BIRAC Regional Techno-Entrepreneurship Promotion Centre presents

MAPPING THE CHANGEMAKERS OF NORTH EAST REGION

"Fuelling the innovation ecosystem in NER

brtc.kiitincubator.in

MESSAGE

The intent to succeed, navigate through challenges, for finding new solutions is an inherent social character in the NER. The local unmet needs, and value realization of unique rich natural resources, no one else can understand better than the people from the region.
Thus, the aspiring innovation ecosystem in the region led by local talent, supported by technology, has a great potential.

BIRAC's regional centre - BRTC is a dedicated initiative to promote and nurture biotech entrepreneurship in NER. This is to bring mentorship network access for translational research and development of innovative products and technologies. Capacity building through setting up of BioNEST Bio-incubation centres; access to the existing infrastructural strength of research institutes; facilitation from central/ state agencies, combined with peer group access of BIRAC network, all this would aid knowledge translation into innovative product development.

A special BIG call was also launched this year for NER to extend funding support to the entrepreneurs and startups for the region.

As an enabler, DBT/BIRAC would continue to extend and create new opportunities together with our partners like KIIT.

I must congratulate BRTC for this new initiative of identifying and creating a pool of local champions – the 'Change Makers'. Students, Scholars, faculty, entrepreneurs, and startups are the drivers to bring the power of innovative ideas that combined with facilitation from enablers can help nurture this local ecosystem for biotech innovation.

Congratulations, this is a great beginning. 'Change Makers' may please remember that recognition also brings responsibility. Welcome on board for an exciting journey ahead!

Dr. Manish Diwan

Head - Strategy Partnership & Entrepreneurship Development
BIRAC, Department of Biotechnology, Govt of India

FOREWORD

India, no doubt, has a huge pool of scientific manpower. However, there is a lot of talent in the north-east that remains untapped. To meet this challenge, BIRAC has established its regional centre at KIIT–Technology Business Incubator (KIIT-TBI) called as BRTC (BIRAC Regional Techno-Entrepreneurship Promotion Centre) in 2019, to promote innovation and entrepreneurship in North Eastern region (NER) and East. Through BIRAC supported BRTC centre, we have reached out to over 2400+ north east Innovators through awareness programs such as Roadshows, Training Programs and Design Workshops for innovators and incubators. We have been trying to spread our footprints across NER and we feel fortunate and happy to collaborate with an enthusiastic network of NE mentors/ Ambassadors and partner with several institutes, universities across all the states in this mission and we hope to continue working together in building the innovation ecosystem of NER. To commemorate its first year milestone, we have instituted the "Mapping the Changemaker" initiative with the objective of encouraging the budding innovators/entrepreneurs of the North Eastern Region for their translational scientific temperament and achievements/contributions to uplifting the NE ecosystem.

To celebrate the spirit of creativity and innovation of these young transformers from the North East India, besides the prize money for best three 'changemaker' in each category (Category 1: M.Sc., Category 2: PhD/Postdoc; Category 3: Young faculties; Category 4: Startups), a catalog has been prepared to feature brief profile and research highlights/ideas of all the applicants because for us each and everyone who has a desire to think, innovate and create a difference in the life of people is a Changemaker in true sense.

This initiative will not only increase the visibility of these young innovators but also will build a strong platform for networking and collaboration with other stakeholders, including mentors, investors across the country. Most importantly, it would certainly motivate young students to follow their path in their quest for excellence in biotech research and entrepreneurship. In this showcase, we feature a total of 51 change makers from various states of NE and overwhelmed with this positive response, going forward the awards will be an annual feature celebrating the NE changemakers year after year.

I am grateful to BIRAC, particularly Dr. Manish Diwan, BIRAC-Head Strategic Partnership & Entrepreneurship Development who has been guiding Biotech startups to undertake strategic research & innovation and Ms. Taranjeet Kaur, BIRAC-Deputy Manager- Entrepreneurship Development to facilitate the BRTC activity effectively and efficiently, without these two pillars, this program could not be envisioned. Thanks to the BRTC team, who has worked at the back end day and night to meet the deadlines.

Be Simple, Humble and Grounded!

Mrutyunjay Suar, Ph.D.
CEO, KIIT TBI

Overview of
BRTC and Changemakers

KIIT-Technology Business Incubator (KIIT-TBI) Bio-NEST has set up the BIRAC Regional Techno-entrepreneurship Promotion Centre (BRTC) in partnership with Biotechnology Industrial Research Assistance Council (BIRAC), with an objective to promote Bioentrepeneurship and build an enabling ecosystem across Northeastern and Eastern states of India. BRTC has been working to support early stage start-ups and budding innovators through various capacity building training programs and workshops. BRTC at KIIT-TBI is also working to identify and mentor potential institutes to build incubators in the North East and East.

Mapping the Changemakers of NE, an initiative of BIRAC-BioNEST BRTC of KIIT-TBI to build and nurture the start-up ecosystem in the Northeast region of the country. As a step towards building an Innovation Ecosystem in NER, it endeavors to Identify young and budding innovators with a translational scientific temperament and build a strong platform for networking. cross-talk and collaboration.

Program Category

Under Changemakers we had four categories. Candidates were Indian citizens from the Northeastern states (Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura).

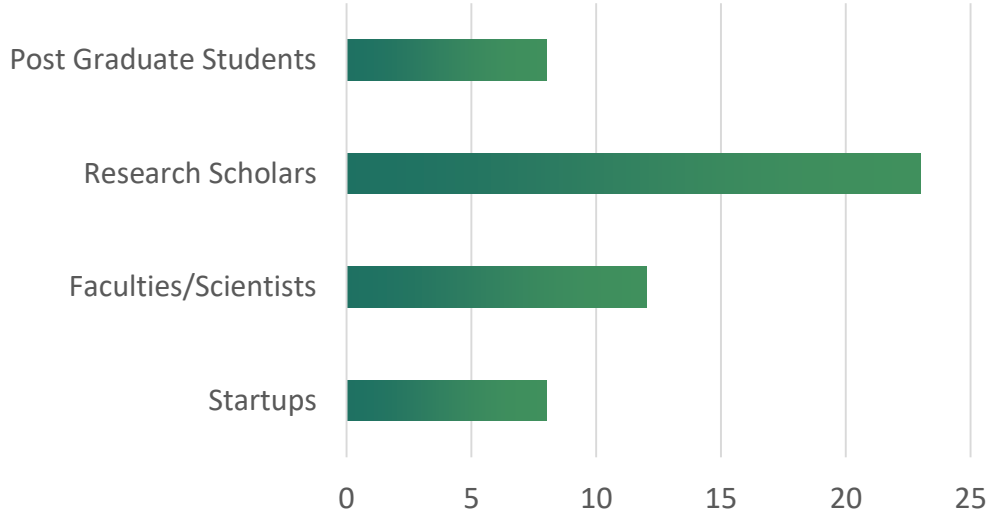
Category 1: Master Students (Pursuing/Completed)
Category 2: PhD Scholars and Post Doctoral Fellows (Pursuing/Completed)
Category 3: Faculties / Scientists
Category 4: Startup Companies less than 5 years old

Program Evaluation Criteria

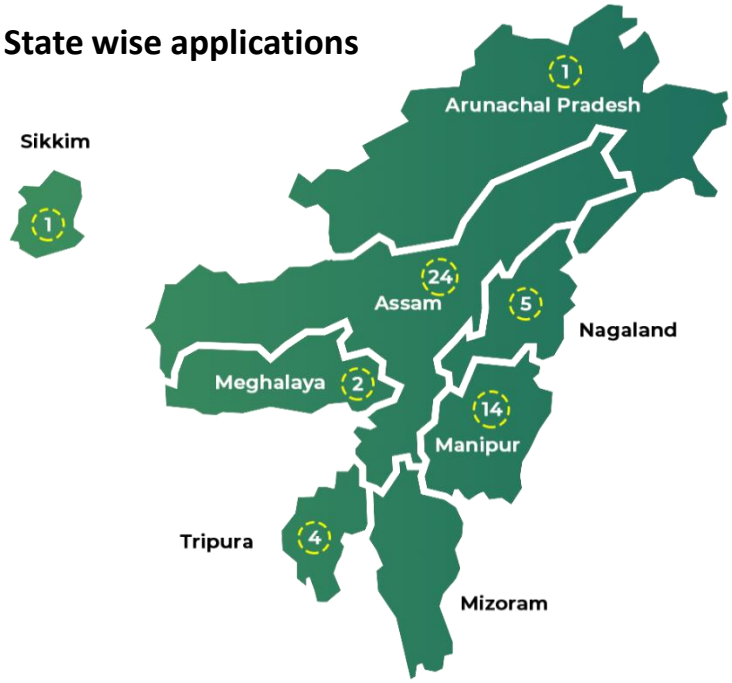
- Technical Background of the Project Leader/Team
- Technical and commercial viability of the Project
- Need in context of NER or Implementation in NER

Program Statistics

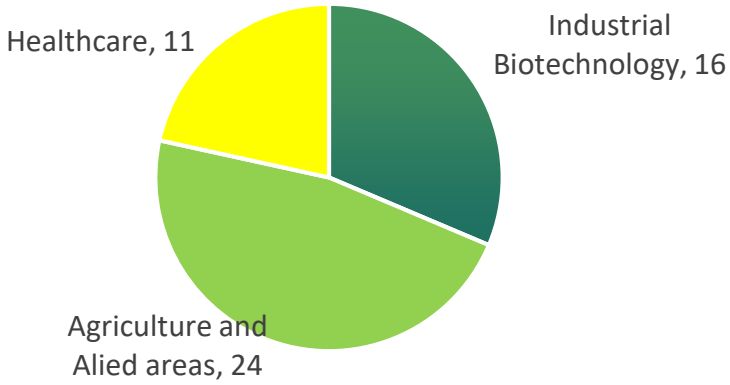
Background of applicants



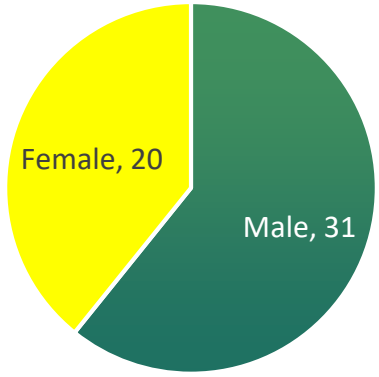
State wise applications



Thematic distribution of the applicants



Gender ratio



Winners

Category 1
Master Students

Mr. Ajoy Modak
Project: : Use of Ramie waste for mushroom cultivation
State: Tripura

Mr. Apurba Gohain
Project: : Investigating the Sustained-Release behavior of cellulose nanofibers embedded urea-formaldehyde resin microcapsules containing a model agrochemical
State: Assam

Ms. Puja Devi Yumnam
Project: : To identify the most efficient starter culture of traditional fermentation process of soybean (Hawaijar) and to upgrade its nutritional value for commercial production.
State: Manipur

Category 2
PhD scholars and Post Doctoral Fellows

Mr. Apurba Das
Project: Development of hybrid ferroelectric-piezoelectric biocompatible ceramic composite for high performance biological coatings in implantable devices and bio-electronic gadgets.
State: Assam

Dr. Ananya Barman
Project: Bioprospection of microbial metabolites of a tea rhizobacteria BTA27 for Tea (*Camellia sinensis L Kuntze*) blister blight control.
State: Assam

Mr. Sujit Das
Project: Impact of “Chubitchi” (fermented rice beverage of Garo Tribes, Meghalaya) in management of Antibiotic Associated Diarrhea
State: Meghalaya

Winners

Category 3
Faculties/ Scientists

Dr. Subham Banerjee

Project: Extrusion based customized biofilaments processing for fused-filaments 3D printing pharmaceutical applications
State: Assam

Dr. Mrityunjoy Mahato

Project: Development of Continuous Mode Hydrothermal Carbonization (CM-HTC) Reactor for Processing of Wet Biomass Waste of North East into Value Added Products
State: Meghalaya

Dr. Temin Payum

Project: Antihypertensive Herbal Drink
State: Arunachal Pradesh

Category 4
Startups

Sanajing Sana Thambal

Project: Eco-friendly approach to produce garments from lotus fiber
State: Manipur

PepThera Laboratories Pvt. Ltd.

Project: Biomolecules for Prevention of Hospital Acquired Infections
State: Assam

RogNidaan Pvt. Ltd.

Project: Oral scanner-An automated system to detect oral dysplasia
State: Assam

Brahmaputra TechnoPharmaceuticals Pvt. Ltd.

Project: Smart N95 Mask using Activated Carbon from Waste Tea Leaves
State: Assam

CATEGORY 1

MASTER STUDENTS

(PURSUING/COMPLETED)

Mr. Apurba Gohain

Project: : Investigating the Sustained-Release behaviour of cellulose nanofibers embedded urea-formaldehyde resin microcapsules containing a model agrochemical
State: Assam

Email: gohainapurba998@gmail.com

Apurba Gohain is currently pursuing M.Sc in Chemistry at Assam University. He is a recipient of University Grants Commission Special Scholarship Scheme for North Eastern Region and Local MLA Scholarship. He was also awarded 1st prize in Science Model Competition- 2012, conducted by Jatiya Vidyalaya Titabar for the project entitled **"Process & Utilization of Solar Energy in Rural hilly area of North-East India"**. He proposes a project entitled "Investigating the Sustained-Release Behaviour of Cellulose Nanofibers Embedded Urea-Formaldehyde Resin Microcapsules Containing a Model Agrochemical".

In the preliminary study, urea-formaldehyde microcapsules containing citronella oil as a model agrochemical were synthesized via in-situ polymerization method with embedded nano-cellulose in the wall for pore generation. The formulated microsystem demonstrated suitable size, morphology and stability with appreciable in vitro release characteristics. Based on the promising results, the applicant proposes to formulate porous microcapsules for controlled delivery of pesticide/ fungicide with prolonged release time which can effectively stabilize and minimize the use of potentially harmful chemicals.

Ms. Leichombam Sweta Devi

Project: : Extraction of essential oil from the plant Ocimum sanctum and to determine its bioactivities for commercial usage.
State: Manipur

Email: romens72@gmail.com

Ms. Leichombam Sweta Devi has completed her M.Sc. in Microbiology from JIS University. She has done her B.Sc. In Microbiology from Asian Institute of Management and Technology, Guwahati University. With an extensive work on her previous project, “Effect of growth of white rod fungi on coconut coir” she gained experience in handling the generic microbiology tools & instruments and microbial isolation & culture techniques. With an active interest in essential oils and bioactive compounds, she proposed an idea of extraction method of these compounds. Her project is entitled as **“Extraction of essential oil from the plant Ocimum sanctum and to determine its bioactivities for commercial usage.”**

The applicant highlights chemical constituents present in ocinum sanctum such as, oleanolic acid, rosmarinic acid, ursolic acid, eugenol, linalool, carvacrol etc. She also mentions that these essential oils of Ociumum sanctum have been recommended for the treatment of bronchitis, malaria, diarrhea, dysentery, antifungal, antimicrobial and skin diseases. As concentration of eugenol present in tulsi leaves has various health benefits, hence developing a novel, improved protocol highlighting efficient reproducible and reliable technique for mass multiplication of medicinally and economically beneficial herb, O. sanctum is the need of the hour. The applicant aims to employ a protocol for extraction of essential oil from the plant Ocimum sanctum, determine its bioactivity furthering to mass scale up for commercialization.

Mr. Ajoy Modak

Project: : Use of Ramie waste for mushroom cultivation
State: Tripura

Email: ajoy.modak27.5@gmail.com

Mr. Ajoy Modak has completed his M.Sc. in Microbiology from the Department of Microbiology, Tripura University. He has astounding working skills in dairy quality control, waste water management & its recycling and isolation & purification of microbes. He also experienced in formation of bio-fertilizer from dairy waste water & its application in agricultural field. Moreover he is also trained in ramie fiber degumming methods by both biological & chemical methods as his M.Sc. thesis was on Characterization of enzyme producing bacteria which are responsible for Ramie fiber degumming. Along with this he holds his expertise in generic R&D lab instrumentation and machine handling. He also has a book chapter in peer-reviewed journals, participated in national workshops and is certified from prestigious institutes of the country.

He along with his team members, **Ms. Mandakini Gogoi** and **Ms. Chaitali Chanda** has proposed a project entitled **"Use of Ramie waste for mushroom cultivation."** Ramie plant is easily found in north east region which is rich in nutritional and pharmaceutical value, hence considered a medicinal plant in various countries. Mr. Ajoy says, "A huge quantity of waste is generated every time after decortications of fiber. The cost of the waste is very less and its usage may limit the application of pesticide and fungicide leading to the production of organic mushrooms devoid of any toxicity." The project is expected to meet promising expectations as it is mentored by Dr. Shaon Ray Chaudhuri, Associate Professor, Dept. Of Microbiology and Prof. Ajoy Krishna Saha, Professor, Dept. Of Botany in Tripura University.

Ms. Abhilasha Saikia

Project: Water hyacinth as a remedial host for wastewater in the river Bharalu
State: Assam

Email: abhilasha1597@gmail.com

Ms. Abhilasha Saikia and **Ms. Sushmita Nath** are currently pursuing their M.Sc. degree from Department of Biotechnology, Gauhati University. These young & innovative minds have proposed an interesting solution to the unmet need of wastewater treatment of the rivers in India. Their project is entitled as **"Water hyacinth as a remedial host for wastewater in the river Bharalu, Assam"**

Their survey highlights that the river Bharalu, was once a source of variety of aquatic species, flora and fauna is now amongst the most polluted and contaminated tributaries of the Brahmaputra. Due to absence of proper sewage water treatment and lack of attention from PCBA , Bharalu has now been listed in priority 1 river category. They have tried to initiate the properties of water hyacinth and related microorganisms as a remedy for the treatment of sewage.

Their approach here is to create a recombinant microorganism which will be highly efficient in the uptake of specific heavy metals that will be regulated by specific genes of the recombinant DNA. The applicant mentions that a large number of useful byproducts like animal and fish feed, power plant energy (briquette), ethanol, biogas, composting and fiber board making can be obtained, once the treatment is over. Also organizations such as NEDFI in Assam have utilized large quantities of water hyacinth in the production of innovative crafts which are well known in Indian and international market. Hence, when the wastewater is treated eventually, manpower can be indulged in removing these weeds, vocational training programmes related to these hyacinth products can be initiated to incorporate the unemployed and flourish a mindset of native entrepreneurship among the mass.

Mr. Sougat Kumar Choudhury

Project: : Blue Revolution in Tripura: A step to think beyond in Fishing Sector
State: Tripura

Email: sougatkrchoudhury@gmail.com

Mr. Sougat Kumar Choudhury has completed his M.Sc. degree in Life Sciences from Tripura University in 1998. Since then he has been the sole proprietor and owner of his venture and deals with the commercial trading of ornamental fishes and aquariums that speaks for his massive experience in this field of blue revolution. For his better understanding in aqua industry and aqua-preneurship, he has been certified and been a part of various workshops and programs like “Aqua Clinics & Aqua Preniorship Development Program (AC & ADP)”, “Capacity Building on Applications of ICT in marketing of Fish and Fish Products”, “Mass Production of Indigenous & Exotic Ornamental Fishes in Tripura” related to blue revolution all over the country.

His proposed project is quite fascinating & interesting as he believes in enhancing fish productivity through proper expansion, intensification, diversification and utilization of land & water. His project is entitled as **“Blue Revolution in Tripura: A step to think beyond in Fishing Sector.”** As Indian fishery sector is constantly facing stiff challenges such as alarmingly shrinking of water spread area, decreasing fish population in natural water bodies and rapidly changing climatic conditions, the applicant aims to develop a framework for the development of knowledge as well as skill in terms of marking of fish, supported by well planned, structured, implemented production and management outline. This framework will be supported by a stable digital platform of ICT (Information, Communication and Technology) with framing connectivity between scientists, policymakers, organizing bodies, investors and most importantly the ground players i.e. the farmers.

Ms. Rajkumari Nirupama

Project: Isolation Of Potential Straw Decomposing Fungi And Commercialization Of The Microbes For Rapid Composting Of Rice Straw
State: Manipur

Email: nancyrajkumari@gmail.com

Ms. Rajkumari Nirupama Devi holds an M.Sc. degree in Agriculture on the thesis entitled "Management of Wirestem disease of rapeseed and mustard by Trichoderma species." She has previously worked at Micro Small and Medium Enterprise- Technical Centre (MSME-TC) Imphal project for FFDC (Flavour and Fragrance Development Centre) for 2 years as a Job Trainee.

With her expertise in plant pathology, she proposed a project entitled **"Isolation Of Potential Straw Decomposing Fungi And Commercialization Of The Microbes For Rapid Composting Of Rice Straw."** The applicant aims to use fungal inoculum isolated from the straw for composting of straws. The inoculant product will help in accelerating the process of composting, making it a farmer-friendly product for meeting the demand for compost and empowering the farmers of the state to adopt organic farming thereby decreasing the use of off-farm products. The applicant mentions that after the screening of all isolated fungi from rice straw and once the effectiveness of the inoculants has experimented, commercial carrier-based or liquid form of the inoculants will be mass-produced and packed in sterile condition maintaining the quality of the product.

Ms. Puja Devi Yumnam

Project: : To identify the most efficient starter culture of traditional fermentation process of soybean (Hawaijar) and to upgrade its nutritional value for commercial production.
State: Manipur

Email: romens72@gmail.com

Ms. Puja Devi Yumnam has completed her M.Sc. in Agriculture from RIMT University. During her term of 2 years in her graduation she completed and published a thesis on Characterization and management of alternaria leaf spot of Tomato Plant, which speaks of her efficacy and determination. She has previously worked in Green Foundation, Sinsang Organic Input Lab Imphal Manipur. She is trained in specimen collection and holds her experience in the field of plant tissue culture, food microbiology and food technology. Her proposed project is entitled as **"A project to identify the most efficient starter culture of traditional fermentation process of soybean (Hawaijar) and to upgrade its nutritional value for commercial production".** She mentions that fermented soybean, Hawaijar available in the markets are usually wrapped in banana leaves which have high chances of getting spoilt, leading to production of toxic compounds which may have deleterious effect on humans following consumption.

In order to deal with this problem, the applicant aims to isolate and classify the starter bacteria found in traditionally fermented soybean (Hawaijar), to determine their genetic relatedness, their metabolic and physiological properties and their ability to produce flavor compounds furthering to determination of the most efficient flavour enriched starter culture that does not produce any toxic compound to humans. The applicant says, the potent microbial strain isolated from the good quality *Hawaijar* samples might be a new bacterial strain. Using this as a starter culture will lessen the fermentation period and at the same time improving the quality of the product. Using a starter culture for the preparation of *Hawaijar* will be the first time highlighting the implementation of a technology based production of fermented food for the benefit and welfare of the people.

Mr. Suneet Talukdar

Project: Utilization of animal manure for mushroom production
State: Assam

Email: talukdar.suneet@gmail.com

Mr. Suneet Talukdar holds a B.Sc. degree in Animation from St. Xavier's College. However, he grew interest in the organic farming of mushrooms and after seeking help from his father in both technical and theoretical domain, he progressed to figure out a much more efficient and organic way of mushroom cultivation.

His project is entitled as **"Utilization of animal manure for mushroom production."** The applicant aims to cultivate mushrooms belonging to Agaricus species such as Button/Portabello/Crimini, using composts from dungs of herbivorous animals as substrate instead of predominantly used synthetic materials. Mr. Suneet mentions that the animals are unable to digest their feed completely and their manure contains a lot of fibers, which can be very much beneficial in mushroom cultivation. The major objective is to decrease the release of ammonia produced from synthetic substrate into the atmosphere which is responsible for greenhouse gas emission.

Mr. Wahengbam Jurjit Singh

Project: Manufacturing and marketing of Aromatic Essential Oils of Manipur
State: Manipur

Email: wahengbamjurjit@gmail.com

Mr. Wahengbam Jurjit Singh has completed his M.Sc. in Zoology from Manipur University. With proficient technical skills, he has completed his Post Graduate Diploma In Computer Application (PGDCA). He has also participated in the International Congress on Vedanta and Science (ICVS) organized by University of Bhagavata Culture, Imphal.

With his major interest in Medicinal Aromatic plants, immune booster medicinal herbs in North East region of India, he proposed a project entitled as **"Manufacturing and marketing of Aromatic Essential Oils of Manipur"**. As the use of synthetic materials for the mushroom cultivation often produces toxic residues which are harmful to the human health, the applicant aims to establish an essential oil manufacturing unit. Mr. Singh mentions that some indigenous essentials oils are antiseptic, antimicrobial in nature which will be beneficial for boosting immune system. After the revenue generation from the unit, it may serve as a platform for marketing of raw materials produced by the farmers. The proposed work will not only meet the demand of essential oil in the market but also generate employment opportunities for the young mass.

CATEGORY 2

PHD SCHOLARS AND POST DOCTORAL FELLOWS

(PURSUING/COMPLETED)

Dr. Abshar Hasan

Project: Surface functionalization of Titanium-based implant materials with improved functionality and performance for orthopaedic applications
State: Assam

Email: aman176106117@iitg.ac.in

Dr. Abshar Hasan has completed his PhD in Biosciences and Bioengineering from Indian Institute of Technology, Guwahati. He is currently working as a Post-doctoral fellow at University of Nottingham, UK. He received prestigious Commonwealth Split-site scholarship 2017-2018 under Dr. Aaron Lau in Pure and Applied Chemistry at Strathclyde University, UK. His research area includes surface functionalization, surface-protein and protein-cell interactions; synthesis and purification of peptoids (peptidomimetics), microbiology and cell culture work. He has published many research papers in peer-reviewed international journals, including Colloids and Surface: B, Langmuir, ACS Biomater. Sci. Eng., Materials Science and Engineering: C, Applied Surface Science. He is an editor of a book and has penned down many book chapters and review papers also.

Dr. Hasan believes that titanium along with its alloys are the first choice for the orthopaedic applications due to their high mechanical strength however they suffer from poor osseointegration and osteoconductivity and thus require surface modification for improved functionality. He along with Mr. Aman Bhardwaj have proposed an interesting project entitled as **"Surface functionalization of Titanium-based implant materials with improved functionality and performance for orthopaedic applications."** Their approach involves formation of self-assembled monolayers on Ti6Al4V surfaces using silanes molecules exhibiting different terminal functional groups such as amine, octyl, and carboxyl. They have reported for the first time, a surface modification strategy that provides a possibility to carefully modulate physico-chemical properties of surfaces. They believe, ease of modification and simple protein adsorption strategy can be efficiently utilized in the field of biomedical engineering, particularly for enhanced osteointegration during orthopaedic applications.

Mr. Apurba Das

Project: Development of hybrid ferroelectric-piezoelectric biocompatible ceramic composite for high performance biological coatings in implantable devices and bio-electronic gadgets.
State: Assam

Email: apurba12@iitg.ac.in

Mr. Apurba Das is currently pursuing his doctoral research in the Department of Physics, IIT Guwahati and is working with Dr. D Pamu. His doctoral research topic is related to the electrical properties of biomaterials that are found to play a prominent role in bone healing. He is a recipient of INSPIRE Scholarship, Department of Science & Technology and UGC Post Graduate Merit Scholarship. He has multiple articles published in various reputed journals and has filed a patent entitled as "Hydroxyapatite comprising of mixed polymorphs of monoclinic and hexagonal phases obtained by sol gel Process" [Indian patent application no. 202031029208]. With multiple years of experience in this research community, he holds his expertise in various high end instruments like XRD, TEM RF magnetron sputtering, Ball milling, and high temperature furnaces.

Mr. Das along with his team members, Ms. Sweety Bora and Dr. D. Pamu, are working on ceramic composites for biological applications and have proposed a project entitled as **"Development of hybrid ferroelectric-piezoelectric biocompatible ceramic composite for high performance biological coatings in implantable devices and bio-electronic gadgets."** The north-eastern part of India is still known to import HAP powder from different parts of the nation to fulfill the medical requirements, however the applicant proposes to generate high quality HAP powder for different dental requirements, generating scaffolds and bone grafts along with coatings for titanium implants which will certainly do wonders to the natives of the region. They found that externally implanted devices with similar properties can prove beneficial for better and faster bone healing responses as bone grafts and scaffolds along with enhanced lifetime of the coated titanium implants. The hybrid ferroelectric-piezoelectric composite that is proposed, will be used for generating scaffolds, grafts or as filings in dental cavities. This is a novel concept and the enhanced performance of such generated composite for various applications is expected to take over the bio-medical market replacing the monolith HAP.

Dr. Mriganko Das

Project: Development of novel nanoformulation for the higher efficacy of turmerone & curcumene from (*Curcuma caesia* i.e. black turmeric) for wide biomedical applications.
State: Assam

Email: dasmriganko@gmail.com

Dr. Mriganko Das holds a Ph.D. degree in Biotechnology - Microbiology & Bioprocess Engineering from School of Biotechnology, Jawaharlal Nehru University, New Delhi. He is currently the Director of Pratyaksha Agrotech Pvt. Ltd. (MSME & DIPP recognized, GOI). He has been a part of various projects related to biofuels and has published many research articles and has also filed a patent entitled "Dual Step process for production of butanol from lignocellulosic biomassusing Clostridium Beijerinckii". He has also been awarded in many national competitions and symposiums. With his profound experience in the R&D field, he has also learned Vocational Courses (Open Learning College), Business Management, Project Management, Internet Marketing, Public Relation & Key Financial Reports from Brentwood School, UK.

He along with his team members, Dr. Jaydeep Bhattacharya and Mr. Supratim Roy Choudhury, proposed a project entitled as **"Development of novel nanoformulation for the higher efficacy of turmerone & curcumene from (*Curcuma caesia* i.e. black turmeric) for wide biomedical applications"**. The applicant proposes to extract the turmerone & curcumene from *Curcuma caesia* (black turmeric) and encapsulate it in biodegradable polymers such as PCL and PLGA which will increase the efficacy and overcome the limitations faced by healthcare sector for societal and economical support. This approach will help in achieving high production yields that will change the economic perspective and health scenario of medicinal world. The proposed idea will potentially increase the production which has not been exploited yet at commercial perspective in a cost effective and eco-friendly manner and the utilization of this endangered wonder through nanobiotechnology approach would prove as an added benefit for health benefits.

Dr. Ananya Barman

Project: Bioprospection of microbial metabolites of a tea rhizobacteria BTA27 for Tea (*Camellia sinensis L Kuntze*) blister blight control.
State: Assam

Email: ananya.barman@gmail.com

Dr. Ananya Barman has completed her Ph.D in Biosciences and Bioengineering from IIT Guwahati. Her thesis title is "Studies on calcium signaling genes phospholipase C-1, secretory phospholipase A2, and calcium proton exchanger-1 in *Neurospora crassa*". At present she is working as a research associate on a DBT sponsored project "Assessment of diversity and pathogenicity of blister blight and dieback disease causal pathogens prevalent in tea grown on different agro-climatic conditions and their biocontrol through microbe based bioformulations". With a very strong and profound work experience and expertise, she has published her research work in 3 international journals and is a recipient of INSPIRE fellowship, DBT Research Associateship Program in Biotechnology & Life Sciences, JRF and SRF from MHRD. She has received multiple national grants and fellowships throughout her research career also presented more that 10 posters in national & international conferences and seminars.

She has proposed a project entitled as **"Bioprospection of microbial metabolites of a tea rhizobacteria BTA27 for Tea *(Camellia sinensis L Kuntze*) blister blight control"**. The applicant has isolated a beneficial rhizobacteria BTA27 from tea rhizosphere soil samples collected from Bateli tea estate in the Udalguri district of Assam, India which has shown very promising antagonistic activity against a large number of tea plant pathogenic fungi. She mentions the presence of secondary microbial metabolites present in the isolate. This antagonistic bacterial isolate also exhibited suppression of pathogenicity on tea leaves in vitro. The isolate can be optimally cultured in the laboratory under sterile conditions for optimum antimicrobial metabolites production, packaged under aseptic conditions and supplied initially to the small scale organic tea growers of the northeast. She believes the developed bioformulation/s can be applicable immediately which will be natural, safe, effective, persistence and durable alternative to chemical fertilizer and it will be cost saving to growers as it will reduce the cost of application.

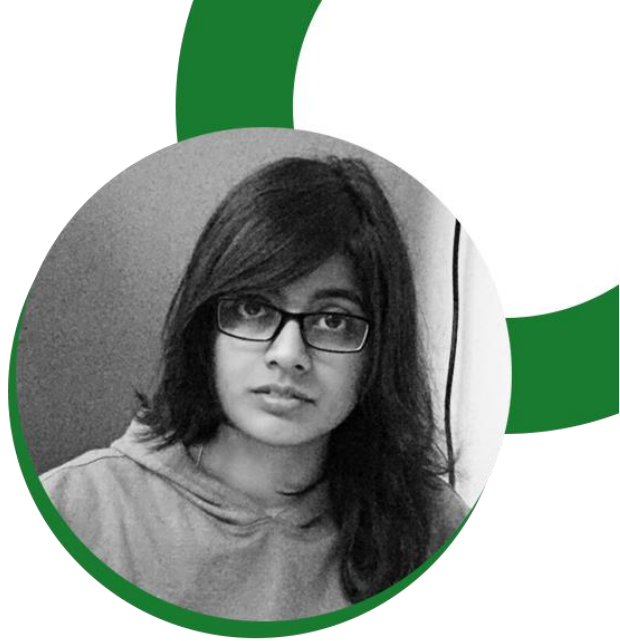
Dr. Dibya Jyoti Hazarika

Project: Optimization of prodigiosin production by endofungal *Serratia macescens* D1 and its commercialization potential
State: Assam

Email: dshine22@gmail.com

Dr. DibyaJyoti Hazarika is currently working as a Research Associate at Assam Agricultural University. He has worked as Junior Research Fellow in the Department of Agricultural Biotechnology and DBT-North East Centre for Agricultural Biotechnology, Assam Agricultural University, Jorhat. His research interest focuses mainly on Microbial secondary metabolites, Bacterial-fungal interactions, Transcriptomics and Metabolomics. He has published his work in reputed journals, presented his work at International conferences and attended many workshops and seminars.

He along with his team members Ms. Merilin Kakoti and Dr. Robin Chandra Boro is working on the optimization and production of a bioactive compound called Prodigiosin. He along with his team, proposed a project entitled as **"Optimization of prodigiosin production by endofungal *Serratia macescens* D1 and its commercialization potential"**. As the current market availability of prodigiosin is very narrow and only 3-4 international companies market prodigiosin commercially at very high cost in India, the applicant proposes that the developed bacterial isolate by his team, has the capability to produce high concentration of prodigiosin in a comparatively lower cost. They harbor a cost-effective production of prodigiosin using an endofungal isolate of *Serratia marcescens* and its antimicrobial activity against gram positive and gram negative bacteria.



Ms. Swati Sharma

Project: Biosurfactant driven adsorption and microbial biodegradation of spilled crude oil
State: Assam

Email: swatisharma7503@iitg.ac.in

Ms. Swati Sharma, prior to her doctoral research, she qualified Graduate Aptitude Test Engineering (GATE) with score of 607 and AIR of 129 in 2016 and shortlisted in Category 2 at position 16/100 selected candidates for DST-Junior Research Fellowship (DBT-JRF-2016). Her educational background includes M.Tech in Biotechnology, NIT Durgapur, West Bengal (2014-2016, 9.12 CGPA) and B.E. in Bio Technology, RVCE Bangalore, Karnataka (2010-2014, 9.46 CGPA). Presently, she is a research scholar in Bio-interface & Environmental Engineering Lab, Department of Biosciences and Bioengineering, IIT Guwahati with 4 year of experience in the field of oil degrading and biosurfactant producing bacteriology. She has published 18 publications in reputed journals and has represented her work in 7 international conferences/workshops.

Ms. Sharma says, “Biosurfactants are the new frontier of oil spill control and remediation, as their unique inherent amphiphilic chemistry allows them to act at the oil-water interface, improving their selectivity of operation.”

With her proceedings, she has proposed a project entitled **”Biosurfactant driven adsorption and microbial biodegradation of spilled crude oil”**. Here, she proposes an integrated biosurfactant driven adsorption and microbial biodegradation of spilled crude oil. Initially, the organic sorbent will be incubated with biosurfactant (< CMC), followed by its inoculation with microbial consortium for crude oil spill remediation study. She mentions, during the consortia growth, the produced biosurfactant will seep into these porous lumens in the sorbent, preventing its inhibitory effect (> CMC) on the microbial growth, as well as maintaining the hydrophobic coating throughout the time of application. Overall, this proposed idea will put forward a self-driven oil adsorption and biodegradation strategy using biosurfactant as the driving force.

Md. Iftikar Hussain

Project: To isolate Necrotic Enteritis (NE) associated *C. perfringens* lytic phages, determine anti-clostridial efficacy and further evaluate therapeutic potential of the phage cocktail in poultry.
State: Assam

Email: mdiftikarhussain@gmail.com

Md. Iftikar Hussain has completed his Ph.D. in Bioengineering and Technology from Gauhati University, Assam. He is currently a Postdoctoral fellow (Dept. of Biotechnology, GoI) College of Veterinary Science, AAU, Assam, India. He is a translational researcher in the field of vaccine development and infection biology. He is experienced in development of bacterial vaccine using recombinant, toxoid, DNA and peptide based platforms. Presently he is pursuing research for synthetic DNA based multi-epitope Clostridioides difficile vaccine candidate project, funded by Department of Biotechnology, GoI. As part of academic research and with his profound expertise in his field, he has co-authored 20 research publications.

Dr. Hussain proposed to **isolate Necrotic Enteritis (NE) associated *C. perfringens* lytic phages, determine anti-clostridial efficacy and further evaluate therapeutic potential of the phage cocktail in poultry**. He says, Phage therapy is found to be significantly effective in prevention of necrotic enteritis compared to the vaccine. It has reduced the mortality by 92%. As the market of phage therapy in India is still growing and presently there are no phage therapeutic products available in national and international market which addresses the issue of Necrotic Enteritis in poultry, the applicant proposes that the developed product will be an additional product in the market which also address standardization of in-feed bacteriophage addition.

Dr. Ningthoujam Chandani Devi

Project: Commercial utilization of starter culture for preparation of *Ngari* (a fermented fish product) of Manipur
State: Manipur

Email: sana.ning@gmail.com

Dr. Ningthoujam Chandani Devi has completed her Ph.D. in Biotechnology from Assam University, Silchar. She is a recipient of UGC - BSR (Basic Scientific Research) fellowship and has 4 first author publications to her name. She has core expertise in isolation and molecular characterization of bacteria, DNA sequence analysis, phylogenetic tree analysis. With her profound knowledge and experience in her field, she has been a part of many national & international conferences and workshops.

With her expertise in food microbiology and fermentation processes, she proposed a project entitled **"Commercial utilization of starter culture for preparation of *Ngari* (a fermented fish product) of Manipur"**. The applicant proposes to isolate a potential microbial strain the *Ngari* samples which may be further identified and characterized. Using consortium of the microbial strains may reduce the fermentation period and the formulation of new technique (s) to prepare *Ngari* hygienically by avoiding cross contamination. Dr. Devi mentions, Using a starter culture for the preparation of *Ngari* will be the first time highlighting the implementation of a technology based production of fermented food for the benefit and welfare of the people of Manipur.

Dr. Thiyam General

Project: Golden veg protein from algae
State: Manipur

Email: generalm48@gmail.com

Dr. Thiyam General holds a Ph.D degree in Biochemical engineering from NIIED- Korean Government Scholarship and also served as NPD Fellow (SERB). With his profound experience in food processing and food optimization, he has published more than 13 publications, 1 book chapter and has one patent. Currently he is a post-doctorate fellow at Dept. Biological Sciences, G.B. Pant University of Agriculture & Technology, India.

Dr. Thiyam says, there is need for alternative microalgae that can be amalgamated in the existing India food system. The existing microalgae biomass are generally green hence their application is limited. Hence he proposed a project entitled as **"Golden veg protein from algae"**. Commercial lutein products are sold as powders, granules or capsules with a lutein continent of 3-80% w/w. He aims to develop algal biomass product enriched with protein (50 to 60%), bioactive substances with antioxidant properties and carotenoids (lutein) in heterotrophic cultivation mode. The applicant proposes to achieve for high-cell-density culture at 70 to 100 g/L, with high protein and lutein content. The heterotrophic cultivation can achieve high biomass 40 g/L and he is targeting to achieve for high-cell-density culture at 70 to 100 g/L, with high protein and lutein content.

Ms. Elizabeth Huidrom

Project: Indicator for Scoville Scale of Chilli Pepper using AI Recognition Technology
State: Manipur

Email: eli7huidrom@gmail.com

Ms. Elizabeth Huidrom is currently pursuing her Ph.D. at CSIR-North East Institute of Science & Technology, Jorhat in the Biological Sciences and Technology Division. Her research area is in Bioprospection focusing on the plants found in Manipur. She is currently availing Junior Research Fellowship from CSIR through UGC-CSIR conducted NET Exam. She was also a recipient of INSPIRE Fellowship under the SHE Programme, under DST, Government of India. With her work experience and her research findings, she also has a publication in a peer-reviewed journal.

She proposed a project entitled as **"Indicator for Scoville Scale of Chilli Pepper using AI Recognition Technology".** The applicant aims to use Artificial Intelligence technology in real time as a recognition tool for identifying the type of chillis. Correspondingly, the Scoville scale of the chilli will be displayed on the screen which will be used to capture the image of the chilli/pepper fruit. This technology would also be a lot of help in research activities related to the related plant. The young researcher believes that, in this present era of technology, capturing a quick image of the chilli pepper on a camera and then obtaining access to the Scoville units of that particular chilli pepper in real time on that screen is a technology that could be considered for efficiency, speed and authenticity regarding the diversity of the species. The repository of the different kinds of chilli pepper all over the world will be valuable in utilization of a buildup of this technology.

Ms. Gloria Nyenthang

Project: Mushroom agronomy as a potential empowerment to women
State: Nagaland

Email: nyenthanggloriaa@gmail.com

Ms. Gloria Nyenthang is pursuing her Ph.D. from Nagaland University, Lumami. Her current research focuses on Mycology and microbiology. She has collaborated with reputed authors and has published a book. She has three years of experience addressing the current research topic and has published her work in journals of international repute. She has also collaborated with reputed authors and has published a book. The applicant mentions that, in the present scenario in Nagaland, the mushroom industry is still in its infancy and only a fraction of the farming community is engaged in small scale seasonal production of mushrooms. Hence along with her team member, Keviphruonuo Kuotsu, she proposed a project entitled as **"Mushroom agronomy as a potential empowerment to women"**.

The applicant focuses on adopting a large-scale integrated production model for cultivating mushrooms that will not only provide food security, sustainable and more nutritious diets but will also streamline the processes involved in cultivation, processing and marketing of mushrooms. Environmentally controlled houses for the manipulation of temperature, humidity, light, etc., to produce the highest possible yields for consistent market supply through year-round production, increased yields, and decreased time required to complete a crop cycle will be the major aim of the project. As fresh mushrooms have limited shelf life, therefore, further processing and canning will be adopted to increase the shelf life for marketing of mushrooms for distant places.

Mr. Harshal D. Kawale

Project: Production of value added chemicals and fuels from waste residues present in all over the north east region (NER)
State: Assam

Email: harshalkawale12@iitg.ac.in

Mr. Harshal D. Kawale is pursuing his Ph.D. at Indian Institute of Technology Guwahati, Assam. He was employed in CSIR-NEERI, Nagpur as Project Assistant Level-III under Dr. Ganesh Kale on waste to bio-fuels project entitled "Thermal Processes for Biofuels from Biomass." His research expertise focuses in biochemical conversion of wastewater/waste biomass into electricity and thermochemical conversion of biomass/waste material to value-added products. He has been an active researcher for last 6 years in Chemical Engineering with expertise in biochemical conversion of wastewater/waste biomass into electricity and thermochemical conversion of biomass/waste material to value-added products.

Mr. Kawale has proposed a project entitled as **"Production of value added chemicals and fuels from waste residues present in all over the north east region (NER)".** The applicant proposes an establishment of pilot scale plant for treating bio-waste material by pyrolysis which can be can be commissioned at various locations of NER with 1Ton/day (1TPD) raw waste material processing capacity which will generate good revenue for farmers/other workers. He believes that the bio-waste material present in surroundings of Assam is untreated and unexamined for their potential value determination. Despite of the fact that NER is rich in natural resources, they are diminishing rapidly. So, it is a need of an hour to develop fruitful technologies such as pyrolysis to treat waste material for production of fuel grade and value added hydrocarbons.

Dr. Kuntal Manna

Project: Development of cost effective herbal nutraceutical solid doses form (Powder and Capsule) using indigenous edible plants components of Tripura and progress a medium enterprise
State: Tripura

Email: waikhom.pharmacy@tripurauniv.in

Dr. Kuntal Manna holds his Ph.D. from Institute of Pharmacy, Nirma University, Ahmedabad, Gujarat, India. He is currently working as an Assistant Professor in Department of Pharmacy, Tripura University (A Central University), Suryamaninagar, Agartala, Tripura, INDIA. He has a core expertise in the field of multi-step synthesis of heterocyclic compounds, drug intermediates, molecular scaffolds and their biological screening for antitubercular, antimicrobial, anti-inflammatory and antioxidant activity, multi-step synthesis of heterocyclic compounds, drug intermediates and molecular modeling and receptor docking studies of novel series of anti-cancer, antibacterial, antilipidimic, antiHIV, prodrug for IBD. Dr. Manna has been honored as 'INSPIRING TEACHER' and felicitated by His Excellency, Sri Pranab Mukherjee, Hon'ble President of India at Tripura University for his outstanding academic and research performances. He is a recipient of several other prestigious grants and 'Fast Track Young Scientists Award' from Department of Science & Technology (DST).

With his extensive and profound knowledge, expertise and research findings, he has authored and co-authored around 26 publications in national and international journals.

He along with his team members, Waikhom Somraj Singh and Bikash Debnath, proposed a project entitled as **"Development of cost effective herbal nutraceutical solid doses form (Powder and Capsule) using indigenous edible plants components of Tripura and progress a medium enterprise."** The applicant aims to formulate novel herbal nutraceuticals by using edible plant which is available in Tripura. Dr. Manna states, the selection of edible plants on the basis of 'traditional knowledge' of ancient community of Tripura' will be done. Then sample will be dried, powdered and packed in a closed airtight container. The dry powder will be used for the formulation of nutraceutical solid doses forms (powder, and capsule) and evaluations of physical parameters of powder and capsule will be done according to Indian Pharmacopeia (IP) or United States Pharmacopeia (USP).

Mr. Lourembam Romen Meitei

Project: "*Meitei Yainghang*'' the potential anti-cancer herbal tea (organic), a clinical study to commercialize the production
State: Manipur

Email: romens72@gmail.com

Mr. Lourembam Romen Meitei has completed his Ph.D. in Biotechnology from Assam University, Silchar. He has a core expertise in isolation and characterization of phytochemicals, DNA sequence analysis and primer designing. He has published his 2 research work in different journals, and has presented his work in various conferences and attended many seminars/workshops. Mr. Meitei says, the active compounds which are derived mostly from plants are highly anti-oxidant and useful in treating many diseases including cancer. Plants are good source of compounds which are non-enzymatic antioxidants capable of attenuating ROS- induced oxidative damage.

With his immense interest in this field, she proposed a project entitled as **"*Meitei Yainghang*'' the potential anti-cancer herbal tea (organic), a clinical study to commercialize the production".** Preliminary study was conducted to understand the potential anti-oxidant activity with reference to the total phenolic content of the rhizomes of *Curcuma Zedoariain*. The herbal tea of *Curcuma Zedoaria* may serve the purpose of detoxification of harmful side effects of any medication such as chemotherapy in cancer patients. After validation, the applicant proposes the establishment of production unit at Manipur and would provide employment opportunities to farmers of the region.

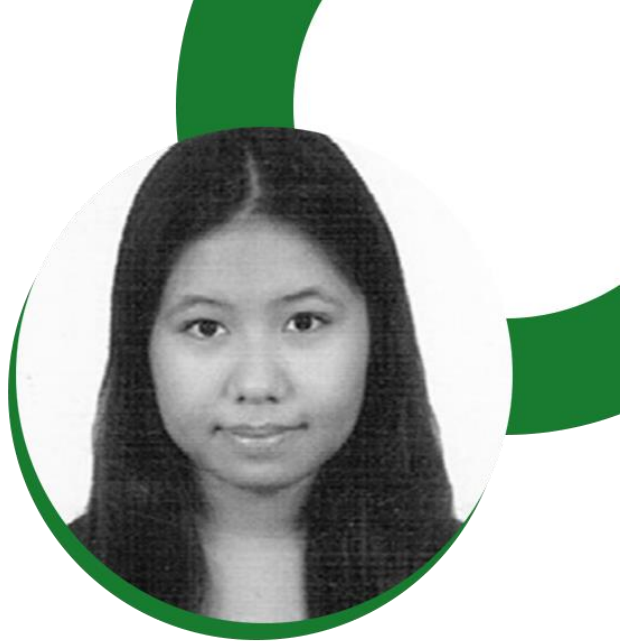
Ms. Lydia Yeptho

Project: Authenticity and sustainability of traditional Naga food in a global business era: a case of economic conditioning
State: Nagaland

Email: yeptholydia@gmail.com

Ms. Lydia Yeptho is pursuing her Ph.D. in Botany Department at Nagaland University. She has completed her Masters degree in Botany with specialization in molecular plant physiology and her current research is focused on food microbiology. She has published 3 papers in Journals of National repute and one book chapter.

She along with her team member, Khikeya Semy, has proposed a project entitled as **"Authenticity and sustainability of traditional Naga food in a global business era: a case of economic conditioning"**. The applicant aims to promote every possible traditional Naga foods in the global market to strengthen the socio-cultural and economic dimensions. The research further aims to include the screening of some traditional foods that may confer potential positive health impacts by identifying their role in managing and preventing lifestyle related diseases and nutritional deficiencies.



Ms. Ngairangbam Yaipharembi Devi

Project: Banana pseudostem: from a waste to valuable food products
State: Manipur

Email: yaipharembi111@gmail.com

Ms. Ngairangbam Yaipharembi Devi is currently pursuing her Ph.D. in CSIR-NEIST, Jorhat, Assam. She has done her B.Sc (H) and M.Sc Botany, from University of Delhi, India. With her profound interest in Economic botany and Bioinformatics, she has worked as a JRF in Advanced Computation and Data Sciences Division, CSIR-NEIST, Jorhat, Assam. She has also received the best Poster Award in the International Conference on "Engineering Sciences and Technologies for Environmental Care (ESTEC-2020)" held at CSIR-NEIST. She is currently working on Bioprospecting of edible plants of Manipur.

Ms. Devi says that, with its high fiber content, banana pseudo-stem has been extensively utilized in making various fiber products like mats, bags, ropes, carpets, etc. However, industrial utilization of the pseudo-stem in food industry is not so known yet. Hence to bring the banana plant into its full potential, she proposed a project which can further enhance the utility of this plant. The project entitled as **"Banana pseudostem: from a waste to valuable food products."** The applicant proposes to develop banana pseudo stem juice and dietary fiber supplement from banana pseudo-stems found in Manipur. She mentions that the biotransformation of the banana plant into various products can be widely commercialized which will greatly help in reducing the wastage of the plant parts while helping the banana farmers by improving their socio-economic condition.

Dr. Pratyush Kumar Das

Project: Bio-prospecting of *Colocasia esculenta* as a cheap source for the production of ethanol
State: Assam

Email: pratyush.das@hdls.in

Dr. Pratyush Kumar Das has completed his Ph.D. in Biotechnology from Siksha 'O' Anusandhan (Deemed to be University). Currently he is working as a Research Scientist (Training & Innovation) at Heredity Life Sciences Pvt. Ltd., Bhubaneswar, Odisha. His research interest focuses on heavy metal analysis, phytoremediation, soil analysis, water analysis, environmental effects of heavy metals, Enzymology, Industrial Biotechnology (Isolation and characterization of antimicrobials, Synthesis of antibacterial formulations) and Plant Biotechnology. He is a recipient of several prestigious awards and published around 16 publications along with 3 book chapters and 2 published editorials in various journals of national and international repute. He has also presented many scientific posters and been a part of more than 12 national conferences which speaks for his profound interest and eagerness to learn and contribute to this society.

With his past experience and interest in environmental technology, he proposed a project entitled as **"Bio-prospecting of *Colocasia esculenta* as a cheap source for the production of ethanol"**. The applicant aims to produce ethanol obtained from the corm of Colocasia plant and further plans to establish production facility which would help generate employment on site. Moreover, it would also benefit the woman folks and farmers who would provide the raw materials (corn) on a regular basis. Other alcohol related products like sanitizers could be produced and distributed through self-help groups (SHGs).

Mr. Soching Luikham

Project: The potential fermented food of Nagaland/North-eastern India as a dietary source of living microorganism
State: Nagaland

Email: sochingluikham@gmail.com

Mr. Soching Luikham is currently pursuing his Ph.D. from National Institute of Technology (NIT), Nagaland. He has 2 publications reported in International journals and is the recipient of many prestigious awards throughout the country. He has been a part of 2 research projects which allowed him to gain his experience and expertise in many generic R&D experimentation techniques, tools and many high end instruments.

Ms. Luikham suggests that the ethnic community of Nagaland use food made of bamboo shoot (Bastenga) which contain high amount of protein, vitamin, fibers, carbohydrates and very low fat. Fermented bamboo shoots of *Bambusa vulgaris* and *Phyllostachys edulis* gives an extra taste when added with vegetables and meat etc. With this he proposed a project entitled as **"The potential fermented food of Nagaland/North-eastern India as a dietary source of living microorganism".** As the traditional foods of Nagaland such as fermented bamboo shoots of *Bambusa vulgaris* and *Phyllostachys edulis*, Fermented soybean (Axone) are rich in protein, vitamin, fiber, carbohydrate content, the applicant propose the exploration of such ethnically rich important diet and marketing of these food at a National/International platform.

Mr. Somprakash Dhar

Project: A Region with Bio Trade Border (BTB)
State: Tripura

Email: cerebrodea@gmail.com

Mr. Somprakash Dhar is presently pursuing his Ph.D. in Geography from Tripura University. He has his 2 first author papers published in national and international journals. Being a bright mind, he is also interested in India Bangladesh Relations, Geo Politics, and Environmental Science. Moreover he has presented his work in many national & international conferences & workshops.

He proposes a project entitled **"A Region with Bio Trade Border (BTB)"**. The applicant aims for developing ICT (Information, Communication and Technology) based model for developing BTBNs. The project aims for establishing BTB for developing a targeted space in terms of biological features which can be brought under the bilateral trade between two countries of India and Bangladesh. Identifying the correct nodes for BTB remains the main task of the project.

Mr. Sujit Das

Project: Impact of "Chubitchi" (fermented rice beverage of Garo Tribes, Meghalaya) in management of Antibiotic Associated Diarrhea
State: Meghalaya

Email: sujitdas557@gmail.com

Mr. Sujit Das is presently working as a PhD Research Scholar in the Department of Rural Development and Agricultural Production, North-Eastern Hill University (NEHU), Tura, Meghalaya. He has previously worked as a Senior Research Fellow in one DBT, Govt. of India funded Twinning Project and as Junior Research Fellow in two DBT, Govt. of India funded Twinning Projects between Dept. of RDAP, NEHU, Meghalaya, India (parent institute) and Dept. of Dairy Microbiology, SMC College of Dairy Science, AAU, Anand, Gujarat, India (collaborating institute). He has received 4 best paper awards from various National/International Conferences held in India and has published 14 research papers in national and international reputed journals and 3 book chapters till date.

As his research area mainly encompasses the characterization of probiotic microorganisms from indigenous fermented foods, development of novel functional fermented foods from indigenous Lactobacillus strains, he along with his team members, Dr. Birendra Kumar Mishra and Dr. Subrota Hati, proposed a project entitled as **"Impact of "Chubitchi" (fermented rice beverage of Garo Tribes, Meghalaya) in management of Antibiotic Associated Diarrhea".** Based on the promising preliminary results obtained from in vivo study, the applicant aims to prepare fermented rice beverage formulated with well characterized Lactobacillus and yeast strains, which could be explored as a potential candidate for preventing the antibiotic-associated diarrhoea (AAD). However, further investigations are warranted for its wide spread usage. Mr. Das adds, this research work has a huge scope to develop the socioeconomic status of the tribal people by providing them with a defined starter culture having health beneficial attributes as well as standardized protocol for the preparation of rice beverage of Meghalaya.

Ms. Sumi Das Purkayastha

Project: Prenatal Vaginal Probiotics: a boon for the mother and the unborn
State: Assam

Email: sumipurkayastha3@gmail.com

Ms. Sumi Das Purkayastha is pursuing her Ph.D. from Assam University, Silchar. Her Ph.D. work is on 'Isolation and characterization of some bacterial flora from human vagina and their antimicrobial activity'. She has her core expertise in Molecular Biology, Microbiology & Genomics. She has 6 publications in peer-reviewed journals and has presented more than 5 papers/posters in different national conferences.

With her profound experience and interest in her work, she proposed a project entitled as **"Prenatal Vaginal Probiotics: a boon for the mother and the unborn."** The applicant aims to design a study focused on the evaluation of vaginal microflora of the healthy fertile and pregnant women of Northeast India. Several vaginal strains were isolated and identified, followed by another study for the determination of probiotic potential of some strains. She mentions, the probiotics, when administered in the vagina directly using capsules, hydrogels, or organogels, can colonize and restore a healthy vaginal environment. Further the applicant also aims to develop a probiotic based on L. mucosae K76(the bacterial strain), the prepotent vaginal lactobacilli, for the treatment of bacterial vaginosis (BV) in females of NE India. K76 with probiotic potential is a normal vaginal flora from healthy women, which can treat BV and prevent complications in pregnant women.

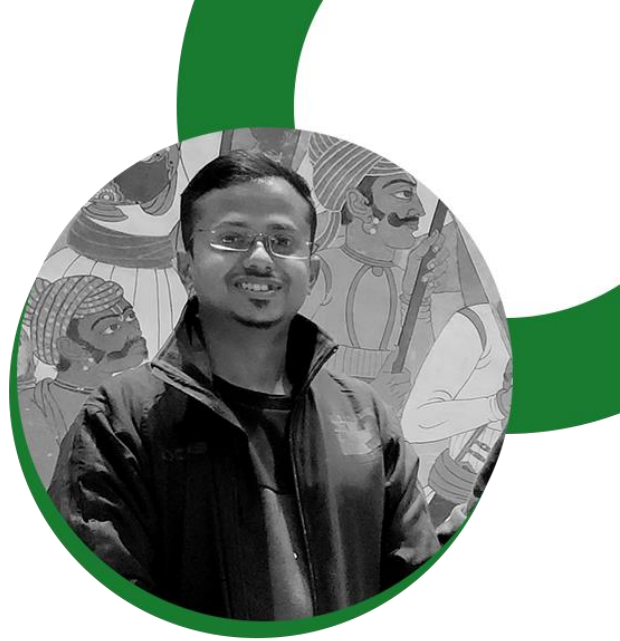
Ms. Swastika Gurung

Project: Microbial Algae as a Tool to Minimize the Effects of Rapid Industrialization in Sikkim
State: Sikkim

Email: swastikagurung89@gmail.com

Ms. Swastika Gurung is currently pursuing her Ph.D. from Kumaun University, Nainital. She did her Ph.D. work on Ecological and Genetic diversity of the algae of few lakes in Sikkim. She has also worked as Quality Control Officer in Microbiology Department-Sun Pharmaceuticals and was involved in environmental excursion and product quality reporting.

With her profound experience in ecological and genetic diversity of algae, she proposed a project entitled as **"Microbial Algae as a Tool to Minimize the Effects of Rapid Industrialization in Sikkim".** The applicant aims to utilize algae as tool for environment impact assessment and bioindicator of water quality. Further applying the knowledge of Genetic Biotechnology and Engineering Sciences in Agro-Economy to produce drought & pest resistant crops and adoption of high yield variety seeds , irrigation facilities and transit from traditional to modern agricultural practices to feed the ever increasing population in the country forms the theme of the current project. Ms. Swastika mentions w.r.t. the context that the interest has now been prioritizing on phycology which is the promising solution for the ongoing challenges in the world.



Mr. Uttariya Pal

Project: RNA@ease"-Low-cost RNA extraction solution for Covid-19
State: Assam

Email: uttariya@gmail.com

Mr. Uttariya Pal is currently pursuing his Ph.D. at IIT, Guwahati with a core expertise in epigenetic gene regulation, differential gene expression pattern and molecular cloning. His current area of research is the role of GPER1 in Breast cancer. Prior to joining doctoral research, he had worked as Quality Control Engineer at GE Water and Process (General Electric) India Ltd. With his experience and R&D exposure, he has published his research works in various journals of national and international repute. He has also been a part of various national and international conferences and seminars and received the Best poster award in World Congress on Cancer 2020, Jaipur, India.

With his expertise in gene regulation & expression, and keeping in mind in dire need of diagnostics of COVID-19, he proposed a project entitled as **"RNA@ease"-Low-cost RNA extraction solution for Covid-19".** The applicant aims to develop a product named RNA@ease without the use of costly silica-based columns which are routinely employed for RNA extraction. In addition, RNA@ease can extract RNA, DNA, and protein from a single lysate, simultaneously. Preliminary results indicated the fact that the quality of the extracted RNA, DNA, and protein using RNA@ease was as good as the quality of the RNA, DNA, and protein extracted using the commercially available products.

CATEGORY 3

FACULTIES/ SCIENTISTS

Dr. Mrityunjoy Mahato

Project: Development of Continuous Mode Hydrothermal Carbonization (CM-HTC) Reactor for Processing of Wet Biomass Waste of North East into Value Added Products
State: Meghalaya

Email: mrityunjoyphy@gmail.com

Dr. Mrityunjoy Mahato has completed his Ph.D. in Science and is currently serving as Assistant Professor North Eastern Hill University, Shillong, Meghalaya. His research interest focuses on the development of nanoproducts from waste, development of a sensor for pesticide and cancer biomarkers, carbon nanocomposite for energy storage material, and radiation shielding polymer nanocomposites. He is in his 3rd research project as Co-PI which raised funding of 56.9L by DBT-Twinning and is based on Quantum Dot Based Biosensor for Early Detection of Prostate Cancer Using multiple biomarkers in Biological samples. He has published around 30 journal articles, 4 book chapters, and 2 review articles in peer-reviewed journals. The h-index of 13 and 500+ citations speaks volumes of his profound experience and R&D exposure throughout his research career. He along with his team members, Prof. Goutam Saha (Co-PI), and Dr. Manashjit Gogoi (Co-PI) proposed a project entitled **"Development of Continuous Mode Hydrothermal Carbonization (CM-HTC) Reactor for Processing of Wet Biomass Waste of North East into Value Added Products".** It is a well-perceived fact that HTC or other waste processing technologies either required high pressure or high temperature or both. Hence, continuous input into the high pressure/temperature reactor is the main challenge to realize the continuous mode operation of the HTC reactor. The applicant aims to address this challenge by designing a continuous mode HTC reactor by using a twin-screw extruder and associated shield engineering or micromanagement. The PI has made a pyrolysis reactor for processing plastic waste as well as biomass waste and is in the process of filing the patent for the same. The HTC reactor will be suitable for technology especially for the NER region for processing wet biomass directly. The proposed CM-HTC reactor technology will have sound commercial potential since this technology is scalable for a larger amount of waste and industrial scale.

Dr. Temin Payum

Project: Antihypertensive Herbal Drink
State: Arunachal Pradesh

Email: teminpayum519@gmail.com

Dr. Temin Payum holds a Ph. D degree in Botany and is presently working as Assistant Professor at Jawaharlal Nehru College, Pasighat, Arunachal Pradesh. He is currently working on a research project, titled "Documentation of best Herbal Practices of East Siang District in Arunachal Pradesh", India and is funded by NIF, Gujarat. With his major expertise in botany, he has 15 years of teaching & research experience.

He has proposed a research topic entitled **"Antihypertensive Herbal Drink".** The applicant aims to formulate a product by utilizing *Clerodendrum colebrookianum*, a herbal plant that has proven efficacy to lower down the high blood pressure and thereby provide a safe and effective remedy for major issues. Dr. Payum writes, There is need for a product that can be easily preserved for a long duration, storable and available to all needy people at any time anywhere, and the present innovation can be a simple but safer and effective remedy innovative of the mentioned problems with a commercial potential that can boost the economy of the region and livelihood engagement for a local entrepreneur.

Dr. Lakshmi K. Singh

Project: Bee Farming/Rubber Honey from Rubber Plantation: Socio-Economic Sustainability for Rubber growers of NE India.
State: Assam

Email: lakshmicpp@gmail.com

Dr. Lakshmi K. Singh has completed her Ph.D. in Physics from the North Eastern Regional Institute of Science and Technology (NERIST) (under MHRD, Govt. of India), Nirjuli, Itanagar, Arunachal Pradesh. She is working as an Assistant Professor in the Department of Physics of ADP College (Gauhati University), Nagaon, Assam. She was the University Topper both in B.Sc. (Physics) and M.Sc. (Physics) from Dibrugarh University. She has about 20 publications in peer-reviewed International Journals and Conferences. She has been an editor of 2 books. She was conferred with several other awards and prizes which include the Best poster award- ICORE 2011, Tezpur University. Her research interest is focused on Natural dyes, Dye extraction and its characterization, Natural rubber, Bio-Physics, Synthesis and Characterization of Nanomaterials and its applications, Energy Devices, Fabrication of Dye-sensitized solar cells, Activated carbon and its application in water purification.

She along with her other team members, Dr. Bishnu P. Koiry, Dr. Malti K. Singh, and Dr. Bibhuti Ranjan Gogoi proposed a project entitled **"Bee Farming/Rubber Honey from Rubber Plantation: Socio-Economic Sustainability for Rubber growers of NE India".** The applicant proposed to promote bee farming (honey from natural rubber tree) to build a strong startup ecosystem in NE. The proposed work has the potential to boost up economic status of the state and will definitely come up as a survivor of rubber farmers in the price fluctuation period. The applicant has research collaborations with the Rubber Technology Department of Tripura University, Tripura, Department of Botany, PDUAM, Dalgaon, Assam and Nagaon Wildlife Division, Nagaon, Assam. Dr. Lakshmi writes as an alternate source of income rubber honey has the potential to commercialize as an immune booster and sugar substitute. It has high medicinal values, used in Ayurvedic and Unani medicinal preparations, malnutrition, ulcers, and impaired digestion, etc.

Dr. Lalit M. Pandey

Project: Designing of engineered surfaces for detection and protection against SARS CoV-2
State: Assam

Email: lalitpandey@iitg.ac.in

Dr. Lalit M. Pandey holds a Ph.D. degree in Chemical Engineering from the Indian Institute of Technology, Delhi. He is an Associate Professor in the Department of Biosciences and Bioengineering, IIT Guwahati. He holds a Ph.D. degree in Chemical Engineering from the Indian Institute of Technology, Delhi. He was awarded Erasmus Mundus India4EU fellowship to pursue his research at Laboratoire des Matériaux et du Génie Physique (LMGP), Grenoble-INP, France for 18 months from 2010 to 2012. Before joining IIT Guwahati, he was working as a Scientist with the Central Pollution Control Board, Ministry of Environment & Forests, Govt. of India from 2009 to 2014 and was involved in research/study relating to water and air pollution in agro-based industries. With his profound experience and exposure, he achieved many prestigious awards in his research career. He has worked in the area of Chemical & Biochemical engineering including Surface and Interfacial Science (focusing in the area of Bio-interfaces and Biomaterials, Protein's structure, and its stability), Nano and Biotechnology, and Environment Chemical Engineering.

He proposes a project entitled **"Designing of engineered surfaces for detection and protection against SARS CoV-2".** The applicant proposes to develop a quick detection method of SARS CoV-2. Preliminary work involving the analysis of biophysical aspects including hydrophobicity, isoelectric point, and binding sites of surface spike glycoprotein of the novel coronavirus has already been carried out the research outcomes are quite promising. The proposed work based on surface engineering strategies not only offers an advantage of rapid virus detection from swab samples but also allows the re-use of the same surface over multiple cycles (samples), provided a simple process of desorption is carried out. "The surface-based strategies not only offer an advantage of rapid virus detection from swab samples but also allow the re-use of the same surface over multiple cycles (samples), provided a simple process of desorption is carried out", says Dr. Pandey.

Dr. Rahul Pralhad Hepat

Project: A nanotechnology-based approach against viral infection in Muga silkworm *(Antheraria assamensis* Helfer*)* endemic to North-East India.
State: Assam

Email: rhepat@gmail.com

Dr. Rahul Pralhad Hepat holds a Ph.D. degree in Insect Molecular Virology from Andong National University, South Korea. He was a recipient of a Visiting Postdoctoral Fellowship, Natural Science Engineering Research Council Canada (NSERC), Canada, and was serving as a Postdoctoral Fellow in the Department of Entomology, University of Kentucky Lexington, USA. Later he joined as Assistant Professor-II in Seri-Biotechnology, Life Science Division with IASST. His field of expertise is Insect Molecular Virology and is involved in understanding the mechanism underlining the insect interaction with its viral and other pathogens, somehow specializing in insect virology and pathology.

Dr. Hepat along with his team is also interested in the discovery of novel insect viruses that could also influence insect's physiology and response to pathogens. The applicant submitted a project entitled as **"A nanotechnology-based approach against viral infection in Muga silkworm *(Antheraria assamensis* Helfer*)* endemic to North-East India"**. He proposes to develop a cost-effective nanotechnology-based approach by synthesizing non-toxic, environment-friendly titanium oxide (TiO2) nanoparticles and using them as an antiviral spray on the host plants to control the CPV infection. The proposed antiviral spray is in the developmental and optimization stage. The production cost in the laboratory has been estimated to be INR 21/L, which can be further minimized in a large scale set up. The lack of competitors and improved performance of the proposed antiviral spray may eventually make it easier for commercialization.

Dr. Rocky Thokchom

Project: Development of Conservation Strategies for the Wild Endangered Orchids of North-East India.
State: Manipur

Email: rockythokchomaau@gmail.com

Dr. Rocky Thokchom is working as Assistant Professor at Pandit Deen Dayal Upadhyay Institute of Agricultural Sciences (PDDUIAS), Utlou. His doctoral work was on studies on the effect of bio-regulators on the regeneration abilities of Anthurium (*Anthurium andreanum* Lind.) and Iris *(Iris ensata* Thunb.) in-vitro. His major interests are in Plant tissue culture, Orchid breeding, Iris breeding, Plant biodiversity conservation, and Bio-farming. He has published 22 research articles and 2 book chapters. He also has received prizes for best oral and poster presentations at national and international conferences.

Dr. Thokchom has proposed a project entitled **"Development of Conservation Strategies for the Wild Endangered Orchids of North-East India".** The applicant aims to conduct a study that will focus on the use of plant hormones for mass propagation of several endangered orchid species of the North-Eastern states and production of different hybrids (Intraspecific, intrageneric and intergeneric hybrids) as well. Dr. Thokchom mentions, in the North-East region of India, focusing mainly in the state of Manipur, very few governmental organizations have already taken up for the mass propagation of orchid species in vitro, but yet to meet the demand. In vitro, mass production of orchid seedlings will solve the problem in orchid biodiversity restoration as well as commercialization of the economically important species.

Dr. Sanjib Baruah

Project: Participation of indigenous community in orchid conservation of Chirang Reserve Forest, Assam
State: Assam

Email: sanjibbaruah9@gmail.com

Dr. Sanjib Baruah holds a Ph. D degree in Botany and is working as Assistant Professor II at Bodoland University, BTAD, Assam. He has 11 years of research experience with 6 years of teaching experience with core expertise in plant taxonomy, floristic study, ethnobotany, and conservation biology. Dr. Baruah is a natural member of the Eastern Himalayan Society for Spermatophyte Taxonomy (EHSST) and is selected for the VDGOOD Young Scientist awards, 2020. To date, he has been an editor of 2 books, has published 9 book chapters with around 29 publications in national & international journals and around 6 scientific articles.

His research work speaks volumes of his vast and profound experience, R&D exposure, and his contribution to the scientific community. With his interest in orchid conservation, he proposed a project entitled **"Participation of indigenous community in orchid conservation of Chirang Reserve Forest, Assam".** Dr. Baruah aims to conserve the precious orchid's resources through mass awareness generation and active community participation in the area. This will certainly help in the transfer of knowledge regarding the value of orchids among the general masses leading to conservation of the species.

Dr. Sibasish Dutta

Project: Fully automated smartphone aided detection of heavy metal ions in the water.
State: Assam

Email: dutta.sibasish94@gmail.com

Dr. Sibasish Dutta received his Ph.D. degree from Tezpur University in 2017. Currently, he is working as an Assistant Professor in the Department of Physics, PDUAM, Eraligool, Assam, India. He has been awarded the DST-SERB ITS fellowship, INSA-CSIR-DAE/BRNS-CICS Travel Fellowship for Photonics West conference. He has published numerous papers in SCI and Web of Science indexed journals such as Elsevier, RSC, Wiley, Springer, AIP, IOP, IEEE, and published two book chapters. His current research interest includes Plasmonics, Optical instrumentation, and Smartphone-based biosensor design. He is also associated with a project related to the survey and removal of Arsenic and Fluoride from water in association with the Dept. of Chemical Sciences, Tezpur University.

He proposed a project entitled **"Fully automated smartphone aided detection of heavy metal ions in the water".** The applicant aims to develop a Point Of Care Testing (POCT) system capable of detecting heavy metal ions in water sources. In this work, a fully automated and user-friendly smartphone device will be fabricated for effective quantitative detection of hazardous heavy metals specifically arsenic, lead, and mercury. With benefits like device compactness, portability, remote monitoring facilities, user-oriented interface & ease of usage and affordability makes them a fast mover in the market and helps them to acquire a bigger market.

Ms. Inaocha Thangjam

Project: The Effects Of Biotechnological Processing Technique On Hawaijar, An Indigenous Fermented Soya of Manipur
State: Manipur

Email: inaocha24@gmail.com

Ms. Inaocha Thangjam is currently an Assistant Professor in the Department of Biotechnology. She has completed her M.Sc. in Biotechnology. She has completed a DBT funded project entitled **"Study on microbial Analysis, Cytotoxic and Genotoxic potential of Nambul River."**

Ms. Thangjam says, Fermented soybeans are prepared at the household level and its selling is limited at homes and small shops. It is not commercially produced due to poor marketability and improper safety measures. This major problem can be settled down by new biotechnological tools and techniques for standardizing them and discovering them in markets for their marketable potential. Considering this, she proposed a project entitled "The Effects Of Biotechnological Processing Technique On Hawaijar, An Indigenous Fermented Soya Of Manipur". The applicant aims to use the fermentation technique to maintain the stability of the soya products. She also mentions that the effect of storage period on quality characteristics revealed that tray drying is a better drying method as compared to sun drying as far as retention of nutritional attributes is concerned. Fermented soy product Hawaijar stored at ambient temperature is acceptable even after four months.

Dr. Ningombam Linthoingambi Devi

Project: Concentrations and potential health hazards of organochlorine pesticides in fish from Loktak Lake, Northeast India
State: Manipur

Email: n.linthoi.devi@gmail.com

Dr. Ningombam Linthoingambi Devi is working as Assistant Professor at the Department of Environmental Science, Central University of South Bihar. She holds a Ph.D. in Environment Science from China University of Geosciences, Wuhan, China. She is a recipient of the Best presentation award in International conference on air quality, health and atmosphere, London, UK, International travel support, SERB-DST Grant project-, UGC Startup Grant project, UGC Dr. D. S. Kothari Postdoctoral Fellowship, DBT-Research Associateship, Department of Biotechnology, Govt. of India and Chinese Government Doctoral Scholarship. She has around 37 publications and 7 book chapters in national and international peer-reviewed journals.

She proposed a project entitled **"Concentrations and potential health hazards of organochlorine pesticides in fish from Loktak Lake, Northeast India"**. The applicant aims to assess the concentration of organochlorine pesticides in lake water and human health risk (carcinogenic and non-carcinogenic) associated with the consumption of fish from Loktak Lake. As is estimated that about 54 % of the households around the Loktak Lake depend on the lake water for drinking and domestic uses, hence it becomes necessary to assess the concentration of OCPs in Lake water and the human health risk associated with the consumption of fish.

Dr. Subham Banerjee

Project: Extrusion based customized biofilaments processing for fused-filaments 3D printing pharmaceutical applications
State: Assam

Email: subham.banerjee@niperguwahati.ac.in

Dr. Subham Banerjee holds a Ph.D. degree which was a MoUs Ph.D. The program between Defence Research Laboratory (DRL), DRDO, Tezpur, Assam and BITMesra, Ranchi, Jharkhand, and is currently working as an Assistant Professor at the National Institute of Pharmaceutical Education and Research (NIPER)-Guwahati. He has done his post-doctoral work in the Translational Health Science & Technology Institute (THSTI), NCR-Biotech Science Cluster, Faridabad, Haryana. His research interest focuses on the area of Nanomedicines, Pharmacoengineering, 3D Printing/Additive Manufacturing Engg., Targeted Drug Delivery Systems, Molecular Pharmaceutics & Pharmacokinetics. He has this huge list of awards, recognitions & fellowships, out of which, some of them are- Early Career Research Award, Gandhian Young Technological Innovation Award, Innovators Under 35 Award, Academic Brilliance Award, and Young Scientist Award. He is the PI & Co-PI of around 9 different projects, each funded by prestigious grants. He has around 7 patents and 42 publications in peer-reviewed journals to date along with 8 international book chapters.

He proposed a project entitled **"Extrusion based customized biofilaments processing for fused-filaments 3D printing pharmaceutical applications"**. This proposal aims to fabricate pharmaceutical-grade biofilaments suitable for fused-filaments 3D printing applications to make desired pharmaceutical formulations (such as 3D printed tablets, capsules, patches, films, implants, and different biomedical devices, etc.) with/without the involvement of active pharmaceutical ingredients (APIs). Fused-filament technology will be employed here as an advanced tool to experience the physical architectural features of biofilaments intended for various 3D printed pharmaceutical matrix designing. Dr. Banerjee says, to date, there are very limited commercially available biofilaments and therefore there is a pretty huge demand for processing customized biofilaments for desirable drug delivery and disease applications.

CATEGORY 4

STARTUPS

Heredity Lifesciences Pvt. Ltd.

Project: Phytoplankton derived animal feed to enable natural vitamin D enriched products
State: Assam

Email: hereditylifescience@gmail.com

Heredity Lifesciences Pvt. Ltd. is a two-year-old start-up company which was incorporated on the 7th of June 2018 under the Companies Act, 2013 (18 of 2013). It bears the corporate identity number as U74999OR2018PTC028991. It was started in the year 2018 with the sole aim of working towards scientific innovations and research for the betterment of society. It has also received a start-up grant under the start-up Odisha policy and has been recently certified with ISO 9001:2015. The company is into innovative research and training that caters to the needs of students and professionals in the field of life sciences keeping pace with recent scientific scenarios. Subhashree Mishra and Gopal Krishna Purohit are shareholders in the company.

They propose a project entitled **" Phytoplankton derived animal feed to enable natural vitamin D enriched products".** The aim of the present project is to prepare Vitamin D rich animal feed supplements for chickens and cows from freshwater phytoplankton and edible plant parts of the *Solanaceae* family, which will ultimately help to increase the Vitamin D content of eggs and milk to the required level of our body (400-600IU) that, naturally contain a low concentration of vitamin D. This will help in reducing the vitamin D deficiency in Indian population (children and adults) (both vegetarian and non-vegetarian) by taking the vitamin D enriched milk, milk products, and eggs in their daily routine. The cost of the animal food supplements will be kept low so that they will be affordable to people of all socioeconomic groups. The target is to launch an animal feed brand that would help to provide enriched Vitamin D products to humans. It would further help farmers sell their own enriched products for a better living.

Brahmaputra Techno Pharmaceuticals Pvt. Ltd.

Project: Smart N95 Mask using Activated Carbon from Waste Tea Leaves
State: Assam

Email: somnath.chanda2@gmail.com

Green Tea Products

Brahmaputra Techno Pharmaceuticals Pvt. Ltd. was started in the year 2019 (6 months old startup) and deals with Health & Wellness Products based on natural products from North East Regions. They are also involved in R&D, Production, and Marketing of Products for the FMCG section. Presently it is incubated at Guwahati Biotech Park for R&D related activities and small scale production. Mr. Somnath Chanda, Mr. Shankar Chanda & Mrs. Kanta Chanda are the shareholders in the company.

They propose a project entitled **"Smart N95 Mask using Activated Carbon from Waste Tea Leaves."** The start-up deals with the complete bioresource utilization of green tea leaves for the preparation of two products i.e. Green tea-based nutraceutical spread and high surface area activated carbon for cosmetic and pollution remediation applications. The company aims to prepare

1. Mask for PPE (Personal Protection Equipment) to prevent human-to-human transmission of COVID-19 by SARS-CoV-2 aerosols produced due to sneezing/coughing of infected patients.
2. Pharma-Grade Carbon by incorporating medicinal/ pharmaceutical grade super-activated carbon which can act as a barrier in the N95 mask.

Bee Food Testing Lab

Project: Establishment Of Food Testing Laboratory In Imphal, Manipur
State: Manipur

Email: wbembee@gmail.com

BEE FOOD TESTING LAB
IMPHAL

Bee Food Testing Lab, founded by Dr. Wahengbam Bembee Devi, is one of the entrepreneur firms among 150 Idea Stage Beneficiaries under Manipur Startup Round II, 2018-19, Department of Planning, Govt. of Manipur. It is incubated at Wahengbam Leikai Sagolband road opp Khongnang Hogaibi Imphal-795001, Manipur.

They proposed a project entitled “Establishment Of Food Testing Laboratory in Imphal, Manipur”. The company aims to provide knowledgeable assistance and guidelines to the small-scale food industries for the production of quality food items that are safe and in accordance with the internationally accepted norms for producing processed, partially processed, and unprocessed food for consumption. Safety with assured quality is the main priority of the laboratory to give reliable results for healthy food consumption by consumers. The proposed food testing lab will provide the food testing facilities with consultancy services to our target market (small scale food processing units/farmers).

PepThera Laboratories Pvt. Ltd.

Project: Biomolecules for Prevention of Hospital Acquired Infections
State: Assam

Email: md@pepthera.com

PepThera Laboratories Private Limited is a Guwahati based start-up by alumni of Indian Institute of Technology Guwahati (IIT-Guwahati) and IIT-Indore. The company is a Department for Promotion of Industry and Internal Trade, Ministry of Commerce & Industry, Government of India recognized start-up vide certificate number: DIPP59463. PepThera Laboratories Private Limited is a Non-Government Private Limited Company incorporated on 24 January 2020 under The Companies Act, 2013. It is registered at Registrar of Companies, Shillong under Company CIN Number U24110AS2020PTC019868. Dr. Gaurav Jerath and Dr. Aparna Rai are the founding Directors of the Company and hold 60% and 30 % of the company shares, respectively.

They propose a project entitled **"Biomolecules for Prevention of Hospital Acquired Infections."** The company has developed a set of biomolecules, which are antibacterial and can be used as disinfectants as well. The biomolecules being developed are utilized for disinfection of hospital surfaces and types of equipment and have been tested on gram-positive, gram-negative, and drug-resistant bacteria. The biomolecules were able to achieve a 5-log reduction, i.e. 99.999% bactericidal efficiency. In view of the current COVID-19 pandemic, they propose to evaluate the developed biomolecules for its virucidal activity.

RogNidaan Pvt. Ltd.

Project: Oral scanner-An automated system to detect oral dysplasia
State: Assam

Email: director.rognidaan@gmail.com

RogNidaan Private Limited was formed in July 2019 under the Companies Act, 2013 (18 of 2013) with Identity number is U85100AS2019PTC019400. The founding members of the company are Dr. Lipi B Mahanta (Chairman / Administrative, PR). Dr. Kangkana Bora (CEO / Technical, PR), Dr. Manish Chowdhury (Executive Director / Technical, PR), and Dr. Anup Das (Executive Director / Medical knowhow, PR). Currently, the company is about to embark on its first project entitle "PapScanner-An automated system to detect cervical dysplasia". The project is being funded by Numaligarh Refinery Limited (NRL), under its Ideation scheme, wherein the company provides Grants-in-Aid to winning contestants.

They propose a project entitled **"Oral scanner-An automated system to detect oral dysplasia"** The company proposes to develop an image-based early diagnosing oral cancer tool for tracing the underlying pattern in the images related to the cause of oral diseases. The stated approach will integrate 2D/3D images from different modalities to extract the structural changes in the shape of the organ. They have targeted health service centers, hospitals, dentists, clinics, and private & public hospitals.

Sanajing Sana Thambal

Project: Eco-friendly approach to produce garments from lotus fiber
State: Manipur

Email: bijiyashantitongbram@gmail.com

Sanajing Sana Thambal was started in the year 2019, near Loktak lake, Manipur by Tongbram Bijiyashanti Devi as a sole proprietorship. The date of incorporation was 04/07/2018. The company deals with the systematic transformation of waste lotus stem into the useable and valuable fabric. This company is working on the extraction of fibers from the lotus stem 100 % Handmade which are converted to high-end premium artisanal scarves, necktie, and fabric. Lotus boosts the economy of the villagers especially women who are employed in the whole extraction process. Presently, the company employs 12 women for processing of lotus stem for the production of garments.

The company proposes to follow an **Eco-friendly approach to produce garments from lotus fiber**, which are found abundant in the Loktak lake. This will promote the conservation of biodiversity through sustainable trade in natural ingredients which will enhance the competitiveness of the local community via economic and social benefits in other countries. Tongbram Bijiyashanti Devi says, ''Eco-friendly'' is the new and emerging term in today's life. Many new fibers are introduced in order to have a sustainable and environmentally friendly future fur next generation. Working in the same direction one such upcoming fiber is the lotus fiber.

The Naga Biotech firm

Project: A logistic approach towards commercialization and assessment of value chains of *Thayie si*, a rare variety of local plantain and its economic impact on livelihood
State: Nagaland

Email: keheithou@gmail.com

The Naga Biotech firm was formed on 20th January 2019 by Mr. Kekhriesielie & Mr. Keheibamding Thou under the vision of promoting Agricultural based food products. It aims at boosting the economy as a whole thereby helping local youths to create employment opportunities and village farmers by introducing them to economy based farming. The firm is comprising of 3 working staff on domestic scale production and manufacturing unit. The company action plan was first designed and undergoes a test and trial method for quality enhancement before introducing into the local market.

They propose a project entitled **"A logistic approach towards commercialization and assessment of value chains of *Thayie si*, a rare variety of local plantain and its economic impact on livelihood"**. *Thayie si* (local plantain) chips produced locally from Nagaland have great future potential if commercialized to a broader range. The company aims to produce banana chips from *Thayie si.* The species is the first of its kind recorded in Nagaland for the production of the chips and are easily available in the region. The product will be rich in iron and potassium and will have nutritional value upon consumption. The product also does not require any additives or chemical preservatives for increasing its shelf life and taste. The taste and aroma are the key points for attracting consumers and is locally accepted by local consumers.

VIKO (Ethnic Productions)

Project: Eco-friendly approach to produce garments & looms
State: Nagaland

Email: dozovekuvolu@gmail.com

The company, VIKO (Ethnic Productions) was incorporated on the 12th of July, 2019, and is situated in Naga United Village, H.No. 192, near CIHSR Dimapur, Nagaland 797112. The products and design concepts have been exhibited and sold at the international loin loom festival (Dimapur, Nagaland), local stores, Delhi, Mumbai fashion weeks, and other major cities, international (Singapore, UK, France), and other online stores. The company is currently having manpower of about 11 weavers (mostly widowed and unemployed), using traditional loin loom and natural fiber (nettle, cotton, and eri), with self/buyers design.

The production and design are purely based on natural and raw materials with a unique and modern touch to it and proving to be **an Eco-friendly approach to produce garments and looms**. The unit is continuously energized with the expansion of its product to its utmost limit, upholding its quality and ethnicity with a modern touch, focusing on the latest and best updates, trend, and value for the market both locally and internationally.

CONCLUSION

The distant parts of India often find it difficult to claim their place in star startup destinations like Mumbai, Delhi, Bangalore & Hyderabad, etc. However, things are progressing now with a new ecosystem emerging from the land of mystical elegance and beauty-The North East of India. Northeast India is fast emerging as a one-of-a-kind startup ecosystem and with the central government pushing for development in the North East, the potential for startups in the eight north-east states has significantly increased over the past few years. One such effort has been made by BIRAC Regional Techno-entrepreneurship promotion Centre (BRTC), an initiative of BIRAC and BioNEST of KIIT-TBI, to build and nurture the startup ecosystem in the Northeast Region of India and it is called as "Mapping the Changemakers“. As a step towards building an Innovation Ecosystem in NER, it endeavors to identify young & budding innovators with a translational scientific temperament and build a strong platform for networking crosstalk & collaboration.

BIRAC REGIONAL TECHNO-ENTREPRENEURSHIP PROMOTION CENTRE

A BIRAC - KIITTBI - BIONEST INITIATIVE

brtc.kiitincubator.in

Campus 11, KIIT-DU, Bhubaneswar, Odisha

brtc@kiitincubator.in