

**No. DSIR/MS/2021/04**  
Government of India  
Ministry of Science & Technology  
Department of Scientific & Industrial Research  
MONTHLY SUMMARY FOR THE CABINET  
(For the month of **April, 2021**)  
(Part-I Unclassified)

**Major achievements during the month of April, 2021:**

**Council of Scientific & Industrial Research (CSIR)**

**Update on Initiatives for COVID-19 Mitigation**

Given the serious situation due to the raging second wave of the pandemic there is tremendous need in the country for make-shift hospitals, ventilators, oxygen concentrators, diagnostics, genomic surveillance of the variant strains and drugs. Towards this, CSIR which has developed a wide range of solutions and products has been working closely with the Government in ensuring timely scale-up and deployment. The various initiatives carried out in the past month or so are highlighted in brief.

- CSIR has been reaching out to various Chief Secretaries highlighting the help CSIR can provide and shared the details of various ready to deploy products along with the industry contacts. The details of products shared include diagnostics such as Feluda powered TATA-MD-CHECK, Dry-Swab diagnostic, Makeshift Hospitals, BiPAP Ventilator, Oxygen Concentrators, Genomic Sequencing support, UV-C disinfection solutions, etc. Discussions were held and are ongoing with several states including Maharashtra, Gujarat, Jharkhand, Punjab, H.P, J&K, Delhi, Telangana, Kerala and others. Support has been extended to few states and work is underway in some areas.
- **Rapidly Deployable Hospitals:** After setting up 11 Makeshift Hospitals with around 350 beds in Ghaziabad, Chennai with NDRF, one in Bhopal and 6 in HP and 2 in Jammu now CSIR is working on **Makeshift Hospital at Safdarjung Hospital and at Lady Harding (total of 300 beds) in New Delhi. In addition,** 500-bed hospital in Himachal Pradesh and 200 bed hospital in Punjab have been planned.
- **Oxygen Concentrators:** A Medical Grade Oxygen Concentrator has been developed by CSIR-IIP, which has 100% indigenous components. This is suitable for 24/7 operation in hospitals and has a scalable design, 100-500 Litres Per Minute (LPM). It can cater to 20-100 patients @5LPM/patient. It has small area requirement. A **presentation of this technology was made before Empowered Group-II which was received well.** While DRDO will set up 500 Oxygen plants, CSIR-IIP technology licensed industry partners will set up 120 plants and will be funded through PM-CARES.

- **Oxygen Concentrator/Enrichment Unit:** In addition to the static Oxygen Concentrator of CSIR-IIP, a portable oxygen concentrator has been developed by CSIR-CMERI. The machine can provide an Oxygen Flow rate 5-10 LPM, >90% and can be used at home setting too. It has been certified by TUV and mechanical performance tested. It is also useful in high altitude areas and the technology has been licensed to four industry partners.
- **SwasthVayu-Non-Invasive BiPAP Ventilation Device:** Non-invasive ventilation devices have been in great demand in the current stage of the pandemic and CSIR-NAL has developed the SwasthVayu which has been tested in clinical trials in over 100 patients and approved by DGHS. More than 1300 pieces have been manufactured and supplied with 1200 pieces to Delhi Government alone. The institute has received good feedback from the State Governments of Jharkhand, Madhya Pradesh, Delhi, and Karnataka.
- **Modular UV disinfectant system,** for rooms, HVAC systems in malls, offices etc has been developed. The UV exposure required to kill the coronavirus was tested and validated at CSIR-IMTech using SARS-CoV-2 viral cultures. As a pilot study, the system has been installed at CSIR HQ Auditorium, air duct system. Two buses of UPSRTC have been equipped with the system. There is no leakage of UV and also there is no formation of ozone. Field trials have been planned.
- **FELUDA Powered TATA-MD-CHECK:** The CSIR-IGIB developed FELUDA (CRSIPR-Cas based paper diagnostic) which is powering the Tata MD CHECK is currently being scaled up to about one lakh tests/day in Maharashtra and other places from the earlier scale of 10,000 tests/day.
- **Dry Swab Direct RT-PCR** method developed by CSIR which is rapid, safe and cost effective and removes step of RNA isolation and uses dry swab has been recommended for wider use by vaccine task force. Further, ICMR has also issued fresh advisory for use in all labs. Earlier advisory by ICMR last year restricted it to centers where there was no automated RNA extractors. CSIR has identified industry partners such as Meril Life Sciences which will provide Reagent A Mix (including Proteinase K and Tris EDTA Buffer) which is required with the Dry Swab method. Further, Apollo Health, Meril, Capital Health and Spice Health are other industry partners where they have developed a kit based on the Dry Swab method.. Meanwhile, CSIR-NEERI which is one of the early adopters of this method has and able to test carry out test in about 3 hours with no backlog and been able to test >50,000 samples.
- **RT-PCR Testing:** 13 CSIR labs have been testing samples for COVID-19 across India with CSIR-CDRI, CSIR-IITR, CSIR-NBRI and CSIR-CFTRI having tested more than 1.0 lakh samples each. All the 13 CSIR labs together have tested about >11,00,000 so far. Further, CSIR-IIIM is supporting the UT of Ladakh by providing instruments and other technical assistance for setting up testing facility at Ladakh.

- **Genomic Surveillance through INSACOG:** CSIR labs CCMB and IGIB as a part of the pan Indian SARS-CoV-2 Genomics Consortium (INSACOG) for Genomic Surveillance for SARS-CoV-2 set up for monitoring the recent emergence of several variants of the virus with increased transmission etc. have been carrying out sequencing of the SARS-CoV-2 genomes and sharing the data with NCDC and other regulators for appropriate action. So far >4500 samples have been sequenced by these two labs alone as part of INSACOG. CSIR labs CSIR-CCMB and CSIR-IGIB have played a pivotal role in identification and characterization of the 'double' 'triple' mutant and the N440K variant observed in South India. Importantly, early data from CSIR-CCMB demonstrated that Covishield vaccine is effective on B.1.617 (Indian Variant or double mutant) allaying many fears.
- In addition, CSIR labs are also working with State Governments and with Kerala, CSIR-IGIB has sequenced about 2400 samples. Recently it has entered into agreement with Maharashtra and Haryana too for genomic surveillance.
- **Clinical Trials:** CSIR has taken up clinical trials of many repurposed drugs with the aim of quickly developing drugs for treatment of Covid-19. The Phase 3 clinical trial of Sepsivac with Cadila and the Phase III clinical trial of repurposed drug for Umifenovir for treatment of Covid-19 have been completed and analysis is in progress.
- Under the CSIR-Ministry of AYUSH Joint Initiative on validation of traditional ayurvedic formulations through scientific evidence, four formulations have been taken up for their clinical safety and efficacy against COVID-19. Meanwhile the therapeutic trial with AYUSH-64 has been shown to exhibit efficacy in the treatment of asymptomatic, mild & moderate cases of Covid 19, as was announced by Ministry of Ayush.

### **New Products/Processes/ Technologies developedd and Technologies licensed transferred during the month**

- CSIR-IICT developed the technology for the synthesis of ortho chlorobenzonitrile by ammoxidation of ortho-chloro toluene for Tatva Chintan Pharma Chem Private Limited, Gujarat.
- CSIR-NEERI developed mud-based improved cookstoves PAVAK-1 and PAVAK-2
- CSIR-CECRI transferred its patented Inhibitor Solution technology to M/s Mahavir Corporation, Maharashtra. It also transferred its technology on Cement Polymer Composite Coatings (CPCC) System for Corrosion Protection of Reinforcing Steel to M/s Jeevach Coating Private Limited, Mumbai.
- CSIR-IHBT Palampur transferred technology for making herbal soap (bars) to Suhavi Producer Company Ltd. (registered FPO), Village Kangar, P.O. Basali, Tehsil Anandpur Sahib, District Rupnagar, Punjab.

## Collaborations/Agreements/MoUs Signed (National)

- CSIR-CDRI signed an agreement with Tulsi Rural Development Trust, Chennai for Pre-Clinical toxicity testing & safety evaluation of carbon nanospheres conjugated HAT activator (CSP-TTK21) in non-clinical models on 27/04/21. Another agreement executed with Reliance Rasayan Pvt Ltd., Ahmedabad on Repurposing of a known drug Almitrine and Ifenprodil which may be useful as COVID-19.
- CSIR-CIMFR signed the following agreements:
  - Tripartite Agreement between Western Coalfields Limited, Nagpur; Maharashtra State Power Generation Company Limited, Mumbai and CSIR-CIMFR, Dhanbad for Coal Sampling Work on 06-04-2021.
  - Tripartite Agreement between Northern Coalfields Limited, Singrauli, M. P.; M/s. Jhabua Power Limited, Gurugram, Haryana and CSIR-CIMFR, Dhanbad for Coal Sampling Work on 06-04-2021.
  - Tripartite Agreement titled “Development and adoption of Real Time Prognosis System for cost effective safe operation of mobile machinery, show cased demonstration of Dumper Fleet” among CSIR-CIMFR, Dhanbad; Lulea University of Technology, Sweden and Indian Institute of Technology, Kharagpur on 08-04-2021.
  - Tripartite Agreement between South Eastern Coalfields Limited (SECL), Bilaspur, Chhattisgarh ; M/s. Jindal Power Limited, Raigarh, Chhattisgarh and CSIR-CIMFR, Dhanbad for Coal Sampling Work on 13-04-2021.
  - Tripartite Agreement between Eastern Coalfields Limited (ECL), Sanctoria, PO. Dishergarh, Burdwan; M/s. Talwandi Sabo Power Limited, Mansa, Panjab and CSIR-CIMFR, Dhanbad for Coal Sampling Work on 26-04-2021.
  - Tripartite Agreement between Eastern Coalfields Limited, Sanctoria, PO. Dishergarh, Burdwan; Nabha Power Limited, Patiala, Punjab and CSIR-CIMFR, Dhanbad for Coal Sampling Work on 27-04-2021.
  - Tripartite Agreement between Eastern Coalfields Limited (ECL), Sanctoria, PO. Dishergarh, Burdwan; M/s. KSK Mahanadi Power Company Limited, Hyderabad and CSIR-CIMFR, Dhanbad for Coal Sampling Work on 28-04-2021.
- CSIR-CSIO signed an agreement for Collaborative Research with ATOS Instruments Marketing Services on 08.04.2021.
- CSIR-IGIB signed an MoU signed Ashoka University on 19-April-2021 for joint research in areas of infectious diseases, human immunology, cancer biology, synthetic biology, data science, artificial intelligence and machine learning in medicine, rare diseases, genomics and therapeutics
- CSIR-IHBT signed the following agreements:
  - An agreement signed with IIT Mandi on 13th April, 2021 for academic and research collaborations
- CSIR-IICT signed the following agreements:
  - Collaboration in R&D activities related to development of NCEs, API Intermediates and Reference Standards (Alder Research Chemicals Private Limited)

- With Bulk Drugs Manufacturers Association (India) for a study to identify the nature of industrial pollutants in Hussain Sagar lake and validate it with water quality data observed during COVID-19 lockdown.
- Bharat Biotech International Limited, Hyderabad for a process optimization for the synthesis of Agonist Molecule at 500g scale
- MoU with VIT-AP University, Amaravati on 10 April 2021 towards, Teaching, Research and Training in selected and advanced thrust areas S&T.
- MoA with DBT on 7th April 2021 in the area of Organic synthesis & process chemistry, INDIGO-effective & affordable flu vaccine for the world.
- CSIR-IMMT: MoU with Siksha-O-Anusandhan University for Academic and Research collaborations; License agreement for process for producing biochar from waste biomass with M/s Indian Plant Feeds
- MoU signed between CSIR-NBRI & Agricultural and Processed Food Products Export Development Authority (APEDA) for development of new floral varieties, expansion of domain areas under floriculture

### **Collaborations/Agreements/MoUs Signed (International)**

- CSIR-IGIB signed MoU with The University of Tokyo on 27-April-2021 for the following:
  - Collaborative Research in the field of CRISPR Cas9 and related components
  - Collaborative studies on DNA, RNA, protein structural insights and interactions; Collaborative studies on therapeutic genome editing, cellular processes and biological systems

### **High impact S&T services offered**

- CSIR-CRRI carried out failure analysis and design of remediation works for Silewani Ghati Hill Road.

### **Outreach Activities (Jigyasa, Skill Development, and others)**

- Under the Jigyasa, launching/adoption of 295 Atal Tinkering Labs (ATLs) across the country was done on April 09, 2021.
- CSIR-IMTECH-Merck High End Skill Development Centre organized the following webinars:
  - 5th April, 2021: Vectors for Gene Cloning- 100 participants; 19th April, 2021: DNA Manipulating Enzymes- 100 participants
  - Virtual Workshop Program: A collaborative Initiative by CSIR-IMTECH-Merck High End Skill Development Centre and Department of Biotechnology, AKS University, Satna, (M.P.) April 26-30, 2021: Cancer Tools & Techniques- 150 participants
- CSIR-NEERI organized a storyboard and quiz programme on water and eco-rejuvenation

### **Conferences, Workshops, etc. organized, if any, during the month**

- CSIR-ISTAD under the PRABHASS organised Diaspora Interaction Meeting and web talks of Diaspora from USA, Japan, Qatar with experts from Indian Institutes

(CSIR, DAE, Academic Institution, NCERT) on 7th April 2021 (Colon Cancer problem and novel biomarker based targeted therapy); 9<sup>th</sup> April 2021 (Nanomedicine (Drug Delivery Systems and anaerobic micro-environment of cancer cells); 12 April 2021(Intelligent Transportation System for Smart Cities in Developing Countries); 15 April 2021 (Planning Microbiome, Nutrition and Long-Term Health Outreach Programme for School Children) and 28 April 2021(Artificial brain and developing Natural Intelligence).

- Conference and interaction meeting on Waste Heat Recovery Systems; Carbon Capture and Storage Technology; and Energy Solutions for Green House Farming; with Korean Delegation on 21-04-2021 at 12:30 PM IST and CMERI, IIP, NEERI, NIIST, CSMCRI participated.
- Discussion/Interaction meeting of CSIR-IIP and Colombian Biofuel Research project team (Colombian Oil Industry, Airforce, R&D Institute)
- CSIR-CECRI: Discussion with All-Russian Scientific Research Institute of Aviation Materials, Moscow on collaborative R&D (Apr 19).
- CSIR-Integrated Skill Development Facility was inaugurated by Smt. Ranjanben Dhananjay Bhatt, MP (Lok Sabha) during the Parliamentary Committee on official language visit.
- CSIR-CFTRI: Food Machinery Portal - A B2B platform for promoting and nurturing MSMEs in food processing was launched on 27.04.2021.

#### **Visit of high-level dignitaries to the Institute/Laboratory**

- The Second Sub-Committee of Parliament on Official Language visited CSIR-CFTRI on 17.04.2021.

#### **Events to mark India@75 or Azadi Ki Amrit Mahotsav**

- The following two success stories of CSIR were showcased as webinars during the month under the #AzadiKaAmritMahotsav and CSIR #80Years\_80SuccessStories series:
  - Eco-friendly rock excavation techniques or strategic and infrastructure projects
  - S&T interventions in medicinal and aromatic plants for rural development in NE India

#### **DEPARTMENTAL ACTIVITIES**

DSIR's mandate is to promote Industrial Research and Development besides technology promotion, development and utilization. In order to promote and nurture Research and Development in the country, Industrial R&D Promotion Programme of the department gives recognition and registration to in-house R&D units of industries, not for profit Scientific and Industrial Research Organizations (SIROs), Public Funded Research Institutions (PFRIs) and periodically renews these recognition / registration under the respective Government Notifications (as amended from time to time), by virtue of which these organizations are able to obtain Customs duty exemptions, Goods & Service Tax (GST) concessions and Weighted tax deductions on R&D by Industry (under section 35(2AB) of IT Act). This scheme helps in encouraging industrial R&D in the country.

## **PUBLIC SECTOR ENTERPRISES**

### **Central Electronics Limited (CEL)**

CEL is an enterprise under DSIR having an objective to commercially exploit the indigenous technologies developed by National Labs and R&D institutions in the country. CEL has developed a number of products for the first time in the country through its own R&D efforts and it continues to emphasize its leading role in the area of solar photovoltaic systems, electronic gadgets for Railway and other strategic electronic equipment/components among others.

- The company manufactured electronic components/systems/SPV products worth Rs. 440.03 Lakhs during April, 2021.
- Sale of items worth Rs. 521.61 Lakhs was realized during April, 2021.

### **National Research Development Corporation (NRDC)**

NRDC continues to lay emphasis on broadening and strengthening the technology resource base by nurturing long term relationships with R&D institutions as well as universities, technical organizations, industries and also individual inventors.

- NRDC has licensed two technologies on 'Seaweed Extract Fertilizers' and 'Recombinant Ectoine deep sea bacteria for skin care and cosmetic application' and has been assigned six technologies by individual innovator ; one technology by Kumaun University, Nainital during April, 2021.
- NRDC has collected premia of Rs.1.5 Lakh from respective technologies during April, 2021.

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