BIRAC Innovators Meet 2015

Invigorating the Biotech Innovation Ecosystem

BIRAC organized its 4th Innovators Meet at Heritage Village, Manesar, Gurgaon, on 15th-16th September 2015. The theme of the meet was ***Invigorating the Biotech Innovation Ecosystem*** and it was attended by over 250 delegates from Government, academia, industry, start-ups and budding entrepreneurs.

The inaugural session started with the welcome address by Dr. Renu Swarup, Senior Adviser, DBT and MD, BIRAC. Her talk set the context of the meet and outlined the role of BIRAC in creating and catalysing the biotech innovation ecosystem across the nation and highlighted the nurturing environment that BIRAC provides.

Dr. Renu Swarup, Senior Adviser, DBT and MD, BIRAC

Prof. K. VijayRaghavan, Secretary DBT & Chairman BIRAC, gave the Inaugural Address highlighting the broad contours of an innovation ecosystem and the evolution of the Indian biotech ecosystem in the country that is increasingly becoming vibrant as new start-ups are taking shape. Further, he highlighted several other changes that are taking shape such as establishment of 'makerspace' in India for new medtech startups to design and develop prototypes as well as shared workspaces. He pointed out that new culture of doing innovations need to be established and the gap between startups, industry and academia need to be bridged through a partnership mode. He emphasized innovations should aim at solving societal problems that are both national and global in nature.

Prof. K. VijayRaghavan, Secretary DBT & Chairman BIRAC

The Keynote Lecture was given by Dr. M.K. Bhan, Former Secretary, DBT & Former Chairman, BIRAC. Dr. Bhan spoke about the maturing of the global biotechnology domain as it connects to other innovation domains. He emphasised that the Indian biotechnology ecosystem has now grown beyond the nascent stage and its amplification would need inspired strategy that takes into account the needs for all stakeholders especially those of young entrepreneurs and innovators.

The inaugural session was followed by announcement of the prestigious ***BIRAC Innovator Awards***. The awards were presented to 4 innovative companies for exemplary innovation in the field of Biotechnology:

- BIRAC Innovator Award in **Agriculture** was awarded to **Mother Dairy Fruit & Vegetable Pvt. Ltd.,** Noida, in recognition of their significant contribution to innovative research *Towards the development of genetically engineered Brassica juncea for heterosis breeding and yield improvement*

- BIRAC Innovator Award in **Healthcare** was awarded to **NovaLead Pharma Pvt. Ltd.,** Pune, in recognition of their significant contribution to innovative research *Towards development of a generic cardiac drug "Galnobax" for potential treatment of Diabetic foot ulcers*

- BIRAC Innovator Award in **Healthcare** was awarded to **Shantani Proteome Analytics Pvt. Ltd.,** Pune in recognition of their significant contribution to innovative research *towards development of a technology platform that captures and identifies specific protein targets of the bioactive compounds in sub-cellular location and thus, contributes to drug discovery efforts.*

- BIRAC Innovator Award in **Industrial Biotechnology** was awarded to **Varuna Biocell Pvt. Ltd.** Varanasi, in recognition of their significant contribution to innovative research *towards Indigenous production of dextranase using Solid State Fermentation (SSF) technique*

In addition to *Innovator Awards*, the **Grand Challenges India** Grants – for the *All Children Thriving* Call, which is a collaborative initiative of DBT, Bill & Melinda Gates Foundation and BIRAC – were officially announced and the recipients were:

- **Society for Applied Studies, New Delhi** for the project entitled *"Improving linear growth of children in low income settings through household supported integrated nutritional, environmental WASH and care interventions in pregnancy and early childhood a randomized controlled trial to achieve the maximum growth potential"*
- **SRM Institute for Medical Science, Chennai** in collaboration with **Flinders University of South Australia and South Australian Health and Medical Research Institute** for the project entitled *"An intergenerational prebiotic approach to establishment of a healthy colonic micro biome in infants"*
- **Centre for Plant Molecular Biology and Biotechnology, Coimbatore** In collaboration with **Home Science College and Research Institute, Madurai and University of California Davis, California, USA** for the project entitled *"Enhancing nutritional security of pregnant women, infants and young children in rural households of Tamil Nadu, India through agricultural intervention"*
- **Translational Health Science and Technology Institute, Faridabad** for the project entitled *"The humble absolute neutrophil count as a measure of mucosal inflammation and as a predictor of linear growth in Indian infants"*
- **National Institute of Biomedical Genomics, Kalyani, West Bengal** In collaboration with **Regional Centre for Biotechnology, Faridabad and Translational Health Science and Technology Institute, Faridabad** for the project entitled *"Stress outcomes on pregnancy, fetal growth and birth weight Development of methods to identify mothers at risk of preterm birth and intrauterine growth restriction resulting from maternal stress"*
- **Mahatma Gandhi Institute of Medical Sciences, Wardha, Maharashtra** in collaboration with ***Kings College, London and Mamta Health Institute for Mother and Child*** for the project entitled *"Low-cost salivary progesterone testing for detecting the risk of preterm births in rural community settings of India"*
- **Translational Health Science and Technology Institute, Faridabad** for the project entitled *"Creation of a Biorepository and Imaging Data Bank for Accelerating Evidence Generation to Facilitate Children to Thrive"*

The awards distribution was followed by unveiling of BIRAC publications – BIRAC Innovators Compendium 2015, BIRAC Resource Facilities report, and 1st BIG report, by Prof. K. VijayRaghavan, Prof. G Padmanaban, Dr. M.K. Bhan and Dr. Renu Swarup.

Post that, the BIRAC Innovator Awardees made presentation about their cutting edge innovations and presented their results and journey to inspire the audience through their success stories.

The first panel discussion entitled **"Building and Scaling Biotech Innovation Ecosystem – Brick by Brick"** was led and moderated by Dr. Renu Swarup. Dr. Swarup emphasised on the role of innovation ecosystem for sustenance of ideas and importance of hand holding and mentoring for growth of these ideas to a final product. The forces and factors involved in building and nurturing an ecosystem were discussed. The panel members were Prof. Anil K. Gupta, IIM Ahmedabad; Mr. David Gill, MD, St. John's Innovation Centre, Cambridge; Dr. C.B. Sanjeevi, Professor, Department of Medicine, Karolinska Institutet; Ms. Deepanwita Chattopadhayay, Chairman & CEO, IKP Knowledge Park; and Mr. Sharad Sharma Co-founder and Governing Council Member, iSPIRT Foundation.

Prof. Anil Gupta's opening talk focused on the urgent steps that need to be taken in providing further boost of the emerging innovation ecosystems across several geographies in India. He highlighted that the emerging ecosystems in India should aim in partnering with other global ecosystems and we should aim in empowering the innovators who lie at the core of any innovation driven hub. Dr. David Gill's talk gave an in depth view of the organic growth of

Cambridge ecosystem over the last few decades and his talk showcased how several dynamic platforms and networks that encourage innovations have helped in creation of the Çambridge Phenemenon, resulting in biggest innovation hub in Europe with 1500 technology firms in Cambridge and its vicinity. His talk also highlighted the seminal role of the University and its interface with other building blocks of innovation ecosystem – banks, funding agencies and mentors. The talk by Dr. Carani Sanjeevi described about the entrepreneurial culture of Karolinska Institutet where the role of hospital and its research wing played a central role in orchestrating a culture of innovation through open communication channels among its stakeholders. The next speaker Ms. Deepanwita Chattopadhayay provided a perspective on the evolution of hubs in Hyderabad and Bangalore and highlighted the existing gaps which need to be bridged. The final talk was given by Mr. Sharad Sharma. He provided a broader view of the changing Indian dimensions in innovations especially the role being played by policymakers and organisations such as iSPIRIT in trying to move the centre of gravity of innovation from a service orientation towards a product nation.

Panel Discussion: Building and Scaling Biotech Innovation Ecosystem – Brick by Brick

The follow-on sessions were planned on focussed parallel discussions in Healthcare, Agriculture and Clean Energy domains.

Panel I – Healthcare: Strategies for addressing Antimicrobial Resistance (AMR) issues in India

Lead Presenter & Moderator: Dr. TS Balganesh, CSIR Centre for Mathematical Modelling and Computer Simulation

Panel Members: Prof. Ramanan Laxminarayan, PHFI; Dr. Ajith Kamath, Pfizer; Dr. Kamini Walia, ICMR and Dr. Anand Anandkumar, Bugworks

AMR is increasingly becoming important public health issue as the number of infectious diseases that are showing resistance to current regimes of antimicrobial treatment, are growing. The Panel discussion focused on urgent attention across a gamut of issues – starting from new R&D for antimicrobial agents, to behavioural change in adherence during antimicrobial treatment and measures that improve public health and understanding. The recommendations were:

1. Innovative ideas should be tested and adopted to address infection control in nosocomial settings.
2. More stress on the Vaccine development and usage so as to reduce the use of antibiotics.
3. Challenge calls on devices & diagnostics, drug discovery, ancient Ayurveda or natural products usage, software or Apps, ICU devices to address AMR issues.
4. Policy discussions to be conducted between ICMR, Industries, PHFI, MCI for parliamentary act on regulating the OTC sales of antibiotics at pharmacies, as today India has become the largest consumer of Antibiotics.
5. Stewardship practices have been found to be effective in reducing the AMR related issues hence strategies should be introduced to adopt these practices.
6. Initiative to be taken in the Agriculture and Poultry industries to address the AMR related problems. Antibiotic stewardship program and policy introduction in veterinary area is a necessity as antibiotic usage is almost twice for animals as compared to humans.
7. Identification of the relevant ICT technologies required for monitoring the Surveillance data for antibiotic resistance and big data analysis of surveillance programs.
8. More awareness to the Society, may help in overcoming AMR related issues.

Panel Discussion - Healthcare: Strategies for addressing Antimicrobial Resistance (AMR) issues in India

Panel II – Agriculture Electronics*: *Opportunities in agriculture electronics: revolutionising productivity and quality

Lead Presenter & Moderator: Dr. David Bergvinson, ICRISAT

Panel Members: Dr. Nabarun Bhattacharyya, C-DAC; Prof. Narendra Ahuja, Information Technology Research Academy; Mr. Ragunathan Kannan, Sathguru Management Consultants

Precision farming, through agricultural electronics' is a rapidly growing area which perhaps will impact agricultural productivity. The Panel intended to find probable answers for – What are the new technologies driving precision farming? How are they impacting crop management patterns? What are the issues that impact their adoption? What policy issues will impact this field? After elaborate discussion, following recommendations were made by the Panellists:

- Effective steps may be taken towards harnessing strength in IT to cater to the needs of agriculture and environment.
- Under the sustainable developmental goals, development of cloud-enabled geospatial/temporal infrastructure is very crucial for agriculture.
- Development of digital technologies to manage risk and opportunities like Sensors Networks (plants, soils, irrigation, etc.). Digital Soil Maps through smart phone based applications is important for modern agriculture.

- Development of ecosystem of integrated digital services offered through collaboration of public and private sectors and farmers would help in further development in the field of agriculture in India.
- Development of digital feedback loop within agri-supply-chain is essential for leveraging data for more responsive and efficient farming systems.
- There is an urgent requirement of a well-defined policy for making data standards for flow of information in agriculture.
- Development and usage of IT tools for online sale and purchase of agricultural goods should be encouraged.

Panel Discussion - Agriculture Electronics*: *Opportunities in agriculture electronics: revolutionising productivity and quality

Panel III – Healthcare: It's written in the DNA: Integrating Big Data Analytics in Personalized Medicine for Standard Care

Lead Presenter & Moderator: Dr. Ramesh Hariharan, Strand Life Sciences

Panel Members: Dr. Partha P. Majumder, NIBMG; Mr. Sam Santhosh, Medgenome; Dr. Sudeep Gupta, ACTREC; Dr Mithua Ghosh, Triesta Science-HCG

Personalised medicine is gaining traction driven by rapidly evolving technologies such as the Next-Generation Sequencing. The panel was requested to address issues, national & global, that impact making genomics based diagnostics a 'standard of care' for a range of health conditions including cancer. How is the information about mutations helping treatment choice and therapies? What are the issues regarding adoption of personalised medicine by healthcare providers especially clinicians? How do the experts see movement of this sector in India and in the West? What policy issues India should be considering that will affect this field to grow and impact healthcare? The recommendations of the panel were:

- Data Sharing initiation should be taken up so that the whole nation gets the benefit by accessing the sequencing data
- Speed up the gene therapy editing trials which are currently at slow pace
- Cancer patients need to be sequenced to analyze the clinical exome and whole genome which would lead to discovery of biomarkers
- Strong collaboration needs to be encouraged between academic institutions, industries and hospitals
- Government should provide subsidies and reduce the custom duties on reagents, machines, diagnostic kits, etc.

Panel Discussion - Healthcare: It's written in the DNA: Integrating Big Data Analytics in Personalized Medicine for Standard Care

***Panel IV – Clean Energy*: Biotech Solutions for Swachh Bharat-Way Towards Clean Energy**

Lead Presenter & Moderator: Dr. R.R. Sonde, Thermax

Panel Members: Prof. V.S. Chary, Administrative Staff College of India (ASCI); Mr. Dinesh Bindinganavale, Pradin Technologies Pvt Ltd; Mr. Mainak Chakraborty, GPS Renewables; Dr. Vishwanath Dalvi, ICT

India, with a growing population pressure in urban and rural areas, has to urgently deal with issues of waste management such that we can aim for a clean environment that will impact health and economy. This panel aimed at discussing what are the current issues and new technologies impacting waste to energy conversions? How can we sustainably integrate the solution(s) in an urban or a rural context? What policy changes need to be made for clean energy and a Swachh Bharat? The Panellists recommended for:

- Biotechnological solutions needed for all kinds of wastes (MSW, Sewage from human waste, industrial waste, agricultural waste and plastic and e-waste)
- BIRAC should focus on getting projects on gaseous fermentation
- Integrated processes like coupling biochemical with chemical may become quite effective
- Technologies focussing on fuel cells, conversion of synthesis gas to other biomolecules and converting methane to liquid form should be encouraged and supported
- Human resources should be attracted to work towards finding waste management solutions

Panel Discussion - Clean Energy: Biotech Solutions for Swachh Bharat-Way Towards Clean Energy

Poster Session

A poster presentation was organized wherein BIRAC innovators presented their projects. The poster session had 27 participants. The evaluating Jury adjudged three participants as the best – Coeo Labs, Bangalore; Rope Production Centre, Madurai; and Geo Biotechnologies Pvt Ltd., Bangalore. Appreciation awards were also endowed to three innovators namely - Dr. Vivekanandan Perumal; Alfa Corpuscles Pvt Ltd; and India Gylcols Ltd.

The Poster session was followed by **BIRAC Huddle –** an informal get-together of innovators with senior stakeholders of the innovation ecosystem in India**,** whereby the innovators got the opportunity to discuss their concerns about the growth of the Biotech innovation ecosystem and also put forward suggestions to address those concerns and challenges.

BIRAC Huddle

The second day started with welcome note by Dr. Renu Swarup and introductory remarks by Prof. K. VijayRaghavan. **Dr. R.A. Mashelkar, Chancellor, AcSIR & National Research Professor, National Chemical Laboratory** was the esteemed guest of the meet. He gave his Plenary Talk entitled *'Building India as an Innovation Nation'*. Dr. Mashelkar's talk was illuminating and inspiring for the audiences present. Dr. Mashelkar emphasised on the importance of patenting the research prior to publishing. He connected the power of patenting with prosperity. He also emphasised that India as a country need to identify the potential present with Indian Labs and urged to utilise this research for developing innovative indigenous solutions. Dr. Mashelkar suggested that knowledge created using funds should be channelized to create revenues. The enlightening talk by Dr. Mashelkar urged the scientific community to find innovative solutions through Indian science and technology which can make global impact.

Dr. R.A. Mashelkar at the Meet

Dr. Mashelkar delivering the talk on "Building India as an Innovation Nation"

Interaction with Mentors: Presentation by BIRAC Innovators

The innovators meet provided an opportunity to BIRAC suported innovators to pitch their innovation to a panel comprising of eminent scientists, angel investors and venture capitalists.

Post the pitching session, the panel mentors provided brief comments for all the innovators. Prof. G. Padmanaban, INSA Senior Scientist emphasised on the lack of availability of venture funds for start-ups. He suggested inclusion of physicists, engineers and varied professional in the process of innovation. Mr. Nitin Deshmukh of Kotak Private Equity suggested the innovators to look for long terms investors. He suggested BIRAC to collaborate with Venture Capitalists as a second phase of support. Mr. Siraj Dhanani from InnAccel mentioned the Israel model of start-up and suggested that procurement of devices and technologies should proactively witness participation from public enterprises and government. Such efforts would assure the venture capitalist faith in the innovation and will easily attract venture funds for technologies.

Mr. P.R. Ganapathy, Villgro Foundation and Dr. Shirshendu Mukherjee, Wellcome Trust urged the innovators to assemble cross functionality in their teams from the very beginning and involve clinicians, manufacturers, distributors and scientists in the process of innovation.

Innovator Pitching to the Mentors

The Mentors Panel

The BIRAC fraternity

Annexure I

BIRAC Innovators Meet 2015
Invigorating the Biotech Innovation Ecosystem
15th – 16th September, 2015
Heritage Village, Manesar

Programme

Day I: 15th September, 2015

09:00am –10:30am: **Registration**

10:30am-01:00pm**:** **Inaugural Session**
Welcome Address and about the theme by Dr. Renu Swarup, Senior Adviser, DBT and MD, BIRAC
Keynote Lecture: Dr. M.K. Bhan, Former Secretary, DBT & Former Chairman, BIRAC
Inaugural Address: Prof. K. VijayRaghavan, Secretary, DBT & Chairman, BIRAC
BIRAC Innovator Awards and Presentation by BIRAC Innovator Awardees

01:00pm-02:00pm: Lunch

02:00pm-03:30pm: **Panel: Building and Scaling Biotech Innovation Ecosystem- Brick by Brick**

BIRAC is focused on building a biotech innovation ecosystem in India. Different innovation hubs are taking shape in India, be it in Bangalore, Pune, Hyderabad, Delhi-NCR or Bhubaneswar. Nurturing and building an ecosystem in any innovation hub involves different sets of forces and factors. How have innovation hubs evolved? What are the ingredients that that help in the growth of innovation hubs and are the same ingredients required for sustaining and maintaining innovation hubs? What are the risks of them decaying? These are some of the issues that the speakers would address.

Moderator: Dr. Renu Swarup, Senior Adviser, DBT & MD, BIRAC
Prof. Anil K. Gupta, IIM Ahmedabad
Mr. David Gill, MD, St. John's Innovation Centre, Cambridge
Dr. C.B. Sanjeevi, Professor, Department of Medicine, Karolinska Institutet
Ms. Deepanwita Chattopadhayay, Chairman & CEO, IKP Knowledge Park
Mr. Sharad Sharma, Co-Founder, iSPIRT

03:30pm-04:00pm: Tea

04:00pm- 06:00pm: **Parallel Focused Tracks (Healthcare, Agriculture & Clean Energy)**

Panel Discussions Tracks	Healthcare	Agriculture Electronics & Clean Energy
04:00pm-05:00pm	**Strategies for addressing Antimicrobial Resistance (AMR) issues in India** AMR is increasingly becoming important public health issue as the number of infectious diseases that are showing resistance to current regimes of antimicrobial treatment, are growing. This needs urgent attention across a gamut of issues – starting from new R&D for antimicrobial agents, to behavioural change in adherence during antimicrobial treatment and measures that improve public health and understanding. **Lead Presenter & Moderator**: Dr. TS Balganesh, CSIR Centre for Mathematical Modelling and Computer Simulation **Panellists:** Prof. Ramanan Laxminarayan, PHFI Dr. Ajith Kamath, Pfizer Dr. Kamini Walia, ICMR Dr. Anand Anandkumar, Bugworks	**Opportunities in Agriculture Electronics: Revolutionising Productivity & Quality** Precision farming, through agricultural electronics' is a rapidly growing area which perhaps will impact agricultural productivity. What are the new technologies driving precision farming? How are they impacting crop management patterns? What are the issues that impact their adoption? What policy issues will impact this field? **Lead Presenter & Moderator**: Dr. David Bergvinson, ICRISAT **Panellists:** Dr. Nabarun Bhattacharyya, C-DAC Prof. Narendra Ahuja, Information Technology Research Academy Mr. Ragunathan Kannan, Sathguru Management Consultants
05:00pm-06:00pm	**It's written in the DNA: Integrating Big Data Analytics in Personalised Medicine for Standard Care** Personalised medicine is gaining traction driven by rapidly evolving technologies such as the Next-Generation Sequencing. We would like the panel to address issues, national & global, that impact making genomics based diagnostics a 'standard of care' for a range of health conditions including cancer. How is the information about mutations helping treatment choice and therapies? What are the issues regarding adoption of personalised medicine by healthcare providers especially clinicians? How do the experts see movement of this sector in India and in the West? What policy issues India should be considering that will affect this field to grow and impact healthcare? **Lead Presenter & Moderator:** Dr. Ramesh Hariharan, Strand Life Sciences **Panellists:** Dr. Partha P. Majumder, NIBMG	**Biotech solutions for Swachh Bharat - way towards clean energy** India,-with a growing population pressure in urban and rural areas, has to urgently deal with issues of waste management such that we can aim for a clean environment that will impact health and economy. This panel will discuss what are the current issues and new technologies impacting waste to energy conversions? How can we sustainably integrate the solution(s) in an urban or a rural context? What policy changes need to be made for clean energy and a Swachh Bharat? **Lead Presenter & Moderator:** Dr. R.R. Sonde, Thermax **Panellists:** Prof. V.S. Chary, Administrative Staff College of India (ASCI) Mr. Dinesh Bindinganavale, Pradin Technologies Pvt Ltd Mr. Mainak Chakraborty, GPS Renewables Dr. Vishwanath Dalvi, ICT

	Mr. Sam Santhosh, Medgenome Dr. Sudeep Gupta, ACTREC Dr Mithua Ghosh, Triesta Science-HCG	

06:00pm-06:45pm: **Poster Session**

06:45pm-07:45pm: **BIRAC Huddle – Interaction with Prof. K. VijayRaghavan, Secretary, DBT & Chairman, BIRAC**

07:45pm onwards: **Dinner**

Day II: 16th September, 2015

09:30am-10:30am: **BIRAC Plenary Lecture:** ***Building India as an Innovation Nation***

Dr. R.A. Mashelkar, Chancellor, AcSIR & National Research Professor, National Chemical Laboratory

10:30am-11:00am: **Tea**

11:00am- 01:00pm: **Interaction with Mentors: Presentation by BIRAC Innovators**

Followed by Mentors' Panel Discussion
The areas that Mentors will deliberate upon are – the funding scenario for start-ups in India, the optimal strategy for start-ups to seek follow-on funding, how start-ups can refine their business models and importance of mentorship.

Mentors Panel:
Prof. G. Padmanaban, INSA Senior Scientist
Mr. Nitin Deshmukh, Kotak Private Equity
Dr. Shirshendu Mukherjee, Wellcome Trust
Mr. P.R. Ganapathy, Villgro Foundation
Mr. Siraj Dhanani, InnAccel

01:00pm-01:30pm: **Summing Up & Close**

01:30pm Onwards: **Lunch**