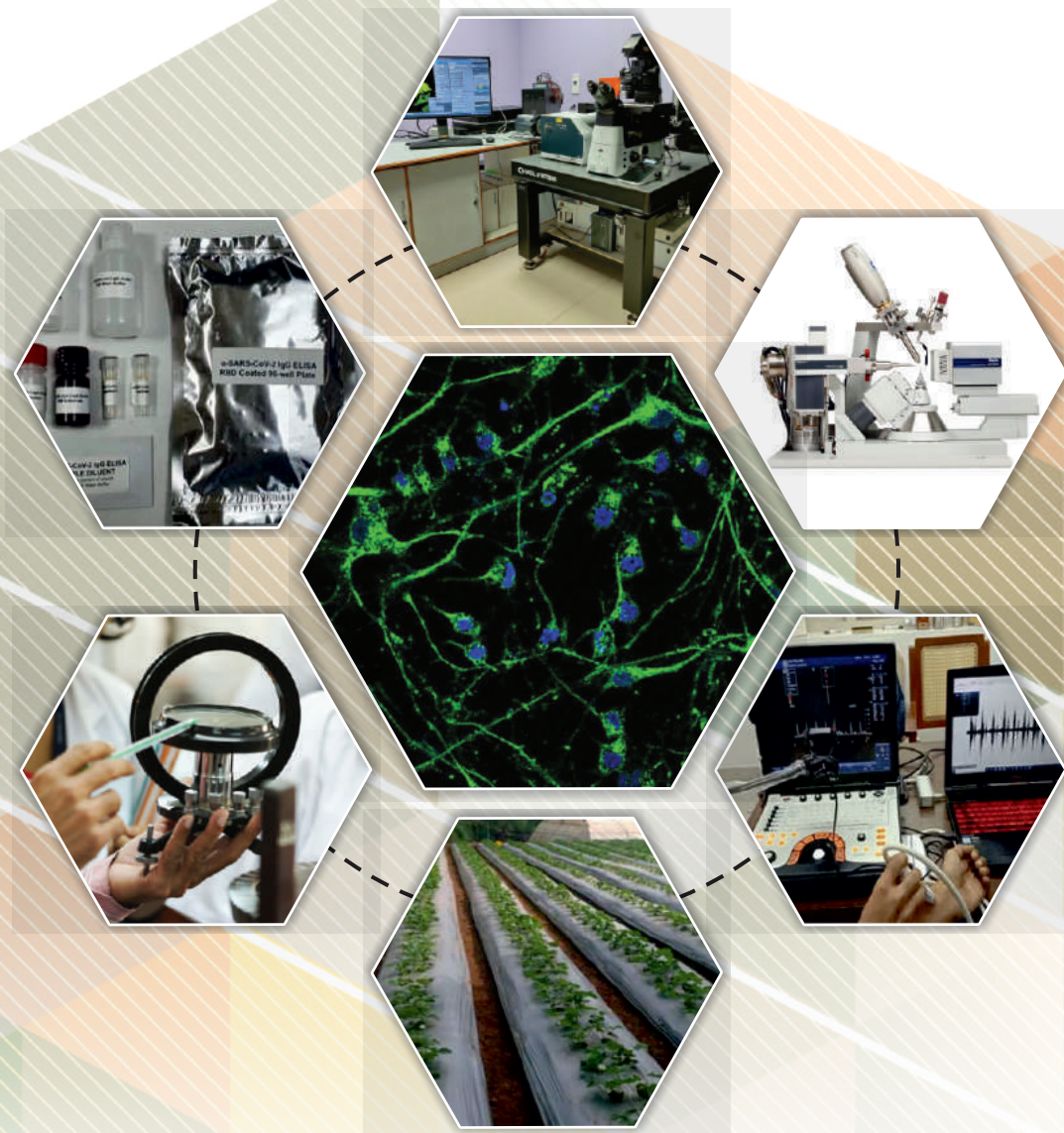




सत्यमेव जयते

# ANNUAL REPORT

## 2021-2022



**Department of Biotechnology**  
Ministry of Science & Technology  
Government of India



# Contents

<b>1. Overview</b>	06
<b>2. Building Capacities:</b>	
- Human Resource Development, Training and Workshops	37
- Research Resources, Service Facilities and Platforms	52
<b>3. Research and Development</b>	
- Agriculture and Allied areas	60
- Bioenergy, Bioresources, Environment & Forest	86
- Healthcare and Medical Biotechnology	111
- Knowledge Generation, Discovery Research, New Tools and Technologies	151
- Biotechnology Science Clusters	166
<b>4. Promoting Entrepreneurship and Industrial Growth</b>	
- Make in India	172
- Start up India	174
- Biodesign Programme	175
- Biotechnology Parks and Incubators Parks	178
<b>5. Building International Collaborations and Partnership</b>	183
<b>6. Special Section: COVID 19</b>	201
<b>7. Societal Programs</b>	
- Biotechnology Based Programme for Societal Development	205
- BIOTECH KISAN	209
<b>8. Promoting Biotechnology in North Eastern Region</b>	219
<b>9. Data Monitoring and Impact Analysis Studies</b>	229
<b>10. DBT Autonomous Institutions and Public Sector Undertakings</b>	252
<b>11. Regulation, Intellectual Property and Legislations</b>	323
<b>12. Administration and Finance</b>	327
<b>13. DBT @ IISF2021</b>	334
<b>Abbreviations</b>	341

## Public Sector Undertakings

### Biotechnology Industry Research Assistance Council (BIRAC), New Delhi

BIRAC, a Government of India Enterprise, not-for-profit, Section-8 company, under Department of Biotechnology, Ministry of Science & Technology facilitates Biotechnology sector by nurturing a pipeline of entrepreneurs, Start-ups, capacity building, connecting Academia-Industry, Investors, Policy initiatives for Medium and Large scale industries in the country. This includes dedicated schemes and programs meant for providing risk capital, targeted funding, establishing high-end Bioincubation centres; technical, business mentorship; legal, IP and regulatory guidance; technology management that help bring innovation excellence for biotechnology firms and making them globally competitive.

#### Vision and Mission:

The vision is 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.”

#### 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.

#### Major Initiatives:

- **Intensifying the Impact of Industrial Innovation (i4)**

The programme provides impetus for pulling the translational ideas past PoC and taking them further along the innovation chain for validation, scale-up, demonstration and pre-commercialization of products and technologies. The programme is operated through two schemes based on the Technology Readiness Level (TRL):

- **Small Business Innovation Research Initiative (SBIRI):** Supports development and initial validation of products/technologies (up to TRL6). Under the SBIRI scheme, 56 products/technologies have been commercialized so far and are market ready or have been transferred. Many technologies have reached early stage of validation. In addition, 45 IPs have been generated through various projects. In the current financial year, one challenge call and one regular call for proposals was announced. The theme of the challenge call was decided after deliberations with area experts. 7 new projects were added in addition to 46 ongoing projects. 5 projects were successfully completed achieving TRL3–6.
- **Biotechnology Industry Partnership Programme (BIPP):** Supports validation, demonstration and pre-commercialization of products/technologies (TRL7 and above). Under BIPP Program, 2 calls for proposals were announced during the current financial year (2021-22). In the 53<sup>rd</sup> call (*challenge call aligned to the Mission Programs of the Government of India*) that closed on 16<sup>th</sup> August, 2021, 36 proposals were received out of which 4 are currently under evaluation. As on 1<sup>st</sup> April, 2021, 39 proposals under various thematic areas were ongoing under BIPP.

The same along with the new sanctioned proposals are being mentored and monitored through Technical Expert Committee Meetings and Online Interactions with PMC Experts. In the current financial year, the BIPP project executed by Kuantum Papers Ltd., Chandigarh got successfully completed at TRL 8 wherein Ethanol Production Plant & Technology for Ethanol Production from Rice Straw has been demonstrated. The pilot plant was run continuously to demonstrate production of 20 Kilolitres ethanol. The Company now intends to set-up a commercial plant.

- Promoting Academic Research Conversion to Enterprise (PACE- AIR and CRS): The Programme has two components as below
  - Academia Innovation Research (AIR): The objective of AIR program is to promote development of Proof-of-concept (PoC) for a process/product by academia with or without the involvement of industry/LLP.
  - Contract Research Scheme (CRS): CRS aims at validation of a process or prototype (developed by the academia) by the industrial partner/LLP.




Since inception of the scheme, 25 calls have been launched and 133 projects have been supported involving 59 sole and 74 collaborative projects. So far, 7 technologies/products developed under the scheme have achieved TRL7 and 13 IPs have been generated. More than 80% of the projects funded under AIR category of PACE so far have achieved TRL3.

- **Social Innovation programme for Products Affordable & Relevant to Societal Health (SPARSH):** Under the program, 14 SPARSH Centres spread over 9 states are established. These Centres are working in six thematic areas of social relevance viz. (i) Maternal and Child Health, (ii) Ageing and Health, (iii) Food and Nutrition, (iv) Waste to Value, (v) Combating environmental pollution and (vi)

Agri-Tech (including reducing post-harvest losses). The 14 Centres currently housed a group of 65 Social Innovators working on various problems of the society. 33 social innovators in three thematic areas namely, “Maternal and Child Health” “Ageing and Health” and “Waste to value” are already graduated, and several novel and interesting ideas to tackle related problems were generated.

- **Innovation clean technology – Scale –up:** Program was launched as a part of the 100 days agenda of the Department of Biotechnology under the Swachh Bharat Mission. Few promising technologies in the area of waste management/waste to energy have been taken forward for Scale up/implementation in association with Municipal Corporations/Urban local bodies (ULBs) identified by the companies. These projects are being implemented with the municipality of Goa; Gram panchayat Bangalore, Municipal corporation of greater Mumbai and Bicholim Municipal Council, Goa. The pilot plants have been erected and data collection is ongoing.
- **Waste treatment at Barapullah Drain:** DBT has leased a land from DDA at the Barapullah drain site. A “Clean Technology Demonstration Park” has been proposed to be developed at this land which will be showcasing technologies for treatment of sewage at Barapullah drain. The proposal for setting up the demo plant has been received and is under processing.

## TRL-8

S.No	Company	Scheme	Technology	One line running description of Technology developed	Picture
1	Kuantum Papers Ltd.,	BIPP	Cellulosic Ethanol Pilot Plant for Rice Straw Management	Ethanol production has been demonstrated	
2	Cadila Healthcare Limited	Covid-19 Consortium call	ZyCoV-D Vaccine	ZyCoV-D is comprised of a DNA plasmid Vector carrying S gene of 2019-nCoV spike-S protein. EUA obtained for both Adolescents (12-18 years) and Adults. Phase III CT ongoing	
3	Health Sensei India Private Limited	Covid-19 Fasttrack call	Health Sensei iOS & web application	Health Sensei iOS & web application connects any vital equipment and transmits real time patient vitals, waveforms and threshold alerts to a remote physician's smartphone. Development and implementation at multiple centres	
4	Varsha BioSciences Pvt Ltd & Tea Research Association, Nagarkatta	CRS	Biopesticide	<i>In vivo</i> multi location/ ecological zones trials of biocontrol formulation produced in 20L fermenters for CIB registration.	