



COVID-19

SCIENCE & TECHNOLOGY EFFORTS IN INDIA

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Compiled by
VIGYAN PRASAR
An Autonomous Organisation
of Department of Science &
Technology, Government of India





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



THE COUNTRY WILL BE SELF-RELIANT BY THE END OF MAY 2020 IN PRODUCING INDIGENOUS RAPID TEST AND RT-PCR DIAGNOSTIC KITS — DR. HARSH VARDHAN

“At least half a dozen candidate vaccines are being supported of which four are in an advance stage.”

- Dr. Harsh Vardhan

Date: 28th April, 2020

Union Minister of Science & Technology, Health & Family Welfare and Earth Sciences, Dr Harsh Vardhan, reviewed through video-conferencing the various initiatives undertaken by the Department of Biotechnology (DBT) and its Autonomous Institutes (AIs) and Public Sector Undertakings (PSUs) – BIRAC and BICOL to tackle the current COVID-19 crisis, especially with respect to progress made in indigenous development of vaccine, Rapid Test and RT-PCR diagnostic Kits.



Secretary, DBT, Dr. Renu Swarup informed that DBT has evolved a multi-pronged research strategy and action plan for immediate response as well as for long-term preparedness to tackle COVID-19. These multifaceted efforts include research towards development of

candidate vaccines, therapeutics, and suitable animal models for COVID-19 as well as development of indigenous diagnostics and genomic studies on the host and pathogen. The DBT and its PSU, Biotechnology Industry Research Assistance Council (BIRAC) has announced a COVID-19 Research Consortium Call to support diagnostics, vaccines, novel therapeutics, repurposing of drugs or any other intervention for control of COVID-19.





During interaction with DBT scientists, Union Minister was informed about various computational methods being developed by DBT labs/AIs to predict potential antiviral drug molecules. In another strategy, surrogates of the virus are being developed representing one or more critical steps in virus lifecycle and inhibitors are being tested. Work is in progress to isolate neutralizing antibodies

either from the patients recovered from COVID-19 or from human antibody libraries. Also, various AIs of DBT are working on development of candidate vaccines which are at various stages of pre-clinical studies with an overall aim to demonstrate the proof of concept and immunogenicity and safety evaluation prior to clinical testing. At the moment, at least 9 of these studies are in early stages and one delivery and adjuvant system for improving the immunogenicity of candidate vaccine is at the advanced stage of development.



While discussing genetic sequencing, Dr. Harsh Vardhan said, "These genetic sequencing efforts remind me of Polio eradication movement 26 years back. Towards the fag end of the Polio movement, active surveillance of the country was done to find out the cases of acute flaccid paralysis. That time also, genetic sequencing was used to establish the travel history of polio virus which eventually helped in the eradication of polio."



After the presentation, Dr. Harsh Vardhan appreciated the work being done by scientists and their innovative ways of finding solutions to mitigate COVID-19. "The sincere efforts of DBT scientists will enable the country to be self-reliant in production of RT-PCS and Antibody test kits by the end of next month. This will make it possible to meet the target of conducting one lakh tests per day by the end of next month," he said. He also exhorted scientists working on

developing new vaccines, new drugs and medical equipment, to speed up their work. "Out of at least half a dozen candidates supported for vaccines, four are in an advanced stage and regulatory platform at one place has been constituted for speedy clearances," he said.



Dr. Harsh Vardhan also appreciated the BIRAC efforts in supporting over 150 start-up solutions of which over 20 are ready for deployment. He also released a hand sanitizer developed by another PSU of DBT, Bharat Immunologicals and Biologicals Corporation Ltd.(BIBCOL) which is engaged in manufacturing of various biological, pharmaceutical

and food products. It is currently manufacturing formulations of Vitamin C and Zinc tablets to contribute towards the solutions for COVID-19. "A contribution of Rupee One towards commercial sale of each single bottle of this Sanitizer will go to PM Cares Fund," Dr. Harsh Vardhan said.

Dr. Renu Swarup, Secretary, DBT, senior officials, Directors of DBT-AIs, Senior Scientists and senior officials from BIRAC and BIBCOL participated in the meeting.



DR. HARSH VARDHAN EXHORTS CSIR SCIENTISTS TO DEVELOP COVID-19 MITIGATION SOLUTIONS TO EFFECTIVELY COMBAT THE DISEASE

12th April 2020, New Delhi

- Genetic sequencing was crucial in eradicating Polio; it will help in COVID-19 mitigation also, said Dr. Harsh Vardhan
- These are times of war, deliver solutions before war ends, not a routine research project, states Dr. Harsh Vardhan
- COVID-19 will give boost to country's resilience and self-reliance and enhance indigenous capacity in developing critical healthcare equipment

Today Dr. Harsh Vardhan, Union Minister for Science & Technology held a review with DG CSIR, Dr. Shekhar C. Mande and all the CSIR lab directors through video conference of the steps undertaken by CSIR and its constituent 38 labs towards mitigation of Corona Virus outbreak in the country.

DG CSIR Dr. Shekhar C. Mande informed that Core Strategy Group (CSG) has been set up in CSIR and the five verticals have been identified under which the COVID-19-related activities are being carried out. These include: Digital and Molecular Surveillance; Rapid and Economical Diagnostics; New Drugs / Repurposing of Drugs and associated production processes; Hospital Assistive Devices and PPEs; and Supply Chain and Logistics Support



Dr Harsh Vardhan during video conferencing on research and developments initiatives on Covid-19 with the directors of CSIR labs



Systems. Dr. Mande also mentioned that 15 CSIR labs are working in close partnership with major Industries, PSUs, MSMEs and other departments and ministries at the time of the crisis in the country.

After briefing of all the efforts being made by the CSIR labs in finding a solution for COVID-19, Dr. Harsh Vardhan informed them about the steps being taken by the Government of India in combating COVID-19.

Dr. Harsh Vardhan exhorted CSIR scientists and said, “India has high expectations from its scientific community and I am sure that the community will rise to the occasion and deliver in this time of need”. He appreciated that CSIR Labs were also participating in testing of swab samples of COVID patients and some of them have started doing genetic sequencing of the virus with a target of doing 500 sequencing in coming weeks. Dr. Harsh Vardhan said, “Genetic sequencing is very crucial in identifying the host response as well as identifying population vulnerability to the disease.” He said, “These genetic sequencing efforts remind me of Polio eradication movement 26 years back. Towards the fag end of the Polio movement, active surveillance of the country was done to find out the cases of acute flaccid paralysis. That time also, genetic sequencing was used to establish the travel history of polio virus which eventually helped in the eradication of polio.”

He also appreciated CSIR for partnering with MSMEs, Major industries, PSUs working on RT-PCR machines. He said, “Plasma-based therapy is very much needed at this hour. For this, we need to motivate the patients who have recovered from the COVID-19 to donate blood.”

He also appreciated the work done by CSIR-NAL with BHEL and BEL on Ventilators, Oxygen Enrichment Devices and 3-D printed face shields, face masks, gowns and other protective equipment. “All these things will help us in next few weeks,” he said.

Dr. Harsh Vardhan, however, cautioned CSIR scientists to develop COVID-19 mitigation solutions keeping fixed timeframe in mind. “These are times of war, CSIR scientists should work to deliver solutions before war ends, they should not treat it as a routine research project”. He said, “COVID-19 has also come as a blessing in disguise as it will give boost to country’s resilience and self-reliance and enhance indigenous capacity in developing critical healthcare equipment.” He also appreciated the collaboration being done by the CSIR scientists using Video Conferencing tools and reiterated the scientists that while doing research they should continue observing social distancing and lockdown because till such time vaccine is developed by scientists to combat COVID-19, these two remain the most potent form of social vaccine.

Dr. Shekhar C. Mande, DG, CSIR, Dr. Anurag Agrawal, Director, Institute of Genomics and Integrative Biology (CSIR-IGIB) and Dr. Nakul Parashar, Director, Vigyan Prasas were present in the review meeting with the Union Minister. Directors of remaining 38 CSIR labs attended the meeting through Video Conference.

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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)

Office Memorandum for focused research on Corona vaccines and other S&T issues

A Task Force for focused research on Corona vaccines and other S&T issues (referred to as the Vaccine Task Force, VTF) Co-Chaired by Dr Vinod Paul, Member, NITI Aayog and Prof K VijayRaghavan, Principal Scientific Adviser to the Government of India has been constituted by the PMO. The Empowered Technology Group (ETG) has been approved by the Cabinet and is Chaired by Prof K Vijay Raghavan.

The Joint Committee of the ETG and PMO constituted Task Force for focused research on Corona vaccine and other S&T met on April 16 and April 20, 2020. The ETG and VTF have approved the 'Guidelines for sharing of biospecimen and data for research related to COVID-19'. These guidelines should be followed and the stipulated timelines for sharing/ providing biospecimens should be adhered to.



Website link:

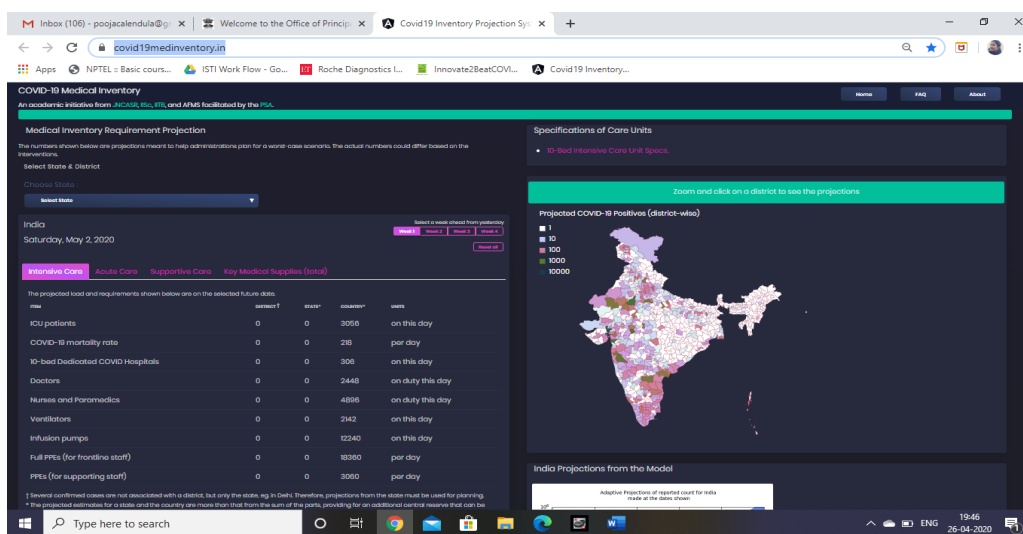
http://psa.gov.in/sites/default/files/VaccineTaskForce_ETG_Guidelines.pdf

COVID-19 Medical Inventory

The COVID-19 Medical Inventory is an academic initiation from Jawaharlal Nehru Centre for Advanced Scientific Research (JNSCAR), Indian Institute of Science (IISc), Indian Institute of Technology Bombay (IITB), Mumbai, and Armed Forces Medical Services (AFMS), facilitated by the PSA. The inventory is a district-level short-term conjecture of medical inventory for COVID-19. This includes inventory for intensive and acute supportive care requirements.

The mathematical model has been tuned with the recent data and the projections have now been revised. The numbers shown below are projections meant to help administrations plan for a worst-case scenario; however, the actual numbers could differ based on the interventions.

This web application provides a four-week projected requirement for various medical inventories across districts, states, and the national level. The initiative aims to be helpful in planning for infrastructure, arranging essential human resources and procurement of materials. MSMEs and other industries working in the production and supply chain of these essentials may use these projections to support their local government administration.



Website link:
<https://covid19medinventory.in/>

Handbook for COVID-19 testing in Research Institutions

Handbook for COVID-19 testing in Research Institutions has been adapted from World Health Organization (WHO) Interim guidance for laboratory testing and issued by the Office of Principal Scientific Adviser to the Government of India. The purpose of this document is to provide interim guidance to laboratories and stakeholders involved in COVID-19 testing of patient samples. Adoption of these best practices is left up to the discretion of the laboratory supervisor.



Website link:
http://psa.gov.in/sites/default/files/pdf/Handbook_COVID19_Research_Institutions.pdf



SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

DEPARTMENT OF SCIENCE AND TECHNOLOGY (DST)

DST-supported NGO network tackle COVID-19 at community level through S&T interventions

The network of S&T-enabled NGOs spread across 22 States of India, supported by the Science for Equity Empowerment and Development (SEED) Division of the Department of Science and Technology (DST), have demonstrated capabilities in containing COVID-19 through various S&T interventions and complemented the efforts of the Government at different States and below levels.

Approximately 1,20,000 facemasks were produced complying with the guidelines of Office of the Principal Scientific Advisor (PSA) to the Government of India. They were distributed in the States of Andhra Pradesh, Delhi, Gujarat, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Rajasthan, Uttarakhand, Uttar Pradesh, Tamil Nadu, Telangana, Tripura, West Bengal and so on, predominantly affected by the COVID-19 outbreak. These have been distributed through the network of 30 NGOs and community-based organizations while other members of the NGO network have also been activated to follow.



Website link:

<https://dst.gov.in/dst-supported-ngo-network-tackle-covid-19-community-level-through-st-interventions>



inorganic hybrid nanocoating based on silica nanoparticles coupled with a polymer matrix that is hydrophobic and disinfects the pathogenic virus associated with COVID-19 that comes in contact with the surface of the mask.

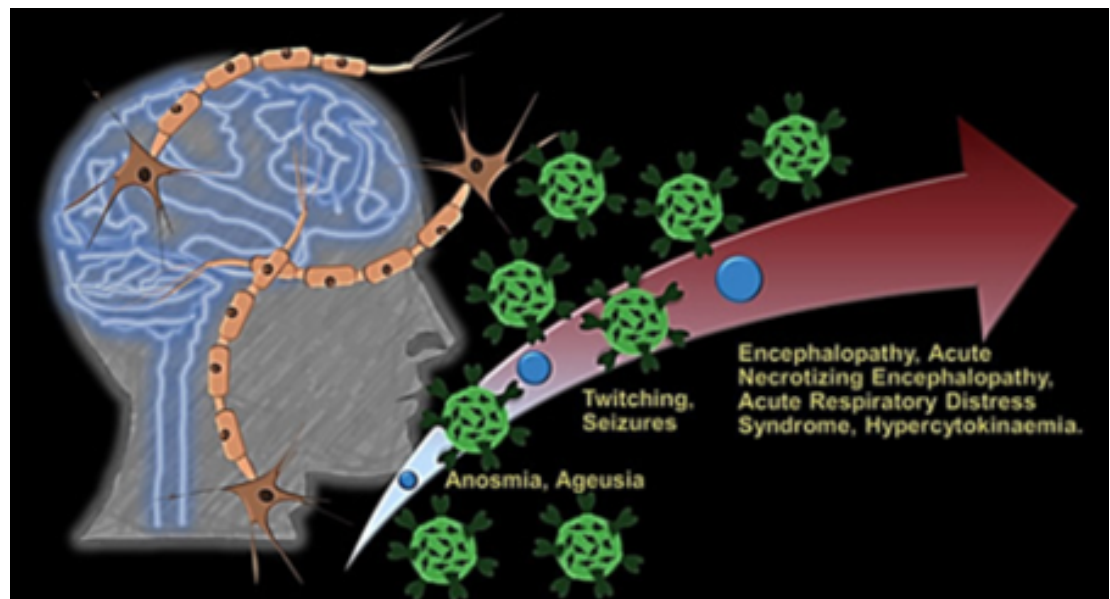
Website link:

<https://dst.gov.in/organic-inorganic-hybrid-nanocoatings-disposable-masks-formidable-arsenal-against-pathogenic-covid>

Study shows that COVID-19 may affect the Central Nervous System causing loss of smell and taste

Scientists of Indian Institute of Technology (IIT), Jodhpur have explored the neuroinvasive nature of the COVID-19 virus, SARS-CoV-2, highlighting that loss of smell and taste of infected patients makes their entire Central Nervous System (CNS) and the underlying structures in the brain more prone to viral infection with devastating effects.

Dr Surajit Ghosh and his team have pointed out that SARS-CoV-2 is known to interact with a specific human receptor known as hACE2 (human angiotensin-converting enzyme-2) which also happens to be the entry point of the virus and has an almost ubiquitous presence in most human organs ranging from lung parenchyma to nasal mucosa. The brain is also known to express this receptor.



Website link:

<https://dst.gov.in/study-shows-covid-19-may-affect-central-nervous-system-causing-loss-smell-and-taste>

Science for Society: SEED Division of DST

There is a strong tendency in scientific research, technology and innovation to focus on applications that generate immediate economic benefits to the society en masse. Information in this segment brings about the solutions to societal needs and problems. The society constitutes of various segments whose specific prerequisites for routine survival, based on a number of verticals, like gender centric, rural divide, geographical disadvantage, and elderly and physically challenged, need to be looked into. The programmes and schemes enlisted here provide long-term core support to science-based incubators, which in turn provide technological solutions and their effective delivery for livelihood generation and societal benefits. Under this programme efforts have been made to associate concerned National Labs or other specialist S&T institutions with each major programme so as to build-in expert input, utilize national S&T infrastructure and link it up with grassroots S&T interventions/initiatives.



Face Shields made by Centre for Technology and Development, Society for Economic and Social Studies

Home-scale or small-group production of simple 2- or 3-ply masks and quality control following the protocol recommended by Principal Scientific Advisor would be undertaken in several SHGs distributed throughout the field area. Training has been provided to 5 members of 7 SHGs who are now actively involved in mask making.

Website link:

<http://dsttara.in/InnerPages/COVIDDetails.aspx?COVIDId=24&Title=Face%20mask%20/%20Shield>



Facemask developed by Sardar Patel Renewable Energy Research Institute, Gujarat

Sardar Patel Renewable Energy Research Institute (SPRERI) planned for 5000 number of cloth facemask for distribution to poor people in rural/tribal areas, nearby hospital dedicated as Covid-19 centre, rural health centres etc. The production activity has been initiated through women SHGs in Anand District. Cost of these cloth masks will be approximately Rs. 10. The project is initially starting in two districts, i.e., Anand and Chota Udepur, Gujarat and nearby rural/tribal areas. Distribution of the masks shall be made through district administration and various line departments and active NGOs in these areas.



Website link:

<http://dsttara.in/InnerPages/COVIDDetails.aspx?COVIDId=22&Title=Face%20mask%20/%20Shield>

Mask prepared by BAIF Development Research Foundation, Pune

Technology has been provided by BAIF for preparation of masks. Seven SHGs have started producing masks and 10,000 masks already prepared have been supplied to health department and district rural health agency through support of NAYARA Energy Ltd. and efforts are being made to work in close coordination with the local administration and extend them all required support.

Website link:

<http://dsttara.in/InnerPages/COVIDDetails.aspx?COVIDId=19&Title=Face%20mask%20/%20Shield>

Himalayan Research Group (HRG) Shimla made sanitizers

Himalayan Research Group (HRG) team is making cotton reusable masks at HRG field station, Village Dhangiarra Distt. Mandi H.P. One thousand bottles of 100 ml hand sanitizers for distribution has already been sourced.



Website link:

<http://dsttara.in/InnerPages/COVIDDetails.aspx?COVIDId=12&Title=Sanitiser>



Barefoot College made masks and sanitizers

Mask made by Barefoot College in Rajasthan is currently provided to individuals who stay on the campus. Later it would be expanded to individuals living nearby Tilonia village. Till date the mask has been provided to medical staff, administrators and cleaners within the campus. These masks are made by the handicraft section in Tilonia using double-layered cotton cloth. The cotton cloth was repurposed to make filter fabric.



The hand sanitizers were made using locally sourced alcohol, aloe vera and castor oil. The first batches have been distributed to nearly 100 staff and their families within the campus.

Website link:

<http://dsttara.in/InnerPages/COVID.aspx>

FEEDS distributed sanitizers in Manipur

Ethno-Medicinal Research Centre at FEEDS have taken up the responsibility of making, training and distributing 1500 sanitizer (100ml) across several villages of Manipur.

Website link:

<http://dsttara.in/InnerPages/COVIDDetails.aspx?COVIDId=4&Title=Sanitizer>

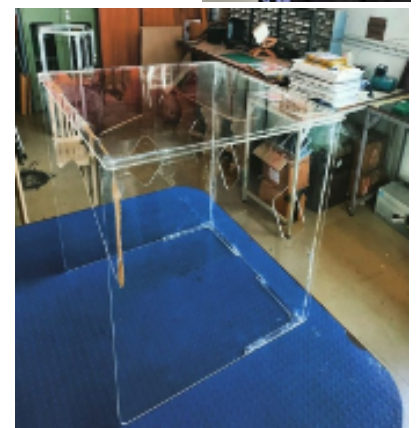
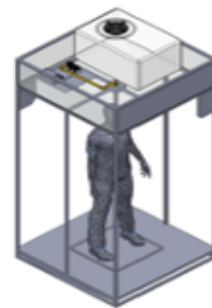


Disinfectant chamber, face shields developed by Vigyan Ashram

Vigyan Ashram has made a design of disinfection chamber. They had made prototype running at Pabal. It is DIY and needs to be tested and certified from independent lab which can be done after the lockdown period.

Vigyan Ashram is making face shield in Fab Lab at Pabal. So far, more than 2000 face shields were made and given to hospitals and health workers. Savitribai Phule Pune University - Design Innovation Centre supported Vigyan Ashram financially to make the face shield and take requisite permission for manufacturing. Now they are planning to prepare additional 1500 face shields in next few days.

Vigyan Ashram has supplied an aerosol box. The box is designed to protect doctors from aerosol while putting patients on ventilator. It was supplied to Nobel Hospital, Pune. This box will help healthcare practitioners to avoid direct exposure with patients while treating them.



Website link:

<http://dsttara.in/InnerPages/COVID.aspx>



SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

DEPARTMENT OF BIOTECHNOLOGY (DBT)

DBT-NIPGR examining potential for anti-COVID drugs from plant products

The Department of Biotechnology's New Delhi-based National Institute of Plant Genome Research (NIPGR) is looking into ways by which it could contribute to the global efforts to come out with new interventions to tackle the COVID-19 pandemic sweeping the world now. A team of researchers at the Institute led by Dr Ashutosh Pandey is working to find drugs against the SARS-CoV-2 virus. The group is rigorously exploring plant's natural products, specifically flavonoids, that are potentially anti-viral in nature. The potential activity of the identified molecule/s against SARS-CoV-2 will be tested in collaboration with the Regional Centre for Biotechnology, Faridabad.

Contact info: Dr Ashutosh Pandey; ashutosh@nipgr.ac.in

Website link:

<http://www.nipgr.ac.in/home/home.php>

'Sundowner Sessions' focusing on Mental Health during National Lockdown by DBT- inStem, Bangalore

During the current COVID-19 outbreak and lockdown, one's well-being is emerging as one of the top priorities from the mental health perspective. With physical distancing as one of the key tools to flatten the curve, one can feel boycotted and isolated, mentally and emotionally drained. The global surveys suggest that this has been affecting the general well-being resulting in a decline in mental health with an increase in suicide rates and severe trauma for many.

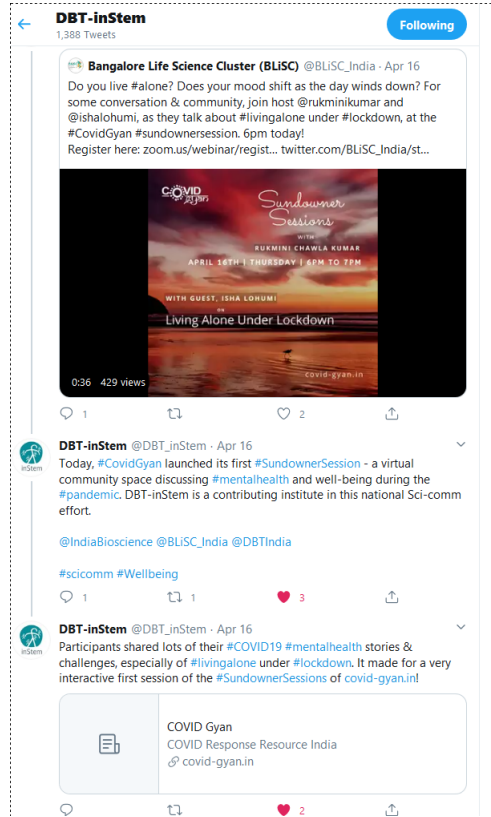
The website, COVID Gyan, was set up by a consortium of institutions to create awareness about COVID-19 for the general public through infographics, posters, research articles, podcasts/videos etc. It is working to address this issue too to bring in a more holistic approach of support during this crisis time.

With evenings being the special periods of vulnerability, COVID Gyan has planned to bring a series of interactive 'Sundowner Session' with Rukmini Chawla Kumar (Author and Editor at Penguin Books). These sessions will focus on discussion of topics of relevance to the lockdown, readings from books/poems and most importantly, some friendly conversations with 'humane'



touch. The idea of these Sundowner Sessions is to create an engaging platform with a community, share challenges that one might be facing, get some tips on these, and spend some time in the company of others while maintaining physical distancing.

The first session was held on 16 April 2020 with the key topic of focus revolving around 'Living Alone during the Lockdown' with guest, Isha Lohumi, a mental health researcher with an M.A. in Social Work in Mental Health. This is especially important for those who are living alone at this time and have to face a day of complete physical isolation. During this one-hour session, participants expressed their trauma, shared their personal stories and coping mechanisms during this lockdown while the panellists addressed some of the concerns and suggested tips to deal with this ordeal. This session was one of its kinds because it made most of them feel that 'everyone is in this together'. We are hoping that such community sessions would be helpful for common man, in general. The video recording of this session will be available on the COVID Gyan website soon.



Well-Being Section on COVID Gyan Website goes LIVE

A brand new 'well-being' section of COVID Gyan also went live recently. Dedicated to several resources on well-being, including ways to deal with isolation, how to keep busy during this trying time, and more, this page of the website is going to bring in 'all round' approach in dealing with this pandemic.

Check out the page <http://covid-gyan.in/well-being> for interesting articles and infographics.



Covid Gyan is the brainchild of Tata Institute of Fundamental Research (TIFR), Indian Institute of Science (IISc), and Tata Memorial Centre (TMC). Several other prominent partners have since joined this noble effort including Vigyan Prasar, IndiaBioScience, and the Bangalore Life Science Cluster (BLiSc), which includes **Institute for Stem Cell Science and Regenerative Medicine** (InStem), Centre for Cellular And Molecular Platforms (C-CAMP), and National Centre for Biological Sciences (NCBS).

Website link:

https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt-01B-23APRIL2020.pdf



treatment and, ultimately, a COVID-19 vaccine. Today's COVID-19 crisis requires a previously unimaginable acceleration of output from the biopharmaceutical and life sciences industry. The way forward requires an enormous collaboration effort like the COVID-19 Virtual Partnering event in which industry can join hands and accelerate #PartneringAgainstCOVID19. Virtual Partnering International event 20 April - 6 May is aimed to encourage inter-regional alliances among life sciences industry, start-ups, research institutes, universities and other stakeholders. The initiative is backed by a consortium of biotech clusters and over 30 national, regional and international trade associations. Pharmaceutical and diagnostics companies have endorsed the initiative, making this a truly global effort. It represents a safe, structured and easy-to-use online meeting space for those working on solutions for COVID-19. The event is organized by Lyonbiopole, Inova, and Evaluate Ltd and will leverage Inova's market-leading platform to efficiently organize one-to-one meetings. Over 1500 attendees from more than 61 countries are participating and it includes representatives from 20 Med Therapeutics: Abbvie; Adjuvatis; Amgen; AstraZeneca; Bristol-Myers Squibb; Calixar; Catalent; Dupont; Eli Lilly; EMD Serono; FosunPharma; Fresenius; Gilead; Menarini; Merck; Pfizer; Roche; Sanofi; Takeda; Teva; UCB; and Vaxess.

DBT – India Alliance develops infographic on COVID-19 for public awareness

India Alliance has developed a 3rd infographic on COVID-19 in 2 languages: English and Hindi. More translated versions in other Indian languages will be released soon. This infographic can be used to educate the general public about the new coronavirus. It simply illustrates the origins of the novel coronavirus, how it may have come in contact with humans and shares basic preventive measures to reduce the spread of COVID-19. The infographic conveys these messages in the voice of the new coronavirus itself thereby making it fun and interesting.

Website link
<https://www.indiaalliance.org/news/415>

ICMR approves DBT's Pune-based NCCS for testing COVID-19 samples

To facilitate the ongoing efforts against COVID-19 in the country, the National Centre for Cell Science (DBT-NCCS) in Pune, an autonomous institute of the Department of Biotechnology (DBT), will soon begin testing samples for SARS-CoV-2, with approval from the Indian Council of Medical Research (ICMR) and the DBT. This is in accordance with the orders received from the Government of India, with DBT-NCCS being one of the Government laboratories



identified for carrying out COVID-testing. The necessary resources and the infrastructure were quickly organized by DBT-NCCS to initiate steps in this direction. Further, to ensure that the tests are conducted in compliance with appropriate safety and quality standards, a section of the staff from DBT-NCCS was sent to the National Institute of Virology (ICMR-NIV) in Pune to be specially trained for this purpose. Fifteen technical staff members and scientists received COVID-related biosafety training and ten technical staff members and scientists received training for COVID testing. Mock testing is being done, and testing of samples will begin in due course. DBT-NCCS is also providing support to CSIR-NCL, IISER-Pune and ARI in their efforts to establish COVID testing labs on their premises.

Website link:

<https://www.nccs.res.in/>

DBT-CDFD starts testing COVID-19 samples from Telangana

The Department of Biotechnology's Hyderabad-based Centre for DNA Fingerprinting and Diagnostics (DBT-CDFD) has started testing COVID-19 samples from Telangana on 18th April after due approval from DBT and ICMR. It has so far tested 526 COVID-19 nasopharyngeal swab samples.

The Institute has been nominated by Office of Director, Medical Education, Government of Telangana along with CSIR-CCMB and ESIC as a centre for pooling of samples from selected districts of Telangana with less than 2% prevalence of COVID positive cases. The districts are Janagaon, Wanaparthi, RajannaSircilla, Nagarkurnool, Mahabubabad, Peddapally, Siddipet, Yadadri, Mulugu, Mancheriyal, Warangal Rural and Narayanpet.

Subsequent to an advisory issued by ICMR on 2nd April 2020, notifying that it has no objection to initiation of COVID-19 testing in laboratories operating under the Department of Biotechnology, CDFD had re-organised the infrastructure to create a designated COVID-19 testing laboratory, procured testing kits and personal protective equipment, and trained the manpower. Senior scientists Drs. Ashwin Dalal, Murali Bashyam, Rashna Bhandari and Harinarayanan are supervising and providing leadership to the task with support from the staff and students. Volunteers were trained at CSIR-CCMB and Osmania Medical College Koti, Hyderabad to conduct RNA preparation and RT-PCR analysis of samples received from different regions of Telangana.



DBT-NABI scientists developing aptamer-based rapid detection strip for novel coronavirus

To tackle the grave situation caused by SARS-CoV-2 there is an immediate need to design quick and efficient detection methods for the virus. The Department of Biotechnology's National Agri Food Biotechnology Institute (NABI) is also contributing in research preparedness in the fight against this virus. Dr.



Nitin Singhal and his team from NABI are working on development of rapid point-of-care test for COVID-19 using aptamers that will be developed against selected peptides of SARS-CoV-2 membrane spike proteins. Conventional methods for detection such as RT-PCR take 6-8 hours including lengthy protocol and require professional expertise, whereas the proposed method can reduce the detection time to approximately 1-2 hours and can be used conveniently. Also, this detection strip can be used for point-of-care testing. This research is a collaborative work between NABI and Translational Health Sciences and Technology Institute, Faridabad to develop aptamer-based methods for viral detection. In this regard, both the respective groups are sharing their experiences and expertise.

Contact Person & Contact Details: Dr Nitin Singhal; Email: nitin@nabi.res.in, Phone No. : +91-172-5221243

Website link:
<https://nabi.res.in/>

DBT-NCCS to explore vaccine candidates and therapeutic strategies

DBT-NCCS is envisaging the production of pseudotype SARS-CoV-2 in a BSL-2 setting using a vesicular stomatitis virus (VSV) platform for candidate vaccine development and use in biomedical research. This project aims to generate a pseudovirus and assess its ability to induce a humoral immune response. On the therapeutic side, scientists at the Centre have recently submitted a grant proposal in response to the CSIR-NMITLI call with a goal to generate neutralizing human monoclonal antibodies (hmAbs) against the SARS-Cov-2 from convalescent phase patients, which could be used for passive transfer into other patients with COVID-19.

Website link:
<https://www.nccs.res.in/>





SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH (CSIR)

Digital surveillance to monitor and control COVID-19 spread

The Centre for Cellular and Molecular Biology (CCMB) and the Institute of Genetics and Integrated Biology (IGIB), along with a few other institutions, are working for the digital and molecular surveillance of the spread of novel coronavirus to understand the biology, epidemiology and disease impact.

Why some people who are infected by the dreaded novel coronavirus do not even show symptoms, leave alone illness? Why some suffer and go to the brink of death while some others come out of the clutches of the virus unscathed? Is the virus mutating so fast that our efforts towards the development of vaccine and drugs will go down the drain or is the change insignificant? A number of such questions abound, for which scientists all over the world are seeking answers.

With digital and molecular surveillance of novel coronavirus, scientists are hoping to get some clue for many of the unknowns today. The centre would be established at IGIB where all the labs, research centres and hospitals will share their data through cloud sharing.

Website link:

<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-1-23-Apr-20.pdf>

<https://www.csir.res.in/>

HCARD, a robot, to assist frontline COVID-19 healthcare warriors

Healthcare workers at hospitals are risking COVID-19 infection 24/7 by taking care of those infected by it. Perhaps the level of risk may get reduced hereafter with the help of a new friend, HCARD. The robotic device HCARD, in short for Hospital Care Assistive Robotic Device, can help frontline healthcare workers in maintaining physical distance from those infected by coronavirus.

HCARD is developed by Durgapur-based CSIR lab, Central Mechanical Engineering Research Institute. The device is equipped with various state-of-the-art technologies and works both in automatic as well as manual modes of navigation.



Lucknow-based IITR is a constituent lab of Council of Scientific & Industrial Research (CSIR). This initiative is part of the Scientific Social Responsibility of CSIR-IITR and was accomplished with the Corporate Social Responsibility contributions of Sangneria Foundation for Health and Education, New Delhi; Round Table India, Lucknow; Rotary Club of Lucknow Baradari; and Meghdoot Gramodyog Sewa Sansthan, Lucknow.



Website link:

<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-2-28-Apr-20.pdf>

<http://iitrindia.org/En/Index.aspx>

India to enhance natural defence against COVID-19

While the world is working towards developing vaccines and antiviral agents for the management of COVID-19, the Council of Scientific and Industrial Research (CSIR) has decided to repurpose an approved immunomodulator called Sepsivac to enhance innate immunity of the body to limit the spread of COVID-19 and fasten the recovery of its patients. Sepsivac is expected to protect the close contacts of COVID-19 patients and healthcare staff by boosting their innate response and thereby preventing them from acquiring the disease. It can be effective to provide quicker recovery to the hospitalized COVID-19 patients, who are not critically ill. Sepsivac could also prevent the progression of disease wherein patients will need ICU management, say CSIR scientists. New clinical trials are now approved by the Drugs Controller General of India (DCGI). These clinical trials are in addition to the recently announced trial on evaluating the efficacy of the drug for reducing mortality (deaths) in critically ill COVID-19 patients.

Website link:

<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-2-24-Apr-20.pdf>

<https://www.csir.res.in/>

Government of Himachal Pradesh notifies CSIR-IHBT as a COVID-19 testing centre

CSIR-Institute of Himalayan Bio-resource Technology (IHBT), Palampur has been declared as a COVID-19 testing centre. The Institute has designated staff with appropriate training to follow prescribed strict procedure and safety protocols. Additional Chief Secretary (Health) of the Government of Himachal Pradesh has notified this facility for undertaking COVID-19 tests by an office order on 22 April 2020.

He further said that besides testing, CSIR-IHBT and Dr. RP Government Medical College, Kangra, are jointly working on sequencing of COVID-19 virus and other research work pertaining to the disease.

Website link:

<https://vigyanprasar.gov.in/isw/Himachal-Govt-notifies-CSIR-IHBT-as-a-COVID-19-testing-centre.html>

<https://www.ihbt.res.in/en/>

Herbal decongestant spray on mask can protect from suffocation

Health authorities have been strongly advocating the use of facemasks to prevent corona infection. At the same time, wearing a mask for a long time is reportedly causing difficulties in breathing and congestion in the respiratory system. To address this issue, scientists at



CSIR-National Botanical Research Institute (NBRI), Lucknow have developed a herbal decongestant spray.

“The main reasons behind this problem include the accumulation of carbon dioxide and humidity in the inner cavity of the mask. When a person breathes in, this goes back to the lungs again. Repetition of this process over a period of time causes discomfort in breathing and congestion,” said Dr. Sharad Srivastava, Senior Principal Scientist, CSIR-NBRI, who led the team of researchers for this study.

“Herbal decongestant spray is a fine blend of four plant-based oils, but the names of these plants cannot be disclosed right now because of issues related to intellectual property. This product is developed based on the principles of Ayurveda and contains ingredients reported in traditional scriptures,” explained Dr Srivastava.

Website link:

<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-3-24-Apr-20.pdf>

<http://nbri.res.in/>



CSIR-IICT initiatives to reduce dependency for APIs and drug intermediates

Active pharmaceutical ingredients (APIs) and intermediates are the key components of any drug that produces the intended effects. India is largely depended especially on China for supply of APIs and drug intermediates. Now Indian Institute of Chemical Technology (IICT), Hyderabad, is collaborating with another Hyderabad-based integrated pharmaceutical company, LAXAI Life Sciences, to develop and manufacture APIs and drug intermediates. The initiative may help in reducing the dependency of the Indian pharmaceutical sector on Chinese imports of these ingredients.

IICT, a laboratory under the Council of Scientific and Industrial Research (CSIR), is working with LAXAI for synthesis of drugs being used in the fight against the Corona Virus. The collaboration will primarily focus on Umifenovir, Remdesivir and a key intermediate of Hydroxy Chloroquine (HCQ). The collaboration will result in a cost-effective process with minimal dependency on China for key raw materials. In addition, Remdesivir, which has been previously administered to Ebola virus patients, is currently under clinical trials to evaluate efficacy and safety against COVID-19.

Website link:

<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-1-24-Apr-20.pdf>

<https://www.iictindia.org/>

CIMAP's Herbal products may boost immunity to avoid infection

CIMAP, a constituent laboratory of the Council of Scientific and Industrial Research (CSIR), has decided to transfer the technology of its herbal products 'CIM-Paushak' and 'Herbal Cough Syrup' to the entrepreneurs and start-up companies. These two products were found to be effective in boosting the immunity of a person. Twelve valuable herbs including Puranva, Ashwagandha, Mulethi, Harad, Baheda and Sataver compounds have been used in both these products.





“The Institute would provide its pilot facility for manufacturing these herbal products - ‘CIM-Paushak’ and ‘Herbal Cough Syrup’ - to entrepreneurs and start-ups after signing of the MoU and transfer of technology,” said Dr. Prabodh K. Trivedi, Director, CIMAP. This pilot plant is equipped with state-of-the-art facilities and a quality control cell.

Website link:

<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-1-25-Apr-20.pdf>

<https://www.cimap.res.in/english/index.php>

CSMCRI’s masks distributed to frontline warriors of COVID-19

COVID-19 needs to be fought at many levels; not just with technology but also by catering to various needs of the society and frontline workers who are fighting against this pandemic. Doctors, health workers, police and municipal employees, who are at the frontline, are taking a greater risk of getting infected by coronavirus. Central Salt and Marine Chemicals Research Institute (CSMCRI), Bhavnagar has been distributing its specially developed masks to all these frontline workers.



Recently, CSMCRI has given 1200 membrane-based facemasks to the Solid Waste Management Department of Bhavnagar Municipal Corporation (BMC). These masks will be distributed by BMC to its road sweepers and personnel deployed for operating the door-to-door household waste collection carts. Apart from this, 300 membrane-based facemasks have been given to the Palitana Town Police Station for their use, evaluation and feedback. CSMCRI has also provided membrane-based facemasks to Mantra Neurology and Epilepsy Hospital, Bhavnagar. In addition, 1000 facemasks have been provided to Bhavnagar Police. The Institute is providing these membrane-based facemasks to homeopathic doctors working with EG University Health Centre and Rotary Health Centre in Bhavnagar.

Website link:

<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-2-27-Apr-20.pdf>

CSIR-NEERI initiates to conduct COVID-19 tests

CSIR-NEERI has come forward to shoulder the responsibility of taking up the COVID-19 testing. Their Environmental Virology Cell (EVC) has taken this challenge of helping the testing and diagnostic healthcare set-up at Nagpur. Dr Krishna Khairnar, Senior Scientist and Head at EVC, is coordinating the COVID-19 testing. Dr Rakesh Kumar, Director CSIR-NEERI had supported the fight against COVID-19 by providing valuable guidance and sponsorship as a Major Lab Project.

Dr Shekhar Mande, Director General, CSIR had been the key figure in ramping-up the CSIR labs throughout the country. CSIR-NEERI (Nagpur) had also been approved for conducting the COVID-19 testing. CSIR-NEERI has also been bestowed with a very important responsibility by Government of India for acting as a regional hub to facilitate capacity building and scaling up of testing facilities for COVID-19 in the region.

Website link:

<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-1-28-Apr-20.pdf>

<https://www.neeri.res.in/>

CSIR delivers immediate relief by providing hand sanitizers, soaps and disinfectants to mitigate COVID-19

“CSIR has always provided technological solutions based on cutting-edge science to some of the most challenging problems that the country has faced,” says Dr Shekhar C. Mande, DG CSIR. “And in combating COVID-19 too our laboratories are bringing to bear their rich scientific experience to develop drugs and vaccines. But at the same time, CSIR has also been quick to provide immediate relief to the country’s citizens in the aftermath of the pandemic – and provision of effective hand sanitizers, soaps and disinfectants to ward off the contagious infection was one such immediate action that our laboratories decided to take.”

Website link:

<https://pib.gov.in/PressReleaseDetail.aspx?PRID=1618158>

<https://www.csir.res.in/>

Applications invited for Project Staff Under COVID-19 Testing Project

CSIR-Indian Institute of Toxicology Research, Lucknow, a constituent laboratory of Council of Scientific & Industrial Research, has invited applications for the engagement of Project Staff under COVID-19 Testing Project.

An online interview for engagement of project staff under COVID-19 testing project will be held on 30th April. Eligible and interested candidates may attend the interview for purely temporary engagement as “Senior Project Associate” and “Project Associate-II” for COVID-19 testing project.

Candidates are requested to send scanned copy of their documents through Email on so.recruit@iitr.res.in latest by 29 April 2020 positively. Candidates shortlisted by the screening committee will be invited for online-Interview through Skype on 30th April 2020 from 9:00 AM onwards. The panel of Project Staff may be prepared for future requirements too, if any, or for up-coming projects.

Website link:

<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-4-28-Apr-20.pdf>

<http://iitrindia.org/En/Index.aspx>

वैज्ञानिकों ने मिस्ट सैनिटाइजर टनल को बताया सुरक्षित

कोविड-19 का प्रसार रोकने और अग्रिम पंक्ति में तैनात स्वास्थ्यकर्मियों, डॉक्टरों, पुलिस और अन्य आवश्यक सेवाओं से जुड़े कर्मचारियों को संक्रमण से बचाने के लिए मिस्ट सैनिटाइजर टनल का उपयोग हो रहा है। लेकिन, इसमें छिड़काव के लिए उपयोग होने वाले सोडियम हाइपोक्लोराइट के दुष्प्रभावों का हवाला देते हुए कई एजेंसियों ने इसके खिलाफ दिशा-निर्देश जारी किए हैं। हालाँकि, अब वैज्ञानिक परीक्षण के बाद मिस्ट सैनिटाइजर टनल के उपयोग को सुरक्षित बताया जा रहा है। काउंसिल ऑफ साइंटिफिक ऐंड इंडस्ट्रियल रिसर्च (सीएसआईआर) की पुणे स्थित प्रयोगशाला नेशनल केमिकल लैबोरेटरी (एनसीएल) के एक ताजा अध्ययन के बाद इस संस्थान के वैज्ञानिकों ने यह बात कही है। संक्रमण हटाने के लिए मिस्ट सैनिटाइजर टनल में कोहरे की फुहार जैसी सूक्ष्म बूंदों के रूप में रसायनों की एक निश्चित मात्रा का छिड़काव किया जाता है। इस टनल के भीतर से होकर गुजरने पर सोडियम हाइपोक्लोराइट की निर्धारित मात्रा का उपयोग संक्रमण हटाने के लिए किया जाता है। वैज्ञानिकों ने सोडियम हाइपोक्लोराइट की विभिन्न सांद्रताओं का मूल्यांकन करने पर मिस्ट सैनिटाइजर टनल में इसके उपयोग को सुरक्षित पाया है।

Website link:

<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-3-23-Apr-20.pdf>

<https://www.ncl-india.org/>



हैदराबाद विश्वविद्यालय के वालंटियर्स को प्रशिक्षित कर रहा है सीसीएमबी

कोविड-19 के खिलाफ सीएसआईआर-सेंटर फॉर सेलुलर एंड मॉलिक्यूलर बायोलॉजी (सीसीएमबी) की मुहिम में अब एक और आयाम जुड़ गया है। कोविड-19 के परीक्षण के लिए सीसीएमबी अब हैदराबाद विश्वविद्यालय के साथ मिलकर काम कर रहा है। दोनों संस्थानों की इस साझा पहल के तहत सीसीएमबी हैदराबाद विश्वविद्यालय के वालंटियर्स को कोविड-19 के परीक्षण के लिए प्रशिक्षण दे रहा है। हैदराबाद स्थित सीसीएमबी कोविड-19 के विभिन्न आयामों पर काम कर रही है। इन आयामों में कोविड के परीक्षण के अलावा दवाओं की रिपरजिंग, वायरस कल्चर, वायरस की जीनोम सीक्वेंसिंग और वैक्सीन का विकास शामिल हैं। सीसीएमबी देश के उन चुनिंदा संस्थानों में से है, जिन्हें कोविड-19 के परीक्षण की जिम्मेदारी मिली है। हैदराबाद और आसपास के इलाकों में कोविड-19 के परीक्षण के दायरे को बढ़ाने के लिए हाल में हैदराबाद विश्वविद्यालय को भी परीक्षणकेंद्र के रूप में चुना गया है। विश्वविद्यालय के वालंटियर्स को सीसीएमबी के विशेषज्ञ परीक्षण के बारे में जानकारी दे रहे हैं। तकनीकी स्टाफ को आईसीएमआर सेमान्यता प्राप्त आरटी-पीसीआर परीक्षण के लिए सीसीएमबी द्वारा प्रशिक्षित किया जा रहा है।

Website link:

<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-2-23-Apr-20.pdf>

<https://www.ccmb.res.in/>

घुटन से बचा सकता है मास्क पर इस हर्बल स्प्रे का छिड़काव

कोरोना संक्रमण से बचाव के लिए मास्क के उपयोग पर जोर दिया जा रहा है। पुलिस, डॉक्टर, स्वास्थ्यकर्मियों और अन्य आवश्यक सेवाओं से जुड़े कर्मचारियों को लंबे समय मास्क लगाना पड़ रहा है, जिससे उन्हें कई बार सांस लेने में घुटन महसूस होती है। भारतीय वैज्ञानिकों ने एक हर्बल डीकन्जेस्टेंट स्प्रे विकसित किया है, जो इस समस्या से निजात दिलाने में मददगार हो सकता है। यह हर्बल डीकन्जेस्टेंट स्प्रे किसी इन्हेलर की तरह काम करता है, जिसे नेशनल बोटैनिकल रिसर्च इंस्टीट्यूट (एनबीआरआई) के शोधकर्ताओं द्वारा तैयार किया गया है। लखनऊ स्थित एनबीआरआई काउंसिल ऑफ साइंटिफिक एंड इंडस्ट्रियल रिसर्च की एक प्रयोगशाला है, जिसे मुख्य रूप से वनस्पतियों पर किए जाने वाले उसके अनुसंधान कार्यों के लिए जाना जाता है। एनबीआरआई के इस हर्बल स्प्रे के शुरुआती नतीजे बेहद शानदार मिले हैं। देर तक मास्क पहनने वाले लोगों को इससे काफी राहत मिल रही है। एनबीआरआई के मुख्य वैज्ञानिक डॉ शरद श्रीवास्तव ने इंडिया साइंस वायर को बताया कि "इस हर्बल डीकन्जेस्टेंट स्प्रे को औषधीय और सगंधपौधों से तैयार किया गया है और इसका उपयोग पूरी तरह से सुरक्षित है।



Website link:

<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-4-24-Apr-20.pdf>

<https://nbri.res.in/>

कोविड-19 की हर्बल दवा पर शोधकर रहे हैं भारतीय वैज्ञानिक

कोविड-19 से निपटने के लिए वैज्ञानिक किसी भी तरीके को छोड़ने के लिए तैयार नहीं हैं। लखनऊ स्थित नेशनल बोटैनिकल रिसर्च इंस्टीट्यूट (एनबीआरआई) में कोविड-19 की जाँच के लिए एक तरफ बायोसेप्टी लेवल (बीएसएल)-2 लैब तैयार की जा रही है, तो दूसरी ओर संस्थान के वैज्ञानिक कोविड-19 की हर्बल दवाओं पर भी शोध कर रहे हैं। इसके लिए एनबीआरआई ने लखनऊ की किंग जॉर्ज मेडिकल यूनिवर्सिटी (केजीएमयू) के साथ करार किया है।

इस समझौते के तहत एनबीआरआई में कोरोना वायरस की जाँच के साथ-साथ वायरस संक्रमण रोकने के लिए हर्बल यौगिकों का परीक्षण किया जाएगा। इस तरह, दोनों संस्थान मिलकर पादप आधारित हेल्थकेयर उत्पाद और दवाविकसितकरण की योजना पर काम कर रहे हैं। काउंसिल ऑफ साइंटिफिक एंड इंडस्ट्रियल रिसर्च (सीएसआईआर) से संबद्ध एनबीआरआई को मुख्य रूप से वनस्पति आधारित अनुसंधान के लिए जाना जाता है। हर्बल यौगिकों के परीक्षण के अलावा, कोविड-19 की जाँच में तेजी लाने के लिए एनबीआरआई में अब बायोसेप्टी लेवल (बीएसएल)-2 स्तरीय लैब तैयार की जा रही है।

Website link:

<http://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-2-22-Apr-20.pdf>



संक्रमण से लड़ने के लिए प्रतिरोधक क्षमता बढ़ा सकते हैं सीमैप के हर्बल उत्पाद

सेंट्रल इंस्टीट्यूट ऑफ मेडिसिनल एंड एरोमेटिक प्लांट्स (सीमैप), लखनऊ के शोधकर्ताओं ने वैज्ञानिक रूप से प्रमाणित दो नये हर्बल उत्पाद विकसित किए हैं। ये हर्बल उत्पाद रोग प्रतिरोधक क्षमता को बढ़ावा देने के साथ-साथ सूखी खांसी के लक्षणों को कम करने में भी मददगार हो सकते हैं, जिसका संबंध आमतौर पर कोविड-19 संक्रमण में देखा गया है।

सीमैप, जो वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद (सीएसआईआर) की एक घटक प्रयोगशाला है, ने अपने हर्बल उत्पादों 'सिम-पोषक' और 'हर्बल कफ सिरप' की तकनीक को उद्यमियों और स्टार्ट-अप कंपनियों को हस्तांतरित करने का निर्णय लिया है। ये दोनों उत्पाद प्रतिरक्षा को बढ़ाने में प्रभावी पाए गए हैं। इन उत्पादों में पुनर्नवा, अश्वगंधा, मुलेठी, हरड़, बहेडा और सतावर सहित 12 मूल्यवान जड़ी बूटियों का उपयोग किया गया है।

Website link:

<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-2-25-Apr-20.pdf>

<https://www.cimap.res.in/english/index.php>





SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

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

Call for proposals (CFP) for Translational Immunology Approaches to COVID-19

Indian Council of Medical Research (ICMR) invites full proposals (in ICMR Ad-hoc Project format) to fast-track the funding opportunities for Translational Immunology and Cellular Therapeutics approach targeting COVID-19 pandemic. All scientific institutions and laboratories are eligible to apply for this CFP. The supported projects are expected to start in June 2020 and should complete latest by the end of May 2022. Last date for project submission: 01 May 2020



Contact info: Dr Geeta Jotwani; tximmun.icmr@gmail.com

Website Link:

https://www.icmr.gov.in/pdf/covid/update/ICMR_COVID_19_Call_for_proposals_V1.pdf

Clinical trial of convalescent plasma in COVID-19 Patients

Clinical trial for convalescent plasma therapy is submitted by Indian Council of Medical Research (ICMR) on April 13, 2020 to Central Drugs Standard Control Organisation (CDSCO), India's apex drug regulator body. CDSCO, on 17 April 2020, has approved the proposal of Indian Council for Medical Research (ICMR) for conducting clinical trial of convalescent plasma in Covid-19 patients, as per the protocol developed by the ICMR.



Website Link:

https://cdsco.gov.in/opencms/opencms/system/modules/CDSCO.WEB/elements/download_file_division.jsp?num_id=NTg2Mw==



Strategy for COVID-19 testing for pregnant women in India

As per ICMR Strategy for COVID-19, asymptomatic pregnant women should be tested in the health facilities where they are expected to deliver and all arrangements should be made to collect and transfer samples to testing facilities.

Website Link:

https://icmr.nic.in/sites/default/files/upload_documents/COVID19_Testing_Strategy_for_Pregnant_Women.pdf

National labs identified for COVID-19 testing to remain open all 7 days a week

A decision has been made by Department of Health Research (DHR) that all the notified national laboratories for COVID-19 testing, including Viral Research & Diagnostic Laboratories (VRDLs) and other labs, spread across the country shall remain open all the 7 days a week. The document contains the list of all the laboratories spread across the country.



Website Link:

<https://dhr.gov.in/whatsnew/national-labs-identified-covid-19-testing-remain-open-all-7-days-week>

Measures undertaken to ensure safety of health workers drafted for COVID-19 services

Doctors and health professionals are at the forefront in the fight against COVID-19. Their efforts and spirit is being widely acclaimed at all levels. The skills and spirit of service among these professional place them in a unique position to save people from this disease. It is of utmost importance that adequate measures have been taken for ensuring their safety. Several measures are taken to ensure safety of healthcare professionals. These are annexed with the attachment (website link).

Website Link:

<https://www.mohfw.gov.in/pdf/MeasuresUndertakenToEnsureSafetyOfHealthWorkersDraftedForCOVID19Services.pdf>

Onboarding of States/Union Territories' COVID-19 warriors to iGoT (Integrated Government Online Training) courses on DIKSHA Platform on COVID-19 pandemic

Integrated Government Online Training (iGOT) has launched a programme to train all the COVID-19 warriors of India. The learning portal has National coverage, free access to all, 24X7 content availability from any location, any device and above all has relevant content developed by the Government of India which is updated regularly as the situation unfolds.

The iGOT COVID version is being hosted on Ministry of Human Resource Development's DIKSHA platform.

Contact info: support@i-got.freshdesk.com

Website Link:

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

<https://igot.gov.in/igot/>



Integrated Government Online Training





SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

DEFENCE RESEARCH AND DEVELOPMENT ORGANISATION (DRDO)

SEWAK - DRDO Robot for keeping hospital staff safe

A team of scientists at CAIR, DRDO has quickly customized one of its robotic solutions to come up with a cost effective robot within a week. The robot is named as Sewak. It can be a safe alternative for the hospital staff like medical professionals and health workers taking care of the COVID-19 patients in the quarantine centres and hospitals. Sewak can be tele-operated by the hospital staff from a remote location to navigate the quarantine zone and distribute food, water, medicine etc. to the affected persons. The robot gets power from maintenance free rechargeable batteries and can work continuously for 5 hours on full charge. It has a capacity of 30 Kg. Video camera fitted in the front helps navigating to the patient's bed. Audio facility provided in the robot facilitates two-way communication between the patient and the hospital staff. This will help the hospital staff communicate with the patient to understand his/her health condition and the recovery he/she is making, explain the dosage of the medicines and comfort the patient. All this is possible while the hospital staff is positioned in a safe zone while the robot moves inside the quarantined zone. This eliminates the risks of exposure of infection to the frontline workers while taking care of the needs of the patients.



This eliminates the risks of exposure of infection to the frontline workers while taking care of the needs of the patients.

Website link:

<https://www.drdo.gov.in/labs-and-establishments/centre-artificial-intelligence-robotics-cair>

https://www.drdo.gov.in/sites/default/files/whats_new_document/attach2.pdf

Suraksha Kawach – Custom designed IoT device

DRDO developed a solution for Corona patient tracking and surveillance to fight the situation. It is an ankle/arm band-based custom IoT solution. The product 'Suraksha Kawach' is realized to be a tamper-proof solution for tracking of COVID-19 patients. It is a GSM- and GPS-enabled rugged system for real-time tracking. It is an integrated solution with software for



central monitoring and management. It is enabled with geo-fencing, tamper detection, battery status monitoring, mechanism for alerts to urban local bodies/police and distributed alert mechanism. The device can also be integrated with Arogya Setu or any other mobile app through server feeds or by introducing a Bluetooth low energy chip in the current design. The unit has battery capacity to withstand quarantine period of 21 days or more, so the device need not be removed for charging. This ensures that the person under quarantine need not remove the device for charging during the monitoring. The configuration or design modifications can allow it to be re-utilized for other tracking purposes after the end of Corona Pandemic. Cost of the device will be Rs 5000.



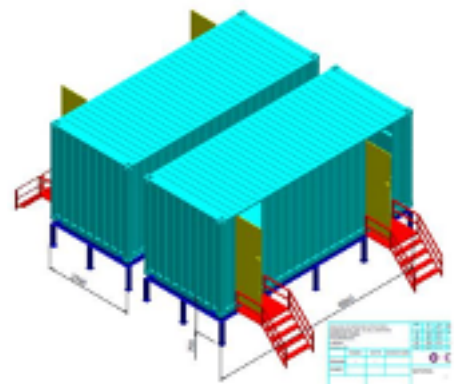
Website link:

<https://www.drdo.gov.in/labs-and-establishments/institute-nuclear-medicine-allied-sciences-inmas>

https://www.drdo.gov.in/sites/default/files/whats_new_document/attach2.pdf

Mobile Virology Research and Diagnostics Laboratory (MVRDL)

RCI, DRDO developed first-of-its-kind mobile lab called MVRDL in India to speed up COVID-19 screening and R&D activities. It was conceptualized on April 6 and all activities have been completed by 20 April, i.e., within 15 days. One MVRDL has been dedicated to the Nation by Hon'ble Raksha Mantri on 23 April 2020. DRDO, in consortium with ESIC Medical College, Hyderabad team configured a combination of two modules. One Bio-Safety Level 3 (BSL-3) lab and another Bio-Safety Level 2 (BSL-2) labs are connected to carry out the virology research and diagnostic activities. The test laboratories are expected to carry out the following activities such as conduct diagnostic test for COVID-19, real-time Reverse Transcription Polymerase Chain Reaction (rRT-PCR) test, virus culturing for drug screening, convalescent plasma-derived therapy, aid in development of vaccine and development of diagnostics kits. This can be positioned anywhere due to its mobile shelter-based configuration and the entire area is conditioned with HVAC system with a design of 100% fresh air ensuring no re-circulation. Room temperature of $24\pm 4^{\circ}\text{C}$ is maintained, relative humidity is maintained less than 60% as per specifications of BSL-3 and BSL-2 labs. The labs are built as per WHO and ICMR bio-safety standards to meet the international guidelines. It will enable the researchers and medical practitioners to undertake research activities and develop diagnostics assays and therapeutics to understand and conduct surveillance of existing as well as new viruses and in developing diagnostic kits.



Website link:

https://www.drdo.gov.in/sites/default/files/whats_new_document/attach2.pdf

https://www.drdo.gov.in/sites/default/files/whats_new_document/Mvrdl.pdf



SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY (MEITY)

Innovation challenge for Development of a Video Conferencing Solution

COVID-19 has thrown unprecedented challenges for the world and industries alike. While we continue to fight these challenges as a nation, amidst business disruptions and remote working scenarios, it is important for all including governments, industry and individuals to contribute with all its might to overcome the present and emerge stronger as humanity. The Government is working towards ensuring that we overcome this challenge and come out stronger as a country and thereby also support the humanity at large to prevail.

Government of India is taking all necessary steps to ensure that we are prepared well to face the challenge and overcome threats posed by this pandemic. In the light of these developments, the Ministry of Electronics & Information Technology announces an Innovation Challenge for Development of a Video Conferencing Solution under the Digital India Initiative. The Innovation Challenge is open for participation from industry, start-ups and individual experts. The end product will be an Indian software product at par with international quality and should work in low and high network scenarios. The initiative is an attempt to promote Indian software products as envisaged under the National Policy on Software Products.



In an attempt to provide initial market the winning team with the best-judged solution will get a contract to deploy their solution for use by Government of India and State Government entities for a period of 4 years and will also be given Rs 1 crore in the first year and an additional Rs 10 lakhs per year for 3 years after the first year towards operations and maintenance of



SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

OTHER SCIENTIFIC AND ACADEMIC INSTITUTIONS

PCR Kits approved for testing of Covid-19 as on 17.04.2020

The document released by Central Drugs Standard Control Organisation (CDSCO) contains a list of types of kits approved for testing of COVID-19 disease, along with the name of firms and their locations.

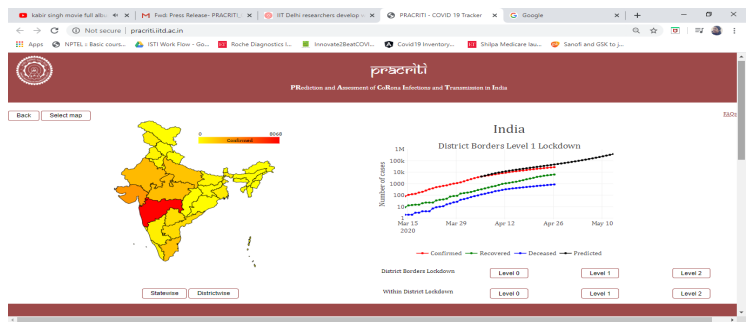
Website Link:

https://cdsco.gov.in/opencms/opencms/system/modules/CDSCO.WEB/elements/download_file_division.jsp?num_id=NTg2MQ==



IIT Delhi researchers develop web-based COVID-19 dashboard 'PRACRITI'- PRediction and Assessment of CoRona Infections and Transmission in India

IIT Delhi researchers have developed a web-based dashboard for predicting the spread of COVID-19 in India. The mobile-friendly dashboard, named as PRACRITI (PRediction and Assessment of CoRona Infections and Transmission in India), gives detailed state-wise and district-wise predictions of COVID-19 cases in India. The projections are provided for a three-week period, which is updated weekly. The researchers believe that such a platform will be highly useful for healthcare bodies and local and central authorities to plan for different future scenarios and resource allocation efficiently.



Website link:

<http://pracriti.iitd.ac.in/>

Pandemic Healthcare Technologies Underway at Indian Institute of Technology Kharagpur(IITKGP)

IIT Kharagpur has set up research funding for R&D work related to COVID-19. The Institute submitted a list of projects to the IIT Council last week of which eight projects have been selected.

The researchers would be working on several technologies including design and development of a rapid diagnostic kit; real-time PCR machine, bodysuit for COVID-19 patients; personal protective equipment for healthcare workers and portable shredder integrated with steriliser; Hazmat Suit with forced purified and cooled air circulation for medical professionals; bootstrapping AMBU-bag as an automated ventilator; telemedicine for fighting the viral pandemic; and large-scale production of recombinant proteins for vaccine and testing. An amount of Rs. 50 lakh has been allotted for Phase I of 8 projects towards development of prototypes. For most of these projects, the prototypes are expected to be ready within 3-4 weeks, while a couple of them would take about six months to deliver the results.



Website link:

<https://kgpchronicle.iitkgp.ac.in/iit-kharagpur-to-fund-healthcare-technology-development-for-covid-19/>

IIT Roorkee start-up develops herbal hand sanitizer to tackle COVID-19

In an endeavour to minimise the transmission risk of COVID-19 and promote basic hygiene, two students of IIT Roorkee have led the development of preparing more than 150 litres (1500 bottles) of herbal hand sanitizer. The hand sanitizer will be distributed free of cost by Heal-agnostics Innovations Pvt. Ltd., a start-up incubated at TIDES, IIT Roorkee under the aegis of Dr Indranil Lahiri and Dr Debrupa Lahiri, with support from the administration.



An initiative of Siddharth Sharma, a research scholar of Centre of Nanotechnology, IIT Roorkee (also a co-founder of Heal-agnostic Innovations) and Vaibhav Jain, research scholar of the Department of Metallurgical and Materials Engineering, it is made of 80% isopropanol/ethanol and comprises of antibacterial, antifungal, anti-inflammatory herbal ingredients; it also works as an excellent moisturiser.

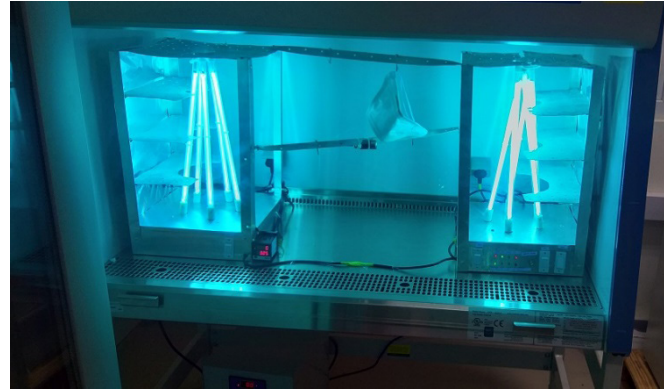
Website link:

https://www.iitr.ac.in/Main/pages/Media_Mention.html

<https://www.ndtv.com/education/coronavirus-iit-roorkee-startup-develops-herbal-hand-sanitizer-to-tackle-covid-19-2199462>

Indian Institute of Technology Jodhpur develops UV-based system for disinfecting medical accessories

Indian Institute of Technology Jodhpur has developed an Advanced Photocatalytic Oxidation Sterilisation System based on UV light and metal oxide nanoparticles in catalyst panels. This can be used for sterilisation of medical accessories being used by doctors and COVID-19 patient handlers.



The System has two indigenous assemblies of UV light sterilisation systems housed within a portable biological safety environment to kill the bacteria and viruses. Metal oxide nanoparticles in catalyst plates are synergistically used in the system in combination with UV lamps. The process eliminates microorganisms including virus and any other suspended particles. It also has an advanced control system and is enabled with the semi-automated operation.

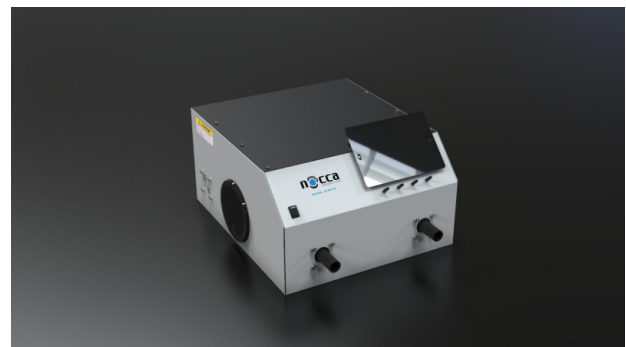


Website Link:

<http://iitj.ac.in/events/index.php?id=568&title=568&event=recognitions>

IIT Kanpur provides innovative technological interventions to combat COVID-19

Indian Institute of Technology Kanpur (IITK) researchers are contributing to tackling COVID-19 pandemic situation by designing and developing innovative products and services related to combating the pandemic. These include Positive Pressure Respirator System (PPRS), Preventive and cost-effective surface coated medicated masks and medical wear, N95 facemask, portable ventilators and anti-viral nasal filter.



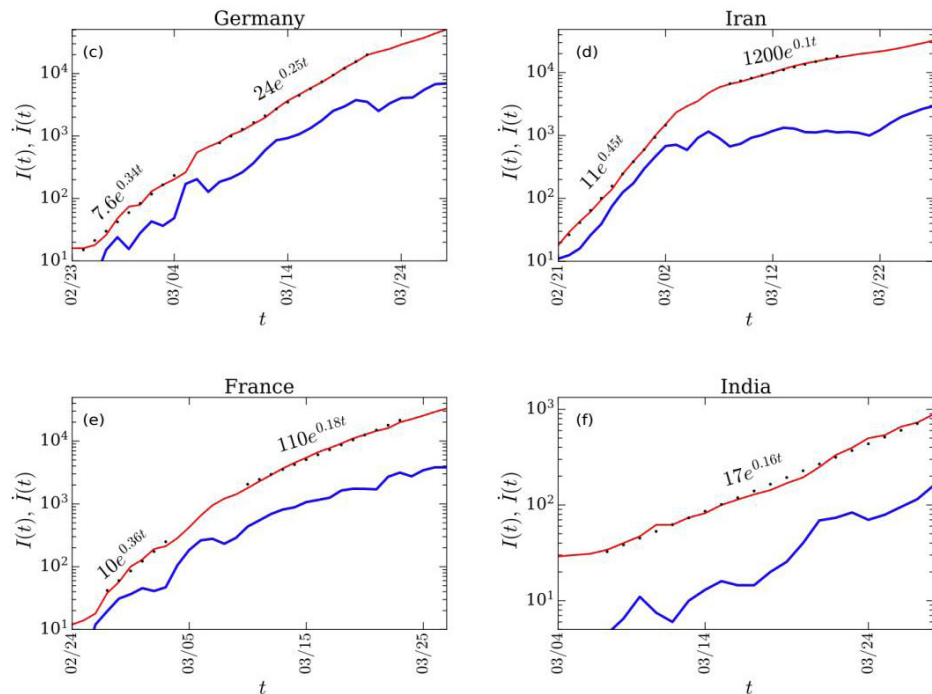
Website Link:

<http://www.iitk.ac.in/new/innovations-on-covid-19>

Exciting work on modelling of COVID-19 at IITK

An interesting and impressive work on modelling of COVID-19 by Prof Mahendra K Verma and his team of Indian Institute of Kanpur (IITK) has been performed. The work demonstrates power-law growth in the spread of COVID-19.

Contact info: mkv@iitk.ac.in



Website link:

<http://www.iitk.ac.in/new/innovations-on-covid-19#>

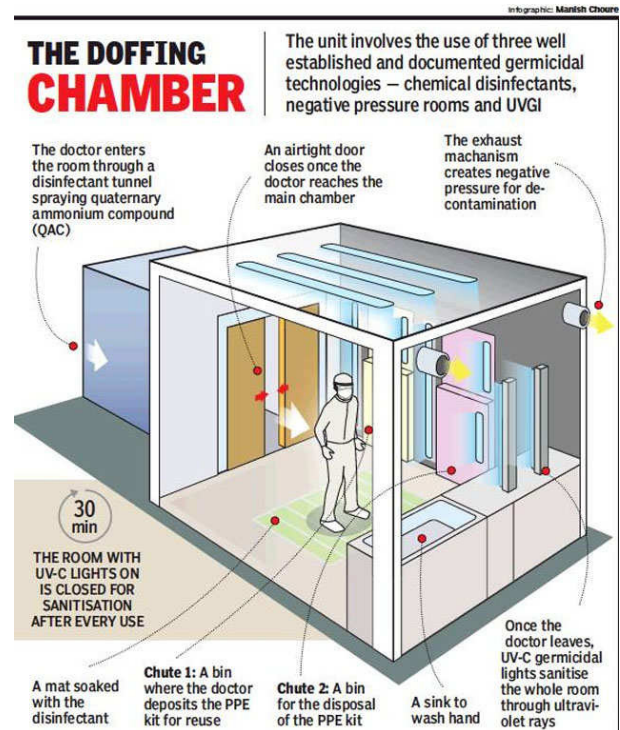
https://www.medrxiv.org/content/10.1101/2020.04.02.20051680v1.full.pdf?fbclid=IwAR3D4xKLFiCUYiBUys2f5D-kKpCYXpVM0xty0DmjDC_WdPDLgM_VTxsE4

IIT Ropar designs doffing unit to enable health workers to remove their personal protective gear under sterile conditions

Researchers at the Indian Institute of Technology, Ropar have designed and developed a 'doffing unit' to enable health workers remove their personal protective gear under sterile conditions. It was conceptualised after the Centre's Special Task Force on COVID-19 desired from all Indian Institutes of Technology (IITs) and other institutions to design a doffing unit for the medical workers. According to experts, personal protection equipment (PPEs) like masks, gloves and gowns worn by doctors, nurses and other health workers have to be removed in a specified way.

Website Link:

<http://www.iitrpr.ac.in/sites/default/files/doffing.jpeg>





contamination from shoe sole, the researchers at NIT Jalandhar developed a shoe sanitisation facility that can disinfect shoe sole of a visitor entering into the campus in less than 30 seconds. A solution of 1% Sodium hypochlorite will be used to disinfect the shoe sole. This facility will significantly reduce the possible risk of COVID-19 transmission from shoes of visitors entering the campus.

Website Link:

https://www.nitj.ac.in/index.php/nitj_cinfo/pages/367

Hand sanitizer developed at NIT Jalandhar to fight COVID-19 outbreak

A team comprising of Dr Shailendra Bajpai, Department of Chemical Engineering, Dr Kiran Singh, Department of Physics and Dr Vikramjit Singh, Department of Chemistry at NIT Jalandhar has developed low-cost alcohol-based hand sanitizer. It promotes hand hygiene and minimises the transmission risk of COVID-19 virus among the residents of the campus.

Website Link:

https://www.nitj.ac.in/index.php/nitj_cinfo/pages/366



Low-cost facemask developed at NIT Jalandhar to fight COVID-19 outbreak

In an effort to help people fight against COVID-19 pandemic, Prof A Mukhopadhyay and Prof V Midha, Department of Textile Technology at National Institute of Technology (NIT) Jalandhar, have developed low-cost facemask to reduce the risk of droplet infection. Facemasks help in stopping large particle droplets, splashes, sprays or splatter, the aerosol that may contain germs (viruses and bacteria) from leaving the wearer's mouth and nose and may help prevent the transmission.

Website Link:

https://www.nitj.ac.in/index.php/nitj_cinfo/pages/368

Prototype of Service Robot developed at NIT Jalandhar to fight COVID-19 outbreak

In an effort to fight against COVID-19 pandemic, Dr Kuldeep Singh Nagla, Department of Instrumentation and control engineering at NIT Jalandhar has developed a prototype model of a Service Robot. The Robot will deliver food, medicine and other materials very efficiently. The wheeled mobile robot will be teleoperated/telepresence based which can be operated through touch screen/joy-stick or mobile phone.

Website Link:

https://www.nitj.ac.in/index.php/nitj_cinfo/pages/369



Prototype of the Service Robot
(Dimensions 28 X 17 X 21 inches)



SCIENCE & TECHNOLOGY EFFORTS ON COVID-19


BY


PRIVATE SECTOR ENTERPRISES

Mumbai-based Marico Innovation Foundation presents Innovate2BeatCOVID Challenge

Marico Innovation Foundation is Mumbai-based innovation focused platform, which work closely with start-ups that are innovative and impactful. The enterprise has initiated a '**Innovate2BeatCOVID**' challenged by calling upon medical technology entrepreneurs, corporates and innovators who can solve the med-tech challenges faced in the **on-going COVID-19 crisis**. This is one-of-a-kind **dynamic grand challenge** where focus is on specific problems statements. As the pandemic progresses, the grand challenge may expand to other items of critical need in consultation with medical experts.

Marico Innovation Foundation presents
INNOVATE2BEAT COVID

SUPPORTED BY  CHANDRA FOUNDATION & HARSH MARIWALA

ADVISORS  PRAXIS GLOBAL ALLIANCE

Website link:

<https://www.maricoinnovationfoundation.org/innovate2beatcovid/>



SCIENCE OUTREACH & POPULARISATION EFFORTS

Initiatives taken towards Science Outreach & popularisation

Ministry of Science and Technology (MoST), Government of India, is striving continuously for reaching to the common people. Since the eruption of COVID-19 pandemic, the Ministry has supported numerous research projects and technology interventions through its various Departments, Autonomous Organisations, Professional Bodies, Statutory Bodies, and Laboratories. In the expedition of science outreach and popularisation, a number of knowledge and information products have been generated and released.

EFFORTS FROM VIGYAN PRASAR

India Science Channel

India Science is an Internet-based Over-The-Top (OTT) Science TV channel. It is an initiative of the Department of Science and Technology (DST), Government of India, implemented and managed by Vigyan Prasar (VP), an autonomous organisation of Department of Science and Technology. This 24x7 video platform is dedicated to science and technology knowledge dissemination, with a strong commitment to spreading scientific awareness, especially with Indian perspectives, ethos and cultural milieu. The initiative is supported by National Council of Science and Technology Communication (NCSTC), DST.

Science and Technology are the main driving forces of the nation and fundamental to progress and growth.

**Convergence of Technologies
in the Times of Virus:**
CODING for COVID-19

LIVE TALK In association with
Prof Ashutosh Sharma **IBM**
Secretary, Dept of Science & Technology,
Govt of India

Friday, April 24, 4 PM
<https://www.facebook.com/indiasciencetv/live/>




**MANN KI
BAAT** with
Shri Narendra Modi
Hon'ble Prime Minister of India

Date & Time
**Sunday
26 April
11:00 am**

LIVE ON
**India
SCIENCE**

Download App from
Google Play App Store






So, advantages of science and technology must reach all sections of the society through popular media of communication. India's large Internet user base of 500 million is split between 305 million urban Indians and 195 million rural Indians, all of whom need to be reached with authentic science and technology content. And to do so, the Internet is fast becoming the most accessible and preferred media for content delivery.

Since the occurrence of COVID-19, India Science has been working tirelessly to connect with the people, in the form of regular bulletins, documentaries, interviews, bytes and live sessions of scientists, doctors, experts, science administrators and policymakers. The following is a brief of the information products produced by India Science.

- i) Daily video bulletin in Hindi and English;
- ii) COVID Explained - Short films to explain research project findings in layman's lingo;
- iii) Interview of top experts from MoST institutions; and
- iv) Facebook live sessions on interviews of various stakeholders and media with DST Secretary.

Contact info: kapil@vignyanprasar.gov.in

Website link:
<https://www.indiascience.in/>

India Science, Technology and Innovation Web Portal

The India Science, Technology and Innovation Portal (ISTI) is a one-stop window for information about developments in India on science, technology and innovation. The portal focuses on bringing all stakeholders and Indian STI activities on a single online platform; helping efficient utilisation of resources; highlighting functioning of scientific organisations, laboratories and institutions; aggregating information on science funding, fellowship & award opportunities spanning from school to faculty level; pooling together conferences, seminars and events; and projecting science in India with its major achievements. The ISTI web portal has been developed

Science & Scientific Responsibility
 in the Time of Virus
 By Prof. Ashutosh Sharma
 Secretary, Dept. of Science & Technology, Govt. of India
 13-April-2020 Monday 05.00 pm IST
 Watch live on Vijnana Bharati Official YouTube channel and Facebook Page
www.youtube.com/q/VijnanaBharatiOfficial
www.facebook.com/VIBHAIIndia.org
 Scan here

साइन्स मीडिया मंच
 'कोरोना काल में ऑनलाइन शिक्षा' पर परिचर्चा
 विभाग
 Date & Time
 Tuesday
 28 April
 4:00 pm
 Download India Science App from Google Play and App Store

भारतीय विज्ञान, प्रौद्योगिकी एवं नवाचार
 India Science, Technology & Innovation
 A one stop source of information on science in India
 7000 Research
 1000 Technologies
 300 Scholarships
 600 Innovations
 100 Funding Schemes
 Science in India numerically
 6862 Research Institutions
 100000 Annual Publications
 7000 Annual Patents Granted
 6038 A&T Tinkering Labs

COVID-19: India fighting by effective implementation of social distancing
 Flattening the Curve
 Number of all people that don't have the virus
 Number of all people that have the virus
 Healthcare System Capacity



by Vigyan Prasar, an autonomous organisation of the Department of Science and Technology (DST) and is coordinated by the Office of Principal Scientific Adviser (PSA), Government of India.

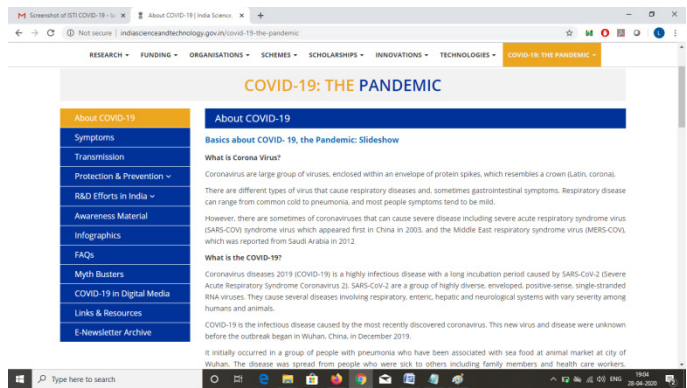
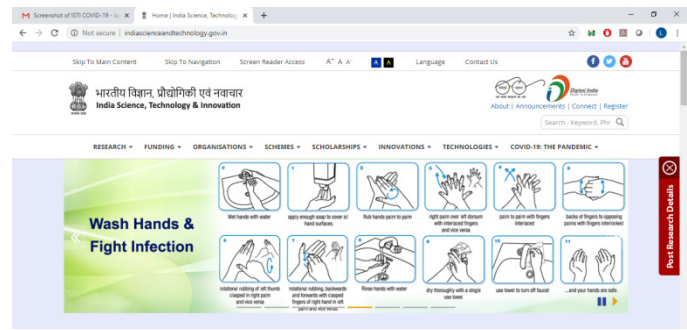
In the critical times of outbreak of COVID-19 pandemic, the web portal serves as a one-stop online information guide to bring together a collection of resources in response to the COVID-19. These resources are generated by efforts made by numerous initiatives and schemes taken up by several Departments and Ministries of Government of India. These are being implemented by public-supported research institutions in India. The content presented here relies on the best available scientific understanding of the disease and its transmission.

The web portal provides all information related to COVID-19, its presentation of symptoms, transmission modes and mechanisms, and various models of protection of individuals, healthcare professionals & prevention from spreading to the community. The reasons, usefulness and impact of social distancing have been communicated in an easy-to-understand manner. The Research and Development efforts made at Ministry level and various funding organisations are enumerated here on as-and-when-available basis. The innumerable infographics have been provided here are sourced from various organisations for efficient delivery of the information and targeting the common people as the largest stakeholder. The frequently asked questions and myth busters are also answered here.

Contact Info: kdgm@vigyanprasar.gov.in

Website link:

<http://indiainsciencandtechnology.gov.in/covid-19-the-pandemic>



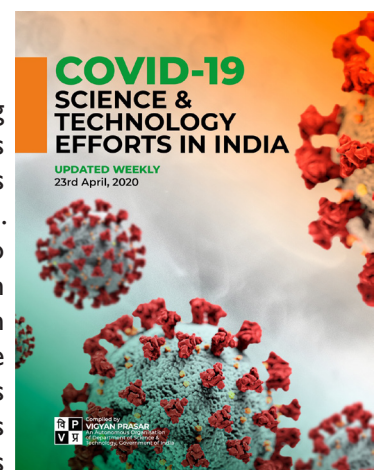
Weekly Publication of e-Newsletter on COVID-19

For the benefit of our stakeholders, Vigyan Prasar is bringing out a weekly e-Newsletter on the most relevant initiatives and efforts taken by Government of India through its various Science Ministries, Departments, and Funding Organisations. These organisations are geared up and working tirelessly to combat the outbreak of COVID-19. These research-driven and technology-based interventions have been initiated on war footing to fight out the outburst of the pandemic. The e-newsletter shall be a handy guide to scientists, researchers and scholars, especially who are interested in knowing various aspects of COVID-19 and contributing to the coronavirus warfare in whatever minuscule way and people at large.

Contact Info: kdgm@vigyanprasar.gov.in

Website link:

<https://vigyanprasar.gov.in/covid19-newsletters/>





In view of providing consolidated and authentic information on the global crisis to the masses in an interesting and interactive mode, the NCSTC, DST in association with Dr Anamika Ray Memorial Trust (ARMT), an educational and research organisation, has brought out multimedia guide carrying important information on A-to-Z of COVID-19, titled “COVID Katha – A Multimedia Guide for Mass Awareness”.

Contact info: mkp@nic.in; dranamikaraymemorialtrust@gmail.com

Website link:

<https://dst.gov.in/sites/default/files/COVID%20Katha.pdf>

**Special issue of monthly magazine
SCIENCE REPORTER on COVID-19 by
NISCAIR**

Science Reporter is a monthly popular science magazine that has been published in India since 1964 by the National Institute of Science Communication and Information Resources (NISCAIR), New Delhi. It seeks to disseminate information about S&T developments throughout the world, with special focus on Indian scientific achievements. The magazine provides insight into all the major scientific and technological developments, presents facts about controversial scientific concepts, and tries to bring to its readers interesting, exciting and informative information from various disciplines of science.



In this moment of a grave health crisis due to outburst of the novel coronavirus, Science Reporter has brought out a special issue on various aspects of mitigating the COVID-19 pandemic.

Contact info: sr@niscair.res.in

Website link:

<http://nopr.niscair.res.in/handle/123456789/54264>