



Theme: Catalysing the Growth of an Innovation Driven Biotech Enterprise
Date: 23rd-24th September, 2013

Meeting Report

BIRAC successfully organized its second Innovators Meet on 23rd-24th September 2013 at Heritage Village Resort, Manesar, Haryana. The theme of the Innovators Meet 2013 – ***Catalysing the Growth of an Innovation Driven Biotech Enterprise*** – focused on policy changes and pathways to drive the Indian Bio-economy to reach USD 100 Bn by 2025. More than 200 stakeholders including Policy makers, Industry leaders, Start-ups, Entrepreneurs and Academic researchers attended the meet.

The meet was inaugurated by Prof. K. VijayRaghavan, Secretary DBT & Chairman BIRAC. Dr. Renu Swarup, MD, BIRAC & Advisor, DBT, reflected on BIRAC's journey and provided snapshot of BIRAC's future endeavours. The keynote lecture was given by Prof. G Padmanaban, Senior Scientist and Innovation Advisor to BIRAC. Prof. Padmanaban's talk explored the preparedness of the country to achieve the USD 100 Bn mark and areas of opportunities in the biotechnology that India could leverage upon. To mark this occasion a compendium of BIRAC funded schemes and innovative projects titled "BIRAC innovators – Creating an Impact" was officially released.

The amalgamation of thoughts from Industry and Academia highlighted the issues critical for the growth of Biotechnology in India and the measures to address them. The two day long meet witnessed deliberations on several relevant issues that impinge upon the growth of the biotechnology enterprise such as funding opportunities and gaps for Bio-entrepreneurs and strategies to foster innovation through bio-enterprises. Specifically the discussions were focused on the needs of start-ups and SMEs which will be engines of bio-innovations.

The flagship ***BIRAC Innovators Award*** was awarded to five best innovations by the industry who have delivered cutting edge innovative products. The criteria of selection included the level of innovation, scientific merit and risk factor attached in each of the project. The awardees were –

- Aristogene Biosciences Pvt. Ltd., Bangalore: Agriculture Sector for the development of improved PCR Kits with internal control for shrimp viruses WSSV, YHV, TSV and IHHNV
- Tergene Biotech Pvt. Ltd., Secunderabad: Healthcare Sector for the development of an indigenous India specific 15 valent *pneumococcal* conjugate vaccine
- Vinvish Technologies Pvt. Ltd., Trivandrum: Biomedical Devices, Implants and Diagnostics Sector for the development of an indigenous PDT Lase system
- Thermax Ltd., Pune: Industrial Processes and Green Technology Sector for the development of Anaerobic Membrane Bioreactor (AnMBR) for waste to energy solutions
- Millenium Exports, Chennai: Industrial Processes and Green Technology Sector for the development of pet animal food, fish leather and other marine biotechnology products from fish waste

The Innovators Meet also provided a platform for start-ups to pitch their ideas to the audience and display their innovative projects in the poster session. Out of the fourteen pitches made, two were adjudged as the best pitches – Achira Labs, Bangalore, for Microfluidics-based platform for multiplexed point-of-care immunoassays and Mr. Jayant S. Karve, Fellow, Stanford India Bidesign, for Intraosseous Access Device.

While evaluating the business pitches, the Jury Panel considered the presentation clarity, value proposition, project concept, business plan, stage of product development and ability to address the Jury concerns about the project.

Poster session witnessed the participation of 24 posters, out of which, three were adjudged as best posters

- **Kaveri Seed Co. Ltd.** for *Development of biotic stress resistance rice through conjunct use of Bio- and Hybrid technologies marker-assisted dissection of genetic basis of yield and improving yield potential under drought stress in Maize*
- **Oriental Aquamarine** for *Design modification and commercialization of nitrifying bioreactor technology for the establishment of organic recirculation prawn seed production system (Phase II)*
- **Praj Industries** for *Lignocellulosic Biomass to Ethanol Technology: Simultaneous Saccharification and Fermentation*

The posters were evaluated on – level of innovation related to the project, quality of presentation and progress/outcome of the project.

Industry Delegates got the opportunity to interact with Prof. K. VijayRaghavan, Secretary DBT and Dr. M. K. Bhan, former Secretary, DBT and discuss the policy challenges in the Indian Biotech sector. During the session, discussion focused on –

- Role of DBT/BIRAC for facilitating regulatory aspects in pharma, industrial and food safety sector
- Facilitation of industry-academia interface by BIRAC.
- BIRAC should work with CDSA to help small companies for facilitating preclinical and Phase-I clinical trial and adequate training for clinical trial related activities.
- Flexibility in operating costs of BIG projects.
- Sharing of Review feedback for projects.
- SMEs and start-ups should proactively participate in communicating the industry requirements to the policy makers.

The agenda of the meet was organized so as to deliberate and discuss the issues pertaining to the various facets of Indian biotechnology industry (Agenda of the meet is attached as Annexure). Plenary sessions and focused roundtables were organized in each area of the biotechnology landscape of the country viz. biopharma, bioservices, bioagri, bioindustrial and bioinformatics. These targeted roundtables focused on mapping granular challenges that each of the sector faces and targeted recommendations were provided such that each area of the biotechnology arena could significantly contribute to the goal of USD 100 Bn.

The meet concluded with the recommendations for fostering the innovation in Indian Bio-economy and creating environment conducive for the commercialization of socially relevant and responsive innovations. The list of recommendations is attached below.

Plenary Panel Session I: Catalyzing the growth of an Innovation Driven Biotech Enterprise – Achieving \$100 Billion by 2025: Action Points to move forward

The panel deliberated on specific issues and action required to achieve USD 100 Bn dollar industry by 2025 and create a vibrant bio-economy. The panel experts focused on discussing new avenues in healthcare, agriculture and industrial biotechnology, impact of social innovation in biotechnology for the country, creation of an ecosystem that fosters entrepreneurial mindset in biotechnology and near term and medium term deliverable goals-

action points to move forward. The panel recommendations are:

- The panelist felt that the goal setting of 100 billion dollar is good rallying point
- They discussed the available opportunities, mission oriented support, social needs and impact of process setting and handling scientific controversies.
- The action points derived have been categorized as given below:
 1. Talent:
 - Ideas from smaller regions/remote areas should be promoted
 - Intellect in academia should be translated to industry
 - Science should be treated holistically and its application wherever possible should also be promoted
 2. Enterprise:
 - Existing universities/lab spaces can double up as incubation infrastructure
 - Industries should be given their own targets to achieve as subsidiary goal setting
 3. Innovation
 - Technical adoption alone will not help as risk of non-introduction of innovative technology is very high
 - Agri-biotechnology should also be seen as a major contributor of innovation and revenue.
 4. Funding
 - Honeycomb structured funding model can be adopted by BIRAC wherein the aspects from early stage discovery to late stage commercial development in a particular domain will be considered e.g. monoclonal antibodies, nutrition etc.
 5. Regulation
 - The regulatory ecosystem should be devoid of fragmentation
 - Institutional memories or policy making should be strengthened
 - Public controversies should be managed by effective and coherent strategy to deal with the society.

Plenary Panel Session II: Accessing & Harnessing Smart Funds for Innovation Driven Biotech Enterprises

Accessing smart funding remains a key hurdle for growth of biotech enterprise. The panel deliberated on the current situation in India for biotech/medtech firms to access capital including policy action points needed to bridge existing gaps and how can they harness different funds to grow the biotech enterprise. The panelists discussed - current issues that impinge upon access to risk capital in India especially in biotechnology/life sciences, private financiers view for the growth of the sector, perceptions of philanthropic organisations about the innovation capital in biotechnology in India, routes to go public for SMEs, building an ecosystem for risk financing that accelerates the creation of a sustainable bio-economy. The panel recommendations are:

- Sustainable and scalable business models around the innovations should be there. This is what, both private & public funders look for.
- Strong participation by the govt. is required in the early stages by providing innovation capital, technology expert pool and access to existing infrastructure.
- Showcase the companies funded by BIRAC to a wider audience of VC/PE/Angel funds to attract follow-on investments. Periodic workshops could be conducted for this purpose.
- BIRAC could collaborate with VC/PE forums to provide visibility to the companies & entrepreneurs so that as they graduate to next level, there is interest from some of the VC/PE companies.

- Business Mentoring is as important as Technical Mentoring. BIRAC could explore the possibility of “Business Mentoring” mechanisms

Plenary Panel Session III: How can Start-ups unleash the power of Innovation driven Biotech Enterprise

Start-ups are the engines for innovation especially in technologically intensive sectors such as biotechnology. The panel deliberated on how startups can be fostered to drive an innovation driven biotech enterprise, status of innovation driven entrepreneurial climate in the country, India specific challenges for start-ups, technology access, availability of mentors and networks and challenges faced by start-ups in different domains. The panel recommended for:

- Tax incentives for investors for investing in start-ups
- Easier access to facilities and resources in the public institutions
- More cGMP facilities and translational facilities as accelerators and for Phase 1 clinical trials
- Mentoring platforms for Start-ups
- Man power needed for start-ups, therefor there is need for more University linkages
- Entrepreneurs meeting platform where they can discuss their idea & interact with other entrepreneur, VC & angel funders
- Public-private partnerships for funding manufacturing prototypes, possibility for creation of manufacturing fund
- Specific funds for IP protection
- Repository for information related to studies/design development/service providers/agencies providing certifications
- Retention of talent by providing a share/equity
- Protection of IP and it is valuable to investors
- Network to find mentors on existing and new platforms.
- Visualization of final product at early stages and having a high desirability quotient can help in the success of the company and cutting time to market.

BioPharma Roundtable

BioPharma roundtable discussion focused on current needs of the country in biopharma especially in biosimilars, vaccines, stem cells and devices, new technologies and platforms required for biopharma R&D and ways to overcome challenges in discovery, manufacturing and access to technology. The panel recommended for:

- Scientific data/ Epidemiological pattern or mapping of Indian disease profile as per Indian demography under partnership of DBT & ICMR that help to identify the industries product development.
- Disease burden priority list could be issued those projects public health needs such as infectious and communicable diseases, non-communicable diseases. Industry academia discussion to work on viable solutions on discovery and research in that particular disease.
- Innovations indicators in biologics and biosimilar space are important and BIRAC to facilitate it.
- Infrastructure funds for biomanufacturing by government and VC together or industry consortium
- Telemedicine, screening devices in medical sector.
- Clinical investigator training and drafting clinical trial protocol with help of CDSA to develop phase I clinical trial center or develop clinical trial expertise in India.
- BIRAC to organize conference for academia technology showcasing. Help to mentor small industries.
- Guideline to work with foreign industries, find and flexible alternatives for Indian public good.
- Mechanism of IP valuation for investor and promoters for technology and products.

BioAgri Roundtable

This roundtable deliberated on issues that the country faces and how the bioagri sector can strategise to be one of the biggest contributors of Indian bioeconomy by 2025. The talks focused on current needs of the country in bioagri especially in food productivity & security, strategies to make India a hub for cutting edge global hot spot for bioagri R&D especially in genetic modification, MAS and RNAi, new agri technologies and infrastructure that India should be invest in and how gaps in this sector can be bridged such that the country becomes a global bioeconomy. The discussion and recommendations are summarized below.

Out of the USD 5 Bn revenue of the Indian biotechnology industry, the contribution of the bio-agri sector is USD 1 Bn. However, the current potential for the agri-biotech sector could be USD 7 Bn. This gap could be bridged via targeted strategies:

- Overcoming the current regulatory challenges that influences the confidence of the industry to conduct R&D in agriculture
- Establishing numerous biotechnology outreach programs which can show to the general public the contribution that the biotechnology industry provides.
- HR & Training especially creating a pool of trained labour force various aspects of bioagri from expertise in molecular breeding to agronomy.
- Focus on New Technologies
 - Virus tolerance in vegetables
 - Bioenergy/value addition of “Bio-Wastes”
 - Post-Harvest value addition
 - New traits in pulses
 - Tolerance to abiotic stresses
 - Biofertilizer/biopesticides/bio-based inputs
- Secondary Agriculture should also be given due importance especially in the following areas
 - Value added products
 - Bio-Pharming
 - Nutri-crops for food & feed
- Focus on disease diagnostics: Several diseases impact agricultural productivity. It is imperative that plant disease diagnostics including molecular marker studies on diseases should be studied. These then could be a basis of rapid identification of plant disease which would then help in taking remedial measures.
- Agricultural Research Services: Several value added services focused on bio-agri should be given support both in terms of infrastructure and funding. These services include:
 - Phenotyping
 - Genotyping
 - Double Haploid facility
 - Gene Introgression
 - Transformational Services

BioIndustrial Roundtable

The roundtable panel discussed the current needs of the Indian bioindustrial sector, initiatives required in bioindustrial R&D especially in industrial enzymes and green chemistry, new technologies and infrastructure that India should be investing in and how can the challenges in this sector be bridged so that the country becomes a global bioeconomy. The panel recommended for:

- Training workshop on “tools and techniques of Industrial biotechnology” for Industry.
- Catalogue on India’s need on products and processes. BIRAC can facilitate brainstorming session in bringing up processes for two products after identify bottle necks.

- Develop an expertise website consisting of academicians in specific research area.
- Organise a focused discussion meeting on products from waste.
- Use bioincubators to develop skilled training programs.
- Prepare a document on regulatory aspects in Industrial biotechnology.

BioServices Roundtable

The roundtable discussion focused on the current status and challenges in the bioservices sector in India. The panelists discussed how India can become a hub for contract research, clinical research and manufacturing, capability building in novel drug discovery and platforms and technologies where investment need to be done. The recommendations of the panel are:

- Training
 - cGMP/ GLP/ GCP (Hands on Training) ,
 - Documentation,
 - Statistical analysis,
 - Drug development,
 - Medicine Chemistry,
 - Investigators / Clinicians (GCP)
- Infrastructure
 - Manufacturing capacity for Quality and affordable Biologics and diagnostics Research reagents
 - Clinical grade Stem Cell facility
 - Supply of chemicals, import of bio-reagents and storage facilities
 - Cold Chain Management Facility at Airports
 - Phase 1 Facility
- Value added differentiated services needs to be promoted
- ATCC hub in India. Easing the process of Importing ATCC strains in India
- Translation of academic Research –
 - Theme based meetings between Academics and Entrepreneurs and Industries
 - Portal of Academia Industry Collaboration (Showcasing the technologies)
- Creation of Databases of Indian biologicals manufacturers

BioInformatics Roundtable

The bioinformatics roundtable discussion was aimed at addressing the challenges faced by Indian bioinformatics sector. The roundtable discussed that how can bioinformatics contribute to drug discovery, agri biotechnology and industrial biotechnology, steps to make India a potential destination for R&D in predictive biology, and new technologies and platform to invest in. The roundtable recommendations are

- Funding mechanisms to be more industry-friendly – Common issue!
- Specific funding to develop open source databases and tools in a consortia mode through collaborative efforts of industry and academia
- These tools to be made available on an Open Source mode
- BIRAC to facilitate shared-access to Supercomputing and Cloud resources
- IT enabled Bio companies to have access to shared experimental facilities and resources
- Training centers specifically for systems/synthetic biology to equip students for industry (Current Bio-Informatics training is woefully inadequate for Industrial applications)
- Centre for excellence in synthetic biology to address food and fuel challenges – towards the \$100 Billion mark
- A Grand Challenge Call to address food/fuel/health challenges using Bioinformatics as an enabling platform

- Consortium of Companies and Academic institutions (FP 07 like model)

Session on Systems and Synthetic Biology

New Frontiers in Life Sciences: Opportunities for Indian biotech at the front end of cutting edge research areas

There was a focused session dedicated to synthetic biology, whereby the talks focused to provide the global scenario and early technological indicators in the arena of Systems & Synthetic Biology. The talks highlighted the opportunities for India to harness especially by the industry and academia such that the country is well positioned to be ahead of the curve in these cutting edge fields. The panel discussed the present scenario in India including technology bottlenecks, regulatory and ethical issues, and the impact of synthetic biology on healthcare, agriculture and industrial biotechnology sector.

BIRAC is thankful to all the stakeholders who participated in the meet and gave their value inputs for achieving the set goal of USD 100 Bn bio-economy. BIRAC has taken the note of every recommendation for promoting and fostering the innovation driven bio-enterprise system in India. BIRAC is committed towards the accomplishment and implementation of the recommendations to the best possible extent.

The Innovators' Moments



Group photo of the participants at BIRAC's Second Innovators Meet, 2013



Lighting of the Lamp by Prof. Vijay Raghavan, Secretary, DBT & Chairman, BIRAC



Dr. Renu Swarup, MD, BIRAC & Advisor, DBT lighting the inauguration lamp



Lighting of the lamp by Prof. G Padmanaban, Senior Scientist and Innovation Advisor, BIRAC; NASI Platinum Jubilee Chair, IISc



BIRAC's official Compendium release



Receiving the Innovators Award in Agriculture sector – Aritogene Bioscience Pvt. Ltd., Bangalore



Receiving the Innovators Award in Healthcare sector – Tergene Biotech Pvt. Ltd., Secunderabad



Receiving the Innovators Award in Biomedical Devices, Implants and Diagnostics sector – Vinvish Technologies Pvt. Ltd., Trivandrum



Receiving the Innovators Award in Industrial Processes and Green Technology sector – Thermax Ltd., Pune



Receiving the Innovators Award in Industrial Processes and Green Technology sector – Millenium Exports, Chennai

Annexure



BIRAC Innovators Meet
***Catalysing the Growth of an Innovation Driven
 Biotech Enterprise***
23rd – 24th September, 2013
Heritage Village Resort, Manesar, Gurgaon

Programme

Day I: 23rd September, 2013

08:00 –09:30am	Registration
09:30 – 11:00 am	<p>Inaugural Session</p> <ul style="list-style-type: none"> i. Welcome & BIRAC's journey, Dr. Renu Swarup, MD BIRAC & Adviser DBT ii. BIRAC Innovator Awards Presented by Chairman, BIRAC iii. Inaugural Address Dr. K. VijayRaghavan, Secretary DBT & Chairman BIRAC iv. Keynote Lecture, Catalysing the growth of an Innovation Driven Biotech Enterprise- Are we prepared? Prof. G Padmanaban, Senior Scientist and Innovation Advisor, BIRAC; NASI Platinum Jubilee Chair, IISc v. Vote of Thanks: Dr. Satya Prakash Dash, Head SPED, BIRAC
11:00-11:30am	Networking Tea
11:30-12:00pm	Innovator Awardees presentations (5 minutes each)
Session I 1200 – 01:15pm	<p>Plenary Panel Session I: Catalysing the Growth of an Innovation Driven Biotech Enterprise – Achieving \$100 Billion by 2025: Action Points to move forward</p> <p>A bioeconomy of \$100 billion will involve interplay of several stakeholders and create a vibrant platform for India to be among the top countries in biotechnology that provides novel and affordable products. The panel will deliberate on specific issues and action required to achieve \$100 billion dollar industry by 2025 and create a vibrant bioeconomy.</p> <p>Moderator: Dr. Utkarsh Palnitkar, KPMG</p> <p>Panelists Mr. Srivatsa Krishna Principal Secretary, Govt. of Karnataka, Dept of IT, BT, Science & Technology Prof. Anil Gupta, IIM</p>

	Dr. TG Balganes, CSIR (C-MMACS) Mr. KV Subramaniam, Reliance Lifesciences Mr. BN Manohar, Stempeutics Dr. Usha Zehr, Mahyco
01:15- 02:00pm	Lunch
02:00 – 03:00pm	Innovators Forum - “An Idea A Minute” – The 60 second elevator pitch by startups and entrepreneurs Moderator: Dr. Taslimarif Saiyed, C-CAMP
Session II 03:00 – 04:00pm	Plenary Panel Session II: Accessing & Harnessing Smart Funds for Innovation Driven Biotech Enterprise Accessing smart funding remains a key hurdle for growth of biotech enterprise. The panel will deliberate on the current situation in India for biotech/medtech firms to access capital including policy action points needed to bridge existing gaps and how can they harness different funds to grow the biotech enterprise? Moderator: Mr. Sujay Shetty, PwC Panelists Mr. Nitin Deshmukh, Kotak Private Equity Mr. Jagannath Samavedam, Venture East Ms. Deepanwita Chattopadhyay, IKP Knowledge Park Dr. Shirshendu Mukherjee, Wellcome Trust India Mr. Anand Sivaraman, Remidio Sri. Pinaki Bhattacharyya, Villgro Innovation Foundation
04:00 – 04:15pm	Networking Tea
Session III 04:15 – 05:30pm	Plenary Panel Session III: How can startups unleash the power of innovation driven biotech enterprise? Startups are the engines for innovation especially in technologically intensive sectors such as biotechnology. The panel will deliberate on how startups could be fostered to drive an innovation driven biotech enterprise. Moderator: Dr. Vinay Konaje, Navya Biologicals Panelists Dr. Dhananjaya Dendukuri, Achira labs Dr. Radha Rangarajan, Vitas Pharma Dr. Ayesha Chaudhury, Windmill Health Mr. Ramkumar Nandakumar, Metaome Dr. Vinay Agarwal, Biopore Surgicals Dr. Chaitanya Saxena, Shantani Mr. Balaji R, Swayambhu Biologics
05:30-06:30pm	Open House Forum – Poster Session and Discussion
06:30-07:30pm	Interaction with Dr. K VijayRaghavan, Secretary DBT & Chairman BIRAC and Dr. MK Bhan, Former Secretary DBT
07:30pm	Cultural Evening & Dinner

BIRAC Innovators Meet

Catalysing the Growth of an Innovation Driven Biotech Enterprise

*23rd - 24th September, 2013
Heritage Village Resort, Manesar, Gurgaon*

Programme

Day II: 24th September, 2013

0800 -0930am	Breakfast				
Session IV 09:30 - 11:00am	<p>Roundtable Concurrent sessions: Accelerating the journey for creation of a innovation driven biotech enterprise</p> <p>Each focused roundtable will address pertinent issues related to the sector and discuss specific action points for accelerating innovation in the sector.</p> <table border="1" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p style="text-align: center;">Biopharma Roundtable</p> <p>Moderator: Dr. Chetan Chitnis ICGEB Dr. TS Rao, Scientist G, DBT Dr. SS Sinha, Scientist G, DBT Dr. Rajat Goyal, IAVI Prof. Udaykumar Ranga, JNCAR Dr. SK Gupta, NII Mr. BM Manohar, Stempeutics Dr. Supreet Deshpande, VLife Sciences Dr. Kuppuswamy Mosuvan Tergene Dr. Vijay Chauthaiwale, Torrent Dr. Ashwin Nangia, Crystallin Mr. Ashok Murty, Erkadi Systems Dr. Shridhar Narayanan, Astra Zeneca</p> </td> <td style="width: 50%; vertical-align: top;"> <p style="text-align: center;">Bio-agri Roundtable</p> <p>Moderator: Dr K K Narayanan, Metahelix Dr. KS Charak, Scientist G, DBT Dr VS Reddy, ICGEB Mr. Anup Karwa, Krishidhan Dr. G Srinivas, Kaveri Seeds Dr Nandakumar Kunchge, Bejo Sheetal Dr. Anand Gole, Tata Chemicals Dr. N Sarla, DRR Hyderabad</p> </td> </tr> <tr> <td style="vertical-align: top;"> <p style="text-align: center;">Bio-industrial Roundtable</p> <p>Moderator: Dr S Ramaswamy, CCAMP Dr. Mohd. Aslam, Scientist G, DBT Mr Shrikumar Suryanarayanan, Sea6 Energy Dr AK Panda, NII Dr. KJ Mukherjee, JNU Mr. GSK Krishnan, Novozymes Dr. Arvind Lali, DBT ICT Centre for</p> </td> <td style="vertical-align: top;"> <p style="text-align: center;">Bio-Services Roundtable</p> <p>Moderator: Dr. Arun Bhatt, Clinevent Dr. Polani Seshagiri, IISc Dr. Ajith Kamath, Pfizer Mr. Ganesh Sambasivam, Anthem Biosciences Dr. Purnima Sharma, BCIL Dr. Sudhakar Bangera, CDSA</p> </td> </tr> </table>	<p style="text-align: center;">Biopharma Roundtable</p> <p>Moderator: Dr. Chetan Chitnis ICGEB Dr. TS Rao, Scientist G, DBT Dr. SS Sinha, Scientist G, DBT Dr. Rajat Goyal, IAVI Prof. Udaykumar Ranga, JNCAR Dr. SK Gupta, NII Mr. BM Manohar, Stempeutics Dr. Supreet Deshpande, VLife Sciences Dr. Kuppuswamy Mosuvan Tergene Dr. Vijay Chauthaiwale, Torrent Dr. Ashwin Nangia, Crystallin Mr. Ashok Murty, Erkadi Systems Dr. Shridhar Narayanan, Astra Zeneca</p>	<p style="text-align: center;">Bio-agri Roundtable</p> <p>Moderator: Dr K K Narayanan, Metahelix Dr. KS Charak, Scientist G, DBT Dr VS Reddy, ICGEB Mr. Anup Karwa, Krishidhan Dr. G Srinivas, Kaveri Seeds Dr Nandakumar Kunchge, Bejo Sheetal Dr. Anand Gole, Tata Chemicals Dr. N Sarla, DRR Hyderabad</p>	<p style="text-align: center;">Bio-industrial Roundtable</p> <p>Moderator: Dr S Ramaswamy, CCAMP Dr. Mohd. Aslam, Scientist G, DBT Mr Shrikumar Suryanarayanan, Sea6 Energy Dr AK Panda, NII Dr. KJ Mukherjee, JNU Mr. GSK Krishnan, Novozymes Dr. Arvind Lali, DBT ICT Centre for</p>	<p style="text-align: center;">Bio-Services Roundtable</p> <p>Moderator: Dr. Arun Bhatt, Clinevent Dr. Polani Seshagiri, IISc Dr. Ajith Kamath, Pfizer Mr. Ganesh Sambasivam, Anthem Biosciences Dr. Purnima Sharma, BCIL Dr. Sudhakar Bangera, CDSA</p>
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	<p>Energy Biosciences Dr. Shams Yazdani, ICGEB Dr Makarand Phadke, Reliance Dr. Anjan Ray, UOP Honeywell Dr. Banibrata Pandey, Nagarjuna Fertilizer Dr. Pramod Kumbhar, Praj</p> <p>Bioinformatics</p> <p>Moderator: Dr. Anand Anandkumar, Cellworks</p> <p>Dr. Madhan Mohan, Scientist G, DBT Prof. S Ramakumar, IISc Dr. Kas Subramanian, Strand Life Sciences Dr. Alok Bhattacharya, JNU Mr. Pankaj Sharma, Leadinvent Dr. Vishwas Joshi, Seagull BioSolutions Mr. Sahil Kapoor, Novoinformatics</p>
11:00-11:30am	Tea
<p>Session V</p> <p>11:30 – 01:30pm</p>	<p>New Frontiers in Life Sciences: Opportunities for Indian biotech at the front end of cutting edge research areas. Focus: Systems & Synthetic Biology Format: Talks</p> <p>The focus of the talks will be to provide the global scenario and early technological indicators in the arena of Systems & Synthetic Biology. It will highlight the opportunities for India to harness especially by the industry and academia such that the country is well positioned to be ahead of the curve in these cutting edge fields.</p> <p>Moderator & Speaker: Dr. Pawan Dhar, Centre for Systems & Synthetic Biology</p> <p>Dr. Kas Subramanian, Strand Life Sciences Prof. Guhan Jayaraman, IIT Madras Dr. Navkant Bhat, IISc Dr. Pramod Wangikar, IIT Mumbai Dr. Pawan Dhar, Centre for Systems & Synthetic Biology</p>
01:30 – 02:30pm	Lunch
02:30 – 03:45pm	Presentation of Action Plan by Moderators of Concurrent Roundtable
03:45 – 04:30pm	Valedictory & Vote of thanks
04:00pm	Meeting Closes