

ANNUAL REPORT

Department of Biosciences and Bioengineering

(PERIOD: 1st APRIL 2019 – 31st MARCH 2020)

1. Year of Establishment of the Department /Centre: 2002

2. Academic Programmes Offered: B. Tech., M. Tech., PhD

3. No. of Laboratories with brief introduction: (Total No: 40)

- i. **MAB (Mechanistic Approaches to Biology) Lab (Dr. B. Anand):** The current focus of our vibrant research group is directed towards addressing fundamental and important questions in the area of RNA biology by employing an eclectic mix of modus operandi that is drawn from biochemical, biophysical, computational and molecular genetics approaches. Our immediate obsession is to resolve the mechanistic questions pertaining to CRISPR Biology and Ribosome Biogenesis.
- ii. **BERL (Bioengineering Research Laboratory) (Prof. Utpal Bora):** The research interests of this laboratory include Biomedical Engineering, Seri-biodiversity, Seri-bioinformatics and Bio-entrepreneurship.
- iii. **Molecular Networks and Recombinant Therapeutics (Dr. Biplab Bose):** The lab is interested in understanding the inter-connected cellular communication systems. Particularly, the lab is interested to know the effect of architecture, kinetics and integration of the molecular pathways on vital cellular processes. The lab uses experimental as well as theoretical tools to understand how information is carried and processed in such signaling networks. The lab is also involved in developing molecules that can target particular signal transduction pathway. Such a molecule can be used to modulate an aberrant pathway involved in a particular disease.
- iv. **Dr. Pranjal Chandra lab:** The lab is interested to combine biotechnology, nanotechnology, material science, and electroanalytical chemistry, approaches to address problems of biomedical significance, human health, and environmental monitoring. Specifically, the lab is interested to develop novel and commercially viable bioanalytical methods for diagnostics applications. The major research work is focused on: (i) Clinical Diagnostics (Cancer cells, DNA, RNA, bio-markers) using electroanalytical methods such as cyclic voltammetry, chronoamperometry, impedance spectroscopy, (ii) Nano-biosensors (*Aptamer*, *antibody*, *enzyme*) based biological phenomenon investigation, (iii) Porous silicon based label free self reporting optical nanosensors, (iv) Microfluidics and Nanomachines.
- v. **Plant Tissue Culture & Secondary Metabolite Production Lab (Prof. Rakhi Chaturvedi):** The tree species with long generation cycle are mostly highly heterozygous in nature due to strict cross pollination and are considered to be recalcitrant (difficult to regenerate in vitro). The genetic improvement of these plants and development of homozygous lines (pure) is either very challenging or impossible using the conventional methods, because the cross pollination is a rule. This limitation has completely been overcome by the research group of Dr Chaturvedi while working on two complex tree species, Neem (*Azadirachta indica*) and Tea (*Camellia species*). Prof. Chaturvedi's laboratory has also involved in developing Plant Cell Culture Technology as an alternative to whole plant extraction for the production of secondary metabolites of medicinal and commercial values. Although these compounds can also be isolated from naturally grown whole plants, continued destruction of plants for the purpose may pose a major threat to species getting extinct. Her research group is able to identify, purify and isolate three main categories of bioactive metabolites: essential oils, coumarins and alkylamides, from in vitro elite cell lines of medicinal plants. Some of these compounds are complex triterpenoids which are difficult to synthesize chemically. The focused research work in the laboratory are: (i) Mass multiplication by micropropagation/clonal propagation of medicinally and economically valuable plants, (ii) In vitro haploid and doubled haploid plant production to generate homozygous (pure) lines to produce hybrid vigour for improved plant yield, (iii) Triploid plant production to develop seedless variety, (iv) Somatic embryogenesis for synthetic seed production, (v) Protoplast isolation and regeneration for single cell cloning and isolation of mutants, (vi) Cytological and Histological studies of in vitro raised cultures to understand their ploidy, development and origin (vii) Cell biomass production in shake-flask for screening, characterization and quantification of medicinally and commercially useful plant metabolites and their scale-up in photo-bioreactors

- vi. **Biophysical Chemistry Lab (Dr. Nitin Chaudhary):** The laboratory focuses on understanding the molecular self-assembly and amyloid diseases, protein/peptide membrane interactions, and developing peptide based antibiotics.
- vii. **Bioprocess Development Lab (Dr. Debasish Das):** Bioprocess Development Lab majorly focuses on developing and demonstrating sustainable technologies towards renewable fuels. We are currently working on developing sustainable technologies towards biocrude production from microalgal isolates, butanol production from *Clostridium* sp, ethanol fermentation from adapted *Z. mobilis* strains. We have ventured towards plant tissue culture and demonstration on a pilot scale facility with industrial collaboration.
- viii. **Prof. V. V. Dasu lab:** The laboratory focuses on Bioprocess development (upstream to downstream), metabolic engineering, and bioenergy.
- ix. **Prof. Siddhartha Sankar Ghosh lab:** The laboratory focuses on development of new generation gene therapy vectors. This mainly includes development of suicide gene therapy for cancer. The lab has also set up infrastructure facilities for interdisciplinary collaborative research in the field of nanoscience and nanotechnology supported by extramural funding at the Centre for Nanotechnology, IIT Guwahati. The major area is to develop new nanoparticles, nanocomposites and nanocarriers and evaluate their antimicrobial and anticancer activities. The lab is perusing research to understand molecular mechanisms of nanoparticle mediated cell cytotoxicity. Other areas, such as, bioimaging using C-dots, metal nanoclusters, gene delivery using quantum dot embedded nanocarriers are also being pursued. The lab is also interested in understanding the molecular pathways involving drug resistance.
- x. **Biosensor and Biofuel Cell Research Lab (Prof. Pranab Goswami):** The lab is involved in the development of novel bio-recognition system and their applications for developing biosensors and biofuel cells. DNA aptamers, catalytic as well as non-catalytic proteins have been investigated as biorecognition elements for some clinical applications targeting to operate in point-of-care and resource limited environments. Focus has been given on the rapid detection of acute myocardial infarction (AMI), cholesterol, alcohol, bilirubin and malaria due to their obvious importance in diagnostic sector.
- xi. **Prof. Arun Goyal Lab:** The lab research interests include Microbial Biotechnology, Molecular Biology, Protein Engineering, Structural & Functional studies of carbohydrate enzymes.
- xii. **Neural Engineering Lab (Dr. Cota Navin Gupta):** Broadly the research lab's current focus is in the areas of brain computer interfaces, imaging genetics for psychiatric disorders, multimodal/multivariate algorithm development and designing wearable medical solutions for patient mobility.
- xiii. **Stem Cell and Cancer Biology Group (Dr. Bithiah Grace Jaganathan):** The current focus of the research group is to understand the role of mechanotransduction in stem cell differentiation and cancer metastasis. The group also studies various signaling pathways and microenvironment mediated chemoresistance in leukemia and breast cancer.
- xiv. **Structural and Computational Biology Laboratory (Dr. Shankar Prasad Kanaujia):** The lab uses the knowledge of various techniques such as molecular biology, structural biology (X-ray Crystallography) and biophysical and biochemical studies to understand the mechanism of different biological functions. In addition, the lab applies the molecular dynamics simulations to further corroborate the results obtained from various experiments. Currently, the lab is focusing on investigating into the mechanisms involved in protein translation initiation, ABC transporters and their role in multidrug resistance.
- xv. **Molecular Microbiology Laboratory (Dr. Manish Kumar):** The research interests of the lab include (i) Molecular interaction of host-pathogen-vector of infectious diseases, (ii) Gene expression analysis of Spirochete, *Leptospira interrogans* and *Borrelia burgdorferi*, (iii) Development of vaccine against outer membrane protein of *Leptospira interrogans* and *Borrelia burgdorferi*, and (iv) Vector borne diseases of Zoonotic importance.
- xvi. **Viral Immunology lab (Dr. Sachin Kumar):** The paramyxoviruses include viruses that are isolated from many species of terrestrial, avian and aquatic animals. The group includes many important pathogens of humans such as measles virus, human respiratory syncytial virus, human parainfluenza viruses, Nipah virus and Hendra virus and animals such as canine distemper virus and Newcastle disease virus. Newcastle disease virus (NDV) is the prototype member of this family and is a leading cause of respiratory disease in avian species. It leads to huge economic losses to the poultry industry in India. The laboratory focuses mainly on understanding the biology of avian paramyxovirus and development of vaccine against them using reverse genetics system.
- xvii. **Cancer Biology Laboratory (Prof. Ajaikumar B. Kunnumakkara):** The research interests of the lab include (i) Role of inflammatory pathways in cancer development, (ii) Identification of novel biomarkers for cancer diagnosis

and prognosis, (iii) Cancer drug discovery, and (iv) Development of transgenic and gene knockout mouse models for biomedical research

- xviii. The Molecular Endocrinology lab (Dr. Anil Mukund Limaye):** The laboratory focuses on the following research themes: (i) Hormone regulation of gene expression, (ii) Role of estrogen in breast tumor invasion and metastasis, (iii) Regulation of cystatin A expression and its role in breast cancer, (iv) HoxB2 in breast cancer, (v) GPR30/GPER-1 biology, (vi) Mechanisms of anticancer activity of EGCG, (vii) Karanjin and its biological effects
- xix. Dr. Soumen Kumar Maiti Laboratory:** The research interests of the lab include Biochemical Engineering, Biofuel, Bioprocess modeling, control, optimization, Metabolic engineering, Downstream processing, Membrane separation, Bioremediation
- xx. Biomaterial and Tissue Engineering laboratory (Prof. Biman B. Mandal):** Tissue engineering has emerged as a potential way to treat tissue damage or organ failure as a result of injury or disease. Our laboratory “Biomaterials and Tissue Engineering Laboratory”, a DBT-Unit of Excellence, majorly focus on developing affordable lab grown tissue/organ replacements for human transplantation. The lab focus on the following areas of importance i.e. Cell Based Tissue Engineering of Grafts and Implants, Human Stem Cell Based Regenerative Medicine, Biomaterials, 3D Bioprinting, Drug Delivery Systems, 3D Disease Tissue Models, Bioinstrumentation
- xxi. Organelle Biology and Cellular Ageing Lab (Dr. Shirisha Nagotu):** The lab focusses on understanding the biogenesis of organelles and the inter-organelle communication within a cell. The lab tries to understand the effect of ageing on organelle biology and the role of organelles in cellular ageing.
- xxii. Prof. Kannan Pakshirajan’s laboratory:** The research interests of the lab are Environmental Biotechnology, Biological removal and recovery of inorganic compounds from wastewaters, Biofuels and other Biotechnological Products: production, process design, kinetics and environmental applications.
- xxiii. Bio-interface & Environmental Engineering Lab (Dr. Lalit Mohan Pandey):** The laboratory focuses on the following research aspects: (i) Surface and interfacial science particularly in the area of Bio-interfaces and Biomaterials (Design of Biocompatible surfaces): The surfaces are modified using various Self-Assembled Monolayers (SAMs) and their interactions with water, bio macromolecules i.e. polymers, proteins and cells are studied, (ii) Protein’s adsorption and aggregation: The lab investigates the adsorption behavior and properties of various adsorbed proteins on surfaces with different wettabilities by forming mono, mixed and hybrid SAMs. The role of surface chemistry at the nanometer scale on aggregation of various therapeutic proteins is studied, (iii) Environmental Biotechnology: The lab focuses on 3Rs. Reduce waste generation, recycle the treated waste and reuse waste as by-product or recover energy from the waste.
- xxiv. Prof. Sanjukta Patra laboratory:** The research interests of the lab include enzyme applications, biotransformation, and biosensors.
- xxv. Prof. Aiyagari Ramesh laboratory:** Biocompatible hydroxyapatite-based nanocomposites have been generated using secreted proteins of probiotic lactic acid bacteria (LAB) as biomineralization scaffolds. The antibiotic loaded nanocomposites exhibited bactericidal activity against *Pseudomonas aeruginosa* biofilm. A gastric fluid tolerant bacteriocin-loaded nanocomposite was generated as an antiadhesion agent to reduce *in vitro* colonization of intestinal cells by pathogenic bacteria and support adhesion of beneficial probiotic LAB. In another research endeavor, low molecular weight synthetic amphiphiles having multimodal chemistry have been rationally designed to promote interaction with staphylococcal lipoteichoic acid and facilitate metal sequestration. The amphiphile could render a profound effect on cell growth and metallophore gene expression in methicillin-resistant *Staphylococcus aureus* (MRSA).
- xxvi. Molecular Informatics and Design Group (Prof. Vibin Ramakrishnan):** Molecular Informatics and Design Group integrates diverse disciplines of science and engineering in the design and development of advanced materials. The lab’s approach to a research problem is ‘idea centric’ with a clear emphasis on the design phase, adopting modeling and informatics tools. The lab experiments a reductionist approach in understanding the interaction between molecules resulting in assembled architectures at nano and micro scale, and further employ it in the design of future materials. An information based modeling approach has been employed in the design and generation of tumor homing and cell penetrating molecules to test their efficacy as future drug delivery vehicles.
- xxvii. Applied Biodiversity Laboratory (Prof. Latha Rangan):** The group tries to address the research questions in areas of Applied Biodiversity with special reference to bioresources of Northeast India using an integrative approach. .

- xxviii. Translational Crop Research Laboratory (Prof. Lingaraj Sahoo):** Pathogens, insects and abiotic stresses cause major losses in yield and quality of crops. The discoveries in basic plant research play a vital role in meeting these challenges by developing technologies to improve agriculture by introducing important traits to crop of interest. The lab employs integrated approaches to identify genes with significant agronomic impact in both model (*Arabidopsis*) and crops (grain legumes and oil seeds), understand the mechanism by which they function and using this knowledge, develop designer crops for diverse plant abiotic (drought, salinity and nutrient deficiency or toxicity) and biotic (viral and insect) stress conditions, useful for growers, industry and consumers. Besides, the lab is working on biofortification in Asiatic grain legumes for healthcare applications and manipulation of key oil biosynthesis genes yield in *Jatropha*, a tropical perennial biofuel crop to improve oil quality and oil.
- xxix. Prof. Gurvinder Kaur Saini laboratory:** The laboratory works in fungal biotechnology. The various aspects that are studied include (i) secondary metabolite production, (ii) development of hyper virulent strains of *Metarhizium anisopliae* and *Beauveria bassiana* using scorpion and spider neurotoxins, (iii) gene stacking in entomopathogenic fungi.
- xxx. Computational Structural Biology laboratory (Dr. Priyadarshi Satpati):** Working in the area of biomolecular interactions using computational methods (e.g. Molecular Dynamics, Electronic Structure Calculations). We are mainly interested in understanding accuracy in biological processes, including ligand binding (MTB selective drug design), protein-protein (DJ-1 dimerization and Parkinson's disease), protein-DNA (DNA recognition by *spo0A* during transcription) and Protein-RNA (release factor binding to mRNA), RNA-RNA (Group II introns) interactions, viral RNA recognition by RIG-I etc.
- xxxi. Bio Process Analytical Technology (BioPAT) Laboratory (Dr. Senthilkumar Sivaprakasam):** The lab develops PAT technology for recombinant therapeutic proteins and value added compounds such as biopolymers, organic acids etc. PAT is defined as 'System for designing (process development), analysing and controlling manufacturing process, based on timely measurements of critical quality and performance attributes of raw material, in process materials and processes with the goal of ensuring final product quality'. PAT methodology envisages the identification of Critical Process Parameters (CPPs) and Critical Quality Attributes (CQAs) for every process. The CPPs are the indication of the overall reliability that a process proceed in the desired direction. Therefore, their monitoring and control establishes the uniform product quality. 'Quality by design' in the PAT emphasizes that monitoring to be accomplished not only during the process, but should begin from raw material characterization, its processing, upstream process, product recovery, downstream process and till the polishing step. Therefore, this reduces the much effort emphasized by regulatory authorities on ensuring quality.
- xxxii. Dr. Kusum Kumari Singh's Laboratory:** The laboratory focuses on the RNA-binding proteins that are involved in the splicing machinery. During splicing of premature mRNA, the spliceosome deposits a multiprotein complex termed exon-junction complex (EJC) onto the mRNAs. The subunits that form the core EJC are eukaryotic translation initiation factor 4A3 (eIF4A3), Y14, MAGOH and barentsz (BTZ, CASC3, and MLN51). Many proteins interact with the core EJC and our focus of study is a protein complex termed as Apoptosis- and Splicing-Associated Protein (ASAP). Components of both ASAP and EJC have been found to function in a wide range of activities pertaining to RNA metabolism including splicing, translation, nonsense-mediated mRNA decay (NMD) and apoptosis. We are currently focusing on the following research areas: Understanding the functions of ASAP with respect to EJC in mRNA metabolism. Elucidating the molecular involvement of RNA-binding proteins (RBPs) in various human diseases such as cancers, neurodevelopmental disorders. Exploring the post-transcriptional gene regulations of different RBPs.
- xxxiii. Protein Biophysics Lab (Prof. R. Swaminathan):** The main research focus in this lab is to investigate the structure, function and dynamics of proteins using spectroscopic techniques like UV-Visible spectroscopy and Fluorescence spectroscopy. Intrinsic electronic absorption and luminescence spectra in proteins originating from photoinduced electron transfer and charge recombination, respectively are actively studied. These novel spectra discovered in our lab are employed to monitor events like protein folding or aggregation in a label-free approach.
- xxxiv. Neurospora Research Group (Dr. Ranjan Tamuli):** The lab is interested to understand the molecular mechanism of calcium signaling pathway using the model filamentous fungus *Neurospora crassa*. Calcium ion is a universal second messenger molecule that impacts almost all cell processes in eukaryotes. The lab hopes to extend its research to understand the role of calcium signaling in memory, learning, and other related areas in future.

- xxxv. **Laboratory for Stem Cell Engineering and Regenerative Medicine (Dr. Rajkumar P. Thummer):** Autologous cell-based therapy is a promising alternative to achieve repair or regenerate damaged cells and/or tissue without any immune rejection. Our laboratory “Stem Cell Engineering and Regenerative Medicine”, mainly focuses on generation of human cells using safe, integration-free reprogramming approaches to derive clinical-grade cells for transplantation. The outcome of our research will bring patient-specific cell therapy closer to clinic for treatment of various debilitating.
- xxxvi. **Malaria Research Group (Prof. Vishal Trivedi):** The research interests of the lab include Anti-malarial Drug Discovery, Immunotoxicity studies in Macrophages, Regulation of Innate Immune Response, Endothelial Cells-RBC cytoadherence during Cerebral Malaria, Designing immunostimulatory and Anticancer agents.
- xxxvii. **Dr. Selvaraju Narayanasamy Lab:** The research interest of the lab include Environmental Biotechnology, Bioprocess Engineering, and Biochemical Engineering.
- xxxviii. **Biomechanics and Simulations lab (Dr. Souptick Chanda):** The Lab is primarily engaged in design and optimization of various orthopaedic implants based on in vitro and in silico biomechanical testing/validations. Simulations for surgery and patient examinations training are also being envisaged at this laboratory.
- xxxix. **Computational lab:** The computational lab is used for carrying out the Bioinformatics and Computational Biology Lab, a lab course of the B. Tech. curriculum.
- xl. **Experimental Teaching laboratory:** The laboratory is used to conduct the experimental course of the B. Tech. and M.Tech. curriculum.

4. Major Equipment and Facilities acquired during 1st April 2019 – 31st March 2020

Ultracentrifuge, Parallel Fermenter with Accessories, High speed and High capacity centrifuge, Reversed Phase Ultra High Performance Liquid Chromatograph, Motorized inverted fluorescence microscope.

5. Major Areas of Research and Development:

Cell signaling, Systems Biology, Protein Biochemistry, Molecular Biology, Immuno Parasitology, Biofuel, Biochemical Engineering, Tissue Engineering and Biomaterials, Stem Cell Biology, Cell Therapy & Regenerative Medicine, Organelle Biology, Inter-organelle Communications, Cellular Ageing, Bio-interfaces and Biomaterials, Environmental Biotechnology, Nanobiotechnology, Chemistry-Biology Interface for Developing Antibacterials and Sensors, Stem cell engineering and regenerative medicine, Molecular Parasitology, Computational Biology, Plant Biotechnology, RNA Biology, Structural Biology, Fungal Biotechnology, Molecular Endocrinology, Systems Biology, Bioprocess Engineering, Cancer Biology, Bio/Physio Sensors and Nanobioengineering, Biosensors and bio-fuel cells, Neural Engineering.

6. Major initiatives and breakthrough in Research and Development during 1st April 2019 – 31st March 2020:

- I. **Dr. Biplab Bose:** We have investigated and established a new approach in quantitative investigation cellular state change during epithelial to mesenchymal transition. We have developed a novel model for pattern formation in planar cell polarity based on statistical physics. We have filed a patent application on a new biosensor for detection of Hepatitis B surface antigen in human blood. We have also reported new peptides derived from diphtheria toxin that may have therapeutic applications.
- II. **Prof. S. S Ghosh:** Apart from our ongoing work on cancer therapeutics, we have worked on flow dynamics of EMT cells during migration in constricted microchannel. Our studies helped in understanding drug resistant behavior of triple negative breast cancer EMT cells during deformation. In addition, we have investigated several signaling events in EMT related to cancer therapeutics. Further, membrane expressed TNF-alpha coated nanoparticles showed effect anti-cancer activities. In device front, our collaborative work led to development of FET based POC device. The transfer of technology (TOT) for the sensor device was also completed.
- III. **Prof. Pranab Goswami:** Following two products developed in the lab of Prof. Goswami has been dedicated to the nation by the HRD minister, India in a meeting held on 14th February 2020.
 - (a) Low cost paper-based kit for onsite detection of formaldehyde.
 - (b) Low cost paper-based kit for onsite detection of methanol.

Following product developed in Prof. Goswami's lab: A prototype of ALCOHOL FUELED ENZYMATIc BIO-BATTERY CUM BIOFUEL CELL. The biofuelcell with a series connection of six unit cells produce 3.1 V power.

- IV. **Prof. Arun Goyal: Initiatives:** Structure and functional characterization of endoglucanases (GH5, GH16) from *Ruminococcus flavefaciens*; Protein engineering of carbohydrate enzymes (chimeric GH5-GH1) for developing novel biocatalysts from *Clostridium thermocellum*; Crystallization and 3D structure analyses of Xyn30A, GH43, GH81, GH26 and PL1B from *Clostridium thermocellum*; Structure and functional characterization of Hemicellulases (L- α -arabinofuranosidase, a family 43 glycoside hydrolase (GH43), glucuronoxylan-xylanohydrolase, (GH30) and β -mannanase (GH26) from *Clostridium thermocellum*, Selection of agro-waste on the basis of their structural carbohydrate composition: Estimation of cellulose, hemicellulose and lignin of different lignocellulosic leafy biomasses viz., jamun, neem, asoka, bamboo, poplar, wild grass, thatch grass, eucalyptus, mango, water hyacinth, corn cob, sugarcane bagasse and whitetop weed, Identification of efficient pre-treatment process aiding in improved saccharification: Confirmation of structural destabilization with porosity increment and lignin breakdown by field emission scanning electron microscopy (FESEM) and Fourier transform infrared (FTIR) spectroscopic analyses.

Breakthroughs: Successfully engineered a chimera of two enzymes namely endoglucanase (ctGH5) and β -glucosidase (ctGH1). This engineered enzyme efficiently hydrolyses the biomass – Sorghum stalk. It is beneficial for bioethanol production (Priyanka Nath et. al., 2019); Improved the efficiency of endoglucanase enzyme through UV-irradiation mediated directed evolution (mutation) (Shweta Singh et. al., 2020).

- V. **Prof. Biman B Mandal: Research outcome on "Bone":** Large volume bone defects are often plagued by concerns relating to donor site morbidity, inadequacy of allogenic/ autogenic graft for transplant, improper onset of vascularization in conventional bone grafts leading to failure of grafts. Addressing these critical issues, we had developed resorbable silk-bioceramic composites which were attributed with osteoinductive and proangiogenic traits. The synergistic effects of mediating osteogenesis and angiogenesis by doping silicon/ zinc doped brushite cements and silk scaffolding enabled in triggering cell responses without the use of any additional growth factors (such as BMPs; vascular endothelial growth factor, VEGF), thus proving to be an alternative for conventionally used strategies (Moses et al 2019). The work was highlighted in "The Hindu" (National Daily, article titled 'IIT Guwahati's bone graft aids extensive bone formation' March 24 2019) and the work was selected to be featured in the ACS Biomaterials Science and Engineering Journal Coverage for March 2019 volume 5 issue 3.

Research outcome on "3D Printing Bioinks": We have developed multifunctional silk-based bioinks which by the virtue of their physico-chemical nature help in preferentially preserve the chondrogenic phenotype and osteogenic phenotype in stem cell laden silk bioinks (Moses et al 2020). The hierarchically biomimetic nature of the osteochondral constructs thus bioprinted maintained cellular crosstalk due to the permeable gel network, bone phase exhibited osteoinductive traits while chondral phase enabled in preservation of the chondrogenic phenotype, during the 2 weeks culture period in vitro. The bioink composition was filed for an Indian patent (Application Number: 201831038727 Filing Date: 12th October, 2018).

Research outcome on "Cancer Therapy": As per the World Health Organization (WHO) report, by 2030, new cases and deaths related to cancer are projected to be 22 million and 13 million, respectively. Conventional chemotherapy is a radical alternative to treat cancer; however, it causes various side effects due to the systemic route of delivery. In our lab, we are using silk as a biomaterial to fabricate injectable hydrogel as a reservoir for anticancer drugs/nanoparticles. In our approach, silk hydrogel properties were further enhanced due to the incorporation of single-walled carbon nanotube, which was modified by the folic acid ligand (SWCNT-FA) to target folic acid receptor-positive cancer cells. The SWCNT-FA/DOX release from silk hydrogel was controlled by pH, temperature, and near-infrared laser illumination. With our in vitro biological studies, we showed active internalization of SWCNT-FA in oral cancer cells for target-specific cytotoxicities (Gangrade et al. 2019). The work was also covered in "The Times of India" (Education, the article titled 'IIT Guwahati researchers develop nature-derived nanomaterials for targeted delivery of cancer drugs' September 26, 2019).

Research outcome on "3D Bioprinting": We have developed a 3D bioprinted anatomically relevant human ear cartilage using silk fibroin based bioink in a cross-linker free approach. The absence of crosslinkers enables the bioink to be completely non-toxic for the encapsulated cells and provides good print fidelity and stability for the structures and makes it cost effective. The printed constructs supported proliferation of chondrocytes and were biocompatible. We have filed for patent for the developed bioink (Indian patent submitted on 12th October 2018 with application number 201831038727). The work is published in ACS Applied Materials & Interfaces journal (IF 8.4) and also highlighted by BBC India.

Research outcome on "Skincare": Chronic exposure of skin to Ultraviolet radiation (UVR) and pollutants depletes endogenous antioxidants and causes various skin disorders, including oxidative damage, photoaging, and skin cancer. Most of the exogenous antioxidants delivered through skin care products lack complete protection or get oxidized by exposure to air and UVR or causes adverse side effects. Addressing most of these critical issues, we have formulated skin care preparation using Muga sericin, which could protect the skin against UVR induced

inflammation, oxidative damage, aging, wrinkling, and skin cancer. The work was highlighted in the National news services (“India Science Wire, Down to Earth, Biotech Times, Research Stash, BioVoice, and Gaon Connection”), as titled “This silk protein can help make beauty and skincare products” 22 August 2019. The results have been published in Photochemical and Photobiological Sciences (Kumar and Mandal 2019a and 2019b), and ACS Applied Bio Materials (Kumar et al., 2018).

Research outcome on “Bioengineered Cardiac Patch”: We have developed a 3D printed cardiac patches using non-mulberry silk fibroin (nSF) based bioink. The specially designed bioink features a dual crosslinking mechanism that results in a stable fabrication of 3D microfibrinous constructs. Addition of non-mulberry silk into the conventional bioink cocktail resulted in the enhancement of the mechanical properties of the constructs making them more suitable for mimicking the local modulus of the native cardiac tissue as well aiding in better implantation ability which has been a drawback with the other bioprinted structures developed using naturally derived materials. Also, the presence of innate cell binding residues in nSF such as RGD motifs and poly arginine residues enhance greater cardiomyocyte attachment, proliferation and functional ability. The bioink developed has been also explored for its potential towards developing vascular as well as avascular constructs. We have filed for patent for the developed bioink (Indian patent submitted on 12th October 2018 with application number 201831038727). The work is published in Advanced Functional Materials (IF 15.6) and also highlighted as a cover article for the journal (Vol. 30, Issue No, 12).

VI. Dr. Lalit M. Pandey:

- Established Titanium alloy (Ti6Al4V) modified with hybrid self-assembled monolayers as a potential metallic orthopedic implant.
- Fe-doped ZnO nanoassembly was designed and established as an effective nanoantibiotic.
- Biodegradation of waste cooking oil and simultaneous production of Rhamnolipids biosurfactant.
- Insights of biosurfactant mediated microbial oil biodegradation.

7. Research Projects:

a) New Sponsored Projects (Total No: 13)

S.No	Principal Investigator	Name of Project	Sponsoring Agency	Amount Sanctioned (Rs. in Lakh)	Co-Investigator	Duration
1	Dr. B. Anand	Functional Mechanism of CRISPR RNA Maturation in an Atypical CRISPR-Cas Adaptive Immune System	SERB	74.48760	NIL	3 yrs
2	Dr. Souptick Chanda	Proximal Femoral Locking Plates (PFLP): Biomechanical Exploration of Design Variants for North Eastern (NE) Population	SERB, Govt. of India	22.97	-	2 years
3	Dr. Nitin Chaudhary	Isolation, synthesis, and structure-function analysis of frog and toad-skin derived antimicrobial, anticancer, and wound-healing peptides	DBT	48.01 (Project in collaboration with Dr. Neeraj Kumar Satija, CSIR-Indian Institute of Toxicology Research)	Dr. Sachin Kumar	2019-2022 (3 years)
4	Dr. Cota Navin Gupta	Cognitive interfaces for software engineering with multimodal brain imaging	DST	58.00	Dr. Souptick Chanda	3 years
5	Dr. Bithiah Grace Jaganathan	Targeting mechanosensitive ion channel Piezo1 in metastatic breast cancer	ICMR	34.09	Dr. Rajkumar P Thummer	3 years
6	Dr. Sachin Kumar	Understanding the cross talk between the host and the pathogen: A way to identify the novel biomarker for the diagnosis of Japanese encephalitis virus infection	Department of Health Research	148.86	Dr Ajanta Sharma, GMCH	2020-2022
7	Dr. Anil Mukund Limaye	DNA methylation in the upstream CpG island of GPER1 and its association with GPER1 expression	ICMR	19.4	Dr. Rajkumar P. Thummer	2 years

		in colon cancer: A pre-clinical proof of concept study in colon cancer cell lines				
8	Dr. Soumen K Maiti	Process intensified production of lignocellulosic liquid biofuel by cyclic shifting of the process parameters in a single bioreactor	SERB, DST	29.9	-	2019-2020
9	Dr. J. P. Borah, NIT Nagaland	Development of multifunctional rare earth based nanomaterial for biomedical applications in reference to magnetic hyperthermia and imaging	NECBH-DBT	15.73	Dr. Lalit Pandey	2019-21
10	Prof. Vibin Ramakrishnan	De novo design of functional nano-assemblies and cell targeting domains with peptide model systems; Live cell and animal imaging methods to study homing and cell penetrating compounds	DBT – NERBPMC	43.0624	Dr. Nitin Chaudhary	3 Years
11	Dr. Kusum K. Singh	Construction of a minigene to analyze the alternative splicing regulation of UPF3B variable exon	CSIR	20.00	-	01/2020 to 12/2022
12	Dr. Kusum K. Singh	Deciphering the assembly of RNPS1 into the spliceosomal machinery	SERB	45.48	-	02/2020 to 01/2023
13	Dr. Tarinee Phukan (RA), Mentor: Dr. Ranjan Tamuli	Understanding the calcium signalling pathway in tomato plant upon infection with <i>Ralstonia solanacearum</i> , the causal agent of bacterial wilt	DBT (RA)	Fellowship and Contingency amount	-	2 Years

b) Ongoing Sponsored Projects (Total No: 45)

S.No	Principal Investigator	Name of Project	Sponsoring Agency	Amount Sanctioned (Rs. in Lakh)	Co-Investigator	Duration
1	Dr. B. Anand	Mapping the hierarchical participation of assembly factors during ribosome assembly	DBT	97.96	NIL	3.5 years
2	Dr. Biplab Bose	Design Principles in the Molecular Network of an Oncofetal Protein	DBT	84.23	Dr. S. S. Ghosh	5 years (2016 - 2021)
3	Dr. Souptick Chanda	Investigation on the Influence of Ferromagnetic Coating on Bone Ingrowth in Hip Stems Made of Composite Titanium-Tantalum (Ti-Ta) Foam	SPARC, MHRD, Govt. of India	27.27	Dr. Rajkumar Thummer, Dr. Debabrata Chakraborty	2 years
4	Dr. Nitin Chaudhary	Investigations into structural organization and curvature-dependent membrane binding of alpha synuclein	DBT	63.23 to IITG (Project in collaboration with RCB Gurgaon and RCU, Belagavi)	Dr. Vibin Ramakrishnan	2017-2020 (3 years)
5	Dr. Nitin Chaudhary	Mechanistic insights into IAPP self-assembly – targeting early intermediates for therapeutics	SERB	47.85	Dr. Sachin Kumar	2018-2021 (3 years)
6	Dr. D. Das	DBT-PAN-IIT Center for Bioenergy (No. BT/EB/PAN IIT/2012)	DBT	92.08 Lakh (AG)	Prof. Arun Goyal,	Dec 2014 – June 2020, 5 Years

		1. Improvement of hydrolytic enzymes by protein engineering for higher activity and SSF of plant carbohydrates to ethanol (PI) 2. Development of <i>Clostridium</i> sp. as a cell factory for butanol production: Metabolic & biochemical engineering approach. (Co-PI)		1.74 Crores (IITG) 22.5 Crores (Overall)	Co-Ordinator: Dr. P. Wangikar (IITB)	
7	Prof. P. Goswami	Studies and Application of Redox Enzymes for Bioelectronics Devices	DBT	145.34	Prof. S. S. Ghosh	2016 - 2021
8	Prof. S.S. Ghosh	DBT Programme Support on Fundamental Molecular Investigations in Biotechnology – Core II grant	DBT	248.76 (amount sanctioned for the Core-II grant)	Prof. P. Goswami Prof. L. Sahoo Dr. B. Bose	2016 - 2021
9	Prof. S.S. Ghosh	Investigation on the Molecular Mechanism of Nanomaterial-Cellular Interactions to Develop Potential Therapeutics	DBT	89.09 (amount sanctioned for the R&D grant-I)	Dr. B. Bose Prof. A. Ramesh	2016 - 2021
10	Prof. S.S. Ghosh	Modulation of Connexin-43 and Histone Deacetylase to Comprehend Cancer Therapy	DBT	57.02	Prof. Arun Chattopadhyay	2018-2021
11	Prof. Arun Goyal	Cloning, expression, biochemical and <i>in vitro</i> analysis of therapeutic chondroitin lyase and oligosaccharides from <i>Pedobacter saltans</i> .	CSIR	19.7	Dr. A.B. Kunnumakkara	May 2016 - May 2020 , 3 Years
12	Prof. Arun Goyal	Development of novel and efficient carbohydrate enzymes for bioenergy and biovalued products	DBT Twinning	120 (72.00 - Arun Goyal)	Prof. P. Bhaumik (IITB) and Prof. Punit Kaur (AIIMS)	Oct 2018-Sep 2021, 3 Years
13	Prof. Arun Goyal	Efficient utilization of sugarcane top for production of cellulosic ethanol and other value added products	DBT	47.2 ACIRD, Yamuna Nagar 24.95 (IITG)	Prof. V. S. Moholkar	3
14	Dr. Cota Navin Gupta	Data driven neuro-behavioural clusters in adults who were born very preterm using multivariate analysis	SPARC	44.44	Dr. Souptick Chanda	2 yrs
15	Dr. Swanirbhar Majumder	Multivariate intrinsic mode functions for electroencephalogram signals using single channel	NECBH	15.5	Dr. Cota Navin Gupta	2.5 yrs
16	Dr. Shankar Prasad Kanaujia	Structural and functional characterizatin of an ABC transporter involved in the	SERB	27.50	None	2019-2022 3 years

		maintenance of lipid asymmetry in <i>Escherichia coli</i> and <i>Shigella flexneri</i> : structure-based drug-designing				
17	Dr. Shankar Prasad Kanaujia	Structural and functional investigation of mammalian cell entry (MCE) proteins from human pathogens: development of structure-based lead molecules	SERB	42.1	None	2018-2021 3 years
18	Dr. Shankar Prasad Kanaujia	Structural investigation of sugar ABC transporters in <i>Mycobacterium tuberculosis</i> and thermophiles: application to the development of drug carriers and biosensors	DBT	126.384	None	2017-2020 3 years
19	Dr. Shankar Prasad Kanaujia	Understanding the mechanism of ABC-type metal sequestering proteins: structure-based novel drug development against human pathogens	DBT	73.55 (IITG – 51.23)	Dr. Shailza Singh (NCCS Pune)	2017-2020 3 years
20	Dr. Manish Kumar	Elucidating the role of Cas6, Cas7, and Cas8 in spirochetes CRISPR adaptive immunity against alien genetic elements	DBT	68.75	Dr. Shankar Prasad Kanaujia	2018-2021
21	Dr. Manish Kumar	Characterization of predicted novel extracellular proteins of pathogenic <i>Leptospira interrogans</i>	ICMR	37.96	Dr. Sachin Kumar	2017-2020
22	Dr. Sachin Kumar	Molecular platform for epidemiology, disease mapping and development of diagnostics for economically important disease of ducks	Department of Biotechnology (NER-BPMC).	210.61	Dr Sulekha Phukan, COVs, AAU	2018-2021
23	Dr. Anil Mukund Limaye	Investigations into estrogen regulation of tumor cell derived ECM remodeling genes and the role of key transcription factors.	DBT (NE Twining)	54.82 (IITG component)	Dr. Ashish Anand	3
24	Prof. Kannan Pakshirajan	The development and implementation of sensors and treatment technologies for freshwater systems in India	DBT	50	Prof. Tapan Dutta (Bose Institute)	3 years
25	Prof. Kannan Pakshirajan	A novel membrane assisted bioprocess for heavy metal removal and recovery as nano powders from acid mine drainage	CSIR	20.27	Prof. G. Pugazhenthii	3 years
26	Prof. Kannan Pakshirajan	Novel biological treatment process for water recycle-reuse and energy conservation in refinery industry	DST	38.7	Prof. G. Pugazhenthii and Prof. Ajaikumar B. Kunnumakkara	3 years
27	Prof. Kannan Pakshirajan	Hydrogenogenic carbon monoxide conversion under mesophilic condition using anaerobic granular sludge biomass for biodesulphurization	DBT	14.45	Prof. Tapan Dutta (Bose Institute)	3 years
28	Prof. Biman B. Mandal	NIRMAAN 3D” - Novel minimally invasive Implants for Reconstructive surgery using Materials providing mechanical	DBT	174.52	Dr. R. P. Thummer	2018-2022

		instruction and prepared by 3D printing				
29	Prof. Biman B. Mandal	Development of minimally invasive novel injectable hydrogel and nano-carrier hybrid system for localized targeted cancer therapy.	DHR	120.97794	Dr. M. Kumar	2018-2021
30	Prof. Biman B. Mandal	Functional collagen nanoparticle impregnated silk nano-ceramic composite 3D matrices for flat bone regeneration	DBT	87.70	Dr. R. P. Thummer	2018-2021
31	Prof. Biman B. Mandal	Bioengineered 3D constructs for cartilage repair, osteochondral regeneration and high throughput drug screening towards osteoarthritis management	DST	46.81	N/A	2018-2021
32	Prof. Biman B Mandal	Fabrication of Biocompatible scaffolds for delivery of stem cells in myocardial infarct model: In search of an ideal cardiac patch	DBT	67.10	Dr. R. P. Thummer	2018-2021
33	Dr. Shirisha Nagotu	Investigating the role of peroxisomes in Parkinson's disease	DBT	74.40 (47.73 IITG + 26.67 JNCASR)	Dr. Ravi Manjithaya JNCASR & Dr. Rajkumar Thummer, IITG	2018-2021
34	Dr. Shirisha Nagotu	Organelle dynamics and cellular ageing in yeast	DBT	86.00 (56-IITG and 30-CEBS)	Dr. Avinash Kale – CEBS, Mumbai & Dr. Rajkumar Thummer, IITG	2017-2020
35	Dr. Lalit Pandey and Dr. Aaron Lau (University of Strathclyde)	An advanced integrated process for the treatment of sewage plant effluent using bio-based antimicrobial metal biosorbents and photocatalytic materials	DST-UKIERI	17.15	Dr. Animes Golder and Dr. Aruna Ivaturi (University of Strathclyde)	2018-20
36	Dr. Lalit Pandey	Mechanistic Insight of Shear Induced Aggregation of Proteins and the Effect of Transition Metal Ions	SERB	46.32	-	2019-2020
37	Dr. Lalit Pandey	Thermodynamics of Protein Aggregation in Bulk Solution and in the presence of Surfaces	INSPIRE, DST	35.00	-	2015-2020
38	Prof. L. Sahoo	Development of Abiotic Stress Resilient Tropical Pulses Through Tailoring of ABA Receptor Genes	DBT	155.6	Dr. B. Bose	2016 - 2021
39	Prof. Vibin Ramakrishnan	Design, Synthesis and Characterization of Metal Impregnating Nano-assemblies using Peptide Model Systems; Applications in heavy metal entrapment in North-East Region	DBT	154.89	NA	3 years
40	Prof. Vibin Ramakrishnan	Peptide Based Molecular Constructs for Tumor Homing and Small Molecule Delivery	BRNS	31.3375	Dr. Nitin Chaudhary	3 years
41	Prof. L Rangan Coordinator	Genome and transcriptome sequencing of aromatic rices from North Eastern region	DBT	90.05	Dr. Gayatri Venkataraman, MSSRF Chennai	2017-2020

					Dr. Sudip Mitra, IITG Dr. Swarup Parida, New Delhi	
42	Prof. L Rangan	Genome and transcriptome sequencing of aromatic rices from North Eastern region	DBT	50.21	Dr. Swarup Parida, New Delhi Dr. Sudip Mitra, IITG	2017-2020
43	Dr. Selvaraju Narayanasamy	Sustainable production of algal biomass: A holistic approach with bioremediation and economical harvesting technique (NECBH Twinning 2018)	NECBH Programme (DBT)	2.4	-	2.5 years
44	Prof. Ranjan Tamuli and Dr. Mandar V. Deshmukh (CCMB)	Understanding molecular mechanism of calcium signaling in <i>Neurospora crassa</i>	DBT, NE-Twinning	84.53 (56.412 for IITG, 28.118 for CCMB)	Dr. Manabendra Sarma (IITG)	3 years
45	Dr. Pranjal Chandra	Development of bi-functional electrochemical nanobiosensor for bacterial exotoxin detection: Implication towards screening of toxin producing bacterial isolates	DBT	38.00		2016-2020

c) Completed Sponsored Projects (Total No: 17)

S.No	Principal Investigator	Name of Project	Sponsoring Agency	Amount Sanctioned (Rs. in Lakh)	Co-Investigator	Duration
1	Dr. Bithiah Grace Jaganathan	BMP Signaling in Osteolytic Bone Metastasis of Breast Cancer	ICMR	25	Dr. Anil M Limaye (IITG) Dr. Gayatri Gogoi (Assam Medical College)	3 years
2	Dr. Bithiah Grace Jaganathan	Study of RhoA Signaling in Bone Metastasis of Breast Cancer	SERB	40.55	-	3 years
3	Dr. Manish Kumar	Study on the Caseinolytic proteases of <i>Leptospira interrogans</i> , a promising target for treating bacterial infection	SERB, DST	70.18	Dr. Shankar Prasad Kanaujia	2016-2020
4	Dr. Sachin Kumar	Development of reverse genetic based recombinant Newcastle disease virus model for understanding immune response in patients infected with Hepatitis C virus	DBT	105.9	Dr Baibaswata Nayak, AIIMS	2016-2019
5	Dr. Sachin Kumar	Improved classical swine fever virus vaccine and its diagnostics using Newcastle disease virus as a vector	DBT, Unit of Excellence of Virology in NE Region	84.8	-	2016-2019
6	Dr. Anil Mukund Limaye	Investigation into estrogen regulation of cystatin A expression in breast cancer	DBT	24.85	Dr. Sachin Kumar	3

		cells and its role in proliferation and migration				
7	Prof. Biman B. Mandal	North East silk biomaterials based injectable hydrogels for drug delivery and tissue engineering	DBT	134.052	N/A	2016-2020
8	Prof. Biman B. Mandal	North east silk based bioengineered vascular conduits	DBT	72.04	Dr. P. Sukumar	2017-2020
9	Prof. Biman B. Mandal	Use of silk from northeast India for culture and transplantation of corneal endothelial cells	DBT	43.65	Dr. P. Sukumar	2018-2020
10	Prof. Biman B. Mandal	Production and development of silk gel and powder as a material for the development of haemostatic and other formulations	DRDO	9.87	N/A	2018-2019
11	Prof. Biman B. Mandal	Bioartificial Pancreas to Treat Diabetes	DST-INSPIRE	35.00	N/A	2013-2019
12	Dr. Shirisha Nagotu	Peroxisome and inter-organelle communication in yeast	DST-SERB	32	Dr. Rajkumar Thummer	2016-2019
13	Dr. Kusum K. Singh	To investigate how ASAP complex interface with splicing and connects EJC	SERB	42.96	Dr. Shankar P. Kanaujia	04/06/2016 till 03/06/2019
14	Dr. Anand Tiwari (Mentor: Prof. Ranjan Tamuli)	Functional characterization and role of TMSF2 , a NRAMP family member, in the life cycle of <i>Neurospora crassa</i>	DST-SERB	31.50	-	3 years
15	Dr. Rajkumar P Thummer	Direct reprogramming of human fibroblasts to functional cardiomyocytes for cell therapy	DST-SERB	40.12	Dr. Shirisha Nagotu	3 years (06/2016-06/2019)
16	Dr. Rajkumar P Thummer	Generation of transgene-free human induced pluripotent stem cells using non-genetic approaches for cell therapeutic applications	DBT (Twinning Projects for NE)	85.28 (51.31 for IITG & 33.97 for NCCS)	Dr. Nibedita Lenka (NCCS, Pune) & Dr. Shirisha Nagotu	3 years (11/2016-10/2019)
17	Dr. Pranjal Chandra	Paper based point-of-care biomedical devise prototype for pathogenic microorganism detection	DST	6.0	-	2018-2020

8. Consultancy (Total No: 02)

S.No	Principal Investigator	Name of Project	Sponsoring Agency	Amount Sanctioned (Rs. in Lakh)	Co-Investigator	Duration
1	Dr. Selvaraju Narayansamy	Removal of Arsenic from aqueous solutions using poly-electrolytes in membrane based systems.	AQUASOLUTION	2.00	Dr. Senthilmurugan Subbiah	2019-2020
2	Dr. Souptick Chanda	Novel design of hip implants	Orthotech Pvt Ltd	4.50	-	4 years

9. Research Publications

International and National Journals (PERIOD: 1 APRIL 2019 – 31 MARCH 2020)

Total No. of International Journal: 220

Total No. of National Journal:

Format for submission of Research Publications/Journals

S.No	Authors	Paper Title	Journal Name	Year	Volume	Issue Number (If any)	Starting Page	Ending Page
1	Nimkar S, Anand B	Cas3/I-C Mediated Target DNA Recognition and Cleavage during CRISPR Interference are Independent of the Composition and Architecture of Cascade Surveillance Complex	Nucleic Acids Research	2020	48		2486	2501
2	K.N Yoganand, Muralidharan M, Nimkar S, Anand B	Fidelity of Prespacer Capture and Processing is Governed by the PAM Mediated Interactions of Cas1-2 Adaptation complex in CRISPR-Cas type I-E system	Journal of Biological Chemistry	2019	294		20039	20053
3	Sharma H, Anand B	Ribosome assembly defects subvert initiation Factor3 mediated scrutiny of bona fide start signal	Nucleic Acids Research	2019	47		11368	11386
4	Katla S, Yoganand K.N.R, Hingane S, Ranjith Kumar C.T, Anand B, Senthilkumar S	Novel glycosylated human interferon alpha 2b expressed in glycoengineered Pichia pastoris and its biological activity: N-linked glycoengineering approach	Enzyme and Microbial Technology	2019	128		49	58
5	Katla S, Karmakar B, Tadi SRR, Mohan N, Anand B, Pal U, Sivaprakasam S	High level extracellular production of recombinant human interferon alpha 2b in glycoengineered Pichia pastoris: culture medium optimization, high cell density cultivation and biological characterization.	Journal of Applied Microbiology	2019	126		1438	1453
6	M Agarwal, T Mondal, B Bose	Peptides derived from a short stretch of diphtheria toxin bind to heparin-binding epidermal growth factor-like growth factor	Toxicon	2019	169		109	116
7	K Chandrasekaran, B. Bose	Percolation in a reduced equilibrium model of planar cell polarity	Physical Review E	2019	100	3	032408-1	032408-8
8	V Devaraj, B Bose	Morphological State Transition Dynamics in EGF-Induced Epithelial to Mesenchymal Transition	Journal of clinical medicine	2019	8	7	911	
9	Souptick Chanda, Kaushik Mukherjee, Sanjay Gupta	A comparative assessment of two designs of hip stem using rule-based simulation of combined osseointegration and remodeling.	Journal of Engineering in Medicine	2019	234	1	118	128
10	Debika Datta, Vishnu Kumar, Sachin Kumar,	Limpid hydrogels from β -turn motif-connected tandem repeats of A β ₁₆₋₂₂	Soft Matter	2019	15	24	4827	4835

	Ramakrishnan Nagaraj* and Nitin Chaudhary*							
11	Karabi Saikia, Vinay Kumar Belwal, Debika Datta and Nitin Chaudhary*	Aromatic-rich C-terminal region of LCI is a potent antimicrobial peptide in itself	Biochemical and Biophysical Research Communications	2019	519	2	372	377
12	Debika Datta, Ramakrishnan Nagaraj* and Nitin Chaudhary*	Water-Alcohol Bigels from Fatty Acylated Dipeptides	The Journal of Physical Chemistry B	2020	124	3	577	588
13	Anshuman Mohapatra, Sowmya Bekshe Lokappa* and Nitin Chaudhary*	Interaction of cavin-1/PTRF Leucine Zipper Domain 2 and Its Congenital Generalized Lipodystrophy Mutant With Model Membranes	Biochemical and Biophysical Research Communications	2020	521	3	732	738
14	AP Bidkar, P Sanpui, SS Ghosh	Transferrin-Conjugated Red Blood Cell Membrane-Coated Poly (lactic-co-glycolic acid) Nanoparticles for the Delivery of Doxorubicin and Methylene Blue	ACS Applied Nano Materials	2020	doi.org/10.1021/acsanm.0c00502	-	-	-
15	S Bhattacharyya, SS Ghosh	Transmembrane TNF α -Expressed Macrophage Membrane-Coated Chitosan Nanoparticles as Cancer Therapeutics	ACS Omega	2020	5	3	1572	1580
16	R Sinha, AP Bidkar, R Rajasekhar, SS Ghosh, TK Mandal	A facile synthesis of nontoxic luminescent carbon dots for detection of chromium and iron in real water sample and bio-imaging	The Canadian Journal of Chemical Engineering	2020	98	1	194	204
17	M Das, U Goswami, S Bhattacharyya, R Kandimalla, A Chattopadhyay	Integration of a Nonsteroidal Anti-Inflammatory Drug with Luminescent Copper for in Vivo Cancer Therapy in a Mouse Model	ACS Applied Bio Materials	2020	3	1	227	238
18	M Das, U Goswami, R Kandimalla, S Kalita, SS Ghosh, A Chattopadhyay	Iron-Copper Bimetallic Nanocomposite Reinforced Dressing Materials for Infection Control and Healing of Diabetic Wound	ACS Applied Bio Materials	2019	2	12	5434	5445
19	Sunil Kumar Sailapu, Deepanjalee Dutta, Anitha. T Simon, Siddhartha Sankar Ghosh, Arun Chattopadhyay	Gold-Nanocluster-Embedded Mucin Nanoparticles for Photodynamic Therapy and Bioimaging	Langmuir	2019	35	32	10475	10483
20	Sunil Kumar Sailapu, Deepanjalee Dutta, Anitha. T Simon, Siddhartha Sankar Ghosh, Arun Chattopadhyay	Smartphone controlled interactive portable device for theranostics in vitro	Biosensors & Bioelectronics	2019	146		11745	
21	Neha Arora, Rajib Shome, Siddhartha Sankar Ghosh	Deciphering therapeutic potential of PEGylated recombinant PTEN-	Molecular Biology Reports	2019	8		1	10

		silver nanoclusters ensemble on 3D spheroid							
22	Binita Nath, Anil P Bidkar, Vikash Kumar, Amaresh Dalal, Mohit Kumar Jolly, Siddhartha Sankar Ghosh, Gautam Biswas	Deciphering Hydrodynamic and Drug-Resistant Behaviors of Metastatic EMT Breast Cancer Cells Moving in a Constricted Microcapillary	Journal of Clinical Medicine	2019	8	8	1194	-	
23	Bhuyan T, Dutta D, Bhattacharjee M, Singh AK, Siddhartha Sankar Ghosh, Bandyopadhyay D	Acoustic Propulsion of Vitamin C loaded Teabots for Targeted Oxidative Stress and Amyloid Therapeutics	ACS Applied Bio Materials	2019	2	10	4571	4582	
24	Anamika Dey, Ashish Singh, Deepanjalee Dutta, Siddhartha Sankar Ghosh, PK Iyer	Rapid and label-free bacteria detection using a hybrid tri-layer dielectric integrated n-type organic field effect transistor	Journal of Materials Chemistry	2019	7	-	18330	18337	
25	Bidkar AP, Sanpui P, Siddhartha Sankar Ghosh	Red Blood Cell (RBC) Membrane Coated Poly (lactic-co-glycolic acid) Nanoparticles for Enhanced Chemo and Hypoxia Activated Therapy	ACS Applied Bio Materials	2019	2	9	4077	4086	
26	Zhdanova, G.O. Konovalova, E.Y. Tolstoy, M.Y. Kashevsky, A.V. Barbora, L. Goswami, P. Goel, S. Fialkow, V.A. Kupchinsky, A.B. Stom, D.I.	Comparative Analysis of Electrogenic Activity of Complex Microbial Preparations in Microbial Fuel Cells	IOP Conference Series: Earth and Environmental Science.	2019	272	3			
27	Naveen Kumar Singh, Priyamvada Jain, Smita Das, and Pranab Goswami *	Dye coupled aptamer-captured enzyme catalyzed reaction for detection of pan malaria and P. falciparum species in laboratory settings and instrument-free paper based platform	Analytical Chemistry	2019	91	6	4213	4221	
28	Naveen K Singh, Sanjay Manmohan, NG Lightson, Pranab Goswami*	A Smartphone-based Fiber-optic Aptasensor for label-free detection of Plasmodium falciparum Glutamate dehydrogenase	RSC Analytical Method	2020	12		1333-	1341	
29	SurajbhanSevda ^{1,2,†} Vijay KumarGarlapati ^{3,‡} Sunandan Naha ¹ MohitaSharma ⁴ Sreemoyee GhoshRay ⁵ Trichur Ramaswamy, Sreekrishnan ⁶ & Pranab Goswami ¹	Biosensing capabilities of bioelectrochemical systems towards sustainable water streams: Technological implications and future prospects	Journal of Bioscience and Bio-engineering	2020	doi.org/10.1016/j.jbiosc.2020.01.003				
30	Sunandan Naha, Chetan Joshi, B Chandrashekhar, TR Sreekrishnan, Pranab	Bioelectrosynthesis of Organic and Inorganic Chemicals in Bioelectrochemical System	Journal of Hazardous, Toxic, and	2020	24	2			

	Goswami, Surajbhan Sevda		Radioactive Waste					
31	Vikky Rajulapati, Arun Dhillon, Kiran kumar Gali, Vimal Katiyar and Arun Goyal	Green bioprocess of degumming of jute fibers and bioscouring of cotton fabric by recombinant pectin methylesterase and pectate lyases from <i>Clostridium thermocellum</i> .	Process Biochemistry	2020	10.1016/j.procbio.2020.02.024	-	-	-
32	Barnali Nath, Kedar Sharma, Komal Ahire, Arun Goyal and Sachin Kumar	Structure analysis of the nucleoprotein of Newcastle disease virus: An insight towards its multimeric form in solution.	International Journal of Biological Macromolecules	2020	https://doi.org/10.1016/j.ijbiomac.2020.02.133	-	-	-
33	Puneet Pathak, Ankush Gupta, Nishi Kant Bhardwaj*, Arun Goyal, Vijayanand Suryakant Moholkar	Impact of mild and harsh conditions of formic acid based organosolv pretreatment on biomass fractionation of sugarcane tops.	Biomass Conversion and Biorefinery	2020	https://doi.org/10.1007/s13399-020-00629-w	-	-	-
34	Ajit Kumar, Shweta Singh, Vikky Rajulapati and *Arun Goyal	Evaluation of pre-treatment methods for <i>Lantana camara</i> stem for enhanced enzymatic saccharification.	3-Biotech	2020	https://doi.org/10.1007/s13205-019-2029-5	-	-	-
35	Priyanka Nath, Kedar Sharma, Krishan Kumar and Arun Goyal	Combined SAXS and computational approaches for structure determination and binding characteristics of chimera (<i>CtGH-L1-CtGH5-F194A</i>) generated by assembling β -glucosidase (<i>CtGH1</i>) and a mutant endoglucanase (<i>CtGH5-F194A</i>) from <i>Clostridium thermocellum</i> .	International Journal of Biological Macromolecules	2020	148	-	364	377
36	Kedar Sharma, Carlos M.G.A. Fontes, Shabir Najmudin and Arun Goyal	SAXS based structure, modelling and molecular dynamics analyses of family 43 glycoside hydrolase α -L-arabinofuranosidase (<i>CtAraf43</i>) from <i>Clostridium thermocellum</i> .	Journal of Biomolecular Structure and Dynamics	2019	10.1080/07391102.2019.1707119	-	-	-
37	Shweta Singh, Arun Dhillon and Arun Goyal	Enhanced catalytic efficiency of <i>Bacillus amyloliquefaciens</i> SS35 endoglucanase by ultraviolet directed evolution and mutation analysis.	Renewable Energy	2019	151	-	1124	1133
38	Dishant Goyal, Krishan Kumar, Kedar Sharma and Arun Goyal	SAXS based structure, modeling and molecular dynamics analyses of a family 5 glycoside hydrolase first endo-mannanase (<i>RfGH5_7</i>) from <i>Ruminococcus flavefaciens</i> FD-1 v3.	Journal of Biomolecular Structure and Molecular Dynamics	2019	- doi.org/10.1080/07391102.2019.1680438	-	-	-

39	Karthika B., Kedar Sharma and *Arun Goyal	Structure and dynamics analysis of a new member heparinase II/III of family 12 polysaccharide lyase from <i>Pseudopedobacter saltans</i> by computational modelling and small angle X-ray scattering.	Journal of Biomolecular Structure and Dynamics	2019	Doi: 10.1080/07391102.2019.1622453	-	-	-
40	Monisha Mohan, Deepa Akula, Arun Dhillon, Arun Goyal and Anindya Roy	Human RAD51 paralogue RAD51C fosters repair of alkylated DNA by interacting with the ALKBH3 demethylase.	Nucleic Acid Research	2019	47	22	11729	11745
41	Sumitha Banu J., Abhijeet Thakur, Vijayanand S. Moholkar and *Arun Goyal	Elucidating the impacts of various pretreatments on the structural composition of Finger millet (<i>Eleusine coracana</i>) straw and optimization of hemicellulose saccharification by recombinant hemicellulases.	International Journal of Biological Macromolecules	2019	135	-	1098	1106
42	Dishant Goyal, Krishan Kumar, Maria S.J. Centeno, Abhijeet Thakur, Virginia M.R. Pires, Pedro Bule, Carlos M.G.A. Fontes and Arun Goyal	Molecular cloning, expression, purification and biochemical characterization of a family 5 glycoside hydrolase first endomannanase (RfGH5_7) from <i>Ruminococcus flavefaciens</i> FD-1 v3.	Molecular Biotechnology	2019	61	11	826	835
43	Krishan Kumar, Shubham Singal and Arun Goyal	Role of carbohydrate binding module (CBM3c) of GH9 β -1,4 endoglucanase (Cel9W) from <i>Hungateiclostridium thermocellum</i> ATCC 27405 in catalysis.	Carbohydrate Research	2019	484	-	-	107782
44	Nadeem Akhtar, Kanika Gupta, Dinesh Goyal and Arun Goyal	Lignocellulosic biomass characteristics for bioenergy application: An overview	Environmental Engineering and Management Journal	2019	18	2	367	384
45	Neha Singh, Kuldeep Roy, Arun Goyal and Vijayanand S. Moholkar	Investigations in ultrasonic enhancement of β -carotene production by isolated microalgal strain <i>Tetrademus obliquus</i> SGM19	Ultrasonics – Sono-chemistry	2019	58	-	104697	-
46	Kedar Sharma, Abhijeet Thakur, Rajeev Kumar and *Arun Goyal	Structure and biochemical characterization of glucose tolerant β -1,4 glucosidase (HtBgl) of family 1 glycoside hydrolase from <i>Hungateiclostridium thermocellum</i> .	Carbohydrate Research	2019	483	-	107750	-
47	Kedar Sharma, Carlos M.G.A. Fontes, Shabir Nazmuddin and *Arun Goyal	Molecular organization and protein stability of <i>Clostridium thermocellum</i> glucuronoxylan endo- β -1,4-xylanase of family 30 glycoside hydrolase in solution	Journal of Structural Biology	2019	206	-	335	344
48	Kedar Sharma, Vikky Rajulapati and *Arun Goyal	Green synthesis of arabinoxyloglucan coated antimicrobial copper nanoparticles	Trends in Carbohydrate Research	2019	11	1	22	30

49	Gupta, C.N., Turner, J.A. & Calhoun, V.D	Source-based morphometry: a decade of covarying structural brain patterns	Brain Struct & Function	2019			3031	3044
50	M. A. Rahaman, J. Turner, CN. Gupta et al	N-BIC: A Method for Multi Component and Symptom Biclustering of Structural MRI Data: Application to Schizophrenia	IEEE Transactions in Biomedical Engineering	2020	67	1	110	121
51	Darilang Mawrie, Kasturi Bhattacharjee, Amit Sharma, Renu Sharma, Jina Bhattacharyya, Harsha Bhattacharjee, Nilutparna Deori, Atul Kumar, Bithiah Grace Jaganathan	Human orbital adipose tissue-derived mesenchymal stem cells possess neuroectodermal differentiation and repair ability	Cell Tissue Res	2019	378		531	542
52	Atul Kumar, Renu Sharma, Sreeja Dattachoudhury, Amit Sharma, Trishna Anand, Jina Bhattacharyya, Kasturi Bhattacharjee, Bithiah Grace Jaganathan	OCT4A transcript level correlates with proliferation potential of human mesenchymal stem cells	Gene reports	2019	16		100459	
53	Renu Sharma, Amit Sharma, Atul Kumar, Bithiah Grace Jaganathan	Phospho-protein Analysis in Adherent Cells Using Flow Cytometry	Bio-protocol	2019	9	4	e3395	
54	Sreeja Dattachoudhury, Renu Sharma, Atul Kumar, Bithiah Grace Jaganathan	Sorafenib inhibits proliferation, migration and invasion of breast cancer cells	Oncology	2020				
55	Monika Chandravanshi, Prerana Gogoi and Shankar Prasad Kanaujia	Structural and thermodynamic correlation illuminates the selective transport mechanism of disaccharide α -glycosides through ABC transporter	FEBS JOURNAL	2019	doi: 10.1111/febs.150			
56	Monika Chandravanshi, Anjaney Sharma, Pratik Dasgupta, Suraj Kumar Mandal and Shankar Prasad Kanaujia	Identification and characterization of ABC transporters for carbohydrate uptake in <i>Thermus thermophilus</i> HB8	Gene	2019	696		135	148
57	Ankit Kumar Sinha, Angshu Dutta, Monika Chandravanshi and Shankar Prasad Kanaujia	An insight into bacterial phospholipase C classification and their translocation through Tat and Sec pathways: A data mining study	Meta Gene	2019	20	100547		

58	Ghosh K K *, Prakash A *, Dhara A , Hussain M S , Shrivastav P , Kumar P , Balamurugan V, Kumar M	Role of Supramolecule ErpY-Like Lipoprotein of Leptospira in Thrombin-Catalyzed Fibrin Clot Inhibition and Binding to Complement Factors H and I, and Its Diagnostic Potential	Infection and Immunity	2019	87	12	e00536- 19	e00536- 19
59	Saha G, Khamar B, Kumari P, Kumar M, Dubey V.	BLIMP-1 plays important role in the regulation of macrophage pyroptosis for the growth and multiplication of Leishmania donovani	ACS Infectious Diseases	2019	5	12	2087	2095
60	Kumari R K, Kumar R, Kumar P, Kumar M	Emergence and variations in disease ecology of tick-borne bovine theileriosis in East India	International Journal of Livestock Research	2019	9	11	12	25
61	Dhara A, Hussain M S, Datta D, Kumar M	Insights to the assembly of functionally active leptospiral ClpP1P2 protease complex along with its ATPase chaperone ClpX	ACS omega	2019	4	-	12880	12895
62	Bordoloi D, Banik K, Vikkurthi R, Thakur KK, Padmavathi G, Sailo BL, Girisa S, Kunnumakkara AB	TIPE is involved in the positive regulation of lung cancer through modulation of Akt/mTOR/NFκB/STAT-3 signaling	Biomedicine	2020	Accepted	-	-	-
63	Buhrmann C, Kunnumakkara AB, Popper B, Majeed M, Aggarwal BB, Shakibaei M	Calebin A Potentiates the Effect of 5-FU and TNF-β (Lymphotoxin α) against Human Colorectal Cancer Cells: Potential Role of NF-κB	International Journal of Molecular Sciences	2020	7	21	E2393	
64	Kunnumakkara AB, Shabnam B, Girisa S, Harsha C, Banik K, Devi TB, Choudhury R, Sahu H, Parama D, Sailo BL, Thakur KK, Gupta SC, Aggarwal BB	Inflammation, NF-κB and Chronic Diseases: How are They Linked?	Critical Reviews in Immunology	2020	40	1	1	39
65	K Dharmalingam, D Bordoloi, AB Kunnumakkara, R Anandalakshmi	Preparation and characterization of cellulose-based nanocomposite hydrogel films containing CuO/Cu ₂ O/Cu with antibacterial activity	Journal of Applied Polymer Science	2020	-	-	49216	-
66	K Dharmalingam, D Bordoloi, AB Kunnumakkara, R Anandalakshmi	Formation and characterization of zinc oxide complexes in composite hydrogel films for potential wound healing applications	Polymer Composites	2020	-	-	25538	-
67	Banik K, Ranaware AM, Harsha C, Nitesh T, Girisa S, Deshpande V, Fan L, Nalawade SP, Sethi G, Kunnumakkara AB	Piceatannol: A Natural Stilbene for the Prevention and Treatment of Cancer	Pharmacologic al Research	2020	153	-	104635	-
68	Khairakpam AD, Banik K, Girisa S, Shabnam B,	The Vital Role of ATP Citrate Lyase in Chronic Diseases	Journal of Molecular Medicine	2020	98	-	71	95

	Shakibaei M, Fan L, Arfuso F, Monisha J, Wang H, Mao X, Sethi G, Kunnumakkara AB							
69	Kunnumakkara AB, Thakur KK, Rana V, Bora B, Banik K, Khatoon E, Sailo BL, Bano S, Girisa S, Gupta SC, Aggarwal BB	Upside and Downside of Tumor Necrosis Factor Blockers for Treatment of Immune/Inflammatory Diseases	Critical Reviews in Immunology	2019	39	6	439	479
70	Bordoloi D, Banik K, Padmavathi G, Vikkurthi R, Harsha C, Roy NK, Singh AK, Monisha J, Wang H, Kumar AP, Kunnumakkara AB.	TIPE2 Induced the Proliferation, Survival, and Migration of Lung Cancer Cells Through Modulation of Akt/mTOR/NF- κ B Signaling Cascade	Biomolecules	2019	9	12	836	-
71	Buhrmann C, Popper B, Kunnumakkara AB, Aggarwal BB, Shakibaei M.	Evidence That Calebin A, a Component of Curcuma Longa Suppresses NF-B Mediated Proliferation, Invasion and Metastasis of Human Colorectal Cancer Induced by TNF- β (Lymphotoxin)	Nutrients	2019	11	12	2904	-
72	Devi Khwairakpam A, Monisha J, Roy NK, Bordoloi D, Padmavathi G, Banik K, Khatoon E, Kunnumakkara AB.	Vietnamese Coriander Inhibits Cell Proliferation, Survival and Migration via Suppression of Akt/mTOR Pathway in Oral Squamous Cell Carcinoma	Journal of Basic and Clinical Physiology and Pharmacology	2019	Accepted	-	-	-
73	Bordoloi D, Monisha J, Roy NK, Padmavathi G, Banik K, Harsha C, Wang H, Kumar AP, Arfuso F, Kunnumakkara AB.	An Investigation on the Therapeutic Potential of Butein, A Tetrahydroxychalcone Against Human Oral Squamous Cell Carcinoma	Asian Pacific Journal of Cancer Prevention	2019	20	11	3437	3446
74	El-Naggar MH, Abdel Bar FM, Choudhary H, Javadi M, Shimizu K, Kunnumakkara AB, Badria FA.	Synthesis of new selective cytotoxic ricinine analogues against oral squamous cell carcinoma	Natural Product Research	2019	Accepted	-	1	12
75	Kunnumakkara AB, Harsha C, Banik K, Vikkurthi R, Sailo BL, Bordoloi D, Gupta SC, Aggarwal BB.	Is Curcumin Bioavailability a Problem in Humans: Lessons From Clinical Trials	Expert Opinion on Drug Metabolism & Toxicology	2019	15	9	705	733
76	Roy NK, Parama D, Banik K, Bordoloi D, Devi AK, Thakur KK, Padmavathi G, Shakibaei M, Fan L, Sethi G, Kunnumakkara AB.	An Update on Pharmacological Potential of Boswellic Acids Against Chronic Diseases	International Journal of Molecular Sciences	2019	20	17	4101	-

77	Roy NK, Monisha J, Padmavathi G, Lalhruaitluanga H, Kumar NS, Singh AK, Bordoloi D, Baruah MN, Ahmed GN, Longkumar I, Arfuso F, Kumar AP, Kunnumakkara AB.	Isoform-Specific Role of Akt in Oral Squamous Cell Carcinoma	Biomolecules	2019	9	7	253	-
78	Banik K, Ranaware AM, Deshpande V, Nalawade SP, Padmavathi G, Bordoloi D, Sailo BL, Shanmugam MK, Fan L, Arfuso F, Sethi G, Kunnumakkara AB.	Honokiol for Cancer Therapeutics: A Traditional Medicine That Can Modulate Multiple Oncogenic Targets	Pharmacological Research	2019	144	-	192	209
79	Kunnumakkara AB, Bordoloi D, Sailo BL, Roy NK, Thakur KK, Banik K, Shakibaei M, Gupta SC, Aggarwal BB.	Cancer Drug Development: The Missing Links	Experimental Biology and Medicine	2019	244	8	663	689
80	Kumar A, Roy A, Deshmukh MV, Tamuli R.	Dominant mutants of the calcineurin catalytic subunit (CNA-1) showed developmental defects, increased sensitivity to stress conditions, and CNA-1 interacts with CaM and CRZ-1 in <i>Neurospora crassa</i>	Archives of Microbiology	2019	doi: 10.1007/s00203-019-01768-z.			
81	Sarmah H, Shah M, Pathak M, Barman NN, Koul M, Gupta A, Sahariah PJ, Neher S, Das SK, Gogoi SM, Kumar S*	Pathodynamics of circulating strains of duck enteritis virus: A step forward to understand its pathogenesis.	Avian Dis	2020				
82	Nath B, Vandna, Saini HM, Prasad M, Kumar S*	Evaluation of Japanese encephalitis virus E and NS1 proteins immunogenicity using a recombinant Newcastle disease virus in mice.	Vaccine	2020	38	7	1860	1868
83	Gupta A, Deka P, Kumar S*	Resiquimod inhibits Newcastle disease virus replication by modulating host cytokines: An understanding towards its possible therapeutics.	Cytokine	2020	125	154 811		
84	Dey S, Gupta A, Saha A, Pal S, Kumar S*, Manna D*	Sunlight-Mediated Thiol-Ene/Yne Click Reaction: Synthesis and DNA Transfection Efficiency of New Cationic Lipids	ACS Omega	2020	5	1	735	750
85	Kumar R, Kumar V, Puro K, Barman NN and Kumar S*	Evaluation of surface glycoproteins of classical swine fever virus as an immunogen and an effective diagnostic for pig: A	Archives of Virology	2019	164		3007	3017

		recombinant Newcastle disease virus approach							
86	Morla S, Kumar A and Kumar S*	Newcastle disease virus mediated apoptosis and migration inhibition of human oral cancer cells: A probable role of Beta-catenin and matrix metalloproteinase-7.	Scientific Reports	2019	9	10882			
87	Kumar V, Yadav K, Kumar R, Chaudhary N, Kumar S*	Glycoprotein D peptide-based diagnostic approach for the detection of avian infectious laryngotracheitis antibodies.	Avian Pathology	2019	48	6	602	609	
88	Shah M, Bharadwaj M, Gupta A, Kumar R, Kumar S*	Chicken viperin inhibits Newcastle disease virus infection in vitro: A possible interaction with the viral matrix protein.	Cytokine	2019	120		28	40	
89	Dave U, Srivathsan A, Kumar S*	Analysis of codon usage pattern in the viral proteins of chicken anemia virus and its possible biological relevance.	Infect Genet Evol	2019	69		93	106	
90	Mondal, S, Kumar V, Roy Chowdhury S, Shah M, Gaur A, Kumar S*, Iyer P*	Template-Mediated Detoxification of Low-Molecular-Weight Amyloid Oligomers and Regulation of Their Nucleation Pathway.	ACS Applied Bio Materials	2019	2	12	5306	5312	
91	Panda S, Pradhan N, Chatterjee S, Morla S, Saha A, Roy A, Kumar S, Bhattacharyya A, and Manna D	4,5-Disubstituted 1,2,3-triazoles: Effective Inhibition of Indoleamine 2,3-Dioxygenase 1 Enzyme Regulates T cell Activity and Mitigates Tumor Growth.	Scientific Reports	2019	9	18455			
92	Ali MZ, Dahiya SS, Moula MM, Kumar S	Efficacy of chicken anemia vaccine in broiler parent stock	Journal of Veterinary Medicine	2019	17	1			
93	Akhtar N, Pradhan N, Saha A, Kumar V, Biswas O, Dey S, Shah M, Kumar S, Manna D	Tuning the Solubility of the Ionophores: Glutathione-Mediated Transport of Chloride Ion across the Membranes	Chem Commun.	2019	55	58	8482	8485	
94	Mulchandani N, Gupta A, Masutani K, Kumar S, Sakurai S, Kimura Y and Katiyar V	Effect of Block Length and Stereocomplexation on the Thermally Processable Poly(E-caprolactone) and Poly(Lactic acid) Block Copolymers for Biomedical Applications	ACS Applied Bio Materials	2019	1	12	3354	3365	
95	Khatoun E, Barman NN, Deka M, Hussain MI, Borah P, Kumar S	Cytokine responses in pigs after natural infection with classical swine fever virus.	Acta Virology	2019	63	1	60	69	
96	Saha A, Akhtar N, Kumar V, Kumar S, Srivastava HK, Kumar S, Manna D	pH-Regulated anion transport activities of bis(iminourea) derivatives across the cell and vesicle membrane.	Org. Biomol. Chem	2019	17	23	5779	5788	
97	Mondal, S, Roy Chowdhury S, Shah M, Kumar V, Kumar S, Iyer P	Nano Particle Assisted Regulation of Nucleation Pathway of Amyloid Tetramer and Inhibition of their Fibrillation Kinetics.	ACS Applied Bio Materials	2019	2	5	2137	2142	

98	Puranik NV, Srivastava P, Bhatt G, John Mary DJS, Limaye AM, Sivaraman J.	Determination and analysis of agonist and antagonist potential of naturally occurring flavonoids for estrogen receptor (ER α) by various parameters and molecular modelling approach	Scientific Reports	2019	9	1	7450	-
99	Goswami G., Kumar R., Sinah R., Maiti SK., Dutta BC., Singh H. and Das D.	A low cost and scalable process for harvesting microalgae using commercial grade flocculant	RSC Advances	2019	9		39011	39024
100	Shreya Mehrotra, Bruna A.G. de Melo, Minoru Hirano, Wendy Kung, Ronald A. Li, Biman B. Mandal*, Su Ryon Shin*	Non-mulberry Silk Based Ink for Fabricating Mechanically Robust Cardiac Patches and Endothelialized Myocardium-on-a-chip Application	Advanced Functional Materials	2020	30	12	-	-
101	Prerak Gupta, Katherine L. Lorentz, Darren G. Haskett, Eoghan M. Cunnane, Aneesh K. Ramaswamy, Justin S. Weinbaum, David A. Vorp* and Biman B. Mandal*	Bioresorbable silk grafts for small diameter vascular tissue engineering applications: <i>In vitro</i> and <i>in vivo</i> functional analysis	Acta Biomaterialia	2020	105	-	146	158
102	Charanya Ramachandran*, Prerak Gupta, Swatilekha Hazra and Biman B Mandal*.	In vitro culture of human corneal endothelium on silk fibroin films for tissue regeneration	Translational Vision Science & Technology	2020	9	4	12	-
103	Ashutosh Bandyopadhyay, Biman B. Mandal*	3D Printed Silk-based Biomimetic Tri-layered Meniscus for Potential Patient Specific Implantation	Biofabrication	2020	12	1	015003	-
104	Dimple Chouhan and Biman B Mandal*	Silk biomaterials in wound healing and skin regeneration therapeutics: From bench to bedside	Acta Biomaterialia	2020	103	-	24	51
105	Joseph Christakiran Moses, Triya Saha, and Biman B. Mandal*	Chondroprotective and osteogenic effects of silk-based bioinks in developing 3D bioprinted osteochondral interface	Bioprinting	2020	17	-	e00067	-
106	Satyajit Mahata, Araghni Bhattacharya, Jadi Praveen Kumar, Biman B. Mandal, Vadivelu Manivannan.	Naked-eye detection of Pd ²⁺ ion using a highly selective fluorescent heterocyclic probe by “turn-off” response and <i>in-vitro</i> live cell imaging	Journal of Photochemistry and Photobiology A: Chemistry	2020	394	-	112441	-
107	Ila Verma, Ashim Malakar, Abhijit Gogo, K. Anki Reddy, Manishekhar Kumar, Biman B. Mandal, G. Krishnamoorthy.	Pyridyl substitution control dynamics and shape dependence of fluorescent aggregates	Journal of Photochemistry and Photobiology A: Chemistry	2020	392	-	112405	-

108	Ashish A Prabhu, Jadi P. Kumar, Biman B. Mandal*, Venkata V Dasu*	High cell density cultivation for enhanced production of recombinant human interferon gamma (rhIFN- γ) using Glucose/Methanol carbon source and exploring the antitumor activity for potential biomedical applications	Biotechnology and Applied Biochemistry	2020	DOI: 10.1002/ bab.186 8	-	-	-
109	Bruna A. G. de Melo, Yasamin A. Jodat, Shreya Mehrotra, Michelle A. Calabrese, Tom Kamperman, Biman B. Mandal, Maria H. A. Santana, Eben Alsberg, Jeroen Leijten, Su Ryon Shin	3D Printed Cartilage-like Tissue Constructs with Spatially Controlled Mechanical Properties	Advanced Functional Materials	2019	29	51	1906330	-
110	Yogendra P. Singh, Ashutosh Bandyopadhyay, Biman B. Mandal*	3D Bioprinting using Cross-Linker Free Silk-Gelatin Bioink for Cartilage Tissue Engineering	ACS Applied Materials & Interfaces	2019	11	37	33684	33696
111	Junmin Lee, Vijayan Manoharan, Louis Cheung, Seungkyu Lee, Byung-Hyun Cha, Peter Newman, Razieh Farzad, Shreya Mehrotra, Kaizhen Zhang, Fazal Khan, Masoumeh Ghaderi, Yi-Dong Lin, Saira Aftab, Pooria Mostafalu, Mario Miscuglio, Joan Li, Biman B. Mandal, Mohammad Asif Hussain, Kai-tak Wan, Xiaowu (Shirley) Tang, Ali Khademhosseini, Su Ryon Shin	Nanoparticle-based hybrid scaffolds for deciphering the role of multi-modal cues in cardiac tissue engineering	ACS NANO	2019	13	11	12525	12539
112	Guru Janani, Shivanshi Kumar, Biman B. Mandal*	Fiber-Reinforced Silk Composite for Enhanced Urokinase Production Using High-Density Perfusion Culture and Bioactive Molecule Supplementation	ACS Biomaterials Science & Engineering	2019	5	11	6137	6151
113	Nandana Bhardwaj, Yogendra P. Singh, Biman B. Mandal*	Silk fibroin scaffolds based 3D co-culture model for modulation of chondrogenesis without hypertrophy via reciprocal crosstalk and paracrine signaling	ACS Biomaterials Science & Engineering	2019	5	10	5240	5254
114	Ashutosh Bandyopadhyay, Suvro Kanti Chowdhury, Souradeep Dey,	Silk – A promising biomaterial opening new vistas towards affordable healthcare solution	Journal of the Indian Institute of Science	2019	99	-	445	487

	Joseph Christakiran Moses and Biman B. Mandal*							
115	Jadi Praveen Kumar and Biman B. Mandal*	The Inhibitory Effect of Silk Sericin against Ultraviolet-induced Melanogenesis and Its Potential use in Cosmeceutics as an Anti-Hyperpigmentation Compound	Photochemical & Photobiological Sciences	2019	18	10	2497	2508
116	Guru Janani, Manishekhar Kumar, Dimple Chouhan, Joseph Moses, Ankit Gangrade, Sohenii Bhattacharjee, Biman B. Mandal*	An insight into silk-based biomaterials: From physico-chemical attributes to recent biomedical applications	ACS Applied Bio Materials	2019	2	12	5460	5491
117	Ankit Gangrade and Biman B. Mandal*	Injectable Carbon Nanotube Impregnated Silk Based Multifunctional Hydrogel for Localized Targeted and On-Demand Anticancer Drug Delivery	ACS Biomaterials Science and Engineering	2019	5	5	2365	2381
118	Dimple Chouhan, Namit Dey, Nandana Bhardwaj, Biman B. Mandal*	Emerging and innovative approaches for wound healing and skin regeneration: Current status and advances	Biomaterials	2019	216	-	119267	-
119	Dimple Chouhan, Piyali Das, Naresh Thatikonda, Samit K. Nandi, My Hedhammar, Biman B. Mandal*	Silkworm silk matrices coated with functionalized spider silk accelerate healing of diabetic wounds	ACS Biomaterials Science & Engineering	2019	5	7	3537	3548
120	Dimple Chouhan, Tshewuzo-u Lohe, Naresh Thatikonda, VGM Naidu, My Hedhammar, Biman B. Mandal*	Silkworm silk scaffolds functionalized with recombinant spider silk containing a fibronectin motif promotes healing of full-thickness burn wounds	ACS Biomaterials Science & Engineering	2019	5	9	4634	4645
121	Shreya Mehrotra, Joseph Christakiran Moses, Ashutosh Bandyopadhyay, Biman B. Mandal*	3D printing/bioprinting based tailoring of in vitro tissue models: Recent advances and challenges	ACS Applied Bio Materials	2019	2	4	1385	1405
122	Shreya Mehrotra, Dimple Chouhan, Rocktotpal Konwarh, Manishekhar Kumar, Jadi Praveen Kumar and Biman B. Mandal*	A comprehensive review on silk at nanoscale for regenerative medicine and allied applications	ACS Biomaterials Science & Engineering	2019	5	5	2054	2078
123	Piyali Das, Yogendra Pratap Singh, Siddhartha Narayan Joardar, Bikash Kanti Biswas, Rupnarayan Bhattacharya, Samit Kumar Nandi, Biman B. Mandal*	Decellularized Caprine Conchal Cartilage toward Repair and Regeneration of Damaged Cartilage	ACS Applied Bio Materials	2019	2	5	2037	2049

124	Arpita Shome, Adil M Rather, Aindrila Ghosal, Bibhas K Bhunia, Biman B Mandal*, Uttam Manna*	Rational Chemical Engineering in Natural Protein Derived Functional Interface	ACS Sustainable Chemistry & Engineering	2019	7	8	7502	7509
125	Dimple Chouhan, Shreya Mehrotra, Omkar Majumder and Biman B. Mandal*	Magnetic actuator device assisted modulation of cellular behavior and tuning of drug release on silk platform	ACS Biomaterials Science & Engineering	2019	5	1	92	105
126	Manikandan, N.A., Pakshirajan, K., Pugazhenth, G.	A closed-loop biorefinery approach for polyhydroxybutyrate (PHB) production using sugars from carob pods as the sole raw material and downstream processing using the co-product lignin	Bioresource Technology	2020	307			
127	Manikandan, N.A., Pakshirajan, K., Pugazhenth, G.	Preparation and characterization of environmentally safe and highly biodegradable microbial polyhydroxybutyrate (PHB) based graphene nanocomposites for potential food packaging applications	International Journal of Biological Macromolecules	2020	154		866	877
128	Goswami, L., Pakshirajan, K., Pugazhenth, G	Biological treatment of biomass gasification wastewater using hydrocarbonoclastic bacterium <i>Rhodococcus opacus</i> in an up-flow packed bed bioreactor with a novel waste-derived nano-biochar based bio-support material	Journal of Cleaner Production	2020	256			
129	Baskaran, D., Sinharoy, A., Pakshirajan, K., Rajamanickam, R.	Gas-phase trichloroethylene removal by <i>Rhodococcus opacus</i> using an airlift bioreactor and its modeling by artificial neural network.	Chemosphere	2020	247			
130	Manoj, K.M., Ramasamy, S., Parashar, A., Gideon D.A., Soman, V., Jacob, V.D., Pakshirajan, K.	Acute toxicity of cyanide in aerobic respiration: Theoretical and experimental support for murburn explanation	Biomolecular concepts	2020	11		32	56
131	Sinharoy, A., Pakshirajan, K.	A novel application of biologically synthesized nanoparticles for enhanced biohydrogen production and carbon monoxide bioconversion	Renewable Energy	2020	147		864	873
132	Kumar, M., Pakshirajan, K.	Novel insights into mechanism of biometal recovery from wastewater by sulfate reduction and its application in pollutant removal	Environmental Technology and Innovation	2020	17			
133	Baskaran, D., Sinharoy, A., Paul, T., Pakshirajan, K., Rajamanickam, R.	Performance evaluation and neural network modeling of trichloroethylene removal using a continuously operated two-phase partitioning bioreactor	Environmental Technology and Innovation	2020	17			

134	Negi, B.B., Sinharoy, A., Pakshirajan, K.	Selenite removal from wastewater using fungal pelleted airlift bioreactor	Environmental Science and Pollution Research	2020	27		992	1003
135	Sinharoy, A., Saikia, S., Pakshirajan, K.	Biological removal of selenite from wastewater and recovery as selenium nanoparticles using inverse fluidized bed bioreactor	Journal of Water Process Engineering	2019	32			
136	Baskaran, D., Rajamanickam, R., Pakshirajan, K.	Experimental studies and neural network modeling of the removal of trichloroethylene vapor in a biofilter	Journal of Environmental Management	2019	250			
137	Arun, S., Manikandan, N.A., Pakshirajan, K., Pugazhenth, G.	Novel shortcut biological nitrogen removal method using an algae-bacterial consortium in a photo-sequencing batch reactor: Process optimization and kinetic modelling	Journal of Environmental Management	2019	250			
138	Manoj, K.M., Soman, V., David Jacob, V., Parashar, A., Gideon, D.A., Kumar, M., Manekkathodi, A., Ramasamy, S., Pakshirajan, K., Bazhin, N.M.	Chemiosmotic and murburn explanations for aerobic respiration: Predictive capabilities, structure-function correlations and chemico-physical logic	Archives of Biochemistry and Biophysics	2019	676			
139	Sinharoy, A., Baskaran, D., Pakshirajan, K.	A novel carbon monoxide fed moving bed biofilm reactor for sulfate rich wastewater treatment	Journal of Environmental Management	2019	249			
140	Borah, S.N., Sen, S., Goswami, L., Bora, A., Pakshirajan, K., Deka, S.	Rice based distillers dried grains with solubles as a low-cost substrate for the production of a novel rhamnolipid biosurfactant having anti-biofilm activity against <i>Candida tropicalis</i>	Colloids and Surfaces B: Biointerfaces	2019	182			
141	Kanaujiya, D.K., Paul, T., Sinharoy, A., Pakshirajan, K.	Biological treatment processes for the removal of organic micropollutants from wastewater: a review	Current Pollution Reports	2019	5		112	128
142	Mandal, B., Prabhu, A., Pakshirajan, K., Veeranki Dasu, V.	Construction and parameters modulation of a novel variant <i>Rhodococcus opacus</i> BM985 to achieve enhanced triacylglycerol-a biodiesel precursor, using synthetic dairy wastewater	Process Biochemistry	2019	84		9	21
143	Patra, C., Mediseti, R.M.N., Pakshirajan, K., Narayanasamy, S.	Assessment of raw, acid-modified and chelated biomass for sequestration of hexavalent chromium from aqueous solution using <i>Sterculia villosa</i> Roxb. shells	Environmental Science and Pollution Research	2019	26		23625	23637
144	Goswami, L., Manikandan, N.A., Taube, J.C.R., Pakshirajan, K., Pugazhenth, G.	Novel waste-derived biochar from biomass gasification effluent: preparation, characterization, cost estimation, and application in polycyclic aromatic hydrocarbon biodegradation and lipid	Environmental Science and Pollution Research	2019	26		25154	25166

		accumulation by <i>Rhodococcus opacus</i>						
145	Sinharoy, A., Pakshirajan, K.	Heavy metal sequestration by sulfate reduction using carbon monoxide as the sole carbon and energy source	Process Biochemistry	2019	82		135	143
146	Paul, T., Baskaran, D., Pakshirajan, K., Pugazhenti, G.	Continuous bioreactor with cell recycle using tubular ceramic membrane for simultaneous wastewater treatment and bio-oil production by oleaginous <i>Rhodococcus opacus</i>	Chemical Engineering Journal	2019	367		76	85
147	Namboodiri, M.M.T., Pakshirajan, K.	Sustainable and green approach of chitosan production from <i>Penicillium citrinum</i> biomass using industrial wastewater as a cheap substrate	Journal of Environmental Management	2019	240		431	440
148	Arul Manikandan, N., Pakshirajan, K., Pugazhenti, G.	A novel ceramic membrane assembly for the separation of polyhydroxybutyrate (PHB) rich <i>Ralstonia eutropha</i> biomass from culture broth	Process Safety and Environmental Protection	2019	126		106	118
149	Goswami, L., Kumar, R.V., Arul Manikandan, N., Pakshirajan, K., Pugazhenti, G.	Anthracene biodegradation by oleaginous <i>Rhodococcus opacus</i> for biodiesel production and its characterization	Polycyclic Aromatic Compounds	2019	39		207	2019
150	Sinharoy, A., Baskaran, D., Pakshirajan, K.	Sustainable biohydrogen production by dark fermentation using carbon monoxide as the sole carbon and energy source	International Journal of Hydrogen Energy	2019	44		13114	13125
151	Riddhi Banerjee, Neha Joshi, Shirisha Nagotu	Cell organelles and yeast longevity: an intertwined regulation	Current Genetics	2019	66		15	41
152	Samridhi Pathak, Sarita Tripathi, Nayan Deori, Basir Ahmad, Hriday Verma, Rama Lokhande, Shirisha Nagotu, Avinash Kale	Effect of Tetracycline family of antibiotics on actin aggregation, resulting in the formation of Hirano bodies responsible for neuropathological disorders	Journal of Biomolecular Structure and Dynamics	2020		DOI:10.1080/07391102.2020.1717629		
153	Swati Sharma, Poulami Datta, Birendra Kumar, Pankaj Tiwari and Lalit M. Pandey	Production of novel Rhamnolipids via biodegradation of waste cooking oil using <i>Pseudomonas aeruginosa</i> (MTCC7815),	Biodegradation	2019	30	4	301	312
154	Swati Sharma, Rahul Verma and Lalit M. Pandey	Insights of ex-situ crude oil biodegradation, its pathway and biosurfactant anabolism by a novel rhizospheric bacteria <i>Agrobacterium fabrum</i> SLAJ731	Biocatalysis and Agricultural Biotechnology	2019	21			
155	Aquib Jawed, and Lalit M. Pandey	Application of bimetallic Al-doped ZnO nanoassembly for heavy metal removal and decontamination of wastewater	Water Science and Technology	2019	80	11	2067	2078

156	Ashutosh Kumar, Buddhadev Purohit, Pawan Kumar Maurya, Lalit M. Pandey, Pranjal Chandra	Engineered Nano-biomolecules assisted signal-amplification strategies towards analytical performance of electrochemical biosensors	Electroanalysis	2019	31	9	1615	1629
157	Varun Saxena, and Lalit M. Pandey	Synthesis, characterization and antibacterial activity of aluminum doped zinc oxide	Materials Today: Proceedings	2019	18	2	1388	1400
158	Varun Saxena, and Lalit M. Pandey	Bimetallic assembly of Fe (III) doped ZnO as an effective nanoantibiotic and its ROS independent antibacterial mechanism	Journal of trace elements in medicine and biology	2020	57			
159	Abshar Hasan, and Lalit M. Pandey	Surface modification of Ti6Al4V by forming hybrid self-assembled monolayers and its effect on Collagen-I adsorption, osteoblast adhesion and integrin expression	Applied Surface Science	2020	505			
160	Aquib Jawed, Varun Saxena, and Lalit M. Pandey	Engineered nanomaterials and their surface functionalization for the removal of heavy metals: A review	Journal of Water Process Engineering	2020	33			
161	Abshar Hasan, Kyueui Lee, Kunal Tewari, Lalit M. Pandey, Phillip B. Messersmith, Karen Faulds, Michelle Maclean, and King Hang Aaron Lau	Surface Design for Immobilization of an Antimicrobial Peptide Mimic for Efficient Anti-Biofouling	Chemistry - A European Journal	2020	DOI: 10.1002/chem.202000746			
162	Swati Sharma, Ch. Shiney Rashmitha, Lalit M. Pandey	Synthesis and characterization of methyl acrylamide cellulose nanowhiskers for environmental applications	Letters in Applied NanoBioScience	2020	9		880	884
163	Valeria Castelletto, Jani Seitsonen, Kunal M. Tewari, Abshar Hasan, Robert M. Edkins, Janne Ruokolainen, Lalit M. Pandey, Ian W. Hamley, King Hang Aaron Lau,	Self-Assembly of Minimal Peptoid Sequences	ACS Macro Lett.	2020	9		494	499
164	Swati Sharma, Lalit M. Pandey	Production of biosurfactant by <i>Bacillus subtilis</i> RSL-2 isolated from sludge and biosurfactant mediated degradation of oil	Bioresource Technology	2020	307			
165	V. S. Yadav, A. Kumar, A. Das, D. Pamu, Lalit M. Pandey, M. R. Sankar	Degradation kinetics and surface properties of bioceramic hydroxyapatite coated AZ31 magnesium alloys for biomedical applications	Materials Letters	2020	270			
166	Mullick, P., Mukherjee, S., Das, G.* and Ramesh, A.*	Generation of a Hydroxyapatite Nanocarrier through Biom mineralization Using Cell-Free Extract of Lactic Acid Bacteria for Antibiofilm Application	ACS Applied Bio Materials	2019	2	7	2927	2936

167	Mukherjee, S., Das, G.* and Ramesh, A.*	Biocompatible Nanocomposite Tailored to Endure the Gastric Niche Renders Effective In Vitro Elimination of Intestinal Pathogenic Bacteria and Supports Adhesion by Beneficial Bacteria	ACS Applied Bio Materials	2019	2	8	3225	3233
168	Dey, P., Das, G.* and Ramesh, A.*	Interplay between Supramolecular and Coordination Interactions in Synthetic Amphiphiles: Triggering Metal Starvation and Anchorage onto MRSA Cell Surface	Langmuir	2020	36	8	2110	2119
169	Gaurav Pandey, Sudhir Morla, Sachin Kumar and Vibin Ramakrishnan	Modulation of tau protein aggregation using 'Trojan' sequences.	Biochimica et Biophysica Acta, BBA - General Subjects	2020	1864	7	189569	
170	Gaurav Jerath, Ruchika Goyal, Vishal Trivedi, T. R. Santhoshkumar and Vibin Ramakrishnan	Conformationally constrained peptides for drug delivery.	Journal of Peptide Science	2020	DOI: 10.1002/psc.3244			
171	Gaurav Pandey, Sudhir Morla, Sachin Kumar and Vibin Ramakrishnan.	Modulating A β Fibrillogenesis with 'Trojan' peptides	Neuropeptides	2020	DOI: 10.1016/j.npep.2020.102030.			
172	Gaurav Pandey, Prem Prakash Das and Vibin Ramakrishnan	Directive effect of chain length in modulating peptide nano-assemblies	Protein & Peptide Letters	2020	DOI: 10.2174/0929866527666200224114627			
173	P Baruah, D Mahanta, I Chakrabartty, L Rangan, AK Sharma, A Khare	Efficacy of cellulose paper treated with Cu and Ag oxide nanoparticles synthesized via pulsed laser ablation in distilled water in the annihilation of bacteria from contaminated water.	Review of Scientific Instruments	2020	DOI:10.1063/1.5144495			
174	P Baruah, A Singh, L Rangan, AK Sharma, A Khare	Elucidation of size, structure, surface plasmon resonance and photoluminescence of Ag nanoparticles synthesized by pulsed laser ablation in distilled water and its viability as SERS substrate.	Applied Physics A	2020	doi.org/10.1007/s00339-020-3375-1.46	1		
175	AR Shelke, L Rangan*	The role of transposable elements in <i>Pongamia</i> unigenes and protein diversity.	Molecular Biotechnology	2020	62		31	42
176	IH Mondal, L Rangan, R Uppaluri	Effect of oven and intermittent airflow assisted tray drying methods on nutritional parameters of few leafy and non-leafy vegetables of North-East India.	Heliyon	2019	5		e02934	
177	A Paul, J Deka, N Gujre, L Rangan, S Mitra	Does nature of livelihood regulate the urban community's vulnerability to climate change?	Journal of Environmental Management	2019	251		109591	

		Guwahati city, a case study from North East India.						
178	R Shelke, L Rangan*	Isolation and characterisation of <i>Ty1-copia</i> retrotransposons from <i>Pongamia pinnata</i> Trees.	Trees Structure and Function	2019	33	6	1559	1570
179	S Basak, AM Ramesh, A Parida, S Mitra, L Rangan*	Evaluation of rapid molecular diagnostics for differentiating medicinal <i>Kaempferia</i> species from its adulterants.	Plant Diversity	2019	41		206	211
180	I Chakrabartty, A Vijayasekhar, L Rangan*	Therapeutic potential of labdane diterpene isolated from <i>Alpinia nigra</i> : Detailed hemato-compatibility and antimicrobial studies.	Natural Products Research	2019	DOI: 10.1080/14786419.2019.1610756.			
181	Abhishek Kumar and P. Satpati*	Mg ²⁺ vs Ca ²⁺ bound active site of group II intron– A MD Study., (2020)	J Mol Graph Model	2020	DOI: 10.1016/j.jmglm.2020.107546			
182	G. Pandit, K. Biswas, S. Ghosh, S. Debnath, A. P. Bidkar, P. Satpati*, A. Bhunia* and S. Chatterjee*	Rationally Designed Antimicrobial Peptides: Insight into the Mechanism of Eleven Residue Peptides against Microbial Infections.	BBA - Biomembranes	2020	DOI: 10.1016/j.bbame.2020.183177			
183	S. Shukla, A Kumar, D. Das, P. Satpati*	Principle of DNA recognition by sporulation-regulatory protein (Spo0A) in <i>Bacillus Subtilis</i> .	Journal of Biomolecular Structure and Dynamics	2020	DOI: 10.1080/07391102.2019.1696890			
184	A. Kumar, P. Satpati*	Why double-stranded RNA with 5'-monophosphate is a poor binder to retinoic acid-inducible gene-I with respect to 5'-hydroxyl analogue?	Journal of Biomolecular Structure and Dynamics	2019	DOI:10.1080/07391102.2019.1671225			
185	A. Kumar, J. Aqvist, P. Satpati	Principles of tRNA ^{Ala} selection by alanyl-tRNA synthetase based on the critical G3U70 base pair .	ACS Omega	2019	4	13	15539	15548
186	Tasrin Shahnaz, Mohamed Fazil S, Padmanaban VC, Selvaraju Narayanasamy,	Surface modification of nanocellulose using polypyrrole for the adsorptive removal of Congo red dye and Chromium in binary mixture	International Journal of Biological Macromolecules	2020	151	-	322	332
187	Shravan Kumar, Tasrin Shahnaz, Selvaraju Narayanasamy, Rajaraman Prasanna Venkatesh	Kinetic and thermodynamic studies on biosorption of Cr(VI) on raw and chemically modified <i>Datura stramonium</i> fruit	Environmental Monitoring and Assessment	2020	192	4	-	-
188	Abhishek Ajmani, Chandi Patra, Senthilmurugan Subbiah, Selvaraju Narayanasamy	Packed bed column studies of hexavalent chromium adsorption by zinc chloride activated carbon synthesized from <i>Phanera vahlii</i> fruit biomass	Journal of Environmental Chemical Engineering	2020	-	-	-	-

189	Chandi Patra, Tasrin Shahnaz, Senthilmurugan Subbiah, Selvaraju Narayanasamy	Comparative assessment of raw and acid-activated preparations of novel <i>Pongamia pinnata</i> shells for adsorption of hexavalent chromium from simulated wastewater	Environmental Science and Pollution Research	2020	103	-	1	16
190	Tasrin Shahnaz, Chandi Patra, Vivek Sharma, Selvaraju Narayanasamy	A comparative study of raw, acid-modified and EDTA-complexed <i>Acacia auriculiformis</i> biomass for the removal of hexavalent chromium	Chemistry and Ecology	2020	-	-	1	22
191	N. Jegan Durai, G. V. T. Gopalakrishna, V. C. Padmanaban & N. Selvaraju	Oxidative removal of stabilized landfill leachate by Fenton's process: process modeling, optimization & analysis of degraded products	RSC Advances	2020	10	-	3916	3925
192	V Karthik, K Saravanan, Chandi Patra, B Ushadevi, S Vairam, Selvaraju Narayanasamy	Biosorption of Acid Yellow 12 from simulated wastewater by non-viable <i>T. harzianum</i> : kinetics, isotherm and thermodynamic studies	International Journal of Environmental Science and Technology	2019	16	11	6895	6906
193	Arunkumar Chandrasekaran, Senthilmurugan Subbiah, Senthumadhavan Ramachandran, Selvaraju Narayanasamy, Pietro Bartocci, Francesco Fantozzi	Natural Draft-Improved Carbonization Retort System for Biocarbon Production from <i>Propolis juliflora</i> biomass	Energy & Fuels	2019	33	11	11113	11124
194	Naveenkumar Ashok Yaranal, Sneha Kumari, Selvaraju Narayanasamy, Senthilmurugan Subbiah	An analysis of the effects of pressure-assisted osmotic backwashing on the high recovery reverse osmosis system	Journal of water supply: Research and Technology-Aqua	2019	-	-	-	-
195	K Keerthi, Selvaraju Narayanasamy, Lily Alen Varghese	Use of combined receptor modeling technique for prediction of possible sources of particulate pollution in Khozikode, India	International Journal of Environmental Science and Technology	2019	-	-	1	14
196	Abhishek Ajmani, Tasrin Shahnaz, Senthilmurugan Subbiah, Selvaraju Narayanasamy	Hexavalent chromium adsorption on virgin, biochar, and chemically modified carbons prepared from <i>Phanera vahlii</i> fruit biomass: equilibrium, kinetics and thermodynamics approach	Environmental Science and Pollution Research	2019	26	31	32137	32150
197	K Janani, N Sivarajasekar, Tasrin Shahnaz, Selvaraju Narayanasamy	Optimization of EDTA enriched phytoaccumulation of zinc by <i>Ophiopogon japonicus</i> : Comparison of Response Surface, Artificial Neural Network and Random Forest Models	Bioresource Technology Reports	2019	7	-	-	-
198	R Saravanakumar, K Muthukumar, Selvaraju Narayanasamy	Enhanced Pb(II) ions removal by using magnetic NiO/Biochar composite	Material Research Express	2019	6	10	-	-

199	V Karthik, N Sivarajasekar, VC Padmanaban, E Nakkeeran, Selvaraju Narayanasamy	Biosorption of xenobiotic Reactive Black B onto metabolically inactive <i>T. Harzianum</i> biomass: optimization and equilibrium studies	International Journal of Environmental Science and Technology	2019	16	7	3625	3636
200	Chandi Patra, Raj Mohan Naidu Mediseti, Kannan Pakshirajan, Selvaraju Narayanasamy	Assessment of raw, acid-modified and chelated biomass for sequestration of hexavalent chromium from aqueous solution using <i>Sterculia villosa</i> Roxb. shells	Environmental Science and Pollution Research	2019	26	23	23625	23637
201	E Suganya, N Saranya, Chandi Patra, Lity Alen Varghese, Selvaraju Narayanasamy	Biosorption potential of <i>Gliricidia sepium</i> leaf powder to sequester hexavalent chromium from synthetic aqueous solution	Journal of Environmental Chemical Engineering	2019	7	3	103	112
202	B Deka and K. K. Singh	The arginine and serine-rich domains of Acinus modulate splicing.	Cell Biology International	2019	43	8	954	959
203	A Dutta, A Dalmia, R Athul, K K Singh, A Anand	Using the Chou's 5-steps rule to predict splice junctions with interpretable bidirectional long short-term memory networks	Computers in Biology and Medicine	2020	116	-	103558	103558
204	Mohd. Ziauddin Ansari and Rajaram Swaminathan	Structure and dynamics at N- and C-terminal regions of intrinsically disordered human c-Myc PEST degron reveal a pH-induced transition	PROTEINS: Structure Function Bioinformatics	2020	doi:10.1002/prot.25880			
205	Amrendra Kumar, Dileep Ahari, Anurag Priyadarshi, Mohd. Z. Ansari and Rajaram Swaminathan	Weak Intrinsic Luminescence in Monomeric Proteins Arising from Charge Recombination.	J. Phys. Chem. B	2020	124	14	2731	2746
206	Haridhasapavalan KK*, Raina K*, Dey C*, Adhikari P, Thummer RP (* Equal contribution)	An Insight into Reprogramming Barriers to iPSC Generation	Stem Cell Reviews and Reports	2020	16	1	56	81
207	Dey S, Patel A, Raina K, Pradhan N, Biswas O, Thummer RP [§] , Manna D [§] [§] Corresponding Author	A stimuli-responsive anticancer drug delivery system with inherent antibacterial activities	Chemical Communications	2020	56	11	1661	1664
208	Borgohain MP*, Haridhasapavalan K*, Dey C, Adhikari P, Thummer RP (* Equal contribution)	An Insight into DNA-free Reprogramming Approaches to Generate Integration-free Induced Pluripotent Stem Cells for Prospective Biomedical Applications	Stem Cell Reviews and Reports	2019	15	2	286	313
209	Kuldeep Mahato, Pranjali Chandra*	Paper based miniaturized immunosensor for naked eye ALP detection based on digital image colorimetry integrated with smartphone	Biosensors and Bioelectronics	2019	128	-	9	16

210	Ashutosh Kumar, Buddhadev Purohit, Kuldeep Mahato, Riddhipratim Mandal, Ananya Srivastava, Pranjal Chandra*	Gold - Iron bimetallic nanoparticles impregnated reduced graphene oxide based nanosensor for label-free detection of biomarker related to non-alcoholic fatty liver disease	Electroanalysis	2019	31	12	2417	2428
211	Ridhima Wadhwa, Taru Aggarwal, Noopur Thapliyal, Ashutosh Kumar, Priya, Pooja Yadav, Vandana Kumari, Boda Sai Charan Reddy, Pranjal Chandra, Pawan Kumar Maurya*	Red blood cells as an efficient in vitro model for evaluating the efficacy of metallic nanoparticles	3 Biotech	2019	9	279	-	-
212	Shilpi Verma, Jyoti Choudhary, Krishna P Singh, Pranjal Chandra, Surinder Singh	Uricase grafted nanoconducting matrix based electrochemical biosensor for ultrafast uric acid detection in human serum samples	International Journal of Biological Macromolecules	2019	130	-	333	341
213	Kuldeep Mahato, Sahil Nagpal, Mahero Ayesha Shah, Ananya Srivastava, Renu Singh; Pawan Kumar Maurya, Amit Jaiswal, Pranjal Chandra*	Gold nanoparticle surface engineering strategies and their applications in biomedicine and diagnostics	3 Biotech	2019	9	57	-	-
214	Kuldeep Mahato, Buddhadev Purohit, Keshav Bhardwaj, Amit Jaiswal, Pranjal Chandra*	Novel electrochemical biosensor for serotonin detection based on gold nanorattles decorated reduced graphene oxide in biological fluids and in vitro model	Biosensors and Bioelectronics	2019	142	-	-	-
215	Buddhadev Purohit, Kuldeep Mahato, Ashutosh Kumar, and Pranjal Chandra*	Sputtering enhanced peroxidase like activity of a repurposed dendritic nanochip for label-free hydrogen peroxide detection in blood sample	Microchimica Acta	2019	186	-	658	-
216	Ashutosh Kumar, Buddhadev Purohit, Kuldeep Mahato, Sharmili Roy, Ananya Srivastava, Pranjal Chandra	Design and Development of Ultrafast Sinapic Acid Sensor Based on Electrochemically Nanotuned Gold Nanoparticles and Solvothermally Reduced Graphene Oxide	Electroanalysis	2019	31	-	1	12
217	Buddhadev Purohit, Ashutosh Kumar, Kuldeep Mahato, Pranjal Chandra	Novel sensing assembly comprising engineered gold dendrites and MWCNT-AuNPs nanohybrid for acetaminophen detection in human urine	Electroanalysis	2020	32	3	561	570
218	Kuldeep Mahato, Buddhadev Purohit, Ashutosh Kumar, Pranjal Chandra	Clinically comparable impedimetric immunosensor for serum alkaline phosphatase detection based on electrochemically engineered Au-	Biosensors and Bioelectronics	2020	148	-	-	-

		nano-Dendroids and graphene oxide nanocomposite						
219	Buddhadev Purohit, Ashutosh Kumar, Kuldeep Mahato, Pranjali Chandra*	Electrodeposition of Metallic Nanostructures for Biosensing Applications in Health Care	Journal of Scientific Research	2020	64	1	-	-
220	Buddhadev Purohit, Kuldeep Mahato, Ashutosh Kumar, Pranjali Chandra*	Smartphone assisted personalized diagnostics devices and wearable sensors	Current Opinion in Biomedical Engineering	2020	13	-	42	50

Conference/Workshop/Seminar/Symposia (PERIOD: 1 APRIL 2019 – 31 MARCH 2020)
Total No. of papers (posters/ abstracts) published in Conference Proceedings: 109

Format for submission of papers published in Conference Proceedings

S. No.	Authors	Paper Title	Name of Conference/ Workshop/ Seminar/ Symposia Proceedings	Year	Starting Page	Ending Page
1	Pratik Nag, Souptick Chanda	Proximal Femoral Locking Plate (PFLP): <i>in silico</i> assessment of external bone remodeling under static loading.	International Conference on Smart Materials for Sustainable Technology	2020		
2	Srirupa Bhattacharyya and Siddhartha Ghosh	Recombinant tmTNF alpha in cancer therapeutics (Srirupa Bhattacharyya)	INCD 2019: 4th International Conference on Nutraceuticals and chronic diseases, Sept 2019, IIT Guwahati	2019		
3	Anil P. Bidkar and Siddhartha Ghosh	Evaluation of Synergistic anticancer activity of MAPK pathway inhibitor & folic acid receptor targeted selenium nanoparticles	INCD 2019: 4th International Conference on Nutraceuticals and chronic diseases, Sept 2019, IIT Guwahati	2019		
4	Debashree Debasmita and Siddhartha Ghosh	Gold nanocluster on bacterial cell surface (Poster - Debashree Debasmita)	ICANN 2019: 6th International Conference on Advanced Nanomaterials and Nanotechnology, Centre for Nanotechnology, IIT Guwahati	2019		
5	Anitha T. Simons and Siddhartha Ghosh	Drug loaded luminescent nanocarrier for antibacterial and anti-biofilm applications	ICANN 2019: 6th International Conference on Advanced Nanomaterials and Nanotechnology, Centre for Nanotechnology, IIT Guwahati	2019		
6	Srirupa Bhattacharyya and Siddhartha Ghosh	Transmembrane TNF alpha expressed macrophage membrane coated chitosan nanoparticles as cancer therapeutics (Poster - Srirupa Bhattacharyya)	ICANN 2019: 6th International Conference on Advanced Nanomaterials and Nanotechnology, Centre for Nanotechnology, IIT Guwahati	2019		
7	Upashi Goswami and Siddhartha Ghosh	Nanomaterials for theranostic applications (Short talk – Upashi Goswami)	ICANN 2019: 6th International Conference on Advanced Nanomaterials and	2019		

			Nanotechnology, Centre for Nanotechnology, IIT Guwahati			
8	Anil P. Bidkar and Siddhartha Ghosh	Red blood cell membrane coated nanocarriers in cancer therapy (Short talk - Anil P. Bidkar)	ICANN 2019: 6th International Conference on Advanced Nanomaterials and Nanotechnology, Centre for Nanotechnology, IIT Guwahati	2019		
9	Deepanjali Dutta and Siddhartha Ghosh	Biomaterials for theranostic and in-vitro 3D cell culture platforms (Short talk - Deepanjali Dutta)	ICANN 2019: 6th International Conference on Advanced Nanomaterials and Nanotechnology, Centre for Nanotechnology, IIT Guwahati	2019		
10	Shilpi Sarkar and Siddhartha Ghosh	Emergence of protein therapeutics in cancer	Departmental Retreat, BSBE, IIT Guwahati	2019		
11	Anil P. Bidkar and Siddhartha Ghosh	Synergistic antiproliferative action of MAPK pathway inhibitor & folic acid receptor targeted selenium nanoparticles	Departmental Retreat, BSBE, IIT Guwahati	2019		
12	Srirupa Bhattacharyya and Siddhartha Ghosh	Deciphering insights of novel recombinant tmTNF alpha in Cancer therapeutics	Departmental Retreat, BSBE, IIT Guwahati	2019		
13	Srirupa Bhattacharyya	Unravelling the role of transmembrane TNF alpha for cancer therapy	World Congress on Cancer, Mahatma Gandhi Medical college and hospital, Jaipur	2020		
14	B. Chatterjee, R. Palaniappan, and C.N. Gupta	Performance Evaluation of Manifold Algorithms on a P300 Paradigm Based Online BCI Dataset	In: Henriques J., Neves N., de Carvalho P. (eds) XV Mediterranean Conference on Medical and Biological Engineering and Computing – MEDICON 2019. MEDICON 2019. IFMBE Proceedings, vol 76. Springer, Cham	2019	1894	1898
15	A. K.Pal, D. Roy, G.V Kumar, B. Chatterjee, L. N. Sharma, A Banerjee, and C.N. Gupta	Empirical Mode Decomposition Algorithms for Classification of Single-Channel EEG Manifesting McGurk Effect	International Conference Series on Intelligent Human-Computer Interaction 2020 Springer Nature Switzerland AG 2020 U. S. Tiwary and S. Chaudhury (Eds.): IHCI 2019, LNCS 11886	2020	49	60
16	Trishna Anand, Jina Bhattacharyya, Bithiah Grace Jaganathan,	Effect of leukemia-bone marrow stroma interactions on stromal and leukemic cells in Acute myeloid leukemia	1st Annual meeting of Hematology Cancer Consortium	2019		
17	Amit Sharma, Jina Bhattacharyya, Bithiah Grace Jaganathan,	Understanding chemoresistance in AML	1st Annual meeting of Hematology Cancer Consortium	2019		

18	Nikhil Kulkarni, and Bithiah Grace Jaganathan	Role of Piezo1 in Colorectal Cancer Metastasis	8th International Translational Cancer Research Conference	2020		
19	Monika Chandravanshi and Shankar Prasad Kanaujia	Structural insights into the selective transport mechanism of α -glycoside ABC transporter and its thermodynamic correlation	16 th Conference of the Asian Crystallographic Association (AsCA2019). December 17-20, 2019. National University of Singapore (NUS), Singapore	2019		
20	Angshu Dutta and Shankar Prasad Kanaujia	Application in Crystallography and Drug Discovery	Indo-Italian Elettra Beamline Workshop: November 11-12, 2019. AIIMS, JNU, NII, ICGEB and RCB, New Delhi	2019		
21	Shankar Prasad Kanaujia	Structure-based functional characterization of protein translation initiation factors and their homologs in archaea	National Seminar on Crystallography (NSC-47), June 19-22, 2019, BARC Mumbai, India	2019		
22	Prerana Gogoi and Shankar Prasad Kanaujia	Understanding the rationale of substrate promiscuity of thermophilic NDP-sugar pyrophosphorylases	National Seminar on Crystallography (NSC-47), June 19-22, 2019, BARC Mumbai, India	2019		
23	Monika Chandravanshi and Shankar Prasad Kanaujia	Structural insights into the selective transport mechanism of disaccharide α -glycosides through ABC transporter	National Seminar on Crystallography (NSC-47), June 19-22, 2019, BARC Mumbai, India	2019		
24	Suraj Kumar Mandal and Shankar Prasad Kanaujia	Metal binding spectrum of a putative metal-specific substrate binding protein from <i>Thermus thermophilus</i> HB8	National Seminar on Crystallography (NSC-47), June 19-22, 2019, BARC Mumbai, India	2019		
25	Prerana Mordina and Shankar Prasad Kanaujia	Structural and Computational Biology Laboratory	1 st Departmental Retreat (Biotech Express). December 21 st , 2019. Department of Biosciences and Bioengineering, IIT Guwahati, India	2019		
26	Vineet Anand and Manish Kumar	Biochemical characterization of a core Cas protein of CRISPR-Cas subtype-IC in <i>Leptospira interrogans</i> serovar Copenhageni strain Fiocruz L1-130	Challenges and Threats of Microbes to Animals and Humans IAVMICON2020, Izatnagar, UP	2020	-	-
27	Madhurima Choudhury, Manish Kumar	The novel role of trigger factor in stimulating caseinolytic serine protease activity of <i>Leptospira</i>	Emerging Areas in Biosciences and Biomedical Technologies-2, IIT Indore	2020	47	47
28	Md. Saddam Hussain, Manish Kumar	<i>Leptospira</i> Cas8b protein: a genetic fusion of large and small subunit of CRISPR-Cas type I-B Cascade complex	Emerging areas in Biosciences and Biomedical Technologies-2 (eBBT-2), IIT Indore	2020	46	46
30	Aman Prakash and Manish Kumar	Potential application of supramolecule ErpY-Like lipoprotein of <i>Leptospira</i> as anticoagulant, complement regulation, and leptospirosis diagnostic kit development	Global Bio-India, New Delhi DBT	2019	-	-

31	Saha G, Khamar B.M, Kumar M, Dubey V.K	Unraveling the role of BLIMP-1 induction during Leishmania donovani infection as a novel escape mechanism	17th International conference of Immunology, Oct 19-23, 2019 Beijing China	2019	1174	1175
32	Anusua Dhara and Manish Kumar	Potential application of natural antibiotic acyldepsipeptide (ADEP1) for targeting ClpP protease of pathogenic Leptospira	Global Bio-India, New Delhi	2019		
33	Dixcy Jaba Sheeba JM, Girija Sikarwar, Mohan C Manjegowda, Ajay Kumar, Anil Mukund Limaye*.	Regulation of cystatin A by estrogen and DNA methylation in breast cancer cells.	Indian Association of Cancer Research , Kovalam, Kochi	5-7 february 2020	23	23
34	Uttariya pal, Mohan C. Manjegowda and Anil M. Limaye*	Transcriptome profiling using next-generation sequencing of MCF-7 cells treated with GPER1-specific agonist G1	World Congress on Cancer, Jaipur	3-5 February 2020	44	44
35	Prerak Gupta, Katherine L. Lorentz, Darren G. Haskett, Eoghan M. Cunnane, Aneesh K. Ramaswamy, Justin S. Weinbaum, David A. Vorp, Biman B. Mandal.	Functional analysis of tubular bilayered silk scaffolds in a rat aortic model for vascular tissue engineering applications.	Combined symposium of The International Society for Applied Cardiovascular Biology and International Society of Vascular Tissue Engineering(ISACB + ISVTE 2019)	2019	1	26
36	Joseph Christakiran Moses, Triya Saha and Biman B. Mandal.	Chondroprotective and osteoinductive silk based bioinks for 3D bioprinting stem cell laden biomimetic osteochondral interface.	International conference on Biomaterial based therapeutic engineering and regeenrative medicine	2019	150	154
37	Shreya Mehrotra, Su Ryon Shin, Biman B. Mandal.	3D Printed Functional and Vascularized Cardiac Constructs Fabricated using h-iPSCs Encapsulated Non-Mulberry Silk Based Bioink.	International conference on Biomaterial based therapeutic engineering and regeenrative medicine	2019	138	142
38	Tanushree Paul, Kannan Pakshirajan and G. Pugazhenth	Bio-oil production from oleaginous <i>Rhodococcus opacus</i> biomass treating refinery wastewater in a bioreactor under fed batch operation mode.	ICESD-2020, February 14-15, 2020, Jadavpur University, Kolkata, India	2020		
39	Tanushree Paul, Iyyappan J, Kannan Pakshirajan and G. Pugazhenth	Biological treatment of refinery wastewater using a submerged tubular membrane bioreactor	RACEEE-2020, February 13-14, 2020, SSN College of Engineering, Chennai, India	2020		
40	Tanushree Paul, Kannan Pakshirajan and G. Pugazhenth	Valorization of <i>Rhodococcus opacus</i> biomass cultivated using refinery wastewater by hydrothermal liquefaction	WATER-2020, January 23-25, 2020, Guwahati, India	2020		
41	Moumita Nandi, Dipak Kumar Kanaujiya and Kannan Pakshirajan	Surfactant aided batch biodegradation of benzyl butyl phthalate and di-butyl phthalate by <i>Arthrobacter</i> sp.	WATER-2020, January 23-25, 2020, Guwahati, India	2020		

42	Moumita Nandi, Dipak Kumar Kanaujiya and Kannan Pakshirajan	Surfactant aided batch biodegradation of benzyl butyl phthalate and di-butyl phthalate by <i>Arthrobacter</i> sp.	WEES-2020, January 13-15, 2020, Durgapur, India	2020		
43	Tanushree Paul, Kannan Pakshirajan and G. Pugazhenth	Eco-toxicity analysis of biologically treated refinery wastewater following cell recycle with tubular membrane	INCD-2019, September 23-25, 2019, IIT Guwahati, Guwahati, India	2020		
44	M. M. Tejas Namboodiri and Kannan Pakshirajan	Fungal chitosan production by <i>Penicillium citrinum</i> using paper mill wastewater: induction kinetics of acetic acid	ICCS-2019, September 19-20, 2019, ICT Mumbai, Mumbai, India	2019		
45	Manoj Kumar and Kannan Pakshirajan	Removal and recovery of heavy metals from acid mine drainage by bio-precipitation	International Conference on Biomass, Fuels and Chemicals, September 12-13, 2019, Annamalai University, India	2019		
46	Arun S and Kannan Pakshirajan	Enhanced biological nitrogen removal in a photo sequencing batch reactor with an algae enriched ammonium oxidizing denitrifiers	International Conference on Biomass, Fuels and Chemicals, September 12-13, 2019, Annamalai University, India	2019		
47	Poulami Datta, P. Tiwari and Lalit M. Pandey	Understanding the Role of Biosurfactants in MEOR Application	Indian Chemical Engineering Congress, CHEMCON-2019	2019		
48	Aman Bharadwaj and Lalit M. Pandey	Adsorption behaviour of bovine serum albumin on Surface with amine self assembled monolayers	Emerging Trends on Advances in Materials Science, ETAMS-2020	2020		
49	Lalit M. Pandey	Self-Assembled Monolayers: Kinetics and Applications in Biomaterials	Emerging Trends on Advances in Materials Science, ETAMS-2020	2020		
50	Swati Sharma, and Lalit M. Pandey	Bio-stimulation of biosurfactant on the biodegradation of crude oil by <i>Bacillus subtilis</i> RSL-2	International Conference on Bioprocess for Sustainable Environment and Energy, ICBSEE-2020	2020		
51	Rahul Verma, and Lalit M. Pandey	Characterization and optimization study of biosurfactant produced from molasses using isolated bacterial strain <i>Bacillus subtilis</i> RSL-2	International Conference on Bioprocess for Sustainable Environment and Energy, ICBSEE-2020	2020		
52	Varun Saxena, Lalit M Pandey, K H Aaron Lau	Solid phase synthesis of Sequence Specific "Peptoids"	International conference on "Peptide Synthesis and Purification"	2020		
53	Varun Saxena, Aqub Jawed, Lalit M. Pandey	Application of bimetallic Al-doped ZnO nano-assembly for heavy metal removal and decontamination of wastewater	Workshop cum Symposium on Bioinspired Nanomaterials for Environmental Applications	2020		
54	Swati Sharma, Lalit M. Pandey	Biosorption of methylene blue dye and lead removal from wastewater immobilized <i>Agrobacterium fabrum</i> SLAJ731	Workshop cum Symposium on Bioinspired Nanomaterials for Environmental Applications	2020		

55	Poulami Datta, Lalit M. Pandey	Evaluation of Oil Washing Efficiency of the Biosurfactant Produced by <i>Bacillus tequilensis</i> from Assam Reservoir Soil,	Workshop cum Symposium on Bioinspired Nanomaterials for Environmental Applications	2020		
56	Rupshikha Patowary, Pankaj Tiwari, Lalit M. Pandey	Microbial Enhanced Oil Recovery (MEOR): Strategies to enhance its efficiency	Workshop cum Symposium on Bioinspired Nanomaterials for Environmental Applications	2020		
57	Samvidha Das, Aman Bhardwaj, Lalit M. Pandey	Biogenic Silver Nanoparticle as an Effective Nanoantibioti	Workshop cum Symposium on Bioinspired Nanomaterials for Environmental Applications	2020		
58	Swati Sharma, Lalit M. Pande	Synthesis and characterization of methyl acryl functionalized amido-cellulose nanowhiskers	Workshop cum Symposium on Bioinspired Nanomaterials for Environmental Applications	2020		
59	Rahul Verma, Lalit M. Pandey	Photocatalytic decolorization of molasses based spent wash using UV/ZnO/TiO ₂ /H ₂ O ₂	Workshop cum Symposium on Bioinspired Nanomaterials for Environmental Applications	2020		
60	Mizanur Rahman, Gopikishan Sabavath, Trinayan Sarmah, Pubali Dihingia, Swati Sharma, Lalit M. Pandey and M. Kakati	Plasma assisted, single-step synthesis of Ag-C nanocomposites with less than ten nano-meter average sizes for antibacterial applications	Workshop cum Symposium on Bioinspired Nanomaterials for Environmental Applications	2020		
61	Sushmita Mishra, Lalit M. Pandey	Role of protein aggregates immobilized biosorbents for heavy metal remediation	Workshop cum Symposium on Bioinspired Nanomaterials for Environmental Applications	2020		
62	Rushikesh Fopase, Lalit M. Pandey	Therapeutic potential of Yttrium Orthoferrites in magnetic hyperthermia for cancer treatment,	International conference on Bioengineering and Regenerative medicine	2020		
63	Vivek Singh Yadav, Anupam Kumar, Apurba Das, D. Pamu, Mamilla Ravi Sankar and Lalit M. Pandey	Hydroxyapatite Deposition over AZ31 for Biomedical Applications,	International conference on Nanoscience and Technology, ICONSAT-2020	2020		
64	MK Gupta, AK Chiranjivi, VK Dubey* L Rangan	Study of Zinc derivatized 3,5-Dihydroxy, 4', 7-Dimethoxyflavone against <i>Leishmania</i> parasite	Fourth International conference on " Nutraceuticals and Chronic diseases (INCD)	2019	141	
65	S Senthilkumar, R Swaminathan*, L Rangan*,	Purification and Characterization of Mammeigin: A possible therapeutic neoflavonoid from <i>Mesua ferrea</i>	Fourth International conference on " Nutraceuticals and Chronic diseases (INCD)	2019	230	

66	G Bhatt, A Kumar, L Rangan*, AM Limaye*,	Insight into Estrogen Receptor alpha (ER-alpha) and ligands (Estrogen, Karanjin) interactions using Computer simulations", ,	Fourth International conference on " Nutraceuticles and Chronic diseases (INCD)	2019	256	
67	L Rangan*	Labdane diterpenes from seeds of <i>Alpinia nigra</i> as promising nutraceuticles	Fourth International conference on " Nutraceuticles and Chronic diseases (INCD)	2019	58	
68	Amrendra Kumar, Shah E Alom, Anurag Priyadarshi, Dileep Ahari, Mohd Z Ansari and Rajaram Swaminathan	Unraveling the Origin of Multi-Exponential Fluorescence Intensity Decay of Tryptophan in Proteins	64 th Annual Meeting of the Biophysical Society, Feb 15—19, San Diego, California, USA	2020	469a	469a
69	Amrendra Kumar, Dileep Ahari, Anurag Priyadarshi, Mohd. Z. Ansari and Rajaram Swaminathan	Weak Intrinsic Luminescence in Monomeric Proteins Arising from Charge Recombination	64 th Annual Meeting of the Biophysical Society, Feb 15—19, San Diego, California, USA	2020	468a	468a
70	Tamuli R, Gohain D, Roy A, Baruah D, Marak CNK, Deka R, Laxmi V, Barman A, Kumar R	Calcium signaling and stress tolerance in the model filamentous fungus <i>Neurospora crassa</i> (Poster presentation)	Asian Microbiology Conference 2019 (AMC 2019), October 1- 4, 2019	2019	-	-
71	Tamuli R, Gohain D, Kumar A, Roy A, Marak CNK, Baruah D.	The CRZ-1 transcription factor and calcium signaling genes are required for heat-shock response, normal circadian clock, and cellulose degradation in <i>Neurospora crassa</i> (Oral presentation)	XI International Conference on Biology of Yeasts and Filamentous Fungi (ICBYFF 2019), November 27-29, 2019	2019	42	42
72	Marak CNK, Tamuli R.	Insights on the mechanism of calmodulin and calcium/calmodulin-dependent kinases in regulating stress tolerance and sexual development in <i>Neurospora crassa</i> (Poster presentation)	XI International Conference on Biology of Yeasts and Filamentous Fungi (ICBYFF 2019), November 27-29, 2019	2019	60	60
73	Roy A, Tamuli R	Identification of critical amino acid residues of calcineurin regulatory subunit (<i>cnb-1</i>) involved in stress response and cross talk with heat shock stress pathway via its target calcineurin responsive zinc finger protein (CRZ-1) in <i>Neurospora crassa</i> (Poster presentation and Flash Talk)	XI International Conference on Biology of Yeasts and Filamentous Fungi (ICBYFF 2019), November 27-29, 2019	2019	80	80
74	Ngiime SD, Tamuli R.	Understanding the molecular mechanism of zinc transporter genes in <i>Neurospora crassa</i> (Poster presentation)	XI International Conference on Biology of Yeasts and Filamentous Fungi (ICBYFF 2019), November 27-29, 2019	2019	122	122

75	Baruah D, Tamuli R.	Understanding the role of phospholipase C-1 and secretory phospholipase A2 in circadian clock and biomass degradation in <i>Neurospora crassa</i>	XI International Conference on Biology of Yeasts and Filamentous Fungi (ICBYFF 2019), November 27-29, 2019	2019	134	134
76	Roy A, Tamuli R	The calcineurin responsive zinc finger protein upregulates <i>hsp80</i> for survival under heat shock stress condition in <i>Neurospora crassa</i>	EMBO Symposium on Calcium Signaling: Molecular mechanisms to role in health and diseases, January 26-29, 2019	2020	61	61
77	Kumar A, Tamuli R	Transcriptional regulation of the calcium signaling gene <i>cna-1</i> in <i>Neurospora crassa</i> under different cellular conditions (Poster presentation)	EMBO Symposium on Calcium Signaling: Molecular mechanisms to role in health and diseases, January 26-29, 2019	2020	-	-
78	Tamuli R, Roy A, Kumar A, Baruah D, Marak CNK, Tiwari A, Ngiime SD	Calcium signaling genes play a role in stress tolerance, thermotolerance, cellulose degradation, and circadian clock in <i>Neurospora crassa</i> (oral Presentation)	Satellite Workshop, SW5 <i>Neurospora crassa</i> , ECFG15, February 17-20, 2020	2020	211	212
79	Tamuli R, Gohain D, Kumar A, Roy A, Marak CNK, Baruah D.	Calcium signaling genes play an important role in tolerance to calcium stress and survival under various stress conditions in <i>Neurospora crassa</i> (Poster presentation)	15 th European Conference on Fungal Genetics (ECFG15), February 17-20, 2020	2020	212	212
80	Rachayeeta Deb and Shirisha Nagotu	Investigating the role of the peroxisomal protein Pex25 in cellular ageing in <i>Saccharomyces cerevisiae</i>	XI International Conference on Biology of Yeasts and Filamentous Fungi	2019	116	116
81	Nayan Moni Deori, Terence Infant W L and Shirisha Nagotu	Characterizing the dual targeting and function of the peroxisomal protein Pex30	XI International Conference on Biology of Yeasts and Filamentous Fungi	2019	74	74
82	Riddhi Banerjee and Shirisha Nagotu	To gain insights into the Drp1 related disorders through analyses of equivalent orthologous mutations in budding yeast Dnm1	XI International Conference on Biology of Yeasts and Filamentous Fungi	2019	101	101
83	Neha Joshi, Neha Meena and Shirisha Nagotu	Investigating the role of peroxisomes in Parkinson's disease	XI International Conference on Biology of Yeasts and Filamentous Fungi	2019	117	117
84	Kedar Sharma, Carlos M.G.A. Fontes, Shabir Najmudin and Arun Goyal	SAXS based structure, modelling and molecular dynamics analyses of family 43 glycoside hydrolase α -L-arabinofuranosidase (CtAraf43) from <i>Clostridium thermocellum</i> .	16th International Conference of the Asian Crystallographic Association, Singapore	2019		
85	Sumitha Banu Jamaldheen, Philip Bernstein Saynik, Vijayanand S. Moholkar and Arun Goyal	Fermentation of xylose of hydrolysate from acid treated FMS and pyrolysis of solid residue: A biorefinery approach	1st International Symposium on Analytical and Applied Pyrolysis, IIT Madras, Chennai, India	2019		

86	Kishan Jaiswal, Kedar Sharma and Arun Goyal	In silico characterization of putative α -L-arabinofuranosidase of family 30 glycoside hydrolase from <i>Ruminococcus flavefaciens</i>	International Carbohydrate Conference on Emerging Frontiers in Carbohydrate Chemistry and Glycobiology , University of Lucknow, UP, India	2019		
87	Kedar Sharma, Kaustubh Chandrakant Khaire, Abhijeet Thakur, Vijayanand Suryakant Moholkar and Arun Goyal	Isolation and characterization of glucuronoxylan from Babool as substitute of commercial xylan for xylanase activity evaluation.	International Carbohydrate Conference on Emerging Frontiers in Carbohydrate Chemistry and Glycobiology , University of Lucknow, UP, India	2019		
88	Kedar Sharma, Sudhir Morla, Kaustubh Chandrakant Khaire, Abhijeet Thakur, Vijay Suryakant Moholkar, Sachin Kumar and Arun Goyal	Extraction, characterization of xylan from neem sawdust and its application in xylanase mediated production of anticancer xylooligosaccharides	International Carbohydrate Conference on Emerging Frontiers in Carbohydrate Chemistry and Glycobiology , University of Lucknow, UP, India	2019		
89	Kaustubh Chandrakant Khaire, Kedar Sharma, Arun Goyal and Vijayanand Suryakant Moholkar	Extraction and characterization of xylan from sugarcane tops.	IV International Conference on Sustainable Energy & Environmental Challenges (IV SEEC), CSIR-National Environmental Engineering Research Institute, Nagpur, Maharashtra, India	2019		
90	Kedar Sharma, Kaustubh Chandrakant Khaire, Abhijeet Thakur, Vijayanand Suryakant Moholkar and Arun Goyal	Acacia xylan as a potential commercial xylan and its application in production of xylooligosaccharides	International Conference on New Horizons in Biotechnology , Trivandrum, Kerala, India	2019		
91	Priyanka Nath, Maibam Premeshworii Devi, Shweta Singh, Vikky Rajulapati and Arun Goyal	Comparative pretreatment using mild alkali and organosolv method for improving enzymatic digestibility of Sugarcane bagasse using cocktail of Chimera (CtGH1-L1-CtGH5-F194A) and Cellobiohydrolase (CBH5A) for bioethanol production	60th Annual Conference of AMI & International Symposium on Microbial Technologies in Sustainable Development of Energy, Environment, Agriculture and Health,, Central University of Haryana, Mahendra Garh	2019		
92	Parmeshwar Gavande, Priyanka Nath, Nazneen Ahmed and Arun Goyal	Structural and functional characterization of a recombinant enzyme of family GH5_4 (RfGH5_4) from <i>Ruminococcus flavefaciens</i> FD-1 v3	88th Society of Biological Chemists' (SBC(I) Annual Meeting and symposium on Advances at the interface of chemistry and biology , Bhabha Atomic Research Centre (BARC),	2019		

			Mumbai, Maharashtra, India			
93	Priyanka Nath, Kedar Sharma and Arun Goyal	Combined SAXS and computational approaches for structure determination and binding characteristics of chimera (CtGH-L1-CtGH5-F194A) generated by assembling β -glucosidase (CtGH1) and a mutant endoglucanase (CtGH5-F194A) from <i>Clostridium thermocellum</i>	88th Society of Biological Chemists' (SBC(I) Annual Meeting and symposium on Advances at the interface of chemistry and biology, Bhabha Atomic Research Centre (BARC), Mumbai, Maharashtra, India	2019		
94	Chinmay Kamale, Kedar Sharma, Arun Goyal and Prasenjit Bhaumik	Structure guided improvement of β -glucosidase from <i>Hungtaiclostridium thermocellum</i> for industrial bioethanol production	DBT National Workshop on Bioenergy (DNWB-2019), IIT Kharagpur, Kolkata, West Bengal, India	2019		
95	Priyanka Nath, Arun Dhillon, Krishan Kumar, Kedar Sharma, Sumitha Banu Jamaldeen, Vijayanand Suryakant Moholkar and Arun Goyal	Assembling of β -glucosidase (CtGH1) and mutant endoglucanase (CtGH5-F194A) from <i>Clostridium thermocellum</i> to develop chimera by protein engineering for enhancing biomass saccharification	DBT National Workshop on Bioenergy (DNWB-2019), IIT Kharagpur, Kolkata, West Bengal, India	2019		
96	Ayaka Tsuchiya, Kedar Sharma, Arun Goyal, Kosei Yamauchi, Tohru Mitsunaga	Search for target protein of quercetin derivatives which have anti-metastasis activity	International Conference on Nutraceuticals and Chronic Diseases (INCD 2019), Indian Institute of Technology Guwahati, Assam, India	2019		
97	Kedar Sharma, Sudhir Morla, Kaustubh Chandrakant Khaire, Abhijeet Thakur, Vijay Suryakant Moholkar, Sachin Kumar and Arun Goyal	Xylanase mediated production of xylooligosaccharides from neem sawdust xylan and its anticancer potential	International Conference on Nutraceuticals And Chronic Diseases (INCD 2019), Indian Institute of Technology Guwahati, Assam, India	2019		
98	Krishan Kumar, Vikky Rajulapati and Arun Goyal	<i>In vitro</i> prebiotic potential, digestibility and biocompatibility assay of Laminarioligosaccharides produced from curdlan by β -1,3-endoglucanase (CtLam81A)	International Conference on Nutraceuticals And Chronic Diseases (INCD 2019), Indian Institute of Technology Guwahati, Assam, India	2019		
99	Vikky Rajulapati, Arun Dhillon and Arun Goyal	Green process of degumming of jute fiber and bioscouring of cotton fabric by alkaline pectinases from <i>Clostridium thermocellum</i>	National Conference on Recent Trends and Advancements in Chemical Sciences, University of Delhi	2019		
100	Shweta Singh, Priyanka Nath, Krishan Kumar and Arun Goyal	Analysis of mechanism for enhanced catalytic efficiency of CMCase from <i>Bacillus amyloliquefaciens</i> SS35 UV2 mutant strain	8th International Forum on Industrial Bioprocessing (IBA-IFIBiop 2019) "Bridging Sustainability and Industrial Revolution	2019		

			through Green Bioprocessing”, Imperial Hotel, Miri, Sarawak, Malaysia			
101	Mohanapriya.N*, Shweta Singh, Priyanka Nath, Sumitha Banu and Arun Goyal	Saccharification of <i>Sorghum durra</i> by chimeric enzyme (β -glucosidase and endo β -1,4 glucanase, C α GH1-L1-C α GH5-F194A) and cellobiohydrolase (C α CBH5A) from <i>Clostridium thermocellum</i> for bioethanol production	8th International Forum on Industrial Bioprocessing (IBA-IFIBiop 2019) “Bridging Sustainability and Industrial Revolution through Green Bioprocessing”, Imperial Hotel, Miri, Sarawak, Malaysia	2019		
102	Sumitha Banu J., Abhijeet Thakur, Vijay S. Moholkar and Arun Goyal	Hemicellulose saccharification from pretreated finger millet straw by recombinant hemicellulases for bioethanol production	8th International Forum on Industrial Bioprocessing (IBA-IFIBiop 2019) “Bridging Sustainability and Industrial Revolution through Green Bioprocessing”, Imperial Hotel, Miri, Sarawak, Malaysia	2019		
103	Priyanka Nath, Arun Dhillon, Krishan Kumar, Kedar Sharma, Sumitha Banu J., V.S. Moholkar and Arun Goyal	Chimera construction from cellulose hydrolysing enzymes by protein engineering for enhancing biomass saccharification	8th International Forum on Industrial Bioprocessing (IBA-IFIBiop 2019) “Bridging Sustainability and Industrial Revolution through Green Bioprocessing” Imperial Hotel, Miri, Sarawak, Malaysia	2019		
104	Chandi Patra, Ajit Kumar, Selvaraju Narayanasamy	Surface porosity modified biopolymer for enhanced sequestration of dye from simulated water.	REFLUX 2019, Indian Institute of Technology Guwahati, Assam, India.	2019		
105	Tasrin Shahnaz, S. Mohamed Madhar Fazil and Selvaraju Narayanasamy	Facile preparation of nanocellulose embedded polypyrrole composite for bromophenol blue and direct blue 6 removal: unary and binary process optimisation and seed toxicity.	REFLUX 2019, Indian Institute of Technology Guwahati, Assam, India.	2019		
106	Tasrin Shahnaz, V. Vishnu Priyan, Selvaraju Narayanasamy	Optimisation of Cr (VI), Co (III) and Cu (II) adsorption onto synthesized Nanobentonite incorporated Nanocellulose/Chitosan Aerogel using Central Composite Design.	WATER 2020, Indian Institute of Technology Guwahati, Assam, India.	2020		
107	Rishabh Gupta, Das Bedadeep, Selvaraju Narayanasamy	Cationic Surfactant modified acid activated biomass for effective sequestration of anionic diazo dyes.	WATER 2020, Indian Institute of Technology Guwahati, Assam, India.	2020		
108	S. Mohamed Madhar Fazil, Tasrin Shahnaz, Selvaraju Narayanasamy	Synthesis of Nanocellulose Embedded Polypyrrole composite and its application in the removal of Congo red and Chromium.	WATER 2020, Indian Institute of Technology Guwahati, Assam, India.	2020		

109	S. Mohamed Madhar Fazil, Tasrin Shahnaz, Selvaraju Narayanasamy	Preparation and Characterisation of Nanocellulose/Polypyrrole composites and its application in antibiotic removal in wastewater.	ICBSEE 2020, National Institute of Technology Rourkela, Odisha	2020		
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Book, Book Chapter, etc. (PERIOD: 1 APRIL 2019 – 31 MARCH 2020)

Total No. of Books published: 01

Total No. of Book Chapters published: 25

Format for submission of Book

S. No.	Name of Author/s	Name of Book	Publisher	Volume and Issue No. (If any)	Total Page No.	ISBN	Year of Publication
1	A Senapati, N Gujre, S Mitra, L Rangan	FLORA of IIT Guwahati		1	211		2019

Format for submission of Book Chapter, etc.

S. No.	Name of Author/s	Name of Paper	Name of Book	Publisher	Volume and Issue No. (If any)	Page No.	ISBN	Year and Date of Publication
1	Samar Das , Shayaram Basumatary, Pankaj Kalita, Vinayak Kulkarni, Pranab Goswami, Akhil Garg, Xiongbin Peng	Bioelectricity Production from Lignocellulosic Biomass	Lignocellulosic Biorefining Technologies	Wiley Online Library	Chapter 6	87-123	Print ISBN:9 781119 568827 Online ISBN:9 781119 568858	10 January 2020 DOI:1 0.1002/ 978111 956885 8
2	Rwivoo Baruah and Arun Goyal	Chapter 7, Exopolysaccharide from Genus Weissella and their functional applications	Microbial Exopolysaccharides: Current Research and Developments, ed Özlem Ateş Duru	Caister Academic Press. DOI:https:// doi.org/10.2 1775/978191 2530267.07	-	18 (165- 182)	-	2019
3	Kaustubh Chandrakant Khaire, Seema Patel, Parmeshwar Vitthal Gavande, Vijayanand Suryakant Moholkar and Arun Goyal	Extremophilic Biofilms “	Biofilm Engineering” eds. R. Navanietha Krishnaraj and R. Sani.	ACS Publishing. (accepted)	-	-	-	2019
4	Rwivoo Baruah and Arun Goyal	Exopolysaccharides from lactic acid bacteria in fermented foods and beverages	Lactic Acid Bacteria: Food Fermentation and Human	Academic Press (Elsevier)/Sp ringer/CRC press	-	-	-	2019

			Wellness" editor R.C. Ray					
5	Sachin Kumar	Avian Paramyxoviruses	Recent Advances in Animal Virology	Springer		339	978- 981-13- 9072-2	2019
6	Venkateswara R Naira, Mahesh R., Suraj K Panda and Soumen K Maiti	Biorefinery Approaches for the Production of Fuels and Chemicals from Lignocellulosic and Algal Feedstocks	Biorefinery of Alternative Resources: Targeting Green Fuels and Platform Chemicals	Springer		141- 170	978- 981-15- 1803-4 (Hard cover), 978- 981-15- 1804-1	2020
7	Manishekhar Kumar , G. Janani, Magali J. Fontaine, David L. Kaplan, Biman B. Mandal.	Silk-based encapsulation materials to enhance pancreatic cell functions	Transplantation , Bioengineering, and Regeneration of the Endocrine Pancreas	Elsevier	Vol. 2	329- 337	978012 814833 4	2020
8	Piyali Das, Yogendra Pratap Singh, Biman B. mandal, Samit Kumar Nandi	Tissue-derived decellularized extracellular matrices toward cartilage repair and regeneration	Methods in Cell Biology	Elsevier	Vol. 157		-	2019
9	Joseph Christakiran Moses, Ankit Gangrade, Biman B. Mandal	Carbon Nanotubes and Their Polymer Nanocomposites	Nanomaterials and Polymer Nanocomposite s	Elsevier	-	145- 175	978012 814615 6	2019
10	M. M. Tejas Namboodiri and Kannan Pakshirajan	Valorization of waste biomass for chitin and chitosan production	<u>Waste Biorefinery</u> Integrating Biorefineries for Waste Valorisation	Elsevier		241- 266	978-0- 12- 818228 -4	Januar y 2020
11	N. Arul Manikandan, Kannan Pakshirajan and G. Pugazhenth	Value addition of waste lignocellulosic biomass through polyhydroxybutyrat e production	Waste Biorefinery Integrating Biorefineries for Waste Valorisation	Elsevier		155- 178	978-0- 12- 818228 -4	Januar y 2020
12	R. Vinoth Kumar, I.G. Moorthy, L. Goswami, G. Pugazhenth, K. Kannan Pakshirajan, Adrián M. T. Silva and Sergio Morales-Torres	Analytical methods in biodiesel production	Biomass Valorization to Bioenergy, Energy, Environment, and Sustainability,	Springer		197- 219	978- 981-15- 0409-9	12 th Octobe r 2019
13	Rushikesh Fopase and Lalit M. Pandey	Magnetic nanomaterials for biomedical application. Materials	Magnetochemis try: Materials and Applications	Pandey Research Forum, USA		276- 322	978164 490060 4	2020

14	Udaratta Bhattacharjee and Lalit M. Pandey	Nanoengineered Materials based Novel Catalysts for different Bio-electrochemical systems	Novel Catalyst Materials for Bioelectrochemical Systems: Fundamentals and Applications	ACS books		45-71	9780841236684	2020
15	Surajbhan Sevda, V.K. Garlapati, Swati Sharma, Udaratta Bhattacharjee, Lalit M. Pandey, T.R. Sreekrishnan	Oil and petrochemical industries wastewater treatment in bioelectrochemical systems	Integrated Microbial Fuel Cells for Wastewater Treatment	Elsevier			9780128174937	2020
16	Poulami Datta, Pankaj Tiwari, and Lalit M Pandey	Microbial Biosurfactants: Remediation of Contaminated Soils	Biodegradation, Pollutants and Bioremediation Principles	CRS Press				2020
17	Swati Sharma and Lalit M. Pandey	Nano-sorbents assisted microbial bioremediation of hazardous petroleum hydrocarbons	Removal of Toxic Pollutants through Microbiological and Tertiary Treatment	Elsevier			9780128210147	2020
18	Aquib Jawed, Swati Sharma, Animes K Golder, Lalit M. Pandey	Plant polyphenols mediated synthesis of iron oxide nanomaterials for heavy metal removal: A review	New Trends in Removal of Heavy Metals from Waste Water Treatment	Elsevier				2020
19	Rahul Verma, Lal Mohan Kundu, and Lalit M. Pandey	Decontamination of distillery spent wash through advanced oxidation methods. In: Advanced Oxidation Processes for Effluent Treatment Plants	Advanced Oxidation Processes for Effluent Treatment Plants	Elsevier			9780128210111	2020
20	Kuldeep Mahato, Buddhadev Purohita, Ashutosh Kumara, Pranjal Chandra	Paper-based Biosensors for Clinical and Biomedical Applications: Emerging Engineering Concepts and Challenges	Comprehensive Analytical Chemistry	Elsevier	89		9780444643452	2020
21	Srijeeb Karmakar, Varun Saxena, Pranjal Chandra, Lalit M Pandey*	Novel Therapeutics and Diagnostics Strategies Based on Engineered Nanobiomaterials	Nanotechnology in Modern Animal Biotechnology	Springer		1-27	9789811360039	2019
22	Sharmili Roy, Shweta J. Malode, Nagaraj P. Shetti*, Pranjal Chandra*	Modernization of Biosensing Strategies for the Development of Lab-on-Chip Integrated Systems	Bioelectrochemical Interface Engineering	Wiley Press		325-342	9781119538424	2019
23	Buddhadev Purohit, Ashutosh Kumar, Kuldeep	Cancer Cytosensing Approaches in Miniaturized	Nanotechnology in Modern Animal	Elsevier		131-147	9780128188231	2019

	Mahato, Sharmili Roy, Pranjal Chandra*	Settings Based on Advanced Nanomaterials and Biosensors	Biotechnology: Concepts and Applications					
24	Ashutosh Kumar, Sharmili Roy, Ananya Srivastava, Mastan Mukram Naikwade, Buddhadev Purohit, Kuldeep Mahato, VGM Naidu, Pranjal Chandra*.	Nanotherapeutics: A Novel and Powerful Approach in Modern Healthcare System	Nanotechnology in Modern Animal Biotechnology: Concepts and Applications	Elsevier		149-161	9780128188231	2019
25	Ashutosh Kumar, Buddhadev Purohit, Kuldeep Mahato Pranjal Chandra*	Advance Engineered Nanomaterials in Point-of-care Immunosensing for Biomedical Diagnostics	Immunosensors ; Detection Science Series	Royal Society of Chemistry		238-266	9781788014373	2019

10. Conferences/Workshops/Symposia Attended: International, National

S.No	Name of Faculty	Name of Conf./Workshop	Place	Date	International/National
1	Dr. Anil Mukund Limaye	National Conference on Cancer Biology and Therapeutics	ILS, Bhubaneswar	29 th -30 th Nov, 2019	National
2	Dr. Anil Mukund Limaye	2 nd World Congress on Cancer	MGUMST, Jaipur	3 rd -5 th Feb, 2020	International
3	Dr. Anil Mukund Limaye	8 th International Translational Cancer Research Conference	BH, Varanasi	13 th -16 th Feb, 2020	International
4	Prof. Biman B. Mandal	IITG Society And Northeast India (ISANI-an Introspection)	IIT Guwahati	February 21, 2020	National
5	Prof. Biman B. Mandal	Nanobioteck 2019, Organized by Indian Society of Nanomedicine (ISNM) in partnership with Department of Biotechnology (DBT), Govt. of India,	Aerocity Delhi	November 21 – 23, 2019	International
6	Prof. Biman B. Mandal	Combined symposium of The International Society for Applied Cardiovascular Biology and International Society of Vascular Tissue Engineering (ISACB + ISVTE 2019)	University of Zurich, Zurich, Switzerland	June 19-21, 2019	International
7	Prof. Kannan Pakshirajan	National Conference on Environment and Biosciences	Avinashilingam University, Coimbatore, Tamil Nadu	20 th & 21 st February, 2020	National
8	Prof. Kannan Pakshirajan	Workshop on Metal Biorecovery and Bioremediation	Principal Hotel, Manchester, UK	28 th and 29 th November 2019	International
9	Prof. Kannan Pakshirajan	MaREI Symposium 2019	University of Limerick, Ireland	6 th and 7 th November 2019	International
10	Prof. Kannan Pakshirajan	Trends in Environmental Biotechnology - Bio-hydrogen and Bio-chemical Production for Ireland's circular economy	National University of Ireland Galway, Ireland	31 st October 2019	International

11	Prof. Kannan Pakshirajan	Launch of GenComm's Community Hydrogen Forum	Dublin College University Alpha, Dublin, Ireland	21 st October 2019	International
12	Prof. Kannan Pakshirajan	Symposium on Microbial Genomics, Host-Pathogen Interactions and Metagenomics	National University of Ireland Galway, Ireland	8 th and 9 th October at	International
13	Dr. Lalit M. Pandey	Emerging Trends on Advances in Materials Science, ETAMS-2020	Gurgaon	Jan 16-17, 2020	National
14	Prof. Aiyagari Ramesh	"Exploring Synthetic Molecules and the Nano-Bio Platform as Therapeutics Against Drug-Resistant Pathogenic Bacteria"	Acharya Nagarjuna University, Andhra Pradesh	Guntur	05 March 2020
15	Prof. Latha Rangan	2 nd Rural Dialogue	IIT Guwahati		National
16	Prof. Latha Rangan	21st Indo US Flow Cytometry Workshop on "Basics of Flow Cytometry and its Applications in Plant Biology Indo-US Flow Cytometry Symposium	Eternal University, Baru Sahib, HP	6-7 Feb 2020	International
17	Prof. Latha Rangan	Fourth INCD	IIT Guwahati	23-25 Sep 2019	International
18	Prof. Latha Rangan	IPR Conclave	USTM, Meghalaya	16 August 2019	National
19	Prof. Latha Rangan	International workshop on empowerment and autonomy of women through a biobased circular economy design: resource recovery from waste.	IIT Guwahati	25 July 2019	International
20	Dr. Kusum K. Singh	World Congress on Cancer	Mahatma Gandhi Medical College and Hospital, Jaipur	03 - 05 Feb, 2020	International
21	Dr. Kusum K. Singh	Cancer Biology Conference	Institute of Life Science, Bhubaneswar	29 – 30 Nov, 2019	National
22	Prof. Ranjan Tamuli	15 th European Conference on Fungal Genetics (ECFG15)	Sapienza University of Rome and Frentani Convention Center Rome, Italy	February 17-20, 2020	International
23	Prof. Ranjan Tamuli	XI International Conference on Biology of Yeasts and Filamentous Fungi (ICBYFF 2019)	Hyderabad Central University, India	November 27-29, 2019	International
24	Prof. Ranjan Tamuli	Asian Microbiology Conference 2019 (AMC 2019)	Mie Center for the Arts, Tsu, Japan	October 1-4, 2019	International
25	Prof. Ajaikumar B Kunnumakkara	The International Conference on Pharmacology Advances in Translational Sciences & Drugs Discovery	National University of Singapore, Singapore	July-4-5, 2019	International
26	Prof. Ajaikumar B Kunnumakkara	2nd International Conference on Cancer Biology and Cell Science	Kuala Lumpur, Malaysia	November 23-24, 2019	International

11. Invited Lectures of Faculty: In India, Abroad (Please do not repeat entries from Sl. No. 10)

S.No	Name of Faculty	Name of Lecture	Name of Inst./Org.	Place	Date
1	Dr. B. Anand	Assembly Defects Compromise Initiation Codon Recognition by Initiation Factors and License the	10 th RNA Group Meet, Rajiv Gandhi Centre for Biotechnology	Thiruvananthapuram	2 May 2019

		Entry of Premature Ribosomes into the Translation Cycle			
2	Prof. S. S. Ghosh	Towards Point of Care Nanotheranostic Devices	International Conference "RDAB-2020	Indian Institute of Information Technology Allahabad (IIT Allahabad	7 th March, 2020
3	Prof. Pranab Goswami	Delivered key note lecture on DEVELOPING 3G BIO-ELECTRODE FOR BIOSENSOR AND BIOFUELCELL APPLICATIONS	International Conference on Nanoscience and Nanotechnology (ICNAN) Organized by VIT, Vellore- 632014, Tamil Nadu, India.	VIT, Tamilnadu	29th November, 2019
4	Prof. Pranab Goswami	Delivered Plenary lecture on Biosensor and biofuelcell: Smart devices for next generation healthcare and analytical science.	"2nd International Conference on Advances in Bioprocess Engineering and Technology (ICABET-2020)"	Heritage Institute of Technology, Kolkata	January 20, 2020
5	Prof. Pranab Goswami	BIOFUELCELL: Smart devices for next generation healthcare and analytical science.	Analytical Methods in Chemical Sciences	Tezpur University	23rd January 2020
6	Prof. Pranab Goswami	BIOFUELCELL Smart device emerged from the interface of material, (bio)chemical, and communication technology for next generation healthcare applications	Recent Trends in Green Energy Utilization	Department of Mechanical Engineering and Industrial and Production Engineering, AEC Guwahati	10-14 February 2020
7	Prof. Arun Goyal	Assembling of β -glucosidase (CrGH1) and mutant endoglucanase (CrGH5-F194A) from <i>Clostridium thermocellum</i> to develop chimera by protein engineering for enhancing biomass saccharification.	DBT National Workshop on Bioenergy (DNWB-2019)	IIT Kharagpur, Kolkata, West Bengal, India	October 17-18, 2019
8	Prof. Arun Goyal	Chondroitin sulphate disaccharide and its applications as anticancer and prebiotics for functional foods.	International Conference on Nutraceuticals and Chronic Diseases (INCD 2019)	Indian Institute of Technology Guwahati, Assam, India	September 23-25, 2019
9	Prof. Arun Goyal	Chimera construction from cellulose hydrolysing enzymes by protein engineering for enhancing biomass saccharification	8th International Forum on Industrial Bioprocessing (IBA-IFIBiop 2019) "Bridging Sustainability and Industrial Revolution through Green Bioprocessing"	Imperial Hotel, Miri, Sarawak, Malaysia	1-5 May, 2019
10	Dr. Sachin Kumar	Newcastle disease virus based approach for the development of diagnostics and vaccine against pathogens.	Microbiology Department, GMCH, Guwahati	Guwahati	18/7/2019
11	Dr. Sachin Kumar	Recombinant Protein based approach for development of rapid and user friendly diagnostics against economically important diseases of Livestock	College of Veterinary Science, Assam Agricultural University, Khanapara Campus	Guwahati	21/12/2019

12	Prof. Biman B. Mandal	Bioengineered Human Tissues: The Way Forward	Assam Science and Technology University	Guwahati	Feb 26-27, 2020
13	Prof. Biman B. Mandal	Silk Based Tissue Engineering	Smart Materials for Sustainable Technology (SMST-2020), Conference	Goa	Feb 22-25, 2020
14	Prof. Biman B. Mandal	Bioengineered Human Tissues and Organs	ICANN 2019, IIT Guwahati	Guwahati	Dec 18-20, 2019
15	Prof. Biman B. Mandal	3D Bioprinting for Tissue Regeneration	IISER Mohali	Mohali	Dec 18-21, 2019
16	Prof. Biman B. Mandal	3D Bioengineered Human Implants	BioTERM-2019, IIT Kanpur,	Kanpur	November 27-30, 2019
17	Prof. Biman B. Mandal	Bioengineered Human Organs	NatFOS 2019, Conference	Jaipur	November 06-08, 2019
18	Prof. Biman B. Mandal	Bioengineering in Healthcare	West Bengal State Student-Youth Science Fair-2019	Kolkata	November 08, 2019
19	Prof. Biman B. Mandal	Bioengineered Tissues	IIT Madras	Chennai	October 18-19, 2019
20	Prof. Biman B. Mandal	Bioengineered Human Tissues: The Way Forward	APA-STERMI 2019, Conference	Goa	October 16-18, 2019
21	Prof. Biman B. Mandal	Bioengineered Human Organs	Reflux, IIT Guwahati,	Guwahati	September 28, 2019
22	Prof. Biman B. Mandal	My Research My Passion	Jadavpur University	Kolkata	September 19, 2019
23	Prof. Biman B. Mandal	3D Bioprinting of Organs	Institute of Life Sciences (ILS), Bhubaneswar,	Bhubaneswar	September 13, 2019
24	Prof. Biman B. Mandal	Healthcare Bioengineering	IISc Bangalore	Bangalore	August 25, 2019
25	Dr. Shirisha Nagotu	Structural and functional analysis of disease causing mutations of Drp1 through analyses of the yeast homologue Dnm1	ICBYFF-2019 University of Hyderabad	Hyderabad	27-29, November
26	Prof. Kannan Pakshirajan	<i>Rhodococcus opacus</i> as a potential biological chassis for second generation biorefineries	National University of Ireland Galway	Galway, Ireland	5 th December 2019
27	Prof. Kannan Pakshirajan	Lessons learned on waste management and climate change in developing countries	National University of Ireland Galway	Galway, Ireland	13 th November 2019
28	Prof. Latha Rangan	Footprint of Women in Science	Royal Global University	Guwahati	28 Feb
29	Prof. Latha Rangan	New record of nuclear DNA and genome size variation among some species of Zingiberaceae from North east India	Baru Sahib, HP	Himachal Pradesh	6 Feb 2020
30	Prof. Latha Rangan	Labdane diterpenes from seeds of <i>Alpinia nigra</i> as promising nutraceuticals	IIT Guwahati	Guwahati	23 Sep 2019
31	Prof. Latha Rangan	Basics of IPR	USTM, Meghalaya	Ribhoi, Meghalaya	16 August 2019
32	Prof. Latha Rangan	IPR and Biotechnology	IIT Guwahati	Guwahati	25 July 2019
33	Dr. P. Satpati	Impact of Molecular Dynamics Simulations in Drug Discovery	National Symposium on Biomedical Engineering, Assam Science and Technology University (ASTU)	Guwahati	26 th -27 th Feb. 2020
34	Dr. Kusum K. Singh	Present Day Biology: Impact of Research at Molecular and Cellular Level	Dept. of Biotechnology, St. Xavier's College, Ahmedabad	Gujarat	03/01/2020
35	Dr. Kusum K. Singh	Green, Sustainable and Evolving Sciences	Dept. of Zoology, Cotton University, Guwahati	Guwahati	29/06/2019

36	Prof. R. Swaminathan	Protein charge transfer luminescence can modify fluorescence parameters of intrinsic and extrinsic fluorophores in a protein	FCS-2019, Tata Institute of Fundamental Research	Hyderabad	19 Dec 2019
37	Prof. R. Swaminathan	Investigating protein structure in a novel and unconventional approach	NSRTZS, North-Eastern Hill University	Shillong	29 Feb 2020
38	Prof. R. Swaminathan	Spectroscopic features of plant flavonoid Karanjin in different solvents and microheterogeneous systems	INCD-2019, IIT Guwahati	Guwahati	25 Sep 2019
39	Prof. R. Swaminathan	My journey at IITG	BSBE Departmental Retreat, IIT Guwahati	Guwahati	21 Dec 2019
40	Dr. Rajkumar P Thummer	Technology and its impact on human health	Asian Institute of Nursing Education	Guwahati	22 nd February, 2020
41	Dr. Rajkumar P Thummer	The art of writing scientific papers	Indian Institute of Technology Guwahati	Guwahati	21 st December 2019
42	Dr. Rajkumar P Thummer	An Insight into a DNA-free Reprogramming Approach to Generate Integration-Free Induced Pluripotent Stem Cells for Prospective Biomedical Applications	65th Annual National Conference of the Association of Physiologists and Pharmacologists of India	Guwahati	29 th November 2019
43	Dr. Pranjali Chandra	Nano-bioengineered Sensors: An Innovative Tool for Next Generation Point-of-Care Clinical Diagnostics	Auspices of CME Foundation of India	Hyderabad, Telangana	14 th April 2019
44	Prof. Ajaikumar B Kunnumakkara	Oral Cancer: challenges and solutions	Gujarat cancer Research Institute	Ahmedabad, Gujrat	28 th September 2019
45	Prof. Ajaikumar B Kunnumakkara	Nutraceuticals and Chronic Diseases	Arya Vidyapeeth College	Guwahati	3 rd October 2019
46	Prof. Ajaikumar B Kunnumakkara	Nutraceuticals in the Prevention and Treatment of Chronic Diseases	Ramaiah Medical College and Hospitals	Bangalore	14 th February 2020

**12. Visitors From Other Institutes / Universities / Organisations / Invited Lectures
(Only distinguished visitors invited by appropriate authority)**

S.No	Name	Name of Inst./Univ./Org.	Purpose/ Name of Lecture	Date	Remarks
1	Dr. King Hang Aaron Lau	University of Strathclyde, United Kingdom	Invited speaker for the conference Bio-inspired Nanomaterials for Environmental Applications	February 12-15, 2020	
2	Dr. Aruna Ivaturi	University of Strathclyde, United Kingdom	Invited speaker for the conference Bio-inspired Nanomaterials for Environmental Applications	February 11-14, 2020	
3	Dr. Dr Sasidhar Gumma	IIT Tirupati	Invited speaker for the conference Bio-inspired Nanomaterials for Environmental Applications	February 12-13, 2020	
4	Prof. Sukesh R Bhaumik	SIU school of medicine, USA	Regulatory mechanism of eukaryotic transcription and its coupling to DNA repair	June 24 2019	
5	Prof. H. Raghuraman	Saha Institute of Nuclear Physics, Kolkata	Site-directed fluorescence approaches for dynamic structural biology of membrane peptides	June 27 2019	
6	Prof. Man Mohan	Shanghai Jiao Tong University, China	DYRK1A interacts with histone acetyl transferase p300 and CBP and localizes to enhancers.	July 17 2019	

7	Prof. Pennathur Gautam	Anna Univeristy, Chennai	Green synthesis and characterization of cadmium sulphide nanoparticles from Chlamydomonas reinhardtii	July 26 2019	
8	Dr. Patrick Shaw Stewart	Director of Douglas Instruments ltd	A novel microseeding method for the crystallization of membrane proteins in lipidic cubic phase	Jan 23 2020	
9	Prof. Arindam Banerjee	Dept. of Biological Chemistry, Indian Association for the Cultivation of Science, Kolkata	Self-assembling peptides	Feb 13 2020	

13. Seminars/Workshops/Conferences/Short-Term Courses Organised

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/ National	No. of participants
1	Prof. S. S. Ghosh (Joint Convener)	6th International Conference on Advanced Nanomaterials and Nanotechnology (ICANN 2019)	-	18-21 December 2019	International	250
2	Dr. Lalit M. Pandey and Prof. Animes Golder	Bio-inspired Nanomaterials for Environmental Applications	DST-UKIERI	February 12-13, 2020	International	75
3	Organizing Chairman Prof. Latha Rangan, Organizing Secretaries Dr. P. Satpati, Dr. Navin C. Gupta, Dr. Souptick Chanda, Dr. N Selvaraju	Advanced Mathematical Modelling for Bioengineering Applications	DBT	17 th -18 th May 2019	National	35
4	Prof. Ajaikumar B Kunnumakkara	Fourth International Conference on Nutraceuticals and Chronic Diseases	Society for Nutraceuticals and Chronic Diseases, Society for Translational Cancer Research, DBT and DST	23 rd -25 th Sep, 2019	International	618
5	Principal Investigator: Dr. Selvaraju Narayanasamy Co-Principal Investigator: Prof. Kannan Pakshirajan	Empowerment and autonomy of women through a bio-based circular economy design: resource recovery from waste	TMT-NUFFIC	22/07/2019-26/07/2019	International	40
6	Dr. Rajkumar P Thummer (Member of Program Advisory Committee)	Two Days National Symposium on Biomedical Engineering organized by Assam Science and Technology University, Guwahati	TEQIP-III	26-27 th February, 2020	National	130
7	Dr. Sachin Kumar	Diagnostic approaches in virology	DBT U-Excel Part-III	4-6 th March, 2020		28
8	Prof. Ajaikumar B Kunnumakkara	Recent Advances in Cancer Biology and Therapeutics	DBT U-Excel	23 rd -25 th Sep, 2019	National	200

A brief report on the major NATIONAL and INTERNATIONAL events with photographs may also be given separately in addition to the format given above.

14. Patents:

No. of Patents Applied with details: 09

No. of Patents Granted with details: -

Sl. No.	Name of Faculty and co researcher	Name	Date Applied/Granted	Application No.	Remarks
1	Goswami N, Paily R P, Bose B	Surface Acoustic Wave Based System for detection of HBsAg.	2019 (Applied)	201931054349	Indian Patent
2	Pranab Goswami, Priyanki Das, Lepakshi Borbora, Arup Das. Title of the invention:	Alcohol fueled enzyme based bio-battery cum biofuel cellenzymatic biofuel cell	2019	201931046354	
3	Pranab Goswami, Sanjay M, Naveen K Singh	Optisense - a smartphone-based multichannel static lspr system for detection or diagnosis	2019	201931039853	
4	Pranab Goswami, Lightson Ng, Smita Das,	Low cost paper-based kit for onsite detection of methanol.	2020	202031004522	
5	Sachin Kumar	A recombinant Newcastle disease virus (rndv) live vaccine vector system for classical swine fever	2020 (Applied)	TEMP/E-1/2074/2020-KOL	
6	Biman B. Mandal and Prerak Gupta	Bi-layered Porous Silk Vascular Grafts and their Uses Thereof	19/06/2019	201931024432	
7	Vibin Ramakrishnan, Ruchika Goyal and Gaurav Jerath	Peptide based Molecular Constructs for Tumor Homing and Cell Penetration	23.08.2019.	TEMP/E-1/36058/2019-KOL	
8	Vibin Ramakrishnan and Gaurav Jerath	Peptide-based Drug Delivery Vectors	23.08.2019	TEMP/E-1/36087/2019-KOL	
9	Vibin Ramakrishnan, Gaurav Pandey and Vivek Prakash	Peptide based modulators for amyloidogenic diseases	27.08.2019	TEMP/E-1/36478/2019-KOL	

15. Awards and honours (Only awards/honours at national/international level from reputed organisations)

1. **Prof. Pranab Goswami** visited University of Alberta, Canada as visiting Professor under the faculty exchange programme of SERB-UAlberta, Canada during 30 Septembet to 19 October 2019.
2. **Prof. Arun Goyal:**
 - (a) Invited as a Member, for Third Meeting of Working Group by AICTE (for considering 10+2 students with Life Science subjects for BTech) Feb 18, 2019.
 - (b) Invited as an Expert member committee for selelction of Professor and Associate Professor, Department of Bioengineering, BIT Mersa, Ranchi, Jan 19, 2020.
 - (c) Invited as Member, Technical Expert Committee for DBT-NER by DBT in the area of Energy, Environment and Biodiversity to review new proposals and project progress, Jan 17, 2020.
 - (d) Invited as Member, for Second Meeting of Working Group by AICTE (for considering 10+2 students with Life Science subjects for BTech) Sep 30, 2019
 - (e) Invited as Member, for First Meeting of Working Group by AICTE (for considering 10+2 students with Life Science subjects for BTech) July 8, 2019

(f) Invited to Judge Best Poster award at International Carbohydrate Conference on Emerging Frontiers in Carbohydrate Chemistry and Glycobiology, Dec. 5-7, 2019, University of Lucknow, UP, India.

(g) Invited as Member, Technical Expert Committee for DBT-NER by DBT in the area Energy, Environment and Biodiversity to review new proposals and project progress, June 19, 2019

(h) Nominated by Chairperson, Governing Body, CIAB and Secretary, DBT as a Member of Scientific Advisory Committee (SAC) of Center of Innovative and Applied Bioprocessing (CIAB), Mohali, Punjab, for period of 3 years till April 2022. June 2019

(i) Invited by Department of Microbiology, Sikkim University to give feedback for course syllabus for MPhil and PhD in Industrial Microbiology. June 2019

(j) Invited as a member, Board of Studies, for approval of syllabi of B.Tech and M.Tech (Biotechnology) at Department Biotechnology, College of Engineering and Technology (CET), Bhubaneswar, Odisha. May 2019

3. **Dr. Sachin Kumar:** Indian Association for the Advancement of Veterinary Research Excellence Award, 2019
4. **Prof. Ajai B. Kunnumakkara:** Best Scientific presentation award, The International Conference on Pharmacology Advances in Translational Sciences & Drugs Discovery, from National University of Singapore, 2019
Member, Senate, National Institute of Pharmacological Education and Research (NIPER) Guwahati, Assam, India.
Member, Screening committee for faculty selection (Assistant, Associate and Professor), Manipur University, Imphal, Manipur.
5. **Prof. Biman B Mandal:** Prof. Biman B Mandal is awarded B.M. BIRLA SCIENCE PRIZE 2018 in BIOLOGY.
Prof. Biman B Mandal is awarded 3D PRINTING WORLD AWARDS 2019 as “Innovator in Tissue Engineering of the year – Medical” for his contribution in 3D bioprinting of human organs and tissues for transplantation.
Prof. Biman B Mandal is awarded APA- Young Scientist Award 2019 by Asian Polymer Association, an International forum on Polymer Science and Technology.
Prof. Biman B. Mandal became Editorial Board Members of the following journals:
Journal of the Indian Institute of Science
Biomedical Materials
Trends in Biomaterials and Artificial Organs (TIBAO)
Frontiers in Bioengineering and Biotechnology
Frontiers in Materials
Frontiers in Molecular Biosciences
Prof. Biman B. Mandal was interviewed by BBC India for his work on 3D Bioprinting. A documentary is made on the bioprinting work.
Prof. Biman B. Mandal’s research was highlighted in leading International, National Newspapers, Magazines and News Channels: BBC India, Scientific American, New Scientist, Rajya Sabha TV, The Hindu, The Times of India, Anandabazar Patrika, Nature India, The Telegraph, India Today, Zee News, Deccan Herald, Financial Express, Science Daily, Dainik Sambad, and Ganashakti etc.
6. **Prof. Latha Rangan:** Inducted member for NASI NORTH-EASTERN CHAPTER for 2019-2020.
7. **Dr. P. Satpati:** “DUO-India Professors Fellowship” for academic visit to Sweden during 5th June- 5th July 2020.

16. Students’ Achievements:

- a. Best Poster Award for Manasasri Muralidharan “Characterization of Essential Riboswitches in Mycobacteria” 2-4 May, 2019, 10th RNA Group Meet, Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram
- b. Mr. Pratik Nag (PhD student) got selected for ‘DBT sponsored BIRAC-National Biopharma Mission in association with Biotech Consortium India Limited Training program’ for a hands-on training in ‘Medical Device Prototyping’ held at IIT, Kanpur from 13th – 17th January, 2020.
- c. Mr. Jaideep Singh Bhardwaj (M.Tech student) got selected for ‘DBT sponsored BIRAC-National Biopharma Mission in association with Biotech Consortium India Limited Training program’ for a hands-on training in ‘Operation and Testing of Medical Devices’ held at CSIR-CSIO, Delhi from 24th – 28th February, 2020.

- d. Ms. Adeline S Vio War (PhD student) won Best Screening Device for Novelty award in ‘Medical Device Innovation Camp’ organized by BETIC, IIT Bombay from 28th September to 2nd October, 2019.
- e. Best Ph.D. Thesis Award (2019-2020) to Dr. Sharbani Kaushik (PhD graduate from Center for Energy) from the International Society for Energy, Environment and Sustainability (ISEES). Dr. Sharbani completed her PhD in October 2018. The title of her thesis was: Cyanobacteria Based Photosynthetic Microbial Fuel Cell: Development and Application for Sensing Alcohol.
- f. Sanjay Manoharan, MTech project student (completed 2019) has received 1st prize for his research proposal, OPTISENSE- A simple smartphone based fibre optic biosensor for detection malaria in human serum sample submitted to Guwahati Biotech Park (GBP) at Assam Start-up Talent Search Contest on 20 November, 2019.
- g. PhD student Phurpa Dema Thungon has received prestigious Overseas Visiting Doctoral Fellowship (OVDF) from SERB (DST)-UAlberta Partnership scheme to carry out a part of the PhD work at University of Alberta (UAlberta), Canada for a period of one year (May 2019-April 2020).
- h. Kedar Sharma received IUCr Young Scientist Award and AsCA and DST travel grants to attend 16th Conference of the Asian Crystallographic Association, 17-20 December 2019, NUS, Singapore.
- i. Kedar Sharma received best poster award for research work entitled “Isolation and characterization of glucuronoxylan from Babool as substitute of commercial xylan for xylanase activity evaluation”. International Carbohydrate Conference on Emerging Frontiers in Carbohydrate Chemistry and Glycobiology, Dec. 5-7, 2019, University of Lucknow, UP, India
- j. Kedar Sharma received best poster award for research work entitled Molecular organization and protein stability of the *Clostridium thermocellum* glucuronoxylan endo- β -1,4-xylanase of family 30 glycoside hydrolase in solution. Presented at Research Conclave, March 14-17, 2019, IIT Guwahati, Assam.
- k. Abhjit Thakur received best poster award for research work entitled “Efficient saccharification of finger millet stalk by a new thermostable α -L-arabinofuranosidase (*PsGH43A*) from *Pseudopedobacter saltans*.” Presented at Research Conclave, March 14-17, 2019, IIT Guwahati, Assam.
- l. Monika Chandravanshi under Dr. Shankar Prasad Kanaujia received IUCr Young Scientist Award to attend the “16th Conference of the Asian Crystallographic Association (AsCA2019)” held at the National University of Singapore (NUS), Singapore, from 17th December to 20th December 2019.
- m. Monika Chandravanshi under Dr. Shankar Prasad Kanaujia received Students Travel Assistant Fund (STAF) for the “16th Conference of the Asian Crystallographic Association (AsCA2019)” held at the National University of Singapore (NUS), Singapore, from 17th December to 20th December 2019.
- n. Mr. Vineet Anand received best poster award in a conference “Challenges and Threats of Microbes to Animals and Humans” at ICAR-IVRI, Izatnagar, Feb 6-7, 2019.
- o. Janani Guru has been awarded “Fulbright Nehru Doctoral Research Fellow” (Aug 2018-May 2019), visited University of Pittsburgh for 9 months, award financed by United States India Education Foundation (USIEF) and Institute of International Education (IIE) New York.
- p. Prerak Gupta has been awarded DST Travel grant award 2019 (SERB) to attend ISACB + ISVTE 2019, Zurich, Switzerland (June 19-21, 2019).
- q. Shreya Mehrotra has been awarded Bajpai Saha Student Award 2019, International conference on Biomaterial based therapeutic engineering and regenerative medicine, IIT Kanpur, Dec 2019.
- r. Nayan Moni Deori working with Dr. Shirisha Nagotu got the best poster prize at ICBYFF-2019, Hyderabad, India for the poster ““Characterizing the dual targeting and function of the peroxisomal protein PEX30”.
- s. G Bhatt received Best Poster Award in 4th International Conference on Nutraceuticals and Chronic diseases in poster titled “Insight into Estrogen receptor α (ER α) and ligands (estrogen, karanjin) interactions using computer simulations” 23-25 Sep IIT Guwahati.
- t. Ms. Bhagyashree Deka (Roll No. 156106047) received training on “Genome/Transcriptome sequence analysis” during November 13-15, 2019 at NCBS, Bangalore.
- u. Mr. Pratap Chandra (Roll No. 166106109) received training on “Genome/Transcriptome sequence analysis” during November 13-15, 2019 at NCBS, Bangalore.
- v. Ms. Ayushi Rehman (Roll No. 196106005) was selected for the INSPIRE fellowship.
- w. Ms. Babita Th. Devi received best poster presentation award at the 8th International Translational Cancer Research Conference held at Banaras Hindu University, Varanasi, India from February 13-16, 2020.

- x. Ms. Elina Khatoon received best poster presentation award at the 8th International Translational Cancer Research Conference held at Banaras Hindu University, Varanasi, India from February 13-16, 2020.
- y. Ms. Sosmitha Girisa received best poster presentation award at the 8th International Translational Cancer Research Conference held at Banaras Hindu University, Varanasi, India from February 13-16, 2020
- z. Ms. Parama Dey was chosen to join an invitation program carried out under the framework of Japan Asia Youth Exchange program in Science (Sakura Exchange Program in Science) administered by Japan Science and Technology Agency. In this program, she attended a workshop on “Research on Molecular Biology of Stress, Aging and Cancer Using Cell Culture Based Assays - Interventions by Natural Compounds” at National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan, October 6-12, 2019
- aa. Ms. Harsha Choudhary received best oral presentation award at the Fourth International Conference on Nutraceuticals and Chronic Diseases (INCD 2019) held at Indian Institute of Technology Guwahati, Guwahati, India from September 23-25, 2019
- bb. Ms. Babita Th. Devi received best poster presentation award at the Fourth International Conference on Nutraceuticals and Chronic Diseases (INCD 2019) held at Indian Institute of Technology Guwahati, Guwahati, India from September 23-25, 2019
- cc. Ms. Varsha Rana received best poster presentation award at the Fourth International Conference on Nutraceuticals and Chronic Diseases (INCD 2019) held at Indian Institute of Technology Guwahati, Guwahati, India from September 23-25, 2019
- dd. Srirupa Bhattacharyya, Best poster presentation award, INCD 2019: 4th International Conference on Nutraceuticals and chronic diseases, Organized by IIT Guwahati, 23rd – 25th September 2019.
- ee. Srirupa Bhattacharyya, Best poster presentation award, World Congress on cancer (WCC), Organize jointly by Mahatma Gandhi University of medical Sciences and Technology (MGUMST, Jaipur and Cancer Institute< Chennai, Ichan School of medicine at Mount Sinai, New York, February 3-5, 2020
- ff. Ms Moumita Nandi, a M.Tech project student at Biosciences and Bioengineering department working with Prof. Kannan Pakshirajan as the supervisor received the Best oral presentation award (2nd prize) at WATER 2020. January 23-25, 2020, IIT Guwahati, Guwahati, India.
- gg. Ms Tanushree Paul, a Ph.D. student at Centre for the Environment with Prof. Kannan Pakshirajan and Prof. G. Pugazhenth (Chemical Engineering Department) as the supervisors received the Best oral presentation award (1st prize) at WATER 2020. January 23-25, 2020, IIT Guwahati, Guwahati, India.
- hh. Ms Tanushree Paul, a Ph.D. student at Centre for the Environment with Prof. Kannan Pakshirajan and Prof. G. Pugazhenth (Chemical Engineering Department) as the supervisors received the Best poster award at INCD-2019. September 23-25, 2019, IIT Guwahati, Guwahati, India.
- ii. Ms Khyati Raina working with Dr. Rajkumar P. Thummer: Was awarded a travel grant to travel to Kyoto, Japan for “Training program in Generation and Maintenance of Human iPS cells” organized by “The Accelerating the application of Stem cell technology in Human Diseases (ASHD)” program supported by Department of Biotechnology (DBT), Government of India and The Centre for iPS Cell Research and Application (CiRA), Kyoto University, Japan from 20th to 26th November, 2019
- jj. Yogendra Pratap Singh has delivered an Invited speaker talk to the “3D PRINTING WORLD 2019” -5th International Conference, Show & Awards held on 29th November 2019 at THE ORCHID HOTEL, Mumbai, on the topic “*Silk based 3D Bioprinting of human load-bearing tissues*”
- kk. Ashutosh Bandyopadhyay secured 4th Position in Talent Search Contest on Innovative Research Ideas Leading to Entrepreneurial Venture in Biotechnology and Allied Areas 2019 organized by Guwahati Biotech Park, 2019, Guwahati, Assam (November 20, 2019)".

17. Any Other (Special Mention)

- I. The first departmental news letter “Awalokan” was launched.
- II. The first departmental retreat (Biotech express) conducted in December 2019.
- III. New and updated department website launched.

IV. Prof. Pranab Goswami’s lab:

(a) "Nature India" highlights the work as Paper-based sensor detects malaria parasites:
doi:10.1038/nindia.2019.65 published online 24 May 2019

(b) The Hindu highlighted the work new paper-based test kit for malaria detection, in its on JUNE 08, 2019

V. Dr. Rajkumar Thummer - Judge for the Regional level of the Indian Science & Engineering Fair - 2019, conducted on the 12th of October 2019 organized at Bharatiya Vidya Bhavan's R.K Sarda Vidya Mandir, Raipur, Chhattisgarh, India

18. Faculty Members (In alphabetical order according to surname)

Sl. No.	Name	Name of the University/Institute/Org PhD degree received from	Designation	Areas of Interest	Date of joining (Not Internal Promotion) for the faculty members who joined during the reporting year
1	B. Anand	Indian Institute of Technology Kanpur, Kanpur	Associate Professor	Structural Biology, Bioinformatics & Computational Biology, RNA Biology, Molecular Evolution and Synthetic Biology	25-02-2010
2	Bora Utpal	Institute of Genomics and Integrative Biology, Delhi	Professor	Biomedical Engineering, Biodiversity and Bio-entrepreneurship	22-12-2004
3	Bose Biplab	All India Institute of Medical Sciences	Associate Professor	Systems Biology, Cell signaling, Recombinant therapeutics	30-06-2006
4	Chanda Souptick	Indian Institute of Technology Kharagpur, India	Assistant Professor	Biomechanics, implant design and optimization, surgical simulations and soft computing	02-05-2017
5	Chandra Pranjali	Pusan National University, Busan, South Korea	Assistant Professor and Ramanujan Fellow	Clinical Bio-sensors, Paper-based bio-sensors, Nano-medicine, Material engineering, Microfluidics and Nanomachines.	21-07-2015
6	Chaturvedi Rakhi	University of Delhi, Delhi	Professor and Dean, Alumni and External Relations (AER)	Plant Cell, Tissue & Organ Culture, Protoplast Isolation and Regeneration, Isolation, Purification and Characterization of Plant Secondary Metabolites	17-06-2004
7	Chaudhary Nitin	CSIR-Centre for the cellular and Molecular Biology, Hyderabad	Associate Professor	Peptide self-assembly and amyloid aggregates, Peptide-membrane interactions Curvature inducing proteins	28-03-2011
8	Das Debasish	Indian Institute of Technology Bombay	Professor	Metabolic engineering, Biochemical engineering, Modelling of fermentation process, Biofuel	17-02-2010
9	Dasu V. Venkata	Indian Institute of Technology Madras	Professor	Bioprocess Development, Metabolic Engineering	22-07-2004
10	Ghosh Siddhartha S.	Indian Institute of Chemical Biology (IICB), Kolkata	Professor	Cancer Gene Therapy, Nanobiotechnology, Molecular Pathways Involving Drug Resistance	10-03-2003
11	Goswami Pranab	Gauhati University	Professor (HAG)	Biosensors and Biofuel cells	16-12-2002
12	Goyal Arun	Indian Institute of Technology Kanpur, Kanpur, India	Professor and Former Head	Molecular Biology, Protein Engineering, Structural and Functional Proteomics of Carbohydrate active enzymes and other industrially important microbial enzymes	25-08-2003

13	Gupta Navin	Brain Computer Interfaces and Neural Engineering (BCI-NE) Group, University of Essex	Assistant Professor	Imaging Genetics, Biomedical Signal/Image Processing, Multimodal Analysis, Computer Aided Diagnosis, Biomedical Instrumentation	23-01-2017
14	Jaganathan Bithiah G.	Johann Wolfgang Goethe University, Frankfurt, Germany	Associate Professor	Stem Cell Biology, Cancer signaling	15-01-2009
15	Kanaujia Shankar Prasad	Indian Institute of Science Bangalore	Associate Professor	Structural Biology and Bioinformatics Studies	23-04-2012
16	Kumar Manish	University of Maryland, College Park, USA	Associate Professor	Molecular interaction of host-pathogen-vector of infectious diseases	25-06-2012
17	Kumar Sachin	University of Maryland, College Park, USA	Associate Professor	Molecular biology of paramyxoviruses	24-04-2012
18	Kunnumakkara A. B.	University of Calicut, Kerala	Professor	Role of inflammatory pathways in cancer development, Identification of novel biomarkers for cancer diagnosis and prognosis, Cancer drug discovery.	01-08-2012
19	Limaye Anil Mukund	Indian Institute of Science Bangalore	Associate Professor	Hormonal regulation of gene expression	17-11-2008
20	Maiti Soumen Kumar	Indian Institute of Technology Bombay	Assistant Professor	Bioprocess Engg, biofuel	18-03-2014
21	Mandal Biman B	Indian Institute of Technology Kharagpur	Professor	Cell based tissue engineering, Biomaterials, Stem cells, Drug delivery systems	31-05-2011
22	Nagotu Shirisha	University of Groningen, Groningen, The Netherlands	Assistant Professor	Organelle biology and Inter-organelle communication, Cellular Ageing, Membrane fission and fusion	23-07-2015
23	Pakshirajan Kannan	Indian Institute of Technology Madras	Professor	Environmental Technology	12-07-2004
24	Pandey Lalit Mohan	Indian Institute of Technology Delhi	Associate Professor	Surface and interfacial science particularly in the area of Bio-interfaces and Biomaterials Protein's adsorption and aggregation, Environmental Biotechnology	19-03-2014
25	Patra Sanjukta	Central Food Technological Research Institute, Mysore	Professor	Enzymes - applications in pharma and food industry	01-10-2007
26	Ramesh Aiyagari	CFTRI, Mysore (Degree awarded by Mysore University)	Professor	Nanobiotechnology, Chemistry-Biology Interface for Developing Antibacterials and Sensors	06-01-2003
27	Ramakrishnan Vibin	Indian Institute of Technology Bombay	Professor	Computational Biology, Bioinformatics, Biophysics, Bio-Organic Chemistry, Bio-nanotechnology	12-07-2011
28	Rangan Latha	University of Madras (Research work carried at IRRI, Manila)	Professor and HOD	Molecular systematics, Biofuel, IPR	29-11-2004
29	Sahoo Lingaraj	Maharshi Dayanand University, Rohtak, India	Professor	Genetic engineering and functional genomics of plants	23-12-2002

30	Saini Gurvinder Kaur	Andhra University, Visakhapatnam	Professor	Fungal Biotechnology, Biological Control, DNA fingerprinting and Transformation studies, Studies on extracellular enzymes and toxic metabolite production, Development of a potent biopesticide	17-12-2002
31	Satpati Priyadarshi	Indian Institute of Science Bangalore	Assistant Professor	Classical molecular dynamics (MD) free energy simulation, Electronic Structure calculations that predict the structure, properties, reactivity, bonding etc. of small molecules	01-06-2015
32	Selvaraju Narayanasamy	Indian Institute of Technology Madras, India	Assistant Professor	Environmental Biotechnology, Bioprocess Engineering, Biochemical Engineering	24-04-2017
33	Senthilkumar S	Central Leather Research Institute, Chennai	Associate Professor	Biocalorimetry, BioPAT, Real-time monitoring and control of bioprocess systems	15-06-2011
34	Singh Kusum K	Institute of Molecular Medicine, Heinrich-Heine University of Duesseldorf, Germany	Assistant Professor	Post-transcriptional gene regulation by RNA binding Proteins	13-07-2015
35	Swaminathan Rajaram	Tata Institute of Fundamental Research, Mumbai	Professor	Protein Structure and Function; Protein Charge Transfer Spectra.	16-04-1999
36	Tamuli Ranjan	CSIR-Centre for the cellular and Molecular Biology, Hyderabad	Professor	Calcium signaling, Genetics, DNA repair	26-12-2008
37	Rajkumar P. Thummer	University of Groningen, Groningen, The Netherlands	Assistant Professor	Stem Cell Engineering and Regenerative Medicine	23-07-2015
38	Trivedi Vishal	Central Drug Research Institute, Lucknow	Professor	Intracellular Signaling in Plasmodium falciparum	13-07-2009

Prof. Ajaikumar B. Kunnumakkara: Fourth International Conference on Nutraceuticals and Chronic Diseases (INCD 2019), 23-25th September 2019, IIT Guwahati

It is our great pleasure to inform you that the Fourth International Conference on Nutraceuticals & Chronic Diseases (INCD) was organized by Department of Biosciences and Bioengineering, IIT Guwahati in collaboration with Society for Nutraceuticals and Chronic Diseases, Society for Translational Cancer Research, National Institute of Pharmaceutical Education and Research (NIPER), Guwahati and DBT-AIST International CENter for Translational and Environmental Research (DAICENTER), Japan during 23rd September- 25th September, 2019 was a huge success. Prof. T. G. Sitharam, Director IIT Guwahati and the Chief Patron of INCD-2019 inaugurated the conference on 23rd September 2019 in presence of Prof. Bharat B. Aggarwal, Chief Patron, INCD-2019; Prof. Oommen V. Oommen, President, Society for Nutraceuticals and Chronic Diseases; Dr. Ajaikumar B. Kunnumakkara, Organizing Secretary, INCD 2019 and Executive Secretary Society for Nutraceuticals and Chronic Diseases, Prof. Latha Rangan, Chairperson, INCD 2019 and Head, Department of Biosciences and Bioengineering and other delegates from abroad and almost all states of India.



During this meeting several distinguished speakers have explained the importance of Nutraceuticals in improving the quality of life in patients with different chronic diseases such as cancer, cardiovascular diseases, obesity, Alzheimer disease, dementia, arthritis, asthma, COPD, Crohn's disease, cystic fibrosis, diabetes etc. The word Nutraceutical is combined from the words nutrition and pharmaceutical. A Nutraceutical product is a food or fortified food product that not only supplements the diet but also assists in treating or preventing chronic disease, so provides medical benefits. Specific and targeted artificially created drugs have not been found much effective against multi-genetic chronic diseases. Also, their extended uses tend to exhibit severe

adverse side effects. In contrast, Nutraceuticals have been found to be multi-targeted, highly effective over long-term and exhibit minimal side effects. The Society for Nutraceuticals and Chronic Diseases works towards exploring such facets. Owing to the credibility INCD conferences have earned in a short span of time, the event received enormous response. This academic conference witnessed participation from USA, Germany, Japan, Singapore, UK and almost every state of India. A total of 618 participants including international and national scientists, doctors and students came together under one umbrella to explore the scientific basis for the "Role of Nutraceuticals in chronic diseases" and present their research. Multidisciplinary symposium, panel discussions, interactive sessions and lectures were strategically

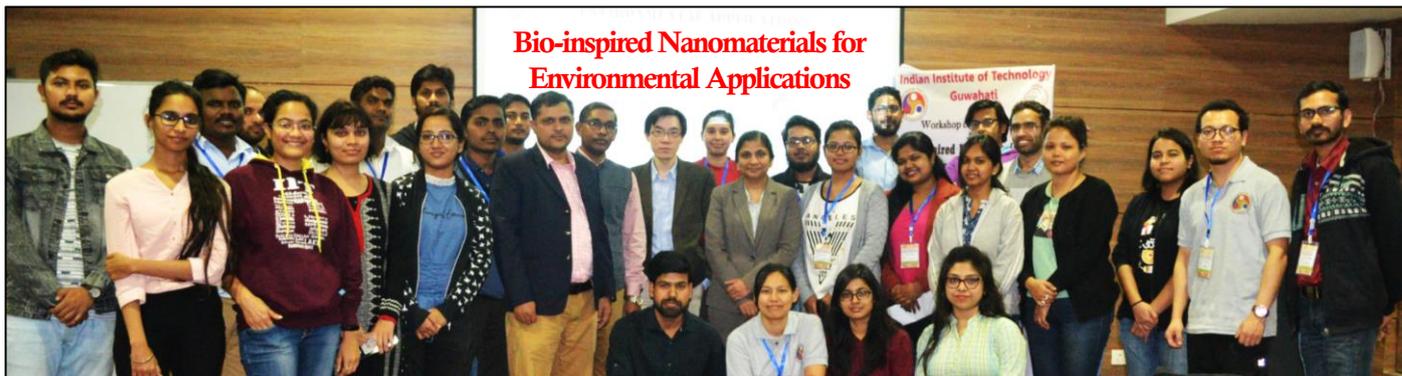


presented by health professionals, scientists and nutritionists. The discussions revolved around long-term clinical studies and their beneficial and other effects. Scientific posters and oral presentations were presented by young scientists, post-doctoral fellows, research scholars and students and few amongst the participants received the "Best Oral" and "Best Poster" Presentation Award. At the valedictory function the venue of the 5th International Conference on "Nutraceuticals and Chronic Diseases" INCD-2020 was declared which will be held at Gujarat Cancer Research Institute, Ahmedabad in September 2020.

Dr. Lalit M. Pandey: During February 12-13, 2020, two days DST-UKIERI supported Workshop Cum Symposium on "Bio-inspired Nanomaterials for Environmental Applications" was organized by Prof. Lalit M. Pandey and Prof. Animes K. Golder at the Centre for the Environment, Indian Institute of Technology Guwahati with the aim to discuss various challenges related to environment and nano-technological interventions via bringing together the experts from various backgrounds working in environmental science and technology. The symposium was the successor of the workshop held on Dec 18, 2019 on "*Recent Advances on Bio-inspired Nanomaterials for Environmental Applications*". The symposium was inaugurated by Prof. Gopal Das, the Dean, Research and Development, IIT Guwahati in the presence of Prof. Mihir K. Purkait, the Head, Centre for the Environment, IIT Guwahati.

The symposium comprised of six technical sessions on Bioinspired nanomaterials, Water and wastewater treatment, Bioremediation, Biosorption, and Photocatalysis in environment applications. The main highpoints of the symposium were the invited lectures by Prof. Aaron Lau and Prof. Aruna Ivaturi, the international collaborators of the project from the University of Strathclyde, Glasgow (UK). There were 08 national and 03 international invited speakers who are the experts in various fields such

as Chemical engineering, Biotechnology, Nano-biotechnology, Chemistry and Civil engineering along with 16 oral presentations by the selected young researchers. Nevertheless, a poster session on day two followed by a hands-on training on “*Dye degradation using Photocatalyst*” by Prof. Ivaturi were the major attractions. Two best oral and three best poster presentations were recognized.



Departmental Retreat – December 21, 2019

The first departmental retreat (Biotech Express) was conducted on December 21, 2019. It was a one-day event where several research groups of the department including faculty, students and department staff participated very enthusiastically. The event was marked by a welcome address by the head of the department, followed by a talk on the history of department establishment “The wonderful journey that began at IITG”, by the former and first HOD of the department. The faculties enlightened the occasion with their intellect and talks on “finding passion and purpose in research”, “the art of writing scientific papers” and “the industrial integration of biotech research”. Further followed an inspiring and motivating alumni talk by one of the pioneers of the department.

The students actively took part in the scientific culture of the program with Oral and Poster presentations which was highly informative, providing insights to their respective lab modules and domains. Post lunch, the session embraced music, art, and leisure. An online Mobile-based Quiz was highly enthralling where not only intelligence but the speed and cognitive ability were tested, the fastest person who answered correctly wins it all. This was followed by “The Secret Journey of DNA” a skit depicting the hidden story behind the DNA structure prediction elegantly played by the collaboration of Faculties, staff, and students. The students showcased their talents in the form of self-composed Hindi and English poems which were a real delight for the audience, the harmony of guitar and flute took us over to a mesmerizing journey of soulfulness. The short crisp event came to a close with a token of appreciation for various events (prize distribution) and closing remarks by the convener.



