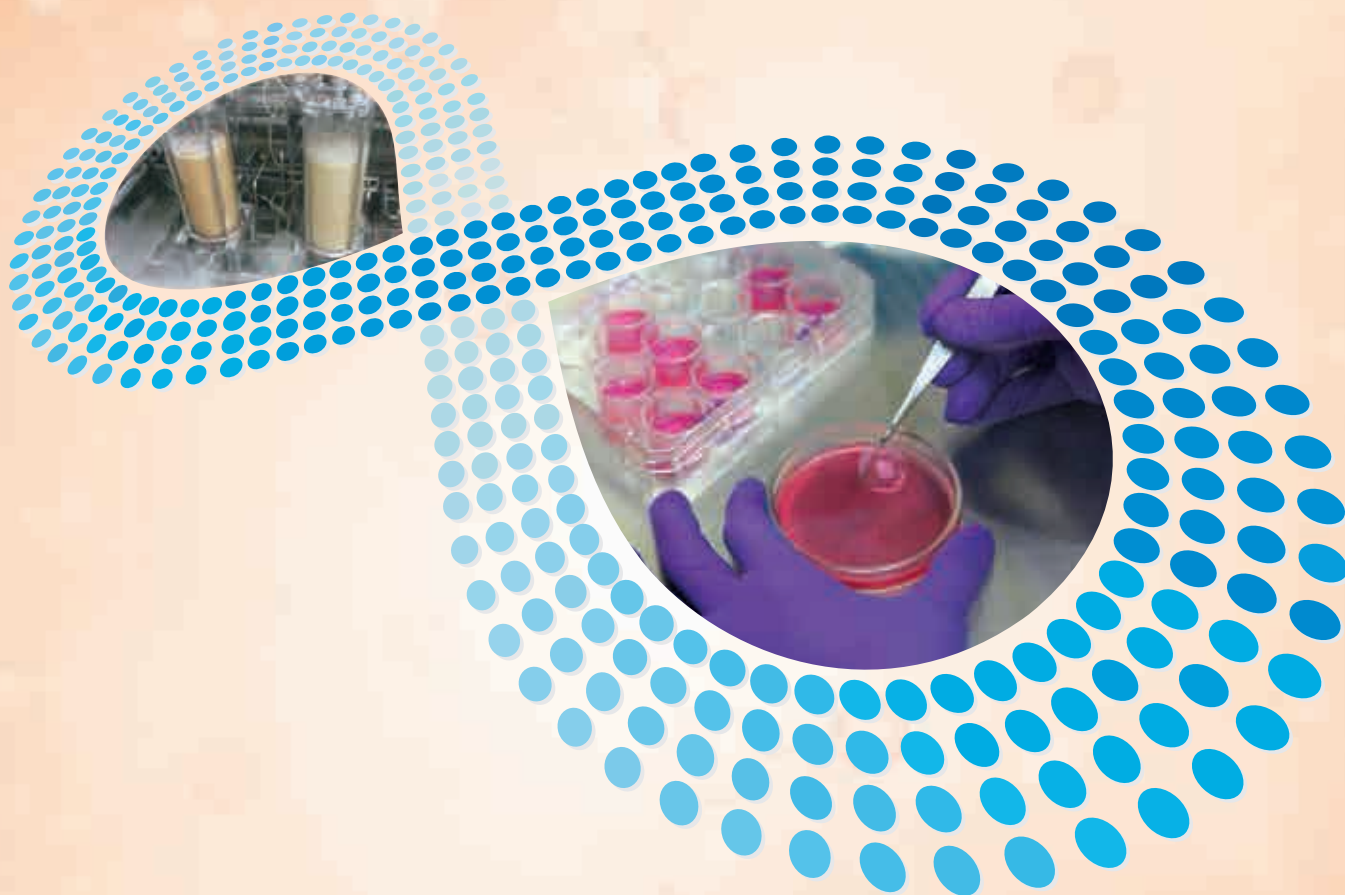


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BIRAC Innovations[®] **Propelling the Bioeconomy**



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



September **2017**

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Chief Editor's Take



BIRAC's efforts in the last 5 years have resulted in several significant changes in the landscape of the Indian Biotechnology Industry. Through our efforts we have transformed the bio-entrepreneurial landscape with funding support to at least 500 startups who are developing innovative, cutting edge, high quality and affordable products. There is a continual increase, year on year, in the number of biotech startups that we support. We believe that these startups will be able to transform Indian biotech landscape. More than 100 new products and technologies have been developed and many commercialised. Affordable product development impacting society is our major focus.

We are confident that our support to startups will deepen - not just in funding, but in other important areas. We are expanding the touch points between our supported startups and other stakeholders such as private funders (Angels & VCs), IP & regulatory experts, clinical testing beds and validation partners to

name a few. We are also expanding our partnerships such as with IAN and TiE. These connect points are important for the next phase of growth of the startups including adoption of products and accessing new markets.

Several significant programs have been launched and many are planned to be launched soon. The National Biopharma Mission as well as the BIRAC AcE Fund and SoCH (challenge award on Solutions for Community Health) are new programs that have been designed to address specific gaps in the ecosystem and we are confident that these programs will be transformative as our other flagship programs such as BIG, SBIRI and BIPP.

We will continue to focus our efforts in propelling the Indian Bioeconomy with the aim to make it a US\$100B industry by 2025.

Dr. Renu Swarup

Senior Adviser/Scientist 'H', DBT, Govt. of India &
Managing Director, BIRAC

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Leader



In the last couple of years we can sense from the signs that are emanating that India has entered a phase where entrepreneurship driven innovation and its potential to transform the country has rightfully entered the public discourse and has received continued top level policy support from the Government through flagship programs such as Startup India and Make in India.

A silent revolution has also taken place in the realm of biotechnology and life sciences industry where we see an efflorescence of entrepreneurship over the last five years- orchestrated and anchored by path breaking programs of the Department of Biotechnology (DBT) and BIRAC. Programs, such as BIG, SBIRI and BIPP and the BioNEST together have propelled bio-innovations from ideation to manufacturing- right here in India- helping bring a positive change for inclination towards R&D in the industry, creating high skilled jobs and manufacturing excellence.

We have also continued to focus on solving societal challenges through our programs such as SPARSH as well as with partnerships with Bill & Melinda Gates Foundation, Nesta UK, Wellcome Trust UK, ICMR, WISH Foundation, Indian Angel Network (IAN) & TiE Delhi.

We have also created platforms such as the Innovators Meet (which is in its 6th edition), BIG & BioNEST Conclaves that aim to bring together stakeholders for knowledge exchange as well as explore possibilities for partnerships. BIRAC continuously refines these platforms integrating new interactions and interfaces between startups and other stakeholders. For example, we now actively interface our biotech startups with the venture funding organisations thereby increasing the probabilities for dilutive funding to bridge the so called "valley of death"- a phase in startup's evolution wherein they require injection of growth funds.

We now have two regional centres- BIRAC Regional Innovation Centre (BRIC) at IKP Knowledge Park and have recently launched a BIRAC Regional Entrepreneurship Centre (BREC) at C-CAMP Bangalore. Our regional centres will amplify our connect points with innovators. They will also be able to channelize feedback from our startups, industry and other organisations which will help us modulate our programs.

The integral power of these efforts are beginning to show results on the ground- products and technologies that are helping communities lead a healthy, clean and safe life, improving industrial processes and efficiencies thereby making Indian biotech industry achieve global standards of excellence and be competitive.

As we look into the future, our approach would involve continuous refinement of existing portfolio of programs and expand our support to the emerging biotech community in India. In the near future we are excited about operationalizing the National Biopharma Mission in partnership with World Bank, BIRAC AcE Fund (an equity fund), BIRAC Innovation Challenge Award for community health (SoCH) and we believe that these programs will further strengthen the Indian biotech innovation landscape and push the innovation agenda for the country.

We continue to seek new modes of engagement with partners and invite aligned organisations to join hands with us. We hope that our efforts will continue to propel the Indian bioeconomy to achieve its potential as a leading global hub for bioinnovations.

Prof. K. VijayRaghavan
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Accessing International Markets and Global Perspective in Life Sciences

Introduction:

India has been focused primarily on R&D in generic space within Life science. Many of the Indian Pharmaceutical companies are starting to invest in drug development for novel drugs. The pipeline of products coming out of Academia in India is small and their adoption by the pharma and biotech industry is slow. This has resulted in two things: i) The Indian Pharma and biotech companies are looking out of India for their drug development pipeline and they have set up subsidiaries abroad in chasing for new drug candidates; ii) The concept of Innovation office in Academic institutions is not a common practice. Documenting discoveries and promoting them to industry does not happen except for few Institutions.

Sweden as an example:

Sweden is ranked as No. 1 Innovation country in the world. There are several reasons for this. The main advantage of Sweden, compared to other countries is that the scientist who makes the discovery owns the discovery, not the Institution where he or she works. This is unique and quite different from other countries in the world (eg. USA, UK) where Institution/University owns the discovery made by the scientist. There are systems put in place by the University that helps the scientist to make his/her discovery into an IP (intellectual property), IP into a company and the company is housed in Science parks/incubation centers within the university for its growth.

Government owned institution like Vinnova (similar to BIRAC in India) as well as other University based funding agencies like Innovationsbron, GU Holding etc. provide start-up funds, early growth capital and after some years hand them over to Venture Cap companies with whom they have first-refusal agreement. There are several firms started like this in Stockholm-Uppsala region, Malmo-Lund region in Southern Sweden, in Gothenburg and in other university towns like Linkoping, Umeå etc. Sweden is home to Astra (now Astra-Zeneca) and Pharmacia (now owned by Pfizer) and their beginnings were small and they relied on the University that funneled ideas.

Housing these start-ups in the academic environment (like science parks located within the institution) allows a lot of cross-talk between both SMEs and Research groups building a bridge for translation.

Indian companies have already visited this innovation milieu in Karolinska Institute in Stockholm and interacted with the Academy and industry players. One of them, Cadila Pharmaceuticals Ltd have started Cadilapharma Sweden AB and have made a great start to bring affordable innovation to India.

Initial challenges for Indian life sciences companies:

The initial challenges would be to promote Innovation at University level. Each University should have an Innovation office that has full knowledge of all the research going on in their departments. Then the Innovation office should find opportunities for interaction with financial institutions/venture capitalists to bring the scientists and the business together. They should also map the funding available from national and international resources in the form of grants and promote partnerships between Academy-Industry as well as Academy-Academy interactions to seek international funding. These will be in the form of network grants from DBT, ICMR etc.

Building bridges:

Sweden is a knowledge economy. Money from federal research grants, EU grants, NIH grants etc. is invested in creating new knowledge by strategic partnerships, networks, etc which lead to new discoveries / innovations that get IP and creation of companies around the IPs. There are a lot of opportunities available for many Indian companies in technology platforms, diagnostic platforms, vaccine platforms etc.

Technology is the game changer. Digital health programs or eHealth is causing dramatic shift in the landscape. Ability to monitor health and seek help will bring influence in prevention based systems, instead of treating patients when they are sick. We are in the cusp of medical revolution with information becoming more accessible and cheaper.

Whole genome sequencing is becoming a lot cheaper and it should be possible for individuals in the future to assess risk and change behaviour depending on the risk profile. With these changes the healthcare will shift from treatment to prevention and this will also alter the landscape for the healthcare and life science companies. In Sweden for example, the state is both the purchaser and care provider in the National Health Care system, enabling the development of new and sustainable system.

Business promotion agencies of the government can be a starting point for finding the right partners/networks etc. For academic institutions as well as SMEs there are partnership opportunities for inter-governmental grants, EU grants, network grants. Some big Indian pharma are venturing into co-development opportunities with Swedish companies thereby bringing innovation, IPs (through partnerships) and technology that can help jumpstart the local efforts.

Networking is Key:

Post establishing contact, it is always important to be in touch with key players. People do not stay in one job for a lot of time. There is constant churning and by being in touch, it is always helpful to expand the network. Networking is key. Support is always available and they are always bi-directional and not uni-directional.

Partnering events are held regularly in Sweden by Swedish agencies as well as European ones in Sweden. These partnering events are rich source of contacts and useful for matchmaking in life science industries, between investors and SMEs, big pharma and SMEs etc.

In conclusion, accessing international markets is critical to the growth of the local SMEs and the state can be an enabler of this. Partnership opportunities can bring ideas and co-development opportunities will allow transfer of technology. This can also improve trust in the partnership. Networking will expose the hidden talent and increase the speed of growth. All these approaches should happen in parallel in bigger scale. India has abundant talent, channeling them would be required.

How to Promote Market Access of Biotech Products in States?



Dr. Jitendar Sharma
Director & CEO, AMTZ

India is expected to be the world's most populous country by 2022. The growing population means an increasing demand for healthcare services. The supply of quality healthcare services is struggling to keep pace with the rapidly rising demand. Biotechnology products are a key component of any healthcare delivery system.

Biotechnology industry has inherent characteristics like long product development cycles, massive costs for commercialization, ethical concerns in development and implementation, stringent regulatory approvals, intellectual property rights and patent laws to name a few. Recent advances in the fields of medicine has led to a convergence of biotechnology and medical technology. The medical technology or medical devices space is critical in delivering biotech products which makes them an essential player in the overall success of biotech products. There is a need to enable the medical devices industry to flourish in the country thus in turn providing superior medical technology to support the biotech industry in healthcare.

The success for biotech products will depend on enabling easy market access as it will ensure that companies have a demand for their products which will in turn generate revenue for further research and innovation. Market access encompasses creation of demand, enabling manufacturing to meet that demand, providing regulatory framework which is simple yet robust, strong intellectual property and patent laws and ensuring certain standards for the products which are being developed.

How to create demand?

The government which administers public health programs in the country can increase spending on healthcare to create demand. In India, government spending on healthcare is amongst the lowest in the world. There is a clear focus to change this through creation and implementation of national programs like the National Dialysis Program, National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases & Stroke (NPCDCS) etc. by the Govt. of India. State governments too have started various programs. The spending though needs to continuously go up to increase coverage. Government spending is linked to healthcare costs and medical devices contribute a significant amount to these costs. Promoting domestic manufacturing of medical technology will lead to greater demand as outlined below: -

- a) Domestic production of medical devices will reduce overall healthcare costs leading to increased healthcare coverage in the country.
- b) Increased coverage means greater demand for biotech products.
- c) Increased demand will provide further impetus to research and development efforts (R&D) leading to further demand for new products.

Educating people and end users about general health, hygiene, care also creates a knowledge system where consumers are taking informed decisions leading to curated, high quality demand thus driving quality as well. Ensuring quality standards are considered along with cost during government procurement will level the playing field for all manufacturers.

What support is needed to enable manufacturing?

Encouraging manufacturers through startup incubators, financial

assistance programs, incentives for local manufacturing, partial funding of capital expenditure through PPP model will allay some of the fears associated with the biotech sector. A strong manufacturing sector ensures there is competitive pricing, high quality products and focused research and development. The government has already taken steps in this direction in sectors like medical devices where they have setup Andhra Pradesh MedTech Zone (AMTZ) at Visakhapatnam where the entire ecosystem for medical device manufacturing is being built.

AMTZ covers all the essential factors necessary for high quality, low cost manufacturing of medical devices like :-

- a) Inverted duty structure was corrected to reduce import duty on raw materials and encourage local manufacturing of medical devices
- b) AMTZ provides common scientific facilities like EMI/EMC, Gamma Irradiation, X-ray and CT Scan tube manufacturing, 3D printing and prototyping and a world class warehouse facility and highly subsidized rates lowering the cost of manufacturing
- c) AMTZ also provides a pre-built manufacturing unit under the plug and play at a rate of Re.1/- per sq ft per month

All medical devices manufactured at AMTZ can achieve an estimated reduction in the manufacturing costs of 40%

Why innovation and R&D needs to be encouraged?

The biotech sector requires consistent innovation and R&D. The high cost of R&D, concerns around Intellectual Property (IP) and patent laws have been major hurdles in driving innovation. Strong IP and patent laws are needed to help these companies to safeguard their investments and to be able to further innovate. The Govt. of India has already made changes to the IP and patent laws in accordance with WTO's Trade Related Intellectual Property Rights Agreement (TRIPS). This will certainly help further investment in the sector especially Foreign Direct Investment (FDI) thus creating additional value and demand generation. Mechanisms to reduce the burden of R&D from companies to research institutes and educational institutions need to be built.

The National Biopharma Mission aimed at accelerating the biopharmaceutical development in the country was launched on 30th June 2017. The mission aspires to create an enabling ecosystem to promote entrepreneurship and indigenous manufacturing in the sector. Furthering this mission, Biotechnology Industry Research Assistance Council (BIRAC), a Public Sector Undertaking of Department of Biotechnology has supported AMTZ to setup the

Kalam Institute of Health Technology (KIHT). KIHT will facilitate:

- a) Focused research on critical components of medical devices
- b) Technology transfer enabling upscale of prototypes
- c) Market access which will lead to access to healthcare for patients

When regulatory frameworks and quality standards can be enablers?

Fair and transparent regulation based on nature and category of products can help companies plan, develop and budget costs, product characteristics, release timelines and build their marketing strategies in advance. Regulatory bodies should avoid building a "one size fits all" framework. Focusing on building guidelines which are based on product categories and end application will make them easy yet robust to implement. The recently notified Medical Device Rules, 2017 which has eased norms for obtaining license and conducting clinical trials is a great step in the right direction of progressive regulatory frameworks.

Quality and matching global standards is an all-encompassing factor. Assured demand, easier manufacturing environment with economies of scale, simpler regulatory framework and IP protection all provide enough room for manufacturers to create high quality products. Since all the factors contribute towards lower costs there is a larger margin for companies to accommodate the costs of high quality manufacturing thus making products at par with global standards. Quality Council of India (QCI) has launched the new Indian Certification for Medical Devices (ICMED) scheme which brings much needed quality certification standards to the medical device industry in India.

What is the way forward?

The steps taken to enable the medical technology industry in India will greatly benefit the biotech industry in the country. A large part of promoting market access falls under the purview of the government, policy makers and policy implementation teams. That said, the focus is also consumers, healthcare providers, insurance providers to support the ecosystem through knowledge, best practices and adopting a qualitative and quantitative approach to all buying and selling. The ecosystem can be enabled by the government but the sustaining, evolving and maturing of the ecosystem will depend on all the stakeholders and not just on one single entity. There are many steps which have been taken like AMTZ, KIHT etc. which when replicated, the biotech and medical technology sectors will grow to an unprecedented paradigm putting India on the global leader list of health promotion.

Anti Microbial Resistance: Module Innovations fight to tackle this global threat.



Sachin Dubey
CEO CoFounder & CEO

Sachin is the Cofounder of Module Innovations and serves as the Chief Executive. He did his B.Tech and M.Tech in Nanotechnology from the Centre for Converging Technologies, University of Rajasthan, Jaipur. He was the Chief Operating officer at Fournira Optime Publishers. He is also part of the healthcare accelerator program at IIM, Ahmedabad and has executive education from IIM-A as part of the top 50 innovators under India Innovation Growth Program (IIGP 2.0). He has been awarded twice back to back prizes at IKMC 2014 and 15 in the diagnostics category. Sachin is also involved with NCL for Technology commercialisation and is a talented business oriented scientific mind.

Anti Microbial Resistance (AMR) is recognized as one of the greatest threats to human health worldwide. AMR is defined as the ability of a micro organism to stop an antimicrobial from working against it. Medicines that treat you today won't be able to help in future. While there are several reasons leading to AMR including overuse of antibiotics, use in poultry and farm animals, over the counter availability without prescription etc., we focus mainly on decision making, whether the antibiotic needs to be given or not. Module Innovations has been developing solutions to tackle this problem by offering rapid, affordable and easy to use diagnostic systems for detection of bacterial infections for Urinary Tract Infections (UTI). One in three women under 24 years of age contracts a UTI, half of all the women in the world will have one case of UTI at least in their lifetime. Globally 150 million people suffer from Urinary Tract infections every year. The humungous patients load seen in Indian hospitals, PHCs and healthcare settings has aggravated the problem of antimicrobial resistance, where antibiotics are given without the correct knowledge of organism and hence the effective antibiotic. Thus in most of the cases an empirical antibiotic treatment is started even before the culture results are available. Broad spectrum antibiotics are given even when narrow spectrums are effective.

Are our current diagnostic methods at blame ? Well, indeed because they are slow, lab intensive, require trained manpower and are not affordable to all. Module Innovations USense™ promises to alleviate this problem by offering a rapid, on-site, affordable and easy to use detection of Uropathogens in 30 minutes at the clinic of the doctor or a PHC. Recent incidences of antibiotics not working in hospital settings have started to surface, which I believe will become more in number if we do not take adequate steps to curb this menace. A new antibiotic takes many years to get developed and be usable for human consumption. If we do not use our existing antibiotics judiciously, we will be left with very less options for treatment where even a mild infection would prove fatal.

So, is there a way we can tackle the problem of AMR ? Well, wise use of antibiotics and taking them only when necessary will be great and effective start. How do we do this? The answer lies in use of rapid and point of care diagnostics systems that indicate if at all the infection is there and does need an antibiotic for treatment. If yes, then which organism. USense™ is one such device aiding the clinicians and workers at a

Newsletter of BIRAC

PHC guide a correct antibiotic therapy. Organizations like NESTA who run the prestigious Longitude prize are working towards finding solutions to alleviate the AMR burden from teams around the globe. They are looking for a rapid test (<30 min), which works on-site and can be used by a less trained health worker to determine whether antibiotics are needed to be given or not.

I feel changes at the policy level are extremely important to check the rise of AMR. The availability of antibiotic over the counter is a concern and should be regulated with a prescription. However, we cannot emulate the western model of prescription based antibiotic completely in countries like India. The high cost of visiting a doctor, and lack of insurance for every citizen need to be thought about. The high patient loads do not favour even a 30 min test. The developing world thus needs a different model to fight the AMR problem. It is sometimes sad to listen from doctors at very big hospitals giving empirical antibiotics without referring a culture test. They cannot be completely blamed however as there is pressure from the patients for a quicker relief. Arming our doctors with a rapid test like USense™ would make much of a difference.

Module began its humble journey with the BIRAC BIG grant with CCAMP Bangalore as its partner. The proof of concept for USense was developed as part of BIG. Module has also been the recipient of SBIRI grant. Module recently received the Longitude prize discovery awards by Nesta given to only 13 teams around the globe with only 2 awards in India this year. Module Innovations is located at NCL Innovation Park in Pune and works in the area of rapid easy to use and point of care diagnostics for various diseases. To know more logon to www.moduleinnovations.com



For more details visit www.birac.com

Launch of National Biopharma Mission

An Industry-Academia Collaborative Mission for Accelerating Discovery Research to Early Development for Biopharmaceuticals Innovate in India (I3)



The first ever Industry-Academia National Biopharma mission was formally launched by the Hon'ble Minister for Science & Technology, Dr Harsh Vardhan on 30th June 2017. The National Mission on Biopharma program, also named as 'Innovate in India' (i3) is a collaboration between the World Bank and the Government of India contributing equally to the overall mission's budget of US\$250 million. This mission aims to accelerate

India's position as a leading biopharma hub through focused programs on vaccines as well as medical technology including devices and diagnostics.

The aim of the mission is to enable and nurture an ecosystem for preparing India's technological and product development capabilities in biopharmaceutical to a level that will be globally competitive over the next decade, and transform the health standards of India's population through affordable product development. The program will specifically focus on the development of new vaccines, bio-therapeutics, diagnostics and medical devices to address the rising burden of diseases in the country. It will also bring isolated centers of excellence together, enhance regional capabilities and strengthen the current bio-clusters network in terms of capacities as well as quantity and quality of output.



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The launch was attended by senior dignitaries from the Government, industry and academia including Prof K. VijayRaghavan (Secretary DBT), Dr Renu



Swarup (Senior Adviser, DBT & MD BIRAC), Dr Soumya Swaminathan (DG ICMR and Secretary DHR), Dr Girish Sahnani (DG CSIR), Dr GN Singh (DCGI) and Mr. John D. Blomquist, Acting Director, World Bank India.



The welcome address was given by Dr Renu Swarup, she highlighted the role of the Government support in biopharma sector as well as the journey of this collaboration. She thanked the stakeholders who contributed to this formal collaboration

including the support from the World Bank team, DBT, IAVI and BIRAC.

Mr. John D. Blomquist, Acting Director, World Bank India mentioned that World Bank is pleased to partner with the Indian Government in its endeavour to build biopharma and medtech capacity through the i3 program. This is the first time that World Bank has partnered with a country. He opined that this program will contribute to developing solutions that will impact not just India but other countries too.

Prof K. VijayRaghavan commented that the Biopharma Mission has the power to transform the landscape of innovation in the country and the focus is to bring 6-10 cutting edge products to the market as well as create high-skilled employment.

The Hon'ble minister Dr Harsh Vardhan mentioned that the Biopharma Mission will contribute to make India an 'Ideas Economy' boost India's transition from being an 'imitator to an innovator' in healthcare and transform people's lives positively. Besides, India will become a major hub for biopharma product development globally.

The meeting concluded with a media interaction and networking.





Grand Challenges India, the partnership of the Department of Biotechnology, BIRAC and the Bill & Melinda Gates Foundation, supported by USAID, is housed at BIRAC and run by the Program Management Unit at BIRAC (PMU- BIRAC). In 2016, the UK's Wellcome Trust joined the PMU-BIRAC as partner and the unit supports the Trust funded Innovator Awards in India.

Grand Challenges India and the PMU at BIRAC currently work in the areas of Maternal and Child Health (MCH), nutrition, sanitation and hygiene, affordable healthcare, policy analysis, knowledge integration and dissemination, with programs and projects across these disciplines that are funded by our partners. The partnership is also exploring new areas to collaborate in, such as funding clinical trials and in developing strategies to mitigate the effects of climate change.

A common thread among these programs and projects is that these focus on encouraging Indian innovation to solve the problems that our vast and diverse population faces. The belief behind this principle is that India will have the best understanding of our challenges and would be able to develop context-specific solutions which can then be applied in other countries facing similar challenges.

1. **Maternal and Child Health (MCH):** The most obvious consequence of poor mother and child health is mother deaths during child birth and neonatal and infant deaths. However, for those mothers and children that do survive birth, there remain several challenges that could impact their future survival and development. Children's health is inextricably linked to the mother's, a relationship that we have only

begun to study and understand. A malnourished mother is more likely to have trouble during pregnancy and childbirth which is likely to impact the growth and development of the fetus and could result in a pre-term birth or a host of complications that will have a long-term impact on the child's health and development.

The All Children Thriving (ACT) program under Grand Challenges India and the Healthy Birth, Growth and Development knowledge integration (HBGDki) platform are two programs that aim at improving MCH. ACT was launched, in part, to direct research efforts to address gaps in our knowledge of various factors that impact maternal and child health and to understand causal linkages between these. The overall goal of the program is to provide a basket of interventions that improve the lives of both mothers and their children.

HBGDki seeks to improve MCH by providing a platform to share data and information to provide academics, quantitative experts and policy makers with the information they need to address complex and interrelated conditions in children that affect birth, growth and that could have a lasting impact on child development. This program intends to enable researchers access a pool of verified data to accurately identify patterns, gaps and interventions, from data and studies from around the world that could be used to address these outcomes.



The KnIT program also works in the areas of maternal and child health, where one of the two current domain centers is working on important questions in the MCH domain that are pertinent to the Indian context.

2. **Agriculture and Nutrition:** Impaired child growth and development, as manifested in early stunting and wasting, remains a stubborn problem globally with a significant burden of disease found in India. Poverty, nutritional deficiencies, inadequate feeding practices, and low socioeconomic status of women are among many important factors contributing to this alarming health crisis. Therefore, the partners believed that it was of utmost importance to fund Indian investigators proposing to test innovations that empower women and span multiple fields including nutritional science, agricultural practices, business and social practices.

In this thematic area, Grand Challenges India's Achieving Healthy Growth through Agriculture and Nutrition program was



launched with the aim to fund a portfolio of pilot projects that target the relationship between agriculture, nutrition, and health to reduce the high incidence of low birth weight and early stunting and wasting among Indian infants. The program also aims at social innovation by empowering women in their multiple family roles.

3. **Sanitation and hygiene:** Hygiene and sanitation play a fundamental but often ignored role in development, especially in

India. Sanitation and hygiene have a direct impact on health. The most obvious manifestation of this link is that of infectious diseases and poor sanitation, as many of these are readily transmitted through unsafe sanitation practices. It is not only water-borne diseases such as typhoid and cholera that are of concern here, but vector-borne diseases such as malaria and dengue that are spread through unsafe disposal of human waste. Diarrhea, which is among the most common complaint of infants and young children, is a direct result of



poor sanitation with poor hygiene practices, and can have long-term impacts on child health and development.

Reinvent the Toilet Challenge under the DBT and the Gates Foundation funded Grand Challenges India program, aims to encourage innovation in the fundamental areas of sanitation and hygiene, which even today pose a challenge in India. This program encourages innovation in waste collection and management to provide modern solutions to address rural and urban sanitation.



4. **Affordable healthcare:** the portfolio of projects under the Wellcome Trust's Affordable Healthcare in India program all focus on directing research to develop and test a host of medical and healthcare interventions that are affordable and accessible to those that need it. The projects funded under this program span a range of topics from developing medical devices that improve the quality of life of patients and people, to funding basic laboratory research. PMU at BIRAC will also manage the Wellcome Trust's Innovator awards in India, announced in early 2017.

5. **Data integration, policy analysis and dissemination:**

For data to be useful, it needs to be analysed, formulated into policy and effectively disseminated among those who make and enforce policy. Data analysis also needs to inform and direct future research to ensure that the resources going into these efforts yield maximum benefits.

Both the HBGDKi India program and the Knowledge Integration and Translational Platform (KnIT) are aimed at collating currently available evidence from different sources and making it available to academics, quantitative experts and policymakers. The larger goals of these programs, though operationalized slightly differently, are to provide accurate evidence to; first, gain an accurate picture of the current state of these pressing issues, second, identify the gaps in our knowledge and direct research towards them and finally, make this validated evidence available to policymakers and researchers to design studies and implement policies.

HBGDki India, is the India arm of the larger HBGDKi program supported by the Bill & Melinda Gates Foundation, and will support the rapid aggregation and comparison of data from these fragmented sources by providing a single platform for this data to be stored from India. The platform will allow contributing academics, statisticians and ultimately policymakers to access this data which would

enable them to obtain a much clear picture on trends and patterns. These insights will help design packages of interventions to address these issues as well as identify gaps in research to direct future efforts. These insights are crucial in deciding what intervention should be delivered to whom, at what point in their life, and in what form, to ensure that we reduce the burden of these three conditions to improve children's lives and their future.

KnIT is a unique platform that has been launched with the aim of collating and analyzing available evidence within India, to inform policymakers and health authorities and aid in the development of evidence-based policy to address the inequalities in the health outcomes in our country. The platform will work by collecting and analyzing currently available evidence, identifying gaps in our knowledge and directing research to these areas, and will work to improve our understanding of current or new interventions or packages of interventions to address the inequalities in our healthcare system.

Currently, KnIT focuses on two tracks, maternal and child health issues and nutrition. MCH focuses on identifying the health system challenges that are barriers to effective, equitable, impactful delivery of health services and identifies strategies how to overcome them. It also focuses on designing delivery strategies based on evidence, and piloting and evaluating programs aimed at improving program delivery, directing implementation research to optimize primary and secondary level healthcare, and generating evidence-based, human resource linked strategies relevant to MCH. The Nutrition track examines public health and medical interventions to mitigate stunting, wasting, severe malnutrition, low birth weight, optimal body composition and metabolic unfit or obesity. In addition KnIT also aims to address multi-sectoral

interventions for health; nutrition; family planning; water and sanitation hygiene; air pollution; child development; food fortification; and agri-nutrition linkages.

6. **Encouraging Ideation:** Innovation is an area that is full of risks, however sometimes the greatest ideas can come from the most unexpected of places. It is to encourage these out-of-the-box ideas that the Grand Challenges India partners launched the Grand Challenges Explorations- India program, as the Indian arm of the Global Grand Challenges Explorations program. GCE-India is aimed at allowing anyone with an idea to apply for a fast-track grant to further develop it. Grantees receive an initial seed grant to develop their ideas. This program is based on the belief that 'Great ideas come from everywhere' and that making initial funding available to even to people who may not have enough evidence to back their idea, may be the start of something big that could address the challenges we face today.

IKP Knowledge Park is the implementation partner for the program and PMU-BIRAC is the managing partner for the program.

7. **Immunization and Infectious Disease:** The PMU at BIRAC, is currently working with the partners on thematic calls and programs that focus on various aspects of immunizations such as new vaccinations and systems to manage data as well as on the emerging threat of antimicrobial resistance (AMR).

6th Joint Steering Committee

The 6th Joint Steering Committee was held on 31st August 2017 at the BIRAC office to take stock of the progress of the partnership and strategize the future of the partnership.

The meeting was attended by representatives of all the partners including the Department of Biotechnology, BIRAC, the Bill & Melinda Gates Foundation, Seattle and the India Country Office and the Wellcome Trust.

Exhibition on S&T at Parliament House Annexe

An Exhibition on Science & Technology Innovations was organised by Scientific Ministries/Departments of Government of India under the aegis of Department-related Parliamentary Standing Committee on Science & Technology, Environment and Forests, from 28th July to 11th August, 2017 at the Parliament House Annexe. The inaugural function of the Exhibition was presided by Smt. Sumitra Jayant Mahajan, Hon'ble Chairman, Rajya Sabha and Mohd. Hamid Ansari, Hon'ble Speaker, Lok Sabha was the Guest of Honour for the exhibition. The exhibition was also graced by the presence of Dr. Harsh Vardhan, Hon'ble Minister of Science & Technology and Earth Sciences, Shri Y S Chowdary, Minister of State for Science & Technology and Earth Sciences, Smt. Renuka Chowdhury, MP Rajya Sabha along with other dignitaries from the different Ministries.



This exhibition was organized with an aim to lay an emphasis on connecting Science and Technology to the masses, in particular for solving their day-to-day problems. The purpose of the exhibition was to showcase the S&T innovations by the various Science Departments and to disseminate the socially relevant products and technologies. The various ministries and departments that showcased their products were: Department of Biotechnology (DBT), CSIR, Department of Science & Technology (DST), Ministry of Earth Sciences (MoES), Department of Atomic Energy (DAE) and the Department of Space (DOS). All these departments and ministries came together to showcase their technological prowess to the honourable Members of Parliament. The idea was to convey the achievements of Indian Science to policy makers of the country. BIRAC along with DBT showcased some of their supported products related to health care and agriculture at the exhibition.



BIRAC & Judge Business School's Ignite Partnership

BIRAC and the Judge Business School (JBS) University of Cambridge UK have partnered since 2013 where BIRAC supports 5 Biotechnology Ignition Grant (BIG)- BIRAC's flagship and arguably India's largest early stage funding program for biotechnology to participate in JBS's one week's Ignite Program.

The one week intensive Ignite program combines aspects of practical sessions, expert clinics, mentoring and networking sessions and an understanding of regulatory & IP landscape that allows early stage entrepreneurs and startups to refine their business models and helps them strategize for the road ahead.

One crucial element for startups is to connect with other startups across the world, exchange peer to peer knowledge and learn about intricacies of different market. The Ignite program provides an unique opportunity to BIRAC's BIG startups to leverage the platform and additionally connect with Cambridge's vibrant innovative ecosystem as well as with other stakeholders beyond Cambridge. Additionally, JBS also arranges a further week of training and mentoring for BIRAC startups facilitating one on one expert interactions as well as catalysing networking that allows the possibility of new partnerships for BIRAC startups.

BIRAC and JBS together select the BIRAC-Ignite fellows through an intensive selection process taking feedback from BIG Partners, responses to a questionnaire and an interview with experts from BIRAC and JBS.

Since the start of the partnership in 2013, BIRAC has supported 24 BIG startups and entrepreneurs to participate in the Ignite program as well as being mentored for a further week. This has allowed our startups to connect with stakeholders in the Cambridge ecosystem and beyond such as the Cambridge Enterprise, Cambridge Science



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Park, Babraham Science Park, AstraZeneca, top faculty from University of Cambridge, UCL and Imperial College as well as connect with other companies such as JA Kemp (a EU Patent Company), Eagle Genomics, Swift Molecular Diagnostics, PharmEnable, CamBiosciences and Cartezia to name a few.

Each year, our startups have comeback with a rich experience and valuable connect points in the UK. In 2017, BIRAC extended its complete support to four entrepreneurs: Geetanjali Radhakrishnan (founder Adiuvo Diagnostics), Vikas Karade (founder AlgoSurg Products), Nilay Lakhar (founder SynThera Biomedical) Shibichakravarthy Kannan (Theranos Lifesciences) who participated in the programme, refined their business models, connected to the Cambridge ecosystem and beyond and also played the role of being BIRAC's ambassador- highlighting BIRAC's role (to the community in the UK) in transforming the entrepreneurial culture in India. The feedback from the 2017 BIRAC Ignite Fellows has been very positive. They have highlighted the range of activities that they participated in the two weeks which has resulted in their appreciation and refinement of their future strategies. Significantly, all four have built collaborations through this program- a clear indication of how platforms and aligned collaborations such as between BIRAC and JBS can inject new energies in business ventures.



BIOTECHNOLOGY INDUSTRY RESEARCH ASSISTANCE COUNCIL
(A Government of India Enterprise)



**TAKE YOUR
INNOVATION
FORWARD
WITH**

**birac
PATH** →

BIRAC-PATH (Patenting & Technology Transfer for Harnessing Innovations) to support BIRAC funded Biotech Start-ups, Innovators and SMEs

- To safeguard the Intellectual Property (IP) by providing the advisory and financial support,
- To build a pipeline of translational technologies emerging from BIRAC supported projects for technology transfer and commercialization

BIRAC as Facilitator under SIPP (Start-ups Intellectual Property Protection) Scheme of DIPP, Govt. of India, for Indian Biotech Start-ups to provide

- General advisory on different IPRs,
- Information on protecting and promoting IPRs in other countries
- Assistance in filing and disposal of the IP applications related to patents



For details visit BIRAC website: <https://birac.nic.in/>
**Contact: Head, SPED and Senior Manager,
IP & Technology Management (biracip.dbt@nic.in)**



Biotechnology Industry Research Assistance Council

(A Govt. of India Enterprise)

Announces Launch of

BIRAC Innovation Challenge Award



BIRAC, Biotechnology Industry Research Assistance Council, a Section 8, 'Not for Profit Company' of Government of India, has been set up as DBT's interface agency, to serve as a single window for emerging biotech companies.

BIRAC invites proposals from

➔ Biotechnology start-ups/entrepreneurs

OR

➔ Academicians, Scientists, Researchers, PhDs, Medical degree holders, Biomedical Engineering graduates

Under the themes

**Platform Technologies for
Reducing the Burden of Diseases
(Communicable & Non-Communicable)**



HACKATHON TRACK

Sanitation and Waste Recycle



IDEATHON TRACK

Winner's Reward!

5 winners from each theme will receive
INR 15 Lakhs for developing a
Minimal Viable Prototype in 6 months

Grand Cash prize of
INR 50 Lakhs for the
winners from both categories

How to apply

Only Online submission of proposals is allowed under SoCH. To register and submit proposals log on to MyGov. User registration is open round the clock. For further details on the scheme, eligibility criteria and registration log on to MyGov or **www.birac.nic.in**.

Important dates

Proposal Submission starts **22nd September, 2017**
Proposal Submission closes (midnight of) **31st October**

Contact : sped.birac@nic.in & mii01.birac@nic.in

BIRAC PROGRAMMES

SITARE (Students Innovations for Advancement of Research Explorations)

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

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

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

Discovery, Early and Late Stage Funding

- **BIG (Biotechnology Ignition Grant):** Biotechnology ignition Grant (BIG) is available to scientists, entrepreneurs from research institutes, academia and startups, to stimulate commercialization of research discoveries by providing very early stage grants to help bridge the gap between discovery and invention.
- **SPARSH (Social Innovation Programme for Products Affordable & Relevant to Societal Health):** SPARSH combines social innovation and biotechnology for the well-being of the society by helping, identify and support cutting edge innovations towards affordable product development with potentially significant social impact. SPARSH provides support in the form of impact funding and fellowships.
- **SBIRI (Small Business Innovation Research Initiative):** It is the early stage, innovation focussed PPP initiative to support incremental R&D in the area of Biotechnology to facilitate innovation and risk taking by SMEs
- **BIPP (Biotechnology Industry Partnership Programme):** BIPP seeks to provide support for early to late stage high risk biotech R&D by industry and/or accelerate commercialization of new indigenous technologies.
- **CRS (Contract Research Scheme):** CRS scheme supports academic institutes to take forward research leads through a validation and translation cycle by the industry. Funding is in the form of grant given to both the academic as well as the industrial partner.

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

- BIRAC's Flagship programme which has created 25 world-class bio-incubators to provide incubation space, mentor networks, instrumentation facilities, IP and technology management support.

Collaborative Funding

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

Equity Funding

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

For further information please contact:

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