



**SCIENCE & TECHNOLOGY
EFFORTS IN INDIA**
ON
COVID-19



VIGYAN PRASAR

[AN AUTONOMOUS ORGANISATION OF
DEPARTMENT OF SCIENCE & TECHNOLOGY]
GOVERNMENT OF INDIA

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सत्यमेव जयते
FOREWORD

डॉ हर्ष वर्धन Dr Harsh Vardhan

स्वास्थ्य एवं परिवार कल्याण, विज्ञान और प्रौद्योगिकी
व पृथ्वी विज्ञान मंत्री, भारत सरकार

Union Minister for Health & Family Welfare,
Science & Technology and Earth Sciences
Government of India

सबका साथ, सबका विकास, सबका विश्वास
Sabka Saath, Sabka Vikas, Sabka Vishwas

The 2019 Novel Coronavirus (SARS-CoV-2) has spread rapidly throughout the world and has assumed the proportion of a Pandemic. Given the lack of an efficacious vaccine as well as non-availability of suitable chemotherapeutic interventions, mankind is experiencing an unprecedented existential crisis.

2. The Ministry of Science and Technology and the Ministry of Health & Family Welfare, with their various departments, are contributing in various ways towards the national R&D efforts for developing solutions to combat COVID-19. The Department of Science & Technology under the Ministry has launched a nationwide exercise to map and boost development of COVID-19 solutions with R&D, seed capital and scale-up support. All academic and research institutions are being reoriented to focus on the development of diagnostics, vaccines, antivirals, disease models and other R&D to enable a cure for this dreadful disease. Around 15 labs of Council of Scientific & Industrial Research (CSIR), under the Department of Scientific & Industrial Research, across the country are working in close partnership with major private sector Industries, PSUs, MSMEs and other Government departments to develop solutions for COVID-19. The Department of Biotechnology (DBT) under the Ministry has also formed a consortium to support the development of Medical equipment, Diagnostics, Therapeutics, Drugs and Vaccines to meet the Healthcare Challenges. Indian Council of Medical Research (ICMR), under the Ministry of Health & Family Welfare has already isolated the virus strain successfully, which is a first step towards vaccine research. Similarly, various other organizations under Ministry of Human Resource & Development, Ministry of Defence, Ministry of Chemicals & Fertilizers, etc. are also contributing substantively to our R&D efforts. The private sector has also come forward in a big way to supplement these efforts.

3. With a view to spreading awareness about the S&T efforts of the Government of India as well as private sector in finding solutions for COVID-19, Vigyan Prasar - an autonomous institution under Ministry of Science & Technology and engaged in large-scale science communication and popularization activities - has compiled all initiatives being undertaken in this field.

4. This document "Science & Technology Efforts on COVID-19 in India" shall serve as a ready-reckoner for policy makers, scientists, researchers, scholars and other stakeholders who might be interested in understanding and keeping themselves abreast with the latest S&T efforts being made to develop solutions to combat COVID-19.


(Dr. Harsh Vardhan)

कार्यालय: 348, ए-स्कंध, निर्माण भवन, नई दिल्ली-110011 • Office: 348, A-Wing, Nirman Bhawan, New Delhi - 110011

Tele: (O) : +91-11-23061661, 23063513 • Telefax: 23062358 • E-mail: hfwwminister@gov.in

निवास: 8, तीस जनवरी मार्ग, नई दिल्ली-110011 • Residence: 8, Tees January Marg, New Delhi - 110011

Tele: (R) : +91-11-23794649 • Telefax: 23794640

PREFACE



At the fag end of 2019, China informed the World Health Organization (WHO) regarding the occurrence of cases of pneumonia of an unknown cause in Wuhan City in Hubei province. On January 9, 2020, WHO issued a statement saying Chinese researchers have made the preliminary determination of the virus as a novel coronavirus. Since then, several lakhs of positive cases and more than one lakh deaths have been reported due to COVID-19 across the world. Lockdowns, curfews, sealing of hotspots of outbreak area, massive airport screenings, quarantines, and social distancing have become the norm across the globe.

In these critical times, access to authentic information is of paramount importance. Vigyan Prasar (VP) has been covering the pandemic since the early days with the science communication perspective and journalistic flavour, ensuring that science and safety are the primary focus. VP is a national level organization of the Department of Science and Technology, Government of India, engaged in science communication and popularization. The principal objective of VP is to serve India's science popularization agenda. This is achieved through several strategically important two-way, stakeholder-specific approaches to communicate about principles and practices of science and technology and implications for development and quality of life. Science popularization therefore serves as a robust knowledge-led tool to fulfil various mutually reinforcing public policy objectives.

For the benefit of the stakeholders, we have prepared a compilation of the most relevant initiatives and efforts taken by the Government of India through its various Science Ministries, Departments, and Funding organizations. These organizations are geared for combating the epidemic of COVID-19. These research-driven and technology-based interventions have been initiated on war footing to fight out the outburst of the pandemic. Government of India, through its various wings, like Science Ministries, Departments, and Funding organizations, has invited Calls for Proposals (CFPs) and Expression of Interest (EoIs) to enhance research and development-related activities to battle the pandemic out.

We hope this initiative of Vigyan Prasar shall be a handy guide to scientists, researchers, and scholars, especially those who are interested in knowing various aspects of COVID-19 and contributing to the coronavirus warfare in whatever minuscule way and people at large.

Vigyan Prasar
New Delhi

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The e-newsletter is being published on a regular basis by collating all the inputs received till the preceding day of the release.

The older issues of e-newsletter are available in the Archival Section at <https://vigyanprasar.gov.in/covid19-newsletters/>

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SCIENCE & TECHNOLOGY EFFORTS TO DEAL WITH COVID-19 BY

OFFICE OF THE PRINCIPAL SCIENTIFIC ADVISER (PSA)

Expanding testing facilities in the country

The Empowered Committee on R&D has worked towards enhancing the testing facilities to meet COVID-19-related challenges by leveraging the existing resources (instruments and human resources) in Government of India laboratories. It has enabled ICMR to issue the required notification allowing institutions under DST, DBT, CSIR, DAE, DRDO and Indian Institute of Science (IISc) to self-assess and prepare their BSL labs for research and testing of coronavirus.

The O/o PSA has developed a “Handbook for COVID-19 testing in Research Institutions” which allows more such labs to self-assess its preparedness in terms of equipment, staff and expertise required for COVID-19 testing. A detailed checklist has been outlined, which can be used by a research lab to self-assess and indicate their preparedness for declaring the lab as a research and testing facility for COVID-19 after ICMR approval. (This handbook has been assembled by a group of young researchers whose efforts are gratefully acknowledged).

Website link:

<http://psa.gov.in/information-related-covid-19/handbook-covid-testing-research-laboratories>

Novel Coronavirus Disease 2019 (COVID-19): Guidelines on rational use of Personal Protective Equipment

The guideline is for healthcare workers and others working in points of entries (POEs), quarantine centres, hospitals, laboratories and primary healthcare & community settings. The guideline uses the setting approach to guide on the type of personal protective equipment to be used in different settings.

Website link:

<http://psa.gov.in/sites/default/files/pdf/GuidelinesonrationaluseofPersonalProtectiveEquipment.pdf.pdf>

Foot-Operated Washing Station implemented at IAO

Foot-operated Washing Station, implemented at the Indian Astronomical Observatory (IAO), Hanle, Ladakh, provided as an example for implementation in the ‘Guidelines for hygiene and

sanitation in densely populated areas, during the COVID-19 pandemic' released by the Office of PSA. IAO has one of the world's highest located sites for optical, infrared and gamma-ray telescopes. It is operated by the Indian Institute of Astrophysics (IIA), Bengaluru.

Website link:

<https://pib.gov.in/PressReleaseDetailm.aspx?PRID=1614064>

Detailed Guidelines:

http://164.100.117.97/WriteReadData/userfiles/PSA_DenseAreaGuidelines_Version8.pdf.pdf



Office of the Principal Scientific
Adviser to the Government
of India_ April, 2020

Guidelines for Hygiene and Sanitation in Densely Populated Areas, During the COVID-19 Pandemic





SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

DEPARTMENT OF SCIENCE AND TECHNOLOGY (DST)

Chitra GeneLAMP-N makes confirmatory tests results of COVID-19 possible in 2 hours

Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), Thiruvananthapuram, an institute of national importance, of the Department of Science and Technology (DST), has developed a diagnostic test kit that can confirm COVID-19 in 2 hours at low cost.

The test kit, funded by the DST called Chitra GeneLAMP-N, is highly specific for SARS-CoV-2 N-gene and can detect two regions of the gene, which will ensure that the test does not fail even if one region of the viral gene undergoes mutation during its current spread.



Website link:

<https://dst.gov.in/chitra-genelamp-n-makes-confirmatory-tests-results-covid-19-possible-2-hours>

Women in Hoshiarpur District of Punjab prepare homemade masks for villagers to fight COVID-19

In Gugwaal Haar village situated in Hajipur Block of District Hoshiarpur, Punjab, a group of young women are working tirelessly to safeguard residents of their villages and those in the vicinity, vulnerable migrant workers and ration and food supply distributors from COVID-19 infections by making and distributing face masks free of cost. The group led by the village Sarpanch Sh Narinder Singh.

The Punjab State S&T Council (PSCST) Chandigarh has received support from the Department of Science & Technology (DST) under the societal programme for women working on the project titled 'Technological Empowerment of Women on Energy from Rural Biomass'

(implemented in the Talwara block of district Hoshiarpur) to launch this initiative for the community in the scenario of Pandemic COVID-19.

Website link:

<https://dst.gov.in/women-hoshiarpur-district-punjab-prepare-homemade-masks-villagers-fight-covid-19>

Integrated geospatial platform to help area-specific strategies & decisions in COVID-19 outbreak

The Department of Science and Technology (DST), Government of India, has created an Integrated Geospatial Platform out of available geospatial datasets, standards-based services, and analytic tools to help decision making during the current COVID-19 outbreak and aid devising area-specific strategies to handle the socio-economic impact in the recovery phase. The platform is initially expected to strengthen the public health delivery system of the State and Central Governments and subsequently provide the necessary geospatial information support to citizens and agencies dealing with the challenges related to health, socio-economic distress, and livelihood challenges. The mobile application SAHYOG as well as the web portal (<https://indiamaps.gov.in/soiapp/>) prepared and managed by the Survey of India (Sol) has been customized to collect COVID-19-specific geospatial datasets through community engagement to augment the response activities by Government of India to the pandemic. Information parameters required as per the Govt. of India strategy and containment plan for large outbreaks have been incorporated in the SAHYOG application. This mobile application will complement the “AAROGYA SETU” mobile application launched by the Government of India for Contact tracing, Public awareness, and Self-assessment objectives. State Spatial Data Infrastructure (SSDI) in Madhya Pradesh, Odisha, Punjab, and Jammu & Kashmir have been providing collateral standards-based geospatial data services to the State and District Level authorities in the respective States through State Geoportals for integration with related health datasets towards combating COVID-19 pandemic.

Website link:

<https://dst.gov.in/integrated-geospatial-platform-help-area-specific-strategies-decisions-covid-19-outbreak>

Special Call under SATYAM to fight against COVID-19

Department of Science and Technology invites concept note under ‘Science and Technology of Yoga and Meditation (SATYAM)’ for the appropriate intervention of yoga and meditation to fight against COVID-19 and other similar kinds of viruses. This special call aims to provide assistance to our society in today’s critical condition arising due to the pandemic COVID-19. The project may address on improving immunity, improving respiratory system, stress, anxiety, depression and others.

The concept note may be submitted at e-PMS (onlinedst.gov.in) till April 30, 2020.

Website link:

<https://dst.gov.in/callforproposals/special-call-under-satyam-fight-against-covid-19>

Call for Expression of Interest - 2nd Set of Products

Sree Chitra Tirunal Institute for Medical Science and Technology (SCTIMST), Thiruvananthapuram, an institute of national importance under the Department of Science & Technology, Government of India, has developed designs and know-how for several products to combat the COVID-19 pandemic crisis. The institute is interested in transferring these designs and know-how to entities that can manufacture and make them available to the users. Expression of Interest (EoI) is invited from interested entities for this purpose.

Website link:

<https://www.sctimst.ac.in/resources/Rev-EOI%20COVID%2019%20-%2008.04.2020.pdf>



SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

THE DEPARTMENT OF BIOTECHNOLOGY (DBT)

DBT's RGCB among other laboratories have been designated as authorized agency for COVID-19 testing in Kerala

The Health & Family Welfare Department, Government of Kerala issued COVID-19 guidelines for distribution of laboratories. The World Health Organization (WHO) has declared the COVID-19 epidemic affecting more than 197 countries as a pandemic. Due to the inflow of people from affected countries, the State of Kerala has strengthened its surveillance and control measures against the disease. As part of improving capacity to test samples taken from suspected and contacts, more labs from public sector are added to the pool in the State with ICMR approval. Rajeev Gandhi Center for Biotechnology (RGCB), Thiruvananthapuram, an autonomous institution of Department of Biotechnology (DBT) has been designated as a diagnostic laboratory for COVID-19 testing.

Website link:

https://vigyanprasar.gov.in/wp-content/uploads/DBT_s-RGCB-among-other-laboratories-have-been-designated-as-authorized-agency-for-COVID-19-testing-in-Kerala-16apr20.pdf

DBT's RGCB Laboratory Medicine & Molecular Diagnostic (LMMD) Facility

COVID-19 Diagnostic Protocols include:

- NABL, NABH, and ILAC accredited laboratory,
- Part of the National Network of "A grade" Virology laboratories certified by ICMR since 2011 and currently an approved COVID-19 diagnostic facility,
- Operates with BSL 2 and BSL3 practice,
- Has 2 viral burnout laminar flow, which does not contaminate the environment with corona virus,
- Four class-3 laminar flow equipment,
- Effluent treatment plant for safe discharge of biological waste,
- Personnel highly trained to handle all viral diseases with experience of over 10 years in viral diagnosis,
- Full personal protection gear (PPE) used for all deployed staff, Four high-end in vitro diagnostic certified machines used for testing,



- Four “minus 80” freezers for sample storage,
- Six “minus 20” freezers for reagent storage,
- Two refrigerated centrifuges for RNA extraction,
- Electronic pipettes are used for testing which prevents error in volumetric measurement,
- 30KvA UPS back up for 5 hours continuous operation,
- Two diesel generators back up for unlimited time,
- Testing time less than 3 hours 30 minutes,
- Rated sample processing capacity of 3072 run per day (24 Hours),
- Declared testing capacity as of now, 500 tests per day.

Testing process followed at lab is given:

- Sample received after confirming cold-chain maintenance. If not maintained, samples are rejected,
- Sample barcode generated and work list made at the front desk,
- The work list along with pending work list, if any, is assigned to the technologist on duty assigned for sample aliquoting,
- Aliquoted sample from the designated aliquoting room is transferred through the pass box to DBN/RNA extraction room where the designated staff will process it. Usually, manual isolation is done, especially when the sample volume is low and/or when doing viruses as manual process gives better.

Website link:

<https://vigyanprasar.gov.in/wp-content/uploads/DBT%E2%80%99s-RGCB-Laboratory-Medicine-Molecular-Diagnostic-LMMD-Facility-16apr20.pdf>

COVID-19: A new diagnostic kit promises to detect infection in four days

Researchers at Rajiv Gandhi Centre for Biotechnology (RGCB), Thiruvananthapuram, are in the final stages of developing a kit that promises to detect SARS CoVID-19 infection as early as four days post-infection of the virus.



The kit will be able to detect two types of antibodies – Immunoglobulin M (IgM) and Immunoglobulin G (IgG). IgM is the first antibody that appears in the human body when it is

exposed to a virus or any other antigen. The presence of IgG antibody in the body, in contrast, is indicative of an individual’s immune status to particular pathogens.

Website link:

<https://www.biovoicenews.com/covid-19-a-new-diagnostic-kit-promises-to-detect-infection-in-four-days/>

BIRAC partners with Invest India for CSR funds for its research consortium

Department of Biotechnology’s public sector undertaking Biotechnology Industry Research Assistance Council (BIRAC) has entered into a partnership with Invest India to seek CSR Funds for its COVID-19 Research Consortium.

The consortium has been set up with a view to accelerate development of diagnostics, vaccines, novel therapeutics and re-purposing of drugs for this novel coronavirus. There is



limited current level of knowledge about the new virus. Critical research questions need to be answered urgently and ways have to be found to fund priority research that can contribute to curtail this outbreak and prepare for future outbreaks.

Website link:

<https://vignyanprasar.gov.in/wp-content/uploads/BIRAC-partners-with-Invest-India-for-CSR-funds-for-its-research-consortium-16apr20.pdf>

IHF's quest to support innovations to tackle respiratory diseases, including COVID-19

As Governments across the world grapple with containing COVID-19, the India Health Fund (IHF) is looking to support innovations that can fight respiratory and airborne infections through its nationwide search, Quest 2020. The quest will provide an opportunity for innovators, scientists and entrepreneurs across sectors to share novel prototypes, which could be game changers in the fight against these diseases, IHF added. Quest 2020's nationwide search for innovations is already open, and innovators have time till April 22, 2020, to send in their applications. The primary aim of this initiative is to support the government's ambitious goal to eliminate tuberculosis in India by 2025 and join the fight against the deadly new coronavirus.

Website link:

<https://www.thehindubusinessline.com/companies/ihs-quest-to-support-innovations-to-tackle-respiratory-diseases-including-covid-19/article31344254.ece>

India's S&T institutions raise their game against COVID-19

With over 1.3 billion population, the spread of coronavirus in India and India's response mechanisms are being closely watched over by the rest of the world. Led by the Hon'ble Prime Minister, Narendra Modi, India is battling this virus with all its might. Invoking the Disaster Management Act of 2015, India announced a complete lockdown on March 25 for a period of 21 days. The early announcement of a lockdown, when the infected count was less than 400, was well appreciated by WHO. A COVID-19 Task Force has been set up and a series of 'social distancing' and other serious measures have been also implemented.

Website link:

<https://www.biovoicenews.com/indias-st-institutions-raise-their-game-against-covid-19/>

Efforts underway to produce therapeutic antibodies against COVID-19

Prof Vijay Chaudhary's group at University of Delhi South Campus-Centre for Innovation in Infectious Disease Research, Education and Training (UDSC-CIIDRET), supported by the Department of Biotechnology (DBT), is isolating genes encoding antibodies, which can neutralize the SARS-CoV-2 using an extensive antibody library already available in-house as well as a library made from cells of patients who have recovered from COVID-19 infection.

Website link:

<https://pib.gov.in/newsite/PrintRelease.aspx?relid=202173>

BIRAC supported Twenty In-Market Startup Products

India Fights Corona: Details of 20 In-Market products from BIRAC supported Startups as potential COVID solutions can be found in the following link.

Fetal Lite: It is an instrument devised to monitor the fetal heart rate for the women-in-labour.
LUNGIQ: It is an instrument devised to review precision insights from Lung CTs.

Website link:

https://birac.nic.in/webcontent/1585918972_covid_solution_v2.pdf

COVID GYAN

Covid Gyan serves as a hub to bring together a collection of resources in response to the COVID-19 outbreak. These resources are generated by research institutions in India and several associated programmes. The content presented on the website provides a scientific understanding of the disease and its transmission. The main objective of the website is to create public awareness and bring in a holistic approach to the understanding of COVID-19 disease and potential means to mitigate it.



Various autonomous institutions associated with the Department of Biotechnology (DBT) are resource providers to this initiative, like the Institute for Stem Cell Science and Regenerative Medicine (InStem) and the Centre for Cellular And Molecular Platforms (C-CAMP).

Website link:

<https://covid-gyan.in/>

A new kit to detect COVID-19 infection

Researchers at the Rajiv Gandhi Centre for Biotechnology (RGCB), Thiruvananthapuram are in the final stages of developing a kit that promises to help detect SARS CoVID-19 infection as early as four days post-infection of the virus. The kit will be able to detect two types of antibodies - Immunoglobulin M (IgM) and Immunoglobulin G (IgG).

Website link:

<https://vigyanprasar.gov.in/wp-content/uploads/A-new-kit-to-detect-COVID-14apr20.pdf>



SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

THE COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH (CSIR)

सुरक्षा सामग्री का उत्पादन बढ़ाने के लिए सीईसीआरआई ने तेज की मुहिम

कोविड-19 के बढ़ते प्रकोप के कारण निजी सुरक्षा उपकरणों की माँग भी तेजी से बढ़ रही है। निजी सुरक्षा उपकरणों की जरूरत को देखते हुए तमिलनाडु के करैकुडी में स्थित केंद्रीय विद्युत रसायन अनुसंधान संस्थान (सीईसीआरआई) निजी सुरक्षा उपकरणों के उत्पादन को बढ़ावा देने के लिए इंडस्ट्री के साथ मिलकर काम कर रहा है। संक्रमण को रोकने के लिए सैनिटाइजर, अस्पतालों के सहायक उपकरण और निजी सुरक्षात्मक उपकरण बेहद जरूरी हो गए हैं। सीईसीआरआई द्वारा बनाए जा रहे निजी सुरक्षा से संबंधित सामग्री में विश्व स्वास्थ्य संगठन (डब्ल्यूएचओ) के दिशा-निर्देशों के अनुसार बना हैड सैनिटाइजर, हैडवॉश सॉल्यूशन और स्वास्थ्यकर्मियों तथा डॉक्टरों की सुरक्षा के लिए फेस शील्ड शामिल हैं। सीईसीआरआई निजी सुरक्षा उपकरणों का उत्पादन बड़े पैमाने पर करने के लिए इंडस्ट्री के साथ साझेदारी भी कर रहा है। फेस शील्ड के उत्पादन के लिए सीईसीआरआई ने बंगलूरु की थ्रीडी लाइकैन कंपनी के साथ करार किया है। संस्थान की कोशिश कम समय में सूक्ष्मजीव प्रतिरोधी फेस शील्ड के बेहतर संस्करण तैयार करने की है, ताकि इसे कोविड-19 से संक्रमित मरीजों की देखभाल में जुटे स्वास्थ्यकर्मियों और डॉक्टरों तक पहुँचाया जा सके।



सुरक्षा सामग्री का उत्पादन बढ़ाने के लिए सीईसीआरआई ने तेज की मुहिम

Website link:

<https://vigyanprasar.gov.in/isw/CECRI-drives-fast-to-increase-production-of-safety-material-hindi.html>

कोविड-19 से लड़ने में सीएसआईआर के साथ खड़ा है उद्योग जगत

कोविड-19 से लड़ने के लिए वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद (सीएसआईआर) ने पाँच स्तरीय रणनीति अपनायी है, जिस पर अमल करने के लिए उसे उद्योग जगत का भी व्यापक समर्थन मिल रहा है। यह जानकारी सीएसआईआर के महानिदेशक डॉ शेखर सी. मांडे ने प्रदान की है। वह सीएसआईआर की 38 प्रयोगशालाओं के निदेशकों के साथ कोविड-19 से जुड़ी रणनीति पर चर्चा के लिए आयोजित एक ऑनलाइन जूम मीटिंग को संबोधित कर रहे थे। कोविड-19 से निपटने के लिए सीएसआईआर की प्रयोगशालाएं पाँच स्तरों पर काम कर रही हैं। इन रणनीतियों को अमली जामा पहनाए जाने के लिए कुछ कंपनियों से करार किया गया है। इन कंपनियों में भारत हैवी इलेक्ट्रिकल्स लिमिटेड (बीएचईएल), सिप्ला, टीसीएस, भारत बायोटेक,



रिलायंस, टाटा सन्स, यूनिलीवर, इंटेल, टीसीएस, कौडिला और भारत इलेक्ट्रॉनिक्स लिमिटेड (बीईएल) शामिल हैं। डॉ मांडे ने बताया कि सीएसआईआर को इन कंपनियों का भरपूर सहयोग मिल रहा है। सीएसआईआर की कोर टीम, जिसमें इसकी प्रयोगशालाओं के आठ निदेशक शामिल हैं, महानिदेशक, डॉ शेखर मांडे के नेतृत्व में कोविड-19 से लड़ने के लिए काम कर रहे हैं।

Website link:

<https://vigyanprasar.gov.in/isw/Industry-stands-with-CSIR-in-fighting-Kovid-19-hindi.html>

कोरोना से लड़ने में मददगार एनसीएल समर्थित स्टार्ट-अप नवाचार

वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद (सीएसआईआर) की पुणे स्थित राष्ट्रीय रासायनिक प्रयोगशाला (एनसीएल) पिछले करीब एक दशक से अपने वेंचर सेंटर के जरिये नवाचार और उद्यमिता को बढ़ावा दे रही है। इस सेंटर द्वारा समर्थित स्टार्ट-अप कंपनियों ने दो ऐसे नये उत्पाद बनाए हैं, जो कोरोना से लड़ने में उपयोगी साबित हो सकते हैं। ये दोनों नवाचार – ऑक्सीजन संवर्धन यूनिट (ओईयू) और डिजिटल इन्फ्रा-रेड थर्मोमीटर हैं, जिन्हें कोरोना के खिलाफ प्रभावी उपकरण माना जा रहा है। एनसीएल के वेंचर सेंटर द्वारा समर्थित पुणे की स्टार्ट-अप कंपनी बीएमईके के शोधकर्ताओं ने यह डिजिटल आईआर थर्मोमीटर विकसित किया है। इस थर्मोमीटर को मोबाइल फोन अथवा पावर बैंक की मदद से संचालित किया जा सकता है। इन्फ्रा-रेड थर्मोमीटर का डिजाइन और इसकी तकनीक की जानकारी ओपन सोर्स में मौजूद है और भारतीय कंपनियां इस निशुल्क तकनीक के उपयोग से आईआर थर्मोमीटर बना सकती हैं। एनसीएल ने यह पहल थर्मोमीटर का उत्पादन बढ़ाने के उद्देश्य से की है, ताकि कोविड-19 के खिलाफ छिड़ी जंग में थर्मोमीटर की मांग को पूरा किया जा सके।

Website link:

<https://vigyanprasar.gov.in/isw/NCL-supported-start-up-innovations-join-the-fight-against-COVID-19-hindi.html>

वायरस को नष्ट कर सकते हैं नई तकनीक से बने मास्क

कोविड-19 के खतरे को देखते हुए भारतीय वैज्ञानिक दिन-रात ऐसे उपाय खोजने में जुटे हैं, जिससे इस चुनौती से निपटने में मदद मिल सके। इसी कड़ी में कार्य करते हुए गुजरात के भावनगर में स्थित केंद्रीय नमक व समुद्री रसायन अनुसंधान संस्थान (सीएसएमसीआरआई) के वैज्ञानिकों ने एक अनूठा फेस-मास्क विकसित किया है, जिसके संपर्क में आने पर वायरस नष्ट हो सकते हैं। सीएसएमसीआरआई के वैज्ञानिकों ने बताया कि इस मास्क की बाहरी छिद्रयुक्त झिल्ली को संशोधित पॉलीसल्फोन मैटेरियल से बनाया गया है, जिसकी मोटाई 150 माइक्रोमीटर है। यह मैटेरियल 60 नैनोमीटर या उससे अधिक किसी भी वायरस को नष्ट कर सकता है। कोरोना वायरस का व्यास 80-120 नैनोमीटर के बीच है।

Website link:

<http://vigyanprasar.gov.in/isw/Masks-made-with-new-technology-can-destroy-viruses-hindi.html>

सीएसआईआर प्रयोगशाला में भी हो सकेगा कोविड-19 किट की वैधता का परीक्षण

वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद (सीएसआईआर) की हैदराबाद स्थित प्रयोगशाला कोशकीय एवं आणविक जीवविज्ञान केंद्र (सीसीएमबी) में भी अब कोविड-19 से संबंधित परीक्षण किट की वैधता का परीक्षण एवं प्रमाणीकरण हो सकेगा। इस पहल के बाद सीएसआईआर-सीसीएमबी भी अब भारतीय आयुर्विज्ञान अनुसंधान परिषद (आईसीएमआर) द्वारा चयनित देश के उन चुनिंदा केंद्रों में शामिल हो गया है, जहाँ पर कोविड-19 के परीक्षण में उपयोग होने वाली किट का प्रमाणीकरण किया जा सकेगा। इससे पहले कोविड-19 की जाँच किट के प्रमाणीकरण के लिए सिर्फ आईसीएमआर से संबद्ध चार केंद्र संचालित हो रहे थे। इन चार केंद्रों में पुणे स्थित राष्ट्रीय विषाणु विज्ञान संस्थान एवं राष्ट्रीय एड्स अनुसंधान संस्थान के अलावा नेशनल इंस्टीट्यूट ऑफ पैथोलॉजी, नई दिल्ली और राष्ट्रीय कॉलरा एवं आंत्र रोग संस्थान, कोलकाता शामिल थे। सीएसआईआर-सीसीएमबी को इस काम के लिए चुने जाने के बाद अब देश में कोविड-19 की परीक्षण किट का प्रमाणीकरण करने वाले पाँच केंद्र हो गए हैं।

Website link:

<https://vigyanprasar.gov.in/isw/Validation-of-Kovid-19-kit-will-also-be-possible-in-CSIR-laboratory-hindi.html>



Indian researchers to work for COVID-19 vaccine

Prime Minister Narendra Modi has given a call to all the scientific community from India to work together and come up with solution to combat COVID-19. Answering to this call Dr Shekhar C Mande, Director General, Council of Scientific and Industrial Research (CSIR) has said that the CSIR labs would be engaged to discover a potent vaccine for novel coronavirus. “We have decided to commence our research and development for developing a vaccine from today,” said Dr Mande. Further he said that “CSIR would try hard to start the clinical trials for the vaccine in the coming weeks.” He made this announcement during an interview given to a national news channel.

Website link:

<https://vigyanprasar.gov.in/isw/Indian-researchers-work-for-COVID-19-vaccine.html>

Researchers focus on inactivated virus vaccine for novel coronavirus

Researchers from the Centre for Cellular and Molecular Biology (CCMB) have embarked upon developing an inactivated virus vaccine for the dreaded novel coronavirus. Inactivated vaccines are known for their safety and easy production.

Website link:

<https://vigyanprasar.gov.in/wp-content/uploads/Researchers-focus-on-inactivated-virus-vaccine-for-novel-coronavirus-15apr20.pdf>

NRDC invites proposals for maturing Lab Scale COVID-19 technologies for tracking, testing and treating

To fight COVID19 combinedly in the country, National Research Development Corporation (NRDC) invites proposal from the innovators under its two scheme, i.e. ,Techno-Commercial Support and Priority projects.

Last date of submission: 15 May 2020

Website link:

<http://www.nrdcindia.com/LatestDetail/34>

Minister exhorts scientists to develop COVID-19 mitigation solutions within fixed timeframe

Union Minister for Health and Family Welfare, Science and Technology and Earth Sciences, Dr Harsh Vardhan, exhorts scientists to develop COVID-19 mitigation solutions within a fixed time frame. “We are in midst of a war and we have to supply the weapons on time. If we supply the weapons when the war is over or have made huge destruction the weapons are useless. It is not like routine CSIR research job,” said Dr Harsh Vardhan. He was addressing a review meeting through video conferencing with Dr Shekhar Mande, Director General of the Council for Scientific and Industrial Research (CSIR) and all the 38 CSIR lab directors.

Website link:

<https://vigyanprasar.gov.in/isw/Minister-exhort-scientists-to-develop-COVID-19-mitigation-solutions-within-time-frame.html>

कोविड-19 से निपटने में महत्वपूर्ण हो सकता है आनुवांशिक अनुक्रमण

आनुवांशिक अनुक्रमण वायरस के प्रति वाहक की प्रतिक्रिया का पता लगाने के साथ-साथ बीमारी के प्रति जनसंख्या की संवेदनशीलता की पहचान करने में भी बेहद महत्वपूर्ण हो सकता है। यह बात स्वास्थ्य एवं परिवार कल्याण, विज्ञान एवं प्रौद्योगिकी और पृथ्वी विज्ञान मंत्री डॉ हर्ष वर्धन ने कही है। वह वैज्ञानिक तथा



औद्योगिक अनुसंधान परिषद (सीएसआईआर) द्वारा कोविड-19 के संदर्भ में किए जा रहे प्रयासों के बारे में वीडियो कॉन्फ्रेंसिंग के जरिये आयोजित एक समीक्षा बैठक को संबोधित कर रहे थे। यह बात महत्वपूर्ण है क्योंकि सीएसआईआर कोविड-19 के लिए जिम्मेदार सिविलर एक्ज्यूट रिस्पेरेटरी सिंड्रोम-कोरोना वायरस-2 (SARS-CoV-2) का आनुवंशिक अनुक्रमण कर रहा है। इसके लिए डॉ हर्ष वर्धन ने सीएसआईआर के उन प्रयोगशालाओं की सराहना की है, जो कोविड-19 रोगियों के स्वाब नमूनों के परीक्षण में जुटी हैं, और इनमें से कुछ प्रयोगशालाएं आगामी हफ्तों में नये कोरोना वायरस के 500 अनुक्रमण करने के लक्ष्य के साथ वायरस के आनुवंशिक स्वरूप का पता लगाने का कार्य कर रही हैं।

Website link:

<https://vigyanprasar.gov.in/isw/Minister-exhort-scientists-to-develop-COVID-19-mitigation-solutions-within-time-frame-hindi.html>



SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

THE INDIAN COUNCIL OF MEDICAL RESEARCH (ICMR), AND THE MINISTRY OF HEALTH & FAMILY WELFARE (MOHFW)

Advisory for effective management & availability of safe drinking water during lockdown due to COVID-19

COVID-19 has taken pandemic proportions in many countries and in view of the seriousness of the matter, Government of India and State Governments have taken several pre-emptive measures to contain this disease in the country. Frequent washing of hands with frothing soaps is recognized as most efficient and effective measure in the listed preventive measures for controlling the spread of the virus. Thus, there is an urgent need to ensure that safe potable water is available to all citizens particularly in the rural areas where facility of medical sanitizers may not be available.

Website link:

<https://www.mohfw.gov.in/pdf/advisorydrinkingwaterpdf.pdf>

Revised guidelines on the use of Truenat™ beta CoV

ICMR has validated Truenat™ beta CoV diagnostic test on Truelab™ workstation and has recommended it as a screening test. All positive samples need to be reconfirmed by a separate confirmatory assay for SARSCoV-2. ICMR released detailed and revised guidelines to perform the diagnostic test.



Website link:

https://icmr.nic.in/sites/default/files/upload_documents/Guidance_TrueNat_14042020.pdf

https://icmr.nic.in/sites/default/files/upload_documents/Guidance_TrueNat_14042020.pdf



Guidance note for enabling delivery of essential health services during the COVID-19 outbreak

The COVID-19 outbreak has placed unprecedented demands on our health system. Focusing on COVID-19-related activities and continuing to provide essential services, it is important not only to maintain people's trust in the health system to deliver essential health services but also to minimise any increase in morbidity and mortality from other health conditions. This note is released by ICMR that is intended to guide states to deliver essential health services for the duration of the COVID-19 outbreak. It elucidates a set of basic principles categorized by health systems elements and provides guidance on the essential services with details annexed. Essential services for all areas include reproductive, maternal, new-born and child health, prevention and management of communicable diseases, treatment for chronic diseases to avoid complications, and addressing emergencies.

Website link:

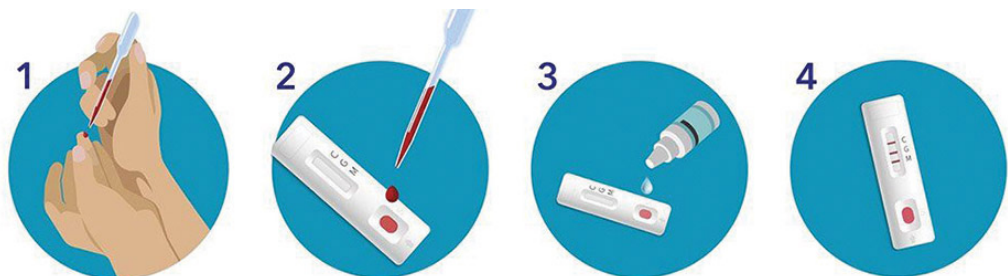
<https://www.mohfw.gov.in/pdf/EssentialservicesduringCOVID19updated0411201.pdf>

List of antibody (IgM, IgG)-based rapid tests

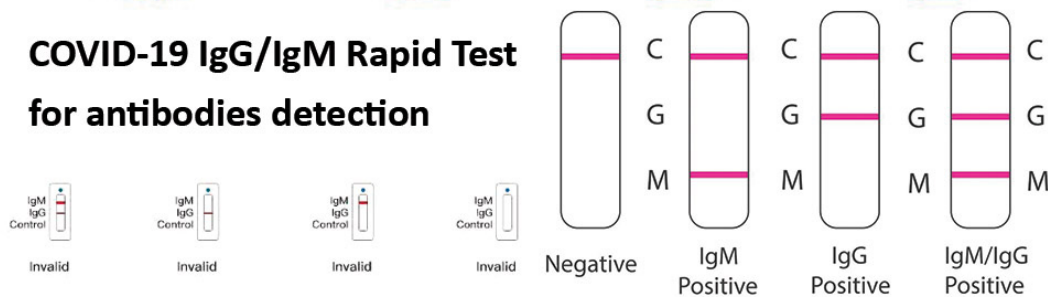
ICMR released a document that enlists 16 antibody-based rapid diagnostic tests that have been validated at National Institute of Virology, Pune. The validation was performed on different parameters, like sensitivity, specificity, repeatability and reproducibility, and found to be satisfactory.

Website link:

https://icmr.nic.in/sites/default/files/upload_documents/Antibody_based_tests_14042020.pdf



COVID-19 IgG/IgM Rapid Test for antibodies detection



Advisory on feasibility of using pooled samples for molecular testing of COVID-19

An advisory has been issued by Indian Council of Medical Research (ICMR), the apex body of medical research in India, to increase the capacity of the laboratories for screening increased numbers of samples using molecular testing for COVID-19 for the purpose of surveillance.

Website link:

https://icmr.nic.in/sites/default/files/upload_documents/Advisory_on_feasibility_of_sample_pooling.pdf



Applications invited from Government & Private Medical Colleges for setting up COVID-19 testing facility

ICMR invites applications from all Government and Private Medical Colleges for establishing a COVID-19 testing facility. All Medical Colleges with following infrastructure and expertise may apply.

Website link:

https://icmr.nic.in/sites/default/files/upload_documents/Invitation_from_Govt_Pvt_Medical_College_COVID19_testing_facility.pdf





SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

THE DEFENCE RESEARCH AND DEVELOPMENT ORGANISATION (DRDO)

DRDO develops equipment for effective sanitisation of public spaces

In the continuing quest for developing indigenous solutions to combat the Coronavirus Pandemic, Defence Research and Development Organisation (DRDO) is ready with technologies for sanitising areas of different sizes. The Centre for Fire Explosive & Environment Safety (CFEES), Delhi has developed two configurations of sanitising equipment. These are spinoffs from technologies developed for fire suppression applications.

Portable Backpack Area Sanitisation Equipment:

CFEES, with the help of its industry partner has developed portable sanitisation equipment for spraying decontamination solution consisting of one per cent Hypochlorite (Hypo) solution for sanitisation of the suspected area. The portable system can be mounted as a backpack and can be carried by the operations personnel. This system incorporates low-pressure twin fluid (air & disinfectant liquid) technology to generate very fine mist. The system is capable of disinfecting upto 300 square metre area. The application areas can include hospital reception, doctors' chambers, office spaces dealing with the general public, corridors, pathways, metro and railway stations, bus stations, etc.



Trolley-mounted Large Area Sanitisation Equipment:

The system incorporates low-pressure single fluid (disinfectant liquid) technology generating very fine mist. It is capable of disinfecting up to 3,000 square metres of area. It has a tank capacity of 50 litres and has a lancing (throw) distance of 12-15 metres. This is useful for disinfecting hospitals, malls, airports, metro stations, isolation areas, quarantine centres and high-risk residential areas.



Website link:

<https://pib.gov.in/newsite/PrintRelease.aspx?relid=200967>



SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

OTHER SCIENTIFIC AND ACADEMIC INSTITUTIONS

IIT Bhilai fights against COVID-19: Faculty members makes novel face mask and swab

In this war against novel corona virus (COVID-19), IIT Bhilai promises to stand by our nation and to fight this war with our fellow citizen with its full capacity and perseverance. Under the able guidance of Director Prof. Rajat Moona, the researchers, faculty members and staffs of IIT Bhilai have dedicated themselves to develop novel technologies to help the medical doctors and the healthcare personnel.

Website Link:

https://www.iitbhilai.ac.in/index.php?pid=faceMask_swab



ITI Limited Palakkad signs MoU with IIT Palakkad to create technological solutions for combating Covid-19

Public Sector Undertaking, ITI Limited Palakkad, has entered into an agreement with IIT Palakkad for jointly developing Electronics & Controls of Portable Emergency Ventilator and Pulse Plethysmograph for Intensive Care Units (ICUs). This prototype will be fine-tuned to make it compatible for ICUs. ITI Limited will also work with IIT Palakkad in developing the Electronics & Controls of Portable Emergency Ventilator.

Website Link:

<https://iitpkd.ac.in/news/iti-limited-palakkad-signs-mou-iit-palakkad-create-technological-solutions-combating-covid-19>



SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

PRIVATE SECTOR ENTERPRISES

Reliance Industries further steps up its support to India's fight against Coronavirus

Reliance Industries Limited has deployed the combined strengths of Reliance Foundation, Reliance Retail, Reliance Jio, Reliance Life Sciences, Reliance Industries, and all the 6,00,000 members of the Reliance Family on this action plan against COVID-19.

Reliance Foundation and RIL Hospitals: Sir H. N. Reliance Foundation Hospital in collaboration with the Brihanmumbai Municipal Corporation (BMC), has set up a dedicated 100-bedded centre at Seven Hills Hospital, Mumbai for patients who test positive for COVID-19. This first-of-its-kind centre in India is fully funded by Reliance Foundation and includes a negative pressure room that helps in preventing cross-contamination and helps control infection. All beds are equipped with the required infrastructure, biomedical equipment such as ventilators, pacemakers, dialysis machine and patient monitoring devices.

Masks and Personnel Protective Suits for Health-workers: RIL is enhancing its production capacities to produce 100,000 face-masks per day and a large number of personal protective equipment (PPE), such as suits and garments, for the nation's health workers to equip them further to fight the coronavirus challenge.

Website link:

<https://www.ril.com/getattachment/bacdc6ec-6dc1-4f28-a10c-d63bb467a7d6/Reliance-Industries-further-Steps-Up-its-Support-t.aspx>

The race for a cure for COVID-19

In TCS' Innovation Lab in Hyderabad, India, a team of TCS scientists have identified 31 molecular compounds that hold promise towards finding a cure for COVID-19. The effort is part of the many worldwide mission-critical activities that TCS is engaged in, working with private enterprise and governmental groups. It represents a crucial breakthrough supporting the larger worldwide endeavour towards combating the coronavirus.

Website link:

<https://www.tcs.com/company-overview/tcs-artificial-intelligence-cure-covid-19>

