

**No. DSIR/MS/2020/06**  
Government of India  
Ministry of Science & Technology  
Department of Scientific & Industrial Research  
**MONTHLY SUMMARY FOR THE CABINET**  
(For the month of **June 2020**)  
(Part-I Unclassified)

**Major achievements during the month of June 2020:**

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

**Key contributions and Activities of CSIR**

Coronavirus is spreading rapidly all over the world including India and the month of June 2020 was centered on the mitigation of Coronavirus pandemic. CSIR is working on several technologies and innovations aimed at mitigating the rapid spread in the country. CSIR's strategy evolved in March to address the COVID-19 comprehensively through the following 5-verticals and more advances and progress was made in June 2020:

- Digital and Molecular Surveillance;
- Rapid and Economical Diagnostics;
- Repurposed/New Drugs and Vaccines;
- Hospital Assistive Devices and PPEs,
- Supply Chain and Logistics

All CSIR labs are contributing to these verticals and CSIR is actively engaged in identifying suitable Industry and PSU partnerships for each and every vertical such that the products and technologies developed are readily scaled up and deployed in the country. CSIR is also working in close synergy with other ministries and departments and state governments in the mitigation of COVID-19 outbreak.

**Digital and Molecular Surveillance**

- Till the end of June 2020, CSIR labs have sequenced more than 500 viral genomes from India and of these 258 genomes were deposited in the global database. With more sequences that would be deposited, it would pave way for detailed analysis of Indian viral strains and India specific mutations if any.
- CSIR-Centre for Cellular and Molecular Biology (CCMB) has come out with an interactive web app named Genome Evolution Analysis Resource for COVID-19 (GEAR-19). The web app analyses the outcome of efforts of the 33 contributing laboratories across the country that till the end of June had sequenced 1,031 genomes of SARS-CoV-2. The identification of clades or viral groups plays an important role in understanding probable origin of a virus infecting a certain

population and also in testing drugs. GEAR-2019 also gives a timeline of distribution of virus belonging to different clades. <https://data.ccmb.res.in/gear19/>

- In the area of digital surveillance, after the pilot study in the Kolar community, similar community surveillance has been initiated in Jamshedpur which would help in tracing and isolation of infected and patients at risk of infection

### **Rapid and Economical Diagnostics**

- 11 labs of CSIR across the country are involved in SARS-CoV-2 sample testing and during the month of June nearly 70,000 samples were tested.
- **CSIR labs engaged in Sample Testing of Coronavirus:**
  - CSIR-Centre for Cellular & Molecular Biology (CSIR-CCMB), Hyderabad
  - CSIR-Institute of Microbial Technology (CSIR-IMTech), Chandigarh
  - CSIR-Indian Institute of Integrative Medicine (CSIR-IIIM), Jammu with NCDC, Delhi
  - CSIR-National Environment Engineering Research Institute (CSIR-NEERI), Nagpur
  - CSIR-Indian Institute of Toxicological Research (CSIR-IITR), Lucknow
  - CSIR-Institute of Himalayan Bioresource Technology (CSIR-IHBT), Palampur
  - CSIR-Central Drug Research Institute (CSIR-CDRI), Lucknow
  - CSIR-Central Leather Research Institute (CSIR-CLRI), Chennai
  - CSIR-Indian Institute of Petroleum (CSIR-IIP), Dehradun
  - CSIR-North East Institute of Science & Technology (CSIR-NEIST), Jorhat
  - CSIR-National Botanical Research Institute (CSIR-NBRI), Lucknow
- CSIR labs supporting State Governments in Testing:
  - CSIR-Nation Institute of Oceanography (CSIR-NIO), Goa
  - CSIR-National Institute of Interdisciplinary Science & Technology (CSIR-NIIST), Thiruvananthapuram
  - CSIR-Indian Institute of Chemical Biology, (CSIR-IICB) Kolkata
- CSIR- NBRI has established an “Advanced Virology Lab” for testing COVID-19. The facility has been developed based on the guidelines of ICMR and WHO. It is a Bio Safety Level (BSL) 3 level facility. The facility will add to the testing capacity of Uttar Pradesh (UP). A team of scientists and researchers from the CSIR-CIMAP will also join the NBRI team for the testing of COVID samples.
- CSIR labs are working towards newer technologies and optimization of existing technologies to increase the testing capacity. In this context, a protocol of diagnostic methodology of using dry swab method and RNA extraction free, developed by CSIR-CCMB was submitted to ICMR. This will save reagents, time and pave way for increased testing.

- Based on technology of CRISPR-Cas Diagnostic test (FELUDA) developed by CSIR-IGIB, TATA Sons is manufacturing the kits in for the purpose of regulatory approval and submitted to ICMR.
- The RT-LAMP diagnostic assay developed by CSIR-IIIM and Reliance Industries Limited has been submitted to ICMR for approval, which has been assigned to NIV, Pune.
- CSIR labs were focused on making improvements in the technology towards enabling pooling (Nested PCR), testing larger numbers (sequencing-based testing), making it easily deployable (Nanopore based testing) and cost-effective (RNA isolation free testing).
- CSIR-CCMB and Syngene are working on Next Generation Sequencing (NGS) based large scale testing of COVID-19 patient samples; and have started validating the approach and amplicons using 4 barcode combinations.

### Repurposed/New Drugs and Vaccines

- Repurposed Drugs: 25 key drug molecules have been identified, of which 8 not manufactured by the Indian industry have been shortlisted for CSIR development. The criteria for shortlisting included the availability of raw material, supply chain management issues, cost, etc. among other factors. Many CSIR labs are working on these candidates.
- CSIR-IICT developed the process for Favipiravir synthesis and Provided API and Key starting materials to Cipla and Cipla is carrying out a clinical trial of Favipiravir. CSIR is also working on taking of combinations of other drugs with Favipiravir for clinical trials with industry partners. This is to improve the efficacy of treatment against Covid19
- Clinical Trial of Umifenovir: CSIR-CDRI Lucknow, received permission for carrying out Phase III Clinical Trial of an existing antiviral drug Umifenovir on Covid19 patients. It is a randomised, double blind, placebo controlled trial of efficacy, safety and tolerability of the repurposed drug Umifenovir. The trial will be carried out at King George's Medical University (KGMU), Dr. Ram Manohar Lohia Institute of Medical Sciences (RMLIMS) and ERA's Lucknow Medical College & Hospital, Lucknow. Successful completion of the trial will provide economical therapeutic option to COVID-19 patients as it is a generic drug.
- Clinical Trials on Ayush Drugs: CSIR with ICMR and Ministry of Ayush began conducting clinical trials for Ayurveda interventions as prophylaxis and as an add-on to standard care to COVID-19. They include Ayurvedic medicines such as Ashwagandha, Yashtimadhu, Guduchi Pippali, and a polyherbal formulation (Ayush-64).
- Sepsivac Clinical Trials: CSIR and Cadila Pharmaceuticals are conducting three clinical trials to evaluate the efficacy of an existing gram-negative sepsis drug, called Sepsivac (Mw) for COVID-19. The three trials are on critically ill Covid19 patients; hospitalized (but not critically ill) Covid19 patients; high-risk Contacts of Covid19. The clinical trial on critically ill Covid19 patients is progressing well at AIIMS-Bhopal, AIIMS-New Delhi and PGI Chandigarh. Before the trial on critically ill patients, the

safety of the drug was established in four patients with severe COVID-19 infection and adjunctive Mw

- Clinical trials on convalescent plasma therapy: CSIR-IICB received approval for a clinical trial for plasma therapy. The plasma therapy RCT has been initiated in Kolkata. The trial is underway.
- The first Phytopharmaceutical trial of AQCH was initiated on 5<sup>th</sup> June by Sun Pharma and is progressing well.
- CSIR is coordinating the DDH2020 Hackathon along with AICTE, MHRD and Office of PSA towards promoting in-silico drug discovery against SARS-CoV-2 among students and researchers.

### **Hospital Assistive Devices and PPEs**

- Technical know-how on the technology of BiPAP ventilator developed by CSIR-NAL is undergoing clinical trials in various hospitals. The technology has been transferred to three more industries:
  - Datasol (B) Pvt. Ltd- Bangalore,
  - Unimech Aerospace - Bangalore,
  - NFOTEC Eng. Pvt. Ltd, Bangalore
- CSIR-Central Scientific Instruments Organisation (CSIR-CSIO) has developed a technology for precision manufacturing of safety goggles for the healthcare professionals involved in treating high-viral load patients as in the case of the COVID-19 pandemic. The technology was transferred to the Sark Industries, Chandigarh on 26 June 2020 for its commercialisation and mass production.
- CSIR-NCL has developed an indigenous nasopharyngeal (NP) swab for collecting samples from the throat cavity of COVID-19 patients. CSIR-NCL team successfully worked out the detailed specifications of NP swab polymers and adhesives. The specifications included medical grade materials that must be used for manufacture, the swab design and the packaging and sterilization protocols. The process knowhow of indigenous NP swabs has been transferred to a Mumbai-based chemical company.
- Makeshift buildings for hospitals, housing and other purposes developed by CSIR-AMPRI and CSIR-CBRI was transferred to Janata Tents and Events on 29 June 2020 at CSIR-AMPRI. The know-how will help in erecting makeshift structures to deal with COVID-19 emergency and other purposes. The technology utilizes light-weight structures which are foldable, easy to erect, safe, reusable and cost-effective
- Intubation Hood: Developed by CSIR-IMMT for doctors who require a transparent hood when carrying out treatment procedures such as intubation. Dentists can also use these during any oral examination. Based on the need of doctors at AIIMS Bhubaneswar, Intubation hoods are designed and delivered. Industry partner: M/s Gitanjali Awards Pvt. Ltd
- Medical Waste Disinfection Machine: CSIR-IITR in tie-up with a Lucknow based start-up has developed a microwave-based disinfection machine 'Optimiser' which can make PPE kits and N95 masks reusable within 10 minutes. As many as 20 PPE

kits and over 40 N95 masks can be disinfected in one go using the microwave technology within 10 mins. A PPE kit and an N95 mask can be recycled and reused 20 times using the 'Optimiser' machine. Over 2,000 PPE kits can be disinfected in a day which will save the cost of the new safety gears. The All India Institute of Medical Sciences (AIIMS) in Jodhpur and Sanjay Gandhi Post Graduate Institute of Medical Sciences (SGPGIMS) in Lucknow have validated the technology.

- CSIR-CECRI developed a zero-emission and cost-effective electrochemical technology by which sodium hypochlorite can be generated by directly oxidizing sodium chloride (saltwater) solution. Sodium hypochlorite is an effective disinfectant against bacteria, viruses, fungi and Mycobacterium.
- Oxygen is required in higher concentration for oxygen therapy in hospitals. A team of scientists at CSIR-NCL have demonstrated the use of hollow fiber membranes to enrich oxygen. The Oxygen Enrichment Unit (OEU) developed by CSIR-NCL is efficient in providing 35-40% oxygen concentration from air with an adjustable flow rate of 0.5-15 lit/min. They are now working with a start-up GENrich Membranes and Bharat Electronics Ltd for scaling up their manufacturing.
- Poly Ti nano coated face masks developed by CSIR-NCL are being manufactured (20,000 masks) and 75,000 pieces of UV sterilized hydrophobic facemasks developed by CSIR-CMERI which is SITRA approved are being produced by industry partners. Further, 18,000 Pedal operated hand washers have been scaled up by CSIR-CSIO and industry partner Jupiter Aqua Lines.
- Functional testing of the CSIR-CSIO developed prototype of Respiratory Assistance Intervention Device, (Respi-AID), as per targeted specifications has been completed using Ventilator calibrator and artificial test lung. Incorporated oxygen and air blending circuit with oxygen concentration monitoring in the developed prototype. Developed PEEP module and incorporated in the developed prototype. Detailed design files are prepared. Validation of the developed prototype is done through anaesthesiologist of GMCH, Chandigarh. Certification testing through Apex Quality Certification Services Pvt. Ltd., Jaipur, completed. Technology transfer is done with M/s. Sivapriya Exim Pvt Ltd. Chennai
- CSIR is focussed on developing PPEs and hospital assistive devices which are duly certified by certification agencies and transferred to industry for scale-up and deployment. Nearly 65,000 Coveralls which have been certified by SITRA have been produced so far in partnership with MAFL which can be scaled up further.
- Electrostatic disinfectant developed by CSIR-CSIO is being produced by industry partners and 130 pieces have been produced that would help in sanitization efforts.
- UV sterilized Hydrophobic Facemask developed by CSIR-CMERI is SITRA approved and 75,000 have been produced. Power Tech Mining and Gaurav Pharmaceuticals are industry partners.
- Pedal operated hand washer developed by CSIR-CSIO and Jupiter Aqua Lines is the industry partner and >18,000 have been produced.

### **Supply Chain and Logistics**

- CSIR Supply Chain & Health Marketplace IT Platform (Aarogyapath) was launched on 12<sup>th</sup> June 2020. <https://www.aarogyapath.in> a CSIR National

Healthcare Supply Chain Portal that aims to provide real-time availability of critical healthcare supplies was launched. AarogyaPath would serve manufacturers, suppliers and customers. During the present national health emergency arising out of the COVID-19 pandemic, where in there is severe disruption in supply chain, the ability to produce and deliver the critical items may be compromised due to a variety of reasons. The **information platform** named **AarogyaPath** with a vision of “*providing a path which leads one on a journey towards Aarogya (healthy life)*” was developed to address these challenges.

### **Outreach Activities**

In addition to the technologies and products being developed and various S&T based activities and interventions, CSIR labs are also engaged in fulfilling scientific social responsibility and have undertaken a wide variety of outreach programs during June 2020, which are listed.

#### **Awareness Campaigns**

- CSIR-NISCAIR and CSIR-CCMB released awareness campaign posters for do's and don'ts in workplaces as the lockdown began lifting this week.
- The World Environment Day was celebrated across almost all CSIR laboratories. Webinars, competitions and lectures were the events held by the labs. Many lab theses focused on COVID-19 initiatives.
- With India in the unlock mode, personal hygiene and care are important to safety and prevention. CSIR has been spreading awareness and public interest messages through social media. CSIR issued a poster on toilet hygiene.

#### **Distribution of Sanitizers/Disinfectants:**

- As a part of its ongoing efforts to support the Nation's fight against Covid-19, BHEL handed over an Electrostatic Disinfectant Machine designed by CSIR-CSIO and manufactured by BHEL's Haridwar unit, for disinfecting the New Delhi Railway Station.
- CSIR-NEERI has joined hands with District Legal Services Authority (DLSA), Nagpur and NGOs to impart training in sanitisation techniques to homeless and migrant labourers staying in Nagpur.
- CSIR-IIP supported AIIMS, Rishikesh, Uttarakhand in fighting against COVID19 pandemic by providing 200 liters of in-house made hand sanitizer.

#### **Online Internships and Webinars**

- CSIR-NEERI in association with CARE INC, USA, announced virtual (work from home) internships to Graduates and Post-Graduates students.
- CSIR has announced ONLINE Summer Research Training Programme (CSIR-SRTP) to engage the students during the Covid-19 and more than 16,000 applications have been received.
- In an effort to create awareness about the usefulness of medical and aromatic plants CSIR-CIMAP announced a photography competition.
- CSIR-IMMT-CII Webinar conducted a on Maximizing the Recovery of Iron Values from Lean and Low-grade Iron Ore Resources.

- Online Webinar on the Fight Against COVID - 19: A Peek into the Global Scene. Was organized on 13th June 2020 to hear experts discuss Live on CSIR-NEERI in Marathi. It saw participation of speakers from different countries along with DG CSIR.
- Webinar on Hospital Assisted Devices and PPEs was held involving several CSIR labs, industry partners and certification agencies to elucidate about the development of hospital devices and PPEs on FB page of CSIR
- As a part of the outreach and science communication efforts of CSIR to make the public aware about COVID-19 disease, cure, therapies, etc., regular webinars and discussions by experts are organized. During the month, a webinar on “Plasma Therapy and Vaccines: an R&D perspective on COVID-19 Management” was organized in Bengali through Facebook live.

### **Societal Sector**

- Under CSIR Aroma Mission, in Tipri Village, Bhaderwah, Doda, UT of J&K, harvesting of lavender flowers was done for the extraction of aromatic oil. Also in Bareilly, Uttar Pradesh, cultivation of Chamomile, vetiver and palmarosa were done for extracting essential oils.
- About 50 kg seed of wild marigold variety Him Swarnima was distributed to the farmers of Aspirational district Chamba (HP) under AROMA MISSION by team CSIR-IHBT for plantation in 45 acres of land.
- CSIR-IMMT donated two trucks full of Terafil water filter (1K) through CSIR-CGCRI that works without power to south 24 Parganas district of West Bengal that lost power line and water source contaminated due to cyclone Amphan.
- Wild marigold variety Him Swarnima (12 kg seed) was also given to the society for plantation in farmers field at Chowari block, district Chamba (HP).
- About 50 kg seed of wild marigold variety Him Swarnima was distributed to the farmers of district Mandi (HP) under CSIR AROMA MISSION by team CSIR-IHBT for plantation in 43 acres of land.
- CSIR-CGCRI carried out humanitarian relief to those affected by Cyclone Amphan and CSIR-IMMT's developed Terafil water filter are being distributed with help of sister lab, CSIR-CGCRI and Bharat Sebasram Sangha in Amphan affected areas of South 24 Parganas of West Bengal.
- Nagpur Municipal Corporation along with CSIR-NEERI and Nagpur Smart and Sustainable City Development Corporation Limited (NSSCDCL) and CSIR-IIP launched an application developed using Google Earth & a dashboard to provide updated information.
- Hon'ble CM of Assam, Shri Sonowal requested senior scientists of CSIR-NEIST to study reasons for tremors reported from the Baghjan region, where a leaking gas well caught fire.
- CSIR labs across the country celebrated the 6th International Yoga day on 21 June through an array of programme. While some labs organized live yoga demonstration sessions, other organized talks and lectures.
- CSIR-CIMAP developed the improved variety of mentha. Called CIM\_Unnati, the variety will be helpful to enhance rural economy. Commercial scale demonstration

was organized by CSIR-CIMAP under the CSIR Aroma mission. Farmers in Uttar Pradesh could distill 18 kg oil from less than 1/5<sup>th</sup> of an acre.

- CSIR-CIMAP facilitated the supply of 300 litres of Hankool Plus developed by the Institute's incubation facility, M/s. Sai International, Lucknow. The product is being sold by the company by the brand name 'Sai-tizer'

## Patents Update

Patents Filed		Patents Granted		Patent Prosecutions in May 2020	
India	Abroad*	India	Abroad*	India	Abroad
29	19	24	11	37	113

\* Data reported to IPU during the said period and may increase later during national phase entries

## 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.

### **Industrial R&D Promotion Programme**

#### **Recognition/ Registration and renewal of In-house R&D in Industry**

- 12 in-house R&D units of industries were granted recognition as well as registration certificates.
- 36 in-house R&D units of industries were granted renewal of recognition as well as renewal of registration certificates.

### **Scientific and Industrial Research Organization (SIROs)**

#### **Recognition/ Registration and Renewal of SIROs**

- 04 SIROs were granted recognition as well as registration certificates.
- 16 SIROs were granted renewal of recognition and 14 were granted renewal of registration certificates.



## **Public Funded Research Institution (PFRIs) Registration and Renewal of PFRIs**

- 04 PFRIs were granted registration certificates.
- 01 PFRI was granted renewal of registration certificate.

## **Fiscal Incentives for R&D by Industry**

- 99 reports in form 3CL submitted to CCIT under Section 35(2AB) of IT Act for weighted tax deduction on industrial R&D involving a total amount of Rs. 129890.75 lakhs.

## **Promoting Innovations in Individuals, Start-ups and MSMEs(PRISM)**

- Three projects were completed successfully during June, 2020.

## **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.1172.83 Lakhs during June, 2020.
- Sale of items worth Rs.964.59 Lakhs was realized during June, 2020.

### **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 been assigned 03 technologies by National Sugar Institute, Kanpur and licensed the technology on fabrication of PPE suits to 03 companies and one technology on Detection of neonatal hyper-bilirubinemia June, 2020.
- NRDC has collected premia of Rs 34.00 Lakh from licensing of technologies during June, 2020.