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Biotechnology Accessible
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Biotech Academicians Engagement
Innovators Incubatees Healthcare
Transformation Sustainable Guidance Incubation Inspiration
Business Leadership Bio-economy Mentorship
Training Technology transfer Intellectual
Intellectual property Commercialization
Vigyan se Vikas \$100 billion building
Capacity Incubators Growth
MedTech Make in India



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



March **2019**

No. 1 | Vol. 6

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Leader's Message



Dr. Renu Swarup
Secretary DBT
& Chairperson BIRAC


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DR. RENU SWARUP

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Message

As BIRAC celebrates its 7th Foundation Day on 20th March, 2019, the theme “Nurturing Innovation-Empowering India” is very apt. BIRAC over these 7 years has very successfully demonstrated this in the Biotech Sector. It gives me immense satisfaction to note that not only has BIRAC created a vibrant Start-up Ecosystem but it has also facilitated very strong Industry Academia linkages and connected the ecosystem both nationally and internationally. Today we have across the country witnessed a growing demand for new innovations and a sense of excitement amongst the innovator community to deliver beyond expectations.

Innovation is key to the economic growth of any Country and we need to constantly innovate to keep up with the societal needs and aspirations. BIRAC has supported innovations which address the complex societal challenges in the Health Care, Agriculture, Environment, Energy and are focussed on improving the lives of millions of our country. BIRAC's main thrust is on Human Resource and Capacity Building, Access to resources for the Start-ups, Industry-Academia partnerships and Access to Investor Networks and Markets.

The underlying objective is primarily developing affordable and accessible innovative products to meet societal needs. These innovations today are technologically empowering the country and we are confident that as we move on, India which has already taken on a very strong Leadership position will be a front runner in innovation and will meet global benchmarks. I would like to congratulate all key players who have contributed to building this ecosystem and have been responsible for “Nurturing Innovations- Empowering India”

Together we must move forward with great enthusiasm and determination to achieve our target of being a Global Player in Biotech Innovation


(Renu Swarup)

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Chief Editor's Take



Dr. Mohd. Aslam

Advisor DBT
& MD BIRAC

Nurturing Innovations: Empowering India

BIRAC has been very active in the last 7 years, deploying its programs to build the biotech innovation ecosystem in the country. BIRAC is committed to work towards fulfilment of our Honourable Prime Minister, Shri Narendra Modi's vision of contributing to 'Make in India', 'Start-up India' & 'Swachh Bharat'. The key strategies of BIRAC are aligned such that the attention stays focused on "Nurturing Innovations: Empowering India". We aim to bring together like-minded organisations, co-create a network and provide the necessary synergies which are needed for product development partnerships across the country.

BIRAC continues to establish deeper engagement with several national & international partners to foster the entrepreneurial ecosystem for Biotech entrepreneurs of India. Initiatives such as creation of 41,50,000+ sq. ft. of incubation space through supporting 41 Bio-Incubators across the country, setting up of 1st Clean Energy International Incubator under Mission Innovation, setting up of 3rd BIRAC regional centre BIRAC Regional Bio-innovation Centre (BRBC) at Venture Centre, launching of SAEN (Secondary Agriculture Entrepreneurial Network) led by The Punjab State Council & Technology (PSCST) and other partners, such as, National Agri Food Biotechnology Institution (NABI), Centre for Innovative and Applied Bioprocessing (CIAB) and BIRAC's BioNEST–Panjab University (BioNEST-PU) are a only a few examples made by BIRAC to nurture the Biotech Ecosystem across India.

In the coming years, BIRAC will continue to be the enabler of the 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. Mohd. Aslam
Advisor DBT
& MD BIRAC

Nurturing Innovations: Empowering India



R. Ramanan
Mission Director -
Atal Innovation Mission,
Additional Secretary
NITI Aayog

India, over the centuries has never lacked great thinkers, scientists, innovators of the world. Indian intellectual might is second to none as is evident through great scientists like President Dr. A.P.J. Abdul Kalam, Sri Ramanujam, Sir CV Raman, Sr. Jagdish Chandra Bose and Dr. Vikram Sarabhai.

What India has however lacked is a holistic innovation and entrepreneurial ecosystem that nurtures, enables and empowers the thinking capabilities of our people to be expressed as great research and practical innovations. This is why whenever Indians go abroad they excel, and become great scientists, business leaders, doctors, engineers, because they have had access to an innovative ecosystem that has helped them evolve their aspirations and dreams into realities.

Many new initiatives in our country nurturing research, innovation are addressing this gap from institutions like DBT, DST etc.

The Atal Innovation Mission (AIM) is one such flagship initiative of the Prime Minister of India under NITI Aayog (National Institution for Transforming India) to promote Innovation and Entrepreneurship across the length and breadth of the country, not just in academies of higher learning but also holistically in schools, universities, small and corporate industries at District, State and National levels.

The Atal Innovation Mission focus is to create and promote a vibrant, world class, sustainable, scalable and empowering innovation and entrepreneurial ecosystem in India that will transform our youth from being just job seekers to job creators and innovators of the future.

Towards this end, Atal Innovation Mission is engaged in the following:

- **Atal Tinkering Labs:** Setting up state-of-the-art Atal Tinkering Labs (ATL) in thousands of schools across the country that would enable children from Class 6 to Class 12 have access to state-of-the-art Technologies like 3D printers, Robotics, Miniaturized electronics and electronic assembly boards, mobile and IOT sensor Technologies etc.. to tinker with, learn from, ideate with, and develop prototype solutions to problems seeking solutions. The students will also be introduced to Design Thinking and other entrepreneurial skills . With Atal Tinkering Challenges regularly posed to the students , the students get an opportunity to solve these challenges leveraging emerging Technologies. These initiatives will create and promote a problem solving, innovative, solution searching mindset in the students at a school level that would subsequently enable innovative students familiar with the latest Technologies enter higher academic institutions and become potential Entrepreneurs/ job creators to date in the last year and half, 5441 schools have been selected for establishment of ATL Labs across 650+ districts and covering all states, out of which 2000+ are already operational and the remaining will be operational by the end of this year. 70% of the selected schools are government and government aided schools. More than two million students will be exposed to innovation through this game changing intervention at the school level

- **Atal Incubators:** For the higher academic/ engineering colleges/ institutions, Atal Innovation Mission is also enabling the creation of world class Incubators - Atal Incubators (AICs) that can effectively promote and create support Start-ups in these institutions. AIM is also providing

scale up support to existing Incubators in the country. To date 101 Incubators have been selected across the country out of which 19 are already operational and 500+ Start-ups created through them. The remaining 82 world class incubators would be operational by the end of next year. These 101+ Atal Incubators will spawn more than 5000 Start-ups in the next four years

- **Atal New India Challenges:** To stimulate product innovations with national social and economic impact AIM has launched 24 Atal New India challenges in collaboration with various Ministries (Ministries of Agriculture, Drinking Water and Sanitation, Rail, Transportation and Urban Housing and Development). Upto Rs. 1 crore grant would be given to three winners of each of these challenges and the winners will also be supported by Atal Incubators / network for further commercialisation of the product in the market place. this will incentivize the creation of products and solutions addressing various critical challenges relevant to India from the Start-ups / entrepreneurs in these Incubators which can benefit the economy as well as society.
- **AIM Innonet Mentors of Change National Network :** AIM has also created a national network of mentors called Mentors of Change – Mentor India network where more than 5000 mentors from corporate and other professional organisations have registered interest to mentor Atal Tinkering Labs and incubators across the country
- **AIM ARISE (Applied Research and Innovation in Small Enterprises):** AIM ARISE initiative is work in progress to trigger wide spread applied research and innovation in the MSME industry aligned to Make in India initiatives that will reduce import dependencies and increase futuristic technologies based export industry of India. This is being designed with the help of ministries to provide great impetus to Make in India initiatives in almost every sector of MSME operations
- **AIM STEER (Science and Technology entrepreneurial ecosystem Rejuvenation)** initiative will seek to ensure alignment between the research and development in major national research institutions and universities of the country to products and services that will have great national and social impact over the next decade. This will also promote applied research to relevant emerging areas leveraging technologies like AI, Blockchain, IoT and satellite technologies

All of Atal India mission initiatives are aligned to the sustainable development goals of the UN to create an Innovative Nation that can create solutions not only for India but also for the rest of the world. The ultimate aim of all these initiatives is to create and encourage a mindset in the burgeoning youth of this country to be productive job creators of the future rather than just job seekers, and to familiarize / ready them with relevant tools and Technologies of the future. To ensure that these initiatives succeed Atal Innovation Mission is proactively nurturing and developing empowering partnerships with leading Indian and Global academia, global governments, large multinationals and corporates and individual Mentors. Corporate partnerships play an important role in each of the Atal Innovation Mission initiatives. CSR funds of corporates can be meaningfully and constructively leveraged to boost these innovation and entrepreneurship related initiatives and help in vital job creation. Initiatives like Swachh Bharat can become an integral part of driving innovation in crucial areas of waste management, water management, health and hygiene. Corporate support could be extended in various forms such as adoption of ATL labs or AICs, mentorship involvement, technology assistance, training the trainers, domain expertise, co. investments, and in other creative approaches.

I have been consistently amazed over the last year and half to see the fascinating innovative ideas and solutions by our young school students in the ATL Labs, Atal Tinkering Challenges as well as by the Start-up incubatees of the Atal Incubators. One can confidently assert that this has now become an irreversible leap forward into a new era of innovative thinking, innovation and potential job creation by the youth of our country. I also believe that the sparks of innovation ignited in our schools, universities, Start-ups and corporate institutions through such initiatives will lead India into a leadership position in the knowledge based economy that is sweeping the world in the current century. The Atal Innovation Mission and other such empowering initiatives are well thought out, long term, disruptive and empowering innovation led initiatives, the success of which will immensely benefit the future of the children and the youth of India, as well as of the world.

SLUSH 2018

SLUSH is a global Start-up and technology event conducted annually at Helsinki, Finland to facilitate meetings between the founders of Start-ups and investors such as venture capitalists, accomplished with events such as workshops, match-making meetings, pitching competitions and booth exhibitions. SLUSH 2018 was the 10th edition of SLUSH series and was organized on 4th & 5th December, 2018 at Messukeskus, Helsinki. The Indian contingent to SLUSH 2018 was led by DIPP/Start-up India. BIRAC was represented by Dr. Saishyam Narayanan, Deputy-Manager-Technical and founders of three BIRAC supported Start-ups, Dr. Subhash Narayanan from Sascan Meditech Pvt. Ltd, Mr. Adarsh Natarajan from Aindra Systems Pvt. Ltd and Mr. Kabir Jayraj Udeshi from Flycatcher Technologies.

On 3rd December, there were pre-SLUSH side events happening around in the city which included Founders day workshops, roundtable meetings, pre-qualification rounds of Slush 100 pitches etc. BIRAC start-ups had opportunity to attend few of the workshops and round table meetings with investors. The workshops were conducted by reputed firms like Techstars and business mentors from many global firms. The take away from this workshop were mainly for founders on to how to study their potential customers and market before introducing and scaling products in to the market. The Pre-qualification rounds of SLUSH 100 pitches in the areas of IoT, Biotech, Medtech and Pharma was another major event on 3rd December.

BIRAC Start-ups also attended the SLUSH Networking Dinner Reception hosted by Hon'ble Ambassador of India to Finland, Ms. Vani Rao at the India House Restaurant. This reception gave the Start-ups opportunity to meet a large number of industry leaders from India as well as from the Helsinki Start-up Services ecosystem who were showing interest to partner with Start-ups from India.

On 4th & 5th December, BIRAC and Start-ups were at designated booth at Indian Pavilion, presenting BIRAC activities and innovative products developed with BIRAC support to the global audience. Many potential engagements were made with global organizations on the BIRAC supported invention, technicalities, possible engagement models that included licensing agreements, IP assignment, royalty payments and reverse licensing etc. BIRAC Start-ups also made many very promising partnership and we have decided to share more information to take this forward. SLUSH 2018 concluded with SLUSH after party on 5th evening.

SLUSH 2018 gave good international exposure to BIRAC supported Start-ups to meet and interact with Start-up founders from various parts of the world, discuss some of the issues that are common to one another, and learn about funding options, scaling up opportunities and gain marketing insights. SLUSH also provided a platform for closer interaction between the Start-up founders from India, which could possibly lead to synergies among Start-ups with complimentary skills, sharing their strengths for speedy growth and betterment of the ecosystem.



BIRAC Start-ups at networking dinner hosted by Ambassador of India to Finland Ms. Vani Rao.



BIRAC Start-ups at designated booths at Indian Pavilion in SLUSH 2018

TiE Global Summit

BIRAC has partnered with The Indus Entrepreneurs (TiE-Delhi NCR) with a view to promote and encourage entrepreneurship in the biotech sector. TiE Delhi – NCR hosted its 3rd Global Summit-Entrepreneurship: Driving Employment, Driving Growth, the largest Global Entrepreneurial Leadership Summit across the globe on 29th-30th November, 2018 at the Taj Palace Hotel in New Delhi. The 2 day mega conclave brought together entrepreneurs, industry leaders, top investors, senior corporate professionals and academia. BIRAC participated in the event by sponsoring the same. As part of the event, a session track titled, "BIRAC energizing Biotech Start-up Ecosystem" was organized. The session focus was to showcase BIRAC's contribution in creating a Biotech Start-up Ecosystem in the country and the session included successful & inspiring entrepreneurial stories from BIRAC family of Biotech Start-ups discussing various aspects of promoting entrepreneurship in the biotech sector at a national level. The speakers included Dr. Tuhin Bhowmick, Pandorum Technologies; Bindu Ananth, NIRAMAI; Dr. Pawan Mehrotra, Aarna Biomed Products; Dr Vishal Rao, Innaumation Medical Devices LLP and the session was moderated by Dr Manish Diwan, Head Strategy, Partnership & Entrepreneurship Development – BIRAC; Srikant Sastri, Founder – Crayon Data & Creator – Chalo Start-up Video Series.

The session was followed by the launch of 2nd edition of WinER (Woman in Entrepreneurial Research) Award by Dr. Renu Swarup, Secretary DBT and Chairperson BIRAC and Dr. Saurabh Srivastava, Chairman Emeritus, TiE Delhi-NCR.

BIRAC also showcased various products and technologies developed through BIRAC support at a large pavilion in the exhibition area. The pavilion attracted many visitors, including budding entrepreneurs, industry experts, angel investors, accelerators etc.



CII Health Tech India 2019

The 2nd Edition of Health Tech India 2019 was held from 3 – 5 February 2019 at Pragati Maidan, New Delhi, India. The event was supported by the Government of India and the Ministry of Health and several associations related to the healthcare sector.

During the 3 day long exhibition, more than 75 exhibitors displayed their technology/ innovations. BIRAC displayed its various funding schemes, international collaborations and impact created so far. BIRAC also took opportunity to showcase its O3 Technology/ innovations:

- 1). FlexiOH- a NextGen Washable Breathable and light weight cast by Ortho Heal Pvt Ltd
 - 2). Dozee – a contact less health monitor that help easily monitor heart, respiration, sleep cycle & stress level every night by Turtle Shell Technologies Pvt Ltd.
 - 3). Niramai, an AI based preliminary cancer detection through Non-Invasive Risk Assessment with Machine Intelligence by Niramai Health Analytix Pvt Ltd.
- Three officials from BIRAC, Dr. Bhuvnesh Shrivastava, Manager-Make in India Cell; Dr. Poonam Singh, Manager-Investment & Ms. Shalini Saini, Programme Officer-National Biopharma Mission represented BIRAC during the three day exhibition. BIRAC pavilion was visited by many enthusiasts from diversified background including Grant aspirants, Students, Industry stakeholders, Start-ups, and International technology partners. BIRAC's efforts towards developing and advancing innovation in India to bring healthcare accessible to common man were appreciated.



BIRAC representatives with BIRAC supported Exhibitors



BIRAC representatives with visitors



BIRAC representatives addressing the queries of a visitor

Indian Science Congress, 2019

The 106th Indian Science Congress 2019 (ISC 2018) was held from January 3 – 7, 2019 at Lovely Professional University (LPU), Punjab. It was inaugurated by Hon'ble Prime Minister Sri Narendra Modi on 3 January, 2019 in the presence of Nobel laureates, Senior Scientists State and Central Ministers, Foreign Dignitaries and huge enthusiastic audience. The theme of Science Congress was "Future India: Science & Technology". The Indian Science Congress Association (ISCA) organised this event to bring together science fraternity from across the world to discuss innovations and researches. The event aimed to bring different science communicators together, to discuss the development and optimum utilization existing & new media and arenas in order to strengthen the dialogue between the research community and the society.

BIRAC officers participated in "Pride of India" (PoI) Expo a Mega Science Exhibition along with Department of Biotechnology and occupied a stall to showcase some of the Products/Technologies supported by BIRAC

The Products/ Technologies showcased by BIRAC were:

- FlexiOH (JC Ortho Heal Pvt. Ltd.)
- SYPHILIS diagnostic kit (Dhiti Life Sciences Pvt. Ltd.)
- Nasofilters (Nanoclean Pvt Ltd)
- Evergreen Insta veg & Fruit wash (Green Pyramid Biotech)
- SYNC Integrated Glucometers (Bioscence)
- Touch Hb (Biosence)
- Multi Analyte reader (Path Sodh Healthcare pvt ltd)
- Malaria Rapid diagnostic Kit (Genomix Biotech)
- Scintiglo (Cutting edge medical devices)



Down Stream Bioprocessing Course

About the Course

This course was jointly organized by Centre for Cellular and Molecular Platforms (C-CAMP) and GE Healthcare, in collaboration with BIRAC and was held from 13th – 16th November, 2018 at C-CAMP, Bangalore. The principle aim of this course was to provide basic hands-on-training in 'Downstream Bio-Processing' to individuals from academia and industry. Along with providing a thorough understanding of basic purification techniques and strategies to the participants, this course also included a primer on bio-molecular interaction kinetics.



The first three days of the course were held at C-CAMP and were focussed on the basic design and execution of chromatography experiments, with emphasis on gel filtration, ion-exchange chromatography, affinity chromatography, hydrophobic interaction chromatography, & reverse phase chromatography. The course covered the hardware (ÄKTA) and the software (UNICORN 7) aspects of the instruments involved. The technical aspects of the course included purification procedures related to sample preparation, column packing, optimization, scale up and fine tuning, columns, resin maintenance etc. The last day of the course was dedicated to the basics and use of Biacore in exploring bio-molecular interaction kinetics, and was carried out at JFWTC, GE campus.

Indo-US Vaccine Action Programme (VAP) and Candidate Vaccine Advisory Committee (CVAC) Meeting

Department of Biotechnology, Govt. of India is implementing a bilateral Indo-US Vaccine Action Programme (VAP) jointly with NIH, USA, to develop new and improved vaccines and vaccine related technologies. In order to provide oversight to research and development (R&D) activities for advancing vaccine candidates approaching readiness for clinical trials, a Candidate Vaccine Advisory Committee (CVAC) has been constituted under the co-chairmanship of Dr. M.K. Bhan, IIT Delhi; Dr. Harry Greenberg, Stanford University; Dr. Gagandeep Kang, THSTI and Dr. Cristina Cassetti, NIH-NIAID, USA.

The Steering Group (SG) on Epidemiological Preparation for Vaccine Trials was constituted on the recommendation of CVAC to provide expedited guidance on epidemiology studies and capability assessments to inform site identification for clinical trials of candidate Dengue and Chikungunya vaccines in India. DBT conducted the Indo-US VAP and CVAC meeting on 15th and 16th January 2019 at The Claridges, New Delhi with support of PMU-National Biopharma Mission, BIRAC. It was attended by Vaccine Researchers, Regulatory Agencies (CDSCO, ICMR) and Policy Experts from India and U.S. including active participation from key researchers for some of the candidate vaccines under development in India.

The focus of the meeting was to understand the Vaccine development landscape within India for TB and Viral diseases namely Chikungunya, Dengue, Zika, Influenza and RSV. The vaccine candidates being supported under National Biopharma Mission were presented by the vaccine companies: Sun Pharmaceuticals Pvt. Ltd., Indian Immunologicals, Bharat Biotech International Limited and Mynvax Pvt Ltd. Along with the technical inputs, emphasis was also laid on the regulatory support and guidelines with respect to novel vaccines. Drug Controller General of India apprised the committee that Central Drugs Standard Control Organization (CDSCO) has made a lot of amendments in the Clinical trial regulations in India to make the process less cumbersome and transparent for the participating industries.

With reference to the Epidemiological Preparation for Vaccine Trials, surveillance data on Dengue and Influenza was also presented. In 2017-18 Dengue serosurvey study was conducted by 10 ICMR and 3 non-ICMR institutes in India. This study focused on estimating age-specific seroprevalence of dengue virus infection in India and estimate seroprevalence of Chikungunya and Japanese Encephalitis (JE) viruses. Influenza surveillance being conducted by the Influenza Surveillance Systems in India covers a no. of areas w.r.t. Influenza infections. It aims at monitoring viral activity, describing seasonality, identification of high-risk groups, determining influenza burden, identifying the local viral strains and facilitating vaccine development, monitoring the anti-viral sensitivity and providing vaccine candidates.

Establishing Clinical Trial Networks in India is one of the mandates of National Biopharma Mission in lieu of building capacity for conducting large clinical trials for novel vaccines. Elaborate discussions on understanding the structure and functioning of similar network supported by NIH in USA were done so as to work towards identifying Indian capabilities and strengths and filling the gaps.

ICT Mumbai, Biosimilar Workshop 2018: Entrepreneurship Workshop and Leadership Conclave

An Initiative of Institute of Chemical Technology, Mumbai



The workshop was organized with stakeholders from industry, mainly from the field of Biologics, regulatory and academia. The Entrepreneurship program (BIRAC day) was attended by entrepreneurs, incubators, investors and young students.

Dr. P.K.S. Sarma, General Manager and Head-Technical, BIRAC gave a talk on various schemes of BIRAC, the early and late stage funds. The initiatives of the National Biopharma Mission (NBM) were presented by Dr. Madhvi Rao, Senior Program Manager, PMU-NBM, BIRAC. Mr. Shreehas Tambe, COO, Biocon Biologics gave the motivational keynote talk on affordable innovation and its access to patients. This was followed by sharing of entrepreneurial journey by few speakers, followed by Q & A session with active participation

from the audience who were quite inquisitive to know more about BIRAC schemes.

Dr Mahesh Balghat, COO, Shantha Biotechnics; Dr Dhananjay Patankar, Vice President, Syngene; Dr Maharaj Sahib, Director, Wockhardt; Mr. Sandeep Majumdar, Vice President, Intas Biopharma; Dr. Venkata Ramana, CSO Reliance Life Sciences were few other leaders from the industry.

The panel discussed Skill Development which is needed as a proactive, rapid and strategic approach from all the stakeholders of the biopharmaceutical industry to generate and sustain the "Human Capital" and accelerate the growth of future industries. The engagement of private players in training and developing Centres of Excellence was highlighted. The need of path breaking innovations and generating successful Entrepreneurship models in this sector, accessibility to affordable biocubating facilities, clusters and research parks largely sponsored by Govt. or Public Private Partnership models was also discussed. The concluding keynote talk was presented by Mr. Virendra Singh, CEO, Maharashtra State Skill Innovation Society, who appreciated the efforts of BIRAC in the above areas.



Biotechnology Industry Research Assistance Council

(A Govt. of India Enterprise)

INVITES PROPOSALS

for

Supporting Affordable Product/ Technology Development

(Discovery to pre-Commercialization)

in

Prioritized areas of Healthcare, Industrial Biotechnology and Agriculture

under



■ Promoting Academic Research Conversion to Enterprise (PACE)

Supports academia to develop technologies/ products (up to PoC stage) and their subsequent validation towards commercialization through *Academic Innovation Research (AIR)* and *Contract Research Scheme*

■ Small Business Innovation Research Initiative (SBIRI)

Supports industry for development of proof-of-concept and early stage validation of products/technologies

■ 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

**Last date
for submission
of proposals
31st March,
2019**

WHO CAN APPLY?

For PACE

Academic institute, University, NGO or Research Foundation registered/accredited by government body is 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 prioritized areas, scheme details & information on 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

Hands-on-Training Workshop on "Biosimilars/ Biologics Characterization"



BIRAC organised a hands-on-training workshop at ICT from Nov 29- Dec 1, 2018. The workshop was partially supported by TEQIP III (Technical Education Quality Improvement Program). The first two days of the event provided hands-on-training on biosimilars/ biologics characterization, while the third day was dedicated to Entrepreneurship talks and Leadership Conclave. A total of 73 participants from different enterprises participated in the Workshop.

The workshop convener Dr. Ratnesh Jain explained the complexity of biopharmaceuticals comprising of biological entities such as recombinant therapeutic proteins, vaccines, mAbs, etc., unlike small molecule based pharmaceuticals. It was conveyed that the methods for biophysical characterization of the biologics, if propagated to the industrial sector and academic institutes, will help in ensuring safety and efficacy of these biopharmaceutical products via establishing similarity of biosimilars to the innovator products.

The two-days intensive training program, involved brainstorming lectures by esteemed keynote speakers from Biocon, Syngene International Pvt Ltd, Wockhardt, Ipca Laboratories, Adello, ACRNS Technologies, Intas as well as academic research institutes such as CSIR-IGIB, CSIR-NCL, IIT-B and subject experts from industry and academia. Participants of the workshop also involved a diverse population of candidates from academic institutes and industries, as well as students, which provided an excellent opportunity for interdisciplinary interactions and collaborations.

Dr Bhavasar from Adello Biologics highlighted the principles of upstream process scale up principles which was also carried out during the hands on training workshop. Understanding higher order structure was another focus of the hands on training which was discussed at length by speakers- Dr Sankaranarayanan from Intas Pharmaceuticals and Dr. Dipak Thakur and Dr. NavratnaVajpai from ACRNS Technologies Pvt. Ltd and Biocon Research Ltd. respectively. Dr. Sanjeev Gupta from Ipca, presented a talk on Glycosylation control approaches in clone and process development for sustainable therapeutic mAb production. Investigating risks of protein aggregation by second virial coefficient analysis using light scattering was another topic on which Dr. Anand Tadas, representing Malvern Aimil Instruments Pvt. Ltd, provided his perspectives.

Hands-on-training on Dynamic Light Scattering (DLS) and Analytical Ultracentrifugation (AUC), the primary bio-analytical techniques used for the determination of Higher Order Structures (HOS) was provided to the workshop participants in association with Beckman Coulter. Associates and sponsors for the workshop from US Pharmacopeia gave practical sessions on Glycan Analysis. Team from Eppendorf was instrumental in providing support and expertise in conducting hands on training in the area of Upstream Bioprocessing to the participants. Along with hands-on-training in sample preparation, analysis and data interpretation, the workshop organizers also provided practical manuals and handouts relevant to the course for benefit of the trainees.

The workshop is expected to foster the development of State-of-the-art infrastructure and skills for biosimilar/biologics manufacture and characterization in the country.

Intellectual Property Law Clinic

BIRAC organized its third and fourth IP Law Clinics at BIRAC Office, Delhi and University of Hyderabad on 15th January, 2019 respectively and 13th February, 2019. The events were organized in association with FITT, Delhi and IKP & BioNEST-UoH, Hyderabad. BIRAC supported grantees were invited to have one to one interaction with BIRAC IP & Technology Management team on IP related matters. The clinics were organized to provide a strategic advisory on IP filing process and to provide a solution based approach on complex IP & Technology Transfer matters. The grantees were also informed on BIRAC-PATH scheme available for BIRAC grantees to provide the financial aid for Patenting and Technology Transfer emerging out from the BIRAC supported projects.



IP Law Clinic in association with IKP & BioNEST-UoH at University of Hyderabad



IP Law Clinic in association with FITT, Delhi at BIRAC Office, Delhi

BIRAC Awareness Workshop on Intellectual Property & Technology Management in Life Sciences

BIRAC organized a one day workshop on “Intellectual Property & Technology Management in Life Sciences” in association with IKP & BioNEST-UoH, Hyderabad on 14th February, 2019. The workshop was designed for the Start-ups, Academia, Post-Docs and SMEs to apprise on the importance of Intellectual Property, Technology Transfer and Commercialization. The workshop also included sessions on regulatory requirements for medical devices and on utilization of Indian biological resources in the research.

The workshop was well represented by about 50 participants from academic institutes, medical colleges, Start-ups and aspiring entrepreneurs engaged in life science sector. The workshop was focused on imparting the knowledge on Intellectual Property (IP) and Technology Management. Sessions were broadly divided into the two segments namely IP & Technology Management and Regulatory requirements related to the Medical device & diagnostics and utilization of Biological resources.

Dr. Sudhakar Bangera apprised the participants about the forms and approval process required for medical devices and Dr. Malathi Lakshmikumar highlighted the importance of obtaining approvals while utilizing the Indian biological material for carrying out research and commercialization. Session on IP & Technology Management covered the strategies to be considered by Start-ups while filing patent applications, importance of Patent Analytics while making strategic decisions on patent filing and commercialization. Dr. Malathi Lakshmikumar gave an overview of different types of patent searches and emphasized the importance of conducting Freedom-To-Operate (FTO) search and its analysis. FTO search and analysis was further explained by highlighting the examples from Medical devices and bio-similar area.

In the afternoon session, Dr. Shirshendu Mukherjee, Mission Director PMU at BIRAC delivered a talk on technology transfer and commercialization process and its importance in the Technology Management. Dr. Vinita Jindal, Senior Manager, IP&TT, BIRAC informed the participants on strategic filing of national and international patent applications and decision making process on filing.

All the sessions were very interactive and several queries were raised by the participants. In the end, participants mentioned that the workshop was very useful, informative and sessions were very engaging.



Participants and Speaker at the Workshop

BioAsia 2019: “Life Sciences 4.0 – Disrupt the Disruption”

With the intent to strengthen a robust ecosystem for Life Sciences, Biotech and Healthcare enterprises, Telangana State Governor Mr. E. S. L. Narasimhan inaugurated the three-day 16th Edition BioAsia 2019 – Asia’s largest biotechnology and life-sciences forum bearing the theme “Life Sciences 4.0 – Disrupt the Disruption”. BioAsia 2019 was held from 25th to 27th February, 2019 at HICC, Hyderabad. The event over the years has emerged as the most pre-eminent technology and bio-business convention in Asia for life sciences, pharmaceuticals and healthcare. This year there was participation of more than 1,700 delegates from industry, governmental authorities, academia and Start-ups representing over 50 countries with around 100 high-profile speakers and 700 corporates.

BIRAC was represented by 5 officials at BioAsia 2019 who engaged in various forums such as Panel Session, International Exhibition & Start-up Stage platform.

On 26th February, Dr. Manish Diwan, Head-SPED, BIRAC participated in a panel discussion ‘Can India match China in the “Bio” race?’ The next day, BioAsia organized a BIRAC powered session ‘Life Sciences 4.0: Challenges and strategic opportunities for healthcare in India’ Chaired by Dr. Renu Swarup, Secretary DBT & Chairperson BIRAC. The special Biotech/ Life Sciences Start-up stage was the main feature of the event. The Governor inaugurated the International Exhibition & Start-up stage wherein a huge number of corporates and 75 Start-ups participated. Their products/ technologies focused on providing cutting edge solutions like innovative pharma and bio-tech solutions, remote diagnostic mechanisms, therapeutic innovations, m-health technologies, wearable devices, among others which are instrumental in transforming life sciences and healthcare sectors.



BIRAC representation at BioAsia 2019



Team BIRAC at BioAsia 2019



BIRAC powered session in progress

Many BIRAC supported Start-ups such as Beable Health, Predible, Janitri, Oncosimis, NemoCare, OmniBRx were among the exhibitors in the Start-ups stage. BIRAC stall was strategically placed in the prominent location at Start-up stage which saw a range of visitors from universities, institutions, companies, students etc. A large number of participants showed interest in various BIRAC schemes.

The event concluded with a valedictory session where Top Five Start-ups were presented “BIRAC Start-ups Awards” sponsored by BIRAC. These Start-ups were selected among the pool of Start-ups present at Start-up stage at BioAsia. These Start-ups received a cash prize of INR 25,000 awarded by Mr. Kris Gopalakrishnan (Chairman Axilor Ventures) and Mr. Jayesh Ranjan, Principal Secretary to the Government, Government of Telangana.

Top Five Starts-ups were:

- Caredose – A med tech venture that uses proprietary technology and inventive packaging to track and ensure real time medicine non-adherence in patient.
- Spectral Insights – A digital pathology company which offers an end to end solution for their customers to adopt Digital transformation from traditional microscopy.
- Dozee – Monitors the sleep, heartbeat, respiration and notification on mobile. It’s a thin sensor sheet which once placed below the mattress tracks users’ heart, respiration, sleep cycle and stress levels, while all one has to do is sleep.
- Ekistics Solutions – Ekistics’ product AuRA (Autologous Reconstruction of Aortic Valve) is a cloud-based technology innovation for recreating the native aortic valve by using patient’s own tissue. AuRA intends to provide an easily reproducible, economical and customisable solution to address inherent shortcomings of prevalent prosthetic solutions.
- Azooka Life Sciences – Helps in staining DNA with the help of a plant based dye that can be conveniently used during life sciences research. Azooka Life sciences offers scientists working on the forefront of research with safe, sensitive, and fast Nucleic Acid Gel Stains, PCR Mastermixes and live cell imaging stains as an alternative to Carcinogenic and Mutagenic dyes.

Grand Challenges India



Launch of the Food based nutritional security for malnourished rural households through capacity building and establishment of nutri-gardens'' program at the M S Swaminathan Research Foundation under the Grand

The Inception Meeting for the project on 'Food based nutritional security for malnourished rural households through capacity building and establishment of nutri-gardens' program being implemented by the MS Swaminathan Research Foundation a specialized initiative under the Grand Challenges India program was held on 23rd January 2019 at IGNOU Hall, at the MSSRF Headquarters in Chennai.

The meeting was attended by the representatives from Krishi Vigyan Kendras from the four zones involved in the program and State Agriculture Universities. Dr. Shirshendu Mukherjee, Mission-Director,

PMU-BIRAC and Ms. Arshi Mehboob, Manager (Programmes), also attended the meeting.

The meeting commenced with a highlight of efforts by MSSRF on Food and Nutrition security for the last 3 decades and followed by brief introduction of the project by Dr. N. Anil Kumar, Executive Director, MSSRF.

Prof. M. S. Swaminathan, in his address spoke about the Indian food current scenario, on how food and nutrition deficiency impacts the cognitive capacity of the school children. He stressed on the importance to address not only protein and calorie deficiencies but that micronutrient deficiencies along with sanitation and Primary Health facilities are important components that should be integrated as interventions to address the problem in totality.

Dr. Purvi Mehta, Head—Asia, Agriculture at the Bill & Melinda Gates Foundation, India Country Office opined that the country has been focussing on enhancing the productivity of staple food and it's time to focus on the nutritional perspective of both the staple food like rice/ wheat/ tubers and to widen the varietal diversity in our diets.

She stressed on three aspects of scalability, monitoring and evaluation and diversification angle, to develop a consortia of partners through ICAR and learn from each centre challenges. She also emphasized the need for diversifying the crop/ varieties along with the livestock system to achieve a complete food based approach to eradicate hidden hunger and malnutrition.

Dr. Renu Swarup, Secretary DBT, joined the meeting through skype and opined about, how the programme will address the SDGs, where already the Poshan Abhiyan programme is being implemented to address malnutrition. She emphasised that scientific outcomes and learnings from the programme especially the technical concepts should feed into the Poshan Abhiyan and the other nutrition related programmes of the country.

She also stressed on the development of baseline data of nutrition status of focussed districts, develop project implementation plan and framework based on the baseline with measurable indicators and plans for mid-term evaluation and course corrections through capacity building. She requested Prof. M.S. Swaminathan's guidance for the project on a regular basis.



The project team with Dr. M S Swaminathan, Dr. Shirshendu Mukherjee and Dr. Purvi Mehta, at the launch of the program.

Dr. N. Kumar, Vice Chancellor, TNAU highlighted the nutrition value of TNAU released improved varieties of millets with high nutrition content in Samai and the culm of which can be used as a fodder. and its inclusion in the garden.

The PMU-BIRAC team (Dr. Shirshendu Mukherjee and Ms. Arshi Mehboob) stressed that the baseline data on nutrition for the focussed districts can be derived from two data Dash boards maintained by NIN (i) Poshan Abhiyan (ii) CAS/Tata Innovation dash boards. It was also decided to set up a steering committee with Dr. Renu Swarup, Dr. Purvi Mehta, Dr. Mohapatra, Secretary, ICAR to take up the programme on a National Mission mode.

Dr. G. N. Hariharan made a presentation on the brief background, till date progress of project and future plan of action on this programme.

Grand Challenges Exploration -India

Under Grand Challenges India (GCI) umbrella, Grand Challenges Exploration (GCE)-India is one of the unique initiatives that identify health care innovation that will enable the goal of equitable health care. 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. This initiative has been launched in an effort to develop a sustainable mechanism for funding health and development innovations in the exploratory domain of India. The initiative seeks to validate ideas from talented and motivated individuals that lend themselves to be incubated in start-ups across India with the aim to encourage entrepreneurship.

GCE- India follows the model of the Global Grand Challenges Explorations that are run by the Bill & Melinda Gates Foundation.

The grantees selected under this program are provided funding for a period of 18 months to test their idea and generate initial evidence. In view of the program mandate, the calls for application require only a two-page proposal on the basis of which ideas are chosen. The ultimate goal is the quest for new medical technology devices, drug delivery systems, diagnostics, and technology enabled service models that can potentially be made available to people from all socio-economic strata.

The program is targeted at identifying high-risk and truly out-of-the-box ideas, and supporting them with seed funding to generate preliminary data. A successful project for GCE-India is one that is a truly novel idea, supported by good scientific principles, aimed at one of the challenges which during the course of 18 months generates enough good data to be funded through other GCI or partner programs, or indeed by any funder.

Since, inception four calls have been launched under this program which so far have supported 20 innovative ideas.

The GCE-India mandates across these 4 four calls have only two commonalities; that there are multiple mandates in every call and that each mandate is relevant to the Indian context and the research needs of the country. The mandates span maternal and child health, mental health, communicable diseases, mental health, Water, sanitation and hygiene (WASH), among many others. The mandates also change to reflect the learnings and contexts from research in the country.

The supported projects are mainly focused at developing point -of-care diagnostics (PoC) test or kit for antimicrobial resistance (AMR), tuberculosis (TB), malaria and HIV diagnostics: to make way for better infection control.

As improvement in maternal, newborn, and child health (MNCH) is an important public health goal that dictates the health for next generation and aids in prognosticating future public health challenges, a few of the supported projects are seeking low-cost imaging modalities/tools for prognosis and predicting fetal distress, and biomarkers to predict asphyxia and sepsis among new born. One of the projects is also aimed at developing tool that will equip mental health care professional with a support system to assess the onset of stress and depression. The scope of another proposed study is to develop a nutrition specific intervention, loaded in the form of a lotion to tackle iron and vitamin deficient anaemia.

Considering cancer as a major health concern one of the projects has proposed high-throughput and low-cost test for diagnosing head and neck cancer, while another intends to develop novel alloplastic neo-bladder for replacement of bladder in patients with bladder cancer.

The GCE-India team ensures that besides granting funding assistance, the investigators also receive access to technical and regulatory advisors

along with network of market entry/business development professionals to refine the solutions proposed by investigators. The programs also seek to encourage innovative ideas that are backed by good R & D processes by removing the risk of financial failure, furthermore as the project funded are in a nascent stage, they may not merit debt/equity funding.

Project Focus:

All Children Thriving program

The program intends to investigate novel cost-effective measurement tools and mechanisms to combat unhealthy birth, growth and development and investigate novel cost-effective measurement tools and mechanisms to combat unhealthy birth, growth and development. The overall goal of the program is to ensure that not only all children survive, but also remain on the trajectory of healthy and productive lives and try to adequately alleviate the burden of birth defects, adverse pregnancy, outcomes and developmental disabilities in children.

Seven projects have been supported under this initiative and each of them projects is aimed at exploring a unique element of the problem with special emphasis on innovative, impactful research on maternal and child health and development.

Of the funded projects, the Linear Growth Study, is a full grant and is a unique study that aims at understanding the factors that have an impact on the growth of infants in the critical period after their birth. The study design is such that it examines the impact of four different and distinct factors, through four intervention packages, on the growth of infants. The power of this study comes from the fact that the infants and their mothers are tracked starting from peri-conception or before conception right upto the time that they are two years of age. This study will generate a wealth of data and information and will help guide policy to

The Linear Growth Study is being implemented by Society of Applied Studies (SAS), New Delhi. The study is unique because of its innovative design and delivery mechanism that has evolved after extensive formative research that has been conducted under the guidance of several experts.

The project aims to achieve optimal growth and development in infants and children living in low resource settings in India, through integrated delivery of a package of evidence-based interventions endorsed in our national programs and by the WHO.

The study is an individually randomised, factorial design trial. The aim of the study is to understand the effect of promoting several strategies which include interventions to improve nutrition, water, sanitation, hygiene, care, and referral for treatment of illnesses together on growth and mental development of young children in this population. Hence, the study will enable a cohort of reproductive age women to enter pregnancy after they are 18 years old, nutritionally replete, with appropriate birth spacing, free from anemia, sexually transmitted infections and wasting, and in an environment with improved water, sanitation and hygiene conditions to reduce the risk of infections in the first trimester of pregnancy. The integrated package of interventions will be given to women before and during pregnancy, and to mothers and children after childbirth, through home-based engagement. The team will be then examining the effect of these interventions on the intended population. Additionally, this study will be examining whether maternal short stature limits the effect of the integrated package of interventions on child growth and to what extent.

The study plans to enrol 12,500 married women aged 18 to 30 years with no child or one child and who want another child and consent for participation. Eligible women are identified through door-to-door survey and randomized to pre- and peri-conception or control (standard care) group is done through computer-based allocation.

The women enrolled in the intervention group are visited for delivery of health and nutrition interventions. Women with severe anemia, diabetes, hypertension, hypothyroidism, suspected tuberculosis, syphilis and symptoms of STI/RTI, epilepsy and severe undernutrition are sent to referral hospital (Safdarjung Hospital) and followed up.

The Nutrition, WASH and Care team provide interventions for anemia prophylaxis, mild to moderate anemia management, multiple micronutrients for all women and snacks and egg/milk for undernourished women. The team also provides interventions related to promotion of positive thinking and problem-solving skills and counselling on menstrual hygiene, personal hygiene and hand washing.

The delivery approach involves local women to provide peer support to study women in addition to existing cadres of health workers that will be used throughout the intervention period. A team of community workers visits women weekly to promote compliance to the interventions being delivered.

Pregnant women are visited by the Pregnancy Team workers to deliver interventions pertaining to nutrition, water, sanitation and hygiene (WASH) and, care and support practices. Antenatal visits are conducted at the outreach clinic or in Safdarjung Hospital.

Strategic importance with reference to policies and programmes in India

In addition to informing-whether intergenerational effect can be altered through delivery of integrated package of interventions in short mothers, the study implications may be pertinent from a policy perspective specially in context of the recently launched Program for young Children. The study is a great opportunity to learn as there are a lot of hidden learnings that could aid in determining future of health systems in India. Furthermore, the evidence drawn from the study could also feed form the basis of ideas for National Nutrition Mission (NNM) in India. It is anticipated that data generated from this trial will provide an excellent opportunity to work with knowledge Integration (ki) – group for data modelling and algorithms to come out with casual factors or other mechanistic pathways.

Improving Linear Growth in Infants from Low Resource Setting in India (IMPRINT)

The Nutrition Intervention Trial for Improving Linear Growth in Infants from Low Resource Setting in India; supplementing lactating mothers (IMPRINT trial) is concurrently doing two sub-studies: (i) the first sub-study aims to promote nutritional adequacy of lactating mothers through use of nutrition supplement(s) and assess its impact on linear growth in the first 6 months after birth (ii) the second sub-study will address the effect of nutrition supplement(s) supplementing infants aged 6-12 months with milk-cereal mix containing varying amount of protein and high-quality protein, together with adequate energy and micronutrients, for 6-12-month-old infants on their linear growth.

Both the sub-studies are being implemented in parallel, on the principle of maternal lactation that together will test approaches that will form an overall strategy to achieve accelerated linear growth during infancy. This trial is very critical to provide specific answers to nutritional interventions that would be most efficient and suitable for mothers and children with the intent to use the findings of these two studies in the ongoing linear Growth study (LGS).

The time frame for completion of these sub-studies is two years. The issues being addressed may be pertinent for future policy intervention, as on date there is no nutritional intervention for lactating mothers as per National guidelines.



Biotechnology Industry Research Assistance Council

(A Govt. of India Enterprise)

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BIRAC provides support for establishment of
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BioNEST has supported

41 Bioincubators

300+ startups

4,50,000 sqft of incubation space

Who can apply

New Incubation Centers
including Tier II and III cities
or Existing incubators

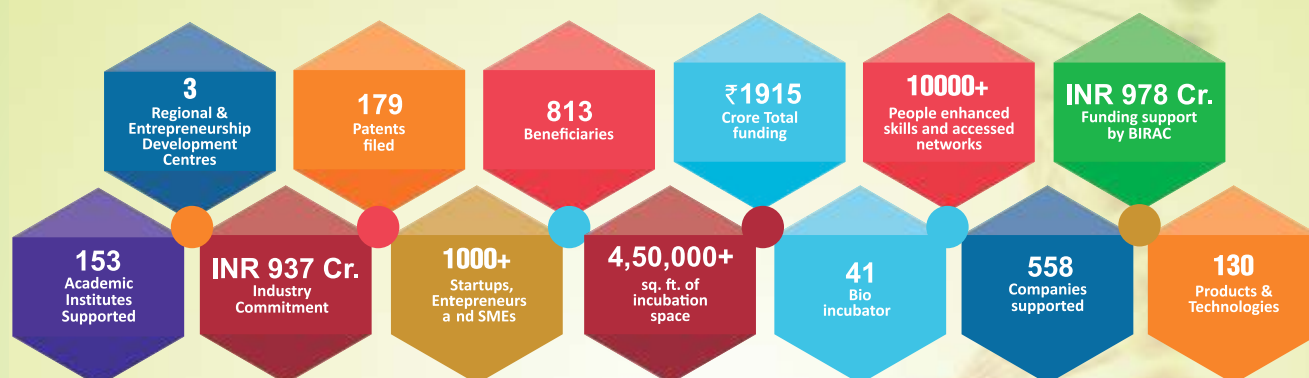


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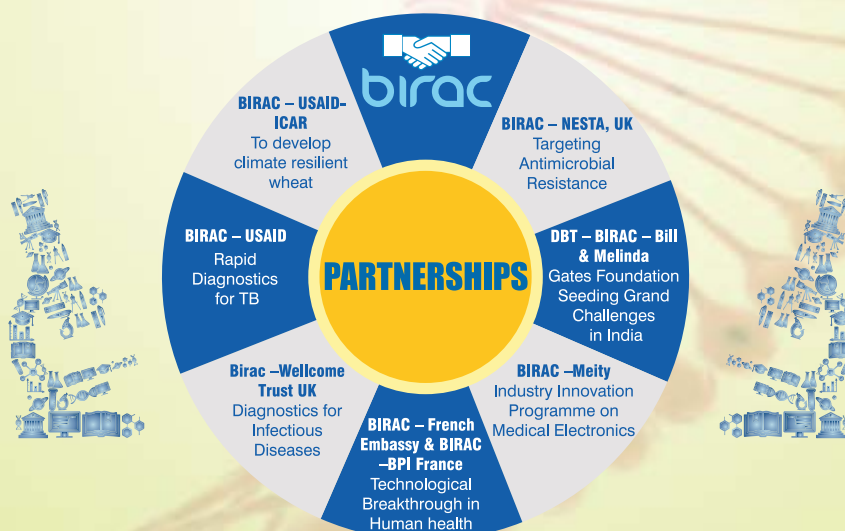
to foster Innovation and Entrepreneurship in Biotechnology

For programme details please visit <http://www.birac.nic.in/bionest.php>
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BIRAC IMPACT



Aligning Partnerships for National & Global Impact



Partnerships For Networks, Platforms & Market Access

WISH – BIRAC – Lords Education and Health Society (LEHS), Through its WISH Initiative : Scaling Innovations through Testing Beds

BIRAC – Business Finland : Enhancing Competitiveness

BIRAC – TISS - (Tata Institute of Social Sciences) : Mentoring innovators and Assessing impact

BIRAC – ICMR (Indian Council of Medical Research) :

BIRAC AcE Fund Partners : Funding Oxygen for the Next Level

BIRAC – TIE (The Indus Entrepreneurs) : Platform for Global Networking

BioCubaFarma : Transfer of technologies and commercialization of innovative healthcare products

BIRAC – ALEAP, BIRAC – TIE : Promote Women Entrepreneurship

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