INNOVATOR'S JOURNEY

@ KIIT-TBI BioNEST

Innovation Stories of our BIG Grantees

Biotechnology Ignition Grant (BIG)

Call 17, 18, 19

Promoting the entrepreneurial culture
in the biotech sector

Preface

BIRAC's Biotechnology Ignition Grant (BIG as it is popularly known) is a pioneering early stage idea to proof-of-concept programme and it is India's largest early stage program in the biotech space.

BIG nurtures Biotech entrepreneurship in individuals and promotes early stage start-ups in the country. It provides grant-in-aid up to INR 50 Lakhs for biotech start-ups and entrepreneurial individuals to support ideation and progression to proof-of-concept for ideas that have potential for commercialization. BIG is targeted towards researchers, scientists, clinicians, engineers, medical and non-medical graduates, experienced industry/ corporate entrepreneurs who could be from research institutes, academia and start-ups.

BIG works with four major mandates:

- Foster generation of ideas having commercialization potential
- Validate proof of concepts
- Encourage researchers to take technology closer to market through start-ups
- Promote biotech enterprise formation

The BIG initiative is unique since this is managed by BIRAC's 8 BIG Partners and it provides for the whole ecosystem support which includes Financing, Business and Technical Mentoring, Technology and IP Management and most importantly Capacity Building.

CEO's Message

BIRAC launched Biotechnology Ignition Grant – BIG in July 2012. The purpose was to populate the Innovation Funnel, to have new Startup's created and Ignite the Innovation Spirit in students and young entrepreneurs across the country. The impact of this has truly been "BIG". In just about 10 years more than 600 + projects have been supported for POC development and it is encouraging to note that out of this 150 are new startups created and seeded through the BIRAC BIG fund.

In India, where attitudes have long been risk-averse, especially regarding technology and scientific led entrepreneurship, establishing a programme that aimed to change this attitude in the biotechnology/life science domain was indeed a pioneering act by BIRAC. It is crucial for any knowledge driven economy to create a base of innovative ideas that has breadth as well as depth such that hundreds of ideas can be tested, refined and provided the right impetus to move them forward. For a long-term strategy for a nation that needs to solve challenges in food security, health and energy, it is important to create and support a vast pool of dynamic entrepreneurial talent who are committed to launch a serious attempt to alleviate the societal challenges.

Mrutyunjay Suar, PhD
CEO, KIIT TBI

KIIT TBI has been a BIG partner of BIRAC since 2014, and since then we have been witnessing a surge of interest both by innovators and startups in the broad field of biotechnology. We have close to 127 innovative projects across the country. As we continue to promote innovation and entrepreneurship, we realized that there are stories here that need to be told. Stories of the entrepreneurs who are trying to change the way things work and create a better society, a better life for all of us. A better life for those who need it the most, because many of these solutions have the potential to help the most marginalized population in our society.

This report highlights the dynamism in the field of biotechnology and celebrates the spirit of 41 innovators who have recently kick stated their entrepreneurial journey with the support of BIRAC BIG Grant and are working on biotechnology innovations such as biomedical devices, agricultural tech, molecular therapeutics, plant based stem cell, bio plastics, hybrid enzymes, among others. Filled with real leanings from trenches of startups, this catalogue would hopefully motivate prospective entrepreneurs and nurture the spirit of entrepreneurship amongst budding innovators in biotechnological industry. We would like to extend our appreciation to all the BIG supported innovators who responded with tremendous enthusiasm in sharing their experiences and insights that have helped us shape this report. We aim to bring forward many more such initiatives for sharing the real-life journey of young entrepreneurs.

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Sector

Industrial Biotechnology

Dr Rajib Biswas
Balya Navarithi Pvt Ltd

Innovation: Development of multimodal optofluidic prototype for sensing heavy metal ions

Proliferation of heavy metal ions in aquatic bodies makes it unusable for life sustenance. There is a need for rapid and inexpensive diagnosis that can sense these ions in limited resource settings. Dr. Rajib Biswas being a technology enthusiast with an immense expertise in fiber optics technology has come up with an Idea, which can solve the problem of water pollution due to heavy metal contaminations.

Dr. Rajib and his core team consisting Dr. Nirmal Mazumder (expert in fabrication of microfluidic devices) and Prof. Pritam Deb (Material scientist) are going to develop a prototype which will be cost-effective as well as equipped with multimodal functionalities so that qualitative as well as quantitative estimations of heavy metals can be done simultaneously. Under the BIRAC BIG Scheme and handholding of KIIT TBI as incubation partner, the team is currently developing a prototype, which will be a synergetic amalgamation of microfluidic channel and photonics. Subsequently, it will be upgraded to as an opto mechanical part to be assembled in smartphones along with its own app. This way, this unique prototype will provide valid information of the aquatic pollutants that can be stored in cloud storage for later access and remediate action. Dr. Rajib believes that with their bigger vision and hardworking nature they would be able to achieve the ultimate goal to develop the final product to serve the nation.

Dr Amrendra Kumar Pandey
F3 Biotechnology Pvt Ltd

Innovation: Micro emulsified salts to enhance starch gelatinization in animal feed.

India is amongst the top most countries for animal farming, which requires continuous supply of nutritional animal feed throughout the year. Keeping this in mind Rajani Prashar, an Engineer who belongs to the city of Education, Dehradun and Dr. Amrendra Kumar Pandey who hails from a small village of Bihar founded F3 Biotechnology, an Indian company, which stands for Food, Feed and Farming, catering feed manufacturers in India. Dr. Pandey, co-founder of F3 Biotechnology has extensive research career in animal husbandry segment focused on Nutrition and Additives Development. Due to his family's involvement in a dairy-based cooperative society, he has obtained a good understanding of feeding supply chains since childhood. Eventually, to accomplish his childhood dream, he completed his Ph.D. in Marine Biotechnology with experience in Animal Health and Nutrients. Throughout his research career, Dr. Pandey worked on development of new raw materials, feed formulation, feed additives, functional feed, and nutritional validation. His research continued without stopping, finding possible solutions to problems such as dust formation, sinking and floating, high processing costs, high feed conversion levels, and competitive market disadvantages.

Starch gelatinization is one of the reasons for all problems in good quality nutritional feed manufacturing system. The gelatinization of starch occurs when it is broken down, forming a gel. This gel works as a lubricant for feed processing and as a binder for the physical stability of feed. Gelatinization of starch is influenced by moisture content and heat. As a result of moisture, there is insufficient gelatinization between feed pellets. In order to meet this need, The F3 have developed Nutri-G, a micro-emulsified salt that enhances starch gelatinization in animal feed during processing. Fortunately, 2021 was the turning point where they got BIRAC Grant, as well as support from KIIT-TBI, with which they believe that they can overcome all odds to create their own sustainable venture.

Debasis Tripathy
Renewable Envirogic Pvt Ltd

Innovation: Fabrication of Automated Mobile Biomedical Plastic Waste Recycling Facility for development of reusable products

Debasis Tripathy, Founder and Managing Director of Renewable Envirogic Pvt Ltd, has always been innovative & creative in finding solutions to social problems. A significant concern over recent years has been the rise in environmental pollution caused by an influx of plastic waste. Due to a lack of bins for recycling, lack of awareness and sense of environmental responsibility, citizens throw away this plastic everywhere, creating problems for our soil systems and wastewater drainage systems. In the past few years, he has realized that the reuse of plastic requires many technological interventions to make it more efficient and sensitive at the same time. His team at Renewable Envirogic Pvt Ltd works on the treatment, disposal and reuse of biomedical waste like manufacture medical tools and devices like surgical gloves, syringes, insulin pens, IV tubes, catheters, inflatable splits, etc.

Biomedical waste generation from healthcare establishments is inevitably an over growing concern from an environmental point of view. In fact, Renewable Envirogic Pvt Ltd is the only authorized recycling company to recycle biomedical plastic waste in the state of Odisha. Mr. Debasis says, “With the support of BIRAC and KIIT Technology Business Incubator, we want to scale-up our business in India by partnering with healthcare care providers, hospitals and diagnostic centers who would join us in our journey. By collaborating with strategic partners, we hope to take this business global”.

Mrityunjay Sahu
Bariflo Labs Pvt Ltd

Innovation: Intelligent solutions for waterbody management and aquaculture management.

Bariflo Labs has developed an innovative water body management system by leveraging fluid dynamics, IoT (Internet of Things), robotics, and AI (Artificial Intelligence) for aqua-farm management. Its intelligent and automated aquaculture management system comprises sediment aeration, water column and sediment mobile monitoring and mobile nutrient control module. The startup has built two verticals based on this technology—the first is aquaculture and the second is waterbody rejuvenation. Its innovations span across the areas of sediment aeration, Carp health management and recycling.

The founders of Bariflo Labs enrolled for the KIIT-SASACT-TIDE-MeitY (The Ministry of Electronics and Information Technology) program for development of remote monitoring, integration of aeration with monitoring system for remote operations. They developed the prototype to market, and establish ties with the government and other ecosystem stakeholders. They also sought to arrive at the correct pricing strategy to enable their products to scale the innovation journey."The program was the ideal platform for us as it had qualified and experienced mentors with rich expertise who could add value to our technological solutions and scale the business model," says Mrutyunjaya. "The program also connected us with various state governments to onboard them as potential customers by integrating our solutions to address their unique challenges."

Cdr Suchin Jain
ipanelKlean Pvt Ltd

Innovation: A disruptive patented technology in waterless solar panels self-cleaning system.

Solar plants are loosing power generation upto 70% in rooftop segment and upto 33% in the utility segment due to dust deposition, there's scarcity of water in cleaning them and it is also banned by most municipalities for washing purposes, water also degrades the solar panels, solar structure and rooftop structure, there's risk of life to solar panel cleaning workers due to high voltage DC electrocution and falling while working. Ipanelklean developed by Suchin Jain, overcomes all these problems with its disruptive patented technology.

It is a dual technology in which the solar panels are first coated with nano-coatings, then remaining dust is blown clean using compressed air and the process is repeated multiple times a day such that the power generation increases upto 100% and payback period reduces by upto 40% that too without additional rooftop space or land area. It provides IRR of 28% in utility segment and 47% and 81% in rooftop segments. We are presently doing multiple pilot installations as part of BIG grant across India. It has large potential economic, environmental and social impact of annual extra revenue generation of 8 billion USD worldwide, annually save 100 billion litres of water, annually save 60 million tons of carbon emissions and save numerous human lives.

Saravanan Aijithkumar
Xython Biotech Pvt Ltd

Innovation: CyFinD - A Proteomics platform technology for Coverage analysis of HCP and HCP Immunoreagents.

As a child, Ajithkumar Saravanan was fascinated with exploring how living things work, and a curiosity to understand living systems opened the door to an interest in biological research. Prior to the humble beginnings of Xython Biotech Private Limited, he worked and gained experience in managing projects and innovations based on R & D. in various aspects of biopharmaceutical industrial requirements, mainly functional assays such as bioassays, RTPCR, ELISA-based predictions, protein profiling, antibody fingerprinting, immunogenicity, hybridomas, cell proliferation and monoclonal antibody production on laboratory scale. He experienced firsthand the complications of developing new bioassays, the limited availability of resources and the high cost of importing such materials and resources and together with his longtime acquaintance Xython Biotech, to develop high quality research material, BA/BE supports assays and methods ready to meet pharmaceutical and biopharmaceutical requirements.

Currently innovation is in the path of conjugating special illuminating dyes that can be used in Bio imaging technologies with broad application in detection of Host cell proteins (HCP) as part of profiling and coverage analysis needed for regulated studies.

In line with Atmanirbhar Bharat's mission, we dream to provide a proteomics platform technology called “Cyfind” for HCP coverage analysis and HCP immune reagents. With the grant support from BIRAC and BIG partner KIIT TBI, helping to make their dream of taking technology to the next level with a vision of application and commercialization.

Dr Mahesh Mansing Patil
Aves FoodTech Pvt Ltd

Innovation: A novel functional fermented food concentrate to reduce abdominal obesity.

Dr Mahesh is one of those few young entrepreneurs of our country who managed to follow his food industry dream and carved a niche on his own, constantly acquiring knowledge in the area. It was during his doctoral days at CSIR-Central Food Technological Research Institute; he identified a very escalating life style problem of human over-nutrition which constantly degenerating societal health and expanding to next generations. It was that moment which inspired him to develop a scientifically validated food product for managing obesity disorder. In addition to his excellent academic achievements, Mahesh has developed company management skills at biotech industries, received DST-INSPIRE doctoral fellowship, and he has contributed in DBT Indo-UK multi-industry collaborative project. In BIRAC-PACE post-doctoral work at NCCS; Mahesh has also helped to develop anti-obesity technology from lab to industry scale. Opportunity to work with such premier Indian organizations, experience in setting up of R&D lab and new product development for food industries has built in him a vision of his own start-up. This 10 year science innovation journey created passionate interest in him to develop as an entrepreneur.

With the vision of healthy India, Mahesh stepped in to entrepreneurial journey with BIRAC-Social Innovation program. He has come up with an idea about functional food against obesity based on immersion collaboration learning from nutritionists, doctors, patients, scientists, food industrialist and customer stakeholders. On the basis of scientific learnings and hard work, he has developed a patentable fermented food technology which reduces abdominal obesity by decreasing subcutaneous fat. With the support of BIRAC-BIG grant and KIIT-TBI, Mahesh and his brilliant dedicated team are developing premium quality commercially viable functional foods. Dr. Mahesh is now Founder Director of Pune based Aves Food Tech Pvt Ltd and keep desire to scale-up food business by mutual collaboration with expertise in production, marketing and industries from the country.

Haneesh Katnawer & Sonam Sodha
Himalayan Hemp Industries Pvt Ltd

Innovation: Reusable and Disposable Himalayan Hemp Sanitary Pads by using Indigenous Cannabis-Hemp Fibers.

Any type of revolution begins with an idea, and when it comes to hemp and menstruation, both are taboos that required a revolutionary thought to bring them both justice. Haneesh and Sonam were on one of their frequent mountain climbing strolls when Sonam Sodha came up with the concept of manufacturing the sanitary pad out of hemp. After discovering the concept, they were astounded to discover that there was not a single hemp-based sanitary pad in the world, and they resolved to create one with the assistance of marginalized people. They registered their company as Himalayan Hemp in order to safeguard the indigenous species of cannabis hemp in the Himalayas while also supplying eco-friendly products made from it to the rest of the world. During this incubation, the prototype was produced and evaluated by Ahmedabad Textiles Industries Research Association for leak-proofing and rash-resistance.

Following that, a market research was conducted in two schools in Uttarakhand and Himachal Pradesh with 300 pupils and 25 farmers for the aim of market and supplier research. After the incubation period was through, Sonam began using the sanitary pad herself for the next 12 months, while also distributing it to her peers, sister, and other relatives. From the standpoint of user experience, she confirmed the lab-validated qualities. Himalayan Hemp won their first award in the India International Science Festival in December 2020 as the second runner up for post-harvest technologies. It was followed by a woman entrepreneur award for Sonam, who came in second place under FICCI FLO. Following that, we were incubated at Amrita-TBI through the NIDHI EIR scheme for a stipend of 30,000 INR per month. While competing against other Asian organizations, we also won one Asia Pacific Cooperative Award. Furthermore, in November 2021, we got another honour in the Go Global Awards under the International Trade Council. But the most significant step forward was when we were approved for the BIRAC BIG grant, and the KIIT TBI team assisted us in preparing for it. With them, we are now able to safeguard and test our product more thoroughly for many more features in order to appropriately scale up the project.

Dr Sikha Mandal
JAS Biotech LLP

Innovation: Scale-up of Mycosporine-Like Amino Acids of Cyanobacteria for formulation of Bio-sunscreen Product.

Innovations that deliver improvements in human life, health and high value product development are often grounded in academic research and are a key factor in the success of any start-up. Dr. Sikha Mandal completed her Ph.D. and then Post-Doctoral Research in USA and has over 13 years of experience in research with cyanobacteria. Sunscreen products are a billion-dollar Industry and were developed to protect against UV radiation. However, despite the use of sunscreen with UV-filters over decades, the incidence of malignant melanoma is still increasing rapidly. The chemical sunscreen products have many bad impacts on human health such as strong estrogenic actions and causing serious problems in sexual development, and associated with low birth weight in children.

In JAS Biotech LLP with the support of BIRAC BIG grant and from our incubator KIIT-TBI, we are developing a sunscreen product from the natural ingredients using Mycosporine-Like Amino Acids of Cyanobacteria which is the strongest UV absorbing compound found in nature, having high antioxidant properties, can prevent human fibroblast cells from UV-induced cell death and can inhibit cell proliferation. With strong scientific background in this field of research and with the support of BIRAC and KIIT TBI we are confident to achieve our goal to develop MAKE IN INDIA safe and natural skin friendly sunscreen products soon.

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.

Vijay Mamtani
Prayogik Technologies Pvt Ltd

Innovation: Bio-inspired superliquiphobic coatings for multifunctional applications.

Vijay Mamtani, the founder and CEO of "Prayogik", began his entrepreneurial journey directly after graduating from university with a degree in electrical engineering from National Institute of Technology Bhopal (NIT-B). Having started his journey as a serial entrepreneur Vijay began his mission to reduce traffic in the busiest cities of India, particularly in Mumbai. In order to achieve his dreams and turn India into a traffic free country, his venture Prayogik (Experiment) began with a problem solving approach from his perspective. Following his success in the IIT entrance exam, Mr. Vijay decided to enroll in NIT Bhopal. He soon realized that everyone follows the "BHEDD CHAAL", where students only try to become IAS or IPS officers or are in search of a good job with a good salary package. Vijay, on the other hand, was passionate about hard work, struggle, and achievements, which allowed him to overcome the tough phases of life. Vijay was going through a lot of mind-changing phases during his second year of college, which is typical for the young generation nowadays. It was at this point that he began working on exciting projects such as "MOBILE BIKE ALARM", "Rental bicycle system", "Self-balancing Skate Board" etc.

As soon as Start-up India announced its funding in 2016, Vijay became enthusiastic as it sparked his ambition to solve social and industrial problems. As far as Vijay was concerned, the government of India would help him in terms of funding, infrastructure, and social names under the start-up category. Consequently, Vijay decided to open PRAYOGIK (Experiment) as a venture to provide solutions to Oil & Gas Industries for their unmanned locations offshore platforms, remote oil wells, harsh environmental conditions, where moving parts are a major problem in terms of cost, remote location and equipment life problems. In collaboration with BIRAC, PUSA Krishi, and ICAR, the validity of their idea for the B-TMSG-DC has been done successfully and these funding bodies are now actively supporting Vijay and his team to continue under Start-up India and Make In India and they are very grateful to KIIT TBI in the role of their mentorship and for acting as their supporting incubator.

Prasanna Kumar Vummanani & Sri Harsha Lanka
Palletize Green-Tech Pvt Ltd

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

We at Palletize adopting a circular economy approach, has developed 100% bio-based, durable transportation pallets made from coconut husk. Worldwide only 15% of the coconut husk is reused, meaning the remaining 85% is burned or landfilled. The current demand for imported timber pallets is 1.7 billion in Asia.

To manufacture the pallets, we took inspiration from a method developed by the mother nature. The result is an environmentally friendly pallet that contains no synthetic solvents. In all, it takes between 60 and 70 shells to make a pallet – and they are as strong as those made of wood or plastic. They can be nested, saving up to 70% warehouse space.

In addition, they are resistant to moisture and termites. And in a circular economy approach, at the end of their life the pallets can be recycled, turned into biomass or used as green manure for agriculture.

Dr Sangeetha Sriram

Innovation: Bio-inspired superliquiphobic coatings for multifunctional applications.

In my childhood, I had queries which were un-answered leading to more queries. The same questions were partially cleared during my higher studies. But, with a profound hope of my graduation days and the inspiration drawn from the Lady of Bio Innovations, Ms. Kiran Mazumdar Shaw; I wished to clear the queries and find solutions that motivated me to become the first woman Entrepreneur of my family.

After completing my dual Master's (M.Sc. and M.Tech : Biotechnology), I felt that Doctoral studies would stretch my intellectual dreams to action. This pushed me to join and explore myself into Advanced Nanomaterials through the Chemical Engineering Department of NIT Rourkela.

"Water sphere on the Lotus Leaf" is the drawing trump card of my research. The Lotus effect phenomenon helped me relate the laboratory scale study of cellulosic-based and other solid surfaces that can be water repellent and liquid-repellent. The correlation to this research started in 2018 from my personal life, and I felt the need to translate this into a product that would be beneficial for all.

Inspired by BIRAC's caption, "Dream Big: Sky is the limit", I applied to BIRAC-BIG 19 to seek support for this idea to pitch in the real world from the walls within my lab. Also, ventured into my own startup, Biomimetic Innovations Private Limited, which is grounded on Biomimicry from the mighty Nature. (Lotus Leaf- Symbol of Purity). I strongly believe that this novel bioinspired "Superliquiphobic Coatings" will fulfill the unmet requirement of people around and again take rebirth as a recyclable option for Mother Nature!

Dr S. Naganandhini

Innovation: Development of functional supplementary poultry feed enriched with hypocholesterolemic compounds of probiotic origin using agro-industrial waste cassava bagasse.

Dr. S. Naganandhini, a profound researcher who has a keen interest in agricultural microbiology and did her doctorate on detection of food-borne pathogens in food chain, is an ideal example of a scientist turning into an entrepreneur. During her Post-Doc, when she was working on biodiesel production from sago industrial wastewater, she visited multiple sago manufacturing units throughout Salem and Namakkal districts of Tamil Nadu. There she witnessed and understood how the sago processors ineffectively dealt with liquid and solid waste generated and how bitterly it affected the livelihood of the people. To deal this issue, Dr. Naganandhini and her team have developed a technology for simultaneous biodiesel production and sago wastewater decontamination, for which an Indian patent was filed too. The awareness attained from the disastrous effects of solid waste mismanagement in sago processing units encouraged her to apply for biotechnological intervention to renovate waste into green products.

As a result, she came up with the idea of transforming these sago processing industrial wastes into supplement feed with unique benefits for poultry instead of using it as garbage filler presently. For the development of this technology, she is supported with BIRAC BIG grant. Currently, she is developing a functional supplementary poultry feed with distinct hypocholesterolemic property which could be entirely produced from an agro-industrial waste cassava bagasse.

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.

Anup TV

Innovation: Insects - The Future Of Waste Management & Alternative Protein Source.

Anup's entrepreneurial journey started in 2020 when he had to quit his job and move back to India during the COVID period. While his visit to MCC (Micro-composting Center), Vellore, he identified that the municipal solid wastes (MSW) production is increasing day-by-day.

With the enormous population of India, waste as a whole is generated in every household, increase in population instigates to higher waste output. This triggered Anup to find a viable solution to solve the problem of MSW. With this as a goal, together with his friend, they embarked on a journey to innovate Entemo-composting for mass degradation of the organic part of MSW. Initially they successfully demonstrated the pilot scale operations of their proposed technology with higher efficacy and feasibility at Vellore. The successful pilot operation proved to be a right admixture of fuel to accelerate their entrepreneurial journey. Recently their innovation was supported by BIRAC BIG scheme and DST NIDHI PRAYAS scheme to develop an industrial scale process for MSW degradation. Anup being one of the youngest innovators in the BIG family understands that the entrepreneurial path towards success can be challenging but with the handholding and support from BIRAC and KIIT TBI, he believes that he can overcome all the hurdles to create his own sustainable venture.

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Sector

Diagnostics

Asim Bhalerao

Fluid Robotics Pvt Ltd

Innovation: Monitoring of COVID-19 Community Spread, Through Robotics and Wastewater-Based Epidemiology WBE

In India, a lack of data about wastewater infrastructure performance is the leading cause behind 50 billion liters of sanitary-sewer-overflows (SSO) occurring every day. SSOs occur when raw sewage is discharged into the environment untreated. On average, less than 30% of urban-sewage in India reaches a treatment plant. Majority of it is discharged untreated into lakes, rivers, and coastlines, through a network of drains. The sewage flowing through these drains is also an important source of public health information. If sampled safely and regularly, it can effectively be used for infectious disease surveillance. To resolve this issue with an advanced and innovative technology, Mr. Asim Bhalerao and Ms. Nidhi Jain started Fluid Robotics to change the way cities think of wastewater.

Mr. Bhalerao, founder of Fluid Robotics, has a Master's in Computer Science, Intelligent Robotics from the University of Southern California (USA) and a Master's in Mechanical Engineering, Design from Santa Clara University (USA). He has previously led engineering teams building Unmanned Aerial Vehicles (UAVs), Autonomous Underwater Vehicles (AUVs) and robots for Minimally Invasive Surgery (MIS) in Silicon Valley. Ms. Nidhi Jain, co-founder of Fluid Robotics also has a Master's in Computer Science from the University of Southern California, and brings her vast experience in product development with companies like Qualcomm and start-ups iSkoot and Flint Mobile in Silicon Valley. Together, with the support of BIG grant from BIRAC and continuous monitoring from KIIT-TBI, they want to expand their wastewater based epidemiology program for tracking the spread of infectious diseases, which is currently deployed for monitoring the population of over 8 million across multiple Indian cities.

Prof Hitesh D. Patel
Fluorescent Diagnostic & Research Pvt Ltd

Innovation: Point of care diagnostic kit development for diagnosis of Mycobacteria

Professor Hitesh D. Patel with his Research team are working on the development of a point care diagnostic kit for diagnosis of Mycobacteria (Sp. For Tuberculosis) work was initiated from serendipity. One day during cleaning of the TLC chamber, Dr. Hitesh found strong fluorescent giving TLC plate, he asked to research scholars. One research scholar Dr. Rajesh Vekaria come forward and said this is my TLC plate. We discussed about the compound and then repeat the reaction for the synthesis. We had found that the same fluorescent-giving compound was formed.

Dr. Hitesh took the sample and asked his research scholar to do the comparison of fluorescent intensity. At the same time, Dr. Hitesh was under communication with Dr. Dhanji Rajani and he requested for testing of compounds synthesized by Dr. Hitesh's lab for the detection of various Gram +Ve and -Ve bacteria, fungi and TB – Tuberculosis too. The first time we had applied for the BIG call – 9, which was too early stage, but then after we have done more work on it and keep applying for BIG – 12, 14, 16 and 17. Finally, at BIG – 17 we were awarded Rs. 49.97 lakhs fund from BIG, BIRAC. During this journey after rejection from BIG – 16, we have collaborated with Labcare Diagnostic (I) Pvt. Ltd. For the manufacturing of strips for the study and also going to support for the manufacturing of future diagnostic kit. We appreciate the support of Labcare during the time of COVID, the team worked for us. We are also thankful to PMO who directed our request to the Gujarat state Health Department to support us for the validation of our kit in the future. We are thankful to the team of KIIT, TBI without their support, guidance, and mentoring we may not get this BIG support.

Once the successful development of the kit, as per the DSIR guidelines, Dr. Hitesh (first professor from the Gujarat University) is going to start the Pvt. Ltd. Company as the Academic Entrepreneur.

Dr Vijaya Kumar Dadi
Krakel Healthcare Pvt Ltd

Innovation: A Non-Invasive POC Device and Respiratory Diseases Diagnostic Platform

Respiratory diseases, or lung diseases are pathological conditions affecting the organs and tissues that make gas exchange difficult in air-breathing animals. Respiratory diseases like Pneumonia is ranked as the leading cause of death in the world. One child dies in every 39 seconds due to Pneumonia. More than 800,000 children under the age of 5 are diagnosed with pneumonia every year. India had the second largest number of child pneumonia deaths in 2018 UNICEF. Only 1 in 5 Front line Health workers can accurately assess the signs of pneumonia exactly causing misdiagnosis and delay and currently no medical device exists in-market to automate this diagnosis.

To solve with this current market need, Dr. Vijaya Kumar Dadi, CEO of Krakel Healthcare Pvt Ltd is currently working on development of a ML based Respiratory Disease Diagnosis Device with high Sensitivity and Specificity for use in Resource limited settings. This will perform evidence based diagnostics which can increase the screening coverage rate by 60%. To understand the ground reality of the current situation, the team visited primary healthcare centres in different districts of Andhra Pradesh and interacted with front line workers, doctors and pulmonologists at private hospitals. Dr. Vijaya is a recipient of NIDHI Prayas grant which helped him to progress to a stage that helped them to test the initial data for better diagnosis.

INNOVATOR'S JOURNEY
@ KIIT-TBI BioNEST

Sector

Drugs & Biosimilars

Dr Abhishek Dutta
Exsure Pvt Ltd

Innovation: Targeted Cancer Therapy Using Autologous Engineered Exosomes

While pursuing his PhD research, deciphering the role of cancer stem cell secreted exosomes in manipulating the host immune system to favor tumour growth, Abhishek Dutta, Founder and CEO of EXSURE Pvt Ltd realized the potential of these Nano-vesicles to act as an effective delivery vehicle. The Indian chemotherapy drug market is flooded with effective anti-cancer drugs but all of them lack the specificity needed to target cancer cells and more importantly cancer stem cells, which are the main cause of cancer initiation, progression, and relapse. This leads to therapy-induced toxicity and tumour recurrence.

Observing this huge unmet need in the market, he and his co-founder embarked on a journey to develop an effective and efficacious bio-engineered exosome-based drug delivery platform targeting both cancer cells and cancer stem cells thereby eradicating cancer from its root. Abhishek Dutta and his team believes that with the support from BIG, BIRAC grant and KIIT-TBI they strive to translate their basic research to an industry ready and relevant product.

Dr Shyamali Dutta
Telscie Genetics Pvt Ltd

Innovation: Novel Antibacterial Medications for Prevention of Antibiotic Resistance

The journey of Dr. Shyamali Dutta (Founder and Managing Director of Telscie Genetics Pvt Ltd) as an entrepreneur began late after having completed 36 years of a full time career in Medicine. Over the course of Dr. Shyamali's career, the field of molecular biology and biotechnology underwent unprecedented and revolutionary developments with a direct effect on the practice of medicine. As a result, an urge arose to return to the basics, which have altered the practice of medicine and led to a deeper understanding of diseases and more effective treatments. A background in medicine helped her to shape the goals for her entrepreneurial journey. With limited resources in hand and passion for research in the field of antibiotic resistant infections, she set up her lab in 2017, which was actually a renovated garage. Dr. Dutta and her team comprising of Anjali Nair, Arpita Biswas and Sayanti Halder began looking for bacterial proteins that enhance antibiotic resistance. One such protein was a novel target with no previously described inhibitors. They used computational methods to screen large chemical databases for inhibitors and came up with two promising molecules.

Dr Dutta and her team finally achieved success in getting the BIG grant under the flagship of BIRAC after four attempts and handholding of KIIT TBI as an incubation partner led to relieve the tension of unpaid bills and they are now able to diversify their protocols for faster achievement of results. Throughout this journey, Dr. Shyamali's team has provided exemplary support throughout the hard times and she laud their patience and hard work. While sharing her experience she said "We could not have kept the company together and reached where we are now without the help and support of the team members, from KIIT TBI and obviously BIG, BIRAC".

Dr Neera Singh
ProCyto Labs Pvt Ltd

Innovation: Development of a novel preservative-free barrier gel formulation for ocular allergies.

Neera Singh is the founder and CEO of ProCyto Labs, a Biotech startup incubated in KIIT-TBI, Bhubaneswar. With Masters in Biotechnology from Kurukshetra University, she went to study in IIT Mumbai and did her PhD in Maternal and Child Health from "NIRRCH", Mumbai on ICMR fellowship. After her PhD she worked in USA in one of the prestigious cancer hospital "MD Anderson Cancer Centre" in Houston, Texas. In the year, 2011, she moved back to Odisha with her husband. While working as DBT-BioCare women scientist in ILS, she finally decided to start her own Biotech venture that she has been planning since her moving back to India. With few innovative ideas in mind the company incubated in KIIT-TBI in 2019 and received their first funding support from startup Odisha to develop a LAMP kit for quick diagnosis of sepsis causing bacteria. During Covid, they also started making affordable molecular biology products and teaching kits specially targeting Odisha colleges and universities. ProCyto labs also conduct regular training programs and workshops to impart Biotech skills to the students here in Odisha.

With her continuous research, consultation and discussion with treating doctor she discussed the possibility of developing a barrier gel that can form a protective layer over ocular surface and prevent the entry of allergens which triggers the subsequent inflammation and allergic response leading to painful symptoms. With an expert team of formulation specialists from SoA university, Bhubaneswar and ophthalmologist from LVPEI Bhubaneswar, they took this novel idea forward and received BIG-BIRAC (18th call). Dr. Singh is also interested to make artificial intelligence one of her core areas in the company and her vision is to establish a world class biotech company here in Bhubaneswar, Odisha. She strongly believes that there is no shortcut to success and one should do whatever it takes to achieve their dreams. KIIT-TBI has provided us with a right platform and excellent mentoring support to move forward in this journey. With BIRAC funding support it was possible to quickly take this idea ahead for translation.

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 Balu Ranganathan, Shruthi Raghunath & Team

Innovation: Breast cancer nanoscaffold therapeutic implant production using machine learning therapeutic algorithms.

Breast cancer is a huge problem, with a total of 31.1 billion dollars spent yearly on breast cancer-related issues for 1.5 million breast cancer patients in the United States and 3.05 million worldwide as of today. The genesis of innovation for the team led by Dr. Balu Ranganathan as Principal Investigator, Shruthi Raghunath and the team of Scientists turned entrepreneurs to save the lives of breast cancer patients has given credence to this unique thought process. The team has more than two decades of technology development experience. They are solution provider for breast cancer patients in terms of reducing recurrence of breast cancer after lumpectomy, which they wish to solve for breast cancer patients in order to improve their longevity and quality of life.
The researchers established that recurrence occurs (cannot be avoided) even after mastectomy because recurrence of breast cancer can arise in the chest wall or skin. This achievement study gain and articulation of learning was accomplished using survival data analytics single result prediction, which our team was able to do through clinical datasets data crunching employing regression analytics.

Their journey was next aided and smoothed by IIT-M Bioincubator, which pointed us in the direction of further knowledge acquisition in the entrepreneurial ecosystem and successful grant proposal pitching to funding agencies by sending us to our BIRAC BIG partner KIIT – Technology Business Incubator. With their thorough and in-depth examination, the KIIT – TBI team improved the content of our final Pitch deck. Our success was obtained by producing therapeutic implants to counteract recurrence and by achieving single result prediction using machine learning algorithms.

Dr Vivekanand Kattimani

Innovation: Eggshell-derived Nano hydroxyapatite for bone regeneration & reconstruction

The dream of developing economic, ideal bone graft substitutes for bone regeneration started for Dr. Vivekanand Kattimani during his post-graduation days of Dental Surgery. In the initial days, few researchers of IIT Madras following by Periyar University, Salem nurtured the main idea. Later during his Ph.D. training the idea conceptualization and realization took place with the support from the DST, Govt. of India. Through POC and scaling up of the technology, the initial idea has been turned into reality at the pilot-scale level. As a result, the developed technology contributed to turning the dream of producing high quality, innovative, cost effective bone graft material into reality for Dr. Vivekanand who is a Maxillofacial Surgeon, Implantologist and an enthusiastic researcher, presently heading the Department of Clinical Research. As a reward for the entrepreneur journey for this novel "BENCH TO BED" initiative, BIRAC recognized the work and granted BIG to meet the health system's unmet needs. After being awarded with the BIG grant and constant handholding by KIIT TBI, he and his team have been able to set up a fully functional lab where the product produced at a lab-scale and pilot-scale has been tested for its efficacy in cellular, animal, and few investigator-initiated studies. Such developed material will enable the reconstruction of resected, diseased bone regeneration and replacement in a better fashion to achieve function and aesthetics much earlier compared to existing materials.
The solution will provide high quality, economic, and better graft substitute material for clinical use. It is in line with Self-reliant and Self-sustainable India. It is a potential replacement material for high-cost imported materials. It also fills the supply chain for B2C and B2B markets for various Industrial applications as raw material.

Dr Atul Anand Bajoria

Innovation: Development of first ever bromelain containing muco-adhesive buccal patch for management of oral submucous fibrosis.

Dr. Atul Anand Bajoria, an oral physician and diagnostician always had a keen interest in developing something non-invasive for his patients suffering from oral potentially malignant disorders. Apart from his routine dental practice, he is an expert in preventive oral oncology. He always felt that there is a huge deficit in treatment of oral pre-cancer when it comes to over the counter topical ointment and gels. They were minimally effective and did not promise a guaranteed outcome. Such lesions would have to be treated surgically, which would be invasive for not only the patient but his or her family as well. So, to bridge this gap he came across BIRAC's BIG call in association with KIIT-TBI, Bhubaneswar.

The surgical management of oral pre-cancer is gruesome, requires good clinical skill and experience. On the other hand, the commercially available ointments and gels have poor retention in the oral cavity which gets washed away by the saliva. The net therapeutic result is nil, as a result both the patient as well as the clinician are at the receiving end. As an oral physician, Dr. Bajoria always felt there is need to come up with something targeted and effective that would retain in the oral cavity for a longer duration to achieve the desired clinical outcome. With the help of BIRAC's BIG grant and KIIT TBI, he is able to bridge this gap that would not only revolutionize the oral pharma sector, but will open other avenues for further clinical advancements in the field of oral medicine. He and his team are confident to come up with this revolutionary muco-adhesive buccal patch that would meet all ISO standards, affordable and available over the counter. Dr. Bajoria always believes "The more you sweat on practice, the less you bleed in battle" with this he thrives to provide quality treatment to all his patients.

INNOVATOR'S JOURNEY
@ KIIT-TBI BioNEST

Sector

Medical Devices

Dr Akash Bihari Pati
Balya Navarithi Pvt Ltd

Innovation: A novel device for detecting the proximal extent of pathology (Leveling) in Hirsch sprung disease

Many believe that disease and defects are the results of bad personal practices. Then why should a newborn or a child suffer due to the same? To alleviate the suffering of these little kids, Dr. Akash Bihari Pati, founder of Balya Navarithi Pvt Ltd, a specialist in the field of Pediatric Surgery, has tried his level best. He believes that this is the only branch in medical science where the patient will outlive the surgeon. Hence, the surgeon's work should be as meticulous as possible so that his patient does not face any difficulty even if he is not there. Innovation is the only way to bring about such results in the field and perform, which is thought impossible. Child health care (not being bread earners) is neglected, particularly in low-income families. In addition, the industry is not keen on innovations because of low returns. Many practice-changing ideas can result in better outcomes in pediatrics.

Hirsch sprung disease is such an area where the time of surgery can be drastically reduced by a handheld device that will detect the pathological segment of the colon in real-time. This device does not require the expertise of a pathologist, which is not available in many centers of our country. To fulfil his dream, he sought the help of KIIT TBI, Bhubaneswar. With their guidance and monitoring, he received the Biotechnology Ignition Grant (BIG) a flagship program of BIRAC, then incubated at KIIT TBI. The device will significantly help pediatric patients requiring surgery for intestinal obstruction worldwide. Hence, his message to all innovators is – Dream wild, which is the first step to innovate.

Dr Swadheena Patro
KNK Square Pvt Ltd

Innovation: An adaptive device to combat noise generated by dental equipment and enable bidirectional communication between the dentist and the patient.

As an experienced dentist, Dr. Swadheena always believes there is a need to eliminate the annoying noise generated by most dental equipment such as drills, scalers, etc. The long-term effects of this noise are very common among dentists in the form of anxiety, imparted hearing, etc. In the same way, the noise generated by the devices creates anxiety in the patient and hampers communication between doctor and patient, making the process more tedious and time-consuming.

With this in mind, the team at KNK Square conceived the first concept of an AI-enabled adaptive headset for dental clinics. The team has a very unusual combination of doctors and engineers. With the clinical experience of the doctors and the technical expertise of the engineers, the first draft of the solution is prepared and presented amid the COVID pandemic BIRAC for BIG Call17 in 2020.The idea was highly appreciated by the BIRAC committee and the grant is approved with the support of KIIT TBI. Now KNK Square is in the process of preparing an furnished device for entering the market in both products and services. The solution has tremendous applications in other areas and they believe in scaling and realizing the dream of Make in India and Make for World Moto.

Vikramaditya Tirthani
Mediklik Webhealth Pvt Ltd

Innovation: Development of Advance Ventilator.

Vikramaditya Tirthani, Founder of MediklikWebhealth Pvt Ltd, embarked on the entrepreneurial journey after graduating in Electrical & Telecommunications Engineering and accumulating 13 years of experience in Health Technology business. He also started his career as a service engineer at a medical equipment refurbishment company and dealt with hardware. He later worked in a hospital and gained knowledge about the application of medical devices and then had the opportunity to work in a company with Johnson and Johnson, which is one of the top 5 companies in the medical device industry. He studied economics and leadership where through severe training from NIS Sparta and he was in touch with all aspects of business development.

After rigorous experience, he started his business career in 2012 and founded Asha Medical System, dedicated to marketing high quality medical devices. In 2013 he founded BIONICS, specializing in technical service, maintenance and consulting for the start of turnkey projects for healthcare institutes. In 2016, he launched Asha Didi App India, India's first AI health help app in local languages to help our country's common person access health related information interactively. During his entrepreneurial journey, he felt that 95% of our medical devices are imported and we are dependent on other countries, so we have to pay very high costs for high-quality medical devices, which increases the treatment costs for the patients and makes the medical care for the ordinary citizens unaffordable and expensive. Through deep research, he found that more than 3.6 million people die from respiratory diseases in India alone every year and More than 46 percent of these patients die due to the lack of a mechanical ventilator. Most of the ventilators currently available are application and environment-specific like, transport ventilators or adult ventilators, which cannot be used for neonatal patients. Most of the international devices currently available are not designed for the needs of our country and are not affordable. To meet these critical needs, Vikram and his team, with the help of the BIRAC BIG grant at KIIT TBI, are developing an advance ventilator that can function in all settings (transport, long-term or convalescence). It will serve all types of patients (neonatal, pediatric and adult) and has no running cost (no disposable flow sensors, bacteria filter, etc.) whereas the fabrication cost is just 1/3 the price of imported ventilators. Again, without compromising safety, accuracy and performance in international standards.

Ramya Yellapragada

StimVeda Neurosciences Pvt Ltd

Innovation: Affordable, Compact, Portable non-invasive brain stimulation device with 32 channel brain monitoring with EEG.

Ramya and Lakshay are founders of StimVeda Neurosciences. They have seen immediate families suffer from different neuro-psychiatric issues and not have an adequate solution. The medications, if effective, had serious side effects. In light of her personal struggles, Ramya, started to study more about the brain from a fundamental perspective - the neuroscience and neurobiology of the brain while she studied computer science at IIITD, and ended up minoring in computational biology too. Lakshay, independently researched computational neuroscience at DTU (formerly DCE).

When they met at a fellowship, they pooled their knowledge and decided to work together in coming up with a safe, efficient and data-driven solution. During their research into better treatments, they learned about brain stimulation as an add-on/alternative to psychiatric medication. The research and application of brain stimulation has come a long way from the shock treatments popularised by media. Technologies like tDCS and rTMS are much more safer than medication and have a faster effect time than medication.

Today, doctors in the best hospitals use a combination of brain stimulation and medication to treat neuro-psychiatric disorders. Brain stimulation helps accelerate the treatment and helps reduce the dosage of everyday medication. However, this technology is not widespread in India yet because of the high costs of the technology, the ease of use of the devices, and the awareness of doctors to additional/alternate treatments. In addition, largely neuro-psychiatric treatment is subjective. There is a lack of affordable brain monitoring technology and appropriate algorithms that quickly understand the signals to provide a more data-driven treatment for the patient. With StimVeda, they are building affordable, easy-to-use, portable brain stimulation and brain monitoring devices and algorithms that can be used by doctors and technicians easily, that is much more affordable in the Indian context, and makes treatment safer and data-driven. StimVeda closely collaborates with AIIMS Delhi to build this technology for India and abroad. They are guided by their esteemed advisors: former Dean of Engineering UC Berkeley, Clinical Psychiatrist AIIMS Delhi, CEO & MD, InfoEdge.

Thalansh Batra
Pareto Tree Pvt Ltd

Innovation: A wrist wearable medical device with a software platform to continuously and non-invasively monitor to detect and predict inpatient health deterioration.

For Thalansh Batra, the founder of Pareto Tree, beginning his career in the aerospace industry has been extremely rewarding and a great learning experience, but not internally satisfying. In the wake of this Thalansh realized, he had to gain a deeper understanding of the business side of things, so he launched a California-based strategy consulting business. This gave him a perspective of what really matters to businesses in different industries and what challenges are on their priority list. Inspired by various companies, Thalansh then went on to become a partner at a venture capital firm supporting student entrepreneurs in Southern California. It was here that he learned what investors really look for and how to generate substantial returns.

It was clear that he did not want to build just another SaaS company helping businesses. Thalansh was looking for a meaningful challenge! Neither a problem nor technology was available to him when he began; he started with empty handed. With a self-realization that the world is based on Pareto Optimality (achieving a state where everyone is at their best possible outcome); he asked himself: “where is there a dire need to achieve Pareto optimality?” The answer of course was healthcare! Keeping this vision in his mind, his entrepreneurial journey kick started when finally launched Pareto Tree with the help of BIG funding supported by BIRAC and continues assistance of KIIT TBI as an incubation partner. As Thalansh had shared some nuggets of his learning throughout his trip to Pareto Tree, he believes “it is crucial in the early stages of a company's development to meet leaders/people with significant experience in launching and selling similar businesses. Technology is only one piece of the puzzle; no innovations in the world have reached the hands of their users without a financial value proposition for their customers. It is admirable to be excited about technology, but to actually make a difference, measurable outcomes are more valuable. A business's most critical task is to make a significant impact on measurable outcomes that matter to its customers, especially healthcare businesses.”

Saurya Mishra
Articulus Surgical Pvt Ltd

Innovation: Design and Development of a Portable and Affordable Surgical Robotic System for Abdominal Surgery.

At its core, Articulus believes in challenging the way technology interacts with the surgical domain. Although the present solution in Surgical Robotics may seem appropriate from a clinical perspective, the product proposition, economics, and business model leaves much to be desired for. What drove us all as a team to take up this challenge was a suggestion from senior official at a major surgical robotics company questioning the competency of India in developing and manufacturing a viable surgical robotics platform and thats how Articulus Surgical was formed.

Over 75% of 170 million abdominal and pelvic surgeries are still being conducted through open procedures, resulting in high recovery time, high blood loss, patient trauma, surgical site hernia and leaves the patient with a massive scar to remind them of the traumatizing experience for the rest of their lives. Minimally invasive procedures still lack the scale due to the high surgical skills required for manual laparoscopy and the current surgical robotics being practically unaffordable for both hospitals and patients. Articulus aims to be the most affordable and portable surgical robotics system in the world enabling surgeons and hospitals to provide unprecedented level of care to their patients.
Articulus Surgical focuses on truly democratizing better surgical outcomes through affordable and accessible minimal invasive surgery.

Dr Pragathi Priyadharsini Balasubramani

Innovation: A pragmatic tool to identify responsiveness to depression treatments and choose personalized treatment strategies.

Depression is a leading cause of disability, affecting 264 million people worldwide and nearly 4% of Indians. A recent GOQii online survey has found that the COVID pandemic has affected almost 43% of 10,000 surveyed online to suffer from some form of depression, and 6% of them were found to be experiencing a severe form of depression. We need effective management of this depression disorder. Though effective medications are available, notably, Non-remission or non-response to treatments is as high as ~50-60% for depression treatments.

The team comprising a neuroscientist, neurologist, computer scientist, and business strategist, decided to work on this important problem of building effective strategies to predict treatment outcomes in depression, and help the society that we were walking with, during this critical after-phase of the COVID wave. Their idea was supported by BIRAC Biotechnology Ignition Grant, 18th Call and the team is currently incubated at KIIT-TBI for holistic enterprise development.

Arun Somasundaram

Innovation: A Low cost CT Scan

The recent Covid-19 pandemic has exposed the fault lines and healthcare infrastructure issues in the Indian medical industry. During the Covid-19 pandemic, hospitals were heavily relying on diagnostic medical imaging equipment like CT scan and X-ray for diagnostics. The truth is, 86% of Indian medical devices like these are imported from foreign countries. Most of the hospitals purchase the refurbished CT scan equipment that are imported from other countries. Mr. Arun Somasundaram, who had prior experience in medical imaging products, started developing a CT scan in his lab and he proved the Image quality and dosage similar to conventional CT scan equipment. He also proved the feasibility of making it a low cost CT scan, which is around 1/7th of the conventional product price in the market. With the support from prestigious BIG grant and through mentorship advice and handholding from KIIT TBI, Mr. Arun is developing a CT scan equipment, which is going to be purely designed and developed in India.

For the first time, the dream of having affordable radiology in rural hospitals could come true. Hence, those living in rural areas do not have to travel long distances for a CT scan. The lives of many accident victims can be saved if only CT scan facility is accessible. The affordability will lead to accessibility of healthcare. This way, we are sure; we will contribute for 'Atma Nirbhar' Bharat mission of India to make our nation self-reliant on radiological medical imaging devices.

INNOVATOR'S JOURNEY
@ KIIT-TBI BioNEST

Sector

Agriculture & Allied Areas

Priyankar Shivhare
Innoweave Biocare Pvt Ltd

Innovation: Smart interconnected sensors for high yield aquaculture.

Matsya presents a state of the art Water quality monitoring and biomass estimation solution tailor made for the needs of aquaculture. Designed system is just more than a water monitoring system, it is an end to end solution for aquaculture management that has an ability to track crucial parameters and take corrective actions to prevent crop wastage thereby increasing ROI for the farmers.

Description of the Company

We at Innoweave Smart Solutions, are a team of passionate Engineers, Designers and Marketers working towards developing and marketing cost effective IOT (Internet of things), AI (Artificial Intelligence) and CV (Computer Vision) enabled solutions tailor made for developing markets for solving unmet needs in the domain of Digital Agriculture and Precision Agriculture.

Founders

Priyankar co-founded Innoweave Biocare in 2018 with a goal to increase the income of Indian farmers by designing and deploying recent advancements in the field of Agritech. He was rewarded with the prestigious School of International Biodesign fellowship from the Department of Biotechnology in 2017. He has completed MS from IIT Madras where he worked on developing patented Artificial Intelligence based microFACS technology. He was awarded with Research Scholar Innovative Project fellowship and was President of The Optical Society, IIT Madras Chapter in 2015-16. He believes in setting high benchmarks and pushing himself to achieve them.

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.

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.

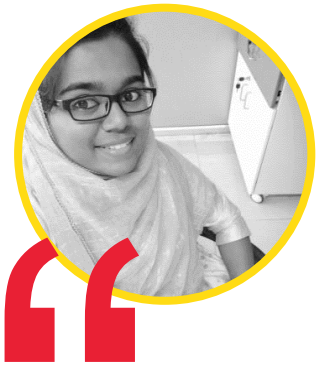
This insight led Prof. N.Irabanta Singh and Aeroshil Nameirakpam to create Nibiaa for the purpose of equipping farmers with new agricultural technology for an increase in overall revenue and with close ties to the land, the two also vowed to only produce solutions that are sustainable and environmentally 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 Ajanto Kumar Hazarika

Innovation: Development of portable spectroscopic instrument for on-site estimation of quality compounds in tea.

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.



Refana Shahul

Innovation: A pragmatic tool to identify responsiveness to depression treatments and choose personalized treatment strategies.

With remarkable academic accolades, Ms. Refana Shahul is a gold-medallist both in her UG & PG and has started her research career through a SERB funded project at Central University of Jammu, Jammu & Kashmir. During her initial research, she studied about medicinal mushrooms especially Cordyceps militaris, its properties, and health benefits and was able to identify a bigger problem in the society regarding this mushroom's cultivation. Her deep passion for entrepreneurship and her urge of contributing to the society has helped her to realize the need for solving this genuine mushroom cultivation problem which is real and will impact many farmers' lives.

With her expertise in applied microbiology and her team's help, she came up with Cordybloomer Readymade Kit, which will simplify the process of this mushroom cultivation, will reduce the cost of investment, improve organic food produce and will involve farmers, women entrepreneurs and students to learn more about this medicinal mushroom and its cultivation technology. With the support of BIRAC BIG Grant they are currently involved in designing and developing an eco-friendly "Cordybloomer readymade kit" for the efficient growth of Cordyceps mushrooms using smart technology.

Dr KRK Reddy

Innovation: Development of innovative agricultural inputs for integrated crop management with special reference to improve nutrient efficiency by crop plants, mitigate abiotic and biotic stress environments utilizing soil, plant and insect microbiomes.

Mr. KRK Reddy, is an entrepreneur and has done his Ph. D in Plant Sciences from Kakatiya University, India, M.Sc, Plant Sciences from Kakatiya University, Warangal, India and Post-Doctoral Research: plant biotechnology, University of Hyderabad, India and University of Bayreuth, Germany. Following post-doctoral research, Dr. Reddy founded Sri Biotech in Hyderabad in 1994 with the goal of developing safe and environmentally friendly alternatives to agrochemicals for crop nutrition and protection. The company's in-house R&D is well acknowledged by national and international research institutions. In addition, the organisation successfully completed various research projects financed by the Department of Biotechnology, Government of India.

Dr. Reddy also serves on the boards of studies and biotech committees of Osmania University, Kakatiya University, Yogivemana University, Nagarjuna University, and Padmavathi Mahila University, as well as the board of studies and biotech committees of Osmania University, Kakatiya University, Yogivemana University, Nagarjuna University, and Padmavathi Mahila University. Aside from that, he worked with the Government of India's Department of Biotechnology as a member of the task force on biofertilizers and biopesticides. He is currently a member of the FICCI-Telangana Agriculture and Food Processing Subcommittee and the CII-Telangana Agriculture Task Force. To pursue his interest for producing breakthrough microbial products for crop management, he founded Sri BioAesthetics Pvt. Ltd. (2016) and Global BioInnovations (2018), which cater to the biological demands of Indian agriculture and international collaborations, respectively.

He goes on to say that while starting a business is always risky and uncertain, the BIRAC BIG programme and the holistic incubation support provided by the KIIT- TBI assisted him in transitioning from the academic mindset that is very focused on your own technology and how great it is, to realising that as a business.

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".

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