COVID-19
SCIENCE & TECHNOLOGY EFFORTS IN INDIA

UPDATED WEEKLY

23rd April, 2020

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

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

जय विज्ञान
जय अनुसंधान

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

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 COVID19.

(Dr. Harsh Vardhan)

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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

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 Prasar were present in the review meeting with the Union Minister. Directors of remaining 38 CSIR labs attended the meeting through Video Conference.

COVID INDIA SEVA TO PROVIDE SOLUTIONS TO COVID-19-RELATED QUERIES

Union Minister of Health & Family Welfare, Science & Technology, and Earth Sciences, Dr Harsh Vardhan launched an interactive platform, COVID INDIA SEVA, on 21 April 2020. The initiative is aimed at providing real-time solutions to COVID-19-related queries. People can post their questions to the COVID INDIA SEVA twitter handle for getting swift replies from the team of trained experts. This initiative is aimed at enabling transparent e-governance delivery at large scale, especially in crises, like the ongoing outbreak of COVID-19 pandemic.

Dr. Vardhan, in a tweet, said that through this platform, trained experts would be able to share authoritative public health information swiftly at scale, helping to build a direct channel for communication with citizens. Commenting on the launch of the social handle, he said that Twitter has proved to be an essential service for both the government and citizens to interact and exchange information, especially in times of need.

The responses by the experts will be available for everyone and users will not be required to share any personal details or health records on this account.

Website link:

https://twitter.com/drharshvardhan/status/1252529868899708930?s=20

http://newsonair.com/Main-News-Details.aspx?id=386270

https://www.businesstoday.in/latest/trends/what-is-covid-india-seva-an-explainer/story/401619.html

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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/

SCIENCE & TECHNOLOGY EFFORTS TO DEAL WITH COVID-19
BY

OFFICE OF THE PRINCIPAL SCIENTIFIC ADVISER (PSA)

Corona Killer Drone CK100

The Office of the Principal Scientific Adviser (PSA), Government of India, and Invest India, India's National Investment Promotion Agency have closely collaborated through the AGNIi Mission and Invest India's Business Immunity Platform (BIP) - to facilitate the use of specially designed drones to support COVID-19 disinfection in Varanasi.

The Government's COVID-19 strategies align with global best practice: protecting Indians against COVID-19, by minimising their chances of catching it. To boost the capacity of the local authority in achieving this, Government is leveraging the power of technology.

Drones offer an effective solution. Using drones, authorities could spray disinfectant over large, crowded, vulnerable urban areas: protecting city-dwellers from COVID-19, while reducing human contact to keep frontline workers safe.

Garuda Aerospace, a Chennai-based drone startup, responded to Varanasi's in such disinfection drive. The team worked with Central, State, and Local government authorities to get Garuda's technologies and personnel to Varanasi. The team

monitored and supported every step of this exercise by helping the Government and the innovator collaborate to fight COVID-19 together.

Drone operations in Varanasi have just commenced. The team will now extend similar capabilities to more cities across India. This forms part of a broader effort to use innovative technology, via Government-innovator collaboration, to reinforce Indian authorities' fight against COVID-19.

Website link:
https://www.agnii.gov.in/innovation/corona-killer-drone-ck100

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/PressReleseDetailm.aspx?PRID=1614064

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

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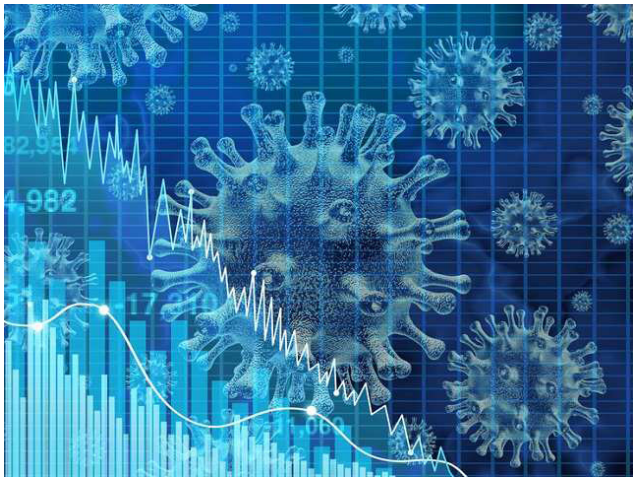
SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

DEPARTMENT OF SCIENCE AND TECHNOLOGY (DST)

A predictive model by JNCASR can help prepare for medical needs for COVID-19



A team of researchers from Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), an autonomous institute under the Department of Science & Technology (DST), Government of India along with a collaborator from IISc Bengaluru have developed a heuristic predictive model for COVID-19 that provides short-term predictions about the evolution of the disease and the medical needs that are generated as a consequence.

The model focuses on the 'Achilles' heel' of COVID-19 response – medical inventory management. By providing key figures for medical inventories such as PPEs and ventilators, this model can significantly aid a systematic and meticulously-planned response to the pandemic. It will provide a full layout of the medical inventory needs, including intensive care, acute care, and medical supplies requirements, district-wise, for the coming weeks. It will also provide a pan-India overview of the development of the pandemic, with a state- and district-level insight into its progress.

Website link:
https://dst.gov.in/predictive-model-jncasr-can-help-prepare-medical-needs-covid-19

CeNS uses electrostatics of materials to develop Tribo E mask to protect healthy individuals from COVID 19

Facemasks used by frontline healthcare professionals, which are of high technical quality, need specialised expertise for production. In contrast, a simple facemask that can contain the spread of the Coronavirus is advised for the general public.

Such a mask, though rudimentary in its action for containing the viral diffusion across the fabric layer, is expected to reduce the transmission of micro-droplets that linger in the air even during a simple conversation, let alone sneeze. Simple, often homemade, ones are advised for healthy individuals rather than those meant for health workers as there is a limited supply of the latter. If only the choice of the fabric can be made intelligently, the mask can serve the purpose more efficiently.

A team of researchers at the Centre for Nano and Soft Matter Sciences (CeNS), Bengaluru, an autonomous institute of the Department of Science and Technology (DST), have come up with a recipe for making facemasks, termed as Tribo E Mask, that can hold electric charges to restrict the entry of infections but interestingly, without any external power.

Website link:
https://dst.gov.in/cens-uses-electrostatics-materials-develop-tribo-e-mask-protect-healthy-individuals-covid-19

DST invites short-term proposals for developing antiviral Nano-coating and Nano-based material for scale up by industry and start-ups to combat COVID-19

The Department of Science and Technology (DST) using the Science and Engineering Board (SERB) portal invites ideas in the form of short-term proposals for developing antiviral Nano-coating and new nano-based material for use in Personal Protective Equipment (PPE), which can be transferred to a partnering industry or start-up for scale up. Such Nano-coatings could contribute immensely in the emerging healthcare requirements in India's fight against the COVID-19 pandemic. This call is for bringing the Academic groups and relevant Industrial groups together for submitting proposals to DST's Nano Mission. It encourages multidisciplinary efforts and collaboration with industrial partners for scaling up production within a year.

The invitation calls for the development of antiviral Nano-coatings for producing anti-COVID-19 triple-layer medical masks and N-95 respirator or better masks in large quantities and PPEs for safeguarding healthcare workers against COVID-19.

The proposals will be screened for suitability and scope followed by a peer-review on a first-come-first-evaluation basis. The items developed and transferred to the industry will need to meet the international standards and may facilitate the development of appropriate Indian standards too for ensuring the quality of the nano-coating-based product.

Last date for submission of proposals: 30 April 2020

Website link:
https://dst.gov.in/dst-invites-short-term-proposals-developing-antiviral-nano-coating-and-nano-based-material-scale

TDB approves support for indigenous company to ramp up production of COVID-19 diagnostic kits

The Technology Development Board (TDB), a statutory body of the Department of Science and Technology (DST), has approved financial support to MyLab Discovery Solutions, Pune, for ramping up production of COVID-19 diagnostic kits they have developed. The company has submitted an application in response to its invitation for proposals for technologically innovative solutions towards fighting COVID-19.

Mylab Discovery Solutions is the first indigenous company to develop real-time PCR-based molecular diagnostic kit that screens and detects COVID-19 from samples of people who display flu-like symptoms. With support from TDB, they will ramp up the production of the kits through automation of the facility from a currently manual process, thereby increasing its present capacity from 30000 tests per day to one lakh tests per day. The Company is expected to complete the automation within the next few months. This kit has been approved by ICMR and CDSCO. The kit will be deployed in a very short time, considering the national emergency.

Contact Info: Cdr Navneet Kaushik, Sc-E; Technology Development Board, navneetkaushik.tdb@gmail.com

Website link:
https://dst.gov.in/tdb-approves-support-indigenous-company-ramping-production-covid-19-diagnostic-kits

TIFAC explores best methods to revive Indian economy post COVID-19

The Technology Information, Forecasting and Assessment Council (TIFAC), an autonomous technology think tank of the Department of Science & Technology (DST), Government of India, by virtue of its mandate of thinking for future, is preparing a white paper to strategise revival of post-COVID-19 Indian economy.

This document would mainly focus on strengthening Make in India initiatives, commercialisation of indigenous technology, developing a technology-driven transparent Public Distribution System (PDS), efficient rural healthcare delivery, reduction of import, adoption of emerging technology domains like AI, Machine Learning, Data Analytics and many more. The white paper will be soon submitted to the decision-making authorities of the Government.

The entire globe has come under one umbrella to fight against COVID-19. The pandemic outbreak is affecting the human life of both developed and emerging economies, with the impact spread over almost all sectors ranging from manufacturing to trade, transport, tourism, education, healthcare, and so on. The extent of the economic impact will depend on how the pandemic outbreak unfolds and also the containment strategy of any nation.

Contact Info: Nirmala Kaushik, nirmala.kaushik@gmail.com

Website link:
https://dst.gov.in/tifac-explores-best-methods-revive-indian-economy-post-covid-19

Women in Varanasi extended a helping hand to migrant workers, villagers affected by COVID-19 pandemic

Rural Women Technology Park (RWTP) at Basani, Varanasi, supported by the Department of Science and Technology (DST) has joined India's fight against the COVID-19 pandemic by extending a helping hand to migrant workers by training and engaging women in making facemask as per WHO guidelines, distributing food as well as hand sanitizers.

More than 500 masks created at the RWTP centre have been distributed among migrant labourers and tribal families in the neighbouring areas of Koiripur, Anei, Kuwar, Chanauli, and Barhi Nevada of development block Baragaon, Varanasi.

The WTP staff has also distributed more than 200 food grains packs (containing 2 kg rice, 2 kg wheat and 1 kg daal) in 15 nearby villages and to the migrant workers who are most affected in this pandemic situation. Social distancing was maintained during the distribution. They also produced and distributed hand sanitizers to the migrant workers, ration and food supply distributors, and villagers to protect them from the Coronavirus.

Contact Info: Dr Indu Puri, Scientist 'F', DST, indub.puri@nic.in

Website link:
https://dst.gov.in/women-varanasi-extended-helping-hand-migrant-workers-villagers-affected-covid-19-pandemic

SAMHAR-COVID-19 Hackathon under National Supercomputing Mission

Centre for Development of Advanced Computing (C-DAC) under the aegis of the National Supercomputing Mission (NSM), a Ministry of Electronics & Information Technology (MeitY) and Department of Science & Technology (DST) initiative, in association with NVIDIA & OpenACC, announces the SAMHAR-COVID=19 Hackathon.

Website Link:
https://samhar-covid19hackathon.cdac.in/

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

Expression of Interest for developing and manufacturing devices for the fast track Programme for COVID-19 pandemic

Sree Chitra Tirunal Institute for Medical Science and Technology (SCTIMST), Thiruvananthapuram invites manufacturers/startups/social groups who are interested in working with the Institute to co-develop and manufacture medical devices on a fast track mode to support the distressing situation created by the epidemic COVID-19. The call is for the development of Ambu bag-based Ventilators, Ventilator Sharing Kit, Battery-operated Assistive Breathing Unit, Isolation Pods, Disposable Safety Face Shield and Deployable Field Units.

Website link:
https://www.sctimst.ac.in/RESOURCES/EOI%20COVID%2019%20-%2029.03.2020.pdf

Proposals invited on COVID-19 & related respiratory viral infections

Science & Engineering Research Board (SERB), a statutory body of the Department of Science & Technology, invites proposals as part of special call under IRHPA (Intensification of Research in High Priority Area) scheme designed explicitly for COVID-19 and related respiratory viral infections to ramp up national R&D efforts for new antivirals, vaccines, and affordable diagnostics.

Website link:
https://dst.gov.in/pressrelease/proposals-invited-covid-19-related-respiratory-viral-infections

Call for Proposals: Indo-U.S. Virtual Networks for COVID-19

The Indo-U.S. Science and Technology Forum (IUSSTF) announces a Call for Proposals for COVID-19 Indo-U.S. Virtual Networks. IUSSTF encourages proposals that convincingly demonstrate the benefits and value of the Indo-U.S. partnership to advance research and address critical challenges related to COVID-19. Virtual Networks would allow Indian and U.S. scientists and engineers currently engaged in COVID-related research to carry out joint

research activities through a virtual mechanism, leveraging existing infrastructure and funding. These network projects could be of two types: Knowledge R&D Networks and Public-Private Virtual Networks.

Last date of submission: May 15, 2020

Website link:
https://iusstf.org/announcements-and-events

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

DEPARTMENT OF BIOTECHNOLOGY (DBT)

DBT-THSTI becomes a member of the global COVID-19 Clinical Research Consortium

Prof. Gagandeep Kang, Executive Director, DBT-THSTI has joined the governance of the COVID-19 Clinical Research Consortium and hence DBT-THSTI becomes the member of this global coalition (https://covid19crc.org/members/). The only other member institution from India which is a part of this Consortium is the Christian Medical College (CMC), Vellore. The COVID-19 Clinical Research Coalition aims to accelerate clinical research for COVID-19 in resource-limited settings. The coalition brings together institutions and groups working to fast-track research that will provide evidence on COVID-19 prevention, diagnosis, and case management in such settings. More details can be found on its website www.covid19crc.org.

Website link:
https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_06S_18APR2020.pdf

More details can be found in this commentary on Lancet:
https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30798-4/fulltext

COVID-19-related efforts of DBT/Wellcome Trust India Alliance

Webinar on COVID-19: Ask the Experts

With the advent of COVID-19 pandemic, there has also been an 'infodemic' - viral spread of misinformation and fear. In such times, the role of journalists, media professionals, community reporters and science and health communicators assumes immense importance. India Alliance, Translational Health Science and Technology Institute (THSTI), Faridabad, International AIDS

Vaccine Initiative (IAVI) and Nature India have partnered to bring together a series of webinars where experts answer questions about COVID-19. The following topics have been covered at the webinars: COVID-19 biology, vaccines, research opportunities, public health impact, bioethics, best practices in fact-checking and reporting a pandemic. So far, four webinars have been organised in this series.

In **Part 4** of this webinar series, organised on 17 April 2020, Dr Soumitra Pathare, Consultant Psychiatrist, Director, Centre for Mental Health Law & Policy, ILS Pune; Ida Jooste, Global Health Media Advisor, Internews; and Padma Priya, Advocacy and communication specialist, Co-founder and Editor, Suno India discussed the 'Role of Language in Times of a Pandemic'.

The role of language in communicating risk in a public health emergency is critical and has a far-ranging impact on affected populations. The webinar covered the following topics: (i) Talking about a pandemic without spreading fear and stigma - what should communicators know and understand? (ii) The role of metaphors in shaping public understanding and human response. What have previous pandemics taught us in this regard? (iii) Humanising a pandemic; (iv) Talking to different public groups about the pandemic; and (v) Key considerations for shaping the public discourse around the pandemic.

Preparation of resources for awareness by India Alliance fellows

Tavpritesh Sethi and his team at IIIT (Indraprastha Institute of Information Technology) Delhi have developed an android application WashKaro to share information on proper hygiene and sanitation practices and a webpage and consortium to raise awareness on COVID-19.

To learn more about their app and to connect and collaborate on COVID-19 awareness-raising, click on: https://arxiv.org/pdf/2003.07074.pdf

Website link:
https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_05S_18APR2020.pdf

To watch the full webinar click on:
https://www.youtube.com/watch?v=rXL2MYMz5bk&feature=youtu.be

DBT-National Centre for Cell Science (NCCS) exploring vaccine candidate for COVID-19

The Department of Biotechnology's National Centre for Cell Science (DBT-NCCS) has initiated research on the generation of a machine learning (ML) model based on patient datasets from Wuhan, Italy, USA and India with a view to explore vaccine candidates.

These mathematical model studies would enable identification of the viral sequences which have evolved with time. These diverse sequences could be utilised for designing peptides with different amino acid combinations. Once the combinations are prepared, these could be tested for their efficacy against the COVID-19 virus.

It is anticipated that since a combination of peptides identified from diverse viral sequences will be used, these peptides if found active, could act on diverse COVID-19 variants and provide cross-protection even if small genetic variations are found.

Website link:
https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_04S_18APR2020.pdf

DBT-IBSD support to COVID-19 diagnostics in NER

Department of Biotechnology's Institute of Bioresources and Sustainable Development (DBT-IBSD) at Imphal, Manipur is setting up a COVID-19 diagnostic centre at Tura, about 400 km from Shillong on a request from the Government of Meghalaya. Presently, there is only one testing centre in Meghalaya at North Eastern Indira Gandhi Regional Institute of Health and

Medical Sciences (NEIGRIHMS) under the Union Ministry of Health and Family Welfare in Shillong. IBSD will provide an RT-PCR machine, refrigerated microcentrifuge, and two freezers, along with technical support and orientation for the use of the equipment. In addition, IBSD is handing over one RT-PCR machine, along with equipment orientation support, to the Government of Manipur's Jawaharlal Nehru Institute of Medical Sciences (JNIMS) at Imphal to augment its diagnostic facility.

Website link:
https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_03S_18APR2020.pdf

DBT-IBSD initiative on Personal Protective Equipment

Department of Biotechnology's Institute of Bioresources and Sustainable Development (IBSD) at Imphal, Manipur is in the process of driving large-scale production of locally made hand sanitizers, masks and other personal protection equipment (PPE) kits.

It is promoting start-ups and encouraging rural entrepreneurship in Manipur and Meghalaya to strengthen the local supply chain, which will be more resilient to outbreaks and lockdowns and help protect the people from community transmission of this highly contagious COVID-19 infection.

Website link:
https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_02S_18APR2020.pdf

Supporting the fight against COVID-19: Activities launched by DBT-RGCB- KRIBS-BioNest

KRIBS-BioNest is a part of the Department of Biotechnology's Thiruvananthapuram-based Rajiv Gandhi Centre for Biotechnology (RGCB). It is involved in its translational research activity. It houses 30 Biotechnology start-ups. They have launched several products ranging from nutraceuticals, cosmeceuticals, biomedicals, and diagnostics to probiotics for aquaponics and plant virus testing. In the wake of COVID-19 pandemic, some of the companies took steps to launch products needed to fight the infection and are in the process of procuring drug licence and other such approvals for mass productions.

M/s. Bipha Ayurveda Pvt. Ltd has introduced sanitizers with Neem and Papaya extracts, both of which have antibacterial and antifungal properties while M/s. Scire Science Pvt. Ltd has started production of an alcohol-based hand sanitizer and has applied for regulatory approval. These sanitizers are packed in handy compact containers shaped in the form of a pen, which is easy to carry.

M/s. Omicsgen Life Science Pvt. Ltd has launched gadget wipes for devices such as mobile phones to prevent the transmission of the microbe. The product assumes importance as hand-held devices are becoming an integral part of human life. The company recently got selected in a challenge conducted by DBT's C-CAMP to select products to combat COVID-19. A total of 840 companies had participated in the contest. C-CAMP will support the start-up to take the product into national and international markets.

Website link:
https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_01S_18APR2020.pdf
https://rgcb.res.in/BioNest/index.php

Several projects approved under DBT-BIRAC COVID-19 Research Consortium Call

Union Ministry of Science and Technology's Department of Biotechnology (DBT) and its public sector undertaking Biotechnology Industry Research Assistance Council (BIRAC) have called for project proposals under their COVID-19 Research Consortium.

DBT-BIRAC Call on COVID-19 Research Consortium → **Proposals sought on development of dianostics, vaccines,therapeutics and other interventions** → **16 proposals have been recommended for funding support**

The first phase of the call ended on 30th March 2020, and around 500 applications were received from academia and the industry. A multi-tiered review process is on, and till date, 16 proposals for devices, diagnostics, vaccine candidates, therapeutics and other interventions have been recommended for receiving funding support under the Consortium.

A multifaceted approach is being adopted to ensure that vaccine candidates utilising different platforms and at different stages of development are fast-tracked through this Research Consortium under funding from DBT's National Biopharma Mission. Both repurposing of existing vaccine candidates for immediate protection of high-risk groups and novel vaccine candidate development were considered while selecting proposals under this call.

Funding support has been recommended to Cadila Healthcare Ltd for advancing the development of a DNA Vaccine candidate against Novel Coronavirus SARS-CoV-2 and also to Bharat Biotech International Ltd for a COVID-19 vaccine candidate utilising the inactivated rabies vector platform.

Further, Serum Institute of India Private Limited (SIIPL) will be supported for Phase III human clinical trials study of a recombinant BCG vaccine (VPM1002) planned in high-risk populations and National Institute of Immunology for the development of a novel vaccine evaluation platform to support SARS-CoV-2 vaccine development.

In addition, OncoSeek Bio Pvt Ltd will be provided support to create an *in vitro* Lung Organoid model and Virchow Biotech Pvt Ltd. will be supported for production of purified immunoglobulin G (IgG) at commercial scale from COVID-19 convalescent sera and high titers of equine hyper immune globulin for the treatment of COVID-infected patients on a large scale.

Following companies will receive financial support to scale-up the production of molecular and rapid diagnostic tests: Mylab Discovery Solutions Pvt Ltd, Huwel Lifesciences, Ubio Biotechnology Systems Pvt Ltd, Dhiti Life Sciences Pvt Ltd, MagGenome Technologies Pvt Ltd, Bigtec Pvt Ltd and Yaathum Biotech Pvt Ltd.

Further, a common shared facility to manufacture diagnostic kits and ventilators will be established at Andhra Pradesh MedTech Zone (AMTZ) under National Biopharma Mission to scale up production capacity of different manufacturers.

Besides, development and deployment of contactless, affordable thermopile-based ultrasonic sensors for the screening of COVID-19 suspects and indigenous production of novel PPE for healthcare professionals will be supported.

For further information: Contact Communication Cell of DBT/BIRAC

Website link:
http://dbtindia.gov.in/

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

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH (CSIR)

CSIR-CFTRI's protein-enriched biscuits reach COVID-19 patients

The Mysuru-based CSIR-Central Food Technological Research Institute (CFTRI) has sent its high-protein biscuits to the COVID-19 patients undergoing treatment in the All India Institute of Medical Science (AIIMS), New Delhi. CFTRI supplied 500 kg of high-protein biscuits and 500 kg of high-protein rusks to the Dietetics Department of AIIMS for its patients. The biscuits were provided on request from the officials of the Institute. The biscuits contain 14% protein while usual biscuits contain around 8-9% protein. "The enriched biscuits will provide the protein needed for recuperating patients," says Dr KSMS Raghavarao, Director, CSIR-CFTRI. "It is also pertinent to mention here that the recipe formulation of the protein-enriched products is being done by the dedicated scientists of CSIR-CFTRI Mysuru and manufactured as per FSSAI regulations," says Dr Parmeet Kaur, Chief Dietician, AIIMS, about the biscuits. COVID-19 patients undergoing treatment in the hospital, along with others, will be receiving the biscuits as part of their routine diet.

Website link:
https://vigyanprasar.gov.in/wp-content/uploads/2_CSIR-CFTRI%E2%80%99s-Protein-Enriched-Biscuits-reach-COVID-19-patients-18apr20.pdf

Cost-effective and indigenous personal protective suit to combat COVID-19

Healthcare workers are at high risk, as they have to work in a high viral load environment. To safeguard medical personnel deployed in COVID-19 treatment clinics, the National Aerospace Laboratories (NAL) has developed cost-effective and quality-certified fabric-based personal protective suits. NAL, along with MAF Clothing Private Limited, has developed these suits.

"The significant advantages of these coveralls are that they are highly competitive in price as compared to other manufacturers and the import content is negligible," said Jitendra J Jadhav, Director, CSIR-NAL. The cost of the product is Rs. 500-600 per piece as compared to those available in the market at Rs. 2000-3000 per piece. "We found polypropylene spun-laminated, multi-layered non-woven fabrics the best material for making the coverall or suits after testing a lot of fabric materials," said Dr Harish C Barshilia, Chief Scientist, NAL. The non-woven fabrics are engineered fabrics that may have a limited life. Although it can be used only once, the fabric stands the test of durability very well. Known for its sterility, non-woven fabrics also have the ability to repel liquids and bar bacteria. The joints of the suits have been sealed with innovative manufacturing processes by using slide machines so that neither blood nor virus can penetrate the coverall.

Website link:
https://vigyanprasar.gov.in/wp-content/uploads/4_Cost-effective-and-indigenous-personal-protective-suit-to-combat-COVID-19-18apr20.pdf

सीडीआरआई की वैज्ञानिक परीक्षण सुविधा को मिला भरोसे का प्रमाणपत्र

काउंसिल ऑफ साइंटिफिक ऐंड इंडस्ट्रियल रिसर्च (सीएसआईआर) के अंतर्गत कार्यरत 38 प्रयोगशालाओं में शामिल सेंट्रल ड्रग रिसर्च इंस्टीट्यूट (सीडीआरआई) को दवाओं पर उसके शोध एवं विकास पर आधारित कार्य के लिए जाना जाता है। लखनऊ स्थित सीएसआईआर–सीडीआरआई की कुछ परीक्षण सुविधाओं को उत्कृष्ट वैज्ञानिक पद्धति का पालन करने लिए का गुड लैबोरेटरी प्रैक्टिस (जीएलपी) प्रमाण पत्र दिया गया है। विज्ञान और प्रौद्योगिकी विभाग (डीएसटी) के अंतर्गत कार्यरत राष्ट्रीय उत्तम प्रयोगशाला पद्धति (जीएलपी) अनुपालन निगरानी प्राधिकरण (एनजीसीएमए) द्वारा उत्कृष्ट मानक वैज्ञानिक पद्धति पर अमल करने वाले वैज्ञानिक परीक्षण सुविधा केंद्रों को यह प्रमाण पत्र दिया जाता है। जीएलपी मापदंडों पर खरा उतरने वाले परीक्षण केंद्र के रूप में सीएसआईआर–सीडीआरआई की वैश्विक स्वीकार्यता बढ़ सकती है। इस प्रमाण पत्र के मिलने के बाद संस्थान द्वारा औषधि अनुसंधान एवं विकास के लिए तैयार किए गए उत्पाद एवं रिसर्च डेटा की स्वीकार्यता संयुक्त राज्य अमेरिका सहित आर्थिक सहयोग और विकास संगठन (ओईसीडी) में शामिल सभी देशों में बढ़ सकती है।

Website link:
https://vigyanprasar.gov.in/wp-content/uploads/Scientific-testing-facility-of-CDRI-gets-certificate-of-trust-hindi-18apr20.pdf

कोविड–19 मरीजों के लिए सीएफटीआरआई ने बनाए उच्च प्रोटीन बिस्किट

देश के विभिन्न अनुसंधान संस्थान कोविड–19 खिलाफ मुहिम में अपने तरीके से योगदान दे रहे हैं। काउंसिल ऑफ साइंटिफिक ऐंड इंडस्ट्रियल रिसर्च (सीएसआईआर) की मैसूर स्थित प्रयोगशाला सेंट्रल फूड टेक्नोलॉजिकल रिसर्च इंस्टीट्यूट (सीएफटीआरआई) ने कोविड–19 के मरीजों को ध्यान में रखकर उच्च प्रोटीन युक्त बिस्किट बनाए हैं।

ऑल इंडिया इंस्टीट्यूट ऑफ मेडिकल साइंस (एम्स), नई दिल्ली में उपचार करा रहे कोविड–19 के मरीजों लिए ये बिस्किट सीएफटीआरई की ओर से भेजे गए हैं। उच्च प्रोटीन युक्त 500 किलोग्राम बिस्किट और 500 किलोग्राम रस्क एम्स के आहार विज्ञान विभाग को उपलब्ध कराए गए हैं, ताकि इसे कोविड–19 से प्रभावित मरीजों के आहार में शामिल किया जा सके। सीएफटीआरआई की ओर से ये बिस्किट एम्स के अधिकारियों के आग्रह पर उपलब्ध कराए गए हैं।

इस बिस्किट को बनाने के लिए गेहूँ का आटा, मैदा, चीनी, हाइड्रोजेनेटेड फैट, सोया आटा, व्हे प्रोटीन (Whey Protein), सोया प्रोटीन, मिल्क सॉलिड्स, ग्लूकोज, नमक और फ्लेवर्स का उपयोग किया गया है। इस बिस्किट के 100 ग्राम के पैकेट से 400 किलो कैलोरी के ऊर्जा मिल सकती है। इसके पोषण मूल्य में कार्बोहाइड्रेट (63.2 ग्राम), प्रोटीन (14 ग्राम), वसा (17.1 ग्राम) और खनिज (1.2 ग्राम) शामिल है।

Website link:
https://vigyanprasar.gov.in/wp-content/uploads/CSIR-CFTRI-protein-enriched-biscuits-reach-COVID-19-patients-hindi-18apr20.pdf

CDRI gets Good Laboratory Practice (GLP) certification

Lucknow-based Central Drug Research Institute (CDRI), under the Council of Scientific and Industrial Research (CSIR), is one of the leading laboratories working in the field of drug research. This CSIR lab has now received a certification for its Good Laboratory Practice (GLP). For drug discovery and research, CDRI became the first laboratory to have GLP-certified safety pharmacology facility and the third government laboratory to get this GLP certification. GLP-compliance certification is voluntary in nature. Test facilities dealing with different chemicals and looking for approval from regulatory authorities before marketing them prefer to obtain GLP Certification for easy acceptance of data by the regulatory bodies. It enhances the reliability and acceptability of the data generated in such facility worldwide. Therefore, the significance of CDRI getting GLP certification is that the drug development data generated by the Institute will now have acceptability in all countries of the Organisation for Economic Co-operation and Development (OECD), including the USA.

Website link:
https://vigyanprasar.gov.in/isw/CDRI-gets-Good-Laboratory-Practice-certification.html

NBRI scientists develop herbal hand-sanitizer

As the demand for sanitizers has increased amid coronavirus outbreak, various laboratories have started the production of sanitizers. In one such endeavour, researchers of the National Botanical Research Institute (NBRI) have developed alcohol-based herbal sanitizer. The product is developed under Council of Scientific and Industrial Research (CSIR)-Aroma Mission as per the World Health Organisation (WHO) guidelines. This sanitizer contains Tulsi essential oil as a herbal constituent, which is a strong natural antimicrobial agent and 60 per cent of isopropyl alcohol for killing germs. The product is validated scientifically for its strong germ-killing activity. "This hand sanitizer has been clinically tested and found to be 'highly-effective' against surface microbes. Its impact lasts for about 25 minutes and it prevents skin from dehydrating," said Dr (Prof.) S K Barik, Director, NBRI. In clinical trials done on the pathogen (*Staphylococcus epidermidis*) harmful to human skin and found on surfaces, the herbal sanitizer has been found to be effective.

Website link:
https://vigyanprasar.gov.in/isw/NBRI-scientists-develop-herbal-hand-sanitiser.html

कोविड–19 से मुकाबले के लिए तैयार तुलसी तेल युक्त सैनिटाइजर

देशभर के वैज्ञानिक संस्थान कोविड–19 की चुनौती से निपटने के लिए अपने तरीके से योगदान दे रहे हैं। नेशनल बोटानिकल रिसर्च इंस्टीट्यूट (एनबीआरआई) के वैज्ञानिकों ने कोरोना वायरस की रोकथाम के लिए तुलसी के तेल जैसे हर्बल तत्वों से युक्त एक हैंड सैनिटाइजर बनाया है।

विश्व स्वास्थ्य संगठन के दिशा–निर्देशों के अनुरूप बनाया गया यह अल्कोहल आधारित हैंड सैनिटाइजर है। काउंसिल ऑफ साइंटिफिक ऐंड इंडस्ट्रियल रिसर्च (सीएसआईआर) की लखनऊ स्थित प्रयोगशाला एनबीआरआई ने इस हैंड सैनिटाइजर को सीएसआईआर के अरोमा मिशन के तहत तैयार किया है।

इसमें हर्बल घटक के रूप में तुलसी के तेल का उपयोग किया गया है। शोधकर्ताओं का कहना है कि तुलसी के तेल में कीटाणुओं को मारने में सक्षम प्राकृतिक रूप से रोगाणु–रोधी गुण पाए जाते हैं। इसके अलावा, सैनिटाइजर में 60 प्रतिशत आइसोप्रोपिल अल्कोहल का उपयोग किया गया है। इस उत्पाद की रोगाणु–रोधी गतिविधि के लिए इसका वैज्ञानिक रूप से परीक्षण भी किया गया है।

Website link:
https://vigyanprasar.gov.in/isw/NBRI-scientists-develop-herbal-hand-sanitiser-hindi.html

Researchers develop a tractor-mounted sanitizing device

Health authorities strongly recommend sanitization as one of the means to contain the outbreak of coronavirus. The Central Mechanical Engineering Research Institute (CMERI), one of the institutions under the Council of Scientific and Industrial Research (CSIR), has developed a tractor-mounted sanitizing system to carry out sanitisation work on roads to fight against novel coronavirus.

This Road Sanitization Unit can be effectively deployed in the long stretches of highways, the areas around toll plazas, etc. These are the places where the probability of spreading the infection is high due to the massive volume of traffic. It can also be deployed in housing complexes, office complexes, sports arenas, apartment buildings, etc.

The Road Sanitizer has a span of 16 feet, which uses 15 to 35 bars of pressure to ensure effective delivery of the sanitizer. Twelve nozzles are used to provide optimum radial coverage of the sanitizer. The system utilizes a 2000 to 5000 litres tank with a pump, which can spray about 22 litres of sanitizer per minute. In practical terms, one full tank of sanitizer can sanitize a stretch of road about 75 km.

Website link:
https://www.vigyanprasar.gov.in/isw/Researchers-develop-tractor-mounted-sanitizing-device.html

सीमैप ने पुलिस और प्रशासन को सौंपा हर्बल सैनिटाइजर हैं कूल

कोविड–19 के खतरे को देखते हुए सेंट्रल इंस्टीट्यूट ऑफ मेडिसिनल ऐंड एरोमेटिक प्लांट्स (सीमैप) ने सैनिटाइजर लखनऊ पुलिस को उपलब्ध कराया है। हैंकूल नाम से इस हर्बल सैनिटाइजर का पेटेंट सीमैप के पास है। सीमैप के निदेशक डॉ प्रबोध कुमार त्रिवेदी ने 500 बोतल हैंकूल सैनिटाइजर लखनऊ के एडीसीपी राजेश श्रीवास्तव को सौंपे हैं।

सीमैप की प्रयोगशाला में तैयार हैंकूल सैनिटाइजर, सतह से संक्रमण हटाने के लिए बनाया गया सरफेस डिस्इनफेक्टेन्ट (स्बाबी) और फ्लोर क्लीनर (क्लीनजर्म) इससे पहले भी स्थानीय प्रशासन को उपलब्ध कराए गए हैं। कुछ समय पूर्व यह सामग्री सीमैप की ओर से लखनऊ प्रशासन को सौंपी गई है।

डॉ प्रबोध कुमार त्रिवेदी ने बताया – "सीमैप द्वारा बनाए गये ये उत्पाद लखनऊ प्रशासन की जरूरी सेवाओं में कार्यरत डॉक्टर्स, नर्स, पुलिस एवं अन्य पैरा–मेडिकल स्टाफ, जो अग्रिम पंक्ति में कोरोनो वायरस के खिलाफ के खिलाफ लड़ाई लड़ रहें हैं, उन्हे वितरित करने के लिए संबंधित अधिकारियों को सौंपे गए हैं।" इन उत्पादों को बनाने में सीमैप के वैज्ञानिक डॉ दिनेश कुमार, सुधा अग्रवाल, प्रियंका सिंह एवं क्षमा श्रीवास्तव ने विशेष योगदान दिया है।

Website link:
https://vigyanprasar.gov.in/wp-content/uploads/CIMAP-entrusted-herbal-sanitizer-to-police-and-administration-hindi-20apr20.pdf

CSIR plans to evaluate Mw for faster recovery of COVID-19 patients

Looking at similarities between clinical characteristics of patients suffering from COVID-19 and gram-negative sepsis, CSIR is now initiating a randomized, blinded, two-arms, active comparator-controlled clinical trial to evaluate the efficacy of the drug for reducing mortality (deaths) in critically ill COVID-19 patients. The Drugs Controller General of India (DCGI) has approved the trial and it will start soon at multiple hospitals.

The drug contains heat-killed Mycobacterium W (Mw). It is found to be extremely safe in patients and no systemic side effects are associated with its use. It can be used concurrently with any other therapies required in the management of such critically ill patients without any restriction. Its unique properties include boosting protective immunity (Th1, TLR2 agonist) and suppressing non-protective response (Th2).

CSIR has also planned to evaluate Mw for faster recovery of hospitalized COVID-19 infected patients and minimize the spread of disease through them as well for providing prophylaxis to persons coming in contact with COVID-19-infected patients like family members and healthcare workers.

Website link:
https://pib.gov.in/PressReleasePage.aspx?PRID=1616379#.Xp5B-YAjlmM.twitter

Indian researchers to go for the clinical trial of sepsis drug against novel coronavirus

The Council of Scientific and Industrial Research (CSIR) is leaving no stone unturned in the battle against novel coronavirus. Repurposing of existing drugs is one of the strategies deployed by CSIR. The Council is implementing this strategy by evaluating an existing drug that is used for treating gram-negative sepsis patients.

The drug, Sepsivac, is available commercially. In gram-negative sepsis patients and in critically ill COVID-19 patients, the altered immune response leads to a massive change in the cytokine profile. Cytokines are produced in response to an infection and they are essential for host defence against pathogens. There are six types of cytokines, each having different families of cytokines. The different mix of cytokines, called cytokine profiles, acts on various pathogens. One of the significant contributors to death by COVID-19 is heightened immune response, called a cytokine storm. The immune system starts attacking both infected and uninfected cells. It makes no difference between a friend and a foe, leading to tissue damage resulting in sepsis. The drug modulates the immune system of the body and thereby inhibits the cytokine storm leading to reduced mortality and faster recovery.

Website link:
https://vigyanprasar.gov.in/wp-content/uploads/Indian-researchers-to-go-for-clinical-trial-of-sepsis-drug-against-novel-coronavirus-21apr20.pdf

कोविड–19 के खिलाफ सेप्सिस की दवा का परीक्षण करेंगे भारतीय वैज्ञानिक

भारतीय वैज्ञानिक अब कोविड–19 से गंभीर रूप से ग्रस्त रोगियों पर सेप्सिस के उपचार के लिए उपयोग होने वाली दवा का परीक्षण करने जा रहे हैं। ग्राम नेगेटिव बैक्टीरिया जनित सेप्सिस की दवा का उपयोग इस परीक्षण में किया जाएगा। सेप्सीवैक नामक इस दवा को काउंसिल ऑफ साइंटिफिक ऐंड इंडस्ट्रियल रिसर्च (सीएसआईआर) के सहयोग से दवा कंपनी कैडिला फार्मास्यूटिकल्स ने विकसित किया है।

सीएसआईआर के महानिदेशक डॉ शेखर सी. मांडे ने कहा है कि "ग्राम नेगेटिव सेप्सिस के कारण होने वाली मौतों की रोकथाम के लिए कैडिला फार्मास्यूटिकल्स ने इस दवा पर व्यापक क्लिनिकल ट्रायल किए हैं। इस

दवा के उपयोग से सेप्सिस के गंभीर रोगियों की मौतों में 50 प्रतिशत से अधिक कमी देखी गई है। हमें उम्मीद है कि कोविड–19 के खिलाफ किए जाने वाले इस दवा के क्लीनिकल ट्रायल से भी मौतों को रोकने में मदद मिल सकती है।"

Website link:
https://vigyanprasar.gov.in/wp-content/uploads/Indian-scientists-to-test-sepsis-drug-against-covid-19-hindi-21apr20.pdf

सीमैप ने विकसित किया मेंथाल आधारित हर्बल सैनिटाइजिंग जैल

केंद्रीय औषधीय एवं सगंध पौधा संस्थान (सीएसआईआर–सीमैप) लखनऊ ने कोरोना वायरस प्रकोप के बीच सैनिटाइजर की बढ़ती मांग को देखते हुए अल्कोहल–आधारित हर्बल हैंड सैनिटाइजिंग जैल विकसित किया है। 'हेंकूल प्लस' नामक यह जैल विश्व स्वास्थ्य संगठन के दिशा निर्देशों के अनुसार विकसित किया गया है। इस हर्बल सैनिटाइजर जैल में मेंथा आरवेन्सिस (मेंथॉल मिंट) के सुगंधित तेल का उपयोग किया गया है, जो विभिन्न रोगाणुओं के के खिलाफ प्रभावी पाया गया है। यह जैविक रूप से अपघटनीय, सुरक्षित और जलन न पैदा करने वाला उत्पाद है। यह उत्पाद सुगंधित पौधों से बनाया गया है। सीएसआईआर–सीमैप के निदेशक डॉ प्रबोध कुमार त्रिवेदी ने कहा है कि "हर्बल हैंड सैनिटाइजर जैल का वैज्ञानिक परीक्षण किया गया है और इसे रोगाणुओं के व्यापक स्पेक्ट्रम के खिलाफ बाजार में मौजूद अन्य उत्पादों के मुकाबले अधिक असरदार पाया गया है। यह बहुत प्रभावी है और त्वचा को डिहाइड्रशन (Dehydration) से भी बचाता है।"

Website link:
https://vigyanprasar.gov.in/wp-content/uploads/CIMAP-developed-menthol-based-herbal-sanitizing-gels-hindi-21apr20.pdf

NRDC invites proposals for funding of commercialisation of COVID-19 combating technologies

National Research Development Corporation (NRDC), an enterprise of Department of Scientific and Industrial Research, Ministry of Science & Technology, Government of India has launched a scheme to support researchers and innovators to scale-up their lab-scale technologies to commercial-scale for combating COVID-19. The financial support will be in the form of grant-in-aid up to Rs 10 lakh. Higher amount can also be considered for deserving proposals having high impact. The financial assistance is for value addition such as scaling up, prototype development, market testing of the prototype, generating data required by regulatory authorities and certification, etc. The focus areas are eco-friendly sanitizers, rapid test kits, PPEs, ventilators, medicines and vaccines. Research laboratories, universities, start-ups and MSMEs can apply for this grant.

NRDC has also brought out a compendium on Indian technologies for combating COVID-19. Most of these technologies are proof-of-concept (POC) tested and would help the entrepreneurs to take the product to market faster as they do not have to reinvent the wheel. Start-ups/Entrepreneurs, who would like to commercialise their POC-tested technologies, can use this grant for that purpose. The last date for applying on prescribed form is 15.5.2020.

For more details about the scheme and application form, interested researchers and innovators can visit the website: www.nrdcindia.com

Website link:
www.nrdcindia.com

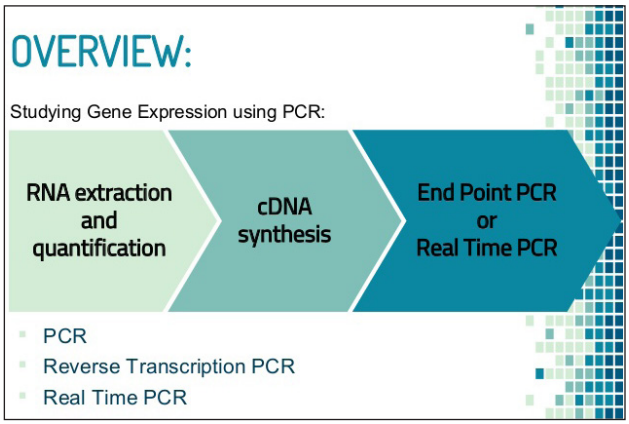
SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

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

Performance evaluation of commercial kits for detection of SARS-CoV-2 RNA by Real-Time PCR

Till 20 April 2020, 33 real-time PCR kits have been validated at various ICMR validation centres. Out of these, 15 kits have been found to be suitable for diagnostics purposes. The link provides the details of the kits, along with their batch number and manufacturer details.



Website Link:
https://icmr.nic.in/sites/default/files/upload_documents/Real_time_PCR_tests_20042020.pdf

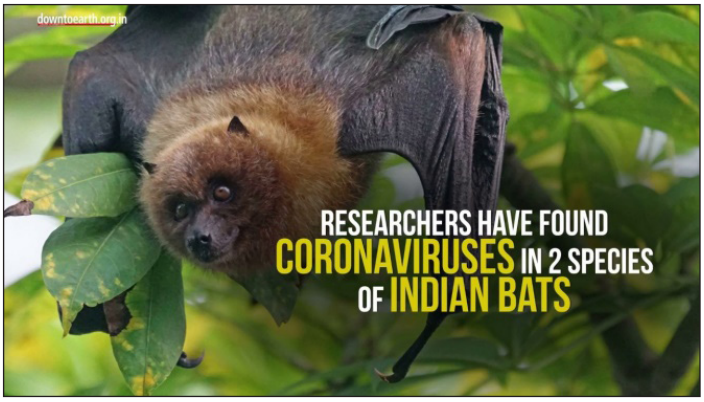
Revised COVID-19 testing strategy for India

The National Task Force at ICMR has carefully reviewed the data evolving from different countries on the use of various diagnostic kits. Based on available evidences, the testing strategy for COVID-19 has been revised further, effective from 17 April 2020.

Website Link:
https://icmr.nic.in/sites/default/files/upload_documents/Rapid_Antibody_test_Protocol.pdf

ICMR study finds two kinds of Coronaviruses in Indian bat species

A study by the Indian Council of Medical Research (ICMR) has found the presence of coronaviruses in bat species from Kerala, Himachal Pradesh, Puducherry and Tamil Nadu. Amid the ongoing pandemic, there have been studies and theories that the coronavirus pandemic which spread from Wuhan in China had originated from bats.



Website Links:
https://weather.com/en-IN/india/news/news/2020-04-15-icmr-study-finds-two-kinds-coronaviruses-indian-bat-species

Advisory for use of Cartridge-based Nucleic Acid Amplification Test (CBNAAT) using Cepheid Xpert Xpress SARS-CoV-2

ICMR releases advisory for use of Cartridge-based Nucleic Acid Amplification Test (CBNAAT) using Cepheid Xpert Xpress SARS-CoV2, effective from 19 April 2020.

Website Link:
https://icmr.nic.in/sites/default/files/upload_documents/Advisory_on_Cepheid_Xpert_Xpress_SARS_CoV2_testing.pdf

Additional guidelines for TrueNat testing for COVID-19

ICMR releases additional guidelines, in addition to existing guidelines, for testing of COVID-19 by TrueNat testing technology. This includes the bio-safety precautions for sample collection and transportation. These additional guidelines are effective from 19 April 2020.

Website Link:
https://icmr.nic.in/sites/default/files/upload_documents/Additional_guidance_on_TrueNat_based_COVID19_testing.pdf

Consolidated information for Regional Depots for Storage and transportation of COVID KITS

The daily COVID-19 testing capacity at various laboratories in the country is being increased and is expected to reach to 1 lakh tests per day by May 31 2020. To meet the increased requirement of testing material with an increasing number of tests, the current model of inventory stocking and distribution is being scaled up significantly. Accordingly, a total of 16 regional depots are being set up and are modelled into self-contained units by strengthening human resources, other resources and infrastructure. Besides 16 regional depots depots at NIMR, New Delhi and NIV, Pune would also function as central depots.

Website Link:
https://icmr.nic.in/sites/default/files/upload_documents/Consolidated_depot_information.pdf

Modification in medicine list in Telemedicine Practice Guidelines

The Indian Government has made a modification in the medicine list of its earlier published Telemedicine Practice Guidelines (Telemedicine Guidelines) on March 25, 2020.
Contact info: mci@bol.net.in

Website Link:
https://www.mohfw.gov.in/pdf/ModificationinMedicineListinTelemedicinePracticeGuidelines.pdf
https://www.mciindia.org/CMS/

Advisory against spraying of disinfectant on people for COVID-19 management

Ministry of Health & Family Welfare Directorate General of Health Services (EMR Division) has issued advisory to examine the merit of using disinfectants as a spray over the human body to disinfect them from COVID-19.

Website Link:
https://www.mohfw.gov.in/pdf/AdvisoryagainstsprayingofdisinfectantonpeopleforCOVID19managementFinal.pdf

Updated containment plan for large outbreaks of COVID-19

The risk assessment, guidelines, and containment measures are being reviewed regularly, and preventive measures are being identified and implemented by Ministry of Health and Family Welfare (MoHFW), Government of India.

Website link:
https://www.mohfw.gov.in/pdf/UpdatedContainmentPlanforLargeOutbreaksofCOVID19Version2.0.pdf

Call for Letter of Intent for participation in Therapeutic Plasma Exchange in COVID-19: Protocol for a Multi-centre, Phase II, Open Label, Randomized Controlled Study

ICMR is inviting a letter of intent from institutions with the equipment and infrastructure available to participate in a clinical trial to study the safety and efficacy of therapeutic plasma exchange for COVID-19 patients, after obtaining necessary approvals and clearances.

Website Link:
https://icmr.nic.in/sites/default/files/upload_documents/LOI_TPE_12042020.pdf

Call for Letter of Intent for Participation in a Phase II, Open Label, Randomized Controlled Study to assess the safety and efficacy of Convalescent Plasma to limit COVID-19-associated complications

ICMR is inviting letter of intent from institutions with the equipment and infrastructure available to participate in a clinical trial to study the safety and efficacy of convalescent plasma in COVID-19 patients, after obtaining necessary approvals and clearances.

Website Link:
https://icmr.nic.in/sites/default/files/upload_documents/LOI_CPL_12042020.pdf

Integrated Govt. Online Training (iGOT) courses on DIKSHA platform on COVID-19 pandemic

Ministry of Personnel, Public Grievances & Pensions, D/O Personnel & Training launched separate courses on the DIKSHA platform on COVID-19 pandemic.

Website link:
https://www.mohfw.gov.in/pdf/iGOTCovid19Circular(2).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

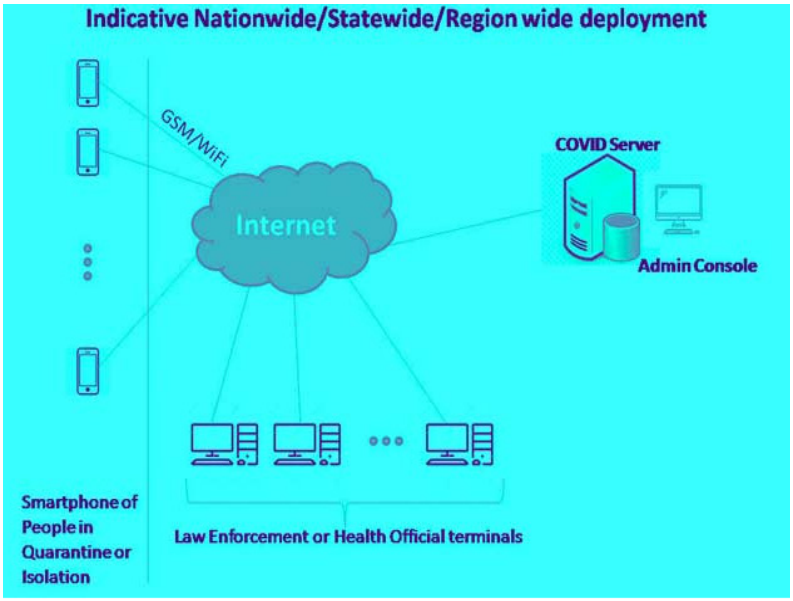
BY

DEFENCE RESEARCH AND DEVELOPMENT ORGANISATION (DRDO)

DRDO's AI brains launch SAMPARC App to track COVID-19 patients

The Centre for Artificial Intelligence and Robotics (CAIR) – one of DRDO's AI arms – has created a technology-focused solution to track patients who are under quarantine. A team of 20 scientists have reportedly developed the App in three weeks. It has been named as SAMPARC, acronym for Smart Automated Management of Patients and Risks. The App has already been offered to various state governments to enable AI-driven measures to slow the outbreak. It has been hosted exclusively for state governments in India.

SAMPARC is a software that includes an App that would be installed on the smartphones of the patients. It is a server-side application that would be used by the state authorities to track the patients. The scientists are already working on the next version of the software based on the feedback from the users. Several state governments, including Maharashtra where the COVID-19 cases have shot up, are set to use this App.

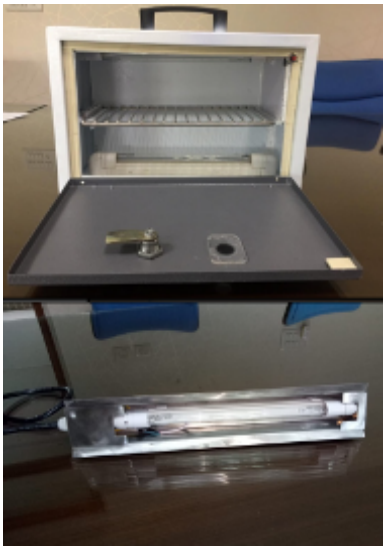


Website link:
https://english.manoramaonline.com/news/nation/2020/04/20/drdo-cair-ai-samparc-app-track-covid19-patients.html

DRDO introduces two new products to enable COVID-19 disinfection process

Defence Research and Development Organisation (DRDO), in its continuous quest to contribute towards the fight against COVID-19, has been developing several solutions from its existing arsenal of technologies and experience. These consist of novel innovations and some others in which products will be quickly configured to suit present requirements. DRDO has introduced two products which can enhance the operations at public places during the outbreak of COVID-19 pandemic.

Automatic Mist-based Sanitizer Dispensing Unit: Centre for Fire Explosive & Environment Safety (CFEES), Delhi along with HPO 1, using its expertise in mist technology for fire suppression, has developed automatic mist-based sanitizer dispensing unit. It is a contactless sanitizer dispenser which sprays alcohol-based hand rub sanitizer solution for sanitising hands while entering the buildings/office complexes, etc. It is based on water mist aerator technology, which was developed for water conservation.



UV Sanitisation Box and Hand-held UV device: Defence Institute of Physiology & Allied Sciences (DIPAS) and Institute of Nuclear Medicine & Allied Sciences (INMAS), DRDO laboratories in Delhi have designed and developed Ultraviolet C Light-based sanitisation box and handheld UV-C (ultraviolet light with wavelength 254 nanometres) device. The UV-C consists of a shorter, more energetic wavelength of light. It is particularly good at destroying genetic material in COVID-19. The radiation warps the structure of the RNA, which prevents the viral particles from making more copies of themselves. The UV-C kills microbes quickly. Sanitisation of the items by employing UV-C light avoids the harmful effects of two chemicals used for disinfection. This is environment friendly and is a contact-free, effective sanitisation method. The UV-C box is designed for disinfecting personal belongings like mobile phones, tablets, purse, currency, the cover of office files, etc.

Website link:
https://pib.gov.in/PressReleseDetailm.aspx?PRID=1615331

Defence PSUs, OFB ramp up their resources to fight COVID-19 pandemic

Hindustan Aeronautics Limited (HAL) Bengaluru, a Defence PSU has set up isolation ward facility with three beds in the Intensive Care Unit (ICU) and 30 beds in wards. In addition, a building having 30 rooms was readied. In all, 93 persons can be accommodated at the HAL facility. HAL has manufactured and distributed 25 PPEs to Doctors in various hospitals in Bengaluru, which are authorised to treat COVID-19 patients. It has also manufactured 160 aerosol boxes which have been distributed to various Government hospitals in Bengaluru, Mysuru, Mumbai, Pune, Uttar Pradesh, Telangana, Andhra Pradesh and Tamil Nadu.

Bharat Electronic Limited (BEL) has come forward on the directions of Ministry of Health and Family Welfare (MoH&FW) to manufacture and supply 30,000 ventilators within two months

for ICUs in the country. The design of these ventilators was originally developed by DRDO, which was improved upon by M/s Skanray, Mysore, with whom BEL has collaborated. BEL is likely to start manufacturing of ventilators between April 20-24, 2020. As per the tentative schedule, BEL is expected to manufacture 5,000 units in April; 10,000 in May and 15,000 in June 2020. It is also making efforts to indigenise these components with the help of DRDO.

Bharat Dynamics Limited (BDL) is developing a prototype of ventilator which is likely to be tested and certified by the first week of May before it starts manufacturing. It is working on this project with the help of a private Pune-based start-up.

Ordnance Factories (OFs) are presently producing 7,500 litres sanitizers against an order of 28,000 litres from HLL, the nodal agency appointed by the Government of India for centralised procurement. The OFs have already supplied 5,148 litres; another 15,000 litres are ready for supply awaiting destination from HLL. So far, OFB (Ordnance Factory Board) has manufactured 60,230 litres of sanitizers which have been distributed to units of HLL at Indore, Belgavi, Thiruvananthapuram, Central Railways, MECL, Nagpur district administration, Uttarakhand, Bihar, Cantonment Board Willington, DM Nagpur, DRM Solapur besides its own hospitals in Ordnance Factories. Two facilities for blood penetration test have been established, one at Chennai and another at Kanpur.

The OFB has so far manufactured 1,11,405 masks which include 38,520 3-ply medical masks. These have been distributed to Tamil Nadu Police, district civil and police authorities in Firozabad and Agra, Cantonment Board Shahjahanpur, Government of Uttarakhand, District Health Officer Shahjahanpur, Military Intelligence, etc.

Website link:
https://pib.gov.in/PressReleasePage.aspx?PRID=1615596

Sample approved, Indore textile units start making 5,000 protective kits per day

Textile units of Indore, engaged in making PPE kits, have increased production with supplies touching over 5000 kits per day. The production capacity was enhanced after team of experts from DRDO and Defence Research Development Establishment (DRDE) in Gwalior visited manufacturing facilities and also cleared samples sent to them.

Website link:
https://www.drdo.gov.in/sites/default/files/drdo-news-documents/NPC%2011%20April%202020.pdf

Coronavirus: DRDO, ITI to team up to manufacture portable ventilators

The Defence Research and Development Organisation (DRDO) and the Indian Telephone Industries (ITI) are likely to ink a deal soon to produce portable ventilators, a first of its kind in India, following the Coronavirus or Covid-19 outbreak. DRDO wants ITI to manufacture portable ventilators and is transferring technology. Once they come up with a final product and after due test procedures, ITI will be able to produce such ventilators.

Website link:
https://www.drdo.gov.in/sites/default/files/drdo-news-documents/NPC%2011%20April%202020.pdf

Covid-19 Sample Collection Kiosk (COVSACK)

A kiosk has been developed by DRDO-DRDL that can help healthcare workers take samples from suspicious patients, without the need of PPE kits. It is designed as such that the Kiosk can be disinfected automatically with the help of its inherent features without any help of human personnel.

Website link:
https://drdo.gov.in/covid-19-sample-collection-kiosk-covsack

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY (MEITY)

Portable molecular diagnostics test instruments for COVID-19

A Polymerase Chain Reaction (PCR) System, developed by IISc under NNetRA initiative is being readied for testing COVID-19 by ShanMukha, a startup. It uses PCR-Thermal Cyclers in conjunction with adapter chain and fluorescence reader unit, equivalent to gold standard technology RT-PCR. The proposed unit would reduce the current turnaround time of 3 days for a batch of 96 samples with RT-PCR machines to 3 hours for 12 samples, which enable processing of 100 samples/day/unit and testing 800 samples/day/unit. This would make it extremely useful to be deployed at or near the COVID-19 hotspots. The initiative is supported by Ministry of Electronics and Information Technology (MeitY).

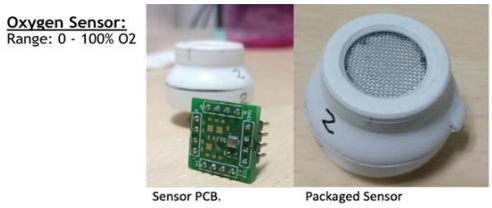
Contact info: saisiva@iisc.ac.in

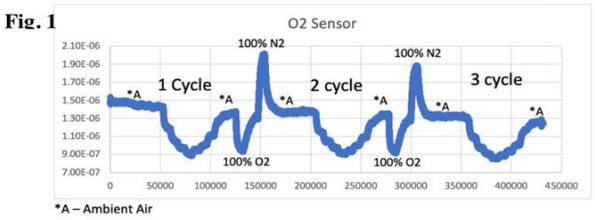
Website link:
https://covid19.iisc.ac.in/mobile-diagnostic-testing-lab-for-covid-19/

Oxygen gas sensor scale up and product delivery for ventilator application

Indian Institute of Science (IISc), Bengaluru has developed sensor technology for O_2 and pressure under NNetRA initiative. Under the aegis of Ministry of Electronics and Information Technology (MeitY), IISc is delivering O_2 gas sensor chip using the 3D printed package to use in

ventilator prototypes under Technology Business Incubator (TBI) startup scheme. N_2 and O_2 gases are mixed in different proportions in the ventilator to measure the precise concentration of O_2 in the gas pushed by the ventilator into the patient's lungs. The said sensor can also be used as 'Oxygen concentrator' that could generate 100% oxygen from ambient air by filtering Nitrogen gas out in a membrane.





Contact info: chandrashekhar@iisc.ac.in; thejas@iisc.ac.in; navakant@iisc.ac.in

Website link:
https://www.eetindia.co.in/iisc-ploystyrene-jugaad-cuts-nano-sensor-cost/?utm_source=US%20Article%20Alert&utm_medium=Email&utm_campaign=us-india-2017-07-21

Strip-based hand-held electrochemical point-of-care testing for COVID-19

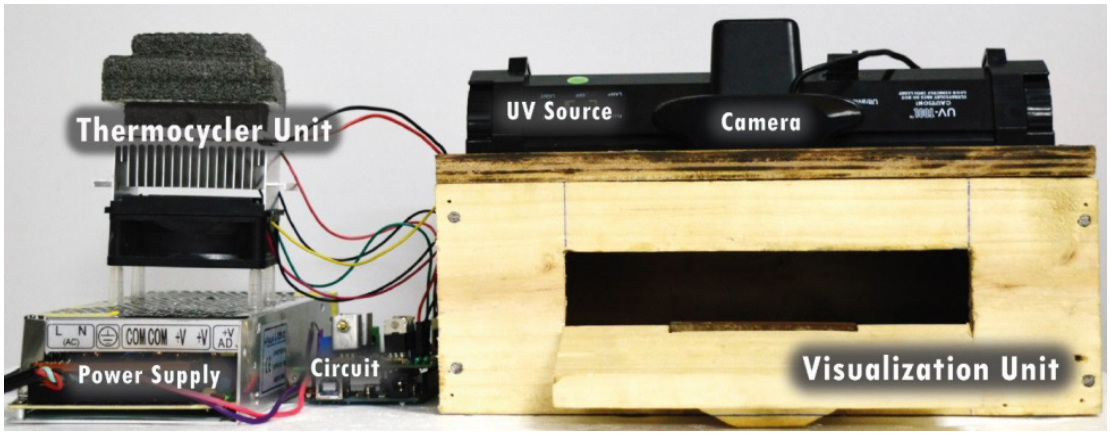
Globally, the strip-based test is not available for COVID-19 diagnostics. Electrochemical biosensors technology has been developed and transferred by Indian Institute of Technology (IISc), Bengaluru to its startup, PathShodhan and now field deployed to measure multiple biomarkers. This technology is now proposed to be redesigned and validated to test COVID-19. PathShodh's existing platform technology, "anuPath(TM)", a multi-analyte lab on palm will be used along with low cost disposable test strips utilizing a novel receptor chemistry, to perform highly accurate and sensitive COVID-19 antibody (IgG and IgM) test. The test can be done with a tiny finger prick blood sample within 5 minutes, in a substantially lower cost than that with ELISA kit. Tentative cost at full-scale production will be about Rs 600 per test. The initiative is supported by Ministry of Electronics and Information Technology (MeitY).

Contact info: vinay.k@pathshodh.com; navakanta@iisc.ac.in

Website link:
https://pathshodh.com/media.php

Product development, field trials and TOT of indigenous RT-PCR device

Indian Institute of Technology Guwahati (IITG) has developed a prototype of a portable, bench-top device under Ministry of Electronics and Information Technology (MeitY)'s initiative to carry out reverse transcriptase-polymerase chain reaction (RT-PCR) and array-based analyses of multiple genes/proteins simultaneously using Au-nanoclusters as probes. Integration of the prototype with PCR-based methods can be a cost effective COVID-19 diagnostics point-of-care test. The device is being enabled to carry out RT-PCR and array-based analyses of multiple genes/proteins to pursue diagnostics of COVID-19.

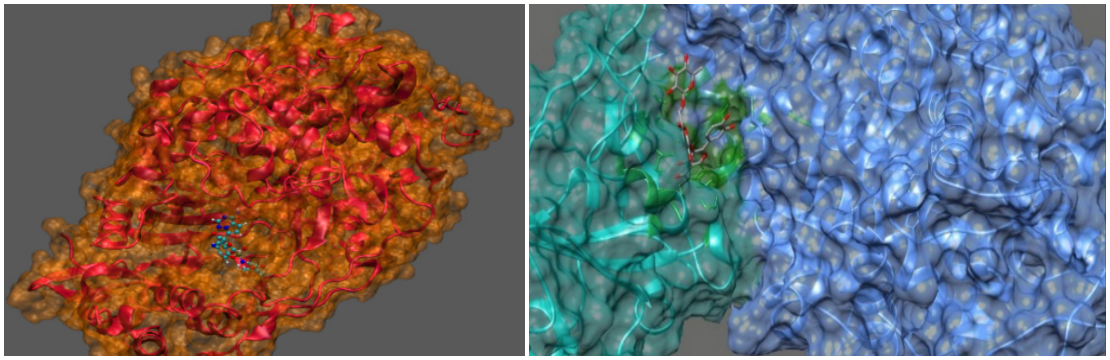


Contact info: swapnilsinha@bioaptagen.com; sghosh@iitg.ac.in; arun@iitg.ac.in

Website link:
https://www.iitg.ac.in/nano/CENTDi/publication/patent_international_f.php

Drug repurposing studies on COVID 19 proteins

The basic challenge in any viral infection is that they have a handful of genes and they rely mostly on the host proteins for their survival. Therapeutic strategies targeting host proteins hold the risk of killing uninfected cells further worsening the medical condition. This demands the need for a unique and specific strategy to target viral proteins. One such strategy is drug repurposing or repositioning. It is one of the fastest and the best drug discovery strategies to identify the best drug suitable for the target of interest from existing drugs. In order to achieve the same, the Bioinformatics Group at C-DAC has performed drug repurposing studies on crucial targets of SARS-nCoV2. The drugs from the FDA-approved databases were docked against the COVID-19 protein targets using National Supercomputing Machines. The initiative is supported by Ministry of Electronics and Information Technology (MeitY).

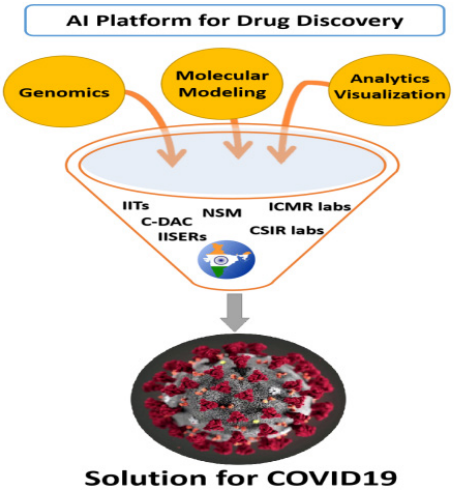


Contact info: rajendra@cdac.in

Website link:
https://www.cdac.in/index.aspx?id=bioinfo

SAMHAR-COVID19 – Supercomputing using AI, ML, Healthcare Analytics-based research for combating COVID-19

C-DAC has launched SAMHAR-COVID19 in partnership with National Supercomputing Mission (NSM) Consortia Members, Startups and Industries, to build a Rapid Supercomputing System and Research Community for India to fight COVID-19. It is proposed to create a Consortium of researchers as virtual 'Rapid Researchers Task Force (RRTF), SAMHAR-COVID19.' The initiative is partnered and co-supported by Ministry of Electronics and Information Technology (MeitY).

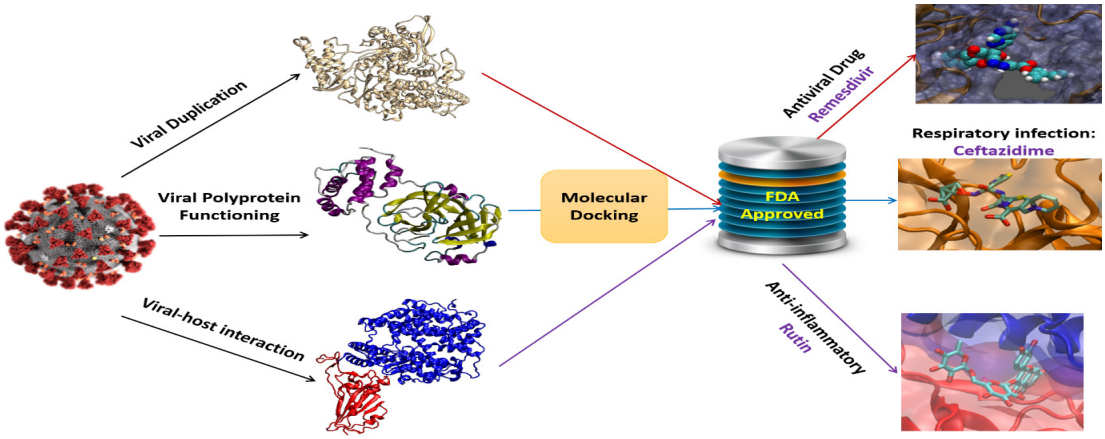


Contact info: mdk@cdac.in

Website link:
https://www.cdac.in/

Computational Drug Repurposing Studies on SARS-nCoV2 proteins

C-DAC has performed Drug Repurposing Studies on Crucial Targets of SARS-nCoV2. Three crucial COVID-19 targets, namely RNA polymerase (RdRp), Main protease (3CLpro) and Spike protein were studied for drug repurposing. C-DAC is presently making efforts to study the Covid-19 virus using the Supercomputing resources set up under the National Supercomputing Mission (NSM). The research group at C-DAC is presently modelling the interactions of the virus proteins with the human proteins. Six proteins of the virus have been identified to study the interactions with the host receptors. Three thousand five hundred molecules from the FDA-approved drug database have been screened for binding to inhibit the virus interaction with the host. The initiative is supported by Ministry of Electronics and Information Technology (MeitY).



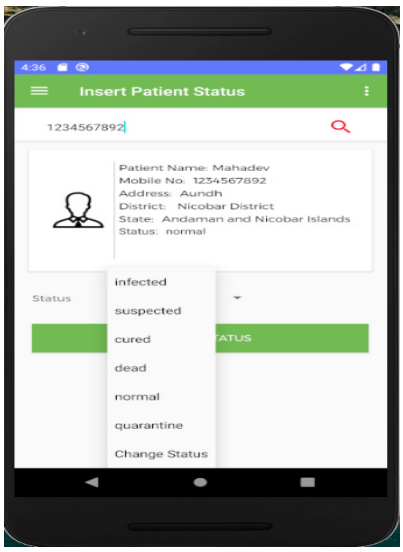
Contact info: mdk@cdac.in

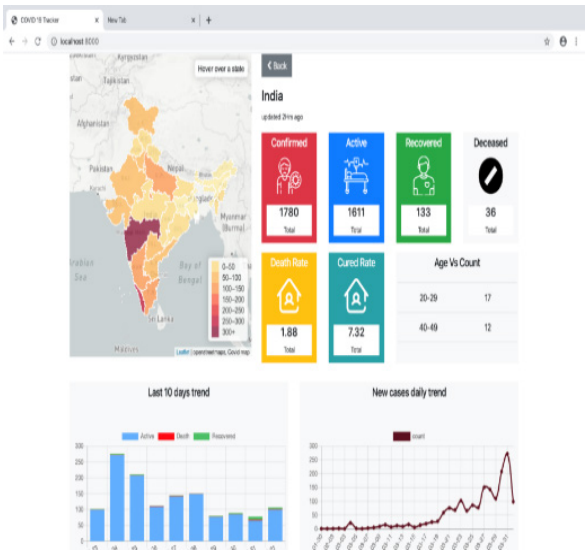
Website link:
https://www.cdac.in/

NAADI Platform – National Analytical Platform for Dealing with Intelligent Tracing, Tracking and Containment of COVID-19 Pandemic along with 2 Mobile apps

C-DAC has developed a platform called NAADI: National Analytical Platform for Dealing with Intelligent Tracing, Tracking and Containment of COVID-19 for infected persons and quarantined people. This platform has been developed along with the mobile applications for

health experts, law enforcement agencies and the general public. This offers Comprehensive Multi-Level, Multi-modal and Multi-lingual Tracing, Tracking and Containment of COVID-19 Quarantined/Under Observation/Infected Individuals. The platform includes nCov-Satark App for health agencies for violation detection based on location-based tracking (GPS) as well as Call Data Records (CDR) and Internet Protocol Data Records (IPDR). It also includes 112++ India App for citizens for triggering medical emergency and response assistance. The initiative is supported by Ministry of Electronics and Information Technology (MeitY).





Contact info: mdk@cdac.in

Website link:
https://www.cdac.in/

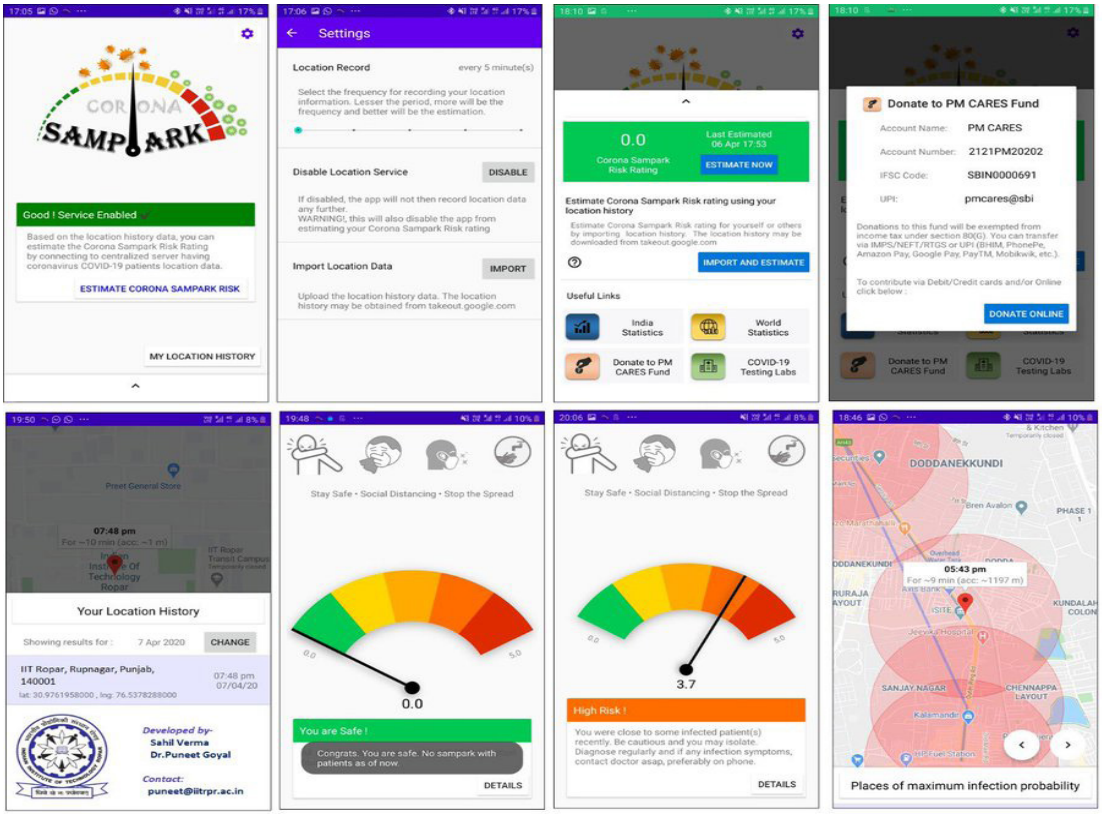
SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

OTHER SCIENTIFIC AND ACADEMIC INSTITUTIONS

IIT Ropar team of researchers present first-of-its-kind, user-centric app, Corona Sampark-o-Meter

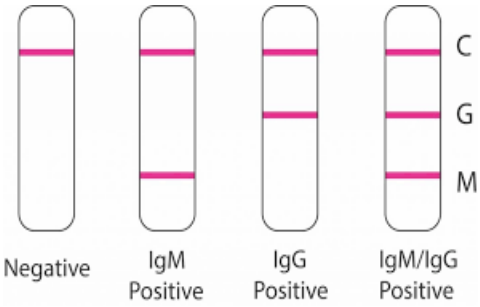
Indian Institute of Technology (IIT) Ropar has developed a mobile-based app called 'Sampark-o-Meter' which can indicate areas on maps with maximum coronavirus infection possibility. This helps people to estimate the risk of coming into contact with any COVID-19 positive/ highly suspected cases in the last 14 days.



Website Link:
https://twitter.com/iitrpr/status/1247552688788660229

India's first indigenous antibody-based coronavirus testing kit

Aligarh Muslim University (AMU) alumnus from the Department of Biochemistry, Mr Nadeem Rahman, Director, NuLife Consultants and Distributors Pvt. Ltd, New Delhi has developed India's first antibody-based testing kit, which takes less than 15 minutes to yield an accurate result. Its cost is Rs 500 at present and the labs charge Rs. 4500 for it. The new kit will provide the general population in India with adequate access to cost-effective testing.



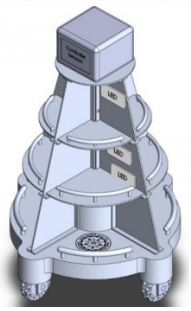
Mr Rahman was permitted by the government authorities during the nation-wide lockdown to reopen the lab of NuLife Consultants and Distributors Pvt. Ltd, where he developed India's first 'Antibody-based Testing Kit' to carry out finger-prick tests, which only takes about fifteen minutes to yield accurate results.

The testing kits launched in just a span of two weeks have been approved by the Indian Council of Medical Research (ICMR) and soon the regular production will start.

Website link:
https://www.amu.ac.in/about3.jsp?did=2495

IIT Ropar researchers have developed a concept 'WardBot' to support healthcare and different industries with a focus to minimise human interaction with COVID-19 patients

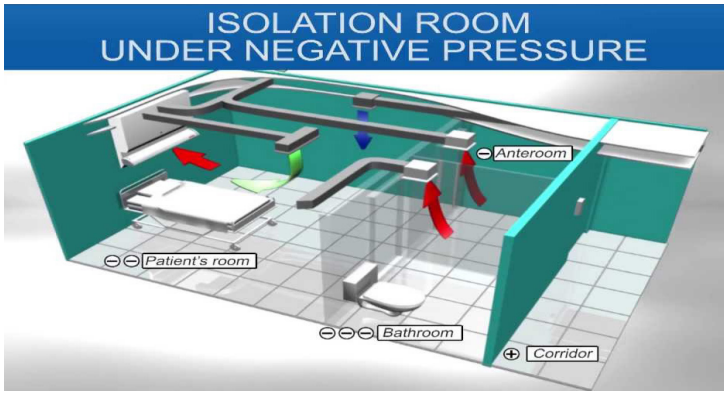
A team of researchers at IIT Ropar is aiming to develop a wardbot that will deliver food and medicine to COVID-19 patients in their isolation wards. The conceptual design is of a bot that can be instructed to receive and deliver food and medicines and the necessary equipment to every room from a remotely-located control room.



Website Link:
https://www.newindianexpress.com/good-news/2020/apr/17/iit-ropar-aims-to-build-ward-bot-that-can-serve-food-and-medicines-to-covid-19-patients-2131483.html

IIT Ropar develops 'portable negative pressure rooms' to shield medical staff from coronavirus

IIT Ropar has sent their proposal to the Ministry of Human Research and Development and Office of Principal Scientific Adviser (PSA) for creating negative pressure isolation rooms on a mass scale.



Website Link:
https://www.newindianexpress.com/nation/2020/apr/06/iit-ropar-develops-portable-negative-pressure-rooms-to-shield-medical-staff-from-coronavirus-2126506.html

Chemistry Department at IIT Jammu creates hand sanitizers

In view of COVID-19 pandemic which has caused a paucity of hand sanitizers in the market, a dedicated team of researchers from IIT Jammu has successfully produced a cost-effective hand sanitizer as per the guidelines laid down by WHO.

Website Link:
https://iitjammu.ac.in/post/chem-hand-santisers

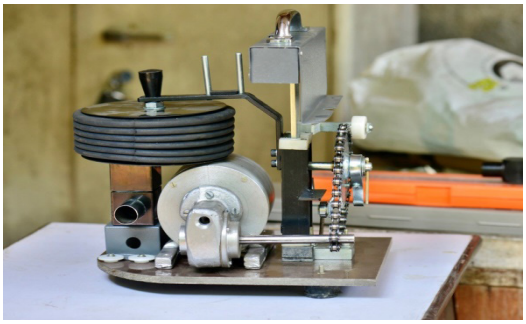
Group Testing for COVID-19: How to Stop Worrying and Test More

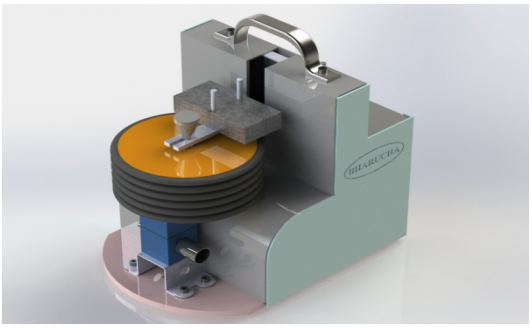
The article 'Group Testing for COVID-19: How to Stop Worrying and Test More' contains a report on the research conducted at IIT Palakkad by Dr Lakshmi Narasimhan on group testing for COVID-19 diagnosis. This article studies the optimal pool sizes and test plans for performing group testing for COVID-19. The effects of pooling and dilution on the sensitivity of the tests were analytically investigated. From this analysis, the optimal pool size to perform group testing to achieve a given sensitivity level was obtained. It was found that up to 57 samples can be pooled together without significant loss in the sensitivity of the tests. Efficient testing plans that reduce the total number of tests performed and increase the number of people tested are provided in detail. The source codes to generate the test plans are also made available online.
Contact info: lnt@iitpkd.ac.in

Website Link:
https://iitpkd.ac.in/news/group-testing-covid-19lnt
https://arxiv.org/abs/2004.06306

IISER Pune's efforts against COVID-19: Computer-aided designs for a mechanical ventilator

Dr Naresh Sharma from IISER Pune's International Relations Office facilitated the contact between researchers at the institute, Dr Umakant Rapol and Dr Sunil Nair, with Dr Prashant Jha, Kings College, London and Nick Booker, Co-Founder of Open Breath and Tech and IndoGenius, who was looking to make Bharucha Ventilator available more widely. IISER Pune then teamed up with Dr Suresh Doravari and student volunteers from IUCAA, Pune to create the designs using a model lent by Capt. Bharucha. The need of the hour is to find a ventilator with a proven design, which has already been used in hospitals and mass produced locally.





Website Link:
http://www.iiserpune.ac.in/news/iiser-pune-s-efforts-against-covid-19-computer-aided-designs-for-a-mechanical-ventilator

CPCB Guidelines for handling, treatment and disposal of waste generated during treatment, diagnostic, quarantine of COVID-19 patients

Central Pollution Control Board (CPCB), a statutory organisation of Ministry of Environment, Forest & Climate Change (MoEFCC) serves as a field formation and also provides technical services to MoEFCC. The principal functions of CPCB are to promote cleanliness of streams and wells in different areas of the States by prevention; control and abatement of water pollution; to improve the quality of air; and to prevent, control or abate air pollution in the country.

In order to deal with COVID-19 pandemic, CPCB, on 19 April 2020, has released detailed guidelines for handling, treatment and disposal of waste generated during treatment, diagnostic, quarantine of COVID-19 patients.

Website link:
https://www.cpcb.nic.in/uploads/Projects/Bio-Medical-Waste/BMW-GUIDELINES-COVID_1.pdf

NITK Surathkal fights COVID-19

National Institute of Technology Karnataka (NITK), Surathkal, researchers have so far developed hand sanitizers, 3D-printed ventilator components and Mask N95 filters and face shields to fight against Coronavirus pandemic.

Website Link:
https://www.nitk.ac.in/nitk-fights-covid-19

IIT Delhi start-up ETEX launches affordable and effective facemask, KAWACH, to provide protection against COVID-19

ETEX is an IIT Delhi start-up for designing and developing smart textile solutions for healthcare. Considering unprecedented challenges in the supply of PPEs during the COVID-19 crisis, ETEX has launched an affordable and effective face mask, KAWACH, for protecting and safeguarding people from the risk of COVID-19.

Website Link:
https://www.etex.in/

Ongoing short-term projects at IIT Delhi

At Indian Institute of Technology Delhi (IITD), several short-term projects are going on, which are technology-based interventions related to combating COVID-19. The researchers are developing various products, like low-cost hand sanitizer in the Department of Chemistry for the campus community; Hazmat Hoody-based mask in the Department of Textile Technology; Sandwich ELISA assay for low cost and rapid detection of coronavirus, bioinformatic tools to design a novel peptide for blocking Coronavirus in Department of Chemical Engineering, and so on. The list enumerating all the projects is provided in the website link, where the new projects are being updated regularly.

Website Link:
http://www.iitd.ac.in/covid-19/research/development/Ongoing%20Short%20Term%20Projects

Ongoing long-term projects at IIT Delhi

At Indian Institute of Technology Delhi (IITD), there are several long-term projects going on, which are technology-based interventions related to combating COVID-19. In the School of Biological Sciences, research interventions undertaken are possible nCoV-19 structural proteins inhibitors from *Azadirachta indica* (Neem); designing vaccine candidates; and so on. In Department of Textile Technology, various projects undergoing are on transparent masks and formulations for viral decontamination of inanimate surfaces. The list enumerating all the projects is provided in the website link, where the new projects are being updated regularly.

Website Link:
http://www.iitd.ac.in/covid-19/research/development/Ongoing%20Long%20Term%20Projects

IIT-Goa to study if COVID-19 infection is air-borne

At the Indian Institute of Technology (IIT), Goa, faculty members from multiple departments — mechanical engineering to physics — are collaborating to calculate and predict the extent of travel of respiratory droplets from human sneezing and coughing spread. Definitive scientific data in this direction was required as the COVID-19 pandemic is taking its toll on the world

Website link:
https://timesofindia.indiatimes.com/city/goa/iit-goa-to-study-if-covid-19-is-air-borne-in-india/article-show/75056125.cms

United States - India Science and Technology Endowment Fund COVID-19 Ignition Grants

IUSSTEF would select and support promising joint U.S.-India S&T-based entrepreneurial initiatives that address the "development and implementation of new technologies, tools, and systems to address COVID-19-related challenges including monitoring, diagnosis, health and safety, public outreach, information and communication". These initiatives can originate from government, academic, non-governmental or commercial entities and any combination thereof, provided they focus on applied R&D and have commercial potential. USISTEF would also consider proposals related to technologies/products that can be re-purposed to address COVID-19 in the current scenario. USISTEF encourages projects that demonstrate a high degree of innovation leveraging advances in science and technology.

Last date of submission: May 15 2020

Website link:
https://iusstf.org/announcements-and-events

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

PRIVATE SECTOR ENTERPRISES

COVID-19 vaccine possible by Q2 of 2022

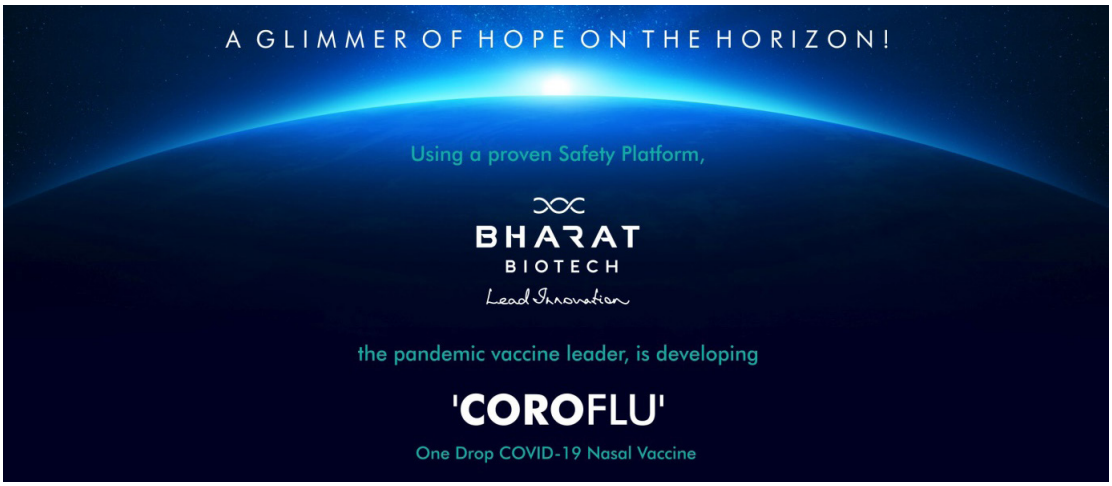
India may get a viable COVID-19 vaccine by the second quarter of 2022, ahead of the original estimated timeline of late 2022, says Adar Poonawalla, Chief Executive Officer of Serum Institute of India (SII), the world's largest manufacturer of vaccines by the total number of doses produced. SII had earlier predicted a Coronavirus vaccine to be commercially available around late 2022; it should be in the market by the second quarter of 2022 given the "positive feedback" received from the regulators who are expediting approvals in a bid to developing a vaccine for the disease at the earliest. SII is collaborating with Codagenix, an American biotechnology firm, for the development of these vaccine candidates and the cost of the project is pegged at ₹300 crore.

Website link:
https://www.seruminstitute.com/news.php
https://www.fortuneindia.com/technology/covid-19-vaccine-possible-by-q2-of-2022-adar-poonawalla/104401

Bharat Biotech set to develop and test vaccine for COVID-19

Bharat Biotech is getting into development and testing of a vaccine against COVID-19, called CoroFlu, as part of an international collaboration of virologists and vaccine makers.

CoroFlu is a one-drop COVID-19 nasal vaccine built on a flu vaccine "backbone" that has been shown to be safe and well-tolerated in humans, in Phase I and Phase II clinical trials. CoroFlu will be built on the backbone of FluGen's flu vaccine candidate known as M2SR. Based on an invention by UW-Madison virologists and FluGen co-founders Yoshihiro Kawaoka and Gabriele Neumann, M2SR is a self-limiting version of the influenza virus that induces an immune response against the flu. Kawaoka's lab will insert gene sequences from SARS-CoV-2, the novel coronavirus that causes the disease COVID-19, into M2SR so that the new vaccine will also induce immunity against the coronavirus.



Website link:
https://www.bharatbiotech.com/

https://www.warf.org/news-media/news/releases-and-announcements/uw-madison-flugen-bharat-biotech-to-develop-coroflu-a-coronavirus-vaccine.cmsx

Zydus Cadila launches a fast-tracked programme to develop a vaccine for the novel coronavirus, 2019-nCoV (COVID-19)

Zydus Cadila, an innovation-driven, global pharmaceutical company, announced that it has initiated an accelerated research programme with multiple teams in India and Europe to develop a vaccine for the novel coronavirus, 2019-nCoV (COVID-19) based on two approaches. The first approach deals with the development of a DNA vaccine against the major viral membrane protein responsible for the cell entry of the novel coronavirus, now called COVID-19. The plasmid DNA would be introduced into the host cells, where it would be translated into the viral protein and elicit a strong immune response mediated by the cellular and humoral arms of the human immune system, which plays a vital role in protection from disease as well as viral clearance. The second approach deals with the development of a live attenuated recombinant measles virus vectored vaccine against COVID-19.

The recombinant measles virus (rMV) produced by reverse genetics would express codon-optimised proteins of the novel coronavirus and will induce long-term specific neutralising antibodies, which will provide protection from the infection. The group's Vaccine Technology Centre in India, which is working on the plasmid DNA vaccine, also has wide ranging capabilities in developing and manufacturing different vaccines for unmet needs.

Website link:
https://zyduscadila.com/public/pdf/pressrelease/Zydus_Cadila_launches_a_fast_tracked_programme_to_develop_vaccine_for_the_novel_coronavirus_2019-nCoVCOVID-19).pdf

Bione launches India's first COVID-19 home screening test kit

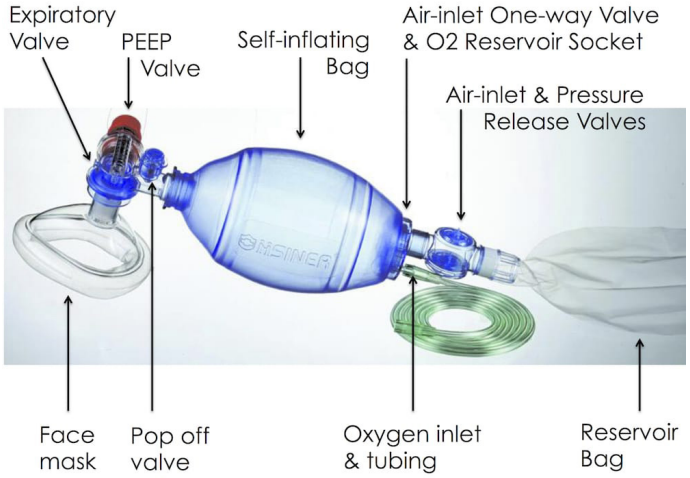
Bione has recently launched a rapid COVID-19 at-home screening test kit and has established itself as the first healthcare company in India to achieve the feat. The easy-to-use kit displays accurate results within minutes, instrumental in the timely screening of the deadly virus. The at-home screening kit is available for sale on their platform bione.in after approval from the requisite medical regulatory authorities.

In a breakthrough development, the Company has devised the screening kit for coronavirus which can provide respite from the impending fear of the contagion. The simple point-of-care home screening kit renders quick results, without having to step out in the wake of lockdown. It will foster timely detection of the disease while acting as a preventive tool for others in proximity to the user, by isolating the carrier immediately. The kit is priced between ₹2000-3000 depending upon the global supply, to increase its affordability for the masses. Under normal circumstances, the ready-to-use kits can be received within 2-3 days of placing the order at their platform. To initiate an effective screening tool for mass screening, the organisation is also in talks to provide bulk orders for early detection.

Website link:
https://zeenews.india.com/india/bione-launches-rapid-covid-19-at-home-screening-test-kit-after-icmr-approval-2273752.html

Mahindra is taking action to fight the Coronavirus

The Mahindra Group has formulated a two-pronged strategy to manufacture much needed ventilators. Along with two large PSUs, the company is working with an existing manufacturer of high spec ventilators to help them simplify the design and scale up capacity. The group is working on an automated version of the Bag Valve Mask ventilator (commonly known as Ambu bag).



Website link:
https://www.mahindra.com/enewsletter-echo/2020/march26/mahindra-is-taking-action-to-fight-the-coronavirus

Diagnostic testing for the Novel Coronavirus (COVID-19) at Max Super Speciality Hospital, Saket

Max Lab, Max Super Speciality Hospital, Saket is now approved for diagnostic testing for the Novel Coronavirus (COVID-19). The tests can happen only if prescribed by a qualified physician, which is a swab-based test. They have a safe and hygienic sample-collection-at-home facility by their trained technicians.

Website link:
https://maxlab.co.in/covid19-testing/

Indian Immunologicals and Australia's Griffith University tie-up for COVID-19 vaccine research

Vaccine manufacturer Indian Immunologicals Ltd (IIL) has entered into a research collaboration agreement with Australia's Griffith University to develop a lead vaccine candidate for coronavirus. As part of the cross-continental collaboration, scientists from IIL and the University will develop a 'Live Attenuated SARS-CoV-2 vaccine' or COVID-19 vaccine using the latest codon de-optimisation technology. The vaccine is expected to provide long-lasting protection with a single dose administration with an anticipated safety profile similar to other licensed vaccines for active immunization.

Website link:
https://www.indimmune.com/mediia/iil-news

Infosys Foundation partners with Narayana Health City to open 100-bed quarantine facility for COVID-19 patients

Infosys Foundation, the philanthropic and CSR arm of Infosys and Narayana Health, one of the largest healthcare providers in the country, have announced the launch of a 100-room quarantine facility for COVID-19 patients, in the vicinity of Narayana Health City in Bengaluru, Karnataka. The facility, aimed at serving patients belonging to the economically weaker sections of the society, will accommodate patients, offer regular monitoring by doctors, nurses, and provide essential medication free of cost.

Website link:
https://www.infosys.com/newsroom/press-releases/2020/open-100-bed-quarantine-facility-covid-19-patients.html

HUL committed towards combating COVID-19

During this challenging phase of COVID-19, Hindustan Unilever Limited stands united with India.

Donating products for better health: Hindustan Lever Limited (HUL) is supporting hospitals in Mumbai, Pune, Kolkata, Tamil Nadu and several other areas by donating Lifebuoy soaps, handwash, sanitizers and Domex floor and bathroom cleaners. It is also distributing health kits, including health and hygiene products and food items for patients, health officials and low-income families. To ensure that the products reach low-income families, HUL is working with social organisations like the United Way and the United Nations Development Programme. Through Project Prabhat, sustainable community development initiative, it is also supporting 1,00,000 migrant labour families by donating food kits and essential hygiene products and also distributing soaps to 5,00,000 families in communities around their factory sites.

Partnerships for better infrastructure: To augment the quarantine system instituted by the Government, HUL has tied up with **Apollo Hospitals, State Bank of India, Oyo, Lemon Tree** and others to create isolation facilities that are equipped with medical supervision. This will help reduce the burden on hospitals while providing acute care for the patients in need. Collaborating with public health authorities (in Maharashtra, Uttar Pradesh and Karnataka), efforts are being made to upgrade the medical facility infrastructures in hospitals treating COVID-19 patients. HUL is also in the process of procuring personal protective equipment for the frontline medical staff at these hospitals. Together with the local administration in Haridwar, HUL has helped set up a 30-bed isolation facility in a record time of three days to help curb the spread of COVID-19.

Website link:
https://www.hul.co.in/news/news-and-features/2020/committed-towards-combating-covid-19.html