

**Biotechnology Industry Research Assistance Council**  
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**birac @ 5**  
 Impacting the Biotech  
 Innovation Ecosystem



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 the Biotech  
 Innovation  
 Ecosystem







“ Successful start-ups are usually created by those who are driven by an idea, or an urge to solve a problem that people face ”

Hon'ble Prime Minister announcing the Start-up India Action Plan



Hon'ble Prime Minister visits BIRAC funded Banana Bio-fertilization Project at QUT, Australia.

MoU Signed between C-CAMP & Qb3 in presence of Hon'ble Prime Minister of India



Hon'ble Prime Minister with Indian start-ups including BIRAC start-ups in California.



Hon'ble Prime Minister launches the Rotavirus vaccine



Hon'ble Prime Minister visiting IISc and interacting with BIRAC startup



Dr. Harsh Vardhan, Shri YS Chowdary along with Prof. K VijayRaghvan and Dr. Renu Swarup at BIRAC's innovators Meet

“ We have cutting edge technologies, the finest scientists with the greatest intellectual acumen, we have enthusiastic research fellows who are putting their hearts and souls into ensuring that the science can really be connected to the people and solve the problems of the country. ”

Dr. Harsh Vardhan  
Speech at the Indian National  
Science Congress, 2016



Dr. Harsh Vardhan  
Union Minister for Science &  
Technology and Earth Sciences

डॉ. हर्ष वर्धन  
**DR.HARSH VARDHAN**



मंत्री  
विज्ञान और प्रौद्योगिकी एवं पृथ्वी विज्ञान  
भारत सरकार  
नई दिल्ली-110001  
MINISTER  
SCIENCE & TECHNOLOGY AND EARTH SCIENCES  
GOVERNMENT OF INDIA  
NEW DELHI - 110001

## Message

The Department of Biotechnology (DBT), GOI established the Biotechnology Industry Research Assistance Council (BIRAC) as a not for profit Public Sector Unit in 2012 with the mandate to build, nurture and grow the biotechnology industry of the nation and contribute to alleviating the challenges that we face in health, food & nutrition, energy and environment. One of the primary aims for establishing BIRAC was to create high quality and affordable products that aim to bring transformative change in the society.

In the last 5 years, BIRAC has taken rapid steps in building the biotech innovation ecosystem in the country especially providing funding to all stages of product development, supporting 500 startups and SMEs, establishing 20 biotech incubators and creating several platforms for startups and SMEs to interface and seek collaborations with different stakeholders including venture funds. These efforts align with the Startup India programme of the country. BIRAC also has provided platforms to bridge academia and industry resulting in several fruitful collaborations which are maturing.

BIRAC has also reached out to national and global stakeholders establishing partnerships that aim to provide further support to the growing biotech community in India as well as in partner countries.

The focused efforts by BIRAC have resulted in commercialization of products and technologies that combine quality and affordability & range from new drugs for treatment of chronic and infectious diseases, medical devices and diagnostics, improved crop hybrids, renewable energies from biological sources. Together this not only increases the innovation quotient of the country making it globally competitive but also is able to transform lives of the country's citizens in a positive manner and that is sustainable.

On the occasion of the 5th Foundation Day, I congratulate BIRAC and DBT and wish BIRAC success for years ahead.

(Dr. Harsh Vardhan)



Shri Y.S. Chowdary at BIRAC's 3rd Foundation Day

Shri Y.S. Chowdary at BIRAC



“Over the last 5 years, a foundation has been laid for an innovation driven biotech enterprise in the country. DBT's National Biotech Development Strategy for 2015-2020 has defined the policy outline to achieve the next transition for the Indian biotechnology. It is important that the excellent work done by BIRAC in creating the Ecosystem is scaled up. I am confident that we can scale up this model to spread across the country”

Shri YS Chowdary  
Speech at the BIRAC's Innovators Meet 2016



Shri Y S Chowdary  
Minister of State for  
Science & Technology and  
Earth Sciences

वाई एस चौदरी  
Y S CHOWDARY



राज्य मंत्री  
विज्ञान और प्रौद्योगिकी एवं पृथ्वी विज्ञान  
भारत सरकार  
नई दिल्ली-110001  
MINISTER OF STATE  
SCIENCE & TECHNOLOGY AND EARTH SCIENCES  
GOVERNMENT OF INDIA  
NEW DELHI - 110003

## Message

India's aim to become a technological superpower and bring prosperity for all its citizens will need immense contributions from the biotechnology industry and it is important that research and development result in products and services that benefit the country and the world. BIRAC has been at the forefront of engaging with all stakeholders- the academia, industry and other organisations- such that the needs of the ecosystem can be identified and an optimal response is delivered.

Over the last 5 years, BIRAC has set a fast pace to respond to the needs of the ecosystem and deliver programs which overcome the inherent risks in product development in the biotech sector. This has resulted in creating a visible impact testified by several biotech products being commercialised and creating impact on the ground across several domains of biotechnology.

BIRAC has reached a significant milestone- celebrating its 5th Foundation Day. On this occasion, I would like to extend my congratulations to all in BIRAC and the Department of Biotechnology (DBT) which has nurtured the public sector enterprise since inception.

Looking into the future, I hope BIRAC is able to leverage its existing strengths and scale its impact for greater good of the society at large.

  
(Y.S. Chowdary)

**“Men are mortal. So are ideas. An idea needs propagation as much as a plant needs watering. Otherwise both will wither and die”**

**Dr. B R Ambedkar**



**Prof. K VijayRaghavan**  
Secretary, DBT  
& Chairman, BIRAC

## *Message*

The early steps of industry engagement by the Department of Biotechnology involved establishment of Small Business Innovation Research Initiative (SBIRI) and Biotechnology Industry Partnership Programme (BIPP)- two PPP programs that aimed to partner with industry for product development. Eventually this led to creation of Biotechnology Industry Research Assistance Council (BIRAC) in 2012- a landmark decision that has had a galvanizing effect on the Indian biotech ecosystem. The intention of creating BIRAC was to have a focused approach to innovation research that leads to novel products and processes, which cater to both national and global needs. Our intention was also to make India a global bio-economy hub for biotechnology with a target of a US\$100 billion biotech industry by 2025.

BIRAC is unique in several ways- it has rapidly filled a gap in the Indian innovation chain and has continued to deliver impactful programs with a sense of urgency. It has learned to take risks and build a relationship of trust with the wide spectrum of entrepreneurs- from nascent start-ups to Small and Medium Enterprises (SMEs), big companies and translational researchers in our academia. In a short span, it has been able to create and sustain collaborations with Bill & Melinda Gates Foundation (BMGF), Wellcome Trust, University of Cambridge, Nesta, USAID, WISH Foundation and DeitY, Government of India to name a few. The collaborations bring value to communities and augment BIRAC's delivery mechanisms.

BIRAC is entering a crucial period. As it looks back and looks ahead- it must remember that change is inevitable and we must be able to face the unknown unknown's of the future. For this, BIRAC needs to stay nimble such that it continues to sense the needs of the country and is able to respond quickly to alleviate national and global challenges. I am sure BIRAC would be able to rise to the challenge through amplification of its activities, build new pathways that will usher in new possibilities and stay committed to the social contract it has with the nation.



**“First they ignore you. Then they laugh at you. Then they fight you. Then you win”**

**Mahatma Gandhi**



**Dr. M K Bhan**  
Former Secretary, DBT &  
Founder Chairman, BIRAC

## *Message*

Happy 5th birthday BIRAC. What a lovely early childhood. Which parent would not be proud of? You have been loved and nurtured by many and even at this tender age, you have already nurtured so many all over the country.


With all things new and innovative, the initial romance and promise must lead to maturity and performance. In innovation our potential is so huge, our need is so large, our opportunities are enormous because our nation and people face many challenges that need solutions.

Dear BIRAC, it is time now to move to scale and to reach every niche in India, to mobilise a million innovators and entrepreneurs, to create an innovation ecosystem that the world looks up to, to produce real solutions, tools, technologies and products that impact on scale, visible to all and admired by the nation.

My message is that it is time to accelerate the brilliance of the micro level. To achieve this we have to catalyse the application dream amongst the brightest scientists and technologists in our universities, institutions and companies. We have to transform the way the Government deals with them and nurtures them. I believe that larger the pipeline, higher the level of innovations and greater will be our entrepreneurial skills. All this will lead to bigger impact.

We must lift the bar on how we will judge ourselves. I believe firmly that BIRAC can go to newer and greater heights. Wish you an enjoyable journey.





**“Innovation distinguishes  
between a leader and a  
follower”**

**Steve Jobs**



**Dr. Renu Swarup**  
Senior Adviser, DBT  
& Managing Director, BIRAC

## *Message*

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Today we at BIRAC complete 5 years of a very eventful, vibrant and satisfying journey. Established in March 2012 as a not-for-profit Public Sector Undertaking of the Department of Biotechnology, Ministry of Science & Technology, Government of India to nurture and foster the Biotech Innovation ecosystem in the Country for affordable and accessible product development, BIRAC today has strived hard to achieve this.

BIRAC has undertaken and supported a multitude of activities from financing high risk research, to supporting nascent ideas and taking these through PoC to validation, to creating shared infrastructure, incubator support mechanisms and most importantly establishing and reinforcing the Industry-Academia connect.

Today with a Pan-India presence supporting over 800 Biotech Industries, SMEs, Research Institutes, which includes nearly 500 startups and entrepreneurs and 80 academic Institutes, we have more than 50 products being commercialized. With strong national partnerships with Indian Council for Medical Research (ICMR), Ministry of Electronics and Information Technology (MeitY) and international partnerships with Bill and Melinda Gates Foundation, Wellcome Trust and many others, BIRAC aims to continue to gain the trust of its Stakeholders in playing a transformational role in building the Indian Bioeconomy and be the bridge connecting Stakeholders to deliver innovative and affordable products. BIRAC would continue its journey as a “connector and catalyst”.

I would like to thank all our stakeholders, partners and each member of the BIRAC family for their contribution in making this journey successful.







**“If you always do what you always did, you will always get what you always got”**

**Albert Einstein**



**Prof. G Padmanaban**  
Former Director,  
Indian Institute of Science,  
Bangalore

## *Message*

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I am 79 years old and BIRAC is only five, but, perhaps, achieved a lot more than one's expectations. It has evolved as a unique PPP model in Biotechnology and worthy of emulation in many other sectors. BIRAC will have to face greater challenges in future and would need to reinvent itself with innovative schemes to foster new inventions and convert them into real products on the ground. This can only be achieved through partnerships with academia, industry and other government/private agencies. In my opinion, BIRAC should remain small, nimble, but act as a catalyst to evolve several collaborative ventures. There is always a comparison with the phenomenal success achieved in Space research and development. The broad spectrum defining the areas in Biotechnology makes identification of priorities difficult. Even so, it is indeed possible to focus on specific products with clear-cut goals. What are the products that would help in reaching the goal of USD 100 bn? What are the products that are desperately needed for the masses to improve health, nutrition and income? There may be products figuring in both the segments. While, there will always be a challenge to build new capabilities, it would also be necessary to concentrate on the process of delivery. Would it be possible to build a unique Commission structure with adequate autonomy ranging from finance to regulatory approvals to take the objectives forward, where BIRAC is the main driver? I wish BIRAC many more happy returns and 'leapfrog' in terms of achievements.



**“Opportunity is missed by most people because it is dressed in overalls and looks like work”**

**Thomas A. Edison**



**Dr. Kiran Mazumdar Shaw**  
CMD, Biocon

## *Message*

India is fast emerging as a biotechnology hot spot with the size of Indian bioeconomy estimated at USD 35 billion. The Indian biotech sector has achieved critical mass in recombinant technology based agricultural and pharmaceutical products and has thus emerged as the world's largest vaccines producer, global scale insulin manufacturer and the largest supplier of genetically modified cotton globally.


The success of India's biotechnology industry can be traced to the pioneering spirit of entrepreneurs who were ably supported by the Department of Biotechnology (DBT) set up in 1986, under the Ministry of Science and Technology. DBT created an enabling ecosystem for biotech enterprises and also set up Biotechnology Industry Research Assistance Council (BIRAC) in 2012 to help fund R&D efforts and entrepreneurship.

Since then, BIRAC has emerged as the largest source of early stage funding for first-time or existing biotechnology entrepreneurs. BIRAC's efforts to build the biotechnology innovation ecosystem in the country have led it to support over 100 new startups, close to 350 companies and over 500 projects.

It has contributed to the generation of over 100 patents and the commercialization of nearly 30 products/technologies. Going ahead, BIRAC has to play a key role in realizing the dream of 'Innovate in India' in the area of applied biotechnology. It can help accelerate, innovation & translation of breakthrough scientific ideas into products and services that can address unmet needs globally.

By promoting entrepreneurship, industry-academia interaction and providing venture capital, it can help catalyse the innovation driven biotechnology industry. Biotechnology is a new frontier for India and BIRAC can help synchronise resources, plans, policies and priorities with a vision to build a USD 100 billion bio-economy in India by 2025.



  
**प्रारूप 1**  
**पंजीकरण प्रमाण-पत्र**

कॉर्पोरेट पहचान संख्या : U73100DL2012NPL233152      2011 - 2012

मैं एतद्वारा सत्यापित करता हूँ कि मैंसर्स  
**BIOTECHNOLOGY INDUSTRY RESEARCH ASSISTANCE COUNCIL**

का पंजीकरण, कम्पनी अधिनियम 1956 (1956 का 1) की धारा 25 के अधीन आज किया जाता है  
 और यह कम्पनी प्राइवेट लिमिटेड है।


यह निमन-पत्र आज दिनांक बीस मार्च दो हजार बारह को दिल्ली में जारी किया जाता है।

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**Form 1**  
**Certificate of Incorporation**

Corporate Identity Number : U73100DL2012NPL233152      2011 - 2012  
 I hereby certify that BIOTECHNOLOGY INDUSTRY RESEARCH ASSISTANCE  
 COUNCIL is this day incorporated under Section 25 of the Companies Act, 1956  
 (No. 1 of 1956) and that the company is private limited.

Given at Delhi this Twentieth day of March Two Thousand Twelve.

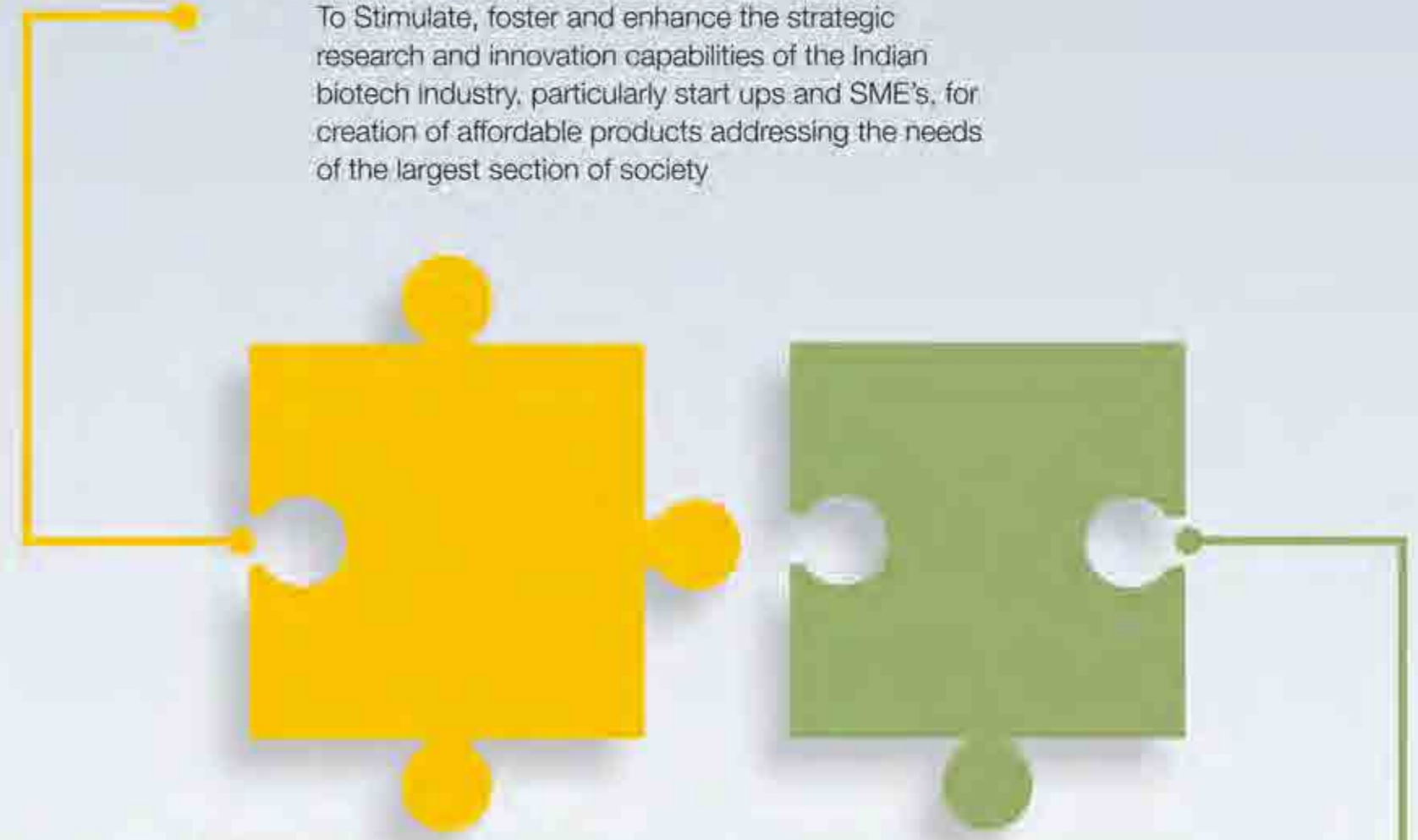
  
 Registrar of Companies, National Capital Territory of Delhi and Haryana  
 कम्पनी रजिस्ट्रार, राष्ट्रीय राजधानी क्षेत्र दिल्ली एवं हरियाणा

\*Note: The corresponding form has been approved by ANITA KLAIR, Deputy Registrar of Companies and this certificate has been digitally signed by the Registrar through a system generated digital signature under rule 5(2) of the Companies (Electronic Filing and Authentication of Documents) Rules, 2006. The digitally signed certificate can be verified at the Ministry website (www.mca.gov.in).

कम्पनी रजिस्ट्रार के कार्यालय जगदलोक में उपलब्ध पत्राचार का पता  
 Mailing Address as per record available in Registrar of Companies office:  
**BIOTECHNOLOGY INDUSTRY RESEARCH ASSISTANCE COUNCIL**  
 A-254, BHISHAM PITAMAH MARG, Defence Colony,  
 NEW DELHI - 110024,  
 Delhi, INDIA


## Vision

To Stimulate, foster and enhance the strategic research and innovation capabilities of the Indian biotech industry, particularly start ups and SME's, for creation of affordable products addressing the needs of the largest section of society



## The Mission

Facilitate and mentor the generation and translation of innovative ideas into biotech products and services by the industry, promote academia - industry collaboration, forge international linkages, encourage techno entrepreneurship and enable creation and sustainability of viable bio enterprises

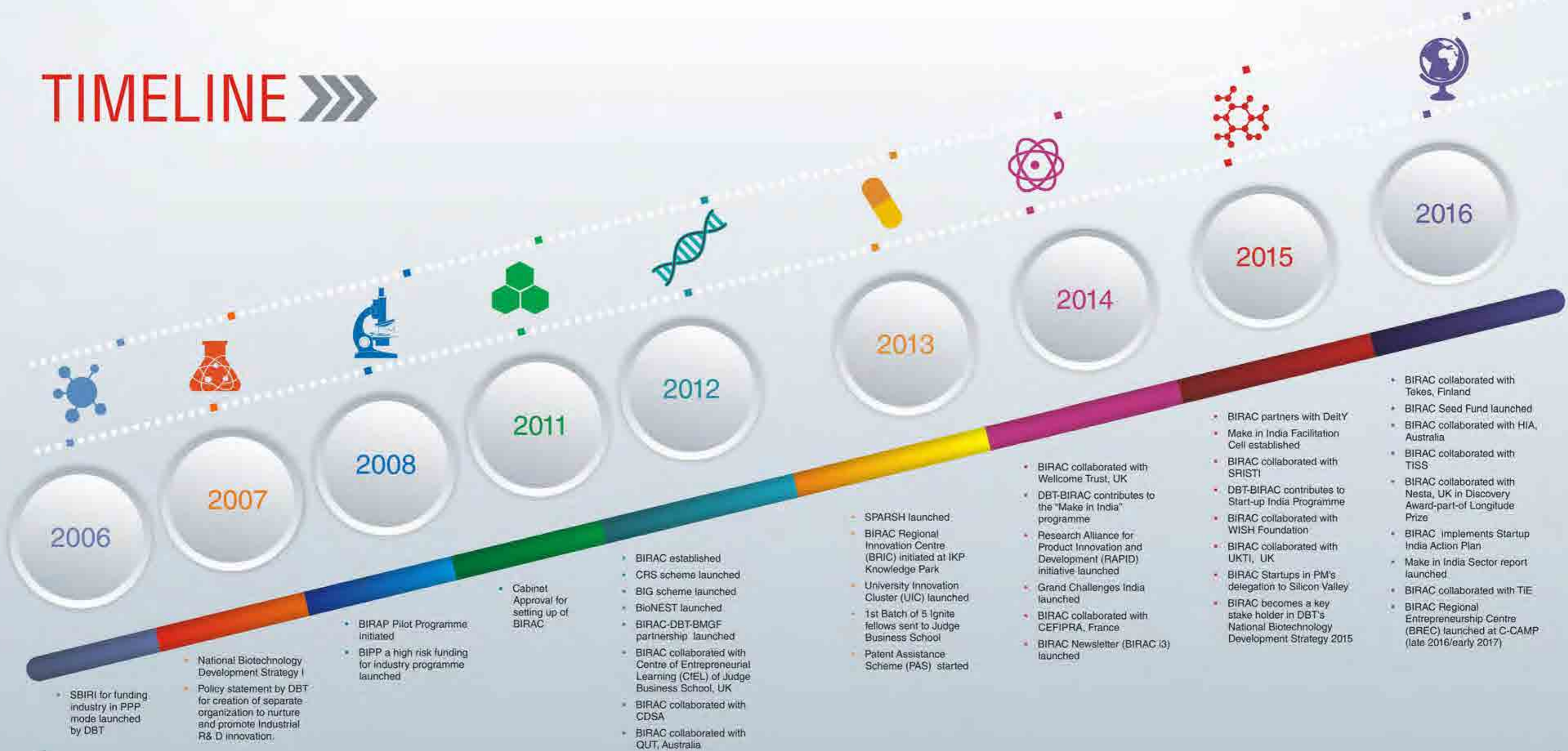


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# TIMELINE



2006

- SBIRI for funding industry in PPP mode launched by DBT

2007

- National Biotechnology Development Strategy I
- Policy statement by DBT for creation of separate organization to nurture and promote Industrial R&D innovation.

2008

- BIRAP Pilot Programme initiated
- BIPP a high risk funding for industry programme launched

2011

- Cabinet Approval for setting up of BIRAC

2012

- BIRAC established
- CRS scheme launched
- BIG scheme launched
- BioNEST launched
- BIRAC-DBT-BMGF partnership launched
- BIRAC collaborated with Centre of Entrepreneurial Learning (CfEL) of Judge Business School, UK
- BIRAC collaborated with CDSA
- BIRAC collaborated with QUT, Australia

2013

- SPARSH launched
- BIRAC Regional Innovation Centre (BRIC) initiated at IKP Knowledge Park
- University Innovation Cluster (UIC) launched
- 1st Batch of 5 Ignite fellows sent to Judge Business School
- Patent Assistance Scheme (PAS) started

2014

- BIRAC collaborated with Wellcome Trust, UK
- DBT-BIRAC contributes to the "Make in India" programme
- Research Alliance for Product Innovation and Development (RAPID) initiative launched
- Grand Challenges India launched
- BIRAC collaborated with CEFIPRA, France
- BIRAC Newsletter (BIRAC i3) launched

2015

- BIRAC partners with DeitY
- Make in India Facilitation Cell established
- BIRAC collaborated with SRISTI
- DBT-BIRAC contributes to Start-up India Programme
- BIRAC collaborated with WISH Foundation
- BIRAC collaborated with UKTI, UK
- BIRAC Startups in PM's delegation to Silicon Valley
- BIRAC becomes a key stake holder in DBT's National Biotechnology Development Strategy 2015

2016

- BIRAC collaborated with Tekes, Finland
- BIRAC Seed Fund launched
- BIRAC collaborated with HIA, Australia
- BIRAC collaborated with TISS
- BIRAC collaborated with Nesta, UK in Discovery Award-part-of Longitude Prize
- BIRAC implements Startup India Action Plan
- Make in India Sector report launched
- BIRAC collaborated with TIE
- BIRAC Regional Entrepreneurship Centre (BREC) launched at C-CAMP (late 2016/early 2017)

# Early Beginnings



## **Early Beginnings: The emergence of BIRAP & establishment of BIRAC**

The early beginnings of BIRAC is linked to the emergence and maturity of its parent organisation the Department of Biotechnology (DBT) which was established in 1986. In the following three decades DBT focused on building infrastructure (several autonomous biotech focused research institutions were established) and training skilled human resources- two key components for building a foundation for an ecosystem. Starting from 1986, DBT began establishing autonomous institutions across the country and focusing on boosting deep science.

## **Translational Programmes & Emergence of BIRAP: Extending the arm of partnership with industry**

A strategic shift occurred in DBT in mid 2000s. DBT responded to the emerging scenario by an extensive stakeholder consultation culminating in a new strategy, the National Biotechnology Development strategy 2007 decided to focus both on deep science and translational research. The key elements of NBDS 2007 were reinforcing the regulatory framework, interministerial co-ordination, a stated goal of promoting the biotech industry and investing 30% of its budget in R&D and PPP mode and implemented the policy through two pioneering programmes SBIRI (operationalised in 2007) and BIPP (operationalised in 2009) which nudged the industry to focus on R&D and build Indian products that could bridge a contextual paradigm- which is to combine affordability with excellence.



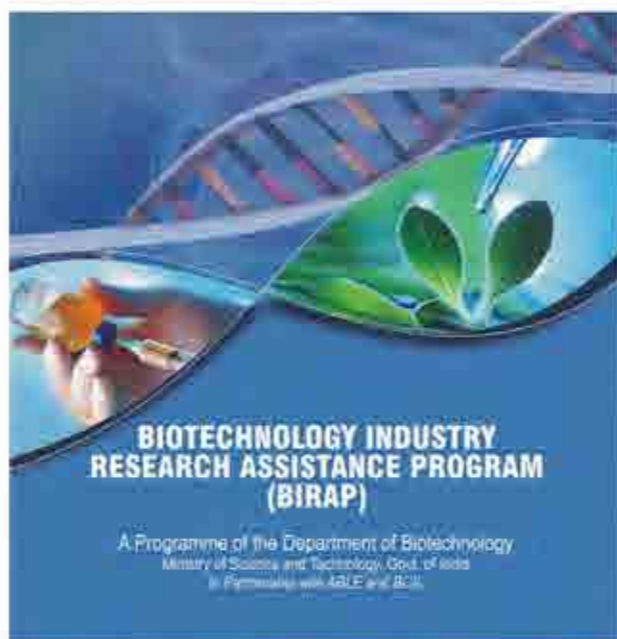
➤➤➤ NBDS 2007 outlining the key elements of the 'Future Bioeconomy'

The feedback from early experiments with SBIRI and BIPP as well as from extensive consultative meetings with other stakeholders made DBT take another far reaching decision to establish the Biotechnology Industry Research Assistance Programme (BIRAP)- the forerunner to BIRAC. The intention was to operationalise BIRAP, corral translational research through a focused entity and create a public sector enterprise under the aegis of the DBT. The Association of Biotechnology Led Enterprise (ABLE), the nodal biotech industry forum became an active partner of BIRAC helping connect BIRAP with wide variety of stakeholders especially with the industry.

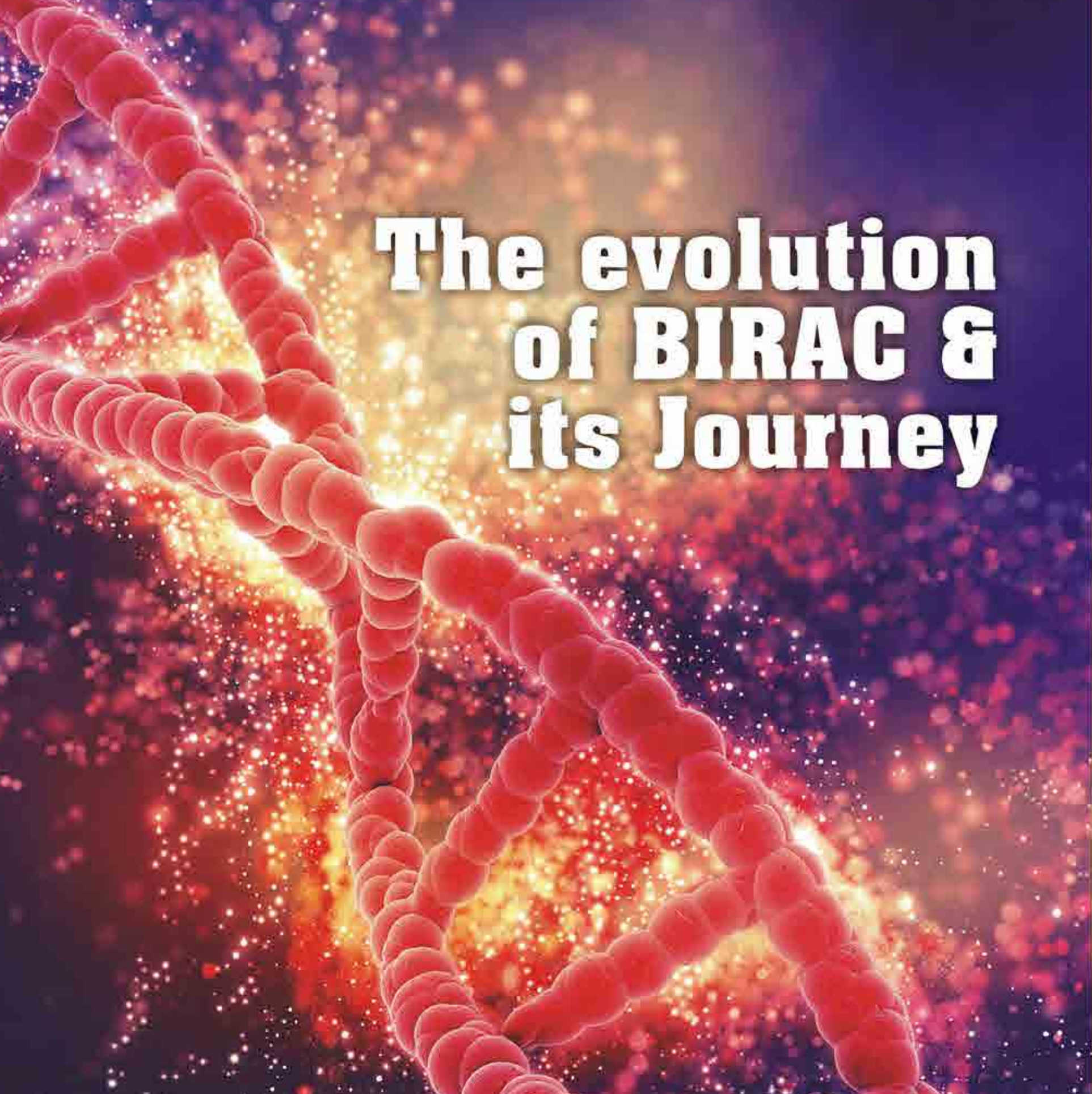
Through concerted efforts by DBT the Cabinet of India gave its approval on 24th November 2011 to establish a not for profit (section 25, now Section 8) public sector enterprise called Biotechnology Industry Research Assistance Council (BIRAC) under the aegis of DBT. DBT continued its engagement with stakeholders to define and design the contours of the company, the mandate for its action and directions for its growth. On 20th March 2012, the BIRAC registered as a company with the Ministry of Corporate Affairs (MCA).



➤➤➤ Inauguration of BIRAP office in 2009



➤➤➤ Dr. M.K. Bhan inaugurating BIRAP in 2009



# The evolution of BIRAC & its Journey



BIRAC's mandate is to establish and empower the biotechnology innovation ecosystem of the country. BIRAC, an unique organisation, plays combinatorial roles- as a developmental agency to build an ecosystem for biotechnology that is globally excellent and nurture start-ups to help them to take their ideas through validation & scaleup for productization.

BIRAC has been able to design and implement several programs that address the fundamental mandate of affordable product development and work with partners to take biotech ideas from bench to the doorstep of people such that it improves their lives and alleviates the collective challenge that our communities across the nation and beyond face.

BIRAC's strategy for building, nurturing and scaling the biotech ecosystem involves inter-weaving three focused approaches viz:

- A. Supporting early and late stage innovation research from ideation to scaleup
- B. Invigorating product innovation and commercialisation for addressing Grand Challenges of national relevance
- C. Enabling and promoting innovation ecosystem through networks, platforms and mentoring





➤➤➤ Inauguration of BIRAC's new office at MTNL Building by Prof. K. VijayRaghavan in 2014



Board Meeting at BIRAC-2015 ➤➤➤



BIRAC Board 2012-2016 ➤➤➤

# Financing High Risk Innovations

The biotechnology industry, in particular, encounters several challenges unlike many other industrial segments- the chief challenge being intense capital & high end infrastructure required from the startup stage, a long gestation phase (anywhere between 5-12 years) for products to reach the market from the ideation stage and intense regulatory scrutiny the products are subjected to as they impact human, animal and plant health. BIRAC has been cognisant of this conundrum and has focused on de-risking all aspects of novel product development chain.

BIRAC has designed funding programs that start right at nebulous ideation stage with several mini-grants and fellowship programs (such as those in BIRAC-SRISTI Gandhian Young Technological Innovation Award, fellowships in University Innovation Cluster and Social Immersion Fellowships), to providing early stage seed grant to reach proof-of-concept (POC) stage (through BIG program) and larger funding tranche for validation and scale up (through SBIRI and BIPP). BIRAC also has designed a social innovation program: SPARSH to catalyse product development in focused social areas.

Further in partnership with the Department of Electronics and IT (DeitY) a program in medical electronics (IIPME) has been launched. In addition, to enthuse academia and industry to work together a

CRS program has been launched. Many a times, BIRAC also launches focused calls for proposal in a particular area under the umbrella of a particular scheme. For example it has had a special call for HPV, agricultural electronics and biopharma to name a few. These inter-connected funding programs allow an excellent idea to move along the chain of product development.

BIG, or Biotechnology Ignition Grant has become one of the flagship early stage program that is changing the landscape of biotech startup culture in the country. Since its inception in 2012, BIG has supported more than 230 startup ideas. Several of the BIG grantees are able to generate follow on funding from both private and public agencies and are going beyond the POC stage sometimes even having accelerated product development. Another marker for the change in mindset is the fact that individual entrepreneurs in BIG are now establishing new startups. Sixty five new startups have taken birth through the support of BIG. BIG is implemented by five BIG partners who provide access to knowledge and infrastructure, guidance and mentoring (business and technical) to startups.

More than 350 startups and entrepreneurs, 394 SMEs and Biotech companies have been supported and are a part of BIRAC's journey.

# BIRAC Programme Portfolio



# Boosting Startup Culture

BIRAC has perceptively shifted the spectrum of the biotech startup culture in the country. This change is no mean feat especially in India where taking risks and changing careers are not commonplace. This shifting of the culture of entrepreneurship will bear fruit in the future. Our funding programs such as BIRAC-SRISTI, SIIP (immersion fellowship), UIC fellowship, BIG and SPARSH have unleashed entrepreneurial journeys that are showing results on the ground.

BIRAC deploys several strategies including funding to inculcate the spirit of entrepreneurship. To instil creative thinking and giving an opportunity to students to test out ideas, try new things and attempt to make an accelerated prototype BIRAC widely conducts "Ideathons" and "Hackathons" across the country.



»»» BIRAC SRISTI GYTI Awards



»»» Ideathon conducted by BIRAC



»»» Hackathon by BIRAC in partnership with IKP

BIRAC understands that bringing communities of startups together can lead to more collaborations. In this regard, BIRAC has established BIG Conclave in 2015 where 150 startups had a chance to interact amongst themselves as well with other experts. Similarly BioNEST Conclave (which was launched in 2017) brings together incubators and startups for smoother knowledge flows amongst incubators and to increase the understanding of the needs of the startups. Further BIRAC also supports Startups to participate in Global platforms such as Ignite at University of Cambridge UK & SLUSH of at Finland. All these platforms provide amazing learning & networking opportunities.

The commitment of BIRAC to invigorate the biotech startups has led BIRAC to establish two centres- BIRAC Regional Innovation Centre (in partnership with IKP Knowledge Park, Hyderabad in 2013) and BIRAC Regional Entrepreneurship Centre (BREC) at C-CAMP, Bangalore. BIRAC has mapped the knowledge networks of the Southern clusters in Hyderabad, Bangalore, Chennai and Trivandrum while BREC (launched in 2017) intends to increase the portfolio of activities for startups including bootcamps, challenge awards and interfacing biotech startups with angel investors.

The concerted efforts by BIRAC and its partners has made many biotech startups gain recognition and awards for their products and services.



»»» Shri Ajai Chowdhry, Co-founder HCL at 1st BIG Conclave 2015



»»» Qb3 startup at BIG Conclave & Immersion at C-CAMP





BIG startups at Ignite, University of Cambridge, UK



Cellzyme receiving India Innovation Growth Programme Awards 2015



Module Innovations receiving Clarion Call 2.0 (IIM Calcutta) 'Most Investible Startup' award



Venture Center wins the National Award for Technology Business Incubation in 2015



BIRAC Innovators at SLUSH Finland with Ambassador of India to Finland



Innovation Market Place by BIRAC



Interaction of women entrepreneurs with Prof. M S Swaminathan



Dr Manju Sharma interacting with the women entrepreneurs at the Golden Jubilee Women's Biotech Park, Chennai

# Impacting People's Lives through Cutting Edge Products and Technologies

BIRAC's support to biotech startups and SMEs has been with the intention to build an indigenous industry that is able to develop products and technologies that range from healthcare including human and animal health (such as vaccines and other biopharma products), medical devices and diagnostics, industrial biotech and bioinformatics which can solve challenges in healthcare, food and agriculture, environment and energy.

One of the defining characteristics of the products developed through BIRAC support is that they combine global excellence with high affordability quotient. It is this "affordable excellence" that allows for greater access to the "largest section of the society"- beautifully aligning with BIRAC's vision, India is



»»» xBITS's RightBiotic device for antibiotic sensitivity detection



»»» Testing of Windmill's Neobreathe World's first foot operated resuscitation device

indeed the "living laboratory" where such excellence and affordability can be woven together and it points to the talent vast talent we have in India.

The wide range of the products exemplifies the fact that given an optimal combination of funding and mentoring, the entrepreneurial talent is able to deliver products on the ground that impact lives of people. These products have started to make an impact in society for example the Rotavirus vaccine is part of the universal immunisation programme, several point of care of diagnostics are making it easier to detect both chronic

and infectious diseases with greater speed and accuracy even in low resource settings, new improved varieties of food crops are able to withstand attacks from pests and parasites as well as climatic stress thus improve farm productivity and livelihood of farmers, renewable energy from biological sources that reduce our dependency on fossil fuels and improve our chances to tackle climate change. These products are destined to impact communities in India and around the world.

These products are tangible results on the ground. There are several stories behind these products- stories of people, teams, perseverance and the entrepreneurial ability to push through the hurdles and other challenges.



Sohum Newborn hearing screening device for early detection of hearing loss <<<



»»» Accuster's 'Mobile lab' in rural settings



Path shodh's microfluidics lab <<<



»»» Lattice's vital signs monitoring device (FYVE S1) being used in a hospital in North-East India



»»» Swasti's team with farmers in pomegranate field checking for bacterial disease



»»» MulBio's point of care PCR Device



»»» Omix Lab; Detecting anti-microbial resistance infection



»»» Artificially manufactured living human liver tissue by Pandorum Technologies



»»» Achira's microfluidic device of care



»»» The Solar Conduction Dryer being used by a beneficiary from the pilot study of Science for Society, Maharashtra, under the Achieving Health Growth through Agriculture and Nutrition call under Grand Challenges India



» Ventilator Associated Pneumonia (VAP) care by Coeo Labs



» Jeevtronics Hand crank defibrillator



» CyCa Onco Solution: Developing an efficient delivery for anti cancer drugs

## Social Innovation

BIRAC is focused on bringing affordable and high quality products that "address the needs of the largest section of society". This focus has alignment with the social innovation approach. Many of the products, that have either been developed or are in the process of being developed, have social innovation as an approach i.e they are targeted for low resource settings. In 2013, BIRAC designed a focused program on social innovation called SPARSH that aims to support innovations in particular domain (such as maternal & child health, ageing, energy & sanitation) that will bring impact to society in the near to medium term.



» SIIP immersion at Malshiras village Tal Saswad District, Pune



» The project site of Eram Scientific and University of South Florida project in Kerala, under the Reinvent the Toilet Challenge under Grand Challenges India



» GPS's BioUrja (Bio waste to energy digester) at one of the largest University Campuses



» SIIP immersion at Melghat areas, Amravati District, Maharashtra

Within SPARSH there is an immersion component (SIIP) to identify societal & healthcare gaps.

Many other programmes such as BIG, IIPME and SBIRI also have large number of social innovation products.



»»» *A women beneficiary of the VeggieLite program of eKutir in Odisha, under the Achieving Health Growth through Agriculture and Nutrition call under Grand Challenges India*

## Building Infrastructure as Launchpads for Startups

One of the early programs that BIRAC launched was the Bioincubation Support BioNEST- the idea behind this was the understanding that unlike startups in the IT sector, enterprising ideas in the biotech sector need incubation support of a different kind- they need a landing space to test their ideas, run their operations, have access to high end-instrumentations and locate in a place where they can connect with other startups and mentors. BIRAC's BioNEST program provides support in establishment of bio-incubators either as a standalone entity or as a part of the academia. BIRAC has supported 20 globally competitive incubators that house more than 300 biotech startups, 175K sq.ft of supported space, and a large common pool of instrumentations for conducting experimentation and get data for evidence based productisation process.

The bioincubators are creating vibrant culture shifts in the geographical location that they are part of- their common interacting spaces allows for startups to meet and exchange information encouraging peer to-peer learning, they conduct innumerable workshops, networking meetings- connecting startups to people with "money & minds". i.e angel and venture funds as well as technical experts.

Several of the bioincubators are establishing international linkages such that the startups gain from international exposure. In 2017, BIRAC also kickstarted BIRAC SEED Fund to help incubators invest seed monies in promising startups and help startups tide over the valley of death.

The combination of incubation, funding and mentoring is key to making India a biotech startup hub.







*KIT TBI - Greenhouse* <<<

>>> *Bioprocessing facility-KIT TBI*



>>> *Bioincubator IKP Hyderabad*



>>> *NMR BTIC, Genome Valley Hyderabad*



*Bioincubator at IIT Madras* <<<



»»» Venture Center having BIRAC's Bioincubator



Hi-end instrumentation at BIRAC supported bioincubator <<<



»»» BIRAC Incubator at IIT-Kanpur

# Awarding Excellence

BIRAC's innovators endeavour to bring new products and technologies that impact lives of people in a positive manner. As mentioned these products and technologies combine high quality with affordability thereby providing an important element of any innovation i.e accessibility for the end user.

Each year, since 2012, BIRAC through a high power committee evaluates products and technologies emerging out of the support that it extends and felicitates the innovator with the prestigious 'BIRAC Innovator Award'. BIRAC also contributed to the National Technology Day award and since 2016 has launched BIRAC Technology Award.



»»» BIRAC Innovator Award 2013



»»» BIRAC Innovator Award 2015



BIRAC Innovator Award 2014 «««

## BIRAC Partnerships: Finding common ground for greater impact

BIRAC is a small organisation but the ethos of the organisation are such that there is a deep cultural understanding and appreciation of the power of partnerships. From its inception, BIRAC has been open to explore possibilities of finding common ground with other organisations to design and implement programs for impact. One of the earliest partnership that BIRAC established in 2012 was to become the project delivery partner for the Bill & Gates Foundation and the DBT joint collaboration for Grand Challenges in India. Since 2013, several programs have been launched under this umbrella such as 'Achieving healthy growth through Agriculture & Nutrition' and Reinvent the Toilet Challenge (both in 2013), All Children Thriving (2014), Grand Challenges Exploration-India (with IKP Knowledge Park in 2016), Knowledge Integration and Translational Platform and Healthy Birth, Growth and Development Knowledge Integration (both in 2016).

BIRAC also has established partnerships with Wellcome Trust (in detection of infectious diseases), CEFIPRA and French Embassy (detection of chronic health conditions), USAID and IKP in rapid diagnostics for TB. BIRAC has also focused in developing innovations to solve one of the current global challenges in anti-microbial resistance (AMR). It has partnered with Nesta, UK for developing a pipeline of innovations which could eventually compete in Nesta's global Longitude Prize.

One of the key gaps in the entrepreneurial ecosystem is the access to networks of health delivery systems, mentors, mobility

and connecting with other global entrepreneurial peers as well as mentors. To address this challenge, BIRAC launched a partnership with Judge Business School (JBS) in 2013 for sending 5 BIG partners to the participate in JBS's flagship Ignite programme and opportunities for the startups to interact with the deep knowledge intensive Cambridge ecosystem. Similarly, BIRAC has a partnership Takes Finland for providing opportunity to BIRAC startups to interact with Finland and other countries through visits.

Market connect is key to success. With this in mind BIRAC has partnered with WISH Foundation India which in partnership with several Governments operationalises several primary healthcare centres (PHCs) which can act as 'test beds' for many of the products that have relevance for low resource settings. BIRAC has also established partnerships with The Indus Entrepreneurs (TIE, New Delhi) and ICMR (for a focused partnerships for helping healthcare startups including medtech) gain valuable traction with other players through conduct of innovation marketplace and other activities.

BIRAC values its partners extremely and this has evolved to a stage now when BIRAC is always in a 'constant conversation' with all its partners- discussing with them the needs of the ecosystem and strategizing to create new tools for impact. Indeed a trust of openness and trust has been reached between BIRAC and all its partners.



DBT BIRAC BMGF Collaboration in 2012



MoU with Wellcome Trust 2014



DBT-BMGF-BIRAC Grand Challenges India Call announced 2014



## Creating Platforms and Networks for Amplification

Since its very inception, BIRAC has understood that innovation including bio-innovation is a 'contact sport'. It has endeavoured to build and strengthen platforms that aggregates people from the biotech and other communities and allows them to understand the dynamics of change in the biotech world at local, national and global levels and these platforms also help BIRAC to absorb and 'listen' to the needs of the community which then informs its own strategies for designing and deployment of different programs. These platforms also sometime provide opportunities for BIRAC's startups and SMEs to tell the peer group and others their own journeys- which becomes critical learning for everyone. Of course these platforms provide networking opportunities. Many positive outcomes have evolved out of these networking opportunities. Over the last 5 years, BIRAC and its partners have touched at least 10,000 people.

Each year BIRAC conducts the Foundation Day, Innovators Meet (a forum for all our supported stakeholders to meet),



Former Hon'ble Union Minister for Science & Technology Shri Jaipal Reddy alongwith Prof. K VijayRaghavan, Dr. Renu Swarup, Dr. Bala Manian & Dr. KM Shaw



MoU with SRISTI for supporting grassroots innovations

BIRAC NESTA Discovery Award for innovations in anti microbial resistance



High level panel at 3rd Foundation Day 2015



High level panel at 4th Innovators Meet 2015



Prof. R A Mashelkar (Former Director General of the Council of Scientific & Industrial Research) inspiring BIRAC's startups at Innovators Meet 2015



Mr. Yigal Elrich Founder Yozma Israel at BIRAC Innovators Meet 2016



Participants at the Innovators Meet 2016



Shri Kris Gopalakrishnan (Co-founder Infosys) at BIRAC Foundation Day 2016



Dr. Steve Buchsbaum (Deputy Director, Discovery & Translational Sciences, BMGF) at 'All Children Thriving' Workshop 2014



BIRAC at BioJapan 2015



BIRAC at Bangalore India Bio





»»» BIRAC Roadshow at Kolkata 2015



BIRAC ABLE workshops 2013-14 «««



»»» BIRAC-ICGEB workshop 2016

## Recognition for BIRAC

In the last five years, BIRAC is being recognised for its hard work and for creating impact across the country. One of the early decisions that BIRAC took was to use technology for seeking proposals- no hard copies of applications for funding is entertained in BIRAC- this at a stage when BIRAC was indeed fledgling organisation. Over the years, BIRAC has been awarded several times and these spur our internal teams and collaborators to amplify engagement with BIRAC.



Dainik Bhaskar Award 2016 «««



»»» Dr. Renu Swarup receiving the Skoch Award 2013



CSI Nihilent Award for e-Governance 2014



Skoch Award 2016



Happy Birthday to Prof. G Padmanabhan



Breaking ice with innovators through tug of war!



Dainik Bhaskar award for Pride of India Public Sector Excellence for Best New Public Sector for 2014-15

## Bonds of BIRAC



100th TEC group picture



Informal interaction with innovators



# The Future



## Maintaining Sustained Excellence

BIRAC was programmed as a developmental agency for a nation building exercise whose foundational principle was anchored in the philosophy that public led science and enterprise ultimately should lead to positive impact in the lives of people- solving collective challenges that we as society face be it in making sure that our children, mothers, our youth, adults and seniors are healthy irrespective of geography and economic background, making sure that we meet our nutritional requirements for all, providing access to energy needs in a sustainable manner and defining a future that is sustainable through clean environment. Another fundamental principle for BIRAC's role is to make India touch the heights of global excellence in science and technology especially in biotechnology and all other streams that interface with biotechnology be it engineering, nanoscience and medicine to name a few. BIRAC believes that such a future can be ushered in through a mixture of deep science, enterprise and translation.

Over the last five years, BIRAC has functioned with a single minded approach to lay the foundation of an innovation driven nation especially in the biotech arena and build the industry to global reckoning as a US\$100 billion bioeconomy.

Our early learnings clearly point to a partnership model of functioning, our programs be it the BIG, SBIRI, BIPP, SPARSH and BioNEST exemplify that bringing together network of people, mentors and organisations leads to amplification of impact.

The world is rapidly changing, we are looking at an important moment of history where different streams of human knowledge endeavours are interweaving and mixing in a dense matrix. This is happening at a speed that was not possible a couple of decades ago. The impact of this fast paced technological revolution is touching all aspects of human life and industry (Industry 4.0 as it is being referred)- be it distributed manufacturing, impact of artificial intelligence, making sense of and using massive amounts of data in an intelligent fashion such that it aids our understanding and leads to tangible benefits for humanity. This period of flux and dynamism provides opportunities for India which she cannot afford to miss if we wish our country to be at the forefront of S&T as well as take the country to higher indices of human development leading to prosperity and peace for all.

The challenge in front is to stay nimble and responsive and be aware of the needs of our citizens and humanity. The challenge is to build our impact that is as deep as it is broad- from grassroots to scale. BIRAC would integrate new knowledge such that the delivery of its deployed tools reaches every household be it in the form of a product or process.

The early success bestows even a greater responsibility upon the organisation to redouble its efforts and lead from the front in this nation building exercise. BIRAC intends to stay focused and reach out to multitudes of partners such that the nation and humanity are positively transformed.

# IMPACT



# BIRAC



# Acknowledgement

BIRAC turns 5 and while the journey might be brief and might have just begun, however the impact of this journey is playing out amongst us. The fruits of the experiments that were seeded are now visible. The journey has been about communities, ecosystems and most importantly about people both within and outside of BIRAC. The journey has catalysed many more journeys akin to a candle lighting other candles. We wished to showcase this journey in these pages.

The idea to publish such a book came a few weeks ago and hence we might have missed a few milestones and our apologies for any omissions. This book has been possible because of contributions from our colleagues at BIRAC as well as our entrepreneurs, innovators and partners who contributed racing against time. The names of all those are so many that it would not be possible to acknowledge all.

We would like to thank Prof. K VijayRaghavan (Secretary DBT and Chairman, BIRAC) for continued support, showing the way forward and for inspiring us to bring this book into fruition. Our deep appreciation to Dr. MK Bhan (Former Secretary, DBT and Founder Chairman BIRAC) for his gentle guidance, affection and support and for inspiration. Special thanks to Prof G Padmanaban who has been guiding BIRAC since inception and Dr. Kiran Mazumdar Shaw for her support to all of us including the message for this special occasion.

Our deep appreciation to Dr. Renu Swarup, Senior Adviser DBT & MD BIRAC for leading us and for constantly guiding us throughout the journey. Without her showing the way and her unstinted support, this publication would not have been possible.

Chhaya Chauhan colleague at BIRAC, worked hard and provided invaluable support to me during framing and scribing of this book. While special effort has been taken to capture salient events, however due to urgency of the project there could be some inadvertent omissions and this is regretted.

Satya Prakash Dash  
Head SPED  
and  
Team BIRAC



Team BIRAC