KIIT-TBI on Propelling

NE Startup Ecosystem

IMPACT REPORT

FOREWORD

Northeast India opens the door to abundant bio-resource and bio-economy. The unexplored yet magnificent states of northeast have exotic flora and fauna that contributes to its unique strength and provides enormous opportunities for Sustainable Development Goals (SDGs).

KIIT-TBI since its inception is committed to strengthen the socio-economic growth in eastern and northeastern India by promoting technology ventures & entrepreneurship. Today, KIIT-TBI has established itself as a major hub for local innovation and incubation ecosystem for E&NE. With a vision to promote regional innovations to solve local problems & build the capacity of the local incubation leaderships in E&NE, BIRAC Regional Technology Promotion Centre (BRTC) was set up at KIIT TBI in the year 2019 with the support of BIRAC, GoI. Over the past three years, KIIT TBI BRTC has worked aggressively on reaching out to the budding startups, innovators across all the states of NE and East.

Till date 5k+ aspiring Entrepreneurs and Innovators from northeast have found a new zeal to convert their ideas into impactful ventures and have supported 25+ home grown startups from NE. BRTC has forged 16 institutional collaborations and trained 31 Incubation managers and leaders from 19 Incubators located across the North-Eastern region to manage and build sustainable incubators. BRTC is also supporting the establishment of BioNEST incubators across the E&NE Region.

Recently KIIT TBI implemented Manipur Technology Innovation (MTI) HUB at Manipur of 10,000 sq ft space under the aegis of Department of IT & Electronics, State Govt of Manipur with a holistic ambition to nurture and promote the ICT-start up innovation ecosystem primarily across Manipur and other states.

KIIT TBI is committed to redoubling efforts, seeking aligned partnerships, and working together synergistically with institutes, startups, academia, and incubators to create a vibrant “North East and Eastern Cluster.”

NE is Rising and Shining!

North East India is making inroads into **Entrepreneurship**

THE ECOSYSTEM AT A GLANCE

The northeastern region of India caters to a wide variety of opportunities and challenges for skill development and building an entrepreneurial ecosystem. With a vision to create and build an enabling ecosystem for technology development and provide structural and fundamental support to the budding starts up of NE Region, BIRAC, GoI set up a Regional Centre named BIRAC Regional Techno entrepreneurship promotion centre (BRTC) at KIIT- TBI in 2019. The aim of the BIRAC BRTC centre is to identify and nurture start-ups with special emphasis on empowering rural NE women entrepreneurs.

Furthermore, BIRAC BioNEST cluster for the Northeast was established in 2020 to provide a holistic platform to catalyze entrepreneurial development as well as provide mentoring support to nascent incubators in the northeast region of India.

To further spur the innovation culture in NE, a special call of NE BIRAC Biotechnology Ignition Grant was initiated by BIRAC for Northeast innovators and entrepreneurs only. The two rounds of this special call has created a zeal of entrepreneurship in the entire region.

Support System

- Mentor Matchmaking
- Business & Technology Mentorship
- PoC Development & Validation
- Fund Raising Assistance
- Capacity Building Programs & Skill development
- Ecosystem Connects & support
- Trials & Product Pilot
- Market Connect
- IP, Tech Transfer, Legal, Regulatory, Digital Support
- Investor Connect
- Cluster Development

birac Ignite Innovate Incubate | BRTC A BIRAC - KIIT-TBI Initiative | East & North East Region BioNEST Cluster

ENABLING THE ECOSYSTEM GROWTH

Proactive support from local communities, academia & State Governments are driving the growth of NE Startup Hub

BRTC
A BIRAC - KIIT-TBI Initiative

BIRAC BioNEST E-NE Cluster

Hub & Spoke Model

BIRAC Regional Techno entrepreneurship promotion centre (BRTC) at KIIT-TBI BioNEST is a regional centre of BIRAC. The aim of the regional centre is to identify and nurture start-ups as well as provide mentoring support to nascent incubators of the region.

It will provide a holistic platform to catalyse interactions between stakeholders in order to promote technology growth in the east and north east region of India, with special emphasis on empowering women entrepreneurs.

BIONEST IIT GUWAHATI · Institute of Life Sciences Bhubaneswar · NIPER GUWAHATI · BRDC · BioNEST Incubator · KIIT-TBI

Nodal Incubator

15 Key Impacts Bolstering the NE Startup Ecosystem

13 States Covered (8 NE & 5 E)	**65** Innovation & Entrepreneurship Programs	**5k+** Beneficiaries Hand-hold	**90+** Startups Mentored	**25+** Innovators/Startups from NE Funded
50+ Institutes Reached	**16** Institutional Collaborations	**31** Incubation Managers Trained	**34+** NE Mentors Onboarded	**2** NE BioNEST Incubator established with KIIT TBI as Mentor Incubator
10 Rural Women Training Program	**1.5k+** Rural Women Empowered	**21** NE Clusters Mapped under SFURTI	**5** NE Clusters Approved under SFURTI	**1 Tech-Hub** Manipur Technology Innovation Hub established in PPP model with Manipur Govt.

MANIPUR TECHNOLOGY INNOVATION HUB

An initiative by Department of IT and Electronics, Government of Manipur
Implemented by KIIT-TBI, Bhubaneswar

Manipur Technology Innovation Hub is setup in Imphal, Manipur under the aegis of Department of IT and Electronics, Government of Manipur with a holistic ambition to nurture and promote the ICT startup innovation ecosystem primarily across Manipur & other states of North East and enable young entrepreneurs to initiate technology startups for commercial exploitation. KIIT-TBI will act as the Nodal Mentoring Incubator for the same.

Supported By

Department of Information Technology Government of Manipur

Ecosystem Partner

BCKIC Bhubaneswar City Knowledge Innovation Cluster Foundation

Mentor Nodal Institution

KIIT-TBI

Academic Institutions

Other Collaborations in Progress

FOCUS AREAS

- Healthcare
- Education
- Agriculture
- Financial Inclusion
- Infrastructure & Transportation
- Environment & Clean Tech
- ICTE Areas

OBJECTIVES

- Mining of techno-commercial resource pool of North East India.
- Create a networked ecosystem to support technology startups and entrepreneurs.
- Coordinate various capacity building workshops.

CAPACITY BUILDING PROGRAM CONDUCTED SO FAR

Roadshows	5

Name of the Institute	Beneficiaries
Manipur Institute of Technology (MIT)	61
Manipur Technical University (MTU)	78
NIELIT Manipur	150
Cipet Manipur	81
NIT Manipur	66

BIRAC BIG NE SPECIAL CALL

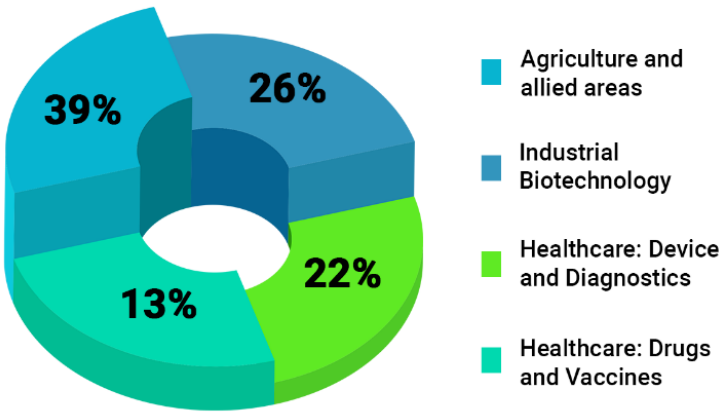
An unique opportunity for aspiring entrepreneurs of NE

BIRAC Biotechnology Ignition Grant (BIG) NE special call is a flagship programme of BIRAC, DBT, GoI, with a grant aid up to 50 Lakhs over a period of 24 months, which ignites young start-ups and entrepreneurial individuals from NE states or from pan India who want to implement their ideas with commercial potential in NE India to establish and validate proof of concept (POC) for the same.

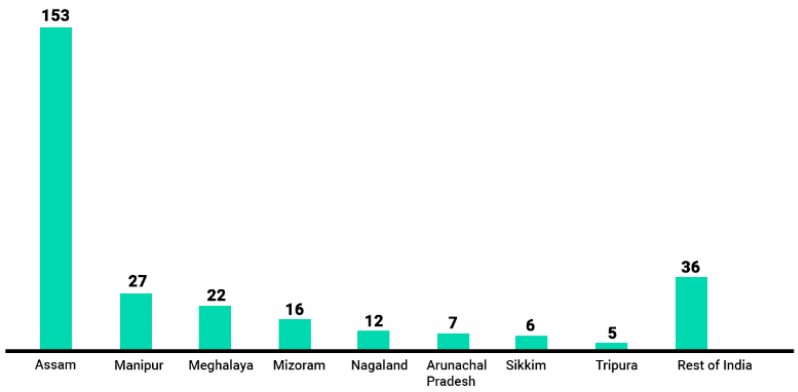
Calls Announced	2

Application Received	290+

Sector Wise Application Distribution



State-wise application distribution



Individual - 78%	Company - 22%

Male - 66%	Female - 34%

6+	4+	25M+
Innovators Supported	Startups Catalysed	Funds Mobilized

Incubation Centres accross NER for BIG NER

BUILDING CAPACITY FOR A STRONGER NE STARTUP ECOSYSTEM

ROADSHOWS

Roadshows are the one-day programs conducted to create awareness and sensitize budding entrepreneurs of East and Northeast about various funding schemes available under BIRAC and other government agencies.

Program Details:

Year	Roadshows Conducted	Total Number of Beneficiaries
2019-2020	7	640
2020-2021	2	224
2021-2022	7	718

CAPACITY BUILDING TRAINING PROGRAM

The two-day structured capacity building training is a follow up of the roadshows with a focus on imparting with necessary knowledge and skills to innovators for transforming their ideas into successful & sustainable ventures.

Program Details:

Year	Training Programs Conducted	Total Number of Beneficiaries
2019-2020	4	427
2020-2021	18	1384
2021-2022	7	369

DESIGN WORKSHOPS

The two-day extensive workshop focuses on product design and business development for early-stage start-ups. The goal of this program is to provide handholding and mentoring support by experts to promising early-stage start-ups so that they move from Stage A to Stage B in terms of their product development or business model. These workshops also include Ideation/Hackathon sessions.

Program Details:

Year	Design Programs Conducted	Total Number of Beneficiaries
2019-2020	1	78
2020-2021	4	196

TRAINING PROGRAM FOR RURAL WOMEN

The training program is a three-day program aimed to empower rural women by providing them with the necessary skills set needed to improve their socio-economic state. This program includes an entire day on sensitizing local women about schemes and opportunities available for women entrepreneurs and the remaining two days are structured to provide basic hands-on training to incorporate biotechnological techniques into their existing ventures.

Program Details:

Year	Training Program Conducted	Total Number of Beneficiaries
2019-2020	2	123
2020-2021	4	303
2021-2022	2	90

CREATING PLATFORMS FOR CROSS TALK & LEARNING BEST PRACTICES

NORTHEAST SHOWCASE EVENT

The showcase is a two-day long event where the successful innovators from outside Northeast are invited and motivated to set up their new/existing enterprises in the Northeast region in partnering with the start-ups of the region.

INCUBATION PRACTICE SCHOOL EVENT (BINER 2021)

This is an exclusive and advance event for training incubation managers from existing incubators (BIRAC/Non-BIRAC) of North East/representatives of institutes located in the Northeast region willing to set up incubation centres.

The selected managers will be taken for a tour and orientation program on running a successful incubation centre at KIIT-TBI and other established incubators in the country to have a first-hand account on understanding and learning the best practices of incubation.

OUTCOME: A total of 31 participants from 19 institutions located across the North Eastern states attended the program. The participants include managers, Directors, CEO, Scientist, Scientific officers and incubation manpower from the 7 BioNEST incubators along with Atal Incubation Centre, North East Agriculture Technology Entrepreneurs Hub.

GENDER WISE APPLICANT DISTRIBUTION

Male - 77%	Female - 23%

NORTHEAST IMMERSION PROGRAM

This is a 5 days intensive activity conducted once a year. Under this program, a cohort of 15 innovators from Northeast are invited to KIIT-TBI for a 3 days exposure program and interact with promising start-ups and mentors and followed by a visit to one of the other BIRAC regional sub-centers and mature incubators and share their expertise. This will provide the start-ups of the region the necessary knowledge and technology essential for building a successful ecosystem of start-ups in the Northeast region.

INSTITUTE WISE PARTICIPATION IN BINER 2021

Name of the Institutes	
Assam	
CSIR-NEIST, Jorhat	2
Guwahati Biotech Park	2
Cotton University, Guwahati	1
IIT Guwahati	2
IASST Guwahati	2
NIPER Guwahati	2
Tocklai Tea Research Institute	1
North East Agriculture Technology Entrepreneurs Hub (an AIC-AAU Incubator)	2
Manipur	
IBSD Imphal	1
Green Foundation	2
MSME Technology Centre Imphal (GOI)	2
Meghalaya	
IBSD Shillong	1
NEHU Tura Campus	2
Mizoram	
Mizoram University BioNEST (DBT)	2
Mizoram University Incubator (DST)	1
Nagaland	
Nagaland Tool Room and Training Centre	1
Sikkim	
Department of Science & Technology, Govt. of Sikkm	1
Tripura	
RKVY RAFTAAR, CAU	3

SPECIAL PROGRAMS FOR NE STARTUPS TO GROW & SCALE-UP

NE INDIA LAUNCHPAD, BUSINESS IDEA COMPETITION

"The NE India Launchpad" under MeitY TIDE 2.0 Program, initiated by KIIT-TBI, NIDHI CoE at KIIT-TBI and BRTC is a unique business idea competition wherein startups and innovators go through a two days boot camp followed by a month of coaching and finally pitching. Assam Downtown University was the ecosystem partner for the program.

Focused areas: Health-tech and Agri-tech

PROGRAM STRUCTURE

Round 1	Boot Camp	2 Days
Round 2	Coaching	1 Month
Round 3	Grand Finale	

STATISTICS

Applications Received:	32
Number of Beneficiaries:	4

Benefits Given:
Up to 10 lakhs in form of grant and fellowships, IP support and virtual incubation at KIIT TBI.

MAPPING THE CHANGEMAKERS OF NORTH EAST REGION

It is an initiative of BIRAC and BioNEST of KIIT-TBI, to build and nurture the startup ecosystem in the Northeast Region of India by identifying young & budding innovators with a translational scientific temperament and build a strong platform for networking crosstalk & 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).

Thematic Areas: Healthcare, Industrial Biotechnology, Agriculture and allied areas.

Category 1: Master Students (Pursuing/Completed)

Category 2: PhD Scholars and Post-Doctoral Fellows (Pursuing/Completed)

Category 3: Faculties / Scientists

STATISTICS

Total No. of Applications	51

Outcome:
Top 3 participants from each category were selected and awarded with the prize money of **INR 10000, INR 7000** and **INR 5000** respectively.

INNOVATIONS TO SOLVE LOCAL CHALLENGES

***25 STARTUPS** HAVE BEEN FUNDED FOR POC DEVELOPMENT*

AGRICULTURE

Startup Name: Nibiaa Devices Pvt Ltd
Innovation: To Prototype the utility of LoRaWAN based IoT Protocol and Smart-Contract based Blockchain Technology for quality tea production & systematic supply-chain traceability & Transparency Solution.
YOI: 2022
Funds Raised: INR 50 Lakhs - BIRAC BIG

Startup Name: Green Biotech Ecosolutions Pvt Ltd
Innovation: Accessibility of the latest technology driven best practices in the field of diagnostics for vast majority of underserved population in India and South East Asia.
YOI: 2020
Funds Raised: INR 25 Lakhs - BIRAC BIG NE

Startup Name: Aranyam Innovations Pvt Ltd
Innovation: Development of microbial bio-formulation/s for Tea Camellia sinensis growth promotion and blister blight disease control.
YOI: 2021
Funds Raised: INR 49.24 Lakhs - BIRAC BIG

Startup Name: Vedam Agro Enterprises
Innovation: Agro Based Food Manufacturing Enterprise With Value Addition.
YOI: 2022

Innovator: Dr. Sanjay Kumar Banerjee
Innovation: Developing Nutritional Product from Musa Balbisiana (Family: Musaceae, Genus: Musa) Fruit to Combat Malnutrition
YOI: 2020
Funds Raised: INR 25 Lakhs - BIRAC BIG NE

Innovator: Dr. Lightson NG
Innovation: Paper-based Kits for On-site Detection of Methanol and Formaldehyde
YOI: 2020
Funds Raised: INR 25 Lakhs - BIRAC BIG NE

Innovator: Spectramind Tea Solutions Pvt. Ltd.
Innovation: Development of Multimodal Optofluidic Prototype for Sensing Heavy Metal Ions
YOI: 2020
Funds Raised: INR 25 Lakhs - BIRAC BIG NE

MANUFACTURING

Startup Name: Ble & Zíng
Innovation: Handcrafted, Eco-friendly, Functional Art For Kitchen
YOI: 2022

WASTE TO VALUE

Innovation: Dr. Chandralekha Ayekpam
YOI: 2022
Funds Raised: INR 14 lakhs - BIRAC Sparsh SIIP

THE NE ECOSYSTEM HAS A HEALTHY MIX OF STARTUPS

INNOVATIONS TO SOLVE LOCAL CHALLENGES

HEALTHCARE: DRUGS

Startup Name: RogNidaan Technologies Pvt Ltd
Innovation: Development and field test of AI – guided software for detection cervix cancer using Pap smear images - PAPSCANNER
YOI: 2020
Funds Raised: INR 25 Lakhs

Startup Name: KNOWLEDGEPIE Pvt. Ltd.
Innovation: Novel Synthesis Of Iron-platinum Nanoparticle Composite And Their Multifunctional Applicability As MRI Contrast Agent & Therapeutic Agent
YOI: 2022
Funds Raised: INR 50 Lakhs

Innovator: Dr. Deepak Bharadwaj
Innovation: Bioactive Reprogrammed Nano-herbal Formulation for Photothermal Therapy-based Cancer Theragnostic
YOI: 2020
Funds Raised: INR 25 Lakhs

HEALTHCARE: DEVICES & DIAGNOSTICS

Startup Name: Medilane HealthTech and Consultancy Services Pvt Ltd
Innovation: India Heath Card ™- A digital healthcare loyalty cards
YOI: 2021

Startup Name: Bio-Dtect Pvt Ltd
Innovation: A Paper Based Point of Care Test Kit for Detection of Pan Malaria and Plasmodium Falciparum Species in Human Blood Serum
YOI: 2020
Funds Raised: INR 25 Lakhs

Startup Name: Foundation for Advancement of Essential Diagnostics
Innovation: Accessibility of the latest technology driven best practices in the field of diagnostics for vast majority of underserved population in India and South East Asia.
YOI: 2022

Startup Name: Symbica Pvt Ltd
Innovation: Development and field test of AI – guided software for detection cervix cancer using Pap smear images – PAPSCANNER.
YOI: 2020
Funds Raised: INR 25 Lakhs - BIRAC BIG NE






Strategic Partnerships - Building an Innovation Ecosystem in NE

Key Stakeholders

बाइरैक
इग्नाइट इनोवेट इंक्यूबेट
birac
Ignite Innovate Incubate

East &
North East Region
BioNEST Cluster

MINISTRY OF DEVELOPMENT OF
NORTH EASTERN REGION

विज्ञान एवं प्रौद्योगिकी विभाग
DEPARTMENT OF
SCIENCE & TECHNOLOGY

Department of
Information Technology
Government of Manipur

Ministry of Electronics and Information Technology
Government of India

BCKIC
Bhubaneswar City
Knowledge Innovation
Cluster Foundation

National Innovation
Foundation, GOI

SFURTI

KIIT-TBI

TTO
RESEARCH TO REALITY

KIIT-TEC

Collaborations

GUWAHATI
BIOTECH PARK

AIC SMU

ASSAM
down town
UNIVERSITY

NIPER GUWAHATI

MANIPUR TECHNOLOGY INNOVATION HUB
IMPHAL

NE Innovators' Journey @KIIT-TBI

Dr Gaurav Jerath and Dr Aparna Rai

Pepthera Laboratories Pvt Ltd

Innovation: Programmable Biomolecules for Combatting Antimicrobial and Multi-Drug Resistance

Pepthera Laboratories incorporated in 2019 was the brain child of two IIT Guwahati researchers Dr. Gaurav Jerath and Dr. Aparna Rai who shared the same interest of developing programmable biomolecules for various tailored bioactivities. They were driven by the passion of transforming Assam as the hub for science and technology start-ups and to create job opportunities for the highly skilled local individuals.

Pepthera Laboratories one of the BIRAC supported start-up incubated at KIIT-TBI is committed to the development of Programmable Biomolecules for the prevention and treatment of infectious and non-infectious diseases. The vision of the company is to develop biomolecular solutions as therapeutics and personal hygiene products, which at present incorporate only chemical moieties, the use of which lead to environmental pollution and rise in antimicrobial resistance.

The team of two has been recognized as the Changemakers of Northeast by BRTC-BIRAC Regional Centre at KIIT-TBI and also won the Antimicrobial Quest 2021 by Centre of Cellular and Molecular Platforms.

Dr Pranita Hazarika

Innovation: Development of an affordable kit for simultaneous and rapid 3 h isolation of DNA, RNA and protein from a single leaf sample for genomic and proteomic analysis

While working on tea molecular biology I faced some difficulties in isolating DNA, RNA and protein for synergistic study of genomics and proteomics at a given time of tea leaf sample. Many reports on established protocols are documented and some kits are commercially available for individual isolation of DNA, RNA and protein. Concurrent study of genomics and proteomics is important in order to dissect the molecular mechanism taking place inside a living system at a given condition and time. This gave a clear picture about the co-ordination between structural and function genomics deciphering the molecular functions taking plane inside any living organism. For undergoing such studies simultaneous isolation of DNA, RNA and protein from a single biological sample is required. Reproducible protocols are hardly available in public domain and some kits are available for such type of simultaneous isolation, for which the kits are costly.

During the course of tea transgenic works we successfully established an economical and rapid (3 hours) simultaneous isolation protocol for DNA, RNA and protein. We published the technique in 2017 and filed for Indian patent in 2018. Then an idea came in my mind to commercialize the extraction buffer used in the protocol thinking about its importance. After searching for funding agencies for biotechnological entrepreneurship I came to know about the BIG Grant from DBT, BIRAC. With the hand holding help from KIIT- TBI and generous grant from BIG Grant during 17th call we are following our endeavor to establish our start up to create a business ecosystem for biotechnological intervention for societal development. This will not only help us to be self sustainable but also can create jobs for plural number of people which I think will be the true sense of service to society with the help of our research experience. This idea will also promote “Make in India” concept and to discourage “job seeker” habit and stimulate “job creator” nature of young minds.

Dr Madhulekha Gogoi

Innovation: Multifunctional Iron-platinum nanoparticle composite for use as MRI contrast agent and therapeutic agent

Fundamental Research is the dream of a researcher who dedicated eight years (post PhD) of her life to research only. She has seen the struggle of research scholars to get permanent jobs and has witnessed the struggle of her family to cope with her father's death due to cancer. She was sad, confused, helpless; the constant feeling of doing something to overcome this grief was haunting her. Then, a day came when her patent on "iron-platinum nanoparticle as MRI contrast agent and therapeutic agent" was granted in India. And she promised to herself that one day she will serve the people by helping with early detection of cancer which is the only fruitful measure to treat cancer. She thinks in this way she can did justice to herself and other family members who did not have any choice other than forgo treatment of cancer at the last stage of her beloved father.

Imaging tumor cells and then differencing it from other normal cells is of prime importance during diagnosis of cancer. Contrast agents play the major role in this venture. In India, 100% of MRI contrast agent market is imported. Which is one of the major reason why cancer diagnosis has become so much sophisticated. Dr. Madhulekha Gogoi and co-founder Mr. Aditya Borborah has established Fundamental Research Pvt. Ltd. primarily to develop MRI contrast agents, which can serve dual role of contrast agent as well as therapeutic agent for cancer diagnosis and treatment. Their project was recently awarded the prestigious BIRAC BIG Grant Funding for coming up with "First to market" "Make in India" product for cancer diagnosis.

Dr Ajanto Kumar Hazarika

Innovation: Development of Advance Ventilator.

Dr. Ajanto Kumar Hazarika is a scientist at Tocklai Tea Research Institute (TTRI), Tea Research Association, Jorhat, Assam. He has more than 28 years of experience in tea manufacturing & quality evaluation, design and development of tea processing machines and Agri-Meteorology. During the course of his research, one vital area identified was to implement stringent quality assurance and process control measures during tea processing, by implementation of sensors and electronics for accurate and onsite measurement of tea quality. He, along with a team of dedicated researchers, namely, Prof. Rajib Bandyopadhyay and Dilip Sing of Jadavpur University, Kolkata, Er. Sandip Sanyal (Mechanical Engineer), Dr. Santanu Sabhapondit (Bio-chemist), Mr. Romen Ch. Gogoi (Tea Taster) of TTRI, Jorhat and Dr. Arunangshu Ghosh of NIT, Patna are now jointly working towards the development of a near infrared (NIR) spectroscopy based sensor system for rapid and onsite assessment of tea quality. They had an opportunity to interact with a team of researchers from Nagoya University of Japan, and came to know the immense application potential of NIR spectroscopy.

With the financial support from BIRAC through KIIT TBI, the team is now actively developing an indigenous NIR instrument for use in the tea industry. This innovation will enable real-time quality assessment of finished tea or fresh tea leaves, facilitate onsite monitoring & process control during tea manufacturing process, lead to the development of low-cost portable NIR with chemo metric software with user-friendly interface, and will be customizable for rapid use by other food & beverage industries.

Aeroshil Nameirakpam
Nibiaa Devices Pvt Ltd

Innovation: To Prototype the utility of LoRaWAN based IoT Protocol and Smart-Contract based Blockchain Technology for quality tea production.

While startups are brewing at major metro cities, there is a rising trend in northeastern region of the country as the preferred destination for startups. People of this region are passionate and enthusiastic to dive in to the one-of-a-kind startup ecosystem in the country. Mr Aeroshil Nameirakpam, Co-founder of Nibiaa Devices Pvt Ltd is one such prominent example who is trying to bring indigenous technologies to solve the problems of local marginal farmers and agricultural practitioners. Nibiaa's origin story began with a simple conversation between Professor N. Irabanta Singh, an agricultural researcher for over 42 years, and his son, Aeroshil Nameirakpam, who just returned back from US Studying and working there for nearly 10 years, who has a background in technology, sat down one day to discuss how agriculture and technology might be combined to help local farmers in India. Having authored numerous case studies and research projects, Prof. N. Irabanta Singh knew first-hand that farmers rarely read or implemented the findings from his research and other innovation in technology that has been happening across the globe.

This insight led Prof. N.Irabanta Singh and Aeroshil Nameirakpam to create Nibiaa for the purpose of equipping farmers with new agricultural technology for an increase in overall revenue and with close ties to the land, the two also vowed to only produce solutions that are sustainable and environmentally friendly combing each other's strength to build this company. Being a native of North Eastern part of India where Tea is a prominent industry, the duo had firsthand experience on the challenges faced by the planters and the industry as a whole due to age old practices, non – adoption of newer technologies and competition from Global market. They decided to do something about it and started working on innovative solutions that will increase the Market presence of the Indian Tea industry in the global arena and make revolutionary changes to the industry on which nearly 1 to 1.5 million People are depended. Currently, with BIRAC BIG and KIIT TBI support and handholding they are developing a novel blockchain and IoT based technology to determine the quality of the tea production and monitor the supply – chain traceability. This would ensure quality tea production at larger scale at an affordable cost.

Dr General Thiyam

Innovation: Cultivated Mushroom and microalgae flour for fortification in traditional food.

Coming from the Northeastern state of Manipur, Dr. Thiyam General, a microbiologist working on microbial fermentation and biotechnology has been supported by BIRAC under the BIG-18th Call. His work is focused on the production of microbial biomass for application in the food, agriculture, and pharmaceutical industries. He is also a recipient of the National Post-Doctoral Fellows Govt India, Korean Government Scholarship for pursuing a Ph.D. in Biochemical Engineering. His 16 years of R&D experience has driven him to translate scientific research to industry know-how. He has been part of the Korean National Branding program and was incubated in various agribusiness start-up incubators like NeatEhub, Naavic, and is currently incubated at KIIT-TBI as a BIG Grantee.

Lack of color of Chlorella for food application and expensive and time consuming artificial production processes have led to the idea of producing Cordyceps and Chlorella flour (yellow color) a base material using heterotrophic fermentation technology for application in fortification in food products like noodles. It primarily targets the geriatric population and to bring a change in the sector of dietary preferences, food cosmetics, and food of healthy origin, alternative protein, and bioactive substances.

Dr Ananya Barman

Innovation: Eco-friendly and cost effective microbial bioformulation/s for Tea growth promotion and disease control

Ananya being from North East India has been an ardent lover of tea right from her childhood. However, one day her outlook towards this highly popular drink completely changed when a local newspaper published that tea samples from Assam has failed chemical residue tests and countries importing tea from India has increased the frequency of tea originating from our country. Being a researcher herself with a Ph.D in Biosciences and Bioengineering from IIT Guwahati in 2018 she got into the grass root level of this problem with a visit to different tea gardens of Assam, Meghalaya and West Bengal. The same year she received a grant from the Department of Biotechnology (DBT) of the Government of India to study the pathogenesis of different bacterial and fungal diseases that have been severely affecting different tea plantations in North East India and thereby crippling the entire tea industry and economic growth of the country.

She became concern not only for herself and her family members but for the society as well as she became aware that the cup of tea we all are happily sipping regularly in our home or office consists of different types of residues of chemicals and pesticides. This is when she came up with a solution and ventured into developing a product, which will be purely organic with no chemicals or pesticides, cost effective, safe, easy to use, and environmental friendly. She formed a team comprising of a microbiologist, a chemist, and a business mentor and together they started working on the prototype. Meanwhile, she applied for the most sought after grant for startups, which is Biotechnology Ignition Grant (BIG), a flagship program of BIRAC, Government of India that is aimed towards finding innovative solutions to societal problems through biotechnological interventions. Luckily, she got the BIG grant and with the support of BIRAC and KIIT TBI, she has finally embarked on her entrepreneurship journey. Dr. Ananya likely sums it up with a few words “Believe in yourself and in your dreams. There is nothing that we cannot achieve. Hard work, patience and perseverance are the doors to your success and beyond. Most importantly, failures teaches you more than success. So dream BIG and do not be afraid of failures”.

NE Innovation Portfolio

State: Tripura

Industrial Biotechnology

Microbial consortium based biofertilizer for increased Ramie Fiber yield

APPLICATION

The innovative process can be deployed as a part of the effluent treatment process in various industrial ETPs like dairy ETPs, fertilizer ETPs, etc.

COMPANY NAME

Waste to Wealth Innovative Technologies LLP

FOUNDERS' NAME

Dr. Shaon Ray Chaydhuri Ashoke Ranjan Thakur

TECHNOLOGY READINESS LEVEL (TRL)

TRL: 8 (The process is currently under the pilot scale operations)

INTELLECTUAL PROPERTY

1. **Bio-fertilizer production from bacterial consortium,** Application No: 201731003023
2. **Microbial consortium and process for degumming of Ramie fiber,** Application No: 201931048663

PROBLEM ADDRESSED

The small and medium-scale dairy installations can afford to treat their effluent with the current technology (generating valuable resources) which was not possible using the existing elaborate technologies in the market. The freshwater could be used for potable purposes instead of wasted for non-potable applications like agriculture. The environment could be protected from the adverse effect of chemical fertilizer leaching while providing nearly free fertilizer (INR 7/1000 lit) for the landowners in the vicinity of the dairy ETP, ensuring round the year fodder and economic crop production in those lands. Adequate agricultural practice will ensure manpower involvement and hence livelihood generation.

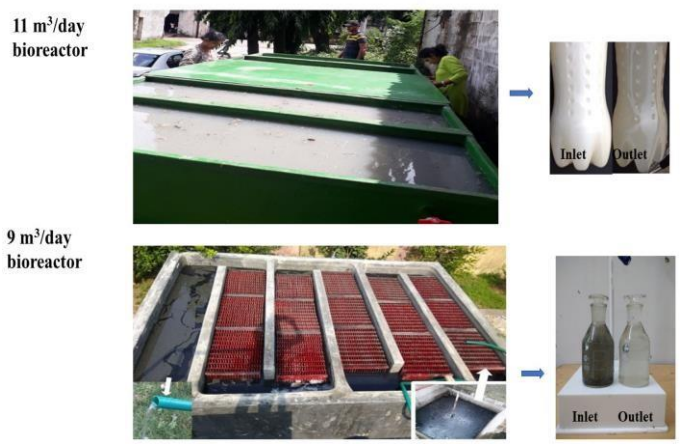
ABOUT THE TECHNOLOGY

Waste to Wealth has developed a process to convert milk processing plant wastewater into liquid biofertilizer within 16 hours using 70% less space (for effluent treatment plant installation), 89% less energy (for system operation), and about 90% less CO_2 equivalent gas emission. The effluent is converted into a value-added product that can replace the use of fresh water and chemical fertilizer for agriculture, hence preserving freshwater for drinking purposes. In addition, the investment in effluent treatment by the ETP operators can be converted into a revenue-earning proposition during long-term operation. The developed biofertilizer is effective in growth enhancement for 17 types of economic crops ensuring environmental protection

FUNDS RAISED/ACHIEVEMENTS

- Received BIRAC BIG Grant worth INR 50 lakhs
- Received MSME Startup fund worth INR 15 lakhs
- Received Regional Climate Launchpad winner in 2019
- Received Visitor's award in Technology Category 2019
- Received NASI Reliance Industries Platinum Jubilee Award 2020

PRODUCT IMAGE



USP

- Effluent is converted into liquid biofertilizer
- Developed biofertilizer is effective in enhancement for 17 types of economic crop
- High efficiency and low running time
- Requires 70% less space for installation
- 89% less energy consumption and about 90% less CO2 equivalent gas emission
- Low capital and operational cost

END USERS/CUSTOMERS

Effluent treatment plants, Dairy industries, Fertilizer industries, etc.

State: Assam

Healthcare: Drugs

Development and field test of AI – guided software for detection cervix cancer using Pap smear images – PAPSCANNER

APPLICATION

An automated cervical dysplasia scanner for early detection and diagnosis. Later on the platform technology can be used to detect other types of cancer

COMPANY NAME

RogNidaan Technologies Pvt Ltd.

TECHNOLOGY READINESS LEVEL (TRL)

TRL: **3 (Software(s)/Systems developed and tested)**

INTELLECTUAL PROPERTY

IP filing is under progress

FOUNDERS' NAME

Dr. Lipi B Mahanta, Dr. Kangkana Bora
Manish Chowdhury & Anup K Das

Website: https://rognidaan.co.in/

PROBLEM ADDRESSED

Cervical cancer is one of the most prevalent cancers among women in North-East India. We construe several reasons, among many, for this high incidence: i) low awareness about the early diagnostic techniques, ii) lack of easy access to the nearest clinic or pathology laboratory, iii) apathy to spend the substantial cost involved for only a screening test, iv) unwillingness for repeated visits to the center as the diagnosis cannot be given on the same day and lastly v) lack of automated software available. Healthcare costs will need to be reduced if we are to treat more people and overcome the reasons mentioned above. Further, accurate and timely diagnosis is the major strategy, as well as a challenge for lowering the incidence of the disease

ABOUT THE TECHNOLOGY

An automated screening solution for early detection of cervical dysplasia from Pap smear images, which we coined "PapScanner". This software device is robust, accurate, and low-cost solution that can be operated even by a simple technician or laboratory assistant. The service of the product is remotely accessible, which makes it more efficient. The algorithm for product development mainly uses current trends of Artificial Intelligence techniques, namely machine learning and deep learning. This unique solution can be used as an early cervical cancer diagnosis test in hospitals, used for regular preventive health check-ups, and large- scale screening in rural and semi-urban areas.

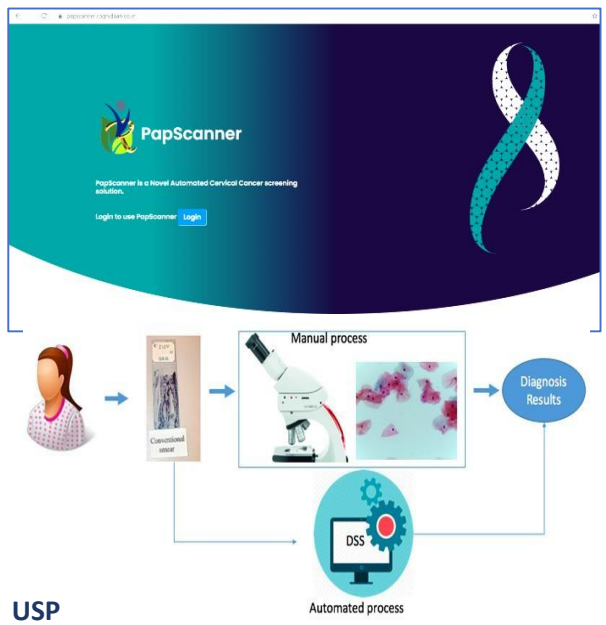
FUNDS RAISED/ACHIEVEMENTS

BIRAC BIG NE for INR 25 Lakhs

END USERS/CUSTOMERS

Pathologist of Hospitals and Diagnostic Centres

PROCESS FLOW



USP

- Automated, fast and user friendly.
- No high-end infrastructure required.
- Reduces the workload of the pathologist
- Cost effective screening tool
- Easy and secure access from remote locations
- Offers binary (suitable for Mass screening) as well as Multi-class classification (for Specialized observation)
- Offers conventional as well as Liquid-based Cytology image analysis

Healthcare: Devices

State: Assam

Development of a market ready multi-articulating adaptive myoelectric hand using sensory feedback

APPLICATION

Functional myoelectric Prosthetic hand for trans-radial amputees that generates a sense of embodiment towards the user

COMPANY NAME

Symbica Pvt Ltd

FOUNDER'S NAME

Nilotpal Baruah

Website: https://www.symbica.in/

TECHNOLOGY READINESS LEVEL (TRL)

TRL: 4 (Functional Prototype developed by integration of different modules)

INTELLECTUAL PROPERTY

Indian Patent has been filed
App No: 202131002483

PROBLEM ADDRESSED

Most of the current prosthetic hand manufacturers rely only on the functional aspects of a prosthetic hand like the number of grasps it can make and the number of degrees of freedom it has, etc. and not on generating a sense of ownership towards the amputee.

PRODUCT IMAGE

ABOUT THE TECHNOLOGY

1. A hybrid underactuated mechanism helps to grab any size object with just a single motor.
2. Self adapting socket ensures perfect socket fit with respect to any change in stump geometry/size.

FUNDS RAISED/ACHIEVEMENTS

1. BIRAC BIG NE Call for INR 25 Lakhs
2. Selected for Assam Startup- COHORT 1.0

USP

1. Affordability with no compromise in grasping configurations generally available in the market.
2. Self adapting socket for stress-free operation of the hand irrespective of any changes in weather and stump geometry.

END USERS/CUSTOMERS

Hospitals, Clinics, Government and Amputees

Healthcare: Diagnostics

State: Assam

Bio-Dtect

A Paper Based Point of Care Test Kit for Detection of Pan Malaria and Plasmodium Falciparum Species in Human Blood Serum

APPLICATION

Bio-Dtect is working on formulating a paper-based malaria biomarker detection kit based on an enzyme- catalyzed reaction. The custom-made dedicated smartphone-based application helps to analyze the data obtained in the test and provides the results in an easily interpretable format to the user.

COMPANY NAME	TECHNOLOGY READINESS LEVEL (TRL)	INTELLECTUAL PROPERTY
Bio-Dtect Pvt Ltd FOUNDER'S NAME Dr. Sudarshan Gogoi	TRL: 4 (Proof-of-Concept has been established and currently working on prototyping)	IP filing is under progress

PROBLEM ADDRESSED

Current PfHRP-II based RDTs available in the market may sometimes show false negative test
because of the deletion/mutation of this particular gene in some of the plasmodium species. To address this issue we have developed a test kit based on P. falciparum glutamate dehydrogenase (PfGDH) and plasmodium lactate dehydrogenase (PLDH) specific to plasmodium falciparum and other pan malaria species. The test kit can detect the biomarkers up to picomolar level in the laboratory settings. Soon, we are going to test the kit with real malaria samples for validation.

ABOUT THE TECHNOLOGY

The developed test kit is based on a dye-based reaction catalyzed by specific malaria biomarkers. The biomarkers are captured from the blood serum using specific aptamers immobilized on gold-coated magnetic beads. On the positive test, the blue-colored reaction mixture containing resazurin is converted into a pink-colored solution (corresponding to resorufin). The dye is then captured on a specially modified paper and the color intensity is determined by a smartphone-based application.

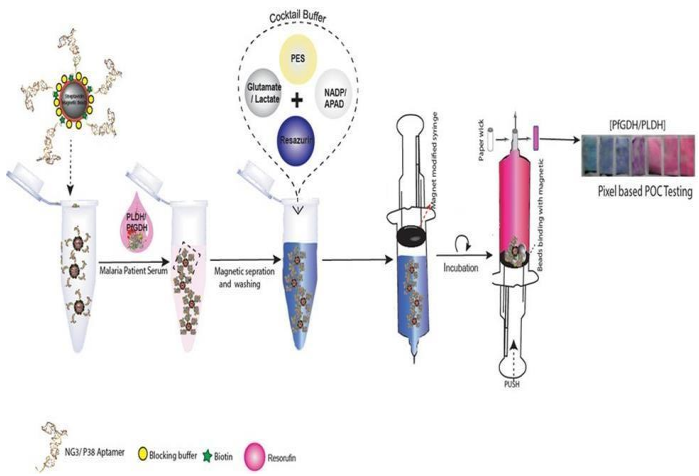
FUNDS RAISED/ACHIEVEMENTS

BIRAC BIG NE Call of INR 25 lakhs

END USERS/CUSTOMERS

Public and Private health workers/Asha Karmi/NGOs

PROCESS FLOW



USP

- The developed test kit does not give false negative result like RDTs.
- Can simultaneously detect plasmodium and other pan malaria species.
- The cost is less than 75 Rupees per kit.

State: Manipur

Agriculture

Industry Scale Development of Probiotic Formulation for Livestock's Management

APPLICATION

Probiotic formulation that can improve animal gut health, growth rate ,feed efficiency and food safety. The probiotics also helps to increases the resistance or immune system of animal/ poultry from diseases thus lowers regular requirements of antibiotics, medicines

COMPANY NAME

Green Biotech Ecosolutions Pvt. Ltd

FOUNDERS' NAME

Ms. Geetashori Yumnam

Dr. Asem Sundari

Website: https://greenbiotechecosolutions.com/

TECHNOLOGY READINESS LEVEL (TRL)

TRL:3 (Proof of Concept Established)

INTELLECTUAL PROPERTY

IP filing is under progress

PROBLEM ADDRESSED

The rapid growth in population has increased the demand for nutritious food. In NER states of India, a large number of the population's livelihoods are based on livestock. Major issues with animal farming were related to disease and the highest number of death of animals is due to diarrhea caused by toxigenic of E-coli. The other zoonotic pathogens, such as Salmonella, can also cause health problems and loss of farmers' income. To overcome the problem a huge quantity of Antibiotics is usually given to live stocks that bio-accumulate in the body of animals and enter the human body while consuming and increasing the expenditure of the farmers.

ABOUT THE TECHNOLOGY

The probiotic formulation would play an important role in Livestock management. It can solve multiple problems of livestock management – diseases, health, foul odor, and the immune system. It helps to increase the resistance or immune system of animal/ poultry from diseases, so it lowers regular requirements of antibiotics, medicines, and others and keeps animal/poultry healthy. The probiotic also improves animal/ poultry health and reduces the mortality rate.

FUNDS RAISED/ACHIEVEMENTS

- Winner of the northeast MANAGE Samunati AgriStartup Award 2021
- Selected and visited to show case at Dubai Expo in Indian Pavilion as a startup by Planning Department, Govt. Of Manipur
- ABI Women Power Award 2022 conferred by Agribusiness Incubation Centre, ICAR Research Complex for NEH Region, Umiam, Meghalaya

PRODUCT IMAGE

USP

- Sources is from indigenous black rice and milk.
- An organic and eco friendly product
- Product will boost the immune system and will decrease the mortality rate of the livestocks.

END USERS/CUSTOMERS

- Ground level farmers
- Livestock producers
- Large suppliers of Food processing industry

State: Assam

Industrial Biotechnology

Biomolecular Surface Disinfectant for Households and Commercial Establishments

APPLICATION

Biomolecules as active and participating ingredients for Disinfectants, Pharmaceuticals, Cosmetics, Processed Foods and Personal Hygiene Products

COMPANY

Pepthera Laboratories Pvt. Ltd.

FOUNDERS' NAME

Dr. Gaurav Jerath

Website: www.pepthera.com

TECHNOLOGY READINESS LEVEL (TRL)

TRL: 2 (Proof-of Principle)

INTELLECTUAL PROPERTY

Patent Number: To Be Filed

PROBLEM ADDRESSED

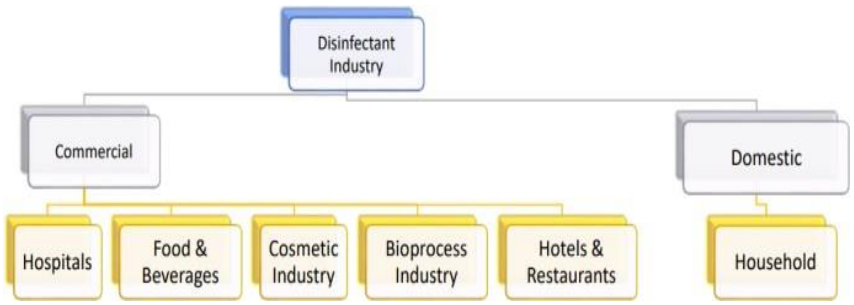
Antimicrobial Resistance (AMR) is a phenomenon responsible for over 1 million annual deaths globally at present. This number is predicted to increase to over 10 Million annual deaths in the next 20 years.

The use of antimicrobial chemicals in daily use products adds to the further development of AMR.

Additionally, the chemicals have a high ecological half-life of over 150 years along with high toxicity.

Therefore, these chemicals have been either banned or highly regulated in western countries.

PRODUCT USES



ABOUT THE TECHNOLOGY

- Our technology has two components:

1. Membrane destabilizing Molecules as
2. Membrane Penetrating Molecules for carrier functions in cosmetic and pharmaceutical sectors.

- We have our proprietary biomolecule design platform, which has been validated to design biomolecules with tailored antimicrobial and carrier activity.

USP

1. Biomolecular Formulation
2. Non-toxic
3. Non-hazardous
4. Low ecological half-life
5. Programmable Technology for developing new formulations within 5 years (antimicrobials).
6. Designed Molecules, therefore, Patentable

FUNDS RAISED/ACHIEVEMENTS

1. Winner of BRTC Changemaker of North East (Startup category)
2. National-level Antimicrobial Resistance Quest 2021
3. BIRAC Biotechnology Ignition Grant (BIG-18) INR 50L

END USERS/CUSTOMERS

1. Surface Disinfection Industry
2. Cosmetic Industry
3. Personal Hygiene Industry
4. Pharmaceutical Industry
5. Food Processing Industry
6. Other industries requiring antimicrobials (e.g. healthcare, bioprocess, etc.)

State: Manipur

Industrial

Cultivated Mushroom and Microalgae Flour for Fortification in Traditional Food

APPLICATION

Base material for Food, nutraceuticals and pharmaceutical applications

COMPANY

Generation Net Nutrition's

FOUNDERS' NAME

Dr. Thiyam General

TECHNOLOGY READINESS LEVEL (TRL)

TRL: 4 (Proof-of-Concept Established)

INTELLECTUAL PROPERTY

Patent Number: Yet to file

PROBLEM ADDRESSED

- Lack of yellow color Chlorella for application in food
- Lack of Alternative cultivation process for medicinal mushroom Cordyceps militaris
- Lack of microbial based functional food materials.

ABOUT THE TECHNOLOGY

- High-density Heterotrophic produced microalgae biomass with no off-flavors

•Heterotopic produced medicinal mycelium as an alternative for Cordyceps

•Fermentation technology with a short cultivation period reduce the production cost.

FUNDS RAISED/ACHIEVEMENTS

1. Supported under BRTC NE Changemakers
2. BIRAC Biotechnology Ignition Grant (BIG-18) INR 50L

END USERS/CUSTOMERS

- Nutrition and medicine ingredients
- Protein rich diet
- Health and wellness trend
- Vegetarianism
- Alternative protein

PRODUCT

USP

•Heterotrophic cultivation of algal biomass with protein 45%, omega 3 fatty acids, lutein, neutral taste, No Off Flavour, easy to mix with traditional food.

•Heterotrophic cultivation medical mushroom mycelium, no toxic heavy metals, axenic culture, and short cultivation period.

State: Manipur

Agriculture IoT, AI/ML

To Prototype the utility of LoRaWAN based IoT Protocol and Smart- Contract based Blockchain Technology for quality tea production and systematic supply-chain traceability and Transparency Solution.

APPLICATION

IoT enabled Precision Agriculture Solution

COMPANY

Nibiaa Devices Pvt Ltd

FOUNDERS' NAME

Aeroshil Nameirakpam

Website: https://www.nibiaadevices.com/

TECHNOLOGY READINESS LEVEL (TRL)

TRL: 4 (Prototype in development)

INTELLECTUAL PROPERTY

Not filled yet

PROBLEM ADDRESSED

- Existing IoT-based agriculture systems have a centralized format and operate in isolation, leaving room for unresolved issues and major concerns, including data security, manipulation, and single failure points.
- This solution proposes a futuristic IoT with a blockchain model to meet these challenges which can not only transform tea industry but any food industry supply chain traceability and transparency in general.
- The project will try to solve some of the above stated problems with the following innovative solution

ABOUT THE TECHNOLOGY

- Intervention on tea Industry by bringing in Complete traceability and transparency in raw material sourcing, manufacturing and distribution related data through IoT, Blockchain and AI Hardware and Software Solution.
- To Utilize smart-contracts based Blockchain Technology to track & trace the workflow of Tea supply chains, Implement traceability and shareability of Data among various key stakeholders.

END USERS/CUSTOMERS

Tea industry and consumers

PRODUCT

USP

To build an IoT, AI and Blockchain based Data driven decision support System to increase the quality and yield of produced tea and provide necessary data to the buyers for export purposes.

Our solution will be able to transforming the Package food industry supply-chain by bringing in Complete traceability and transparency in raw material sourcing, manufacturing and distribution related data through IoT, Blockchain and AI Technology

State: Assam

Healthcare: Drugs

Novel Synthesis of Iron-platinum Nanoparticle Composite and Their Multifunctional Applicability as MRI Contrast Agent & Therapeutic Agent

APPLICATION

FePt nanoparticle to be used as MRI contrast agent and therapeutic agent for cancer cells. This efficient in vitro therapeutic effect is exhibited by the nanoparticles as monitored through DCFHDA-DCFH assay for the generation of reactive oxygen species (ROS) to kill tumor cells.

COMPANY

KNOWLEDGEPIE Pvt. Ltd.

FOUNDERS' NAME

Dr. Madhulekha Gogoi

TECHNOLOGY READINESS LEVEL (TRL)

TRL: **3 (Prototyping development stage)**

INTELLECTUAL PROPERTY

Patent Number:
Indian Patent 351940

PROBLEM ADDRESSED

The existing MRI contrast agents available in the market are Gd-based. Recent research reports the cases of nephrogenic systemic failure (NSF) in patients with renal impairment or dialysis on multiple exposures to such contrast agents due to Gd-release and tissue retention.

ABOUT THE TECHNOLOGY

FePt nanoparticles are superparamagnetic in nature and hence exhibit negative contrast in alteration to positive contrast property of Gd-based contrast agents. In addition, vitamin C molecules play an important role in capping the nanoparticles and restricting the average particle size to below 5 nm. Whereas catalytic property of the Pt phase is important from the therapeutic point of view as it helps in the generation of hydroxyl radical from H_2O_2 catalytically.

FUNDS RAISED/ACHIEVEMENTS

BIRAC BIG 18TH Call for INR 50 Lakhs

END USERS/CUSTOMERS

End users: radiologists operating MRI for diagnosis
Customers: Pharmaceutical companies

PRODUCT

USP

- It is a novel, facile, aqueous, thermo-free, green, one-pot process
- Gd^{3+} and Mn^{2+} related toxicity issue can be overcome by using the vit. C capped FePt nanoparticle based contrast agent
- Additional potential theranostic application

State: Manipur

Healthcare

India Heath Card ™- A digital healthcare loyalty cards

APPLICATION

Medilane Healthcare through Indian health cardholders provides healthcare facilities in different parts of Manipur in different healthcare service providers namely Hospitals, Diagnostic Centers, Optical stores, Dental clinics, Physiotherapy clinics, Pharmacies, salons, and spas.

COMPANY

Medilane HealthTech and Consultancy Services Pvt Ltd **Dr. Dayananda Meitei**

Website: https://medilane.org/

PROBLEM ADDRESSED

Today, inaccurate diagnosis, medication errors, inappropriate or unnecessary treatment, inadequate or unsafe clinical facilities or practices, or providers who lack adequate training and expertise prevail everywhere.
Medilane brings in quality health service and health coverage in Manipur.

ABOUT THE TECHNOLOGY

Medilane, the most trusted home healthcare and Ambulance service provider in the state of Manipur, with an aim towards making affordable and accessible healthcare to the public.

This organization provides 24X7 Ambulance services, Home nursing care services, Doctors/Physiotherapy/Sample collection on call, Medical oxygen and Equipment rental. Covid and post covid care. Medilane also offers health Insurance and Health privilege cards to provide quality healthcare treatment to all.

USP

- 24x7 service
- Easy access to healthcare
- Benefits to users
- App based easy service provider

FUNDS RAISED/ACHIEVEMENTS

- MeiTy NE-Launchpad Accelerator Program Winner

PRODUCT

Manufacturing

State: Manipur

Handcrafted, Eco-friendly, Functional Art for Kitchen

APPLICATION

Produce a whole range of organic/eco-friendly homeware that not only works as functional pieces but also as an art piece in itself at home.

COMPANY

Ble & Zíng

FOUNDERS' NAME : Ms. Chanreiphi
Raising Website: www.tulahome.in

ABOUT THE TECHNOLOGY

We produce versatile stoneware that is glaze free,100% biodegradable, Organic,Toxic- free,100% food-safe. Retain the quality of the
food prepared in them, Microwave safe, Can be used on a gas stove and open flames, its stainless, Eco-friendly, Odor-free, Refrigerator safe, easy cleanup, functional and elegance

PRODUCT

ADVANTAGES

1. Food grade biodegradable container
2. Toxic free, eco friendly
3. Traditional practices
4. The raw material is unique to Ukhrul district of Manipur
5. High demand in the metros
6. Reduce the use of plastic and environment friendly

USP

1. Eco friendly product
2. Toxic free
3. Odor free
4. One of the best ceramic clay found in the country
5. Serpentinite rock found at Nungbi village is the main raw material.

END USERS/CUSTOMERS

Alternative to the plastic dishware

Agriculture & Food

State: Manipur

Agro Based Food Manufacturing Enterprise with Value Addition

APPLICATION

Reviving the traditional agri-based industries with value addition for socio economic upliftment

COMPANY

Vedam Agro Enterprises

FOUNDERS' NAME

Dr. Kh. Vedamani Devi

Website: https://vedamagro.org/

PROBLEM ADDRESSED

1. To enhance the agro industries
2. Value addition of the local product
3. Sustainable utilization of the local resources
4. Scaling up the local product to meet regional demand
5. Improve the socio economic condition of local women.
6. Development of rural women cluster model

ABOUT THE TECHNOLOGY

1. Reviving of the traditional knowledge
2. S&T intervention to traditional agro industries.
3. Enhance the shelf life of the product.
4. Value addition to meet the demand of the people
5. Reduce the waste of the local resources thereby converting into agro wealth

FUNDS RAISED/ACHIEVEMENTS

Looking for funding opportunities

PRODUCT




USP

1. Local resources with high nutritive values
2. Enhance the shelf life of the product
3. Value addition of the product
4. Alternative livelihood to the women
5. Women based cluster group for improving the socio economic condition

END USERS/CUSTOMERS

For all looking for nutritive natural product

State: Assam

Industrial

Development of Low Cost Microbial Based Wetting Agent: A Mission To Promote Eco-Friendly Blending Agent for Agriculture

APPLICATION

Replace chemical wetting agents with bacteria derived wetting agents for sustainable agriculture.

COMPANY

Poohar Essence Pvt Ltd

FOUNDERS' NAME

Dr. Debajit Kalita

Website: www.poohar.com

PROBLEM ADDRESSED

1. To reduce the use of chemical fertilizer
2. Provide healthy and organic food
3. Development of formulation of microbial based bio fertilizer.
4. Scaling up the bio fertilizer production for commercial purposes
5. Increasing demand for green solutions in food and Agri Sector.
6. Spreading agent Market is growing - USD 52.4 billion by 2026.

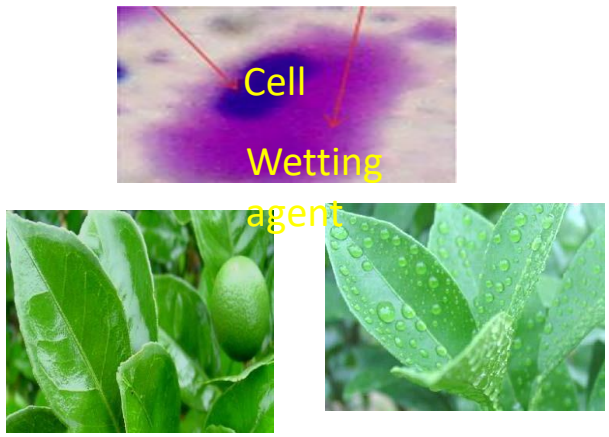
ABOUT THE TECHNOLOGY

1. Microbial derived biomaterial
2. Reducer, Spreader, repellant and compatible.
3. Low cost, affordable, eco friendly, user friendly, effective and efficient.
4. The Preliminary experiments and formulations showed that the proposed idea has high technical feasibility

END USERS/CUSTOMERS

Agricultural sector with focus on organic farming

PRODUCT



USP

1. Enhancing spray solution of the pesticide.
2. Lowering the surface tension, allowing more pesticide to reach its target.
3. Also reduce the amount of bounce a droplet
4. Influence interfaces both inside and outside the leaf or the intended target pest
5. Reducing the load and overuse of pesticide
6. Helping in more production using less pesticide

State: Manipur

Industrial

Manufactures Herbal Products of Natural Origin and Consultancy

APPLICATION

Herbal products with quality and with less side effect and manufactured with a cost effective technique which is patented.

COMPANY

Kumshung

FOUNDERS' NAME

Dr Wangkheirakpam Sujata

INTELLECTUAL PROPERTY

Patent Granted No: 327026 on 9/12/2019

PROBLEM ADDRESSED

- Synthetic compound causes unwanted ill side effects.
- Products of natural origin do not have side effects.
- Existing synthetic personal health care products have undesired side effects.
- Such products are unfavorable to all.
- Prolong use of synthetic products sometimes may worsen ailments and health.

PRODUCT




ABOUT THE TECHNOLOGY

1. Chemical-free personal care products
2. Toxic free, eco friendly
3. Natural based products
4. Scientifically validated
5. Wise use of the natural resources

USP

1. Eco friendly beauty product
2. Chemical free
3. Herbal personal care products
4. Good for health and skin
5. Quality Product and with fewer side effect

END USERS/CUSTOMERS

Personal care product with focus on women

State: Assam

Healthcare:

Accessibility of the latest technology driven best practices in the field of diagnostics for vast majority of underserved population in India and South East Asia

APPLICATION

Augment the 'Essential Diagnostics List' of the World Health Organization

COMPANY

Foundation for Advancement of Essential Diagnostics **FOUNDERS'**

NAME

Anamika Baruah

Website: www.faed.in

PROBLEM ADDRESSED

- FAED is working in the areas of clinical laboratory management, pathology, and laboratory medicine.
- The primary aim is to make accessibility of the latest technology-driven best practices in the field of diagnostics for the vast majority of the underserved populations in India and South East Asia.
- FAED aims to augment the 'Essential Diagnostics List' of the World Health Organization that has been recently adopted by the Indian Council of Medical Research for implementation in the Indian health care system.

SERVICE PROVIDED

ABOUT THE TECHNOLOGY

1.Promote the practice of advanced laboratory medicine in Government-run civil hospitals and public health dispensaries across India.

2.Continuous Medical Education on advanced laboratory medicine and clinical test utilization for community health workers, nurse practitioners, and physicians.

3.Empower Indian civil hospitals and public health dispensaries in low resource settings to implement best practices in laboratory medicine.

4.Train a new generation of Medical Laboratory Scientists in India so that they can play a consulting roles within those low-resource health centers to utilize modern laboratory medicine in the best way possible even in any remote village in India.

5.Conduct research in disease dynamics and surveillance studies in the Indian subcontinent through the lens of pathology and laboratory medicine.

USP

1.Providing affordable and accessible diagnostic and healthcare services to the people in India.

2.Timely disease diagnosis to the vast majority of underserved populations.

END USERS/CUSTOMERS

Heath care sector

Waste to Value

BIRAC SPARSH Social Innovation Immersion Program(SIIP)

INNOVATOR

Dr. Chandralekha Ayekpam

Brief Profile of the Innovator

As born in an underprivileged state like Manipur in the 1990s, searching for solutions to issues on her own has become our unconscious habit. The urge to contribute to the betterment of society was there from the beginning. The clarity in thoughts and a clear vision of what and how she wants to execute her plans scientifically.

She has worked on the successful completion of a multi-institutional network project entitled "Encapsulated Microorganisms for Environmental Processes" from which she learned the technologies and methodologies involved in encapsulation and application for environmental protection. Later, she completed Ph.D. in Biotechnology from CSIR-CFTRI, Mysuru under the topic entitled "Integrated approach for Extraction, Purification, and Concentration of Bioactives from Selected Algae".

She believes that her research will only be useful if we could able to solve the issues of society through our scientific knowledge. Her proposals are mostly focused on utilizing the bioresources of Northeast India and at the same exploring the traditional knowledge as well.

Till now she was selected for interstate boot camp, Academy for women entrepreneurs (AWE) startup grant, by the Indo-US collaborative program. Selected for virtual incubation in KIIT-TBI (NE launchpad program), for patent filling and now a SPARSH fellow under the thematic area "Waste to wealth" at KIIT-TBI.

HANDHOLDING BY KIIT-TBI

- Incubation Support
- IP Support
- Company Formation
- Technical and Business Mentoring
- Mentoring under SPARSH-SIIP

FUNDS RAISED/ACHIEVEMENTS

- MeiTy NE – Launchpad Winner
- Shortlisted for Academy for women entrepreneurs (AWE) startup grant
- BIRAC SPARSH-SIIP Waste-to-Value cohort

State: Assam

Healthcare:

Bioactive Reprogrammed Nano-herbal Formulation for Photothermal Therapy-based Cancer Theranostics

APPLICATION

The product is a ready-to-use and easily injectable nano herbal gel Nano-herbal photos thermal therapy for cancer theranostics. The herbal gel is reprogrammed with the aid of the modern nanotechnology which improves the bioavailability and reduces the high dosages

INNOVATOR

Dr. Deepak Bharadwaj
PVP
NIPER Guwahati

TECHNOLOGY READINESS LEVEL (TRL)

TRL: 3 (Hypothesis testing and initial proof of concept)

INTELLECTUAL PROPERTY

IP filing process is under progress

PROBLEM ADDRESSED

The current nano-herbal gel-based product addresses a translatable solution for the treatment of accessible superficial tumors in humans and veterinary animals. In India, among all the cancer patients, 60 of them are suffering from superficial cancers skin, breast, and oral. Similarly, the areas of veterinary oncology require new strategies to provide them with efficient treatment regimens. Many of them had already lost their vital organs due to surgeries like glossectomy, mandibulectomy, or neck dissection. Many of these surgeries are due to improper diagnosis or treatment at early stages. The proposed product can be used as a sustainable and efficient therapeutic model for the management of tumors in both humans and veterinary animals.

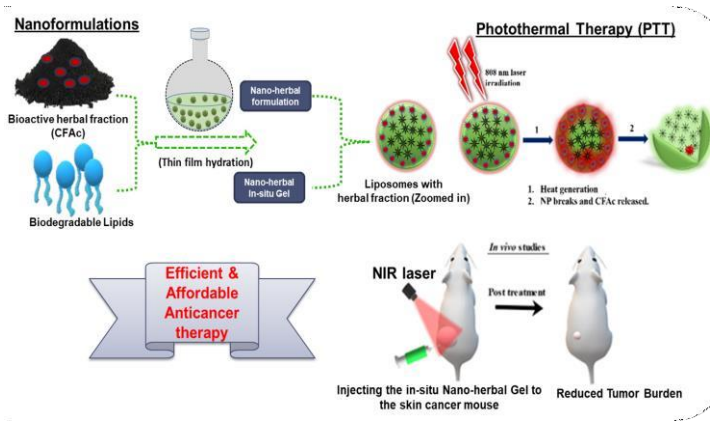
ABOUT THE TECHNOLOGY

The aid of light-based therapies ameliorates the adverse effects and improves the bioavailability which can reduce the typical large dosages, especially in chronic diseases like cancer. The technology being used is Photothermal-based ablation of cancer cells, referred to as photothermal therapy PTT which is a futuristic

FUNDS RAISED/ACHIEVEMENTS

BIRAC BIG NE grant of INR 25 Lakhs

PROCESS FLOW



USP

- The product is a multi-functional agent which inhibits the growth of cancer cells using light and its inherent anti-cancer properties.
- The nano-herbal gel will be a sustainable, cost- effective, and novel method for the management of tumors of superficial origin.

END USERS/CUSTOMERS

Ayurvedic practitioner, Clinical and Veterinary Oncologists.

Industrial Biotechnology

Biodegradable Adult Diaper

APPLICATION

Sustainable diapers made from locally sourced bamboo and wetness sensors for adults with or without disabilities .

INNOVATOR

Ms. Melinda Nongbet Sohlang

TECHNOLOGY READINESS LEVEL (TRL)

TRL: **3 (Individual core components optimized at lab scale)**

INTELLECTUAL PROPERTY

IP filing is under progress

PROBLEM ADDRESSED

Cloth has been used since time immemorial as a sanitary pad/diaper which later paved the way for single-use disposable diapers. However, this created an environmental problem as disposable diapers use polythene (which though later are made to be biodegradable) clog the landfills as they do not easily decompose.

ABOUT THE TECHNOLOGY

The project aims at validating a prototype for a bio- based, biodegradable adult diaper equipped with a wetness sensor.
A diaper that is bio-based and biodegradable, liquid permeable, leak-proof top sheet. A layered inner absorbent pad with an impermeable outer sheet, and fiber laminate. The locally grown bamboo is used as an absorbent with a wetness sensor (turmeric patch/smart sensor).

FUNDS RAISED/ACHIEVEMENTS

BIRAC BIG NE Call of INR 25 lakhs

END USERS/CUSTOMERS

1. Bed-ridden adults
2. Working professionals with no access to toilets People with
3. urinary incontinence
4. Care-givers

PRODUCT IMAGE

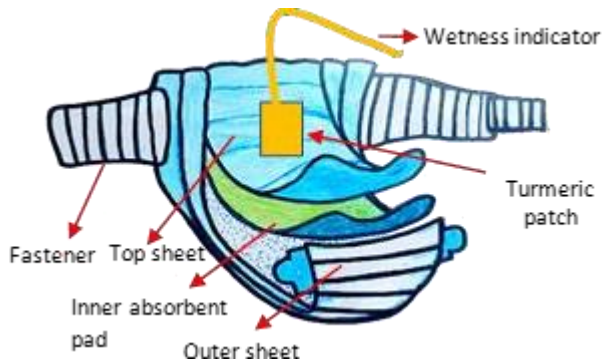


Fig: Proposed prototype

USP

- Bio-based and biodegradable.
- Locally available raw material.
- Wetness sensor

State: Assam

Industrial Biotechnology

Protein Hydrolysate From Bio-waste of Indian Silk Industry to Fight Malnutrition

APPLICATION

Low cost protein hydrolysate developed from the edible silkworm pupa which is rich in nutrients particularly quality protein and lipid.

INNOVATOR

Dr. Prachurjya Dutta

CSIR - NEIST

TECHNOLOGY READINESS LEVEL (TRL)

TRL: **4 (Concept proven from lab scale)**

INTELLECTUAL PROPERTY

IP filing process is under progress

PROBLEM ADDRESSED

Malnutrition in all its forms remains a global concern, particularly affecting highly vulnerable populations in several regions of the world. The Global Nutrition Report, 2016 confirms the urgency of collective action to combat malnutrition cascading. NE India, being an extensive grower of silkworms, our startup is focused on the following aspects:

- Sustainable technology for silkworm pupae processing and value addition as food products. ØNovel pharmaceutical and nutraceutical products (protein hydrolysates; lipids and bioactive compounds).
- Process development for inhibiting/eliminating allergens.

ABOUT THE TECHNOLOGY

Waste silkworm pupae of the Indian silk industry are the primary source for the development of safe processed foods. The functional components are extracted and isolated from waste silkworm pupae for the development of functional food and health supplements. 8 variations of the ready-to-eat food products from waste silk pupae would be available after an extensive in-depth analysis of the shelf-life, packaging, and nutrient content of the extract.

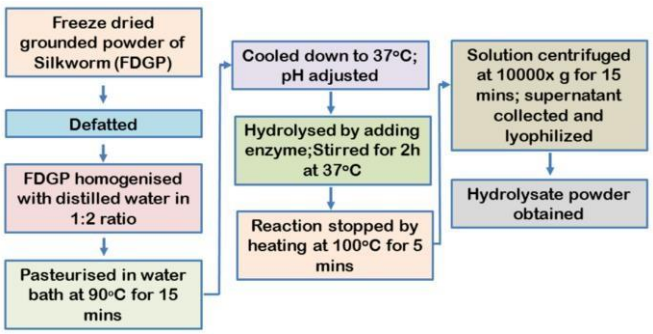
FUNDS RAISED/ACHIEVEMENTS

BIRAC Ignition Grant-NER of INR 25 lakhs

END USERS/CUSTOMERS

1. Consumers
2. Sports Nutrition
3. Raw material for other products such as protein bar

PROCESS FLOW



USP

- Low cost alternative to conventional meat or other protein source
- Rich in protein and other micro nutrients
- Apart from nutritional benefits it also have medicinal values

State: Assam

Industrial Biotechnology

Developing Nutritional Product from Musa Balbisiana (Family: Musaceae, Genus: Musa) Fruit to Combat Malnutrition

APPLICATION

Creating nutritional supplements from indigenous banana variety that is well proven for its nutraceutical value for infants and mothers.

INNOVATOR

Dr. Sanjay Kumar Banerjee

NIPER Guwahati

TECHNOLOGY READINESS LEVEL (TRL)

TRL: **4 (Proof of Concept Demonstrated)**

INTELLECTUAL PROPERTY

IP filing is under progress

PROBLEM ADDRESSED

Malnutrition is a serious public health problem and is linked to a substantial increase in the risk of mortality and morbidity. Musa balbisiana is a banana variety that is well-known for its high nutritional value and strong antioxidants available in North-East India but the presence of seed prevents its consumption. This variety of bananas has been utilized in folk medicine for a long time by the tribal people of North-east India especially by children to improve their health and growth rate. However, there is no method to separate the seeds from the pulp and preserve the fruit pulp so that people with malnutrition can use it throughout the year.

ABOUT THE TECHNOLOGY

The primary focus of this company is to develop Musa balbisiana fruit pulp powder, which can be stored at room temperature and supplemented in malnutrition subjects specially child or women to improve their overall health. The primary focus id the development of fruit powder and capsule using two drying techniques -tray drying process and Spray drying process. The finished product will be in the form of powder/capsule with the optimum utilization of fruits that would ensure long term use/storage.

FUNDS RAISED/ACHIEVEMENTS

BIRAC BIG NE for INR 25 Lakhs

END USERS/CUSTOMERS

Children between 6 months to 12 years.

PRODUCT IMAGE

USP

- Stable nutritional product for malnutrition
- Indigenous raw material
- Cost effective nutritional supplements

State: Manipur

Industrial Biotechnology

Paper-based Kits for On-site Detection of Methanol and Formaldehyde

APPLICATION

Simple and affordable detection kit for both methanol and formaldehyde on a single testing platform. The developed kit can be used in the alcohol industry either by large-scale or small-scale industries for rapid quantity and quality assessment.

INNOVATOR

Dr. Lightson NG
RGCB, Thiruvananthapuram

TECHNOLOGY READINESS LEVEL (TRL)

TRL: 5 (Concept proven from lab scale to Bioreactor level experiments under optimized conditions)

INTELLECTUAL PROPERTY

Patent Number:
1. Appl. No. 201831041908
2. Appl. No. 202031004522

PROBLEM ADDRESSED

- Formalin/formaldehyde is used as a preservative for milk & seafood.
  Both methanol & formalin have adverse health effects ranging from dizziness, blindness, CNS breakdown, coma, and even death.
- Contamination & adulteration of alcoholic drinks & hand sanitizers with methanol.

The technology can detect either or both methanol and formalin concentrations on a single test kit within 2 min.

ABOUT THE TECHNOLOGY

The user-friendly testing kit uses paper chips & reagents. Drop-cast the sample, and reagents on the paper chip. Purple coloration indicates the presence of either methanol or formaldehyde. The image is captured using a smartphone & quantify with the app.

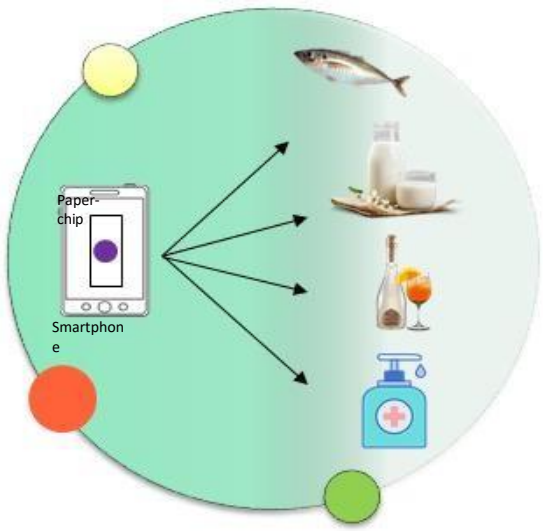
FUNDS RAISED/ACHIEVEMENTS

- BIRAC BIG NE grant-in-aid for INR 25 Lakhs.
- Winner of 6th Edition of GBP's Talent Search Contest on "Innovative Research Ideas Leading to Entrepreneurial Venture in Biotechnology and Allied Areas"

END USERS/CUSTOMERS

- Consumers (Milk, Fish, Seafood, alcohol beverages)
- Producers (Milk, Fish, Seafood, alcohol beverages)
- Retailers (Milk, Fish, Seafood, alcohol beverages)

PROCESS FLOW



USP

- Multiple detection kit
- Affordable and portable
- Require small volume (~ 5µL)
- Both yes/no format & quantitative analysis
- Exploring the application of smartphone app

State: Assam

Industrial Biotechnology

Development of an Affordable Kit for Simultaneous and Rapid (3 H) Isolation of DNA & RNA

APPLICATION

1. Simultaneous isolation of DNA, RNA and protein from a single leaf sample
2. Individual isolation of DNA or RNA or protein from leaf sample

COMPANY

Primogen Biotech Pvt. Ltd.

FOUNDERS' NAME

Dr. Pranita Hazarika

TECHNOLOGY READINESS LEVEL (TRL)

TRL: 3

INTELLECTUAL PROPERTY

Patent Number: 201831000081, Dated 01.01.2018

PROBLEM ADDRESSED

1.It is difficult to simultaneously extract DNA, RNA and protein from a single leaf sample for synergistic study of genomics and proteomics

2.The extraction kits are available in the market are (Bioline, Sigma, Qiagen, TRIzol) not economical

ABOUT THE TECHNOLOGY

Establishment of an affordable kit for simultaneously extraction of DNA, RNA and protein from a single leaf sample for synergistic study of genomics and proteomics

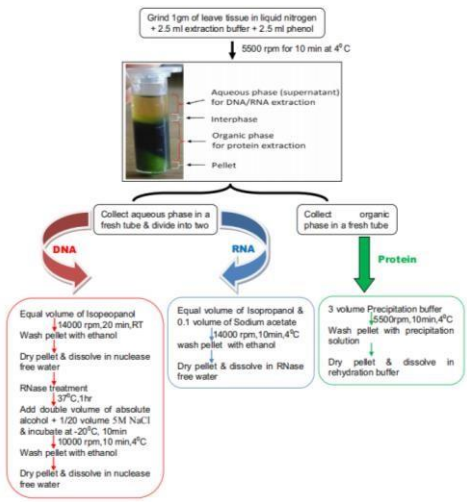
FUNDS RAISED/ACHIEVEMENTS

BIRAC Biotechnology Ignition Grant (BIG-18) INR 50L

END USERS/CUSTOMERS

Researchers working in the line of molecular biology

PROCESS IMAGE



USP

1. Economical kit for the simultaneous extraction of DNA, RNA, and protein from a single leaf sample for the synergistic study of genomics and proteomics.
2. Comparative kit performance with the similar available in market

State: Assam

Industrial Biotechnology

Development of Portable Spectroscopic Instrument for Onsite Estimation of Quality Compounds in Tea

APPLICATION

Quality assessment of tea by onsite estimation of key biomarkers contributing towards quality. Quality assurance & process control in tea processing

INNOVATOR

Dr Ajanto Kr Hazarika

Tocklai Tea Research Institute

TECHNOLOGY READINESS LEVEL (TRL)

TRL: 4 (Technology validated in lab)

PROBLEM ADDRESSED

1. Detection of quality biomarkers in tea by using rapid instrumental methods
2. Use of the non-destructive, non-contact method of quality estimation using optical means
3. Indigenously developed & low-cost for routine quality inspections in Agri-based industries

ABOUT THE TECHNOLOGY

NIR spectroscopy (range 780 to 2500 nm) is dependent upon the existence of vibrational overtone and combination bands due to molecular vibrations. The detector employed here is an InGaAs based on PDA (Hamamatsu, Japan) which possess a very high sensitivity, accuracy, and response speed. Together with high-powered radiation sources (halogen lamps), it can impart a high signal-to-noise ratio for NIR measurements of samples. This fact partially compensates for the lower intensities of NIR absorption bands.

The technology will be used to estimate key biomarkers like theaflavin, catechin, and its fractions in tea by correlating their spectral signatures with a reference chemical and organoleptic values.

FUNDS RAISED/ACHIEVEMENTS

BIRAC Biotechnology Ignition Grant (BIG-18) INR 50L

END USERS/CUSTOMERS

Tea industry, corporate houses, tea factories, auction houses & brokers, analytical labs

PRODUCT

USP

- Real time quality assessment of finished teas, and fresh tea leaves
- Onsite monitoring & process control
- Low-cost portable NIR systems (with a few bought-out components) & chemometric software
- User-friendly
- Customize beverage industries

State: Assam

Industrial Biotechnology

Development of Multimodal Optofluidic Prototype for Sensing Heavy Metal Ions

APPLICATION

The device has a great potential for commercialization due to its unique design, low cost, portability and rapid heavy metal detection. Smartphone-integrated machine learning technology will make the device versatile for various application including the present application such as heavy metal detection

COMPANY

SenzTech Private Ltd.

FOUNDERS' NAME

Dr. Rajib Biswas

TECHNOLOGY READINESS LEVEL (TRL)

TRL: 4 (Technology validated in lab)

INTELLECTUAL PROPERTY

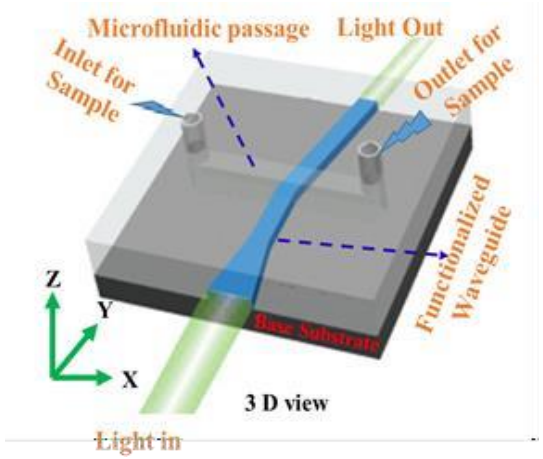
Patent Number: Development of multimodal optofluidic system for sensing heavy metal ion Application No. Provisional Filing 202131041315 (14-09-2021

PROBLEM ADDRESSED

The proliferation of heavy metal ions in aquatic bodies makes them unusable for life sustenance. There is a need for a rapid and inexpensive diagnosis that can sense these ions in limited-resource settings.

The project is going to develop a Prototype that will be cost-effective as well as equipped with multimodal functionalities so that qualitative, as well as quantitative estimations, can be done simultaneously

PRODUCT



ABOUT THE TECHNOLOGY

The proposed prototype will be a synergetic amalgamation of microfluidic channels and photonics. As shown in the side view, the waveguide for guiding light will be customarily designed so that the interaction of impinging light with microfluidic will be at its optimum, leading to direct sensing and quantification of the analytes. For best performance,

USP

- Real time quality assessment of finished teas, and fresh tea leaves
- Onsite monitoring & process control
- Low-cost portable NIR systems (with a few bought-out components) & chemometric software
- User-friendly
- Customize beverage industries

FUNDS RAISED/ACHIEVEMENTS

BIRAC Biotechnology Ignition Grant (BIG-18) INR 50L

END USERS/CUSTOMERS

Tea industry, corporate houses, tea factories, auction houses & brokers, analytical labs

State: Assam

Agriculture and Allied Areas

Development of microbial bio-formulation/s for Tea Camellia sinensis growth promotion and blister blight disease control

APPLICATION

A microbial bioformulation/s that will help in growth promotion of Tea (Camellia sinensis) crop and also aid in the control of the devastating blister blight disease of Tea. The developed product will be totally organic, efficient, safe and easy to use and will be devoid of any chemicals or chemical residues. Our product will involve novel indigenous bioactive metabolites producing actinobacterial strains.

COMPANY

Aranyam Innovations Pvt. Ltd

FOUNDERS' NAME

Dr. Ananya Barman

TECHNOLOGY READINESS LEVEL (TRL)

TRL: 3

PROBLEM ADDRESSED

Blister blight is one of the most devastating and damaging diseases of the Tea crop. This disease is highly prevalent in the different Tea estates of India and almost all the major tea-producing countries of the world. For its control different traditional practices are employed along with the use of chemicals and pesticides. Traditional practices are laborious and time-consuming. Whereas chemicals and pesticides cause harm to the environment, decrease soil fertility, and are detrimental to human health. Therefore, we need a chemical-free and efficient product that will not only be effective against blister blight but also cause growth promotion of the Tea crop.

ABOUT THE TECHNOLOGY

Our product will consist of novel bioactive secondary metabolites producing actinobacterial strains. These strains are easily culturable and their origin is Tea endophytes themselves. They are varied temperature and agro-climatic adaptable strains. They have broad antifungal and antibacterial activity. They have no harmful effect on the indigenous microbial communities.

FUNDS RAISED/ACHIEVEMENTS

- Winner of BRTC NE Changemaker- Category 2 (PhD and Post Doctoral Fellow)
- BIRAC BIG 18TH Call for INR 50 Lakhs
- Best Young Women Innovative Entrepreneur Award at Assam Biotech Conclave

END USERS/CUSTOMERS

Tea industry, tea producing tea estates, small tea growers, organic tea growers

PROCESS IMAGE

USP

- Chemical free product
- Applicable in different agro-climatic conditions across North East and also Southern India
- Easy application; less laborious
- Good quality and quantity of produce
- Will be effective against other fungal and bacterial diseases of tea and other agricultural crops
- Safe to use
- Customers will be able to enjoy residue free tea drink

East and Northeast is Rising and Shining!!

Let's build it together in a Cluster Model

KIIT-TBI acknowledges the support of-

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Ignite Innovate Incubate

East & North East Region BioNEST Cluster

MINISTRY OF DEVELOPMENT OF NORTH EASTERN REGION

विज्ञान एवं प्रौद्योगिकी विभाग
DEPARTMENT OF SCIENCE & TECHNOLOGY

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