6th Annual Report
2017-18


DELHI-NCR
FOSTERING ENTREPRENEURSHIP


tsive and Sustainable Growt

About BIRAC

Vision

Stimulate, foster and enhance the strategic research and innovation capabilities of the Indian biotech industry, particularly startups and SMEs, for creation of affordable products addressing the needs of the largest section of society.

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.

Focus

Empowering and Enabling the Biotech Innovation Ecosystem for affordable product development

Core Values

Integrity | Transparency | Team work | Excellence | Commitment

Key Strategies

Foster innovation and entrepreneurship in all places of research

Promote affordable innovation in key social sectors

Higher focus on startups & small and medium enterprises

Contribute through partners for capability enhancement

Encourage diffusion of innovation through partners

Enable commercialization of discovery

Ensure global competitiveness of Indian enterprises

Set-up in 2012 by Department of Biotechnology, Ministry of Science & Technology, Government of India, to serve as its interface agency to promote industry-academia interface, BIRAC is a Section 8 "Not-for-profit Company" under the Companies Act, 2013. The mandate of BIRAC is to nurture and empower the biotech innovation ecosystem and transform all elements of the nascent biotechnology industry systems. A Schedule 'B' Public Sector Undertaking, BIRAC is guided by an independent Board of Directors comprising of senior scientists, academicians and policy makers. To serve various dimensions of its mandate, BIRAC operates mainly in 3 verticals. *Investment schemes* provide funding support to academia, entrepreneurs, start-ups, SMEs and Biotech Companies for all stages of the product development value chain, right from discovery to commercialization. Besides the regular investment schemes, there are also few special product development missions. The second vertical is *Entrepreneurship Development* which focuses not only on the funding support, but also on making available the right infrastructure, mentoring, licensing, IP, regulatory guidance and networking for technology transfer. Lastly, BIRAC's *Strategic Partnership* group works closely with all partners – national and international which includes Government departments and Ministries both Central and State, industry organisations, international bilateral agencies, philanthropic organisations and corporate sector, to leverage the strength and expertise and mobilize resources and extend the outreach of its activities.

In the last six years, BIRAC has played a pivotal role in nurturing the emerging biotechnology industry of the country by adopting following strategies:

i. Foster innovation and entrepreneurship in all places of research with focus on startups & small and medium enterprises
ii. Enable commercialization of discovery
iii. Promote affordable innovation in key social sectors
iv. Diffusion of innovation and Capability enhancement through partnership
v. Preparing Indian enterprises for global competitiveness

BIRAC has made considerable effort to reach out to its stakeholders and launch initiatives to address to the pressing needs of the growing enterprise and build and strengthen the Innovation Research ecosystem. BIRAC's key strategies are aligned in a manner that the attention stays focused on 'Innovation Research for Affordable Product Development'. This includes inculcating and strengthening the Innovation Research Culture in young entrepreneurs, startups and SMEs. For this to happen effectively, the academia – industry interface has been strengthened and systems put in place to encourage academic research leads to move out of laboratories, through the translational phase to product development. 'Partnerships' are the key to success – partnerships between academia and industry, between industry consortia, between national and international research groups and industries and also between innovation–funding and development agencies – national, global, government philanthropic and corporate houses.

As a core 'development agency', BIRAC promotes the entire chain of product/ technology development, right from idea to proof of concept, to validation, scale up to commercialization. The emphasis is not only on providing financial support but strengthening the ecosystem and complete handholding to enable the entrepreneurs to grow and take their ideas forward to product development. In 2017-18, BIRAC's

endeavour has been to consolidate what it has created and then pick on those critical components which need to be built upon.

In the investment vertical, funding from idea to PoC to early and late stage validation right upto pre-commercialization was continued across the product development value chain through BIG, SBIRI and BIPP Schemes. Realizing the hesitancy of the Industry to venture in high-risk areas, and to leverage the strong infrastructure & technical capability academic/ research establishments during 2017-18, BIRAC launched a new scheme "PACE" *(Promoting Academic Research Conversion to Enterprise)*. The aim of the scheme is to encourage/support academia to develop technology/product (up to PoC stage) of societal/ national importance and its subsequent validation by an industrial partner. The scheme has two components *(a) Academic Innovation Research (AIR) and (b) Contract Research Scheme (CRS)*

BIRAC has started with BIRAC's initiative-Sustainable Entrepreneurship and Enterprise Development Fund "SEED Fund". The basic idea of SEED Fund is to provide Capital assistance to startups with new and meritorious ideas, innovations and technologies. This would enable some of these start-ups to graduate to a level where they will be able to raise investments from angel/Venture capitalist or they will reach a position to seek loans from commercial banks /financial institutions.

In the Ecosystem enablers, BIRAC continued to support young entrepreneurs and startups in the biotech sector with an aim to create an enabling ecosystem to have at least 2000 startups by 2020, i.e. at least 300-500 new startups each year. This will require funding, infrastructure and capacity building. BIRAC will aim to be a single window for young startups and work through its partners and regional centres to not only facilitate startup creation but to provide the network and create a mentorship platform.

In 2017-18, BIRAC set up a new Regional Centre, called as BIRAC Regional Bioinnovation Centre (BRBC) to support and promote Entrepreneurship in Life Sciences.

To focus on Affordable Product Development, BIRAC operationalized Mission programmes under RAPID. One Such Mission is 'Accelerating Biopharmaceutical Product Development'. The other mission is in Agriculture – 'Heat Resilient Wheat'. Both these are in partnership with international funding organizations.

International Partnerships for Affordable Product Development through Grand Challenges and other such schemes continued with BMGF, USAID, Wellcome Trust and others.

I. Nurturing Innovations

(i) SITARE (Students Innovations for Advancement of Research Explorations)

An initiative launched by BIRAC in collaboration with SRISTI – a voluntary organization at IIM Ahmedabad – aiming at supporting the innovations and creativity at grassroot level among the university students, including individual innovators.

- Every year, BIRAC provides mini-seed funds of INR 15 lakhs to 15 ideas by the student teams with academic mentors to carry out R&D in-situ.
- Biotech Ignition School (3-4 weeks residential programme) is also organized where 10-12 ideas are selected for funding of INR 1 lakh each.

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

- **University Innovation Clusters (UIC):** Pre-incubation innovation hubs created in universities to foster the culture of innovation and techno-entrepreneurship in university students by five UICs have been initiated at:
  - Anna University, Chennai
  - Panjab University, Chandigarh
  - Tamil Nadu Agricultural University, Coimbatore

- ❖ University of Rajasthan, Jaipur
- ❖ University of Agricultural Sciences, Dharwad

Features of UICs

- ❑ A Cluster for 5-6 students/ young entrepreneurs to test their ideas/discoveries and take them to Proof of Concept (PoC)
- ❑ An incubation space-2500-3000 Sq.ft
- ❑ BIRAC Innovation Fellowships for two (2) Post Docs. and four (4) Post M.Sc. Fellows per university
- ❑ BIRAC Innovation Grant:
  - ❖ Post Doc. Fellow: BIRAC Innovation Fellowship @ Rs. 50,000/- p.m. & Innovation Grant of Rs. 5,00,000 p.a. for three years
  - ❖ Post M.Sc. Fellows: BIRAC Innovation Fellowship @ Rs. 30,000/- p.m. & Innovation Grant of Rs. 2,00,000 p.a. for three years
- ❑ Industry Participation for training, mentoring, sponsored research and networking opportunities and IP & Technology Management; access to risk finance among others.

(iii) 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.

- ❑ SIIP clusters are operated by five Incubation Partners namely, Venture Center, Pune; THSTI, Faridabad; KIIT, Bhubaneswar; Villgro, Chennai and SCTIMST – TIMED, Kerala.
- ❑ Fellowship amounting to INR 50,000 per month to each Fellow
- ❑ Mini kick start grant of INR 5 lakhs per Fellow

(iv) BIG (Biotechnology Ignition Grant): Flagship startup funding programme of BIRAC which provides the right admixture of fuel and support to young startups and entrepreneurial individuals.

- ❑ For individuals, researchers from academia and startups
- ❑ Seed grant of up to INR 50 lakhs for research projects with commercialization potential with duration of up to 18 months
- ❑ Mao Managed by six BIG Partners – C-CAMP, Bangalore; IKP Knowledge Park, Hyderabad; FIIT, Delhi; Venture Center, Pune; KIIT, Bhubaneswar and SIIC, IIT Kanpur
- ❑ Partners provide mentoring, monitoring, networking and other business development related activities

(v) SPARSH (Social Innovation Programme for Products Affordable & Relevant to Societal Health): The Scheme aims to develop innovations that would create direct impact in the society in the near to medium term future. Provides support to cutting edge innovations towards affordable product development that can bring significant social impact and address challenges of inclusive growth. The Programme has focused on thematic areas such as Mother & Child Health, Waste Management, Soil and Plant Health and Ageing & Health.

- Idea to Proof of Concept: Grant[redacted]d assistance up to INR 50 lakhs for a period up to 18 months
- Proof of Concept to Validation: Grant[redacted]d assistance up to INR 50 lakhs over the period up to 24 months
- Innovative pilot scale delivery models: Grant[redacted]d for a period up to 24 months. The project cost sanctioned for the Company would be matched equally by BIRAC and the Company.

(vi) BIRAC Innovation Challenge Fund : In FY 2017-18, BIRAC launched an Innovation Challenge Award SoCH (Solutions for Community Health to support innovative ideas from the individuals, entrepreneurs, academia, and companies. 10 winners were selected in round one with each winner receiving INR 15 lakhs. The final winner out of the 10 would receive INR 50 lakhs.

II. Funding Product and Process Development

(i) Early and Late Stage Funding

- **Small Business Innovation Research Initiative (SBIRI):** Early stage, innovation focused PPP initiative in the area of Biotechnology, aims at funding high risk innovative R&D beyond proof-of-concept.
  - Support in form of grant-in-aid for projects up to INR 100 lakhs in PPP mode
- **Biotechnology Industry Partnership Programme (BIPP):** Support for high risk, accelerated technology development especially in futuristic technologies having major economic potential and focused on IP creation
  - Provide for product evaluation and validation through support for limited and large scale field trial for agriculture products and clinical trials (Phase I, II, III) for health care products
  - Financial support by BIRAC up to 50% of the approved project cost
  - Funding support in form of grant-in-aid with corresponding obligation of royalty payment
- **Promoting Academic Research Conversion to Enterprise (PACE):** Encourages/supports academia to develop technology/product (up to PoC stage) of societal/ national importance and its subsequent validation by an industrial partner. The scheme has two components:
  - **Academic Innovation Research (AIR):** The objective of the scheme is to promote development of Proof-of-concept (PoC) for a process/product by academia with or without the involvement of industry
  - **Contract Research Scheme (CRS): Supports validation of academic research having commercialisation potential, by the industry.**
    - Funding is in the form of grant is given to both the academic as well as industrial partners
    - IP rights reside with the academia, the industry partner has first right of refusal for commercial exploitation of the New IP

(ii) Product Commercialization Program (PCP)

Once a project has reached product/process development stage (TRL 7 and above), and is moving towards commercialization then besides technical and funding support, the grantee also requires guidance on various other issues such as IP, regulatory, business plan, market conditions, networking, etc. in a concerted manner which may be little difficult to provide under the existing funding programmes. To deal with all these requirements of an entrepreneur, BIRAC has launched Product Commercialization Program (PCP) in 2017-18.

The objective of the proposed program is to hasten the product commercialization process by providing all necessary support to the projects which have performed well under the ongoing funding programs of BIRAC and attained TRL 7 or higher and have a potential of moving ahead towards commercialization. Through this programme BIRAC proposes to become a Product Development Partner (PCP) and work with such projects to give them all support which include the required financial grant, mentoring, connecting with Investors, regulatory facilitation, market access, etc. There is no ceiling of budget under PCP and the extent of funding depends upon the stage of development and further steps required.

(iii) Funding in Collaborative Models – National and International Partnerships

- **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

- **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
- **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). This will create and innovators' pipeline for competing in the coveted Longitude Prize – a challenge programme having a prize fund of 10 million pound, to solve the problem of global antibiotic resistance
- **DeitY (Department of Electronics and Information technology):** Launched Industry Innovation programme on Medical Electronics (IIPME) for supporting innovations in medical electronics and med devices sector
  - ❑ Support extended for – establishing PoC, validation, and scale-up
- With the creation of program management unit in BIRAC, the newly launched National Biopharma Mission by DBT, in partnership with the World Bank got operationalized. 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 would focus on development of drugs, vaccines and medical technologies.

(iv) BIRAC SEED Fund (Sustaining Enterprise and Entrepreneurship Development): Financial equity based support to startups and enterprises through bio-incubators for scaling enterprises.

- 11 Incubators have been provided INR 100-200 Lakhs each for investing in enterprises
- Investment in each enterprise shall be to the tune of INR 15-30 lakhs

(v) BIRAC Biotechnology Innovation Fund - AcE (Accelerating Enterprises): 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 was launched on 1st December 2017. The fund will invest in professionally managed Venture Funds and Angel Funds dedicated to domain areas of life sciences and biotechnology. Under this, 6 VC partners have been identified and further operational modalities to manage the fund are being formulated.

III. Enablers for Scaling up the Ecosystem

(i) BIRAC BioNEST (BIRAC–Bioincubation: Nurturing Entrepreneurs for Scaling up Technology): Flagship programme of BIRAC has supported 30 world-class bio-incubators

- Provides incubation space, mentor networks, instrumentation facilities, IP and technology management support, resource mobilization and legal services
- 3,20,000 sq. ft of incubation space created
- More than 350 innovators supported

Board of Directors

(L to R): Prof. Pankaj Chandra, Prof. Ashok Jhunjhunwala,
Dr. Renu Swarup, Dr. Mohd. Aslam, Prof. Akhilesh Tyagi, Shri Naresh Dayal

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AWARDS

BIRAC National Award for Indigenous Product Commercialization

National Technology Day is celebrated every year on 11th May. BIRAC has instituted the 'BIRAC National Award for Indigenous Product Commercialization' which is given to an organisation demonstrating excellence in successfully commercializing an indigenously developed technology on the occasion of National Technology Day. BIRAC National Award for Indigenous Product Commercialization for the year 2017 was awarded to **Windmill Health Technologies Pvt. Ltd., New Delhi** for developing NeoBreatheTM. The Device is the world's first foot powered manual resuscitator that empowers grassroots-caregivers to save newborns with ease and efficacy. Designed, developed and manufactured in India, for the world, through Government of India support, it is helping bring down infant mortality from birth asphyxia that currently claims 2,00,000 lives a year in India alone.

Dr. Avijit Bansal, Co-founder and CEO of Windmill Health Technologies Pvt. Ltd. receiving 'BIRAC National Award for Ingenious Product Commercialization' 2017 from the Former Honourable President of India Shri. Pranab Mukherjee

BIRAC won Dainik Bhaskar's "India Pride Awards" in the category India Image Enhancement, creating a global brand

BIRAC won Dainik Bhaskar's "India Pride Awards" in the category India Image Enhancement, creating a global brand. The award was given by Shri Dharmendra Pradhan, Hon'ble Minister of Petroleum and Natural Gas and Skill Development & Entrepreneurship and Shri Shivraj Chauhan Hon'ble Chief Minister of Madhya Pradesh and was received by Dr Renu Swarup,currently Secretary, DBT &Chairperson, BIRAC.

Dr. Renu Swarup receiving the award from Shri Dharmendra Pradhan, Minister of Petroleum & Natural Gas & Skill Development & Entrepreneurship & Shri Shivraj Chauhan, Chief Minister of Madhya Pradesh

National Entrepreneurship Award 2017 under Mentor (Government) Category awarded to Dr. Renu Swarup, currently Secretary DBT & Chairperson, BIRAC

Dr. Renu Swarup, Secretary Department of Bio-technology, Ministry of Science & Technology was awarded with National Entrepreneurship Award, 2017 under Mentor (Government) category in the Recognition Track. Union Finance Minister Shri Arun Jaitley presented the awards at the National Entrepreneurship Award Ceremony, 2017 in New Delhi.

Dr. Renu Swarup receiving the award from Shri Arun Jaitley, Union Finance Minister

Skoch Order of Merit under category "SKOCH TECHNOLOGIES FOR GROWTH 2017" for BIRAC for Creating Biotechnology Innovation Ecosystem in India from concept to Reality.

BIRAC was adjudged amongst the 'Top 80 Projects in India' for the year 2017 and was conferred 'Skoch Order-of-Merit' during the 50th Skoch Summit held on 20th December, 2017 at the Constitution Club of India, New Delhi

Biotechnology Industry Research Assistance Council

CIN: U73100DL2012NPL233152

Regd office: 1st Floor, MTNL Building, 9, CGO Complex, Lodhi Road, New Delhi-110003

Website: www.birac.nic.in **Email:** birac.dbt@nic.in **Tel:** 011-24389600 **Fax:** 011-24389611

Notice

Notice is hereby given that the Sixth Annual General Meeting of the Company will be held on:

Day and Date: 25th September 2018 **Time**: 12.30 p.m.

Venue: 1st floor, MTNL Building, 9, CGO Complex, Lodhi Road, New Delhi – 110 003.

for transacting the following business:

Ordinary Business:

1. To receive, consider and adopt the Audited Financial Statements of the Company as on March 31, 2018 together with the Reports of the Directors and Auditor thereon and comments of the Comptroller & Auditor General of India in terms of Section 143(6)(b) of the Companies Act, 2013
2. To fix the remuneration of the Statutory Auditor for the financial year 2018-19, in terms of provisions of Section 139(5) read with Section 142 of the Companies Act, 2013.

NOTES:

1. MEMBERS ENTITLED TO ATTEND AND VOTE MAY APPOINT ONE OR MORE PROXIES TO ATTEND AND VOTE INSTEAD OF THEMSELVES. PROXIES TO BE VALID MUST BE RECEIVED AT THE REGISTERED OFFICE OF THE COMPANY NOT LESS THAN FORTY-EIGHT HOURS BEFORE THE APPOINTED TIME OF THE MEETING
2. Only bonafide members of the Company whose names appear in the Register of Members in possession of valid attendance slips duly filed and signed will be permitted to attend the meeting. The Company reserves its right to take all steps as may be deemed necessary to restrict non-members from attending the meeting.
3. It will be appreciated that queries, if any, on accounts and operations of the Company are sent to the registered office of the Company ten days in advance of the meeting so that the information may be made readily available.

By Order of the Board
Kavita Anandani
Company Secretary

Registered Office:

1st floor, MTNL Building, 9, CGO Complex,
Lodhi Road, New Delhi – 110 003

Date: 24th August, 2018

Chairperson's Message

The motto of the Ministry of Science and Technology, Government of India is "Vigyan se Vikas" and at BIRAC, we are committed to this principle, not only in letters but in spirit. BIRAC believes in the power of science to drive development and improve lives and it is towards this goal that we are striving.

The last year in BIRAC has seen many avenues of progress. The new National Biopharma Mission, launched by DBT, in partnership with the World Bank is now a fully functional Program Management Unit at BIRAC. Programs under the mission are now underway and it is hoped that with its focus on drugs, vaccines and medical technologies, the program will contribute significantly to the goal of building India as a global hub for biotech product development and manufacturing.

Two new programs have also been launched in the last year. The AcE Fund is a fund of funds based on equity and is focused at supporting entrepreneurs in the so called 'Valley of death' during product development. BIRAC will partner with Venture and Angel Funds and will invest much-needed risk capital to fledgling entrepreneurs. It is hoped that this program will helps entrepreneurs move more rapidly through the development pipeline.

The other is the recently formed Product Commercialization Unit (PCU) that has been created within BIRAC, to play a catalytic role in commercializing BIRAC funded projects. This unit will assist with the regulatory, intellectual property, policy, funding and other aspects of taking products to the market, which is usually a difficult

BIRAC has contributed to the rapid evolution of the biotech start-up landscape in the country by supporting more than 500 entrepreneurs and start-ups. BIG, one of the flagship programs has catalysed formation of more than 70 new start-ups- individual entrepreneurs who established new enterprises.

Our incubation and pre-incubation support programs such as BioNEST and University Innovation Clusters (UIC) have also grown. We are now supporting 30 biotech (including medtech) incubators across the country that provide incubation, nurturing and mentoring space to more than 350 biotech start-ups. We have also initiated the BIRAC Incubator SEED Fund program where 11 of our incubators have been funded to provide equity based support to start-ups.

Our other flagship programs such as SBIRI, BIPP and CRS continue to provide pathways for development of products and technologies which will contribute to improved healthcare, agriculture, food and nutrition, animal husbandry, new forms of biofuel and energy sources and cleaner environment.

BIRAC's contribution to the Government's national programs such as 'Make in India' (MII) and 'Startup India' has also grown. The MII Facilitation Cell within BIRAC continues to interact with other agencies to frame policies and track achievements of our commitment to the MII and Startup India plans.

BIRAC continues to foster deeper engagement with all our national and international partners such as the Bill & Melinda Gates Foundation (BMGF), Wellcome Trust, Nesta, Tekes, Ministry of Electronics and IT (MeitY) and WISH Foundation. In the previous year, we have established new partnerships with ICMR, ISBA, TiE-Delhi, Indian Angel Network (IAN) and Perkin Elmer to further our collaborative goals.

Despite our achievements in the last year, we are always conscious that there is always room for innovation and improvement. BIRAC remains committed to supporting the biotechnology industry in India to making this a $100 billion economy by 2025.

Dr. Renu Swarup
Secretary DBT & Chairperson, BIRAC

Dr. Renu Swarup
Secretary DBT & Chairperson
BIRAC

Outgoing Chairman's Message

Prof. K. VijayRaghavan

India is going through an extraordinary phase in its history, akin only to the challenges it faced during independence. Today, there is a renewed enthusiasm to use knowledge and science as a component of social and economic change. In the perspective of a problematic India with regard to Health, Agriculture, Nutrition, Sanitation, Energy, Development etc. continued investment over the past decades in science and technology has been paying off in ways which position it to address the past complex challenges.

BIRAC when structured in 2012, had its thrust on creating a biotech innovation ecosystem that was conducive to the needs of the young entrepreneurs, start-ups etc. and to act as an industry-academia interface to network all the aforementioned entities in such a manner that their ideas and discoveries stand up to their full potential to drive the force of development of the masses in India and beyond. Also, BIRAC strived to leverage national and international expertise through strategic partnerships, which have since been formed and have helped in catalysing innovation in several biotech sectors.

With the unique models of innovation funding and ecosystem development framed, BIRAC has notched up spectacular results with more than 300 start-ups supported, over 3 lakh sq.ft. in incubation space, 745 beneficiaries in companies, entrepreneurs & academia, more than 35 products/technologies supported till now.

BIRAC implicitly recognises that exponential scaling of several bio-enterprises will lead to rapid growth of the overall industry, which is a must to achieve our stated goal to be a US $100 billion bioeconomy by 2025. As BIRAC is also aware that successful scale-up of bio-enterprises involving a 360° cohesive strategy it would continually strive to understand the current and future needs of bio-enterprises and bring in transformational change through supporting and sustaining cutting edge technologies that would provide solutions to challenges faced not only by the country, but for the rest of the world.

Prof. K. VijayRaghavan
Principal Scientific Adviser to the Govt. of India

Managing Director's Message

Dr. Mohd. Aslam
Managing Director

The Annual Report is an important milestone each year for any organization. It gives us a chance to look back and assess our achievements as well as our failures to understand and improve on them.

BIRAC's 6th Annual Report highlights the activities BIRAC has conducted over the last year against its mandate to help build the nation's biotech innovation ecosystem by nurturing, enabling, catalysing and empowering biotech entrepreneurs, startups and SMEs alike with innovative ideas for novel biotech products and processes.

BIRAC has created a support system for entrepreneurs throughout the product development pipeline starting from the ideation stage right upto commercialization. BIRAC also works to bring new entrepreneurs into the fold, with programs such as the University Innovation Cluster, BIRAC-GYTI Awards and SIIP Fellowships. Then come the early stage funding programs such as BIG, SPARSH and IIPME that support early testing of novel ideas.

BIRAC is not simply only a funding agency. While funding is an important aspect of our work, equally important is the support that we provide for IP, regulatory aspects and commercialization of products through our special cells within the organization. The BioNEST program seeks to provide infrastructural support to entrepreneurs across the country with 30 supported incubators.

Translational support is provided by programs such as BIPP and SBIRI, which support the middle stages of the pipeline.

We have also taken a focused approach through establishment of our Regional centres especially BIRAC Regional Innovation Centre (BRIC), BIRAC Regional Entrepreneurship Centre (BREC) and the recently launched BIRAC Regional Bioinnovation Center (BRBC).

BIRAC's collaborations, both national and international have been and will continue to be an important aspect of our work. Leveraging the core competencies of different organizations and countries helps us align and achieve the target of developing India's innovation ecosystem and increasing the positive impact and accessibility of funded products and technologies. Our partnerships with the Bill & Melinda Gates and Wellcome Trust as well as the World Bank have been strengthened through the Grand Challenges India program and the National Biopharma Mission. Our partnerships with CEPIFRA, Tekes, TiE, the Indian Council of Medical Research, Indian Angel Network, WISH and USAID remain critical in delivering important programs.

Our commitment to the Government's Missions is also an important aspect of BIRAC's work. Make in India, Start Up India, Invest India in building aligned strategies for biotechnology for the nation.

The new programs launched in the last year, such as the AcE Fund and the Product Commercialization Unit will hopefully address some of the gaps in the pipeline and will help deliver impact in an accelerated manner.

The support that we have extended to over 500 entrepreneurs and startups over the last 6 years has now started translating into development of more than 100 novel products and technologies.

As we work achieve our goals for the future, we are excited and motivated to improve and innovate to continue delivering impact.

Dr. Mohd. Aslam
Managing Director

Board of Directors

*Dr. Renu Swarup	:	Chairperson
**Prof. K. VijayRaghavan	:	Chairman
***Prof. Ashutosh Sharma	:	Chairman
#Dr. Mohd. Aslam	:	Managing Director and Government Nominee Director

Non-Executive Independent Director

Prof. Ashok Jhunjhunwala	:	*Director*
Prof. Akhilesh Tyagi	:	*Director*
Shri. Naresh Dayal	:	*Director*
Prof. Pankaj Chandra	:	*Director*

**Appointed as Chairperson w.e.f. April 10, 2018 and tenure as Managing Director till April 09, 2018*
#Given additional charge as Managing Director, BIRAC w.e.f. April 10, 2018
*** Tenure till February 2, 2018*
**** Was appointed as Chairman from February 3, 2018 to April 9, 2018*

Dr. Renu Swarup

Dr. Renu Swarup is presently Secretary (DBT), Ministry of Science & Technology, Government of India. A PhD in Genetics and Plant Breeding, Dr. Renu Swarup completed her Post-Doctoral at The John Innes Centre, Norwich UK, under Commonwealth Scholarship and returned to India to take up the assignment of a Science Manager in the Department of Biotechnology, Ministry of Science and Technology, GoI, in 1989. At DBT, she has been involved in the overall policy, planning and coordination. She has also been responsible for developing, funding and monitoring programmes under the National Bioresource Development Board in the area of Energy Biosciences, Bio resource Development and Utilization and Plant Biotechnology - Bio prospecting, Tissue Culture and other Biomass associated programmes. Some major initiatives led by her include the National Biodiversity Characterization programme with Department of Space, the National Microbial Culture Collection, National Certification System for Tissue Culture Plants and the recently announced National Biopharma Mission. She was actively engaged in the formulation of the Biotechnology Vision in 2001, National Biotechnology Development Strategy in 2007 and Strategy-II 2015-2020 as the Member Secretary of the Expert Committee. She has been deeply involved in nurturing the Biotech Innovation Ecosystem in the Country. She was also a member of the Task Force on Women in Science constituted by the Scientific Advisory Committee to the Prime Minister. She is a Member of the National Academy of Sciences India and a life Member of India Science Congress.

Dr. Mohd. Aslam

Dr. Mohd. Aslam, Advisor (Scientist 'G') in the Department of Biotechnology (DBT) is currently holding additional charge as Managing Director, BIRAC. He is involved in planning, coordination and monitoring of various R&D programmes in plant biotechnology and allied areas. Currently, he is handling major programmes of DBT such as Centres of Excellence in Biotechnology, Translational Research in Products and Processed from Medicinal & Aromatic Plants and Technology Development in Silk. Dr. Aslam is the Member Secretary of the Technical Advisory Committee of Centres of Excellence in Biotechnology and DBT's Expert Groups on Translational Research in Products and Processed from Medicinal & Aromatic Plants and Technology Development in Silk. He is also working as the nodal officer in DBT for three autonomous institutions – National Institute of Immunology (NII), New Delhi; Institute of Bioresources and Sustainable Development (IBSD), Imphal, Manipur; and International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi and also for Biotech Industry Research Assistance Council (BIRAC), New Delhi.

Profile of Independent Directors

Prof. Ashok Jhunjhunwala,
Institute Professor – Department of Electrical Engineering,
IIT Madras

Prof. Ashok Jhunjhunwala is an Institute Professor at Indian Institute of Technology, Madras at Chennai, India. He has just completed one year of his services as Principal Advisor to Ministry of Power and MNRE, Delhi. Also he is currently working as a Principal Advisor in Ministry of Railways, Delhi. Prof. Ashok Jhunjhunwala did B.Tech from IITK, MS and Ph.D from the University of Maine and was a faculty at Washington State University from 1979 to 1981, before joining IIT Madras in 1981. Prof. Jhunjhunwala is considered the pioneer in nurturing Industry - Academia interaction in India towards R & D, Innovation and Product Development. His group (TENET) at IIT Madras has innovated, designed, developed and commercialized a large number of technologies in the area of Telecom, IT, Banking and Energy sectors, especially in solar rooftop and electric vehicles. He conceived and built the first Research Park (IIT Madras Research Park) in India which houses over 65 R & D companies and 100 incubated companies. He leads IITM Incubator which has incubated 120 companies so far. Prof. Jhunjhunwala has been Chairman and member of various government committees and has been on boards of several education institutions in the country. At the same time, he has been on the boards of a number of public and private companies and has driven comprehensive changes, especially in the area of technology, in the companies. He was a Director on the board of State Bank of India, Bharat Electronics, HTL, NRDC, IDRBT, VSNL and BSNL. He has also been on board member Tata Communications, Mahindra Rewa, Sasken, Tejas Networks, TTML, Intellect and Exicom. He is currently also on the board of BIRAC and Chairman of Technology Advisory Group of SEBI. Prof. Jhunjhunwala was conferred Padma Shri in 2002, Shanti - Swarup Bhatnagar award, Vikram Sarabhai Research award, H. K. Firodia award, Silicon India Leadership award, Millenium Medal at Indian Science Congress, UGC Hari Om Ashram award, IETE's Ram Lala Wadhwa Gold Medal, JC Bose fellowship and Bernard Low Humanitarian award. TiE conferred on him the title of "Dronacharya" for his contributions to the cause of entrepreneurship. He is fellow of IEEE, INSA, NAS, IAS, INAE and WWRF. He has also been conferred Honorary Doctorate by University of Maine and Blekinge Institute of Technology, Sweden.

Prof. Akhilesh Tyagi

Working in the area of Plant Genomics and Biotechnology, Professor Tyagi led first successful Indian initiatives on genome-wide sequencing in rice, tomato and desi chickpea. This has heralded the era of high throughput genomics in India. Pioneering contributions were made to the area of neo- and sub-functionalization of regulatory gene families in plants during evolution. A transcriptome atlas of water-deficit response and grain development in rice has been generated. Novel genes/alleles were characterized with a view to gain and protect yield. Over-all, >250 publications of international repute have been generated. This research is largely an outcome of investigations of national/international collaborators and >120 Post-Doctoral, Doctoral, Master, Fellow and Trainee researchers, carried out under the auspices of several projects executed in his leadership. He has delivered over 300 invited lectures and chaired over 50 sessions in national (~50 cities) and international (~15 countries) meetings. In addition, he is serving on Editorial Boards of Transgenic Research, Molecular Genetics & Genomics, Rice, and others.

At the University of Delhi, Professor Tyagi has served as Head, Department of Plant Molecular Biology, Chairman, Board of Interdisciplinary and Applied Sciences and Director, Interdisciplinary Centre for Plant Genomics. Professor Tyagi has also provided leadership to the National Institute of Plant Genome Research as Director. In his leadership as President, the National Academy of Sciences, India and its chapters reached about 20000 people, including children, women and those from rural areas, under its science and society program during 2015-16. He served as Chairman of DBT-UGC Task Force on Human Resource Development and Program Advisory Committee on Plant Sciences, DST, Government of India, and on Governing Boards of more than ten institutions. He has been given JC Bose National Fellowship Award, National Bioscience Award, NASI-Reliance Industries Platinum Jubilee Award in Biological Sciences, Bhasin Award for Science and Technology, Birbal Sahni Medal of IBS, BP Pal Memorial Award of ISCA, and FC Steward Lecture Award of PTCA(I), among others. He is Fellow of the National Academy of Sciences, India, the Indian National Science Academy, the Indian Academy of Sciences, the National Academy of Agricultural Sciences and The World Academy of Sciences.

Shri . Naresh Dayal

Shri. Naresh Dayal, IAS, has worked with the Government of India for 37 years in various positions at the state and national levels. As Secretary, Ministry of Health and Family Welfare, He has been responsible, among other things, for all policies and programs in Public Health, supervising National Health Authorities, assessing and devising the policies for the country's manpower requirements in health. He holds a Masters degree in Arts from University of Delhi and also in Professional Studies, Agriculture, from University of Cornell, USA. Shri Naresh Dayal is also the Chairman of the Expert Appraisal Committee for Coastal Regulation Zone and Infrastructure Projects for Environment and CRZ clearances by the Ministry of Environment, Government of India. He was a Director of State Trading Corporation of India Limited. He has been Non-Executive -Director at Balrampur Chini Mills Limited since November 15, 2016.He has been an Independent Director of Glaxo Smith Kline Consumer Healthcare Limited since April 23, 2010. He served as an Independent Director of The State Trading Corporation of India Ltd. from July 10, 2011 to July 9, 2014.

Prof. Pankaj Chandra

Prof. Pankaj Chandra is the Vice Chancellor and Chairman, Board of Management of Ahmedabad University since October 2015. He was the Director of the Indian Institute of Management Bangalore (2007-2013) and Professor of Operations & Technology Management at IIM Ahmedabad and IIM Bangalore. He holds a B.Tech. from the Banaras Hindu University and a Ph.D from The Wharton School, University of Pennsylvania. He has taught at various institutions such as McGill University in Montreal, University of Geneva, The Wharton School, University of Pennsylvania, International University of Japan, Cornell University, Renmin University, Beijing and IIM Ahmedabad (IIMA). He has worked briefly with The World Bank in Washington DC. He was the Chairperson of the Doctoral Programme at IIM Ahmedabad and the first Associate Dean (Academic) at ISB, Hyderabad. He was part of the founding team at the Centre for Innovation, Incubation and Entrepreneurship (CIIE) at IIMA and its first Chairperson.

Professor Chandra has served as member of the Government of India Committee on Clusters for Development of the Informal Sector. He was a member of the two High Powered Committees - the Government of India Committee on Rejuvenation of Higher Education (Yashpal Committee) that relooked at the Indian Higher Education system as well as the Committee on the Autonomy of Central Institutions. He was a member of two Steering Committees constituted by the Planning Commission of India for 12th Plan Development, one on Higher & Technical Education (where he also chaired the Sub-Committee on Student Financial Aid), and the other on Industry. He was a member of Central Advisory Board of Education (CABE) subcommittee on Teacher Education. Until recently, he was also a member of the Telecom Regulatory Authority of India (TRAI).

Professor Chandra's research and teaching interests include Manufacturing Management, Supply Chain Coordination, Building Technological Capabilities, higher education policy, and hi-tech entrepreneurship. He has published extensively in international refereed journals and has served on the editorial boards of several international journals. His forthcoming book studies issues of Governance, Change & Institution Building in Indian Universities. He has been conducting the national survey on Competitiveness of Indian Manufacturing since the last 20 years.

Professor Chandra has been involved in several startups, has also been a consultant to large Indian and multi-national firms and serves on the Boards & Academic Councils of several firms and institutions (Mindtree, BIRAC, NID, IGIDR, Srishti School of Art, Design &Technology, Film & Television Institute of India, IIT Jodhpur, IIIT Bangalore, IIIT Dharwad, BHU).

CORPORATE INFORMATION

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COMPANY SECRETARY

Ms. Kavita Anandani

Vigyan Se Vikas

Directors' Report

Poorti Kit

This Project was Supported
& Funded by BIRAC

DIRECTORS' REPORT

To the Members,

1. ABOUT BIRAC

Biotechnology Industry Research Assistance Council (BIRAC) is a not-for-profit Section 8 company incorporated under the Companies Act, 2013 and a Schedule B, Public Sector Enterprise, set up by Department of Biotechnology (DBT), Ministry of Science & Technology, Government of India as an interface agency to strengthen and empower the emerging biotech enterprise to undertake strategic research and innovation, addressing nationally relevant product development needs.

BIRAC is an industry-academia interface and implements its mandate through a wide range of impact initiatives, be it providing access to risk capital through targeted funding, technology transfer, IP management and handholding schemes that help bring innovation excellence to the biotech firms and make them globally competitive. In its six years of existence, BIRAC has initiated several schemes, networks and platforms that help to bridge the existing gaps in the industry-academia Innovation research and facilitate novel, high quality affordable products development through cutting edge technologies. BIRAC has initiated partnerships with several national and global partners to collaborate and deliver the salient features of its mandate.

2. OUR PHILOSOPHY & ACHIEVEMENTS

BIRAC's vision aims to 'Stimulate, foster and enhance the strategic research and innovation capabilities of the Indian biotech industry, particularly start-ups and SMEs, for creation of affordable products addressing the needs of the largest section of society'. BIRAC's philosophy is rooted in its mission to 'trigger, transform and tend biotech start-ups to convert innovative research in public & private sector into viable and competitive products and enterprises'.

Since its inception in 2012, BIRAC has acted as a 'Development Agency' to lay the foundation of a biotech ecosystem in the country. The vision of the organisation clearly defines its core philosophy to create societal impact through cutting edge products that are affordable as well as exemplified in the statement 'affordable products addressing the needs of the largest section of society'. This foundation has been built on the premise that for India to grow to become a knowledge driven economy it is essential that biotechnology plays a significant role in this endeavour.

BIRAC aims to achieve the vision and mission, which have been enshrined in its charter, through various mechanisms that call for strategy involving multitudes of aligned partnerships such that bio-innovation takes root in start-ups, SMEs as well as in research institutes and academia.

Over the last 6 years, BIRAC has, with several other partners, focused on bringing positive change in the biotech ecosystem of the country. It has designed, launched and implemented a panoply of programmes which have been categorised into SITARE, eYUVA, Funding for Product & Process Development and Enablers for Scaling the Ecosystem. It has recently initiated the Product Commercialization Program for creating a clear path for BIRAC funded projects to be taken to market. BIRAC has engaged with the whole spectrum of community from students, entrepreneurs, start-ups, entrepreneurial faculty, SMEs as well as translational organisations and R&D centres.

Engagement at the Foundational Level: Students, Entrepreneurs and Start-ups: Building New Pathways for exciting 'Entrepreneurial Journeys' through early stage funding, incubation and equity funding

It is essential to recognise that to build and transform an industry, one has to begin at triggering positive changes in the foundation. BIRAC has successfully initiated several programmes under the umbrella of **SITARE** and **eYUVA** which are bringing about a change in the biotechnology industry. These programmes capture the entrepreneurial energies of students and nudge them towards greater creativity and innovation. For example, through **BIRAC-SRISTI GYTI** awards, we provide INR 15 lakhs to student teams in academic institutions to take forward their research ideas under the guidance of an academic mentor (49 such ideas have so far been awarded). These awards are presented by the Hon'ble President of India at the Rashtrapati Bhavan, inspiring young

students to aim at achieving. We also provide INR 1 lakh to students pursuing validation of grassroot ideas (more than 150 such ideas have been facilitated).

We have also focused on deepening our engagement with universities pro-actively through **University Innovation Cluster** (UIC) wherein we have supported 5 universities across the country through Innovation Fellowships and pre-incubation space. 23 Innovation fellows are currently working in different UICs across the country.

Social innovation is gaining traction as innovators try to find novel solutions to societal challenges such as public health, ageing, maternal & child health and sanitation. The SPARSH programme, launched in 2013, has focused on building the social innovation potential in India through biotech tools and products. Within **SPARSH,** BIRAC has designed an immersion programme called SIIP that allows young fellows to immerse in various communities and hospitals and identify gaps that can be bridged by innovative solutions. 20 **SIIP fellows** are currently working diligently to identify societal needs in the area of Ageing and Health and Waste to value. In past, many of the SIIP fellows have been able to transition into enterprise mode with follow on funding from BIG and other agencies.

BIRAC's **Biotechnology Ignition Grant (BIG** as it is popularly known) is a pioneering early stage idea to proof-of-concept programme and it is India's largest early stage program in the biotech space. Through BIG, BIRAC has already supported close to 300 entrepreneurial ideas and at least a dozen have accelerated to commercialisation stage while another 15-20 are in validation stages. In 2017-18, two calls of BIG were announced (11thand 12th). In the 11thcall, 355 applications were received indicating an increasing response from the start-up and entrepreneurial community. It is interesting to note that BIG has been catalyst for launching more than 80 new start-ups wherein individual recipients have established their enterprises. These start-ups are also delivering national assets through filing IPs for their cutting edge technologies (100 such IPs have been generated through BIG). More than INR 125 crores of funds have been raised by around 60 companies through public and private investors including angel investors and venture funding.

Biotech start-ups face an uphill task for commercialisation, as access to infrastructure remains a critical hurdle. The need for biotech incubator is greater than ever and BIRAC in 2012 initiated the Biotech Incubator Support Scheme (BISS) which is now appropriately called as **BioNEST**. Through this program, BIRAC has been able to provide support to 30 bioincubators across the country. These bioincubators together provide more than 337,000 sqft of incubation space, access to common instrument facilities besides office space for nascent start-ups to grow. BioNEST has been able to nurture more than 355 biotech start-ups and entrepreneurs and complements our early stage funding programs such as BIG, SPARSH and IIPME. In 2017-18, eleven new bioincubators were supported including thoseat ICRISAT, University of Hyderabad, ICAR-IIHR and IIIT Hyderabad. It is also to be noted that many of earlier bioincubators such as at NCL's Venture

Center and SIIC at IIT Kanpur have now matured and BIRAC have been extended support for their scale up.

BIRAC's Initiative Sustainable Entrepreneurship and Enterprises Development Fund (SEED Fund) aims at providing financial equity based support to the start- ups and enterprises through bio incubators for scaling enterprises. A total support of INR 100- 200 Lakhs has been provided to 11 Incubators for investing in promising enterprises.

Engagement at SME level for Product Development: Catalysing Commercialisation of cuttingedge and affordable biotech products for the nation and theworld through transformational PPP models, industry-academia partnerships and focused approaches through Early Translation Accelerators

Supporting translation of ideas until its commercialisation is one of the core mandates of BIRAC and in this regard many of our flagship programmes such as SBIRI and BIPP provide impetus for pulling the idea past POC and taking it further along the innovation chain especially validation and scale. A wide gamut of cutting edge projects were supported via the two programmes covering areas such as drugs, bio-similars, stem cells, agriculture, industrial biotechnology and device and diagnostics.

SBIRI and BIPP were the pioneering industry focused programs which were initiated by the Department of Biotechnology (DBT) in 2006 and 2009 respectively. These programs over the years, have helped several products reach the market and impact people's lives positively.

SBIRI provides support to pull a POC to early stage validation and in 2017-18, three calls were announced which supported project in various areas of Biotechnology. While two of these were regular calls, one of the calls was dedicated to development of *"Novel tools/technologies/processes and product optimization/scale-up of Anti-Snake Venom"*. Over the years, SBIRI has supported 248 projects that have resulted in development of 34 product/ technologies.

BIPP, another truly pioneering PPP program, was launched in 2009. This program provides support from validation to scale and eventual commercialisation and remains our flagship 'late stage funding' instrument. Over the years, BIPP has supported 191 projectsinvolving 132 sole companies and 59 collaborative projects. Forty five products and technologies have so far been developed through BIPP and 30 IPs have been generated. During 2017-18,65 projects were supported including 11 new projects.

A concerted effort by BIRAC to bring together academia and industry and collaborate is through **Academic Innovation Research (AIR)andthe Contract Research Scheme (CRS).** Through CRS, academic leads could be tested via an industry partner. So far 45 projects have been supported under this program including 42 academia and 27 companies.

SPARSH is the Social Innovation Program of BIRAC which addresses the need of finding innovative solutions to society's most pressing social problems. 6 calls have been announced so far.

Similarly, BIRAC has set up **Early Translation Accelerator (ETA)** to pull academic discoveries towards translation. An ETA focused on "Healthcare" has been established at C-CAMP and the second one in industrial biotech/bio processing has been established at IIT Madras. Several projects are ongoing under both the ETAs.

To provide further impetus to product development in biopharmaceuticals, BIRAC has continued its efforts to map the needs of biopharma sector such, that future programmes can be implemented. The program was approved by the Cabinet for implementation in May 2017 with a total cost US$ 250 million which is 50% co-funded by World Bank. During 2017-18, the program launched 4 RFP in Biotherapeutics and 2 RFP in the Vaccine development. The proposal evaluation is under different stages of processing.

A Product Commercialization Program has been launched in the 2017-18 to hasten the product commercialization process by providing support to projects that have completed early stage validation.

BIRAC Regional Centres: Engaging with Regional Communities to map innovations and support entrepreneurs

Till the beginning of the financial year, BIRAC had 2 regional centres at (BRIC) IKP and (BREC) C-Camp. BRIC has generated a consolidated report on Mapping of the ten clusters along with a set of policy recommendations to improve and enhance the performance of the clusters which was released in October 2017.In 2017-18, BREC conducted various awareness events, workshops, national level entrepreneurial challenges, boot camps etc. with a view to boost entrepreneurship in the Indian biotech sector.

The 3rd regional centre of BIRAC was set up during 2017-18. This centre named as BIRAC Regional Bioinnovation Centre (BRBC) has been set up at Venture Centre, Pune and became operational with effect from 28thMarch, 2018. BRBC is mandated to be a high quality national resource center to support and promote entrepreneurship in life sciences.

BIRAC working towards fulfilment of the goals of the National Mission Programs: Make in India & Start-up India

The Make in India Cell at BIRAC ensures wider dissemination of the Government programmes and other information relevant to the establishment and growth of startups, SMEs and Companies. After the successful completion of Make in India 1.0, the facilitation cell at BIRAC under the guidance of DBT has formulated the Make in India Action Plan 2.0. The progress of this action planis reviewed by DIPP from time to time.

We have contributed to the Start-up India action plan with a mix of deliverables that includes funding start-ups and supporting incubation for nascent biotech start-ups. Our commitment to Start-up India is to build 50 biotech incubators and 5 regional centres besides supporting 2000 start-ups by 2020.

Industry-Academia Collaborative Mission for Accelerating Discovery Research to Early Development for Biopharmaceuticals - Innovate in India for Inclusiveness (i3)

The program named Innovate in India (I3) is an industry- academia collaborative mission ofDepartment of Biotechnology (DBT) in collaboration with World Bank for accelerating discoveryresearch to early development of Biopharmaceuticals and will be implemented by BIRAC. The program was approved by the Cabinet forimplementation in May 2017 with a total cost US$ 250 million which is 50% co-funded by WorldBank. Request for proposals have been announced and proposals are in different stage of shortlisting.

National & International Partnerships to Amplify our Mandate

BIRAC is cognisant of the fact that transformation of an idea to product would need joint efforts from other organisations. It is with this aim, BIRAC has expanded its partnerships and alliances with both Indian and international agencies. Some of the partnerships provide funding while others open networks and knowledge for India's start-up and SME community.

Our partnership with **Ministry of Electronics and IT (MeitY)** in the area of medical electronics (Industry Innovation Programme on Medical Electronics) focuses on boosting innovation capabilities in electronics, software, algorithms and hardware in a range of areas such as imaging and navigation to technologies for chronic. A total of 34 projects were funded in three rounds of selection during 2016-18.

Our partnership with **Bill & Melinda Gates Foundation** has gained strength through launch and implementation of Grand Challenges India where BIRAC is a project management partner in the tripartite collaboration between DBT, BMGF and BIRAC. In 2017-18, GCI continued its work in the areas of Agriculture and Nutrition, Sanitation and hygiene, Data analysis, knowledge integration and dissemination, maternal and child health, and encouraging ideation. A new theme 'Immunizations and Infectious Diseases' was also added to the portfolio of the partnership.

Similarly BIRAC has strengthened its partnerships with the Indo-French agency CEFIPRA, BPI France and Wellcome Trust. BIRAC has a growing partnership with USAID and IKP in the realm of TB Diagnostics whose phase I is complete and three projects have been selected for the second phase of the program.

NESTA UK has launched a global Longitude Prize aiming to find several solutions to AMR. BIRAC's partnership with NESTA is aimed at supporting Discovery Awards Programme for innovators working for innovative diagnostics for anti-microbial resistance (AMR) and 9 innovators have been supported till now who are working in exciting projects and will hopefully be strong contenders for the Longitude Prize.

Access to primary and secondary care healthcare facilities remains a challenge for many of our start-ups who are developing cutting edge med tech products. Our partnerships with **WISH Foundation** and **ICMR** attempts to provide access to these facilities such that the products being developed can be validated in 'field settings'.

Our continuing partnership with the Judge Business School, **University of Cambridge, UK** is engaged inconnecting our BIG innovators with the deep innovation ecosystem of Cambridge and beyond. In 2017-18 we sent **four BIG grantees** to Cambridge to train in business and technical aspects of their enterprises in the flagship Ignite workshop. Our partnership with Tekes Finland is for connecting Finnish innovation ecosystem with India. In December 2017, five BIRAC supportedstart-ups along with BIRAC representative participated in the Global start-ups event SLUSH, which provided them the platform to interact with international investors, participate in various talks, interviews, panels and pitches.

We have also joined hands with **Tata Institute Social Sciences (TISS), Mumbai** to help our social innovators.

BIRAC has partnered with **TiE-Delhi NCR** for mentoring biotech start-ups and providing continuous platform for BIRAC supported start-ups to interface with funders and investors. BIRAC and TiE launched an award focused at rewarding the women entrepreneurs inbiotechnology. The award, named as WInER Award (Women In Entrepreneurial Research) was awarded to 15 women entrepreneurs on the International Women's Day, celebrated at Vigyan Bhawan on 8th March, 2018.

BIRAC has also signed a MoU with **Indian Angel Network** (IAN), to bring the biotechnology start-ups closer to angel investors.

Platforms: Bringing the evolving Community together for Collaborations

BIRAC pro-actively nurtures emerging start-ups and SMEs through seminars, workshops and other platforms. In 2017-18several Roadshows, Grant writing,IP, regulatory and hands-on training workshops were organised. Several seminars and workshops were also conducted through our programme (BIG, BRIC and SIIP) Partners.

We have created platforms such as **Innovators Meet** (the 6th Innovator Meet was held in September 2017), **Foundation Day** (6th Foundation Day was organised in March 2018) for networking/collaborations. The flagship platform for BIG startups, the BIG Conclave was organised in August 2017 with the intention of bringing together biotech startups to one platform. Cumulatively, we connect close to 1500 stakeholders each year and along with our partners this number increasesbeyond 2500. Together, these platforms have allowed innovators to meet, share information and best practices, catalyse partnerships and network.We also actively participated in BIO 2017and BIO Asia.

In FY 2017-18, BIRAC launched an innovation challenge Award, **SoCH** i.e. Solutions for Community Health to support innovative ideas from individual entrepreneurs, academia and companies under 2 themes through an open discussion on MyGov Portal:

- Platform for reducing disease burden (Communicable & Non-Communicable Diseases)
- Sanitation & Waste recycling

3i Portal

3i Portal has been providing a user friendly and convenient solution for effective management of various funding schemes of BIRAC. New features are added to the portal on regular basis in order to enhance the ease of use for all types of users. The portal is now being expanded to manage loan recoveries under BIPP and SBIRI. In addition, data mining and analysis has been made easier through number of newly added reports. The portal has assisted in conducting surveys and generating reports based on the same. New features to be implemented in near future include advanced search options (such as single click view of all information related to a project) and development of mobile application.

In addition, it is also envisaged to develop a networking portal as a platform to connect the biotech community (at national level as the first step and subsequently at global level). The networking portal shall provide information about products and services offered by various companies, key areas of active research being undertaken by companies/academic institutes/entrepreneurs, technologies available for licensing/sale etc.

A **technology portal was** launched on the 6th Foundation Day which provides information about the projects funded by BIRAC.

Recognition for BIRAC Start-ups & SMEs

Several BIRAC supported startups and SMEs have received recognition from other national and international agencies for their products and technology development.

- **Windmill Health Technologies Pvt. Ltd.,** New Delhi won the BIRAC National Award for Indigenous Product Commercialization on the occasion of Technology Day event on May 11th 2017 at New Delhi.
- **Pandorum Technologies Pvt. Ltd,** Bengaluru received the too innovator award at the ET start-up award 2017.
- **Bugworks Research India Pvt. Ltd,** Bengaluru featured in the list of top 30 start-ups for 2017 in Indsight India and won a global grant from CARB-X
- **Module innovations and Embryyo Technologies** won the discovery award round 2 of Longitude Prize funded by Merck
- **String Bio Pvt. Ltd,** Bengaluru bagged a US$ 100,000 grant at the inaugural Future Food Asia Award
- **Achira Labs Pvt. Ltd,** Bengaluru raised investments from Catarman Ventures.
- **Amrita Vishwa Vidyapeetham** and **Wipro** jointly won the Aegis Graham Bell award 2017 for "Innovation in mHealth" category for first of its kind and cost effective Diabetes management solution.

Key achievements

During the year BIRAC supported projects in all major areas of biotechnology sector i.e. Healthcare, Agriculture, Industrial biotechnology and Bioinformatics/Infrastructure as part of meeting its objective of promoting affordable innovation in key social sectors. Healthcare covers the areas of Drugs (including drug delivery), Bio-similars (including regenerative medicine), Vaccines/Clinical trials & Devices/diagnostics whereas Agriculture covers Marker assisted selection (MAS), RNAi, Transgenics & soil health management. Industrial biotechnology includes Industrial products/processes and secondary agriculture.

During the year, **nine** BIRAC supported grantees got funding from agencies other than DBT which is a reflection of the quality of innovation/ enterprise which has been created with BIRAC's support. The average decision making time to support a project for funding was **163 days** during the financial year 2017-18.

During the year, 27 projects out of the identified 49 projects achieved Technology Readiness Level - 7 (TRL-7) amounting to **55%** of the total number of projects which had been identified for achieving TRL-7. The projects which have reached TRL-7 are ready to move into demonstration/ late stage validation and would be a pipeline for the product commercialization.

395 beneficiaries were supported by BIRAC under its various schemes during 2017-18. **One regulatory workshop** and **five Hands on training workshops** were conducted during the year, benefitting **231 participants.**

BIRAC also facilitated **four** industrial Academia meets with a participation of at least 10 industries during 2017-18.

The total amount mobilized from sources other than the Department of Biotechnology (DBT), which is the Administrative Ministry was **19.5%** of the annual allocation from DBT. During the financial year 2017-18, **92%** of the total funds mobilized by the organization were disbursed towards fulfilling the mandate of BIRAC.

Over the 6 years, BIRAC has been able to nurture and grow the biotech ecosystem in the country through a combinatorial approach that involves instruments such as funding for product development, advice and mentor startups in a range of technical, IP and business issues, create and operationalise networks for knowledge sharing as well as build effective partnerships. The cumulative strategy is to take the Indian biotech industry to become a global innovation destination in R&D and manufacturing such that our academia, translational centres, incubators and industry become hubs for ideation and development of cutting edge products that can bring positive social impact to communities and help India achieve her goal of being a US$100Billion economy by 2025.

3. AUDIT COMMITTEE

BIRAC is a Schedule B CPSE under the Department of Biotechnology, Ministry of Science & Technology registered as a Section 8 Not-for-profit Company under the Companies Act, 2013. The constitution of the Audit Committee is a requirement under the Corporate Governance Guidelines issued by the Department of Public Enterprises (DPE). The Audit Committee has four directors, three of them being non-official Independent Directors viz. Prof Akhilesh Tyagi as Chairman and Prof. Ashok Jhunjhunwala, Prof. Pankaj Chandra and Dr. Mohd. Aslam as members. Dr. Renu Swarup, currently Secretary DBT and Chairperson, BIRAC was a member of the Audit Committee till April 9, 2018 by virtue of being the Managing Director of BIRAC. Dr. Mohd. Aslam, the Government Nominee Director on the Board of BIRAC was given additional charge as Managing Director, BIRAC on Dr. Renu Swarup being appointed as Secretary, DBT

4. FINANCIAL STATEMENT

The financial statement is made on accrual method of accounting under the historical cost convention, in accordance with the accounting standards issued by the Institute of Chartered Accountants of India.

5. EXTRACT OF THE ANNUAL RETURN

In accordance with Section 134(3)(a) of the Companies Act, 2013, an extract of the Annual Return in the prescribed format is appended as *Annexure 1* to the Directors' Report.

6. NUMBER OF MEETINGS OF THE BOARD

The Board met five times during the financial year, the details of which are given in the Corporate Governance Report, which forms a part of the Annual Report. The intervening gap between any two meetings was as prescribed under the Companies Act, 2013.

7. PARTICULARS OF CONTRACTS OR ARRANGEMENTS MADE WITH RELATED PARTIES

BIRAC has not entered into any contracts or arrangements with related parties as per the provisions of Section 188(1) of the Companies Act, 2013.

8. RTI

BIRAC follows all the necessary procedures and processes in accordance with the Right to Information Act, 2005, as amended from time to time and Government Guidelines. It has appointed a Central Public Information Officer (CPIO) and an Appellate Authority. The details are available on its website (www.birac.nic.in).

9. RISK MANAGEMENT POLICY

BIRAC has a Risk Management Policy in place approved by the Board. The mandate of BIRAC is to nurture innovation by mentoring and funding high risk, highly innovative projects by itself or with multiple partners throughout the innovation value chain, namely, early stage innovation research, product development, product validation and commercialization. BIRAC, being a Government organization, the need for Risk Management is reflected in its commitment to ensure transparency and public accountability of its partnerships, activities and schemes. The schemes, activities, workshops and partnerships are monitored by Standard applications, formats, MoUs and funding agreement which have inbuilt controls and accountability mechanisms at every stage.

There is a proper technical evaluation of projects by a Committee of experts and an in-house legal drafting and vetting process, financial due diligence and screening of projects is undertaken, internal controls and audit protocols are in place with the Comptroller & Auditor General of India (C&AG) conducting supplementary audit.

Risk Management monitoring process in the organization is based on compliance reporting in the Risk calendar which is circulated to all the Department Heads with comprehensive parameters drawn from the Risk Register for managing schemes, activities and providing funding support. The Board ensures the integration and alignment of the risk management system with the

corporate and operational objectives and also ascertains that risk management is undertaken as a part of normal business practice and not as a separate task at set times.

An Internal Process Review Committee reviews the process vis-à-vis the Standard Operating Procedures and reports to the Board for any deviations and suggestions to make the processes better.

10. DISCLOSURE UNDER THE SEXUAL HARASSMENT OF WOMEN AT WORKPLACE (PREVENTION, PROHIBITION AND REDRESSAL) ACT, 2013

The Complaints Committee with the terms of reference as required under the CCS(Conduct) Rules and the Guidelines laid down by the Hon'ble Supreme Court in Vishaka and others vs. State of Rajasthan was reconstituted to form the Internal Complaints Committee (ICC) under The Prevention of Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 and the rules notified thereunder in order to redress complaints received regarding sexual harassment under the said Act.

All employees of BIRAC including regular employees, contractual, part time, daily wage earners, either employed directly or through an agent or contractor, whether for remuneration or not, trainees, apprentices, those working on a voluntary basis, directors and experts on various committees are covered under this policy. The organization has not received any grievances under this Act, during the financial year 2017-18.

11. MEMORANDUM OF UNDERSTANDING (MOU)

BIRAC had entered into the fourth Memorandum of Understanding (MoU) for the financial year 2017-18 with the Administrative Ministry, the Department of Biotechnology (DBT), Ministry of Science & Technology on July 4, 2017, as per the Guidelines issued by the Department of Public Enterprises.

BIRAC was also awarded 'Excellent' grading for its achievements against the targets set out in the MoU for the year 2016-17 by the Department of Public Enterprises.

12. DIRECTOR'S RESPONSIBILITY STATEMENT

In accordance with the provisions of Section 134(5) of the Companies Act, 2013, the Directors' state that:

- in the preparation of the annual accounts, the applicable accounting standards had been followed along with proper explanation relating to material departures;
- the directors had selected such accounting policies and applied them consistently and made judgments and estimates that are reasonable and prudent so as to give a true and fair view of the state of affairs of the company at the end of the financial year and of the profit and loss of the company for that period;
- the directors had taken proper and sufficient care for the maintenance of adequate accounting records in accordance with the provisions of this Act for safeguarding the assets of the company and for preventing and detecting fraud and other irregularities;
- the directors had prepared the annual accounts on a going concern basis; and
- the directors had devised proper systems to ensure compliance with the provisions of all applicable laws and that such systems were adequate and operating effectively.

13. CORPORATE GOVERNANCE

A separate report on Corporate Governance is annexed with this report *(Annexure 2)*

14. AUDITORS' REPORT

M/s. RMA & Associates, Chartered Accountants are the Statutory Auditors of the Company appointed by the Comptroller and Auditor General of India for the period under review (Financial year 2017-18). The Auditors' report and CAG report are appended to the financial statements and are self-explanatory and suitably explained in the various Notes to the accounts.

15. BANKERS

TheBankers of the organisation are:

- Corporation Bank Limited, Block 11, CGO Complex, Lodhi Road, New Delhi – 110003.
- State Bank of India, Core 6, SCOPE Complex, Lodhi Road, New Delhi – 110003.

16. ABOUT DIRECTORS

BIRAC is guided by a Board comprising of senior professionals, academicians, policy makers and eminent professionals from the industry. The tenure of Prof. K. VijayRaghavan, Secretary DBT and Chairman of the Board ended on February 2, 2018. Prof. Ashutosh Sharma, Secretary DST was given additional charge as Secretary, DBT and thereby Chairman, BIRAC for the intermittent period from February 3, 2018 to April 9, 2018. Dr. Renu Swarup, Senior Adviser, Department of Biotechnology who was holding additional charge as Managing Director, BIRAC was appointed as Secretary, DBT and thereby Chairperson, BIRAC with effect from April 10, 2018. Dr. Mohd. Aslam, who is the Government Nominee Director on the Board of BIRAC was given additional charge as Managing Director, BIRAC from April 10, 2018.

The Company places on record its appreciation for the valuable inputs and contribution of the outgoing Chairmen, Prof. K. VijayRaghavan and Prof. Ashutosh Sharma. The Company also places on record its heartiest congratulations to Dr. Renu Swarup, who is currently holding the post of Secretary, DBT and Chairperson of the Board of BIRAC and Dr. Mohd. Aslam who is currently holding additional charge as Managing Director, BIRAC.

In addition to Dr. Renu Swarup, Secretary DBT and Chairperson, BIRAC and Dr. Mohd. Aslam, Scientist 'G', Department of Biotechnology who is the Managing Director and Government Nominee Director, the Board comprises of four independent directors i.e. Prof. Ashok Jhunjhunwala, Professor, IIT Chennai, Prof. Akhilesh Tyagi, Professor of Plant Molecular Biology, South Campus, Delhi University, Prof. Pankaj Chandra,Vice Chancellor and Chairman, Board of Management of Ahmedabad University and Shri. Naresh Dayal, IAS and Retd. Secretary, Ministry of Health and Family Welfare.

17. CONSERVATION OF ENERGY, TECHNOLOGY ABSORPTION AND FOREIGN EXCHANGE EARNINGS AND OUTGO

The information pertaining to conservation of energy, technology absorption, foreign exchange earnings and outgo as required under Section 134(3)(m) of the Companies Act, 2013 read with Rule 8(3) of the Companies (Accounts) Rules, 2014 is as follows:

A. Conservation of Energy

Disclosure regarding conservation of energy is not applicable to our Company.

B. Technology Absorption, Adoption and Innovation

Particulars required under Rule 8(3)(B) of the Companies (Accounts) Rules, 2014 have not been given since the company has no direct Research and Development activity. However, the main function of BIRAC is to facilitate and provide financial support for generation and translation of innovative ideas into biotech products/technologies, foster innovation in all places of research and to encourage diffusion of innovation through partners. The details are provided in the Management Discussion and Analysis Report.

C. Foreign Exchange Earnings & Outgo

The foreign exchange earnings and outgo during the year are given below:

Grant received in foreign exchange to the extent utilized (in Rs.)	11,82,46,299
Foreign Exchange outflow (in Rs.)	
A. Technology Transfer	8,57,941
B. Books, journals and database subscriptions	53,39,046
C. Entrepreneurial Development	13,49,720
D. Advertisement, Publicity, Publication	23,94,520
E. Foreign travel & Meeting	3,98,749
CIF Value of Import	Nil

ACKNOWLEDGMENT

The Directors wish to place on record their appreciation for the valuable guidance and co-operation extended by the Auditors, Banks and various Government agencies. The Directors also wish to place on record their appreciation for the sincere efforts put in by the executives and staff of the Company.

For and on behalf of Board
Dr. Renu Swarup
Chairperson

Date : 24th August, 2018
Place : New Delhi

Annexure 1

EXTRACT OF ANNUAL RETURN

as on the financial year ended on March 31, 2017

[Pursuant to Section 92(3) of the Companies Act, 2013 and Rule 12(1) of the Companies (Management and Administration) Rules, 2014]

I. REGISTRATION AND OTHER DETAILS:

i) CIN:**U73100DL2012NPL233152**

ii) Registration Date: **March 20, 2012**

iii) Name of the Company: **Biotechnology Industry Research Assistance Council**

iv) Category / Sub-Category of the Company: Section 8 Private Limited Company limited by shares (Government Company)

v) Address of the Registered office and contact details: 1st floor, MTNL Building, 9, CGO Complex, New Delhi – 110 003. Website: www.birac.nic.in Email: birac.dbt@nic.in Tel: +91-11-24389600

vi) Whether listed company Yes / No: No

vii) Name, Address and Contact details of Registrar and Transfer Agent, if any:

Skykine Financial Services Pvt. Ltd., D-153 A, 1st Floor, Okhla Industrial Area, Phase - I, New Delhi – 110 020

Contact Person: Shri Virender Rana

II. PRINCIPAL BUSINESS ACTIVITIES OF THE COMPANY

All the business activities contributing 10% or more of the total turnover of the company shall be stated:-

Sl. No.	Name and Description of main products/services	NIC Code of the Product/service	% to total turnover of the company
1	Research and experimental development on natural sciences and engineering (NSE)	73100	100%

III. PARTICULARS OF HOLDING, SUBSIDIARY AND ASSOCIATE COMPANIES -

S. No.	Name and address of the company	CIN/GLN	Holding/ Subsidiary/ Associate	% of shares held	Applicable Section
1	N.A.	N.A.	N. A	N. A	N.A

IV. SHARE HOLDING PATTERN (Equity Share Capital Breakup as percentage of Total Equity)

i) Category-wise Share Holding

Category of Shareholders	No. of Shares held at the beginning of the year				No. of Shares held at the end of the year				% Change during the year
	Demat	Physical	Total	% of Total Shares	Demat	Physical	Total	% of Total Shares	
A. Promoters									
(1) Indian									
i) Individual/ HUF	-	-	-	-	-	-	-	-	-
ii) Central Govt	10000	N.A.	10000	100	10000	N.A.	10000	100	NIL
iii) State Govt (s)	-	-	-	-	-	-	-	-	-
iv) Bodies Corp.	-	-	-	-	-	-	-	-	-
v) Banks/FI	-	-	-	-	-	-	-	-	-
vi) Any Other	-	-	-	-	-	-		-	-
Sub-total (A) (1):-	10000	N.A.	10000	100	10000	N.A.	10000	100	NIL
(2) Foreign									
a) NRIs - Individuals	-	-	-	-	-	-	-	-	-
b) Other - Individuals	-	-	-	-	-	-	-	-	-
c) Bodies Corp.	-	-	-	-	-	-	-	-	
d) Banks / FI	-	-	-	-	-	-	-	-	-
e) Any Other....	-	-	-	-	-	-	-	-	-
Sub-total (A) (2):-	-	-	-	-	-	-	-	-	-
Total shareholding of Promoter (A) = (A)(1)+(A)(2)	10000	N.A.	10000	100	10000	N.A.	10000	100	NIL
B. Public Shareholding									
1. Institutions									
a) Mutual Funds	-	-	-	-		-	-	-	-
b) Banks/FI	-	-	-	-		-	-	-	-
c) Central Govt	-	-	-	-		-	-	-	-
d) State Govt(s)	-	-	-	-		-	-	-	-
e) Venture Capital Funds	-	-	-	-		-	-	-	-
f) Insurance Companies	-	-	-	-		-	-	-	-
g) FIIs -	-	-	-		-	-	-	-	
h) Foreign Venture Capital Funds	-	-	-	-		-	-	-	-
i) Others (specify)	-	-	-	-		-	-	-	-
Sub-total (B)(1):-	-	-	-	-		-	-	-	-
2. Non-Institutions									
a) Bodies Corp.									
i) Indian	-	-	-	-		-	-	-	-
ii) Overseas	-	-	-	-		-	-	-	-
b) Individuals									

i) Individual share-holders holding nominal share capital upto Rs. 1 lakh				-					
ii) Individual share-holders holding nominal share capital in excess of Rs 1 lakh	-	-	-	-	-	-	-	-	-
c) Others (specify)	-	-	-	-	-	-	-	-	-
Sub-total (B)(2):-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total Public Share-holding (B) = (B)(1) + (B)(2)	-	-	-	-	-	-	-	-	-
C. Shares held by Custodian for GD Rs & ADRs	-	-	-	-	-	-	-	-	-
Grand Total (A+B+C)	**10000**	**NA**	**10000**	**100**	**10000**	**NA**	**10000**	**100**	**NIL**

(ii) Shareholding of Promoters

Sl. No.	Shareholder's Name	Shareholding at the beginning of the year			Shareholding at the end of the year			% change in Share-holding during the year
		No. of Shares	% of total Shares of the company	% of shares Pledged/ encum-bered to total shares	No. of Shares	% of total shares of the company	% of shares Pledged/ /encum-bered to total shares	
1	President of India	9000	90%	Nil	9000	90%	Nil	Nil
2	Prof. K. VijayRaghavan Secretary, DBT and Chairman, BIRAC (on behalf of the President of India) till 02.02.2018	900	10%	Nil	Nil	Nil	Nil	100%
2	Prof. Ashutosh Sharma, Secretary, DBT and Chairman, BIRAC (on behalf of the President of India) from 03.02.2018 till 09.04.2018	Nil	Nil	Nil	900	10%	Nil	100%
3	Dr. Renu Swarup, MD, BIRAC (on behalf of the President of India)	100	1%	Nil	100	1%	Nil	Nil
	Total	**10000**	**100%**	**Nil**	**10000**	**100%**	**Nil**	**Nil**

(iii) Change in Promoters' Shareholding (please specify, if there is no change)

Sl. No.		Shareholding at the beginning of the year		Cumulative Shareholding during the year	
		No. of shares	% of total shares of the company	No. of shares	% of total shares of the company
	At the beginning of the year	NIL	NIL	NIL	NIL
	Date wise Increase/Decrease in Share-holding during the year specifying the reasons for increase/decrease (e.g. allotment/ transfer/ bonus/sweat equity etc):	NIL	NIL	NIL	NIL
	At the End of the year	NIL	NIL	NIL	NIL

(iv) Shareholding Pattern of top ten Shareholders (other than Directors, Promoters and Holders of GDRs and ADRs):

Sl. No.		Shareholding at the beginning of the year		Cumulative Shareholding during the year	
	For each of the top 10 Shareholders	No. of shares	% of total shares of the company	No. of shares	% of total shares of the company
	At the beginning of the year	NIL	NIL	NIL	NIL
	Date wise Increase/Decrease in Shareholding during the year specifying the reasons for increase/decrease (e.g. allotment/ transfer/ bonus/ sweat equity etc):	NIL	NIL	NIL	NIL
	At the End of the year (or on the date of separation, if separated during the year)	NIL	NIL	NIL	NIL

(v) Shareholding of Directors and Key Managerial Personnel

(A) Prof. Ashutosh Sharma, Chairman (on behalf of the President of India) as on 31.03.2018

Sl. No.		Shareholding at the beginning of the year		Date of Change	Cumulative Shareholding during the year	
	For Each of the Directors and KMP	No. of shares	% of total shares of the company		No. of shares	% of total shares of the company
	At the beginning of the year	0	0	-	0	0
	Date wise Increase / Decrease in Shareholding during the year specifying the reasons for increase/ decrease (e.g. allotment / transfer/ bonus/ sweat equity etc)	NIL	NIL	15.03.2018 transfer	900	9%
	At the End of the year	900	9	-	900	9

(B) Dr Renu Swarup, Managing Director (on behalf of the President of India)

Sl. No.		Shareholding at the beginning of the year		Cumulative Shareholding during the year	
	For each of the Directors and KMP	No. of shares	% of total shares of the company	No. of shares	% of total shares of the company
	At the beginning of the year	100	1	100	1
	Date wise Increase / Decrease in Shareholding during the year specifying the reasons for increase/ decrease (e.g. allotment / transfer/ bonus/ sweat equity etc)	NIL	Nil	Nil	Nil
	At the end of the year	100	1	100	1

V. INDEBTEDNESS:

Indebtedness of the Company including interest outstanding/accrued but not due for payment

	Secured Loans excluding deposits	Unsecured Loans	Deposits	Total Indebtedness
Indebtedness at the beginning of the financial year i) Principal Amount ii) Interest due but not paid iii) Interest accrued but not due	NIL	NIL	NIL	NIL
Total (i+ii+iii)	**NIL**	**NIL**	**NIL**	**NIL**
Change in Indebtedness during the financial year • Addition • Reduction	NA	NA	NA	NA
Net Change	NIL	NIL	NIL	NIL
Indebtedness at the end of the financial year i) Principal Amount ii) Interest due but not paid iii) Interest accrued but not due	NIL	NIL	NIL	NIL
Total (i+ii+iii)	**NIL**	**NIL**	**NIL**	**NIL**

VI. REMUNERATION OF DIRECTORS AND KEY MANAGERIAL PERSONNEL

A. Remuneration to Managing Director, Whole-time Directors and/or Manager:

Sl. No.	Particulars of Remuneration	Name of MD/WTD/ Manager				Total Amount
		Dr. Renu Swarup , Managing Director	.....	.....	.....	
1.	Gross salary (a) Salary as per provisions contained in Section 17(1) of the Income-tax Act, 1961 (b) Value of perquisites u/s 17(2) Income-tax Act, 1961 (c) Profits in lieu of salary under Section 17(3) Income- tax Act, 1961	N.A as she is holding Additional Charge as Managing Director of BIRAC	-	-	-	-
2.	Stock Option	-	-	-	-	-
3.	Sweat Equity	-	-	-	-	-
4.	Commission - as % of profit - others, specify...	-	-	-	-	-
5.	Others, please specify	-	-	-	-	-
	Total (A)	**-**	**-**	**-**	**-**	**-**
	Ceiling as per the Act	-	-	-	-	-

B. Remuneration to other directors:

Sl. No.	Particulars of Remuneration	Name of Directors				Total Amount
		Prof. Ashok Jhunjhun wala	Prof. Pankaj Chandra	Prof. Akihilesh Tyagi	Mr. Naresh Dayal	
1.	Independent Directors					
	• Fee for attending Board committee meetings (5 Meetings)	40,000	50,000	50,000	20,000	1,60,000
	• Commission	-	-	-	-	-
	• Others, please specify					
	• Audit Committee (4 Meetings)	40,000	50,000	50,000	-	1,40,000
	• Independent Directors' Meeting					
	Total (1)	**80,000**	**1,00,000**	**1,00,000**	**20,000**	**3,00,000**
2.	Other Non-Executive Directors	**Dr. Mohd. Aslam (Government Nominee)**	-	-	-	-
	• Fee for attending board committee meetings	NIL	-	-	-	-
	• Commission	-	-	-	-	-
	• Others, please specify					
	Total (2)	-	-	-	-	-
	Total (B) = (1 + 2)	**80,000**	**1,00,000**	**1,00,000**	**20,000**	**3,00,000**
	Total Managerial Remuneration	**80,000**	**1,00,000**	**1,00,000**	**20,000**	**3,00,000**
	Overall Ceiling as per the Act	N.A.	N.A.	N.A.	N.A.	N.A.

C. **REMUNERATION TO KEY MANAGERIAL PERSONNEL OTHER THAN MD/MANAGER/WTD**
Exempted from disclosure as BIRAC is a government company

Sl.	Particulars of Remuneration	Key Managerial Personnel			
		CEO	Company Secretary	CFO	Total
1.	Gross salary				
	(a) Salary as per provisions contained in Section 17(1) of the Income-tax Act, 1961	-	-	-	-
	(b) Value of perquisites u/s 17(2) Income-tax Act, 1961	-	-	-	-
	(c) Profits in lieu of salary under Section 17(3) Income-tax Act, 1961	-	-	-	-
2.	Stock Option	-	-	-	-
3.	Sweat Equity	-	-	-	-
4.	Commission				
	- as % of profit				
	- others, specify...	-	-	-	-
5.	Others, please specify	-	-	-	-
	Total	**-**	**-**	**-**	**-**

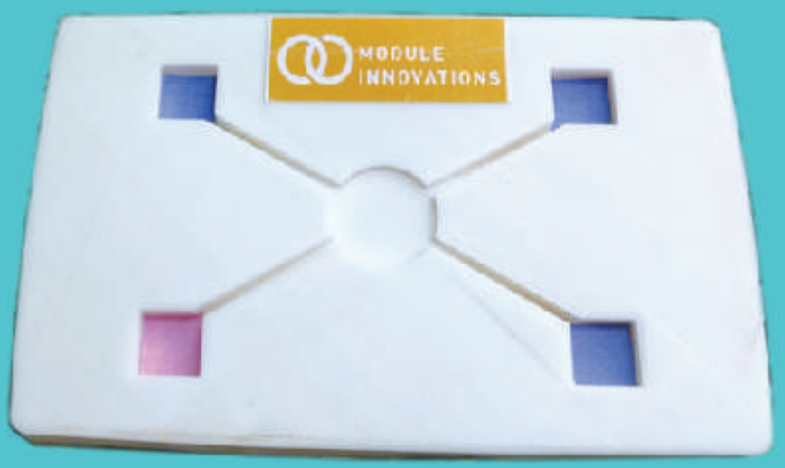
VII. PENALTIES/PUNISHMENT/COMPOUNDING OF OFFENCES:

Type	Brief Description	Details of Penalty/Punishment Compounding fees imposed	Authority [RD/ NCLT/COURT]	Appeal made if any (give Details)
A. Company				
Penalty	Nil	Nil	Nil	Nil
Punishment	Nil	Nil	Nil	Nil
Compounding	Nil	Nil	Nil	Nil
B. Directors				
Penalty	Nil	Nil	Nil	Nil
Punishment	Nil	Nil	Nil	Nil
Compounding	Nil	Nil	Nil	Nil
C. Other officers in default				
Penalty	Nil	Nil	Nil	Nil
Punishment	Nil	Nil	Nil	Nil
Compounding	Nil	Nil	Nil	Nil

Vigyan Se Vikas

Management Discussion and Analysis Report

(Forming Part of the Directors' Report for 2017-18)



Module Innovations

This Project was Supported
& Funded by BIRAC

MANAGEMENT DISCUSSION AND ANALYSIS REPORT

(Forming Part of the Directors' Report for 2017-18)

INDUSTRIAL STRUCTURE AND DEVELOPMENT

India has grown exponentially in the field of Science and Technology in the last four years and the Research and development work has addressed many of the problems the society has been facing. Science is now considered as one of the most powerful tools for growth and development. At present India is ranked 6th globally in the number of scientific publications and 9th in the number of patents filed.

Biotechnology plays a pivotal role in the scientific innovation ecosystem of the country. Government's initiatives and role in harnessing the biotechnology potential of the country has been critical for strengthening the roots of innovations and research and development. BIRAC has launched several programmes that align to Government of India's national missions such as Swachh Bharat, Swasth Bharat, Startup India, Make in India, Doubling farmer's income etc.

According to Able's 2018 report on Bioeconomy, India is presently growing at 6.8% and is valued at USD 44.47 Billion. The industry continues to be dominated by the Biopharma segment. It alone contributes to 54.67% share of the total Bioeconomy. It is also reported that half of the bioeconomy is through diagnostics and medical devices. Vaccines contributed to 30% while therapeutics contributed for the rest. Bioagri is the second largest contributor to the country with 23.17 % share.

During 6 years of its existence, BIRAC has made a significant contribution in developing and strengthening biotech ecosystem in the country through its various flagship programmes such as BIG, BIPP, SBIRI, PACE, BioNEST, SITARE, eYUVA, UIC, etc. Besides various funding programs that have spurred the growth of start-ups in the field of biotechnology, BIRAC has made serious efforts to make early stage capital/seed money accessible to the start-ups. Under BIRAC's BioNEST programme, 30 bioincubation facilities have been established across the country. In 2017-18, BIRAC launched Product Commercialisation Unit (PCU) which helps start-ups to facilitate the process of product commercialization and derisk the challenges faced by them. To take care the financial needs of the start-ups/entrepreneurs after ceasing of BIRAC support, BIRAC has been instrumental in connecting its beneficiaries with venture capitalists, biotech/healthcare accelerators and early stage funders.

The Indian Biotechnology sector has always been the flag bearer for showcasing the country's strength and advancement in the modern technology arena. The onus now is to handhold, mentor and harness the innovations that can contribute towards the economic and scientific development of the nation by catering to the basic needs of food and nutrition and healthcare of the masses. It is with this objective and focus that BIRAC has stepped up its efforts to deliver on the priority areas.

STRENGTH AND WEAKNESSES

BIRAC's vision and mission directly aligns with the National Biotechnology Development Strategy (NBDS), formulated by DBT in 2015. It is also contributing to entrepreneurship and innovation ecosystem in the field of biotechnology under Atal Innovation Mission, Ministry of Skill Development & Entrepreneurship, MeitY, ICMR, through its own programmes or in partnership with agencies sharing common goals. BIRAC actively contributed to Make in India Biotech Strategy and Start up India. All these national missions mention BIRAC as the go-to partner in the realm of biotechnology.

While the infrastructure (both human resources and facilities) and the overall environment that facilitates entrepreneurship and innovation has improved significantly in the recent past, there still exists a gap between industry and academia in translating gains of academic research into products and processes for societal benefit. In order to catalyse translational research, over the years, BIRAC has strengthened its partnership with academic institutes by establishing Technology Transfer Offices (TTO's), bioincubators, UICs and supporting industry-academia collaborative projects.

Regulatory landscape will be one of the key factors that would determine the future growth of the Indian biotechnology sector. Aligning with government policy of Ease of Doing Business, BIRAC aims to provide key inputs to regulatory agencies in building a transparent evidence based regulatory

landscape in India in the field of biosimilars, stem cells, medical technology, clinical trials and bio-agri products.

RISK AND GOVERNANCE

The biotechnology innovation pathway involves long gestation period. This generates enormous pressure on start-up enterprises that are attempting to build novel, high quality and affordable products in India. For building an excellent bioeconomy funded on innovation, the industry needs an aligned strategy that integrates all aspects of biotechnology innovation- science, translational research, industry-academia partnerships, academic curricula, entrepreneurship & vibrant startup and SMEs, incubators, early stage funding, Angel funding, late stage VC funding, routes to IPO, ease of doing business, financial and technical regulation. All these elements need to come together.

One of the gaps in Indian biotech startup is lack of extensive 'Angel Funding' especially in the range of INR1.5 crores to INR5 crores. This funding is crucial for startups to cross the valley of death. For this, BIRAC has launched the AcE (Accelerating Entrepreneurs) fund. BIRAC has also initiated three regional centers, BIRAC Regional Entrepreneurship Centre (BREC), BIRAC Regional Innovation Centre (BRIC) and Biotechnology Regional Bioinnovation Center (BRBC) that conduct multitudes of programs which help startups to understand and refine their business models, regulators, connect them to investors for follow on funding and so on.

One of the risks is the global economy and its health which is influenced by numerous factors as well as understanding the emerging paths of global biotech industries. This would need pro-actively connecting to the leading centres across the world- be it in the US, UK, Germany, Finland, Singapore or Japan. BIRAC's partners bring the knowledge of growth of biotech industry in other countries. BIRAC proactively seeks partnerships with other S&T knowledge agencies across the world such as Tekes, Nesta, UKTI, BIO-US to name a few, learning about the best practices in other geographies and leveraging our partnership to bring value for Indian companies.

OUR WORK

I. Investments

1. Biotechnology Ignition Grant (BIG)

1. Biotechnology Ignition Grant (BIG)

The Biotechnology Ignition Grant (BIG) is BIRAC's flagship funding scheme that provides early-stage funding for biotech startups and entrepreneurial individuals to support ideation and propel ideas with translational potential towards proof-of-concept. BIG is targeted towards scientist entrepreneurs from startups, research institutes, and academia.

BIG works with four major mandates:

- To foster generation of innovative ideas with commercialization potential
- To support testing of early stage ideafor validation of proof-of-concept
- To encourage researchers to take technology closer to market through startups
- To stimulate enterprise formation

The scheme is implemented through six partners called the BIG Partners, who work with grantees **(BIG Innovators)** to not only disburse their project related funds and provide technical mentoring but also to provide hand-holding for activities related to mobilizing resources, IP management, legal and contracts and other business development related activities which BIRAC is determined to make available to those start-ups and entrepreneurs who require these services.

BIRAC's BIG Partners are strategically located in major institutes operating BioNEST incubators having an outreach across the country.

- Centre for Cellular and Molecular Platforms (C-CAMP), Bangalore
- Foundation for Innovation and Technology Transfer (FITT), New Delhi
- IKP Knowledge Park, Hyderabad
- KIIT-Technology Business Incubator, Bhubaneswar
- Venture Center-NCL, Pune
- SIDBI Innovation and Incubation Centre, IIT Kanpur

In FY 2017-2018, two calls BIG 11 and BIG 12 were launched on 1st July 2017 and 1st January, 2018 respectively. BIG 12th call also encouraged applications of Artificial Intelligence, Machine Learning, Internet of Things, Automation integration with Biotech innovations. It helped in alignment of IT sector innovators with the Biotech sector as reflected in a surge of applications received totalling upto 587 almost twice the number from previous calls.

Through BIG 10th call a total of 31 proposals were supported while the 11th call supported a total of 39 projects. In total, 70 new projects were supported in FY-2017-18.

As at the end of the financial year 2017-18, a total of 140 projects were active and a sum of INR 34.29 crore was released to BIG partners for disbursement to new and ongoing awardees.

So far BIG has received more than 2900 proposals, out of which, 285 have been supported. Through these 285 projects more than 100 IPs have been filed; around 30 products/technologies have been developed and 40 more are under validation; 700 high calibre workforce has been created. The scheme has also catalyzed setting up of more than 80 new startups and promoted women entrepreneurship by supporting more than 60 women entrepreneurs. Out of 285 projects supported by BIRAC, 60 of these projects have also received follow on funding of about $125 million through other sources including from angel investors and venture capitalists, other schemes of BIRAC, state government funding schemes and trusts/foundations.

- **3rd BIG Conclave**

The 3rd BIG Conclave was organized at KIIT-TBI, Bhubaneswar, on 4th-5th August, 2017

Participants at the 3nd BIG Conclave

The conclave witnessed a confluence of experts from industry, academia, law firms and BIRAC BIG Entrepreneurs. The conclave was a platform for the BIG Grantees to showcase their journey as innovators and entrepreneurs, reflecting the aspects of starting small, scaling-up, USPs of the technology, business models, investment pitch, scouting for and building the team, patenting and licensing strategies, regulatory challenges, incubation and mentoring. Entrepreneurs and experts shared their entrepreneurial journey, experiences and knowledge about the innovation ecosystem in the country which benefitted the audiences immensely.

Around 120 participants attended the conclave to make and expand their networks for collaborative opportunities.

2. Small Business Innovation Research Initiative (SBIRI)

SBIRI scheme has played a vital role in promoting research and innovation in the Indian biotech sector. SBIRI as a scheme was launched to promote and facilitate companies to take their established proof of concept (PoC) towards early stage validation, thus fulfilling a major gap in the product development cycle. However, the scheme has been instrumental in nurturing not only established companies, but also start-ups in the field of biotechnology who are now availing this grant after completing the PoC studies in the BIG.

Ever since its inception, 248 projects involving 184 sole companies and 64 collaborative projects have been supported through SBIRI under which a sum of Rs. 257.36 crores has been committed. 34 products/technologies have been developed/ validated through the scheme, few of which have already been commercialized and some promising research leads are getting ready to hit the market.

In the last financial year, three calls for proposals were processed. The 33rd & 34th call were regular calls targeting the major thematic research areas of BIRAC such as Vaccines and Clinical trials, Drugs, Biosimilar and Stem cells, Agriculture, Device and Diagnostics, Bioinformatics and Industrial Biotechnology. The 35th call was a special call on *"Novel tools/ technologies/processes and product optimization/scale-up of Anti-Snake Venom"*.

Under these 3 calls, 107 proposals were received out of which 25 proposals were recommended for

financial support. Under the 36th Call for proposals, which closed on 31st March, 2018, 77 proposals were received out of which 24 have been recommended for further consideration.

The ongoing projects under the various thematic areas, as mentioned earlier, were mentored and monitored through online evaluation or site visits, or presentationsbefore Technical Expert Committee (TEC). In 2017-18, 77 unique beneficiaries were supported. Out of these, 62 beneficiaries were companies (both SMEs and start-up) and 15 were academic collaborators.

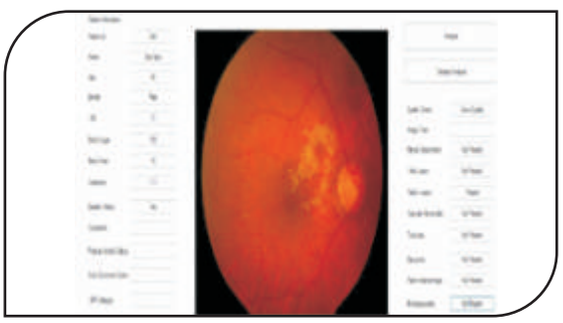
Of all the supported projects, 14 projects matured from BIG scheme to secure a follow on SBIRI funding. These proposals dealt with various research aspects such as Vortex diode cavitation device for industrial effluents, novel prosthetic heart valve, SmartScope: a portable microscope with advanced features and bioabsorbable implants based on polylactic acid to name a few.Two projects funded under the SBIRI scheme won *"BIRAC Innovator award"* during the year. Oraxion Therapeutics, a spin-off from BIRAC supported Aten Porus Lifesciences entered into an "*Option to License*" agreement for US $125 Million with a US-based biopharma company for its drug ORX-301 (developed through SBIRI support) for the treatment of rare diseases.

A device for secretion and oral hygiene management to reduce risk of acquiring ventilator associated pneumonia developed by Coeo Labs Pvt Ltd, Bengaluru

Platform for production of Glucuronides and their deuterium labelled analogs by Bio-organics and Applied Materials Pvt Ltd, Bengaluru

NoXeno device to help the clinicians in removing foreign bodies from the nasal tract of children safely and quickly developed by Innaccel Technologies Pvt Ltd, Bengaluru

Device for electrodynamic ablation of pathogens from healthcare environment developed by Biomoneta Research Pvt Ltd, Bengaluru



A machine learning based software for the detection of diabetes retinopathy developed by Advenio Technosys Pvt Ltd, Karnal

3. Biotechnology Industry Partnership Programme (BIPP)

The Biotechnology Industry Partnership Programme (BIPP), a public-private partnership (PPP) scheme was launched in January, 2009 to promote innovative research in the Biotech sector. BIPP is a government partnership with industries to support, on a cost sharing basis, path-breaking research in futuristic technology areas having major economic potential. It is focused on IP creation with ownership retained by Indian industry and wherever relevant, by collaborating scientists. One of the striking features of the scheme is that it even supports transformational technology/process development which involves high risks. The scheme encourages collaborations and partnerships, between industry-academia and industry – industry.

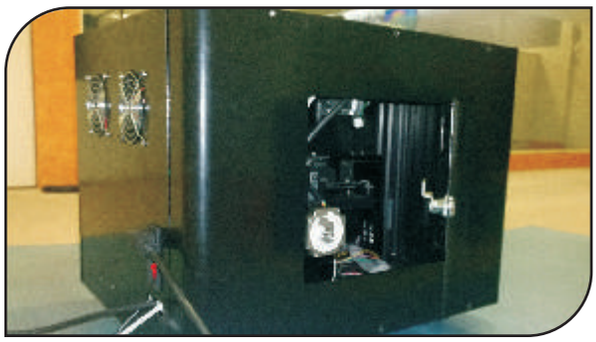
Ever since its inception, BIPP has made a tremendous impact and has supported 191 projects involving 132 sole companies and 59 collaborative projects. Through the support provided under this scheme, 45products/technologies have been successfully developed some of which have already been commercialized and some are ready to hit the market. In addition, 6 facilities have been created as research resources and 30 new IPs have been generated.

During 2017-18, a total of 65 projects, including 11 new ones were supported. 17 projects got successfully completed during this period. In addition, three new calls (41st, 42nd and 43rd) for proposals were announced, out of which 41st and 43rd were regular calls targeting major thematic research areas of biotechnology. The 42nd call was a special call for *"Validation and Scale-up of Industrial Enzymes and developing novel tools/technologies/processes and product optimization/Scale up of "Anti Snake Venom"*. Under 41st and 42nd call, a total of 47 proposals were received out of which 4 proposals were recommended for financial support. In the 43rd Call for proposals which closed on 31st March, 2018, 50 proposals were received which are under various stages of technical evaluation.

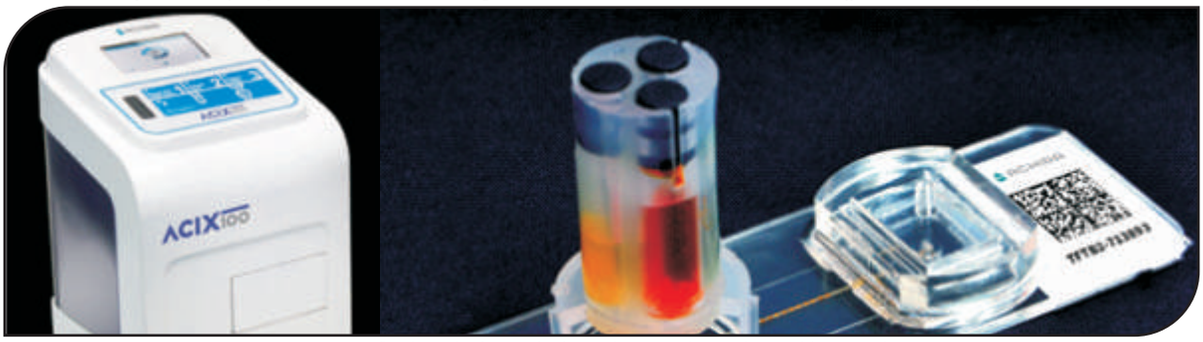
Some of the products/technologies supported under BIPP that were commercialized during 2017-18 include:

- OptraScan developed by Optra Systems Pvt. Ltd., Pune,
- MAMRIT which is an Infrared thermography based non-invasive breast imaging device developed by Tuscano Equipment Pvt. Ltd., Chennai,
- Lysolecithin as Nutraceutical animal feed developed by A. P. Organics Ltd., Punjab and
- Leutin developed by OmniActive Health Technologies Ltd., Mumbai

Working prototype of Microfluidic-based, Laser-assisted Bovine Sperm Sorting (MLBSS) System developed by Jiva Sciences Pvt. Ltd., Bengaluru



Optra Systems Pvt Ltd., Pune has developed OncoScan, which is an automated, affordable and compact whole slide scanner.



ACIX100 is a microfluidics platform which combines a plastic disposable cartridge containing dry reagents and a desktop reader instrument developed by Achira Labs Pvt Ltd., Bengaluru

Shishunethra, which is a portable, handheld, lightweight, easy to use, ROP screening device to screen pre-mature babies in India has been developed by Forus Health Pvt. Ltd., Bengaluru

An affordable ambulatory EEG device developed by Axxonet System Technologies, Bengaluru in collaboration with NIMHANS, Bengaluru

Lysolecithin as Cattle feed supplement developed by A.P. Organics Limited., Sangrur

Free Lutein beadlets (5%) developed by Omniactive Health Technologies Limited, Mumbai

4. PACE (AIR + CRS)

CRS Scheme was launched in 2012 for bridging the gap between Academia and Industry. In the year 2017-18, CRS scheme was restructured and launched as **Promoting Academic Research Conversion to Enterprise (PACE)** in June, 2017 with two different components i.e., AIR and CRS.

a. ***Academic Innovation Research (AIR):*** Promotes development of Proof-of-concept (PoC) for a process/product by academia with or without the involvement of industry (Duration: 18 Months, Maximum cost of the project: Rs. 50 Lakh).

b. ***Contract Research Scheme (CRS):*** Aims at validation of a process or prototype (developed by the academia) by the industrial partner (Maximum duration of 36 Months with no ceiling on the cost of the project)

CRS applies innovation as a coherent plan to deliver academic capabilities of translational research towards product development. It aims to enable validation of academic research that has commercialization potential and to engage the contract research and manufacturing (CRAMS) industry to carry out validation of processes or prototypes. Under this scheme, both academic as well as industrial partners receive funds as grant-in-aid. While funds are provided to academia for in-house research which forms a part of validation of the Proof of Concept, industrial partners are funded for undertaking validation. The IP rights reside with academia and the industry partner always has first right of refusal for commercial exploitation of the new IP.

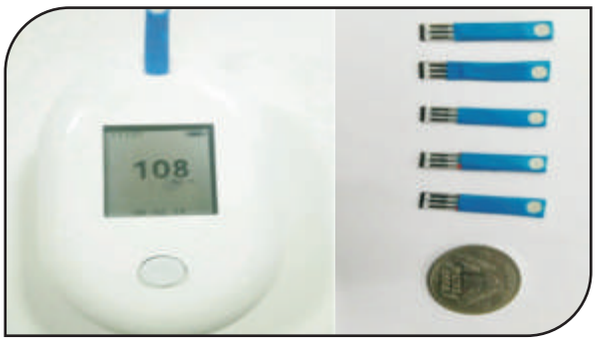
Since inception of thescheme, 14 calls have been launched and 45 projects have been supported involving 42 academic institutions and 27 companies. 6 technologies developed under the scheme have achieved TRL7 and 2 IPs have been generated.

In 2017-18, a total of 35 projects involving 59 beneficiaries were supported (37 academic institutions and 22 companies).During the year, two regular calls and one special call focussed on Anti-Snake

Venom were announced. Under these calls, 238 proposals were received out of which 22 projects have already been recommended for funding and another 16 proposals are under consideration.

Progress of the projects with regard to development of new technologies/products for moving towards commercialization was carefully monitored through PMC visits, thematic reviews, and online evaluation in accordance to the scheme guidelines. Some of the successful outcomes of the projects supported under PACE during 2017-18 includes a non-enzymatic glucose sensor based glucometer, and vaccine against a fatal viral disease of dogs.

CRS fund recipients Amrita Vidya Peetham and Wipro Limited have jointly won the Aegis Graham Bell Awards 2017 under "Innovation in m-Health" category for developing first of its kind and cost effective diabetes management solution.



Non-enzymatic glucose sensor based glucometer developed by Amrita School of Biotechnology, Kerala and Wipro Technologies Pvt. Ltd., Bengaluru

Ginger dry extract developed by Kerala Agriculture University and Arjuna Naturals, Aluva

Virus like particle vaccine against a fatal viral disease of dogs developed by TRPVB and validated by Palamur Bioscience Pvt. Ltd, Telangana

5. Social Innovation Programme for Products: Affordable & Relevant to Societal Health (SPARSH)

SPARSH is the Social Innovation Program of BIRAC which addresses the need of finding innovative solutions to society's most pressing social problems. Since its inception, the program has been investing in high impact ideas and innovations that could address unmet needs and challenges that are neglected.

Till date, six calls for proposals have been launched under the program. The first two calls of SPARSH were aligned with UN Millennium Development Goals 4 and 5 i.e., *"Reducing child mortality and improving maternal health"*. The third and the fourth call for proposals were on *"Waste to Value"*, and *"Ageing and Health"*, respectively. The focus of the third call reflected the mandate of **Swatch Bharat Mission** which aims at elimination of open defecation and conversion of unsanitary toilets to pour flush toilets. While the fifth call *"Innovative Diagnostic tools for Soil and Plant Health"* was aimed at promoting the entrepreneurs and start-ups researching in the field of soil and plant health assessment, under the sixth call "Waste to Value" proposals were invited to generate viable solutions for integrated and sustainable waste management, and develop recycling technologies.

While in the first five calls 40 innovative projects were supported, under the 6th call, over 100 proposals were received out of which 6 proposals have been recommended for financial support. Some of the product/technologies that were developed during the year under the Scheme are:

A point-of-care (POC) device for testing antibiotic sensitivity of different bacteria found in human urine that are responsible for Urinary Tract Infection (UTI). Developed by Xcellence in Bio Innovations, Bits-Pilani, Hyderabad

ReMeDi NOVA – A device consisting of multiple sensors with a common access interface, that can be used to provide a wide range of diagnostics at the point of care has been developed by Neurosynaptic, Bengaluru

The Rhino Digester System - A completely sealed, compact odor free and easy to use digester for treatment of organic waste by Flycatcher Technologies, Vadodara

SAANS, a low cost and easy to use manual Continuous Positive Airway Pressure (CPAP) device, which is used to maintain a constant air pressure to keep the lungs of newborns and infants open during troubled breathing has been developed by Coeo Labs, Bengaluru

Social Innovation Immersion Program (SIIP)

SPARSH through its **Social Innovation Immersion Program (SIIP)** provides fellowships to "Social Innovators" for identifying and addressing specific needs and gaps in social sector and promote social entrepreneurship.

The SIIP partners provide the rural and clinical immersion to the innovators. The innovators are also mentored on process of systematic clinical & community observation, need assessment, refinement and affordable technology development. In many cases, by the time the project gets completed, the beneficiaries are able to generate data that is sufficient enough to fetch next level of funding.

Some of the research ideas identified and further developed by SIIP fellows include: Use of CRP and IL-6 values to enhance the sensitivity and specificity of tests carried out todetermine the presence of neonatal sepsis, blood supply chain logistics, tensiometer for uterine atony compression sutures and portable uterine contraction monitoring device for low resources healthcare settings etc.

For *"Maternal and Child Health"* BIRAC has partnered with four SIIP partners (i) Venture Center, Pune (ii) THSTI, Faridabad(iii) KIIT, Bhubaneswar and (iv) Villgro, Chennai. Under the programme 14 social innovators were supported.

Four SIIP Fellows are presently working on research problems related to "*Waste to Value*" such as sewage water management, vegetable/fruit post-harvest waste management etc. are being managed and mentored by Venture Centre, Pune

For immersion of SIIP fellows in the field of "*Ageing and Health*" BIRAC has partnered with Venture Centre, CCAMP, KIIT and SC-TIMED. 16 SIIP fellows inducted under the program are trying to find solutions to the problems encountered by senior citizens.

Tata Institute of Social Sciences (TISS) has been engaged as SIIP knowledge partner to train, mentor, and monitor the performance of SIIP fellows working at various locations.

6. Affordable Products and Technologies developed through Investment schemes

BIRAC has an inherent system of distributing the projects into 7 theme areas for project monitoring and promoting innovation in that sector. The Healthcare sector has been categorized into 4 thematic areas namely, Drugs (including drug delivery), Biosimilars and Regenerative Medicine, Vaccines and Clinical Trials, Devices and Diagnostics. The other theme areas for which BIRAC provides funding are Agriculture (including Aqua culture and Veterinary Sciences), Industrial Biotechnology (covering Industrial Products & Processes and Secondary Agriculture) and Bioinformatics and Facilities.

BIRAC emphasizes that projects supported through its various funding schemes on conclusion yield the targeted outcome in the form of products, Process/Technology development and IPR. Towards this end, BIRAC supported projects under various schemes are regularly mentored and rigorously monitored for their Technological Readiness Level (TRL) on a scale of TRL 1 to TRL 9. This monitoring is achieved through visits of Project Monitoring Committee (PMC) experts to the project implementation site, presentation of progress of the work by the Project Coordinators before the Technical Expert Committee (TEC) and online evaluation of milestone completion reports by the subject matter experts associated with the project.

There is always an effort on part of BIRAC to enable/assist the beneficiaries so that the product/process under development could be commercialized at the earliest. To this end, BIRAC has initiated a Product Commercialization Program (PCP) to address the challenges faced by innovators towards commercial launching of their product and market expansion. PCP will be fully functional in the coming years to fast-track the commercialization of BIRAC supported technologies and products.

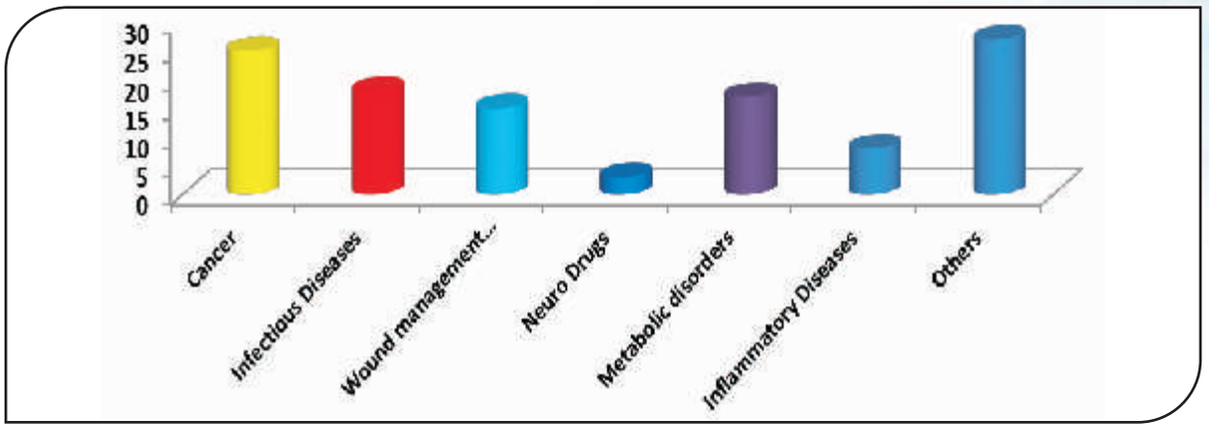
The initiatives undertaken by BIRAC have resulted in successful completion of targeted milestones of many projects from different sectors, and development of many early/late stage technologies and affordable products. During the year 2017-18, 36 projects completed Early Stage Validation and 15 projects reached commercialization stage.

1. Sector-wise

i. Healthcare

a. Drugs

BIRAC supported projects for drug development, drug delivery and for the development of platform technologies in this sector. BIRAC's funding to drugs sector focuses on development and validation of affordable technologies and products with a view to reduce their cost and increase their availability and accessibility to the society. The projects supported under drugs mainly deal with the indications such as cancer, infectious diseases, inflammation, neurodegenerative diseases etc. Many of the projects accomplished the objectives successfully and are ready to go to the next stage. Disease wise distribution of the projects supported are depicted below.

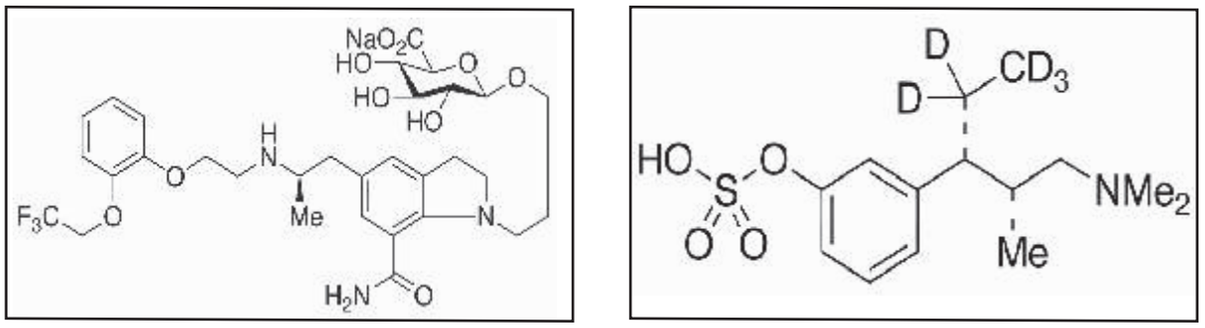


Following Products/Technologies have been successfully commercialized or have completed Early Stage Validation in 2017-18

List of commercialized Products and Technologies:-

1. Synthesis Platform O-Glucuronides & Deuterium labelled analogues of Drug molecules (Bioorganics and Applied Materials Pvt Ltd)

Technology to synthesize D-labelled compounds and O-glucuronides has already been validated on two compounds i.e. labelled Silodosin and Tapentadol O–glucuronides. The technology is commercially ready and labelled compounds are being supplied



D-labelled Silodosin and Tapentadol O–glucuronides

2. Silver Nanoparticle based surface sterilizer spray for hospitals (WeInnovate Biosolutions)

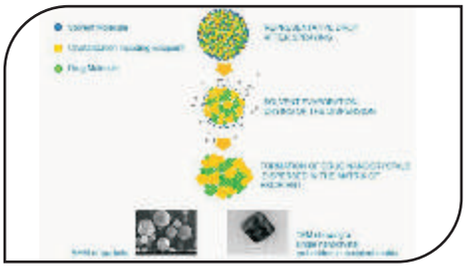
Silvoclean Surface spray

Silvo Clean is an all-purpose inorganic surface sterilization spray made up of a proprietary formula consisting of Silver Nano particles. It is effective against Bacteria, Spores and Viruses. Product is commercially launched and is getting validated with medium size hospitals and private clinics for effectiveness in clinical environments.

List of Products and Technologies reached TRL-7 (early stage validation):-

1. Nanocrystalline solid dispersion platform for increased drug solubility (Windlas)

NanoCrySP is a bottom-up platform spray drying based technology for generation of nanocrystals in presence of



NanoCrySP Technology

small molecule excipient like mannitol.The nanocrystals of size 1000 nm are obtained embedded in the matrix of excipient 5-20 micron. The nanocrystals would enhance solubility, dissolution rate and decrease the onset of action. Technology has been demonstrated at pilot scale for production of curcumin and celecoxib.

Apart from the commercialized and validated technologies listed, following are few notable technologies that have established Proof of concept in FY-2017-18 through BIRAC support:

1. **Structure based efflux-pump inhibitors for drug-resistant Gram negative bacteria (Bugworks Pvt. Ltd)**

   Four potent lead molecules having antibacterial activity against broad spectrum pathogens have been identified to be taken into clinical trials.

2. **Therapeutics for orphan disease Niemann-Pick Type C Disorder (Aten Porus Life Sciences Pvt. Ltd)**

   Synthesized and characterized polymeric pro drugs ORX-301 for Niemann-Pick Type C disorder. Efficacy has been established in animal model.A US based biopharmaceutical company has invested in further development of this drug.

3. **Transdermal delivery system for Rheumatoid Arthritis (Bombay College of Pharmacy)**

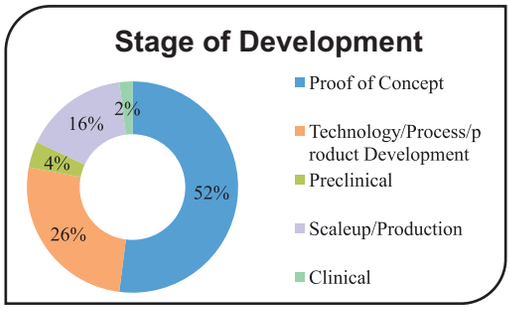
   A topical gel with methotrexate gel composition was optimized for iontophoretic transdermal delivery for Rheumatoid Arthritis.

b. Biosimilars and Regenerative Medicine

BIRAC has supported projects for developing novel Biologicals & Regenerative medicines and for the process development of existing products in this area for increasing the present market share/output in the country. The projects supported in these areas address diseases like Cancer, Diabetes, Inflammatory diseases & Alzheimer's and for the development of platform technologies for producing monoclonal antibodies. In the field of regenerative therapy the usage of different types of stem cells is focused. Along with supporting clinical trials in the field of regenerative therapy, creation of Stem cell Bank has also been funded.

In general, the projects funded under this category are for development of proof of concept followed by technology/process/product development.

Following are few of the products and technologies which completed early stage validation and include GMP grade material production and early stage clinical trials.



List of Products and Technologies reached TRL-7 (Early stage Validation):-

1. **Plasma purified Alpha-1 Antitrypsin and C1- esterase Inhibitor (Virchow Biotech Pvt. Ltd)**

   Developed method for the purification of Alpha-1 Antitrypsin (A1AT) and C1- esterase Inhibitor (C1-INH) and received approval for the in-house facility to manufacture A1AT and C1-INH. Material for conducting clinical trials has been produced and approvals for conducting clinical trials are awaited.

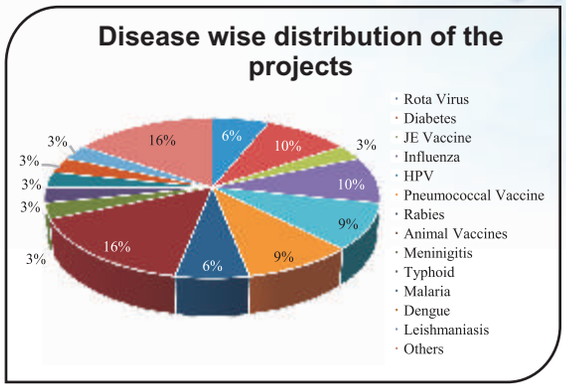
2. **Cell replacement therapy for Urethral Strictures (Regenerative Medical services Pvt. Ltd)**

   Successfully developed autologous cell therapy for Urethral Strictures and validated on 13 patients with successful outcomes proving the safety and efficacy of the treatment.

c. Vaccines and Clinical trials

Vaccine development has played an important role in combating infectious diseases. BIRAC has supported few very important projects under this theme. The projects supported in this area address diseases like Diarrhoea (Rotavirus), Japanese Encephalitis (JE), Influenza, Cervical Cancer (HPV) and Dengue . BIRAC supported projects to combat bacterial infections like Pneumococcal and Meningitis, Parasitic infections like Malaria and Leishmaniasis. Vaccines for Cattle and Rabies

were also supported by BIRAC. Disease-wise breakup of projects supported is represented below



BIRAC supports clinical trials of drugs/biotherapeutics apart from vaccine clinical trials. Supported clinical trial projects include drugs for Diabetes/Diabetic foot ulcers, Biosimilars and regenerative medicine.

For making India a hub for design and development of novel, affordable and effective biopharmaceutical products and solutions, BIRAC launched National Biopharma Mission (A collaborative mission of DBT and World Bank) in the financial year 2017-18. The main target of the mission is to develop at least 2-3 Vaccines closer to market in five years. The target vaccines are HPV, Dengue and Pneumococcal. Other vaccines of national relevance will also be supported through this mission.

Following are few successful technologies and products under this theme during 2017-18.

Brucella S19 vaccine vial

1. **New process for the production of thermos-stable freeze-dried Brucella abortus strain 19 Vaccine for veterinary use (Vivimed Labs Pvt. Ltd)**

   Brucella abortus is bacterial pathogen of livestock and causes abortion resulting in widespread loss to farmers. The vaccine against Brucella abortus was developed to counter Brucellosis disease. The vaccine is freeze dried to maintain quality and potency in field conditions.

2. **A novel technology for producing peste des petits ruminants (PPR) vaccine in suspension culture instead of adherent culture (Vivimed Labs Pvt. Ltd)**

   Peste des Petits ruminants (PPR) virus is a serious pathogen of sheep and goats. PPR vaccine is an inactivated vaccine and is traditionally produced using monolayer cells. The novel technology to grow the virus in suspension adapted BHK-21 cells has been scaled up for lower production cost.

3. **Galnobax™ for diabetic foot ulcers (NovaLead Pharma Private Limited)**

   Galnobax ™ was re-purposed for wound healing for treating diabetic foot ulcers. Phase II clinical trials successfully completed and moving towards phase III clinical trials.

4. **A diodothyronine (T2) mimetic for the treatment of metabolic cardiovascular risks (Torrent Pharmaceuticals Limited)**

   Safety and efficacy of TRC150094 tested in Phase II clinical trial for treatment of cardio-metabolic risk in overweight/obese diabetic and pre-diabetic subjects with dyslipidaemia

5. **Bevacizumab for the treatment of colorectal cancer (EPR Centre For Cancer Research And Bioinformatics)**

   Biosimilar Bevacizumab was produced at pilot scale in GMP facility and Pre-clinical studies completed successfully. Clinical trial approvals are awaited.

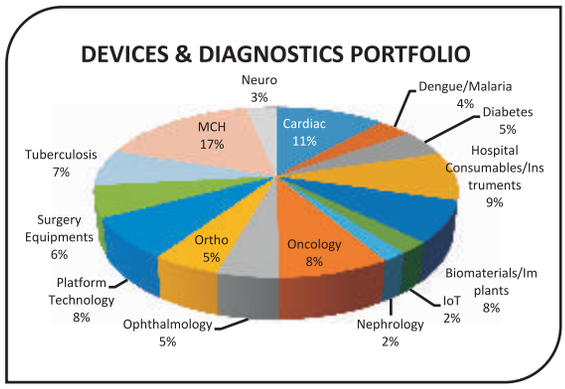
6. **Virus like particle vaccine against a fatal viral disease of dogs (TRPVB –Palampur)**

   Vaccine for Parovirus infection of dogs developed and completed clinical trials in Beagle dogs. Yield improvement and challenge study are proposed as next steps.

d. Devices and Diagnostics

Analysis of BIRAC funded projects in this area suggests that entrepreneurs have shown maximum interest in diagnostic instruments and kits including imaging devices and prognostic biomarker based assays. The PoC devices are also on the radar of start-ups. The latest trend is for personal wearables & customized IoT based devices. The interoperability of the devices is the current trend amongst the young entrepreneurs. The devices and diagnostics sector has seen maximum number of patent filing.

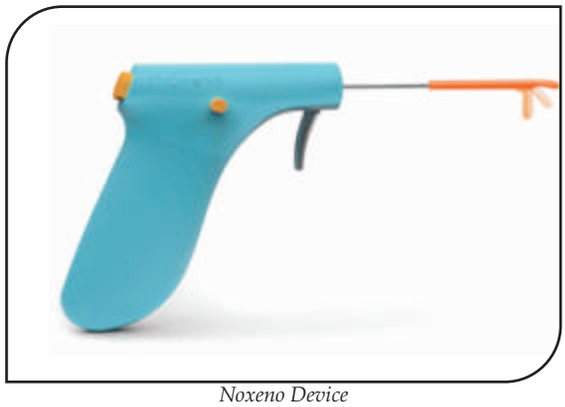
BIRAC supported technologies range from handheld PoC devices to high end diagnostic Imaging devices and surgical instruments. Areas like Cardiology, Oncology, Ophthalmology and Maternal and Child Health have witnessed maximum number of projects. Orthopedics, Biomaterials, Implants and hospital consumables are few latest attractions which are high on market demand.



List of commercialized Products and Technologies

1. Nasal Foreign body Extractor (Innaccel)

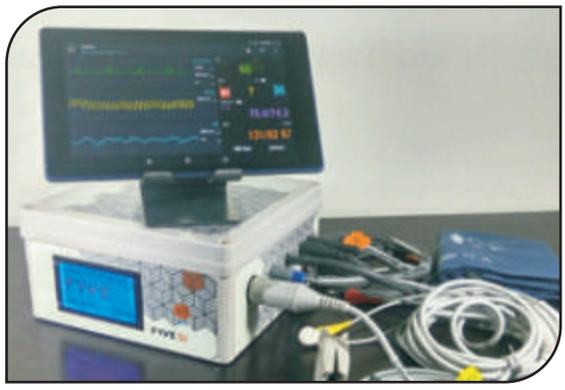
Noxeno device offers a simpler and safer way to remove anterior nasal foreign bodies from children in a rural clinical settings. It has an easy to use hinge that goes in straight and bends to "hook" Nasal Foreign Body (NFB) at will. There is a disposable sheath for added layer of safety and sterility. Noxeno also has a built in light to illuminate tip for better visualization. Device is commercially launched and is undergoing clinical validation.



Noxeno Device

2. Low-cost ICU monitor system (Lattice Innovations Pvt Ltd)

FYVE-S1 Patient Monitoring System is aimed at critical care monitoring in low resource settings. Bluetooth and WiFi-enabled Android tablets are used for visualization of vitals and waveforms. The networked system ensures that relevant data is accessible to healthcare providers thus improving responsiveness and quality of care. Completed development of monitoring device, android based bedside display and web-based remote monitoring console. The product has already achieved early sales.



FYVE-S1 Patient Monitoring System

3. Infrared thermography based non-invasive breast imaging devices (Tuscano Equipment Pvt. Ltd)

MAMRIT device employs simultaneous X-ray and infrared acquisition and processing systems for an enhanced breast imaging. The device has a positioning assembly housed inside a closed chamber and provided with the Infrared and X-ray imaging systems to simultaneously capture an infrared image and a X- ray image of the breast under examination. A patient support table with an opening is provided to enable a patient to lie in a prone position without compressing the breast during imaging. The device is used to correlate anatomical and physiological characteristics and post process analysis of a breast tissue thereby reducing a number of false positive results. The device has been commercially launched.

MAMRIT Breast Imaging device

4. **In vitro diagnostic Instrumentation (Robonik India Pvt. Ltd)**

Three products (ELISA processor, automatic biochemistry and urine strip analysers) have been validated at NABL approved labs and commercialised.

5. **Digital Pathology Scanner (Optra Systems Pvt. Ltd)**

OptraScan is a digital pathology solution to disrupt optical microscopes used in Pathology with Digital Systems leveraging computer aided diagnostics to bring objectivity and transparency in Oncology, Infectious and Inflammatory disease detection and treatment. Clinical validation completed across many pathology labs and product commercially launched

OptraScan-Digital Pathology Device

6. **Deafness screening device for newborn (Sohum Innovations Pvt. Ltd)**

Developed a novel brain signal acquisition device to screen new borns for birth defects (hearing loss) in resource poor settings to prevent speech loss. The device uses Auditory Brainstem response (ABR) technology in an innovative way to provide results to be interpreted by even an unskilled worker. The device has sensitivity of 98.25% and specificity of 90%. Sohum device has been commercially launched and has presence in over seven states in the country. The Company has won awards like NASSCOM ICT led Healthcare Innovation Award-2016, First runner up-Sankalp Social Innovation Award-2016 etc.

New born Screened with Sohum Device

List of Products and Technologies reached TRL-7 (Early stage validation):-

1. **Hand cranked defibrillator for low resource settings (Jeevtronics Pvt. Ltd)**

An affordable Bi-Phasic defibrillator with a built-in power generator for low resource settings using a hand crank. In-built power generator (12 seconds of easy hand cranking) charges a high voltage capacitor to 1800V. A battery-less operation, wireless enabled device for patient data recording and transmission are added advantages in the device. A beta-prototype of the instrument is ready and PCT has been filed for charging and discharging technologies

Hand-cranked defibrillator

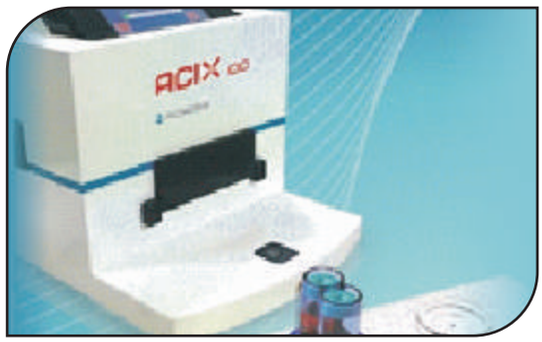
2. **"RightBiotic: The Fastest Antibiotic Finder" (Excellence in Biological Innovations and Technologies)**

The system comprises of a readout machine with an on board embedded chip comprising of a microprocessor, an optical sensor, a strip loading mechanism integrated with appropriate light source and transmitted light absorption system, and an on-board analytical algorithm, the output from which is displayed on a screen and printed for permanent records. An accompanying kit containing required consumables has proprietary medium for accelerated bacterial growth, a system for harvesting bacteria from the biological fluid and pre-functionalized strips for testing for 15-23 antibiotics for antibiogram.

RightBiotic Device

3. **Cloud enabled smart solutions for diabetes care (Amrita School of Biotechnology & Wipro, Bangalore) :**
A novel non-enzymatic glucose sensor based glucometer is a 'cost effective device and cloud enabled smart solution' for diabetes care.

4. **Microfluidics platform for point-of-care immunodiagnostics (Achira Pvt. Ltd)**
Achira Labs has developed a novel diagnostics system by translating its cutting-edge micro and nanoscale technologies. Proprietary micro-bio-sensors and ACIX 100, a table-top instrument, capable of performing and analyzing microfluidics based immunoassays have successfully demonstrated their potential by matching all set standards in the market. Diagnostic cartridges have been developed for thyroid panel and fertility panel, validated at NABL accredited labs and are being scaled up.



ACIX reader and microfluidic cartridge

5. **Portable Epilepsy-EEG system (Axxonet systems Pvt.Ltd)**
An affordable ambulatory EEG device that can be used in rural areas, homes, hospitals and even in the most inaccessible areas, that can record and analyse EEG to automatically report ictal activity (Epileptic) during a seizure. EpiDome can empower a trained healthcare worker or a PHC doctor to identify Epileptic symptoms. Device has undergone clinical validation.

EpiDome Ambu-EEG Device

6. **Molecular Platform for Malaria Detection (OmiX Research and Diagnostics Laboratories Pvt. Ltd)**
The technology comprises of a genomic DNA isolation module which enriches the Plasmodium DNA against the human DNA from blood sample to achieve sensitivity of 1-5 parasitic DNA per microliter of blood. System uses molecular probe based two-step isothermal-PCR for detection of 18s rRNA of P.vivax or P.falciparum. Developed a DNA biochip prototype with DNA probes attached and validated its efficacy on limited number of clinical malarial samples to achieve high sensitivity and specificity.

Omix-DNA Amplification Kit

7. **Hand-held oral cancer screening Device (Sascan Meditech Pvt. Ltd)**
A hand-held screening device with a central camera and an array of 4 mono–colour LEDs (405-610 nm) for detecting the auto flourescence and absorbance-reflectance ratio associated with tissue carcinogenesis in oral cancer patients. Device and associated software was integrated and combined system was validated on over 50 subjects/patients in a clinical trial to demonstrate 87.5% sensitivity, and 100% specificity, respectively.


Hand-held Oral cancer Screening device

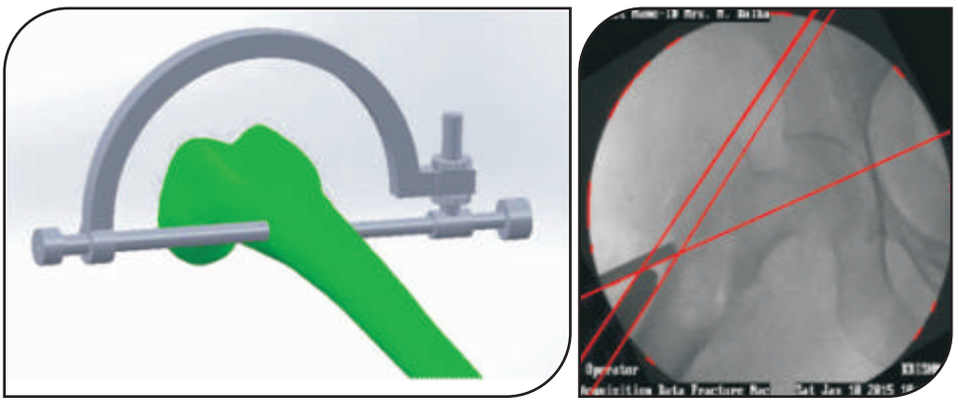
8. Diagnostic Lab in a suitcase (Accuster Technologies Pvt. Ltd.)

Applicant has developed SGO2, SGPT, CRP and Micro Albumin tests and incorporated them on to the Mobile lab.These tests have been clinically validated and added to the list of diagnostic test on Accuster Mobile Lab

Mobile-Lab

9. Navigation system with surgical jigs for orthopaedic Surgery (VMP Ortho)

Navigation in orthopaedic Surgery along with surgical jigs with a 2D to 3D conversion software developed for knee replacements and validated on PLA bone model in operation theatre under C-arm



Surgical navigation software and Jigs

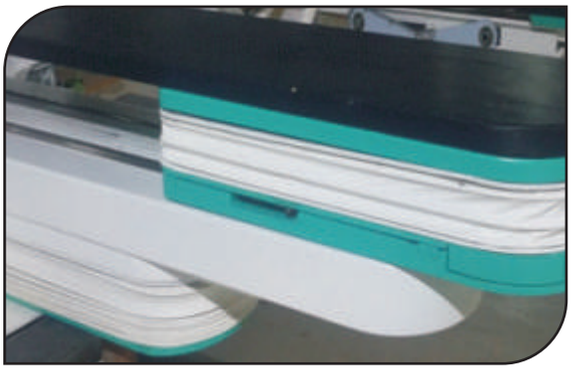
10. Artificial Larynx for voice restorationfor voice restoration in throat cancer patients (Tuhin Subra Sengupta)

An artificial Larynx based on electronic vibrations for voice restoration in post-operative throat cancer patients has been developed. The miniaturization of vibrator module and a controller unit in the electro larynx has been achieved. The integrated system has been developed and tested for its functionalities in volunteers. Applicant has incorporated a company Anahera Healthcare Pvt. Ltd. during the grant period.

Artificial Larynx for voice restoration

11. Hexapod couch for LINAC machine (Panacea Medtech Pvt. Ltd.)

Panacea Medtech Pvt. Ltd has developed a high end electro medical device which is a Hexapod Computer Controlled Patient Couch for the Linear Accelerator (LINCA) machine for precise radiology treatments. The system has been developed and verified. LINAC integrated with Hexapod computer controlled couch is to be evaluated at hospitals.



Hexapod Couch for LINAC

12. Portable Paediatric eye imaging device (Forus Health Pvt. Ltd)

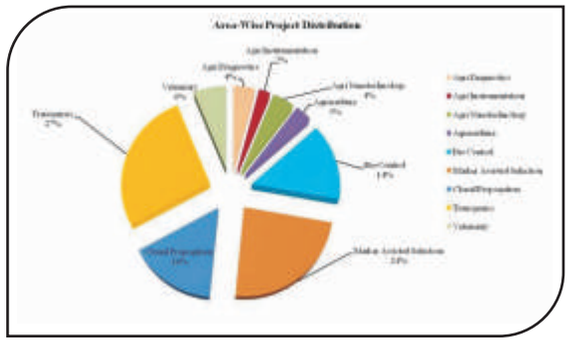
3nethra neo

3nethra neo is an advanced wide-field digital imaging system that assists clinicians in identifying paediatric ocular diseases. The contact device can be easily operated by qualified clinicians and trained technicians to quickly capture detailed colour retinal images. Images captured by 3nethra neo replace manual hand-drawn documentation with accurate photo documentation, thereby enabling a more informed clinical decision. Device is commercialized

In addition, Sohum Innovations Private Limited, Innaccel and Lattice Innnovations Private Limited have completed early stage validation (TRL-7) and moved to commercialisation phase in 2017-18.

ii. Agriculture

Agriculture is one of the dominant sectors of Indian economy, which plays a crucial role in its growth and sustainability. BIRAC is supporting biotechnological interventions pertaining to agro-climatic challenges, biotic and abiotic stresses, higher and sustainable yield, nutrition and environment. The pipeline of projects at BIRAC covers major areas of the agriculture innovation system such as Marker Assisted Selection (MAS), transgenics, tissue culture, etc. Some of the other research areas currently being supported by BIRAC in the field of agriculture relate to Agri - nano-biotechnology (pesticides and fertilizers), diagnostics, biocontrol agents and digital/precision agriculture. Few projects in the field of Aqua and veterinary sciences have also been supported.



Products and Technologies that have reached TRL- (early stage validation):

1. Biopesticides for tea ecosystem (TRA Nagarkatta/Varsha Bioscience and Technology)

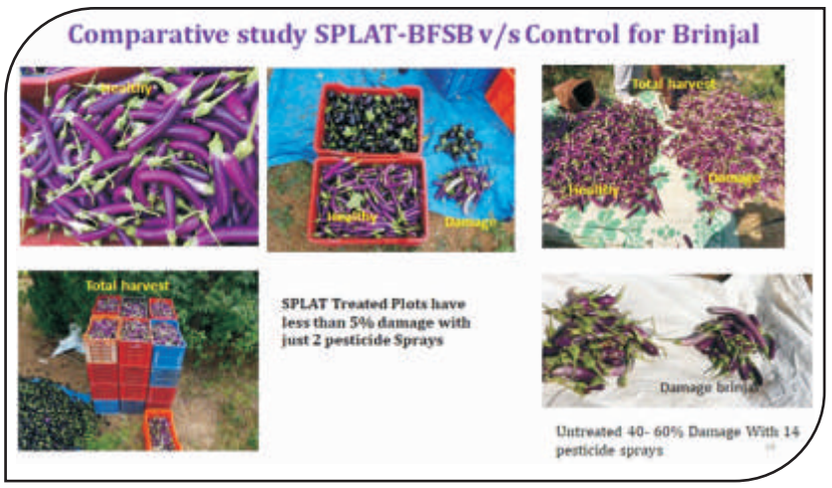
The study aims at development of efficient bio-control formulations which are consistent with the local infestation of strains on the tea plantation and are entirely based on the non-usage of chemical pesticides.The study assumes significance due to the existing problem of plant pathogen and insect pests in tea growing areas. Selected strains of three micro-organisms i.e. *Trichoderma harzianum* KBN-29, *Beauveria bassiana* BKN-1/14 and *Metarhizium anisoplae* Met-5-1 were pooled to develop a liquid formulation. In vitro and in vivo bio-efficacy of the developed formulation has been assessed at multi-locations for the control of dieback, blight, termite, tea mosquito bug and red spider mite. The toxicity studies are in progress for the bio-pesticide registration at a GLP lab.

The three biological control agents used in the formulation are indigenous isolates, developed from the tea ecosystem of West Bengal itself. With proven efficacy, the formulation is likely to have significant impact in organized tea cultivation in the state/ region.

Few other technologies wherein considerable progress has been made and the outcome seems to be promising are:

Control of pests using Specialized Pheromone & Lure Application Technology (SPLAT) ATGC Biotech Pvt. Ltd.

The study aims at controlling of pests with use of Specialized Pheromone & Lure Application Technology (SPLAT) through mating disruption/ auto confusion/ attract &kill and MAT in males. The technology developed involves sustained release of pheromone formulations for manipulating insect behaviour by sending false female signals to males, creating auto-confusion and disrupt mating. A ready to use, no pump, no spray, no water, no pest resistance, an eco-friendly, apply and forget technology, is applied once a month for achieving perfect 'Family Planning' programs among insects. Independent field evaluation trials conducted on a large-scale for four of the economically devastating pests like Pink Boll Worm in Cotton (SPLAT-PBW), Fruit and Shoot Borer in Brinjal (SPLAT-BFSB), *Tuta absoluta* (South American Tomato Leaf Miner) in Tomato (SPLAT-TUTA) and Leaf Miner in Citrus (SPLAT-CLM) crops have shown promising results in terms of lowered losses,higher income to the farmers and reduced exposure to pesticides.



Transgenic BmNPV resistant silkworm (Centre for DNA Fingerprinting and Diagnostics - CDFD)

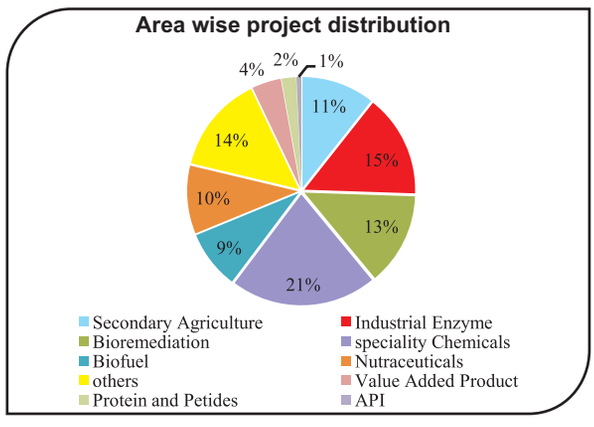
Bombyx mori Nucleopolyhedrovirus (BmNPV) that infects the silkworm, *B. mori,* accounts for >50% of silk cocoon crop losses globally. It was envisaged that simultaneous targeting of several BmNPV essential genes in transgenic silkworm would elicit a stable defence against the virus and therefore, short sequences of four essential BmNPV genes were introduced into the silkworm germline in tandem, either in sense, or antisense, or in inverted-repeat arrangement. The transgenic silkworms carrying the inverted repeat-containing transgene showed stable protection against high doses of Baculovirus infection. Further, the antiviral trait was incorporated to a commercially productive silkworm strain highly susceptible to BmNPV.

The transgenic lines generated under Nistari genetic background showed stable resistance against virus and this antiviral property was then transferred to a high yielding commercial baculovirus susceptible, CSR2 silkworm strain through marker assisted backcross breeding technique. In the study, several transgenic hybrids were generated by crossing Nistari and CSR2 transgenic lines with various commercial breeds. The best performing hybrids were identified for multi-location field trials based on their survival rate upon baculoviral infection and cocoon quality traits. This transgenic technology, first in insects in India, is expected to provide opportunities for alleviating one of the major constraints in silk productivity.

Silkworm rearing facility

ii. Industrial Biotechnology including secondary agriculture

Bio-based manufacturing and product markets are becoming more established, and are poised for rapid growth in the future.BIRAC has been instrumental in supporting projects in several areas of Industrial Biotechnology which can be categorized in sub-areas such as bioenergy, speciality chemicals, industrial enzymes, industrial processes, bioremediation, secondary agriculture, infrastructure support and many other fine chemicals.Area wise project distribution is shown below



List of commercialized Products and Technologies

1. Sophorolipid formulations for sanitization and sterilization of fruits/vegetables (Green Pyramid Biotech. Pvt. Ltd.)

A complete harmless, potable, organic solution has been developed that offers visually detectable and scientifically proven results approved by National Certification

Evergreen and Bioclean Veg & Fruit wash

Boards and Authorities. The foundation of these products is a biosurfactant based API with properties of an amphiphilic having resemblance to an emulsifying agent. The product acts on pathogens by disrupting their cellular membrane thus inhibiting their growth on surface of vegetables

2. **Process & Technology for encapsulation of Lutein (OmniActive)**

OmniActive has developed a novel process of encapsulation as well as composition which results in free flowing, water soluble and stable free leutin and leutin:zeaxanthin beadlets with uniform size distribution. The company has received order for 4-8 tonnes for lutein. Commercial level plant has been set-up at Pune, supported by TDB.

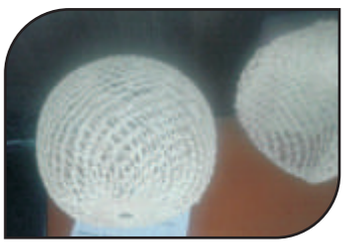
3. **Lysolecithin based animal feed formulation (AP Organics Limited)**

Lysolecithin as a nutraceutical for animal feeds has been commercialized. Rice Bran lysolecithin is helpful in increasing milk yield and fat content of milk. It offers an economical source of energy to Indian cattle thus helping Indian dairy sector in meeting their demand for milk production.

Ricela- Lysoclecitin based cattle feed supplement

4. **Technology and value added products from Banana Pseudostem ropes (Rope Production Centre, Madurai)**

The company is providing permanent employment opportunities in the village with the capacity to produce 15,000m rope/day and make value added products like bags, fruit bags, weaving mat, weaving grill and other products. The banana farmers are getting additional income of Rs 5/Pseudo stem. More than 40 rural women have been employed. Rope production Centre has been able to sell 4-5 machines so far and many products made from the banana ropes like bags, fruit bags, weaving mat etc. are being sold in the market.


Light Lamp from Banana ropes

5. **Green Process & Technology for conversion of R-PAC to L-Norephedrine (M/s Embio Limited):**

Norephedrine is a chiral auxiliary used in the production of anti-HIV drug Efavirenz. Embio developed a greener transaminase route for production of L-norephidrine. 95% conversion with 99% diastereomeric excess has been achieved in lab scale. At present the cost of production is comparable to the chemical route. The company is continuing its efforts to take the project to techno-commercial viability.

List of Products/Processes/Technologies reached TRL-7 (Early stage Validation)

1. **Chemical-free Filter-free water purification technology (Openwater.in):**

A Pilot project processing 100L of water/hour was set-up at IISc and was used for treating and polishing wastewater.


Water purification technology

2. **Process & Technology for Removal of H2S from Biogas (Daurala Sugars)**

Technology for up-gradation of biogas by removing sulphur has been demonstrated at pilot scale - I (gas flow rate of 10 m3/h). Further scale up is ongoing.

3. **Green Process & Technology for purification of tea Catechins (Baijnath Pharmaceuticals):**

A green process for the extraction of catechins from tea leaves using water as an extraction medium has been optimized. Purification of produced catechins at a purity level of 60% has been achieved.

4. Decentralized waste processing system (Flycatcher Technologies)

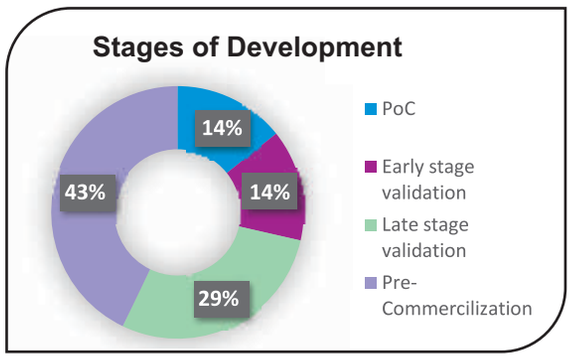
The prototype for a stand-alone compact digester for decentralized waste processing has been developed and pilot trials have been completed.

In addition, Green Pyramid Biotech Private Limited, Omniactive, AP Organics and M/s. Embio Limited have completed early stage validation (TRL-7) and moved to commercialisation phase in 2017-18.

Compact Biodigester for onsite food waste processing

iii. Bioinformatics

The Bioinformatics sector has transformed the way research is conducted today from hypothesis-driven based to data-driven. Bioinformatics data analysis applications are capable of analysing large amount of genomic and proteomic information to facilitate research activities in the fields ranging from healthcare to agriculture. BIRAC is encouraging Bioinformatics industries for frugal innovation mainly by transforming data into valuable information that will be useful for disease diagnosis and therapeutics. Maximum projects supported under this theme fall under pre-commercialization and late stage validation of developed softwares platforms.



Following are the products and technologies which are at commercialization stage

List of commercialized Products and Technologies:-

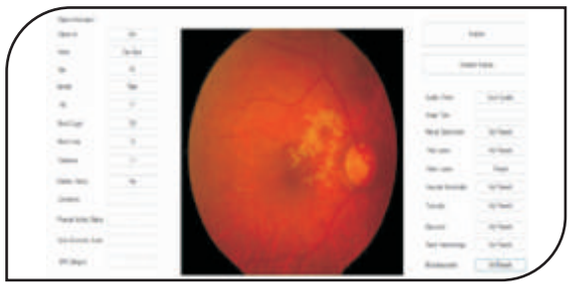
1. Development of single tube multi gene onco-diagnostic tests for use with next generation sequencing platforms (SciGenom Labs Pvt. Ltd.)

A kit for the detection of onco mutation for more than 10 type of cancers with high sensitivity. Also a computational pipeline for the analysis of NGS data.

Onco-panel kit and NGS software

2. A computer assisted tool for identification of abnormality in retinal images: A Telemedicine Solution"(Advenio TecnoSys Pvt. Ltd.,)

A Telemedicine platform: A machine learning based, cloud based and standalone tool named "ChironEye' has been developed.It analyses retinal fundus images & detects diabetic retinopathy, hypertensive retinopathy, diabetic macular edema and a host of other diseases. It annotates lesions and regions of interest, and assists doctors to arrive at a diagnosis faster and higher accuracy



ChironEye platform

iv. Technology upgradation

The technical group along with experts take the responsibility of continuously monitoring and mentoring the supported projects to meet their objectives. Technical group assigns nodal officers for each thematic area (to have overall understanding of projects from that theme) and technical officers for each project (to closely monitor the progress of the project). Further, they take the responsibility of achieving the goals for their respective projects. This close monitoring and mentoring has resulted in development of several process, technologies, commercialization of products/technologies, technology maturation of projects to Technology Readiness Level-7 (TRL-7) and filing of IPRs. Table below provides the details of the development of process/technologies facilitated & products commercialized, number of projects that reached TRL-7 and number of IP filed through BIRAC funding in the year 2017-18.

S.No	Category	Accomplished
1	Development of process, technologies & products facilitated	15
2	Number of projects that have achieved Technology Readiness Level (TRL) of 7	27
3	IP filed	21

Intellectual Property filed

The following Indian Patent applications were filed during 2017-2018:

1. An Apparatus for Orientating Objects (IN201841007424)
2. A cell-penetrating conjugate, and uses thereof (IN201831002945)
3. A complex for penetrating cellular membrane, and uses thereof (IN201731029916)
4. An economical process for preparation of anaerobic granules for waste water treatment (IN201721040610)
5. Heavy chain anti-fungal antibodies derived from camels and their modifications for antifungal applications (IN201821001184)
6. Stabilized fat soluble nutrient compositions and process for the preparation thereof (IN201721032171)
7. A digital endoscope and a method of use thereof (IN201721032933)
8. Photo-Responsive Shape Changing Polymer Composition For Colored Optical Lens (IN201721038965)
9. Peptides of sericin and formulation thereof for cryopreservation (IN201741014273)
10. Air Decontamination Assembly (IN201741016833)
11. Modified gene sequences encoding choline oxidase and a method for preparing betaine using the same (IN201741027084)
12. A Process for Bioremediation of Organic Industrial Effluents (IN2017/4/1/0/1/5214)
13. Method of preparation and use of polydiacetylene-based nanoparticles for the sensing of analytes (TEMP/E1/19063/2017-MUM)
14. Heterocyclic compounds useful as anti-bacterial agents and method for production (IN201741012799)
15. A gonio camera without a slit lamp (IN2017/4/1/0/2/4086)
16. System for accurate guidewire positionig during ortopaedic surgery (IN201723014642)
17. Dual drive clutch operated spinning machine with auto winder (IN201741029975)
18. Intelligent rope spinning machine (IN201741029974)

19. Automated banana pseudo stem rope making machine (IN201741029973)
20. System for enhancing image quality of a subject using CBCT (Cone Beam Computed Tomography) (IN201741026459)
21. Polymer based formulation for the release of drugs and bioactives at specific GIT sites (IN201721013710)

II. Entrepreneurship Development

1. BioNEST (Bio incubation Nurturing Entrepreneurship for Scaling Technologies)

BIRAC is cognizant of the needs of the biotech startups in the country and its portfolio for entrepreneurship development includes not just funding but also support for bioincubation which is a crucial determinant for developing a holistic ecosystem of support and network for biotech enterprises. Through the BioNEST scheme, BIRAC has extended funding support to 30 bioincubators across the nation. Each of these bioincubators have been selected based on an assessment matrix that evaluates their capabilities in supporting biotech ventures as well as ability to provide nesting grounds for the budding biotech startups. This is in line with the key strategies of BIRAC i.e to foster innovation and entrepreneurship in all places of research, to promote affordable innovation in key social sectors with higher focus on start-ups and small and medium enterprises.

Each of the bioincubator is a building block of a bio-innovation ecosystem which will add value and foster the growth of biotech startups. Over the years, BioNEST has been able to create the world class infrastructure and high end equipment facilities that will ensure global competitiveness of Indian enterprises.

BIRAC under the BioNEST Scheme:

- Provides incubation space to start-ups and entrepreneurs
- Connects industry and academia and enable interactions for efficient exchange of knowledge as well as facilitate technical and business mentorship
- Provides enabling services and required mentorship for IP and Technology Management, legal and contract, resource mobilisation and networking platform
- Provides access to world class infrastructure and high end equipment facilities
- BIRAC has supported 30 bio incubators creating a cumulative area of 3,20,000 sq. ft. for budding entrepreneurs

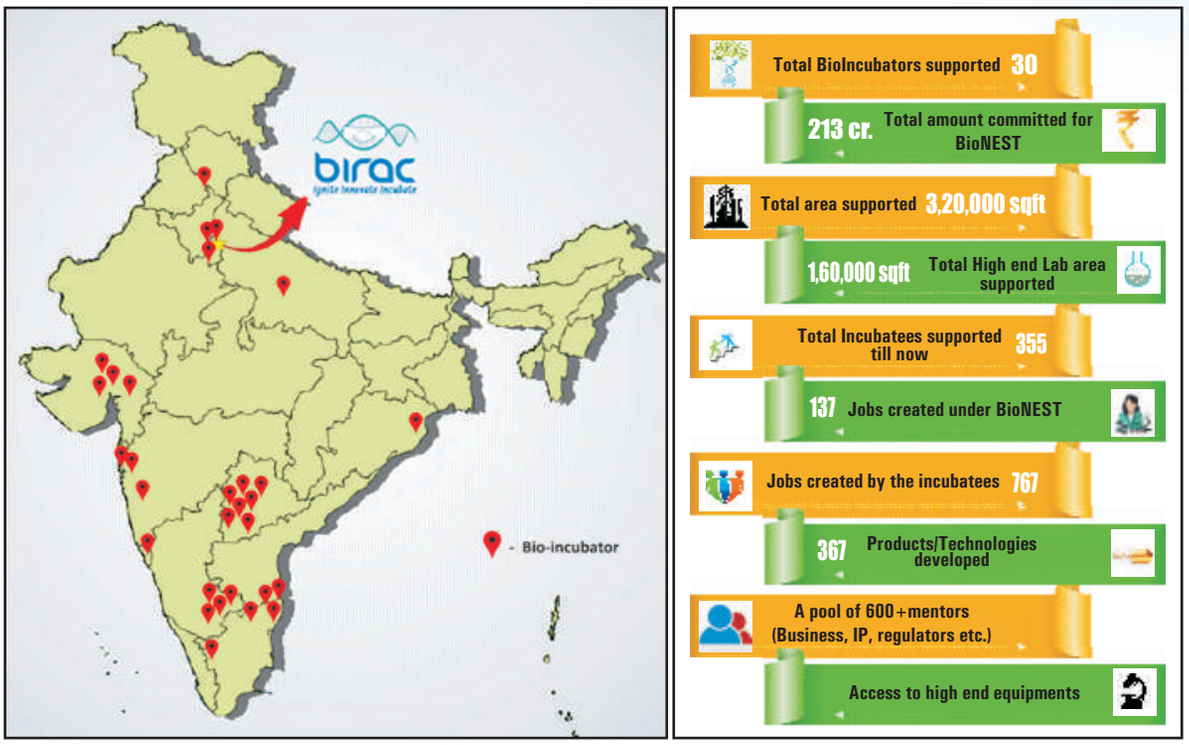
Impact created by BIRAC's BioNEST Programme

Over the years BioNEST is expanding BIRAC's footprint across the country by creating an infrastructural ecosystem for innovation. Each Bioincubator addition to the network creates an impact in supporting Biotech startups. Some of the aspects for selection of new Bioincubators are geographical location, existing ecosystem in and around these centers, startup culture, earlier experience and expertise in incubation, technical and research institutional in around these centers, space etc. considering these factors the incubators are supported at Stand Alone Parks/Bio Parks, Indian Institute of Technologies, Universities/Research Institutes Biotech Clusters.

Till date, funds to the tune of INR 213 crores of funds have been sanctioned and INR 162 crore has been disbursed for the 30 projects under BioNEST. BIRAC has supported 30 bio incubators creating a cumulative area of 3,20,000 sq. ft. for budding entrepreneurs.

During the FY 2017-18, a total of 10 new incubators were supported at IKP Eden, Bengaluru, ICAR-IIHR, Bengaluru, ICRISAT, Hyderabad, Punjab University, Chandigarh, SRISTI Innovations,

Ahmedabad, University of Hyderabad, IIIT Hyderabad, PSG STEP, Coimbatore, VIT-Technology Business Incubator, Vellore, and Somaiya BioRiiDL, Mumbai. Three earlier supported incubators were also supported for upgradation i.e. RCB-Faridabad, CCAMP, Bengaluru e and IIT Kanpur.



BioNEST Footprints and impact of the scheme till now

S. No.	List of Bio-incubators supported under BioNEST from North towards South
1.	Panjab University, Chandigarh
2.	Foundation for Innovation And Technology Transfer, IIT Delhi
3.	Zonal Technology Management & Business Planning and Development Unit (ZTM-BPD), IARI, Delhi
4.	Regional Centre for Biotechnology, Faridabad
5.	SIDBI Innovation & Incubation Center, IIT Kanpur
6.	B. V. Patel Pharmaceutical Education and Research Development Centre (PERD), Ahmedabad
7.	Ahmedabad University
8.	SRISTI Innovations, Ahmedabad
9.	Gujarat State Biotechnology Mission, Savli
10.	Society for Innovation and Entrepreneurship, IIT Bombay
11.	RiiDL (Research Innovation Incubation Design laboratory Foundation), Somaiya Vidyavihar, Mumbai
12.	Venture Center, NCL, Pune
13.	Birla Institute of Technology & Science, Pilani, Goa Campus
14.	C-CAMP, Bengaluru
15.	Bangalore Bioinnovation Centre, Bengaluru
16.	Indian Institute of Horticultural Research (IIHR), Bengaluru

17.	IKP Eden, Bengaluru
18.	IKP Knowledge Park, Hyderabad
19.	SBTIC, Hyderabad
20.	a-IDEA, NAARM-TBI, Rajendra Nagar, Hyderabad
21.	University of Hyderabad
22.	ICRISAT, Hyderabad
23.	L.V. Prasad Eye Institute, Hyderabad
24.	IIIT Hyderabad
25.	IIT Madras Research Park, IIT Madras
26.	Healthcare Technology Innovation Centre - IIT Madras
27.	Golden jubilee Biotech Park for Women Society, Chennai
28.	PSG-STEP, Coimbatore
29.	VIT-TBI, Vellore
30.	KIIT-TBI, Bhubaneswar

Snapshot of facilities supported under BioNEST

2. SEED Fund (Sustainable Entrepreneurship and Enterprise Development Fund)

Through Bio-incubators BIRAC is able to support the "space, services, and knowledge" requirements of start- ups. However, there are still wide gaps that exist in financial support required by a technology driven start-up typically in the initial phases when it is not an obvious target for investments by Angel Investors. BIRAC Initiative Sustainable Entrepreneurship and Enterprises Development Fund (SEED Fund) primarily aims to address this need of early stage startups. This scheme is implemented through select BioNEST incubators.

The basic idea of SEED Fund is to provide Capital assistance to start-ups with new and meritorious ideas, innovations and technologies that have potential to grow as successful enterprises in future. This would enable some of these start-ups to graduate to a level where they will be able to raise investments from Angel/Venture capitalist or they will reach a position to seek loans from commercial banks /financial institutions. This equity based seed support is positioned to act as a bridge between promoters' investment and Venture/Angel investment.

- 11 Incubators have been provided upto INR 200 Lakhs for investment in enterprises.
- Investment in an enterprise is available upto INR 30 Lakhs
- The benefits of this scheme is extended to all Biotech Startups who may or may not be BIRAC supported.

3. Biotechnology Innovation Fund – AcE

The proposed initiative – Biotechnology Innovation Fund - AcE (Accelerating Entrepreneurs or "AcE Fund"), will operate as "Fund of Funds" to foster R&D and innovation in Biotechnology domains (including areas such as healthcare, pharma, medical devices, agriculture, sanitation). AcE Fund shall invest in and partner with SEBI-registered AIFs (i.e. Venture Funds and Angel Funds), which will be professionally managed and desirous of investing in Biotechnology sector. It is intended that the AcE Fund plugs the gap of the "Valley of Death" encountered by the Biotech startups during their product development cycle and growth phase.

AcE Fund shall enable creation of an ecosystem for providing risk capital to young enterprises to undertake research and development in high priority technology areas. It will, in the process, enrich the intellectual property in the country and encourage more entrepreneurs to work towards product and technology development of high quality at affordable economies in sustainable manner.

A call to invite potential AcE Fund partners was initiated in Dec 2017. The process of identifying Fund Partners is in progress. The fund would be operationalized in FY 2018-19.

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

In order to nurture a culture of applied research and need-oriented (societal or industry) innovation among young researchers, it is imperative to give their imagination wings with access to local ecosystems, professional mentoring and funding support. To further this aim, BIRAC launched the University Innovation Cluster (UIC) to foster a culture of innovation and techno-entrepreneurship in Indian Universities. UICs are operating in 5 Universities as mentioned below:

1. **Anna University, Chennai**
2. **Panjab University, Chandigarh**
3. **Tamil Nadu Agricultural University, Coimbatore**
4. **University of Rajasthan, Jaipur**
5. **University of Agricultural Sciences, Dharwad**

Each UIC has an incubation space of about 2000-3000 sq. ft. that houses common laboratory facilities. Postdoctoral and postgraduates Innovation Fellows conduct translational R&D at each UIC, supported by dedicated staff which helps UIC fellows understand commercialization pathways. Presently, UICs are operational and working with 23 Innovation Fellows to facilitate their journey towards entrepreneurship.

5. SITARE (Students Innovations for Advancement of Research Explorations)

BIRAC has collaborated with the Society for Research and Initiatives for Sustainable Technologies and Institutions (SRISTI) to support grass-root level innovations through the university/college level students. Two categories of Awards – BIRAC-SRISTI GYTI Awards and BIRAC-SRISTI

Appreciation Awards – have been constituted to support and mentor these young innovators. The awards are aimed at nurturing the grass-root innovations to make them ready for next level of funding to take innovations to a PoC stage. In March 2018, 15 innovators were awarded with BIRAC-SRISTI GYTI Awards during the Festival of Innovation & Entrepreneurship (FINE) organized by National Innovation Foundation at the Rashtrapati Bhavan. We now have a total of 49 innovators presented with BIRAC-SRISTI GYTI Awards. Innovations supported under GYTI awards span across the spectrum, including development of new anti-microbials, devices and diagnostics for resource poor settings, maternal and child health care, wastewater treatment, etc.

Hon'ble President Shri Ram Nath Kovind at inauguration of Festival of Innovation & Entrepreneurship (FINE) and presentation of Gandhian Young Technological Innovation Awards, at Rashtrapati Bhavan, in New Delhi

Hon'ble President Shri Ram Nath Kovind alongwith the BIRAC SRISTI GYTI Award winners 2018

This year a new initiative of BIIS workshop (Biotech Ignition School) was initiated under BIRAC-SRISTI partnership. Each BIIS workshop is organized for a period of 3-4 weeks and attended by around 40 students (pursuing graduation/post-graduation) selected from a pool of more than 300 applications received from various parts of the country. The students are provided hands on training in various basic techniques of biochemistry, microbiology, phytochemistry, etc. in collaboration with institutes such as LJ College of Pharmacy and NIPER. From each workshop 10-12 students are selected for an appreciation award of INR 1 lakh each. Two such workshops were organized at Ahmadabad during FY 17-18.

6. BRIC (BIRAC Regional Innovation Centre)

BIRAC's reach is pan-India and to further strengthen its linkages with regional ecosystems, BIRAC launched its first Regional Innovation Centre called BRIC at IKP-Knowledge Park, Hyderabad with the following mandates:

- Mapping Regional Innovation System
- Promote Entrepreneurship Development
- Set up an IP & Technology transfer Cell

During the 3-year period, BRIC focussed on four life sciences clusters in southern India: Hyderabad, Bengaluru, Chennai and Thiruvananthapuram. With the successful completion of Phase I, a report on mapping the four innovation ecosystems was released. A similar exercise was taken up as part of Phase II of the study in six clusters in Central India: Ahmedabad, Mumbai, Pune, Bhopal-Indore, Bhubaneshwar and Vishakapatnam. The Phase II initiative was a continuation of Phase I with the above three mandates spread over 13 months.

In both the Phases, RIS mapping was carried out to understand the current status of innovation around these clusters and identify the gaps that hinder innovation. As part of the BRIC mandate, the centre was also involved in various IP & Technology Transfer and Entrepreneurship development activities. The Centre facilitated the patent searches, drafted and filed for start-ups, academia and independent innovators and also organized technology showcase, IP awareness & regulatory workshops and provided a platform to connect an entrepreneur to other stakeholders for specific requirements such as clinicians, mentors, experts for IP strategy or regulatory compliance, etc.

The special emphasis on providing the necessary networking opportunity to the start ups / young entrepreneurs is an important component and this helps young researchers who are setting up their own enterprise to connect with academia and large companies.

A consolidated report on Mapping of the ten clusters along with a set of policy recommendations to improve and enhance the performance of the clusters was released in October 2017.

Releasing the Phase II BRIC report

7. BREC (BIRAC Regional Entrepreneurship Centre)

The BIRAC Regional Entrepreneurship Centre (BREC) was set up in partnership with C-CAMP with a mandate to create and inculcate a spirit of bio-entrepreneurship, facilitate and catalyze the journey of ideas of bio-entrepreneurs towards commercialization, enable and empower bio-entrepreneurs through business and technology advice and mentorship covering all aspects of business- financial, legal, IP, business model & planning, market understanding.

In FY 2017-18, BREC conducted various awareness events, workshops, national level entrepreneurial challenges, boot camps etc. with a view to boost entrepreneurship in the Indian biotech sector.

Major activities undertaken by BREC are as follows:

a) <u>National Life Science Entrepreneurship Awareness Programme for students: 4 awareness programs were conducted at following locations:</u>

a. Christ University, Bangalore
b. Guwahati Biotech Park, Assam
c. Sikkim Manipal University, Sikkim
d. CIIE, IIM Ahmedabad

National Life Science Entrepreneurship Awareness Programme

Through these programmes, BREC reached out to over 250 undergraduate and post graduate students to excite them about bio-entrpreneurship as a positive career choice.

b) <u>BIRAC – C-CAMP National Life Science Entrepreneurship Challenge (NBEC):</u> Nation-wide call for inviting innovative ideas across the country under NBEC was launched on August 16, 2017. The call for proposals received over 1500 registrations from across the country. 150 applicants out of these were selected for regional qualifiers held at Bangalore, Delhi, Mumbai and Chennai. Out of these 150, 39 finalists were shortlisted for 2 day entrepreneurship development and mentoring session at Bengaluru. This session culminated into the final pitching by 9 selected participants. The grand jury panel was chaired by Dr. Kiran Mazumdar Shaw.

Nationwide launch of National Science Entrepreneurship Challenge

c) Entrepreneurship Development Boot camp Programme: BREC organized a 3 day residential boot camp, designed and delivered by eminent faculty from the UK along with experts from India. The programme comprised over 15 sessions delivered by 2 international and 10 national faculty members and covered topics such as the Commercialization Canvas, Maturity Mapping Exercise, Customer definition exercise, Distribution, marketing and sales, pitching for investment etc. The camp was attended by 57 founders and co-founders of life science start-ups from across the country.

d) Meet the Investor Series-Dragon's Den: This programme includes a series of quarterly one on one meetings between investors and start-up bio-entrepreneurs. The objective of this series is to initiate and catalyse interactions between start-ups and investors by providing them a common platform. BREC organized 5 such meetings during the year. Investors included 1 Crowd, Ankur Capital, Eight Road Ventures, Endiya Partners, Unitus Seed Fund, Vilgro, Kae Capital, KITVEN Fund, SeedX, Operator VC and many more. Through these meetings, 23 start-ups interacted with 19 investors through 100+ one on one meetings.

Meet the Investor Series-Dragon's Den

e) Entrepreneurship Development Workshops: BREC organized 3 such workshops on different topics during the FY 17-18 at following locations:

a. Health Technology Assessment at C-CAMP, Bengaluru

b. Understanding Investor Term Sheets at India Habitat Centre, New Delhi

c. Regulatory Requirements in Clinical Trials at CDSCO Regional Office, Hyderabad

Through these workshops, BREC provided valuable domain specific knowledge to more than 150 start-ups and entrepreneurs across the country.


Entrepreneurship Development Work shop organized by BREC at C-CAMP, Bengaluru

8. BRBC (BIRAC Regional Bio-Innovation Centre)

The 3rd Regional Centre of BIRAC was set up during the financial year 2017-18, named as BIRAC Regional Bio-innovation Centre (BRBC), at Venture Centre, Pune. This centre became operational with effect from 28th March, 2018. BRBC is mandated to be a high quality national resource center to support and promote Entrepreneurship in Life Sciences. The centre would provide following services:

- Venture Mentoring Service: High level mentor pool creation for networking and match making with prospective and experienced entrepreneurs.
- Venture Base Camps: BRBC would run focused theme based camps to orient entrepreneurs to relevant activities facilitating product commercialization processes. Tentative themes include: Fund raising for Early stage (pre-POC) and Late Stage (Seed investment), Exit Strategy and M&A, Technology transfer and IP strategy, Regulatory processes and Certifications.
- Regulatory Information and Facilitation Center: BRBC would facilitate a seamless, personalized approach for entrepreneurs in understanding the regulatory approval process for biotech products in India.
- BioIncubation Practice School for western regions: The centre would provide comprehensive hands on experiential learning required for setting up/running of bio-Incubators in Tier II & Tier III cities nearby Pune.

III. Affordable Product Development

1. Early Translation Accelerator (ETA)

BIRAC is supporting Early Translation Accelerators (ETAs) to focus on catalyzing transformation of young academic discoveries (publications/patents) with possible commercial and societal impact into economically viable ventures and technologies. The aim of the ETA is to add translational component to establish proof-of-concept/validation and to attract industry to take these validated technologies further in terms of development.It is expected to collaborate with academic investigators, engage industry and to leverage international translation ecosystems. Although commercialization of early stage technologies is a difficult task, adding this translational component to establish proof-of-concept/validation is a big step towards attracting industry to take these validated technologies further in terms of development.

The ETA is being created to act as an interface between academia and industry, with the main objective of identifying academic ideas with commercial potential and finding a suitable industrial partner for technology transfer and commercialization. The ETA will not only act as an interface, but also play an active role in further developing lab-scale ideas and tailoring them to suit industrial requirements. The network developed by the ETA with academia and industry and the modalities developed for translational research and technology transfer will make the ETA as an attractive proposition to be leveraged by academia as well as industry.

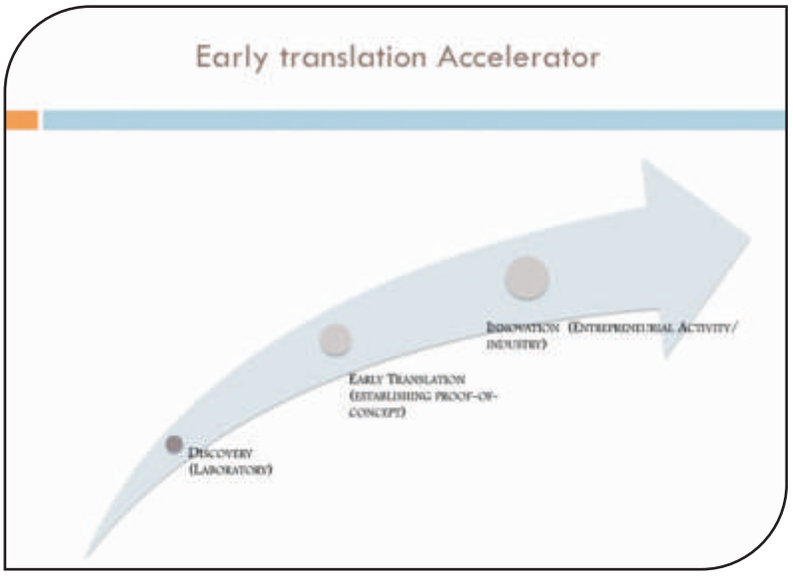
Towards achieving this BIRAC has already supported healthcare ETA at C-CAMP and Industrial Biotechnology ETA (ETA-IB) at IIT-Madras.

A total of three projects were selected and supported under the health care ETA at C-CAMP. These are as follows:

1. Platform for improved erythropoietin (EPO)
2. Validation of novel compounds in neuro-degenerative diseases
3. Validation of novel self-assembled short peptide based nanomaterials for Glioblastoma therapy.

The first project at C-CAMP i.e. Lentiviral Vector Platform for improved Erythropoietin expression concomitant with shRNA mediated host cell elastase down regulation has been completed. There is a process and product patent filed in this project. The technology has been taken by Sekkei Bio Private Ltd. Other two projects are progressing well and are expected to be completed by March, 2019.

The second ETA for Industrial Biotechnology has been established at IIT-Madras in 2017-18. The ETA-IB is involved in the development of a structure for translational research and technology development for production of industrially important proteins and metabolites from natural and recombinant systems. The first project i.e. Cloning, Production and Purification of the Plasmodium vivax malaria biomarker Tryptophan-rich proteins is progressing well and expected to deliver a diagnostic kit that can be used for the detection of Plasmodium infection. Selection of few more projects in the area of industrial biotechnology is in process.



2. Research Alliance for Product Innovation and Development (RAPID)

i. BIRAC - USAID – ICAR – Development of climate resilient wheat cultivars

During 2016-17, BIRAC in partnership with USAID and Indian Council for Agriculture Research (ICAR) had initiated a 5 year long project for development of high-yielding, heat-tolerant wheat cultivars suitable for the Indo-Gangetic Plains. These new varieties shall be developed by building upon the available resources and breeding materials by utilizing information from model systems and currently available modern breeding, genetic, genomic, physiological, and biochemical tools.

During the course of the study, genes/QTLs controlling heat tolerance will be identified, mapped and tagged; improved insight into physiological, genetic, biochemical, and molecular bases of the trait obtained, and a system will be put in place to utilize the new information in cultivar development.

The specific objectives of the project include a) Optimizing MABS at the partner institutions and transfer of already available and newly discovered QTLs for heat tolerance to popular, elite wheat cultivars grown in the Indo-Gangetic Plains, b) Identifying and developing user-friendly DNA markers for the heat tolerance by evaluating wheat germplasm. Lines with highest level of heat tolerance will be used as donors for MABS and MAFB and the newly developed DNA markers will aid selection of heat tolerance by introgression c) Pyramiding various individually introgressed genes and QTLs controlling complementary modes of heat tolerance by doubled-haploid approach to further increase the heat tolerance of the cultivars d) Understanding physiological basis of heat tolerance by first studying the respective roles of various physiological processes in determining heat tolerance and then developing user-friendly, cost effective enzymatic or physiological, high-throughput assays to evaluate wheat lines and segregating material for heat tolerance as well as to differentiate various types of heat tolerance with the eventual objective of combining complementary modes of actions into a single cultivar; and e) Establishing an objective-oriented and targeted approach to train graduate students and junior scientists.

ii. BIRAC-QUT, Australia – Bio-fortification and disease resistance in Banana

BIRAC has supported a technology development and transfer program for bio fortified and disease resistance banana from Queensland University of Technology (QUT), Australia whose overall aim is to address food and nutritional security through bio-fortification.

Under this program, technology transfer has been carried out for developing transgenic varieties of Indian banana (*Grand Naine and Rasthali*) with enhanced micronutrients (iron and pro vitamin A) and disease resistance (*Fusariumand BBTV*).

The program's objectives are being jointly translated by 5 Indian research organisations namely, National Agri-Food Biotechnology Institute (NABI), Mohali, National Research Centre for Banana (NRCB), Bhabha Atomic Research Centre (BARC), Indian Institute of Horticultural Research (IIHR) and Tamil Nadu Agricultural University (TNAU).

Significant progress has been made by the partnering institutions in taking forward the key objectives. Currently, transgenic plants developed using the constructs provided by QUT are at various stages of development and are being evaluated both under laboratory conditions as well as the net house.

iii. Secondary Agriculture

One of BIRAC's key strategy is to focus its efforts on taking basic research to the next stage of innovation value chain i.e. towards translational research. As part of this strategy, BIRAC has decided to set up a Secondary Agriculture Entrepreneurial Network (SAEN) in Punjab to help academic researchers and potential biotech entrepreneurs in transforming their early discoveries to commercially viable validated technologies. The mandate of the proposed set-up is to collaborate with researchers, engage industry and to encourage researchers to work further on their discoveries towards their application.

BIRAC and Punjab State Council for Science & Technology (PSCST) have been discussing the need for creating an enabling ecosystem for development of Agri-Food Biotechnology/ Secondary

agriculture sector in Punjab. This includes mapping the unmet needs of industry as well as requirements of start-ups in this sector and exploring solutions to address the same by networking with the existing institutions.

In this regard, a Brainstorming meeting was held at PSCST wherein the broad concept of a project for setting up Secondary Agriculture/Food Processing Entrepreneurial Network in Punjab has been worked out.

The operational mechanism of the envisioned Secondary Agriculture Network would involve a combination of Top-down and Bottom-up approach i.e. translation of R&D leads of NABI, CIAB and other relevant institutions to commercial ventures, identifying state-specific requirements for value-addition to Agri/horticultural produce as well as the unmet needs of the industry and developing focused programs to address the same.

It was decided that the Core Group comprising PSCST, NABI, CIAB & BioNest-PU will jointly steer this Network and accordingly a proposal was received from them for setting up of the Network. The proposal has been funded and has started in March 2018. The finalized activities of the network are:

i. Assessment of Unmet Needs of Agri/ Food Industry & Development of Technological Solutions to Address the Same.
ii. Technology Mapping & IP Landscape of Research Leads from R&D Institutions/Organization.
iii. Pre-Commercial Validation/Scale Up/ Demonstration/ Commercialization of R & D Leads through Setting-up Early Translations Accelerators
iv. Creating the Pipeline of Incubatees and Entrepreneurs.
v. Capacity Building for Entrepreneurship Development

iv. Waste to Energy Mission

BIRAC with core competency as a knowledge provider can bring about a transformational change in the sanitation condition of the country by fostering and nurturing innovative technologies for Waste treatment, disposal and conversion to value added products. BIRAC can institutionalize a major role in identifying appropriate intervention themes including:

1. Facilitating the development of technologies that could be commercialized or scaled up within a specified time frame
2. Formation of commercially viable model for waste management services

To take this program forward, BIRAC had announced a call for proposals on *Waste to Value* under the 6th Call of SPARSH. A total of 104 proposals were received out of which 6 proposals were recommended for support

IV. Partnerships

a. Co-funding Partnerships

A. International

a) Wellcome trust

BIRAC has collaborated with the Wellcome Trust, a global charity organization based in the United Kingdom, to scout and support innovations in translational medicine in the domain of diagnostics for infectious diseases. The objective of this initiative is to fund translational research projects to deliver safe and effective healthcare products for India at affordable costs through collaborative research. Two proposals have been funded from the first call. The proposal on 'High Sensitivity Multiplex point-of-care assay systems for the detection of blood borne infections in emergency setting' is pursued by THSTI-Designinnova-University of Turku-Kaviogen whereas the second proposal on 'A Bench side molecular assay for detection of carbapenem resistant gram negative bacteria' is pursued by VITAS Pharma. VITAS project is recently completed and focused on developing a molecular diagnostic assay, based on Loop-mediated isothermal amplification (LAMP), for the detection of Carbapenem resistant Gram negative bacteria (CRGNB). LAMP based assays were found to be sensitive enough to detect the resistance in patients samples and multicentric trials (approx. 1800 isolates) have already been performed. The other proposal from THSTI focuses on developing a multiplex point-of-care assay system for the detection of blood borne infections with high sensitivity such as HIV, HCV, HBsAg and HCV core antigen. These projects are regularly monitored. BIRAC is planning to announce a call in collaboration with the Wellcome Trust in 2018-2019.

b) CEFIPRA and Bpi France

BIRAC has joined hands with CEFIPRA – the Indo-French Centre for Promotion of Advanced Research in India to support high quality bilateral research, encourage and enable Indo-French collaboration between public, private research groups, industry, clinicians and end-users. Under this initiative, BIRAC has implemented two partnership programs, one with the French Embassy (2014-15) and another with Bpifrance financement (2015-16). Two calls have been announced till date under these partnerships. The first call in collaboration with French Embassy was announced during 2014 and two projects were selected for funding in the areas of molecular diagnostics for cardiovascular diseases. One project has been completed from first call and has developed mAbs against oxidized ApoA1 which could recognize the human, mice and rabbit atherosclerotic plaques. These monoclonal antibodies were developed for the screening of CVD patient sera and atherosclerotic plaques of CVD patients.

The second call with French Embassy was launched in the areas of Molecular diagnostic for prediction of Alzheimer's & other dementia, new assisting technologies for mobility of physically challenged (incl. prosthesis and robotics applications) and biomaterials & cell engineering for health applications. One project has been recommended and awarded in 2016-17 which is on designing an electrochemical immunosensor for the detection of Amyloid Beta in Biological Fluids of Alzheimer's patients. All these projects are continuously monitored.

Bpifrance financement is a public investment bank which finances businesses from the seed phase to transfer to stock exchange listing through loans, guarantees and equity and provides support to innovation projects. The call for proposals has been launched in the area of digital health & individualized medicine and one project has been recommended for funding in 2016-17 which was monitored in 2017-18. The ongoing proposal is on developing a simple telemedicine tool that can be used by patients and their family and professionals which allows to connect examination devices: blood pressure cuff / sphygmomanometer, thermometer etc.

BIRAC is planning to launch the third call in each partnership in 2018-19 aiming to promote interaction between potential French and Indian participants after deciding upon the scope of calls and themes.

c) USAID IKP-TB

IKP has entered into an agreement with USAID and secured a grant to support ''Innovations in tuberculosis (TB) control in India'' at a 1:1 leverage with funds raised by IKP from other sources. The first call for proposals from IKP focussed on addressing the problem of treatment adherence in collaboration with BMGF.

In the second call for proposals from IKP, BIRAC is supporting new diagnostics for TB in collaboration with USAID. Six proposals have been selected for funding in the first phase of the program i.e. in 2015-16. The projects that are funded in the first phase are in the areas of novel methods for MTB sample collection, detection of infection by X-ray scattering, real time detection by Smart Genie, diagnosis using biomarker signatures and non-invasive & biomarker based triage test for TB. The phase I is complete and as per the review of the progress of the projects three projects have been selected for the second phase of the program. They are a) A filter paper based method of MTB sample collection, transportation and storage at room temperature b) NextGen Real time MTB LAMP detection by Smart Genie and c) Biomarker-based triage test for TB.

All the above three projects are progressing well and are expected to complete in 208-19.

d) Nesta

BIRAC has collaborated with Nesta, a UK based innovation charity organization, for creating a pipeline of innovators for the Longitude Prize, in the area of Antimicrobial Resistance (AMR). Longitude Prize is an initiative of Nesta focused at finding solutions to help tackle the problems in the AMR domain. Longitude Prize is a £10 million prize fund for a diagnostic tool that can rule out antibiotic use or help identify an effective antibiotic to treat patient. Under the ambit of BIRAC-Nesta partnership

for supporting Indian innovations in antimicrobial diagnostics BIRAC & Nesta had organised two calls for soliciting proposals and subsequently arranged for the selection of awardees through a Global Panel of experts from different organizations/institutions. Till now BIRAC has allocated £200,000 towards the BIRAC Discovery Award Fund (BIRAC-DAF).

Since AMR is one of the biggest challenges that the world is facing, our partnership with Nesta has been productive and successfully 9 innovators have been supported till now who are working in exciting projects and will hopefully be strong contenders for the Longitude Prize.

BIRAC Nesta jointly organized a workshop on AMR

B. National Partnerships

a. Ministry of Electronics and Information Technology, Government of India (MeitY)- Industry Innovation Programme on Medical Electronics (IIPME)

Industry Innovation Programme on Medical Electronics (IIPME) is a collaborative project between the, Ministry of Electronics and Information Technology, Government of India and BIRAC, Department of Biotechnology, Ministry of Science and Technology, Government of India. The project is mandated with funding a portfolio of Indian led projects that target innovations in the multi-disciplinary areas comprising of electronics, engineering, medical devices, healthcare, software, algorithms and information technology.

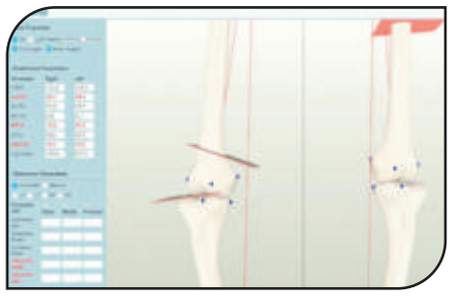
IIPME was initiated in February 2015 to help address the challenges of the medical electronics fraternity and to bring in fast -paced research and development in this hitherto untouched area. The call for proposals was announced in the following areas,

- Imaging and navigation
- Technologies for chronic diseases
- Convergence of medical device and bioinformatics
- Increasing the outreach through Medical electronics

There were two calls announced in 2015 and 2016 which saw an overwhelming response form the Indian researchers, start-ups and SMEs. A total of 288 LOIs were received and through three rounds of evaluation between 2015 and 2017 34 projects were supported. Three projects have been successfully completed and seven more projects are nearing completion. Many of the supported proposals from the first round of selection have reached technology maturation and achieved success in generating early stage technology/prototype. Some of the successful projects from the IIPME scheme have received recognitions and awards at many national and international platforms as promising technologies. Few successful outcomes from the projects supported under IIPME are listed below

1. **X-ray to 3D model conversion software for Surgery Planning**

Through the IIPME seed grant support Dr. Karade has developed a Cloud based 3D Surgery Planning Software, Tabplan3D-XrayTo3D, which will improve the performance of the surgery because of the accurate 3D view of patient's anatomy.The applicant has completed the beta level prototype and tested the proposed solution on 17 patients. Applicant has incorporated a company called "Algosurg Pvt Ltd".Tabplan3D has won Awards like American Bazaar Start-Up Award-2017, US-India Startup Forum; MIMICS Innovation Award - 2016, Asia Pacific Region; Gold Medal, India Innovation Growth Program – 2015 etc.



2. **Hand cranked defibrillator for low resource settings**

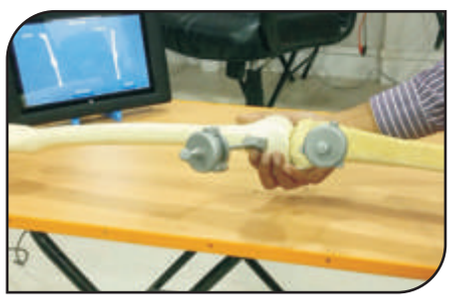
Jeevtronics Pvt. Ltd. has developed an advanced prototype of a very affordable bi-phasic defibrillator with a built-in hand-crank based power generator for low resource settings. The charging circuit was tested with 20 individuals to ensure that the capacitor can be charged to 200 joules in less than 15 sec. Product Design has been completed along with testing for defibrillator life. Project has achieved almost all the proposed milestones. Jeevtronics have won many awards and recognitions like the eN-ABLE Start-up Awards-2016, First runner up-Sankalp Social Innovation Awards-2016, etc.

3. **Artificial Larynx for voice restorationfor voice restoration in throat cancer patients**

An Artificial Larynx based on electronic vibrations for voice restoration in post-operative throat cancer patients has been developed. The miniaturization of vibrator module and a controller unit in the electro larynx has been achieved. The integrated system has been developed and is being tested for its functionalities in volunteers. Applicant has incorporated a company Anahera Healthcare Pvt. Ltd. during the grant period.

4. **Surgical navigation system for orthopedic surgeries**

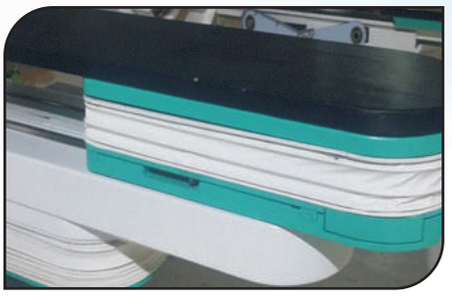
Arthritis Research Pvt. Ltd has developed an accurate, affordable, easy-to-use and portable surgical navigation device for total knee replacement (TKR) surgery. Development of a sensor/array system and motion tracking camera along with a data processor has been achieved. Integrated sensor module, software and a touch screen displaying the limb alignment measurements have been tested on saw bone model. Cadaveric studies and clinical validation are the future plans.



5. **Deafness screening device for newborn**

Developed a novel brain signal acquisition device to screen new born for birth defects (hearing loss) in resource poor settings to prevent speech loss. The device uses Auditory Brainstem response (ABR) technology in an innovative way to provide results to be interpreted by even an unskilled worker. The device has sensitivity of 98.25%, and specificity of 90%. First batch of 20 prototypes has been manufactured and comparative clinical studies

performed. Sohum Device has been commercially launched and has presence in over seven states in India. Sohum has won awards like NASSCOM ICT led Healthcare Innovation Award-2016, First runner up-Sankalp Social Innovation Award-2016 etc.



6. Hexapod couch for LINAC machine

Panacea Medtech Pvt. Ltd has developed a high end electro-medical device which is a Hexapod Computer Controlled Patient Couch for the Linear Accelerator (LINCA) machine for precise radiology treatments. The system has been developed and verified. LINAC integrated with Hexapod computer controlled couch and to be evaluated at hospitals.

7. Laproscopic surgical training simulator

Merkel Haptics Systems Pvt. Ltd has developed a cost effective and affordable hi-fidelity Laparoscopy Surgical Training Simulator for novices and laparoscopic residents to gain additional training outside the operative setting in order to improve patient safety.The device has been validated at medical colleges for user feedbacks and further iterations before market launch.

8. Non-invasive opto-glucometer

Aries Biomed Pvt. Ltd has developed a non-invasive glucometer having a SpO2 like finger probe with Near Infra-Red (NIR) and Radio frequency (RF) sensor and display unit which can transfer data to an App via Bluetooth.The advanced prototype has recently been produced and ISO certified. Clinical testing has been done on large cohorts to prove the efficiency of the device. They are getting ready for commercial launch

b. Bio-toilets in North Eastern India

Given the central importance of sanitation and hygiene in India and in light of the Swachh Bharat Abhiyan, it is important to explore sanitation solutions from different sources. The Department of Biotechnology funded a program executed by The Energy and Resources Institute (TERI) North Eastern Regional Centre, Guwahati to install 100 toilets in schools in North Eastern India, and BIRAC is mandated with the implementation, management and coordination of the entire project.

The proposal is aiming at phase wise installation of 100 toilets and exploring the scale-up option for indigenously available technologies such as bio-digestor technology.

In total 60 toilets have been installed till date. Material has been dispatched for another 40 toilets. All the installations are expected to be completed by the first quarter of this financial year. Six districts each in Assam and Mizoram have been covered for installation. Pamphlets and read outs are being given in all schools for increasing sensitization. Water saving (7 L) has been achieved due to change in design of toilet pan. There is 100% containment with no seepage in ground water and hence, the bio-digester technology may prove to be successful in North East India where the water table is very high.

Biotoilet in a school in Manipur

Reedbed installed at a site in North East India

b. Networks, Platforms and Market Access

i. WISH

BIRACpartnered with WISH (WadhwaniInitiativeforSustainableHealthcare) Foundation (a non-profit organization involved in taking innovation to the end users)for leveraging the network and engage the SCALE programme of WISH to scale the innovations in primary healthcare centres through state governments. The main objectives of this partnership include :

- Identify and assess need based, high potential innovations and demonstrate their technical worthiness for scale up
- Conduct field test beds for demonstration of innovations within public health service delivery system
- Build effective partnerships to identify and nurture innovations
- Facilitate introduction and connect of innovators with public procurement initiatives
- Build an innovation ecosystem to accelerate scale-up of innovations

Taking this partnership forward, a Joint Advisory Group meeting of BIRAC & WISH foundation was convened to discuss and identify the technologies/products which would be validated in the field test beds of primary healthcare centres. These centres would help to create a pipeline for the state governments to systematically induct promising and high impact innovations on continuous basis. Under this Partnership with WISH, in one year, four BIRAC supported products/technologies would be validated.

ii. BIRAC-ICMR

BIRAC and ICMR have signed a MoU, wherein, both the parties decide to establish a collaborative framework under which both can carry out activities related to the exchange of best practices and setting up of coordinated support measures to foster technology and knowledge transfer and cooperation for validation studies.

BIRAC and ICMR together have formulated a model whereby BIRAC supported start-ups can validate their innovations by leveraging ICMR's labs, research facilities and associated resources. The proposed model will enable BIRAC supported startups and SMEs to use ICMR's resources.

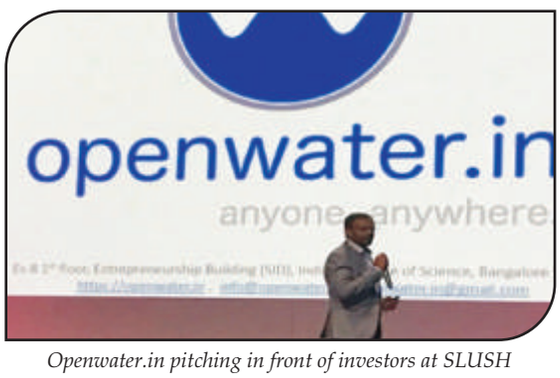
It was agreed that Clinical validation studies for BIRAC supported products/technologies can be performed through ICMR clinical trial network. BIRAC has sent a list of 19 projects which have reached at least TRL6/7 and are ready for human clinical investigations. As informed by ICMR, they will take forward 5-6 projects in Phase-I for clinical validation/ trials.

Out of the five discussed technologies, two were shortlisted for clinical validation at ICMR centres. It was decided that ICMR will help the companies for developing clinical study protocols and validation strategy with funding support from BIRAC.

iii. Tekes

BIRAC has collaborated with Finnish Funding agency – Tekes, for leveraging the expertise and ecosystem at Finland to boost the capacity and network of the Indian Start- ups working majorly in the medical technology Domain. In December 2017, Five BIRAC supported Start-ups along with BIRAC representative participated in the Global Start up event called SLUSH, which provided them the platform for Opportunity to meet with numerous international investors, participate in various talks, interviews, panels, pitches, roundtable discussions and workshops, showcase their product at a demo booth in the heart of the venue.

One of the BIRAC supported start- up **Open water. in** got a chance to compete with the best companies in the investor – pitch session where they presented their technology and the business case, finally they were shortlisted among top 50 companies in the world. The event provided to explore opportunity of business networking and new partnerships for these start – ups



Openwater.in pitching in front of investors at SLUSH

Mrs. Vani Rao, Hon'ble Ambassador – Finland along with the BIRAC delegation

iv. TiE

BIRAC has partnered with TiE-Delhi NCR to leverage each other's strengths for mentoring biotech start-ups and providing continuous platform for BIRAC supported start-ups to interface with funders and investors.

Under the umbrella of this partnership, BIRAC and TiE jointly organized two major activities during 2017-18 as mentioned below:

WInER Awardee receiving the award

BIRAC and TiE launched an award focused at rewarding the women entrepreneurs in biotechnology. The award was named as WInER Award (Women InEntrepreneurial Research). From more than 100 applicants, 15 women entrepreneurs were selected and awarded with INR 5 lakhs each on the International Women's Day celebrations at Vigyan Bhawan on 8th March, 2018. The awards were conferred upon by Dr. Kiran Mazumdar Shaw, Dr. Manju Sharma and Dr. Anil Kakodkar. The awardees would now undergo an intensive one week long accelerator programme at Golden Jubilee Women Biotech Park, Chennai, wherein they will be trained on various aspects related to regulatory, IP, licensing, fund raising etc. The best 3 women entrepreneurs finalists out of 15 would receive further funding of INR 25 lakhs each.

Hon'ble Minister, S&T interacting with BIRAC during exhibition at Vigyan Bhawan

BIRAC-TiE Entrepreneurship awareness workshops for students were organized at three locations: IIT Roorkee, Lucknow Biotech Park and Chitkara University. The workshops witnessed an attendance of over 200 enthusiastic students and their faculty members. Several mentors and successful entrepreneurs shared their journeys, personal experiences and tips to succeed with the participating student community. BIRAC representatives also shared the gamut of possible opportunities that are available for those who want to tread the path of entrepreneurship. The workshops were highly appreciated.

v. IAN

BIRAC signed a MoU with Indian Angel Network (IAN), India's first and arguably the World's largest angel network. This partnership is intended to bring the biotechnology start-ups closer to angel investors, who apart from money will provide invaluable mentoring and global market access. As an activity under this partnership, BIRAC organized a pitching session for 6 BIRAC grantees in front of IAN investors.

MoU signing with IAN

c. BIRAC Innovation Challenge Award

In FY 2017-18, BIRAC launched an innovation challenge Award, SoCH i.e.; Solutions for Community Health to support innovative ideas from individual entrepreneurs, academia and companies under 2 themes through an open discussion on MyGov Portal:

- Platform for reducing disease burden (Communicable & Non-Communicable Diseases)
- Sanitation & Waste recycling

After several rounds of evaluation including Hackathons & Ideathons at four participating bioincubators, 5 applicants were identified as first round of Winners from each theme and the result was announced on BIRAC's 6th Foundation Day. These applicants were awarded INR 15 lakh each and a challenge to develop Minimal Viable Prototype (MVP) under the mentoring by Domain experts in next 6 months. These 10 early winners will now compete for INR 50 lakh award money in each theme.

Early winners of SoCH receiving the award on BIRAC Foundation Day

V. Extramural Project Management Units

i. Program Management Unit at BIRAC- a partnership of the Department of Biotechnology, the Bill & Melinda Gates Foundation, the Wellcome Trust and USAID

➢ **Grand Challenges India**

Grand Challenges India (GCI) is the Indian arm of Global Grand Challenges, launched in 2012 and is the flagship program managed by the PMU at BIRAC for the Department of Biotechnology and the Bill & Melinda Gates Foundation partnership. In 2016, the Wellcome Trust also joined the PMU-BIRAC as a partner.

GCI was launched with the aim of directing funding and research to address some of the most daunting health and development challenges we face today. It does this by fostering Indian-led innovation to develop affordable and sustainable solutions to these challenges, both in the country and across the globe.

The ambit of GCI is intentionally diverse in an effort to include a wide range of research areas that have direct or indirect impacts on public health and development, in order to maximize benefits. GCI also funds projects at various stages in their lifecycle; from basic science research in laboratories, to proof-of-concept projects and potentially to scale-up to innovation projects. GCI is also mandated to work across different disciplines, such as maternal and child health, infectious diseases, vaccines, point-of-care diagnostics, agricultural development, food and nutrition, sanitation and hygiene among others.

In 2017-2018, GCI continued its work in the areas of Agriculture and Nutrition, Sanitation and hygiene, Data analysis, knowledge integration and dissemination, maternal and child health, and encouraging ideation. A new program under a new theme 'Immunizations and Infectious Diseases' was also added to the portfolio of the partnership.

❖ **Maternal and child health**

India is home to approximately one-third of the world's malnourished children. Many of these malnourished babies are born to adolescent mothers in India. Malnourished women are less likely to deliver healthy babies, thereby perpetuating the inter-generational cycle of under-nutrition leading to wasting, stunting and poor development in children. Given its grave importance in India, the GCI partners have made MCH a core theme of the work of the partnership through three currently run programs: All Children Thriving (ACT), HBGDki India and KnIT. Each of these programs attempts to address MCH through different mechanisms, either by funding basic research to understand causal linkages, or by providing opportunities to share data on MCH within the country and abroad to understand the important patterns, trends and issues to better target research as well as policy.

1. All Children Thriving

Keeping in view the global maternal and child death estimates the "All Children Thriving" (ACT) was launched as a third call under "Grand Challenges India" (GCI) initiative. By creating and measuring integrated solutions for healthy birth and development, the call is aimed at ensuring not only the survival of children but also ensures that they lead a healthy and productive life. The following seven projects funded under this program (1 full grant and 6 seed grant) explores a unique element with special emphasis on innovative, impactful research on maternal and child health and development.

i. Creation of a Biorepository and Imaging Data Bank for Accelerating Evidence Generation to Facilitate Children to Thrive, Translational Health Sciences and Technology Institute, Faridabad

The biorepository project is aimed at creating India's first bio-bank or repository of longitudinally collected biological specimens from pregnant women, accompanied with well characterized information on the associated environmental, clinical, social and epidemiological determinants through the course of pregnancy.

On February 2018, a site-visit was made to the project site with the PMC member of the project, Dr. Karlee Silver, Vice President, Grand Challenges Canada (GCC) to have candid evaluation of the project intended activities. The requisite biorepository infrastructure for long-term storage of biospecimens/resources, has been created in an area of 1176 sq. feet. The study team appraised that study has enrolled 4200 pregnant women in the study. Approximately, 50,0000 bio-specimens have been collected and 140,000 images of longitudinal data collated on morphology, biometry, blood flow of uterus, fetus and the placenta.

ii. The Simple Absolute Neutrophil Count as a Measure of Mucosal Inflammation and as a Predictor of Linear Growth in Indian Infants, Translational Health Sciences and Technology Institute, Faridabad

This project is attempting to fill in the primary gap of lack of an inexpensive, simple biomarker of future short stature that can be applied early in life. The study intends to collect blood samples (cord blood, and venous blood at 6- 14 weeks, and 24 weeks of life) as well as stool samples (meconium, and stool collected at 1, 2, 4, 6, 10, 14, and 24 weeks of life) from 200 infants for estimating markers of gut inflammation and correlating them with absolute neutrophil count. Till date, 7920 pregnant women have been screened for this study, of which 4679 fulfilled the eligibility criteria. Informed consent has been obtained from 4135 participants to provide cord blood at the time of delivery, and subsequent blood and stool samples from infants at the aforementioned time points. The enrolment of committed infants in the study (n=200) is over and of these, venous blood for immunophenotyping has been taken at 6 weeks from 66 infants, at 10 weeks from 67 infants, at 14 weeks from 59 infants. Of recruited infants, 121 have completed the follow-up and provided us with the 24-week blood sample.

The PMU-BIRAC team has made site visits to THSTI to review the project progress and also visited the repository being created for storage of serum, stool, cord blood, DNA and RNA samples.

iii. Low-Cost Salivary Progesterone Testing for Detecting the Risk of Preterm births (PTB) in Rural Community Settings of India, Mamta Health Institute for Mother and Child, New Delhi and Mahatma Gandhi Institute of Medical Sciences, Wardha

Currently, there is no simple test/ biomarker available to screen women at risk of PTB in resource constrained settings. The present study aims to evaluate the accuracy and feasibility of salivary progesterone to predict PTB. This simple, non-invasive test by estimating progesterone in saliva will aid in predicting PTB. The study has been planned to recruit pregnant women in first trimester of their pregnancy from Panna and Satna districts of Madhya Pradesh with high crude birth rate of 31.7 and 28.8 respectively and high rate of prematurity (24% of births occurring < 37 weeks). In July 2017, the PMU-BIRAC officials made site visit to the one of the project implementation site i.e. Panna district of Madhya Pradesh to review the technical progress of the project. It was learnt that identification of pregnant women at an early stage of their pregnancy (<12 weeks) is being facilitated by trained health care workers like Accredited Social Health Activist (ASHA's), Auxillary Nurse Midwife (ANMs) and Anganwadi Workers (AWW) through urine pregnancy test (UPT).

Till date, 1800 pregnant females have been registered in the study. The confirmation and dating of pregnancy is done by ultrasonography (USG) scans, these scans are being verified by radiologist at MGIMS, Wardha. Of 1800 females recruited in the study USG scan and saliva collection have been done in 1200 and 700 females respectively. The saliva is collected between 24 to 28 weeks of pregnancy for estimation of progesterone levels, as published literature has reported higher level of progesterone related to PTB during this period of gestation. The collected saliva samples are transferred to MGIMS for storage and subsequent estimation of progesterone levels is done via enzyme linked immunosorbent assay (ELISA).

iv. **Improving linear growth of children in low income settings through integrated nutritional, environmental WASH and care interventions in pregnancy and early childhood a randomized controlled trial from the Society for Applied Studies, New Delhi** aims to establish the maximum growth and developmental potential of infants and children living in poor households through integrated package of interventions. Around 5000 women enrolled in study and out of these 1700 women have become pregnant. Study is progressing well and all interventions are being delivered as per the standard protocols. Consequent to several discussions with the foundation on the need of LGS study to pre-test the nutrition interventions for lactating women and their infants, the TAG, PMU-BIRAC and BMGF together decided to fund a sub-study under LGS trial which is called as the IMPRINT trial. This trial started in Jan 2018 for a period of 2 years and total study subjects around 2000.

v. **Stress outcomes on pregnancy, fetal growth and birth weight. Development of methods to identify mothers at risk of preterm birth and intrauterine growth restriction resulting from maternal stress from National Institute of Biomedical Genomics, West Bengal** plans to develop biological markers of stress during pregnancy that correlate with enhanced risk of adverse outcomes in mothers and their babies. Till date approx. 1400 study participants enrolled. After enrolment of first 1000 pregnant women, the stress score range for each category of low, moderate and high stress defined. Cortisol estimation in hair shaft initiated in women falling under each category of stress.

vi. **An intergenerational prebiotic approach to establishment of a healthy colonic microbiome in infants from** SRM Institute of Medical Sciences (SIMS), Chennai, Tamil Nadu will evaluate the effect of orally administered prebiotic starches on fecal microbiota composition and metabolic capacity, and breast milk microbiota composition and breast milk immune function, in lactating women of childbearing age in a semi-urban setting in India. Completed sample collection. Samples all transported from the two field sites under cold chain conditions to the PI's laboratory in Chennai. Completion of fecal DNA extraction and QC. Short chain fatty acid analysis on fecal samples ongoing by GC-MS and Quantitative analysis of pathogens by PCR is ongoing

vii. **Enhancing nutritional security of pregnant women, infants and young children in rural households of Tamil Nadu, India through agricultural intervention, Centre for Plant Molecular Biology and Biotechnology, Coimbatore in collaboration with Home Science College and**

Research Institute, Madurai and University of California Davis, California, USA will evaluate the development of nutrient rich genotypes in rice possessing the key nutraceuticals and therapeutic clues through which required nutrients such as iron and zinc for pregnant women and infants of rural households will be supplemented sustainably. Improved line of rice will be compared with the traditional parents and other popularly eaten white rice varieties for its nutritional content and therapeutic values. The improved lines of rice having nutritive, anti-diabetic and therapeutic characters may be registered.

❖ **Agriculture and Nutrition**

Good nutrition is essential for increased productivity, reduced poverty and healthier lives. Undernutrition is the largest contributor to child mortality worldwide, and nearly 25 per cent of children under 5 are chronically malnourished in India.

Agriculture's essential role is to ensure that diverse, nutritious foods, adequate to meet the needs of people of all ages, are available and accessible at all times, either from the market or from farmers' own production.

2. Achieving Healthy Growth through Agriculture and Nutrition (AGN)

Shaping and structuring agriculture and food systems in ways that improve the nutrition, incomes and productivity of smallholders farmers and the rural poor was the program goal of the first GCI call titled *'Achieving Healthy Growth through Agriculture and Nutrition'* launched in August 2013.

The supported five pilot studies brought together a multi-disciplinary consortium of interventions to evaluate innovations at the nexus of agriculture, nutrition, and health to reduce the high incidence of low birth weight, early stunting and wasting among Indian infants and empower women in their multiple family roles.

The Technical Advisory Group (TAG) in October 2017, reviewed all five projects that were successfully completed or nearing completion by December, 2017. The TAG discussed consideration for Transition to Scale Grants for some of the projects that had done well to validate their results. It therefore recommended scaling up of the three interventions while adding more clusters to bring out a significant social impact. The Transition to Scale Grants are under discussion.

Upcoming program:

3. Nutrition Sensitive Agriculture

With the Government's renewed focus on nutrition, and the setting up National Nutrition Mission in 2018, it is clear that malnourishment in women and children particularly, is an important focus area for research.

To support this mission, the Executive Committee of GCI approved a program that focused on a food-based approach to eradicate malnutrition and bringing nutrition focus to farming systems from the MS Swaminathan Research Foundation.

The program is focussed on developing and demonstrating location specific nutri-rich plants garden at local KVKs to enrich farming system and to enhance human nutrition in four different agro-ecosystems. The selected districts are highly malnourished or vulnerable districts. The program intends to improve Diet Diversity Score of the undernourished farm household's upto 60% from base level. The program will roll out in FY 2018-2019.

❖ **Sanitation and Hygiene**

Hygiene and sanitation play a fundamental but often ignored role in development and health and without improvement in sanitation infrastructure and practices, any gains we make against infectious diseases and other health issues will be lost. By working in this area, Grand Challenges India, through the Reinvent the Toilet Challenge, encourages Indian innovators and entrepreneurs to lead the charge in conceptualizing truly novel and sustainable technologies and innovations to provide sanitation across the country, which could then possibly be used in other countries facing similar challenges.

4. Reinvent the Toilet Challenge

This program was directed at addressing the problems in sanitation and specifically targeted tThis program was directed at addressing the problems in sanitation and specifically targeted towards Indian innovation and creativity. The mandate of the call was broad to ensure that the most innovative and cutting-edge projects were funded. The call for proposals was also mandated to focus on stand-alone, affordable, environmentally and economically sustainable solutions that did not require connection to the sewer or deployment in rural and poor urban communities that often need them the most. The first round of the RTTC program was launched in 2013 and six projects were funded and five projects were successfully completed by March, 2017. The last project was completed in May 2017.

In May 2017 Executive committee reviewed all six projects and recommended two projects (a. Eram Scientifics and b. BITS Pilani) which had successfully demonstrated proof of concept at a laboratory scale with experimental data, for innovation-to-scale grants. These technologies are simple, cost-effective, reliable and culturally acceptable.

a) Eram Scientific and University of South Florida's collaborative project titled 'Field testing of off-grid, self-sustained, modular, electronic toilet for slums, with solar energy for Indian weather and integrated with mixed waste processing unit, with water, energy / fertilizer recovery'
b) BITS Pilani's - 'Empowered septic tank as decentralized wastewater treatment system' project were proof-of-concepts for employing new technologies for the entire waste management process.

❖ **Data analysis, knowledge integration and dissemination**

Effective research can be done and impactful policy created only when it is based on validated evidence. Substantive amounts of research is already being done all over the world but in a fragmented manner; some as published data, some in manuscripts form and some as unpublished datasets. There is therefore a pressing need to bring data from different sources together and to systematically analyze it to inform further research and policy formulation. The HBGDki India and KnIT programs work in this area and work synergistically by analyzing Indian and global data to identify the right questions that are important for India, collecting the available data, packaging it for policymakers and identifying research gaps to direct future research.

5. Knowledge Integration and Translational Platform (KnIT)

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 works by identifying gaps in our knowledge and policy and synthesizing currently available evidence to improve our understanding of current or new interventions or packages of interventions to address the major health issues in our country.

The platform operates through two Domain centres that work on two important tracks, Nutrition and Maternal and Child Health.

The Nutrition track examines public health and medical interventions to mitigate stunting,

wasting, severe malnutrition, low birth weight, optimal body composition and metabolic unfitness or obesity. In the last year, this track has collated and produced publications across four thematic areas which are low-birth weight, anaemia, diarrheal mortality and wasting and stunting in the first 6 months of life and associated maternal, social or environmental factors and caregiving practice among others.

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. In the last year, the MCH Domain centre has worked on providing a system level situation analysis and diagnosis of the care of sick and small new borns at the district level. This is being conducted through systematic reviews and specially designed surveys and data analysis methods primarily from Himachal Pradesh.

Currently, the Society for Applied Studies (SAS) and the International AIDS Vaccine Initiative (IAVI) are the two domain centres that are working on the nutrition track and the Maternal and child health track respectively.

6. Healthy Birth, Growth and Development knowledge integration (HBGDki) India

The Bill & Melinda Gates Foundation initiated the Healthy Birth, Growth and Development knowledge initiative (HBGDki) which supports the rapid aggregation and comparison of data from these fragmented sources by providing a single platform for this data to be stored.

This initiative will essentially create a knowledge compendium that will allow researchers and others to access a variety of data from different parts of the world, to allow them to obtain a much clearer picture of global trends and analyses on factors that affect child birth and subsequent development. The three major areas of focus for this initiative are: *Preterm birth, physical growth faltering and impaired neurocognitive development.*

11 collaborators signed agreement to share 24 datasets, 23 datasets have been curated and uploaded on GHAP Platform.

Grand Challenges Explorations Workshop, December 2017

The HBGDki India Grand Challenges Explorations Workshop was hosted by the Program Management Unit – BIRAC, jointly supported by the Department of Biotechnology (DBT), Government of India, BIRAC, the Bill & Melinda Gates Foundation and the Wellcome Trust in New Delhi in December, 2017.

The HBGDki community workshop was to socialize about HBGDki progress using two new tool, and engage in broad conversation to define the India global health problems where data, models, and tools are likely to lead to transformative solutions.

The two day workshop was inaugurated by Secretary, Department of Biotechnology, Government of India, Prof. K. VijayRaghavan on 5th December 2017 brought together clinical researchers, data scientists, global health thought leaders and the HBGDki staff to collaborate, share knowledge, and generate transformative new ideas and was attended by over 60 participants from India and abroad.

Prof. K. VijayRaghavan addressing the participants of the workshop

The Healthy Birth, Growth and Development knowledge initiative (HBGDki) Workshop sessions were designed to provide the audience with an overview of the HBGD platform and included a detailed introduction to the working of the platform. The HBGDki sessions also included Action Labs where participants were provided the access to tools and were introduced to its working and could follow it on their own laptops for hands-on experience.

Followed by the inspiring stories from lightning talks from HBGDki India contributors, the design-thinking session engaged attendees to help select the best call topics for data specific GCE for India perspective.

The HBGDki community

❖ **Encouraging ideation**

Great ideas come from everywhere' and 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. This is the core belief behind this thematic area and today the GCI partners run the Grand Challenges Explorations –India program which is implemented by IKP Knowledge Park and managed by PMU-BIRAC.

7. Grand Challenges Exploration-India

The Grand Challenges Exploration-India (GCE-India) is one of the path breaking program under Grand Challenges India (GCI) initiative. This fast-track program is aimed at identifying, nurturing and encouraging innovative ideas to create novel, indigenous technologies to improve the public health situation in India. Although, GCE-India mirrors global GCE program of the Bill & Melinda Gates Foundation (BMGF), however, being India-centric, it addresses challenges that are specific to the Indian health ecosystem. The program supports proof-of-concept or initial validation of ideas with seed grant that eventually lend themselves to be incubated in start-ups across India resulting in venture creation. The call is managed by PMU-BIRAC and is implemented by IKP Knowledge Park.

Since, inception four calls have been launched under this program. The Round 3 of GCE-India program was launched on 15 July-31 August 2017 (for a period of 45 days) with focus on 14 problem statements. Of 237 applications received under this call, five proposals were provided funding support. Till date 12 projects have been supported under this program.

GCE-India Round 4 call was launched on 15 February- 31 March 2018, with focus on 13 problem statements. The number of applications received under this call were 777 and they are under triage.

❖ **Immunizations and Infectious diseases**

In FY 2017-2018, a new theme was added to the portfolio of the PMU-BIRAC and GCI, Immunization and Infectious diseases, which will focus on the funding of R&D in these areas.

The increasing importance of this theme in India is evident with the emphasis on immunizations and infectious diseases and emerging public health threats such as AMR by the Government of India.

Under this theme, the partnership will focus on the development of new vaccines, innovations in immunization data systems and antimicrobial resistance over the next financial year.

8. Improving Immunization Data Systems (IDIA)

Grand Challenges India fourth thematic call was announced on 15th November, 2017 on 'Immunization Data: Innovating for Action', a program directed at addressing challenges faced in collecting, analyzing and using data on immunization and health. The call was open for 60 days with funding support from Department of Biotechnology, GoI and the Bill & Melinda Gates Foundation to support the set of projects aligned to the Indian strategy requirement and in technical partnership with the Ministry of Health and Family Welfare, Government of India, the Department of Health Research (DHR) and the Indian Council of Medical Research (ICMR), who will be providing their valuable technical and practical inputs in selecting and reviewing projects.

The program explicitly seeked solutions that focus specifically on conceptualizing and demonstrating innovations in data systems for immunization to aid in real-time visibility of correlation between consumption and coverage of immunizations and should have the potential to be scaled up in multiple settings. The overall goal is to seek ideas that should potentially translatable to practical interventions in India's immunization programme.

The Phase 1 funding support in form of grant at a maximum of $200,000 per project is for developing proof of concept in 12-18 months, for a maximum of 10 projects. Phase 1 required preliminary data and are meant to provide an opportunity to develop, refine, and rigorously test approaches that have previously shown promise in controlled or limited settings.

The Phase 2 funding support in form of grant is for validating impact in 18-24 months for follow funding to scale the most successful and impactful projects from Phase I, with the ultimate aim being integration into the government program.

The call was closed on 15th January, 2018 at 11:59:59 PM and accepted 70 applications that were submitted online only. The screening was done on the 70 applications internally which assessed early eligibility of proposals which reviewed the scope of the proposal as per the mandate pre-defined in the call RFP and did due diligence of submitted documents.

The eligible proposals were sent to the Area Review Panel (ARP) for expert assessment. Each proposal was assigned to three reviewers. The scores of the reviewers were then normalized and the successful proposals were invited to present their idea to the Technical Advisory Group (TAG) of the program.

Upcoming programs

In 2017-2018, three new programs were in the planning stages, including a new call on innovations to address antimicrobial resistance in India.

The third program was in the planning stages in the same year and is a new experimental program, the 'Sentinel experiment in India' planned for a tentative launch in FY 2018-2019. This program will focus on creating and fostering delivery of more appropriate (affordable, deliverable and scalable) versions of extant interventions; to drive the discovery and development of new transformational advances toward impact that cannot otherwise be achieved. The program will be run as an experiment by the PMU-BIRAC on behalf of the Bill & Melinda Gates Foundation. The program is expected to help in catalysing innovation for the discovery and translation of transformative solutions to global health and development inequity.

ii. Industry-Academia Collaborative Mission for Accelerating Discovery Research To Early Development For Biopharmaceuticals - Innovate in India for Inclusiveness (i3)

The program named Innovate in India (i3) is an industry- academia collaborative mission of Department of Biotechnology (DBT) in collaboration with World Bank for accelerating discovery research to early development of Biopharmaceuticals and will be implemented by Biotechnology Industry Research Assistance Council (BIRAC). The program was approved by the Cabinet for implementation in May 2017 with a total cost US$ 250 million which is 50% co-funded by World Bank.

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, medical devices and diagnostics to address the rising burden of diseases in the country.

Launch of the National Biopharma Mission

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. Focussing on product development, the Mission will strengthen and create shared infrastructure for product development and validation of Centre of Excellences for knowledge generation and skill development for technology strengths and technology management This mission will develop platform technologies for product validation, link institutions to strengthen clinical trial networks, promote partial de-risking for novel products, and build capacities in emerging areas such as translational bioinformatics, bioethics etc. This will be a great platform which will offer buoyancy as well as universal support to biotechnological innovation, and transform India into a global hub for cutting-edge biotechnology research and development.

The programme will help deliver 6-10 new products in the next five years, create several dedicated facilities for next-generation skills, and hundreds of jobs in the process. It intends to collectively fill the missing link between the discovery and development and bring together private sector, Government and academia which we can call triple helix of medical innovation which can spur further development. The initial focus will be on Vaccines for Pneumococcus, Dengue and Biosimilars for cancer, diabetics and rheumatoid arthritis and medical devices and diagnostics.

It promises to boost the growth curve for domestic biopharma in India by accelerating the translation of research concepts into viable products, enabling sustainable networks for collaboration between industry and academia, and supporting entrepreneurial ecosystem amongst many others. The program has a great potential to take it further & move the idea of Make in India to Innovate in India (i3).

Present Status

In December 2017, the programme launched the following calls inviting applications from academia and Industry for grant-in-aid funding. The submitted applications have been reviewed by the Scientific Advisory Group and Technical Advisory Group and undergoing further technical and financial due diligence.

Biotherapeutics

RFP 1: Biosimilar – Product Development
RFP 2: Process Development Laboratory
RFP 3: Chemistry, Manufacturing, Control Units
RFP 4: cGLP validation facility for Bio therapeutics
RFP 5: Cell line repository

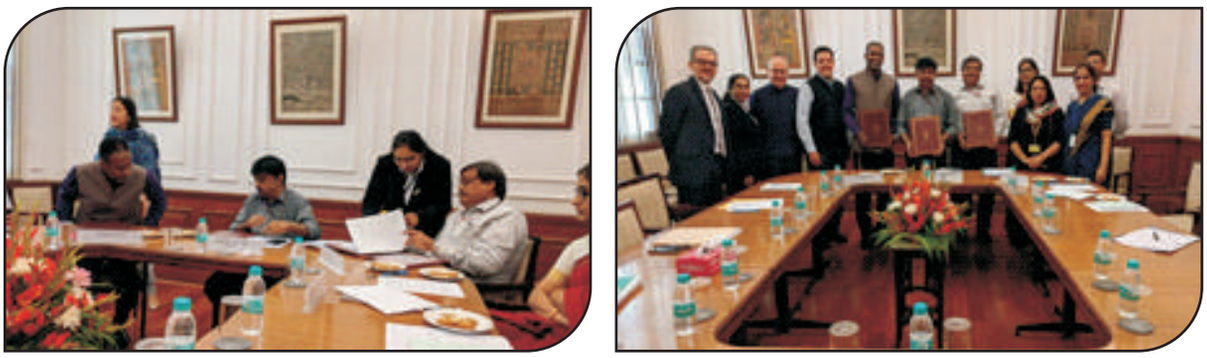
Vaccines

RFP 1: Novel Vaccine candidates for HPV, Dengue and Pneumococcal
RFP 2: Novel and complex vaccine candidates for other diseases of high burden and Priority in India

Medical Devices and Diagnostics for developing core Technology for the identified segments.

A dedicated 6-membered team has been recruited to manage this Project Management Unit (PMU) established at BIRAC.

The Department of Economic Affairs, World Bank and BIRAC signed the Loan Agreement and Project Agreement for implementing the "Innovate in India for Inclusiveness (i3)" Programme on 24th April 2018



Signing of the Loan Agreement and Project Agreement for implementing the 'Innovate in India for Inclusiveness (i3)' programme

VI. Specialized services

1. IP & TT

The in house IP & Technology Management cell at BIRAC provides support to start-ups, academia and SMEs on various aspects of IP & Technology Management such as Patent searches, landscaping, patent drafting, filing, freedom to operate, Technology evaluation and assessment.

BIRAC undertakes an extensive IP evaluation of proposals that it receives for its flagship funding programmes such as BIPP, SBIRI, PACE, IIPME, SPARSH, BMGF, Wellcome Trust, National Bio-Pharma Mission and BIG. In addition to this, it also provides clarity on many of the IP and licensing issues in collaborative research projects including international projects.

BIRAC extends support to protect the emerging intellectual property from innovative R&D projects from start-ups & SMEs funded by BIRAC. In this regard, BIRAC started "Patenting & Technology Transfer for Harnessing Innovations (PATH)" scheme to support the Intellectual Property and transfer of technologies through its empanelled IP & Technology Transfer Firms. Scheme was launched in 2013 and under the scheme; five (5) industries have been supported so far.

Apart from the various IP & Technology Management offerings, the BIRAC IP & Technology Management cell also organizes several IP & Technology Management awareness and capacity building workshops for Start-ups, SMEs and academicians. In 2017-2018, two such workshops were organized at different locations such as Pune and Jaipur.

➢ **Patent & Technology Transfer for Harnessing Innovations (PATH)**

To facilitate the protection of Intellectual Property of entrepreneurs, industries and SMEs, BIRAC has initiated a Patenting & Technology transfer for Harnessing Innovations (PATH) scheme, to encourage the technological innovation in the country.

To implement the scheme, BIRAC has also empanelled technically competent and experienced IP & Technology Transfer (TT) firms who could provide assistance for Patent search, filing, drafting and commercialization of such technologies if required. BIRAC supported projects under BIG, SBIRI and BIPP can avail assistance for IP generated in the funded program. A total of five patents have been supported through the PATH.

Patent filing support has been extended for Complete Indian filing, PCT filing and national phase entries in different countries such as US, EU, Australia, UK and India. These patent applications are filed mainly in the area of secondary agriculture, agriculture and healthcare.

VII. Mentoring and capacity building

1. BIRAC-University of Cambridge Entrepreneurship Education Programme - IGNITE

BIRAC partnered with CfEL, Judge Business School (JBS) at University of Cambridge in 2013 for Ignite programme with an aim to provide the bioentrepreneurs opportunities to transform their innovative idea to a successful business venture.

In FY 2017-18, four BIG Grantees were awarded the Ignite fellowship to attend the training programme at JBS.

Ignite programme was scheduled for two weeks. The first week was embraced with lecture series by renowned and qualified mentors covering various areas of entrepreneurship such as Value Proposition, Preparation of Business Models, Team building, defining Marketing Strategy, Finance and Business Negotiations etc. The second week started with meeting startups from Cam Bioscience, Accelerator Cambridge for exchange of knowledge and experience among themselves. There were visits to renowned companies of UK such as Swift Molecular Diagnostics, PharmEnable, Astra Zaneca, Spirea. Site visits were followed by workshops for BIRAC Innovators on "company structure", "how to pitch", "branding of your products".

BIRAC BIG Ignite fellows at Judge Business School, University of Cambridge, UK

Overall the candidates were delighted and the programme provided a great platform to make international collaborations, networking and pitching with investors and polish their business idea. BIRAC plans to continue its participation in the IGNITE program

2. Roadshows and Grant writing

BIRAC is committed towards stimulating, fostering and nurturing the entrepreneurial flair in the Indian biotech ecosystem for which researchers, students, academic faculties and budding entrepreneurs are the focal points. The objective of the roadshows and IP workshops is to sensitize the target audiences about the BIRAC support for the entrepreneurs and the importance and relevance of intellectual property in the biotechnology regime. Moreover, these workshops also provide a platform for the aspiring entrepreneurs to gain knowledge about effective grant writing skills from the experts in the domain. The main aim is to motivate the students and researchers to take entrepreneurship as a career, since BIRAC has the mechanism to support them and to make the young entrepreneurs aware of the power of intellectual property and ways to manage it. Roadshow cum IP workshop for the financial year 2017-18 was conducted in the University of Rajasthan, Jaipur.

3. Hands-on training for skill development and Regulatory workshops

Hands-on Trainings

Realizing the importance of conducting hands-on training workshops for upgrading the technical skills of the start-ups and industry personal, BIRAC organizes hands on training workshop regularly. The following five hands on training workshops were organized during 2017-18.

1. Hands-on training workshop on "High end analytical instruments" with IKP Knowledge Park, Genome Valley, Hyderabad (13th-16th November, 2017)"

The training program focused on latest technologies with hands-on experience and demonstrations through onsite analytical instrumentation facility. The hands-on training consisted of three modules, each module consisting of detailed theory and practical application of the analytical instrument(s); Inductively Coupled Plasma Mass Spectrometry (ICP-MS: Agilent 7700x), Liquid Chromatography - Mass Spectrometry (Waters: ACQUITY UPLC H-Class System, TQD), and Nuclear Magnetic Resonance Spectroscopy (NMR, Bruker 400 MHz). The total number of participants in the workshop was 26 from different Institutes.

2. BIRAC CBT- IIT Delhi workshop on CBT COURSE SERIES 2017 (6th-8th December, 2017)

The workshop was organized by BIRAC in collaboration with Center of Excellence for Biopharmaceutical Technology-IIT Delhi. The training program includes the best practices and cutting edge technologies on a diverse set of topics ranging from regulatory approvals, Continuous Processing, Electron Microscopy for Characterizing Biotherapeutics, Design of Experiments to hands on course in downstream processing. There were a total of 10 different modules spanning for a duration of 3 days. The total number of participants attended different modules was 171 whereas the participants registered for CBT Course Series 2017 were 112 as some of the participants attended more than one module.

3. BIRAC– ICT Biosimilar Workshop 2017 (11th to 15th December, 2017)

The workshop on "Hands on Training in Biosimilar/ Biologics Characterisation" at the Department of Chemical Engineering, Institute of Chemical Technology, Mumbai, was held from 11th to 15th December, 2017. The objective of the workshop was to enhance better understanding of experimental design and data interpretation of mAb aggregation during the development of biologics/biosimilar products. Hands-on training was provided to participants on three techniques: Size Exclusion Chromatography (SEC), Dynamic Light Scattering (DLS) and analytical Ultracentrifugation (AUC). Eighteen participants had registered for the workshop of which, two were students from different research institutes and sixteen were from pharma/biotech industry, including Sun Pharmaceuticals, Syngene, Advy Chemicals, HiMedia Laboratories, etc.

4. BIRAC – C-CAMP Hands-on Course on Flow Cytometry (12th to 15th December, 2017)

Training course on Flow Cytometry was conducted by BIRAC in collaboration with C-CAMP from 12th to15th December 2017 at C-CAMP to provide hands-on training in Flow Cytometry Techniques and Applications (Analysis & Sorting) for Academia and Industry. During the wet lab session, practical activities on sample preparation and data acquisition; and analysis were carried out. A total of 13 participants participated in the training course from various institutes like IIT Hyderabad, Reva University, PGIMER, Chandigarh, CCMB, Hyderabad, IICT, TNAU, Coimbatore, GR Danudaran College of Science, Coimbatore and Pfizer.

5. BIRAC– ICT Workshop on "Food Preservation Techniques (26-28 February 2018)

The workshop on "Food Preservation Techniques" was organized at the Department of Food Engineering and Technology, ICT, Mumbai. The workshop focussed on hands-on training on food preservation techniques such as manufacturing thermally processed or dehydrated fruits and vegetable products. The workshop also consisted of an overview on Food Safety Management System (FSMS) for Food Business as well as applying supercritical fluid extraction for high value food components. A total of 13 participants attended the workshop from different institutes and enterprises.

Regulatory Workshops

Workshop on Taking Med-Tech Startups beyond Prototyping: Regulations, IP monetization & Funding

A 2 day Workshop on "Taking Med-Tech Startups beyond Prototyping: Regulations, IP monetization & Funding" was organized by BIRAC and Venture Center, Pune (9th-10th February, 2018).The workshop involved investors and representatives from funding agencies, IP experts and the regulators (from Delhi and Mumbai) as well as regulatory experts as key speakers. A total of 24 speakers and panelists together contributed their expertise to the workshop. A pool of Entrepreneurs/Start-ups, Technology/IP Managers & few researchers with a total number of 49 were registered for the workshop. On the Day 1, the first half was dedicated to the Investment trends in MedTech and early stage Med -Tech ventures and the second half was dedicated to the IP Strategies for Medical Technologies & Case studies and best practices in IP in medical device industry. On the Day 2, the first half was dedicated to the "IP Licensing and Technology Transfer, Valuation of IP/technology" and the second half consists of Regulatory issues and its implications in med tech commercialization.

VIII. Supporting National Programs

Biotechnology has emerged as an integral part of the Indian bio-economy. The estimated value of biotechnology sector was USD 11.6 billion in 2017 growing with a CAGR of 20%. The projected target for the government is to reach the market size value of USD 100 billion by 2025. Currently, Indian biotech industry holds 3% of the global market share and is 3rd largest in Asia-Pacific region.

BIRAC along with Department of Biotechnology (DBT) is playing a crucial role in the implementation and delivery of the flagship programs of the Indian Government, such as 'Make in India' and 'Startup India'. BIRAC recognizes the necessity for entrepreneurship development among the youth in the country and hence has taken initiatives to build, support and promote Indian Biotech Ecosystem in Healthcare, Agriculture and Industrial Biotechnology.

1. Make in India

Make in India is a flagship program that was launched on September 25, 2014 by the Government of India which intends to facilitate investments and build best in class manufacturing infrastructure in India with an aim to give Indian economy global recognition.

Significance of MII Facilitation Cell

- **Role in Strategic Decisions and Policy making**
  - ❖ Make in India (MII) Facilitation Cell provides key inputs for articulating major policy recommendations for the Biotechnology Sector both to DBT and BIRAC. The research and analysis team of the Cell seeks and collates the information required for designing new programmes and initiatives at BIRAC.
  - ❖ Strategy Meets and Stakeholder discussions are organized by the Cell to discuss and formulate the roadmap and strategies for DBT & BIRAC. The recommendations of such meetings are instrumental in evaluating existing and creating new programmes, e.g.:
    - ❒ Facilitation of seamless transition of proposals across different schemes of BIRAC such as from BIG to SBIRI.
    - ❒ Creation of Regulatory Facilitation Cell at BIRAC
    - ❒ Product commercialization Unit creation at BIRAC

- **Resolving Queries related to Startup India and Make in India**

The Facilitation Cell acts as a single window for resolving the queries of startups, entrepreneurs and companies. More than 50 such queries have been handled till now. The Cell connects them to the relevant departments and endeavors that queries are addressed. The Make in India Cell has also developed a dedicated Microsite where all the information related to opportunities and benefits provided by GoI have been put-up in public domain at http://www.birac.nic.in/mii/. The content of the Microsite is regularly updated, e.g., information regarding State and Central Govt. Policies, incentives offered by the Government of India and so on.

- **Make in India Action Plan formulation**

The Action Plans for Make in India 1.0 for Biotechnology Sector have been formulated and regular monitoring is done by the Facilitation Cell. Progress reviews and regular updates of the same are taken by DIPP. Post successful completion of the MII 1.0 Action Plan, a new and focused roadmap for Make in India 2.0 has been formulated by this Cell to facilitate strategic growth of Biotechnology sector for the next 4 years.

- **Communication and Outreach**

Make in India Facilitation Cell has a major role in the Communications and Outreach activities of BIRAC and DBT through:

- Advertisements and Publications: Various publications showcasing BIRAC's role and achievements over the years have been published by the Cell.
- Social media and Microsite: The outreach is also done through Social media and Microsite.
- Innovation Market Places and Investor Pitches organized to connect Innovators and startups to market and Angel & Venture Capital funds.

The Make in India Cell ensures wider dissemination of the Government programmes and other information relevant to the establishment and growth of startups, SMEs and Companies. A

dedicated website has been developed for the information dissemination and handholding of startups and companies (http://birac.nic.in/mii/index.php)

Make in India Facilitation Cell at BIRAC had organized a Strategy Meet in June 2017 to discuss the road map for the Make in India and Start up India in. BIRAC has already started implementing the recommendations.

The facilitation Cell at BIRAC has organised various events and interactions for startups and other Biotech companies such as Investor's Meet for promoting and boosting the entrepreneurial ecosystem of the country along with providing exposure to the budding entrepreneurs and connecting them to relevant Investors and stakeholders.

The cell is also responsible for contributing towards dissemination of information about various initiatives and programmes of BIRAC.

BIRAC Strategy Meet

2. Startup India

Startup India is a flagship initiative of the Government of India, intended to build a strong ecosystem for nurturing innovation and Startups in the country that will drive sustainable economic growth and generate large scale employment opportunities. The Government through this initiative aims to empower Startups to grow through innovation and design. The Prime Minister of India formally launched the initiative on January 16, 2016.

To further strengthen and empower the emerging biotech startup ecosystem, DBT along with BIRAC has drafted a detailed action plan with a mandate of promoting and nurturing the innovation research ecosystem in the country with special focus on startups and SMEs. The main features of the action point are as follows:

- **Objectives**

  To foster and facilitate bio-entrepreneurship

- **Roles and Responsibilities:**

  DBT endeavours to scale up the number of Startups in the sector by nurturing approximately 300-500 new Startups each year to have around 2,000 Startups by 2020. In order to promote Startups in

the sector, DBT shall be implementing the following measures along with BIRAC:

✓ ***Bio-incubators, Seed Fund and Equity Funding:***

- 5 new Bio-clusters, 50 new Bio-Incubators, 150 technology transfer offices and 20 Bio-Connect offices will be set up in research institutes and universities across India.
- Biotech Equity Fund – BIRAC AcE Fund in partnership with National and Global Equity Funds will provide financial assistance to young Biotech Startups.

✓ ***Encouraging and leveraging global partnerships:***

- A Letter of Intent (LOI) has been signed between BIRAC and PerkinElmer. The goal of the partnership is to promote the portfolio of 'Indian led revenue based innovations/start ups' in multidisciplinary areas comprising of medical devices, point of care, algorithms and information technology/software, to help scientists/doctors/public health experts/related fraternity who are dealing/delivering the issues related to maternal health, newborn health and food.
- Amplification of Bio-innovation through BIRAC Regional Bioinnovation Centre (BRBC). The BRBC aims to impart bioentrepreneurs with the necessary knowledge and skills required for converting innovative ideas into successful ventures. DBT shall set up 5 Regional centres or Mini-BIRACs in the next 5 years.

- **Major Activities under Startup India Initiative:**

✓ Presently 30 Bioincubators have been setup across India with world class facilities.

✓ Department is supporting 3 Bio-clusters (NCR, Kalyani and Bangalore) and approval of Pune Bio-cluster is in advance stage.

✓ BIRAC has launched AcE Fund and SEED fund to provide capital assistance to start-ups and act as a bridge between promoters' investment and venture/angel investors.

✓ BIRAC has setup its 3rd BIRAC Regional Bioinnovation Center (BRBC) at Pune.

BIRAC has stimulated the biotech startup culture in the country. We understand that bringing national and international communities of startups together can lead to more collaborations.

Boosting the Startup ecosystem by providing platforms such as Hackathons, Ideathons and Exhibitions and showcasing events

IX. Facilitating Industry Academic Interaction

1. Innovators' Meet

The 6th Innovators Conclave of BIRAC was held at Indian Habitat Centre, New Delhi on 21st-22nd September 2017. The theme for this conclave was "BIRAC Innovations: Propelling the Bioeconomy". The Innovators conclave witnessed the confluence of around 300 Scientists, Entrepreneurs, Industry experts, Policy-makers and Investment Heads. The conclave was inaugurated by the Hon'ble Union Minister for Science & Technology and Earth Sciences, Dr. Harsh Vardhan, and attended by Guest of Honor, Mr. YS Chowdary, Hon'ble Minister of State (MoS), Science & Technology and Earth Sciences.


Dr. Renu Swarup, Prof. K VjayRaghavan, Prof. Anil Gupta, Hon'ble Minister for S&T, Earth Sciences, Dr. Harsh Vardhan, Shri YS Chowdary and Dr. Anil Kakodhar, releasing BIRAC's Stars Entrepreneurs Booklet at the 6th Innovators' Meet

Inaugurating the conclave, the Chief Guest, Dr. Harsh Vardhan, Hon'ble Union Minister for Science & Technology and Earth Sciences, said, "BIRAC led by the DBT is playing a catalytic role in building a 100 billion dollar Indian bio economy. We are now effectively leveraging the research and entrepreneurial capabilities of this sector to address the needs of our people by creating affordable products that have the potential to change lives and catapult India into a brighter future. Our Government is focused on making India a global hub for innovation and BIRAC is playing a crucial role in shaping the biotech innovation ecosystem of India."

2. Foundation Day

BBIRAC celebrated its 6th Foundation Day on March 20, 2018 at India Habitat Center, New Delhi by organizing a knowledge and networking event with the theme "Sustaining Innovation: A Market Driven Pathway". The event was attended by a large number of dignitaries from scientific & industry sectors both from within the country and overseas including an active participation of around 400 start-ups, entrepreneurs & researchers from industry and biotech organization.

The event was inaugurated by Hon'ble Union Minister for Science & Technology, Earth Sciences and Environment, Forest & Climate Change, Dr. Harsh Vardhan and attended by Guest of Honour, Prof Vinod K Paul, Hon'ble Member, NITI Aayog, Govt. of India; Eminent Scientist Prof G Padmanaban along with Prof Ashutosh Sharma, Secretary, DST & DBT and Dr. Renu Swarup, currently Chairperson, BIRAC. The event brought together nearly 400 entrepreneurs and startups, scientists from industry and academia, public and private sector, policy makers, and national & international organizations.

The inaugural session mentioned about several launch pads provided by BIRAC for all the enthusiastic entrepreneurs across the country. BIRAC has over the years facilitated the creation of vibrant start up ecosystem. We are pleased that we are seeing the impact of this ecosystem in not only providing affordable solutions for societal problems but also enhancing innovation competence. It is now important to develop robust pathways to sustain these innovations.

The event also saw the felicitation of Prof. G Padmanabhan, Former Director and current Honorary Professor of the Indian Institute of Science, Bengaluru, on the occasion of his 80th birthday and the release of the second volume of his memoirs, titled 'Doing science in India: My second innings'.

Felicitation of Prof. G. Padmanaban by Hon'ble Minister for S&T, Earth Sciences, Dr. Harsh Vardhan;

Exhibition – Poster display of Products and Technologies;

Announcement of New Partnership b/w BIRAC and PerkinElmer

3. Outreach Initiatives

a. IRACi3 – The Quarterly Newsletter of BIRAC

BIRAC i3, the quarterly newsletter of BIRAC entered into its 4th year in 2017-18 since its launch. This newsletter highlights articles from industry/ academia/ scientific experts and innovators along with the activities of BIRAC. BIRAC i3 has gained traction in the community and is circulated among variety of organisations (Government, Industry and Foundations). Hence, it successfully communicates BIRAC's initiatives for the biotech innovation ecosystem to the concerned stakeholders. The newsletter will continue to enrich the experience of its readers by communicating updates and opinions of industry leaders.

b. National Entrepreneurship Day Celebrations –Workshop organized at Miranda House

BIRAC celebrated **National Entrepreneurship Day on 9th November 2017** by organizing a workshop for young students based around the theme "Catalysing a cultural shift in youth entrepreneurship" at Miranda House. The event was aimed at imparting further momentum to the thrust laid on entrepreneurship by the government and to encourage more youth to become entrepreneurs and job creators. Inaugural session was initiated by the welcome speech of Dr. Pratibha Jolly, Principal Miranda House who welcomed the participants and introduced the objective for celebrating National Entrepreneurship Day by. Dr. Renu Swarup, Senior Adviser, DBT and MD, BIRAC highlighted BIRAC's role in nurturing entrepreneurship. She gave a brief overview of BIRAC's programmes and its journey over the years and how it has been able to transform the Indian Biotech landscape.

Dr. Sanjay Saxena, Head-Investment, BIRAC apprised the participants about the different programs available for startups and entrepreneurs. Ms. Kriti Taneja from FITT Delhi talked about the role of incubators in boosting entrepreneurship. Ms. Geetika Dayal, Executive Director, TiE-Delhi NCR gave an interesting talk on how entrepreneurship can be taken up as a carrier choice. Towards the end of the workshop two of the BIRAC supported startups i.e. Dr. Tripti Bhatnagar from Codon Biotech and Dr. Sudeshna Adak from OmiX Research and Diagnostics Laboratories shared their wonderful journeys as startups with the students. The event concluded with the vote of thanks and was successful in truly inspiring and bringing out the real spirit of entrepreneurship.

Dr. Renu Swarup addressing students on National Entrepreneurship Day

c. BIRAC's presence in Bengaluru TECH SUMMIT 2017

The Department of IT, BT and S&T, Government of Karnataka, organized India's premier Biotech event, Bengaluru India Bio, the 17th edition of the event was scheduled from 16th to 18th November, 2017 at Bengaluru Palace. The theme for the summit was IDEATE, INNOVATE and INVENT. Honorable Chief Minister Shri. Siddaramaiah launched the Bengaluru Technology Summit-2017 at Bengaluru Palace on 16th November in the presence of other dignitaries that included Guest of Honour's, Ms. Anne Berner, Hon'ble Minister for Transport and Communications, Finalnd; Mr. R.V. Deshpande, Minister for LMI and Infrastructure Development, GoK; Mr. K.J. George, Minister for Bengaluru, Development and Town Planning GoK; Shri Priyank Kharge, Minister for IT, BT and Tourism, D. Sudhakar, Chairman KEONICS, C.N. Ashwath Narayan, MLA Mallshwaram Constituency, Dr. Subhash C Khuntia, Chief Secretary, Government of Karnataka, Shri S Gopala Krishnan, Chairman, VGIT & Co-Founder, Infosys, Ms. Vanitha Narayanan, Chairman, IBM

–India, Dr. Omkar Rai, Director, Technology Parks Of India and Dr. Kiran Mazumdar Shaw, Chairman VGBT & CMD, Biocon.A team of two officers Dr. Amita Joshi, BIRAC and Ms. Arshi Mehboob, PMU-BIRAC actively attended the sessions and represented in the tech summit. A joint stall was put up explaining all the BIRAC and GCI funding schemes, its partners through Bio posters.

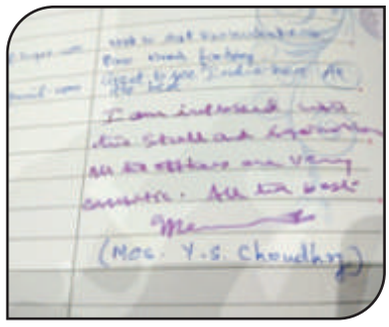
BIRAC at Bengaluru TECH SUMMIT 2017

d. BIRAC's presence at BIO International Convention 2017

BIO International Convention, 2017 was held at San Diego from 19th to 22nd June. The event was attended by 16123 delegates from 74 countries and 48 states. The BIO exhibition from 20th-22nd June, 2017 featured more than 1800 exhibitors including 50+ International, Regional and State Pavilions. The participants included leading biotech and pharma companies, CROs, Academic Institutions, Government Agencies, patent advocacy firms and Venture Philanthropy Organizations. In addition, more than 41,400 partnering meetings were organized with 3500 participating organizations.

Team India at BIO 2017 was represented by members from DBT, ABLE, ICMR, Ministry of AYUSH, BIRAC, State Governments, Kerala State Industrial Development Corporation, IKP Knowledge Park and several Indian Biotechnology start-ups. The India Pavilion was inaugurated by the Minister of State for Science, Technology and Earth Sciences, Government of India, Mr. Y.S. Chowdary on 20th June, 2017. This was followed by the release of the India Biotech Handbook, 2017. The Minister visited the booths in the Pavilion and interacted with the teams. He appreciated the enthusiasm demonstrated by team India.

The BIRAC booth saw several visitors over the span of three days. They were highly impressed by the impact that BIRAC had created in a short span of 5 years. The visitors appreciated the constant support that BIRAC provides to Indian start-ups through various schemes that cater to the different stages of product development, right from Idea generation to pre-commercialization. The technical and IP support provided to applicants was also acknowledged.



Inauguration of India Pavilion and visit of Minister of State to BIRAC booth

e. BioAsia Conference 2017

BIRAC Team at BioAsia 2017

The 15th edition of BioAsia 2018, the flagship event of Federation of Asian Biotech Associations, FABA and Government of Telangana was organized in Hyderabad from 22nd- 24th February, 2018. The convention was host to an array of activities including business partnering, exhibition, and technology conferences with talks from some global thought leaders, interactive sessions, CEO Conclave, start-up showcase, bio park visit, networking dinners and more. The event was attended by Shri Suresh Prabhu, Hon'ble Minister of Industries & Commerce, Government of India; Shri K.T. Rama Rao, Hon'ble Cabinet Minister for Industries & Commerce, Government of Telangana and many others. BIRAC team alongwith its startups showcased several schemes and programs launched by BIRAC during the exhibition. Entrepreneurial community were inquisitive about the BIRAC's various funding schemes, especially the BIG and the BioNEST schemes.

OUR FUTURE PLANS

Grand Challenges India (GCI) program:

GCI plans to add new challenges in the current year which would have an impact on addressing issues in improving maternal & child health, nutrition, medical device innovation and HPV vaccine development. Data management and tools for understanding data will be a priority and will continue to work with various stakeholders to address the most pressing health and development challenges in India.

Program on Synthetic Biology

The area of Synthetic Biology today requires special attention in view of the enormous applicable potential. It is important to develop a clear road map for supporting cutting edge research in this area for potential industrial applications.

Since Synthetic Biology is an emerging technology, BIRAC is intending to support a program on "Synthetic Biology for transition towards a bio-based economy". The main aim of the program will be to generate research, development and commercialization activities by involving industry and academia.

Mission program on Technologies for Swachh Bharat

BIRAC with core competency as a knowledge provider will be able to bring about a transformational change in the sanitation condition of the country by fostering and nurturing innovative technologies for Waste treatment, disposal and conversion to value added products. As BIRAC can institutionalize a major role in identifying appropriate intervention themes including a) Facilitating the development of technologies that could be commercialized or scaled up within a specified time frame and b) Formation of commercially viable model for waste management services, a mission program is proposed with the following approach a) Identify technologies and validate (Phase 1) b) Setting up a translational centre for bioconversion of waste (Phase 2) and c) Scale up.

Innovation and Regulation Facilitation Unit

BIRAC is planning to set up a facilitation unit to address the queries of Start –ups, Entrepreneurs, Researchers, Academicians, Incubation Centres, SMEs etc., on Regulatory pathways and Regulation, Funding opportunities, Mentorship, Investment opportunities, Market access, Industry Academia partnerships and Intellectual Property.

Special Call for proposals

To give extra impetus to entrepreneurship in the field of agriculture, and emerging technologies, in addition to regular call for proposals, BIRAC proposes to launch special calls under various funding schemes

Increase in number of calls

In view of the overwhelming response from the applicants, instead of one, there would be two calls for proposals in a year under SPARSH scheme

Promote Women Entrepreneurship:

As a focussed activity to promote Women Entrepreneurship, BIRAC is planning to set up a Women Entrepreneurship Network across India. Initial discussions with stakeholders are in progress to take up this activity in North East region as a first step.

BIRAC has recently signed a Memorandum of Understanding (MoU) with Association of Lady Entrepreneurs of India (ALEAP) to extend this activity in Vizag. Additionally, through ALEAP associated agencies including South Asian Women Development Forum (SAWDF), BIRAC can envisage to extend the outreach to SAARC nations.

SUPPORTING SERVICES

a. Legal

The Legal cell of BIRAC provides a wide array of advisory and support services including drafting, reviewing, executing and modifying contracts, agreements and internal policies and ensuring that they are in compliance with all statutory or legal requirements.

The services of the Legal Cell also includes providing legal guidance for the on-going and new funding programs, providing legal protection and risk management advice to management, managing the legal due diligence process pertaining to the various funding schemes, advising the management on the modalities of national and international co-funding initiatives facilitating technology acquisition, implementation of the National Biopharma Mission, promoting alternative dispute resolution etc.

b. Internal control system and their adequacy

The Company has established systems providing adequate internal controls, commensurate with the size and nature of the business. Such systems have been appropriately documented. There is a very clear policy to maintain confidentiality and ensure No-Conflict of Interest.

c. Human resources

The HR & Administration Department in BIRAC, with its diverse mix of skill sets and its unique perspective on business operations, is positioned to add strategic value on critical issues across the employee life span from recruiting and on boarding to talent development and retention.

During the year, the Company is continuously working on formulating new employee centric policies and amending the existing ones to cater to the needs of the work force and also to maintain Company's pace with external certainties. The department has focused on continuous improvement to increase efficiency and accountability, while improving services and streamlining administration.

HR Department is constantly in the endeavour to induct right people at the right time to meet organizational needs. The department has put concerted efforts in talent management and succession planning practices, strong performance management and training initiatives to ensure that it consistently develops inspiring, strong and credible leadership. **BIRAC is a growing organisation and succession planning is an integral part of the strategic planning process to connect with the long term goals and objectives of the Company and to help mitigate risk associated with attrition. A holistic succession plan has been implemented across the organization and an integrated, systematic approach has been adopted for identifying, developing, and retaining capable and skilled employees in line with current and projected organisational objectives.**

HR Department reviews the performance of employees in a systematic way and takes it as a developmental tool for all round development of the employee and the organization. **Online submission of Annual Performance Appraisal Reports (APAR) in respect of all executives (E0 and above) is activated in the beginning of the financial year and closes in April – May of the following year with end year appraisal and review. Based on the performance ratings, the contracts of employees are renewed and promotions are awarded. DPC is convened twice a year and assesses the suitability of employees for contract renewals and promotions.**

Training and development activities have played a key role to upgrade the workforce to adopt new

technologies, systems and practices and make the workforce ready to face the future challenges. BIRAC is focussed on enhancing skill development of its employees by organizing in-house trainings and identifying domain specific training in reputed training institutes. **In 2017-18 more than 100 man-days training have been imparted to BIRAC Employees out of which 15 man-days training to 03 employees in Centre of excellence has been imparted for career progression of employees.**

Online quarterly vigilance clearance is updated for Senior Executives (Level -4 and above) as per the DPE norms.

Human Resource & Administration Department in BIRAC strives on implementing employee engagement activities through which employees feels a strong emotional and personal connection to their workplace which in turn reduces staff turnover, improve productivity and efficiency. National events such as Vigilance Awareness Week, Swachhata Pakhwada, Hindi Divas, Anti-terrorism day, Women's Day etc. are also observed in BIRAC with fervour and zeal.

1. **Swachhata Pakhwada** – Cleanliness in office is though observed throughout the year by BIRAC, but significantly during the period of Swachhata Pakhwada (25th September to 02nd October 2017). In the Pledge administered by MD – BIRAC, all employees pledged to contribute to this noble cause. A Number of activities have been undertaken which includes drawing competition and other activities to bring about a change in attitude towards cleanliness. All employees contributed towards the mission and winners were awarded.
2. **Sadhbhawna Diwas –** A pledge taken ceremony was administered in BIRAC on Sadhbhawna Diwas to propagate communal harmony, peace and national integrity.
3. **Vigilance Awareness Week –** Vigilance Awareness Week is observed in BIRAC from 30th October to 4th November, 2017 to encourage all employees to collectively participate in the prevention of corruption and fight against. The basic motto of this week is to create a corruption free society.

In observance to Vigilance Awareness Week, a lecture on the subject has been organised to create awareness among employees regarding the existence, causes and the threat posed by corruption.

Prize Distribution - Swachhata Pakhwada

A discussion on awareness about cleanliness

Pledge ceremony on Sadhbhawna Diwas

A talk on Vigilance awareness

Pledge ceremony on preventing corruption

4. **Hindi Diwas –** Hindi Diwas is observed in BIRAC from 15th to 30th September, 2017 to promote and propagate importance of official language. Hindi Diwas is organized in BIRAC with the unique programs and competitions relate to Hindi Poems, Idioms and songs etc. Each employee actively participated in the same.

Hindi Poetry Competition

Prize Distribution – Hindi Diwas

5. **Anti – Terrorism Day -** The staff observed Anti-Terrorism Day by pledging for promoting peace. The pledge was administered with the objective to wean away the youth from terrorism and the cult of violence by highlighting the sufferings of the common people. The Day is observed to generate awareness in the country among all sections of people, about the menace of terrorism and violence and its effect on the people, society and the country as a whole.

Pledge for Promoting Peace

6. **Women's Day**

Women's Day is celebrated in BIRAC by organizing variety of programs like competitive activities, women's issues, including other women rights promotional activities, exchange of gifts etc. It is celebrated to enhance the worldwide awareness about women, their rights, contributions, importance of education, career opportunities etc.

A talk on Women's achievements

Prize Distribution – Women's Day

With regular communication and sustained efforts HR and Admin Department is ensuring that employees are aligned on achieving BIRAC's strategic mission, while keeping employees engaged and motivated. It strongly believes in fostering a culture of trust and mutual respect in all its employees and seeks to ensure that BIRAC's core values and principles are understood by all.

Vigyan Se Vikas

Report on Corporate Governance

VAP CARE

This Project was Supported
& Funded by BIRAC

REPORT ON CORPORATE GOVERNANCE

1. BIRAC PHILOSOPHY ON GUIDELINES ON CORPORATE GOVERNANCE

Corporate Governance refers to a set of systems, principles and processes by which a company is governed. They provide the guidelines as to how the company can be directed or controlled such that it can fulfil its goals and objectives in a manner that adds to the value of the company and is also beneficial for all the stakeholders in the long term. Stakeholders in this case would include everyone ranging from the board of directors, management, shareholders to customers, employees and society. BIRAC is committed to sound principles of Corporate Governance with respect to all its policies, practices and procedures. The Company's policies clearly reflect its values of transparency, professionalism and accountability. BIRAC constantly strives to uphold these values so as to generate long term economic value to all the stakeholders.

2. BOARD OF DIRECTORS

The Board of Directors currently consists of 6 Directors viz. an Executive Chairperson, an Executive Managing Director and Government Nominee Director and 4 independent directors.

Five Board meetings of the Company were held on the following dates: June 22, 2017, August 22, 2017, September 12, 2017, December 18, 2017 and March 12, 2018.

The details of Directors and Board Meetings attended are as follows:

Name of the Director	Category	Directorships in other companies	Member/ Chairman of of Committees in other companies		Board Meetings attended (Nos.)	Attend ance at last AGM
			Member	Chairman		
Dr. Renu Swarup*	Chairperson's (Executive)	NIL	NIL	NIL	5	Yes
Dr. Mohd. Aslam**	Managing Director (Executive) and Government Nominee Director	2	NIL	NIL	3	Yes
Prof. Ashok Jhunjhunwala	Independent Director	2	NIL	NIL	4	No
Prof. Pankaj Chandra	Independent Director	1	NIL	NIL	5	No
Prof. Akhilesh Tyagi	Independent Director	1	NIL	NIL	5	Yes
Shri. Naresh Dayal	Independent Director	2	NIL	NIL	2	No
Prof. K. VijayRaghavan#	Chairman	NA	NA	NA	4	Yes
Prof. Ashutosh Sharma##	Chairman	NIL	NIL	NIL	1	NA

* Managing Director upto April 9, 2018 and subsequently appointed as Secretary, DBT and Chairperson, BIRAC w.e.f April 10, 2018

** Appointed as Managing Director (Additional Charge) w.e.f. April 10, 2018 in addition to being the Government Nominee Director

Was Chairman, BIRAC upto February 2, 2018

Was Chairman, BIRAC for the period February 3, 2018 to April 9, 2018

None of the Directors are members of more than 10 Committees and/ or act as Chairman of more than 5 Committees as prescribed under the Guidelines on Corporate Governance for Central Public Sector Enterprises (CPSEs) issued by the Department of Public Enterprises (DPE).

There are no pecuniary relationships or transactions of the non-executive directors of the Company.

3. AUDIT COMMITTEE

The Audit Committee was reconstituted as on May 16, 2018 with Dr. Renu Swarup, who was the Managing Director, becoming the Secretary, DBT and thereby, Chairperson, BIRAC and Dr. Mohd. Aslam who was the Government nominee director being given additional charge as Managing Director with effect from April 10, 2018. The Managing Director BIRAC being a part of the Audit Committee, Dr. Renu Swarup ceased to be a member of the Audit Committee and Dr. Mohd. Aslam was inducted as a member of the Committee with effect from May 16, 2018.

The Audit Committee consists of four directors viz. Prof. Akhilesh Tyagi as Chairman and Prof. Pankaj Chandra, Independent Director, Prof. Ashok Jhunjhunwala, Independent Director and Dr. Mohd. Aslam, Managing Director as members. Five Audit Committee meetings were held during the year on the following dates: June 22, 2017, August 22, 2017, September 12, 2017, December 18, 2017 and March 12, 2018.

The details of attendance of the directors at the Audit Committee meeting are as follows:

Name of the Director	No. of audit committee meetings attended
Prof. Akhilesh Tyagi	5
Prof. Ashok Jhunjhunwala	4
Prof. Pankaj Chandra	5
Dr. Renu Swarup#	5
Dr. Mohd. Aslam*	0

 # upto May 16, 2018 **Appointed W.e.f. May 16, 2018*

4. BOARD PROCEDURE

The meetings of the Board of Directors are generally held at the Company's registered office at New Delhi. The Company complies with the statutory requirements for holding board meetings. Apart from the statutory matters requiring Board's approval, all major decisions including key financial ratios, actual operations, feedback reports and minutes of meetings are regularly placed before the Board.

5. SHAREHOLDER INFORMATION AS ON MARCH 31, 2018

Category Code	Category of shareholders	Total No. of shares	Total value of shares (in ₹)	Total Shareholding as a percentage of total number of shares
Shareholding of Promoter and promoter category	President of India	9000	90,00,000	100
	Prof. Ashutosh Sharma (held on behalf of the President of India	900	9,00,000	
	Dr. Renu Swarup (held on behalf of the President of India)	100	1,00,000	
	GRAND TOTAL	10000	1,00,00,000	100

The Company has received its International Securities Identification Number (ISIN) under the depository system.

6. GENERAL BODY MEETINGS

The details of the General Body Meetings are as follows:

Period ended on	Venue		DateTime
31.03.16	MTNL Building, 1st floor,9, CGO Complex, Lodhi Road, New Delhi – 110 003	20.09.2016	10.00 a.m.
31.03.17	MTNL Building, 1st floor,9, CGO Complex, Lodhi Road, New Delhi – 110 003	12.09.2017	4.30 p.m.
31.03.18	MTNL Building, 1st floor,9, CGO Complex, Lodhi Road, New Delhi – 110 003	25.09.2018	12.30 p.m.

7. DISCLOSURES (AS PER DPE GUIDELINES)

1. Company has not entered into any material, financial or commercial transaction with the Directors or the management or their relatives in which they are either directly or through their relatives interested as directors and/ or partners
2. The Company has complied with applicable rules and regulations and no penalties or strictures were imposed on the Company by any statutory authority during the last two years
3. The Company has complied with the applicable provisions of the guidelines of Corporate Governance
4. Department of Public Enterprises vide its OM dated 29.07.2010 advised all CPSEs to submit an annual compliance report on implementation of policies and guidelines issued by DPE by 30th June every year. In compliance of the directives of DPE, BIRAC submitted its compliance report to the Department of Biotechnology for onward transmission to DPE.
5. No item of expenditure was debited in the books of accounts which was not for the purpose of the organisation
6. No expenses of personal nature of the Members of the Board of Directors were incurred out of the funds of the Company

8. MEANS OF COMMUNICATION

Members/ Shareholders are apprised about the performance of the Company at each Annual General Meeting. The Company is an unlisted, private limited Section 8 company and therefore, the need to communicate its quarterly or half-yearly results does not arise.

9. COMPLIANCE CERTIFICATE

In terms of Clause 8.2 of the DPE Guidelines on Corporate Governance, a certificate form a practising Company Secretary, M/sNeelam Gupta & Associates, New Delhi confirming the compliance with the provisions of Corporate Governance forms a part of the report on Corporate Governance.

10. CODE OF CONDUCT

BIRAC is committed to conduct business in accordance with the highest standards of business ethics and compliance with the applicable laws, rules and regulations. A Code of Business Conduct and Ethics in accordance with the DPE Guidelines has been laid down for all the Board members and senior management.

All the members of the Board and senior management personnel have affirmed compliance with the same for the financial year 2017-18. The Code of Business Conduct & Ethics has also been put up on the website of the Company (www.birac.nic.in)

DECLARATION AS REQUIRED UNDER THE DPE GUIDELINES ON CORPORATE GOVERNANCE

"All the members of the Board and Senior Management Personnel have affirmed compliance of the **Code of Business Conduct & Ethics for Board Members and Senior Management** for the financial year ended on March 31, 2018"

Sd/-
Dr. Mohd. Aslam
Managing Director

CERTIFICATE OF COMPLIANCE OF CORPORATE GOVERNANCE AS PER THE GUIDELINES OF DEPARTMENT OF PUBLIC ENTERPRISES (DPE) BY A COMPANY SECRETARY IN WHOLE TIME PRACTICE.

To the members of Biotechnology Industry Research Assistance Council (BIRAC)

We have examined the compliance of the conditions of Corporate Governance by Biotechnology Industry Research Assistance Council ("the Company") for the year ended on March 31, 2018, as stipulated in the guidelines of Corporate Governance for Central Public Sector Enterprises (CPSEs) issued by Department of Public Enterprises (DPE) vide its order dated May 14, 2010.

The compliance of the conditions of Corporate Governance is the responsibility of the Management. Our examination was carried out in accordance with the provisions of the guidelines of DPE and limited to a review of the procedures and implementation thereof, adopted by the Company, for ensuring the compliance of the conditions of Corporate Governance. It is neither an audit nor an expression of opinion of the financial statement of the Corporation.

In our opinion and to the best of our information and based on the submissions, clarifications and explanations given to us, and according to the reports, records and documents maintained by the Company, we certify that the Company has complied with the conditions of Corporate Governance, as stipulated in the guidelines of DPE.

We further state that such compliance is neither an assurance as to the future viability of the Company nor the efficiency or effectiveness with which the management has conducted the affairs of the Company.

For Neelam Gupta & Associates
Company Secretaries

(Neelam Gupta)
Practicing Company Secretary
Proprietor
PCS 6950

Date: 24.08.2018
Place: New Delhi

Vigyan Se Vikas

Auditors' Report & Annual Accounts

Aum Voice Prosthesis

This Project was & Supported & Funded by BIRAC

RMA & ASSOCIATES LLP
CHARTERED ACCOUNTANTS

LLPIN: AAI-9419 / (ISO 9001:2015)
INDEPENDENT AUDITOR'S REPORT

To The Members of
BIOTECHNOLOGY INDUSTRY RESEARCH ASSISTANCE COUNCIL

Report on the Financial Statements

We have audited the accompanying financial statements of **BIOTECHNOLOGY INDUSTRY RESEARCH ASSISTANCE COUNCIL** ("the Company"), which comprise the Balance Sheet as at March 31, 2018, the statement of Income & Expenditure Statement accounts, the Cash Flow Statement for the Year ended 31 March, 2018, and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Financial Statements

The Company's Board of Directors is responsible for the matters stated in Section 134(5) of the Companies Act, 2013 ("the Act") with respect to preparation and presentation of these financial statements that give a true and fair view of financial position, financial performance and Cash Flows of the company in accordance with the accounting principles generally accepted in India including the Accounting Standard specified under Section 133 of the Act, read with rule 7 of the Companies (Accounts) Amendment Rules, 2016. The responsibility also includes maintenance of adequate accounting records in accordance with the provision of Act for safeguarding the Assets of the Company and for preventing and detecting frauds and other regularities: selection and application of appropriate accounting policies; making judgments and estimates that are reasonable and prudent; and design, implementation and maintenance of adequate internal financial controls, that were operating effectively for ensuring the accuracy and completeness of accounting standard, relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatements, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit.

We have taken into account the provisions of the Act and the Rules made there under including the accounting standards and matters which are required to be included in the audit report.

We have conducted our audit in accordance with the Standards on Auditing specified under Section 143 (10) of the Act and other applicable authoritative pronouncements issued by the Institute of Chartered Accountants of India. Those Standards and pronouncements require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and the disclosures in the financial statements, The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal financial control relevant to the Company's preparation of the financial statements that give a true and fair view, in order to design audit procedures that are appropriate in the circumstances. An audit also includes evaluating the appropriateness of the accounting policies used and the reasonableness of the accounting estimates made by the Company's Directors, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

a) In our opinion and to the best of our information and according to the explanations given to us, the financial statements give the information required by the Act in the manner so required and give a true and fair view in conformity with the accounting principles generally accepted in India of the state of affairs of the Company as on 31st March 2018, its Income and Expenditure Account and its Cash Flow Statement for the year ended on that date.

Report on Other Legal and Regulatory Requirements

1. As required by the Companies (Auditor's Report) Order 2016, issued by the Central Government of India in terms of sub-section (11) of Section 143 of the Act, are not applicable,
2. As required by Section 143 (3) of the Act, we report that:

a) we have sought and obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purpose of our audit;

b) in our opinion proper books of account as required by law have been kept by the Company so far as appears from our examination of those books;

c) the Balance Sheet, Statement of Income and Expenditure and Cash Flow Statement Account dealt with by this Report are in agreement with the books of account ;

d) In our opinion, the Balance Sheet, Statement of Income and Expenditure Account, comply with the Accounting Standards specified under Section 133 of the Act, read with Rule 7 of the Companies (Accounts) Amendment Rules, 2016 ;

e) With respect to adequacy of the internal financial controls over financial reporting of the Company and the operating effectiveness of such controls, refer to our separate Report in "Annexure A";

f) With respect to the other matter to be included in the Auditor's Report in accordance with Rule 11 of the Companies (Audit and Auditors) Amendment Rules, 2017, in our opinion and to the best of our information and according to the explanations given to us;

1) The Company does not have any pending litigation which would impact its financial position.

2) The Company did not have any long-term contracts including derivatives contracts for which there were any material foreseeable losses.

3) There were no amounts which were required to be transferred to the Investor Education and Protection Fund by the Company.

Further as per the direction of Comptroller and Auditor General of India we are reporting on the points as asked for u/s 143 (5) as given below:-

S.No.	Directions u/s 143 (5)	Reply
I	Whether the company has clear title/lease deeds for freehold and leasehold land respectively? If not please state the area of freehold and leasehold land for which title/lease deeds are not available.	Not Applicable
2	Whether there are any cases of waiver/ write off of debts/loans/interest etc., if yes, the reasons there for and the amount involved.	Not Applicable
3	Whether proper records are maintained for inventories lying with third parties & assets received as gift/grant(s) from Government or other authorities.	Not Applicable

For **RMA & Associates LLP**
Chartered Accountants
Firm Registration No. 000978N/ N500062

Sd/-
CA. Rahul Vashishtha
(Partner)
Membership No. 097881

Place: New Delhi
Dated: 05.07.2018

Address: Plot No. - A-13, Ground Floor, Lajpat Nagar-III New Delhi - 110024
Phone: 011 -49097836 E-Mail: ca.jamit@gmail.com
Website : www.rma-ca.com

RMA & ASSOCIATES LLP
CHARTERED ACCOUNTANTS

LLPIN: AAI-9419 / (ISO 9001:2015)

Annexure-A to the Independent Auditor's Report,

Report on the Internal Financial Controls

We have audited the internal financial controls over financial reporting of **BIOTECHNOLOGY INDUSTRY RESEARCH ASSISTANCE COUNCIL** ("the Company") as of March 31, 2018 in conjunction with our audit of the financial statements of the Company for the year ended on that date.

Management's Responsibility for Internal Financial Controls

The Company's management is responsible for establishing and maintaining internal financial controls based on the internal control over financial reporting criteria established by the Company considering the essential components of internal control stated in the Guidance Note on Audit of Internal Financial Controls over Financial Reporting issued by the Institute of Chartered Accountants of India. These responsibilities include the design, implementation and maintenance of adequate internal financial controls that were operating effectively for ensuring the orderly and efficient conduct of its business, including adherence to company's policies, the safeguarding of its assets, the prevention and detection of frauds and errors, the accuracy and completeness of the accounting records, and the timely preparation of reliable financial information, as required under the Companies Act, 2013.

Auditors' Responsibility

Our responsibility is to express an opinion on the Company's internal financial controls over financial reporting based on our audit. We conducted our audit in accordance with the Guidance Note on Audit of Internal Financial Controls Over Financial Reporting (the "Guidance Note") and the Standards on Auditing, issued by ICAI and deemed to be prescribed under Section 143 (10) of the Companies Act, 2013, to the extent applicable to an audit of internal financial controls, both applicable to an audit of Internal Financial Controls and, both issued by the Institute of Chartered Accountants of India. Those Standards and the Guidance Note require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether adequate internal financial controls over financial reporting was established and maintained and if such controls operated effectively in all material respects.

Our audit involves performing procedures to obtain audit evidence about the adequacy of the internal financial controls system over financial reporting and their operating effectiveness. Our audit of internal financial controls over financial reporting included obtaining an understanding of internal financial controls over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion on the Company's internal financial controls system over financial reporting.

Meaning of Internal Financial Controls Over Financial Reporting

A Company's internal financial control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A Company's internal financial control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Inherent Limitations of Internal Financial Controls over Financial Reporting

Because of the inherent limitations of internal financial controls over financial reporting, including the possibility of collusion or improper management override of controls, material misstatements due to error or fraud may occur and not be detected. Also, projections of any evaluation of the internal financial controls over financial reporting to future periods are subject to the risk that the internal financial control over financial reporting may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Opinion

In our opinion, the Company has, in all material respects, an adequate internal financial controls system over financial reporting and such internal financial controls over financial reporting were operating effectively as at March 31, 2018, based on the internal control over financial reporting criteria established by the Company considering the essential components of internal control stated in the Guidance Note on Audit of Internal Financial Controls Over Financial Reporting issued by the Institute of Chartered Accountants of India.

For **RMA & Associates LLP**
Chartered Accountants
Firm Registration No. 000978N/ N500062

Sd/-
CA. Rahul Vashishtha
(Partner)
Membership No. 097881

Place: New Delhi
Dated: 05.07.2018

Address: Plot No. - A-13, Ground Floor, Lajpat Nagar-III New Delhi - 110024
Phone: 011 -49097836 E-Mail: ca.jamit@gmail.com
Website : www.rma-ca.com

Biotechnology Industry Research Assistance Council (BIRAC)			
Balance Sheet As at 31st March, 2018			
CIN U73100DL2012NPL233152			
			(Amount in Rs.)
Particulars	**Note No.**	**As at 31.03.2018**	**As at 31.03.2017**
I EQUITY AND LIABILITIES			
(1) Shareholder's Funds			
(a) Share Capital	1	1,00,00,000	1,00,00,000
(b) Reserves and Surplus	2	92,43,26,051	2,82,97,46,998
(2) Non Current Liabilities	3	89,57,87,216	-
(3) Current Liabilities	4	90,21,66,034	29,41,96,887
TOTAL		**2,73,22,79,301**	**3,13,39,43,885**
II ASSETS			
(1) Non-Current Assets			
(a) Fixed Assets			
(i) Tangible Assets	5	1,02,23,661	1,39,57,279
(ii) Intangible Assets	5	3,642	10,304
(b) Long-Term Loans and Advances	6	1,00,36,45,034	1,60,51,84,883
(2) Current Assets			
(a) Cash and Cash Equivalents	7	94,65,06,431	84,26,12,657
(b) Other Current Assets	8	77,19,00,533	67,21,78,762
TOTAL		**2,73,22,79,301**	**3,13,39,43,885**
Significant Accounting Policies and the accompanying Notes to Accounts.	14 & 15		

The notes referred to above form integral part of Financial Statements.

For and on behalf of Board of Directors

Sd/-	Sd/-	Sd/-
Kavita Anandani	**Mohd. Aslam**	**Renu Swarup**
(Company Secretary)	(Managing Director)	(Chairman)
	DIN 06786302	DIN 01264943

Auditors Report
As per our report of even date attached

For RMA & Associates LLP
Chartered Accountants
Firm Reg. No. 000978N/ N500062

Sd/-
CA. Rahul Vashishtha
(Partner)
Membership No. 097881
Place : New Delhi
Date : 05.07.18

Biotechnology Industry Research Assistance Council (BIRAC)

STATEMENT OF INCOME & EXPENDITURE FOR THE PERIOD ENDED 31st MARCH, 2018

CIN U73100DL2012NPL233152

(Amount in Rs.)

Particulars	Note No.	For the Period ended 31.03.2018	For the Period ended 31.03.2017
(1) INCOME:			
Grants Received as Utilised	9	1,67,81,77,807	1,27,52,48,146
Extra-Mural Grants Received as Utilised	11A-F	25,06,37,613	10,68,43,247
Other Income	10	2,54,24,057	3,52,94,035
Total Revenue		**1,95,42,39,477**	**1,41,73,85,428**
(2) EXPENDITURE			
Programme Expenditure	11	1,56,68,17,042	1,18,34,75,845
Extra-Mural Programme Expenditure	11A-F	25,06,37,613	10,68,43,247
Employee Benefit Expenses	12	5,57,00,358	4,92,24,788
Depreciation & Amortisation Expenses	5	40,57,035	48,59,300
Other Expenses	13	6,58,45,756	6,86,89,907
Total Expenses		**1,94,30,57,804**	**1,41,30,93,086**
(3) Surplus of Income over Expenditure before exceptional and extraordinary items		**1,11,81,673**	**42,92,341**
Add/ (Less): Prior Period Income/ (Expenditure) (net)		-	-
(4) Surplus before extraordinary items		**1,11,81,673**	**42,92,341**
Add/(Less): Extraordinary Items		-	-
Add: Depreciation adjusted from Capital Reserve		40,57,035	48,59,300
(5) Income before tax		**1,52,38,708**	**91,51,641**
Less: Provision for Income Tax		-	-
Surplus Carried Forward to Reserve & Surplus A/c		**1,52,38,708**	**91,51,641**
Earning per equity share:			
(1) Basic		1,524	915
(2) Diluted		1,524	915
Significant Accounting Policies and the accompanying Notes to Accounts.	14 & 15		

The notes referred to above form integral part of Financial Statements.

For and on behalf of Board of Directors

Sd/-	Sd/-	Sd/-
Kavita Anandani	**Mohd. Aslam**	**Renu Swarup**
(Company Secretary)	(Managing Director)	(Chairman)
	DIN 06786302	DIN 01264943

Auditors Report
As per our report of even date attached
For RMA & Associates LLP

Chartered Accountants
Firm Reg. No. 000978N/ N500062

Sd/-
CA. Rahul Vashishtha
(Partner)
Membership No. 097881
Place : New Delhi
Date : 05.07.18

Biotechnology Industry Research Assistance Council (BIRAC)			
Cash Flow Statement for the Period Ended 31st March 2018			
CIN U73100DL2012NPL233152			
			(Amount in Rs.)
Particulars		**For the Period ended 31.03.2018**	**For the period ended 31.03.2017**
Cash Flow from Operating Activities:			
Net Surplus as per Income & Expenditure Account		1,11,81,673	42,92,341
Adjustments for :			
Depreciation		40,57,035	48,59,300
Management Expenses		(7,16,495)	(7,16,494)
Foreign Exchange Fluctuation		69,138	(13,449)
Interest Income		(2,46,75,233)	(2,39,78,487)
Operating Profit before Working Capital changes		**(2,12,65,555)**	**(1,98,49,130)**
Increase/(Decrease) in Provisions & Payables		38,44,23,479	3,99,15,723
Increase/(Decrease) in Grant Utilisation		40,88,86,527	11,39,89,687
Increase In Capital Reserve (Non Recurring)		3,16,755	11,61,576
Fund Utilisation Towards PPP Activities (Net)		(83,57,22,163)	22,94,01,665
Provision for Sub-Standard & Doubtful Assets		(18,54,09,997)	(4,39,35,266)
(Increase)/ Decrease in Security Deposit		-	6,55,286
(Increase)/ Decrease in Other Current Assets		90,13,832	87,20,349
(Increase)/Decrease in Advances PPP Activities (Net)		30,81,10,745	8,75,44,035
		8,96,19,178	43,74,53,055
Cash Generated from / (used in) Operations		**7,95,35,296**	**42,18,96,266**
Income Tax Refund / (Paid)		-	-
Net Cash from (Used in) Operating Activities	**(A)**	**7,95,35,296**	**42,18,96,266**
Cash Flow From/ (Used In) Investing Activities:			
Purchase of Fixed Assets		(3,16,755)	(11,61,576)
Net Cash from/(Used in) Investing Activities	**(B)**	**(3,16,755)**	**(11,61,576)**
Cash Flow From/ (Used In) Financing Activities:			
Interest Income		2,46,75,233	2,39,78,487
Net Cash from/(Used in) Financing Activities	**(C)**	**2,46,75,233**	**2,39,78,487**
Net Increase in Cash and Cash Equivalents	**D=(A+B+C)**	**10,38,93,774**	**44,47,13,177**
Cash and Cash Equivalent at beginning of the year	(E)	84,26,12,657	39,78,99,480
Cash and Cash Equivalent at end of the year	**F=(D+E)**	**94,65,06,431**	**84,26,12,657**

For and on behalf of Board of Directors

Sd/-	Sd/-	Sd/-
Kavita Anandani	**Mohd. Aslam**	**Renu Swarup**
(Company Secretary)	(Managing Director)	(Chairman)
	DIN 06786302	DIN 01264943

Auditors Report
As per our report of even date attached
For RMA & Associates LLP
Chartered Accountants
Firm Reg. No. 000978N/ N500062
Sd/-
CA. Rahul Vashishtha
(Partner)
Membership No. 097881
Place : New Delhi
Date : 05.07.18

Biotechnology Industry Research Assistance Council (BIRAC)		
Notes to Financial Statements		
1.Share Capital		**(Amount in Rs.)**
Particulars	**As at 31.03.2018**	**As at 31.03.2017**
A. Authorised		
10,000 (10,000) Equity shares of Rs 1000/-each	1,00,00,000	1,00,00,000
B. Issued, Subscribed & Fully paid		
10,000 (10,000) Equity shares of Rs 1000/-Each fully paid up	1,00,00,000	1,00,00,000
Subscribed but not fully paid	Nil	Nil
TOTAL	**1,00,00,000**	**1,00,00,000**

C. Reconciliation of Number of Shares

Particulars	**As at 31.03.2018 No of shares**	**As at 31.03.2017 No of shares**
Number of equity shares at the beginning	10,000	10,000
Add: Equity shares issued during the period	**-**	**-**
Number of equity shares at the end (closing balance)	10,000	10,000

D. Details of Shareholders holding more than 5% in equity shares of the company

Name of Shareholder	**As at 31.03.2018**		**As at 31.03.2017**	
	No. of fully paid up shares	**% of shares held**	**No. of fully paid up shares**	**% of shares held**
President of India	9,000	90%	9,000	90%
"Dr. (Prof.) Ashutosh Sharma (held on behalf of President of India)"	900	9%	900	9%

E. Other details and Rights

The company has only one class of equity shares issued at par value of Rs.1000 each.
Each equity shareholder has right to one vote per share.
The shares do not have dividend rights.
Shares carry no distribution right in the event of liquidation.

2. Reserves and Surplus		(Amount in Rs.)
Particulars	**As at 31.03.2018**	**As at 31.03.2017**
I. Capital Reserve		
BIRAC Fund (Non Recurring)		
Opening Balance	1,39,67,583	1,76,65,307
Add: On Account of Capital Expenditure during the period	3,16,755	11,61,576
	1,42,84,338	1,88,26,883
Less: Depreciation on Capital Expenditure (Refer Note 4)	40,57,035	48,59,300
(A)	**1,02,27,303**	**1,39,67,583**
II. Other Reserve ($)		
Pre-BIRAC Unrealised Portfolio(*)(#)	1,26,54,05,716	1,65,52,09,818
Pre-BIRAC Portfolio Realised (Cumulative)	91,74,15,521	52,76,11,418
	2,18,28,21,237	2,18,28,21,237
Funds Utilised for Loans under PPP Activities after 31/03/2014(#)	85,45,31,106	77,28,37,748
	3,03,73,52,343	2,95,56,58,985
Less: Provision for Sub-Standard & Doubtful Assets (Refer Note 15.3)	36,96,18,500	18,42,08,503
	2,66,77,33,843	2,77,14,50,482
Less: Transferred to Non- Current Liability	89,57,87,216	-
Less: Transferred to Current Liability	91,74,15,521	-
(B)	**85,45,31,106**	**2,77,14,50,482**
III. General Reserve		
Surplus		
Opening Balance	4,43,28,933	3,65,80,292
Appropriation :		
Less: Fund utilised during the previous year	-	14,03,000
Add: Transfer from Statement of Income & Expenditure	1,52,38,708	91,51,641
(C)	**5,95,67,641**	**4,43,28,933**
TOTAL (A+B+C)	**92,43,26,051**	**2,82,97,46,998**

$ Refer Note 15.16

Include interest not yet realisable amounting to Rs. 14,32,19,156/- (Previous year Rs. 14,84,69,552/-).

3. Non Current Liabilities		
Particulars ($)	**As at 31.03.2018**	**As at 31.03.2017**
Pre-BIRAC Unrealised Portfolio(*)(#)	1,26,54,05,716	-
Less: Provision for Sub-Standard & Doubtful Assets (Refer Note 15.3)	36,96,18,500	-
	89,57,87,216	**-**

$ Refer Note 15.16

4. Current Liabilities		(Amount in Rs.)
Particulars	**As at 31.03.2018**	**As at 31.03.2017**
Unutilised Grant (Refer Note 15.13)		
Unutilised Grant (BIRAC)	-	-
Unutilised Grant (PPP Activities)	1,22,24,591	41,52,403
Unutilised Grant (DBT-BMGF-WT PMU) #	42,70,96,482	23,45,84,837
Unutilised Grant (DBT/Welcome Trust Programme)	-	2,80,70,953
Unutilised Grant (MeitY (IIPME))	(2,22,60,450)	32,30,164
Unutilised Grant (Make in India Facilitation Cell)	4,50,770	69,634
Unutilised Grant (Bio-toilets in schools from North East Region)	1,24,12,762	34,69,977
Unutilised Grant (National Biopharma Mission - I3)	3,77,92,702	-
Unutilised Grant (AcE Fund)	21,47,47,638	-
	68,24,64,495	**27,35,77,968**
Trade Payables		
Trade payables dues to micro and small enterprises (Refer Note 15.15)	27,37,895	6,44,735
Trade payables other than due to micro and small enterprises	1,51,53,762	1,68,73,646
Other Payables		
Pre-BIRAC Realised Portfolio	91,74,15,521	-
Refunded to DBT	72,04,66,688	-
	19,69,48,833	**-**
Statutory Liabilities	39,75,245	31,00,538
Provision for Gratuity (Refer Note 15.17)	8,85,804	-
	21,97,01,539	**2,06,18,919**
TOTAL	**90,21,66,034**	**29,41,96,887**

Refer 15.13 & 15.16

Unutilised Grant under DBT-BMGF-WT PMU is to be utilised over a period of three years.

Biotechnology Industry Research Assistance Council (BIRAC)

5. Schedule of Fixed Assets (Amount in Rs.)

Particulars	Gross Block				Depreciation				Net Block	
	As at	Addition	Sales/ Adjustments	As at	As at	For the Year	Adjustments	As at	WDV as at	WDV as at
	1-Apr-2017	2017-18	2017-18	31-Mar-2018	1-Apr-2017	2017-18	2017-18	31-Mar-2018	31-Mar-2018	31-Mar-2017
Tangible Assets										
Furniture & Fixtures	2,63,07,009	2,70,815	-	**2,65,77,824**	1,36,85,423	32,89,719	-	**1,69,75,142**	96,02,682	1,26,21,586
Office Equipment	2,52,793	45,940	-	**2,98,733**	2,01,269	28,963	-	**2,30,232**	68,501	51,524
Computers	44,52,271	-	-	**44,52,271**	31,68,102	7,31,691	-	**38,99,793**	5,52,478	12,84,169
Total Tangible Assets	**3,10,12,073**	**3,16,755**	**-**	**3,13,28,828**	**1,70,54,794**	**40,50,373**	**-**	**2,11,05,167**	**1,02,23,661**	**1,39,57,279**
Intangible Assets	7,40,419	-	-	**7,40,419**	7,30,115	6,662	-	**7,36,777**	3,642	10,304
Total Intangible Assets	**7,40,419**	**-**	**-**	**7,40,419**	**7,30,115**	**6,662**	**-**	**7,36,777**	**3,642**	**10,304**
Total	**3,17,52,492**	**3,16,755**	**-**	**3,20,69,247**	**1,77,84,909**	**40,57,035**	**-**	**2,18,41,944**	**1,02,27,303**	**1,39,67,583**
Previous Year Figures	3,05,90,916	11,61,576	-	3,17,52,492	1,29,25,609	48,59,300	-	1,77,84,909	1,39,67,583	1,76,65,307

6. Long Term Loans & Advances **(Amount in Rs.)**

Particulars	As at 31.03.2018	As at 31.03.2017
Security Deposit - MTNL Premises	94,08,300	94,08,300
Security Deposit - BCIL	18,956	18,956
Long Term Loans and Advances *(Secured against Bank Guarantee/ Hypothecation/ Personal Guarantee)* *		
Loans Portfolio *(Including Interest on Loan Accounts PPP Activities)- Not yet realisable)* #	2,11,99,36,820	2,42,80,47,565
Less: Current portion of Long Term Loans & advances reflected under Current assets ($)	75,61,00,542	64,80,81,435
Less: Provision for Doubtful Assets (Refer Note 15.3)	33,71,49,132	9,68,14,101
Less: Provision for Sub-Standard Assets (Refer Note 15.3)	3,24,69,367	8,73,94,401.73
	99,42,17,778	1,59,57,57,627
TOTAL	**1,00,36,45,034**	**1,60,51,84,883**

* Refer 15.3 & 15.4.

Interest not yet realisable amounting to Rs. 14,32,19,156/- upto 31.03.2018 (Previous year Rs. 14,84,69,552/-)

($)The current portion of Long term Loans & Advances of Rs.75,61,00,542/- (Previous year Rs. 64,80,81,435/-) includes the overdues as per Note no. 15.4 of Notes to Accounts.

7. Cash & Cash Equivalents **(Amount in Rs.)**

Particulars	As at 31.03.2018	As at 31.03.2017
Cash in Hand	28,923	6,422
Balances with Banks:		
In Current Accounts	1,79,468	3,20,241
In Saving Accounts	67,26,97,540	31,63,62,012
In Fixed Deposits	27,36,00,500	52,59,23,982
TOTAL	**94,65,06,431**	**84,26,12,657**

8. Other Current Assets **(Amount in Rs.)**

Particulars	As at 31.03.2018	As at 31.03.2017
Current Portion of Long Term Loans and Advances:(*)	75,61,00,542	64,80,81,435
(Secured against Bank Guarantee/Hypothecation/ Personal Guarantee)		
Other Assets		
Accrued Interest-FD & Saving Account (PPP, DBT / WT)	32,11,102	1,32,41,046
Recoverable from Government Agencies (Tax Credit)	80,61,566	60,62,311
Prepaid Expenses	36,14,635	10,17,173
Recoverable from BCIL	-	36,45,777
Other Recoverable	9,12,687	1,31,020
TOTAL	**77,19,00,533**	**67,21,78,762**

* Refer 15.3 & 15.4.

9. INCOME (Amount in Rs.)

Grants Received as Utilised	For the Period ended 31.03.2018	For the Period ended 31.03.2017
PPP Activities	1,37,62,09,785	1,01,93,45,494
BIRAC Activities	30,17,31,728	25,03,77,424
Additional Interest	2,36,294	55,25,228
TOTAL	**1,67,81,77,807**	**1,27,52,48,146**

10. Other Income (Amount in Rs.)

Particulars	For the Period ended 31.03.2018	For the Period ended 31.03.2017
Interest Received - Bank Accounts	2,46,75,233	2,39,78,487
Management Expenses - BMGF	7,16,495	7,16,494
Foreign Exchange Fluctuation	(69,138)	13,449
Miscellaneous Income	1,01,467	1,05,85,605
TOTAL	**2,54,24,057**	**3,52,94,035**

11. Programme Expenditure (Amount in Rs.)

Particulars	For the Period ended 31.03.2018	For the Period ended 31.03.2017
Grants Disbursed		
PPP Activities	1,34,13,98,572	98,02,08,206
BIRAC Activities	19,06,07,257	16,41,30,351
Programme Expenditure		
PPP Activities (Operational expenditure on Advertisement, Meeting and PMC)	3,48,11,213	3,91,37,288
Total	**1,56,68,17,041**	**1,18,34,75,845**

11A. Programme Management Unit DBT & BMGF (Amount in Rs.)

Particulars	For the Period ended 31.03.2018	For the Period ended 31.03.2017
Programme Expenditure (GCI)	11,42,62,794	2,38,69,536
Operational Expenditure	6,12,33,006	6,19,16,536
Operational Non Recurring Expenditure	-	46,350
(A)	17,54,95,800	8,58,32,422
Less:		
Programme Funds from DBT (GCI)	5,26,70,095	48,84,167
Programme Funds from BMGF (GCI)	5,90,60,931	1,83,09,167
Programme Funds from US AID (GCI)	25,31,768	6,76,202
(B)	11,42,62,794	2,38,69,536
Less:		
Operational Fund from DBT	40,64,141	70,86,524
Operational Non Recurring Fund from DBT	5,15,265	-
Operational Fund from BMGF	5,12,55,936	5,09,02,091
Operational Non Recurring Fund from BMGF	-	46,350
Operational Recurring Fund from WT	53,97,664	39,27,921
(C)	6,12,33,006	6,19,62,886
(Refer to Note : 15.14.3) (A-B-C)	-	-

11B. Extra-Mural Programme - MeitY **(Amount in Rs.)**

Particulars		For the Period ended 31.03.2018	For the Period ended 31.03.2017
Programme Expenditure		4,47,66,812	1,51,90,750
Operational Expenditure		7,23,802	15,44,686
	(A)	4,54,90,614	1,67,35,436
Less:			
Programme Funds from MeitY		4,47,66,812	1,51,90,750
	(B)	4,47,66,812	1,51,90,750
Less:			
Operational Fund from MeitY		7,23,802	15,44,686
	(C)	7,23,802	15,44,686
(Refer to Note : 15.14.5)	**(A-B-C)**	**-**	**-**

11C. Extra-Mural Programme - Make In India **(Amount in Rs.)**

Particulars		For the Period ended 31.03.2018	For the Period ended 31.03.2017
Programme Expenditure		-	-
Operational Expenditure		33,97,083	38,47,366
	(A)	33,97,083	38,47,366
Less:			
Programme Funds from Make in India		-	-
	(B)	-	-
Less:			
Operational Fund from Make in India		33,97,083	38,47,366
	(C)	33,97,083	38,47,366
(Refer to Note : 15.14.6)	**(A-B-C)**	**-**	**-**

11D. Extra-Mural Programme - Bio-toilets in Schools from NER **(Amount in Rs.)**

Particulars		For the Period ended 31.03.2018	For the Period ended 31.03.2017
Programme Expenditure		80,20,000	-
Operational Expenditure		11,22,470	4,28,023
	(A)	91,42,470	4,28,023
Less:			
Programme Funds from Biotoilets in NER School		80,20,000	-
	(B)	80,20,000	-
Less:			
Operational Fund from Biotoilets in NER School		11,22,470	4,28,023
	(C)	11,22,470	4,28,023
(Refer to Note : 15.14.7)	**(A-B-C)**	**-**	**-**

11E. Extra-Mural Programme - National Biopharma Mission (Innovate in India) **(Amount in Rs.)**

Particulars		For the Period ended 31.03.2018	For the Period ended 31.03.2017
Programme Expenditure		-	-
Operational Expenditure		1,22,07,298	-
	(A)	1,22,07,298	-
Less:			
Programme Funds from National Biopharma Mission (I3)		-	-
	(B)	-	-
Less:			
Operational Fund from National Biopharma Mission (I3)		1,22,07,298	-
	(C)	1,22,07,298	-
(Refer to Note : 15.14.8)	**(A-B-C)**	**-**	**-**

11F. Extra-Mural Programme - AcE Fund **(Amount in Rs.)**

Particulars		For the Period ended 31.03.2018	For the Period ended 31.03.2017
Programme Expenditure		-	-
Operational Expenditure		49,04,348	-
	(A)	49,04,348	-
Less:			
Programme Funds from AcE Fund		-	-
	(B)	-	-
Less:			
Operational Fund from AcE Fund		49,04,348	-
	(C)	49,04,348	-
(Refer to Note : 15.14.9)	**(A-B-C)**	**-**	**-**

12. Employees Benefit Expenses **(Amount in Rs.)**

Particulars	For the Period ended 31.03.2018	For the Period ended 31.03.2017
Salary & Allowances to Staff	4,42,04,916	3,89,20,425
Employer's Contribution to Provident Fund & Other Funds	72,55,255	50,84,003
Consultancy Fee	42,40,187	52,20,360
TOTAL	**5,57,00,358**	**4,92,24,788**

Refer Notes: 14.18 List of Abbreviations used in Financial Statement:

13. Other Expenses **(Amount in Rs.)**

Particulars	For the Period ended 31.03.2018	For the Period ended 31.03.2017
(A) Rent	4,12,69,867	3,96,24,813
(B) Advertisement & Publication	34,60,506	41,28,342
(C) Journal & Subscription	7,85,797	74,41,306
(D) Meetings:		
Meetings & Conferences	54,44,170	45,93,076
Sitting Fees & TA and DA	4,13,498	4,64,109
(E) Office and Administration Expenditure:		
Travel	33,54,414	17,38,464
Office Expenses	48,40,486	49,31,950
AMC Computer	9,45,051	6,97,027
Legal & Professional	3,89,291	7,99,542
Postage & Telephone Expenses	6,42,316	5,92,508
Power & Electricity	18,60,858	15,45,069
Printing & Stationery	3,38,778	3,03,144
Internet Expenses	16,63,906	13,25,256
(F) Training Expenses	2,50,300	3,36,290
(G) Statutory Audit Fees	1,59,300	1,55,250
(H) Miscellaneous Expenses	27,218	13,761
TOTAL	**6,58,45,756**	**6,86,89,907**

Refer Notes: 15.19 List of Abbreviations used in Financial Statement:

14. Significant Accounting Policies

1. Corporate Information

Biotechnology Industry Research Assistance Council (BIRAC) "the Company" is a Section 8 "Not-for-Profit Company" under the provisions of the Companies Act 2013, having CIN U73100DL2012NPL233152. BIRAC is also registered under Section 12A of the Income Tax Act 1961.The Company is engaged in nurturing, promoting and mentoring Research and Development in Biotech Sector.

2. Basis of Preparation of Financial Statements

The Financial Statements of the Company are prepared in accordance with Generally Accepted Accounting Principles in India (Indian GAAP). These are incompliance, in all material respects, with the Accounting Standards notified under the Companies (Accounting Standards) Amendment Rules, 2016, (as amended) and the relevant provisions of the Companies Act 2013. The Financial Statements are prepared on accrual basis and under the historical cost convention.

Preparation of Financial Statement requires the Management to make estimates and assumptions in regard to the reported amount of assets, liabilities, expenses and income of the reporting period. The estimates used in preparation of the Financial Statement are prudent and reasonable. The difference between the actual results and estimates, if any, are recognised in the reporting period in which the results are known and / or materialised.

2.1 Revenue Recognition

i) Interest:

a) Interest on loan granted is recognised on a time proportion basis taking into account the amount outstanding and applicable rate of interest.Interest Accrued, not yet realisable during the year on loans under various schemes are shown under other Reserves.Additional interest on the delayed payment is recognised on receipt basis.

b) Interest against time deposits with banks are accounted on accrual basis.

ii) Royalty is recognised on accrual basis on acknowledgement of amount due by the beneficiary.

iii) Management Fee is recognised on accrual basis in accordance withthe terms of the relevant agreement.

2.2 Grants-in-Aid

Income by way of grants-in-aid has been recognised under Matching Principle of Accounting. All expenditure incurred out of the grants-in-aid, comprising of grants disbursed and other programmatic expenditure are matched with equal amount of income and adjusted against the grants- in -aid. Unspent balance of Grants- in -aid are carried forward as liability to be utilised in subsequent years.

The application of funds for disbursement of loans under different schemes is shown as Loans and Advances under Non-Current Assets. Loans disbursed during the year under different scheme are shown under other reserves as per Matching Principle of Accounting.

2.3 Expenditure

All expenses are accounted for on accrual basis.

Funds released as grants-in-aid are treated as expenditure in the Income & Expenditure Account. Further, amount unutilised as per the Utilisation Certificates received on completion of the projects are accounted as Income.

2.4 Reserve & Surplus

a) Assets acquired are treated as Capital Reserve and amortised every year with depreciation charged.

b) DBT portfolio taken in account by BIRAC from BCIL as on 31.3.2014 vide DBT transfer Order dated 25th September 2012 and approved by Board dated 17th December 2013 was classified as Other Reserves. Consequent to the direction by DBT vide Order dated 8.11.2017, the pre BIRAC Realised Portfoliois to be refunded back to DBT. In accordance to the Order, outstanding unrealised portfolio has been transferred from Other Reserves to Non-Current Liabilities and pre -BIRAC Realised Portfoliohas been transferred from Other Reserves to Current Liabilities. Funds utilized for Loans subsequent to the date of take over along with accrued interest (not yet realisable)during the financial year is continued to be held as Other Reserves.

Provision for any substandard / doubtful / Bad debt that may arise on non-recovery from any borrower would be adjusted against the taken over amount first. Any write-off which is not covered by the amount taken over would be subsequently adjusted against Fund utilized subsequent to the date of take over held under "Other Reserves".

2.5 Fixed Assets

Fixed Assets are stated at cost, net of accumulated depreciation and accumulated impairment losses, if any. Gains or losses arising from disposal of fixed assets are measured as the difference between the net disposal proceeds and the carrying amount of the assets disposed of.

2.6 Depreciation and Amortisation

Depreciation on assets is provided on useful life basis on written down value method as prescribed under Schedule II to the Companies Act, 2013.

Depreciation on fixed assets added/disposed of during the year/period is provided on pro-rata basis with reference to the date of addition/disposal.

2.7 Intangible Assets

Intangible assets acquired are measured separately at cost. Intangible assets are carried at cost less accumulated amortization and accumulated impairment losses, if any. Internally, generated intangible assets are not capitalized and expensed off in the Statement of Income and Expenditure in the year in which the expenditure is incurred.

Intangible assets are amortized over a period of five years as per Accounting Standard - 26 as no useful life provided in Schedule II to the Companies Act, 2013.

2.8 Foreign Exchange Transactions/Translation

Foreign currency transactions and balances: Foreign Currency Transfer is made as per the approved Government guidelines. For any contribution being received from foreign entities, the necessary approval is obtained under the Foreign Contribution (Regulation) Act, 2010.

(i) Initial Recognition: Foreign currency transactions are recorded in the reporting

currency by applying the exchange rate between the reporting currency and the foreign currency at the date of the transaction.

(ii) Conversion: Foreign Currency monetary items are retranslated using the exchange rate prevailing at the reporting date.

(iii) Exchange Difference: Exchange differences arising on long-term foreign currency monetary items related to acquisition of a fixed asset are capitalized and depreciated over the remaining useful life of the asset. The exchange differences on other foreign currency monetary items are accumulated in 'Foreign Currency Monetary Item Translation Difference Account' and amortized over the remaining life of the concerned monetary item.

All other exchange differences are recognized as income or as expenses in the period in which they arise.

2.9.1 Employees Benefits

a) All the employees of the Company are on contractual basis. Provision of Employer's contribution is made as per the provisions of Employees Provident Fund Act, 1952.

b) The Company makes annual contributions under the Employees Gratuity scheme to a fund administered by Trustees covering all eligible employees. The plan provides for lump sum payments to employees whose right to receive gratuity had vested at the time of resignation, retirement, death while in employment or on termination of employment of an amount equivalent to 15 days salary for each completed year of service or part thereof in excess of six months. Vesting occurs upon completion of five years of service except in case of death.

The plan assets are maintained with SBI Life Insurance Company Ltd. Employee Gratuity Scheme. The details of Investments maintained by SBI Life Insurance Company Ltd are not made available and have therefore not been disclosed.

2.10 Operating Leases

Lease payments for assets taken on operating lease are recognised as an expense in the Statement of Profit and Loss as per terms of lease agreement.

2.11 Provisions & Contingent Liabilities

a) Funds sanctioned and yet to be released till the reporting period due to timing difference of milestone are not taken as liability, these are accounted as expenses on actual release of payment.

b) Provisioning on substandard Asset has been provided as per the approved classification of asset based on recoverability.

c) A provision is recognized when the company has present obligations as a result of past event. It is probable that an outflow of resources embodying economic benefits will be required to settle the obligations and reliable estimate can be made of amount of the obligation. Provisions are not discounted at their present value and are determined based on the best estimate required to settle the obligation at the reporting date. These estimates are reviewed at each reporting date and adjusted to reflect the current best estimates.

2.12 Earning Per Share

The company is a section 8 "Not for Profit Company". It does not generate any income/revenue from its activities. It does not distribute any dividend to its shareholders. However for the compliance of AS -20 the company has computed EPS as under:

a) Basic earnings per share are calculated by dividing the net income or loss for the period attributable to equity shareholders by weighted average number of equity shares outstanding during the period.

b) For the purpose of calculating diluted earnings per share, the net profit or loss for the period attributable to equity shareholders and the weighted average number of shares outstanding during the period are adjusted for the effects of all diluting potential equity shares.

15. Notes to Accounts for the period ended 31st March 2018.

15.1 Biotechnology Industry Research Assistance Council (BIRAC) receives funds from Department of Biotechnology (DBT), Ministry of Science & Technology, Government of India by way of grant-in-aid for its operation.

15.2 During the current financial year BIRAC disbursed Rs. 141,67,59,677(Previous year Rs. 116,70,39,793) in various PPP Activities & Rs. 19,15,23,421(Previous year Rs. 16,41,30,351) under BIRAC Activities. Disbursement under PPP Activities includes an amount of Rs. 4,59,15,405(Previous year Rs. 18,68,31,587) disbursed as loans under BIPP & SBIRI Programme. The disbursement were made in tranches as per the milestones determined for the activities. Contingent liability on account of sanctioned grants but not disbursed due to the timing difference of milestone based payments are not accounted.

(Amount in Rs.)

Particulars	Disbursement for the year 2017-18	Disbursement for the year 2016-17
PPP Activities		
Biotechnology Industry Partnership Programme (BIPP)	24,58,40,888	38,00,50,029
Small Business Innovation Research Initiatives (SBIRI)	6,53,50,605	8,31,42,605
Bio- Incubators support Scheme (BISS)	49,37,31,051	24,49,99,690
Biotech Ignition Grant (BIG)	34,29,00,000	33,00,00,000
University Innovation Cluster (UIC)	78,00,000	1,31,60,000
Translation Accelerator (TA)	2,08,57,180	1,12,19,840
Contract Research Scheme (CRS)	11,58,81,738	4,43,47,849
Social Innovation programme for Products: Affordable & Relevant to Societal Health (SPARSH)	5,49,52,515	3,01,19,780
Seed Funding for Incubators	4,00,00,000	3,00,00,000
Total	**1,38,73,13,977**	**1,16,70,39,793**
BIRAC Activities		
Partnership Program	8,30,93,047	6,53,49,378
Capacity Building & Awareness	89,40,287	52,71,678
Technology Transfer / Acquisition	2,13,09,512	6,45,40,127
IP Services	58,65,076	6,02,488
Entrepreneurial Development / Regional Centres	7,13,99,335	2,83,66,680
Total	**19,06,07,257**	**16,41,30,351**

15.3 Loan and instalment due from borrowers shown under Long term Loans & Advances and other Current Assets respectively are secured wholly or partly by way of bank Guarantee / Hypothecation of asset / personal guarantee.

BIRAC has classified the loan assets based on aging of overdue under standard asset, standard asset –Rescheduled, sub-standard asset, and doubtful assets as under:

Standard Asset	Loan accounts not rescheduled and not classified as substandard or doubtful.
Standard Asset - Rescheduled	Loan accounts which, on account of reschedulement, are not classified as substandard or doubtful assets.
Substandard Asset	Loan accounts, other than Standard Asset- Rescheduled, in which payment of instalment is due for more than one year.
Doubtful Asset	Loan accounts certified as doubtful assets by Internal Recovery Committee of BIRAC.

On Classification of an asset from standard to sub-standard or doubtful, interest has been derecognised and requisite provisioning are made for the substandard asset and Doubtful assets. The details of standard, standard- rescheduled, substandard and doubtful assets and the provisions made are given below;

(Amount in Rs.)

Particulars		As on 31.3.2018	As on 31.3.2017
Standard Asset	A	1,33,45,04,464	1,61,08,61,673
Standard Asset – Rescheduled	B	23,30,20,409	29,66,65,594
Sub Standard Assets	C	12,06,74,509	34,24,10,747
Doubtful Assets	D	43,17,37,439	17,81,09,551
Total Assets	**E (A+B+C+D)**	**2,11,99,36,821**	**2,42,80,47,565**
Provision on Substandard Assets	F	3,24,69,367	8,73,94,402
Provision on Doubtful Assets	G	33,71,49,132	9,68,14,101
Total Provision	**H(F+G)**	**36,96,18,500**	**18,42,08,503**
Interest derecognised	**I**	2,26,02,327	1,48,30,502

15.4 The current maturities of the loan & advances amounting to Rs. 75,61,00,542/- (Previous Year Rs. 64,80,81,435/-) includes overdue amount as per Table below and are disclosed under other current assets (Refer to notes to financial statement 8)

(Amount in Rs.)

Age Wise Overdue Position		As on 31.3.2018	As on 31.3.2017
Upto one year	(A)	58,62,554	2,74,35,950
More than one year accumulated	**(B)**	**32,83,62,766**	**26,76,71,102**
	Total (A+B)	**33,42,25,321**	**29,51,07,052**

15.5 Suit Filed Accounts:

15.5.1 Suits filed by the company: 2

15.5.2 Suits filed against the company: Nil

15.6 Programme Management Unit – DBT and BMGF

Department of Biotechnology (DBT) and Bill Melinda Gates Foundation (BMGF) have signed an MOU for supporting priority areas of research. BIRAC has been entrusted the

responsibility to be the "Technical Management Unit". In this regard, BIRAC established a Programme Management Unit to administer programmes, of affordable product development in the area of Health Care and Agriculture. **Refer Note 15.14.3**

15.7 DBT- Wellcome Trust Programme

The amount received from Department of Biotechnology under DBT – Wellcome Trust Programme amounting to Rs.1025 lacs received in the financial year 2012-13 has been returned to DBT. The interest amount is kept in a separate bank account. **Refer Note 15.14.4**

15.8 BIRAC – Extra Mural Programme

(a) MeitY(IIPME): Industry innovation programme on Medical electronics has been initiated by BIRAC in collaboration with Ministry of Electronics and Information Technology, Government of India. **Refer Note 15.14.5**

(b) Make in India Facilitation Cell: BIRAC has established a programme management unit for Biotechnology Industry Facilitation – Make in India Cell to channelize investment in India. **Refer Note 15.14.6**

(c) Bio-toilets in schools from North East Region: BIRAC is undertaking a programme on Bio toilets in schools from North East Region for benchtop demonstration of anaerobic digester for biogas generation and its utilization. **Refer Note 15.14.7**

(d) National BioPharma Mission (I3): The program named Innovate in India (I3) is an industry- academia collaborative mission of Department of Biotechnology (DBT) in collaboration with World Bank for accelerating discovery research to early development of Biopharmaceuticals and to be implemented by Biotechnology Industry Research Assistance Council (BIRAC). **Refer Note 15.14.8**

(e) AcE Fund: BIRAC is implementing the Biotechnology Innovation Fund - AcE Fund initiated by Department of Biotechnology, Govt of India for providing risk capital to Biotech startups for product development cycle and growth phase. **Refer Note 15.14.9**

15.9 Prior Period Adjustment

The prior period items are accounted in accordance with Accounting Standard - 5. The previous year figures are reclassified and regrouped in accordance with the requirements applicable in the current financial year.

15.10 Related Party Disclosure:

The provisions of Accounting Standard-18 are not applicable as there is no transaction between a reporting enterprise and its related parties.

15.11 Provision for Tax:

No Provision for Income Tax has been made in the current reporting period since the company has been registered as a charitable entity u/s 12A of Income Tax Act, 1961 vide order No. 2974 dated 12th May, 2014.

15.12 Foreign Exchange Transactions:

During the current reporting period the following income/expenditure has been incurred.

A. Income: Grant received in foreign exchange to the extent utilised Rs. 11,82,46,299 (Previous Year Rs. 7,38,61,731)

B. Expenditure

S. No.	Particulars	For the Period ended 31.03.2018	For the Period ended 31.03.2017
(i)	Technology Transfer	8,57,941	1,28,17,927
(ii)	Books, Journal and Database Subscriptions	53,39,046	69,24,995
(iii)	Entrepreneurship Development	13,49,720	16,09,224
(iv)	Advertisement/Publicity/Publication	23,94,520	13,00,930
(v)	Foreign Travel and Meetings	3,98,749	11,73,160

C. CIF Value of import is Nil for the current reporting period.

15.13 Details of Grant Utilisation

(Amount in Rs.)

S.No	Particulars	Fund Available	Fund Utilised	Balance
1	BIRAC	30,20,48,483	30,20,48,483	-
2	PPP Activities	1,43,43,49,781	1,42,21,25,190	1,22,24,591
3	PMU - DBT/BMGF:			
	(i) Operational	**18,79,25,505**	**6,12,33,006**	**12,66,92,499**
	BMGF	17,74,03,200	5,12,55,936	12,61,47,264
	DBT Operational	41,80,775	40,64,141	1,16,634
	DBT - Non Recurring	6,20,075	5,15,265	1,04,810
	WT Operational	57,21,455	53,97,664	3,23,791
	(ii) Projects	**41,46,66,777**	**11,42,62,794**	**30,04,03,983**
	BMGF	31,51,33,178	5,90,60,931	25,60,72,247
	DBT	8,38,94,834	5,26,70,095	3,12,24,739
	USAID	1,56,38,766	25,31,768	1,31,06,998
	Total	**60,25,92,282**	**17,54,95,800**	**42,70,96,482**
4	Wellcome Trust	2,85,95,684	2,85,95,684	-
5	MeitY(IIPME)	2,32,30,164	4,54,90,614	(2,22,60,450)
6	Make in India Facilitation Cell	38,47,853	33,97,083	4,50,770
7	Bio-toilets in schools from NER	2,15,55,232	91,42,470	1,24,12,762
8	National BioPharma Mission (I3)	5,00,00,000	1,22,07,298	3,77,92,702
9	AcE Fund	21,96,51,986	49,04,348	21,47,47,638

15.14 Supplementary Schedule on Scheme Balances as on 31.03.2018

15.14.1 IR&I (PPP) Activities Funds

(Amount in Rs.)

Particulars			As on 31.03.18	As on 31.03.17
	Opening Balance		**41,52,403**	**-**
Add:	Funds received from DBT		1,41,00,00,000	1,20,00,00,000
Add:	Interest Income	82,75,838		68,74,000
Add:	Recoveries from unspent grant	1,19,21,540	2,01,97,378	34,55,484
			1,43,43,49,781	1,21,03,29,484
Less:	**Amount disbursed during the year :**			
	Grants Disbursed	1,34,13,98,572		98,02,08,206
	Loans Disbursed	4,59,15,405		18,68,31,587
	Programme Expenses	3,48,11,213	1,42,21,25,190	3,91,37,288
	Unutilised Balance Carried Forward		**1,22,24,591**	**41,52,403**

15.14.2 BIRAC FUNDS

(Amount in Rs.)

Particulars			As on 31.03.18	As on 31.03.17
	Opening Balance		-	-
Add:	Received from DBT		30,00,00,000	25,00,00,000
Add:	Interest Income		20,48,483	15,39,000
			30,20,48,483	25,15,39,000
Less:	**Amount disbursed for Grants**			
	Partnership Programmes	8,30,93,047		6,53,49,378
	Technology Transfer & Acquisition	2,13,09,512		6,45,40,127
	Intellectual Property	58,65,076		6,02,488
	Entrepreneurial Development	7,13,99,335		2,83,66,680
	Capacity Building & Awarness	89,40,287	19,06,07,257	52,71,678
			11,14,41,226	8,74,08,649
Less:	**Utilisation towards:**			
	Manpower Expenses	5,57,00,358		4,92,24,788
	Non-Recurring Expenses	3,16,755		11,61,576
	Recurring Expenses	6,58,45,756	12,18,62,869	6,86,89,907
			(1,04,21,643)	(3,16,67,622)
Add :	Surplus Redeployed towards Expenses		1,04,21,643	3,16,67,622
	Unutilised Balance Carried Forward		-	-

15.14.3 BMGF PMU

(Amount in Rs.)

Particulars			As on 31.03.18	As on 31.03.17
	Opening Balance		23,45,84,838	1,43,44,115
	Operations Fund	11,37,96,876		86,89,299
	Project Fund	12,07,87,962		56,54,816
Add:	Received From BMGF - Project	19,90,35,985		13,84,20,248
	Received From BMGF - Operations	4,65,97,732		15,06,73,232
	Received From DBT - Project	9,30,33,000		
	Received From DBT - Operations	1,62,86,000		
	Received From WT - Operations	-	35,49,52,717	93,10,402
Add::	Bank Interest & Unspent Grant	1,30,54,728	1,30,54,728	76,69,263
			60,25,92,282	32,04,17,260
Less:	**Project Disbursement**			
	GCI: AgNu	18,16,000		45,68,930
	GCI: ACT Projects	7,88,62,367		1,34,25,000
	GCI: IKP Projects	2,52,00,000		-
	GCI: IDIA Projects	10,84,517		
	GCI: RTTC Projects	72,99,910	11,42,62,794	58,75,606
Less:	**Activities Expenditure**			
	HBGDki	73,37,135		33,53,713
	KSTIP	67,50,258		70,69,898
	Communication Support	92,28,825	2,33,16,218	1,58,08,500
Less:	**Operational Expenditure**			
	Manpower Expense	74,59,633		68,24,706
	Meeting Expenses	66,14,385		1,07,28,172
	Expenses for Space	1,01,93,715		95,92,156
	Administrative Expenses	70,19,631		38,94,976
	Equipment Expenses	5,15,265		46,350
	Wellcome Trust- Manpower	51,57,418		37,44,792
	Wellcome Trust- Travel	2,40,246		1,83,129
	Management Expenses	7,16,495	3,79,16,788	7,16,494
	Balance Fund			
	BMGF - Projects	25,60,72,247		11,60,50,278
	DBT - Projects	3,12,24,739		(1,03,51,082)
	USAID - Projects	1,31,06,998		1,50,88,766
	BMGF - Operations	12,61,47,264		11,96,65,468
	DBT - Operations	2,21,444		(1,14,85,150)
	WT- Operation	3,23,791	42,70,96,482	56,16,558
			42,70,96,482	**23,45,84,838**

*Details of Equipment Expenses: (Amount in Rs.)

Particulars	As on 31.03.18	As on 31.03.17
Office Equipment	5,15,265	46,350
Computers	-	-
Intangible Assets	-	-
Total	**5,15,265**	**46,350**

15.14.4 DBT-Wellcome Trust Programme

(Amount in Rs.)

Particulars		As on 31.03.18	As on 31.03.17
	Opening Balance	2,80,70,953	12,59,44,696
Add::	FDR & Saving A/c Interest	5,24,731	46,26,257
	Total	2,85,95,684	13,05,70,953
Less:	Unspent Grant Returned	2,85,95,684	10,25,00,000
	Unutilised Balance Carried Forward	**-**	**2,80,70,953**

15.14.5 MeitY (IIPME)

(Amount in Rs.)

Particulars		As on 31.03.18	As on 31.03.17
	Opening Balance	32,30,164	1,80,45,600
	Received during the period	2,00,00,000	-
		2,32,30,164	1,80,45,600
Add:	Bank Interest	-	19,20,000
		2,32,30,164	1,99,65,600
Less :	Programme Expenditure	4,47,66,812	1,51,90,750
	Operational Expenditure	7,23,802	15,44,686
	Unutilised Balance Carried Forward	**(2,22,60,450)**	**32,30,164**

* The programme Expenditure includes loan disbursed amounting to Rs. 22,00,000 (Previous Year Rs.27,15,000) having the total outstanding of Rs. 50,03,818 (including accrued interest) (Previous Year Rs. 27,36,339).

15.14.6 Make in India Facilitation Cell

(Amount in Rs.)

Particulars		As on 31.03.18	As on 31.03.17
	Opening Balance	69,634	4,83,871
	Received during the period	37,07,956	34,16,129
		37,77,590	39,00,000
Add:	Bank Interest	70,263	17,000
		38,47,853	39,17,000
Less :	Operational Expenditure	33,97,083	38,47,366
	Unutilised Balance Carried Forward	**4,50,770**	**69,634**

15.14.7 Bio-toilets in schools from North East Region

(Amount in Rs.)

Particulars		As on 31.03.18	As on 31.03.17
	Opening Balance	34,69,977	7,70,000
	Received during the period	1,78,76,000	30,00,000
		2,13,45,977	37,70,000
Add:	Bank Interest	2,09,255	1,28,000
		2,15,55,232	38,98,000
Less :	Programme Expenditure	-	-
	Operational Expenditure	91,42,470	4,28,023
	Unutilised Balance Carried Forward	**1,24,12,762**	**34,69,977**

15.14.8 National Biopharma Mission (Innovate in India)

(Amount in Rs.)

Particulars		As on 31.03.18	As on 31.03.17
	Opening Balance	-	-
	Received during the period	5,00,00,000	-
		5,00,00,000	-
Add:	Bank Interest	-	-
		5,00,00,000	-
Less :	Programme Expenditure	-	-
	Operational Expenditure	1,22,07,298	-
	Unutilised Balance Carried Forward	**3,77,92,702**	**-**

15.14.9 AcE Fund

(Amount in Rs.)

Particulars		As on 31.03.18	As on 31.03.17
	Opening Balance		
	Received during the period	21,77,51,612	-
		21,77,51,612	-
Add:	Bank Interest	19,00,374	-
		21,96,51,986	-
Less :	Programme Expenditure	-	-
	Operational Expenditure	49,04,348	-
	Unutilised Balance Carried Forward	**21,47,47,638**	**-**

15.15 Disclosures required under Section 22 of Micro, Small and Medium Enterprise (MSME) Development Act, 2006

(Amount in Rs.)

S. No.	Particulars	AS ON 31.03.18	AS ON 31.03.17
(i)	Principal amount remaining unpaid to MSME suppliers as at the end of the reporting period.	27,37,895	6,44,735
(ii)	Interest due thereon remaining unpaid to MSME suppliers as at the end of the reporting period.	-	-
(iii)	The amount of interest paid along with the amounts of the payment made to the supplier beyond the appointed day.	-	-
(iv)	The amount of interest due and payable for the period.	-	-
(v)	The amount of interest accrued and remaining unpaid at the end of the reporting period.	-	-
(vi)	The amount of further interest due and payable even in the succeeding year, until such date when the interest dues as above are actually paid.	-	-
	Total	**27,37,895**	**6,44,735**

The above information regarding dues to Micro and Small Enterprises has been determined to the extent such parties have been identified on the basis of information collected with the Company.

15.16 Consequent to the amendment made in significant accounting policy as per 14.2.4, the financial impact on the amendment is as under:

S.No	Particulars	Impact
1	Reserves & Surplus	"DBT portfolio taken in account by BIRAC from BCIL as on 31.3.2014 vide DBT transfer Order dated 25th September 2012 and approved by Board dated 17th December 2013 amounting to Rs.253,64,00,224/- (including principal amount accrued interest and amount realized till date of takeover.)
		As on 31.3.2018 the outstanding unrealised portfolio amounting to Rs. 89,57,87,216/- has been transferred from Other Reserves to Non-Current Liabilities, after adjustment of realised amount of Rs.126,99,54,073/-, write off amounting to Rs.9,60,000/-, provisions for substandard & doubtful debts amounting to Rs.36,96,18,500/- and rectification amounting to Rs.80,436/-.
		Amount of Rs. 91,74,15,521/-, being the balance amount of Pre BIRAC realised portfolio of Rs.126,99,54,073/- after adjustment of Rs.35,25,38,551/- towards amount utilised for I & M sector has been transferred from Other Reserves to Current Liabilities. As per DBT order dated 8.11.2017, Rs.72, 04,66,688/- has been refunded to DBT.
		The balance amount of Rs. 19,69,48,833/- is continued to be shown under Current Liability."
2	Non Current Liabilities	Non current Liabilities amounting to Rs. 89,57,87,216/- on account of transfer from Reserves & Surplus

3	Current Liabilities	As per DBT order dated 8.11.2017, Rs.72, 04,66,688/- has been refunded to DBT. The balance amount of Pre -BIRAC portfolio realized (cumulative) Rs. 19,69,48,833/- is continued to be shown under Current Liability.
4	Provisioning	Provision for any substandard / doubtful / Bad debt that may arise on non-recovery from any borrower would be adjusted against the taken over amount first. Any write-off which is not covered by the amount taken over would be subsequently adjusted against Fund utilized subsequent to the date of take " over held under "Other Reserves".

15.17 Disclosure pursuant to Accounting Standard (AS) 15 Revised "Employee Benefits" :

i) Defined Benefit Plans (Gratuity):

a) The amounts recognised in Balance Sheet are as follows: Para 120(n) of AS 15

Particulars	Financial Year ending	
	2017-18	2016-17
Present Value of Defined Benefit Obligations at the end	57,98,777.00	27,40,475.00
Fair Value of Plan Assets at the end	49,12,973.00	-
Funded Status - Deficit/ (Surplus)	**8,85,804.00**	**27,40,475.00**
Unrecognized Past Service Cost	-	-
Effects of Asset Ceiling	-	-
Net Liability/ (Asset) at the end of the period	**8,85,804.00**	**27,40,475.00**

b) The amount recognised in income & expenditure account are as follows:

Particulars	Financial Year ending	
	2017-18	2016-17
Expenses to be recognised in Profit & Loss accounts	28,60,921.00	27,40,475.00

Particulars	Financial Year ending	
	AS ON 31.03.18	AS ON 31.03.17
(Gain) / Loss on Plan Liabilities	11,40,451.00	-
% of Opening Plan Liabilities	41.62%	0.00%
Gain / (Loss) on Plan Assets	8,757.00	-
% of Opening Plan Assets	0.00%	0.00%

ii) The Company's required Contribution during the next year is INR 8,85,804/- or one months salary of the employees covered under the scheme, which ever is lower.

iii) Valuation Results

The valuation results for the defined benefit gratuity plan as at 31/03/2018 are produced in the tables below:

a) The changes in the present value of defined benefit obligation representing reconciliation of opening and closing balance thereof are as follows: Para 120 (c)of AS 15

Particulars	Financial Year ending	
	AS ON 31.03.18	AS ON 31.03.17
Defined Benefit Obligation at the beginning	**27,40,475.00**	**-**
Add :- Current Service Cost	16,98,613.00	7,25,770.00
Add :- Interest Cost	2,19,238.00	-
Add :- Prior Service Cost – Vested benefit	-	20,14,705.00
Add :- Prior Service Cost – Non Vested benefit	-	-
Add :- Curtailments	-	-
Less :- Benefits Paid directly by the Company	-	-
Less :- Benefits Paid from Fund	-	-
Add/Less :- Net transfer in/(out) (including the effect of any business combinations/divestitures)	-	-
Add/Less :- Actuarial Loss / (Gain) on Obligation	11,40,451.00	-
Defined Benefit Obligation at the end	**57,98,777.00**	**27,40,475.00**

b) Changes in the fair value of plan assets representing reconciliation of the opening and closing balances thereof are as follows: Para 120 (e)of AS 15

Particulars	Financial Year ending	
	AS ON 31.03.18	AS ON 31.03.17
Opening balance of the fair value of the plan assets	-	-
Add: Adjustment to Opening balance	-	-
Add: Expected Return on plan assets	1,88,624.00	-
Add: Contributions by Employer	47,15,592.00	-
Add: Contributions by Employer	-	-
Add: Assets Distributed on Settlements	-	-
Add: Assets Acquired on acquisition/(Distributed on Divestiture)	-	-
Add: Exchange Difference on Foreign Plans	-	-
Add/(less): Actuarial gains/(losses)	8,757.00	-
Less: Benefits Paid	-	-
Closing balance of the plan assets	**49,12,973.00**	**-**

c) Fair value of plan assets

Particulars	Financial Year ending	
	AS ON 31.03.18	AS ON 31.03.17
Opening balance of the fair value of the plan assets	-	-
Add: Adjustment to Opening balance	-	-
Add: Actual Return on plan assets	1,97,381.00	-
Add: Contributions by Employer	47,15,592.00	-
Add: Contributions by Employer	-	-
Add: Assets Distributed on Settlements	-	-
Add: Assets Acquired on acquisition/(Distributed on Divestiture)	-	-
Add: Exchange Difference on Foreign Plans	-	-
Add/(less): Actuarial gains/(losses)	-	-
Less: Benefits Paid	-	-
Fair value of the plan assets at the end	**49,12,973.00**	**-**
Excess of Actual over estimatedd return on Plan Assets	8,757.00	-

d) Expenses Recognised in the Profit & Loss Account

Particulars	Financial Year ending	
	AS ON 31.03.18	AS ON 31.03.17
Current Service Cost	16,98,613.00	7,25,770.00
Interest Cost on Obligation	2,19,238.00	-
Past Service Cost	-	20,14,705.00
Expected return on Plan Assets	-1,88,624.00	-
Amortization of Prior service cost	-	-
Net acturial (Gain)/Loss to be recognised	11,31,694.00	-
Transfer In/Out	-	-
Curtailment (Gain)/Loss recognized	-	-
Settlement (Gain)/Lossrecognised	-	-
Expense recognised in Income & Expenditure account	**28,60,921.00**	**27,40,475.00**

e) Amount for the current period

Particulars	Financial Year ending	
	AS ON 31.03.18	AS ON 31.03.17
Actuarial Loss / (Gain) for the current period - Obligation	11,40,451.00	-
Actuarial Loss / (Gain) for the current period - Plan Assets	-8,757.00	-
Total Actuarial Loss / (Gain) for the current period	**11,31,694.00**	**-**
Actuarial Loss / (Gain) loss recognized in the current period	**11,31,694.00**	**-**

f) Movement in Liability recognized in the Balance Sheet

Particulars	Financial Year ending	
	AS ON 31.03.18	AS ON 31.03.17
Present Value of Obligations as at the beginning	27,40,475.00	-
Expenses Recognized in P & L Statement	28,60,921.00	27,40,475.00
Benefits Paid	-	-
Actual Return on Plan Assets	1,97,381.00	-
Acquisition Adjustment	-	-
Present Value of Obligations as at the end	**57,98,777.00**	**27,40,475.00**

g) Major categories of Plan Assets (as percentage of Total Plan Assets)

Particulars	Financial Year ending	
	AS ON 31.03.18	AS ON 31.03.17
Equities	-	-
Gilts	-	-
Bonds	-	-
Insurance Policies	100%	-
Total	**-**	**-**

h) Bifurcation of Present Value of Obligationat the end of the current period as per revise Schedule III of the Companies Act, 2013

Particulars	Financial Year Ending	
	AS ON 31.03.18	AS ON 31.03.17
Current Liability (Short Term)	4,98,430.00	-
Non-Current Liability (Long Term)	53,00,347.00	27,40,475.00
Present Value of Obligation as at the end	**57,98,777.00**	**27,40,475.00**

The principal assumptions used in determinning gratuity obligation for the company's plan is shown below:-

Particulars	Financial Year Ending	
	AS ON 31.03.18	AS ON 31.03.17
Discount Rate (Per Annum)	8.00%	8.00%
Salary Growth Rate (Per Annum)	10.00%	10.00%
Expected Rate of Return on Plan Assets (Per Annum)	8.00%	8.00%

The estimates of future salary increases, considered in acturial valuation, take account of inflation, seniority, promotions and other relevant factors, such as supply and demand in the employment market

15.18 The previous year's figures are reclassified and regrouped in accordance with the requirements applicable in the current financial year to make item comparable.

15.19 List of Abbreviations used in Financial Statement:

S. No.	Abbreviation	Description
1	BIRAC	Biotechnology Industry Research Assistance Council
2	BMGF	Bill Melinda Gates Foundation
3	BISS	Bio Incubator Support Scheme
4	BCIL	Biotech Consortium India Limited
5	BIG	Biotechnology Ignition Grant
6	BIPP	Biotechnology Industry Partnership Programme
7	CRS	Contract Research Scheme
8	DBT	Department of Biotechnology, Ministry of Science & Technology, Government of India
9	MeitY	Ministry of Electronics and Information Technology
10	ETA	Early Translational Accelerator
11	FD	Fixed Deposit
12	GCI	Grand Challenges of India
13	I&M	Industry and Manufacturing
14	IIPME	Industry Innovation Programme on Medical Electronics
15	IP	Intellectual Property
16	MTNL	Mahanagar Telephone Nigam Limited
17	Misc.	Miscellaneous

18	PMU	Programme Management Unit
19	PMC	Projects Monitoring committee
20	PPP Activities	"Public-Private Partnership Activities(Earlier termed as Industry and Manufacturing (I&M) Sector.)"
21	SBIRI	Small Business Innovation Research Initiative
22	SBH	State Bank of Hyderabad
23	SPARSH	Social Innovation programme for Products: Affordable & Relevant to Societal Health
24	TA & DA	Travel Allowance & Diem Allowance
25	UIC	University Innovation Cluster
26	AcE Fund	Accelerating Entrepreneurs
27	NBM (I3)	National Biopharma Mission (Innovate in India)
28	AgNu	Agriculture-Nutrition Projects
29	IDIA	Immunization Data for Innovating Action
30	RTTC	Reinvent the Toilet Challenge
31	HBGDKi	Healthy Birth Growth Development Knowledge Intigration
32	IMPRINT	Improving Growth in Infant Trail
33	ACT	All Children Thriving
34	KSTIP	Knowledge Integration and Translation Platform
35	WT	Wellcome Trust

For and on behalf of Board of Directors

Sd/-
Kavita Anandani
(Company Secretary)

Sd/-
Mohd. Aslam
(Managing Director)
DIN 06786302

Sd/-
Renu Swarup
(Chairman)
DIN 01264943

Auditors Report
As per our report of even date attached

For RMA & Associates LLP
Chartered Accountants
Firm Reg. No. 000978N/ N500062
Sd/-
CA. Rahul Vashishtha
(Partner)
Membership No. 097881

Place : New Delhi
Date : 05.07.18

COMMENTS OF THE COMPTROLLER AND AUDITOR GENERAL OF INDIA UNDER SECTION 143(6) (b) OF THE COMPANIES ACT, 2013 ON THE FINANCIAL STATEMENTS OF BIOTECHNOLOGY INDUSTRY RESEARCH ASSISTANCE COUNCIL FOR THE YEAR ENDED 31 MARCH 2018

The preparation of financial statements of Biotechnology Industry Research Assistance Council for the year ended 31 March 2018 in accordance with the financial reporting framework prescribed under the Companies Act, 2013 (Act) is the responsibility of the management of the company. The statutory auditor/auditors appointed by the Comptroller and Auditor General of India under section 139 (5) of the Act is/are responsible for expressing opinion on the financial statements under section 143 of the Act based on independent audit in accordance with the standards on auditing prescribed under section 143(10) of the Act. This is stated to have been done by them vide their Audit Report dated 05th July 2018.

I, on behalf of the Comptroller and Audit General of India, have conducted a supplementary audit of the the financial statements of Biotechnology Industry Research Assistance Council for the year ended 31 March 2018 under section 143 (6) (a) of the Act. This supplementary audit has been carried out independently without access to the working papers of the statutory auditors and is limited primarily to inquires of the statutory auditors and company personal and a selective examination of some of the accounting records.

Based on my supplementary audit, I would like to highlight the following significant matter under section 143(6) (a) of the Act which have come to my attention and which in my view are necessary for enabling a better understanding of the financial statements and the related audit report.

A. Comments of Financial position.

Current Liabilities - ₹ 90.21 crore

The Company incurred ₹ 4.55 crore on account of expenditure on behalf of Ministry of Electrical Information & Technology (MeitY) under its scheme. The Company has received assistance/grant of ₹ 2.32 crore from MeitY and balance amount of ₹ 2.23 crore was recoverable from the MeitY during the year 2018-18. The Company depicted ₹ 2.23 crore negative figure under Current Liabilities, instead of showing the same as Current Assets. Hence, the company failed to comply with the requirements of the Schedule III of the Companies Act, 2013

This has resulted in understatement of Current Liabilities by the amount of ₹ 2.23 crore and understatement of Current Assets by the same amount.

B. Comments on Cash Flow

While preparing the Cash Flow Statement, the Company has taken amount of ₹ 94.62 crore instead of ₹ 84.53 crore under the head of Cash and Cash Equivalent for the year 2017-18 which is not in line with requirements of AS-3. This has resulted in understatement in cash from operating activity by an amount of ₹ 10.13 crore and overstatement in closing balance of cash and cash equivalent by the same amount.

Further, the disclosure requirements under the paragraph no. 42 and 45 of Accounting Standard 3 have also not been complied with

C. Comments on Disclosure

Cash and Cah Equivalent - ₹ 94.65 crore

The above head includes an amount of ₹ 66.82 crore account of funds received from the Ministry for different project which were to be spent on respective project only.

The company disclosed these amounts under the head of cash and cash equivalents under the saving account and fixed deposits, whereas it should be disclosed separately as per the requirements of Schedule III of Companies Act, 2013.

D. Other Comments

Income and expenditure statements

The Company has charged the Depreciation of ₹ 40.57 lakh in Income and Expenditure Statement and written back the same in Income and Expenditure Statement through extraordinary items instead of disclosing the head Income, which is not in line with the requirements of Accounting Standard 12.

For and behalf of the
Comptroller & Auditor General of India

Place : New Delhi
Date : 04.09.2018

(मनीष कुमार)
महानिदेशक वाणिज्य लेखापरीक्षा
एवं पदेन सदस्य, लेखापरीक्षा बोर्ड – IV

CAG REPORT & MANAGEMENT REPLY

A. CAG Comments on Financial position.

Current Liabilities –Rs. 90.21 crore

The Company incurred Rs. 4.55 crore on account of excess expenditure on behalf of Ministry of Electrical Information & Technology (MeitY) under, its scheme. The Company has received assistance/ grant of Rs. 2.32 crore from MeitY and balance amount of Rs. 2.23 crore was recoverable from the MeitY during the year 2017-18. The Company depicted Rs. 2.23 crore as a negative figure under Current Liabilities, instead of showing the same as Current Assets. Hence, the company failed to comply with the requirements of the Schedule III of the Companies Act, 2013.

This has resulted in understatement of Current Liabilities by the amount of Rs. 2.23 crore and under statement of Current Assets by the same amount.

Management Reply:

Noted. Matter is being followed up with Meity for receipt of balance grant.

B. CAG Comments on Cash Flow

While preparing the Cash Flow Statement, the Company has taken amount of Rs. 94.65 crore instead of Rs. 84.52 crore under the head of Cash and Cash Equivalent for the year 2017-18 which is not inline with requirements of AS-3. This has resulted in understatement in cash from operating activity by an amount of Rs. 10.13 crore and overstatement in closing balance of cash and cash equivalent by the same amount.

Further, the disclosure requirements under the paragraph no. 42 and 45 of Accounting Standard 3have also not been complied with.

Management Reply:

Para – 5 of the Accounting Standard -3 defines "Cash and Cash Equivalents" as:

Cash equivalents are short term, highly liquid investments that are readily convertible into known amounts of cash and which are subject to an insignificant risk of changes in value.

The key components of such as classification is:

a)The asset should be highly liquid and convertible into known amounts of cash.

b)It should be subject to insignificant risk of change in value.

The FDR, even though they are for a period of more than 3 months duration (three months is only suggestive and not an essential requisite) are easily converted into usable cash without loss in any value. Therefore the period of FDR has no significance and the deposits are truly cash equivalent, as the funds are available for utilisation as per need at immediate notice.

In view of above, disclosure requirements under AS -3 have been duly complied with.

C. CAG Comments on Disclosure

Cash and Cash Equivalent – Rs. 94.65 crore

The above head includes an amount of Rs. 66.82 crore on account of funds received from the Ministry for different projects which were to be spent on respective projects only. The company disclosed these amounts under the head of cash and cash equivalents under the saving account and fixed deposits, whereas it should be disclosed separately as per the requirements of Schedule III of Companies Act 2013.

Management Reply:

Para – 5 of the Accounting Standard -3 defines "Cash and Cash Equivalents" as:

Cash equivalents are short term, highly liquid investments that are readily convertible into known amounts of cash and which are subject to an insignificant risk of changes in value.

The key components of such as classification is:

a) The asset should be highly liquid and convertible into known amounts of cash.

b) It should be subject to insignificant risk of change in value.

The FDR, even though they are for a period of more than 3 months duration (three months is only suggestive and not an essential requisite) are easily converted into usable cash without loss in any value. Therefore the period of FDR has no significance and the deposits are truly cash equivalent, as the funds are available for utilisation as per need at immediate notice.

In view of the above, disclosure requirement as per Schedule III of Companies Act, 2013 duly is complied with.

CAG comment is noted to separately disclose the balances of each programme in future.

D. CAG Other Comments

Income and expenditure statement

The Company has charged the Depreciation of Rs. 40.57 lakh in Income and Expenditure Statement and written back the same in Income and Expenditure Statement through extraordinary items instead of disclosing the same under the head Income, which is not in line with the requirements of Accounting Standard 12.

Management Reply:

Assets acquired with government Grants have been shown at their cost of acquisition and the appropriate disclosure for the same has been made in the Capital Reserve.

Depreciation of Rs. 40.57 lakh on such assets have been correctly charged as per AS-6 "Depreciation Accounting".

Para 20 of AS6 states that;

The depreciable amount of a depreciable asset should be allocated on a systematic basis to each accounting period during the useful life of the asset. Therefore charging of Depreciation has not resulted in overstatement of expenditure.

The second part of the observation states that write back of depreciation in Income and Expenditure statement through extraordinary items has resulted in understatement in surplus before extraordinary items.

In this regard it is to be noted that the income relatable to depreciation on grant based assets is to be treated as deferred income. The Disclosure requirements under AS 12 does not provide for adjustment of such deferred income from depreciation charged in Profit & Loss Account. Moreover deferred income does not arise out of routine operations of BIRAC and cannot be sustained in future. It is not earned as a result of normal activities. By virtue of it being deferred income, ie: pertaining to earlier years, but allocated from year to year on the basis of the depreciation charged over the life of the assets it is correctly disclosed under Extraordinary Items head. Appropriate disclosure for the same is reflected in the income & Expenditure Statement as per the disclosure requirements of AS12.

The Net Income after such adjustment remains unchanged, irrespective of the treatment.

In view of above, AS 12&AS 6 are duly complied with.

Regd. Office:1st Floor, MTNL Building, 9, CGO Complex, Lodhi Road, New Delhi-110003
Website: www.birac.nic.in Email: birac.dbt@nic.in Tel: 011-24389600 Fax: 011-24389611
CIN NO: U73100DL2012NPL233152

Attendence Slip

Name of the Member/proxy (In Block Letters)	
Address of Member / Proxy:	
Folio No. :	
No of Shares Held	

I certify that I am a member / proxy for the member of the Company.

I hereby record my presence at the 6th Annual General Meeting of the Company held on Tuesday, September 25, 2018 at 12:30 p.m. at MTNL Building, 1st Floor, 9 CGO Complex, Lodhi Road, New Delhi-110003

……………………………………….
Member's / Proxy's Signature

Regd. Office: 1st Floor, MTNL Building, 9, CGO Complex,
Lodhi Road, New Delhi-110003 E-mail: birac.dbt@nic.in Website: www.birac.nic.in, Tel: +91-11-24389600
CIN NO: U73100DL2012NPL233152

PROXY FORM

[Pursuant to Section 105(6) of the Companies Act, 2013 and Rule 19 (3) of the Companies (Management and Administration) Rules, 2014]

Name of the Member(s)		E-mail ID:
Registered Address		Folio No. :

I/We, being the member(s) of ….……...........……… shares of the above named Company, hereby appoint:

(1) Name:……………….……….....................……………..

Address: ....

E-mail Id: ……………………………………......................……………………………….……..

Signature: …......................... or failing him/her;

as my/our proxy to attend and vote (on a poll) for me/us and on my/our behalf at the 6th **Annual General Meeting** of the Company, to be held on **Tuesday, September 25, 2018 at 12:30 p.m.** at MTNL Building, 1st Floor, 9 CGO Complex, Lodhi Road, New Delhi-110003 and at any adjournment thereof in respect of such resolutions as are indicated below:

S.No	Resolutions	For	Against
1.	**Ordinary Business** To receive, consider and adopt the Audited Financial Statement of the Company as on March 31, 2018 together with the Reports of the Directors and Auditor thereon and comments of the Comptroller & Auditor General of India in terms of Section 143(6)(b) of the Companies Act, 2013		
2.	To fix the remuneration, of the New Statutory Auditor for the financial year 2018-19, in terms of provisions of Section 139 of the Companies Act, 2013		

Signed this……………………. day of………………………….. 2018. Signature of the Shareholder______________________

....

Signature of first proxy holder   Signature of Second proxy holder

Affix Revenue Stamp

* Applicable for investors holding shares in electronic form.

Notes :

1. MEMBERS ENTITLED TO ATTEND AND VOTE MAY APPOINT ONE OR MORE PROXIES TO ATTEND AND VOTE INSTEAD OF THEMSELVES. PROXIES TO BE VALID MUST BE RECEIVED AT THE REGISTERED OFFICE OF THE COMPANY NOT LESS THAN FORTY-EIGHT HOURS BEFORE THE APPOINTED TIME OF THE MEETING
2. Only bonafide members of the Company whose names appear on the Register of Members in possession of valid attendance slips duly filed and signed will be permitted to attend the meeting. The company reserves its right to take all steps as may be deemed necessary to restrict non-members from attending the meeting.


Microfluidics based diagnostics, Achira Labs
Oxygen Enrichment Unit, Genrich Membranes
VACCINES FOR PLANTS
Plant Vaccines, Swasti Agro
Maxio, Perfint Healthcare
EXOCAN
ExoEnrich, Exocan Healthcare Technologies
Hearing loss screening device for newborns, Sohum Innovation Lab
Pilot plant for lignocellulosic ethanol, India Glycol
Righbiotic, Xcellence in Bioinnovations
Ricela
Ricela cattle feed supplement, A P Organics
Osteo 3D, DF3D Creations
Poorti Kit, Aarna Biomedical
Single Use Safety Syringe, Alfa Corpuscles
100+Onco panel for NGS, SciGenom Labs
Vibrioshield, Aristogene Biosciences
Noxeno, Innaccel Acceleration Services
Solar Conduction Dryer, Science for Society
birac
Ignite Innovate Incubate
birac impact
Sync Glucometer, Biosense Technologies
TJay, Terrablue
Trypsin Clearance Assay Kit, Affigenix Biosolutions
Human Albumin and Human immunoglobulin, Celestial Biologicals
miRHYTHM, Cardea Biomedical Technologies
VAPCare, Coeo Labs
Fabca, ELISTA, Auto Urine, Robonik
Dextrasol, Varuna Biocell
Scintiglo, Cutting Edge
ShishuNethra, Forus Health
Neobreathe, Windmill Healthcare
Oral Cancer Screening Camera, Sascan Meditech
Touch-Hb, Biosense Technologies
Molecular Beacon based "Chlamy & Nes" kit, DSS Imagetech
Silvo Clean, Weinnovate Biosolutions
AnuPath, Pathshodh
SWEET REVOLUTION
Honey Leaf, GVS Biotech
eToilets, ERAM Scientific Solutions
Anaerobic Membrane bioreactor , Thermax
Malaria
Malaria Rapid Card Test, Genomix Molecular Diagnostics
FlexiOH, Orthoheal
Balloon Catheter, Sahajanand Medical Devices
MAMRIT, Tuscano Equipments
Fibroheal
Fibroheal, Healthline

Biotechnology Industry Research Assistance Council

(A Govt. of India Enterprise)

Ist Floor, MTNL Building, 9 CGO Complex, Lodhi Road, New Delhi - 110003

Email : birac.dbt@nic.in, Website : www.birac.nic.in, Twitter handle: @BIRAC_2012