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Sustaining Innovation:

A Market Driven Pathway

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Ignite Innovate Incubate
Biotechnology Industry Research Assistance Council
(A Government of India Enterprise)

March **2018**
No. 1 | Vol. 5

In this issue

Design, Production and Circulation :
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Chief Editor's Take

SUSTAINING INNOVATION: A MARKET DRIVEN PATHWAY

BIRAC completes 6 years of its inception on 20th March 2018. The Biotech Innovation Ecosystem has witnessed a tremendous growth and through various policies, interventions by the Government, today we have a well developed ecosystem. BIRAC has supported 1,000 start-ups and nearly 500 companies, created more than 300,000 Sq/ft of incubation space, setup 2 Regional Centers and put in place mechanisms for supporting students, entrepreneurs, start-ups, small companies and large biotech industries. Collectively all stake holder have developed more than 100 technologies and processes and brought more than 25 novel products to the market. These affordable products impact society at large and have contributed to the healthcare, agriculture and industrial biotech sectors.

For sustaining innovation, a market driven pathway is the key to success. BIRAC has now moved forward to bring in this support mechanism for promoting the growth of the ecosystem. From partnerships to equity investments, the thrust is on helping our start-ups which have been seeded by BIRAC to successfully grow and eventually become established enterprises. There are a number of challenges in this pathway from investment to regulation to mentorship and finally market access. BIRAC has over these years successfully connected with the key stakeholders and is providing its entrepreneurs with an effective platform for interaction and technology product showcasing.

In the coming years, BIRAC will continue to be the enabler of Biotech Entrepreneurial ecosystem and will leverage its strength and capacity to bring in transformational change through supporting and sustaining cutting edge and disruptive technologies that would provide solutions in healthcare, agriculture, sanitation and other areas, not just for the country but for the rest of the world.

Dr. Renu Swarup
Senior Adviser/Scientist 'H', DBT, GoI &
Managing Director, BIRAC

Professor K VijayRaghavan completes his term as Chairman BIRAC

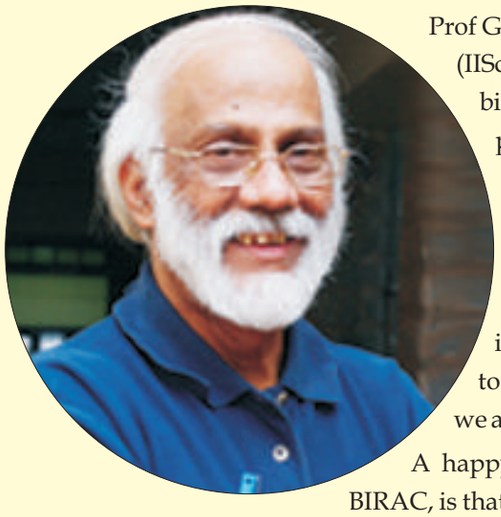
Prof. K. VijayRaghavan assumed charge as Chairman BIRAC since its inception and the Secretary of the Department of Biotechnology in January 2013. Before that, he was instrumental in the establishment of the National Centre for Biological Sciences, and steered it as its Director between 1997 and 2013.

As the Chairman of BIRAC, Prof. VijayRaghavan has provided a dynamic leadership to our team. With his vision BIRAC has been able to play a combinatorial role as a developmental agency to build a globally excellent biotech ecosystem and nurture start-ups to help them to take their idea through validation & scale up for productization.

We extend our heartfelt gratitude towards Prof. VijayRaghavan for his motivation and efforts helping BIRAC to attain successful heights. We wish him the very best for the future & hope that we will continue to benefit from his guidance and well wishes.

BIRAC Team

BIRAC wishes
Prof Govindarajan Padmanaban
on his 80th birthday!



Prof G Padmanaban was the former director of the Indian Institute of Science (IISc), and presently serves as honorary professor in the department of biochemistry at IISc. Prof Padmanaban is the recipient of many prestigious honors and awards. Recognising Prof Padmanaban's contributions, the Government of India honoured him with the Padma Shri (1991) and Padma Bhushan (2004) awards.

Prof Padmanaban and BIRAC have had a close association since the inception of the organisation. Prof Padmanaban has been and continues to be a stalwart supporter and guide for the work that BIRAC is doing and we are grateful for his expertise and the time he continues to devote to us.

A happy coincidence, one that reflects the Professor's importance to us at BIRAC, is that he and BIRAC share birthdays and each year we have the opportunity to celebrate with him on BIRAC's Foundation Day on 20th March.

This year, this occasion is all the more special. Reaching an 80th birthday is a rare and remarkable milestone. All the more so when the entire life has been devoted to furthering science and paving the way for research and development in India for the greater good, as Prof Padmanaban's has. This is an opportunity for all of us around him to acknowledge his contributions and show our gratitude.

BIRAC wishes Prof Padmanaban on this wonderful occasion and would like to thank him for the guidance and expertise that he has given us. Our association has been a privilege and honour, one that we hope will continue on.

Expert Speak

Padmaja Ruparel
President, Indian Angel Network

Fuelling the Bio-Economy, Powering the Next Disruption

Indian start-up ecosystem has been in the news for all the right reasons. In the past 4-5 years, India has seen a flurry of innovative tech based start-ups which have garnered the world's attention, both in terms of the potential disruption they bring through indigenous innovation and with the big investors rushing to invest in these start-ups.

The world today, sees India in a new light. It sees it as a hub of innovation, disruption and the massive scale our start-ups/ventures can achieve driven by the favorable demographics and macro-economic factors. There has been a boom in tech startup funding in India which has produced some of the finest unicorns ready to take on the global stage. This fanfare also poses a larger question to the investors and entrepreneurs alike- Where will the next disruption come from? Which sector is best poised in India to produce the next unicorns with the potential to touch billions of lives.

Amidst this discussion and the fanfare which the tech ecosystem is garnering, there is one vertical of start-ups which is quietly making rapid strides and is on the verge of producing a disruption, which in India alone could change millions of lives. Over the past decade, spurred by several positive changes in the ecosystem the Indian biotechnology ecosystem has grown at a compounded growth rate of 22-25%. The revenue of the sector has grown from a mere $500 million in 2003 to a staggering $10 billion in 2015. In the next decade, India should aspire to be a global leader in the biotechnology arena such that it is home to bio- innovations that address challenges in Healthcare, Agriculture and Fuel-based Security. If the biotechnology industry becomes more innovation friendly spurred by government's policies and participation of the Angel investor community, the sector could touch potentially $60-70 billion in the next decade.

To substantiate the above, we see two main drivers which would result in the bio economy boom which are – 1. Rapid evolution of Tech and 2. Changing global economy. Rapid changes in the field of technology and socio-economic changes will impact the Bio-economy hugely. With the shortening of the cycles of technology, our understanding of the complexities at multiple levels like cellular, organ and tissue level is growing rapidly. With the rapid advancements in the field of 3D printing, AI, big data and machine learning, computing billions of permutations at a genetic level and throwing relevant results is becoming easier. Rapid strides in hardware technology is enabling affordable delivery of the biotech solutions with minimal infrastructure.

With the world population predicted to reach 9 billion by 2050, there would be an urgent need of affordable and sustainable delivery of healthcare. Also, the growing population would also demand more productive output in agriculture to sustain itself. Governments would have to ensure that the policies and schemes are delivered in a secure manner for the beneficiary to utilise its full benefit. To ensure this we would be needing some checks and balances in for of an immutable verification. Bringing in the mix of a person's biological prints, is one of the most fool proof method to enable this immutable verification.

How do we ensure that the vision for the role of biotechnology in India

Expert Speak

is sustained and reaches its full potential? For starters, the Indian startup ecosystem has been quick to jump at this opportunity. If we look at the statistics, a total of 1,022 biotech startups were launched in India between January 2012 and December 2016, with more than $2.8 billion in investment. India has seen ventures like MapMyGenome, Medgenome, Syngene and Mitra Biotech picking up huge amounts of angel and VC money and knocking doors at the Indian unicorn club. Every success story has a very humble beginning. Normally, biotech start-ups unlike their tech counterparts require longer gestation periods and considerable amount of seed capital for them to validate their products.

It is at this stage, the intervention, guidance and capital become most important for these ventures to bear fruition. Here, the role of angel investing and platforms like Indian Angel network become crucial. We at IAN have been fortunate enough to come across path breaking ventures in biotechnology and have had the opportunity to invest in them as well. Companies like Vitas Pharma, Transcell and Pandorum are some of the ventures where IAN has successfully validated IAN's money, mentoring and market access model. Our experience in working and seeding biotech ventures has been a mix of patience and foresight.

Angel networks like IAN can play a pivotal role in enabling biotech ventures to be the part of the Indian start up success story. With our vast resource of nearly 500 Angel investors, we are in a position to leverage that network to provide necessary mentoring, capital and business-based resources to a budding startup. On the monetary front, IAN along with the IAN fund can work in tandem to keep help sustain these ventures by infusing timely capital to help the venture in sailing through the long gestation periods witnessed by such ventures. With the backing of a multi-faceted angel network and a sizeable war chest in the form of the fund, the startup can focus on fine tuning their product and focus on research and development to make their offering market ready.

The other crucial leg to make the Bio-economy a success story is the push by the government to foster innovation in this space. The government till now is taking the right steps to ensure this. The ministry has come forward to set up 15 new biotechnology hubs along with another 15 new technology business incubators. Apart from the incubators, the Biotechnology Industry Research Assistance Council (BIRAC) will support setting up of 3,000 additional start-ups in different parts of the country.

The allocation for Department of Science and Technology (DST) for the last five years has witnessed a whopping 90 percent increase over preceding five years, followed by a 65 percent increase for Department of Biotechnology (DBT), 43 percent for Council of Scientific and Industrial Research (CSIR) and 26 percent for the Ministry of Earth Sciences (MoES).

IAN is a proud partner of government bodies and is happy to be a part of their decision-making process. We are privileged to have deep ties with DBT, BIRAC and its supported incubators. Also, this constant push from government represents a new dimension in their evangelization drive that was so far focused on engineering institutes. That's also because most students of biological sciences would move on to research and teaching only. They were never introduced to the possibility of starting up in this area too. Accelerators, Incubators and Entrepreneurship Development Centers across cities will help these students further. IAN in fact is engaging deeper with the biotech incubators and accelerators: helping mentor both startups and incubator managers to help them develop business & investor insights. We hope this will bring a paradigm shift in what we are trying to build together – Indian innovative start-ups which can become global footprint companies!

As a part of our long-standing commitment towards this relationship, IAN has taken the onus to give necessary investor related exposure to these budding ventures. As a result of this, the angel community is slowly getting to know and interact more with these ventures resulting in their willingness to support, mentor and fund such ventures. It's imperative for the networks to collaborate more and work for the sector that will have a more cohesive investing ecosystem. Our long term vision at IAN is to be the 'go to' destination for biotech start-ups when it comes to funding and mentoring. IAN is committed towards driving the emergence of focused domain solutions, invest in category leaders, and fund start-ups so that they can raise funds from INR 25 Lakh to INR 50 Crore on a single platform.

We look to partner with not only government bodies but also with India's leading research and tech institutes to scout potential ventures, validate the technology through our government partnerships, mentor them by leveraging our angel network, provide them seed capital and ensure that their time isn't diverted in raising a subsequent larger round through the IAN fund. Like the field of biotechnology has a popular term called 'SNIP'. We would also like to come up with our own SNIP which stands for Scouting, Nurturing, Integrating and Providing the necessary capital.

Innovator Speak

Anand Anandkumar
CEO and MD,
Bugworks

Santanu Datta
CSO and Executive Director,
Bugworks

The Story of Bugworks

The Science :

It is now acknowledged in the bio-pharma industry circles albeit that the overtly process driven anti-infective drug discovery methodology adopted by big pharma has been a failure. This has led to the exit of big pharma from Antibiotics discovery and the field is now populated with start-up SMEs like Bugworks. From the very beginning we were very clear in our strategy to keep the internal workforce to be absolutely world class but minimum in numbers and divide our workflow into two interacting domains - Design-hypothesis-validation and decision-making would be within the employee workforce, while the data generation that propels a discovery and preclinical development cascade would be through external partners. This we term as "chaos inside-process outside". This execution format has several value adds; firstly data are generated by a highly proficient team, where the individuals who are generating the data have no scientific bias as to which data supports the hypothesis and which does not, hence blinded. Secondly as recipients of the final data for analysis and decision-making, we are not biasing the conduct of the experiments and our decisions are driven by the end results which are provided by the relevant external expert group. The fully integrated internal data generation, analysis and decision-making models are often fraught with over-interpretation and selective bias. The core team in Bugworks having over 150 years of anti-infective industry experience have come up with an in silico– in vitro integrated platform technology that has shown its prowess in converting many diverse chemical start points into potent antibacterial leads effective against a wide diversity of drug resistant clinical isolates of the ESKAPE (acronym for the six pathogens with alarming multidrug resistant virulence: *Enterococcus faecium, Staphylococcus aureus, Klebsiella pneumoniae, Acinetobacter baumannii, Pseudomonas aeruginosa* and *Enterobacter cloacae)* and beyond.

The integrated platform first identifies molecules that are only effective against specifically constructed efflux deficient bacteria. These molecules are ineffective against wild type bacteria because they are thrown out by efflux pumps located on the outer wall of the bacteria – an innate defense mechanism that protects the bacteria from noxious molecules of wide chemical diversity. Using a proprietary computer aided structural biologyalgorithm these molecules are optimized to avoid the effluxpumps, thereby rendering them effective against wild type bacteria. Using an inhouse algorithm that uses system

biology computational tools and experimental screening against a curated mutant library of bacterial strains the target of these molecules are then identified. The mechanism of action of the antibacterial agents are then experimentally validated. Using medicinal chemistry knowledge and structural biologyinsights these molecules are then optimized through a cascade of microbiology, biochemistry, pharmacology and toxicology assays. This process simultaneously optimizes the molecules for increased potency, bioavailability and safety, while reducing or eliminating efflux liabilities. The spectrum of potency is then established against a large panel of recent clinical isolates through our valuable collaborations with St. John's Hospital and Narayana Health in Bangalore. After establishing the proof of principle in animal models, a lead candidate is selected which is profiled extensively in IND Enabling and GLP toxicology studies. Based on satisfactory results with respect to antibacterial efficacy in animal models at a dose that is suitable for administering in humans with adequate safety margins, we approach the regulatory agencies for seeking permission (Investigational New Drug, IND) to test in humans.

Funding:

A typical drug discovery timeline is about ten to fifteen years and takes astronomical funds sometimes reaching up to billions of dollars. Any investor however knowledgeable or sympathetic in the right mind would think ten times before investing in this space. This is where BIRAC, Department of Biotechnology, Govt. of India has made a significant contribution to our efforts. We have been supported not only with 3 independent grants, but also provided with laboratory space in C-CAMP within the NCBS Bio-cluster in Bangalore. This enabled us to work with very little capital investment and overhead. Equally significant is the trust and confidence placed on us by Angel investors! Notable among them is the first Angel, who was not even remotely connected to health care or life sciences, but whose investment decision was stunning to say the least. The three co-founders spent about an hour with this Angel, following which a cheque was literally waiting. As stated by the Angel, it was a moon-shot investment in an area that is very poorly understood, but if and when it leads to success, it would have made a significant difference to humankind. We were indeed overwhelmed and humbled by this investment.

A key decision was made that until we were stable as an organization, a few of us would not draw salaries from the company. Also to the credit of all our beginning stage employees, they too settled for salaries that were well below the industry norm. We also borrowed an important leaf from the manual of Infosys, where all our employees were adequately compensated with employee stock options (ESOPs).

The saga of fund raising is a never-ending one! We might have made over 250 presentations with a success rate of 1%. The journey in itself has been an adventure. We have encountered investors, who have never met us face to face, but simply at the end of phone call and powerpoint presentation, wrote a cheque. On the contrary we have also encountered many institutional investors , who tire us with their first order questions over and over again, but in the end find us too risky to invest. And through all that we have raised a princely sum of $5M over three years! While the science we do and the products we are developing have been endorsed at the highest level globally as evidenced by the CARB-X grant that we received recently, somehow the same hasn't been as palatable to international investors, who still appear to prefer an address in the Boston or Bay Area or Cambridge UK!

No regrets, we are now very close to nominating our first candidate for GLP studies and hopefully get the IND in a year's time. The whole team is driven by the opportunity to make a huge difference to human life all over the globe. Innovation from India to solve one of the globe's biggest challenges!

Celebrating Women Entrepreneurship

Biotech WInER Award

BIRAC in collaboration with TiE-Delhi NCR announced "Biotech WInER Award" in December 2017 to reward the spirit of women entrepreneurship. 15 women entrepreneurs were awarded with seed money of INR 5 Lakh each. The award was given during the National Conference on 'Technological Empowerment of Women': Commemorating the International Women's Day on 8th March, 2018 by Dr. Kiran Mazumdar Shaw, Prof. (Mrs) Manju Sharma, Dr. Anil Kakodkar and Dr. Renu Swarup at Vigyan Bhavan, New Delhi.

A few bytes from the winners about their innovations and the role of BIRAC during their journery

Geethanjali Radhakrishnan, Founder & Director, Adiuvo Diagnostics

Adiuvo Diagnostics, a techno-social enterprise, is aimed at developing platform technologies in optoelectronics to effectively aid in early disease detection, specifically customized for rural settings. They are developing, reagent less pathogen detection platform, under which Skin scope will be our first product.

The product realization has taken momentum only with the support from BIRAC, through BIG Grant, fellowship at Judge Business School, regular mentoring by Project Monitoring Committee in fine tuning the product, connects with experts and more importantly constant encouragement needed to accelerate a nascent startup.

Dr. Livy A. Shivraj, Director Technical, SLS Cell Cure Technologies Pvt Ltd

Dr. Livy along with her team have developed a LAMP based POC platform for detecting dengue rapidly at an affordable price. She is currently validating it for other pathogens too. She has also developed SNP based risk predictive panels for cancer, CVD and life style disease development.

BIRAC has been instrumental in promoting start ups by encouraging them to leverage their expertise and bring new innovations into the market place. BIRAC`s efforts in promoting women entrepreneurs especially is praiseworthy. She strongly feels that women entrepreneurs with the help of BIRAC will definitely bring new and lasting changes to the Indian society and economy. Women are good in multitasking and it's a good idea to help women build businesses. Their team laud BIRAC's efforts in this direction.

Neelam Dwivedi, Co-founder & Director, NeelAgil Technologies Pvt Ltd

We have developed a safe and affordable "oral insulin technology" for diabetes patients under the guidance of Prof. Jayesh Bellare at Dept. of Chemical Engineering, Indian Institute of Technology Bombay. I have been selected for AIT-Swissnex 4 for industrial training which had given me an idea to register our company "NeelAgil Technologies Private Limited". The Biotech WInER Award by BIRAC-TiE Delhi NCR has given me a platform to initiate my start-up with the seed funding of 5 Lakh INR. I was very happy to receive the award from my role model "Kiran Mazumdar Shaw".

Pratyusha Pareddy, Co-founder, Nemo. Care

Nemo. Care wellness is a platform where we use cutting edge technology to build simple life saving solutions that are carefully designed for the masses. Our first product, Nemocare Protect is a wearable for the newborn that tracks it's complete health, identifies apneas, respiratory irregularities and other life-threatening conditions ensuring timely treatment is made available to save the baby's life. The wearables are connected to a platform which then uses Machine learning to analyze the vital statistics data to give early warning scores for possible infections and other disease conditions, making it the most comprehensive medical decision support system for the doctor. BIRAC's support in our journey has been invaluable especially in regards to mentorship and funding. They have played a very active role promoting women entrepreneurship and helping us dream big. With their help and contribution, we are surely and steadily inching towards achieving our goals.

Kumari Priyanka, Co-founder, Robo Bionics

Robo Bionics was started with a vision to build a company that would strive to improve human lives, so that the human spirit would "NEVER FEEL BROKEN". We made it our mission to develop a prosthetic hand with sense of touch that would be simple to use yet effective by means of making the robotic device interact with the user at multiple steps and at the same time differentiate our product from rest of the available prosthesis. To further simplify the process the entire system would be a wearable device eliminating the need of any implants. An added benefit would be the reduced training time.

To enable us to progress in our journey, BIRAC supported us through the IIPME grant. The grant ensured that we have an all rounder team to work round the clock to turn this development into a success. BIRAC's workshop on Bio-Entrepreneurship and IP helped us in understanding how we could take our business to the next level, while protecting all our innovations and ideas using the IP laws available at our disposal.

Dr. Shilpa Malik, Founder & Director, Bioscan Research

Bioscan Research aims to be a pioneer in brain health monitoring devices. Their innovative approach has given rise to development of multiple cases of patent. They have identified multiple problem areas where they would be able to utilize their expertise in photonics device development to solve the same. BIRAC has bolstered their confidence in this journey. The Biotech WInER Award by BIRAC-TiE Delhi NCR has provided an opportunity to find multiple partners to expedite the development and deployment process. At the same time, the prize money and the potential financial support can prove to be a great catalyst in this phase of research and development.

Shivani Gupta, Director, Inochi Care Pvt Ltd

We are developing dressing technology for accelerated healing of wounds like diabetic foot ulcers, pressure sores etc. The proposed dressing would be able to heal and overcome the challenges of halted wound healing by exudates removal, reducing inflammation and edema, enhancing cell proliferation and tissue perfusion and controlling microbial growth.

BIRAC has always supported our product innovation. We have got productive feedback from BIRAC members and jury regarding our project. Along with WInER award, BIRAC has also provided us the financial support under the IIPME scheme to develop the product. We are thankful to BIRAC for all the support provided.

Shivi Kapil, Founder & Director, Empathy Design Labs

Shivi Kapil along with her team is targeting the problem of stillbirths by monitoring the fetal health during antenatal period. They have designed a solution, KRIYA, which is IOT (Internet of things) where a wearable design, i.e., patch is placed on mothers belly and it provides information, alerts and further suggestions on mobile app.

She is utterly grateful to BIRAC and its programs like SIIP, BIG, IIPME etc. which have encouraged her to not to give up on her passion and ambition to improve healthcare outcomes. She also attended other programs such as boot camp for BREC – National Bio entrepreneurship boot camp organized with BREC and C-CAMP.

Dr. Sudeshna Adak, CEO & Director, OmiX Research and Diagnostics Laboratories Pvt Ltd

Sudeshna founded OmiX with a vision to take high end technologies in life sciences that have been developing over the last decades and transform them into affordable and accessible solutions to the critical healthcare needs of countries like India. OmiX Labs is developing a platform for cost-effective testing for genetic fingerprint of organisms in clinical and non-clinical samples, outside of laboratory settings.

During their journey, OmiX has been supported through various grants and initiatives of BIRAC. The BIG grant has helped OmiX establish its initial credibility. Subsequently, OmiX has been the recipient of the BIRAC-NESTA Discovery Award and the Grand Challenges Explorations India grant. Moreover, Sudeshna also was the recipient of the BIRAC Ignite Fellowship which helped her make important strides in business strategy for OmiX.

BIRAC Feature

Supriya Kashikar, Co-founder & COO, Genext Genomics

We have been blessed to get right mentor throughout our start-up till now. Prof B C Harinath was our scientific mentor and BIRAC gave us a big boost to start our research on tuberculosis through BIG funding. Twenty Four months of guidance and C-CAMP mentoring has shaped the project into a lead.

We are making bi-specific antibodies as therapeutic lead in TB. Apart from TB research, we have developed a platform to deliver recombinant antibodies and proteins for Oncology research. We offer service in custom protein and antibody developments to many clients and this makes our model sustainable. Our goal is to make the country self sufficient and reduce the import cost.

Dr. Susmita Chaudhuri, Co-founder, TRiTEK Innovation Pvt Ltd

We have developed 'Ezy-Typ', a highly accurate and field deployable test for typhoid, a unique product encompassing three patent pending technologies. The original proof-of-concept, developed at THSTI with grant support from DBT and THSTI, has been taken forward for productization in our start-up. This project has the potential to develop a future gold standard for typhoid diagnostic test entirely developed in India.

BIRAC has been the pillar of support for development of this product throughout the prototype development to validation stages. Mainly supported by BIG grant and mentored by the eminent expert panel at BIRAC and our BIG partner IKP (Hyderabad), we are currently running clinical evaluation of our product.

Dr. P N Shilpa, Co-founder &Technical Director, Virtis Bio labs Pvt. Ltd

The primary focus of company is to develop diagnostic kit for women and child health. We have been funded by BIRAC under SPARSH scheme for developing immuno-chromatographic kit for neonatal sepsis by S. aureus. We have developed a quantitative rapid and specific detection of neonatal sepsis induced by gram positive bacteria, S. aureus through novel monoclonal antibodies using immune-chromatographic method.

I am honored to be one of the recipients of Biotech WInER Award given by BIRAC-TiE Delhi NCR. This award supported us to keep up the momentum and allowed to proceed our long journey of innovation and development process. My special thanks to Dr. Renu Swarup, who made WInER award possible with seed grant of INR 5 lakh and TiE Delhi membership. It is a great source of inspiration to establish our goal in child healthcare diagnostics.

Dr. Nusrat J M Sanghamitra, Founder & CEO, CyCa OncoSolutions

At CyCaOncoSolutions, we have developed a proprietary molecular nanomachine as a high speed, high precision drug delivery device. In 2016, 'molecular nanomachine as a novel drug delivery device' was just an idea. At that stage, BIRAC took the first risk and granted us 47 Lakh INR as a part of BIG grant in its 6th call. CyCaOncoSolutions was registered in Bhubaneswar, Odisha in February 2017. Subsequently,we were accepted into the global accelerator program RebelBio, SOS Ventures, Cork, Ireland and New Frontiers program, Enterprise Ireland. However, the continuous support and encouragement of BIRAC is much beyond the release of fund. With every recognition that comes from BIRAC means a lot and inspires me to continuously strive to develop CYDD as a novel drug delivery system and towards a successful realization of 'make in India' campaign.

Dr. Geetha Manjunath, CEO & CTO, Niramai Health Analytix

NIRAMAI has recently launched a new breast cancer screening solution to enable radiation-free, early-screening for breast cancer using machine-learning powered Computer Aided Diagnostics. It is a non-contact, non-invasive, low cost, easy to use, portable solution that is effective for women of all ages. The solution developed by NIRAMAI uses a thermal sensing device which is placed at a distance of 3 feet from the patient and a software solution built using its patented technique called Thermalytix © to automatically diagnose malignant patients and generate a screening report. This core technology invented by NIRAMAI is a fusion of sophisticated machine learning algorithms over thermal images. Dr. Geetha Manjunath is a proud winner of Biotech WInER Award presented by BIRAC-TiE Delhi NCR.

Dr. Sneha Maria. M, Director & Co-Founder, Ariken Labs Pvt Ltd.

My interdisciplinary background has driven me towards the development of healthcare and diagnostic devices. I have worked on the development of microfluidic devices for blood plasma separation for my PhD thesis, which we are taking forward for product development. BIRAC has opened many avenues to encourage budding entrepreneurs, providing support for various challenges faced in the Biotechnology industry. To be chosen for Biotech Women In Entrepreneurial Research (WInER) award 2018 is a great honor. This has positively invigorated me and will be of immense help in all my future endeavors in 'the road less travelled'.

Conference

BioAsia, 2018

The 15th edition of BioAsia 2018, the flagship event of Federation of Asian Biotech Associations, FABA and Government of Telangana was organized in Hyderabad from 22nd-24th February. The convention was host to an array of activities including business partnering, exhibition, and technology conferences with talks from some global thought leaders, interactive sessions, CEO Conclave, start-up showcase, bio park visit, networking dinners and more.

The event was attended by Shri Suresh Prabhu, Hon'ble Minister of Industries & Commerce, Government of India; Shri K.T. Rama Rao, Hon'ble Cabinet Minister for Industries & Commerce, Government of Telangana and many others. The event witnessed the participation of 1,757 delegates from Healthcare, Biotech, Pharma, Life-Sciences, IT, Academia and Start-ups representing over 52 countries with 100 high profile speakers and 500 Corporates.

The inaugural session on the first day witnessed the presence of Shri K. T. Rama Rao, Hon'ble Minister for Industries and Commerce, Government of Telangana. In the same session, the Genome Valley Excellence Award 2018 was presented to Professor Michael N. Hall, a veteran expert from Biozentrum, University of Basel, Switzerland for his pioneering work in discovering the nutrient-activated TOR (Target of Rapamycin) proteins. On the second day, the event witnessed announcement of investments from Biocon, that will be expanding its current presence in Hyderabad on APIs (Active Pharmaceutical Ingredients) Intermediates to add 500 new jobs. The company will also start R&D lab of its subsidiary Syngene in Genome Valley, Telangana, which is expected to generate another 1500 high tech jobs.

The highlight of day was the CEO Conclave which explored the key recent developments in the Indian Life Sciences industry and the actions that manufacturers and the government are taking to ensure holistic growth, with a focus on keeping patients as a priority. On the third day, Shri Suresh Prabhu and Shri K.T. Rama Rao deliberated on the future of the pharmaceutical industry and the opportunities that lie ahead in the domestic and international markets. BioAsia 2018 also recognized 6 start-ups from the healthcare industry as "6 start-ups to look forward to". An eminent jury consisting of IIIT (Hyderabad), IKP Knowledge Park and LV Prasad Eye Institute chose 30 start-ups from close to 200 applications, out of which the top 6 were showcased.

Exhibition

The trade show at BioAsia 2018 provided the opportunity to exhibitors and start-ups to showcase their strengths, innovations, products and services to a large and captive global audience. BIRAC team including Dr. Manish Diwan, Head SPED; Dr. Chhaya Chauhan, Manager Incubation, and Dr. Saishyam Narayanan, Project Officer, Technical Group, showcased several schemes and programs launched by BIRAC during the exhibition. People from the entrepreneurial community were inquisitive about the BIRAC's various funding schemes, especially the BIG and the BioNEST schemes.

Workshop

"Taking Med-Tech Start-ups beyond Prototyping: Regulations, IP monetization & Funding"

A 2-Day Workshop on ***"Taking Med Tech Start-ups beyond Prototyping: Regulations, IP monetization & Funding"*** was organized by BIRAC and Venture Center, Pune on 9th and 10th February 2018. An overwhelming and enthusiastic response was received from all the participants. A total of 24 speakers and panelists together contributed their expertise to the workshop. The audience included a pool of Entrepreneurs/ Start-ups, Technology/ IP Managers & Researchers.

The first half of Day 1 was dedicated to understanding *'Investment trends in MedTech and early stage MedTech ventures'*. The second half was dedicated to *'IP Strategies for Medical Technologies & Case studies and best practices in IP in medical device industry'*. The second day saw the first half dedicated to *'IP Licensing and Technology Transfer, Valuation of IP/ technology'*. The speakers explained the various forms of IP licensing & Tech transfer models in the Med –Tech sector. The second half was dedicated to regulatory issues and its implications in med-tech commercialization.

The session was concluded with a thanking note by Mr. Amit Katiyar and Dr. Nutan from BIRAC and Dr. V Premnath Venugopal and Dr. Roshan Yedrey from Venture Center who were the organisers of the event. The workshop was appreciated by all the attendees.

BIRAC-TiE Entreprenurship Awareness

BIRAC in association with TiE-Delhi NCR organized an entrepreneurship awareness workshop for students in northern parts of the country, including Roorkee and Lucknow. The workshop in Roorkee was held at the Department of Biotechnology, IIT-Roorkee on 5th February, 2018. TIDES Incubator at IIT-Roorkee also made an active contribution in making the event a success. The workshop was well attended by the 55-60 students from IIT and nearby colleges. The panel discussion included topics such as developing a good business model, art of fund raising, BIRAC's role in supporting the innovation ecosystem and case studies of successful entrepreneurs supported by BIRAC.

Another workshop on similar lines was organized at the Lucknow Biotech Park on 9th February, 2018 and it also witnessed a healthy participation of many students.

Event

BIRAC Team at SLUSH, 2017
Helsinki, Finland

SLUSH, 2017 was held at Exhibition and Convention Centre of Helsinki, Finland from November 28 to December 2, 2017. Dr. Sanjay Saxena, Head – Investment, along with five BIRAC supported start-ups/ entrepreneurs attended the event, namely, Dr. Karthik Raghunandan, COO, Openwater.in Private Limited; Dr. Rajkumar Rajagopal, MD, Cellzyme Biotech India Private Limited; Dr. Nachiket Deval, Co-Founder, Coeo Labs Private Limited; Dr. Pankajkumar Chhatrala, CEO, OrthoHeal Pvt. Ltd., Vadodra; Dr. Ram Mohan Rao, Co-Founder, Yostra Lab Private Limited.

SLUSH is a start-up and tech event, organized annually by a community of entrepreneurs, investors, students, and festival organizers. The very core of SLUSH is to facilitate founder and investor meetings and to build a world-wide start-up community. SLUSH-2017 was a two day event attended by over 17,500 including 2,300 start-ups and 1100 investors.

On 29th November, the entire delegation of BIRAC visited the Exhibition and Convention Centre of Helsinki and the Indian pavilion set-up by the Indian embassy in Finland to showcase their innovations. Thereafter, the group attended the SLUSH 100 Pitching. In this day long event, 100 start-ups from different parts of the world had pitched for their innovation. Dr. Karthik Raghunandan, one of the members of the BIRAC delegation was short-listed for the qualifying round (top 50). The event featured representatives from several important Finnish businesses and government organizations, TEKES, BIRAC start-ups, Kerala start-up mission, cyber security and others.

On 30th November, Ms. Vani Rao, Indian Ambassador in Finland inaugurated the Indian Pavilion which was visited by several dignitaries, representatives from various organizations, investors, and others participants interested in Indian start-ups in India. Several internationl companies such as Microsoft, Google, Bayer, Tesla, Bosch, etc displayed their latest products/ technologies and highlighted their areas of interest for collaboration.

Slush Y Science was an official vertical of SLUSH organized in partnership with University of Helsinki, HiLIFE. One of the sections of SLUSH Y Science focused on "Starting up – Start-ups and Investors" on 1st December. Dr. Sanjay Saxena shared the stage with Dr. Nina Rawal, Head of Life Science at Industrifonden in the Investor Panel which was based on the theme: "So, you want to start a business!"

Key Learnings from SLUSH

SLUSH enabled the exposure of start-ups and investors to a global business environment. BIRAC successfully showcased the Indian innovations (products/ technologies) to the international audience through this platform exploring possibilities of partnership/ investment with international companies, entrepreneurs, and investors.

HBGDki India Grand Challenges Exploration Workshop

2nd - 4th December 2017

The HBGDki India Grand Challenges Exploration Workshop was a two-day event hosted by the Program Management Unit – BIRAC, jointly supported by the Department of Biotechnology (DBT), Government of India, BIRAC, the Bill & Melinda Gates Foundation and the Wellcome Trust in New Delhi in December, 2017.

This workshop brought together clinical researchers, data scientists, global health thought leaders and the HBGDki team together to explore further opportunities to collaborate, share knowledge, and generate transformative new ideas.

The workshop was inaugurated by Prof. K. VijayRaghavan, Secretary, Department of Biotechnology, Ministry of Science and technology, Govt. of India on 5th December 2017. Dr. Renu Swarup, Senior Advisor Department of Biotechnology and Managing Director BIRAC also welcomed the members in attendance and spoke about importance of data collection and analysis through the HBGDki platform and its important link with the KnIT platform and that the collaboration way forward would be able to accomplish much more. The sessions provided an overview of HBGDki, the history of HBGDki India and an introduction to Knowledge Integration with a detailed review of the platform and approaches used.

Interspersed between sessions on both days were Lightening talks- short, inspiring accounts from the HBGDki India Community in India who through the examples of their work brought forward some themes where data, models, and tools that were likely to lead to transformative solutions both for India and the broader global health agenda.

That evening, a talk by Dr. Lalit Dandona, Director, India State-level Disease Burden Initiative, was organised for the participants where he provided key insights from the recently released Disease Burden Trends in the States of India report that highlighted the importance of data and its analysis for India.

The second day began with Dr. Steven Buchsbaum, Bill & Melinda Gates Foundation, giving an overview of the 2018 Grand Challenges Explorations (GCE) call being planned. Thought Leader, Dr. M. K. Bhan, Professor, IIT-Delhi, provided insights and explained why a Data-focused GCE is needed for India emphasizing that scientifically derived evidence is the most powerful instrument to design impactful programs and make enlightened policy and highlighted the role that a platform like HBGDki can play in this space. Thea Norman, Bill & Melinda Gates Foundation, summarised the two-day community workshop with learnings, reflections, gratitudes and the next steps for future engagements for meaningful partnerships.

Dr. Shirshendu Mukherjee, PMU-BIRAC concluded the workshop by thanking all the participants and organisers.

Grand Challenges Explorations India – Round 4 Call announcement

The Grand Challenges Exploration (GCE)-India is one of the initiatives under GCI umbrella. Being managed and administered by Program Management Unit (PMU) housed at BIRAC, the program is implemented by IKP Knowledge Park, Hyderabad. The program is aimed at identifying, nurturing, and empowering, out-of-box ideas at pre-proof of concept stage, to help exploratory research that might have a tremendous impact on developing world healthcare and development ecosystems.

The program has been designed in a manner that two rounds of calls are launched per year (one in spring and the other in autumn) and till date four calls have been launched. The recently launched, Round 4 Call (15th February 2018) will remain open for a period of 45 days (till 31st March 2018). The mandates of Round 4 Call have been designed to address the broad range of public health issues of interest in India, such as infectious diseases; non-communicable diseases; mental health; maternal and child health; geriatric care, food and nutrition; and sanitation.

For more details on the mandate, please visit www.gce-india.org/.

National Health Mission, Haryana and KnIT Meeting
14th December 2017

National Health Mission, Haryana in collaboration with Program Management Unit at Biotechnology Industry Research Assistance Council (PMU-BIRAC), supported Knowledge Integration and Translational Platform (KnIT) Nutrition Domain Center - Society of Applied Studies (SAS), New Delhi convened a National Level Consultation Workshop on "Management and Elimination of Malnutrition in Haryana" titled "Kuposhan Mukt Haryana" in Chandigarh on 14th December 2017.

The meeting was led by Dr. Vinod Paul, Member Health NITI Aayog, and the honorable Chief Minister of Haryana, and had high level representations from Ministry of Health and Family Welfare; Ministry of Women and Child Department (WCD), Government of Haryana. Dr. M.K Bhan, National Science Professor, IIT Delhi and Chair KnIT Scientific Advisory Committee (SAC); PMU-BIRAC officials; and KnIT Nutrition Domain Center CHRD, SAS, team actively participated in meeting deliberations.

The Honorable Chief Minister announced the launch of the State Nutrition Mission for Haryana. There were deliberations on challenges to identify areas where actions are needed for accelerating progress towards a malnutrition-free India.

There was focused discussion on the scientific basis of an improved program content and design for nutrition. The meeting shared the vision for new program for management of Severe Acute Malnourishment (SAM). Taking into account the effectiveness of iron formulations and Iron-Folic Acid (IFA) supplementation, potential strategies for accelerated impact were also discussed. Designing MCH policies, which are pivotal to correct malnourishment, anaemia and micronutrient deficiency among pregnant women, was also stressed.

Meeting attendees at the National Level Consultation Workshop on Management and Elimination of Malnutrition in Haryana, in December 2017.

International Conference on Antimicrobial Resistance (AMR)

16th – 17th February, 2018

National Institute of Pharmaceutical Education and Research, Kolkata (NIPER-K) in partnership with ICMR-National Institute of Cholera and Enteric Diseases, Kolkata organized an international conference on Anti-Microbial resistance. The conference was designed towards the situational analysis of AMR with respect to its problem, determinants and challenges ahead with ongoing research and strategies required to reduce the burden in India and elsewhere in the future.

The conference was attended by around 50 delegates who were a mix of experts from various fields including Former-DG ICMR, Dr.V.M.Katoch, clinicians, Microbiology scientists, pharmacists, Professors from International universities, faculty and staff of NIPER and NICED, WHO representative and several PhD students, working in the field of Anti-microbial resistance.

Antimicrobial resistance (AMR) is a serious concern to the health authorities at global level jeopardizing global health security. The pressure is on our country in particular, the world's largest consumer of antibiotics and where easy access to antibiotics and environmental antibiotic pollution has been documented. AMR is of particular concern in developing nations, including India, where the burden of infectious disease is high and healthcare spending is fairly low. Unfortunately, India has among the highest bacterial disease burden in the world. Antibiotics, therefore, have an extremely important role in limiting morbidity and mortality. It is important that our clinicians take prudent approach in using antibiotics.

Dr. Arpita Gupta, from the PMU-BIRAC team attended the conference and presented on AMR: Funder's perspective.

Team visiting genomic lab facility at NIBMG

All Children Thriving

Site visit to National Institute of Biomedical Genomics, Kalyani for 'Stress outcome on pregnancy, fetal growth and birth weight development of methods to identify mothers at risk of preterm birth and intrauterine growth restriction resulting from maternal stress'

The PMU-BIRAC team made a site visit to NIBMG (National Institute of Biomedical Genomics), Kalyani, to review the technical and financial progress of the ongoing All Children Thriving (ACT) project titled "Stress outcome on pregnancy, fetal growth and birth weight development of methods to identify mothers at risk of preterm birth and intrauterine growth restriction resulting from maternal stress". The visit provided an opportunity to the team to interact with the PI and other collaborators of the study, for candid evaluation of the project activities, to gain understanding of the proposed analysis plan and see the laboratory facility where genomic and epigenomic studies would be done.

The team first visited the Genomics lab for complex diseases headed by Dr. Arindam Maitra, Principle Investigator of the said project. PMU team observed the sophisticated

infrastructure of the labs which held machines for DNA sequencing, Illumina I-scan processor with bead chips for DNA methylation studies and RT-PCR machines for Telomere length measurement. The site-visit also provided PMU-BIRAC team an opportunity to interact with study staff present within the laboratory.

Dr. Mukherjee was invited as a guest speaker for addressing the faculty and PhD students on "Effective Grant Writing". The same was delivered in the presence of Director, NIBMG and Dr. Partha Majumder.

Site visit to Translational Health Science Technology Institute, Delhi for "All Children Thriving" project with Dr. Karlee Silver, Grand Challenges Canada

For effective monitoring of projects, supported under Grand Challenges India (GCI) initiative, a Project Monitoring Committee (PMC) had been constituted. The PMC was required to review the milestone reports of the project, this also encompasses a site visit to the project site. One of the projects supported under "All Children Thriving (ACT)" initiative of GCI framework is "Creation of a biorepository and imaging data bank for accelerating evidence generation to facilitate children to thrive" being implemented at Translational Health Science and Technology Institute (THSTI), New Delhi.

A four-member team consisting of PMU-BIRAC officials and designated PMC member of the project, Dr. Karlee Silver, Vice President, Grand Challenges Canada (GCC) visited the project site on 22nd February 2018 to have candid evaluation of the project activities., to gain understanding of the parent cohort/ study from which biorepository has emerged and learn about the sub-studies that had been/ are being proposed from the ongoing study. The team first visited the Gurgaon General Hospital (GGH), a large district hospital in Haryana from which cohort of pregnant females is being recruited.

The team visited the antenatal clinic where the process of patient screening, consent taking and enrolment was demonstrated. The team was showcased the fully dedicated radiology services with trained radiologist established for imaging of pregnant women (for longitudinal data on morphology, biometry, blood flow of uterus, fetus, and placenta).

Following this, the team visited the biorepository and requisite infrastructure for long-term storage of biospecimens.

Dr. Silver and PMU team were very happy to see the significant thoughtfulness of study teams and the way they troubleshoot to overcome the obstacles. She commended the study team for real-time knowledge and expressed that the core groups involved with the study are technically and scientifically very robust and had convincingly presented their progress.

Grand Challenges Canada Roundtable hosted by PMU-BIRAC

23rd February 2018

BIRAC hosted GCC Funders Roundtable on 23rd February, 2018 for Transition-to-Scale Program which was by invitation only. The PMU-BIRAC and BIRAC team attended the roundtable along with the six invited innovators.

Dr. Karlee Silver, Vice President GCC introduced the Transition-to-Scale Program, which seeks to support the transition to scale and sustainability of Bold Ideas with Big Impact® from existing innovators/grantees previously or currently funded under several

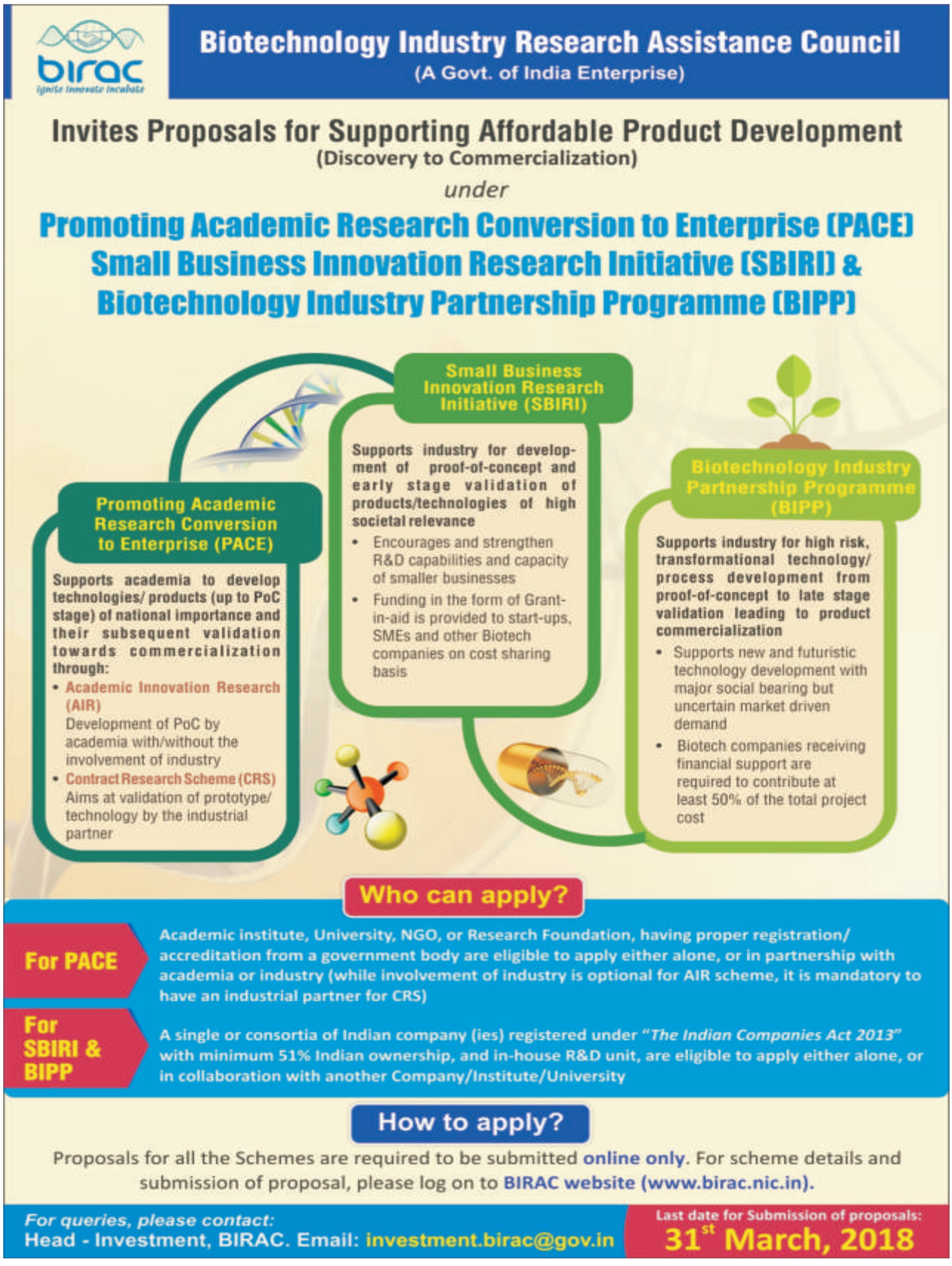
programs like Stars in Global Health, Saving Lives at Birth, Saving Brains, and Global Mental Health programs, as well as invited innovations from approved partners, such as the Every Woman Every Child Innovation Marketplace.

Grand Challenges Canada intends to make investments of up to $1.0 million CAD to catalyze the scale and sustainability of the most promising global health innovations. Innovators are required to secure matching funding, strongly preferred (i.e. a 1:1 match to Grand Challenges Canada contribution) ideally from a "smart partner" who can help to scale the innovation via their distribution channels, local knowledge, etc.

The innovators pitched their innovations, problem the innovation addressed, validation status and outcomes. They highlighted the element for which they need additional support for scalability.

Dr. Silver concluded the meeting with the note that GCC investments have produced results and anticipation is more impressive outcomes as innovations scale.

The group meeting at BIRAC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(A Govt. of India Enterprise)
Invites Proposals for Supporting Affordable Product Development
(Discovery to Commercialization)
under
Promoting Academic Research Conversion to Enterprise (PACE)
Small Business Innovation Research Initiative (SBIRI) &
Biotechnology Industry Partnership Programme (BIPP)
Small Business Innovation Research Initiative (SBIRI)
Supports industry for development of proof-of-concept and early stage validation of products/technologies of high societal relevance
• Encourages and strengthen R&D capabilities and capacity of smaller businesses
• Funding in the form of Grant-in-aid is provided to start-ups, SMEs and other Biotech companies on cost sharing basis
Promoting Academic Research Conversion to Enterprise (PACE)
Supports academia to develop technologies/ products (up to PoC stage) of national importance and their subsequent validation towards commercialization through:
• Academic Innovation Research (AIR)
Development of PoC by academia with/without the involvement of industry
• Contract Research Scheme (CRS)
Aims at validation of prototype/ technology by the industrial partner
Biotechnology Industry Partnership Programme (BIPP)
Supports industry for high risk, transformational technology/ process development from proof-of-concept to late stage validation leading to product commercialization
• Supports new and futuristic technology development with major social bearing but uncertain market driven demand
• Biotech companies receiving financial support are required to contribute at least 50% of the total project cost
Who can apply?
For PACE
Academic institute, University, NGO, or Research Foundation, having proper registration/ accreditation from a government body are eligible to apply either alone, or in partnership with academia or industry (while involvement of industry is optional for AIR scheme, it is mandatory to have an industrial partner for CRS)
For SBIRI & BIPP
A single or consortia of Indian company (ies) registered under "The Indian Companies Act 2013" with minimum 51% Indian ownership, and in-house R&D unit, are eligible to apply either alone, or in collaboration with another Company/Institute/University
How to apply?
Proposals for all the Schemes are required to be submitted online only. For scheme details and submission of proposal, please log on to BIRAC website (www.birac.nic.in).
For queries, please contact:
Head - Investment, BIRAC. Email: investment.birac@gov.in
Last date for Submission of proposals:
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BIRAC PROGRAMMES

SITARE (Students Innovations for Advancement of Research Explorations)

BIRAC SRISTI GYTI AWARDS: Aimed at supporting the innovations and creativity at grass root level among the university students, including individual innovators.

eYUVA (Encouraging Youth for Undertaking Innovative Research through Vibrant Acceleration)

- ***University Innovation Clusters (UIC):*** UIC initiative seeks to create an entrepreneurial culture in the Universities and help students to take their novel ideas to proof of concept.
- ***SIIP (Social Innovation Immersion Fellowship):*** A fellowship programme that builds the next generation of social entrepreneurs by helping them 'immerse' and interface with communities to identify gaps and then work on bridging the gaps through an innovative product or service offering.

Discovery, Early and Late Stage Funding

- ***BIG (Biotechnology Ignition Grant):*** Biotechnology ignition Grant (BIG) is available to scientists, entrepreneurs from research institutes, academia and startups, to stimulate commercialization of research discoveries by providing very early stage grants to help bridge the gap between discovery and invention.
- ***SPARSH (Social Innovation Programme for Products Affordable & Relevant to Societal Health):*** SPARSH combines social innovation and biotechnology for the well-being of the society by helping, identify and support cutting edge innovations towards affordable product development with potentially significant social impact. SPARSH provides support in the form of impact funding and fellowships.
- ***SBIRI (Small Business Innovation Research Initiative):*** It is the early stage, innovation focussed PPP initiative to support incremental R&D in the area of Biotechnology to facilitate innovation and risk taking by SMEs
- ***BIPP (Biotechnology Industry Partnership Programme):*** BIPP seeks to provide support for early to late stage high risk biotech R&D by industry and/or accelerate commercialization of new indigenous technologies.
- ***CRS (Contract Research Scheme):*** CRS scheme supports academic institutes to take forward research leads through a validation and translation cycle by the industry. Funding is in the form of grant given to both the academic as well as the industrial partner.

BIRAC BioNEST (BIRAC – Bioincubation: Nurturing Entrepreneurs for Scaling up Technology)

- BIRAC's Flagship programme which has created 25 world-class bio-incubators to provide incubation space, mentor networks, instrumentation facilities, IP and technology management support.

Collaborative Funding

- ***Indo-French Centre for the Promotion of Advanced Research (CEFIPRA):*** Support high quality bilateral research, encourage and enable Indo-French collaboration between public, private research groups, industry, clinicians and end-users in the domain of red biotechnology.
- ***Wellcome Trust, UK:*** Support innovations in translational medicine in the domain of diagnostics for infectious diseases.
- ***Grand Challenges India (GCI):*** A consortium of DBT, Bill & Melinda Gates Foundation, Wellcome Trust, USAID, and BIRAC, focussing on supporting innovations in the areas of maternal and child health, agriculture and nutrition, sanitation and infectious diseases.
- ***USAID and IKP Knowledge Park:*** Support for new diagnostic tools for TB, with funding commitment of INR 5 crores for 3 years.
- ***NESTA, UK:*** BIRAC partnership with Nesta, a charity organization in UK, is aimed at supporting Discovery Awards Programme for innovators working for innovative diagnostics for anti-microbial resistance (AMR).
- ***Industry Innovation programme on Medical Electronics (IIPME):*** BIRAC in partnership with DeitY (Department of Electronics and Information technology) launched IIPME for supporting innovations in medical electronics and med devices sector.

Equity Funding

- ***SEED (Sustaining Enterprise and Entrepreneurship Development) Fund:*** Financial equity based support to start ups and enterprises through bio-incubators for scaling enterprises.
- ***AcE (Accelerating Enterprises) Fund:*** A Fund of Funds to scale-up R&D and innovation in biotechnology domains of sectors such as healthcare, pharma, medical devices, agriculture, sanitation and many more.

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