar Goyal
<b>5</b>	Development of UV Activated ZnO Quantum Dots Based Hydrogen Gas Sensor	2021-23	IRDPS, JIIT	Rs. 4,20,000	<b>PI:</b> Dr. Yogesh Kumar

## COMPLETED PROJECTS

<b>1</b>	Development of Algorithms For Narrow Band Interference Reduction In IRNSS Received Signal	2011-2012	ISRO	5.77 L	<b>PI:</b> Prof. R. C. Jain
<b>2</b>	RPS Project – Development Of IP Core For Real Time Audio Video Surveillance System	2009-2012	AICTE	5 L	<b>PI:</b> Prof. R. C. Jain
<b>3</b>	NPMASS (National Program On Micro And Smart Systems)	2009-2014	Aeronautical Development Agency (ADA), GOI.	50 L	<b>PI:</b> Prof. A. B. Bhattacharya
<b>4</b>	A Low- Voltage CMOS Test Chip For Thermal Sensor And RF Application On AMS 0.35 Um Technology Node Using Mentor Graphics PDK	2011-2013	Mentor Graphics, India	6.6 L	<b>PI:</b> Prof. R. C. Jain

