

5th Annual Report 2016-17





birac @

5 Impacting the Biotech Innovation Ecosystem



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

Key Strategies

- Foster innovation and entrepreneurship in all places of research
- Promote affordable innovation in key social sectors
- Higher focus on start-ups & 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

Core Values

- Integrity
- Team work
- Commitment
- Transparency
- Excellence



BIRAC is a Section 8 Not-for-profit Company under the Companies Act, 2013 set up by Department of Biotechnology, Ministry of Science & Technology, Government of India as its interface agency to promote industry-academia interface. The mandate was 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 entrepreneurs, start-ups, SMEs and Biotech Companies for all stages of the product development value chain from discovery to proof of concept to early and late stage development to validation and scale up, right upto pre-commercialization. There are also 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 and other networks for technology transfer and licensing, IP and business mentoring including regulatory guidance. 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.

BIRAC was set up in 2012 as a Not-for-profit Section 8 company and a Public Sector undertaking under the Department of Biotechnology (DBT), Ministry of Science & Technology, Government of India. BIRAC has worked on the critical components of the ecosystem to give shape and implement its mandate and more importantly show tangible outcomes that reflect the positive results catalysed by BIRAC.

In the last four years, BIRAC has played a pro-active role in nurturing the emerging biotechnology industry of the country. In this regard the key strategies for BIRAC have been to:

- Foster innovation and entrepreneurship in all places of research
- Promote affordable innovation in key social sectors
- Higher focus on start-ups & 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

BIRAC has made a special effort to reach out to all its stakeholders and launch special initiatives which cater to the 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, start-ups 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.

BIRAC's main mission is to bring together the likeminded organisations, create these networks and provide the necessary synergies which are needed for product development partnership. While the attention stays focused on affordable and social innovation, the efforts continue to create capacity and strengths to build a globally competitive Indian 'Biotech Enterprise'.

BIRAC as a core 'development agency' focuses on the entire product development chain from idea to proof of concept, to early stage - late stage, validation scale up, right up to commercialization. The emphasis is not only on providing the funding but complete handholding to help the entrepreneurs to grow and take their ideas forward to product development. It is important to build a framework to nurture entrepreneurs and support entrepreneurship development. BIRAC has been constantly working in this direction.

BIRAC works towards fulfilling this goal by starting at the bottom of the pyramid, where the base has to be the strongest – that is our student and young entrepreneurs, supporting novel ideas and taking them to proof of concept and then providing the essential support for early and late stage right upto scale up and pre-commercialization.

While funding is a critical component, it cannot be the only support mechanism. BIRAC is working towards strengthening the entire ecosystem, to encourage entrepreneurs to take up innovation research. BIRAC helps them to – 'Ignite, Innovate and Incubate'.

In 2016-17, BIRAC's endeavour has been to consolidate what it has created and then pick on those critical components which need to be built upon. Staying focused on the 3 verticals the effort has been to go deeper into each, growth scale rather than growing horizontally and diversifying in new areas.

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. BIRAC started the Bio-incubator Seed Fund with the incubators to invest in start-ups which require funds to help them mobilise funds from private investors.

BIRAC will also now work toward addressing National and Global Challenge of the SDG through its SBIRI, BIPP and CRS Scheme. These schemes would also make more effort to engage in industry-academia partnership and move research leads/ technologies from laboratories forward.

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

BIRAC also set up a new Regional Entrepreneurship Development and Mentorship Centre. 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 and 100 nascent ideas are awarded 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 four Incubation Partners namely, Venture Center, Pune; THSTI, Faridabad; KIIT, Bhubaneswar; and Villgro, Chennai.
- ❑ Fellowship amounting to INR 35,000 to INR 50,000 per month to each innovator
- ❑ Mini kick start grant of INR 5 lakhs per innovator

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

- ❑ For individuals, researchers from academia and start-ups
- ❑ Seed grant of up to INR 50 lakhs for research projects with commercialization potential with duration of up to 18 months
- ❑ Managed by five BIG Partners – C-CAMP, Bangalore; IKP Knowledge Park, Hyderabad; FIIT, Delhi; Venture Center, Pune; and KIIT, Bhubaneswar

- Partners provide mentoring, monitoring, networking and other business development related activities

(v) **SPARSH (Social Innovation Programme for Products Affordable & Relevant to Societal Health):** 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. Focus on areas such as Mother & Child Health and Waste Management. Programme supports affordable product development at various stages:

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

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

□ **Contract Research Scheme (CRS):** Supports validation of academic research having commercialisation potential, by the industry.

- ❖ Funding is in the form of grant 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) 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 an 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
- ❑ **MeitY (Ministry 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
- (iii) **BIRAC SEED Fund (Sustaining Enterprise and Entrepreneurship Development):** Financial equity based support to start-ups and enterprises through bio-incubators for scaling enterprises.
 - ❑ 3 Incubators have been provided INR 100-200 Lakhs for investing in enterprises
 - ❑ Investment in enterprise to the tune of INR 20-30 lakhs
- (iv) **BIRAC AcE Fund (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. The fund will invest in professionally managed Venture Funds and Angel Funds dedicated to domain areas of life sciences and biotechnology.

III. Enablers for Scaling up the Ecosystem

- (i) **BIRAC BioNEST (BIRAC - Bioincubation: Nurturing Entrepreneurs for Scaling up Technology):** Flagship programme of BIRAC has created 19 world-class bio-incubators
 - ❑ Provides incubation space, mentor networks, instrumentation facilities, IP and technology management support, resource mobilization and legal services
 - ❑ 2,50,000 sq. ft. of incubation space created
 - ❑ More than 200 innovators supported

Board of Directors



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

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AWARDS

BIRAC National Award for Indigenous Product Commercialization

For the first time to celebrate the National Technology Day (May 11), BIRAC has instituted the 'BIRAC National Award for Indigenous Product Commercialization' to be given away to an organisation demonstrating excellence in successfully commercializing an indigenously developed technology. Achira Labs, a Bangalore based start-up, working on innovative point-of-care medical diagnostics platforms received the award for 2016 from the Honorable President of India, Shri Pranab Mukherjee at the National Technology Day event organised by the Technology Development Board at Vigyan Bhawan, New Delhi.



Dr. Dhananjay Dendukuri, Co-founder and CEO of Achira Labs receiving 'BIRAC National Award for Indigenous Product Commercialization' 2016 from the Honourable President Shri Pranab Mukherjee

Skoch Order of Merit for the BIRAC 3i Portal (Investment for Industry Innovation Research)

BIRAC 3i Portal (Investment for Industry Innovation Research) was adjudged amongst the 'Top 100 Projects in India' for the year 2016 and was conferred 'Skoch Order-of-Merit' during the 46th Skoch Summit held on December 15, 2016 at the Constitution Club of India, New Delhi



BIRAC receiving the Skoch Award 2016



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 Fifth Annual General Meeting of the Company will be held on:

Day and Date: September 12, 2017

Time: 4.30 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, 2017 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 2017-18, 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: August 22, 2017



Chairman's Message

The journey of BIRAC that began five years ago, in 2012, has now gathered pace impacting the landscape of biotech innovation across the country. As we celebrated our 5th Foundation Day, in March 2017, it was evident that the elements needed for building a vibrant biotech innovation ecosystem for biotechnology in India have been put substantively in place and have entered a new phase. BIRAC has played a key role in providing a national leadership in this transition.

The last financial year has seen many positive changes. The new National Biopharma Mission, launched by DBT, along with partnership with the World Bank was approved by the Cabinet. BIRAC is a key member of this mission and is responsible for its implementation. The programs designed within this mission, especially with its focus on drugs, vaccines and medical technologies, will significantly propel change in the mission to build India as a global biotech product and manufacturing hub with US\$100 billion bioeconomy.

Through BIRAC's early stage programs such as the Biotechnology Ignition Grant (BIG), which is the largest early stage biotech funding program in the country, and other flagship programs such as SPARSH and IIPME, we have transformed the biotech start-up landscape in the country by supporting more than 500 entrepreneurs and start-ups. BIG itself has catalysed formation of more than 70 new start-ups- individual entrepreneurs who established new enterprises.

Our early stage funding programs are complemented by our incubation and pre-incubation support programs such as BioNEST and University Innovation Clusters (UIC). We have now supported 24 biotech (including medtech) incubators across the country that provide incubation, nurturing and mentoring space to more than 250 biotech start-ups. We have also initiated the BIRAC Incubator SEED Fund program along with three of our incubators to provide equity based funding to start-ups. We look forward to implementation of the BIRAC AcE Fund- an equity based fund of fund in the current financial year.

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. Through BIRAC' support more than 70 products have been commercialised and the pipeline for new product generation is healthy.

BIRAC is one of the leading partners for several national programs such as 'Make in India' (MII) and 'Startup India'. The MII Facilitation Cell within BIRAC continuously interacts with other agencies to frame policies and track achievements of our commitment to the MII and Startup India plans.

We have also taken a focused approach through establishment of our Regional centres especially BIRAC Regional Innovation Centre (BRIC) and the newly established BIRAC Regional Entrepreneurship Centre (BREC). These two centres continue to engage with the biotech community and build its capabilities.

Our partners play a significant role in helping us build the biotech ecosystem. We have continued to build deeper engagement with 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, TiE-Delhi and Indian Angel Network (IAN) to further our collaborative goals.

BIRAC has received excellent rating on compliance with Guidelines on Corporate Governance for CPSEs for the year 2015-16 announced by Department of Public Enterprises.

As we look into the future, we are aware of the opportunities and the challenges. We have optimism that we can further quicken the pace of change through our focused efforts and our commitment to excellence and through building new partnerships

Prof. K.VijayRaghavan

Secretary, DBT, Govt. of India
& Chairman, BIRAC



Managing Director's Message

It gives me immense pleasure to present the 5th Annual Report of BIRAC highlighting the activities BIRAC has conducted over the previous year with a focus to build the nation's biotech innovation ecosystem through nurturing, enabling, catalysing and empowering the biotech entrepreneurs, start-ups and SMEs who have innovative ideas for novel biotech products and processes.

Glancing over the last five years we notice that our programmes which encompass the whole chain of product development cycle, including protection of intellectual property, have been creating tangible impact on the ground. Our nascent stage funding programs such as BIRAC-GYTI Awards, SIIP Fellowships, UIC have been able to generate budding entrepreneurs. We and our partners engage with the entrepreneurial community through hackathons and ideathons. Our early stage flagship funding programs especially BIG and others such as SPARSH and IIPME have been successful in creating a vibrant biotech start-up culture in the country. We have complemented our funding to entrepreneurs and biotech start-ups with our biotech incubator program, BioNEST that have become hubs for entrepreneurial activities.

The support that we have extended to over 500 entrepreneurs and start-ups is now translating into development of more than 70 novel products and technologies. In this translation our product development programs such as SBIRI and BIPP have played an important role in de-risking several aspects of product development.

BIRAC has become the implementing Agency for the recently launched Biopharma Mission program- a significant achievement in our vision to build a biotech product nation attaining US\$100 billion biotech industry. We hope that aligned with our programmes, the Biopharma Mission will indeed catalyse significant growth in the industry.

We have continuously engaged with other Ministries and national programmes such as Make in India, Startup India and Invest India in building aligned strategies for biotechnology for the nation.

Our efforts have been to continuously identify the gaps and opportunities in the ecosystem and design solutions for the community through aligned partnerships. In this regard we have now established new partnerships with a host of organisations such as TiE, Indian Council of Medical Research (ICMR) and Indian Angel Network (IAN). Along with our valued partners such as Bill & Melinda Gates Foundation, Wellcome Trust, CEFIPRA, USAID, WISH Foundation and Tekes, we continue to deliver impactful programs.

The networking platforms that we have built such as Innovator Meet and Innovation Market Place, BIG Conclave and BioNEST Conclave along with our Roadshows and other regulatory, technical and business workshops provide excellent opportunities for networking for our entrepreneurs.

As we strategize into the future, we will continue to build and scale on the foundations that we have established such that our impact becomes not just pan India but global.

Dr. Renu Swarup
Senior Adviser/Scientist 'H', DBT, GOI. &
Managing Director, BIRAC

Board of Directors

Prof. K. VijayRaghavan : Chairman
Dr. Renu Swarup : Managing Director

Non-Executive Independent Director

Prof. Ashok Jhunjhunwala : Director
* Prof. Akhilesh Tyagi : Director
* Dr. Naresh Dayal : Director
* Prof. Pankaj Chandra : Director
Dr. Gagandeep Kang : Director
Prof. Deepak Pental : Director
Dr. Dinakar M Salunke : Director
Government Nominee
Dr. Mohd.Aslam : Director
* Appointed w.e.f. March 15, 2017
Tenure till March 15, 2017

Profile of Prof. VijayRaghavan



Professor K. VijayRaghavan is the Secretary, Department of Biotechnology, Government of India since January 28, 2013. Before that, he was the Director of the National Centre for Biological Sciences (NCBS) of the Tata Institute of Fundamental Research (TIFR) and the interim head of The Institute of Stem Cell Biology and Regenerative Medicine (inStem) a new autonomous institute of the Department of Biotechnology (DBT). Prof. VijayRaghavan's contributions in science, as a developmental biologist, have been recognized widely. He was conferred an honorary Doctor of Science degree by the University of Edinburgh in 2011. He is a J. C. Bose Fellow of the Department of Science and Technology. He gave the J.C. Bose Memorial Lecture at the Royal Society in 2010, was awarded the inaugural Infosys Prize in Life Sciences 2009. He is a recipient of Shanti Swarup Bhatnagar Prize, India's most prestigious science award, in 1998. He is a fellow of The Indian National Science Academy and The Indian Academy of Sciences and served on the Council of the latter. Prof. VijayRaghavan is an Associate Member of the European Molecular Biology Organization. In 2012, Prof. VijayRaghavan was elected a Fellow of the Royal Society and in 2014 a Foreign Associate of the U. S. National Academy of Sciences.

Profile of Dr. Renu Swarup



Dr. Renu Swarup is presently Senior Adviser in the Department of Biotechnology (DBT), Ministry of Science & Technology, Government of India. She also holds additional charge of Managing Director, Biotechnology Industry Research Assistance Council (BIRAC) a Public Sector Undertaking of DBT setup to foster and nurture Innovation and Entrepreneurship Ecosystem in the Biotech system. 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.

Profile of Independent Directors

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 GlaxoSmithKline 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. Ashok Jhunjunwala,
Institute Professor – Department of Electrical Engineering, IIT Madras**



Ashok Jhunjunwala is an Institute Professor at Indian Institute of Technology, Madras at Chennai, India. He is currently on deputation as Advisor to Minister of Power and MNRE, Government of India.

Prof. Ashok Jhunjunwala 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.

Dr. Jhunjunwala 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.

Dr. Jhunjunwala has been Chairman and member of various government committees, Boards of education institutions and was Board Member of a number of public and private companies. The companies include State Bank of India, TATA Communications, BSNL, Bharat Electronics, Mahindra Electricals, Sasken, Polaris, NRDC, BIRAC, Intellect, Tejas, TTML, IDRBT, HTL. At each place he has driven innovative and comprehensive changes, especially in the area of technology. He is currently on the Chairman of Technology Advisory Group of SEBI.

Dr. Jhunjunwala 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 LalaWadhwa 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. Pankaj Chandra



Professor 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 start-ups, 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).

Dr. Gagandeep Kang



Dr. Gagandeep Kang is the Executive Director of the Translational Health Science and Technology Institute in the National Capital Region. She is on a sabbatical from her former position as a Professor in the Division of Gastrointestinal Sciences at the Christian Medical College (CMC) in Vellore.

Dr. Kang's research on enteric infections focuses on epidemiology, prevention and vaccine development. She has worked with the Indian Council of Medical Research and the National Institute of Epidemiology to develop a network of Indian rotavirus clinical surveillance sites and laboratories. She heads the WHO Rotavirus Reference Laboratory for the South East Asian Region, coordinating efforts to ensure high quality investigations to support estimation of disease burden and prepare for monitoring the impact of vaccines. In addition, her group at CMC carries out clinical research on rotavirus and polio vaccines,

conducting both complex field studies and laboratory assays for evaluation of vaccine performance. Complementary studies on gut function investigate the sequelae of enteric infections and effects on long term growth and development.

Dr. Kang's work has been supported by direct competitively obtained funding from the US National Institutes of Health, the Wellcome Trust, the Bill and Melinda Gates Foundation, the European Union and other international and national funding. Her work has resulted in over 200 publications, in national and international journals of high standing, and her academic contributions have been recognized, as the first woman and the first Indian to be invited to edit the prestigious Manson's Textbook of Tropical Medicine. The large body of research conducted by her group has led to practical interventions to prevent diarrhoeal disease, and continues to lay the groundwork for further interventions in the form of treatment techniques and vaccines.

She holds MBBS, MD and PhD degrees from CMC a Fellowship of the Royal College of Pathologists, London. She is an elected Fellow of the Indian Academy of Sciences, National Academy of Sciences, Indian National Science Academy, the UK Faculty of Public Health and the American Academy of Microbiology. She chairs the Immunization Technical Advisory Group for the WHO's South East Asian Region, and serves on several Scientific Advisory Groups nationally and internationally and is a member of the WHO's Immunization and Vaccine Implementation Research Advisory Committee and the National Technical Advisory Group on Immunization. Dr. Kang retired from the Board of BIRAC on March 15, 2017.

Prof. Deepak Pental



Professor Deepak Pental is former Vice-chancellor of University of Delhi and currently associated with Centre for Genetic Manipulation of Crop Plants (CGMCP) at South Campus of the University. He did his undergraduate and postgraduate degrees from the Department of Botany, Panjab University and subsequently Ph.D. from Rutgers University, USA. He was a Postdoctoral and University Research Fellow at the University of Nottingham from 1978-84. Prof. Pental's research interests are in breeding of mustard and cotton. He has published more than seventy research papers in national and international peer reviewed journals and his work has led to significant breakthroughs in hybrid seed production technologies. He is an elected member of the National Academy of Agricultural Sciences, the National Academy of Sciences, the Indian Academy of Sciences and the Indian National Science Academy. Prof.

Pental is recipient of many awards which include – Jawaharlal Nehru Fellowship in 2004; 'Officer Des Palmes Academiques' by the Government of Republic of France in 2007; Om Prakash Bhasin Award in 2008; J. C. Bose Fellowship from DST in 2010; FICCI award in 2010 for innovative R&D in Life Sciences and a D.Sc (hc) from the University of Nottingham in 2012. Prof. Deepak Pental retired from the Board of BIRAC on March 15, 2017.

Dr. Dinakar Masanu Salunke



Dr. Salunke is currently the Director at ICGEB, New Delhi. He was earlier the Executive Director of Regional Centre for Biotechnology, Faridabad from 2010 to 2015.

After obtaining Ph. D. (1983) from Indian Institute of Science Bangalore, he carried out post-doctoral research at the Brandeis University in USA. He returned to India in 1988 to join the National Institute of Immunology, New Delhi and worked there until 2010. Dr. Salunke's Research Interests are Structural Biology of Immune Recognition, Molecular Mimicry and Allergy. He is a Fellow of the Indian National Science Academy (2004), Indian Academy of Sciences (2001), and the National Academy of Sciences (India)

(1995), The World Academy of Sciences (2014).

Dr. Salunke is recipient of many awards viz. GN Ramachandran Gold Medal for Excellence in Biological Sciences and Technology (2010), JC Bose National Fellowship Award (2007), Ranbaxy Research Award for Basic Research in Medical Sciences (2002), Shanti Swarup Bhatnagar Prize for Biological Sciences (2000), National Bioscience Award (1999), among others. Dr. Dinakar Masanu Salunke retired from the Board of BIRAC on March 15, 2017.

Government Nominee

Dr. Mohd. Aslam



Dr. Mohd. Aslam is currently Advisor (Scientist 'G') in the Department of Biotechnology (DBT). 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.

CORPORATE INFORMATION

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COMPANY SECRETARY

Ms. Kavita Anandani

Directors' Report



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 a new 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 three 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.

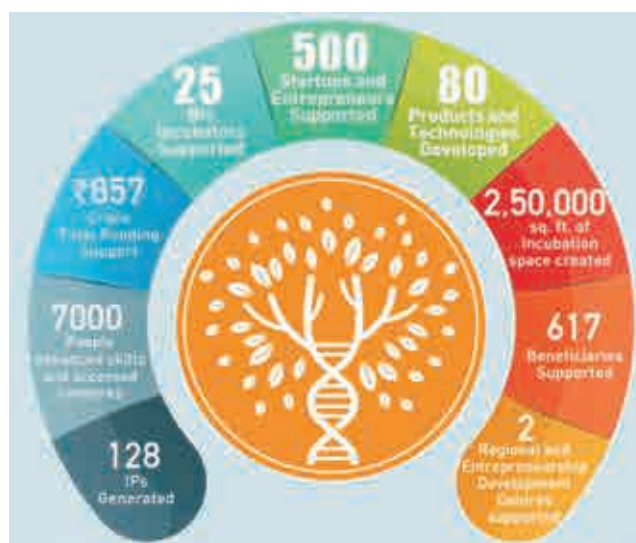
2. OUR PHILOSOPHY & ACHIEVEMENTS

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 5 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. 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 Startups: 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. This, BIRAC has successfully attempted by creating several programmes under the umbrella of SITARE and eYUVA. 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 1 lakh to 100 entrepreneurial ideas (currently 134 such ideas have been facilitated) and additionally we also provide INR 15 lakhs to student teams at academic institutions to take forward their ideas under the guidance of an academic mentor (34 such BIRAC-SRISTI awards have been provided). The Hon'ble President's Rastrapati Bhavan is the venue where these awards are announced that inspires our young students to aim at achieving.

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. 17 Innovation fellows are currently working on taking their ideas towards commercialisation.

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. 14 **SIIP fellows** have been working diligently to identify societal needs. Many of the SIIP fellows are 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 referred to as) 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 more than 212 entrepreneurial ideas and at least a dozen have accelerated to commercialisation stage while another 15-20 are in validation stages. In 2016-17, two calls of BIG were announced (9th & 10th). In the 10th call, 313 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 71 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 (70 such IPs have been generated through BIG). More than INR 100 crores of funds have been raised by around 50 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 19 bioincubators across the country. These bioincubators together provide more than 200,000 sq. ft. 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 200 biotech start-ups and entrepreneurs and complements our early stage funding programs such as BIG, SPARSH and IIPME. Many of these incubatees at BIRAC's BioNEST are now able to grow and become 'Anchor Companies' to hand hold new nascent companies in the bioincubators. In 2016-17, six new bioincubators were supported such as at Bangalore Bioinnovation Cluster (BBC), BITS Pilani Goa campus and Ahmedabad University to name a few. It is also to be noted that many of earlier bioincubators have now matured and BIRAC has been extending support for their scale up such as at NCL's Venture Center and SIIC at IIT Kanpur.

In 2016-17, BIRAC also launched **BIRAC SEED Fund**. This fund aims to plug the gap of bridge funding through an equity mode. In this program, BIRAC provides funding up to INR 2 crores to bioincubators who in turn equity invest up to INR 30 lakhs in start-ups. Three bioincubators viz. IKP Knowledge Park, NCL's Venture Center and C-CAMP have been selected for BIRAC SEED Fund.

Engagement at SME level for Product Development: Catalysing Commercialisation of cutting edge and affordable biotech products for the nation and the world 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, 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 2016-17, three calls were announced (31st, 32nd and 33rd) which supported a range of projects ranging from vaccines, stem cells to agriculture. Over the years, SBIRI has supported 221 projects and 27 product/ technologies have been developed through SBIRI.

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 182 projects, 177 companies and 65 academic institutions. Nineteen products and technologies have been developed through BIPP and 30 IPs have been generated. In 2016-17, 70 projects were supported which included 31 new projects.

A concerted effort by BIRAC to bring together academia and industry to collaborate is through the **Contract Research Scheme (CRS)**. Through CRS, academic leads could be tested via an industry partner. Presently, 17 projects involving 19 academia and 20 collaborators are ongoing indicating the fruitful steps BIRAC has taken to bring academia and industry on to a platform for collaborations.

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 first project is progressing there while the second ETA in industrial biotech/bio processing is being established at IIT Madras.

To provide further impetus to product development in biopharmaceuticals, BIRAC has continued its efforts to map the needs of the biopharma sector such that future programmes can be implemented. Recently in May 2017, the Cabinet Committee approved the **Biopharma Mission in partnership with the World Bank** wherein INR 1500 crores would be provided to boost the Indian Biopharma sector in vaccines, biosimilars and medtech. This is a significant moment in the history of Indian biotechnology and this mission would be operationalised in the current financial year, with 50% funding coming from World Bank.

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

A key feature of putting policy into practice is to understand the landscape of innovation and proactively map existing capabilities as well as identify gaps. BIRAC through a partnership with IKP established BIRAC Regional Innovation Centre (BRIC) in 2013 to extensively map the regional innovation in South Indian clusters. In 2015-16, BRIC has proactively mapped the evolving biotech ecosystem at Bangalore, Chennai and Trivandrum. The findings were officially released as a report in October 2016 and further engagement with stakeholders to build on the learnings from the

report have been initiated. Through BRIC, another exercise in mapping has been initiated in the Western cluster (Mumbai, Pune, Ahmedabad), Central India (Bhopal and Indore) and Eastern India cluster of Bhubaneswar and Vizag. BRIC also conducts workshops, networking meetings and technology showcasing for entrepreneurs and start-ups.

BIRAC also continuously engages with student communities to spur them to think innovatively and we have organised Ideathons and Hackathons. An extensive Hackathon in medtech domain was organised in June 2016 along with IKP Knowledge Park and C-CAMP wherein 10 teams participated over 3 days and 'hacked' solutions for several healthcare challenges.

Our commitment to engage with start-ups such that we are able to amplify their transition to the next level is high and in this regard, BIRAC established its 2nd regional centre at C-CAMP, Bangalore in January 2017. This centre is focussed on conducting entrepreneurial activities and is named as BIRAC Regional Entrepreneurship Centre (BREC). BREC will conduct various awareness programmes, workshops, boot camp, national level challenge etc. to foster the spirit of entrepreneurship in the biotech sector.

BIRAC working towards fulfilment of the goals of the National Mission Programs: Make in India & Startup India

During the previous year, BIRAC provided active support to Startup India Mission as well as the Make in India programme. With support from DBT, BIRAC has created a Biotechnology Industry Facilitation Cell under the Make in India umbrella to identify key areas of growth for Make in India. We have continuously interacted with DIPP for supporting the Biotechnology component of Make in India. Our aim also has been to support the Startup India programme. We have contributed to the Startup 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 centers besides supporting 2000 start-ups by 2020.

In 2016-17, the Make in India cell of DBT which is housed in BIRAC conducted an extensive study and published a report on the Make in India opportunity for India. This report was released in September 2016 at the BIRAC 5th Innovator Meet by Hon'ble Minister for Science & Technology, Dr. Harsh Vardhan and by Shri. Y.S. Chowdary, MoS Science & Technology. The report captured the global perspectives about how leading countries have developed their biotech industry and the lessons for India to draw upon.

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. A total of 19 projects have been funded in the first round.

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. Under this collaboration, three calls for Grand Challenges India have been launched including Achieving Healthy Growth through Agriculture and Nutrition, Reinvent the Toilet Challenge and All Children Thriving (which was launched in 2014). In total, 18 projects have been awarded including 7 in All Children Thriving whose awards were announced in 2015-16. The PMU also launched KniT (Knowledge Integration and Translational Platform) in 2016 to work closely with State healthcare machineries.

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 second call for new diagnostics for TB has supported six proposals for support in first phase.

Antimicrobial Resistance (AMR) is a rapidly emerging public health issue due to variety of factors including development of resistance in microbes due to improper use of antibiotics without prescriptions, usage of antibiotics in animal feed industry and several other factors. This has led to

an emerging crisis in development of mutated microbes which are resistant to known antibiotics (including multidrug resistance) that is increasingly causing growing numbers of mortality as well as hospital acquired infections. **Nesta UK** has launched a global Longitude Prize aiming to find several solutions to AMR. We have established a partnership with Nesta UK in Longitude Prize especially in **Discovery Awards** to create pipeline of projects for AMR. In 2016-17, five Indian teams received Discovery Awards and the awards were conferred in London.

Access to primary and secondary care healthcare facilities remains a challenge for many of our start-ups who are developing cutting edge medtech 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'.

A whole set of partnerships established by BIRAC smoothen knowledge flows, encourage mobility and help in creation of national and international networks. Our continuing partnerships with the Judge Business School, **University of Cambridge, UK** connects our BIG innovators with the deep innovation ecosystem of Cambridge and beyond. In 2016-17 we sent **five BIG grantees** to Cambridge to train in business and technical aspects of their enterprises in the flagship Ignite workshop. While our new partnership with Tekes Finland is for connecting Finnish innovation ecosystem with India, we have also joined hands with **TISS Mumbai** to help our social innovators.

Platforms: Bringing the evolving Community together for Collaborations

BIRAC pro-actively nurtures emerging start-ups and SMEs through a variety of programmes. It actively engages with all stakeholders through seminars and workshops and many other platforms.

In 2016-17 we conducted four Roadshows, Grant writing and IP workshops as well as four hands-on training workshops. Through support to our programme partners such as our BIG Partners, BRIC and SIIP Partners we have conducted several seminars and workshops over the last year.

We have created platforms such as **Innovators Meet** (the 5th Innovator Meet was conducted in September 2016), **Foundation Day** (5th Foundation Day was organised in March 2017). As part of the 5th Foundation Day, BIRAC and the PMU organised **Grand Challenges Meeting** from 21st- 24th March. The flagship platform for BIG start-ups, the BIG Conclave was organised in June 2016 with the intention of bringing together biotech start-ups to one platform. In 2016-17 we also initiated a platform for our biotech incubators to connect by organising the 1st **BioNEST Conclave** where biotech incubators discussed salient issues affecting them and recommended policy framework to address the issues. Cumulatively we connect close to 1500 stakeholders each year and along with our partners the numbers increase to 2500 and beyond. Together, these platforms have allowed innovators to meet, share information and best practices, catalyse partnerships and network. We also actively participated in BIO 2016 as well as other platforms such as BIO Asia at Hyderabad to name a few.

Our engagement with student community is valued by us. To instil a spirit of innovation, BIRAC conducted a Hackathon in Bangalore in June 2016 in partnership with IKP Knowledge Park. BIRAC also participated in **Festival of Innovations at the Rastrapati Bhavan** and organised an **Innovation Marketplace** in partnership with **Indian Council Medical Research (ICMR)** and **National Innovation Foundation (NIF)** in March 2017.

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 sms alerts, 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.

Recognition for BIRAC Start-ups & SMEs

1. **Dr. Sanjiv Sambandan, Openwater.in** was ranked amongst GEN Top 10 (of 1000+ start-ups from 165 countries) and F6S top 10 for his project titled "Hassle Free Waste Water Treatment: From Water-bottles for Individuals to Systems for Communities"
2. **Mr. Vinayak Nandalike, Yostra Labs Private Limited** received funding from Villgro, Marico and Karnataka Govt. Idea2Poc for his project, Warm Oxygen Therapy for Treatment of Diabetic Foot Ulcer
3. **Dr. Rajlakshmi Borthakur, Terra Blue Exploration Technologies Private Ltd.** won the following awards:
 - a. Innovate for Digital India Challenge, 2016
 - b. Assam Young Innovator's Award
 - c. Acer Award, Taiwan

For her project title, "TJay - An Innovative Solution for the Prediction & Management of Epilepsy"
4. **Dr. Shanthanu Chakravarthy** received funding from Karnataka Govt. (Idea2POC) for his project titled, A Virtual Reality (VR)-based endoscopy simulator
5. **Dr. Sreekar Kothamchu, Nesa Medtech Pvt. Ltd.** received Excellence in Medical Research & Development- IHP Awards and funding from Karnataka Govt. (Idea2POC) for his project on Affordable and Minimally invasive therapy for woman with Symptomatic Uterine Fibroids
6. **Mr. Mihir Mehta, Green Pyramid Biotech. Pvt. Ltd.** won the following awards:
 - a. TiE smash-up award of Rs. 25L
 - b. 10 L from SINE IITB-SwissNex (Winner among the top 10 start-ups in India for the Academia Industry Training – AIT Cycle 3 jointly organized by Department of Science and Technology (DST), Swissnex India and Society for Innovation and Entrepreneurship (SINE, IIT Bombay).)

For his project titled, Bio-Synthesis, Production and Formulation of Sophorolipids for the purpose of Sanitizing/Sterilizing Fruits and Vegetables thus enhancing their shelf-life.
7. **Smrita Pradhan** was selected as finalist in Young Innovators Challenge Award, 2017 conducted by 3M for her project Development of Economically Viable Products for Microbial & Mammalian Cell culture, Animal Nutrition etc., by Recovering Silk-Sericin from the Industrial Effluents by Implementing Novel Strategies for Degumming and Recovery
8. **Dr Renuka Diwan, Bioprime AgriSolutions** was selected as an Untd fellow, social entrepreneurs, for the 2017 cohort for her project Process to produce double haploid parental lines with new, unique, rare genetic combinations using DH technology coupled with a strategy to increase or alter meiotic recombination in the technology demonstration system of mustard
9. **Pranav Chopra, Crimson Healthcare Pvt Ltd** received funding under IndoUs grant 2017 for his project SphinX – Ostomy Management Device
10. **Dr. H V Srinivas** received Economic Times Power of ideas 2016 and follow on funding under Idea2PoC grant Govt. of Karnataka for his project on A gonio-camera without a slit lamp
11. **Dr. Pankaj Chhatrala, JC OrthoHeal Pvt Ltd** received following awards and recognitions for his project titled, FlexiOH: Breathable, Washable and Lightweight cast immobilization for fractured bone
 - a. DST Lockheed martin Gold medal for top 30 innovation under Indian Innovation Growth program
 - b. Commercialization support From IC2 institute University of Texas on being shortlisted among top-10 technologies in IIGP-2016.
 - c. Nominated as part of Indian delegate visit to silicon valley- USA by IUSSTF.
12. **Ms. Geethanjali Radhakrishnan, Adiuvo Diagnostics Private Limited** received follows awards and recognitions for her project titled Portable Hand Held Dermoscope For Real Time Non-Invasive Detection And Monitoring Of Skin Infections Using Multi-Wavelength UV Fluorescence
 - a. Part Of CIIE Accelerator Cohort Program, 3 Month - IIM Ahmedabad
 - b. ASME Ishow - Hardware Innovator Award Conducted By American Society Of Mechanical Engineer In 2016
 - c. Supported by VILLGRO INNOVATION FOUNDATIONS

Key achievements

BIRAC provides support to 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 financial year 2016-17, BIRAC announced **12 successful calls for proposals** under various schemes in which **780 proposals** were received. The percentage of new applicants during the year was **51%** indicating the outreach initiatives and market efficiency of BIRAC. The average decision making time to support a project for funding was **162 days** during the financial year 2016-17.

During the year, **six** 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.

During the year, 24 projects out of the identified 47 projects achieved Technology Readiness Level - 7 (TRL-7) amounting to **51%** 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.

391 beneficiaries were supported by BIRAC under its various schemes during the year 2016-17. **Two regulatory workshops** and four Hands on training workshops were conducted during the year, benefitting **200 participants**.

The total amount mobilized from sources other than the Department of Biotechnology (DBT), which is the Administrative Ministry was **14%** of the annual allocation from DBT. During the financial year 2016-17, **92%** of the total funds mobilized by the organization were disbursed towards fulfilling the mandate of BIRAC.

Over the 5 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, advise and mentor start-ups 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 Schedule B CPSE under the Department of Biotechnology, Ministry of Science & Technology registered as a Section 8 Company of the Companies Act, 2013. The constitution of Audit committee is a requirement under the Corporate Governance Guidelines issued by Department of Public Enterprises (DPE). With a change in the composition of the Board, the Audit Committee was reconstituted on March 15, 2017 with 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. Renu Swarup as members.

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 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 necessary procedures and processes in accordance with the Right to Information Act, 2005 as amended from time to time & Government Guidelines; it has appointed a CPIO and 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 innovation value chain, namely, early stage innovation research, product development, product validation and commercialization. BIRAC being a Government Organisation, 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 agreements which have inbuilt controls and accountability mechanisms at every stage.

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

Risk Management monitoring process in the organisation is based on compliance reporting in the Risk calendar which is circulated to all Department Heads with comprehensive parameters drawn from 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 processes vis-à-vis the Standard operating Procedures and reports to the Board for any deviations & suggestions to make processes better.

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

The Company has a Grievance Redressal Mechanism and has a Complaints Committee with 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. The State of Rajasthan which will also serve as the Internal Complaints Committee (ICC) to redress complaints received regarding sexual harassment under the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013.

All employees (permanent, contractual, temporary, trainees) are covered under this policy. The Company has not received any grievances during the financial year 2016-17.

11. **MEMORANDUM OF UNDERSTANDING (MOU)**

BIRAC had entered into the third Memorandum of Understanding (MoU) for the year 2016-17 with the Administrative Ministry, the Department of Biotechnology (DBT), Ministry of Science & Technology on September 26, 2016, as per the Guidelines issued by the Department of Public Enterprises (DPE).

BIRAC was also awarded 'Excellent' grading for its achievements against the targets set out in the MoU for the year 2015-16 by the Department of Public Enterprises (DPE)

12. DIRECTORS' 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 2016-17). The Board places on record its appreciation for the services rendered by the outgoing auditors, M/s SAMPRK & Associates.

The Auditors' Report /CAG Report are appended to the Financial Statements and are self-explanatory and suitably explained in various Notes to the accounts.

15. BANKERS

Bankers 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. Prof. K. VijayRaghavan, Secretary, Department of Biotechnology is the Chairman of the Board and Dr. Renu Swarup, Senior Adviser, Department of Biotechnology is the Managing Director.

The Board was reconstituted on March 15, 2017 with 3 new directors viz. Shri. Naresh Dayal, Prof. Pankaj Chandra and Prof. Akhilesh Tyagi, who were appointed as independent directors. The current composition of the Board includes 4 independent directors viz. the 3 independent directors as stated hereinabove and Prof. Askok Jhunjhunwala, who continues on the Board of BIRAC as an independent Director. Dr. Mohd. Aslam, Scientist 'G', Department of Biotechnology is the Government nominee director. The tenure of three of the independent directors, viz. Prof. Deepak Pental, Department of Genetics, University of Delhi, Dr. Dinakar Mashnu Salunke, Director of International Centre for Genetic Engineering and Biotechnology, New Delhi and Dr. Gagandeep Kang, Professor & Head, Department of Gastrointestinal Sciences, Christian Medical College, Vellore came to an end on March 15, 2017. The Company places on record its appreciation for the valuable inputs and contribution of the outgoing directors.

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 has 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.

C. Foreign Exchange Earnings & Outgo

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

Grant received in foreign exchange to the extent utilized	Rs. 7,38,61,731
Foreign Exchange outflow	
A. Technology Transfer	Rs. 1,28,17,927
B. Books, Journals and database subscriptions	Rs. 69,24,995
C. Entrepreneurial Development	Rs. 16,09,224
D. Advertisement, Publicity, Publication	Rs. 13,00,930
E. Foreign Travel & Meetings	Rs. 11,73,160
CIF value of import	Nil

ACKNOWLEDGMENT

The Directors wish to place on record their appreciation for the valuable guidance and cooperation extended to the Auditors, Banks, and various governmental 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.

Date: August 22, 2017
Place: New Delhi

For and on behalf of Board
Prof. K. VijayRaghavan
Chairman

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)	72100	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 Shareholding during the year
		No. of Shares	% of total Shares of the company	% of shares Pledged/encumbered to total shares	No. of Shares	% of total shares of the company	% of shares Pledged/encumbered 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)	900	10%	Nil	900	10%	Nil	Nil
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 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	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	
		No. of shares	% of total shares of the company	No. of shares	% of total shares of the company
	For each of the top 10 Shareholders				
	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. K. VijayRaghavan, Chairman (on behalf of the President of India)

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
	For Each of the Directors and KMP				
	At the beginning of the year	900	9	900	9
	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	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	
		No. of shares	% of total shares of the company	No. of shares	% of total shares of the company
	For each of the Directors and KMP				
	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 Jhunjunwala	Dr. Deepak Pental	Dr. Gagandeep Kang	Dr. Dinakar M. Salunke	Prof. Pankaj Chandra	Prof. Akihilesh Tyagi	Mr. Naresh Dayal	
1.	Independent Directors								
	• Fee for attending Board committee meetings (5 Meetings)	40000	50000	30000	50000	10000	10000	10000	200000
	• Commission	-	-	-	-	-	-	-	-
	• Others, please specify								
	• Audit Committee (4 Meetings)	40000	-	-	40000	10000	10000	-	100000
	• Independent Directors' Meeting	-	-	-	-	-	-	-	-
	Total (1)	80000	50000	30000	90000	20000	20000	10000	300000
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)	80000	50000	30000	90000	20000	20000	10000	300000
	Total Managerial Remuneration	80000	50000	30000	90000	20000	20000	10000	300000
	Overall Ceiling as per the Act	N.A.	N.A.	N.A.	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

Management Discussion and Analysis Report

(Forming Part of the Directors' Report for 2016-17)



MANAGEMENT DISCUSSION AND ANALYSIS REPORT

(Forming Part of the Directors' Report for 2016-17)

INDUSTRIAL STRUCTURE AND DEVELOPMENT

India proudly stands among the world's top 10 nations for the number of scientific publications. Among the nations that publish 50,000 or more papers, India ranks 17th in the number of citations received and 34th in the number of citations per paper across the science and technology space. Moreover, the credibility of the India's innovation potential gets further impetus by its 12th standing in the number of patents filed.

It is imperative to emphasize here that biotechnology plays an anchoring role in developing a robust yet economically viable innovation ecosystem in the country. Government's initiatives and role in harnessing the biotechnology potential of the country have been critical for strengthening the roots of the innovations and research and development. A string of programmes have been launched to promote investment and manufacturing in India. Programmes such as Make in India, Digital India, and policies relating to FDI norms and tax incentives have paved the way for attracting investments in the diversified sectors and promoting entrepreneurship. Startup India Action Plan, announced on 16th January, 2016 is a flagship initiative of the Government. The initiative intends to develop, foster and nurture an ecosystem for supporting innovations having potential for propelling a sustainable economic growth for the country.

Biotechnology industry in India has been on a steady growth trajectory. From humble beginnings and US\$ 1.1 Billion revenues in 2005, the industry has grown to US\$ 7 Billion revenues at a CAGR of 20% in the last ten years and has reached US\$ 11.6 Billion in 2017. The industry would need to shift to a higher growth trajectory (30% +) over the next 10 years to meet its ambitious target of US\$ 100 Billion by 2025.

Over the last 5 years, BIRAC has contributed immensely to the development of the biotech ecosystem that can fuel future growth through its various flagship programmes categorised in SITARE, eYUVA, Funding Product & Process Development and Enablers for Scaling up the Ecosystem such as BioNEST. The access to early stage capital especially through early seed money is now available and this has kickstarted a biotech start-up culture in the country. BIRAC's BIG programme has been instrumental in spurring the biotech start-up growth. Further several bioincubators have been operational in the aforementioned period and BIRAC's Bioincubation programme has been a key to the growth of 20 bioincubation facilities across the country. Follow on funding especially via BIRAC (through its flagship SBIRI and BIPP) have been instrumental in validation, scale-up and commercialisation of products. Over the last 5 years several venture capital, biotech/healthcare accelerators and early stage funders have become active in India, contributing to the growth story of the biotech industry.

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

STRENGTH AND WEAKNESSES

The National Biotechnology Development Strategy that was announced by the Department of Biotechnology (DBT) in December 2015 aims to scale the focus on innovation R&D while deepening India's basic science research. BIRAC's vision and mission have direct alignment to NBDS 2015 strategy.

Nationally, there is a renewed focus on entrepreneurship and innovation through national programmes such as 'Make in India', Startup India, Swachh Bharat and Atal Innovation Mission. In all of these programmes, BIRAC is positioned to lead the way in the S&T especially biotechnology innovation in the country. BIRAC has actively interacted (and positively contributed to) with DIPP, Atal Innovation

Mission, Ministry of Skill Development & Entrepreneurship, DeitY and ICMR aiming to start inter-agency dialogues for common goals. BIRAC actively contributed to Make in India Biotech Strategy, Start up India strategy and Atal Innovation Mission Report in 2015-16. All these national missions mention BIRAC as the go-to partner in the realm of biotechnology.

While the infrastructure- both human resources and facilities have improved in the recent past, there still exists a gap between industry and academia especially in translation of fruits of academic research into products and processes for societal benefit (i.e. translational research). BIRAC is committed to work academic institutes to catalyse translational research through establishment of Technology Transfer Offices (TTO's), incubators, industry-academia collaborative projects and deepen its commitment to early stage translation programmes.

The evolving situation in the regulatory landscape will be one of the key factors for future growth of the Indian biotechnology sector especially Ease of Doing Business, regulation in the realm of biosimilars, stem cells, medical technology, clinical trials and bio-agri products. BIRAC aims to provide key inputs to regulatory agencies in building a transparent evidence based regulatory landscape in India.

RISK AND GOVERNANCE

The biotechnology innovation pathway has a long gestation period ranging from 6-10 years. This creates immense pressure on start-up enterprises that are attempting to build novel, high quality and affordable products in India. For building an excellent bioeconomy founded 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 start-up 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.

BIRAC can extend its support in all areas, however there are areas such as regulation where BIRAC does not play the role of regulator. BIRAC can, however, extend its support to regulators in understanding the evolving technological changes such that clear regulations can be designed that does not impinge upon the growth of the industry.

One of the gaps in Indian biotech start-up is lack of extensive 'Angel Funding' especially in the range of INR 1.5 crores to INR 5 crores. This funding is crucial for start-ups to cross the valley of death. BIRAC intends to work with Angel Funding agencies such as Indian Angel Network (IAN) as well as other venture fund agencies such as Bharat Funds, numerous accelerators and aligned organisations to bridge this crucial gap. We have also initiated BIRAC Regional Entrepreneurship Centre (BREC) which will conduct multitudes of programs which will help start-ups to understand and refine their business models, regulators, connect them to investors for follow on funding.

One of the risk 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 will proactively partner with other S&T knowledge agencies across the world such as Tekes, 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

As laid out in the mandate, BIRAC works across three principal verticals, with each vertical having a specified scope of work and programs/schemes that are run. Additionally, BIRAC provides support across several others facets of the biotech industry, academia and government interface.

I. Investments

BIRAC, through its Investment vertical, provides necessary opportunities to public sector

researchers, 1st generation Entrepreneurs, early start-ups and SMEs to take forward their discovery and innovation research and work together to promote affordable innovation in key social sectors, through commercialization of the discoveries to ultimately ensure global competitiveness of our Indian enterprises.

Through its investment programmes, BIRAC aims to empower, enable and catalyse the innovation driven biotech enterprise to fulfil the vision of ‘a US \$100 billion Biotech Industry by 2025’.

The Investment vertical currently runs five schemes that are the flagship programs of BIRAC; the BIG, BIPP, SBIRI, CRS and SPARSH, with a sixth program in a testing phase, the AcE Fund.

1. **Biotechnology Ignition Grant (BIG)**

The Biotechnology Ignition Grant (BIG) is BIRAC’s flagship funding scheme that supports early-stage funding for biotech start-ups and entrepreneurial individuals to support ideation and propel it towards the important milestone of proof-of-concept for ideas that have translational potential. BIG is targeted towards scientist entrepreneurs from research institutes, academia and start-ups.

- **BIG works with four major mandates:**

- To foster generation of ideas with commercialization potential
- To scale-up and validate proof of concepts
- To encourage researchers to take technology closer to market through start-ups
- To stimulate enterprise formation

The scheme is managed by five partners, 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.

Today, BIRAC’s BIG Partners are institutes and incubators spread 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-TBI, Bhubaneswar
- Venture Center-NCL, Pune

In FY 2016–2017, two calls BIG 9 and BIG 10 were launched on 1st July 2016 and 1st January 2017 respectively.

The 8th call of BIG saw a total of 20 proposals supported while the 9th call supported a total of 23 projects. In total, 43 new projects were supported in FY-2016-17. BIRAC also published its 2nd BIG report, outlining the achievements and growth of this flagship national program.

As of FY-2016-17, a total of 155 projects were active. A total of INR 32,96 crores was released to BIG partners to be disbursed to new and ongoing awardees.

So far, we have received more than 2000 proposals, out of which, 212 have been supported. Through these 212 projects under BIG, more than 70 IPs have been filed; around 20 products/technologies have been developed and 30 more are under validation; 600 high caliber workforce has been created. The scheme has also catalyzed setting up of more than 70 new start-ups and promoted women entrepreneurship by supporting more than 50 women entrepreneurs. 50 of these 212 projects have also received follow on funding through other sources including from other schemes of BIRAC, state government funding schemes, trusts/foundations, angel investors and venture capitalists.

- **2nd BIG Conclave**

The 2nd BIG Conclave was organized at C-CAMP, Bangalore on 16th and 17th June 2016.

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, USP's of the technology, business models, investment pitch, scouting for and building the team, patenting and licensing strategies, regulatory challenges, and 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 200 participants attended the conclave to make and expand their networks for collaborative opportunities.



Participants at the 2nd BIG Conclave

2. Small Business Innovation Research Initiative (SBIRI)

SBIRI scheme has played a vital role in fostering public-private partnership, thereby promoting research and innovation in the Indian biotech sector. The scheme has been instrumental in nurturing not only established companies, but also start-ups in the field of biotechnology and has seen their active participation in taking up innovative research and product development. SBIRI as a scheme has been launched to promote and facilitate companies to take their established proof of concepts towards early stage validation, thus fulfilling a major gap in the product development cycle.

In the last financial year, three calls for proposals were announced. The 31st & 32nd calls were regular calls targeting major thematic research areas of biotechnology including Vaccines and Clinical trials, Drugs, Biosimilar and Stem cells, Agriculture, Device and Diagnostics, Bioinformatics and Industrial Biotechnology. Under these calls, 65 proposals were received out of which 21 proposals were recommended for financial support. The 33rd Call for proposals, which closed on 31st March, 2017 has received 42 proposals out of which 17 have been recommended by the Technical Expert Committee (TEC) for presentation.

Ever since its inception, 221 projects involving 161 sole companies and 60 collaborative projects has been supported through SBIRI. 27 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.

During the year 2016-17, projects related to various thematic areas, as mentioned earlier, were supported and managed. The Mentoring and Monitoring of the projects was achieved through 'Project Monitoring Committee' site visits, online evaluations or presentations before Technical Expert Committees (TEC). In 2016-17, 95 beneficiaries were supported. Out of these 74 companies were supported of which 70 beneficiaries were SMEs, 21 were academic collaborators and 4 were start-ups (less than 3 years old). Of all the supported projects, 10 projects matured from BIG scheme to secure follow on SBIRI funding.

During 2016-17, 21 projects were completed out of which one of the products 'miRHYTHM' which is an innovative, high-end, palm sized, single lead ECG display device for ambulatory and long term rhythm monitoring developed by M/s Cardea Biomedical Technologies Pvt. Ltd., Delhi in collaboration with AIIMS, New Delhi was launched on 22nd September, 2016 during Innovators Meet organized by BIRAC.

3. Biotechnology Industry Partnership Programme (BIPP)

The Biotechnology Industry Partnership Programme (BIPP), a public-private partnership 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 frontier 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.

Proposals funded in BIPP are categorized under 7 thematic areas including vaccines and clinical trials, drugs, biosimilar and stem cells, Agriculture, Device and Diagnostics, Bioinformatics and Industrial Biotechnology. Regular monitoring and mentoring of the projects is carried out by reviewing the progress on a 6 monthly basis by subject matter experts, through PMC visits or by presentations by the applicant companies and their respective collaborators before a Technical Expert Committee (TEC).

Ever since its inception, BIPP has made a tremendous impact and has supported 182 projects involving 177 companies and 65 academic institutes. Through the support provided under this scheme, 19 Products/ technologies have been successfully developed, 6 facilities have been created as research resources and 30 new IPs have been generated.

During 2016-17, a total of 70 projects, including 31 new ones were supported. 19 projects were successfully completed during this period. In addition, three calls (38th, 39th and 40th) for proposals were announced. These were regular calls targeting major thematic research areas of biotechnology. Under 38th and 39th calls, 48 proposals were received out of which 11 proposals were recommended for financial support. The 40th Call for proposals closed on 31st March, 2017 under which 23 proposals were received.

4. Contract Research Scheme (CRS)

CRS applies innovation as a coherent plan to deliver academic capabilities of translational research towards product development. It aims to enable validation of academia 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. While IP rights reside with academia, the industry partner always has first right of refusal for commercial exploitation of the new IP.

The scheme supports project under 7 thematic areas like the SBIRI and BIPP schemes. Progress of the projects with regard to development of new technology/products for moving towards commercialization is carefully monitored through PMC visits, thematic reviews, and online evaluation in accordance to the scheme guidelines.

Two regular calls for proposals were announced during 2016-17 in which a total of 31 proposals were received out of which 9 were supported. Presently, 17 projects involving 19 academia and 20 collaborators are ongoing.

Some of the successful outcomes of the projects supported under CRS include development of a rapid method/kit for HLA allele diagnosis in people suffering from epilepsy, establishment of a novel bioreactor system for production of high redox potential laccase and production of somaclonal variants of ginger with high gingerol content.

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, five 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 SPARSH third call also reflects the mandate of Swachh Bharat Mission which aims at elimination of open defecation, conversion of unsanitary toilets to pour flush toilets, etc. The Fifth call '*Innovative Diagnostic tools for Soil and Plant Health*' was launched on 26th January, 2016 for entrepreneurs and start-ups in the field of soil and plant health assessment.

Few projects supported under SPARSH

Science for Society-S4S

- Electricity Free Baby Incubator (EFBI) is a baby care unit that creates ideal artificial atmosphere for neonatal baby to save it from hypothermia
- High societal impact as the Incubator is for rural settings where electricity is not available.
- Clinical validation is underway



Periwinkle Technologies Pvt. Ltd

- A Responsive Care Platform - www.Net4Hemo.com - for patients with Bleeding Disorders. This is a registry of Indian patients aimed at helping children with Hemophilia in getting diagnosed in time, avoiding disabilities, pain, and early death by finding treatments faster.
- As part of the system, patients can receive remote consultation from their doctors, support each other on the community forum, talk to mentors, and access useful resources. This will help not only in finding treatment faster, but also in avoiding the hassle of travel, wait time, cost, and disability, and prevent a painful life or early death. The system helps NGOs and Government in planning distribution of factors more efficiently.



- Deployed in the state of Maharashtra

H.N Shivakumar (Individual Researcher)

- A non-invasive patch for the delivery of iron via transcutaneous route.
- Device will make iron delivery simpler for anaemic patients where daily compliance is difficult.
- Device is under development



Cellzyme Biotech Pvt. Ltd.

- Iron Rich Rice Bran Protein Hydrolysate from the by product of Rice Bran oil Industry
- Fortified food rich in essential vitamins, micronutrients and minerals can be used by expectant mothers. Can also be used to address the child malnutrition by fortifying with other foods offered in the mid day meal scheme executed by the government in various states of India.
- Product is in pre-commercialization stage



Under the program, 20 innovative projects were supported under the first three calls. During 2016-17, in the fourth call, 18 projects have been recommended for support.

SPARSH through its Social Innovation Immersion Program (SIIP) provides fellowships to 'Social Innovators' for identifying and addressing specific needs and gaps in social sectors.

SIIP partners provide rural and clinical immersions to the innovators as well as mentorship on the process of systematic clinical & community observation, needs assessment, refinement and affordable technology development. On completion of this immersion, the Social innovators reach a point where they either have a ready business plan to pitch to investors, or an advanced proposal with some preliminary results suitable for seed funding.

Some of the 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 to determine the presence of neonatal sepsis, Tensiometer for Uterine Atony Compression Sutures, portable uterine contraction monitoring device for low resources healthcare settings, etc.

For '*Maternal and Child Health (MCH)*' BIRAC had partnered with four SIIP partners (i) Venture Center, Pune (ii) THSTI, Faridabad (iii) KIIT, Bhubaneswar and (iv) Villgro, Chennai to support 14 social innovators. The Immersion program for thematic area 'Waste to Value' under which four SIIP fellows will be supported will be implemented through Venture Centre, Pune.

A Memorandum of Understanding with Tata Institute of Social Sciences (TISS) has been signed to train, mentor and monitor the performance of SIIP fellows.



SIIP 'Social Innovators' during clinical and field immersion.

6. Affordable Products and Technologies developed through Investment schemes

BIRAC has an inherent system of grading the projects into 7 theme areas for project monitoring and promoting innovation in that sector. The Pharmaceutical and 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 remaining theme areas are Agriculture (including Aqua culture and Veterinary Sciences), Industrial Biotechnology (covering Industrial Processes, Industrial Products and Secondary Agriculture) and Bioinformatics and Facilities.

It has been BIRAC's endeavour to evolve efficient system of project evaluation that enable decision making in minimum possible time. During 2016-17, the cycle time (average time taken to evaluate a proposal and issue of Grant-in-Aid Letter Agreement) to the grantee was reduced to only 162 days which is significantly less than the previous years and quite comparable to international standards.

It is equally important that the projects supported by BIRAC through its various funding schemes on conclusion yield the targeted outcome with respect to product or technology development, IPR, etc. Towards this end, BIRAC supported projects under various schemes are regularly mentored and rigorously monitored for their Technological Readiness Level (TRL) on a

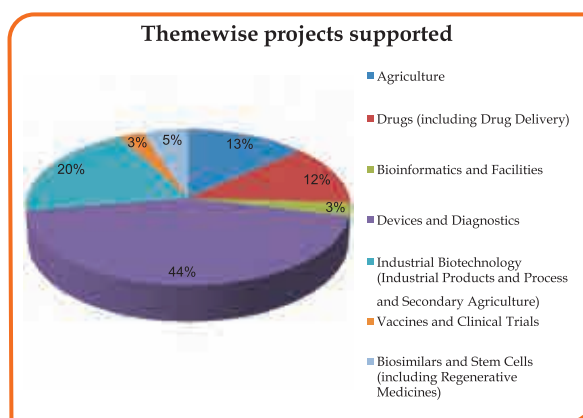
scale of TRL 1 to TRL 9. This monitoring is achieved through visits of Project Monitoring Committee (PMC) experts to the project implementation site, presentation of progress of the work by the Project Coordinators before the Technical Expert Committee (TEC) and online evaluation of Milestone Completion reports by the subject matter experts associated with a particular project. There is always an effort on part of BIRAC to enable/assist the beneficiaries in achieving higher TRLs so that the product/process under development could be commercialized at the earliest.

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 2016-17, 36 projects completed Proof of Concept studies/Early Stage Validation and 9 projects reached commercialization stage.

Details of some of the recent products and technologies developed are highlighted below:

1. **Sector-wise**
 - i. **Healthcare**
 - a. **Drugs**

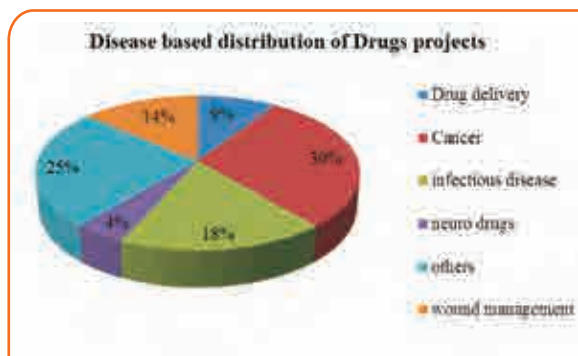
BIRAC has supported projects for drug development, drug delivery and for the development of platform technologies in this sector. BIRAC's funding in the drugs sector focuses on development and validation of affordable technologies and products with a view to reduce their cost and increase their availability and accessibility to the society. Projects supported under drugs were mainly focused on, but not limited to, indications such as cancer, infectious diseases, inflammation



Theme (sector) wise breakup of the ongoing and funded projects in 2016-17

and neurodegenerative diseases. The chart gives the disease based distribution of the projects funded under the theme drug development.

Some of the early stage technologies /prototypes developed or products /technologies commercialized from the projects under this theme during FY 2016-17 are presented below



Projects completed Proof of Concept studies/Early Stage Validation

Disease based distribution of projects funded under Drug Development

1. Lipid carrier based Nanogel formulation with 5-Fluorouracil for topical application (V.B. Medicare Pvt. Ltd)

A lipid carrier based nanogel formulation was developed with 5-Fluorouracil for topical treatment of multiple actinic and solar keratosis. This formulation has been optimized, characterized and evaluated for its stability, pre-clinical efficacy and toxicity and has entered Phase-1 clinical trials.

2. Collagen and cellulose based haemostat foam and spray for wound closure (ExCel Matrix Biological Devices P. Ltd.)

A novel cross linked protein gel foam and spray based product formulation with collagen and cellulose micro-particles along with other factors like phospholipids and transglutaminase for enhanced haemostasis



Haemostatic gel foam

3. Small molecule drug candidate for accelerated fracture healing (Enem Nostrum Remedies Pvt. Ltd.)

A potential lead candidate KM B011 as a novel bone anabolic agents for accelerated fracture healing. The pharmacological characterization of the candidate and rodent toxicity studies has been carried out and to prove its safety. Large animal toxicity studies and early clinical trials are underway.

4. Tumor Necrosis Factor-alpha (TNF- α) inhibitor as drug for neuroinflammatory diseases (Yasham P2D Lifesciences Pvt. Ltd.)

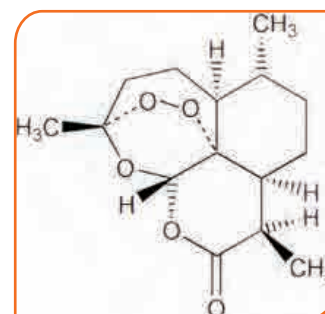
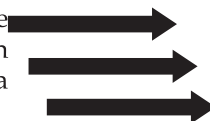
Thiothalidomide analogues as anti-TNF α specific, orally bioavailable, potential small molecule drug candidates showing high efficacy in STZ model of Alzheimer's disease.

5. Bacterial DNA Gyrase inhibitors as novel drug candidates for multidrug resistant infections (Vitas Pharma Research Pvt. Ltd)

A bacterial DNA gyrase inhibitor compound VT-03-00062 showing potential antibacterial activity against gram negative bacteria like E.coli and Acinetobacter baumannii with moderate activities against Klebsiella and Pseudomonas. Safety and efficacy data has been generated for this molecule in two animal models.

6. Semi-synthetic Artemisinin for Malaria (Bakul Finechem Research Centre)

A process and platform for steady and cost effective supply of semi-synthetic artemisinin using a yeast-based fermentation coupled with synthetic chemical process. This platform is more economical than current plant-based extraction strategy to ensure its affordable access to malaria patients.



Semi-synthetic Artemisinin

b. Biosimilars and Regenerative Medicine

BIRAC has supported a total of 18 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 addresses diseases like Cancer, Diabetes, Inflammatory diseases, Alzheimer's and platform technologies for producing monoclonal antibodies and different kind of Stem cells. All the projects are being mentored and monitored for delivering successful technologies and affordable products in the coming FY. During the financial year 2016-2017, the projects supported under the area of Biosimilars and Regenerative medicine are:

1. A new class of anti-infective biologicals AbTids (AbGenics LifeSciences Pvt. Ltd.)

A novel technology where antimicrobial peptides are fused with the antibodies to fight against the drug resistant ESKAPE pathogens in humans

2. Platelet rich plasma for addressing issues of IVF (Innov4Sight Health and Biomedical Systems Pvt Ltd)

A technology for increasing the thickness of endometrium using biologically active peptides/growth factors (BAPC) derived from umbilical cord blood.

3. Anti-cancer drug for targeting differentiated cancer cells and Cancer Stem Cells

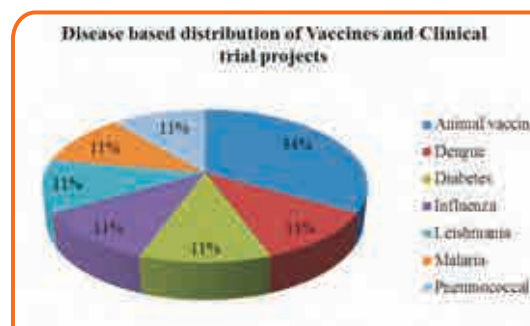
Developing novel anti-cancer drug Cleistanthin and its analogs which can exhibit biological activity against cancer & cancer stem cells.

4. Anti-VEGF fusion protein for AMD (Clonz Biotech Pvt Ltd)

Production of anti-VEGF fusion protein (Aflibercept) on high density fermentation and its downstream processing. The product will have significant therapeutic value for Age-related Macular Degeneration.

c. Vaccines and Clinical trials

Vaccine development has played an important role in combating infectious diseases. By realizing this, BIRAC has supported few very important projects under this theme. The disease based distribution of the projects under this theme are shown in the chart above.



Theme wise distribution of projects under Vaccines and Clinical Trials

Some successful outcomes under this theme are:

Projects completed Proof of Concept studies/Early Stage Validation

1) Indigenous vaccine for cell associated Marek's Disease for Poultry (INDOVAX Pvt. Ltd)

A vaccine formulation for cell associated serotype 1 Marek's disease from an indigenous field isolate for subcutaneous vaccination of chickens. The safety and efficacy studies and field trials have been completed successfully.

2) **Freeze-dried Brucellosis vaccine with better shelf life (Vivimed Labs Limited)**

Novel technology for freeze drying Brucella abortus strain 19 liquid vaccine for Brucellosis in order to elongate its shelf-life in the cold chain. The vaccine was found stable up to one year and safe in guinea pig model.

In addition, the following projects have been supported in this area during 2016-17,

1) **Virosome Vaccine for Dengue (Seagull Biosolutions Pvt. Ltd)**

Ascertaining the potential of Dengue virosomes expressing prM, E proteins and NS1 proteins & evaluating its effectiveness to induce a tetravalent anti-dengue protective immunity in animals.

2) **Targeting Fatal viral disease in Dogs by virus like particles (TRPVB,TANUVAS)**

A vaccine against a viral disease caused by Canine parvovirus infection in dogs.

3) **A malaria vaccine candidate (ICGEB)**

Validation and conduction of phase I clinical trial for a novel recombinant vaccine candidate for Plasmodium vivax

4) **Uregro™ towards treatment of urethral stricture (Regenerative Medical Services Pvt. Ltd)**

An open label, multi centric clinical trial to assess the safety and efficacy of autologous adult live cultured buccal epithelial cells (Uregro™) for treating urethral strictures

d. **Devices and Diagnostics**

BIRAC along with the country has witnessed a positive wave of developments in the devices and diagnostics sector over the year. Lot of young individuals have ventured into the sector and started their entrepreneurship journey. BIRAC also promoted the 'Make in India' wave and supported large number of projects under the devices and diagnostics schemes through its flagship schemes. Some of the successful outcomes under this theme are:

Projects completed Proof of Concept studies/Early Stage Validation

1. **Point of Care Diagnostic Device for Diabetes management (PathShodh Healthcare Private Limited)**

A handheld PoC diagnostic device capable of measuring 8 different biomarkers including Glucose, Hb, HbA1c, Serum albumin, Glycated albumin. This clinically validated technology works on disposable test strips following a dry chemistry and provides results in less than a minute.



Anupath™-Multi-Analyte Device

2. **Hollow fiber membrane based low cost oxygen concentrator (Genrich Membranes Pvt. Ltd.)**

An Oxygen Enrichment Unit based on an indigenously developed hollow-fiber membrane technology for medical applications. This technology enriched oxygen concentrations in the air to 35% at ambient temperature. The device is designed for single patient use for home care and is getting clinically validated.



Membrane based Oxygen Enrichment Unit

3. **A Perinatal Monitoring Device (Brun Health Pvt Ltd)**

A low cost, novel, electronic labour monitoring tool for automatic capturing of vital parameters of both mother and child. The vitals are displayed as an easy to interpret graph and any variations in any of the parameters will be notified by an alarm for timely interventions.



Brün™ - A Feto-Maternal Monitoring Device

4. Ingeniously developed post-mastectomy breast prosthetics (Dr. Pawan Mehrotra)

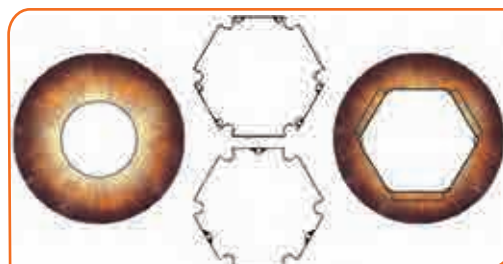
A post-mastectomy kit for breast cancer survivors for restoration of dignity, confidence & femininity. The kit has custom-sized/shaped prosthetic breasts made from biocompatible material and brassieres for the prosthesis. This kit is getting functionally validated at multiple centres



Poorti-Post-mastectomy kit with breast prosthesis

5. Pupil Expansion Devices and Delivery System (Nayan Eye Centre Pvt. Ltd)

A new pupil expansion device for enlarging a non-dilating pupil during cataract surgery, which has several advantages over the presently used Malyugin ring. The device has been extensively validated by eye surgeons at various hospitals nationally as well as overseas is ready for licensing / commercialization of the device.



B-Hex Pupil Expansion Device

6. Diagnostic method for the detection of HLA allele associated with anti-epileptic drug allergy (AIIMS and Khanna's Pathlabs)

A rapid method/kit for HLA allele diagnosis in persons with epilepsy. HLA alleles associated with adverse drug reactions against antiepileptic drugs (AEDs) in epilepsy patients can be identified using a LAMP assay based HLA typing on isolated DNA samples and whole blood samples



LAMP assay based HLA allele diagnosis

7. Indigenous single use safety syringe (Alfa Corpuscles Pvt. Ltd.)

A low cost indigenous single use safety syringe with passive spring actuated needle stick injury and reuse prevention mechanism. Clinical validation before large scale commercialization is targeted.



Single use safety syringe

8. Novel Sample processor for rapid diagnosis of TB (Advanced Microdevices)

Two different kits have been developed for the Novel sample processing for the simple and rapid diagnosis of TB, MDR-TB and XDR-TB. 1) Bio-safe filtration smear kit (Smear kit) and 2) Molecular Drug Susceptibility testing kit (Mol-DST kit) (this kit has 2 sub-parts (i) for Sputum processing for DNA isolation and (ii) isolation of Pure M. tuberculosis DNA for the Mol-DST assay. Validation on patient sputum samples underway.

9. Low Cost Blower/BLDC Motor ICU Ventilator (Erkadi Systems)

A low cost Blower / BLDC motor ICU Ventilator. The performance verification tests were performed on prototypes and initial clinical validation was conducted through the support.

10. Reality-TV based Diabetes Prevention Program for India (Janacare Solutions Pvt. Ltd)

mDiab mobile app was developed as a life style coaching program under the diabetes prevention program. The mobile app having 12 tutorial videos are undergoing trials at two hospitals.



Habits-Interactive lifestyle improvement mobile application for preventing diabetes

11. Digital Onco-pathology Scanner (Optra Systems Pvt. Ltd.)

A device for scanning and automated PAP Smear Imaging for Cervical Cancer Screening. A complete solution for digitising cervical cytology smears, analysing and classifying cells in scanned images as normal and abnormal. It will also share information generated from the digitized glass slide, taking it beyond the traditional microscope paradigm. The device is an effort towards reducing the manual effort on the part of the cytopathologist and increase sensitivity, accuracy and reproducibility of reporting.



Oncoscan-Whole-slide digital scanner and auto analyser

12. PCR based Diagnostic kit and Instruments for diagnosis of Chlamydia and Neisseria infection (DSS Imagetech Pvt. Ltd)

A PCR based Diagnostic kit and point of care Fluorescence Reader for diagnosis of Chlamydia and Nisseria infection. The results of the indigenous CT/NG product is comparable to the CE marked kit



Molecular Beacon based "Chlamy & Nes" kit Point of care Fluorescence Reader

Product/Technology Commercialized

1. Miniaturized cellular flow analyser as PoC diagnostic device (C-CAMP)

A miniaturized flow analyser useful in point-of-care testing in India, particularly for cell counting and has applications to HIV testing in particular, has been developed. The functional prototype was developed technology is transferred for scale up and commercialization.



Microfluidics Based Flow Analyser

2. Foot operated neonatal resuscitator (Windmill Health Technologies Pvt. Ltd.)

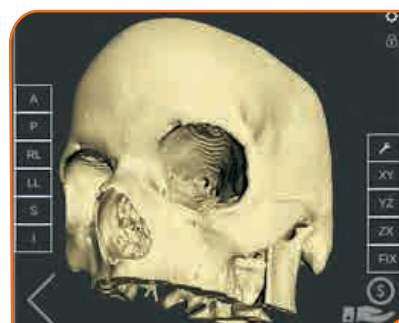
World's first foot operated new born resuscitation system that makes it easy for frontline workers to save the life of a new born. Unlike the currently used bag masks which are hand-bagged, the foot pedalling frees one hand of the operator. Product is commercially launched in December 2016.



NeoBreathe™-Foot operated neonatal resuscitator

3. Platform for creation of Medical Models Online for pre-surgical planning (df3D creations Pvt. Ltd)

Online-cloud based software for creating medical models for crania-facial surgery which is freely accessible through any web browser on any operating system and doctors can upload patient data and create medical models online after editing, cutting, slicing as per requirement. The software is completely FREE for use by a doctor and the 3D printed model is charged for. The product confirms to of ISO 13485 and IEC 62304. The product has been commercialized and available online since Nov 2016



Cloudf3D-Online platform for creating medical model for 3D printing

4. High performance exosome isolation kit (Exocan Healthcare Technologies Pvt. Ltd)

A one-step exosome (Nano-scale vesicles secreted by cells) isolation technology for enriching exosomes from a sample of interest (cell culture media, serum, urine, saliva etc.). This technology can be used for both academic R&D and, clinical diagnosis purpose (to be done) to detect/diagnose a disease e.g. cancer, diabetes, immunity associated diseases.



ExoEnrich™-Exosome isolation kit

5. Ambulatory Single Lead ECG Display Device (Cardea Biomedical Technologies Pvt. Ltd)

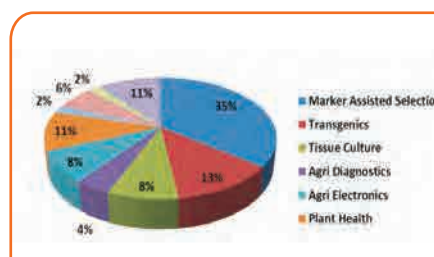
An innovative, high-end, palm sized, single lead ECG display device for ambulatory and long term rhythm monitoring and on-the-go applications. An advanced arrhythmia monitor which captures and displays arrhythmia as it happens in real time on any mobile phone working on Android platform. The hardware is necessarily a single lead, locket sized ECG system meticulously designed to send noise free ECG data over Bluetooth



miRHYTHMTM-Real-time ECG system and algorithm for Arrhythmia monitoring

ii. Agriculture

BIRAC is supporting agriculture both under technology as well as policy initiatives. Current R&D efforts being funded are primarily for crops that can contribute to higher & more stable yields, enhanced nutrition and are resistant to biotic and abiotic stress. The current pipeline of BIRAC funded projects consists of the entire innovation chain from pre-proof-of-concept to pre-commercialization under key areas of agriculture i.e. Marker Assisted Selection (MAS), transgenics, tissue culture, etc. Some of the other research areas currently being supported in the field of agriculture includes Agri-nano-biotechnology (pesticides and fertilizers), diagnostics, biocontrol agents, etc.



Area wise breakup of projects under Agriculture

Some of the successful outcomes under this theme during 2016-17 are following

Projects completed Proof of Concept studies/Early Stage Validation

1. Development of value added products using gingerol (Kerala Agricultural University with Arjuna Naturals Pvt. Ltd)

The study aims at developing value added products using gingerol. Under the project, two ginger clones with high (8%) gingerol content have been developed and tested for their stability. Results pertaining to animal toxicity studies undertaken thus far have also been quite encouraging. Other component of the investigations includes analysis and separation of 6-gingerol from other gingerols and stability studies for retention of gingerol in the product.



Ginger Dry extracts with high gingerol content

2. Development of Bacterial leaf Blight resistant Rice hybrids through molecular marker assisted breeding (Ganga Kaveri Seeds Pvt. Ltd)

Developing improved rice hybrids resistant to Bacterial Leaf Blight using marker assisted selection. Under the project, agronomic traits of the selected lines were evaluated for different gene combinations; phenotypic evaluation under artificial conditions was done and value added first version and second version hybrids were generated. Two hybrids, namely GK5003 and GK5017 containing Xa21 gene for bacterial leaf blight resistance have been developed. Multi-location trials of these hybrids during kharif season have yielded promising results. Mini-kit of the first version of hybrids will be distributed to the farmers in 2017



Value added hybrids GK5003(RAMBHA) and GK5017 containing Xa21 gene for bacterial leaf blight resistance

3. Development of blast resistant rice hybrid and rice variety through Molecular Marker Assisted Breeding (Ganga Kaveri Seeds Pvt. Ltd)

Value added rice hybrids (GK 5017 & GK-56) containing three blast resistance genes Pi1, Pi2 and Pi54 have been developed through Marker Assisted Breeding. These hybrids were evaluated at multi-location trials (5 locations) where their performance was found to be very promising.



Hybrid rice containing blast resistance genes

4. Control white spot syndrome virus of shrimp using nano-formulated dsRNAi (GPS Biotech Pvt. Ltd)

A Nano- Formulation mixed with dsRNA-VP28 has been developed for controlling the WSSV infection of Shrimp. The treated (with developed nano-formulation) shrimp were challenged with WSSV. The percentage survival of shrimp treated with nano-formulated dsRNA-VP28 at a

concentration of 8.6 $\mu\text{g-dsRNA/g}$ of feed was 80% (challenged with WSSV). The trial was conducted on 15 shrimps over a period of 30 days.

5. **Development of silk protein based cryopreservation medium for bovine sperm to sustain viability and motility to enhance success rate of artificial insemination (Healthline Pvt. Ltd)**

The company has developed a Sericin protein based Sperm cryopreservation media and the trials conducted so far have been very encouraging.

Product/Technology Commercialized

1. **Bacteriophage based antimicrobial preparation for controlling vibriosis in shrimps (Aristogen Biosciences Pvt. Ltd)**

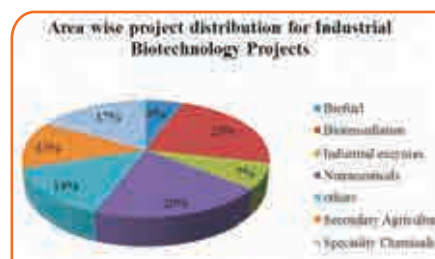
VIBRIOSHIELD is an all-natural, non-chemical antimicrobial preparation made out of bacteriophages that can control Vibriosis in shrimp culture by replacing antibiotics, thus ensuring higher yield and profitability



Vibrioshield- The anti-vibrio phage probiotic for shrimps

iii. **Industrial Biotechnology including secondary agriculture**

Industrial biotechnology holds great potential to solve global challenges, offering new prospective for meeting the world's demand for food, feed, fuel, materials and more while reducing our impact on the environment. If developed to its full potential, industrial biotechnology may have a larger impact on the world than healthcare and agricultural biotechnology. It offers businesses a way to reduce costs and create new markets while protecting the environment. Nature of projects emphasizing on technologies and processes which are being taken care by BIRAC majorly includes biofuels, specialty chemicals, industrial enzymes, secondary agriculture, nutraceuticals, bioremediation and many other fine chemicals. Some of the successful outcomes under this theme are:



Theme wise breakup of projects in Industrial Biotechnology

Projects completed Proof of Concept studies/Early Stage Validation

1. **VodCa [Vortex Diode based Cavitation] for devices in Distillery and bioreactors (Vivira Process Technologies Pvt. Ltd)**

Proof of concept has been established for a novel and patent protected vortex diode based cavitation device (VoDCa®) for enhancing biogas yield and throughput of anaerobic digesters. Using this technology, average increase of 12% in biogas yield is observed. VoDCa is based on the concept of hydrodynamic cavitation. Controlled cavitation can be used to enhance chemical reactions or propagate certain unexpected reactions because free radicals are generated in the process due to disassociation of vapours trapped in the cavitating bubbles.



VoDCa® technology for anaerobic reactors

2. Omega-3 Fatty Acids from Marine Microalgae (AlgalR NutraPharms Private Limited)

Docosahexaenoic acid (DHA) production from marine microalgae by redirecting the fatty acid metabolisms more specifically to DHA synthesis, which increased the titre of total fatty acids from 40% to 78% on dry cell weight with the DHA yield. This product developed was is certified by NABL accredited testing lab.



Docosahexaenoic acid (Omega-3)

3. Laccase production for bleaching industry (IMTECH with Rossari Biotech Pvt. Ltd)

Laccase has diverse applications in various industries such as bioremediation, paper and pulp industry, wine making, beer production, bread making, juice clarification, tea industry, removal of aflatoxin in food and fodder. Demonstrating laccase production in India will be proof of technological competence to develop process for production of the expensive high redox potential laccase. In this proposal laccase production has been scaled up to is pilot scale and pure laccase suitable for various applications has been produced



Laccase production for denim bleaching

4. Innovative method to extract silk grade banana fibre (Vel Naturals Pvt. Ltd)

Developed a technology and machine which can extract banana fibres without losing its original natural lustre and with increased shelf life of the banana fibers after extraction. The natural fiber is useful for many handmade handicrafts products and banana cloth weaving and some industrial application.



Silk grade banana fiber extraction technology

5. Bioconversion of glycerol to 1, 3 propanediol (Codon Biotech Pvt. Ltd)

Technology for the conversion of Bioethanol derived glycerol into 1, 3 propanediol utilizing low cost nitrogen source demonstrated at 100 L scale.



6. Production of Beta Galactosidase from Agri-waste (Varuna Biocell Pvt. Ltd)

The company has produced approximately 170 kg purified enzyme with Activity NLT 2000 ALU/gm using agri-waste through solid state fermentation in a Koji room. Approximately 70 kg enzyme has already been consumed for trial purposes in various nearby dairy industries.

7. Lycopene extraction from tomato (Hydrolina Biotech Pvt. Ltd)

The project is for the extraction of Lycopene from Tomato and this project can benefit around 1000 acres of tomato cultivating farmers in perpetuity which will encourage for extension of the technology in due course of time. Carotenoid extract from Tomato with high amount of Lycopene can be a value addition to the tomato farmers as it ensures fixed minimum return on investment irrespective of the market flooding hence assures stabilized rural economy in the tomato belt. The plant has a capacity to convert 10 tons of tomato per day.



Lycopene extraction facility

8. Process for effervescent preparations of amino acids (Steer Engineering Pvt. Ltd.)

This technology for manufacturing effervescent granules (Both sodium and potassium) in a co - rotating twin screw processor is very efficient, passivated, continuous and scalable. More than 90% carbon dioxide retained in the effervescent granules with enhanced product solubility and stability.



Effervescent granules production technology

Products Commercialized

1. Recombinant Lipase (Aumgene Biosciences Pvt. Ltd)

The company has developed the scale-up process for production of recombinant lipase enzyme in 10,000L Scale for detergent industry

2. Nitrifying bioreactor for aquaculture (Oriental Aquamarine Biotech India Pvt. Ltd)

Integrated organic nitrifying and denitrifying bioreactor for Recirculating Aquaculture Systems (RAS) with a bacterial consortium delivery system that converts: 1) Ammonia (NH₃) and ammonium (NH₄⁺) to nitrite (NO₂) 2) Nitrite to nitrate (NO₃) 3) Nitrate reduced to molecular nitrogen (N₂). Nitrate reduced to molecular nitrogen (N₂). The packed bed reactors has a capacity of 60000 litres/day and the reactors could be operated without any change in the circulating water up to 300 days



Nitrifying & Denitrifying Bioreactor for Aquaculture

iv. Bioinformatics

The Bioinformatics sector has transformed the way research is conducted today from a hypothesis

driven based to data driven one based on focused method. Soon Indian Bioinformatics industries will play a key role in healthcare sector and BIRAC is encouraging Bioinformatics industries for frugal innovation mainly by transforming data into valuable information that will be useful for disease diagnosis and therapeutics.

Projects completed Proof of Concept studies/Early Stage Validation

1. Single tube multi gene onco-diagnostic tests (SciGenome Labs Pvt. Ltd)

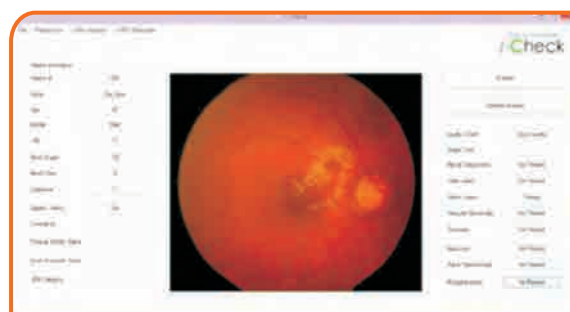
Multi Onco diagnostic kit is under development. Probe performance was tested on cancer cell lines and samples. Beta testing is also done on 44 patient samples. Validation of the computational pipeline for the analysis A of NGS data is under process.



Multi Onco diagnostic kit & Multi gene onco panel

2. A computer assisted tool for identification of abnormality in retinal images (Advenio TecnoSys Pvt. Ltd)

A machine learning based cloud -based standalone tool for the screening of diabetes retinopathy. This tool was trained with more than 5000 fundus images. Tested on more than 200 fundus images of patients with reported >95 % accuracy.



iCheck- Tool for automated detection and grading of diabetes retinopathy

Products Commercialized

1. An innovative algorithm based Malaria Diagnostics

An Identical Multi-Repeat Sequences (IMRS) based primers for the diagnosis of malaria (*P. falciparum* & *P. vivax*) has been developed and validated on clinical samples to demonstrate very high sensitivity and specificity. This platform technology is being developed for diagnosis of other infectious diseases and being licensed. This technology is also getting translated into a paper fluidics technology based product



Platform technology for IMRS based infectious disease diagnosis

v. 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 number of new technologies developed, affordable products commercialized, number of projects that reached TRL-7 and number of IP filed through BIRAC funding in the year 2016-17.

S.No	Category	Accomplished
1	Novel Process/technologies developed	2
2	Affordable products/technologies commercialized	7
3	Projects completed early stage validation	24
4	IP filed	22

Intellectual Property filed

The following patents were filed in 2016-17

1. Tunable Biomaterials (2016/1/1/025607)
2. Tunable Biomaterials for tissue engineering (2016/1/1/025635)
3. A novel formulation for rapid wound healing and control of infection (2016/2/1/0/25112)
4. Suturing ring for prosthetic heart valves (2016-11002178 and US patent application 15/151,439)
5. Suturing ring for prosthetic heart valves (Design US Patent: 15/146,075)
6. Cyclodextrin-polymer complexes, methods and applications thereof (20164002350)
7. Biosorbent for adsorptive separation of heavy metals from aqueous systems (20163/1/013293)
8. A method for accelerated degradation of coir pith (E-106/122/2016/CHE)
9. Iontophoresis patch for transdermal delivery of iron (IN201641027390)
10. A Novel Process for Cultivation of Snowflake Cordyceps (2016/4/1/023050)
11. Green manufacturing using recombinant deacetylase (2016/4/1/029516)
12. Heterocyclic compounds useful as anti-bacterial agents and method for production (2016/4/1/017526)
13. Portable illuminated lens for mobile eye photography
14. Smartphone assisted device and system for eye imaging
15. Semi-quantitative method to measure antibodies for assessment of timing of vaccination (2016/4/1021297)
16. Bioreactor application for the effective multiplication of Banana cv. Elakki Bale from embryogenic cells (201641026029.00)
17. Novel FYN Kinase Inhibitors (PCT/IB2016/055135)
18. Device and method for optical detection of human albumin in biological samples (IN2016/4/1/035058)
19. Manufacture of porous glass and glass-ceramic particulate structures by gel casting (IN201721009050)
20. Defibrillator (Design Registration number-289404)
21. Apparatus and method for detecting and characterizing cancer cells using digital holographic microscopy (IN2016/1/1027124)
22. Multiplex real time PCR kit for diagnosis of Multidrug Resistance (MDR) and Extensively Drug Resistance (XDR) tuberculosis (IN2016/4/1033933)

II. Entrepreneurship Development

Bio-innovation, like any other innovation, is driven by start-ups and SMEs, organizations that are usually new to the field. These organizations benefit from smart mentoring (especially to start-ups) and hand holding, getting access to networking platforms to exchange information and understand technology and business strategies and building capacity in all areas relevant to the biotech industry.

In order to nurture bio entrepreneurship, BIRAC ensures that such organizations are provided the mentoring and hand-holding necessary to take them through the pipeline with the ultimate goal of commercializing their products. BIRAC follows the strategy of promoting entrepreneurial motivation through various funding and entrepreneurial development programs that cover the whole gamut of funding and other services ranging from capacity building, mentoring, networking etc. thereby providing a conducive and supportive ecosystem for start-ups and entrepreneurship development.

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

Bio-incubation is a crucial aspect of encouraging the biotech industry in the country by supporting start-ups with material items such as space and technology, a resource that is often lacking in their early days. It allows harnessing of the entrepreneurial potential of start-ups by providing access to infrastructure as well as mentoring and networking platforms.

BIRAC supports incubation facilities under four categories:

- a. Supporting New BioNESTs at Academic/Research Institutes/ Research Hospitals/organizations fostering innovation and entrepreneurship.
- b. Establishing new BioNESTs with various other co-funding agencies such as State Government Biotech Council/S & T Council and other national and international organizations promoting entrepreneurship and incubation.
- c. Strengthening existing incubators attached to academic institutes/ research institutes, stand alone incubators/ Research Hospitals to establish BioNEST
- d. Support for scaling-up of already funded BioNEST

Under the above mentioned categories, BIRAC has upgraded and strengthened existing incubation facilities at certain strategic locations in the country and has established world class bio-incubation facilities.

A BIRAC supported bio-incubation facility has the following salient features:

- Provides good incubation space to Start-ups and Entrepreneurs.
- Provides access to a pool of special equipments in the common equipment facility.
- 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 mobilization and networking platform.
- Establishes an efficient governance models.

BIRAC has till March 31, 2017, supported twenty (20) Bio-incubators, out of which four incubators have been supported twice for phase 2 under scale up support with increased space and other enabling facilities to help start-up grow.

A total area of 250,000 sq.ft. has been supported for bio-incubation activities of which more than 100000 sq.ft. is an active incubation space. Additional space of 50000 sq.ft. will also become active with in the FY 2017-18.

Till now approximately more than 250 start-ups/ entrepreneurs have been supported through BioNEST facilities. An additional 6-10 new incubators were screened for support in near future.

BIRAC's BioNEST supported incubators are playing a catalytic role across the country to transform the entrepreneurial ecosystem regionally and several of the mature bioincubators are now establishing international linkages as well as integrating aspects of start-up 'Accelerator Models'

The list of BIRAC BioNEST is in the table below

BioNEST Bio-Incubators	
1.	Ahmedabad University, Ahmedabad
2	B. V. Patel PERD Centre, Ahmedabad
3	Gujarat State Biotechnology Mission (GSBTM), Ahmedabad
4	C-CAMP, Bangalore
5	Bangalore Bioinnovation Centre (BBC), Bangalore
6	IIT Madras Research Park, Chennai
7	Golden Jubilee Women Biotech Park, Chennai
8	Healthcare Technology Innovation Centre HTIC, Chennai
9	IKP Knowledge Park, Hyderabad
10	Society for Biotechnology Incubation Centre (SBTIC) , Hyderabad
11	NAARM-TBI, Hyderabad
12	KIIT-TBI, Bhubaneswar
13	IIT Bombay, Society for Innovation and Entrepreneurship (SINE), Mumbai
14	IIT Delhi, Foundation for Innovation and Technology Transfer (FITT), Delhi
15	ZTM-BPD, IARI, New Delhi
16	NCR Biocluster, Faridabad
17	BITS Pilani K K Birla Goa campus, Goa
18	IIT Kanpur, SIDBI Innovation & Incubation Centre (SIIC), Kanpur
19	Entrepreneurship Development Centre, Venture Center, NCL, Pune

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

Though bio-incubators are able to support the 'Space, Services and Knowledge' requirements of start-ups, there are still wide gaps that exist in financial support required by a technology driven start-up in the initial phases. BIRAC's initiative -Sustainable Entrepreneurship and Enterprise Development Fund ("SEED Fund") primarily aims to address this need through the incubators.

The basic idea of SEED Fund is to provide capital assistance to start-ups 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 capitalists or a position where they are able to seek loans from commercial banks / financial institutions.

In the first cycle of selection, BIRAC SEED Fund was awarded to three incubators for making equity based investments in biotech incubate companies. CCAMP, Bangalore, Venture Center, Pune, and IKP, Hyderabad were supported under the program.

3. **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 researchers and to catch them young, it is imperative that there be a focus on fostering local ecosystems and providing professional mentoring and support.

To further this aim, BIRAC launched the University Innovation Cluster (UIC) to foster a culture of innovation and techno-entrepreneurship in Indian Universities.

Five University clusters as mentioned below have been identified:

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 2000-3000 sq.ft. that houses common laboratory facilities and postdoctoral and postmasters Innovation Fellows conduct translation R&D at each of the UIC supported by dedicated staff who help UIC fellows to understand commercialization pathways.

All the UICs are operational and working towards their milestones. 17 Innovation fellows are currently working in different UICs across the country.

Three UIC fellows from TNAU will apply for patent protection through BIRAC PATH program after proper due diligence.

4. **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 at the university /college level through the students of such institutions. Two categories of Awards – BIRAC-SRISTI GYTI Awards and BIRAC-SRISTI GYTI 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 2017, 17 innovators have been awarded with BIRAC-SRISTI GYTI Awards during the Festival of Innovations organized by National Innovation foundation at Rashtrapati Bhavan. We now have a total of 34 innovators selected for the BIRAC-SRISTI GYTI Awards, and 135 innovators shortlisted for BIRAC-SRISTI GYTI Appreciation Awards. Innovations supported under GYTI awards span across the spectrum, including development of new antimicrobials, devices and diagnostics for resource poor settings, maternal and child health care, wastewater treatment etc.

The appreciations awards have been provided to support validation of grassroots practices for treatment of arthritis, diarrhea, toothache; wound healing; development of devices and diagnostics; pest and disease control in fruits and vegetables, termite control etc.

5. **BRIC (BIRAC Regional Innovation Centre)**

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

BRIC is mandated to help start-ups and SMEs in the region through services such as IP and technology transfer. The initial mandate of BRIC was also to conduct an extensive Regional Innovation System (RIS) mapping in South India where more than 70 percent of biotechnology firms are located. 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 detailed RIS Mapping has been conducted for Hyderabad, Bangalore, Chennai and Trivandrum & Kochi regions, highlighting the characteristics of each of the hubs. The mapping has also identified all the stakeholders including enablers for each of the cities. The R&D scenario especially in biotech realm through an analysis of publication data as well as IP data has also been studied revealing important insights such as collaboration between industry and academia as well as indicating translational capabilities in several institutions. The key findings from the study were collated into a report and the insights derived through the exercise were used to recommend policy changes to drive innovation around these clusters. The report was released in the form of a book on October 24, 2016 during the International Knowledge Millennium Conference 2016. Further, BRIC has also conducted numerous workshops and mentorship programmes for funding options, entrepreneurship, IP awareness, commercialization challenges and technology showcasing. BRIC has helped many start-ups in providing specific information that were sought with respect to the Entrepreneurship and funding options available in India. Cumulatively more than 1200 relevant persons have interacted with BRIC through its various activities.

Based on the above pilot exercise, BRIC activities with the same mandate were extended to cover the following clusters: Ahmedabad, Mumbai, Pune, Bhopal-Indore, Bhubaneswar and Vishakhapatnam. This study will provide a comparative and contrasting nature of the various clusters in the country and would provide the changes in these clusters following the recent policy interventions by the government.

6. **BREC (BIRAC Regional Entrepreneurship Centre)**

With the aim of fostering and facilitating bio-entrepreneurship with a special emphasis on providing bio-entrepreneurs with the necessary knowledge and skills to aid them in transforming their innovative biotech ideas into successful & sustainable ventures, the BIRAC Regional Entrepreneurship Centre (BREC) was set up in partnership with C-CAMP.

The centre was set up with the clear mandate to create and inculcate a spirit of bio-entrepreneurship, facilitate and catalyze the journey of biotech 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.

The introductory meeting for BREC was held on 23rd February, 2017 at BIRAC Office, New Delhi.

BREC shall conduct various awareness events, workshops, national level entrepreneurial challenges, boot camps etc. with a view to boost entrepreneurship in the Indian biotech sector.

Major activities envisioned under BREC are as follows:

- a) **National Life Science Entrepreneurship Awareness Programme:** The awareness program will focus on disseminating awareness, through talks and interactive sessions, about entrepreneurship, especially biotech entrepreneurship, to students (graduates & postgraduates) in centres for higher learning especially colleges, universities and research institutions.
- b) **BIRAC – C-CAMP National Life Science Entrepreneurship Challenge:** The national entrepreneurship challenge will have a nation-wide call for early life science innovation ideas. Top ideas will be given small start-up fund.

- c) **Entrepreneurship Development Boot camp Programme:** A structured boot camp comprising a series of lectures and case studies covering the details of all business aspects with a focus on life science entrepreneurship will be organized. This is expected to be similar to the boot camps organized at the leading entrepreneurial ecosystems of the world such as Deshpande Centre at MIT and University of Cambridge (Ignite Programme)
- d) **Meet the Investor Series-Dragon's Den:** A panel of investors like Angel Investors, High Net Worth Individuals, VCs etc. will be invited and encouraged to make deal(s) with start-ups allowing start-ups to access small funds quickly either as a bridge-fund or for small project activities.
- e) **Entrepreneurship Development Workshops:** Workshops and events covering several aspects of regulatory maze, certification and standardization processes, issues related to clinical trials, data interpretation and usage etc. will be organized for start-ups and budding entrepreneurs.

III. Partnerships

Partnerships are the third vertical through which BIRAC functions, where the main objective is to collaborate with like-minded organizations to achieve a common goal of fostering the innovations ecosystem by a combination of systems such as providing market access, networking platforms and mentoring to bio-entrepreneurs.

BIRAC works with a wide range of partners both, national and international, to achieve its vision and mission and these include engagement with industry, policy makers and other key stakeholders.

BIRAC's approach to partnerships applies to four inter-related areas; promoting collaborative research, building capacity in the country, understanding and implementing international best practices, ensuring access to world – class infrastructure, encouraging free flow of ideas and researchers internationally and finally, tapping CSR funds available with companies for the promotion of innovation led R&D in biotechnology.

i. Co-funding Partnerships

a) International

BIRAC partners with some of the premier research, business and philanthropic organizations from across the world across a range of themes from healthcare and sanitation to agriculture and nutrition. BIRAC has been open to explore possibilities of finding common ground with other organizations to design and implement programs for impact.

- a) **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 (GCI)

GCI is the flagship program under the Department of Biotechnology and Bill & Melinda Gates Foundation partnership and was launched with the aim of directing funding and research into some of the greatest health and development challenges that the country faces and does this by fostering

Indian innovation and research to develop affordable and sustainable solutions to improve health and promote development, in India and across the globe.

Today, GCI is also supported by the United States Agency for International Development (USAID/India) in nutrition and agriculture related programs.

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 health and development to have the widest possible impact. GCI also funds projects at various stages in their life; from basic science research in laboratories, to

proof-of-concept projects and potentially to scale-up to innovation projects. These include, and are not limited to maternal and child health, infectious diseases, vaccines, point-of-care diagnostics, agricultural development, food and nutrition, sanitation and hygiene among others.

Apart from Grand Challenges Explorations- India, GCI has launched three calls across India with the aim of addressing three of the greatest challenges that we in the country face; malnourishment, sanitation and mother and child health through the Achieving Healthy Growth through Agriculture and Nutrition, Reinvent the Toilet Challenge and All Children Thriving programs in 2013 and 2014.

Achieving Healthy Growth through Agriculture and Nutrition

The GCI partnership announced the first Grand Challenges India call titled Achieving Healthy Growth through Agriculture and Nutrition in August 2013. The overall goal of the program was to target the linkage and relationship between agriculture, nutrition and health.

The program was launched with the mandate of encouraging innovation and research in the areas of agriculture, nutrition and social empowerment, which would lead to the larger goal of improvement in health of women and children. Proposals for the program were sought in the areas of agricultural innovation, where the thrust was to develop interventions to improve nutritional and economic outcomes of women farmers; innovations in nutrition, where the focus area was understanding the causes, determinants and developing interventions to address low birth weight, stunting and wasting; and social innovation, where the emphasis was on identifying and designing tools to improve communication around nutrition and agriculture especially among women farmers.

The initiative has funded a portfolio of five Indian led pilot projects that sought to target this relationship between agriculture, nutrition, and health to reduce the high incidence of low birth weight, early stunting and wasting among Indian infants and aims at empowering women, through interventions, in their multiple family roles.

Most of the projects under this program came to end in FY 2016-2017.

- **Designing on-farm participatory models of Integrated Farming Systems for enhancement of household diet diversity and livelihoods of women small holder farmers, from Annamalai University, Tamil Nadu** tested the viability of an alternative farming system on productivity, economic return and women empowerment. 150 women farmers and others participated and adopted the IFS techniques that were piloted, and the project saw an increase in the household meat availability for wetland beneficiaries group by more than 2.63 times, and the frequency of consumption of animal products also increased as compared to the control which can indicate better nutrition for the participating farmers.
- **Ensure year-wise nutritional food security to Indian women through community level implementation of Domestic Solar Conduction Dryer (SCD) from Science for Society, Maharashtra** tested a new technology to assess its impact on diet diversity of the participants and economic returns. The project had 200 participating women farmers but estimates that 400 households actually benefitted from the increased availability of solar conduction dried foodstuffs that were now available year round instead of only during specific seasons. This improved availability of a variety of foodstuffs meant that diet diversity improved leading to improved nutrition.



A beneficiary of the project using the Solar Conduction Dryer

- **VeggieLite – Conjunction of agriculture, nutrition and health for inclusive development of women, from eKutir, Odisha** piloted a supply chain innovation to assess its impact in improving access to fresh vegetables and fruits to supplement nutrition at affordable prices in rural and peri-urban areas. The project had 1200 farmers who participated and benefitted from the program and led to the establishment of 100 Agriculture or Vegetable Entrepreneurs. The daily transaction volume of vegetables and fruits from farm to consumer through VeggieLite carts/ kiosks increased to 3-4 Tonnes/ day and post-harvest losses or wastage reduced to 2%, because of minimal or less involvement of intermediaries.



The eKutir carts ready to distribute fresh produce

- **Digital technology enabled and community-driven integrated agriculture and nutrition intervention to promote maternal and child nutrition in Odisha**, from Digital Education, Odisha, an ICT based pilot project tested the impact of a combination of ICT and participatory approaches to improving knowledge of women on nutrition. The project estimated that 1300 women were directly benefitted from the pilot project.



A beneficiary working on a video

- **Novel approach to reduce zinc malnutrition in rural women and children through agronomic bio-fortification of food crops, from Amity University, Noida** tested an agricultural intervention that used foliar application of zinc on rice and wheat crops to potentially address micronutrient deficiency through supplementation of food crops. 540 famers and rural households benefitted and 70 hectares of soil was covered with zinc rich soil.

Reinvent the Toilet Challenge

Given the central importance of hygiene and sanitation in India, the Grand Challenges India partnership launched the Reinvent the Toilet Challenge in 2013, inviting ideas on how to improve the current toilet system or even overhaul the way we currently manage waste.

The call focused on Indian entrepreneurs and innovators and mandated that projects focus on stand-alone, affordable and environmentally and economically sustainable solutions that do not require connection to the sewer or electrical grid, to enable their deployment in rural and poor communities that often need them the most.

Six projects were funded and these spanned the life cycle of the waste collection and management cycle; two of them aimed to redesign the way human waste is collected by employing scientific principles, two projects were providing proof-of-concept for the entire waste management process and one project assessing a scientific proof-of-concept in the laboratory.

The program will come to an end in early financial year of 2017-2018 and a subsequent scale-up call is being considered by the partners. All the projects under the RTTC call have achieved the goals that they had set, with some projects having gone above and beyond. As of March 31, 2017 five of the six funded projects came to a close.

- **Eco-toilet from Pradin Technologies, Bangalore-** aimed to utilize ultrasound to move and settle human waste collected in a specifically designed latrine. This redesigned latrine used less water and therefore provided a more sustainable solution to collect human waste.

- 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, from Eram Scientific and University of South Florida** aimed to develop and demonstrate an innovative sanitation and resource recovery solution for slum areas in India. The combined technology was piloted in a school near Trivandrum, Kerala where it served over 1500 students and people from the local neighborhood. The teams are now looking to further scale up the testing of the system in slums and are looking to reduce the cost of the system by replacing some components with locally or indigenously manufactured components.


- Use of viral agents, microbial fuel cell and effective recycling strategy to improve the economics human waste disposal from Amrita School of Biotechnology, Kerala** is a proof-of-concept for using viral agents to target and kill pathogens and odor-producing bacteria in fecal waste and also develop for ways to integrate this into waste treatment systems. The team has now developed a phage library and is looking at possible implementation methods.
- Hygienic Water-free toilet from Institute of Chemical Technology, Mumbai** aimed to redefine the receiving material for human waste from water to granular material, thereby completely bypassing the need for water in this process. The project aimed to redesign the conventional toilet to use a bed of granular that will ensure that there is no fecal staining of the system, fecal matter is cut-off from vectors, does not contaminate surface waters and that the user is always presented with a fresh, clean and dry surface in an effort to develop a culturally acceptable alternative toilet system.
- Empowered septic tank as decentralized wastewater treatment system, from BITS Pilani, Goa and Ghent University** aimed to develop a financially affordable and simple-to-operate decentralized wastewater treatment system which relies on electrochemical reactions and the production of chlorine, to manipulate the pH of the wastewater to destroy pathogens and helminthes. The system was tested in a lab, then for a household and then finally scaled up to serve a 100 person hostel, within the campus. The team is now looking to further scale-up the system and deploy it for testing in slums.



The pilot system underwent extensive testing
- Effect of environmental parameters on the treatment of human fecal waste by Black Soldier Fly larvae from Indian Institute of Technology, Roorkee** aimed at refining a biological-agent based technology to understand the optimal conditions needed for its efficient use in India. The team tested the optimal environmental conditions, in terms of temperature and humidity, for Black Soldier Fly larvae (BSFL) to reduce the amount of human feces in waste septage.

All Children Thriving

Improving the health of the next generation, the well-being of mothers, infants and children is an important public health priority. Addressing maternal infant and child health concerns not only minimizes public health challenges ensuing within families and communities, but consequently reduces the overall burden on healthcare system. The burden of maternal and child death impinges most heavily on people in developing countries.

Keeping in view these concerns, the 'All Children Thriving (ACT)' was launched as a third call under GCI framework. The call intends to support projects that are mainly focused on prevention of ailment, disorders, and impairment among newborns, children and mothers, as they are the backbone of the nation's health system. By developing best strategies program tries to alleviate the burden of birth defects, adverse pregnancy, outcomes and developmental disabilities in children.

Seven projects with special emphasis on innovative, impactful research on maternal and child health were supported under this program. All the seven projects are unique, exploring distinctive aspect of maternal and child health issue. These projects are funded by DBT, Bill & Melinda Gates Foundation and our supporting partner USAID

In 2016-2017, all the projects have had their first releases and have begun work.

- **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 an integrated package of interventions. This is one of the largest trials of its kind in the country and aims to follow a cohort of 12000 women from peri-conception, through conception, to gestation, birth and to two years after birth. The interventions that would be provided include antenatal care, WASH, nutrition and healthcare. Additionally, this study will be examining whether maternal short stature limits the effect of the integrated package of interventions on child growth and to what extent. Most importantly, this study will provide much needed evidence on whether intergenerational effects on linear growth of children can be overcome in India and to what extent.
- **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. Staff is in place and subject enrolment on-going.
- **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. The project progressing as per the milestones.
- **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.

- **Creation of a biorepository and imaging data bank for accelerating evidence generation to facilitate children to thrive from Translational Health Science and Technology Institute, New Delhi** is building a platform to accelerate evidence generation. The study is investing in a first-of-its-kind bio-bank of longitudinally collected biological specimens from pregnant women until postpartum (up to 6 months). These bio specimens with well characterized information on the associated environmental, clinical, social and epidemiological factors will support identification of risk factors, predisposing the mothers to preterm birth (PTB). The study will collect biospecimens from approximately 8000 mothers, that include maternal serum, saliva, feces, vaginal swabs, among others and will also collect longitudinal ultrasound images. In 2016-2017, the team had screened 9445 subjects for the study and enrolled 2186.
-
- A patient being enrolled into the study at the project site*
- **The simple absolute neutrophil count as a measure of mucosal inflammation and as a predictor of linear growth in Indian infants from Translational Health Science and Technology Institute, New Delhi** is attempting to address the lack of a simple, low-cost, prospective biomarker for future short stature or stunting. Hypothesizing that infants in settings with poor sanitation conditions and associated abnormal inflammation of the gut and neutrophils are drawn to these sites of microbial colonization or are exhausted during the clearing of microbes from circulation, study aims to validate the use of absolute neutrophil count as a predictor/biomarker for stunting in infants.
 - **Low-cost salivary progesterone testing for detecting the risk of preterm births in rural community settings of India from Mahatma Gandhi Institute of Medical Sciences, Sevagram, Maharashtra** is under way to develop novel, low-cost test for pre-term birth (PTB). The study intends to test and validate the low-cost salivary progesterone as a point-of-care (POC) test for detecting risk of PTBs in rural community settings of India.

Grand Challenges Explorations- India



Grand Challenges Explorations- India (GCE-India) is the Indian arm of the Grand Challenges Explorations (GCE), and is part of the joint partnership of the Department of Biotechnology and the Bill & Melinda Gates Foundation under Grand Challenges India.

GCE- India is implemented by IKP Knowledge Park based in Hyderabad, India with PMU-BIRAC as the managing partner on behalf of the DBT and Bill & Melinda Gates Foundation.

The program provides selected grantees funding for a period of 18 months to the tune of \$100,000 to test their idea and generate initial evidence. In keeping with this idea, the calls for application require only a two-page proposal on the basis of which ideas are chosen.

Two calls have been launched under which two proposals have been supported under the first call.

In the first round of calls, GCE-India received 85 applications, out of which 2 applications were funded.

- Surveillance of antimicrobial resistance among urinary tract care infections seen in primary care, OmiX Research and Diagnostics Laboratories Pvt Ltd., Bangalore, Karnataka
- miRNAs as Evaluation Biomarker of Tuberculosis Treatment Response, Dr.. Asif Mohammed, ICGB, New Delhi

Round 2 received 156 applications against 13 problem statements including clean energy for health.

Healthy Birth Growth and Development knowledge integration- India (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.

The platform will allow contributing academics, statisticians and ultimately policymakers to access this data which would enable them to obtain a much clearer picture on trends and patterns which will in turn help design packages of interventions to address these issues as well as identify gaps in research to direct future efforts.

11 data contributors have initiated the upload of their data to the common platform.

Knowledge Integration and Translational Platform (KnIT)



Launched in 2016, the Knowledge Integration and Translational Platform (KnIT) is a unique initiative tailored for the Indian policymaking scenario targeting the Indian State Governments for development and implementation

of cost-effective, sustainable interventions or packages of multi-sectoral health interventions. The platform will collate and analyze available evidence within India, to inform policymakers and health authorities and aid in the development of evidence-based policy to address the inequalities in the health outcomes in our country. The platform will work by collecting and analyzing currently available evidence, identifying gaps in our knowledge and directing research to these areas, and will work to improve our understanding of current or new interventions or packages of interventions to address the inequalities in our healthcare system through gap analysis and systematic reviews.

Currently, KnIT focuses on two tracks, maternal and child health issues and nutrition. MCH focuses on identifying the health system challenges that are barriers to effective, equitable, impactful delivery of health services and identifies strategies how to overcome them. It also focuses on designing delivery strategies based on evidence, and piloting and evaluating programs aimed at improving program delivery, directing implementation research to optimize primary and secondary level healthcare, and generating evidence-based, human resource linked strategies relevant to MCH.

The Nutrition track examines public health and medical interventions to mitigate stunting, wasting, severe malnutrition, low birth weight, optimal body composition and metabolic unfitness or obesity. In addition KnIT also aims to address multi-sectoral interventions for health; nutrition; family planning; water and sanitation hygiene; air pollution; child development; food fortification; and agri-nutrition linkages.

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

Wellcome's Affordable Healthcare in India and Translational Awards

The Wellcome Trust funded the Affordable Healthcare in India initiative that encourages the development of innovative solutions and devices for healthcare at affordable prices, so that they are accessible to those that need them the most. This program currently funds 21 projects in India that explore a range of topics, such as developing new devices and diagnostics, to engaging in basic

research. These projects are directly funded by the Wellcome Trust and the PMU-BIRAC supports the management of these projects in India for the Trust.

The Wellcome Trust announced its new Innovation strategy that is applicable to India in March 2017, and the PMU at BIRAC will support the Trust through outreach programs and identifying new synergies.

Grand Challenges India Meeting 2017

In March 2017, the first ever Grand Challenges India Meeting was hosted by the Program Management Unit at BIRAC in partnership with the Department of Biotechnology, BIRAC, the Bill & Melinda Gates Foundation and the Wellcome Trust, in New Delhi, India. The Grand Challenges India Meeting 2017 followed BIRAC's 5th Foundation Day celebrations.

The meeting consisted of six main scientific tracks; All Children Thriving (ACT), Healthy Birth, Growth and Development knowledge integration India (HBGDki India), Knowledge Integration and Translational Platform (KnIT), Discovering the Science behind Implementation Research and two unique tracks; Science talks and the Igniting Young Minds series.

The meeting was attended by over 250 participants, both from the country and around the world. Representatives of all the partner organizations; the Government of India, the Bill & Melinda Gates Foundation, the Wellcome Trust and USAID India were present, as were young researchers and students, and eminent researchers and program officers from a variety of institutions and funding agencies.

The meeting was inaugurated on 21st March, with the Honorable Minister for Science and Technology and Earth Sciences Dr. Harsh Vardhan as Chief Guest. The Hon'ble Minister launched a publication titled 'Grand Challenges India; Our journey so far', which was a compilation of stories of some of the projects that have been funded under the Grand Challenges India umbrella, with a special emphasis on their impact and spoke on the importance of innovation to improve the quality of life of people. Prof. VijayRaghavan, Secretary DBT and Chairman BIRAC delivered the keynote address.



The Honorable Minister for Science and Technology & Earth Sciences, Dr. Harsh Vardhan addressing the inauguration



The Hon'ble Minister and the distinguished panel launching the 'Grand Challenges India: Our journey so far' publication



The Grand Challenges India team

b) Wellcome trust



BIRAC has collaborated with the Wellcome Trust, a global charity 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. These projects are regularly monitored. BIRAC is planning to announce a call in collaboration with the Wellcome Trust in 2017-2018.

c) 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 (2014-2015) and another with Bpifrance financement (2015-2016). 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.

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. 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 will be monitored in 2017-2018.

BIRAC is planning to organize meetings/workshops in collaboration with CEFIPRA, French Embassy and BpiFrance in 2017 to decide upon the scope of future calls, to decide the themes and to promote interaction between potential French and Indian participants.

d) USAID IKP-TB

BIRAC is supporting new diagnostics for tuberculosis (TB) in collaboration with IKP/USAID. 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 focused on addressing the problem of treatment adherence in collaboration with the Bill & Melinda Gates Foundation.

The second call for proposals aimed at supporting new diagnostics for TB in collaboration with BIRAC. The duration of the program is 3 years spread over two phases. The projects that are funded in the first phase are in the areas of novel methods for Mycobacterium tuberculosis (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.

As per the review of the progress of the projects after completion of first phase, three projects are funded for the second phase:

- a) A filter paper based method of MTB sample collection, transportation and storage at room temperature
- b) NextGen real time MTB-LAMP (Loop mediated Isothermal Amplification) detection by SmartGenie
- c) Biomarker-based triage test for TB

e) NESTA



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

Under the ambit of the BIRAC-Nesta partnership, Nesta had organized the call for soliciting proposals and subsequently arranged for the selection of awardees through a global panel of experts from different organizations/institutions. BIRAC



BIRAC Nesta Discovery Awards event

has contributed £100,000 towards the first call of Discovery Awards launched in 2016 as BIRAC Discovery Award Fund (BIRAC-DAF) and has funded 5 Indian teams under this call.

ii. National Partnerships

a) Ministry of Electronics and Information Technology (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 Biotechnology Industry Research Assistance Council (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

The first call for LoI (Letter of Intent) was announced on May 31, 2015 and the second call on June 10, 2016. It was decided to keep the call open throughout the year and to evaluate the LoIs three times during the year with evaluation rounds starting from July 10, 2016, Nov 10, 2016 & March 10, 2017.

Fourteen projects funded from the first call are being monitored and mentored every six months either by presentation to the Medical Electronics Advisory Group (MEAG) committee or by site visits. From the second call LoIs, eleven projects (five in the first round and six in the second round) were funded in three categories i.e. Seed grants (Idea to PoC), Early Transition and Transition to Scale. This accounts for almost 12 percent of the total received LOIs. Selection of projects from third round is in progress. Till date, a total of INR 337.00 lakhs have been released supporting nineteen of these projects under IIPME scheme. Below are the status and outputs from ongoing projects from IIPME funding

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

A medical Software which can improve the surgical outcome by aiding the surgeon by providing accurate 3D view of patient's anatomy, automatic decision making tools and highly accessible web/cloud platform. An alpha level prototype has been developed and is under clinical validation.



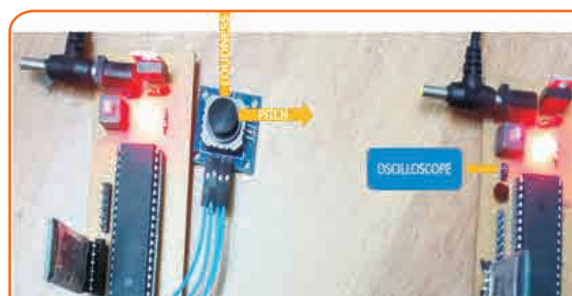
X-ray to 3D

PSI design

3D Surgery Planning Software and Patient Specific Instrument

2. Artificial Larynx for voice restoration for voice restoration in throat cancer patients

Electronic vibrator electro larynx designed for modulating loudness and pitch simultaneously during a speech, which makes it different from the currently available products. Alpha prototype is ready and getting tested for improvements



Electronic vibrator larynx design

3. Transvaginal digital colposcope

Portable transvaginal digital colposcope with smartphone interface for cervix cancer screening in low resource settings for combining VIA and Colposcopy for primary screening and confirmation of diagnosis at single visit. Current version has an external pen-camera for capturing images and videos on an android device



4. Navigational Flexible Robot for Craniofacial Surgery

Stereotactic flexible, articulated robot that enters the face via the mouth minimal access for craniofacial surgery. Design 3D CAD model of the Cranio-bot and fabrication & implementation of the software by directly commanding the Cranio-bot to navigate over the bone and cut it. Design, build and implement the sensor based localization system. Technology is under patenting



Cranio-bot

5. Test Strip Free Personal Glucometer

A stable, glucose-sensitive, Polymer-anionic dye compound based glucometer has been designed and the improvement of the process is being worked upon. Clinical evaluation is planned at various hospitals



Strip-free Glucometer

6. Hand cranked defibrillator for low resource settings

An affordable Bi-Phasic defibrillator with a built-in power generator for low resource settings using a hand crank. A beta-prototype of the instrument is ready and PCT has been filed for charging and discharging technologies



Hand-cranked defibrillator

7. Disposable PCR cartridges for TB diagnosis

Development of an integrated disposable cartridge for Polymerase Chain Reaction based identification and quantification of M. tuberculosis. The cartridge functional sequence has been completed and heating and cooling timing for the prototype is being optimized.



Disposable PCR cartridge

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 from The Energy and Resources Institute (TERI) North Eastern



Biotoilet in Don Bosco school, Assam

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 key feature of this initiative is the integrated approach that is formulated for interlinking school toilets with anaerobic digester for maintaining hygiene while imparting resource recovery education to the student to remove the misconception on usage of biogas from human waste.

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

The shortlisting of schools in the 7 states is complete covering both public and private schools including residential schools.

The applicant is in the process of installing 50 toilets in four states i.e. Tripura, Assam (Guwahati), Manipur and Mizoram. 35 residential schools have been identified from Manipur, Mizoram and Tripura of which 21 residential schools have been verified.

Further, TERI's membrane technology is ready which has been given to the fabricator and the installation of which in one of the schools of Guwahati is expected by April-May, 2017.

B. Networks, Platforms and Market Access

i. WISH

BIRAC collaborated with the WISH Foundation – a non-profit organization involved in taking innovations to end users – to scale up innovations supported by BIRAC. Through this partnership, BIRAC aims to commercialize innovations supported through its programs, by leveraging the networks and the established SCALE programme of WISH, which aims to scale up innovations in primary healthcare sector through State Governments. Taking this partnership forward, a Joint Advisory Group (JAG) meeting of BIRAC and WISH Foundation was convened on 8th July 2016, to discuss the operationalization of the association and to understand the requirements of both BIRAC and WISH. BIRAC presented 17 innovative products having application in primary health care. WISH has shortlisted 10 innovations for Health Technology Assessment (HTA) assessment and then the selected innovations will be presented to State Governments for inclusion in state procurement list.

ii. BIRAC-ICMR



BIRAC and ICMR have entered into a partnership to establish a collaborative framework where both organizations can leverage pooled resources to foster bio-entrepreneurship through networking platforms, enable start-ups and entrepreneurs to leverage the resource facilities of BIRAC and ICMR on mutual and shared facilities. In March 2017, ICMR and BIRAC partnered for an Innovation



Market Place at Rashtrapati Bhawan during the Festival of Innovations. The Innovation Market Place provided a platform for various innovators and start-ups to connect with the experts and investors.

iii. Tekes



BIRAC has collaborated with the Finnish Funding Agency – Tekes, for leveraging the expertise and ecosystem at Finland to boost the capacity and networks of the Indian start-ups working majorly in the medical technology domain. In November 2016, four BIRAC supported Innovators participated in the Global Startup Event called Slush, which provided a platform for Indian companies to find investors, form collaborations and learn from the advanced ecosystem.



BIRAC Innovators at SLUSH Finland with His Excellency, the Ambassador of India to Finland

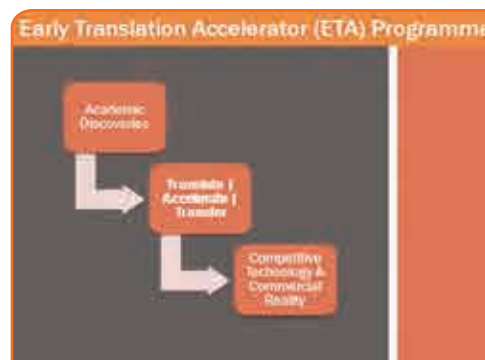
IV. Affordable Product Development

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 and is expected to collaborate with academic investigators, engage industry and to leverage international translation ecosystems.

The first ETA has been established at C-CAMP in the area of healthcare. The first project i.e. platform for improved erythropoietin (EPO) expression is progressing well and expected to deliver a platform technology that can be used for other bio-therapeutics as well. The second project i.e. Validation of novel compounds in neuro-degenerative diseases and third project i.e. Validation of novel Self-assembled short peptide based nanomaterials for Glioblastoma therapy has recently initiated at C-CAMP healthcare ETA.

BIRAC has set up a second ETA in the area of Industrial biotechnology at IIT Madras, activities for which are expected to take off in 2017-18.



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

Under this initiative of BIRAC, the focus is on accelerating the rapid development of nationally important technologies and products that need coordinated efforts across a variety of areas, from understanding national & market needs, policy & milieu surrounding a technology/product to technology acquisition and development.

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

During the financial year 2016-17, BIRAC in partnership with USAID and the Indian Council for Agricultural Research (ICAR), has jointly funded a project entitled 'Development of heat tolerant, high yielding and climate resilient wheat cultivars by utilizing genomics, molecular and physiological information and resources.' Under the proposed study high yielding heat tolerant wheat cultivars suitable for the Indo-Gangetic plains would be developed. The anticipated deliverables of the project includes; (a) Development of heat-tolerant varieties of wheat, (b) Identification of genes and QTLs controlling heat tolerance and the corresponding user-friendly DNA markers, (c) Development of a system of high throughput phenotyping of heat tolerant wheat varieties both under controlled environment and field conditions (d) Establishment of physiological and enzymatic assays to associate with heat tolerance in wheat, (e) Establishment of national genotyping and doubled haploid production facilities (f) Optimization of various new breeding and crop improvement approaches including MABS, Marker Assisted Forward Breeding (MAFB), high-throughput biochemical and enzymatic assays.



Doubled haploid population phenotyping trial in progress at PAU, Ludhiana during season 2016-17

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

BIRAC has supported a technology development and transfer program of biofortified and disease resistance banana from Queensland University of Technology (QUT), Australia to be translated by

5 Indian research institutes namely, National Agri-Food Biotechnology Institute, Mohali, Punjab, National Research Centre for Banana, Trichy, Tamil Nadu, Bhabha Atomic Research Centre, Mumbai, Tamil Nadu Agricultural University, Coimbatore and Indian Institute of Horticultural Research, Bangalore.

In the initial phase of the project that ended in November 2016, transgenic plants of two Indian cultivars namely, Grand Naine and Rastali were developed using various gene constructs provided by QUT. These transgenic plants need to be transferred to net-houses for contained trials, screening and selection. To achieve this, the project has been extended till November 2019.

During 2017-18, the Indian partners shall move forward with the positive leads available with them towards product development. The focus shall be on transfer of transgenic plants developed using various constructs provided by QUT from the lab to net-houses for contained trials and evaluation for desired agronomic traits.

V. Specialized services

The Specialized Services group provides foundational groundwork to support the mission and vision of BIRAC through multitudes of activities.

The strategic aim of this group is to analyze the intellectual property potential of emerging projects in all programs of BIRAC, to hand-hold emerging IP to be secured and to help map the potential technologies in public sector institutions including facilitating technology transfer and create dedicated IP awareness through workshops

1. IP&TT

The in-house IP & Technology Management cell at BIRAC provides support to start-ups and SMEs on various aspects of Intellectual Property & Technology Management such as patent searches, landscaping, patent drafting, filing, freedom to operate, technology evaluation and assessment, among others. BIRAC undertakes extensive IP evaluations of proposals that it receives for its flagship funding programs such as BIPP, CRS, SBIRI, IIPME, SPARSH and BIG. Additionally, the cell facilitates IP & technology management related activities between academia and industry in collaborative projects.

Apart from the various IP services, the IP cell also helps to formulate patent policies for universities & organizations.

BIRAC IP & Technology Management cell also organizes several capacity building and awareness workshops on various aspects of IP and Technology Transfer. In FY 2016-17, four (4) IP awareness workshops have been conducted at different locations such as Jammu, Varanasi, New Delhi and Mumbai. These workshops were conducted by experts from the field who provided information and knowledge regarding various aspects of IP and its strategic use by entrepreneurs and academic researchers. The workshop elicited a lot of interactive session from faculty, SMEs and start-ups with respect to the patenting issues in biotechnology related areas/Life Sciences like GMOs, patenting of cloning of genes, micro organism etc.

• Patent & Technology Transfer for Harnessing Innovations (PATH)

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

To implement the scheme, BIRAC has also empanelled technically competent and experienced IP & Technology Transfer (TT) firms who provide assistance for patent search, filing, drafting and

commercialization of such technologies if required. So far two patents have been supported through the BIRAC-PATH. Patent filing support has been extended for national phase entries in different countries such as US, EU, Australia and India. These patent applications are filed mainly in the area of secondary agriculture and healthcare.

VI. Mentoring and capacity building

BIRAC plays an important role as a mentor and a capacity builder for start-ups and young entrepreneurs and innovators who work in the area, given the organization's reputation and access to leading experts and organizations.

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

BIRAC has channelized the participation of the 5 BIG grantees to participate in the CfEL's mentorship and capacity building program in July 2016. The 2 week program is aimed at developing the business skills among the entrepreneurs through interaction with eminent leaders in the industry, providing a platform for entrepreneurs to share their ideas and seek collaborations from suitable partners and pitch their ideas to investors.

The response from the previous batches has been good and it has been emphasized by the participants that the program has helped them in honing their business skills, improvising their business plans and networking for the advancement of their innovation to next level. BIRAC plans to continue its participation in the Ignite program.



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

2. Roadshows and Grant writing

BIRAC is keen to achieve its mandate of creating awareness among its stakeholders about the activities of the organization by conducting Grant Writing Workshops. Four such workshops were organized in 2016-17 at the following places:

- IIIM, Jammu
- IIT, BHU, Varanasi
- ICGEB, New Delhi and
- SINE, IIT Bombay

These workshops focused on sensitizing participants about BIRAC's initiatives for promoting the innovation ecosystem, imparting effective grant writing skills necessary for writing successful proposals to funding agencies, and disseminating information on the various aspects of IP such as its importance, leveraging IP for business ventures and management. Talks and sessions are delivered by experts in various fields and law firms are also invited so that the audience can gain first hand insights on matters of IP and technology management and exploitation. Nearly more than 200 stakeholders participated in these workshops.

The participants interacted with the BIRAC team on various aspects such as schemes available for individual innovators as well as for the academia and also on recent amendments in the Indian Patent Act after announcement of Startup Action Plan.



BIRAC Roadshows at Jammu and Mumbai

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 industry personal, BIRAC organizes hands on training workshop regularly. The following four hands on training workshops were organized during 2016-17.

1. **BIRAC-ICGEB Hands-on Training on Development and Improvement of Strains for Biomolecule Production**

The training program focused on modern tools and techniques used in experimental research in the area of strain development and improvement for the production of biomolecules. The three day training covered in-depth the genetic engineering approaches which included DNA cloning, PCR, genome editing and systems biology. The total number of participants in the workshop was 14 from different enterprises.



2. Hands-on training workshop on High-End Analytical Instruments at Life Science Incubator, IKP Knowledge Park

The four day hands-on training workshop on high-end analytical instruments at Life Science Incubator (LSI), IKP Hyderabad consisted of training on four modules, each module consisting of detailed theory and practical application of one among the four analytical instrument(s); NMR, HPLC, TGA-DSC and Particle Size Analyser-FTIR. The participants had choice to select any two modules to get trained in these four days. There were 25 registered participants.



3. BIRAC - C-CAMP Hands-on Training workshop on Molecular Biology techniques, Recombinant protein Expression and Purification

Hands-on training covered molecular biology techniques like cloning, PCR, restriction digestion, ligation and transformation, recombinant protein expression, small-scale expression in E. coli, demonstration of BioFlo415 Fermentor (Eppendorf AG), Protein purification: Chromatographic techniques like affinity chromatography using AKTA Protein purifier etc. There were a total of 22 participants from 12 different enterprises.



4. Hands-on training workshop on 'Analytical tools for Bio-molecular Characterization' at CBST, VIT University, Vellore

The workshop focused on three different analytical techniques for Bio-molecular characterization. The analytical techniques were Process Analytical Technology (PAT) (AKTA Systems, GE Healthcare & CIMac QA monolithic column, BIAseparations), LC-MS based proteomics (Agilent) and Surface Plasmon Resonance (SPR) Based BIAcore (GE Healthcare). There were total of 27 participants.



Regulatory Workshops

BIRAC is conducting regulatory workshops under the series 'Demystifying Indian Drug regulations for Product Approvals' regularly and organized the following two regulatory workshops, in collaboration with Clinical Development Services Agency (CDSA).

Existing Regulations for Biopharmaceuticals in India on March 15, 2016 at Venture Centre, Pune

The objective of the workshop was to provide direct, relevant and valuable information on key scientific aspects of biopharmaceuticals including its regulations in India. This workshop focused on sharing the updates on regulatory developments and guidance documents, review approval process, real time experience in filing and seeking approval, step-wise development process, standard format and content of IND submissions, including regulatory and scientific requirements, pre-clinical and clinical needs in the area of biopharmaceutical development. This workshop gave ample opportunity to interact with the regulators and clarify doubts through networking and Q & A sessions.

This workshop was attended by 38 participants from various organisations. There were 8 faculty members which included 3 Senior Regulators from CDSCO.

Current Regulations for Medical Devices & in vitro Diagnostic Kits in India on March 30, 2017 at C-CAMP, NCBS, Bengaluru

The objective of the workshop was to provide direct, relevant and valuable information on key scientific aspects of Medical devices and in vitro diagnostic (IVD) kits including its regulations in India. This workshop focused on Medical Devices – Indian Regulatory Scenario, Introduction to CDSCO, its structure with respect to medical devices, regulation for import, manufacture and sale of medical devices; classification of medical devices- comparative analysis; design & development of medical devices; safety assessment of medical devices; clinical trials of medical devices; Indian & ISO standard: CE certification, ISO 13485, Indian standards; Regulations for IVD kits; sharing the updates on regulatory developments and guidance documents, review approval process, real time experience in filing and seeking approval, step-wise development process, including regulatory and scientific requirements. This workshop gave ample opportunity to interact with senior regulators through networking and 'Meet the Regulator' sessions, this session was very well appreciated by the participants as they got an opportunity to interact with the regulators and seek clarification and guidance.

This workshop was attended by 74 participants from various organisations. There were 9 faculty members which included 4 Senior Regulators from CDSCO (2 Present and 2 Former Regulators).



VII. Supporting National Programs

BIRAC actively works to support the Government of India's National Programs through a variety of programs. Make in India and the Startup India program, both very relevant to BIRAC's mandate and vision are actively supported through facilitation Cells and plans created in partnership with the Department of Biotechnology.

1. Make in India



'Make in India' initiative was launched on September 25, 2014 by the Government of India with an aim to give Indian economy global recognition.

The Department of Biotechnology has a foundational partner in the 'Make in India' initiative as it has specific relevance to the biotechnology sector in India, given that the country's biotechnology industry is in the growth phase where opportunities are immense. Considering the importance of the biotechnology sector in the program, the Department entrusted BIRAC with the responsibility of creating a facilitating ecosystem in the country for promoting the manufacturing capabilities of the Indian biotech sector. Hence, BIRAC has

established a Make in India Facilitation Cell for disseminating the relevant information in context to Make in India and attracting investments in the sector.

Major Activities of 2016-17:

- In 2016-2017 the Make in India Facilitation Cell initiated a high level report on Make in India opportunities and identified several areas for support in high value manufacturing. The report was released by Hon. Minister for S&T and Hon. State Minister for S&T at the 5th Innovator Meet in September 2016. The report highlighted the global and Indian biotechnology research and industrial landscape; underlined the challenges faced by the Indian biotech industry; and brought out the fiscal and policy incentives offered by the Government for the biotech industry and start-ups in India.



- The Cell ensures wider dissemination of the Government programmes and other information relevant to the establishment and growth of start-ups. A dedicated website has been developed for the information dissemination and handholding start-ups < <http://birac.nic.in/mii/index.php>>.

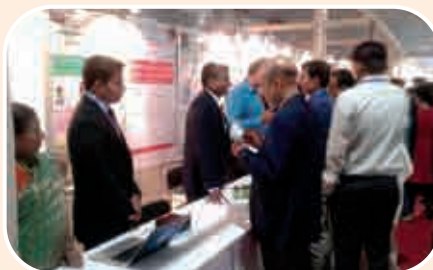
The cell also prepares brief industry analysis reports to track new Government initiatives and identify market trends related to biotechnology and start-up ecosystem and has also prepared a two year achievement report of Biotechnology sector which is published by DIPP.

The facilitation cell coordinates with DIPP/KPMG on a regular basis for updates in MII action plan on the online web portal.

The Cell has also brought out a compilation of Products developed by innovators with the support of BIRAC and has contributed to the creation of Innovation Market Place at BIRAC's fifth Innovators Meet and ICMR exhibition at the Rashtrapati Bhawan. The purpose behind organizing an Innovation Market Place was to showcase the products, indigenously developed by the innovators supported by BIRAC, to relevant Investors and stakeholders.

The cell provides continuous inputs for Startup India Action Plan and also responds to queries related to Make in India, Startup India and others related to entrepreneurship, start-ups & ease of doing business.

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



Boosting the Startup culture by providing platforms such as Hackathons, Innovation Market Place and Investors Meet etc

2. Startup India

Startup India is a flagship initiative of the Government of India, intended to build a strong ecosystem for nurturing innovation and start-ups in the country that will drive sustainable economic growth and generate large scale employment opportunities. The Government through this initiative aims to empower start-ups to grow through innovation and design. The Department of Biotechnology along with Biotechnology Industry Research Assistance Council (BIRAC) has championed the cause of promoting the Startups Innovation ecosystem in the biotech domain in the country. To further strengthen and empower the emerging biotech start-up ecosystem, Department of Biotechnology 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 start-ups and SMEs. Through this initiative, DBT endeavours to scale up the number of start-ups in the sector by nurturing approximately 300-500 new start-ups each year to have around 2,000

start-ups by 2020. Presently, 20 bioincubators and 3 bioclusters have been supported. 20 Bioconnect offices will be established at different universities/institutes across India to promote forward thinking and exchange between stakeholders in academia, industry, government agencies, trade, professional services and financial organisations. BIRAC has launched BIRAC Seed Fund to provide capital assistance to start-ups and act as a bridge between promoters' investment and Venture/angel investment.

BIRAC has shifted the biotech start-up culture in the country. We understand that bringing communities of start-ups together can lead to more collaborations. In this regard BIRAC has provided several platforms to the start-ups for showcasing their innovations. BIRAC had conducted a 'Hackathon' at IKP Eden to create functional prototypes and validate the same for innovative devices and diagnostics to screen, detect and manage diabetes, cancer, and cardiovascular diseases. To connect the start-ups to industry experts and investors, BIRAC also created Innovation Market place at BIRAC Innovators Meet in September 2016 and at the Rashtrapati Bhawan along with ICMR in March 2017. These platforms provide opportunities for the start-ups to showcase their products/technologies and pitch about their innovations.

VIII. Facilitating Industry Academic Interaction

BIRAC occupies a unique position at the boundaries of industry and academia with arms in both areas. This provides the organization a unique opportunity to facilitate interactions between these arms to enable exploring of new networks, partnerships and knowledge generation and synthesis.

BIRAC facilitates interactions through print publications, outreach programs and BIRAC organized events.

1. Innovators' Meet

BIRAC organized its 5th Innovators Meet at New Delhi on 22nd-23rd September 2016, which witnessed the confluence of around 300 scientists, entrepreneurs, industry experts and policy-makers. The theme of the meet was Biotechnology Innovation Ecosystem: Strategizing for the Next Leap.



Dr. Harsh Vardhan, Union Minister of Science & Technology & Earth Sciences, GoI was Chief Guest; Shri Y.S. Chowdary, Minister of State for Science & Technology and Earth Sciences, GoI, was the Guest of Honour; Prof. K. VijayRaghavan, Secretary DBT & Chairman BIRAC; Mr. Yigal Erlich, YOZMA Group, Israel; Dr. Renu Swarup, Senior Adviser, DBT & MD, BIRAC; Mr. Sujay Shetty, Leader, PwC were also present.

Delivering his keynote lecture, Mr. Yigal Elrich, Founder, Yozma Group, Israel spoke about the journey of Israel becoming a start-up nation and his vision of accelerating start-ups. He elaborated about the funding scenario and success ingredients contributing to Israel's growth.

BIRAC Innovators Awards

The inaugural session also included the announcement of the prestigious BIRAC Innovator Awards. The awards were presented broadly in three fields including Agriculture, Healthcare and Industrial Biotechnology. The awardees were:

1. AGRICULTURE -Nirmal Seeds Pvt. Limited, Pachora, Jalgaon for 'Development of nutritionally improved mustard (Brassica juncea) varieties/hybrids', in collaboration with The Energy and Resources Institute, New Delhi.
2. HEALTHCARE (Therapeutics)-Serum Institute of India Pvt. Limited, Pune for 'Development of Polysialylated Erythropoietin'.
3. HEALTHCARE (Devices & Diagnostics)-Panacea Medical Technologies Pvt. Limited, Bengaluru for 'Development of Flat Panel Computed Tomography (FPCT) machine'.
4. INDUSTRIAL BIOTECHNOLOGY (Technology Development)-India Glycols Limited, Kashipur for 'Validation of technology for production of 3000 Litre ethanol/day', in collaboration with DBT-ICT Centre for Energy Biosciences, Mumbai.
5. INDUSTRIAL BIOTECHNOLOGY (Product Development)-Aumgene Biosciences Pvt. Limited, Surat for 'Scale-up & commercialization of recombinant lipase enzyme'.

The inaugural session was followed by announcement of the prestigious BIRAC Innovator Awards. Innovation Market Place, Poster session and Conversation with the Investors session were the highlights of 5th Innovators meet.



Honb'le Minister for S&T and ES Dr. Harsh Vardhan, MoS for S&T and ES Shri. Y S Chowdary, Mr. Yiegal Elrich YOZMA Group, Israel, Prof. K VijayRaghavan Dr. Renu Swarup and Mr. Sujay Shetty release the BIRAC compendium at the Innovators Meet 2016

Innovation Market Place

BIRAC created the Innovation Market Place to highlight the products/technologies developed through BIRAC support. 23 Innovators were selected to not only showcase their technologies/prototype to investors but also to network with participants from Industry and academia. The innovators pitched for their innovation to the audience. The investors guided the innovators about the challenges faced during the early phase of establishing ventures, and suggested them to strategize their commercialization plans in advance to avoid the gap between product readiness and launch.



2. Foundation Day

BIRAC celebrated its 5th Foundation day, by organizing a high profile knowledge and networking event at Hotel Ashok, New Delhi with the theme BIRAC @5- Impacting the Biotech Innovation Ecosystem on 20th -21st March 2017. The event was attended by a large number of dignitaries from government, scientific & industry sector both from within the country and overseas. More than 250 start-ups, entrepreneurs & researchers from industry and biotech organization were also present to grace the occasion.

The Honorable Minister for State for Science and Technology, Mr. Y.S. Choudhary, Professor VijayRaghavan, Secretary Department of Biotechnology and Chairman BIRAC, Dr. M.K. Bhan, Former Secretary, Department of Biotechnology & Founder Chairman, BIRAC and Dr. Renu Swarup, Senior Adviser, Department of Biotechnology and Managing Director BIRAC, launching the BIRAC Corporate Brochure at the 5th Foundation Day.

Shri Y.S. Chowdary, Minister of State for Science & Technology and Earth Sciences, GoI, as Guest of Honour delivered the inaugural address and the keynote address was given by Dr. M.K. Bhan, Former Secretary, DBT & Founder Chairman, BIRAC.



Hon'ble Minister of State for S&T and ES Shri Y S Chowdary, Dr. MK Bhan, Prof K VijayRaghavan and Dr. Renu Swarup releasing BIRAC Brochure at the 5th Foundation Day of BIRAC

The 5th Foundation Day was also the event for release of coffee table book titled 'BIRAC@5

Impacting the Biotech Innovation Ecosystem', a chronicle of BIRAC's journey since its inception five years ago.

The event witnessed interactive panel discussions compiling the issues, challenges and key strategies to overcome those issues in order to make India a Biotech Hub in the near future. Promoting innovations through Industry –Academia Partnership and scaling up the innovations to

commercialization stage were the focal areas of these informative discussions. Bio-innovation exhibition was also organized at the event to provide a platform to entrepreneurs for showcasing their innovations.



Various High level Panel discussions at the Foundation Day event

Bio-innovation Exhibition

During the Foundation Day, BIRAC provided a platform to entrepreneurs for showcasing their innovations. The entrepreneurs interacted with a diverse range of experts including Shri Y.S. Chaudhary, Hon'ble Minister of State for Ministry of Science & Technology & Earth Sciences. Total 28 products/technologies had been showcased during the exhibition. The interesting innovative products exhibited were point-of-care medical diagnostics, waste management technology, India's first artificial liver tissue using 3D printing, next generation drugs or therapies, innovative medical devices and plant healthcare system. The innovators pitched sustainable development as a marketing tool for their cutting edge products. The interesting innovative products exhibited were point-of-care medical diagnostics, waste management technology, India's first artificial liver tissue using 3D printing, next generation drugs or therapies, innovative medical devices and plant healthcare system. The innovators pitched sustainable development as a marketing tool for their cutting edge products.



Shri Y.S. Chowdary, Minister of State for Science & Technology and Earth Sciences at the Bioinnovation exhibition

1st BioNEST Conclave

BIRAC organised its 1st BIONEST Conclave to mark 5 years of its continuous support to Bioincubators and start-ups. The 1st BIONEST Conclave was organized on 30th and 31st January, 2017 at India Habitat Center, Lodhi Road, New Delhi. The Conclave was attended by around 100 participants from Incubation fraternity, start-ups, Industry, academia, Bioparks and stakeholders from National and International organizations. The forum provided opportunities to discuss on topics ranging from policies on incubation, operationalization, sustainability, models of incubation to evolution of incubators. The inaugural address included recorded messages by Prof. K VijayRaghavan, Secretary DBT and Chairman BIRAC and Dr. M K Bhan, Former setratary DBT delivered the address to the incubation fraternity. Keynote address was given by Dr. Sanjeevi Carani, Department of Medicine, Karolinska Institute, Sweden. He gave a detailed perspective of Cluster development activities in Sweden. Dr. Renu Swarup talked about BIRAC's journey towards nurturing ecosystem. The Inaugural session was followed by panel discussions.



1st BioNEST Conclave at Delhi on 30th and 31st January 2017

3. Outreach Initiatives

a. BIRACi3 – The Quarterly Newsletter of BIRAC

BIRACi3, the quarterly newsletter of BIRAC entered into its 3rd year in 2016-17 since its launch. The newsletter has been successful in communicating 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. BIRAC's presence at BIO International Convention 2016

The 2016 BIO International Convention drew near about 16,000 industry leaders from 76 countries. Educational program included 157 sessions which addressed the latest business opportunities and breakthroughs in medicine, diagnostics, environment, energy production, food and agriculture and more.

The Indian Pavilion was inaugurated by Dr. Kiran Majumdar Shaw. The public sector was present in force with representatives from states such as Karnataka, Bangalore Bio-innovation Center, Telangana, T-Hub, Andhra Pradesh, Department of Biotechnology, Govt. of India and BIRAC. Several start-ups and law firms represented the private sector in the event.



BIRAC at BIO US 2016 at San Francisco, USA

c. **BioAsia Conference 2017 (6th-8th Feb 2017, Hyderabad)**

Theme of the conference was Power of the past and Force of the future. Conference was inaugurated by the presentation of Genome Valley excellence awards 2017 and was awarded to Dr. Paul Stoffel's (Johnson and Johnson) and Prof. Kurt Wuthrich (Nobel Laureate) followed by visit to international exhibition. Dr. Paul Stoffels, Prof. Kurt Wuthrich and Dr. Vas Narasimhan, Novartis delivered keynote address. Dr. Renu Swarup, MD BIRAC delivered the keynote address at one of the panel discussions and BIRAC participated in the International Exhibition and showcased the current events, schemes and future targets of BIRAC

OUR FUTURE PLANS

Over the last few years, BIRAC's efforts have created a foundation of a vibrant translational ecosystem for biotech innovation in the country encompassing all the categories of innovation funnel including ideation to proof of concept to validation and finally scale up and commercialisation. This has resulted from our ability to sense the emerging needs in the ecosystem, consult with wider stakeholders and design programmes that fill this gap.

As we move forward, we are committed to help achieve the goals mentioned in the National Biotechnology Development Strategy-II, Make in India and Startup India thus aiming to take the Indian biotechnology sector to the next level.

Focus on programmes in Entrepreneurship

We will deploy new programmes such as BIRAC Incubator Seed Funding and BIRAC AcE fund in 2016-17 which will hopefully help to bridge the 'valley of death' that most of our start-ups encounter. We are also committed to focus on increasing the number of high quality incubators across the country through our support and hopefully we will be to extend our support to 7-8 more incubators across the country. Our focus is also on increasing the touch points with the community such that we increase awareness about 'innovation research' in the community especially through focused themed Hackathons.

Mapping and sensing of the emerging biotech ecosystem across the country is important and we intend to extend the reach of our mapping through BIRAC Regional Innovation Centre (BRIC) to geographical areas such as Mumbai, Pune, Ahmedabad, Baroda and Bhubaneswar.

Our footprint across the nation has significantly increased and to provide greater emphasis on entrepreneurship development, we will create BIRAC Regional Entrepreneurship Centre (BREC) at C-CAMP, Bangalore.

Secondary Agriculture

Several potentially high impact technologies in terms of value added products from agriculture produce are presently at different stages of development and a coordinated effort could benefit the scale up of their production and dissemination. BIRAC is interested in accelerating the development of newer technologies and value added products from agro-produces, by-products and enhance professional expertise of Indian scientists and knowledge base in food processing, by-products utilization and biofuels. To take this forward, BIRAC is in the process of engaging institutes focusing on Secondary agriculture.

BIRAC proposes to develop a Secondary Agriculture Bio-cluster (SAB)/Bio-incubator with the aim of benefiting the district level small and medium enterprises. Two locations based on the need have been identified in the northern region of India for setting up of a bio-cluster and bio-incubator at Punjab and Haryana respectively. The two institutions identified are CIAB, Mohali and NIFTEM, Sonapat. Further, PSCT Punjab will also be involved for the management of the Secondary Agriculture Biocluster (SAB).

To achieve this, BIRAC intends to collaborate with Ministry of Food Processing Industries (MoFPI) and the initiative is expected to bring a quantum of change in the value added agriculture for the benefit of farmers.

Agri Electronics

Agriculture in India is fast approaching a plateau in its growth curve as many of the benefits of green revolution like fertilisation, irrigation and seed selection have already been realised. Hence, a new impetus in the form of a technology intervention is needed to reboot the system of growth and development.

One such technology intervention to be considered is Agri Electronics, which is an emerging and multidisciplinary frontier of advanced research - a potential vehicle for digitisation of green revolution which will usher an era of engineering of new systems and e-devices for improvement in crop productivity, quality and value.

Considering Agri Electronics as a technology intervention to enable public private partnerships with cross disciplinary approach and align with government's broader initiative of 'DIGITIZING INDIA' and 'MAKE IN INDIA', BIRAC intends to collaborate with MeitY to take this initiative forward and submitted a proposal.

SUPPORTING SERVICES

Any organization is made by its people and its supporting services. The Technical teams are fully and effectively supported by the supporting services, Legal and Human Resources teams.

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, promoting alternative dispute resolution etc.

b. Internal control system and their adequacy

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

c. Human resources

The goals of the Human Resources & Administration Department is to support BIRAC in achieving its strategic mission, while ensuring employees are engaged and motivated to help the organization succeed. HR's success here may be measured by our ability to align and integrate processes by identifying issues and executing corrective measures effectively. In moving forward, HR has targeted its operational initiatives to align with BIRACs Strategic Plan by initially identifying ways to leverage and develop technology as a means to cut costs and improve internal efficiencies.

Human Resources put into action the process: making contingent hiring which enabled management to fill critical positions faster to meet organizational needs. The Department is strategically focused by thinking and acting in the best interest of the organization and the workforce; in particular, while developing policies & guidelines, events and delivering services. Dedicated to quality, excellence and continuous improvement, we work to ensure competitiveness in our human resource management policies and practices by actively seeking and developing best practices, methods and approaches.

To bring out a positive change and development within the organization, where the change encapsulates almost everything is one of the biggest factors that contribute to the need of training and development. For the same, BIRAC is focused in imparting domain specific training to its

workforce both in-house and the training programs organized by specialized institutes. In 2016-2017 more than 90 man-days training have been imparted to employees.

Employee engagement as a workplace approach in BIRAC builds the right conditions for all members to give of their best each day, committed to the value & ethics, put a way forward to contribute towards organisational success, with an enhanced sense of their own well-being. National events such as Vigilance Awareness week, Swachta Pakhwada, Hindi Diwas, Anti-Terrorism day, Women's Day etc. are observed in BIRAC with much commitment and enthusiasm.

1. Swachta Pakhwada

In this endeavour, all employees took a pledge on cleanliness and vowed to spread awareness among others and wherever they go. In the pledge administered by MD-BIRAC, all employees undertook to contribute 100 hours per year towards cleanliness. An effort has been taken by all employees to identify the documents and files/ magazines / journals which are too old and as per the governing law can be weeded off.

The exertion is continued and till date has helped in segregating and compiling various documents. In this connection, an Essay writing Competition was also held in BIRAC and the winners were awarded.



2. Vigilance Awareness Week

Vigilance awareness week is observed in BIRAC to create awareness among all employees to check corruption at every level. It inspires the system to implement preventive measures effectively, so that transparency and accountability can be maintained in the governance. The basic motto of this week is to create a corruption free society.

In observance to the Vigilance Awareness Week an Inter-Departmental Quiz competition on the subjected topic, was organized in BIRAC on 4th November, 2016.



3. Hindi Diwas

Hindi Diwas is celebrated in BIRAC to echo the importance of Hindi language 'our Mother tongue'. Hindi Diwas is organized in BIRAC with the unique programs and competitions related to Hindi poems, idioms, story recitations etc. Each employee took an active participation in the same.



4. Anti-Terrorism Day

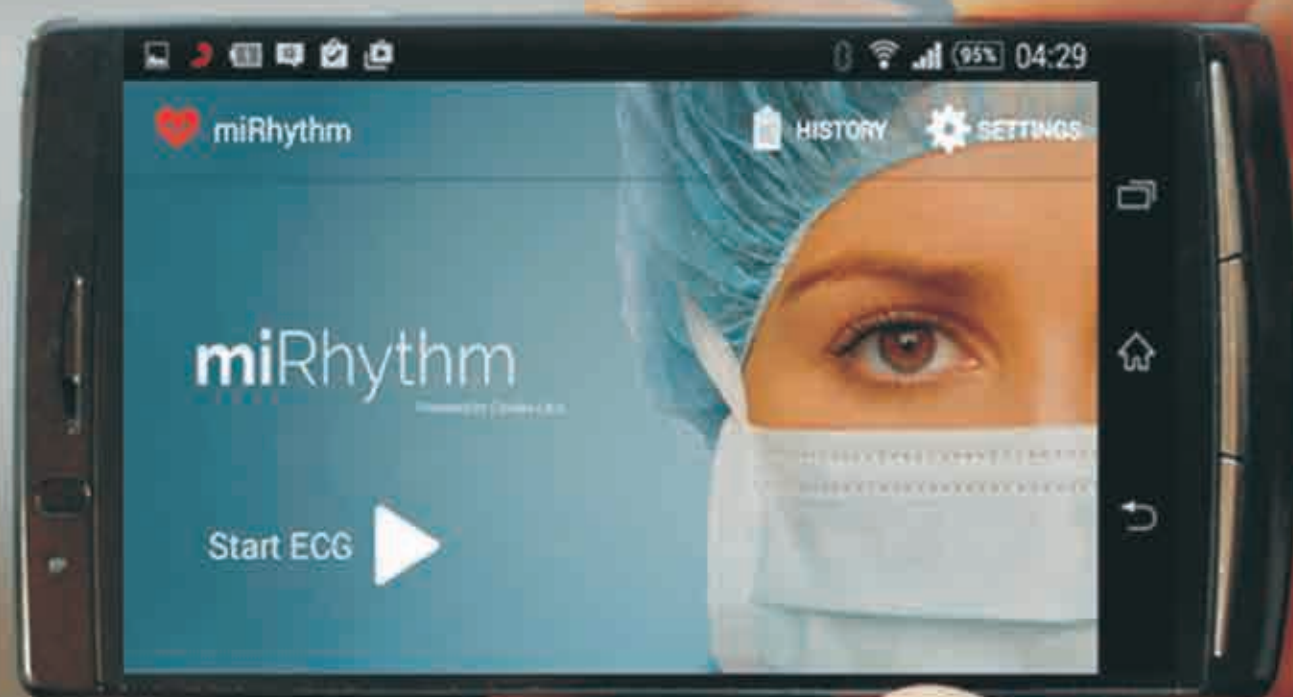
The Anti-Terrorism Day is celebrated on May 21 to raise awareness among all sections of people, about the danger of terrorism, violence and its dangerous effect on the people, the society and the nation as a whole. This day in BIRAC is observed by taking a Pledge to generate awareness among all sections of the people, about the menace of terrorism and violence and its effect on the people, society and the country as a whole.



5. Women's Day

Women's Day is observed in BIRAC by celebrating the social, economic, cultural and political achievements of women. It commemorates the movement for women's rights by organizing variety of programs like competitive activities, luncheons, discussion on women's issues, rights and achievements. This year the colour scheme of Women's day in BIRAC was blue clothing for women & pink for men to dispel the myths surrounding colours and traditional masculinity and femininity.





Report on Corporate Governance



REPORT ON CORPORATE GOVERNANCE'

1. BIRAC PHILOSOPHY ON GUIDELINES ON CORPORATE GOVERNANCE

Corporate governance refers to the 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 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 policy clearly reflects 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 consists of seven directors viz. an Executive Chairman, an Executive Managing Director, 4 independent directors and 1 Government Nominee director.

Five board meetings of the Company were held on the following dates: June 7, 2016, August 18, 2016, December 13, 2016, January 19, 2017 and March 15, 2017

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.)	Attendance at last AGM
			Member	Chairman		
Prof. K. VijayRaghavan	Chairman (Executive)	3	NIL	NIL	5	Yes
Dr. Renu Swarup	Managing Director (Executive)	NIL	NIL	NIL	5	Yes
Dr. Ashok Jhunjhunwala	Independent Director	2	NIL	NIL	4	NO
Prof. Pankaj Chandra*	Independent Director	1	NIL	NIL	1	NA
Prof. Akhilesh Tyagi*	Independent Director	1	NIL	NIL	1	NA
Mr. Naresh Dayal*	Independent Director	2			1	NA
Dr. Deepak Pental	Independent Director	NIL	NIL	NIL	5	NO
Dr. Dinakar Masanu Salunke	Independent Director	NIL	NIL	NIL	5	YES
Dr. Gagandeep Kang	Independent Director	1	NIL	NIL	3	NO
Dr. Mohd. Aslam	Government Nominee	2	NIL	NIL	3	YES

*W.e.f. March 15, 2017

**Upto March 15, 2017

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 of the Board was reconstituted on May 15, 2017 on account of reconstitution of the Board. The Committee consists of four directors viz. Prof. Ashok Jhunjhunwala, Prof. Akhilesh Tyagi, Prof. Pankaj Chandra who are independent and Dr. Renu Swarup, who is the Managing Director of the Company. Prof. Akhilesh Tyagi is the Chairman of the Committee. Four audit committee meetings were held during the year on the following dates: June 7, 2016, August 18, 2016, December 13, 2016 and March 29, 2017. The details of attendance of the directors at the Audit Committee meetings are as follows:

Name of the Director	No. of audit committee meetings attended
Prof. Akhilesh Tyagi*	1
Prof. Ashok Jhunjhunwala	4
Prof. Pankaj Chandra*	1
Dr. Renu Swarup	4
Dr. Dinakar Mashnu Salunke**	3

*W.e.f. March 15, 2017

** Upto March 15, 2017

The Company Secretary acts as the Secretary to the Committee.

4. BOARD PROCEDURE

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

5. SHAREHOLDER INFORMATION AS ON MARCH 31, 2017

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
	Dr. (Prof.) K. VijayRaghavan (held on behalf of President of India)	900	900,000	
	Dr. Renu Swarup (held on behalf of President of India)	100	100,000	
	GRAND TOTAL	10000	1,00,00,000	100

The Company received its International Securities Identification Number (ISIN) under the depository system on 13th April 2015.

6. GENERAL BODY MEETINGS

The details of the Annual General Meetings are as follows:

Period ended on	Venue		DateTime
31.03.2015	MTNL Building, 1st floor, 9 CGO Complex, Lodi Road, New Delhi - 110 003	09.09.2015	4.30 p.m.
31.03.2016	MTNL Building, 1st floor, 9 CGO Complex, Lodi Road, New Delhi - 110 003	20.09.2016	10.00 a.m.
31.03.2017	MTNL Building, 1st floor, 9 CGO Complex, Lodi Road, New Delhi - 110 003	12.09.2017	4.30 p.m.

No special resolutions had been passed at the last Annual General Meeting

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 issues by DPE by 30th June every year. In compliance to directives of DPE, BIRAC submitted its Compliance Report to 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 organization.
6. No expenses of personal nature of the Members of the Board of Directors were incurred out of the funds of the Company.
7. BIRAC has in place a suitable Risk Management Policy

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 from a practising Company Secretary, M/s. Neelam 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 & 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 2016-17. 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, 2017”

Sd/-
Dr. Renu Swarup
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, 2017, 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

Date: 26.07.2017

Place: New Delhi

Proprietor

PCS 6950

Auditors' Report & Annual Accounts



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, 2017, the statement of Profit and Loss accounts, the Cash Flow Statement for the Year ended 31 March, 2017, 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 2017, 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.
 - 4) The Company has provided requisite disclosures in Note 14.15 to these financial

statements as to the holding of Specified Bank Notes on November 8, 2016 and December 30, 2016 as well as dealings in Specified Bank Notes during the period from November 9, 2016 to December 30, 2016. Based on our enquiries, test check of the books of account and other details maintained by the Company and relying on the management representation regarding the holding and nature of cash transactions, including Specified Bank Notes, we report that these disclosures are in accordance with the books of accounts maintained 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
1	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.	Yes, Rs 9.60 lakhs has been written off in books of accounts on account of one time settlement. The reasons for the write off has been attributed to the fact that the promoter / director/ scientist of the concerned company expired, resulted into loss to BIRAC.
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. Deepak Gupta

Partner

Membership No. 081535

Place: New Delhi

Dated: 28.06.2017

Address: Plot No. - 75, LGF, Patparganj Industrial Area, Delhi - 110092

Phone:011 - 45261214 E-Mail: rma.ca12@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, 2017 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, 2017, 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. Deepak Gupta
Partner

Membership No. 081535

Place: New Delhi

Dated: 28.06.2017

Address: Plot No. - 75, LGF, Patparganj Industrial Area, Delhi - 110092

Phone: 011 - 45261214 E-Mail: rma.ca12@gmail.com

Website: www.rma-ca.com

Biotechnology Industry Research Assistance Council (BIRAC)			
Balance Sheet As at 31st March, 2017			
CIN U73100DL2012NPL233152			
			(Amount in Rs.)
Particulars	Note No.	As at 31.03.2017	As at 31.03.2016
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	2,82,97,46,998	2,63,88,26,682
(2) Current Liabilities			
(a) Current Liabilities	3	29,41,96,887	18,42,40,193
TOTAL		3,13,39,43,885	2,83,30,66,875
II ASSETS			
(1) Non-Current Assets			
(a) Fixed Assets			
(i) Tangible Assets	4	1,39,57,279	1,76,58,318
(ii) Intangible Assets	4	10,304	6,989
(b) Long-Term Loans and Advances	5	1,60,51,84,883	1,83,73,26,651
(2) Current Assets			
(a) Cash and Cash Equivalents	6	84,26,12,657	39,78,99,480
(b) Other Current Assets	7	67,21,78,762	58,01,75,437
TOTAL		3,13,39,43,885	2,83,30,66,875
Significant Accounting Policies and the accompanying Notes to Accounts	13 & 14		

	For and on behalf of Board of Directors		
Sd/-	Sd/-	Sd/-	
Kavita Anandani	Renu Swarup	K. VijayRaghavan	
(Company Secretary)	(Managing Director)	(Chairman)	
	DIN 01264943	DIN 02721859	

Auditors Report
As per our report of even date attached
Sd/-
For RMA & Associates LLP
Chartered Accountants
Firm Reg. No. 000978N/ N500062

CA. Deepak Gupta
(Partner)
Membership No. 081535

Place : New Delhi
Date : 28.06.2017

Biotechnology Industry Research Assistance Council

Biotechnology Industry Research Assistance Council (BIRAC)			
STATEMENT OF INCOME & EXPENDITURE FOR THE PERIOD ENDED 31st MARCH, 2017			
CIN U73100DL2012NPL233152			
(Amount in Rs.)			
Particulars	Note No.	For the Period ended 31.03.2017	For the Period ended 31.03.2016
(1) INCOME:			
Grants Received as Utilised	8	1,27,52,48,146	91,04,28,612
Extra-Mural Grants Received as Utilised	10A-D	10,68,43,247	18,71,61,566
Other Income	9	3,52,94,035	2,81,45,121
Total Revenue (A)		1,41,73,85,428	1,12,57,35,299
(2) EXPENDITURE:			
Programme Expenditure	10	1,18,34,75,845	80,13,54,655
Extra-Mural Programme Expenditure	10A-D	10,68,43,247	18,71,61,566
Employee Benefit Expenses	11	4,92,24,788	3,70,03,633
Depreciation & Amortisation Expenses	4	48,59,300	68,97,626
Other Expenses	12	6,86,89,907	6,65,20,178
Total Expenses (B)		1,41,30,93,086	1,09,89,37,658
(3) Surplus of Income over Expenditure before exceptional and extraordinary items	C=(A-B)	42,92,341	2,67,97,640
"(4) Add/ (Less): Prior Period Income/ (Expenditure) (net)"	(D)	-	(8,89,661)
(5) Surplus before extraordinary items	E = (C+D)	42,92,341	2,59,07,979
(6) Extraordinary items	(F)	-	-
(7) Income Before Tax	G = (E-F)	42,92,341	2,59,07,979
Add: Depreciation adjusted from Capital Reserve		48,59,300	68,97,626
		91,51,641	3,28,05,605
Less: Provision for Income Tax		-	-
Surplus Carried Forward to Reserve & Surplus A/c		91,51,641	3,28,05,605
Earning per equity share:			
(1) Basic		915	3281
(2) Diluted		915	3281
Significant Accounting Policies and the accompanying Notes to Accounts	13 & 14		

For and on behalf of Board of Directors		
Sd/-	Sd/-	Sd/-
Kavita Anandani (Company Secretary)	Renu Swarup (Managing Director) DIN 01264943	K. VijayRaghavan (Chairman) DIN 02721859

Auditors Report

As per our report of even date attached

Sd/-

For RMA & Associates LLP

Chartered Accountants

Firm Reg. No. 000978N/ N500062

CA. Deepak Gupta

(Partner)

Membership No. 081535

Place : New Delhi

Date : 28.06.2017

Biotechnology Industry Research Assistance Council (BIRAC)		
Cash Flow Statement for the Period Ended 31st March 2017		
CIN U73100DL2012NPL233152		
	(Amount in Rs.)	
Particulars	For the Period ended 31.03.2017	For the period ended 31.03.2016
Cash Flow from Operating Activities:		
Net Surplus as per Income & Expenditure Account	42,92,341	2,59,07,979
Adjustments for :		
Depreciation	48,59,300	68,97,626
Management Expenses	(7,16,494)	(1,95,216)
Foreign Exchange Fluctuation	(13,449)	(3,23,922)
Interest Income	(2,39,78,487)	(2,05,54,944)
	(1,98,49,130)	(1,41,76,456)
Increase/(Decrease) in Provisions & Payables	3,99,15,723	14,39,49,386
Increase/(Decrease) in Grant Utilisation	11,39,89,687	(4,56,23,086)
Increase In Capital Reserve (Non Recurring)	11,61,576	5,01,307
Fund Utilisation Towards IR&I (PPP) Activities (Net)	22,94,01,665	2,33,49,915
Provision for Sub-Standard & Doubtful Assets	(4,39,35,266)	(14,02,73,237)
(Increase)/ Decrease in Security Deposit	6,55,286	-
(Increase)/ Decrease in Other Current Assets	87,20,349	(86,47,611)
Increase in Advances IR&I (PPP) Activities (Net)	8,75,44,035	7,51,22,026
	43,74,53,055	4,83,78,700
Cash Generated from / (used in) Operations	42,18,96,266	6,01,10,224
Income Tax Refund / (Paid)	-	-
Net Cash from (Used in) Operating Activities (A)	42,18,96,266	6,01,10,224
Cash Flow From/ (Used In) Investing Activities:		
Purchase of Fixed Assets	(11,61,576)	(5,01,277)
Net Cash from/(Used in) Investing Activities (B)	(11,61,576)	(5,01,277)
Cash Flow From/ (Used In) Financing Activities:		
Interest Income	2,39,78,487	2,05,54,944
Net Cash from/(Used in) Financing Activities (C)	2,39,78,487	2,05,54,944
Net Increase in Cash and Cash Equivalents D=(A+B+C)	44,47,13,177	8,01,63,891
Cash and Cash Equivalent at beginning of the year (E)	39,78,99,480	31,77,35,589
Cash and Cash Equivalent at end of the year F=(D+E)	84,26,12,657	39,78,99,480

For and on behalf of Board of Directors

Sd/-
Kavita Anandani
(Company Secretary)

Sd/-
Renu Swarup
(Managing Director)
DIN 01264943

Sd/-
K. VijayRaghavan
(Chairman)
DIN 02721859

Auditors Report

As per our report of even date attached

Sd/-

For RMA & Associates LLP

Chartered Accountants

Firm Reg. No. 000978N/ N500062

CA. Deepak Gupta

(Partner)

Membership No. 081535

Place : New Delhi

Date : 28.06.2017

Biotechnology Industry Research Assistance Council (BIRAC)		
Notes to Financial Statements		
1.Share Capital	(Amount in Rs.)	
Particulars	As at 31.03.2017	As at 31.03.2016
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 31.03.2017	As at 31.03.2016
	No of shares	No of shares
Number of equity shares at the beginning	10,000	10,000
Add: Equity shares issued during the year	-	-
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 31.03.2017		As at 31.03.2016	
	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.) K VijayRaghavan (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 31.03.2017	As at 31.03.2016
I. Capital Reserve		
BIRAC Fund (Non-Recurring)		
Opening Balance	1,76,65,307	2,40,61,626
Add: On Account of Capital Expenditure during the year	11,61,576	5,01,307
	1,88,26,883	2,45,62,933
Less: Depreciation on Capital Expenditure (Refer Note No.4)	48,59,300	68,97,626
(A)	1,39,67,583	1,76,65,307
II. Other Reserves		
(A) Pre- BIRAC Funding by DBT		
Pre-BIRAC Unrealised Portfolio*	1,65,52,09,818	1,97,46,19,548
(B) Funds Utilised for Loans under IR&I (PPP) Activities after 31/03/2014(#)	77,28,37,748	54,10,57,083
	2,42,80,47,566	2,51,56,76,631
Less: Provision for Sub-Standard & Doubtful Assets (Refer Note 14.3)	18,42,08,503	14,02,73,237
	2,24,38,39,064	2,37,54,03,394
Pre-BIRAC Portfolio Realised (Cumulative)	52,76,11,418	56,17,16,240
Less: Funds Utilised towards BIRAC, IR&I (PPP) Activities	-	37,47,61,910
	2,77,14,50,482	2,56,23,57,724
Add: Fund utilised during the previous year	-	2,22,23,359
(B)	2,77,14,50,482	2,58,45,81,083
(C) General Reserve Surplus		
Opening Balance	3,65,80,292	2,59,98,046
Appropriation		
Less: Fund utilised during the previous year	14,03,000	2,22,23,359
Add: Transfer from Statement of Income & Expenditure	91,51,641	3,28,05,605
(C)	4,43,28,933	3,65,80,292
TOTAL (A+B+C)	2,82,97,46,998	2,63,88,26,682

* DBT portfolio taken in account by BIRAC from BCIL as on 31/03/2014 vide DBT Transfer order dated 25th September 2012 and as per Board Approval dated 17th December, 2013.

Interest not yet realisable amounting to Rs. 14,84,69,552/- upto 31.03.17 (Previous year Rs. 14,11,35,617/-)

Biotechnology Industry Research Assistance Council

3. Current Liabilities		(Amount in Rs.)
Particulars	As at 31.03.2017	As at 31.03.2016
Unutilised Grant (Refer Note 14.13)		
Unutilised grant (BIRAC)	-	-
Unutilised grant (IR&I (PPP) Activities)	41,52,403	-
Unutilised grant (DBT-BMGF-WT PMU) #	23,45,84,837	1,43,44,115
Unutilised grant (DBT/Welcome Trust Programme)	2,80,70,953	12,59,44,696
Unutilised grant (MeitY (IIPME))	32,30,164	1,80,45,600
Unutilised grant (Make in India Facilitation Cell)	69,634	4,83,871
Unutilised grant (Bio-toilets in schools from North East Region)	34,69,977	7,70,000
	27,35,77,968	15,95,88,282
Trade Payables		
Trade payables dues to micro and small enterprises (Refer note no. 14.16)	6,44,735	-
Trade payables other than due to micro and small enterprises	1,68,73,646	2,26,29,797
Other Payables		
Statutory Liabilities	31,00,538	20,22,114
	2,06,18,919	2,46,51,911
TOTAL	29,41,96,887	18,42,40,193

Refer 14.13

Unutilised Grant under DBT-BMGF-WT PMU is to be utilised over a period of five years.

Biotechnology Industry Research Assistance Council (BIRAC)

4. 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-2016	2016-17	2016-17	31-Mar-2017	1-Apr-2016	2016-17	2016-17	31-Mar-2017	31-Mar-2017	31-Mar-2016	
Tangible Assets											
Furniture & Fixtures	2,61,97,373	1,09,636	-	2,63,07,009	92,93,535	43,91,888	-	1,36,85,423	1,26,21,586	1,69,03,838	
Office Equipment	2,52,793	-	-	2,52,793	1,58,898	42,371	-	2,01,269	51,524	93,895	
Computers	34,14,731	10,37,540	-	44,52,271	27,54,146	4,13,956	-	31,68,102	12,84,169	6,60,585	
Total Tangible Assets	2,98,64,897	11,47,176	-	3,10,12,073	1,22,06,579	48,48,215	-	1,70,54,794	1,39,57,279	1,76,58,318	
Intangible Assets	7,26,019	14,400	-	7,40,419	7,19,030	11,085	-	7,30,115	10,304	6,989	
Total Intangible Assets	7,26,019	14,400	-	7,40,419	7,19,030	11,085	-	7,30,115	10,304	6,989	
Total	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	
Previous Year Figures	3,00,89,639	6,32,757	1,31,480	3,05,90,916	60,27,983	68,97,626	-	1,29,25,609	1,76,65,307	2,40,61,656	

Biotechnology Industry Research Assistance Council

5. Long Term Loans & Advances

(Amount in Rs.)

Particulars	As at 31.03.2017	As at 31.03.2016
Security Deposit - MTNL Premises	94,08,300	94,08,300
Security Deposit - BCIL	18,956	6,74,242
Long Term Loans and Advances		
<i>(Secured against Bank Guarantee/ Hypothecation/ Personal Guarantee) *</i>		
Loans Portfolio (Including Interest on Loan Accounts (IR&I (PPP) Activities)- Not yet realisable) #	2,42,80,47,565	2,51,55,91,600
Less: Current portion of Long Term Loans & Advances reflected under Current assets (\$)	64,80,81,435	54,80,74,254
	1,77,99,66,130	1,96,75,17,346
Less: Provision for Doubtful Assets (Refer Note No 14.3)	9,68,14,101	14,02,73,237
Less: Provision for Sub-Standard Assets (Refer Note No 14.3)	8,73,94,402	-
	1,59,57,57,627	1,82,72,44,109
TOTAL	1,60,51,84,883	1,83,73,26,651

* Refer 14.3 & 14.4.

Interest not yet realisable amounting to **Rs. 14,84,69,552/-** upto 31.03.17 (Previous year Rs. 14,11,35,617/-)

(\$)The current portion of Long term Loans & Advances of **Rs. 64,80,81,435/-** (Previous year Rs. 54,80,74,254/-) includes the overdues as per Note no. 14.4 of Notes to Accounts.

6. Cash & Cash Equivalents

(Amount in Rs.)

Particulars	As at 31.03.2017	As at 31.03.2016
Cash in Hand	6,422	16,138
Balances with Banks:		
In Current Accounts	3,20,241	1,53,541
In Saving Accounts	31,63,62,012	4,86,42,803
In Fixed Deposits	52,59,23,982	34,90,86,998
TOTAL	84,26,12,657	39,78,99,480

7. Other Current Assets

(Amount in Rs.)

Particulars	As at 31.03.2017	As at 31.03.2016
Current Portion of Long Term Loans and Advances: (Secured against Bank Guarantee/Hypothecation/ Personal Guarantee)	64,80,81,435	54,80,74,254
Other Assets		
Accrued Interest-FD & Saving Account (IR&I (PPP), DBT / WT)	1,32,41,046	78,11,985
Recoverable from Government Agencies (Tax Credit)	60,62,311	64,93,201
Prepaid Expenses	10,17,173	20,15,619
Recoverable from BCIL	36,45,777	37,30,807
Other Recoverable	1,31,020	1,20,49,571
TOTAL	67,21,78,762	58,01,75,437

* Refer 14.3 & 14.4.

8. INCOME

(Amount in Rs.)

Grants Received as Utilised	For the Period ended 31.03.2017	For the Period ended 31.03.2016
<u>IR&I (PPP) Activities:</u>		
- Biotechnology Industry Partnership Programme	22,65,53,136	17,65,00,082
- Bio Incubator Support Scheme	24,89,98,869	18,32,20,328
- Small Business Innovation Research Initiative	7,56,33,708	6,97,87,248
- Biotechnology Ignition Grant	33,37,58,043	20,71,58,709
- Contract Research Scheme	4,62,94,183	7,08,69,265
- Early Translational Accelerator	1,13,58,083	-
- University Innovation Cluster	1,32,50,626	1,37,487
- Social Innovation programme for Products: Affordable & Relevant to Societal Health	3,33,53,053	-
- Seed Funding for Incubators	3,01,45,793	-
BIRAC Activities	13,24,62,729	9,37,08,183
Manpower Expenses	4,92,24,788	3,70,03,633
Recurring Expenses	6,86,89,907	6,74,09,839
Additional Interest	55,25,228	46,33,838
TOTAL	1,27,52,48,146	91,04,28,612

9. Other Income

(Amount in Rs.)

Particulars	For the Period ended 31.03.2017	For the Period ended 31.03.2016
Interest Received - Bank Accounts	2,39,78,487	2,27,40,421
Management Expenses - BMGF	7,16,494	1,95,216
Foreign Exchange Fluctuation	13,449	3,23,922
Miscellaneous Income	1,05,85,605	48,85,562
TOTAL	3,52,94,035	2,81,45,121

Biotechnology Industry Research Assistance Council

10. Programme Expenditure

(Amount in Rs.)

Particulars	For the Period ended 31.03.2017	For the Period ended 31.03.2016
GRANTS DISBURSED (IR&I (PPP) Activities)		
Biotechnology Industry Partnership Programme - (BIPP)	20,93,04,842	15,81,04,119
Small Business Innovation Research Initiative - (SBIRI)	6,70,56,205	6,06,54,856
Bio Incubators Support Scheme - (BISS)	24,49,99,690	18,04,65,000
Biotech Ignition Grants - (BIG)	33,00,00,000	20,00,00,000
University Innovation Cluster - (UIC)	1,31,60,000	-
Early Translational Accelerator - (ETA)	1,12,19,840	-
Contract Research Scheme - (CRS)	4,43,47,849	6,59,40,400
Social Innovation programme for Products: Affordable & Relevant to Societal Health - (SPARSH)	3,01,19,780	-
Seed Funding for Incubators	3,00,00,000	-
Total Grants Disbursed (A)	98,02,08,206	66,51,64,375
ACTIVITIES (BIRAC)		
Partnership Programmes	6,53,49,378	4,86,08,039
Capacity Building	52,71,678	41,26,684
Technology Transfer & Acquisition	6,45,40,127	2,63,58,145
Intellectual Property Services	6,02,488	23,98,130
Entrepreneurial Development / Regional Centre	2,83,66,680	1,22,17,185
Total Activities (B)	16,41,30,351	9,37,08,183
Programme Expenditure		
(Operational expenditure on Advertisement, Meeting and PMC)		
IR&I (PPP) Activities	3,91,37,288	4,24,82,097
Total Programme Expenditure (C)	3,91,37,288	4,24,82,097
Total (A+B+C)	1,18,34,75,845	80,13,54,655

10A. Programme Management Unit DBT & BMGF

(Amount in Rs.)

Particulars	For the Period ended 31.03.2017	For the Period ended 31.03.2016
Programme Expenditure - (GCI)	2,38,69,536	13,38,05,923
Operational Expenditure	6,19,16,536	2,04,63,034
Operational Non Recurring Expenditure	46,350	2,82,080
(A)	8,58,32,422	15,45,51,037
Less:		
Programme Funds from DBT - (GCI)	48,84,167	1,65,68,915
Programme Funds from BMGF - (GCI)	1,83,09,167	6,79,42,239
Programme Funds from US AID - (GCI)	6,76,202	4,92,94,769
(B)	2,38,69,536	13,38,05,923
Less:		
Operational Fund from DBT	70,86,524	51,14,000
Operational Non Recurring Fund from DBT	-	1,31,480
Operational Fund from BMGF	5,09,02,091	1,53,49,034
Operational Non Recurring Fund from BMGF	46,350	1,50,600
Operational Recurring Fund from WT	39,27,921	-
(C)	6,19,62,886	2,07,45,114
(Refer to Note : 14.14.3) (A-B-C)	-	-

10B. Extra-Mural Programme - MeitY

(Amount in Rs.)

Particulars	For the Period ended 31.03.2017	For the Period ended 31.03.2016
Programme Expenditure	1,51,90,750	1,39,54,400
Operational Expenditure	15,44,686	30,00,000
(A)	1,67,35,436	1,69,54,400
Less:		
Programme Funds from MeitY	1,51,90,750	1,39,54,400
(B)	1,51,90,750	1,39,54,400
Less:		
Operational Fund from MeitY	15,44,686	30,00,000
(C)	15,44,686	30,00,000
(Refer to Note : 14.14.5) (A-B-C)	-	-

10C. Extra-Mural Programme - Make In India

(Amount in Rs.)

Particulars	For the Period ended 31.03.2017	For the Period ended 31.03.2016
Programme Expenditure	-	-
Operational Expenditure	38,47,366	17,16,129
(A)	38,47,366	17,16,129
Less:		
Programme Funds from Make in India	-	-
(B)	-	-
Less:		
Operational Fund from Make in India	38,47,366	17,16,129
(C)	38,47,366	17,16,129
(Refer to Note : 14.14.6) (A-B-C)	-	-

10D. Extra-Mural Programme - Bio-toilets in Schools from NER

(Amount in Rs.)

Particulars	For the Period ended 31.03.2017	For the Period ended 31.03.2016
Programme Expenditure	-	1,20,30,000
Operational Expenditure	4,28,023	19,10,000
(A)	4,28,023	1,39,40,000
Less:		
Programme Funds from Bio-toilets in NER School	-	1,20,30,000
(B)	-	1,20,30,000
Less:		
Operational Fund from Bio-toilets in NER School	4,28,023	19,10,000
(C)	4,28,023	19,10,000
(Refer to Note : 14.14.7) (A-B-C)	-	-

11. Employees Benefit Expenses

(Amount in Rs.)

Particulars	For the Period ended 31.03.2017	For the Period ended 31.03.2016
Salary & Allowances to Staff	4,41,40,785	3,50,31,053
Employer's Contribution to Provident Fund & Other Funds	50,84,003	19,72,580
TOTAL	4,92,24,788	3,70,03,633

12. Other Expenses

(Amount in Rs.)

Particulars	For the Period ended 31.03.2017	For the Period ended 31.03.2016
(A) Rent	3,96,24,813	3,59,63,260
(B) Advertisement & Publication	41,28,342	43,69,792
(C) Journal & Subscription	74,41,306	67,79,918
(D) Meetings:		
Meetings & Conferences	45,93,076	39,44,723
Sitting Fees & TA and DA	4,64,109	5,58,972
(E) Office and Administration Expenditure:		
Travel	17,38,464	38,31,841
Office Expenses	49,31,950	42,80,655
AMC Computer	6,97,027	7,78,394
Legal & Professional	7,99,542	9,28,104
Postage & Telephone Expenses	5,92,508	6,30,948
Power & Electricity	15,45,069	18,10,691
Printing & Stationery	3,03,144	1,59,941
Internet Expenses	13,25,256	16,85,489
(F) Training Expenses	3,36,290	6,17,194
(G) Statutory Audit Fees	1,55,250	1,48,203
(H) Miscellaneous Expenses	13,761	32,054
TOTAL	6,86,89,907	6,65,20,178

Refer Notes: 14.18 List of Abbreviations used in Financial Statement:

13. 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 in compliance, 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 with the 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 31/03/2014 vide DBT Transfer order dated 25th September 2012 and approved by Board dated 17th December, 2013 is classified as "Other Reserves".
- c) Loans disbursed and interest accrued, but not realisable during the financial year has been shown under "Other Reserve".
- d) Loans which are overdue as per the norms fixed for regulating the payment, are treated as Substandard and interest applied in the current year is reversed in such loan accounts. Further, provision for such Sub-standard loans is adjusted from the balance 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 there of 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:

- 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.
- 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.

14. Notes to Accounts for the period ended March 31, 2017

- 14.1 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.
- 14.2 During the current financial year BIRAC disbursed Rs.116,70,39,793 (Previous year Rs. 84,77,03,675) in various schemes under IR&I (PPP) Activities & Rs. 16,41,30,351 (Previous year Rs. 9,37,08,183) under BIRAC Activities. Disbursement under IR&I (PPP) Activities includes an amount of Rs. 18,68,31,587 (Previous year Rs. 18,25,39,300) disbursed as loans under BIPP & SBIRI scheme. The disbursement were made in tranches as per the milestones determined for the projects/activity.

(Amount in Rs.)

IR&I (PPP) Activities	Disbursement for the year 2016-17	Disbursement for the year 2015-16
Biotechnology Industry Partnership Programme - (BIPP)	38,00,50,029	30,56,86,419
Small Business Innovation Research Initiatives - (SBIRI)	8,31,42,605	9,56,11,856
Bio- Incubators support Scheme - (BISS)	24,49,99,690	18,04,65,000
Biotech Ignition Grant - (BIG)	33,00,00,000	20,00,00,000
University Innovation Cluster - (UIC)	1,31,60,000	-
Translation Accelerator - (TA)	1,12,19,840	-
Contract Research Scheme - (CRS)	4,43,47,849	6,59,40,400
Social Innovation programme for Products: Affordable & Relevant to Societal Health - (SPARSH)	3,01,19,780	-
Seed Funding for Incubators	3,00,00,000	-
Total	1,16,70,39,793	84,77,03,675
BIRAC ACTIVITIES		
Partnership Program	6,53,49,378	4,86,08,039
Capacity Building & Awareness	52,71,678	41,26,684
Technology Transfer / Acquisition	6,45,40,127	2,63,58,145
IP Services	6,02,488	23,98,130
Entrepreneurial Development / Regional Centres	2,83,66,680	1,22,17,185
Total	16,41,30,351	9,37,08,183

- 14.3 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 Sub-standard or doubtful.
Standard Asset - Rescheduled	Loan accounts which, on account of reschedulement, are not classified as Sub-standard or doubtful assets.
Sub-standard 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 Sub-standard asset and Doubtful assets. The details of standard, standard- rescheduled, Sub-standard and doubtful assets and the provisions made are given below;

(Amount in Rs.)

Particulars		As on 31.3.2017	As on 31.3.2016
Standard Asset	A	1,61,08,61,673	1,73,56,50,447
Standard Asset - Rescheduled	B	29,66,65,594	21,88,48,207
Sub-standard	C	34,24,10,747	56,10,92,946
Doubtful Assets	D	17,81,09,551	-
Total Assets	E (A+B+C+D)	2,42,80,47,565	2,51,55,91,600
Provision on Sub-standard Assets	F	8,73,94,402	14,02,73,237
Provision on Doubtful Assets	G	9,68,14,101	-
Total Provision	H(D+F)	18,42,08,503	14,02,73,237
Interest derecognised	I	1,48,30,502	1,15,37,887

- 14.4 During the year, one time settlement of a loan account where in Rs 9,60,000/- has been written off as bad debts. (Previous Year Rs. Nil) and a loan account has been rescheduled wherein accrued interest amounting to Rs.1,19,43,489 capitalised (Previous Year Rs.69,90,800).

The current maturities of the loan & advances amounting to 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 7)

(Amount in Rs.)

Age Wise Overdue Position	As on 31.3.2017	As on 31.3.2016
Upto one year (A)	2,74,35,950	96,12,199
More than one year accumulated (B)	26,76,71,102	26,43,30,134
Total(A+B)	29,51,07,052	27,39,42,333

14.5 Suit Filed Accounts:

14.5.1 Suits filed by the company: 2

14.5.2 Suits filed against the company: Nil

14.6 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 Notes 14.14.3**

14.7 DBT- Wellcome Trust Programme

The amount received from Department of Biotechnology under DBT – Wellcome Trust Programme amounting to Rs.1025 lakh received in the financial year 2012-13 has been returned to DBT. The interest amount is kept in a separate bank account. **Refer Notes 14.14.4**

14.8 BIRAC - Extra Mural Programme

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 Notes 14.14.5**

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 14.14.6**

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 14.14.7**

14.9 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.

14.10 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.

14.11 Provision for Tax:

No Provision for Income Tax has been made in the current year 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.

14.12 Foreign Exchange Transactions:

During the current financial year the following income/ expenditure has been incurred:

- A. Income: Grant received in foreign exchange to the extent utilised Rs. 7,38,61,731 (Previous year Rs. 14,19,46,706)
- B. Expenditure

S. No.	Particulars	For the Period ended 31.03.2017	For the Period ended 31.03.2016
(i)	Technology Transfer	1,28,17,927	1,28,04,404
(ii)	Books, Journal and Database Subscriptions	69,24,995	45,80,547
(iii)	Entrepreneurship Development	16,09,224	47,29,031
(iv)	Advertisement/Publicity/Publication	13,00,930	-
(v)	Foreign Travel and Meetings	11,73,160	3,39,273

C. CIF Value of import is Nil for the current financial year.

14.13 Details of Grant Utilisation

(Amount in Rs.)

S.No	Particulars	Fund Available	Fund Utilised	Balance
1	BIRAC	28,32,06,622	28,32,06,622	-
2	IR&I (PPP) Activities	1,21,03,29,484	1,20,61,77,081	41,52,403
3	PMU - DBT/BMGF:			
	(i) Operational	17,57,59,762	6,19,62,886	11,37,96,876
	BMGF	17,06,13,909	5,09,48,441	11,96,65,468
	DBT Operational	(50,18,701)	70,86,524	(1,21,05,225))
	DBT - Non Recurring	6,20,075	-	6,20,075
	WT Operational	95,44,479	39,27,921	56,16,558
	(ii) Projects	14,46,57,498	2,38,69,536	12,07,87,962
	BMGF	13,43,59,445	1,83,09,167	11,60,50,278
	DBT	(54,66,915)	48,84,167	(1,03,51,082)
	USAID	1,57,64,968	6,76,202	1,50,88,766
	Total	32,04,17,260	8,58,32,422	23,45,84,838
4	Wellcome Trust	13,05,70,953	10,25,00,000	2,80,70,953
5	MeitY(IIPME)	1,99,65,600	1,67,35,436	32,30,164
6	Make in India Facilitation Cell	39,17,000	38,47,366	69,634
7	Bio-toilets in schools from North East Region	38,98,000	4,28,023	34,69,977

14.14 Supplementary Schedule on Scheme Balances as on 31.03.17

14.14.1 IR&I (PPP) Activities Funds

(Amount in Rs.)

Particulars	As on 31.03.17	As on 31.03.16
Opening Balance	-	-
Add: Funds received from DBT	1,20,00,00,000	68,41,85,000
Add: Interest Income	68,74,000	
Less: Recovery of funds utilised from available resources	-	(15,44,72,408)
Add: Recoveries from unspent grant	34,55,484	79,34,629
	1,21,03,29,484	53,76,47,221

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Add:	Funds Utilised from available resources*		-	35,25,38,551
			1,21,03,29,484	89,01,85,772
Less:	Amount disbursed during the year :			
	Grants Disbursed	98,02,08,206		66,51,64,375
	Loans Disbursed	18,68,31,587		18,25,39,300
	Programme Expenses	3,91,37,288	1,20,61,77,081	4,24,82,097
	Unutilised Balance Carried Forward		41,52,403	-

14.14.2 BIRAC FUNDS

(Amount in Rs.)

Particulars		As on 31.03.17	As on 31.03.16
	Opening Balance	-	-
Add:	Received from DBT	25,00,00,000	20,00,00,000
Add:	Interest Income	15,39,000	8,63,979
	Adjustment of Funds Utilised from available resources*	-	(2,44,64,376)
Add:	Carried forward balance adjusted against General Reserves	-	2,22,23,359
		25,15,39,000	19,86,22,962
Add:	Funds Utilised from available resources*	-	-
		25,15,39,000	19,86,22,962
Less:	Amount disbursed for Grants		
	Partnership Programmes	6,53,49,378	4,86,08,039
	Technology Transfer & Acquisition	6,45,40,127	2,63,58,145
	Intellectual Property	6,02,488	23,98,130
	Entrepreneurial Development	2,83,66,680	1,22,17,185
	Sponsorships and Workshops	52,71,678	41,26,684
		8,74,08,649	10,49,14,779
Less:	Utilisation towards:		
	Manpower Expenses	4,92,24,788	3,70,03,633
	Non-Recurring Expenses	11,61,576	5,01,307
	Recurring Expenses	6,86,89,907	6,74,09,839
		(3,16,67,622)	-
Add:	Surplus Redeployed towards Expenses	3,16,67,622	-
	Unutilised Balance Carried Forward	-	-

14.14.3 BMGF PMU

(Amount in Rs.)

Particulars		As on 31.03.17	As on 31.03.16
	<u>Opening Balance</u>	1,43,44,115	5,33,00,246
	Operations Fund	86,89,299	1,16,64,087
	Project Fund	56,54,816	4,16,36,159
Add:	Received From BMGF - Project	13,84,20,248	3,82,27,677
	Received From BMGF - Operations	15,06,73,232	1,45,87,391
	Received From USAID - Project	-	5,95,96,903
	Received From WT - Operations	93,10,402	29,84,03,882
Add::	Bank Interest	76,69,263	31,82,935
		32,04,17,260	16,88,95,152
Less:	<u>Project Disbursement</u>		
	GCI: Agriculture-Nutrition Projects	45,68,930	1,88,22,759
	GCI: ACT Projects	1,34,25,000	7,26,82,324
	GCI: IKP Projects	-	2,52,00,000
	GCI: RTTC Projects	58,75,606	2,38,69,536
Less:	<u>Activities Expenditure</u>		
	HBGDki	33,53,713	-
	KSTIP	70,69,898	-
	Communication Support	1,58,08,500	2,62,32,111
Less:	<u>Operational Expenditure</u>		
	Manpower Expenses	68,24,706	30,13,050
	Meeting Expenses	1,07,28,172	42,48,963
	Expenses for Space	95,92,156	83,10,240
	Administrative Expenses	38,94,976	46,95,565
	Equipment Expenses	46,350	2,82,080
	Wellcome Trust- Manpower	37,44,792	-
	Wellcome Trust- Travel	1,83,129	-
	Management Expenses	7,16,494	3,57,30,775
	<u>Balance Fund</u>		
	BMGF - Projects	11,60,50,278	(40,60,803)
	DBT - Projects	(1,03,51,082)	(54,66,915)
	USAID - Projects	1,50,88,766	1,51,82,534
	BMGF - Operations	11,96,65,468	1,30,87,925
	DBT - Operations	(1,14,85,150)	(43,98,626)
	WT- Operation	56,16,558	23,45,84,838
		23,45,84,838	1,43,44,115

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*Details of Equipment Expenses:

(Amount in Rs.)

Particulars	As on 31.03.17	As on 31.03.16
Office Equipment	46,350	1,61,980
Computers	-	10,150
Intangible Assets	-	1,09,950
Total	46,350	2,82,080

14.14.4 DBT- Wellcome Trust Programme

(Amount in Rs.)

Particulars	As on 31.03.17	As on 31.03.16
Opening Balance	12,59,44,696	11,69,11,122
Add: FDR & Saving A/c Interest	46,26,257	90,33,574
Total	13,05,70,953	12,59,44,696
Less: Unspent Grant Returned	10,25,00,000	
Unutilised Balance Carried Forward	2,80,70,953	12,59,44,696

14.14.5 MeitY (IIPME)

(Amount in Rs.)

Particulars	As on 31.03.17	As on 31.03.16
Opening Balance	1,80,45,600	-
Received During the Year	-	3,50,00,000
	1,80,45,600	3,50,00,000
Add: Bank Interest	19,20,000	-
	1,99,65,600	3,50,00,000
Less: Programme Expenditure	1,51,90,750	1,39,54,400
Operational Expenditure	15,44,686	30,00,000
Unutilised Balance Carried Forward	32,30,164	1,80,45,600

* The programme Expenditure include loan disbursed amounting to Rs. 27,15,000 (Previous year Rs. Nil) having the total outstanding of Rs. 27,36,339 as on 31.03.17 (including accrued interest) (Previous year Rs. Nil).

14.14.6 Make in India Facilitation Cell

(Amount in Rs.)

Particulars	As on 31.03.17	As on 31.03.16
Opening Balance	4,83,871	-
Received During the Year	34,16,129	22,00,000
	39,00,000	22,00,000
Add: Bank Interest	17,000	-
	39,17,000	22,00,000
Less: Operational Expenditure	38,47,366	17,16,129
Unutilised Balance Carried Forward	69,634	4,83,871

14.14.7 Bio-toilets in schools from North East Region

(Amount in Rs.)

Particulars	As on 31.03.17	As on 31.03.16
Opening Balance	7,70,000	-
Received During the Year	30,00,000	1,47,10,000
	37,70,000	1,47,10,000
Add: Bank Interest	1,28,000	-
	38,98,000	1,47,10,000
Less: Programme Expenditure	-	1,20,30,000
Operational Expenditure	4,28,023	19,10,000
Unutilised Balance Carried Forward	34,69,977	7,70,000

14.15 Details of Specified Bank Notes (SBN) held and transacted during the period 08/11/2016 to 30/12/2016

(Amount in Rs.)

Particulars	SBN	Other Denomination Notes	Total
Closing cash in hand as on 08.11.2016	29,500	42,497	71,997
(+) Permitted Receipts	-	1,00,500	1,00,500
(-) Permitted Payments	-	83,161	83,161
(-) Amount deposited in Banks	29,500	9,319	38,819
Closing cash in hand as on 30.12.2016	-	50,517	50,517

14.16 Disclosures required under Section 22 of Micro, Small and Medium Enterprise (MSME) Development Act, 2006

(Amount in Rs.)

S. No.	Particulars	AS ON 31.03.17	AS ON 31.03.16
(i)	Principal amount remaining unpaid to MSME suppliers as at the end of the accounting year	6,44,735	-
(ii)	Interest due thereon remaining unpaid to MSME	-	-
(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 year	-	-
(v)	The amount of interest accrued and remaining unpaid at the end of the accounting year	-	-
(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	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.

14.17 No amendment has been made in the significant accounting policies during the period.

14.18 List of Abbreviations used in Financial Statement:

S. No.	Abbreviation	Description
1	BIRAC	Biotechnology Industry Research Assistance Council
2	BMGF	Bill Melinda Gates Foundation

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3	BISS	Bio Incubator Support Scheme
4	BCIL	Biotech Consortium India Limited
5	BIG	Biotechnology Ignition Grant
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
19	PMC	Projects Monitoring committee
20	IR&I (PPP)	Innovation Research & Incubation (Public-Private Partnership)(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	WT	Wellcome Trust

14.19 The previous year's figures are reclassified and regrouped in accordance with the requirements applicable in the current financial year to make item comparable.

Auditors Report

As per our report of even date attached

For RMA & Associates LLP

Chartered Accountants

Firm Reg. No. 000978N/ N500062

For and on behalf of Board of Directors

Sd/-
Kavita Anandani
(Company Secretary)

Sd/-
Renu Swarup
(Managing Director)
Din No. 01264943

Sd/-
K. Vijay Raghavan
(Chairman)
Din No. 02721859

Sd/-
CA. Deepak Gupta
(Partner)
Membership No. 081535

Place : New Delhi

Date : 28.06.2017

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 2017

The preparation of financial statements of **Biotechnology Industry Research Assistance Council** for the year ended 31 March 2017 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 appointed by the Comptroller and Auditor General of India under Section 139(5) of the Act is 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 **28th June 2017**.

I, on behalf of the Comptroller and Auditor General of India, have decided not to conduct the supplementary audit of the financial statements of **Biotechnology Industry Research Assistance Council** for the year ended 31 March 2017 under section 143(6)(a) of the Act.

**For and on the behalf of the
Comptroller & Auditor General of India**
Sd/-

(Dr. Ashutosh Sharma)
Principal Director of Commercial Audit &
Ex-Officio Member, Audit Board-IV

Place : New Delhi

Date : 13.07.2017



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

Attendance 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 5th Annual General Meeting of the Company held on Tuesday, September 12, 2017 at 4:30 p.m. at MTNL Building, 1st Floor, 9 CGO Complex, Lodi 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 5th Annual General Meeting of the Company, to be held on **Tuesday, September 12, 2017 at 4:30 p.m.** at MTNL Building, 1st Floor, 9 CGO Complex, Lodi 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, 2017 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 2017-18, in terms of provisions of Section 139 of the Companies Act, 2013		

Signed this day of 2017. Signature of the Shareholder

Signature of first proxy holder

Signature of Second proxy holder

* Applicable for investors holding shares in electronic form.

Affix
Revenue
Stamp

Notes:

- 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
- 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.



Aeridovanda BIRAC



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