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Vigyan se Vikas



विज्ञान से विकास



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Ignite Innovate Incubate

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



September **2018**

No. 3 | Vol. 5

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Leader's Message



Dr. Renu Swarup
Secretary DBT & Chairperson BIRAC

According to Global Innovation Index Report 2018 released by World Intellectual Property Organisation, India has climbed up in its ranking from 81 in FY 2015 to 57 in FY 2018. India has been able to maintain a higher rank in Central & South-East Asia region with a strong support from policy framework established by Government of India in favour of various stakeholders who have been contributing to the Indian innovation ecosystem. Flagship programs of Indian Government, 'Make in India', 'Start-up India' & 'Swachh Bharat' have provided a huge platform to Indian innovators to showcase their ideas on a broad spectrum of topics.

India has a vibrant start-up ecosystem owing to the innovations happening throughout the country. ABLE (Association of Biotechnology Led Enterprises) in a report in 2018 has mentioned the presence of 1,732 startups in the life sciences sector across India, incorporated since 2012.

Biotech sector comprising of Biopharma, Bioagri, Bioservices, Bioindustrial and Bioinformatics has contributed to the Indian Bioeconomy growth reaching to \$44.47 billion in FY 2017. DBT and BIRAC are poised to develop a favourable Entrepreneurial and Biotech Innovation Ecosystem for SMEs, Industry and Academia. BIRAC has supported more than 1000 start-ups, entrepreneurs & SMEs along with 31 Bioincubators till date.

BIRAC has completed its 6 years and during these years, it has made a conspicuous impact in the Biotech Innovation Ecosystem in India. BIRAC, further in its endeavour to handhold innovators, has launched Biotech FIRST (Facilitation of Innovation & Regulation for Start-ups and Innovators). The facilitation unit will address Start-ups, Entrepreneurs, Researchers, Academicians, Incubation Centres, SMEs, etc. pertaining to their queries about regulation, funding opportunities, mentorship, investment opportunities, market access, industry-academia partnerships and intellectual property matters. BIRAC's recently launched Regional Centre, BRBC (BIRAC Regional Bio-innovation Centre) has a mandate to be a high quality national resource centre to support and promote Entrepreneurship in Life Sciences.

As we move ahead in our journey, we intend to rope in states for Make in India & Start-up India programs to develop a more vibrant Biotech Innovation Ecosystem throughout the country.

Chief Editor's Take



Dr. Mohd. Aslam

Advisor (Scientist 'G'), DBT & MD BIRAC

India recognises the growth potential of biotechnology and ability of Indian innovators to bring differentiated products to address unmet needs in healthcare, pharma, food, energy and allied sectors. Constant efforts have been made by BIRAC to develop a favourable entrepreneurial innovation ecosystem for SMEs, Industry and Academia. More than 1000 start-ups, entrepreneurs and SMEs along with 31 bio-incubators have been supported till date. Presently, India is among the top 12 destinations for biotechnology in the world and approximately 3% share in the global biotech industry. An excellent foundation, improved infrastructure, expanding regional markets, receptivity to home-grown innovation in biotechnology products and services, and a supportive national policy mandate have started yielding positive effects. With current 20% CAGR, it does seem possible for the Indian industry to step up the growth rate to accomplish higher challenges.

To achieve the goal of creating a sustainable bioeconomy, India needs a concerted effort from the Government of India, private industry and academia. Flagship programs such as 'Make in India', 'Start-up India' and 'Swachh Bharat' were launched by GoI to improve India's manufacturing competitiveness along with developing India as a global innovation hub. BIRAC has diligently leveraged the scientific strengths of the country to do just the same.

Recent initiatives of BIRAC and DBT, such as the launch of Biotech FIRST (Facilitation of Innovation & Regulation for Startups and Innovators) Hub along with BIRAC's partnership with Kalam Institute for Health Technology for Facilitation for Testing & Standardization of Medical Devices, demonstrates BIRAC's goal to make India a Global Innovation Hub in the biotechnology sector.

As we move forward in our journey, BIRAC intends to engage with relevant stakeholders to bridge the gaps that still exist among industry and academia in Biotech sector.

BIRAC Awards & Recognition

Dr Renu Swarup, Secretary DBT & Chairperson
BIRAC has been awarded TIE Delhi WomenABLER
AWARD on 20th August, 2018 for her contributions to the
Indian entrepreneurial ecosystem.



BIRAC received the "IP Excellence In India 2018"
Award At The Questel Orbit - Indian IP Awards 2018



Advances in Science and Technology: Driving Significant Public Health Gains and Improving Access to Reach Unserved Populations



Nachiket Mor, PhD
India Country Director
Bill & Melinda Gates Foundation



Harish Iyer, PhD
Senior Scientific Advisor
Scientific Programs and
Life Sciences Partnerships,
India Country Office
Bill & Melinda Gates Foundation

From the industrial revolution to the internet one, we continue to witness the positive impact of science and technology on humanity. Every aspect of our lives, from how we travel, to how we learn and communicate, to how we transact business has been touched and transformed. Human health has been no exception. The discovery of penicillin, the world's first antibiotic in 1929, altered the course of modern medicine giving doctors a chance to completely cure people of deadly infectious diseases. Since then, scientists have eradicated smallpox, invented insulin to treat diabetes, developed the polio vaccine and the pacemaker. And it is in the area of health, where further innovation in science and technology – now mixed with rapid advances in computing power, data sciences, and its applications – will drive significant positive impact on human lives in the future.

Take for example, the intersectional work being carried out in health and sanitation – a precursor to a healthy national population. Today, only 58% of the country's 263 million households have a toilet, and a massive building programme as part of the Government's Swachh Bharat – Clean India campaign is underway. But it will take science and innovation to provide, quality, cheaper and more creative options of sanitation where traditional models have not worked. Take Eram Scientific Solutions Pvt Ltd (Kerala) – for example. Eram, in collaboration with University of South Florida, and supported by Government of India's Department of Biotechnology (DBT) and Bill & Melinda Gates Foundation, is working to develop an off-grid, self-sustained, modular and electronic toilet for houses and communities. The system will have a modern, public toilet with an advanced onsite, biological treatment system and will be housed in a standalone unit that will be initially field tested in suburban slums which face massive sanitation challenges. Indeed, while access to sanitation is a basic human right – it will take interesting innovations in science and technology solutions to make it a reality for poorer sections of society.

In India, the question we face, thus, is twofold – first, how do we apply these discoveries to challenges we face and second, how do we reach the largest number of people efficiently to make sure we address the existing deprivation. And it seems that on the question of inclusion and increased beneficiaries too – science and technology-driven solutions are showing the way forward. We see this play out in the battle against Tuberculosis (TB). While scientific breakthroughs have lead us to tackle new strains of drug resistant TB and TB treatment is free, it is well known that the Directly Observed Therapy Short Course or DOTS treatment is very cumbersome with high drop-out rates. It requires three weekly visits to the hospital and compliance is hard. To tackle TB, adherence and compliance is as critical as the discovery of new medicines. Today cutting-edge biometric monitoring systems and web-monitoring and adherence systems are being deployed to tackle the TB epidemic. Work carried out by Everwell Health Solutions in Bangalore, India with funding from the Bill & Melinda Gates Foundation, USAID and UKAID, for example, wraps TB medication in a custom envelope. Patients report their adherence using basic mobile phones and toll-free phone calls to numbers revealed only after dispensing their medication. With more than 50,000 patients enrolled, primarily in India, 99DOTS is an affordable, scalable, TB-appropriate medication monitoring technology.

For science and technology to continue to serve human lives in a positive way – more innovations which target the people at the bottom of the pyramid will have to be made – be it new drugs, health technologies, clean water or sanitation solutions. Indeed, in the discovery stage itself, if these solutions are designed to cater to the poorest – inclusion is more likely to follow. The Oral Polio Vaccine, for instance, is relatively inexpensive, effective, and easy to administer, thus making it affordable and well-suited for mass vaccination campaigns across a country like India.

In 2017, we had already begun to see the protentional of microbiome in the diagnoses, prevention and treatment of disease; the discovery of a diabetes drug that reduces cardiovascular disease; liquid biopsies to find a circulating cancer tumour DNA; 3-D visualisation for augmented reality or surgery; self-administered HPV tests and bio-absorbable stents; drones and their potential of bringing medical care to people in emergencies.

An internationally engaged scientific community, equipped with the latest in science, and with the ability to think critically will continue to help India advance science and technology to achieve its health goals. These will include administering programs more efficiently, finding new preventative health solutions in nutrition, vaccines, as well as approaches to heal. Vigyan Se Vikas will continue apace – we will have to ensure that its benefits are spread and leveraged far and wide.

AUM Voice Prosthesis

Innaumation Medical Devices



Dr. Vishal Rao

MBBS, MS, Fellow Tata Memorial Hospital
Innaumation Medical Devices

Speech and communication in our society forms not only a basic tenet to sustain life force, but also a right for freedom, peace, justice, and dignity. Only due to cost constraints these patients were bereft of this essential means of communication. India sees about 10 lakh new cases of cancer each year. Of these 25,000 cancers roughly affect the throat. Typically, early stages we are able to preserve the voice box through radiotherapy. Even in advance cases of that cancer such as stage 3 we can offer chemo radiotherapy and save voice box in 80% of the patients. However, patients with throat cancer coming in stage 4 end up losing their voice box. In this regard, it may surprise you that 80% of our cancers are detected late – stage III/IV, 80% of our patients hail from poor economic background, 80% of our healthcare is private run & purchase power parity (PPP) of an average Indian – <2\$ per day. Hence at the least, 5000 patients in India each year potentially stand to lose their voice box to throat cancer at most conservative estimates.

Most of us may assume we speak through our throats! unfortunately the answer is NO. We speak through our brain. Speech travels to our ear, get analyzed as sounds in auditory cortex of brain. From there to the Wernike area to Broca area and speech cortex. This then instructs the vocal cords to vibrate and intercept sounds. How does a throat cancer patient who has lost his voice box speak then? Any obstruction or interception to air produces sound. In these patients who speak after the voice box removal, their food pipe vibrates and intercepts air, produces speech as directed by the intact brain.

The present invention discloses a voice prosthesis device, which is implanted in patients undergoing laryngectomy enabling the patient to speak after surgery. The voice prosthesis device comprises a cylinder that includes a first end and a second end. The device further includes an outer washer, an inner washer, a partial shutter, a shutter guard and adjustable rings. The inner washer is attached to the first end of the cylinder and stabilizes the voice prosthesis device at the first end thus preventing an inward movement of the voice prosthesis device into the trachea/air pipe. The outer washer is attached to the second end of the cylinder. The outer washer is coupled with the second end of the cylinder and stabilizes the voice prosthesis device at the second end to prevent an inward movement of the voice prosthesis into the esophagus/food pipe. Further, the inner washer is placed diametrically opposite to the outer washer. The thickness of the outer washer diametrically ranges from 40mm to 45mm. The first opening of the cylinder accommodates the partial shutter, which is made up of platinum cured silicon material and allows the air to pass through.

The device further includes a shutter guard placed at the inner part of the inner washer further fixed to the cylinder. The presence of shutter guard prevents the food particles from pushing the shutter inwards. The shutter guard is made up of medical grade material. The device further includes plurality of rings, which are added to the first or the second end of the cylinder based on the size of the voice prosthesis required for a trachea-esophageal wall of the

After the insertion of the prosthesis in the patient after laryngectomy, the prosthesis allows the patient to speak even in the absence of larynx. The partial shutter relatively opens when the air is exhaled from the lungs and allows the air to pass through from the second end to the first end of the cylinder. This mechanism also prevents the entry of food particles into the second end,

thus preventing fungal infection in the prosthesis and extending the life span of the prosthesis.

The voice prosthesis allows the patient to speak after laryngectomy. The voice prosthesis is simple, non-invasive and cost effective. The presence of rings in the voice prosthesis helps in preventing the piston effect thus increasing the life span of the prosthesis in the patient.

Presently the device has 5 utility patents and 2 design patents filed for with WIPO & in India where the patents have been applied for. The prosthesis has received scientific clearance and ethical approval. It has complied with the rules eluded for medical devices under the CDCSO, Govt. of India. Clinical studies has been initiated and we have more than several patients having received the prosthesis and been able to use the prosthesis and speak again – Some after 10 year of silence.

Future perspectives – Thanks to BIRAC BIG Grant, Aum Voice Prosthesis is now a reality and touching the lives of hundreds of voiceless patients who have started to speak. some after 10 years of silence.

Collateral Innovations with Aum Voice Prosthesis: Wooden Toy Inserter from Channapatna

Currently we plan to take this prosthesis device to all regional cancer centers across country where several hundreds of patients wait for such a speech device to speak again. Not only this, several countries across the world have reached out including developed nations where such devices are unavailable nor is the technique to perform these procedures known.



Throat cancer patients regained voice



This medical device helps throat cancer patients to get their voice back after voice box removal

Aum Voice Prosthesis

Vigyan se Vikas



Dr. Vishal Rao and Shashank have developed this unique device for throat cancer patients who undergo laryngectomy and are unable to speak after the surgery due to removal of voice box.

Aum Voice Prosthesis is popularly known as
\$1 SPEAKING DEVICE.

THIS PROJECT WAS SUPPORTED
& FUNDED BY BIRAC



Integrated Farming System to Improve Agricultural, Nutrition and Livelihoods



Dr. RM Kathiresan, Ph.D., D.Sc.

Director,
Research and Development
Annamalai University

The innovation of Annamalai Rice + Fish + Poultry Integrated Farming System emerged from its root of Institutional field experiments in Annamalai University on choosing the best suited farming elements among different components such as poultry, fish, Japanese quail, duck etc., for integration with transplanted rice, as early as 1996. Poultry rearing and fish culture were chosen and the technology for integration was perfected, through several on-farm field experiments in farmers holdings using of 200 m² plots through a DBT funded project, with optimizing stocking density of poultry birds and fish fingerlings size and specifications of poultry cage, fish trench, mode of agro input use etc, during 2001-2007. Later the technology was upscaled through 838 on- farm models of 200 m² of rice fields integrated with poultry cages and fish trenches, spread through 36 villages in 12 clusters of four disadvantaged districts of Tamilnadu state viz., Cuddalore, Nagapattinam and Villupuram. This project was funded by ICAR and World Bank under National Agricultural Innovation Project component III— Sustainable Rural Livelihoods Security, during 2008 to 2014.

In a conventional Rice + Fish + Poultry system as demonstrated until now the salient features are:

- In one acre rice field, 90 cents rice area is left undisturbed and 10 cents is excavated as a fish pond without any rice crop.
- A poultry cage is installed in the fish pond and the fish component and poultry component do not directly integrate with rice. The poultry manure needs to be collected at the end of the season after draining the pond for application to rice field which is laborious.
- Mostly layer birds are raised in the poultry cages.

In the Rice + Fish + Poultry system demonstrated and proposed by Annamalai University here in after termed as Annamalai Rice + Fish + Poultry these salient features differ as listed below:

- The poultry cages are installed in the rice field itself with the help of four concrete posts 8' high, 4' buried inside and 4' protruding above, that lifts the cage above the crop canopy. The cage bottom is of wire mesh, that leaves the poultry waste to reach the rice fields directly, wherein they get dissolved in standing water and serve both as a crop manure as well as fish feed.
- The fish trenches that accommodate the fishes, as a permanent shelter are 1m deep and a width of 1m at the top and 0.75 m at the bottom and they run along the side of the rice field, occupying 10 per cent of the rice fields. The fish fingerlings as a polyculture with Catla, Rogu, Mrigal, Common carp in equal proportions of a stocking density of 5000 fingerlings ha⁻¹ (considering the rice field dimension and not the trench dimension) are released after 15 days of transplanting rice seedlings. They swim into the rice fields and feed on the pests and weeds during morning and evening hours and take shelter in the trench during day time with sunny weather to avoid temperature fluctuation of shallow water column standing in the rice field.
- Cages are of dimension 6' x 4' x 3' accommodating 20 broiler birds in each cage. Larger cages hamper crop growth because of shading and higher stocking density by increased volume of poultry litter per unit area that are acidic in nature.
- This way a perfect integration of all the three components, with fishes helping pest and weed control in rice, poultry complimenting rice with slow paced addition of nutrient rich organic matter up to 8.5 t ha⁻¹ in every crop season and weed control by acidic nature of the litter as well as allelomediatory principle, is evolved in this design.

- Further, three generations of broiler birds within one rice cropping season, offers excellent revenue generation that enhances livelihood security of resource poor farmers. In case of natural calamities such as flash floods wherein the crop could totally be damaged, this broiler meat output would offer solace and serve as a climate resilience mechanism.

The livelihoods of farmers were enhanced by 80 percent with an increase in the annual income by Rs. 25,516, on an average of all the 838 farmers adopting the technology.

The striking success of this Rice + Fish + Poultry farming system has made 392 other farmers (other than the 838 identified development partners) to adopt this in their holding. Further 12 of the identified development partners have been extending the technology from the project supported 200 m² area to half an acre (2000 m²) of their holdings. Further, the State Planning Commission of Tamilnadu, on requests from farmers who have been consulted, at their regional consultative meetings, invited an exclusive presentation of the project interventions at the State Planning Commission Chennai, where in all the secretaries and executives of line departments participated. The technology was accepted for upscaling throughout the state. The State Agriculture department also has started sending batches of 50 farmers, for training in Rice+ Fish + Poultry farming through its ATMA scheme and so far six batches have been trained.

The DBT – BIRAC Grand Challenges India Agriculture and Nutrition Programme supported by BIRAC, Bill and Melinda Gates Foundation and USAID, had the Annamalai Rice + Fish + Poultry technology tried for enhancing the nutritional status of 75 women farmers in Cuddalore district of Tamilnadu. This Integrated Farming System installed afresh in 75 women farmers fields, after 18 months saw the poultry meat intake of women farmers increased by 4 kg/month and fish meat intake increased by 4 kg/month due to production of meat in their own holdings (previously it was unaffordable for them to buy meat on a weekly basis due to poor income. Thus these farmers with poor animal protein intake earlier, had an increased animal protein intake). Accordingly, blood haemoglobin count of these development Partner or beneficiary of wetland cluster increased from 11.7 gm/dl to 13.9 gm/, folic acid level from 7.61 ng/mL to 8.76 ng/mL, serum albumin from 4.20 gm/dl to 4.87 gm/dl, calcium level from 9.4 to 10.05, globulin from 1.94 gm/dl to 2.79 gm/dl (sampled from an average of 10 beneficiary women farmers). The Child Anthropometry [0-5 years] increased – body weight from 15 kg to 20 kg and BMI from 13.9 to 19.5.



Fully Off-Grid Electronic Toilets and Resource Recovering Treatment System changing the notions of Sanitation



Midhu S.V.

Deputy General Manager (R&D)
Eram Scientific Solutions Pvt. Ltd.

Pulluvila, a village in Trivandrum, Kerala has been pulled out straight into the global sanitation landscape with the award-winning automated electronic toilet (eToilet) from Eram Scientific Solutions, integrated with a resource recovery system from US-based University of South Florida that is turning waste into Nutrient, Energy and Water (NEW generator).

Technology for disposing of human waste hasn't changed a whole lot since the innovation of the flush toilet in the 16th century. These days, you push a handle or button, and water whisks waste away to either a septic system or a sewage treatment plant. Problem is, this system doesn't work so well for the 2.5 billion people who lack access to running water. Aligning to resolve the issue, an innovative experiment is happening in Pulluvila, Trivandrum, a small coastal village in the Southern side of Kerala, thanks to innovative thinking and its application by Eram Scientific and University of South Florida.

Eram Scientific Solutions, the pioneers of Electronic Toilets in India, has been working on a sanitation project championed by the Bill & Melinda Gates Foundation and the Biotechnology Research Assistance Council (BIRAC), under the Dept. of Biotechnology, Govt. of India for community sanitation. This programme is an India-specific programme modeled on the Gates Foundation's global Reinvent the Toilet Challenge and is named as Reinvent the Toilet Challenge-India (RTTC-India).

The overall goal of the project is to develop and demonstrate an innovative sanitation and resource recovery solutions for the slum areas in India. The first objective is to design and implement a novel public sanitation platform that meets the specific needs of slums through new designs. The second objective is to demonstrate closed loop resource recovery by integrating the slum eToilet with a novel onsite waste water treatment and recovery solution termed The NEWgenerator developed by University of South Florida (USF).

The total system is working in solar-power and it has an in-built waste processing capability that recovers nutrient, energy and water from the waste. It also offers a remote maintenance and monitoring feature that relies heavily on web and mobile technologies. More importantly, the system is designed to work completely off-grid, ie, there is no need for external electricity and water for the functioning of the toilet except for personal cleaning.

eToilet, which has been customized and refined for this project, is a modular, prefabricated toilet made of steel enclosure, integrated with electronic systems to ensure cleanliness and hygiene for every user with auto flushing and floor washing mechanisms, remote monitoring capabilities, robust and strong structure and can be easily installed at site. The interiors of eToilet provide a comfortable ambience in terms of look, feel and functionality. The well-lit interior with LED lights and exhaust fan will work only when a person enters and has natural ventilation as well as offers privacy and safety.

The USP of eToilet is its self-washing and cleaning mechanisms which comprises of automatic pre-flushing before entry, automatic flushing after use, automatic floor cleaning after fixed intervals. This ensures that the eToilet is clean even for the next user. eToilet has sensors for water and electricity conservation and hence uses less water and power. eToilets are 100% environment friendly and is developed on a holistic convergence of the latest technologies in electrical, mechanical, web and mobile. The eToilets are connected over the GPRS and realtime information on the usage, water low conditions etc. are available online.

The completely solar powered eToilet is connected to the NEWgenerator thus creating a unique model of sanitation recovery with a perfect back end processing through which resource generation/recovery is made possible.

The NEWgenerator harvests nutrient fertilizers (Nitrogen, Phosphorous, and Potassium), energy through biogas, and clean water from human wastes. The machine achieves a high

level of waste treatment through the use of anaerobic membrane bioreactor technology (AnMBR). A high level of pathogen destruction is achieved to ensure safe sanitation. This robust, low-energy and off-the-grid technology enables a number of treatment and resource reuse applications. It is a machine in a box that can-do Water recycling, Energy harvesting, Fertilizer recovery and ultimately turn waste into profit.

The eToilet-NEWgenerator has the potential to help alleviate sanitation problems in developing communities. Both Eram and USF are hopeful that the system would promote sustainable sanitation services for both the poor and urban regions. It is a truly aspirational next-generation product that everyone will want to use in developed as well as developing nations.

Unique features of product / technology:

- Technology enabled self-sustainable sanitation models
- Cost-effective sanitation infrastructure for the target groups
- Self-sustained sanitation model with resource generation
- Nutrient, Energy and Water can be generated from Human waste
- Decrease in epidemic diseases caused by lack of adequate sanitation facilities
- Develop new sanitation culture using technology to unaddressed strata
- Off-grid system which does not require any external utility connections
- Unmanned, low maintenance and low Opex system.
- Remote monitoring capabilities will ensure minimum down time.
- Maximum deployment possible in the target areas

There are two clear directions in which the technology developed for this project can go in the future. The first is to focus on fine tuning and fully optimizing the existing eToilet and NEWgenerator designs to make them even more resilient and cost effective. Along this path of development, the NEWgenerator will continue to operate as a separate unit with a similar treatment capacity. This allows for some flexibility in terms of final installation, as the treatment unit can be connected to a variety of front end units. This unit is also suitable to a variety of locations and environments throughout India due to its robust design and ability to provide onsite water recovery. Beyond slum applications, this technology is well suited to a variety of high density urban locations in need to high end water treatment.

A second thrust of research would be to completely integrate of the eToilet and NEWgenerator into a smaller foot print unit. By reducing the size of the unit, the integrated system could be implemented in an even greater variety of settings, especially in slum areas where space limitations are great. This smaller unit can also benefit from reduced costs, as the housing for the NEWgenerator can be produced within India using the same manufacturing channels that ESS currently uses. The reduced cost and the smaller size of this integrated unit would allow for its rapid adoption throughout urban areas of India. To get to this level of full integration, research and testing would be required to miniaturize the NEWgenerator.



New Initiatives by BIRAC

Biotech FIRST HUB

Facilitation of Innovation & Regulation for Start-ups and Innovators

DBT, BIRAC, ICMR, CDSCO representatives will be available for taking queries

A facilitation unit, set up by BIRAC, to address the queries of Start-ups, Entrepreneurs, Researchers, Academicians, Incubation Centres, SMEs, etc.

FIRST HUB will be open every first friday of the month at BIRAC office from 3:00pm-5:00pm

REGULATORY PATHWAYS & REGULATION

FUNDING OPPORTUNITIES

MENTORSHIP

INVESTMENT OPPORTUNITIES

MARKET ACCESS

INDUSTRY ACADEMIA PARTNERSHIPS

INTELLECTUAL PROPERTY

* Prior appointment is essential as only 5-6 innovator slots are available

* Details such as Company name, Address, Contact, Technology/ Innovation Summary, Stage of Development and Specific Queries can be shared through the online portal at www.birac.nic.in

* For any further details, please contact Sonia Gandhi, Senior Manager-Investments, BIRAC at sgandhi.birac@nic.in

Kick-Start for FIRST HUB

The 1st meeting of the FIRST HUB which is a Facilitation Cell to address the queries of Start-ups, Entrepreneurs, Researchers, Academicians, Incubation Centres, SMEs was conducted on 7th Sep 2018 at BIRAC. The representatives from Niti Aayog, CDSCO, ICMR, NIB, DBT and BIRAC addressed the queries of innovators.

The FIRST HUB was launched on 10th August 2018 and within a short time has received huge response from Innovators across the country. The FIRST HUB is a platform to solve the queries of Innovators through Face to Face meetings, Telecon or E-mail.



Visit of Indian Delegation to Sweden

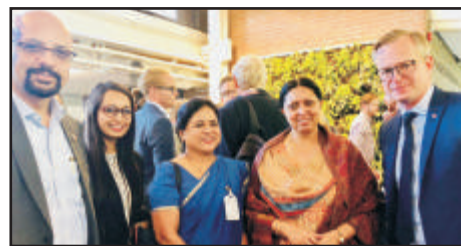
A high level Indian delegation led by Dr. Renu Swarup, Secretary Department of Biotechnology, Government of India visited Sweden during 20th-22nd Aug, 2018 to explore collaboration opportunities between the two countries in the area of biotechnology. The delegates were Dr. Renu Swarup, Secretary DBT; Dr. Alka Sharma, Advisor, DBT and Dr. Manish Diwan, Head – SPED, BIRAC; Ms Taranjeet Kaur, Deputy Manager – Entrepreneurship Development, BIRAC. The meetings included Face to Face discussions on Sweden-India Innovation Partnership at G2G level, interactions with implementing agencies to understand their policy, Triple Helix model of Innovation and site visits to Innovation Clusters and Test Beds. The 3-day agenda included visits to **Ministry of Enterprise and Innovation, Ministry of Education and Research, Swedish Research Council, Nobel Media, Vinnova, Uppsala Innovation Center (UIC), Uppsala University Bio Cluster, KTH Royal Institute of Technology and Karolinska Institute Innovation Centers.**

During visits to Vinnova, Uppsala Innovation Center (UIC), Uppsala University Bio Cluster, KTH Royal Institute of Technology and Karolinska Institute Innovation Centers their core activities and policies were discussed and possible areas of collaborations were explored.

A MoU of extension of existing partnership was also signed between DBT & Vinnova and BIRAC as an implementing agency under the umbrella MoU. New initiatives were discussed to leverage the DBT Vinnova partnership {such as exchange programme of Indian & Swedish Start-ups, Market access to start-ups, Networking events and access to Test Beds}.

Indian delegates also attended the launch of Testa Center (GE Healthcare Sweden) by Mr. Mikael Damberg, Minister of Enterprise & Innovation, Sweden. The Testa Center is a test bed for production of biological products.

It is felt that there are tremendous opportunities for partnerships between BIRAC and like minded agencies of Sweden in the area of Biotechnology and Healthcare. BIRAC can also learn from Sweden's Triple Helix Model (Industry, Academia and Government) and continue its efforts to abridge the existing gaps in Indian Biotech Ecosystem.



Indian Delegates with Mr. Mikael Damberg, Minister of Enterprise and Innovation, Sweden



Indian Delegates with Ms. Malin Cederberg-Östberg, State Secretary and other delegates from Ministry of Education, Sweden



Meeting between Indian Delegates and Vinnova, Sweden for discussion on future activities

States' @ New India 2022

India's Most Impactful State Policy Conclave Strong States Make Strong Nation

States' @ New India 2022 is a prestigious flagship programme of the PHD Chamber of Commerce and Industry PHDCCI, which aims to support the socio-economic development of Indian States with a motto, Strong States Make Strong Nation.

The main objective of Conclave was to host decision makers to discuss the key agenda of growth for "Making New India by 2022".

The chief guest for the event were Shri Manohar Lal Khattar, Chief Minister Haryana and Mr. Manish Sisodia, Deputy Chief Minister Delhi. The event was attended by many other dignitaries, such as, Shri Deepak Bagla, MD & CEO Invest India; Mr. Anil Khaitan, President PHD Chamber; Mr. Rajeev Talwar, Senior VP PHD Chamber, Shri Rajat Agarwal, CEO Invest Punjab; Smt. Vini Mahajan, Additional Chief Secretary, Government of Punjab and many more.

The agenda of the Conclave focused on giving new insights about the policies and action plans of Indian Government & States to all the stakeholders. Dr. Manish Diwan, Head-Strategic Partnerships & Entrepreneurship Development, BIRAC spoke about 'Fostering Innovation & Creating Government-Industry Interface'. Dr. Diwan discussed about BIRAC's impact in nurturing Biotech Innovation Ecosystem in the country. He emphasized that BIRAC can become the strategic implementing & knowledge partner with States to create and foster such an Ecosystem of Biotech Start-ups especially in the Tier II & Tier III cities.

The States' Conclave held B2G sessions of State Government Officials and Industry Delegates from the States of Haryana, Punjab, Uttarakhand and Delhi.



DBT-BIRAC Nature Research Academy Workshop for Funders



The Department of Biotechnology, Government of India and BIRAC held a workshop designed for funders designed and implemented by the Nature Research Academies team. This workshop was designed for funders who review and approve research proposals. The DBT, BIRAC and Nature Research Academies team worked together to design the modules that were tailored specifically for funders. The workshop featured a combination of short lectures, open discussion and practical exercises. At the end of the workshop, the attendants took a test.

The training was led by Dr. Jeffery Robens, Editorial Development Manager at the Nature Research Academies. The workshop participants were from DBT and BIRAC and had strong scientific backgrounds. Many participants had several years of experience on reviewing and monitoring grant proposals.

The workshop was planned over 2 full days and the first day covered funding ethics, clinical research methodology and effective writing. The second day began with reviewing proposal structure, how to stay up-to-date in the field and monitor trends, and concluded the day discussing important point in reviewing grants. Participant feedback after the workshop showed that a 100% of the attendants were satisfied with the expertise of the trainer, the relevancy of the presented topics, the usefulness of the content among others.

Workshop on Synthetic Biology- A program organised jointly by BIRAC and Indian Institute of Technology, Madras (IITM) & IITM Bioincubator



BIRAC organized a three day workshop on Synthetic Biology. This training workshop was organized as part of Industry mentoring of BIRAC in collaboration with IIT, Madras- Bioincubator, Chennai. An overwhelming and enthusiastic response was received from all the participants. The total number of participants in the workshop was 25 from different enterprises. The audience included a pool of Entrepreneurs/Start-ups and researchers.

The workshop started with a welcome address by Prof. Guhan Jayaraman, Faculty, IIT Madras & Coordinator- IITM-Bioincubator, wherein he remarked about the activities at Bioincubator and the importance of conducting this workshop. He also gave an overview on synthetic biology tools and techniques with recent advances and applications of the same. The expert faculty associated with the workshop were Dr. M. Anantha Barathi, Dr. Shashi Bala Prasad and Dr. Sudeshna Sengupta from IITM, Bioincubator. The team from Bioincubator gave a detailed lecture with practical classes on the specific metabolic pathways and tools required to design such pathways. Dr. Anirudh Ranganath, CEO, Quest Combio Pvt. Ltd. and Mr. Amogh, CTO, Medha Innovations Pvt. Ltd. gave detailed learning on the computational tools used in synthetic biology. They also gave an experience of starting a new company in the fields of synthetic biology.

Further the workshop focussed on lectures and hands on practical sessions in the area of synthetic biology the participants were exposed to the latest trends in this area, including computational and experimental tools for design of genetic circuits in bacterial systems. The purpose of the training programme was to upgrade skills and generate trained human resource in the related sector.

BIRAC - TiE WinER Accelerator at Golden Jubilee Biotech Park, Chennai from 7th -13th July, 2018

BIRAC in collaboration with TiE-Delhi NCR organized a 7-day intensive Accelerator Programme for 15. Biotech WinER Awardees (Women in Entrepreneurial Research) at Golden Jubilee Biotech Park, Chennai from 7th -13th July, 2018. To make the accelerator program more effective and intense, BIRAC consciously considered the opinions of the individual candidate expectations regarding the challenges and lacuna they were facing. The five major thrust areas which were expressed by them were fund raising, team management, IP and regulatory, manufacturing and marketing. The leading expertise pan India from the above mentioned thrust areas were invited.

The 7-day programme culminated into a Demo Day for identification of Top 3 Women led start-ups. The participants presented their pitch to the jury. The 3rd position was a tie between 2 Innovators. So, a total of 4 winners were announced & awarded INR 25 Lakh each. Dr. Renu Swarup, Secretary, DBT & Chairperson, BIRAC presided over the valedictory ceremony and conferred the awards to the winners.



Pre-Pilot Workshop for SIIP fellows



Four days' workshop specially designed for "Social Innovation Immersion Program" fellows was organised at SC-TIMST- TIMED Trivandrum. The said workshop is second in the series of three workshops proposed for Social Innovators under the theme "Ageing and Health". 16 Social Innovators from four SIIP Implementation partners (Venture Centre, KIIT, SC-TIMST and CCAMP) were trained on the concepts of problem mapping, case for venture creation, feasibility checks and grant pitching skills. The faculty from Tata Institute of Social Sciences, Mumbai and BIRAC subject experts helped in developing critical insights among the SIIP Fellows on social, economic, political and environmental dimensions of product development. SIIP Fellows are currently trying to develop innovative solutions for the most pressing problems in the "Ageing and Health" arena.

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 C-CAMP, Bangalore on 23rd August, 2018. The program was designed for the Start-ups, Academia and SMEs to make them aware of the aspects and importance of Intellectual Property, Technology Transfer and Commercialization processes.

The workshop was well represented by about 45 participants from academic institutes, medical colleges, start-ups and aspiring entrepreneurs engaged in life sciences sector. The workshop was focused on imparting the knowledge on Intellectual Property (IP) and Technology Management. Sessions were broadly divided into the three segments namely IP Management, Technology Management and Regulatory requirements related to the Medical device & diagnostics and Biodiversity. Session on IP Management highlighted the knowledge to the audience on role and importance of IP for Start-ups, Patentable subject matters in India, Patent searches and Strategic patent filing. Session on Technology Management covered the overview of Technology Transfer & Commercialization and use of different agreements required by Start-ups during the negotiation process. Last session was focused on the regulatory requirements on Medical Devices & Diagnostics and Biodiversity related matters on the utilization of the biological resources for research and commercialization purposes.



BIRAC's 2nd IP Law Clinic organized at C-CAMP, Bangalore on 24th August, 2018

BIRAC conducted its second IP Law Clinic at C-CAMP, Bangalore on 24th August, 2018 where BIRAC supported grantees had one to one interaction with the BIRAC IP & Technology Management team on IP & Technology Management related matters. The clinic was organized to provide a strategic advisory on IP filing process and to provide a solution based approach on complex IP & Technology Transfer matters. BIRAC team explained about BIRAC-PATH scheme which is available for its grantees to provide the financial aid for Patenting and Technology Transfer emerging out from the BIRAC supported projects.




BIRAC and WISH Partnership to provide last mile Primary Healthcare Innovations in Rajasthan




Taking ahead the partnership, BIRAC and LEHS-WISH (Wadhvani Initiative for Sustainable Healthcare) along with National Health Mission, Government of Rajasthan, launched two BIRAC supported innovations, SOHUM and ATOM on 4th September 2018, at Hotel Holiday Inn, Jaipur City Centre. With the guidance of National Health Mission, BIRAC-WISH partnership aims to create an impact in the health care environment in the state by making the inaccessible services accessible to the doorsteps of masses. This launch is a part of the larger objective of BIRAC-WISH partnership to introduce new innovations and technologies as solutions to the unmet healthcare concerns and make it affordable and accessible till the last mile. The aim of this launch was to address the diseases at the primary health centre level, reducing patient load at the secondary and tertiary centres, thus converting the existing PHC and sub-centres to Health & wellness centres delivering all the services listed by the government.

Mr. Naveen Jain, MD-NHM, Rajasthan was the chief guest for the function and both the devices were officially launched in the state by MD-NHM, Rajasthan. BIRAC was represented by Dr. Shirshendu Mukherjee, Dr. Saishyam Narayanan and Mr. Utkarsh Mathur. Mr. Rajesh Ranjan Singh, COO, WISH foundation and Dr. R. K. Srivastava, Senior Advisor Innovations and Dr. Kavita Kachroo, HTA Manager represented WISH foundation along with other field staff for the state of Rajasthan.



Promoting Make in India



BIRAC & KIHT, in partnership, will facilitate start-ups, entrepreneurs, researchers, academicians, incubation centres & SMEs in Testing and Standardization of Medical Devices

Standards that can be tested:

- * Electromagnetic Interference (IEC 60601 Series)
- * Electromagnetic Compatibility (IEC 60601-1-2 Series)
- * Electrical Safety Testing
- * Biocompatibility (ISO 10993)
- * GMP (ISO 13485)
- * Software Testing (IEC 62304)
- * Material Testing (Relevant ASTM Standards)
- * Radiation Protection (IEC 60801-1-3)

Additional Services:

- * Rapid Prototyping
- * Health Technology Assessment
- * NIPUN Certificate application

Cost will vary depending on parameters, such as:

- * Duration of Testing
- * Testing Chamber Configurations
- * No. of units required to be tested

Testing charges are subsidized for BIRAC referred start-ups to an extent of 40%-70%

For getting reference through BIRAC & availing the subsidized cost E-request may be sent to: Sonia Gandhi, Senior Manager-Investments, BIRAC at sgandhi.birac@nic.in

Grand Challenges India



Grand Challenges Antimicrobial Resistance Partner Meeting, July 2018

The Grand Challenges India Antimicrobial Resistance (GCI-AMR) call was launched in early April 2018, in partnership with Grand Challenges Partner countries, South Africa, Africa and Brazil. Each country partner developed a mandate that was common with other countries, yet was also specific to their own country mandates on AMR.

Each partner launched their own call in their geographies, and conducted their own review process. However, given the opportunities to connect researchers and ideas from different themes, topics and to each other, it was decided to have a meeting with all the partners to discuss the selected, or the top proposals.

This meeting was held at the Wellcome Trust in London, on 24th July, and continued at the Bill & Melinda Gates Foundation Office in London, on 25th July.

At this meeting, each partner discussed either the selected proposals, or the top proposals, depending on where they were in the review process. Each country partner weighed in on possibilities to connect these researchers with experts or peers to ensure that the project has the best chance of succeeding.

A short introductory meeting was also held where the work of the Grand Challenges partnership was discussed, to inform other divisions and departments at the Trust about the work being done in the various countries and to discuss possibilities for future partnerships. Dr. Mukherjee, Mission Director, PMU-BIRAC presented the work of Grand Challenges India at this meeting.

At the end of the meeting, it was felt that such a discussion and sharing of information would prove to be very informative, especially so that each of the Grand Challenges country partners is aware of the work that other partners are doing and this will enable more cross-country partnerships.

Grand Challenges Exploration-India Round 4

The Grand Challenges Exploration (GCE)-India is one of the fast track programs under Grand Challenges India. This program intends to provide seed funding to highly innovative ideas at the pre-proof of concept stage to address challenges specific to the Indian public health domain. The initiative seeks to validate ideas from talented



The Grand Challenges Country partners with the Grand Challenges team from BMGF, Seattle and Wellcome Trust representatives, at the Wellcome Trust, London.

and motivated individuals that lend themselves to be incubated as start-ups across India with the aim to encourage entrepreneurship.

The grantees selected under this program are provided funding for a period of 18 months to the tune of \$100,000 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.

Since its inception in 2015, four calls have been launched under this program. The exponential growth of the program in the last three years is evident through increasing number of applications received under subsequent rounds. The call received 85,156 and 237 applications in first, second and third Round of GCE-India calls respectively. More importantly, the quality of the proposals has also seen a marked improvement over time, which indicates the acceptability of the program to the research community.

The response to the Round 4 call that closed on 31st March of this year was enormous. 777 applications were received under 13 different mandates.

The call mandates were specifically drawn from diverse domains of maternal and child health, health or behaviour change wearables, diagnostics and devices, cervical cancer, antimicrobial resistance, agriculture and nutrition, geriatric care and sanitation. The applications were received from all spheres of scientific community, ranging from academia (faculty, postdocs/researchers) to industry (large corporates, small-medium enterprises, start-ups), non-governmental organizations and individuals. Likewise, the call saw applications from most states of India. After initial eligibility check, 585 applications were sent for the review to the respective subject matter experts. Each proposal was appraised by three reviewers on the scale of 1-10 on 6 criteria namely Novelty, Feasibility (technical), Sustainability (cost to user against current/new alternatives), Accessibility (ease of deployment in low-resource settings), Potential Impact, and Team Execution Effectiveness.

The reviewers scores on all the applications have been received and the scores have been normalized following due-diligence processes. The selection committee meeting for Round 4 call is scheduled for 20th and 21st August 2018.

Ki Data Challenge

knowledge integration (ki) Data Challenge, sixth call under GCI was launched on 3rd July for 45 days with a goal to foster new approaches in data-driven decisions designed to answer critical scientific questions related to maternal and child health and development outcomes, using innovative data analytics and modelling approaches applied to HBGD ki India or to other relevant data sets that applicants can access.

The grant is envisaged to fund around 9 projects for a period of 12-18 months with a maximum of \$ 100,000 for each project. Robust outreach was done through various digital, social and print mediums. The ki team did outreach at premier institutes like IITD, IIT Madras, NCL Pune, ISI



The GCE- India Round 4 Selection Committee meeting



Outreach event at IIT-Madras, July 2018



Outreach event at NIRRH, Mumbai.

Kolkata, NIRRH Mumbai with a very unique mandate and different landscape of researchers as the idea behind this call was to develop strong collaborations between data scientists/modelers and clinical researchers, thus enabling development of data analytics capacity in India with respect to MCH domain.

The application process was open until 17th August, 2018, and the program received a good response with 116 submissions of applications. The triage is in progress.

Sentinels Experiment

The Sentinels Experiment intends to source innovation in India to address global health challenges by working with sentinels for excellence and innovation, who can identify new ideas and scientists in their institutions, networks, and regions.

The initiative engages with explicit innovation practitioners, new partners, new ideas and new opportunities focused on creating and fostering delivery of more appropriate (affordable, deliverable and scalable) versions of extant interventions, the contribution could be by way of a new product, service or process.

The experiment is using special 'administrative mechanisms' to provide offers of grant agreements either on-site or within days after our meeting and fund within 2 weeks of receiving a returned, signed grant agreement.

Towards this, a series of meetings were held at Centers of Excellence namely, IISc, NCBS Bangalore and CMC Vellore in April, 2018 to socialize the "Sentinels" experiment and find people who ideally are not working on global health problems but have relevant skills, technologies and potential passion.

24 two pager proposals has been received from a closed list of innovators/companies, academicians from the key institutions like IISc, NCBS and other Institutes in Bangalore which are under review.

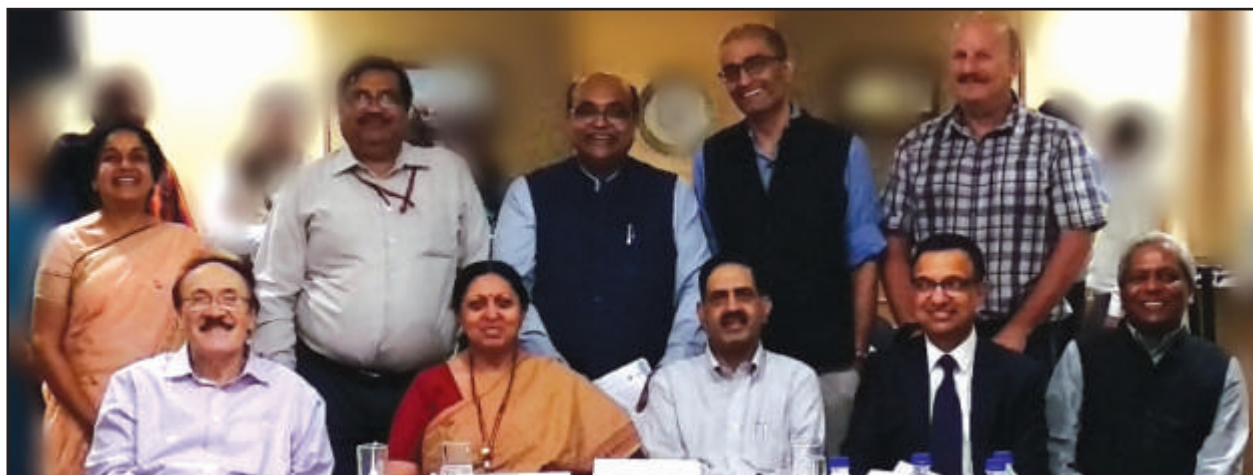
Grand Challenges India Executive Committee Meeting 2018

Grand Challenges India and the Program Management Unit at BIRAC are governed by an apex body known as the Executive Committee (EC). This EC is co-chaired by representatives from the Department of Biotechnology, Government of India and the Bill & Melinda Gates Foundation. Dr. Renu Swarup, Secretary, DBT and Dr. Natchiket Mor, Country Director, India Office of the Bill & Melinda Gates Foundation are the current co-chairs of this committee which reviews the progress of the programs and decides the research and funding priorities for the partnership.

The 8th Executive Committee Meeting was held on 30th July 2018. A showcase meeting followed, where current GCI grantees presented the work funded by the partnership to the EC and invited dignitaries.



Sentinels Experiment team at IISc, Bangalore.



The Executive Committee of Grand Challenges India, with Dr. MK Bhan, Chair, SAC, GCI; Prof K VijayRaghvan, Principal Scientific Advisor and Prof. Balram Bhargav, Secretary, Department of Health Research & DG ICMR

National Biopharma Mission Updates

National Biopharma Mission (NBM) conducted a roundtable session on 'Working Together Towards Affordable Indigenous Biosimilars' on July 18, 2018 at BIRAC office, New Delhi.

The meeting was chaired by Prof. Mark Smales, Professor of Industrial Biotechnology, School of Biosciences, University of Kent and was attended by industry representatives and academic researchers working in the field of biosimilars. The specific objectives of this brainstorming session were to identify the key challenges faced by industry and academia in the development of biosimilars in India and suggest methods and solutions to resolve them.

Some of the challenges faced by the biosimilar industry in India identified during the session included availability of indigenous cell lines, cost of raw material and purification reagents, analytical characterization facilities and global regulatory procedures for dossier filing along with possible solutions to each of them. The NBM will try to address some of the challenges by identifying key areas of intervention that can have an immediate, positive impact on the biosimilar industry. The inputs received during this session will also be helpful in development of new RFPs inviting industry-academia consortia for indigenous development of biosimilars.

Team members from NBM, Dr. Kavita Singh (Mission Director) and Dr. Hardeep Vora (Program Manager) participated in the following meetings.

Update meeting on 1st World Conference on Access to Medical Products and International Laws for Trade and Health on August 6, 2018 at Nirman Bhavan, New Delhi.

This meeting was conducted to get an update on the activities of the participating agencies as decided in the 1st meeting held on Nov 21-23, 2017. Dr. R K Vats, Additional Secretary, Ministry of Health and Family Welfare, Government of India chaired this update meeting. Representatives from various governmental organizations and agencies including BIRAC, DBT, ICMR, AMTZ, WHO etc. were present at the meeting.

All representatives updated the committee about the activities undertaken by their respective organizations with respect to the minutes of the meeting of November 2017 meeting. Though it was not part of the first meeting, NBM updated on the activities under the BIRAC umbrella. Activities such as funding of CMC facility, funding of medical devices and new proposal calls for GCLP and TRC were discussed and how they can help push for innovation, research & development and affordability in the field of medical products.

International Consultation on Research to Combat Nipah Virus Disease, 6th–8th August 2018, New Delhi, India hosted by Indian Council of Medical Research and WHO, SEA.

The objectives of the workshop were to discuss research preparedness for Nipah outbreak, identify potential research areas for research during Nipah outbreak and to draft research proposals on the identified potential research areas.

This was the first opportunity when all the primary stakeholders of research in Nipah virus came on the same platform to enable the SEA Region to lead the research work and preparedness for Nipah outbreak.

National Biopharma Mission aims to facilitate early development of promising novel vaccine candidates and monoclonal antibodies for high priority, complex infections by the Indian industry. Thus, this meeting was of utmost importance as there were discussions on product development of monoclonal antibodies for infectious diseases. This aligned with NBM's strategy to accelerate product development by strengthening the ecosystem, enable de-risking and increase success rates by providing support across the product value.

20th August, 2018 Meeting at ICMR Conference Room, New Delhi entitled 2nd National Consultation Meeting on Essential Diagnostics List in India.

The meeting was organized to undertake a discussion on the 1st Essential Diagnostics List (EDL) published by the WHO in May 2018 and how India should take a lead in establishing a National EDL. The various participating agencies, researchers and diagnostics companies put forward their views about the requirements of the National EDL in India in light of the revised Medical Devices Rule 2017 published by DCGI. Many experts were of the view that medical devices should also be included in the National EDL list along with diagnostics. The National Biopharma Mission may play a critical role in the overall impact of this development since one of the scopes of the Mission is development of diagnostics and medical devices capabilities within the country. Identification and finalization of a National EDL may help the NBM in narrowing down to the essential technologies that can be promoted under the program. This may lead to development of indigenous capabilities and increased self-reliance for the country in the field of medical devices.

2nd Annual Regulators Conclave for Central and State Regulatory Authorities, on 23rd and 24th August, 2018 at Kasauli Himachal Pradesh. Organised by Central Drugs Standard Control Organization (CDSCO), in collaboration with the WHO Country Office for India and the Government of Himachal Pradesh.

The government is dynamically changing the regulatory landscape attributing to the new policies and interventions. The recently released Rules for Medical Devices and in-vitro diagnostics released in the public domain being one such example. The regulatory conclave brought all national and states regulatory counterparts onto a single platform with the following objectives: to ensure advancement of regulatory systems in the country by sharing global best practices and newer updates regarding WHO listed authorities. Deliberations on inter-ministerial and cross cutting issues such as holistic approach for quality and access of medical products through MSME. And enabling regulatory ecosystem for innovation in health technologies, standards for medical devices & diagnostics and their validation for access in global markets for Indian manufacturers. Since NBM is supporting the development of Medical Devices and Diagnostics and also has the mandate of training across MSME participation in this meeting allowed discussions with various stakeholders. Dr Kavita Singh, Mission Director, NBM-PMU shared her thoughts in the conclave on "Enabling Regulatory Ecosystem for Innovation in Health Technologies"



Biotechnology Industry Research Assistance Council

(A Govt. of India Enterprise)

**Inviting you to be an
Enabler for nurturing Biotech Startups**



**Bioincubators Nurturing Entrepreneurship
for Scaling Technologies**

BIRAC provides support for establishment of
World Class Biotech Incubators through BioNEST

BioNEST has supported

31 Bioincubators

300+ startups

3,37,000 sqft of incubation space

Who can apply

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



Academia/ Research Institutes/
Research Hospitals/ Organizations

to foster Innovation and Entrepreneurship in Biotechnology

For programme details please visit <http://www.birac.nic.in/bionest.php>
Contact: Dr. Chhaya Chauhan, Manager Incubation (sped4.birac@nic.in)
Dr. Manish Diwan, Head SPED (sped.birac@gov.in)

BIRAC PROGRAMMES

SITARE (Student Innovations for Advancement of Research Explorations)

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

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

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

Discovery, Early and Late Stage Funding

- **BIG (Biotechnology Ignition Grant):** Biotechnology ignition Grant (BIG) is available to scientists, entrepreneurs from research institutes, academia and start-ups, to stimulate commercialization of research discoveries by providing very early stage grants to help bridge the gap between discovery and invention.
- **SPARSH (Social Innovation Programme for Products Affordable & Relevant to Societal Health):** SPARSH combines social innovation and biotechnology for the well-being of the society by helping, identify and support cutting edge innovations towards affordable product development with potentially significant social impact. SPARSH provides support in the form of impact funding and fellowships.
- **SBIRI (Small Business Innovation Research Initiative):** It is the early stage, innovation focussed PPP initiative to support incremental R&D in the area of Biotechnology to facilitate innovation and risk taking by SMEs
- **BIPP (Biotechnology Industry Partnership Programme):** BIPP seeks to provide support for early to late stage high risk biotech R&D by industry and/or accelerate commercialization of new indigenous technologies.
- **PACE (Promoting Academic Research Conversion to Enterprise) :** PACE scheme encourages/supports academia to develop technology/product (up to Proof-of-concept stage) of societal/national importance and its subsequent validation by an industrial partner

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

- BIRAC's Flagship programme which has created 31 world-class bio-incubators to provide incubation space, mentor networks, instrumentation facilities, IP and technology management support.

Collaborative Funding

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

Equity Funding

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

For further information please contact:

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