



# KOSHIKA

*Unit of Life, Technology & Communication*

## NEWSLETTER OF DEPARTMENT BIOTECHNOLOGY

Volume 1 | Issue 1 | September 2021



**Jaypee Institute of Information Technology, Noida**  
(Deemed to be University under Section 3 of UGC Act, 1956)

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# *Message from the Pro-Chancellor*

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I congratulate the Department of Biotechnology for bringing out the inaugural issue of the departmental newsletter ‘**KOSHIKA**’. In the present era of instant communication and knowledge sharing without boundaries, the initiative of launching a newsletter is highly commendable. Koshika will be a veritable knowledge repository, capturing various departmental activities at one place and it will empower the students by providing them a forum to pen down their learning in a newsletter.

Even in these precarious times, the faculty and the students of the Department have enthusiastically come forward and contributed to putting together this newsletter which showcases their collective knowledge, experiences and creative expression. It is a matter of great pride and satisfaction that the Institute has such highly motivated students and educators. Their drive, dedication and determination, underpinned by their creative and professional prowess and empathy has ensured uninterrupted learning and teaching despite the challenging situation that we are confronted with. This is palpable as you browse through the pages of this newsletter.

I again wish to congratulate the HOD, staff and students for their extraordinary efforts. We believe in making sure that our students know that they are seen and encouraged to explore their true potential. Here while perfection is not an option, excellence is. The newsletter provides the readers a glimpse into the structure and facilities in the Department, and a comprehensive view of the co-curricular and extracurricular activities –the conferences and workshops conducted, the training programs, alumni meets and industry interactions organized, and exhibits the creative and scientific writing skills of the faculty and students and much more.

I sincerely hope that Koshika will be a regular feature, that it will go from strength to strength and provide our readers a comprehensive understanding of the ongoing work in the Department.

With best compliments,

**Prof. S.C. Saxena**

Pro-Chancellor

Jaypee Institute of Information Technology, Noida

# *Message from the Vice Chancellor*

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I am happy to know that Department of Biotechnology of Jaypee Institute of Information Technology (JIIT), Noida is bringing out their first ever Newsletter 'KOSHIKA'. The Department Strives to create an environment encouraging students to learn more and provide an auxiliary system to support extra-curricular participation. The newsletter is a testimony to all the quality teaching and research happening in the Department. I look forward to reading about the various activities and achievements in the Newsletter.

Heartiest congratulations and wishing you all success in your endeavours!

With best regards,  
**Prof. Yog Raj Sood**  
Vice Chancellor  
Jaypee Institute of Information Technology, Noida

# *Message from the Head of the Department*

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Success is where opportunities meet preparation. In the Department of Biotechnology at Jaypee Institute of Information Technology (JIIT), Noida, our motto has been to ensure that our students are trained and prepared to take on every challenge, both inside and outside the campus.

We not only try to assist students to realize their potential; we believe our students must imbibe every skill which will help them succeed academically, as well as in society. We encourage initiatives such as this newsletter which provides a platform where creativity can flourish and individual talent is recognised and nurtured. It gives me immense pleasure to know that both our staff and students have the requisite self-assurance to reproduce their knowledge in the form of articles, interviews and quizzes. The ethos of the editorial team has promoted curiosity and inquisitiveness and I hope it helps to create a fine foundation for our students to move out with confidence into the world beyond our institution. The newsletter also captures the increase in our interaction with the growing number of our alumni, who have forged ahead in a diversity of careers and interests. Thanks to the efforts that have gone into the release of the inaugural issue of '**KOSHIKA**', we look forward to this becoming a regular feature. I am sure it will provide a strong curricular and co-curricular platform for our students to learn and grow.

With best wishes to the entire team

**Prof. Pammi Gauba**

Head of Department

Biotechnology

Jaypee Institute of Information Technology, Noida

# *Message from the Editorial Team*

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“Les chefs-d'œuvre ne sont jamais que des tentatives heureuses.” - The masterpieces are nothing but happy attempts.

With utmost happiness, we welcome our readership to the inaugural issue of “**KOSHIKA**”, the newsletter of the Department of Biotechnology, at JIIT NOIDA. This newsletter is a mouthpiece for our collective departmental achievements and is aimed at our students, alumni, and department faculty, support staff members, and potential research and industry partners. The intention to start this newsletter was to ensure that our stakeholders are abreast with our teaching/research activities, breakthroughs and achievements.

Further, we encourage our readership to communicate and connect with us. We will be glad to hear about your experiences in the department, professional and/or professional accomplishments. We, the editorial team at “**KOSHIKA**”, assure you that we will leave no stone unturned to highlight your achievements, and bring forth your creative and innovative outpourings.

Also, here we take the opportunity to acknowledge our Pro-Chancellor, Vice Chancellor, and HOD for giving their valuable inputs and providing us the opportunity to be in the steering team for the departmental newsletter. Last, but not the least, we acknowledge the support of faculty colleagues in the department who gave valuable inputs and suggestions, and kept us motivated to succeed in our maiden endeavours.

Looking forward to your feedback and participation.

With best wishes,

***Prof. Vibha Rani***  
***Dr. Sonam Chawla***

# *Department of Biotechnology*

## *VISION*

**To be a centre of excellence in Biotechnology for providing quality education and carrying out cutting edge research to produce professionals, innovators, researchers and entrepreneurs.**

## *MISSION*

- **To offer contemporary, futuristic and flexible curricula of Biotechnology for teaching and training.**
- **To carry out globally acceptable cutting-edge research through sponsored projects and to provide state of art laboratories for experimental work.**
- **To develop bio-safe, socially, ethically and environmentally acceptable solutions to address health, environmental, industrial, entrepreneurial and societal concerns.**

# *Programme Educational Objectives*

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## **B.TECH. BIOTECHNOLOGY**

- PEO1: To provide fundamental and practical knowledge in the field of Biotechnology for pursuing research career in industry and academia.
- PEO2: To impart analytical and research skills and nurture entrepreneurial endeavours.
- PEO3: To develop biotechnologists with professional ethics to address global and societal issues for sustainable development.

## **M.TECH. BIOTECHNOLOGY**

- PEO1: To impart advanced theoretical and practical knowledge in Biotechnology and allied fields.
- PEO2: To provide domain knowledge and expertise for successful career in academics, research and industry.
- PEO3: To develop ethically and socially responsible professionals with leadership and entrepreneurship skills.

## **M.Sc. ENVIRONMENTAL BIOTECHNOLOGY**

- PEO1: To impart advanced theoretical and practical knowledge in Environmental Biotechnology and allied fields.
- PEO2: To enhance knowledge and expertise for a successful career in academics, research and industry.
- PEO3: To develop professionals with social, environmental and ethical awareness.

## **M.Sc. MICROBIOLOGY**

- PEO1: To impart advanced theoretical and practical knowledge in Microbiology and allied fields of Biotechnology.
- PEO2: To enhance knowledge and expertise for a successful career in academics, research and industry.
- PEO3: To develop professionals with social, environmental and ethical awareness.



# Departmental Structure

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## Meet Our Faculty



**Pammi Gauba Ph.D.**  
Prof.  
Environmental Biotechnology



**Neeraj Wadhwa Ph.D.**  
Prof.  
Microbial & Food  
Technology



**S. Krishna Sundari Ph.D.**  
Prof.  
Microbial & Environmental  
Biotechnology



**Sudha Srivastava Ph.D.**  
Prof.  
Biosensors, Nano-  
Biotechnology



**Sujata Mohanty Ph.D.**  
Prof.  
Molecular Genetics &  
Genomics



**Indira P. Sarethy Ph.D.**  
Prof.  
Microbial & Plant  
Biotechnology



**Reema Gabrani Ph.D.**  
Prof.  
Protein Engineering



**Vibha Rani Ph.D.**  
Prof.  
Medical Biotechnology



**Rachana Ph.D.**  
Prof.  
Natural Products  
Therapeutics



**Shweta Dang Ph.D.**  
Assoc. Prof.  
Novel Drug Delivery Systems



**Ashwani Mathur Ph.D.**  
Assoc. Prof.  
Process Engineering



**Vibha Gupta Ph.D.**  
Assoc. Prof.  
Structural Biology



**Shalini Mani Ph.D.**  
Assoc. Prof.  
Medical Biotechnology



**Smriti Gaur Ph.D.**  
Assoc. Prof.  
Microbial Biotechnology



**Chakresh K. Jain Ph.D.**  
Asstt. Prof. (Sr)  
Bioinformatics



**Priyadarshini Ph.D.**  
Asstt. Prof. (Sr)  
Medical Biotechnology



**Susinjan Bhattacharya Ph.D.**  
Asstt. Prof. (Sr)  
Microbial Biotechnology



**Garima Mathur Ph.D.**  
Asstt. Prof. (Sr)  
Environmental Biotechnology



**Shazia Haider Ph.D.**  
Asstt. Prof. (Gr-2)  
Bioinformatics



**Manisha Singh Ph.D.**  
Asstt. Prof. (Gr-1)  
Medical Biotechnology



**Sonam Chawla Ph.D.**  
Asstt. Prof. (Gr-1)  
Medical Biotechnology



**Ms Ekta Bhatt.**  
Asstt. Lecturer.  
Environmental Biotechnology

# *Uniqueness of the Department*

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Our curriculum is designed to prepare the students as prominent contributors in the fields of Biotechnology, Bioinformatics and impart in them the skill sets that not only enable their adaptation to academia, research, and industry but also to address the demands of the continuously evolving technologies and industry.

Smart curriculum for developing Biotechnology expertise in students by offering project-based learning through faculty mentoring in areas such as: Proteomics & Genomics Technologies, Nanobiotechnology, Antimicrobial Resistance, Animal & Plant Cell Culture, Fermentation & Downstream Processing, Molecular Diagnostics, Disease & Healthcare, Pharmacogenomics, Biosensors, Bioeconomics and Waste Management.

To facilitate students in acquiring '**Proficiency certificates**', in the fields of: Industrial Biotechnology, Medical Biotechnology, Plant and Microbial Biotechnology, Bioinformatics, Environmental Biotechnology and Food Biotechnology.

Encourage students to participate in relevant workshops, invited lectures and conferences ensuring the overall progress and technical skills enhancement.

Two main centres namely Centre of Excellence in Emerging Diseases and Centre of Excellence in Plant and Microbial Biotechnology have been set-up with the vision of becoming a Centre of Excellence of international repute in the field of Biotechnology.

Department have received total project grant of INR-10 Crores from premier national funding agencies namely: DBT, DST, AICTE, ICMR, AYUSH, UPCST and Ministry of Environment reflect, our Department's crucial research emphasis.

Total 37 PhDs have been awarded from the department and 66 scholars are currently pursuing their doctoral degrees.

In the last 5 years, Department faculty have published >250 papers in journals of international repute and have filed/granted patents.

Our alumni are successful in securing admission at institutions of excellence to pursue higher studies, are placed in various renowned national and international organizations or have set up successful business ventures.

# Research Thrust Areas

To strengthen departmental research, two Centres of Excellence have been established

## Centre of Excellence in Emerging Diseases

Centre of Excellence in Emerging Diseases” addresses the questions of molecular pathogenesis of emerging viral and bacterial pathogens (host pathogen interactions, essential metabolic pathways of pathogens), structural biology, lifestyle diseases such as cancer, cardiovascular diseases and the design of novel diagnostics and therapeutics. Research emphasis is also on microRNA and peptide-based therapeutics, regulatory peptides, biosensor and ELISA based diagnostics, and drug encapsulated nanoparticles and nanoemulsions. The research activities at the centre has generated ~7.5 crore extramural research funding from various agencies of Govt. of India including Department of Biotechnology (DBT), Department of Science & Technology (DST), Indian Council of Medical Research (ICMR) and All India Council for Technical Education (AICTE).

Thrust area includes

- **Disease and Omics Technology**
- **Bioinformatics**
- **Nanotechnology**
- **Industrial Biotechnology**
- **Medical Biotechnology**
- **Pharmaceutical Biotechnology**

## Centre of Excellence in Plant & Microbial Biotechnology

Plant & Microbial Biotechnology centre addresses growing concern over environmental pollution, depleting natural resources and increasing demand of natural bio-products of therapeutic and industrial importance, bioresources, biorefining, bioremediation of organic and inorganic pollutants, enzymes for environment, food, industrial applications, biofertilizer, biocontrol agents for agriculture improvement and natural products for healthcare applications. The centre has garnered extra mural funding to the tune of Rs. 238.41 Lakhs through research grants from Department of Biotechnology (DBT), UP-CST, Department of Science & Technology (DST) & Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy (AYUSH), Ministry of Environment, Govt. of India.

Thrust area includes

- **Bioremediation**
- **Bioresources**
- **Environmental Biotechnology**
- **Plant and Agriculture Biotechnology**
- **Pro- and Prebiotics**
- **Food Biotechnology**
- **Microbial Biotechnology**

# Industrial Relevance of the Courses

To keep our students updated about the latest developments in the industry and real world, core and elective courses are offered to them in all the industry relevant fields.

<i>Areas</i>	<i>Courses</i>	
<i>Medical Biotechnology</i>	<ul style="list-style-type: none"> <li>• Molecular Biology &amp; Genetic Engineering</li> <li>• Cell Culture Technology</li> <li>• Molecular Diagnostics</li> <li>• Stem Cells &amp; Healthcare</li> <li>• System Biology &amp; Neural Network</li> </ul>	<ul style="list-style-type: none"> <li>• Metagenomics</li> <li>• Molecular Evolutionary Biology</li> <li>• Genomics &amp; Society</li> <li>• Public Health &amp; Economics</li> <li>• Diseases &amp; Healthcare</li> </ul>
<i>Industrial Biotechnology</i>	<ul style="list-style-type: none"> <li>• Fermentation Technology &amp; Downstream Processing</li> <li>• Bioprocess Engineering</li> <li>• Instrumentation Techniques in Biotechnology</li> <li>• Product Development in Biotechnology</li> <li>• Bioprocess &amp; Industrial Biotechnology</li> <li>• Techno Economic Bio-Feasibility Reporting</li> </ul>	<ul style="list-style-type: none"> <li>• Nano-biotechnology</li> <li>• Aquaculture</li> <li>• Animal &amp; Plant Biotechnology</li> <li>• IPR in Biotechnology</li> <li>• Biosensors</li> <li>• Biostatistics and its Applications</li> <li>• Market Research in Biosciences</li> </ul>
<i>Pharmaceutical Sciences</i>	<ul style="list-style-type: none"> <li>• Bio-Pharmaceutics &amp; Pharmacokinetics</li> <li>• Clinical Trials &amp; Database Management System</li> </ul>	<ul style="list-style-type: none"> <li>• Regulatory Affairs</li> <li>• Drug Delivery</li> <li>• Phyto-therapeutics &amp; Pharmacology</li> </ul>
<i>Bioinformatics</i>	<ul style="list-style-type: none"> <li>• Introduction to Bioinformatics</li> <li>• Biocomputing &amp; Applications</li> <li>• Machine Learning Tools in Bioinformatics</li> <li>• Molecular Modeling &amp; Drug Design</li> </ul>	<ul style="list-style-type: none"> <li>• Information Technology for Biologists</li> <li>• System Biology &amp; Neural Network</li> </ul>
<i>Food Biotechnology</i>	<ul style="list-style-type: none"> <li>• Human Nutrition &amp; Health</li> <li>• Food Biotechnology</li> <li>• Nutraceuticals</li> </ul>	<ul style="list-style-type: none"> <li>• Enzymes in Food Processing</li> <li>• Nano-science in Food Technology</li> </ul>

# *Biotech Laboratory*

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Research infrastructure and enabling facilities of Department of Biotechnology has contributed to its success in carving a niche for itself on the national biotech education map. The department has consistently maintained its ranking in top 10 biotechnology departments for education quality and research infrastructure amongst private institutions offering Biotechnology courses in India (Source: Biospectrum, a leading Biotechnology Magazine).

A total 2000 sq. ft dedicated lab area of Biotechnology Department has a well-organized record maintenance system in place. The status of instruments is reviewed on a regular basis by lab committee under the supervision of HOD, Biotech. The department also has chemical purchase committee which keeps a record of existing resources and purchase of consumables.

The research and training standards are maintained to the current state-of-art as we regularly up-grade the laboratory equipments. Our laboratories comply with the bio-safety norms and facilitate students with essential equipments for performing microbiological, biochemical, immunological, and molecular experiments such as gel electrophoresis, protein expression and purification, nucleic acid isolation, immuno-technology studies, molecular cloning methodologies, cell culture technology, functional genomics applications, and bioinformatics that span the methodological repertoire of biotechnology research.

A well versed computerized maintenance management system to keep a track of laboratory assets, AMCs, usage, service / chemical suppliers is managed by lab personnel. Stock registers, log and lab record books are maintained by faculty, lab staff and students and inspected time to time by HOD. Standard operations procedures for high end equipments are made available to users with bio-safety guidelines.

# *Our Lab Staff*



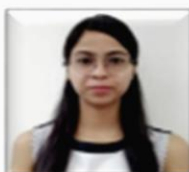
**Mr. Kamal Singh**  
(Lab Assistant)



**Mr. Raj Kumar Singh**  
(Senior Technician)



**Mr. Narendra Yadav**  
Lab Engineer



**Ms. Raveena Goswami**  
(Lab Assistant)



**Mr. Kaushal Adhikari**  
(Lab Attendant)



**Mrs. Deepa Kandpal**  
(Lab Attendant)

## *Laboratory Instruments at Glance*



# New Arrivals

## ➤ Bio-rad Real Time PCR

The instrument has wide range of applications in diagnostics and therapeutics. Real-time PCR played a critical role in detection and quantification of Covid-19 viral pathogens.



*Installation of Machine in Biotech Laboratory*

## ➤ Muse Cell Analyzer

A bench top cell analyzer provides fluorescence based quantitative results of single cell analysis.



*Hands on Training Session for Lab Staff*

## ➤ *Eppendorf Refrigerated Centrifuge 5804 R*

The instrument is used for the centrifugation process required for separating components of different density. It helps to complete general processes such as cell harvesting, DNA separation, separating cell lysates. It comprises of additional rotors, wing bucket and deep well plate.



### *Training of Students*

## ➤ *IKA RV 10 Rotary Evaporators*

Rotary evaporators help in easy removal of solvent from samples at low pressure. The instrument is designed in a way to perform under vacuum so as to decrease the boiling point of the compound and heating of sample.



### *Hands on training session for Research Scholars*



# Our Hubs

## RIBOSE

Ribose, the technical hub of Department of Biotechnology at IIIT, Noida is working towards a holistic aim of inculcating interest and providing an accredited platform for young minds to explore and indulge in the ever growing field of biotechnology.

Faculty coordinators are:

- Dr. Ashwani Mathur
- Dr. Chakresh Jain
- Dr. Smriti Gaur



## Biotech. faculty associated with various other hubs:

<i>HUB</i>	<i>ASSOCIATED FACULTY</i>
Yoga And Health	<ul style="list-style-type: none"><li>• Prof. Reema Gabrani</li><li>• Dr. Shweta Dang</li><li>• Ms. Ekta Bhatt</li></ul>
Crescendo	<ul style="list-style-type: none"><li>• Prof. S. Krishna Sundari</li></ul>
Page Turner Society	<ul style="list-style-type: none"><li>• Prof. Indira P. Sarethy</li></ul>
Jhankaar	<ul style="list-style-type: none"><li>• Dr. Smriti Gaur</li></ul>
EcoQuence	<ul style="list-style-type: none"><li>• Prof. Pammi Gauba</li><li>• Prof. Neeraj Wadhwa</li><li>• Prof. Indira P. Sarethy</li></ul>
Adwitya	<ul style="list-style-type: none"><li>• Dr. Priyadarshini</li></ul>

# Faculty Publications

S.No.	Papers Published in Journals <i>Jan-Aug 2021</i>
1.	<b>E. Bhatt</b> and <b>P. Gauba</b> . "Phytotoxicity of Tetracycline and Amoxicillin on <i>Vigna radiata</i> and its remediation potential in hydroponic system". Current trends in biotechnology and pharmacy, vol. 15(3), 2021.
2.	C. Faujdar, <b>Priyadarshini</b> . "Evaluation of In-vitro Cytoprotective, Wound Healing and Antioxidant Effects of <i>Ocimum sanctum</i> Leaf Extract". Current trends in biotechnology and pharmacy, vol. 15(3), 2021.
3.	D. Mody, V. Verma and <b>V. Rani</b> . "Modulating host gene expression via gut microbiome- microRNA interplay to treat human diseases". Critical Reviews in Microbiology, vol. 47(3), 2021.
4.	G. Agarwal and <b>R. Gabrani</b> . "Antiviral Peptides: Identification and Validation". International Journal of Peptide research and therapeutics, vol. 27, 2021.
5.	<b>M. Singh</b> , S. Agarwal, P. Pancham, V. Agarwal, H. Kaur, and R. Kaur. " <i>In silico</i> Validation and Fabrication of Matrix Diffusion-based Polymeric Transdermal Patches for Repurposing Gabapentin Hydrochloride in Neuropathic Pain". CNS & Neurological Disorders - Drug Targets, vol. 20, 2021.
6.	<b>V. Gupta</b> , E. Bhatt, M. Verma, N. Singhvi, K. Ponnusamy, Md. Malik, H. Verma, R. Kumar, U. Sood, P. Hira, S. Satija, Y. Singh and Rup Lal. "Comparative Genomics and Integrated Network Approach Unveiled Undirected Phylogeny Patterns, Computational Hotspots, Functional Crosstalk and Regulatory Interactions in SARS-CoV-2". mSystems, vol. 6(1), 2021.
7.	<b>S. Mani</b> , G. Swargiary and R. Chadha. "Mitophagy Impairment in Neurodegenerative Diseases: Pathogenesis and Therapeutic Interventions". Mitochondrion, vol. 57, 2021.
8.	K. Passi, P. Patel and <b>C. K. Jain</b> . "Prediction of Heart Cancer Data Using Hybrid Optimization and Machine Learning Techniques". International journal of extreme automation and connectivity in healthcare, vol. 3(1), 2021.
9.	D. Rani, B. Nayak and <b>S. Srivastava</b> . "Immunogenicity of gold nanoparticle based truncated ORF2 vaccine in mice against Hepatitis E virus". 3 Biotech, vol. 11(2), 2021.

S.No.	<p style="text-align: center;"><b>Papers Published in Journals</b> <i>Jan-Aug 2021</i></p>
10.	I. Thapa, <b>S. Gaur</b> . "Decolorization of azo dyes by newly isolated <i>Citrobacter sp.</i> strain EBT-2 and effect of various parameters on decolourization". J Appl Biol Biotech, vol. 9(4), 2021.
11.	<b>M. Singh</b> , S. P. Singh, D. Yadav, M. Agarwal, S. Agarwal, V. Agarwal, G. Swargiary, S. Srivastava, S. Tyagi, and <b>S. Mani</b> . "Targeted delivery for neurodegenerative disorders using gene therapy vectors: Gene next therapeutic goals". Current Gene Therapy, vol. 21(1), 2021.
12.	R. Ghildiyal and <b>R. Gabrani</b> . "Computational approach to decipher cellular interactors and drug targets during co-infection of SARS-CoV-2, Dengue, and Chikungunya virus". Virus disease, vol. 32(1), 2021.
13.	R. Ghildiyal, <b>R. Gabrani</b> . "Deciphering the human cellular interactors of alphavirus unique domain of Chikungunya Virus". Virus Res., vol. 295, 2021.
14.	P. Mathur and <b>V. Rani</b> . "MicroRNAs: A critical regulator and a promising therapeutic and diagnostic molecule for diabetic cardiomyopathy". Current gene therapy, vol. 21 (5), 2021.
15.	N. Atale, C. B. Mishra, S. Kohli, R. K. Mongre, A. Prakash, S. Kumari, U. C. S. Yadav , R. Jeon and <b>V. Rani</b> . "Anti-inflammatory Effects of <i>S. cumini</i> Seed Extract on Gelatinase-B (MMP-9) Regulation against Hyperglycemic rdiomyocyte Stress". Oxidative medicine and cellular longevity, vol. 2021, 2021.
16.	K. Sharma and <b>V. Rani</b> . "A comparative study of antioxidative and cardioprotective efficacy of raw and aged garlic extract". International journal of herbal medicine, vol. 9(3), 2021.
17.	K. Sharma and <b>V. Rani</b> . "Anticancerous and Antimicrobial Properties of Garlic". Journal of natural product and plant resources, vol. 11(2), 2021.
18.	R. K. Tiwari, S. Chanda, M. Udayabanu, <b>M. Singh</b> and S. Agarwal. "Anti-Inflammatory, and Anti-Arthritic Potential of Standardized Extract of <i>Clerodendrum serratum (L.) Moon</i> ". Frontiers in pharmacology, vol. 12, 2021.
19.	<b>I. P. Sarethy</b> and A. Saharan. "Genomics, proteomics and transcriptomics in the biological control of plant pathogens: a review". Indian phytopathology, vol. 74 (5), 2021.
20.	A. Saharan, N. Srivastava, <b>I. P. Sarethy</b> . "Morphological and molecular characterization of Actinomycetes isolates and their metabolite fingerprinting". Indian journal of agricultural sciences, vol. 91 (4), 2021.

# Ph.D. Awarded

## (2020-2021)

S. No.	Enrolment Number	Name of the Scholar	Title of the Thesis	Date of Award of PhD
1	15401008	Rahul	Fabrication of Nanotechnology based Point-of-Care Device for detection of thyroid disorder	11 <sup>th</sup> July, 2020
2	16401004	Kopal Singhal	Comparative genomics of <i>Wolbachia</i> in Indian <i>Drosophila</i>	24 <sup>th</sup> July, 2020
3	15401005	Sharad Saxena	Investigating microRNAs and matrix metalloproteinases as therapeutic target in glucose induced cardiac stress	27 <sup>th</sup> August, 2020
4	16401006	Atinder Pal Kaur	Development of Drug loaded nanoemulsion based formulations for Urinary tract infection	31 <sup>st</sup> Oct, 2020
5	14401012	Deepali Verma	Biochemical and structural insights into bacterial CysEs: Rational discovery of novel inhibitors for AMR interventions	13 <sup>th</sup> Nov, 2020
6	16401001	Kuldeep Nigam	Nano-Carrier based approach for neuropathic pain management	31 <sup>st</sup> Dec, 2020
7	14401009	Pratibha Yadav	Rhizoremediation of residual organophosphate pesticides employing competent plant growth promoting bacteria	9 <sup>th</sup> March, 2021

# 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 Faculty Projects

- Evaluation of the production strategies, nutritional value and therapeutic properties of probiotic Seabuckthorn juice. Department of Science & Technology, Govt. of India and Academy of Scientific Research and Technology (ASRT), Egypt. (from Indian Scientist only; Separate for Egypt Scientist) **PI: Prof. Pammi Gauba, Dr. Ashwani Mathur** (India) jointly with Prof. Shoby El-Sohaimy, ARID Lands Cultivation Research Institute, SARTA City, Egypt; Duration: 2021-2023, Grant Value: 12 Lakh
- Nose to brain delivery of surface-modified drug loaded PLGA nanoparticles for management of Trigeminal Neuralgia.: Delhi, **PI: Dr. Shweta Dang; Co-PI: Prof. Pammi Gauba.** Co Pi: Dr Amit Tyagi, INMAS, ICMR, GOI, Duration: 2020-2023, Grant Value: 40.6 Lakh
- Evaluation of the heavy metals content in market samples of plant raw drugs used in Ayurveda. AYUSH, GOI, **PI: Prof. Pammi Gauba,** Duration: 2017-2021, Grant Value: 41.1 Lakh
- Application of customized PGPM based formulations for reclamation of soil permeated with Organophosphate pesticide residues. **PI: Prof. S Krishna Sundari Co-PI: Prof. Sudha Srivastava,** DBT, Duration: 2017-2020, Grant Value: 62.1 Lakh
- Investigating microRNAs as the Next Generation Therapeutic Targets in Diabetic Cardiomyopathy. **PI: Prof. Vibha Rani,** SERB-DST, GOI, Duration: 2018-2021, Grant Value: 40 Lakh

- Developing Functional bacterial cellulose composites as immobilization matrix, Council of Science and Technology U.P, **PI: Dr. Garima Mathur Co-PI: Prof. Pammi Gauba**, Duration: 2019-2021, Grant Value: 6.6 Lakh
- Targeting biofilm formation by inhibiting Cysteine biosynthesis pathway enzymes in ESKAPE pathogens with natural products. **PI: Dr. Vibha Gupta/ Dr Purna Diwan/Dr. Rakesh Kumar Gupta**, DST, GOI, Duration: 2021-2024, Grant Value: 42.30 Lakh
- Exploring efficacy of plants and microbes for remediation of E-Waste Contaminated Soil. **PI: Prof. Pammi Gauba, Co-PI: Dr. Shweta Dang**, Ministry of Forest and Environment, Duration: 2020-2023, Grant Value: 47.93 Lakh
- Potentially novel carbohydrases (cellulase and related enzymes) for waste management from cultivable bacteria and functional metagenomic library of North East India biodiversity hotspot **PI: Prof. Indira P. Sarethy**, DBT, GOI, Duration: 2017-2021, Grant Value: 22.21 Lakh

**Nano-Biotechnology Lab**  
Synthesis of Novel Nanomaterials

**Microbial biopolymers and their composites: production and characterization**  
LAYERED BIOMATERIALS  
LAYER 1: POLYMER  
LAYER 2: CELLULOSE  
LAYER 3: CELLULOSE

**INNOVATIVE DRUG DELIVERY FOR INTRAMAZAL DELIVERY**

Group	1	2	3	4
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0

**Bacterial cellulose production from *Glucoacetobacter xylius* MTCC799**  
Growth rate and estimation of BC  
FTIR spectra of BC

**Functional food enhancing lifespan**  
Model organism  
Drosophila Genomics  
Microbiome  
Wolbachia Genomics  
Evolutionary studies  
First Indian WGS on NGS using Illumina  
Zapranus infans  
Understanding invasive pest nature  
Eco-geographic variations

**THERAPEUTICS OF EMERGING DISEASES**  
Chikungunya Virus transmission  
Cloning of proteins into suitable vectors  
Bio-Peptide library display to find inhibitors  
Protein Purification  
Y2H to find out molecular interactome  
Pull down assay  
Pull down assay  
ELISA  
Location studies

# Faculty As Mentor

S. No.	Title of project	Faculty	Duration (Years)	Fellowship	Amount (Lakh)
1	Analysis of host interactors of Chikungunya virus non structural Protein 1.	Prof. Reema Gabrani	2019-2022	CSIR-SRF	7.1
2	Structure, function and inhibition of isocitrate lyases of <i>Mycobacterium tuberculosis</i> .	Dr. Vibha Gupta	2016-2021	DST – Inspire	21.9
3	Fabrication of nanotechnology based point- of-care device for thyroid disease diagnosis.	Prof. Sudha Srivastava	2016-2021	DST – Inspire	21.9
4	Ayurvedic herbal formulations in modulating gut microbiota which is associated with diabetic cardiomyopathy.	Prof. Vibha Rani	2019-2024	DST – Inspire	24.60
5	<i>Syzygium cumini</i> polyphenols in drug induced cytotoxicity.	Prof. Vibha Rani	2019-2024	CSIR-JRF	24.60
6	Designing an alternative cancer therapy by study of anticancerous herbs for their potential mitocan activity.	Dr. Shalini Mani	2018-2023	NFST (Ministry of Tribal affairs)	22.08
7	To develop a millet-based fermented food product and assessment of its nutritional and functional properties.	Dr. Smriti Gaur	2019-2024	DBT	24.60

# *Innovative Efforts: Our Patents*

<b>S. No.</b>	<b>Patent Application No (PAN)</b>	<b>Patent Title</b>	<b>Author</b>	<b>Status</b>
1.	PAN 202111032404	Development of Synbiotic Corn Cinnamon Chocolate and Its Functional Analysis	Dr. Smriti Gaur and Shubhi Singh	Filed
2.	PAN 202111005772	Polynucleotide Novel Molecule in Cardiovascular Therapeutics	Prof. Vibha Rani and Priyanka Mathur	Filed
3.	PAN 202111001763	Synergistic Combination Of Temozolomide and D-Limonene for Glioblastoma Multiforme Treatment	Prof. Reema Gabrani and Megha Gautam	Filed
4.	PAN 202111005634	Recombinant Biocatalyst with Enzymatic Activity	Dr. Samiya Khan, Dr. Nidhi Gupta and Prof. Pammi Gauba	Filed
5.	PAN 202111005269	Mitochondria Targeting Ability of Natural Compound in Breast Cancer and Its Synergistic Effect with Existing Therapy	Geeta Swargiary and Dr. Shalini Mani	Filed
6.	PAN 202011032629	Recombinant <i>Rhodococcus</i> Sp. with Dioxygenase Gene Cassette	Dr. Samiya Khan, Dr. Nidhi Gupta and Prof. Pammi Gauba	Filed
7.	PAN 2020110 19986	Synergistic Effect of Herbal Plant Extract Against Urolithiasis	Dr. Priyadarshini	Filed



<b>S. No</b>	<b>Patent Application No (PAN)</b>	<b>Patent Title</b>	<b>Author</b>	<b>Status</b>
8.	PAN 202011020344	Poly Ribonucleotide Sequence [(Tag) <sub>7</sub> C <sub>2</sub> ] as Type Iv Collagenase Natural Inhibitor	Prof. Vibha Rani, Sharad Saxena	Filed
9.	PAN 202011001014	Co-Delivery Of Baclofen & Lamotrigine Via PLGA Nanoparticles	Dr. Shweta Dang, Kuldeep Nigam and Amit Tyagi	FER Submitted
10.	PAN 201911051941	Biocatalyst Dioxygenase Activity	Dr. Samiya Khan, Dr. Nidhi Gupta and Prof. Pammi Gauba	Filed
11.	PAN 201911047575	Synergistic Effect of Temozolomide and Phytocompound in Human Glioblastomas Multiforme Cell Lines	Prof. Reema Gabrani and Megha Gautam	Filed
12.	PAN 201911047275	Capsaicin and Curcumin Loaded Nanoemulsion Based Gel for Neuropathic Pain Management	Dr. Shweta Dang and Kuldeep Nigam	Filed
13.	PAN 2782/DEL/2010	Thermally Stable Enzymes with Improved Biocatalytic Activity and A Process to Prepare the Same by Making Their Nanoparticles	Prof. Sudha Srivastava and Shikha Sharma	Granted Patent Patent No. 309474
14.	PAN 201811012008	An Improved Electrode for Electrochemical Device	Prof. Sudha Srivastava and Rahul Saxena	Published

# Triumphs

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**Ms. Priyadarshini Gupta**  
(Research Scholar)

Awarded DST-INSPIRE fellowship (Ref. No. DST/INSPIRE/03/2019/002656; Dated- 19<sup>th</sup> Aug 2021) for her research entitled "*Investigation of Indian herbs as ACE-2 and TMPR-2 modulator in Hydroxychloroquine induced Cardiotoxicity*". (Duration: 2021-2026; Grant value: Rs. 25 Lakh);  
**Faculty Mentor: Prof. Vibha Rani**



**Ms. Shivani Singhal**  
(Research Scholar)

Best poster presentation  
award



**Ms. Divya Jindal**  
(M. Tech Student)

Best oral presentation  
award

2nd Virtual International Conference on Naturopathy, Nanotechnology, Nutraceuticals, and Immunotherapy in Cancer Research - 2021 (ICN3IC-21) June 11<sup>th</sup>-12<sup>th</sup>, 2021.

## *Invited talk/ Presentation/ Award*

*(March – August 2021)*

- ❖ **Dr. Vibha Gupta** delivered an invited talk in IuCr 2021 - 25<sup>th</sup> Congress and General Assembly of the International Union of Crystallography held from August 14<sup>th</sup> - 22<sup>nd</sup> 2021 at Prague, Czech Republic.
- ❖ **Prof. Vibha Rani** delivered an invited talk entitled “ Micro RNAs as Promising Targets for Diagnostic and Therapeutics ” in webinar series on “Emerging Trends in Microbiology and Biotechnology”, organized by University of Kota, Rajasthan from July 1<sup>st</sup> - 4<sup>th</sup>, 2021.
- ❖ **Dr. Shweta Dang** “Honourable Mention for Oral Presentation” award for presenting a paper titled “In vitro and In vivo analysis of Lamotrigine loaded PLGA nanoparticles” at ‘Second International Conference of Nanoscience and Nanobiotechnology’ organized by University of Brasilia, Brazil, May 26<sup>th</sup> -28<sup>th</sup>, 2021.
- ❖ **Dr. Shalini Mani** received Best paper award for presenting a paper titled as “Molecular Docking and ADMET Studies to Predict the Anti-Breast Cancer Effect of Aloin by Targeting Estrogen and Progesterone Receptors” at IEEE sponsored International conference on Nanoelectronics, Nanophotonics, Nanomaterials, Nanobiosciences, Nanotechnology (5NANO2021), April 29<sup>th</sup>-30<sup>th</sup>, 2021.
- ❖ **Prof. Rachana** received Women Scientist Award in the field of Biomedical sciences in Health and wellness conclave by Social talks, Supported by - IPC, USP, NCPM, World Book of records, March, 2021.

# News & Views

## Recent Events Organized by Department



Department of Biotechnology  
Jaypee Institute of  
Information Technology



(Declared Deemed to be University u/s Sec  
of UGC Act 1956) A-10, Sector 82, Noida

ONE WEEK FACULTY DEVELOPMENT  
PROGRAM

**Food and Agriculture  
Biotechnology**

2nd- 7th August, 2021



**Workshop on Omics  
Data Analysis**  
16<sup>th</sup>-17<sup>th</sup> April 2021  
Department of Biotechnology JIIT Noida

**Speakers:**

- Dr. Rita Sharma , BITS Pilani
- Dr. Sitabhra Sinha, IMSc, Chennai
- Dr. Debasis Das ,IGIB, New Delhi
- Dr. Amit Yadav, IHSTI, Faridabad

Registration free:   
<https://forms.gle/iG5UGMRRg3AXTgse9>

Last Date of Registration : 15 April, 2021

Contact Us: Dr. Chakresh Jain





JAYPEE INSTITUTE OF  
INFORMATION TECHNOLOGY,  
NOIDA



ERGONOMICS PERSPECTIVES  
Adding Quality to the Work – life balance  
and Related Injuries in  
CoVID-19 Era



**Department of Biotechnology  
JIIT Noida**  
presents  
**MEET OUR ALUMNI SERIES**



**"HACCP and  
Microbiology for biotech  
students for Food  
Manufacturing Sector"**

**Mr. Abhishek Tyagi**  
The pro-bono consultant and  
volunteer, Abhishek Tyagi, brings  
us his experience and journey  
through building a distinguished  
career in food safety systems,  
social audits and much more.

📅 11 Aug 2021  
🕒 4:00-5:00pm  
🔗 [meet.google.com/ani-jjyd-fmp](https://meet.google.com/ani-jjyd-fmp)

REGISTRATION LINK:  
<https://forms.gle/LKq6KCXaxaihSXu39> or  
Scan QR Code



Jaypee Institute of Information Technology 

**Virtual Workshop and Hands On Training  
On  
Bioinformatics Approaches  
for  
Data Analysis and Research**



Convenors  
Prof Pammi Guaba  
Prof Rachana  
Dr. Shazia Haider 

**Eminent Speakers**



Dr Mohammad Askandar Iqbal, Department of Biotechnology, Jamia Millia  
Islamia, New Delhi  
Dr. Arun Kumar Krishnan, Department of Biological Sciences, IISER  
Berhampur, Odisha  
Prof. Samudrala Gourinath SLS, JNU, New Delhi, Jawaharlal Nehru University  
New Delhi, India  
Dr. Kalalarasan Ponnusamy, National Centre for Disease Control, New Delhi  
Dr. Zubair Mallik, School of Computational and Integrative Sciences, JNU,  
New Delhi 

**12 -14 August 2021** 

<https://forms.gle/GCypATsmBvvWUosYA>

Contact Details  
Prof. Rachana +91 9315434437  
Dr. Shazia Haider +91 9811930241  
Email - [bioinfworkshop01@gmail.com](mailto:bioinfworkshop01@gmail.com)

Registration Fee - Rs. 500/-

# Upcoming Events



**DEPARTMENT OF BIOTECHNOLOGY,  
JAYPEE INSTITUTE OF INFORMATION TECHNOLOGY,  
NOIDA**

*Organizes*

**5th International Conference on  
Advances in Biosciences and  
Biotechnology  
(Theme: Innovations in Life Sciences  
and Computational Biology)  
ICABB-2022  
(20<sup>th</sup> to 22<sup>nd</sup> Jan, 2022)**





**Organising Committee**  
ICABB 2022  
(20th - 22nd JAN 2022)

**Chairperson**

  
**PROF. PAMMI GAUBA**  
HEAD, DEPT OF BIOTECHNOLOGY

  
**PROF. RACHANA**

  
**DR. SHAZIA HAIDER**

**CONTACT DETAILS**  
Email: [icabb22@gmail.com](mailto:icabb22@gmail.com)  
[conference2022@jiitnoida.com](mailto:conference2022@jiitnoida.com)  
Prof. Rachana: [ORGSUBCOM@jiitnoida.com](mailto:ORGSUBCOM@jiitnoida.com)  
Dr. Shazia Haider: [SHAZIAHAIDER@jiitnoida.com](mailto:SHAZIAHAIDER@jiitnoida.com)



**Advisory Committee**  
ICABB 2022

  
**Prof. Hariom Gupta**  
Director Jiit, Noida-128

  
**Prof. D K Rai**  
Dean Jiit, Noida-62

  
**Prof. Jayesh Bellare**  
IIT, Bombay

  
**Dr. D K Gupta**  
Founder Felix Hospital, Noida

  
**Prof. S Panda**  
IIT, Kanpur



**Administrative Committee**  
ICABB 2022 (20th - 22nd JAN 2022)

 <b>PROF. K KRISHNA SUNDARI</b>	 <b>PROF. SUDHA SRIVASTAVA</b>	 <b>PROF. INDIRA P SARETHY</b>	 <b>PROF. REEMA GARBANI</b>
 <b>DR. SWETA RAO</b>	 <b>DR. ASHWANI MATHUR</b>	 <b>DR. SHALINI MAHI</b>	 <b>DR. VIBHA GUPTA</b>
 <b>DR. CHAKRESH K JAIN</b>	 <b>DR. PRIYADARSHINI</b>	 <b>DR. S R HAT TACHARYA</b>	 <b>DR. GARIMA MATHUR</b>
 <b>DR. MANISHA SINGH</b>	 <b>DR. SONAM CHHILA</b>	 <b>MS. EKTA BHATY</b>	



**Technical Committee**  
ICABB 2022  
(20th - 22nd JAN 2022)

  
**PROF. NEERAJ WADHWA**

  
**PROF. SUJATA MOHANTY**

  
**PROF. VIBHA RANI**

  
**DR. SMRITI GAUR**

DEPARTMENT OF BIOTECHNOLOGY  
JAYPEE INSTITUTE OF INFORMATION TECHNOLOGY, NOIDA  
*organizes*

**Webinar on Introduction to Cresset  
Science and Technology**



**MR. ANAND BALUPURI**  
Application Scientist, Cresset

Dr. Balupuri has worked on various drug targets including kinases, GPCRs and amyloid proteins and is the author of several scientific publications. He has many years of research experience in computer-aided drug design and molecular modeling.

**FEATURES OF THE WEBINAR**

- Chemists from 15 out of the world's top 20 pharmaceutical companies use Cresset computational solutions to help them find the best small molecules for their project.
- Learn about the science and methods which provide medicinal and computational chemists with unrivalled insight into protein-ligand systems, an informative approach to biosostere replacement, molecule design and SAR, and outstanding visualization and multi-parameter optimization.
- We will also demonstrate how to perform QSAR using Flare, a structure-based design tool from Cresset.

📅 7th September 2021

🕒 90 Minutes

📎

**September, 2021**

**Industry-Academia Interaction**

**McKinsey & Company**

 <b>Jyoti Saini</b>	<p>B.tech Biotechnology, 2010 MS, Biotechnology, University of Pennsylvania, 2011 Manager of Client Capabilities(Asia)</p>	<p>Associated with McKinsey for the last 9 years Heads a team of 15+ members working across 4 hubs – India, China, Japan, Korea Have worked with top Indian and Global pharma companies on topics like remediation, quality metrics, quality culture and audit readiness Specializes in the Quality space within Operations</p>
 <b>Geetika Bhalla</b>	<p>B.tech Biotechnology, 2013 Senior Capabilities &amp; Insights Analyst</p>	<p>Associated with McKinsey for the last 6 years Worked with top Medtech and Pharma companies across Commercial and Org domain in India Heavily involved in recruitment and coaching process of young members in the team</p>
 <b>Srishti Mittal</b>	<p>B.tech Biotechnology, 2020 Junior Capabilities &amp; Insights Analyst</p>	<p>Associated with McKinsey for the last 1 year Worked with consultants globally on pharma centered projects across Commercial and Operations domain</p>

**September, 2021**

# *Open Horizon*

## *Faculty Corner*

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### ***COVID-19: A scientific perspective***

The world has witnessed with a large number of casualties all across the world during the Covid-19 pandemic, a novel zoonotic disease which is caused by a SARS-CoV-2 virus a member of the CoV's family having RNA as genetic material and proven as recent outbreak in Dec 2019, leading the high morbidity and mortality of humans.

The origin and spreading/ transmitting of virus held through zoonotic agents primarily by bats to human. The virus has invaded in human system mainly by the receptor, angiotensin-converting enzyme 2 (ACE-2) and neuropilin (NRP1) which is quite commonly found in nasal epithelium apart from the body organs like lungs heart peripheral system etc. Symptomatically COVID-19 is similar to influenza like a strong attack mainly on respiratory system organs i.e., lungs and elicit burden on immune system. It further extends its adverse effect on other body organs including heart and kidneys and whole metabolism of body system.

So far there is no established treatment available, except with the possibilities of effective vaccines, In the development of vaccine either it is based on the whole virus or bacterium or the virus parts *i.e.* protein subunit which elicit the immune responses of host or viral vectors or merely the genetic material (DNA/RNA) are considered so far some of the vaccines like Covishield, Covaxin, Sputnik V, and Moderna having more or less the same efficacy, are available for protection against virus.

More than 200 vaccines have been developed world wide and around 52 vaccines are in human trials as per World Health Organization.

Much scientific discoveries and developments at various front including the viral genomics, proteomic and transcriptomics etc. along with computational framework, methods and tools etc. have facilitated the large amount of data (big data) with rising challenges for computational analysis and interpretation. Bioinformatics and system biology in combination with latest soft computing technologies like artificial intelligence, machine learning methods have opened the new plethora with their indispensable role for accurate interpretable and effective multi-omics data analysis towards understanding the disease biology of the pathogen.

In our traditional ayurvedic system, there are several spices such as turmeric (haldi), cumin (jeera), black pepper (kalimirch) and coriander (dhaniya) are known as immune-modulators and helpful in boosting the immune system as a support against the viral progression. Ayurvedic kadha and herbal tea comprising basil (tulsi), Ginger (shunthi), cinnamon (dalchini), munakka as well as yoga are also an aided support. Apart from that the alkaline environment of body system which could be managed by adding lemon, garlic etc in our daily food diet may also be helpful to support the antiviral environment in our body system.

With current state of knowledge still long way to go for understanding the hidden mystery of the viral interaction with host-environment –nature nexus...

***Dr. Chakresh K. Jain***

# बारिश का पानी

जाने क्या होता है?  
बरसात के पानी में  
सौ रंग से भर जाते हैं,  
फीकी ज़िंदगानी में ।

जीवन सा फूट पड़ता है  
धरती की कोख से,  
कोंपल भी झांकती हैं  
शाखों की ओट से ।

परिदे भी भीगते हैं  
मन भर के, जी भर के,  
अनगिनत रंग होते हैं  
तितली के परों पे ।

संगीत महकता है  
कलियों के ओठ से,  
खुशियाँ टपक जाती हैं  
दूबों की नोक पे ।

नाचती हैं रश्मियाँ  
चाँद के चारों ओर,  
धुँध ढक देती है  
सूरज की कोर-कोर ।

कशती कागाज़ की तिरती है  
इस छोर से उस छोर,  
कुछ डूबती - तिरती हुई  
कुछ मंज़िल की ओर ।

ऐसा ही कुछ होता है  
बारिश के पानी मे,  
मौज भी, मंज़िल भी  
सब एक ही पानी में

ऐसा ही कुछ होता है  
बरसात के पानी मे,  
सौ रंग से भर जाते हैं  
इस ज़िंदगानी में ।

**प्रोफेसर रचना**



## *OMICs-Based Approaches & Computational Work*



Scientific advances in therapeutics have remarkably progressed in several diseases. Despite the plethora of information we have collected, specific and targeted therapies remain challenging. Most disease processes have been studied after the manifestation of symptoms, limiting the possibilities of interventions to halt the disease progression. Beyond this, a possibility of therapy resistance leading to disease relapse limits the efficacy of the therapy. Complexity of diseases and involvement of multiple cells makes it difficult to develop specific therapies that do not result in adverse outcomes. Therefore, approaches to develop personalized and precision medicine are urgently needed.

The coronavirus pandemic has challenged the traditional working style of biologists. These difficult circumstances have forced us to think out of the box and come up with efficient approaches to keep the work running. Computational work has proven to be an asset in these challenging times and enabled us to explore understudied avenues for personalized medicine.

Latest advancement in the field of single-cell-omics based approaches combined with artificial intelligence to construct a molecular disease map enables us to better understand disease trajectories. There has been a boom in the Single-cell transcriptomics-based approaches and have provided us with comprehensive cell atlas of healthy as well as disease organs. These atlases reveal the complexity and heterogeneity of cell types and their plasticity. Single-cell epigenetic studies have provided additional information on DNA methylation, chromatin accessibility, histone organization and modifications. This has enabled us to understand the spatio-temporal association of the molecular make up that regulates disease processes and cellular communication network.

Latest proteomics technologies involving mass-cytometer and lipidomics based approaches have further revealed key insights of functionally relevant nodes in the disease map. However, these approaches are required to be integrated with each other and with other artificial intelligence-based approaches. This would include analysis of multi-center disease cohorts, high content imaging and patient derived experimental disease models such as organ-on-chip approaches. This would scale up the information available from omics approaches to clinical applications. Handling and integration of such large molecular datasets will require sophisticated computational pipelines and machine learning approaches. Such predictive computational models will lay the grounds for advanced personalized disease models.

Computational approaches have classically been used to identify molecular structures and their interactions. Current algorithms enable us to dock computationally designed chemical structures on these targets and explore novel therapeutic approaches. Although these findings are usually need fusion of computational and experimental efforts, they can largely reduce the effort of screening multi-compound libraries.

The potential of digital work and molecular networks requiring artificial intelligence is unprecedented and needs to be unlocked. The current advancements have set the stage of such integrated data analysis but would need developed of dedicated pipelines to implement this in clinical routine.

***Dr. Shrey Kohli***

***(Research Scientist)***

***Institute for Laboratory Medicine,  
Clinical chemistry and Molecular  
Diagnostics,***

***University of Leipzig, Germany.***

***JIIT, Biotechnology (2011)***

# *My Journey: From Jaypee to UPenn*



It still feels like a dream to me.

Getting an admit in a top-tier Ivy League University like UPenn, could not have been possible without the guidance that I got from JIIT and I can't thank my teachers enough.

They have been pillar of strength for students. Devoted availability of professors to answer any question that pops up in our head has directed our energies to positive fruition. My major and minor project guides were just a text away and have always walked an extra mile to help me in a situation of crisis.

My major mentor Prof. Vibha Rani has been the guiding light. During all the serious research related conversations, she helped me clear the clutter in my brain and choose bio engineering for my masters.

Prof. Pammi Gauba has been an endless informational resource, who is always available for students despite having huge responsibilities being HoD. It is her suggestion that today I am in Upenn pursuing my masters.

Dr. Shweta Dang and her course Biopharmaceutics and Pharmacokinetics, which made me choose Drug Delivery and Therapeutics as my concentration.

I must also mention Dr. Anuj Bhardwaj, who taught me mathematics and statistics courses (I took five mathematics and statistic courses - predominantly under Dr. Anuj Bhardwaj). Dr. Bhardwaj kept my interest in mathematics alive for such long during my time at JIIT.

I couldn't have been more blessed to have such encouraging teachers.

For student aspiring to continue their education in Biomedical Engineering at top universities- mathematics and statistic courses at JIIT is highly recommended as this is single most important factor which helped me get admits in some of the most sought-after courses (eg Imperial College -London, UNSW-Sydney, Rice University, Brown University, University of Pennsylvania).

JiIT has excellent facilities like well stocked library and fully equipped laboratories which have one of the best biotechnological equipments available at university levels anywhere in country. It is up to us students to make most of it. All I can say JiIT fulfils all requirements to enhance wet/dry lab skill sets of students.

Without a doubt I can say that JiIT has its curriculum well set for students to pursue their higher education abroad. I have been blessed to have a great department to help and guide me with the application process. I am glad that I chose JiIT for an under-grad course in biotechnology.

I also take this opportunity to offer my gratitude to Prof. Pammi Gauba and Prof. Vibha Rani who were always there to write recommendations for me during the admission process. Forever indebted to them.

I wish everybody who is or plans on to study Biotechnology, the best of luck. I assure, you are on the right track. Make most out of the resources that you have and work hard!

***Ms. Bhavya Bhardwaj***  
***B.Tech, Biotechnology (2020)***

***MSE Bioengineering***

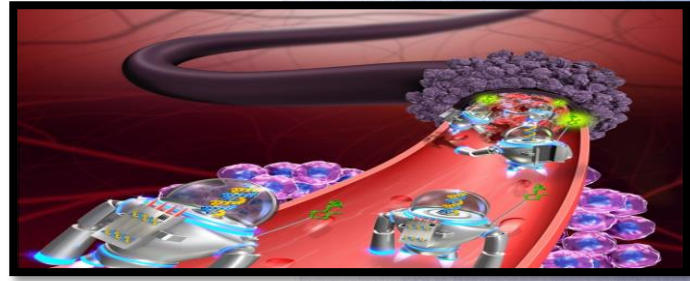
***University of Pennsylvania, Philadelphia***



# *Student Corner*

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## *Tiny drug delivery robots*



It's funny how the use of biotechnology can make our weirdest fantasies come true. As a child I always imagined, if we could get some miniature heroes to kill all the bad guys (cancerous cells and microbes) inside our body at the target spot, and voila!! Guess what?? It is actually possible!!

Science says that tiny drug-carrying robots smaller than a red blood cell that can move against the course of blood stream, when directed by magnets, can have application in developing drug delivery systems directly to cancer cells.

Metin Sitti and co-workers from the Max Planck Institute for Intelligent Systems, Germany, have devised microscale robots whom they call "microrollers" which can simultaneously carry anti-cancer drugs as well as specifically target cancerous breast cells of human origin. The inspiration of devising the "micro-rollers" came from white blood cells whose inherent function is to move along the blood vessel walls against the direction of blood stream.

These micro scale robots are spherical, and made of glass microparticles, coated with thin magnetic nanofilm composed of nickel and gold on one side and a coating of the anti-cancer drug doxorubicin as well as molecular specificity conferring agents for cancerous cells, on the other side.

The microrollers were tested in a simulation experiment using murine blood and synthetic channels lined with human endothelial cells. The microrollers were then introduced into the system containing a mix of oncogenic and normal tissue. Interestingly, the tiny robots specifically migrated and adhered to oncogenic cells, and eventually UV light was used to activate them and release doxorubicin.

Moreover, magnetic fields were used to control the movement of the microrollers in hemodynamic settings and it was observed that microrollers can attain a speed upto - 600  $\mu\text{m/s}$ .

Setti has assured that the directionality and flow of these microrollers can easily be controlled using magnetic field and eventually they intend to develop different approaches to trigger drug release, like heat or near-infrared light.

The microrollers tested in the above study were 3-7.8  $\mu\text{m}$  in diameter and were smaller than an average human RBC which is nearly 8  $\mu\text{m}$  in diameter. In future, the research group intend to make microrollers from biodegradable materials to ease up biodegradation and elimination.

Researchers are also aspiring for studying the use of microrollers in small animal models. “The rollers need to transport enough cancer drugs, as a result of which, we need to have them in large amounts but since we can locally take them to the right target and deliver it there, we don’t need massive dosages”.

Recently, this research field has grown by leaps and bound due to advancements in material and fabrication know-how, actuation and micro-scale imaging technology. Even so, current state of the art on use of microrobots in clinical settings is limited to use in skin/eye and areas with ease of delivery like the gut, or have low fluid dynamics. Targeting deeper tissues in human body is challenging. The scientists anticipate that the bio-inspired devised by them will help creating new opportunities for controlled way finding of microrobots in the circulatory system in fast blood flow conditions. This would presumably alleviate the avenue of targeted and localized therapeutic delivery using micro rollers.

### ***References:***

- 1.MIT Press, 2017, <http://robotics.sciencemag.org/content/5/42/eaba5726>
- 2.*Adv. Ther.*, 2019, 2, 1800064.
- 3.*Annu. Rev. Control Robot. Auton. Syst.*, 2019, 2, 205–230.
- 4.*Nat. Mater.*, 2019, 18, 1244–1251.
- 5.*Nature*, 2019, 575, 164–168.

# *Artificial Blood: Innovative Idea of Transfusion Sciences*

Blood plays a crucial role in the working of the human body. Since ancient times adequacy and wellness of blood has been related with disease prevention and cure. For critical patients requiring urgent blood transfusions, blood is genuinely the elixir of life. Due to shortage of donors and possible disease transmission through blood transfusions, a part of research has been focussed on discovering safe replacements to human blood. In this report I will be comparing the properties of some potential artificial blood alternatives like perfluorocarbons, HBOCs, plastic blood that have reached preclinical and clinical preliminaries. Deaths and casualties are well documented in situations of immense blood loss such as accidents, war, surgery. Thus, search for alternatives is consistently there. Certain biotechnological products such as perfluorocarbons, haemoglobin based oxygen carriers also known as HBOCs, and plastic blood are emerging alternatives and may eventually be used to supplant human blood. They can help make medical recovery and can also control the cost of medical procedure and recovery.

William Harvey was the pioneer in studying blood and described the flow of blood for the first time in 1616. 50 years later, the first recorded human transfusion was made though numerous recipients died. The next landmark discovery in blood transfusion studies was made in 1901 when Karl Landsteiner discovered and reported various blood groups. This led to blood transfusions becoming a routine procedure in hospitals. Advancements have also been made in collection and screening strategies making blood storage safe and enhanced the storage up to 35 days. In underdeveloped and developing nations, blood transfusion is a low priority service leading to a general absence of adequate and nationwide access to safe and affordable blood supply. Thus emphasizing the need for blood substitutes to address the risks associated with blood transfusions and limited blood availability.

## **Blood alternates**

There is an upsurge in demand for blood substitutes in medical emergency care. Artificial blood can allow for gaseous exchange as well as perform vital tasks in the cardiovascular system.

The key features of a blood alternative are controlled cost, volume expansion, minimum side-effects, free of transfusion transmissible infectious agents and thus have high oxygen carrying capacity. Different terms normally used for blood alternates are blood substitutes or blood surrogates. Voluven, Haemaccel, Gelofusin are some examples of colloid based volume expanders, and crystalloid based volume expanders are represented by PFCs and HBOCs.

### **PFCs (Perfluorocarbons)**

PFCs are oxygen carriers classified in the therapeutics category, though they are in development phase and are not marketed yet. On account of their small size and easy movement through blood capillaries, the PFCs have higher performance than native red blood cells. PFCs are cheaper, and contamination free in light of the fact that their synthesis doesn't need any biological material. The material involved in synthesis of PFCs is biologically inert with an ability to dissolve about 50 times more oxygen than plasma. PFC's are water insoluble so they combine with emulsifiers, for example, lipids. Flusol was the first PFC marketed in 1989 by Green Cross Corp. of Osaka, Japan.

### **HBOCs (Haemoglobin Based Oxygen Carriers)**

This represents an engaging class of oxygen carriers currently in later stages of clinical investigations. Haemoglobin is the main carrier of oxygen from the lungs to different tissues across body. Artificial blood substitutes also function on the same lines. HBOCs use haemoglobin, the same oxygen-carrying protein molecule found in the blood, however the haemoglobin in HBOCs isn't membrane bound and have a more drawn out timeframe of realistic usability and longer shelf life. Nevertheless, there are certain risks related with use of free haemoglobin (toxic impacts). The flow of oxygen from blood to the cell can be deranged when oxygen is being delivered via a cell-free carrier rather than normal red blood cells.

Thus, this correspondence emphasizes on the importance of discovering a blood alternate as many individuals lose their lives because of inadequate blood availability in the blood bank centres.

### **References:**

1. *Cardiovasc Hematol Agents Med Chem*, 2019,17(1), 11-16
2. *Ann Intern Med*, 2000,132(5),420-423
3. *Artificial Organs*, 2004, 28(9), 789-94
4. *Indian J Crit Care Med*, 2008, 12(3), 140-144



# *Gratitude To God's Microbial Creation*

*Tiny lives everywhere and in underexplored  
The ocean, mountain, lake and road  
With lot many genes within novel creode  
Serve immense chemo-diversity at natural mode*

*Gene clusters when get expressed  
Many products can be harnessed  
Compounds related to different classes  
Help to combat threatening disasters*

*Antibiotics can cure illness  
Vaccine they produce, generate wellness  
Scrumptious offering food flavors  
Keep body fit with immune boosters*

*Help to erode environmental calamities  
Thrived to generate potential energies  
Immense power to deteriorate debris  
Geochemical cycling favor element's release*

*Outstanding power of balancing ecosystem  
Strengthening biotech via employment creation  
Enhancing GDP of the nation  
Hearty gratitude to God's microbial creation*

*Nidhi Srivastava*

*Ph.D. Scholar*

*Department of Biotechnology*

*JIIT-Noida*

# Meet Our Entrepreneurs

**Mr. Gaurav Kumar & Mr. Atul Kumar,  
(Directors)**

**Gralit India Biotech Pvt. Ltd  
Batch 2012, IIIT**



## Stepping Stones

We still remember the day (23<sup>rd</sup> July 2007) when we joined IIIT Noida, as a biotechnology student, eager to pursue their integrated B.Tech - M.Tech course with a bag full of hopes and my eyes looking up the sky. While attending our first session at LT-1, all the faculty members of Biotechnology Department interacted with the fresh brains and we both realized that this Incubation Centre is definitely going to shape our future. The journey started with Lectures, Tutorials & most importantly Practical work as well as projects where we get a hands-on experience on various analytical techniques and literature that actually make us aware of the actual implementation of science. We were not very bright students neither anyone's favourite, but still tried hard to make our presence visible among our C3 batch of 36 students by striving on learning the things with hope and enthusiasm. The best part of this college is the faculty & staff members who are always there to support you by understanding your concerns and challenges. Being part of this esteemed university, we got a chance to learn multiple subjects Personality Development, Marketing, Liaising, Intellectual Property Rights and other important topics which acted as a driving force to focus on our goals and leading us towards achieving greater heights. They make you stronger to stand out in a crowd, build your self-confidence and allow you to add fire to your ideas. You become a learned person who holds the novel ideas of implementing the changes required in the society as well as can do wonders with his or her wisdom.



***We practice and implement "Aromachology"***

## [When the Zeal had hits in](#)

From back benchers to Managing Director, our road to success was not that easy but yes, we did beat the odds well. During our college days we somehow managed to get placed in a good MNC company through Campus Placement after completing our M.Tech in Biotechnology in 2012 but unfortunately our triumph didn't last long. As it didn't take long to feel the “Spark” of doing something for the society and definitely yes for our future which had been embedded in us by a remarkable experience at IIIT, after which we shifted our focus towards our aim and started working towards our project of “Air Sanitization & Commercial Scenting”. We started the project in December 2012 but soon it met a bizarre ending due to some analytical errors. We struck back with a positive attitude chasing our dreams & figuring out all possibilities that can sail our boat in the right direction as it is rightly said: ***"No one can destroy iron, but its rust can!! Likewise, none can destroy a man, but his own mindset can !!"***

After deep diving and rectifying the defects of our products, we were successful in attaining a qualitative outcome with which we started our manufacturing in February 2013, formed the Private Limited company and since then we never needed to look back.

## [The success story we're all here for](#)

We at ***Gralit India Biotech (GIB)*** lab with the help of our highly skilled research team understands & develops the finest notes of fragrances exclusively for the hospitality industry. Apart from this, We assist brands in creating their unique Signature Scent, their Olfactory - Fragrant identity. Gralit India Biotech is one of the most creative & leading scent marketing agencies in India. Our scent diffusion equipment is made in-house and uses cold diffusion technology to create an unforgettable unique ambiance. We believe in impactful experiences, welcoming spaces, innovative design, and meaningful strong aromatic connections.



# Trending News Bulletin

Another milestone achieved by India in field of Covid vaccine as Covaxin receives GMP certificate from Hungary.

<https://economictimes.indiatimes.com/industry/healthcare/biotech/pharmaceuticals/covaxin-receives-gmp-certificate-from-hungary-bharat-biotech/articleshow/85060636.cms>

Portable tent that can turn into stretcher at the time of emergency made by FDA in US.

<https://www.fiercebiotech.com/medtech/portable-negative-pressure-tent-scores-fda-emergency-ok-to-stretch-limited-covid-resources>  
<https://www.fiercebiotech.com/medtech/portable-negative-pressure-tent-scores-fda-emergency-ok-to-stretch-limited-covid-resources>

Discovery of a new process for making RNA much purer and more cost effective made by researchers at the University of Massachusetts

<https://www.sciencedaily.com/releases/2021/08/210805180652.htm>

Research made on new techniques to reflect on DNA's torsional stiffness by using motor protein.

<https://www.technologynetworks.com/genomics/news/new-technique-measures-stiffness-of-dna-351962>

GentiBio, Inc., USA to get \$157M to propel treatment for Type 1 diabetes.

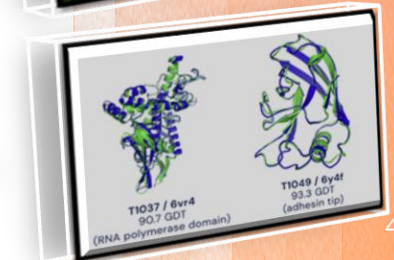
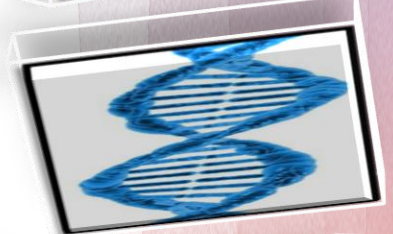
<https://www.fiercebiotech.com/biotech/gentibio-banks-157m-to-fuel-treg-treatment-for-type-1-diabetes>

Study being carried out to identify a plant enzyme present in cell wall that has potential to turn woody *Populus spp.* into a source for producing industrially relevant chemical.

<https://www.sciencedaily.com/releases/2021/08/210805115437.htm>  
<https://www.technologynetworks.com/proteomics/news/enzyme-could-turn-trees-into-a-source-of-major-industrial-chemical-351726>

AlphaFold: An AI solution to a fifty-year-old protein folding problem.

<https://deey.com/blog/article/alphafold-a-solution-to-a-50-year-old-grand-challenge-in-biology>



# *Do You Know...?*

- ❖ **Human brain has 100 billion neurons. We have 400 & 100 billion stars in the Milky Way on the high and low-end respectively.**

<https://asd.gsfc.nasa.gov//2015/07/22/how-many-stars-in-the-milky-way/>

- ❖ **The longest neuron in the human body measures up to 1 meter and is a part of sciatic nerve.**

<https://www.ncbi.nlm.nih.gov/books/NBK554388/>

- ❖ **The cells undergo death when they complete their job and this process is known as apoptosis. They have the seed of their own destruction in inactive form which is activated at the time of apoptosis.**

Elmore, Susan. "Apoptosis: a review of programmed cell death." *Toxicologic pathology* vol. 35,4 (2007): 495-516. doi:10.1080/01926230701320337

- ❖ **Cells also have skeleton called cytoskeleton which helps in providing shape to the cell and holding the cell organelle at place.**

Fletcher, Daniel A, and R Dyche Mullins. "Cell mechanics and the cytoskeleton." *Nature* vol. 463,7280 (2010): 485-92. doi:10.1038/nature08908

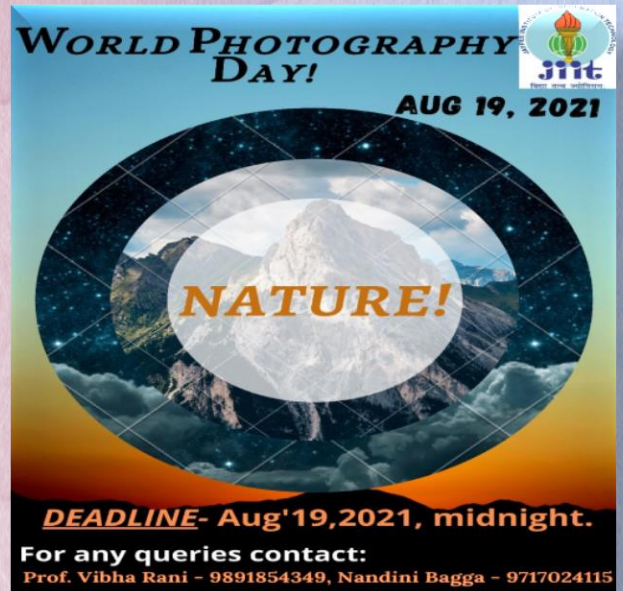
- ❖ **Skin cells regenerate in every 27 days.**

Ojeh N, Pastar I, Tomic-Canic M, Stojadinovic O. Stem Cells in Skin Regeneration, Wound Healing, and Their Clinical Applications. *Int J Mol Sci*. 2015 Oct 23;16(10):25476-501. doi: 10.3390/ijms161025476. PMID: 26512657; PMCID: PMC4632811.

# Our Celebrations

## World Photography Day!

August 19<sup>th</sup>, 2021



***“All work and no play will make you sad and grey! ”***

Keeping this in mind, the Department of Biotechnology organized an open to all photography contest within the department. The contest was organized on the occasion of World Photography Day. The “Nature” themed event attracted a huge crowd with plentiful responses which indicated the enthusiasm not just amongst students but also the faculty and alumni.

Heartiest congratulations to all the participants and highly grateful to our HOD ***Prof. Pammi Gauba*** and complete faculty panel including ***Ms. Ekta Bhatt, Prof. Indira Sarethy, Prof. Rachana, Prof. Reema Gabrani, Prof. Sujata Mohanty, Dr. Shweta Dang, Dr. Vibha Gupta*** and ***Prof. Vibha Rani*** for active participation and making this contest a success.

# Most Appreciated Photographs!! BY FACULTY...



**Prof. Pammi Gauba**



**Prof. Rachana**



*Save nature for a better future*

**Prof. Sujata Mohanty**



**Prof. Vibha Rani**



**Prof. Reema Gabrani**



**Dr. Vibha Gupta**



**Dr. Shweta Dang**



**Ms. Ekta Bhatt**



**Prof. Indira P Sarethy**

# *BY STUDENTS...*



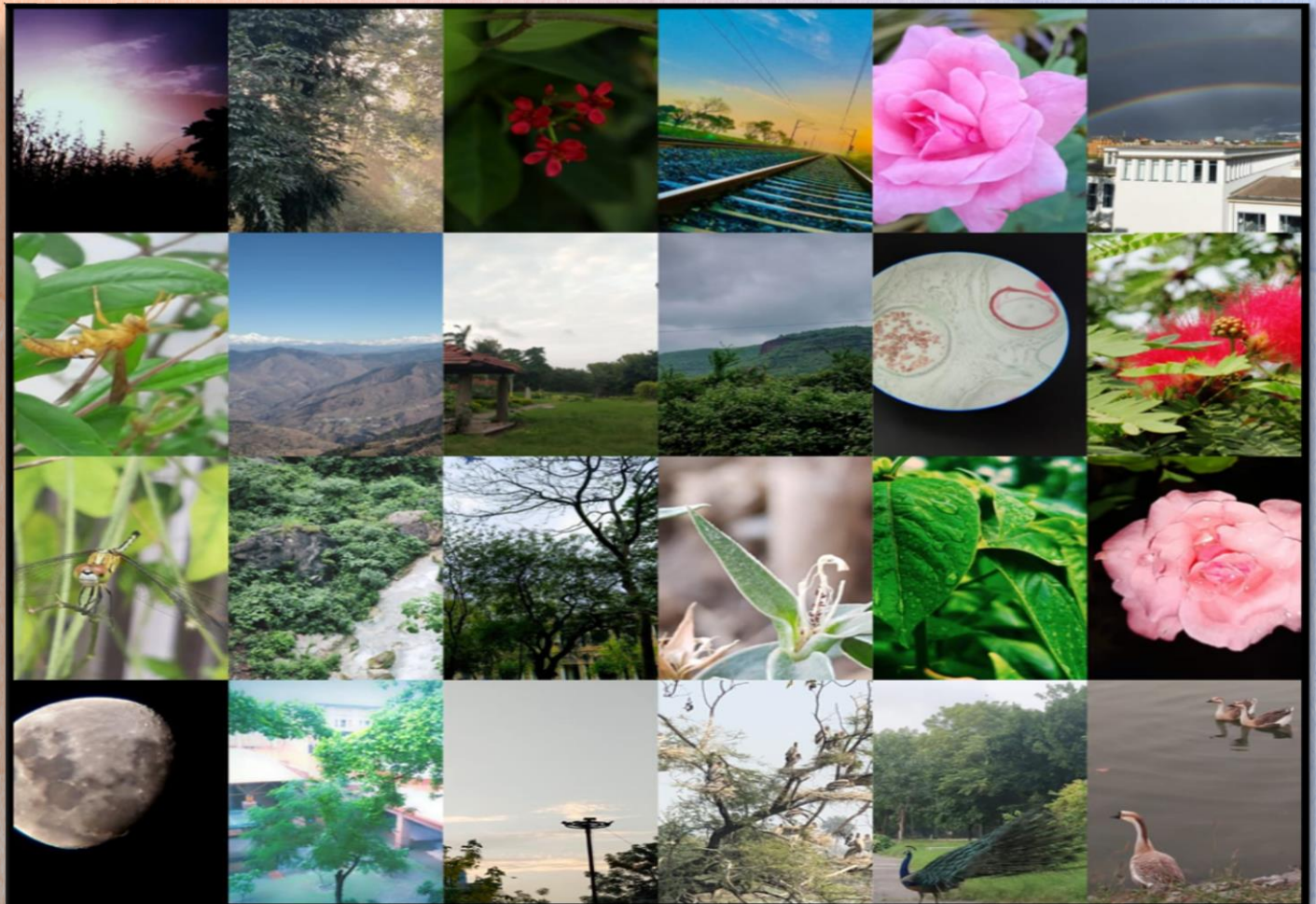
*Mahender Singh Rawat*



*Aastha Sachan*



*Aishlee Kaul*





# National Sports Day

August 29<sup>th</sup>, 2021


*“It is not my country’s duty to push me ahead. It is my duty to push my country ahead.” – Major Dhyan Chand*

The National Sports Day in India is widely celebrated on August 29<sup>th</sup>. This day marks the birth anniversary of Major Dhyan Chand Singh Ji, the Indian hockey player who conquered gold medals in Olympics in the years 1928, 1932 and 1936. This day not only marks the glory that Major Dhyan Chand brought to the country but also to the spirit that he lived for. Gone are the days when sports were looked down upon.



The Department of Biotechnology at Jaypee Institute of Information Technology urges each individual to practice some sport. Also, to consider the current pandemic situation we find ourselves in, it's highly important for us to be fit and take great care of our bodies to which sports is an easy, fun and rewarding way. It's found in numerous studies that athletics and physical activities facilitate weight loss, battle adverse health conditions and uplifts positive energy. It promotes deep-sleep and enhance overall physical and mind health and therefore all together increase overall performance of an individual.

*With this message, We wish one and all a very happy sports day!!*

JAYPEE INSTITUTE OF INFORMATION TECHNOLOGY  
DEPARTMENT OF BIOTECHNOLOGY



**CELEBRATES  
NATIONAL SPORTS DAY  
29 AUGUST 2021**



*“It is not my country's duty to push me ahead. It is my duty to push my country ahead.” - Major Dhyan Chand*

3 Olympic Golds  
1928, 1932, 1936

*Solve me!*



## ***Across:***

- 1- Chemical used as a medicine.*
- 3- One of the contractile proteins in muscle.*
- 6- Collective term used for the sepals of a flower.*
- 8- Spherical bacterium.*
- 11- Internal layer of cells of gastrula.*
- 12- Unit of information inside a cell.*
- 13- Protein that act as biological catalyst.*

## ***Down:***

- 2- One of four bases in nucleic acid.*
- 3- The water insoluble portion of starch.*
- 4- Group of proteins found in milk.*
- 5- Mature reproductive cell which is capable of fusion with opposite gender to form zygote.*
- 7- Abnormal condition that negatively affects the part of organism.*
- 9- Nucleotide sequence within a gene removed by RNA splicing.*
- 10- Sequence of three DNA or RNA nucleotides.*

***Curious to know the answer? Stay tuned...***

# Way Forward!

---

*Competitive exams evaluate your understanding and the application of concepts. For biotechnology students, keen on higher studies following are the key national competitive exams.*

*We will be discussing each in subsequent issues here.*

❖ GATE Biotechnology(BT) or life science(XL)

❖ CSIR-UGC NET

❖ AIIMS

❖ ICAR

❖ ICAR AIEEA (PG)

❖ IIT-JAM

❖ DBT- BET

❖ Some institutions have their own entrance tests. For studies abroad GRE and TOFEL/ILETS are required.

## **GATE Biotechnology (BT) or Life Science (XL):**

*For pursuing M. Tech, M.S. or Ph.D. in IIT, IISc, or any other Central Universities-* GATE is an entrance examination for admission in to PG courses in Engineering/Science in IITs/NITs/IITs and other institutes. It usually takes place in February with its registration starting from August. You can appear for GATE when you are in pre-final year/final year/passed in Engineering in a relevant field from a recognized board. Being from a biotechnology background, you can apply for Biotechnology and Life Science. Since GATE- Biotechnology is a new addition from 2010 and their syllabus is quite similar. It's a 180 Minute exam with 65 questions of 100 marks with an approximate cut off of 40 marks.

***GATE 2022 website:** <http://gate.iitd.ac.in/>*

## **CSIR-UGC NET:**

*M.S./Direct Ph.D. in CSIR Institutes, IISc Bangalore and other Universities-* The test is conducted to determine for Lectureship and Junior Research Fellowship in various Indian institutes, national laboratories and universities. Certain eligibility criteria have been laid down by University Grants Commission (UGC) for the test. The applications for the test are invited twice a year. The test is conducted online for 3 hour duration with multiple choice questions

***CSIR-UGC NET website:** <https://csirnet.nta.nic.in/WebInfo/Page/Page?PageId=1&LangId=P>*

# ***Students Qualified GATE 2021...***



**Sinjini Datta**  
**AIR -184**



**Khushboo Garg**  
**AIR -1101**



**Krishanu Aich**  
**AIR -2072**



**Srishti Varshney**  
**AIR -1400**

# *Essence of KOSHIKA*

Unit of Life, Technology and Communication....

**“Koshika”** translating to cell, is the fundamental living unit in biological sciences comprising various organelles.

*This newsletter showcases the collective potential of each and every member associated with the department. “Koshika” was named unanimously, where each organelle has a unique, indispensable function. An orchestrated co-ordination amongst the organelles sustains and propagates a cell to express as **LIFE**.*

*The students, faculty, lab-staff having a unique role are unified in efforts and pursuits to bring vibrancy and success to Biotechnology Department. Our “**nucleus**” carrying the genetic code, is the quintessential motivation and opportunity to facilitate each student to find a place to grow and branch out. The faculty and lab staff are the powerhouses – the **mitochondria**, driving the learning process for each student. The students represent our outgoing **vesicles** loaded with information and their degrees, communicating with the outer world and bringing us laurels and recognition.*

*With our first issue of Koshika, we aim to pay our courtesy to the **Panchtatva- Five Fundamental Elements of Life**. It's no secret that we've aimed to fill you with life through the course of these few pages and to document the great everyday efforts of our department. These primary colours in newsletter that we've used symbolizes “**Life**”: Blue for water (jala), Green for earth (prithvi), Red for fire (tejas), White for wind (vayu), and Black for space (akasha) which teach us that we need to understand and hold our basics. Rising upto the skies while holding to your roots is simply the way of life we've been practicing so long. Therefore, these colours are a tribute to the hard work of each and every member of the department who have worked so diligently to make the Department stand where we are.*

**Thus, we bring forth our newsletter, the “Koshika – Unit of life, technology and communication”**

# EDITORIAL TEAM...



**Prof. Pammi Gauba**  
**(HOD, Biotech)**



**Prof. Vibha Rani**  
**(Chief Editor)**



**Dr. Sonam Chawla**  
**(Co-Editor)**



**Shivani Singhal**  
**Ph.D.**



**Nandini Bagga**  
**B. Tech, 3<sup>rd</sup> year**



**Harshita Singh**  
**Ingtd M.Tech, 3<sup>rd</sup> year**



**Ishsirjan Kaur Chandok**  
**B. Tech, 4<sup>th</sup> Year**



**Aditi Kaushik**  
**B.Tech, 3<sup>rd</sup> Year**



**Anam Upadhyay**  
**B.Tech, 3<sup>rd</sup> Year**



**Reem Gandhi**  
**B.Tech, 3<sup>rd</sup> year**



**Prashant Kaushik**  
**B.Tech, 3<sup>rd</sup> year**

We hope you liked reading the newsletter. We would love to hear your valuable feedback. Do write to us at

**[koshika.newsletter@gmail.com](mailto:koshika.newsletter@gmail.com)**

