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Grassroots Innovations Impacting Lives

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Ignite Innovate Incubate
Biotechnology Industry Research Assistance Council
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Chief Editor's Take

It is a pleasure to bring the latest edition of BIRACi3 showcasing the activities of BIRAC and the innovators. BIRAC's supported innovators belong to a range of institutions and communities- from students, faculty and researchers in universities and research institutions, startups in metropolitan cities as well as smaller towns.

Indeed we are cognisant of the fact that innovations can emerge from all communities and what is important is to empower and enable the innovations such that the most impactful innovations go through a pathway for creating sustainable impact. Grass roots innovations emerge from the length and the breadth of the country and as mentioned earlier BIRAC endeavours to connect the grass roots innovations and innovators to formal institutions. In this regard, many of our programmes play a key role especially our partnership with SRISTI- an organisation that closely works with grass roots innovators, evaluates their innovations and propels them forward. BIRAC's other flagship programs such as BIG, SPARSH and UIC encourage innovators to understand the problems at the grass roots level and design solutions that is appropriate, high quality and still affordable.

Moving forward it will be important for us to tap into the rich grassroots innovations and traditional knowledge that India possesses. For this we will work with aligned organisations across the country.

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

in this issue

Editorial Committee

Satya Prakash Dash
Head, Strategy Partnerships & Entrepreneurship Development

Chhaya Chauhan
Manager (Research Analysis and Facilitation)

Design, Production and Circulation :
Chiranjn Advertising, E-170, East of Kailash, New Delhi, Email : chiranjn@hotmail.com

Leader

Optimizing Grassroots Innovations for Scale

BIRAC, over the years, has endeavoured to nurture biotech innovations emerging from entrepreneurs as well as from entrepreneurial faculties and researchers in academia. We understand that a nation's entrepreneurial energies reside in all sections of the society and hence BIRAC has laid programs that reach out to our citizens in all walks of life, seeking ideas which then can be translated for creating positive impact in communities.

Our partnership with SRISTI for BIRAC-SRISTI GYTI Awards wherein we provide ideas emerging from students across the country with institutional and funding support for transitioning into proof-of-principle as well as through our social innovation program SPARSH which has an "immersion fellowship component" (called SIIP) we help fellows go into communities and identify gaps which can then be bridged via a biotech solution in form of products and services. Our flagship startup program BIG encourages startups to solve societal problems with world class high quality products that have relevance in low resource settings.

Indeed it is one of BIRAC's mandate to encourage product development that combines high quality and affordability- which we believe would then be crucial for giving equitable accessibility to users who might be resourced challenged.

Connecting grass root level ideations to institutional innovation routes and mechanism is important for refinement of the ideas through iterations and for making them equivalent to global gold standards of benchmarks- a key philosophy underlying this is "affordability" should not be equated with "less than gold standard products". We believe that innovators in India including grass roots innovators can solve this conundrum of marrying high quality and extreme affordability in products.

In future, BIRAC would expand the connect with the grass root innovators, map the traditional knowledge and bridge them to institutional forms of support through partnerships and through this we hope that the base of our innovation potential would expand thus becoming a key ingredient for solving national & global challenges and creating a better world.

Prof. K.VijayRaghavan
Secretary, DBT, Govt. of India
& Chairman, BIRAC

BIRAC@5-Impacting the Biotech Innovation Ecosystem

BIRAC completed five years of its successful existence. To mark the celebration of its 5th Foundation day, a high profile knowledge and networking event was organized at New Delhi with the theme "BIRAC @5- Impacting the Biotech Innovation Ecosystem" on 20th -21st March 2017, the event was attended by a large number of dignitaries from scientific & industry sectors both from within the country and overseas and more than 250 start-ups, entrepreneurs & researchers from industry and biotech organization were also present to grace the occasion.

Day-1

The event kick started by showcasing the BIRAC Impact in promoting innovations and entrepreneurship during five years through a short movie followed by lighting of the lamp by dignitaries. The dignitaries included Shri Y.S. Chowdary, Hon'ble Minister of State for Ministry of Science & Technology & Earth Sciences as Guest of Honour; Prof. K VijayRaghavan, Secretary Department of Biotechnology & Chairman BIRAC; Dr. M K Bhan, Former Secretary,

DBT & Founder Chairman, BIRAC, Dr. Renu Swarup, Senior Adviser, DBT & MD, BIRAC.

Dr. Renu Swarup gave the Welcome address by highlighting government's role in supporting the biotech innovation ecosystem by launching various schemes such as Make in India, Startup India, SATHI etc. Prof. K. VijayRaghavan, in his keynote address, emphasized upon BIRAC's achievements during five years. He also suggested that innovation and research must be directed towards addressing the most pressing problems of society and as social entrepreneurship is the key to creating an inclusive society, government is committed to providing all the necessary support.

Shri Y. S. Chowdary, while inaugurating the event said that research and innovation has been one of the key areas that the government has focused on. BIRAC, which has completed five years, stands at the cusp of a great leap. Globally, BIRAC has been hailed as one of the most effective government measures to create an enabling environment for research and development to flourish in a country.

Dr. M. K. Bhan in his address described how ecosystems (both research and infrastructure) evolve through continuous dialogue and understanding of the needs of the stakeholders. He appreciated the model and design that BIRAC works upon which is responsible for its success. He also suggested that a model should adopt the needs of the future.

A coffee table book on BIRAC's five year journey was also released by the dignitaries. The inaugural session was concluded by vote of thanks by Dr. Satya Prakash Dash, Head, SPED, BIRAC.

Measuring Innovation Impact- the National & Global Perspective	**The Journey of Change Makers : BIRAC pushing the innovation envelope and creating impact**	**The Industry-Academia Partnership: Bridging the Chasm**	**Building and Transforming an Innovation Nation: Combinatorial Role of Stakeholders**	**Biotech Startups- Forward & Onward: Creating impact with BIRAC**
Moderator: Utkarsh Palnitkar, KPMG	**Moderator:** Premnath Venugopalan, Venture Center	**Moderator:** Rohit Srivastava, IIT Bombay	**Moderator:** Deepanwita Chattopadhayay, IKP Knowledge Park	**Moderator:** Satya Prakash Dash, BIRAC
Panellists: Andreas Muranyi Scheutz, Sweden	**Panellists:** Ezhil Subbian, String Bio Private Ltd.	**Lead Talk:** Prof. G Padmanaban, IISc Bangalore	**Theme Talk:** Prof. D Balasubramanian, LVPEI	**Panellists:** Dhananjaya Dendukuri, Achira Labs
Steve Buchsbaum, USA	Chayan Chatterjee, Lattice Innovations Pvt Ltd.	**Panellists:** Navakant Bhat, IISc	**Panellists:** Rema Subramanian, Ankur Capital	Arun Chandru, Pandorum
Auli Pere, Finland	Sachin Dubey, Module Innovations Pvt. Ltd.	Arvind Lali, DBT-ICT Center	Taslimarif Saiyed, CCAMP	Radha Rangarajan, Vitas Pharma
Daniel Berman, UK	Pankaj Parashar, Cutting Edge Medical Devices Pvt. Ltd.	PVM Rao, IIT Delhi	Erik Azulay, IC2	Nitin Sisodia, Sohum Innovations Labs
Sharad Sharma, iSPIRT	Deepak Raj, Df3D Creation	Sanjay Singh, Gennova Biopharmaceutical Ltd.	Raajiv Singhal, Abraaj Capital	Abhay Shendye, Swasti Agro
Carani Sanjeevi, Sweden		KK Narayanan, Founder, Metahelix	Gopal Krishna Dasika, Pfizer	

Conclusion: Day-1

Session-I:

The panel concluded with focus on combinatorial approach for innovation and hacking our own traditional knowledge for scaling innovation proportion in India.

Session-II:

The panellists suggested that there should be a continuous support through grants without time lags for effective milestone completion. Incubation time in Biotech sector should be increased in order to nurture as well as scaling up their innovations. Incubators to provide customized trainings pertaining to business model generation, market analysis and customer identification.

Session-III:

The panel discussed about the interdependency of academia & industry on each other for getting effective outcomes from the innovations. The panel included academic and industry experts. Strengthening academic research and building confidence between the industry and academia was the key discussion area for the panel.

Session-IV:

The panellists highlighted the approaches required for reducing the gap and play co-operative and coordinated role in order to help entrepreneurs and startups commercialize their innovations.

Session-V:

The entrepreneurs deliberated on great business ideas and its implementation to action in affiliation with BIRAC. The presenters showcased their innovation and significant positive impact created by them in society/community. Each demonstrated innovations was based on specific technology, that served as solution or strategy to create self-sustaining value chains and improve health outcome in resource constrained settings..

Day-2

The day started with an impactful informative session on "Preparing for Industry 4.0". The key speakers included, Dr. Vijay Chandru, Strand Life Sciences, Dr. S. Ramaswamy, NCBS, Dr. P.M. Murali, President, ABLE. Dr. Satya Prakash Dash (BIRAC) set the context for Industry 4.0 and presented the evolution journey from Industry 1.0 till Industry 4.0. The speakers emphasized upon the transition from identifying DNA structure to evolution of Next Generation technologies to identify and modify DNA sequences and thus paving the way for Industry 4 concept. They elaborated about their functional areas and scope for identification and investment in certain areas to promote the innovation Ecosystem.

India as a Biotech Hub in 2025- The Opportunities & Challenges
Chair: Prof. K VijayRaghavan, Secretary DBT
Theme Talk: Dr. Kiran Mazumdar Shaw, Biocon
Shri Ramesh Abhishek, Secretary DIPP, GoI
Dr. Soumya Swaminathan, DG ICMR
Prof. Anil Sahasrabudhe, Chairman AICTE
Dr. Trilochan Mohapatra, DG, ICAR
Dr. Jitendar Sharma, CEO, AMTZ
Summing up: Dr. Renu Swarup, Senior Adviser, DBT & MD BIRAC

Session-II: Dr. K.M. Shaw, CMD, Biocon, in her theme talk urged to promote activities and ventures that leverage innovation to strengthen Indian biotech ecosystem. Sh. Ramesh Abhishek, Secretary, DIPP, GoI, stated that with various government initiatives including "Make In India" and "Start Up India", country is on path to become world's leading start-up ecosystem. Dr. Soumya Swaminathan, DG, ICMR, emphasized that identifying diseases and priority areas for research is a key to leverage funding for innovative projects. Prof. Anil Sahasrabudhe, Chairman, AICTE, mentioned how introduction of human biology into engineering syllabus supported emerging biotech enterprises. He stated that study of biology was promoted among engineering students, by referring it as "study of living machines". Dr.Trilochan Mohapatra, DG, ICAR focussed his talk on Agri –biotech initiatives that may be looked upon to accomplish scientific and industrial development of the country. Dr Jitendar Sharma, CEO, AMTZ, Government of Andhra Pradesh shared how pooling and analysis of scientific data available in-house with scientific facilities would assist in bringing out the best, and accomplishing country's dream to become an innovation hub .

Prof. K VijayRaghavan, Secretary, DBT, emphasized upon the role of State and Inter Government agencies, to focus diligently on emerging global challenges such as AMR, TB, Agribiotech and clean energy to deal with the health, food and energy crisis respectively.

Conclusion:

While concluding Dr. Renu Swarup stated that we should now have vision and agenda for 2030 that incorporates scale up and transformation of existing Biotech innovation ecosystem of the country. The focus now should be on how innovations can be taken to the market. She also pointed that there is a need to continuously monitor Action Plans for Make in India , start-up India and other programs to achieve larger outcomes from national mission programs.

BIOINNOVATION EXHIBITION

During the Foundation Day, BIRAC provided a platform to entrepreneurs for showcasing their innovations. The entrepreneurs interacted with a diverse range of experts including Shri Y.S. Chowdary, Hon'ble Minister of State for Ministry of Science & Technology & Earth Sciences. Total 28 products/technologies were showcased during the exhibition. Out of which 9 products/technologies are in commercialization stage.

The interesting innovative products exhibited were point-of-care medical diagnostics, waste management technology, India's first artificial liver tissue using 3D printing, next generation drugs or therapies, innovative medical devices and plant healthcare system. The innovators pitched sustainable development as a marketing tool for their cutting edge products.

Windmill bags BIRAC National Award

In 2016, BIRAC instituted the "BIRAC National Award for Indigenous Product Commercialization" to be given away to an organization demonstrating excellence in successfully commercializing an indigenously developed technology. The award will be given each year on the occasion of National Technology Day (May 11).

Windmill Health Technologies, a Delhi based start-up working towards developing smart innovations to impact local and global health received the "BIRAC National Award for Indigenous Product Commercialization for the year 2017". Dr. Avijit Bansal Co-founder & CEO of Windmill Health, received the award from the President of India, Shri Pranab Mukherjee at the National Technology day event organized by the Technology Development Board at Vigyan Bhavan New Delhi on May 11, 2017. The function and award ceremony was also graced by Dr. Harsh Vardhan, Union Minister for Science and Technology, Shri Y. S. Chowdary, Minister of State for Science and Technology other dignitaries from various agencies and institutions in the S&T space.

Windmill Health Technologies received the award for developing NeoBreathe™: World's first foot operated new born resuscitation system. The device launched in 2016 is the world's first foot operated manual resuscitator that empowers grassroots caregivers to save new borns with ease and efficacy. Designed, developed and manufactured in India for the world through Government of India support, it is helping bring down infant mortality from asphyxia that currently claims 2,00,000 lives a year in India alone.

About Windmill Health Technologies

Windmill Health, is a Delhi based start-up company that spun-off from the School of International Biodesign at AIIMS, New Delhi in 2012. It was cofounded by Dr. Avijit Bansal and Dr. Ayesha Chaudhary, both fellows of the SIB program. The company's mission is to be a powerhouse of high-impact innovation in global health.

Grassroots Innovations
Minds on the Margin are not Marginal Minds

Prof. Anil K. Gupta
Centre for Management in Agriculture, IIMA

Prof Anil Gupta is a world renowned expert in innovations especially grassroots innovations at the Indian Institute of Management Ahmedabad (IIMA) as well as member of the Governing Council of IIMA and is the Executive Vice Chair of National Innovation Foundation. He holds a PhD (Management) from Kurukshetra University India and MSc Biochemical Genetics, 1974 from Haryana Agricultural University, Hisar. He is a Fellow of National Academy of Agricultural Sciences as well as the World Academy of Art and Science, California.

Over the last three decades, Prof Gupta has continued his tireless efforts to map grassroots innovations and link them to the formal sector thereby providing a pathway for their recognition, rewards and usage. He has been instrumental in founding several institutions and platforms such as the Honey Bee Network, National Innovation Foundation, SRISTI, GIAN, Techpedia and Festival of Innovations (FOIN). He was a Member, advisory board, Global Innovation Centre, UNICEF, New York (2015-2016); Member National Innovation Council (2010-2013) India.

He has received several awards in recognition of his seminal work in the field of grassroots innovations including Padma Shri in 2004, Star Personalities of Asia by Business Week (2001), Humanistic Lifetime Management Award (2013) from Humanistic Management Network, at the 73rd Annual meeting of the Academy of Management, USA, Hermes Award (2012) from European Institute for Creative Strategies and Innovation, Paris. He was conferred a Ph.D Honoris Causa, by San Martin de Porres University, Peru and Doctor of Letters from Central University of Orissa, July, 2012.

He is a widely acknowledged author and has recently published Grassroots Innovation: Minds on the Margin are not Marginal Minds, New Delhi Penguin Randomhouse.

Q. What are your reflections on the "innate" creativity that is present in all levels of society especially in the grassroots levels?

AG: It is evident to us that when people are either neglected or bypassed by the market or the state or both, they have no choice but to be self reliant. They can have several options- they can have a low level equilibrium trap- they can have suboptimal use of resources and adjust and adapt to them. There are some who have aspiration for a better quality of life and have the confidence that they can solve problems through their own genius and also feel that they must find out a way to for solutions from the available resources either working alone or in groups. There are different kinds of creative expressions that we witness at the grassroot levels. In a few cases innovators find solutions that can stretch or push the boundaries of formal science and innovation. We have seen this in assistive devices, farm machinery, herbal pesticides, in natural resource management. Sometimes and the formal sector would wonder why they couldn't find such a solution with all the resources they have at their command.

That diversity in the creativity innovations makes it interesting for formal S&T Sector to take it as a mutual learning opportunity to learn and share value.

Q You have catalysed establishment of several institutions starting from the Honey Bee Network (HBN) and initiated "Shodhyatras"- the walks through different communities across the country. Can you please reflect on the institutions and their evolution?

AG: The quest of the Honey Bee Network (HBN) is to give visibility, voice and velocity to the ideas at

the grassroots level. You see an innovation, you make them visible and connect them to others to cross pollinate and then you link them to formal S&T institution to give speed and velocity to their ideas such that you can fastrack their potential. There were four principles when we started that we must learn and share in their "language", we must "reciprocate" and connect them to others for "solidarity", the third was a fair share of any value being created should go back to them (that is"responsibility"). As you can see these are also elements of "Open Innovation" which was obvious to us even before the term was not in use. We started the instrument of IPR for protecting their knowledge rights. People thought IPR was only for large corporates, our logic was that poor people only have their knowledge that makes them rich. If you take it away without any reciprocity then there is nothing left with them. We got them protection in India and abroad in early 2000s and we filed patents for them in the US. When the patents were granted, it was no more an hypothesis, it was no more an imagination, it was something that proved that they were able to do something which transcended the prior art in those countries as well.

HBN was never formalised, it always has remained an informal social network. It has also grown outside India in 70 countries and has grown tremendously in places such as China.

As HBN evolved, around 1993, I felt that there is a need for an institutional mechanism for taking HBN forward and SRISTI was established as a voluntary organisation. The four verticals of SRISTI are "educational innovation", "technological innovations", "institutional innovations" and "cultural innovation or creativity".

In early 1997, we had an interesting conference on creativity at grassroots at IIM-Ahmedabad. We realised that the social innovations need to have a business model. The outcome of this conference was that we established GIAN (Gujarat Grassroots Innovations Augmentation Network) as a vehicle to connect three dots innovations, investments and enterprise and reduce the transaction cost of bringing these together. It was perhaps the first incubator in the country.

In 1998, we wished to scale up GIAN model across the country and work with grassroots innovators as well as with the distributed knowledge of the country in a new model. We then planned the National Innovation Foundation (NIF)with Dr Mashelkar chairing the NIF.

In 2000, National Innovation Foundation (NIF) NIF was established with INR 30 crore corpus from the Government of India. For the first ten years with INR 1.6 crore we achieved to fund 30 to 40000 ideas from the grassroots.

Around 1998 we started "Shodhyatras"- the walks through the country. Through these walks we were uncovering creative ideas of children, ideas of women, understanding traditional food systems, machinery and a whole range of things. Our knowledge systems were becoming stronger through this. NIF built on these knowledge system and its role was to scout and document and to develop IPR protection right program, add value to them and then give risk capital by providing micro-venture finance through SIDBI. In 2010-11 NIF became a full-fledged part of the Department of Science & Technology (DST). NIF has achieved milestones in the area of knowledge economy which was unprecedented and more than 200K ideas were mapped.

Around this time, SRISTI started "Techpedia" which today has 190,000 ideas by students and this was for the first time in India that a platform of such database was created. We discovered that many meaningful projects were being done. We started connecting the students with industry and also tapping into the innovation of the teachers and training the teachers.

Hon'ble former President Pranab Mukherjee wished to celebrate the innovations and create a Festival of Innovations (FOIN) with the focus of innovations from grassroots but also innovation for grassroots. We brought multitudes of organisations such as DBT, BIRAC and ICMR to partner, for a new ecosystem emerging such that all actors who are funding innovations can join hands

with each other and solve problems. This ecosystem achieved a new salience from FOIN. It also showed both the formal and the grassroots ecosystem that many of the challenges faced are similar specially lack of funding and lack of mentors to name a few.

Through these efforts we began to fill one missing block after another. It was essentially to create a map and people began to see the connection between them.

Q. There is a lot of talk on Jugaad. What is your opinion about its relevance in India especially since it has a connotation of "lesser quality". Do you think encouraging Jugaad is the way forward for India?

AG: India has a leadership in frugal innovations and there is a hunger for frugal innovation. Frugality must not be confused with temporary solutions such as Jugaad. Jugaad mindset can never make a country a great country in terms of solving problems in a systematic way. Jugaad is a quick fix, but one cannot stop there. One should go beyond and find out a systematic solution.

Frugal solutions need not be clumsy solutions. Indian Space program, with Mission to Mars and Mission to Moon, are the most frugal programs anywhere in the world - it is not Jugaad. All this is because of the ability of Indian mind for "More for Less" as well as "More for less for many". We have never been a "wasting society" and we were originally a circular economy but we lost our way somewhere.

Q. You once commented that the "The Minds on the Margins are not Marginal Minds". Can you please elaborate on this?

AG: Many times we think that people who are economically poor are also poor in the mind, which is a paradox and absurd statement because imaginations are not constrained. People who might be constrained in material resources may not be constrained in intellectual and mental resources. There are many live examples and evidence regarding this and we have found this during our Shodhyatras. People with less material resources are not just "tinkerers", but they can conceptualise, theorise and construct new relationships (for finding new solutions) which are accessible and democratic.

Q. How do you see the future evolve for India in the next decade and which are the areas that your focus would be drawn to?

AG: We need to recognise that in India we have two tier education- poor children are not getting quality education. I would like to contribute to help grow children in receiving quality education.

The second is that we need to accelerate validation of traditional knowledge. We have to strive to conduct large scale screening and validation of traditional knowledge by linking them with large network of science laboratories and departments. A great deal remains to be done.

The third area is "functional food"which is the future. Growing crops in areas that is mineral rich such that natural mineral intake is increased and healthcare is alleviated is one such example and there are many.

The fourth is the "creativity we have seen in children". They are much less patient than us. I never get tired in showcasing the creativity of children. Encouraging children to do research, harness their ability to observe and find solutions to challenges that we face is something we should focus.

We need to challenge our young people to find solutions. I hope we will find new volunteers, new biotechnologists, students and faculty who will give us voice, visibility and velocity to the ideas of common good.

BIRAC and Nesta Team Up to Fight Antimicrobial Resistance

-- New Seed Grant Funding Announced for POC Test Developers --

Daniel Berman
Lead Longitude Prize, Nesta UK

Daniel Berman leads the Longitude Prize which is a challenge with a £10 million prize fund to reward a diagnostic test that promises a sure solution to the problem of global antibiotic resistance. Longitude prize is supported by Innovate UK as funding partner and is run by Nesta. He has more than 15 years of experience in the domain of International Public Health and proven expertise in stimulating and developing innovation in both medicines and diagnostics products. Daniel Berman had previously served as General Director of Médecins Sans Frontières (MSF) Southern Africa office in Johannesburg, South Africa. He has also worked in Ethiopia on a local pharmaceutical production project for the World Health Organization (WHO).

Nesta, the London-based innovation foundation, and BIRAC are building on their successful partnership to further support Indian teams to win the Longitude Prize. The two organisations have announced a new round of Discovery Awards, which are seed grants to support Prize competitors.

The Longitude Prize, funded by Innovate UK, is a £10 million (INR 819 million) prize fund, with an £8 million (INR 655 million) payout to reward a transformative point-of-care diagnostic test. The winning test will help solve the problem of global antibiotic resistance by curbing the overuse and misuse of antibiotics.

The challenge for competing teams is to create a rapid point-of-care test that will enable health workers and pharmacists, or even patients, to correctly diagnose bacterial infections and therefore know whether or not antibiotics were needed. The winning test might also identify pathogens and/or susceptibility to specific antibiotics to help guide treatment decisions and move toward more targeted antibiotic treatment.

There are currently 239 teams competing from 41 countries around the world. Indian researchers and companies are well represented within this global competition with 42 teams participating from Delhi, Pune, Bangalore, Hyderabad and other cities around India. Out of the 41 countries where all Longitude teams are based, only the UK has more teams competing than India.

A new round of Discovery Awards, open exclusively to Indian teams, was launched on the 5th June 2017 and will close on 1st September 2017, midnight IST. The Awards provide seed grants (£10,000 - £25,000; or INR 823,906 - INR 2 million) to help teams and individuals develop their ideas for the Longitude Prize as well as overcome barriers that they might be facing in developing their products. Discovery Awards are designed to both support current teams and to entice new teams to enter the competition.

BIRAC is funding this call for £100,000 (around 8,193,181 INR). For more information or to submit a request for funding visit: https://longitudeprize.org/enter/discovery-awards.Events are planned by BIRAC (Delhi), C-CAMP (Bangalore) and the Venture Center (Pune) to raise awareness about AMR and promote participation in the current round of Discovery Awards.

In November 2016 first round Discovery Awards were granted to:

- Dr. Radha Rangarajan, CEO, Vitas Pharma
- Dr. Sudeshna Adak, CEO OmiX LABS
- Dr. Shridhar Narayanan, FiNDeR
- Mr. Vikas Pandey, Valetude Primus Healthcare
- Prof. J. S. Virdi, Delhi University

For the current round of Discovery Awards, Competitors are encouraged to apply who:

- Are facing barriers in progressing the development of their idea
- Are working in collaboration across sectors, disciplines or geographies which make it difficult to access other sources of funding
- Are working on an idea that is difficult to access other sources of funding for
- Are working on a very novel idea

The £8 million Longitude Prize is designed to payout to the first team that develops a test that meets the following criteria:

- **Needed:** Improving the antibiotic treatment decision of a globally occurring problem.
- **Accurate:** Eliminating harmful treatment decisions and giving confidence to the user.
- **Affordable:** Must be affordable for purchase and use in intended markets. Less expensive tests will be favoured.
- **Rapid:** Under 30 minutes from sample collection to result.
- **Easy-to-use:** The test must be suitable for point-of-care and should not be designed to be run by a technician in a lab.
- **Scalable:** There must be a feasible business plan for full-scale manufacture and international distribution.
- **Safe:** The benefits of using the test far outweigh any risks associated with it.
- **Connected:** Tests with built-in data-recording and transmission capability will be favoured.

Before a team can submit an application to win the prize they must have at least three design-locked, optimised prototypes which are ready for performance testing in preparation for regulatory approval. The Longitude Prize will support the design and implementation of these studies.

You can find the full prize rules at: https://longitudeprize.org/enter/prize-rules

The deadline to apply for the Discovery Awards is midnight IST on 1st September 2017. The final deadline to submit an application to win the £8 million Longitude Prize is 30th September 2019, unless a winner is announced beforehand.

Have you got a great idea for a rapid diagnostic test that could go win the Longitude Prize? Find out more: https://longitudeprize.org

Harbinger of good health in rural areas

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

Sudeshna Adak holds both a Bachelor and a Masters in statistics from Indian Statistical Institute and a Ph.D in statistics from Stanford University. She has in the past worked for multiple research institutes such as IBM India Research Lab and Harvard School of Public Health, GE Global Research and GE Healthcare. She is currently CEO & Director at OmiX Research And Diagnostics Laboratories Pvt. Ltd.

The village of Sugganahalli in Karnataka has a primary health centre catering to a population of almost 25000 people. The most common infections it sees are urinary tract infections and respiratory infections. But the doctor there can only treat based on symptoms and has no diagnostic tools available to confirm the diagnosis and identifying the causative agents. The village of Pedaballi in Andhra Pradesh hosts a mobile hospital once a month and each visit lasts a day before the mobile hospital moves on to the next village. Infections are also treated symptomatically. At both villages, if the fever persists and the patient deteriorates, they are sent to the nearby district hospital or tertiary centre for a culture test. This is the story of not just Sugganahalli and Pedaballi, but of every village across India. The delay in treatment and the cost burden now makes this infection a deadly peril for the patient.

Today, major tertiary care centres and district hospitals are flooded with patients coming from small towns and villages across the country, often bearing the cost burden themselves. As many studies have reported, infectious diseases are becoming increasingly difficult to manage, particularly in the developing world and in the tropical regions. The reasons are diverse - migratory populations, climate change, emergence of antimicrobial resistance, and more. India lies at the confluence of many of these factors and the burden of suffering and hardship fall mostly on the poor and on those with limited access to medical facilities.

OmiX Labs is dedicated to the mission of making low-cost easy-to-use diagnostic technology easily available in places like Sugganahalli and Pedaballi and for people with less resources. We intend to do this by leveraging science that identifies genomic and proteomic biomarkers in infectious agents. The deployment technology is intended to be functional and disposable, thus making it suitable for primary health centres, mobile clinics, and small diagnostic labs.

Our extended team is multi-disciplinary. Clinicians provide disease treatment context, biologists understand biomarker expression, chemists synthesize reagents, material scientists make substrates, physicists and engineers enable instrumentation, and software experts process and deliver measured outcomes. Our kind of innovation is not defined by domain boundaries but by intended benefit. In our case that benefit is the early and precise diagnosis of infection and the resulting optimal recommendation of treatment. Treatment recommendation is an objective that we are realizing is important - innovation is only useful if the outcome is actionable.

Working at the grassroots level calls for several layers of collaborations. We collaborate with academic institutions to make the science work, with design labs to prototype the technology, with tertiary care hospitals and research labs for clinical validation, and with non-profit trusts for primary data and field trials. The nature of our impact has led to funding and organizational support from social enterprise incubators. We are privileged to have such partners and thankful for the support and guidance.

Throughout our journey so far, DBT and BIRAC have been a big support. Initial funding to OmiX Labs was in the form of a Biotechnology Ignition Grant (BIG). Additional funding in the form of a NESTA Discovery Award and a Grand Challenges Explorations grant has expanded the range of possible impact. An Ignite fellowship for me to visit Cambridge University introduced us to new ideas and new mentors. Our work on malaria is facilitated by collaborators at the Institute of Life Sciences, a DBT institution. It is fair to say that without DBT and BIRAC looking out for us, OmiX Labs would be in a lesser place today.

In the course of my career in universities and corporate research labs, both in India and abroad, I have seen the best in diagnostic and therapeutic healthcare. I have also seen the end patient in Indian circumstances. My vision is that to build technology based on best-in-class science with the right quality and affordable prices. Practitioners in rural and deprived urban areas work with serious resource constraints. Working within these constraints is challenging and exciting for me and my team. Innovation that touches lives may not be easy to make but, with partners like BIRAC, companies like OmiX Labs have made it their mission.

Innovations for extending critical care

Chayan Chatterjee
Co-founder & COO, Lattice Innovations

Chayan Chatterjee is the Co-founder & COO at Latice Innovations. He started his career with ITC Limited, in manufacturing and engineering. He subsequently managed sales operations, and then 50% of the product portfolio of Omni GuideInc, a manufacturer/ seller of laser-based microsurgical tools based in Cambridge, MA. He has also led indigenous product development of technologies for tele-ICU services in his role as Director, MedTech at Glocal Healthcare. He holds Bachelor's and Master's degrees in Mechanical Engineering from IIT Bombay, and is an MBA from Wharton.

Rural and semi-urban India is plagued by poor infrastructure and poverty, which result in non-availability of skilled medical professionals. The challenges are amplified in the case of critical and emergency care. Critical care uses typically 10 per cent of the hospital bed strength but accounts for more than 80 per cent of the resource utilization.

Over the years there has been a surge in volume and severity of cases treated in ICUs, yet training in critical care lags behind and there is a shortage of fully trained critical care intensivists, resulting in the loss of many lives each year.

Lattice's Critical Care Management System is aimed at bridging the divide between healthcare demand and supply, by facilitating remote analysis of healthcare information and management of critical patients. The solution seeks to solve problems related to Skill Shortage, Cost and Speed & Accuracy of Care, which severely impact the delivery of critical care in developing economies.

A case in point is Lattice's recent experience working with Makunda Christian Hospital, a low cost healthcare provider in Northeast India.

Makunda hospital is located in a tribal populated area at the junction of three northeast states - Assam, Mizoram and Tripura. The hospital sees a high volume of patients coming from these states and maintains a clear focus on reaching out to the poor by providing affordable quality services. The hospital is recognized by Assam and Tripura Governments as a registered hospital under the RSBY scheme, and is also part of several Government schemes and is the main service provider in Karimganj area.

Lattice Innovations installed its networked multi-parameter patient monitoring systems (FYVE S1) at the hospital, which are currently being used in the ICU. Using the web-based remote monitoring console, clinicians are able to monitor patients even when they are not physically present at the ward (or even the hospital), thus reducing the time to decision making and positively impacting patient outcomes.

Grand Challenges India

Grand Challenges India, the partnership of the Department of Biotechnology, the Bill & Melinda Gates Foundation and supported by USAID, is housed at BIRAC and run by the Program Management Unit at BIRAC (PMU- BIRAC).

In 2017, Grand Challenges India has completed five years since its inception with its host organization, BIRAC.

Grand Challenges India (GCI) Meeting 2017:

The first ever Grand Challenges India (GCI) Meeting 2017, 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, was held in New Delhi in March 2017 and was attended by over 200 participants from the country and abroad.

The meeting was inaugurated on 21st March 2017 by the Honourable Minister for Science and Technology & Earth Sciences, Dr. Harsh Vardhan who as Chief Guest spoke on the importance of innovations in improving the lives of people and released a publication that chronicled some of the work done under the Grand Challenges India partnership titled 'Grand Challenges India: Our journey so far'.

The meeting took place over 3 days, from 22nd to 24th March 2017 in New Delhi and site visits were arranged on 25th March to a nearby project site in Gurugram.

The aim of the meeting was threefold: first, to share knowledge on the work of Grand Challenges India since its inception five years ago; second, to provide an opportunity for the GCI and scientific community in the country to interact with the global community to facilitate interchange of ideas and experiences; and finally, to explore opportunities for researchers, implementers, policy makers, academics from across diverse fields to work together to address some of the greatest challenges that we face today.

The theme of the meeting was the linking of scientific research, data management and analysis, and policy implementation with a special emphasis on the Indian context. Three GCI programs were under focus here; the All Children Thriving, the Healthy Birth Growth and Development knowledge initiative (HBGDki) and the Knowledge Integration and Translational Platform (KnIT) and the focus was on exploring how these three programs, and others like them, could interlink and work together to address challenges in maternal and child health.

Two unique sessions aimed to showcase the work of eminent researchers as well as young innovators across a range of disciplines around maternal and child health, data analytics among others.

Science Talks were designed as a series of interactive sessions with established and eminent researchers from India and abroad, to introduce their work across diverse disciplines such as immunology, neurocognitive development and growth, microbiome, chronic diseases in mother and child among others to the audience.

Igniting Young Minds, was a series of scientific sessions by young researchers from all around the globe with presentations that displayed their extraordinary research and work across different disciplines. This track explored how successful innovators and entrepreneurs transformed ideas and research into action and impact.

The All Children Thriving session built on the ACT platform that links related programs from multiple Grand Challenges partners. The track brought together expertise in science, policy, and the implementation of global health and development programs to address how and when in the life cycle to most effectively intervene to ensure that children not only survive, but also have the chance to live healthy and productive lives.

The Healthy Birth, Growth and Development knowledge initiative (HBGDki) sessions were designed to provide the audience with an overview of the platform and included a detailed introduction to the working of the platform. The HBGDki sessions also included an Action Lab where participants were provided the software used by the platform and were introduced to its working, and could follow it on their own laptops for a truly hands-on experience.

The Knowledge Integration and Translational Platform (KnIT) session introduced this unique initiative from India, which aims to synthesize and summarize data and evidence into easily packaged forms for policymakers, particularly at the state level within the country. The session elucidated the working of this platform and explored some questions and themes that could be of potential interest for the platform.

Other sessions included ones on other Grand Challenges India supported projects, a session on the work of the Bill & Melinda Gates Foundation and the organization's R&D priorities and a session on the work of BIRAC in the area of Maternal and Child Health.The meeting concluded on 24th March 2017 with a Closing and Valedictory Session chaired by Prof. VijayRaghavan.

Grand Challenges Learning and Evaluation Meeting 2017

The meeting was hosted by Bill & Melinda Gates Foundation in collaboration with Grand Challenges Canada (GCC) and Global Affairs Canada from April 24 to 25th, 2017, at the Mars Center Toronto, Ontario, Canada.

The Learning & Evaluation Meeting provided participants an opportunity to explore areas for improvement and to help building amore sustained learning and assessment process, through shared knowledge with active engagement of global partners. The meeting had representation from Global Grand Challenges (GC) Network Partners (GC Africa, GC South Africa, GC Brazil, GC India GC Peru, GC Korea and GC Europe); and prominent development innovation organizations.

The aim of the meet is to recognise future challenges through the measurement of results. This one and a half day meeting was aimed at providing an interactive platform to the GC Network Community for sharing their approaches, learning and evaluation practices. The meeting also allowed the participants to introspect and reflect, as to how they can build a more sustained evaluation process and innovation pipeline. The collective conversation in the meeting was intended to identify the knowledge gaps, areas for improvement and themes for launching new Grand Challenges.

The Innovation Market place session of the meeting was focused on highlighting the innovation with significant impact that requires transition to scale.

Another pertinent track of this meeting was on Connected Data. The track focused on a unique GC

Data Repository that has been created by Bill & Melinda Gates Foundation by pulling-together GC partner investment data into a common 'repository'. The developed tool allows the partners to answer business intelligence questions. The meeting was built on parallel tracks that allowed the participants to move freely across the sessions and attend sessions of their interest, and priorities.

From the Grand Challenges India team, Dr. Shirshendu Mukherjee, Mission Director, and Dr. Richa Vashishtha, Program Officer attended the meeting and presented the work of the GCI team of PMU at BIRAC.

Knowledge Integration and Translational Platform (KnIT):

The Knowledge Integration and Translational Platform (KnIT) launched in 2016, is a unique initiative that aims to provide evidence and experience-based guidance to accelerate progress, equity and input in the development of health systems in India. This platform seeks the purpose of collating and analysing available data within the country, to facilitate the development of evidence-based policy to address the inequalities in health outcomes in our country. The program intends to support state and federal governments to design programs to facilitate integration of new interventions and promote the comprehensive integrated development of health systems.

2nd KnIT Scientific Advisory Committee (SAC) Meeting

The Scientific Advisory Committee (SAC) is the main overarching body for KnIT program guidance.

The second KnIT - Scientific Advisory Committee Meeting was held on 26th May, 2017, where the two Domain Centres i.e., SAS and IAVI-India, working on nutrition and maternal and child health (MCH) issues respectively, presented on their work so far and their future plans.

The Scientific Advisory Committee meeting provided an opportunity for the domain centres to benefit from discussions and seek advice from the experts in the SAC. There were spirited scientific deliberations among the members which was valuable for the Domain centres.

Site visit to Bhubaneswar for a project under the All Children Thriving program:

The PMU at BIRAC team visited one of the study sites at Bhubaneswar on 17th May 2017, for the project under All Children Thriving scheme titled 'An intergenerational pre-biotic approach to establishment of a healthy colonic microbiome in infants'. The project Co-PI, Dr. Balamurugan, accompanied the team and was later joined by project staff at the field. The project implementation is assisted by local community workers (ASHA worker and Male Health Worker).

The project proposes to feed a safe and readily available resistant starch, namely high amylose maize starch (HAMS) to 2 groups of participants (women, 18-21 years and infants, 6-8 months) for 6 weeks, with appropriate consent, and thereafter to longitudinally collect fecal samples for microbiota analysis using next-generation sequencing. The basic assumption is that the pre-biotic intervention will enhance the growth of beneficial bacteria and reduce the carriage of harmful bacteria / enteric pathogens in the faeces of these two groups of individuals. The group of women study participants have been enrolled from rural areas of Vellore, Tamil Nadu and the infants in the study have been enrolled from rural areas of Bhubaneswar.

The PMU team visited Haripur and Bhusandpur villages, located 80 kms from Bhubaneswar city. Dr. Balamurugan explained the schedule of the daily field visits, informed that the team starts from Bhubaneshwar at 6.30 AM every day for the assigned villages. They then break-off into 2 teams, visiting all infants at their houses, distributing pre-biotic powder and leaving the house only after ensuring the consumption.

At these villages of Bhubaneswar site, early weaning infants (6-8 months) had been recruited. After recruitment and baseline stool sample collection, the pre-biotic was being administered daily under supervision, mixed with weaning food for infants (home based cereal/lactogen/cerelac), subsequently stool samples will again be collected at 3 weeks after onset of feeding, after 6, 12 and 24weeks.

Firstly, the PMU-team visited the enrolled infants' (mostly 6-8 months) houses in Haripur village and observed the process of feeding the pre-biotic mixed with their food.

Following this, the team visited another village, Bhusandpur, located 5 km from Haripur. The PMU-team observed a similar process of feeding pre-biotics to the infants by visiting separate households. A total 32 infants have been recruited from Haripur and 32

from Bhusandpur. The team also observed the register being maintained for the field containing

Pre-biotic being fed to infant at Bhusandpur village

feeding details of each infant.

Team then visited IIT Bhubaneswar, Toshali campus to observe deep freezers storing the stool samples and aliquots at - 80 Degrees Celsius temperature. These will be transported on dry ice to SIMS institute for PCR analysis and further analyses.

Fast Adaptive Informed Randomized (FAIR) trial –

This is first of its kind trial that has been proposed as a sub-study under linear growth study (funded under the ACT program) and is an opportunity for a proof of value of currently running HBGDki program. SAS is presently involved in conducting Linear Growth study, an individually randomized trial to achieve optimal growth and development in children, at 24 months of age, residing in low resource settings through integrated delivery of a package of evidence-based interventions as per the National Program. To inform the current set of interventions, there is a need to assess impact of the compelling interventions on linear growth and call for a process of decision making and filtering these putative interventions that is faster than large, long duration randomized controlled trials of traditional variety. Adaptive design trial with appropriate features may have something to offer in terms of attaining this objective and that too with a reasonable degree of certainty. SAS emerged as the best fit candidate to overlay this trial framework with existing Linear Growth study. Adaptive trial is being supported by mathematical modelling designs from HBGDki team.

The HBGD ki team alongwith 5 global data scientists, were in Delhi from May 23-26th, 2017 to meet the SAS team in order to develop the protocol for the FAIR trial. The overarching goal of this FAIR trial is to utilize the insights gained from it to determine the optimal package of interventions to be used in the Linear Growth Study for children aged 6-24 months. The PMU-BIRAC team participated in the meeting with full technical and organisational support.

Executive Committee Meeting – May 2017

The Executive Committee is the overarching committee that monitors the work and the future direction of the Grand Challenges India program and the PMU at BIRAC. This meeting is bi-annual and EC members are traditionally representatives of the Department of Biotechnology, Government of India and the Bill & Melinda Gates Foundation.

Currently, Prof. K. VijayRaghavan, Secretary Department of Biotechnology and Chairman, BIRAC and Dr. Nachiket Mor, Country Director, India Office, Bill & Melinda Gates Foundation are the Executive Committee members. The 6th Executive Committee meeting took stock of the work done so far and discussed future proposals and directions for the partnership.

The Grand Challenges India microsite was also launched at this meeting by Prof. K. VijayRaghavan, and Dr. Nachiket MOR, who congratulated the team on the effort and noted that the microsite is an important tool in communicating the work of this partnership.

The microsite is now available at **www.birac.nic.in/grandchallengesindia.**

Celebrating World IP Day 26th April

BIRAC celebrated World Intellectual Property Day on 26th April, 2017 to learn about the role that intellectual property rights (patents, trademarks, industrial designs, copyright) play in encouraging innovation and creativity. Theme for this year was Innovation – Improving lives, how innovation is making our lives healthier, safer, and more comfortable, turning problems into progress. To memorialize the event, Dr. Arjun Surya Founder& Director, Curadev Pharma Private Limited was invited to deliver a talk. Also, BIRAC launched BIRAC-PATH (Patenting & Technology transfer for Harnessing Innovations) to support BIRAC funded Biotech Start-ups, Innovators and SMEs.

BIRAC Participation in BIO US 2017 at San Diego, 19th-22nd June

BIO International Convention, 2017 was held at San Diego from 19th to 22nd June. The event was attended by 16123 delegates from 74 countries and 48 states. The BIO exhibition from 20th- 22nd June, 2017 featured more than 1800 exhibitors including 50+ International, Regional and State Pavilions. The participants included leading biotech and pharma companies, CROs, Academic Institutions, Government Agencies, Patent Advocacy Firms and Venture Philanthropy Organizations. In addition, more than 41,400 partnering meetings were organized with 3500 participating organizations.

Team India at BIO 2017 was represented by members from DBT, ABLE, ICMR, Ministry of AYUSH, BIRAC, State Governments, Kerala State Industrial Development Corporation, IKP Knowledge Park and several Indian Biotechnology start-ups. The India Pavilion was inaugurated by the Minister of State for Science, Technology and Earth Sciences, Government of India, Mr. Y.S. Chowdary on 20th June, 2017. This was followed by the release of the India Biotech Handbook, 2017. The Minster visited the booths in the Pavilion and interacted with the teams. He appreciated the enthusiasm demonstrated by team India.

The BIRAC booth saw several visitors over a span of three days. They were highly impressed by the impact that BIRAC had created in a short span of 5 years. The visitors appreciated the constant support that BIRAC provides to Indian start-ups through various schemes that cater to the different stages of product development, right from Idea generation to pre-commercialization. The technical and IP support provided to applicants was also acknowledged.

BIRAC Roadshow on Bio-Entrepreneurship, Grant-Writing & Intellectual Property Management

Venue: Centre for Converging Technologies - University of Rajasthan, Jaipur

A one day roadshow on Bio-Entrepreneurship, Grant writing and IP management was organized by BIRAC in association with University of Rajasthan, Jaipur on 23rd June 2017. The paramount ambition of this workshop was to spread the knowledge of Bio-Entrepreneurship, grant writing & Intellectual Property management for key discoveries and product development in day to day research. Workshop was attended by 86 participants that included a mix of graduate, post graduate students, post-docs, UIC-fellows and scientists from different organizations.

Inaugural session was initiated by opening remarks of Prof. Kailash Agrawal, Prof. & Head, Department of Botany, where translational activities of the University were apprised to the participants. Dr.Vidya Patni, Asst. Chief Coordinator, UIC-B, University of Rajasthan welcomed all the dignitaries and highlighted the importance of the workshop.

Morning session commenced with the presentation of Dr. Sanjay Saxena, Head Investment, BIRAC, on "Funding opportunities for product development and academic collaborations" to apprise the participants about different programs currently available for start-ups and Academia. Dr. Shirshendu Mukherjee, Mission Director-Wellcome Trust and Bill & Melinda Gates Foundation, India, delivered a talk on key elements of effective grant writing and briefed the audience about the critical points that should be considered while submitting any proposal to any funding agency.

Afternoon session started with the experience sharing by a Ignition Grant awardee Dr. Pawan Melhotra who enlightened the participants by sharing his journey of entrepreneurship. Second session of the workshop was dedicated to the Intellectual Property Management that was very well managed by Mr. Abhishek Sen, Patent Attorney/Head-Patent Operations (Delhi) at S. Majumdar& Co. and Ms. Suvarna Pandey, Patent Attorney, RanjanNarula& Associate. Participants were apprised on "Introduction to IP & Technology management and Patent Analytics for research and business planning" and on "Patentable subject matter and filing process in India and abroad".

Biotechnology Industry Research Assistance Council

(A Govt. of India Enterprise)

birac
Ignite Innovate Incubate

Announces 6th Call of

Sparsh

Touching a Billion Lives

Social Innovation Programme for Products Affordable & Relevant to Societal Helath

Waste to Value

Under the present call, proposals related to implementation of novel, efficient, cost – effective and environment friendly interventions/ technologies for sustainable management of waste and its conversion to valuable products are invited.

Proposals with well-established proof of concept (PoC) may be submitted by companies/ LLP/ academia either alone, or in collaboration

About SPARSH...

SPARSH aims at promoting development of innovative solutions to address society's most pressing social problems through biotechnological approaches. The Scheme has two components:

a) Product Development

Funding is provided to support innovations towards affordable product development that can bring significant social impact and address challenges of inclusive growth. 20 projects have been supported and 8 products/prototypes/technologies have been developed.

b) Social Innovation Immersion programme (SIIP)

SIIP is an immersion fellowship scheme aimed to create a pool of social innovators/entrepreneurs who could identify specific social needs & gaps, and bridge them using biotechnological approaches (product or services). So far, 18 social innovators have been mentored through BIRAC – SIIP partners; 50 novel solutions identified; 12 prototypes have been developed.

Municipal Waste	Agriculture Waste	Industrial Waste	Other Waste

Maximising Value with Biotechnological Interventions For

Bio-based Products	Advanced Biofuels/ Bioenergy	Efficient ways for Disposal

How to apply

Proposals for the Scheme 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 further information, please contact : Head Investment : investment.birac@gov.in or Project Officer : sparsh.birac@nic.in

Last date for submission of proposals **30th September, 2017**

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.

For further information please contact:
Biotechnology Industry Research Assistance Council (BIRAC)
1st Floor, MTNL Building, 9, CGO Complex, Lodhi Road, New Delhi-110003, INDIA
Tel: + 91-11-24389600 I Fax: + 91-11-24389611
E-mail: BIRAC.dbt@nic.in I Web: www.BIRAC.nic.in