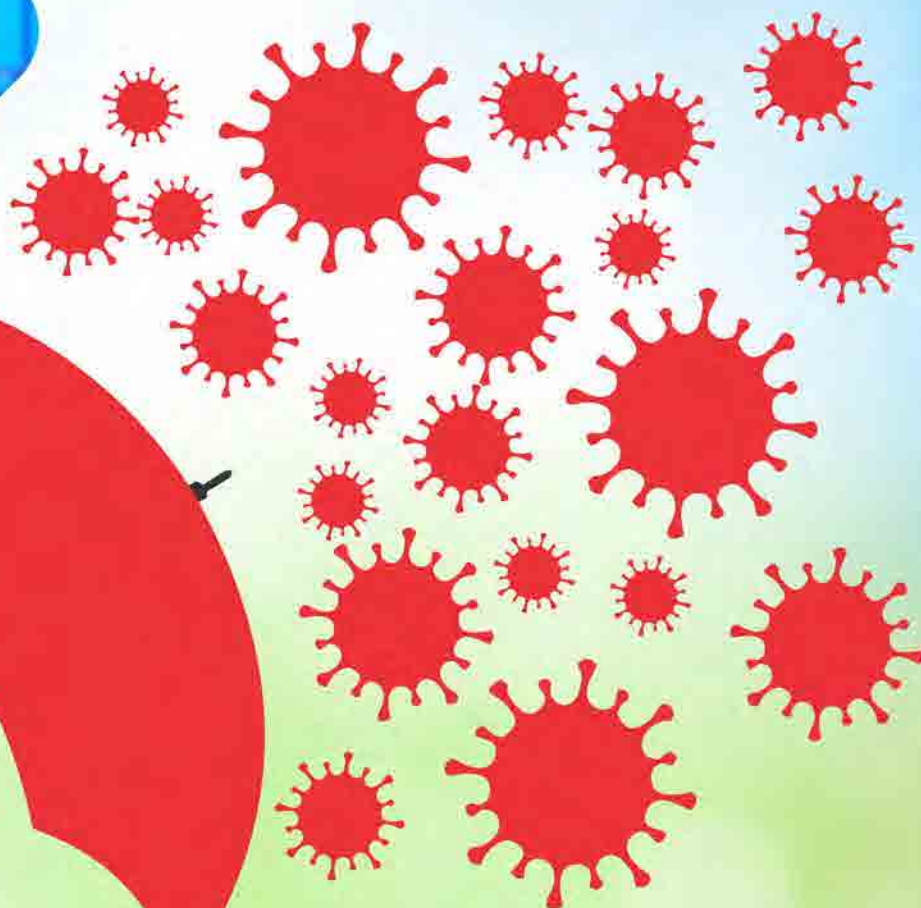


birac

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Ignite • Innovate • Incubate

Redefining Resilience



B&G CONCLAVE 6.0





birac

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Dr Renu Swarup
Secretary, DBT
& Chairperson, BIRAC

LEADER'S MESSAGE

The year 2020 was the year of Science & Innovation. I understand this year had a lot of challenges but it was also a year of plethora of opportunities for young innovators, scientists and researchers. It is unimaginable how science has redefined itself in this single year. I am glad that the young innovators of the country responded to the clarion call from our Prime Minister for Atma Nirbhar Bharat and worked towards the vision of Made in India/Vocal for local initiatives for building a self-reliant nation.

Department of Biotechnology and its PSU BIRAC have been very instrumental in the Nations fight against the pandemic. From the DBT-BIRAC COVID research consortia call to Mission COVID Suraksha, we indeed have come a long way. India is proud of being the vaccine capital of the world

and this is for the first time that the vaccine has gone from the lab to its introduction in the public health system in less than 12 months. A variety of platforms that were supported under the COVID Consortia by DBT-BIRAC, have now progressed to advanced stages of clinical development. The first indigenous DNA vaccine candidate, ZyCoV-D recently got the DCGI nod for initiating Phase III clinical trials, while the m-RNA platform is gearing up for beginning Phase I clinical trials. The subunit candidate is undergoing Phase I/II trials. Besides this, BIRAC is also providing advisory support to Dr Reddy's Laboratory for the non-replicating human adenoviral vector candidate; SPUTNIK V from Gamaleya Institute which is currently undergoing Phase II/III trials in India. There are many others in the pipeline.

Collaboration and integration have been the key lesson from the response to COVID-19. I am very confident that this innovation ecosystem that we have created in terms of our working culture, in terms of the national & International collaboration and more precisely in terms of the strength that we have instilled in our human resource and infrastructure will help us not only to fight COVID but this preparedness will go much beyond. The capacity-building efforts that we initiated for clinical trial research in neighbouring countries under the Ind-CEPI program, is one prime example of this. The pandemic has also highlighted the need to create resilience both in public and private spheres to overcome any unforeseen circumstances.

Biotech is one of the fastest-growing segment post COVID-19 & the contribution of the scientific community in dealing with the crisis is unparalleled. We are very quickly moving as a start-up nation, and this is such a big push to the spirit of self-reliance. The pandemic has drastically altered the perception of health priorities in India and world over. It has changed the way we look at technology for not just curative but also preventive aspects of health for a self-reliant nation. I am confident that DBT and BIRAC will continue to reinforce and energise the country's innovation ecosystem.



Anju Bhalla

Joint Secretary DST and MD BIRAC

CHIEF EDITOR'S TAKE

The year 2020 was all about the global health pandemic that caused widespread disruptions. The rapid spread and increase in the number of cases not only created a health crisis but impacted the economy in numerous ways that changed the world drastically. The virus has, without doubt, changed forever the world as we know it. No pandemic in recent times has unleashed such despair and destitution. However, as they say, that "every dark cloud has a silver lining". This year was also all about science, research, innovation and technology and the preparedness for this pandemic and beyond.

Resilience in the year 2020 became a prime virtue. Undoubtedly, this current crisis is the watershed moment and the course taken today will surely lay

the foundation for tomorrow as to how to shape India's healthcare system. If we have learned some lessons from the pandemic, it is that there is a need for resilience both in the public and private spheres. Initially, it was every country for itself, but the world soon realized that it was necessary to collaborate and work together to fight the pandemic.

As a country, we have been fighting this pandemic situation with a spirit of self-reliance. In the manufacture of PPE and testing kits, we have achieved a remarkable turnaround and we are not only a provider of vaccines, but also a major player in producing them indigenously. Mission COVID Suraksha is a testimony to the fact and I am glad that BIRAC is the implementation agency for this mission. BIRAC has identified potential technologies and innovations through all its programs and schemes to identify potential COVID-19 solutions for immediate deployment to support the masses at large through Fast Track Review, DBT-BIRAC COVID Research Consortia Call, NBIRC, First Hub etc.

Creating an ecosystem for innovation needs to be a holistic and dynamic process. The vibrant ecosystem at BIRAC has helped the innovators to think out of the box and come up with solutions to address the COVID-19 challenges. The BioNEST incubators of BIRAC had also done their bit by initiating local/regional/national COVID solution challenges. 130+ COVID-19 related solutions have been developed by the start-ups supported through the BioNEST incubators. More than 300+ virtual events have been conducted since March 2020 till date by BioNEST incubators and 25,000+ participants have been benefited from the same.

The magnitude of the crisis has overwhelmed our health systems. However, it is now that our efforts as a collective society need to be at this moment—creating strong, sustainable and equitable foundations for the future health systems. It is no more about quick fixes to problems but sustainable cross-sector collaboration. A resilient society of the future will be supported by strong data and a sound technology infrastructure effectively shouldering health system.

BIG CONCLAVE 6.0

The 6th edition of BIRAC's BIG Conclave - an annual congregation of biotech start ups and ecosystem enablers was organized in partnership with one of the BIG Partners - StartUp Incubation and Innovation Centre IIT Kanpur on 27-28th November 2020, virtually through an online platform. The theme of the event was 'Resilience Redefined' recognizing the sustenance of Startup ecosystem through challenging times of Covid. This national event brought together several Technical Experts, Business Leaders, Innovators and Entrepreneurs on a common virtual platform and showcased the trailblazing innovations supported by BIRAC through its Biotechnology Ignition Grant (BIG) Program.

The event witnessed an overwhelming participation of 56 speakers, 1000+ audience and 50+ virtual booths put together by the biotech start ups.

The inaugural session of the event was graced by eminent delegates including Mr. Jayant Sinha, Member of Parliament and former Union Minister, Government of India; Dr. Renu Swarup, Secretary Department of Biotechnology and Chairperson, BIRAC and Dr. R A Mashelkar, Former Director General CSIR. Shri Jayant Sinha appreciated and encouraged the innovators and ecosystem partners and highlighted that the development model for India needs to be very different from the one adopted by West, China and Japan. He mentioned that "We have to solve the problems of Jhanda Chowk, not Times Square." Dr. R A Mashelkar further requested the startups community to aspire higher by saying "You cannot change the beginning but you can change the ending. Keep your aspirations high. Come up with highly Innovative ideas".






BIG CONCLAVE 6.0
CONFAB

Navigating the way forward post Covid-19: Healthcare

Moderator

Dr Taslimarif Sayed
CEO, C-GAMP

Mr. Yashdeep
Vice President, Global Innovation Program, Service

Mr. Anil Jauhari
Deputy Secretary, Ministry of Health

Prof. Shervanthi Homer
Consultant Vascular Surgeon, Leads Gangrene Management and Prof. of Endovascular and Surgery, University College London

Dr Jitendra Sharma
Managing Director, AMT2

Dr Jayant Karve
CEO, Nucleo Life Sciences

2:50 - 3:30 PM

27th November

www.bigconclave2020.iitkincubator.com

The two-day event had thematic discussions on topics pertinent to the growth and scaling of start-ups such as Art of Business Negotiations, Product Branding and positioning, Importance of mental health amongst startups and brainstorming thematic confabulations around discussing the aftermath of COVID, its impact on early-stage startups and remedies to defend against the tide across Healthcare, Agriculture and clean environment sectors.

The experts of Healthcare Panel shared the mantra of three A's, Affordability, Accessibility, and Appropriateness to check one's preparedness to delve into building solutions for the masses. Panelists also deliberated extensively on scenarios Pre and



BIG CONCLAVE 6.0 | **CONFAB**

Navigating the way forward post Covid-19: Clean Environment

Moderator

Dr. Mrutyunjay Suar
CEO, KIRI TBI BIOBEST

Panelists:

- Dr. Ganesh Das**
CEO, Dign Energy International Incubation Centre
- Dr. AK Panda**
Director, National Institute of Immunology
- Dr. Shaon Ray Chaudhuri**
Founder, Waste to Wealth Innovative Technologies LLP
- Prof. Amit Kapoor**
Honorary Chairman, Institute for Climate Resilience
- Dr. Sanjiv Sambandan**
Founder, Openwater.in

2:30 - 3:30 PM | 27th November

www.bigconclave2020.silincubator.com

Post-clinical research, Certification, Regulatory framework, and Business aspects as well. The Agriculture panel featured some of the brilliant minds who have worked at the grassroot levels, discussing the challenges, initiatives, and realignment in the Agriculture sector. Panelists also touched upon various relevant issues ranging from FPO, FPCs public sector reach, financial assistance, technical validation, sustainability issues, synergies in future innovations, issues of GMO policies, and CRISPR technology etc. Addressing the importance of sustainability and Clean environment, the panelists of this session discussed transformative ideas to use mushroom treatment for waste, use of biopolymers, reuse of plastic waste, waste segregation, and the efforts made towards

scalable localized solutions covering some interesting anecdotes from North-East region.

'My Story of resilience' sessions featured inspiring stories of BIG Innovators who successfully pivoted and sailed through the Covid days.

Day 1 of the event ended with a special session by Mr. S. Gopalakrishnan, Chairman, Axilor Ventures and co-founder Infosys. In his conversation with Dr. Manish Diwan, Head, Strategic Partnerships and Entrepreneurship Development, BIRAC, he shared his opinions on the power of Telemedicine, need for development of manufacturing capabilities, AI and Machine Learning, and strengthening collaboration between industry and academia to enhance the yield of research multi-folds, through mission mode research programs.

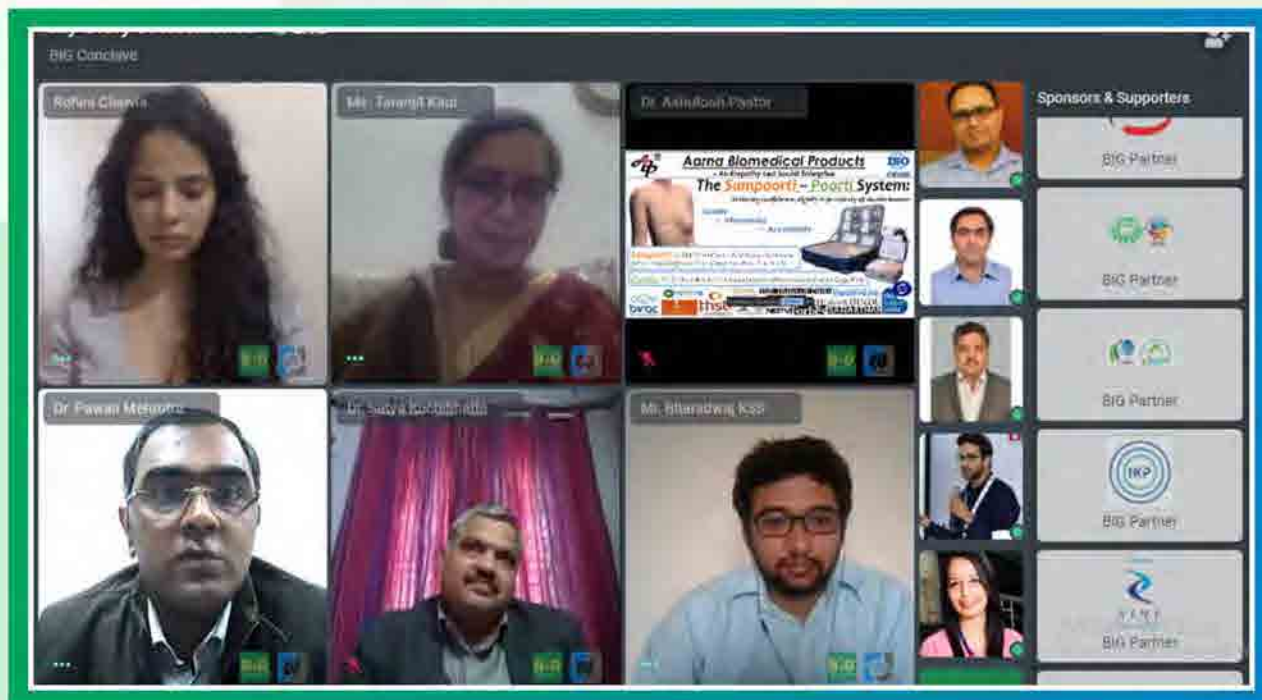
Day 2 kicked off with an inspirational talk on Social Innovation by Dr. Vishal Rao, Founder, Inaummation Medical Devices, one of the startups supported by BIG who highlighted that Great Innovations come as a result of collaboration and not through competition. He also shared some key insights on design thinking to identify and solve social problems. Dr. Rao is the innovator



inventor of \$1 speaking device for throat cancer patients - an innovation that has been recognized as one of the 100 global social innovations across the globe.

The confab session had representations from Bharat Innovation Fund, BIRAC and CDSCO to highlight how the whole ecosystem evolved during lockdown period to support the most relevant innovations. 'We were worried about withering away of startups during this pandemic but the way our startups have responded, has built even a greater confidence in our Innovation ecosystem' said - Dr Manish Diwan, Head - Strategic Partnership & Entrepreneurship Development, BIRAC. Dr Rubina Bose, Deputy Drugs Controller (India) at Central Drugs Standard Control Organization shared her personal experiences on how CDSCO fast tracked the approvals and helped the startups in clearing regulatory hurdles.

One of the major highlights of the conclave was 'The Investor-startup duo session' which presented key insights on building the chemistry between startup and its investor. The session featured 2 BIG Grantees and their investors who have made follow on investments. "Passion is sales collateral and the endorsement that you can bring really helps in the early stage of the startups" – said Ms Padmaja Ruparel, Cofounder Indian Angel Network.





BIG CONCLAVE 6.0 | 27-28 Nov 2020

VISITORS' CHOICE AWARD!

Exhibit at BIG Conclave
Attract the maximum visitors
Stand a chance of winning Cash Rewards!

Register Now!

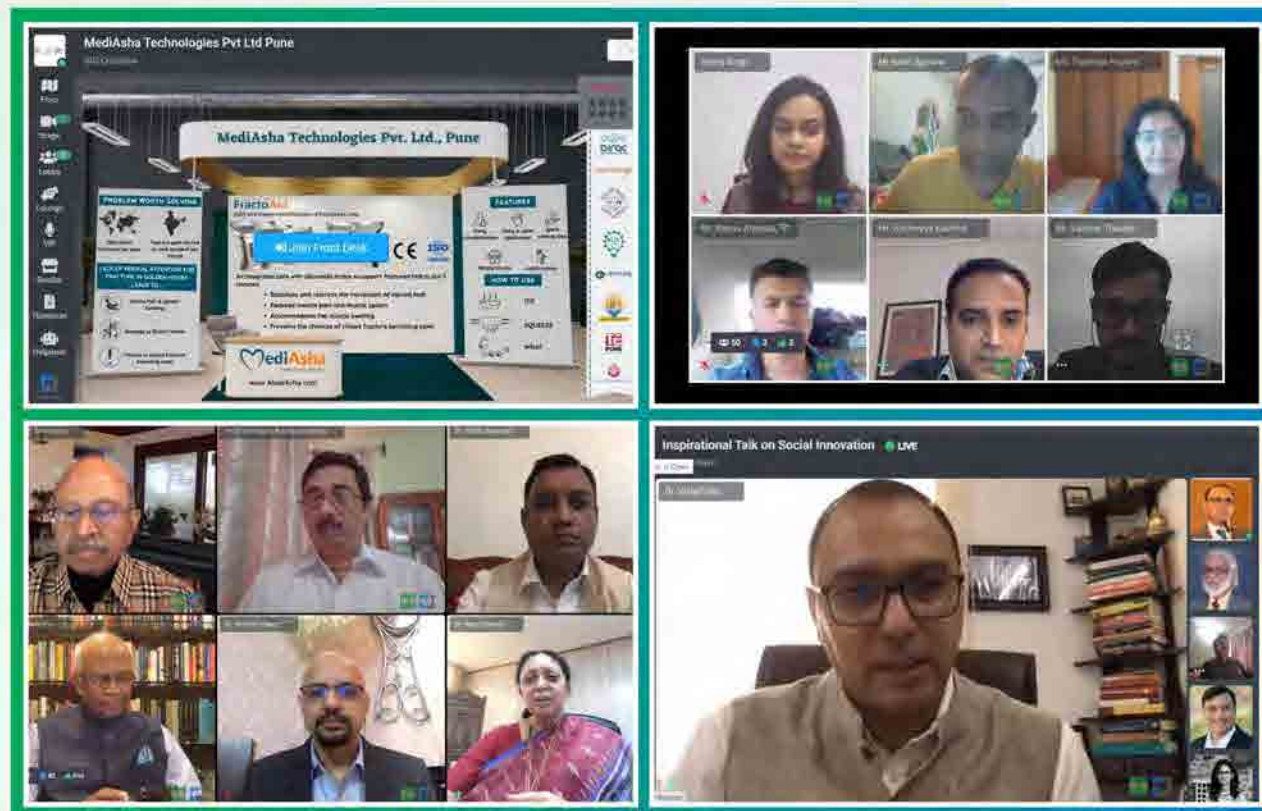
Before 12pm, 26th Nov | <https://siicincubator.com/bigconclave2020/>

The event concluded with a special address by Prof. G Padmanabhan, Former Director, IISc Bangalore followed by announcement of winners of the Visitors Choice Awards for the startup booths. MediAsha Technologies, Revy Environmental Solutions and Urinalytics were recognized as the winners.

Browse through the session recordings at: <http://bigconclave2020.siicincubator.com/>

About BIG: BIG is the largest biotech entrepreneurship development scheme to empower individuals for innovation driven bioentrepreneurship across the country. BIRAC's flagship BIG scheme supports entrepreneurial individuals and startups with a grant of up to INR 50 lakhs for 18 months. It is implemented through

BioNEST Incubators recognized as BIRAC's BIG partners. Presently, there are 8 BIG partners including Venture Center, Pune, IKP Knowledge Park Hyderabad, C-CAMP, Bangalore, KIIT-BioNEST Bhubaneswar, FITT, IIT Delhi, SIIC, IIT-Kanpur, SINE-IIT Bombay and a-idea NAARM. This year a new layer of BIG Associate Partners has been introduced with an aim to extend the reach into deeper pockets of the country and further enhance footprint of the scheme. BIG has so far supported over 550 innovative ideas and helped create 200+ new startups from individual entrepreneurs.



MediAsha Technologies Pvt. Ltd. Pune

MediAsha Technologies Pvt. Ltd., Pune

Practo Add

MediAsha Pvt. Ltd.

CE ISO

MediAsha

Water Aashu (Pvt. Ltd.)

Inspirational Talk on Social Innovation - LIVE



SITARE-GYTI AWARDS CEREMONY 2020

Young science and technology students can play a very important role in the progress of any nation. Their youthfulness makes them less reverential, conformist and compliant. The inquisitiveness and an urge to excel may motivate many of them to pick up problems that may either push the frontier of technology, solve unmet social needs or develop frugal processes for the existing solutions. SITARE-GYTI is BIRAC's scheme that recognizes the efforts of young students for translation of R&D to products and processes relevant to the larger society. The purpose of SITARE-GYTI Award has been made sharper this year with a focus on technologies having potential for eventual establishment of biotech start-ups.

Under SITARE-GYTI 2020, we received 250 entries from student innovators under six categories from 96 universities and institutes across 23 states and Union Territories. Based on technical evaluation by subject matter experts, fourteen awards and eleven appreciations were selected under SITARE-GYTI this year. The SITARE GYTI 2020 awardees include student innovators pursuing state-of-the-art scientific inventions, socially relevant discoveries and frugal manufacturing inventions in different areas ranging from healthcare to sanitation and waste management. While majority of the awardees are from premier institutions viz., IITs, IISc, JNC SAR, NIPERs etc., some outstanding students are from other institutions in Tier 2 cities also.

The GYTI award ceremony 2020 was held virtually on November 05, 2020 and graced by Hon'ble Union Minister Dr. Harsh Vardhan, Ministry of Health and Family Welfare, Science and Technology and Earth Sciences of India along with Dr R. A. Mashelkar, Former Director General, CSIR, Dr Renu Swarup, Secretary, Department of Biotechnology and Dr. Shekhar C. Mande, DG, CSIR.

Hon'ble Minister Dr. Harsh Vardhan appreciated the tremendous energy that exists amongst youth and advised scaling up the activity multi-folds. He focused on the goal of Health for All and urged the

scientific community to contribute to this mission. He emphasized that Science has the potential to solve the most contentious issues and problems of the society and it's the most appropriate time for youth to grow and bring about a change. He ensured that the Government is there to support the innovative ideas in all forms, technical, financial or any other. His key message to innovators and startups was, "India dreams, India delivers". He encouraged all to dream big and deliver big.

Dr. Renu Swarup congratulated the young innovators on building up science that is delivering to society and emphasized that SITARE programme is an effort to strengthen our innovation ecosystem. She indicated towards the need for mature incubators to now become mentors and to reach out to Tier 2 and Tier 3 cities. She conveyed her sincere appreciation for all mentors and guides who have helped build the ecosystem.

Dr. R. A. Mashelkar pointed towards the cover page of GYTI Book which featured a Pole Star. He encouraged the young students to find their own North Star (passion/goal), which will help them plan and steer their actions. "Purpose, perseverance and passion is the key to success", he said. Dr. Mashelkar appreciated the efforts by BIRAC and said that Talent, Technology and Trust is the strength with which BIRAC has brought a revolution in the country.

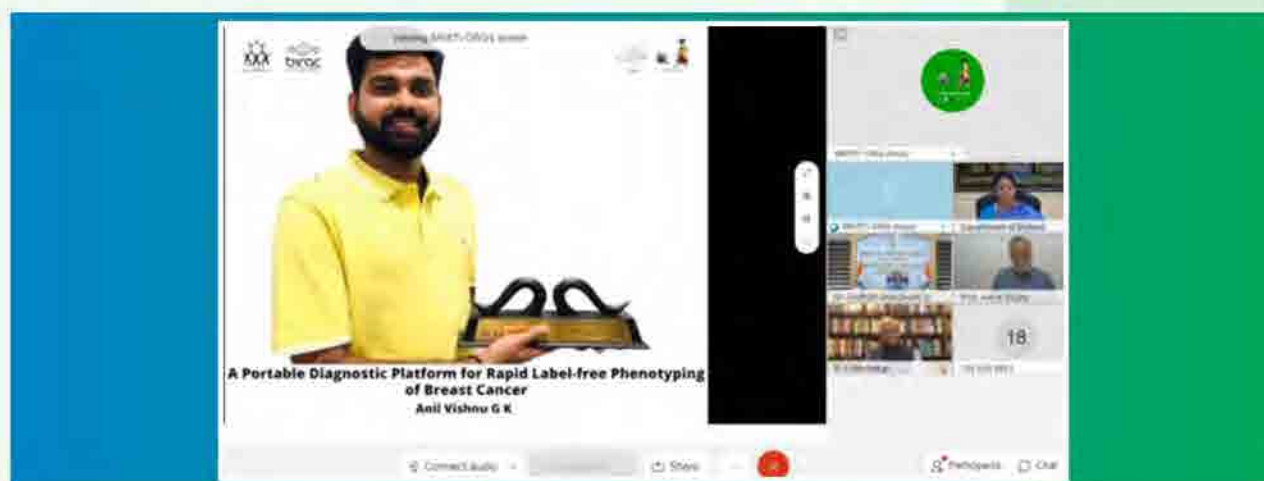
Dr. Shekhar Mande, DG, CSIR was appreciative of the work by young minds showcased during the award ceremony. He also highlighted the sincere efforts by scientists and experts who helped in reviewing the entries so that the best ones could be selected for SITARE-GYTI Awards. He mentioned that the idea of giving fillip to the nascent innovations through such awards has caught on and there is a widespread feeling on the need to learn from the innovative students and their outstanding achievements and to mentor them to address the unmet

needs of the country and the world.

Hon'ble Minister during his talk also referred to the programme JIGYASA an effort to take school students to the lab and in that context Dr. Swarup referred to the initiatives that DBT is taking to bring the school students from aspirational districts and other remote areas to build their capacities and potential to pursue a career in life sciences. Dr. Harsh Vardhan recalled the way polio mission was achieved and mentioned that a similar determination,

collaboration and coordination is needed to overcome the problems we are facing today.

Dr. Manish Diwan, Head, Strategy Partnership and Entrepreneurship Development, BIRAC congratulated all the students and highlighted that BIRAC is committed to take all the suggestions forward and ensure that the awardees as well as the appreciated students benefit from the strong support system that BIRAC has created in the country through partnership with various institutions like SRISTI and Honey Bee Network.



LAUNCH OF DBT-BIRAC CLEANTECH DEMO PARK

On 8th Oct 2020, Hon'ble Union Minister of Science and Technology, Health & Family Welfare and Earth Sciences, Dr Harsh Vardhan inaugurated the "DBT-BIRAC Clean Tech Demo Park" at the Barapullah drain site, near Sundial Park, New Delhi. Sh. Anil Baijal, Lieutenant Governor Delhi also graced the occasion with his kind presence. The event was held virtually in the presence of Dr Renu Swarup, Secretary, DBT and Chairperson BIRAC, officials from DBT, BIRAC, Startups and other stakeholders.

This Clean Tech Demo Park is the first such initiative in the country to demonstrate technologies for waste to value, clean environment and clean energy. BIRAC's Clean Energy International Incubation Centre would provide the local anchor and handholding support to Startups, Entrepreneurs who may come from different parts of the country, and manage the Park. DBT & BIRAC have so far supported over 1500 start-ups & entrepreneurs and have established 50 incubators across the country. Out of these, representative technologies in the area of Waste to Value, Clean Energy & Clean Environment will get this unique opportunity to demonstrate in this park.



Initial cohort of DBT-BIRAC supported technologies that have been considered for implementation at Barapullah site at “DBT-BIRAC Clean Tech Demo Park” are:

- Revy environmental solutions Pvt Ltd, Vadodara- **Anaerobic granulated sludge for quick start of UASB reactor**
- Vivira Process Technologies Ltd, Pune- **Vortex diode cavitations (VoDCa®) for COD reduction**
- Phycolinc Technologies Pvt Ltd- **BiotikPlaX: A live micro-algal product for in-situ water body restoration**
- Openwater.in –**Membraneless, chemical-free, wastewater treatment system**
- Shaon Ray Chaudhary, Bhubaneshwar- **Single unit operation to process dairy wastewater after fat removal**

DBT-BIRAC has already undertaken several initiatives for converting municipal solid & liquid wastes into wealth in the form of energy, clean water & other value-added products.

This park would serve as a platform where suitable innovative technologies developed by Startups or individuals can be demonstrated with support from DBT/BIRAC. This further would pave the way for wider acceptance and commercialization of these clean technologies, and contribute towards the success of national missions - Swachh Bharat and Atmanirbhar Bharat.



WEBINAR ON

“Showcasing demonstrated Waste-to-Value Technologies”

As part of the 100 days agenda of the Department of Biotechnology (under the Swachh Bharat Mission), technologies in the area of waste management have been supported by BIRAC for implementation in association with Municipal Corporations/ Urban local bodies (ULBs).

These were officially launched by Dr. Renu Swarup, Secretary, Department of Biotechnology in a Webinar on “Showcasing Demonstrated Waste to Value technologies”. The webinar was organized on 1st October 2020 to commemorate the 152nd birth anniversary of Mahatma Gandhi, Father of Nation.



Decentralized Organic Waste to Energy for ULBs Via GPS Renewables' BioUrja Biogas Technology

Technology Partner GPS Renewables
ULB Partner MCGM
Project objective: To showcase BIRAC's BPS supported BioUrja technology for a ULB use-case in a typical urban location | **Location:** Haj Ali, Mumbai
Capacity: 2 TPD (running on source segregated urban waste collected by MCGM in D ward (Malabar Hill, Haj Ali areas))




Location: Haj Ali view *BioUrja Plant at site*




UPCOMING PROJECT
GROUND WATER TREATMENT SYSTEM

Mavallipura

25000 L/day System






Input **Output**



Skillful Engineering | Advanced Features

- lot enabled to **scale rapidly** and **high-quality service**
- Design for **ease-of-use & ease-of-service**
- Continuous evolution**

WEBINAR ON

Funding opportunities at BIRAC and Key Elements of Grant Writing

To apprise the potential applicants about various funding schemes of BIRAC and on writing effective grant proposals, BIRAC organized two webinars entitled *"Funding opportunities at BIRAC and key elements of Grant Writing"*. Dr. Sanjay Saxena, GM and Head, Investment, BIRAC introduced the participants of the various funding schemes of BIRAC and appraised them on the eligibility criteria of the various Schemes. Dr. Shirshendu Mukherjee, Mission Director, Grand Challenges India shared the guidelines for writing an effective grant proposal. A total of 1050 participants registered for the webinars. The presentations were followed by a Q&A session which witnessed an active participation by the applicants.



Live Webinar

Get Answers to all your Questions about **FUNDING OPPORTUNITIES** at BIRAC and **GRANT WRITING**

18th NOVEMBER
3:00-5:00 p.m.

Dr. Sanjay Saxena
GM and Head, Investment, BIRAC

Dr. Shirshendu Mukherjee
Mission Director, GCI, BIRAC

FOR REGISTRATION:
<https://register.gotowebinar.com/register/643236703226000908> or visit www.birac.nic.in



Live Webinar

Get Answers to all your questions about **FUNDING OPPORTUNITIES** at BIRAC and **GRANT WRITING**

Wednesday
NOVEMBER
11th
3:00-5:00 p.m.

Dr. Shirshendu Mukherjee
Mission Director, GCI, BIRAC

Dr. Sanjay Saxena
GM and Head-Investment, BIRAC

For Registration:
<https://attendee.gotowebinar.com/register/643236703226000908> or visit www.birac.nic.in

जन CARE INNOVATION CHALLENGE

Reimagining the Healthcare Delivery in Low Resource Settings

BIRAC and NASSCOM in collaboration with Grand Challenges India (GCI) launched “जनCARE” Innovation Challenge on 28th Dec 2020. This is to discover, design and scale the Health-Tech Innovations that can work in low resource-settings especially in the areas of Cardiovascular Diseases, Maternal & Childcare, Diabetes, COPD, Cancer care, Eye care, and other NCDs. The challenge launched will identify upto 25 Healthtech solutions from startups and provide pilot test beds in collaboration with State Governments & Industry to help their validation and scale up for adoption. This would further promote customized products developed by start-ups to address the local challenges and unmet needs and hence, the population of low resource areas; PHCs, CHCs in rural and semi-urban areas are likely to get benefitted through local deployment of the innovative and affordable healthtech solutions.

This BIRAC-NASSCOM partnership aims to enhance the efficiency of healthcare delivery at the last mile and also encourage national & international stakeholders to join hands in scaling Healthtech sector. The Challenge is an industry-wide collaborative effort; Astra Zeneca, GE Healthcare, Siemens Healthineers, Medanta Hospitals, St John's Research Institute, Health Care Global Enterprises and TATA AIG have already joined hands with this innovation challenge to provide their support and mentorship to the participating Start-ups till the end of pilot phase.



JANCare Challenge was officially launched over a webinar by Dr. Renu Swarup, Secretary, DBT and Chairperson, BIRAC in the presence of Ms. Debjani Ghosh, President NASSCOM, Dr. Naresh Trehan, Chairman & MD, Medanta Hospital, various Industry leaders, and State representatives and other BIRAC and NASSCOM's team members.

INDUSTRY PARTNERS

SEAMEO, HCG, AstraZeneca, GE Healthcare, Siemens Healthineers, Medanta Hospitals, St John's Research Institute, Health Care Global Enterprises, TATA AIG.

CHALLENGE AREAS: POINT OF CARE DIAGNOSIS, BASIC HEALTH SOLUTIONS, TELE CONSULTATIONS PLATFORMS, TELE DIAGNOSTIC SOLUTIONS, SELF MONITORING SOLUTIONS, REMOTE PATIENT MONITORING, OTHER RELATED HEALTHTECH SOLUTIONS.

PHASES: DISCOVER (Present the Best Health Tech Solution that works in Low Resource Settings), DESIGN (Develop a Prototype Solution that addresses the health challenge in Low Resource Settings), SCALE (Develop a Scalable Solution that can be deployed in Low Resource Settings).

Application Open: 28th December 2020 till 21st January 2021

Webinar Interface: A grid of participants including Dr. Renu Swarup, Ms. Debjani Ghosh, Dr. Naresh Trehan, and other industry leaders.

BENGALURU TECH SUMMIT 2020 (BTS 2020)

Next is Now

A digital event of Bengaluru Tech Summit 2020 ("Next is Now") was held on 19th to 21st November 2020. It was jointly organised by Karnataka government's Department of Electronics, Information Technology, Biotechnology and Science & Technology and it was India's flagship event.

The event was inaugurated by Hon'ble Prime Minister of India Shri Narendra Modi in the presence of H.E Mr. Scott Morrison- Hon'ble Prime Minister of Australia, H.E Mr. Guy Parmelin, Vice President of Swiss Confederation and Shri Ravi Shankar Prasad, Union Minister for Communications, Electronics and Information Technology, and Law & Justice. The inauguration function was presided by Shri B. S. Yediyurappa, Chief Minister of Karnataka and also graced by Dr. C.N. Ashwath Narayan, Deputy Chief Minister and Minister for IT, Bt and S&T, Government of Karnataka and Shri Jagadish Shettar, Minister of Large and Medium Scale Industries and Public Enterprises, Government of Karnataka.



Dr. Renu Swarup, Secretary DBT & Chairperson, BIRAC addressing at Bengaluru Tech Summit 2020

BIRAC actively participated in the event. Dr Renu swarup, Secretary DBT & Chairman BIRAC was a distinguished speaker of the Day 2 session on "R&D Labs to Market". The panel deliberated upon success stories and challenges faced by the start-ups from lab to market. Panel also deliberated upon possible solutions like "Atmanirbharta comes from Atmavishwash". Co-panellists included Prof Ashutosh Sharma, Secretary, DST; Dr. Shekhar Mande, Secretary DSIR & DG-CSIR.

The session on "Accelerating innovation" on Day 1 was deliberated by one of the BIRAC's BioNEST Incubator CCAMP and some of BIRAC supported start-ups like Blackfrog Technologies, Hanugen Therapeutics Pvt Ltd, Nesa Medtech. All the start-ups shared their insights. Panel also deliberated on a need for a comprehensive support to start-ups.

Dr. Kavita Singh, Mission Director, NBM-PMU, BIRAC moderated Day 1 session on "Atmanirbhar Bharat – NBRIC". On Day 2, the session on "Biotechnology for managing a pandemic" panellist deliberated about convergence of multiples technologies like biotech, Artificial Intelligence etc.

The session on "Start-up Reboot" was held on Day 3. Panellist reflected on some of the solutions for the start-up reboot that is to create a right environment to attract the foreign investor so that the flow of capital in India will increase. The session on "Regulatory challenges for growth in Biotech" and "Regulatory Challenges for growth in Biotech-Agri" was also held on Day 3.

The three-day event saw participation from 25+ countries; around 250 speakers and 5000 attendees, participated in 4 Parallel Conference Tracks on IT, BT, GIA and Start-Up. More than 146 start-ups showcased innovation in IT, electronics, IoT, healthcare, Medtech, Agritech, Fintech, Edtech, and mobility sectors at the BTS 2020.



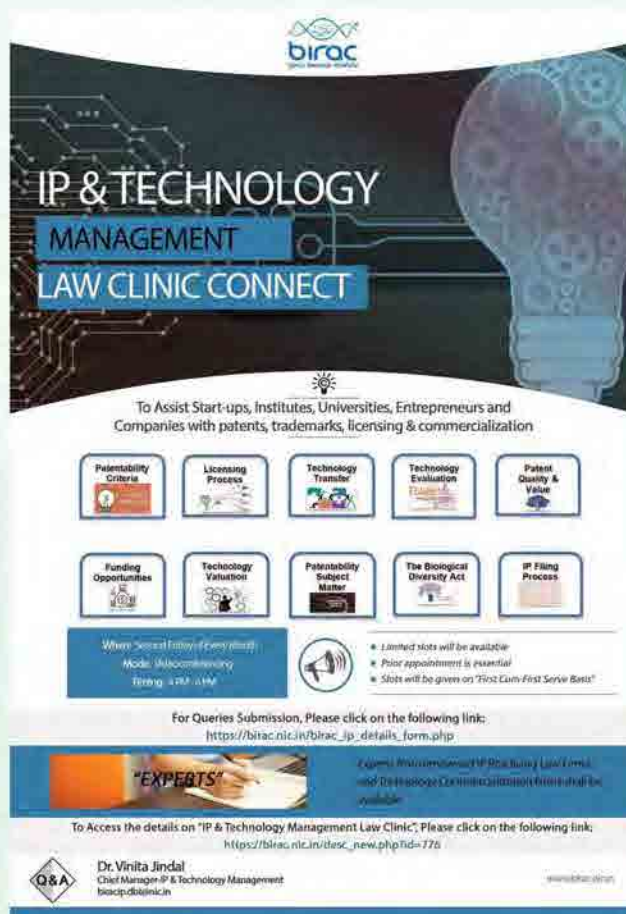
Dr. Kavita Singh, Mission Director, NBM-PMU, BIRAC moderating the session at Bengaluru Tech Summit 2020

IP & TECHNOLOGY MANAGEMENT LAW CLINIC CONNECT

Intellectual Property Rights (IPRs) are crucial for businesses as they drive innovation resulting in the delivery of better services and products for consumers. However, Intellectual Property is often a daunting subject for start-up companies. There are various forms of IPRs namely as Patents, Trademarks, Designs, Copyright, Trade secret etc. under which a start-up thinks about protecting their ideas/concept/product and technology. However, the lack of a clear understanding on how IP rights are obtained & enforced and technologies are commercialized are often confusing to the start-ups, which can leave their IP & Technology vulnerable. Keeping that in view and to handhold the Start-ups, Entrepreneurs, Institutes, Universities and Companies aware on the above, BIRAC has initiated a mentorship and advisory program **"IP & Technology Management Law Clinic Connect"**.

The Program shall act as a counsel to the Small Business, Startups, Institutes, Universities, Companies, and entrepreneurs by providing advice on a broad range of IPRs (Patent, Trademark, Copyright) and Technology Transfer & Commercialization process and strategy. Intent of "IP & Technology Management Law Clinic Connect" is to provide advisory and guidance broadly on Patentability Criteria and Patentable subject matter, Technology Transfer and Commercialization Process and Strategy, Advise on International or Foreign Patent filing strategy, Patent & Technology Valuation, The Biodiversity Act.

The Clinic shall operate on Second Friday of every Month through Videoconferencing from 4 pm to 6 pm.



IP & TECHNOLOGY MANAGEMENT LAW CLINIC CONNECT

To Assist Start-ups, Institutes, Universities, Entrepreneurs and Companies with patents, trademarks, licensing & commercialization

Patentability Criteria	Licensing Process	Technology Transfer	Technology Evaluation	Patent Quality & Value
Funding Opportunities	Technology Valuation	Patentability Subject Matter	The Biological Diversity Act	IP Filing Process

Where "Second Friday of Every Month" Mode: Videoconferencing Timing: 4 PM - 6 PM

For Queries Submission, Please click on the following link:
https://birac.nic.in/birac_ip_details_form.php

"EXPERTS"
 To Access the details on "IP & Technology Management Law Clinic", Please click on the following link:
https://birac.nic.in/law_clinic_new.php?id=776

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 Chief Manager-IP & Technology Management
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DBT-BIRAC Call on COVID Therapeutics

The occurrence of COVID-19 elevated intense attention not only within India but internationally however still we do not have fully approved (by US-FDA or CDSCO) medication for treating people infected with the novel coronavirus SARS-CoV-2. People infected with this new coronavirus have reported a wide range of symptoms – ranging from mild to severe illness - often appearing 2-14 days after exposure to the SARS-CoV-2 virus. As the disease counts rise in India, it is of utmost importance to develop therapeutics that could be helpful in treating the patients infected with Corona virus. Effective strategies for prophylaxis and holistic management are of paramount importance in curtailing the progress of the disease and reducing burden on hospitals.

DBT/BIRAC jointly announced a request for proposals in the area of Covid-19 Therapeutics. This call was launched on 15th October 2020.

The scope of this call was to address at least one of the following objectives:

- Development of therapeutics to address a rapid response towards the current COVID-19 outbreak: relevant “clinical ready”-assets including approved therapies or compounds in development, which could be repurposed for use in treating patients with the coronavirus.
- Development of therapeutics to address the current and/or future coronavirus outbreaks: identification of new potential assets and approaches that could be utilised including preventive strategies and combination approaches and could also address potential resistance. This may also include optimisation of promising treatments used in rapid response.

Research proposals **with established, robust Proof of Concept i.e. TRL 4 and above** were invited in this call. In addition *development of in-vitro assays and in-vivo models (irrespective of TRL) for evaluating therapeutics were also considered.*

A total of 39 proposal were received under this call, after vigorous technical evaluation 7 proposals were recommended for funding subject to legal, IP and financial clearance



Department of Biotechnology (DBT)
&
Biotechnology Industry Research Assistance
Council (BIRAC)

Announce
JOINT CALL FOR PROPOSALS

On
COVID 19-Therapeutics

(Companies, LLPs and Academic Institutes can apply either individually or jointly)

Call closes on: 31st October 2020 at 5:30 pm

CONTACT
Dr. Dhiraj Kumar, Senior Manager - Technical, BIRAC
dkumar@birac.gov.in

*For more information Please check RFP at
www.birac.gov.in and www.dbt.gov.in



CLEAN ENERGY INTERNATIONAL INCUBATION CENTRE

India's first-of-its-kind Clean Energy Incubator for innovators, entrepreneurs and start-ups

Innovators and entrepreneurs driven to solve the most critical social, economic and environmental challenges need tremendous support to be able to bring about a positive change in the lives of people and communities. The innovation ecosystem has to evolve to support these mission-driven innovators and entrepreneurs throughout their lab-to-market journey. This includes support right from the product development phase, wherein, they need lab infrastructure to build the prototype, to the commercialization phase requirement of business development and market access support.

Furthermore, innovations developed to promote universal energy access, energy efficiency in the energy life cycle through introduction of clean energy are the need of the hour to transform the way the world produces and consumes energy. With an objective to provide complete "lab-to-market" incubation support to clean energy enterprises, both Indian and International, the Clean energy International Incubation Centre (CEIIC) was established in 2018 under the BioNEST programme of BIRAC.

CEIIC is anchored by Social Alpha, and is the joint initiative of Tata Trusts and the Government of India, supported by Department of Biotechnology, BIRAC, Tata Power and Tata Power – Delhi Distribution Limited. CEIIC has been set up as a part of the BioNEST Scheme for promoting innovations in the energy space and has become the first International Incubator in India under Mission Innovation. Mission Innovation (MI) is a global initiative of 24 countries and the European Commission (on behalf of the European Union) working to reinvigorate and accelerate global clean energy innovation with the objective to make clean energy widely affordable.

Keeping in mind the objective of CEIIC, one of the central elements of the initiative was to develop physical infrastructure, which would include co-working spaces, rapid prototyping workshops, state-of-the-art innovation labs with world class product development and testing facilities and build cleantech product management expertise. Conceived as a 'global innovation center of excellence', CEIIC is focused on start-ups from India and other MI countries, the incubator is geared with end-to-end rapid prototyping facility to enable start-ups to develop their products and create early prototypes for testing. CEIIC's office space has an area of 17,000 ft², which includes an seating space, lab space and common area at the facility. In addition, lab facilities (outside the premises) such as Rapid Prototyping Lab, Switch Gear Workshop, Engineering Lab, DT Workshop, Meter testing Lab, Automation Lab and Battery Testing Lab cover an area of over 25,000 ft², making the total area available to startups under CEIIC >42,000 sqft. While the original rental charges are Rs 10,000 per seat per month, or are covered in lieu of equity for incubatees, it is being offered at discounted prices right now to support some of the early start-ups as the facility is new.



PCB prototyping machine in CEIIC Lab

More than 380 start-ups have been evaluated for support by CEIIC over the last two years, with the objective to identify promising Clean Energy-based technology innovations in the space of sustainable energy which need incubation support in their journey from lab-to-market. Till date, 25 start-ups have been incubated at CEIIC which were selected by two editions of the Social Alpha Energy Challenge conducted annually. The incubatees have been supported in product development through access to lab infrastructure, along with technical mentorship by in-house experts. In total, the incubated start-ups have 10 granted IPs, 3 provisional patents and 19 patents that have been filed and are in process. In addition, the incubatees have access to seed capital from Social Alpha, support for techno-commercial pilot deployment from Tata Power and other Social Alpha partners, accelerated market access support through scale-up implementation programmes in the Social Alpha network. Out of the 25 incubatees, 8 start-ups are at the commercialization stage and have been able to service around 7,000 customers collectively so far.

The start-ups also receive opportunities such as getting their environmental impact assessment and articulation done through reputed partners of CEIIC and international visibility and networking opportunities in India and other countries. The RISE Institute, Sweden had done an assessment of the innovations for understanding the magnitude of their climate impact. They have found that the innovations developed by the 8 of the incubated start-ups have the potential to avoid more than 90 million Tonnes of carbon dioxide equivalent in the atmosphere per year by the year 2030. In addition, another 40 assessed finalists of the energy challenge displayed the opportunity to save another 115mT of cumulative emission by 2030 as per their assessment.

Among the incubates companies, Social Alpha has invested in 4 start-ups – Sys3E Technologies, Tan90 Thermal Solutions, Himalayan Rocket Stove and Urja. Sys3E is involved in design & development of Solar PV trackers driven by innovative design and efficient tracking algorithm. The trackers are viable even at distributed scale and plays a critical role in increasing the energy security for the nation. Urja has developed a solution to track industrial device or circuit-level energy wastage patterns in real-time leading to reduced energy consumption. The platform enables production insights across capacity utilization, energy leakages, process bottlenecks, and utilizes Machine-learning based fault detection.

Tan90 aims to change the cold chain in India with their portable cold storage solution based on Phase Change Material technology. Their products are designed to plug the gaps, particularly, in the first and last mile of the food supply chain, thus reducing food wastage.



Portable cold storage developed by Tan90 Thermal Solutions



Himalayan Rocket Stove has developed a heating and cooking solution specifically for the high-altitude regions with 2x combustion efficiency as compared to conventional heating solutions in the region. The company is currently manufacturing three product lines based on the size of space that requires heating – Eco1, Eco2 and Eco3. The company has also introduced a new low cost smaller version of the product – EcoMini, to meet the requirement of the marginal community.



Eco Range of products developed by Himalayan Rocket Stove

The Clean Energy International Incubation Centre (CEIIC) is run under the leadership of Dr. G Ganesh Das, Chief Executive Officer (CEO). Ms. Smita Rakesh leads the Clean Energy and Climate Action Portfolio at Social Alpha.



PCB prototyping machine in CEIIC Lab



BioNEST @ VIT, VELLORE



VIT
Vellore Institute of Technology
(Autonomous University established by the Government of Tamil Nadu)

BioNEST @ VIT, Vellore is a Bioincubation facility for startups working in the connected medical device segment and affordable healthcare. It is supported under the BioNEST programme of BIRAC.

- **Location**

Vellore, Tamil Nadu

- **Total space (Incubation, Lab space, common area etc.)**

10000 Sq.(Under BioNEST- 6000 Sq.; Lab- 2000 Sq.; Incubation- 3000 and Common area: 1000)

- **No. of Incubatees supported till now (under BioNEST)**

15

- **Total Products/technologies commercialized**

5

- **Total IPs facilitated**

16

- **Rentals**

VITTBI has heavily subsidised the charges payable by the incubatees. The plug and play facilities: Cowork space @Rs.1000 per seat and an individual office space-5 seater @Rs.4000/month. In addition, there is an incubation fee of Rs.2000/month. Lab equipment charges are also very low compared to the market rates and charges aren't levied to use general purpose lab equipment/accessories.

- **Facilities offered and unique features**

Core facilities under BioNEST incubation includes HPLC, UPLC, RTPCR, Animal Imaging Facility, Deep Freezer, Spectrophotometers, Atomic Absorption Spectroscope, Electronic product development & test facility including Zemax software, Optics work benches, PCB & 3D printing and Thermal camera.

In addition, VITTBI facilitates privileged access to the entire VIT campus R & D facilities that include TEM, SEM, XORD, Animal House and institutional ethical committee approvals

More than 600 students of VIT have worked as interns at VITTBI start-ups during the past three years.

VITTBI has a strong investor, industry mentor & expert network in the Chennai-Bangalore region and start-ups are making full use of the same.





- About the Team

Dr. A. Balachandran- Senior General Manager (A techno commercial professional with over 31 years of experience- 17 years at VITTTBI)

Ms. Sudha Rajagopalan, Dy. Manager (A techno commercial professional with around 30 years of experience- 12 years at VITTTBI)

Mr. John Joseph, Mr. Jagannathan. V and Mr. Venkatesan. R are the technical support staff and Mr. Gopinath. S is the product development support engineer.



VIT BioNEST Team members

• Incubatees that have created an Impact

Alfaleus Technologies Pvt.Ltd (<https://www.alfaleus.in/>)
<https://www.youtube.com/watch?v=hcT5EifxCaU>

- Developed and commercialised a head mounted Virtual Reality based Glaucoma screening device (C3 Visual Field Analyser) in association with Aravind Eye Hospital, Pondicherry. Sold over 40 device in the past 18 months;
- Has a manufacturing partnership with Remidio, Bangalore. Raised a seed fund of Rs.40 Lakhs (DST) and another Rs.5.5 Lakhs (PoC/MeitY) grant from VITTTBI. It has two employees and six VIT student interns.
- Working on another 'Low vision aid' product and clocked revenue of Rs.12.5 Lakhs during 2019-20. Won several awards including AIT SWISSNEX (Rs.10 Lakhs prize during 2019) award.
- One patent application has been filed so far.
- Mr. Sandal Kotawala, alum of VIT (2018) is the lead entrepreneur.



Bariflo Labs Pvt.Ltd
<https://bariflolabs.com/>

Bariflo Labs is an industry 4.0 compliant start up and has developed water body management system based on Fluid dynamics, IOT, robotics, AI for aqua-farm management. It offers technological solution for aquafarmers, co-operatives, villages, communities, cities & industries at a variety of scales. It intends to make farming and environment management economically sustainable.

Bariflo was supported with a NIDHI PRAYAS grant and BIRAC SEED fund of Rs.30 Lakhs at VITTTBI. It has raised further support from Odissa Govt. It has deployed the systems in aqua culture farms located at Nagapattinam (TN) and Bhimavaram (AP).

Three patents were filed and four design registrations carried out so far.

Mr. Mrituynjaya Sahu, an alum of NIT, Rourkela is the lead entrepreneur.



Ashva Wearable Technologies

<https://yourstory.com/herstory/2020/12/woman-entrepreneur-intelligent-wearable-knee-pain-physiotherapy-qualcomm>

<https://www.edexlive.com/happening/2020/oct/08/this-bengaluru-duos-smart-wearable-device-will-show-you-just-how-fit-your-knees-are-15098.html>

Products

1. Fitknees

Ashva's flagship product (currently in trials with St John's Hospital, Bangalore) is an intelligent knee wearable device for monitoring the progress of patients with chronic knee injuries (like osteoarthritis)

Fitknees provides deep data analytics reports (just like a blood test report) pertaining to various functional, clinical and subjective parameters of the knees.

2. The Cu.Re app (Customised Rehabilitation)

A mobile app for physiotherapists and patients specifically for virtual physiotherapy consultations and personalised treatment regimes for low to medium risk patients.

The Cu.Re app is now live exclusively on Google Play store and in Beta pilots (available for 100 patients only), links as below:

Patients App:

<https://play.google.com/store/apps/details?id=com.ashvaweartech.patientmyphysio>

Physicians

App: https://play.google.com/store/apps/details?id=com.ashvaweartech.curempatient&hl=en_US

Beneficiary of NIDHI PRAYAS grant (VITBBI), BIRAC SEED fund (VITBBI) and BIG grant (IKP). Two patent applications have been filed so far.

Ms. Anmol Saxena and Mr. Sandeep Reddy (alum of VIT -2017) and had a stint with Ford Motors and Intel respectively are the cofounders.





Tishyas' Medical devices Development Solutions Pvt.Ltd
(<http://www.medevplus.com/>)

Product: IXanner™

IXanner™ has been developed to reduce the cases of preventive blindness. It is a portable and advanced eye screening device that allows paramedics and vision technicians produce the diagnostic details of inside structures of the eye within seconds. With this information, an ophthalmologist diagnoses any blindness causing disease at an early stage and helps prevent blindness.

Their first hardware prototype has been sold to SAMEER, IIT Mumbai and now under negotiations with NIMHANS, IISc and NCBS. Other associations include HomeCyte GmbH, SciDogma where we sold one of the components that is assembled in our IXanner™. Other components have been exported as well, taking the total registered revenue of 62L INR and a pipeline of 90L INR.

Innovation lies in the below:

Novelty in Spectrometer design that improves the robustness and reduces the system's sensitivity to misalignment and temperature fluctuations. A patent has been filed

Novelty in the miniaturized optical delay line that gives a quick transition between cornea and retinal imaging. Patent filing is in process.

Dr. Ravikiran Manapuram, co founder is a PhD in Biomedical Engineering from University of Houston with over a decade's experience in Medical device industry including a stint in a leading MNC.



Ravi Kiran, PhD



Mathew Kurian, MBBS



Srinivas, MBA



Sharad, MScTech



Sachin, BTech



Sweta, CA Inter



Bio-INCUBATOR AT C-CAMP

Bio-incubator at C-CAMP supported by BioNEST scheme of BIRAC offers a "plug & play" model wherein we provide a fully equipped, dedicated lab space, with small and large table top equipments as well as access to high-end platform technologies, services and clean rooms/culture rooms. Along with the small bench top equipment at hand on the benches, all the start-ups have open access to the present larger equipment in the common laboratory area as well as the large sophisticated equipment in the common equipment rooms. C-CAMP also makes available its established high-end platform technologies as a service to all C-CAMP start-ups.

Other than space & equipment, C-CAMP provides more crucial support in terms of mentoring, funding opportunities and access to a highly enriched and stimulating eco-system with connections to many stakeholders involved in the Indian innovation ecosystem. This network is continuously growing and includes scientists and research institutions, experienced entrepreneurs, mentors, government and private funding bodies, regulatory agencies, international eco-system players and industry. This eco-system, we find is absolutely vital for transforming early-stage scientific ideas into impactful commercial innovations.



Labs at CCAMP



Tissue Culture facility



Cafeteria at CCAMP

- Location: Bangalore, India
- Total Space: Under Phase 3 – 10,000 sq ft
- No. of Incubatees supported till date:

A total of 39 Resident Incubatees supported under Phase 1 phase 2 and phase 3 (BioNEST)

- Total products/technologies commercialized:

10 bio-nest residents' products commercialized, a few more from non-resident incubatees

Rentals:

C-CAMP offers different models for incubation for start-ups as per their requirement of biology lab set-up, med-tech set-up, clean room requirement etc, hence the charges vary accordingly. Further, the rentals also vary depending on the stage of the start-up – individual innovator/academic entrepreneur, early stage start-up or mid-level start-up.



C-CAMP STAR INCUBATEES:

Pandorum Technologies:



Pandorum Technologies: Pandorum Technologies is a biomaterials company working to develop biomimetic materials that can be designed & integrated in different ways for different desired properties with various applications in healthcare including tissue engineering. They have created artificial mini liver tissue which can be used as a platform for pre-clinical drug discovery & development and they have also recently been successful in creating bio-engineered human cornea for implantation. Pandorum has been successful in raising over 27 Cr till date including their Series A round from IAN, 021 Capital, 500 Startups and the KITVEN fund. Pandorum won the Economic Times Top Innovator award in 2017 and first place at 2019 Entrepreneurship World Cup (India) among many accolades.



Eyestem:

Eyestem is a cell therapy company focused on creating a platform for stem cell and gene editing to develop breakthrough therapies for incurable diseases of eye. Their lead product is EyecyteRPE aimed at treating Dry AMD (Age-related Macular Degeneration). They have also recently made available their Anti-Covid screening (ACS) platform to determine efficacy of drugs/vaccines using iPSC-derived lung progenitors. Eyestem has been able to raise funding of over INR 20Cr including an undisclosed amount from global investors in Switzerland and South Africa. Eyestem

was selected by Niti Aayog to represent India's startup ecosystem at the India Singapore summit last year.

Bugworks Research:



Bugworks Research is a drug discovery company that aims to discover novel antibiotics for hospital acquired infections. Bugworks uses highly differentiated Systems Biology approaches to identify novel combinations that enhance the action of antibiotics and to discover novel mechanisms that target biofilms. They have recently been successful in raising their series B funding of \$7.5 M from Japan-based University of Tokyo Edge Capital (UTEC) and Global Brain Corporation along with

South Africa-based Acquipharm Holdings and has raised a total of over INR 135 Cr till date. They have been listed amongst the top 36 game-changing start-ups in the world by CBInsights.

Sea6 Energy:



Sea6 Energy is a resident incubatee at C-CAMP which has worked on and developed an Agri-Stimulant from seaweed extract that is now in the market. They have recently developed & commercialized their second product AgForte which boosts plant immunity. They have in the last decade developed renewable energy solutions

and innovative technologies for sustainable, large-scale and mechanized ocean farming. They have raised private investment from Tata capital and till date raised over INR 50 Cr of funding. They were selected among the top five startups recognized by NABARD for their innovative agri-focused ventures last year.

Coeo Labs:



Coeo Labs
www.coeo.in

Coeo Labs is an innovation-driven company solving unmet clinical needs in the field of emergency and critical care. Their first product, VAPCare, is a device to prevent ventilator associated pneumonia (VAP) in the ICU setting. Their second product, Saans, is a low-skill, low cost, neonatal CPAP device, which maintains respiration and oxygenation in premature neonates with RDS (Respiratory Distress Syndrome) by providing constant airflow and pressure to keep the lungs open during transport to a tertiary care / NICU setting.

Coeo Labs have also responded to the current pandemic and upgraded its second product, Saans by changing the amount of air delivered through the machine to help coronavirus affected patients. Apart of this their 1st product, VAPcare is also helping doctors & healthcare providers stay safe as the entire process of saliva & secretion suctioning is automated for ventilated COVID-19 patients who need this. Coeo Labs have been able to raise over INR 5 Cr in follow-on funding and have won a number of accolades since inception including the Commonwealth Secretary-General's Innovation for Sustainable Development Award, 2019 which was presented to them by Prince Harry, Duke of Sussex.

String Bio:



String Bio is a Bangalore-based venture started in 2013 that is focused on advanced synthetic biology tools to establish fermentation processes for conversion of waste into green chemicals and peptide for animal feed. Their first product is an organic protein supplement for fish. String Bio has been able to raise funding of over INR 20 Cr including their recent Series A round. They have been recognized globally as one

of the 5 synthetic biology companies in the world to develop sustainable solutions for waste management, among many other awards and accolades.





TAKACHAR: HARVESTING VALUE FROM AGRICULTURAL WASTE

Indian entrepreneur named among 'Young Champions of the Earth' winners by UN environment agency

A 29-year-old Indian entrepreneur is among the seven winners of the prestigious "Young Champions of the Earth" 2020 prize given by the UN environment agency to international change-makers utilizing progressive concepts and impressive motion to assist resolve some of the world's most urgent environmental challenges. Vidyut Mohan, an engineer, is the co-founder of "Takachar", a social enterprise enabling farmers to stop open burning of their waste farm residues and earn additional earnings by changing them into value-added chemical compounds like activated carbon on-site.



Vidyut Mohan, co-founder of "Takachar"



Understanding Farmer's problems

Takachar is on a mission to fight climate change by transforming massive amounts of waste biomass into marketable products around the world. Worldwide, \$120 billion worth of crop and forest residues are burned in the open each year, leading to deterioration in air quality not only in rural areas, but also in nearby cities. If used productively, these residues represent a \$10 billion market globally. Takachar's process can be a profitable way to make economic use of this biomass, while reducing air pollution. Using a novel concept called oxygen-lean torrefaction, Takachar has developed and patented the design of small-scale, low-cost, portable equipment to convert waste biomass

in the form of crop residues into solid fuel, fertilizer, and specialty chemicals like activated carbon. Compared to the process of sending crop residues to centralized conversion facilities, Takachar's system is more profitable by significantly reducing the logistics cost of hauling loose, wet, and bulky crop residues by up to 60%. Takachar's technology eliminates greater than 95% of particulate matter, volatile matter and carbon monoxide emissions as compared to open burning of crop residues. Takachar's product does not require any external source of energy to provide heat for the process, and is 100x cheaper than competitive large scale centralized biomass processing technologies. Farmers can use a wide variety of crop residues in the equipment such as rice husks, paddy straw, coconut shells, sugarcane trash & bagasses, cotton plant stalk etc.

Takachar works with farmer groups and farm based businesses (such as rice mills and coconut oil mills) who use Takachar's technology to produce a "carbon rich" output using the local available crop residue waste, and connect them directly to a buyer (such as units that produce activated carbon). This ensures that the owners of the hardware have a constant market for the machine output, thereby ensuring a continuous income stream for these rural businesses, incentivizing the productive utilization of crop residues and increasing farmer incomes by up to 30%.

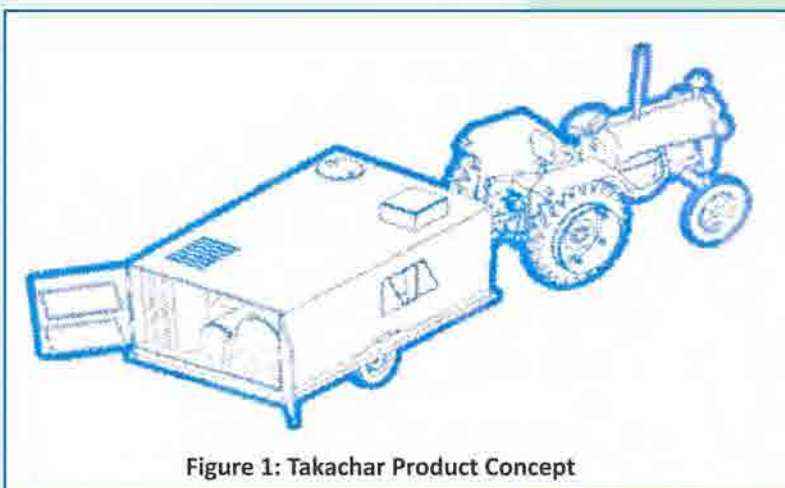


Figure 1: Takachar Product Concept

Takachar's product will be introduced in the market in 2021 and the company is currently looking for partners who are interested in bio-based carbon raw materials for their production processes. By 2030, Takachar aims to mitigate 100 million tons of carbon dioxide equivalent emissions and 75,000 tons of particulate matter emissions per year.

The startup is incubated at BIRAC supported Clean Energy International Incubator at Rohini

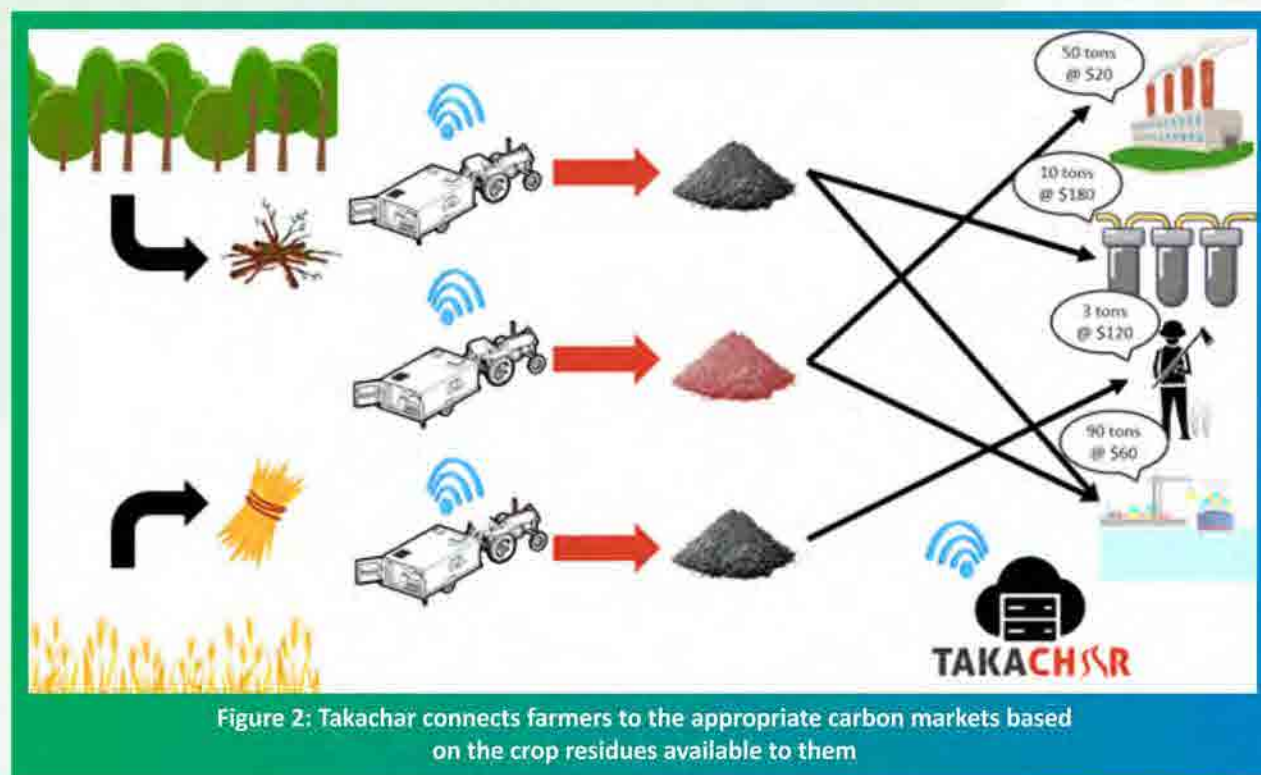


Figure 2: Takachar connects farmers to the appropriate carbon markets based on the crop residues available to them

Jan Andolan Campaign on COVID-19

Jan Andolan Campaign was launched by Hon'ble Prime Minister Shri Narendra Modi on 08th October, 2020 in order to spread awareness about the safety precautions for COVID-19. As per instructions from DBT, the activities organized in BIRAC are as given below:

1. As retention of information is much higher by visual means, e-banners and poster on awareness about Jan Andolan Campaign on Covid-19 were displayed at prominent locations.
2. Information about the Jan Andolan Campaign on Covid-19 was circulated to BIRAC employees and displayed on BIRAC 3i Portal and BIRAC Intranet system.
3. BIRAC disseminated the information to its beneficiaries and network in order to promote the campaign at a large scale.
4. Pledge was administered through online platform.

Constitution Day – 2020

26th November was is celebrated as Constitution Day to commemorate the adoption of the Constitution of India.

BIRAC commenced the event by reading out The Preamble of Indian Constitution at 11:00 AM on 26th November 2020 reaffirming our commitment to uphold its ideology.

As retention of information is much higher by visual means, e-banners on Constitution Day were displayed at the office entrance, Reception and BIRAC Website.

A talk was organised on Constitutional Values highlighting the importance of fundamental duties and their relevance in the 21st century. The session outlined the significance of the day along with acknowledgement and gratitude towards Dr. B.R. Ambedkar (Father of Indian Constitution) and his other team members. The lecture also spoke on how fundamental duties are imperative to the citizens of a country as much fundamental rights are.

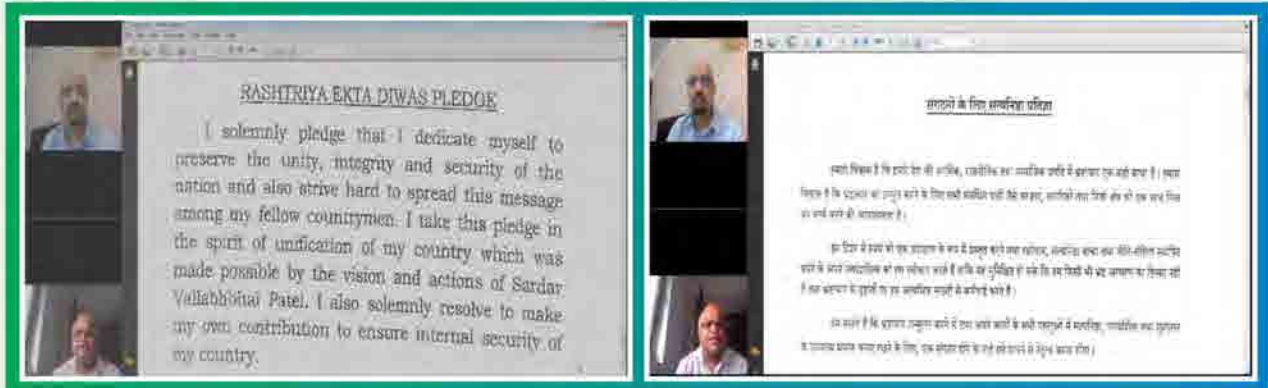
Photo / videos of the activities are also uploaded on twitter handle of BIRAC.





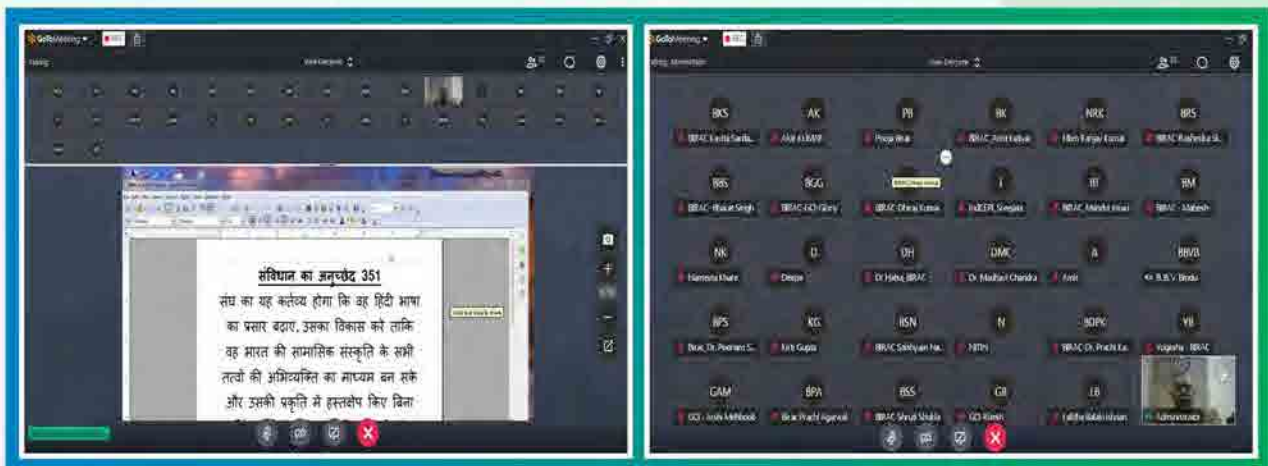
Vigilance Awareness & National Unity Day

Vigilance Awareness Week and Rashtriya Ekta Diwas was observed in BIRAC from 27th October 2020 to 02nd November 2020 and on 31st October 2020 respectively. The observance of the Vigilance Awareness Week and Rashtriya Ekta Diwas commenced with the "Integrity Pledge" and "Rashtriya Ekta Diwas Pledge" taken by all employees of BIRAC.



Workshop on Official Language Act

In line with the implementation of Official Language Act, a virtual workshop was organised for BIRAC employees to acquaint the employees with the importance and provisions of the Official Language. The workshop helped employees in understanding the constitutional provisions of Official Language Act and on implementing official language in day to day official correspondence.





GRAND CHALLENGES INDIA

Grand Challenges Annual Meeting 2020



The Grand Challenges Annual Meeting convened virtually from 19th - 21st October, 2020 bringing together policymakers, scientific leaders calling for deepened scientific collaborations in solving global health problems, with great emphasis on COVID-19 with an "India for the World" framing. The GCAM 2020 was originally scheduled to be held in New Delhi, the virtual meeting continued to be supported by key partners in India, including the Department of Biotechnology, Ministry of Science & Technology, Government of India (DBT) and the Indian Council of Medical Research (ICMR). The meeting was co-hosted by the Government of India, Grand Challenges Canada, the United States Agency for International Development, Wellcome Trust and the Bill & Melinda Gates Foundation.

The Grand Challenges Meeting 2020 focused on the momentum of the growing global partnerships and ever-growing Grand Challenges community to help end the threat of the COVID-19 pandemic more sooner than later, particularly during times of incredible global need.



Hon'ble Prime Minister, Narendra Modi inaugurated the Grand Challenges Annual Meeting 2020 and delivered the keynote address. The Prime Minister elaborated on the key initiatives taken for managing the pandemic and spotlighted India's commitment to accelerate progress on public health goals through science and innovation. He also appreciated the commendable efforts of the Grand Challenges program and stressed on the efforts taken against the COVID-19 pandemic by the global partnerships. The PM elaborated on various steps taken by India in fighting the pandemic. The keynote address also highlighted how India is investing in innovation to advance health solutions and prevent another pandemic like COVID-19.

Mr. Bill Gates, Co-Chair and Trustee, Bill & Melinda Gates Foundation, delivered the plenary framing conversation and focused on lessons from the COVID-19 pandemic to inform R&D going forward in vaccine platforms, monoclonal antibody platforms and diagnostic platforms.



Dr. Harsh Vardhan, Union Minister for Health & Family Welfare, Science & Technology & Earth Sciences delivered the opening remarks for the plenary program of the Grand Challenges Annual Meeting 2020. He stressed that global collaborations are paramount and we should focus on creating an effective health system to improve pandemic preparedness.

Dr. Renu Swarup, Secretary, Department of Biotechnology and Chairperson, BIRAC delivered the host country welcome at the Inaugural plenary session. She elaborated on how the power of collaborations was immense and by harnessing this power we will be able to deliver the promise of innovation to find solutions to this pandemic.



Day 2 of the Grand Challenges Annual Meeting featured a high-level panel discussion which explored the Indian experience in managing COVID-19 from a scientific and disease management perspective. The session was moderated by Dr. Swarup who outlined the country's efforts to mitigate the challenges of the pandemic. The session had participation of national and international key policy makers and eminent researchers who provided the global views of the Indian response to the COVID-19 pandemic. The session was divided into two panels that discussed strategies and methods of "Managing the pandemic" and "Scientific intervention for fighting the pandemic".



Dr. Renu Swarup also participated on a panel on "From the Frontlines to Labs to Boardrooms: Women & Girls at the Center of Global Health & Development Innovation" – that will discuss how COVID-19 is exacerbating existing gender, racial, economic and social inequities; explore strategies

to actively center the needs of women and girls in the COVID-19 response and the global health and development innovation agenda; and identify pathways to elevate more women leaders. The panel was moderated Anita Zaidi, Director, Vaccine Development, Surveillance, and Enteric & Diarrheal Diseases, Bill & Melinda Gates Foundation and had Melinda Gates, Co-Chair, Bill & Melinda Gates Foundation with leading experts in the field.



The three- day program featured leaders talks, panel discussions and virtual informal conversations on different topics ranging from scientific interventions for fighting the pandemic, managing the pandemic and accelerating the development and implementation of global solutions to combat this pandemic and prevent the next one.

Political world leaders, eminent scientists and researchers from across the globe joined this annual meeting to discuss key priorities for accelerating progress across the Sustainable Development Goals in the post-pandemic world and elaborated on addressing the challenges to manage COVID-19.

Additionally, the meeting orchestrated concurrent sessions over three days on following:

- Enabling Crop Analytics at Scale
- Smart Farming Innovations for Small Scale Producers
- Optimizing Birth, Growth and Development
- Global Partnerships & Grand Challenges
- Leveraging Pathogen Genetic Sequencing
- Vaccines & Global Health Technology
- Optimizing Drug Discovery and Translation
- Radical Thinking to Tackle Mental Health/Supporting Youth Mental Health
- Digital Health – From Impact to Scale

The virtually organized meeting was attended by over 1700 delegates from over 75 countries.

THE MEDTECH CHALLENGE PROGRAM WORKSHOP

The Med-Tech Challenge: Market Acceleration Training & Award program is designed around the needs of Indian innovators and entrepreneurs working in the areas of developing medical technologies for public health who have a validated proof-of-concept for their technology and are in the process of taking their product to the market.

The program aims to fill the gap in the development and delivery of affordable medical technologies in India and plans to address the low movement of affordable technologies through the development pipeline. It will therefore select and mentor Indian entrepreneurs to further develop their medical technology innovations, which will already have strong proof-of-concept data.

The funded projects will also be mentored from a business-readiness perspective to deliver affordable medical technologies which would have maximum access through public and private markets and fulfil a strong unmet medical need.

Venture Well, a leading organization in innovation and entrepreneurship education is the Technical Facilitator for this program and will provide their expertise in reviewing applications and will design and deliver the Accelerator Workshop.

The Medtech Accelerator workshop was due to be held from 21-25th March in Delhi. However, due to the Covid-19 pandemic, several international restrictions were put into place at the time. Therefore, it was decided to postpone the workshop and subsequently the partners decided to conduct the workshop in a virtual manner.

The workshop, developed and delivered by Venture Well, was aimed at providing innovators with the tools that would allow them to develop and translate their business strategy into action, to take their innovations to the market.

The curriculum of the workshop focused on different aspects of the business strategy, such as understanding the customers, team and resources and business plan development, among others.

To accommodate time zones and manage online meeting fatigue, the weekly plan for the conduction of the workshop was planned such that Mondays focused on presentations and introduction of key topics, Wednesdays on networked learning, where teams participate in group discussions and attend breakouts with mentors and instructors to discuss lecture topics, customer discovery interviews, and activities in the workbook and Friday Fridays focused on 'individual check-ins' between teams and mentors to receive feedback on their work and how it applies to their ventures.

The workshop was inaugurated on 1st August 2020 and the 5-week workshop period came to an end on 12th October 2020 and then mentorship period continued for another 4 weeks where innovators had individual check in times with their assigned and other mentors.

The reception of the workshop was very positive with all the innovators who appreciated the content, design and delivery of the workshop.



Virtual Orientation for the Innovators held before the workshop.



WOMEN LEADERS IN GLOBAL HEALTH CONFERENCE 2020

The 4th Annual Women Leaders Global Health Conference 2020 was convened virtually from 13-15 October, bringing together policymakers, researchers, front line health workers and youth leaders calling for urgent action on diverse leadership in global health.

The event was expected to happen in India this year, however, due to the pandemic, the event was moved digitally. The theme of this year's conference was Connect, Commit and Act. Approximately 1500 people participated from across the different parts of the world.

This year's conference provided an opportunity to reach a broader audience, elevating new voices and further facilitating geography-specific discussion, while maintaining the sense of global community, learning and passion.

The Conference was spanned over three days with dynamic sessions and speakers each day. The sessions were open to everyone and the first two days were geographic-specific with focus on women's leadership in South Asia and Africa. The third day highlighted the global dialogue.

WLGH2020 hosted over 20+ sessions; 50+ influential speakers from diverse sectors in global health around the globe who were a part of plenary sessions, panel discussions, networking and mentoring opportunities.

The Day 1 of WLGH 2020 had the spotlight on South Asia. Some thought-provoking sessions inspired global dialogue around leadership and development challenges focusing on gender equality and parity. Some of the sessions included:

- South Asia women shaping health
- Prioritizing the Mental Health of Women in the Workforce During Emergencies
- Elevating Women's Voices in Popular Culture and the Media
- Learning How to Advocate for Change
- Leadership During Crisis: A Conversation
- Making policy with a gender lens

Secretary, Department of Biotechnology and Chairperson, BIRAC, Dr. Renu Swarup, and Executive Vice Chairperson, Apollo Hospitals, Dr. Shobana Kamineni were the Co-Champions for the WLGH 2020 Conference and also the Co-Chairs of WLGH-International Steering Committee. Dr. Swarup announced that the Global Women Leaders in Global Health conference will take place in India in 2021 and will be hosted by DBT & BIRAC.



Dr Swarup in a session with Dr. Shobana Kamineni on "Leadership during Crisis" gave an overview about the status of vaccine development in India and how with the pandemic; leadership approach has been tailored to meet the needs of masses. She also talked about the gender imbalances in the organisation and outlined the common roadblocks for women advancing their careers in STEM in India and broadly South Asia. Several other officials and dignitaries from the global scientific community also participated in the event.



MAKE IN INDIA

Stakeholder Meeting for Establishing Technology Clusters

A high-level stakeholder meeting was organized by Make in India Cell of DBT/BIRAC on 12th November 2020 through VC to discuss the Strategy for drawing up a well-defined Action Plan for establishing Technology Clusters across the country. The meeting was chaired by Dr. Renu Swarup, Secretary DBT.

The stakeholders deliberated on the Detailed strategy and Action Plan for establishing Technology Clusters. The proposed Technology Clusters can specialize to cater sub-sector requirements for supporting PoC to Pilot (Technology Propellers) and Pilot to Manufacturing (Manufacturing Zones). These Technology Clusters would address a critical gap and help in scaling up the success of Startup ecosystem.

Working group has been constituted for preparing an Action Plan and Detailed Project Report to establish Technology Clusters across the country for further action.



Stakeholder Meeting for Establishing Technology Clusters



NATIONAL BIOPHARMA MISSION

NBM Webinar Series on Ethics in Clinical Research

The National Biopharma Mission conducted a series of 4 webinars on Ethics in Clinical Research during the autumn of 2020. Under the umbrella of the Indo-US Vaccine Action Programme (VAP), DBT and Department of Bioethics of the U.S. National Institutes of Health Clinical Center (NIH) have initiated a collaboration to build Clinical Research Ethics capacity in India. The webinars were organized by National Biopharma Mission on behalf of DBT attracting a total attendance of 1946 participants including 798 women participants.



Glimpses from the series on Ethics in Clinical Research

Ethics in clinical research focuses largely on identifying and implementing the acceptable conditions for exposure of some individuals to risks and burdens for the benefit of society at large.

The webinars addressed ethical issues in clinical research, focusing on vaccine trials and new technologies. As well as providing an overview of current controversies and discussions, the presentations will also try to identify issues that need further ethics research in the context of clinical trial infrastructure development in India. The target audience were clinical researchers, members of ethics review committees and individuals who are involved in developing policies at institutional, state or national levels.

SEPTEMBER
24 **WEDNESDAY 11 A - 6 PM IST**
Scientific and Ethical Standards of Clinical Research in Public Health Emergencies

OCTOBER
08 **WEDNESDAY 2 P - 6 PM IST**
Navigating Ethical Issues in Large Community - based Vaccine Field Trials

OCTOBER
22 **WEDNESDAY 3 P - 6 PM IST**
Challenges in Conducting Human Challenge Studies: Policy Perspectives from India and United States

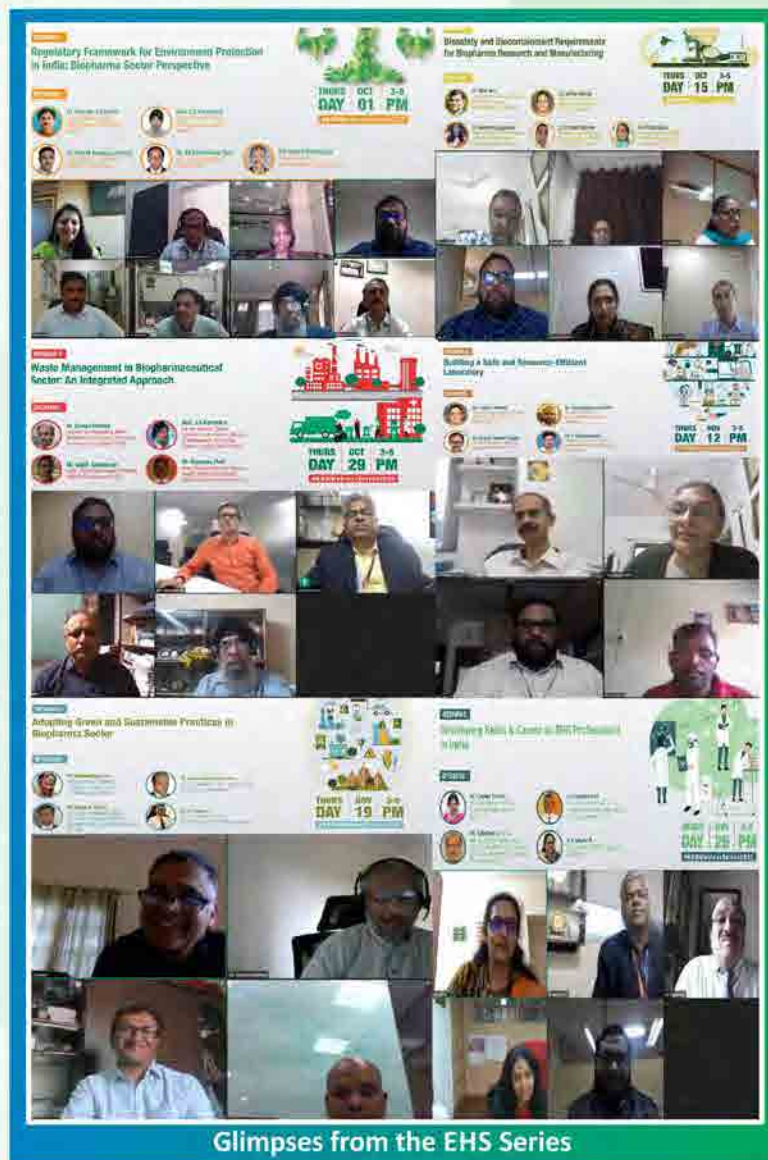
NOVEMBER
05 **WEDNESDAY 4 P - 6 PM IST**
Ethical Perspectives in Planning and Conducting Clinical Trials for Cell and Gene Therapies

Ethics in Clinical Research Webinars

NBM Webinar Series on Environment, Health and Safety Management

The National Biopharma Mission conducted a series of 6 webinars on ‘Environment, Health and Safety’ in the autumn 2020 in order to sensitize and create awareness about environment management and sustainability amongst the stakeholders of biopharmaceutical sector.

The Mission is committed to environmental sustainability by upholding numerous good practices throughout their pursuit of fulfilling their mandate. The coverage of the 6 webinars as part of the Webinar series covered laws for environment protection & waste management in India, environmental and health risks associated with biotech activities, compliance to Indian legislation for biopharma sector, biosafety and biocontainment rules and procedures, risk assessment and mitigation strategies during research/manufacturing, laboratory safety, hazard identification, process safety, environment sustainability – resource efficiency and conservation, use of green technologies, etc. The webinars were conducted through virtual platform; wherein national and international speakers and subject experts shared their knowledge and experience. The series of webinars was attended by biopharma companies, startups, incubators and generally all stakeholders of the biotechnology industry, with a total attendance from 2061 participants including 888 female participants.



Glimpses from the EHS Series

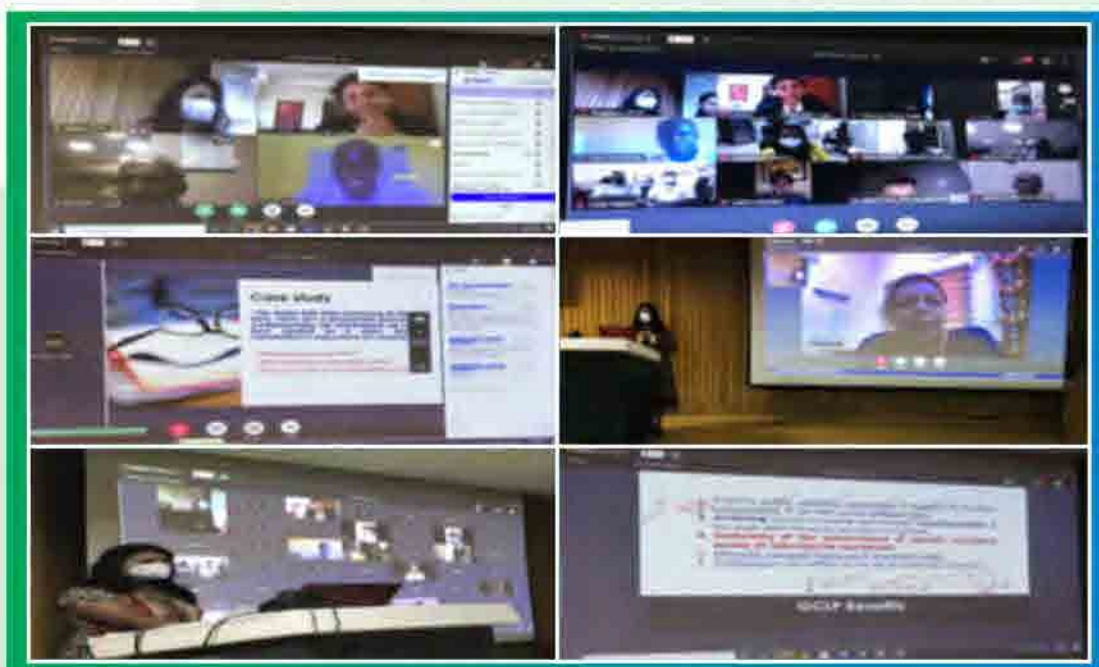
OCTOBER 01 WEBINAR 1 3 - 5 PM IST Regulatory Framework for Environment Protection in India: Biopharma Sector Perspective	OCTOBER 29 WEBINAR 3 3 - 5 PM IST Waste Management in Biopharmaceutical Sector: An Integrated Approach	NOVEMBER 19 WEBINAR 5 3 - 5 PM IST Adopting Green and Sustainable Practices in Biopharma Sector
OCTOBER 15 WEBINAR 2 3 - 5 PM IST Biosafety and Biocontainment Requirements for Biopharma Research and Manufacturing	NOVEMBER 12 WEBINAR 4 3 - 5 PM IST Building a Safe and Resource-Efficient Laboratory	NOVEMBER 26 WEBINAR 6 3 - 5 PM IST Developing Skills & Career as EHS Professional in India

GCLP Training Program

Under the DBT's Resource of Indian Vaccine Epidemiology Network (DRIVEN 2020), Clinical Development Services Agency (CDSA) in consultation with National Biopharma Mission, BIRAC organized and successfully conducted a well-structured comprehensive 2-half days GCLP training program for 05 priority sites which are also funded by NBM to conduct a seroprevalence study on COVID-19, Dengue and Chikungunya earlier. All the selected sites were engaged in DRIVEN 2020 study who attended these two half-day sessions that were conducted on October 12 and 21, 2020 for understanding the blood sample management and testing manual of DRIVEN 2020 as per the GCLP requirements as PRIMARY OBJECTIVE. SECONDARY OBJECTIVES included understanding GCLP principles, seek cognizance in the implementation of GCLP principles in their laboratories, enable all the stakeholders to be aware and get engaged in a clinical trial/research by understanding their roles and responsibilities, explain the blood sample management in DRIVEN 2020, demonstrate working knowledge incorporating the testing manual of DRIVEN 2020.

The knowledge sharers in the training program consisted of national and international faculties, eminent experts and experienced trainers who imparted training to the participating sites through interactive online mode. The total of 82 participants from the 05 sites attended this online GCLP training program. This program was planned in a workshop pattern with lectures/interactive session's and a panel discuss with some exercises. Each participant received an extensive learning material (pre-course reading material) from CDSA before the workshop as SLIM (Self Learning Important Material). All the presentations of this training program are shared with all the participants, post-training. This program offered a platform for all the participants (especially the laboratory team engaged in DRIVEN 2020) to seek answers to various unresolved queries related to GCLP implementations in their work.

This training program ensured readying the site for carrying out GCP compliant clinical trial generating high-quality research data. Also, to overcome critical gaps common at all the sites such as lack of GCP and GCLP training of the research staff (especially laboratory staff for GCLP) and non-familiarity with the prevailing clinical trial regulations as well as best research practices for regulated trials.



Glimpses from GCLP Training Program

Training of Trainers Program at Faridabad

Under the DBT's Resource of Indian Vaccine Epidemiology Network (DRIVEN 2020), National Biopharma Mission, BIRAC organized a 6-days Training of Trainers (ToT) program at Faridabad from 28th October to 2nd November 2020 for the establishment of demographic, development and environment surveillance site where 06 new Demographic Surveillance sites participated to fulfill the objectives – establishment of the surveillance sites; understanding and testing of processes, validations and algorithms; and development of implementation, monitoring and data management mechanism of the sites.

The training program was inaugurated by Dr Renu Swarup (Secretary, DBT) with a keynote address from Prof Narendra Kumar Arora (Executive Director, The INCLIN Trust International). Couple of guest lectures by Dr Sonali Sarkar (JIPMER) sharing her extensive learning experience of RePORT network and Dr Sanjay Juvekar (KEMHRC, Vadu HDSS-Pune) speaks on capitalising on the opportunities and sustaining surveillance sites. More than 37 in-person and 80 site staff participated virtually. This training covered classroom as well as field visits to sensitize on GIS mapping and census enumeration and to get well versed with the electronic data collection platform (SOMAARTH). The training ensured harmonizing the processes to be followed which would eventually reflect the quality of the data collected from all the sites and preparedness for future clinical trials.





Training of Trainers Program at Hyderabad

Under the DBT's Resource of Indian Vaccine Epidemiology Network (DRIVEN 2020), National Biopharma Mission, BIRAC organized a Training of Trainers (ToT) program for 05 existing Demographic Surveillance Sites, NBM grantees at Hyderabad from 19th to 22nd November 2020 for establishing serial sero-surveillance to monitor the trend of SARS-CoV-2, Dengue and Chikungunya infection transmission in the general population with the objectives to establish the serial sero-surveillance to monitor the trend of SARS-CoV-2, Dengue and Chikungunya infection transmission in the general population; laboratories protocol to follow for collection, labelling, storage, shipment and archival; and development of implementation, monitoring and data management mechanism of the sites

Training was provided to 38 in-person and more than 100 online participants including scientific as well as field staff with a focus to sensitize them on good clinical lab procedures, community engagement strategies and on the use of Electronic Data Management platform (SOMAARTH-3), for data collection. All the sessions have been recorded and shared with the participating sites which is being used to train the field staff at their respective sites.



Glimpses from ToT program at Hyderabad

IND-CEPI

IND-CEPI MISSION

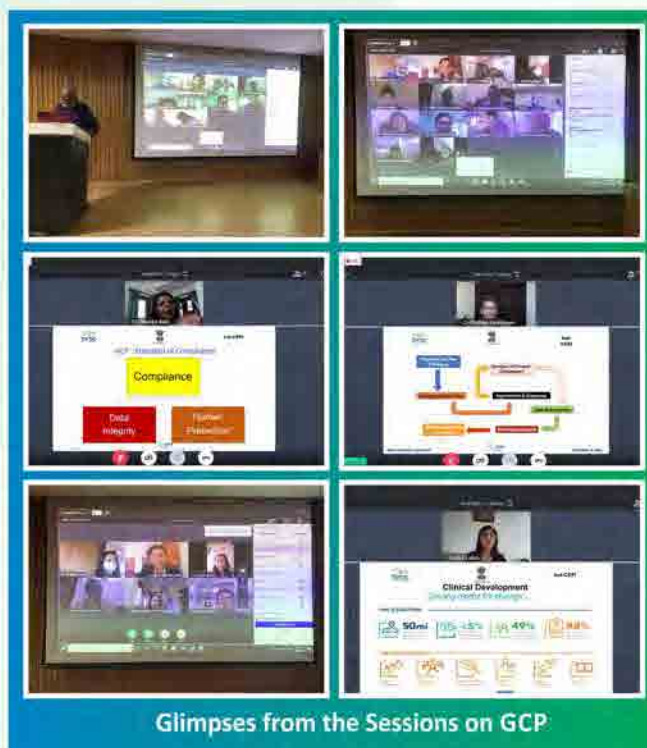
The Department of Biotechnology, Ministry of Science and Technology, Government of India is supporting the implementation of the Ind-CEPIs mission “Epidemic preparedness through rapid vaccine development: Support of Indian vaccine development aligned with the global initiative of the Coalition for Epidemic Preparedness Innovations (CEPI)”, through a dedicated Program Management Unit (PMU) at Biotechnology Industry Research Assistance Council (BIRAC).

Supporting skill development, capacity building, regional networking and development of surveillance frameworks is one of the important mandates of the Ind-CEPI Mission. Aimed at this, the Mission initiated an eCourse Series “Strengthening Clinical Trial Research Capacity in Neighbouring Countries” in collaboration with CDSA, Faridabad. An orientation session to this training program was conducted on 22nd Sep 2020 through online platform. This training envisaged an in-depth coverage of Good Clinical Practice, Ethical considerations in clinical research, Good Clinical Laboratory Practice and Novel vaccine development and immunization policy in a pandemic across 4 Programs and 10 sessions during 9th Oct to 4th Dec 2020. Each program closed with exit examinations, after which certifications were issued.

Participating Countries:

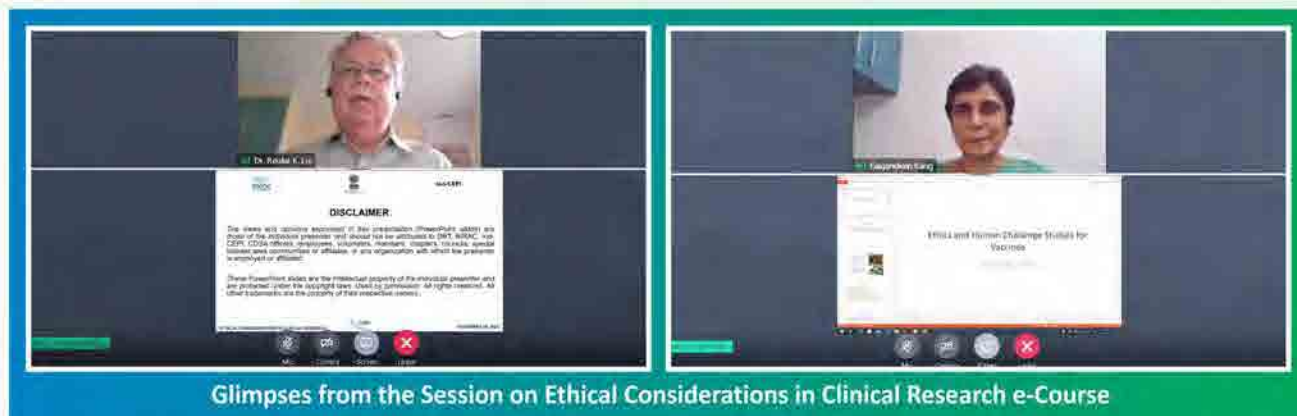
Afghanistan, Bangladesh, Bhutan, Maldives, Mauritius, Nepal and Srilanka

Program 1-Good Clinical Practice (GCP): 4 sessions were held on 9th, 16th, 23rd, 29th Oct 2020 that covered various aspects of GCP by esteemed faculty and key opinion leaders from renowned intuitions from industry and academia. These 4 sessions observed a participation from 75, 90, 60 and 88 participants respectively from neighbouring countries. Major topics covered included GCP & ICH Guidelines, importance & essential components of protocol, investigational brochure, Informed consent, roles and responsibilities of sponsors, investigators and ethics committee, recruitment methods and retaining strategies, types of adverse events, quality assurance, audits and inspections and adoption of Technologies in Clinical Trials, clinical trials of medicinal products in health emergencies, consequences of GCP non-compliance: case studies, research misconduct and assessment.



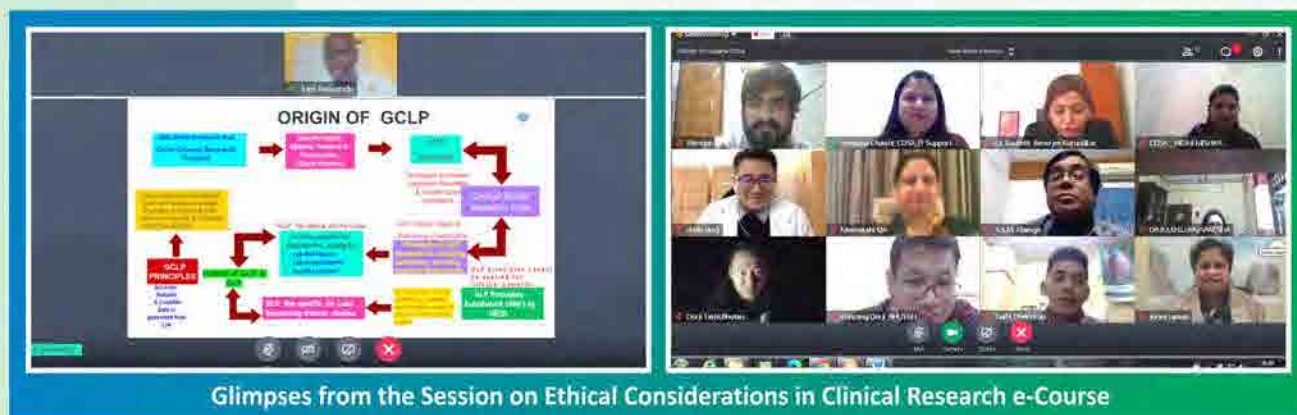
Glimpses from the Sessions on GCP

Program 2-Ethical Considerations in Clinical Research: 2 sessions were held on 6th and 13th Nov 2020 that were attended by 116 and 88 participants respectively. Major topics covered included introduction to research ethics, challenges ahead for the ethics committees, ethics and human challenge studies for vaccines and ethics in population-based vaccine trials, ethical issues in international collaborative research, composition, competence, functioning and decision making of ethics committee, informed consent process overview: relevance, requirements, and documentation and informed consent process challenges vulnerable population, interventional studies, etc.



Glimpses from the Session on Ethical Considerations in Clinical Research e-Course

Program 3-Good Clinical Laboratory Practice (GCLP): 2 sessions were held on 20th and 27th Nov 2020 that were attended by 73 and 68 participants respectively. Major topics covered included Laboratory Quality Management System (LQMS), GCLP principles and guidelines, infrastructure, equipment, reagents & consumables, sample management: the cradle to grave journey, pre-examination, examination and post-examination procedure, sample acceptance/rejection, discussion on writing SOPs, sample storage & disposal, internal quality control, external quality assessment/ proficiency testing, internal audit, quality indicators, safety in laboratories, ethical considerations, risk management and data management.



Glimpses from the Session on Ethical Considerations in Clinical Research e-Course



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Dr. Manish Diwan, Head Strategic Partnership & Entrepreneurship Development (sped.birac@gov.in)



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