SCIENCE & TECHNOLOGY EFFORTS IN INDIA ON COVID-19

UPDATED FORTNIGHTLY

15th October 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

The COVID-19 pandemic is unleashing a human development crisis. On some dimensions of human development, conditions today are equivalent to levels of deprivation. The crisis is hitting hard on all constitutive elements of it: economy, health and education. Most of the current strategies to reduce the risk of SARS-CoV-2 transmission are based on controlling interactions between humans, including case isolation, tracking patient contacts and screening passengers crossing borders. The pandemic has posed one of the biggest challenges to the entire humanity. In the wake of its outbreak, our lives have changed in ways we had never imagined before. We all are adapting to live with coronavirus and adjusting to new normal of several aspects of our day-to-day life, since there is no early tapering off of the disease.

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, ensuring that science and safety are the primary focus. For the benefit of the stakeholders and target audience, Vigyan Prasar is preparing and publishing compilation of the most relevant initiatives and efforts taken by the Government of India through its various Science Ministries, Departments, and Funding organizations, in the shape of daily, weekly, and now fortnightly e-Newsletter. 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, has invited Calls for Proposals (CFPs) and Expressions of Interest (EoIs), announced various hackathons and challenges and reached out to general public through various apps, pledges, etc. to enhance research and development-related activities to battle the pandemic out as well as making the nation aware and self-reliant.

The pandemic was superimposed on unresolved tensions between people and technology, between people and the planet, between the haves and the have-nots. These tensions were already shaping a new dimension of inequalities pertaining to enhanced capabilities and the new necessities of the 21st century. But the response to the crisis carries the potential to shape strategies on how those tensions can be addressed and how inequalities in human development are reduced. 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 and making the nation Atmanirbhar. Atmanirbhar Bharat, the vision of New India, will be fulfilled with aggressive implementation of the Make in India initiatives and when we would be wholeheartedly 'Vocal for Local'.

Vigyan Prasar
New Delhi

Dr Harsh Vardhan releases National Clinical Management Protocol based on Ayurveda and Yoga for management of COVID-19

06th October 2020, New Delhi

Dr Harsh Vardhan, Union Minister for Health & Family Welfare today released National Clinical Management Protocol based on Ayurveda and Yoga for management of COVID-19 in the virtual presence of Sh. Shripad Yesso Naik, Minister of State for AYUSH (Independent Charge). Dr Rajiv Kumar, Vice Chairman, NITI Aayog and Dr V.K. Paul, Member (Health), NITI Aayog also joined virtually.

An Interdisciplinary Committee for integration of Ayurveda and Yoga Interventions in the 'National Clinical Management Protocol: COVID-19', chaired by Dr V M Katoch, former Director General, ICMR and composed of a group of experts with domain knowledge had formulated the report and submitted recommendations based on acceptable experimental and clinical data. These findings, indicating potential benefits and safety of the medicines, were presented before the National Task Force on COVID-19 and Joint Monitoring Group and subsequently developed into the protocol on the recommendations of NITI Aayog.

Based on their recommendations, the Ministry of AYUSH constituted a National Task Force which, in consensus with expert committees from All India Institute of Ayurveda (AIIA), Delhi; Institute of Post Graduate Training and Research in Ayurved (IPGTRA), Jamnagar; National Institute of Ayurveda (NIA), Jaipur; Central Council for Research in Ayurvedic Sciences (CCRAS); Central Council for Research in Yoga and Naturopathy (CCRYN) and other national research organizations prepared the National Clinical Management Protocol based on Ayurveda and Yoga for management of COVID-19.

Hailing the achievement on the part of Ministry of AYUSH that the advisories for boosting the immunity of the people have become highly popular, Dr Harsh Vardhan noted, "Prime Minister Shree Narendra Modi ji has emphasized following AYUSH advisories for management of COVID-19 crisis. This protocol dealing with preventive and prophylactic measures is a significant step in not only in management of COVID but also in making traditional knowledge relevant to solving problems of the modern time". He expressed satisfaction with the inclusion of easily available and common Ayurvedic herbs and formulations like Guduchi, Ashwagandha, and AYUSH-64 in treating mild and asymptomatic COVID-19 cases.

Dr Harsh Vardhan spoke on the role of Ayurveda in the colonial struggle when Shree Harvilas Sharda had compiled a section on Hindu medicine to argue for India's contribution to the World, "Ayurveda can be traced to the Vedic age as a subtext of

Atharva Veda. The science travelled to Persia and from there to Europe and had a significant impact in the foundations of Modern medicine..... Unfortunately, Ayurveda did not receive much attention after independence until Prime Minister Shree Narendra Modi ji took up this cause with the importance it deserves," he added.

He detailed the efforts of the government in promotion of AYUSH with 'The National Commission for Indian System of Medicine Bill, 2020' and the bill to confer the status of Institute of National Importance on the Cluster of Ayurveda Institutes at Jamnagar. "Their unanimous passage indicates the consensus in reviving traditional systems of medicine," he said.

Shree Rajesh Bhushan, Secretary (AYUSH); Vaidya Rajesh Katoch and other senior officials of AYUSH Ministry were also present at the event.

Website link:
https://www.pib.gov.in/PressReleasePage.aspx?PRID=1662002

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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 ON COVID-19
BY

OFFICE OF THE PRINCIPAL SCIENTIFIC ADVISER (PSA)

National Reagents Consortium: A Cluster approach for promoting high-quality, affordable and indigenous manufacture of diagnostics and reagents

The COVID-19 pandemic has brought to the forefront an unprecedented challenge of catering to the national need for diagnostic kits in India in a short period of time. It has compelled us to re-evaluate our strengths and resources needed to tackle an issue of this magnitude. For a country like India with a billion-plus population, rapid and effective testing is an important step in handling the crisis. The enormous challenge of a severe shortage of COVID-19 diagnostic testing kits has hampered the country's plans for large-scale testing of the population. This shortage of kits is primarily caused by a lack of supply of high quality reagents that go into the manufacturing of these kits. Several factors are responsible for this supply-chain obstruction such as high global demand; price and supply risk of imported products; and quality, capability and capacity issues of the local manufacturers. Indigenous manufacturing of kit reagents and components is an integral link in the value chain of diagnostic manufacturing.

To address the problem at a national level, the office of Principal Scientific Adviser (PSA) to Government of India (GoI) has led the creation of public-private partnership models for a nation-wide capacity-building programme for diagnostics through city clusters including cities such as Bengaluru, Delhi, Hyderabad and Pune. Emphasising the need for such an initiative, Prof. K. VijayRaghavan, PSA to GoI said, "Building capabilities and capacities of indigenous manufacturers of reagents and kits will ensure that we are able to effectively implement the testing strategies for our population. The programme will also go a long way in making India self-sufficient in the area of molecular diagnostics."

The Hyderabad City Cluster (HCC) took up the initiative to form the Reagent Consortium and fill the gaps in the affordable manufacturing of indigenous diagnostics and reagents. Hyderabad is strongly positioned to lead the way by utilising its existing expertise in the life sciences sector. The Reagent Consortium is being led by CSIR-CCMB (Centre for Cellular and Molecular Biology), a premier research institute under the CSIR umbrella, supported by RICH (Research and Innovation Circle of Hyderabad), the nodal entity of the HCC. Other members of the Consortium will be the MSME reagent manufacturers, and testing and validation agencies. CCMB has been involved in the national COVID-19 mitigation activities from the very early stage of the pandemic and has been at the forefront of testing, training, kit validation, anti-viral drug screening, vaccine collaborations and development of diagnostic kits. CCMB is also one of the ICMR-approved testing and validation centres and a national repository for COVID-19 patient samples. With its large pool of researchers and its first-hand experience with COVID-19-related projects, CCMB is well-equipped to support the national plan of development of diagnostic reagents and kits.

The Consortium has initially focused on the RT-PCR diagnostic platform. It has identified MSME manufacturers of components and reagents. The RT-PCR technique finds wide applications

in research, diagnosis and detection of several diseases. A target of 500,000 reactions for COVID-19 testing has been set for the pilot phase of this programme, which will be scaled up to enable production of 10 million kits per month within a year of beginning the programme. The pilot phase of the programme, which will run for 6 months, has been funded by FIND India (Foundation for Innovative New Diagnostics) with support from Bill and Melinda Gates Foundation.

Dr Rakesh Mishra, Director of CSIR-CCMB said, "Bringing together suppliers of biotechnology reagents to meet the national emergencies is critical and the cluster is helping in truly aggregating the stakeholders in the diagnostic space." Highlighting the importance of a collaborative network, Ajit Rangnekar, Director-General of RICH said, "The prior creation of clusters helped us to quickly plan and organise our activities around this initiative, and put in place the required structures." The programme has received an enthusiastic response from the MSME players. Dr Sudarshan Reddy, Founder and CEO of Oncosimis Biotech, a company incubated at AIC-CCMB said, "India undoubtedly needs more high-quality, affordable testing to safely re-open the economy. I appreciate the efforts of CSIR-CCMB in developing self-sustainable COVID-19 testing solutions by providing the much-needed insights and guidance to bring out better products."

The programme will help expand India's R&D capabilities by making low-cost, high-quality reagents readily available with creation of a streamlined network of the entire value chain. The programme is a step in the right direction to respond to the *Aatmanirbhar Bharat* (Self-reliant India) call of Hon'ble Prime Minister to ensure that the country is well-prepared to handle future crises.

For any further queries on the initiative, feel free to connect with sapna.poti@gov.in at the Office of the Principal Scientific Adviser (PSA), Government of India.

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

DEPARTMENT OF SCIENCE AND TECHNOLOGY (DST)

Lucknow lab records shortest average time to process samples among institutions in India

As the COVID-19 patient numbers are recorded, a testing hub in Lucknow for the disease has recorded the shortest average time to process samples among institutions in the country.

With 1000 to 1200 samples being tested per day, the story of the rise of Birbal Sahni Institute of Palaeosciences (BSIP), an autonomous institute of the DST, to the top institution not only in the state but throughout the country in terms of average processing time of samples is one of sheer grit and dedication.

With a small team of 8 members, the lab is running 24x7 to test samples from various districts of Uttar Pradesh. The number of samples tested by BSIP has crossed 50,000, of which approximately 1600 samples were reported positive for SARS-CoV-2 with zero pendency. Keeping in light the present scenario and to aid the authorities to contain this pandemic, BSIP has provided testing reports (on daily basis) to the concerned districts in record time of 24 hours.

BSIP joined hands with the Government of Uttar Pradesh to combat COVID-19 in the state by becoming one of the five Central Government research institutes in Lucknow, which took initial steps to start laboratory testing of COVID-19. Availability of a BSL-2A laboratory, primarily for ancient DNA work in the Institute, became the advantage needed to immediately prepare for testing.

Website link:
https://dst.gov.in/lucknow-lab-records-shortest-average-time-process-samples-among-institutions-india

Multiple options for COVID-19 detection kits from start-ups on the cards through support of CAWACH Initiative of NSTEDB, DST

India will soon have the option of choosing from several COVID-19 rapid detection technologies that start-ups are working on currently.

A technology to conduct rapid molecular tests at small clinics, points of entry like airports, or small laboratories; a lab-on-palm platform for Rapid Antibody Test; and a test kit with a reader enabling direct antigen testing in suspected COVID-19 samples are some of them.

The technologies developed by some start-ups have been repurposed and extended for COVID-19 with support from the Centre for Augmenting WAR with COVID-19 Health Crisis (CAWACH), an initiative by National Science & Technology Entrepreneurship Development Board (NSTEDB), DST, implemented by Society for Innovation and Entrepreneurship (SINE), IIT Bombay.

Website link:
https://dst.gov.in/multiple-options-covid-19-detection-kits-start-ups-cards-through-support-cawach-initiative-nstedb

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

DEPARTMENT OF BIOTECHNOLOGY (DBT)

DBT-RCB signs MoA for antiviral activity testing against SARS-CoV-2

The DBT's Regional Centre for Biotechnology (DBT-RCB) has signed memoranda of agreements with Patanjali Research Institute, Haridwar and Defence Institute of Advanced Technology, Pune to identify the scope of services for the Antiviral activity testing against SARS-CoV-2.

Under the MoA, DBT-RCB will provide antiviral activity testing against SARS-CoV-2 in cell culture models at a non-cytotoxic concentration of the test substance to meet the growing need for in vitro antiviral assays for the new drug candidate/test substances. Patanjali Research Institute, Haridwar and Defence Institute of Advanced Technology, Pune shall reimburse the cost of services. Earlier, a similar MoA was signed with Almoner Biotech, New Delhi; Zealous Health Pvt. Ltd., Hyderabad; Government Medical College, Thrissur, Kerala; and Satej Global Science, Ahmedabad.

Contact info: Dr Deepika Bhaskar (deepika.bhaskar@rcb.res.in);
Dr Nidhi Sharma (nidhi.sharma@rcb.res.in)

Website link:
https://www.rcb.res.in/
https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_01S_28Sep2020.pdf

Project sanctioned under "DBT-AYUSH Network on R&D Activities related to SARS-CoV-2 Virus and COVID-19 Disease"

Project entitled "Sub-Network 1: Studies on anti-SARS-CoV-2 activity of selected medicinal plants and formulations in cell culture model of virus infection" under "DBT-AYUSH Network on R&D Activities related to SARS-CoV-2 Virus and COVID-19 Disease" to be implemented jointly at Regional Centre for Biotechnology (RCB), Faridabad , Institute of Bioresources and Sustainable Development (IBSD), Imphal and Jadavpur University, Kolkata was sanctioned.

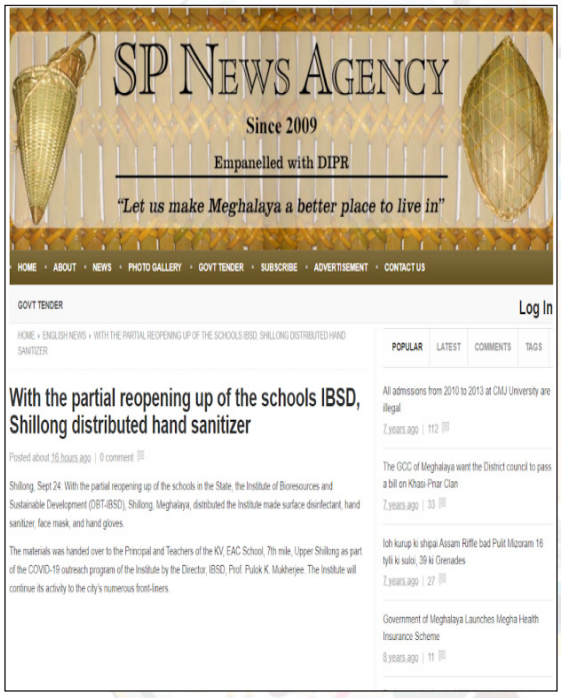
Contact info: Prof. Pulok K. Mukherjee (director.ibsd@nic.in)

Website link:
https://pib.gov.in/PressReleaseframePage.aspx?PRID=1658688
https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_01BB_28Sep2020.pdf

DBT-IBSD distributes hand sanitizer, surface disinfectant and facemasks

The DBT-Institute of Bioresources and Sustainable Development (DBT-IBSD), Shillong distributed the Institute-made surface disinfectant, hand sanitizer and face masks to Kendriya Vidyalaya, Eastern Air Command, Upper Shillong, Meghalaya in the presence of Principal and school staff on 24 September, 2020.

As per the guidelines of unlock 4.0 and considering the overall COVID-19 situation in Meghalaya, students from class 9th onwards may be allowed to visit schools on a voluntary basis. As a part of COVID-19 outreach programme, IBSD, Shillong has now started distribution of surface disinfectant,



hand sanitizer and facemasks to different schools in and around Shillong. This initiative will protect school students, teachers and other staff. IBSD, Shillong will continue this outreach activity to the schools in different villages in Meghalaya. The DBT-IBSD centres in different parts of North East India are actively participating and serving the society during the COVID-19 scenario under the leadership of its Director, Prof. Pulok K. Mukherjee.

Contact info: Prof. Pulok K. Mukherjee (director.ibsd@nic.in)

Website link:
http://ibsd.gov.in
https://thenortheasttoday.com/ibsd-continues-with-covid-19-outreach-programme/
https://spnewsagency.com/with-the-partial-reopening-up-of-the-schools-ibsd-shillong-distributed-hand-sanitizer/
https://theshillongtimes.com/2020/09/25/news-capsule-2134/

DBT-IBSD takes up new research initiatives on phytopharmaceuticals to fight COVID-19

As part of efforts to strengthen the national efforts against the COVID-19 pandemic, DBT-Institute of Bioresources and Sustainable Development (DBT-IBSD) has taken up new research initiatives on Phytopharmaceuticals Mission and has established a Centre of Excellence for Phytopharmaceuticals.

The Institute is extensively working on exploration and documentation of a large number of medicinal plants of north east India for scientific intervention for the characterization of bioactive compounds having antiviral and other therapeutic activities. It is also planning to establish a phyto-markers library useful as standard reference compounds for evaluation of phytopharmaceuticals.

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DBT-IBSD COVID-19 laboratory tests over 1,940 samples

The COVID-19 testing laboratory set up by DBT-Institute of Bioresources and Sustainable Development (DBT-IBSD) and Jawaharlal Nehru Institute of Medical Sciences (JNIMS) at Imphal, Manipur has tested over 1,940 samples. The laboratory was accorded approval by Indian Council of Medical Research (ICMR) on July 11, 2020. It initiated independent testing soon after.

In addition, the establishment of the COVID-19 testing laboratory at Pasteur Institute, Shillong, under State Government of Meghalaya is in process and DBT-IBSD is continuing with the preparation of several extracts of medicinal plants with antiviral properties. These are being shared with DBT-RCB and DBT-ILS for antiviral screening with a focus on SARS-CoV-2.

Further, DBT-IBSD is finalizing the draft of a monograph of medicinal plants with antiviral properties from north east India and work is under progress on a project titled "Studies on anti-SARS-CoV-2 activity of selected medicinal plants and formulations in cell culture model of virus infection" sanctioned under "DBT-AYUSH Network on R&D Activities related to SARS-CoV-2 Virus and COVID-19 Disease". It is to be implemented jointly by RCB, Faridabad, IBSD, Imphal and Jadavpur University, Kolkata.

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DBT-NBRC held popular webinar on COVID-19 and the brain

Often people are worried whether COVID-19 can affect mental health, mental function or cause neurological issues. We all often get concerned with the reports in popular media that people recovering from Coronavirus infection suffer from issues like confusion, inability to concentrate loss of smell and taste and carry out normal brain functions.

As part of its outreach activities to engage with the general public, DBT-National Brain research Centre, Manesar in association with CSIR Pensioners Welfare Association (HQs) has organized a webinar for creating awareness on the subject for its staff, members and general public.

The webinar titled 'COVID and the Brain' is by M. V. Padma Srivastava, one of India's most accomplished neurologists at AIIMS, New Delhi. Dr Srivastava is Head of the Department of Neurology and Chief, Neurosciences Centre at AIIMS. She is also Honorary Professor at University of Central Lancashire, UK.

The webinar was held on October 10, 2020 and provided an excellent opportunity to know how the brain gets affected and the possible adverse effects of COVID-19 on the human brain. The participants had the opportunity to ask questions and seek clarifications for doubts and concerns on this important aspect.

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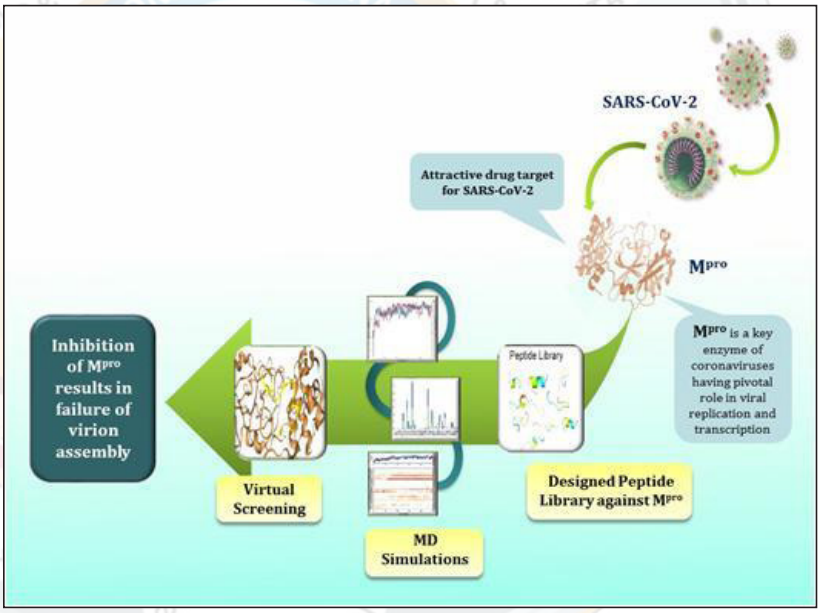
Website link:
https://twitter.com/PsethNbrc/status/1310171640274190343/photo/1
http://www.nbrc.ac.in/newweb

Machine learning helps identify molecules with therapeutic potential against COVID-19

Dr Shailza Singh's team at the DBT's National Centre for Cell Science (DBT-NCCS), Pune, have been involved in research aimed at identifying targets that could be used to design therapeutic peptides against many variants of the virus causing COVID-19. For this purpose, they used machine learning algorithms to select specific viral sequences from among the diverse sequences reported from different parts of the world. They used a novel technique of combinatorial machine learning algorithm with an optimization algorithm, to design a set of novel peptides, from which they identified peptides that showed a strong binding affinity towards an enzyme called M^{pro} using computational studies.



Machine learning helps identify potential therapeutic molecules that target the M^{pro} protein of the COVID-19-causing virus

"M^{pro}" is the main protease enzyme of the COVID-19-causing virus. It is an attractive drug target since it is a key enzyme that plays a pivotal role in mediating viral multiplication. Moreover, humans do not have any molecule similar to it, which means that any therapeutic agent that blocks it would ideally not affect humans adversely.

The newly designed peptides could potentially serve to block the functionality of M^{pro}, which could result in regulating the replication of the viral RNA and thus help control the virus. Further experimental validation could help develop effective therapeutics in the future. These

peptides also show promise for safeguarding against viral variants that might arise in future as well, since the machine learning strategy used here was based on studying all the mutants available till date, which therefore takes into consideration the evolvability of the virus. These promising research outcomes have been accepted for publication in the international journal, *BBA Molecular Basis of Disease*.

The urgent need to tackle the current COVID-19 pandemic has fuelled a surge in research aimed at rapid development of vaccines and therapeutics against this novel disease. Rising to this unprecedented challenge, the scientific community is using various tools and approaches to address this issue. In addition to the conventional approaches, modern tools in the researchers' arsenal that have been popular in the current war on COVID-19 include computational biology, artificial intelligence and machine learning. These tools are being used to help identify viral components that could serve as targets for the development of vaccines and therapeutics.

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Website Link:
https://www.sciencedirect.com/science/article/pii/S0925443920303264
https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_01BB_5Oct2020.pdf

DBT-RCB signs MoA with IISER, Kolkata for antiviral activity testing against SARS-CoV-2

DBT-Regional Centre for Biotechnology (RCB), Faridabad has signed an MoA with IISER, Kolkata to identify the scope of services for the antiviral activity testing against SARS-CoV-2 to meet the growing need for the *in vitro* antiviral assays for the new drug candidate/test substance (TS). Under the agreement, RCB will provide antiviral activity testing against SARS-CoV-2 in the cell culture model at a non-cytotoxic concentration of the TS, while IISER, Kolkata, shall be reimbursing the cost of services.

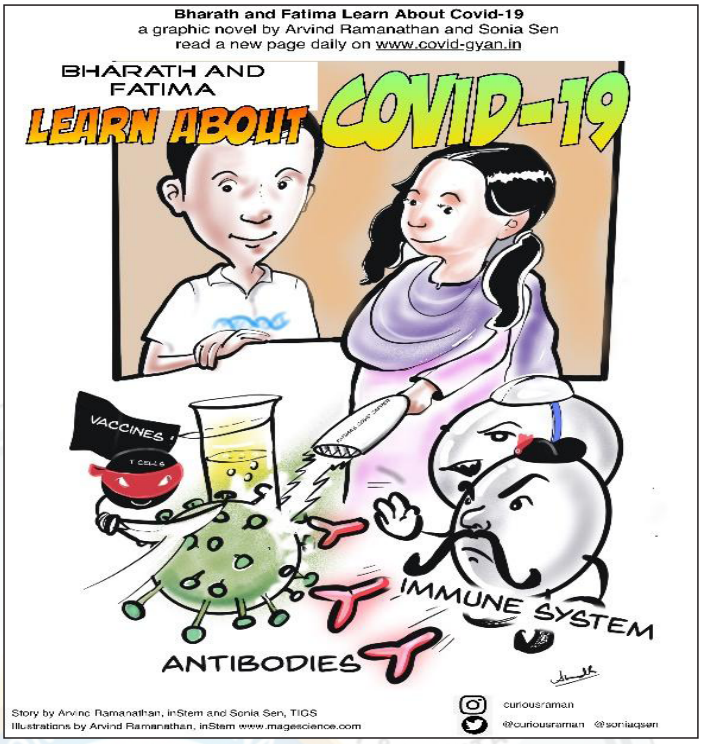
Contact info: Dr Deepika Bhaskar (deepika.bhaskar@rcb.res.in); Dr Nidhi Sharma (nidhi.sharma@rcb.res.in)

Website link:
https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_03BB_5Oct2020.pdf
https://www.rcb.res.in/
https://www.rcb.res.in/upload/SARS-CoV2%20Antiviral%20activity%20testing.pdf

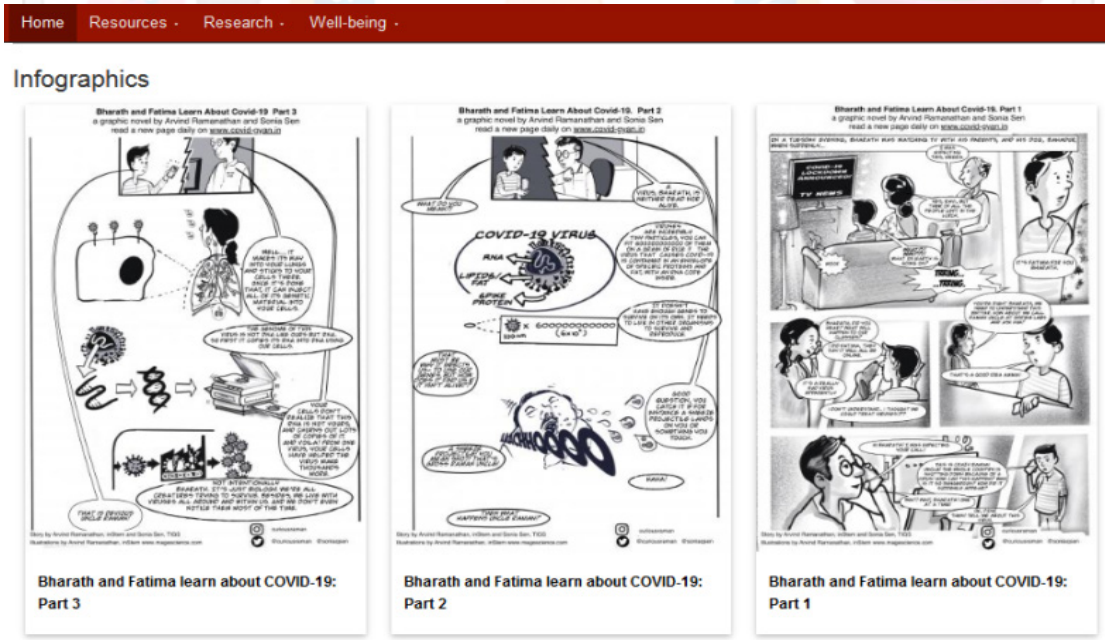
Graphic novel on COVID-19 awareness by Arvind Ramanathan of inStem

Dr Arvind Ramanathan of DBT's Institute for Stem Cell Science and Regenerative Medicine (inStem), Bangalore has created an informative graphic novel which was launched on COVID Gyan website recently. This was done in collaboration with his colleague Sonia Sen.

Graphical narration (colloquially referred as 'comics') has a rich history in our culture, with series such as Amar Chitra Katha demonstrating the trans-generational power of this medium. As a faculty at inStem with deep interests in cartooning and graphical narration, Dr Ramanathan's effort in developing this comic is to create awareness in non-specialist readers, especially children, about the current health crisis. The comic is based around two curious young children, Bharath and Fatima, who learn from their uncle, Raman, who is a scientist too, about COVID-19, the immune system, and vaccines. This effort with anticipated translations into local languages will serve as a widespread platform for science education and communication. As an awareness campaign, this 20-page graphic novel is released as a daily bulletin at https://covid-gyan.in/.



A snippet of the cover page of the graphic novel titled 'Bharath and Fatima Learn about COVID-19'.



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Website link:

https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_04BB_5Oct2020.pdf

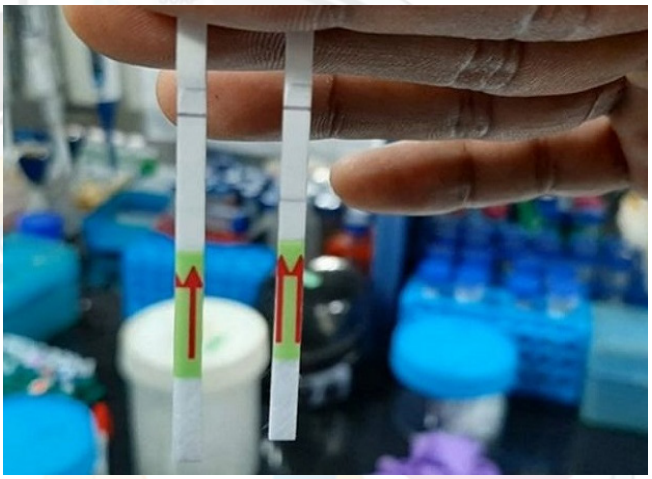
https://www.instem.res.in/

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH (CSIR)

India's new paper COVID-19 test could be a 'game changer'



A team of scientists at the Delhi-based CSIR-Institute of Genomics and Integrative Biology (IGIB) has developed an inexpensive paper-based test for coronavirus that could give fast results similar to a pregnancy test. The test, named after a famous Indian fictional detective, is based on a gene-editing technology called Crispr. Scientists estimate that the kit called FELUDA (FNCAS9 Editor-Limited Uniform Detection Assay) would return results in under an hour and cost Rs. 500.

FELUDA will be made by a leading Indian conglomerate, Tata, and could be the world's first paper-based COVID-19 test available in the market.

"This is a simple, precise, reliable, scalable and frugal test," Professor K VijayRaghavan, Principal Scientific Adviser to the Indian government, told the BBC.

Researchers at the IGIB as well as private labs tried out the test on samples from about 2,000 patients, including ones who had already tested positive for the coronavirus.

They found that the new test had 96% sensitivity and 98% specificity. The accuracy of a test is based on these two proportions. A test that is highly sensitive will detect almost everyone who has the disease, and a test that has high-specificity will correctly rule out almost everyone who doesn't have the disease. The first ensures not too many false negative results and the second not too many false positives. India's drug regulator has cleared the test for commercial use.

With more than six million confirmed infections, India has the world's second-highest COVID-19 caseload. More than 100,000 people in the country have died of the disease so far. After a slow start, India is now testing a million samples a day in more than 1,200 laboratories across the country. It is using two tests.

The first is the time-tested, gold standard polymerase chain reaction, or PCR swab tests, which uses chemicals to amplify the virus's genetic material in the laboratory. The second is the speedy antigen test, which works by detecting virus fragments in a sample.

The PCR test is generally reliable and costs up to Rs. 2,400. It has low false positive and low false negative rates. The antigen tests are cheaper and use finger-prick blood samples to find signs of previous infection. They are more precise in detecting positive infections, but generate more false negatives than the PCR test. Scaling up testing in India hasn't meant easy availability yet, according to Dr Anant Bhan, a researcher in global health and health policy.

"There are still long wait times and unavailability of kits. And we are doing a lot of rapid antigen testing which have problems with false negatives," Dr Bhan told the BBC. He believes the FELUDA test could potentially replace the antigen tests because it could be comparatively cheaper and more accurate.

Website Link:
https://www.csir.res.in/slider/indias-new-paper-covid-19-test-could-be-%E2%80%98game-changer%E2%80%99

Tests reveal silent reinfections in hospital workers

Two staff members at a hospital in India who tested positive for the coronavirus became reinfected several months later and had no symptoms in either instance. The hospital employees, a 25-year-old-man and a 28-year-old woman, worked in the COVID-19 ward. Both tested positive for SARS-CoV-2 in May, although neither had symptoms. After testing negative, they returned to work. Both tested positive again roughly three-and-a-half months after the first positive test. Neither had symptoms, but both had higher levels of virus than in May.

Genomic analysis by Vinod Scaria at the Institute of Genomics and Integrative Biology in New Delhi and his colleagues showed that the SARS-CoV-2 that infected the workers the second time was genetically different from the first virus that infected them — evidence that the workers were infected anew rather than harbouring leftover virus. The results suggest that asymptomatic reinfections are often underreported.

Website Link:
https://www.csir.res.in/slider/tests-reveal-silent-reinfections-hospital-workers

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

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

ICMR issues revised guidelines for TrueNat testing for COVID-19

ICMR issues revised guidelines for TrueNat testing for COVID-19**.** The TrueNat system is now a comprehensive assay for screening and confirmation of COVID-19 cases. Sample is collected in viral lysis buffer and hence biosafety and biosecurity requirements for use of TrueNat are minimal. There are three different types of TrueNat assays available now:

1. Assay 1: TrueNat Beta CoV E gene Screening assay
2. Assay 2: TrueNat SARS CoV2 RdRp gene confirmatory assay
3. Assay 3: TrueNat Covid-19 Multiplex assay

TrueNat system is also now a multiplexed point-of-care test that includes a single assay comprising of both the screening (E gene) and confirmatory (Orf1a) targets in a single test. All samples of suspected COVID-19 cases can also be tested by this assay. All negatives are to be considered as true negatives. All samples that test positive by this assay must be considered as true positives. No further RT-PCR-based confirmation is required for samples that are confirmed as true positives by the TrueNat assays.

Website Link:
https://www.icmr.gov.in/pdf/covid/labs/Revised_Guidelines_TrueNat_Testing_24092020.pdf

ICMR invites letter of intent for participation in National Clinical Registry of COVID-19

There is a pressing need for collection of systematic data on clinical signs and symptoms, laboratory investigations, management protocols, clinical course of COVID-19 disease, disease spectrum and outcomes of patients. Such data will serve as an invaluable tool for formulating appropriate patient management strategies, predicting disease severity, patient outcomes etc. In view of this, Ministry of Health & Family Welfare (MoHFW), ICMR, New Delhi and All India Institute of Medical Sciences (AIIMS), New Delhi have proposed to launch a National Clinical Registry for COVID-19 (NCRC). The NCRC will aim at collecting good quality, real-time clinical data to inform evidence-based clinical practice, research, formulating guidelines and policy making. In view of this, ICMR invites a letter of intent from institutions and hospitals identified as dedicated COVID Hospitals or dedicated COVID Health Centres under the project to establish National Clinical Registry of COVID-19.

Website Link
https://www.icmr.gov.in/pdf/covid/techdoc/Letter_of_Intent_National_Clinical_Regsitry_of_COVID19_v1.pdf
https://www.icmr.gov.in/tender.html

Dedicated Vaccine Portal and National Clinical Registry for COVID-19 launched by ICMR

Dr Harsh Vardhan, Union Minister for Health & Family Welfare, Government of India launched the vaccine portal for COVID-19 and National Clinical Registry for COVID-19, developed by ICMR. ICMR has always been in the forefront of health research in the country and is now leading the country in tackling the unprecedented pandemic through scientific rigour and innovation. To disseminate the vaccine-related information the exclusive portal will be helpful in creating awareness among the masses. All queries of common people on vaccine development process would be addressed through this portal.

Hon'ble Minister Dr Harsh Vardhan also launched the National Clinical Registry for COVID-19 developed by ICMR. This registry will collect systematic data on clinical signs and symptoms, laboratory investigations, management protocols, clinical course of COVID-19 disease, disease spectrum and outcomes of patients. The data will serve as an invaluable tool for formulating appropriate patient management strategies, predicting disease severity, patient outcomes etc.

Contact Info: rajnikant.srivastava@gmail.com, sharma.lk@icmr.gov.in

Website Link:
https://www.icmr.gov.in/pdf/press_realease_files/ICMR_Press_Release_ICMR_launched_Vaccine_Portal_and_National_Clinical_Registry_for_COVID19.pdf

ICMR invites expression of interest for validation of rapid antigen detection assays for COVID-19

ICMR invites applications for validation of rapid antigen detection tests for COVID-19 from all manufacturers who have developed such test. The gold standard RT-PCR diagnostic test for COVID- 19 has limitations in terms of widespread availability. In view of this, there is urgent requirement of reliable and convenient rapid point-of-care antigen detection assays with high sensitivity and specificity. Such assays could be used as potential diagnostic tests in all possible public and private healthcare settings and made available for mass testing.

Contact Info: guptanivedita.hq@icmr.gov.in, drneetu.vijay@icmr.gov.in

Website Link:
https://www.icmr.gov.in/pdf/tender/Revised_EOI_for_Ag_kit_validation_19082020_v2.pdf
https://www.icmr.gov.in/tender.html

MoHFW releases SOP on preventive measures to be followed in entertainment parks and similar places to contain spread of COVID-19

MoHFW has issued SOP on preventive measures to be followed in Entertainment Parks and similar places to contain spread of COVID-19. Entertainment Parks and similar places are frequented by a large number of people for leisure and entertainment. To prevent spread of COVID-19 infection, it is important that required physical distancing and other preventive measures are followed in these places. The document outlines various generic precautionary measures to be adopted in addition to specific measures to be ensured at Entertainment Parks and similar places to prevent spread of COVID-19. Entertainment Parks and similar places in Containment Zones shall remain closed. Only those outside Containment Zones will be allowed to reopen.

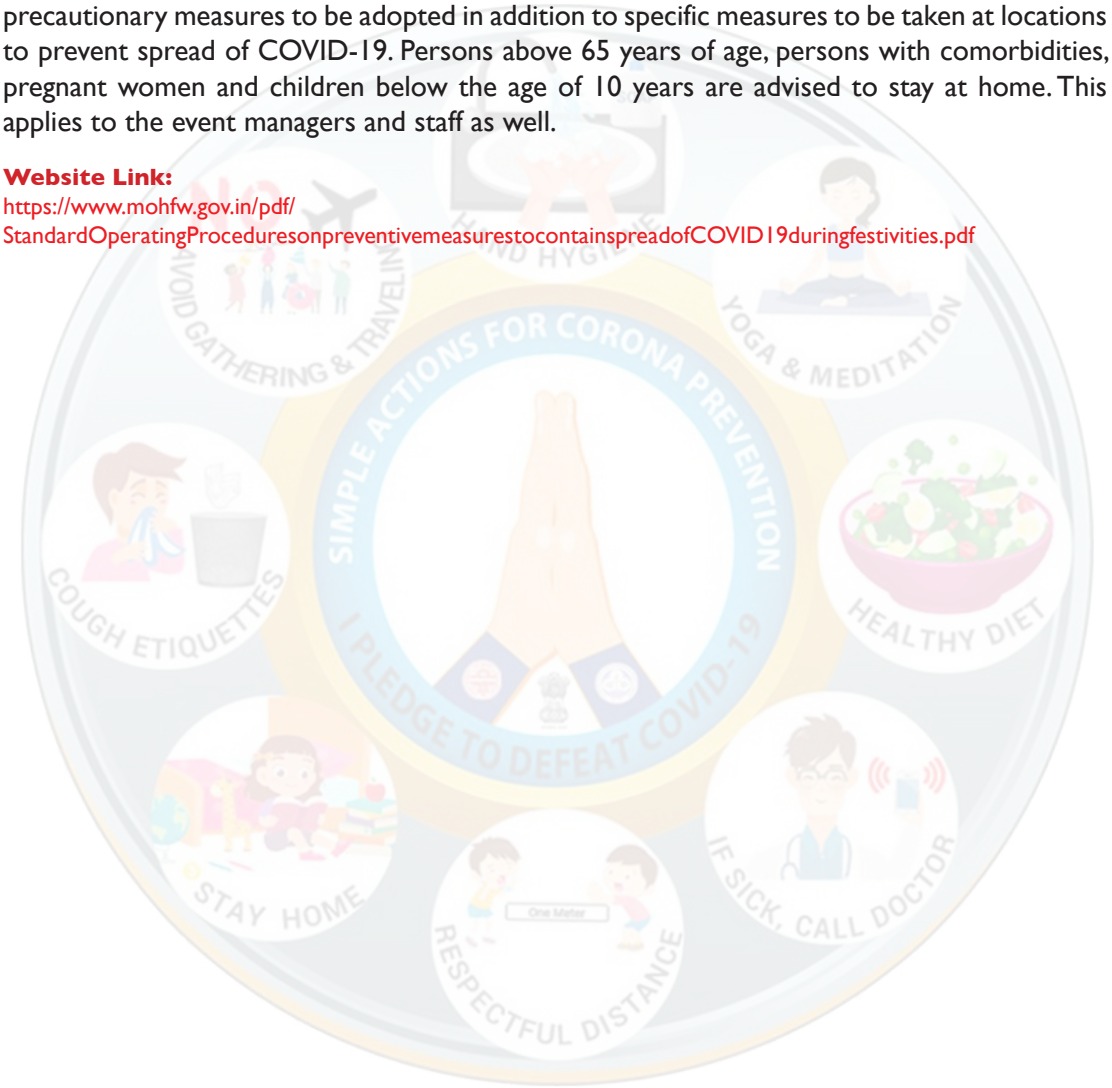
Website Link:
https://www.mohfw.gov.in/pdf/SOPonpreventivemeasurestobefollowedinEntertainmentParksandsimilarplacestocontainspreadofCOVID19.pdf

MoHFW issues SOP on preventive measures to contain spread of COVID-19 during festivities

The months of October to December are time for festivities that witness gatherings of large number of people in specified locations for religious worship, fairs, rallies, exhibitions, cultural functions, processions etc. These events may last for a day, a week or more. To prevent spread of COVID-19 infection, it is important that necessary preventive measures are followed for such events.

In this context, MoHFW issues standard operating procedures on preventive measures to contain spread of COVID-19 during festivities. The document outlines various generic precautionary measures to be adopted in addition to specific measures to be taken at locations to prevent spread of COVID-19. Persons above 65 years of age, persons with comorbidities, pregnant women and children below the age of 10 years are advised to stay at home. This applies to the event managers and staff as well.

Website Link:
https://www.mohfw.gov.in/pdf/StandardOperatingProceduresonpreventivemeasurestocontainspreadofCOVID19duringfestivities.pdf

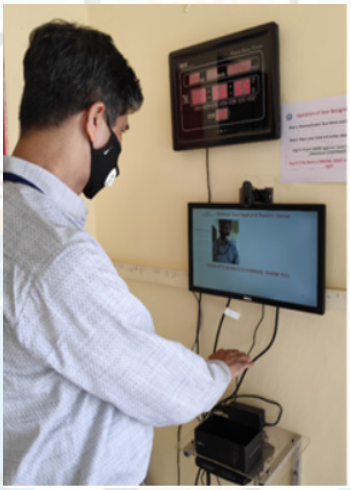


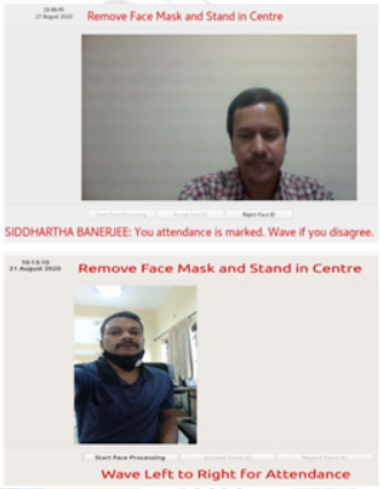
SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

DEFENCE RESEARCH AND DEVELOPMENT ORGANISATION (DRDO)

DRDO develops AI-enabled face recognition-based contactless attendance system





An easy-to-use, cost-effective, scalable contactless attendance system has been developed by the DRDO as an alternative to finger-print-based attendance. The face recognition-based solution comprises of Single Board Computer (SBC), display, webcam and a motion sensor. Users have to wave their hand above a motion sensor to initiate the detection process. Once the person is identified, the attendance is marked without any other input. The face detection model is based on Multi-Task Convolutional Neural Network (MTCNN) and the face recognition model uses contrastive learning method.

The system requires few (10-20) sample images of each employee to train the AI model. However, during the run-time, the system does not require any user face image. The training is done in an offline mode on a GPU compute platform. However, during operation the software runs on commodity CPU platform. The system can be deployed to new places, which would require training of the AI model using the face images of the employees at the place of deployment. New employees can also be enrolled easily and the system can be scaled up.

Website Link:
https://www.drdo.gov.in/ai-enabled-face-recognition-based-contactless-attendance-system

DRDO builds Confined Area Disinfection Devices to support increased sanitisation

DRDO has developed an automated portable device called Ozonated Radical Confined Space (ORCS) Disinfection Unit to support enhanced cleaning and sanitisation of confined spaces. Ozone treatment of confined space at lower concentration can neutralize Coronavirus. The device uses optimal concentrations of Ozonated fog which is dispersed after getting mixed with Radical dispensing solution ensuring sanitization of confined space.

ORCS Disinfection Unit produces aqueous fog that spreads 360° and able to disinfect a room of 12 x 12 x 10 ft in less than 20 minutes. The spread of Ozonated fog is fast and it reaches to multiple penetration zones otherwise inaccessible to UV-C radiation which is also a method of Confined Space Sterilization.

The device uses 67% lesser than human permissible values of ozone (0.1 ppm x 8 h) as per OSHA 1999:1000 standard. It supports cold sanitization/sterilization process thus no issues of heating of confined space or any surface. It is an ideal equipment for home, healthcare unit, office, hotels, rail/metro /ship/air coaches, clinics, cars, and ambulance for daily sanitization.

Website Link:
https://www.drdo.gov.in/confined-area-disinfection-devices

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

SCIENTIFIC AND ACADEMIC INSTITUTIONS

IIT Delhi Start-ups E-TEX and Clensta launch antiviral protection kit for COVID-19 Care

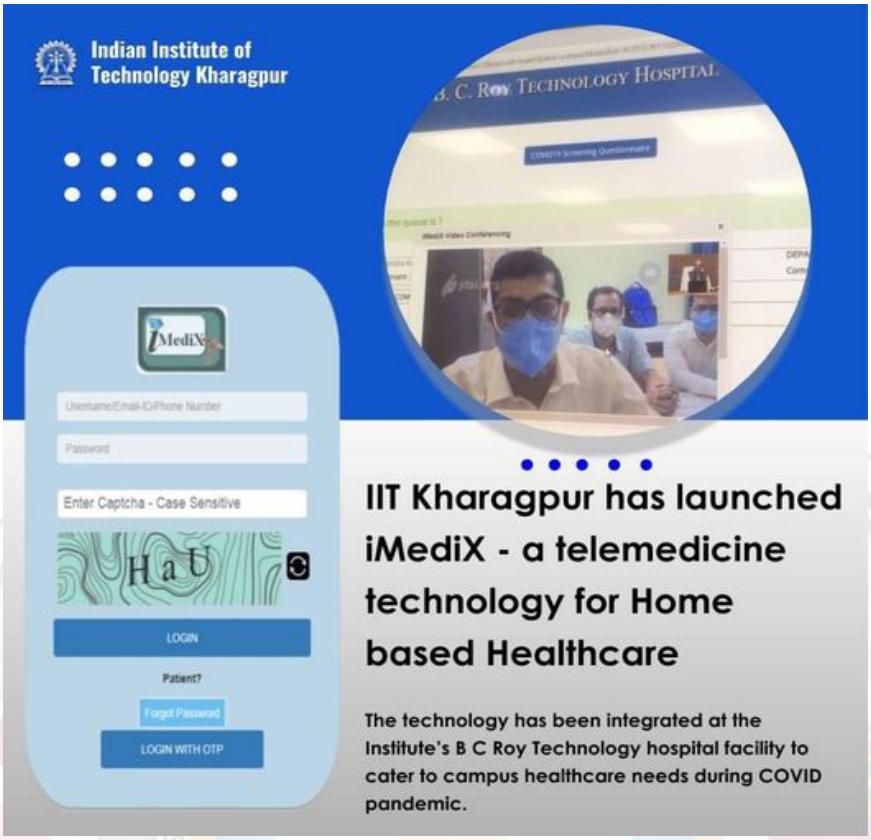
With an ambition to provide protective cover to people in these challenging times, two IIT Delhi incubated start-ups, E-TEX and Clensta, have teamed up and launched a complete antiviral protection kit for masses at an affordable price on the occasion of Mahatma Gandhi's 151st Birth Anniversary. The antiviral kit, unveiled by Prof V. Ramgopal Rao, Director, IIT Delhi, consists of a novel Clensta protection lotion and hand sanitizer, E-TEX Kawach Antiviral T-Shirt, and Kawach Mask. The products are backed up by experts from the chemical and textile departments of IIT Delhi. The lotion can be used over any exposed part of the body including face and hands. The application of the product keeps the users safe from viruses by disrupting it for almost 24 hours and reduces the extended use of alcohol-based sanitizers and washing hands multiple times a day. The antiviral efficacy of the Clensta lotion was conducted at different intervals of times and found to be 99.95% effective in virus protection as per American Society for Testing & Materials (ASTM)-E-1052-20

Website Link:
https://home.iitd.ac.in/startup-etex.php

Merging homecare & healthcare, IIT Kharagpur launches iMediX Telemedicine Technology

IIT Kharagpur launched iMediX, a telemedicine technology, developed by researchers at the Department of Computer Science & Engineering under the guidance of Prof. Jayanta Mukhopadhyay. The system integrates homecare with healthcare services from the hospital. Considering the emergent needs due to COVID-19 pandemic, the system facilitates critical healthcare support to patients at their doorsteps through remote consultation by a physician. The system is accessible by any standard internet browser and also from a mobile device.

The software was launched on October 2, 2020, on the occasion of Gandhi Jayanti and will be integrated at the Dr B. C. Roy Technology Hospital of the Institute which provides emergency healthcare services for the campus residents and employees.



Website Link:
https://kgpchronicle.iitkgp.ac.in/iit-kgp-develops-telemedicine-for-home-care/

IIT Kharagpur proposes solid waste management policy during endemics

A recent study by IIT Kharagpur researchers has led to the formulation of a set of environmental recommendations for solid waste management an endemic situation. The researchers have explored the challenges faced by the solid waste management sector, typically cases in

biomedical waste, plastic waste, and food waste management, during the pandemic and the underlying opportunities to fill existing loopholes in the system.

Website Link:
https://kgpchronicle.iitkgp.ac.in/iit-kgp-study-proposes-pandemic-waste-management-policy/

IIT Delhi-incubated start-up launches antimicrobial water storage containers 'AqCure'

Mixing traditional science with nanotechnology, IIT Delhi-incubated start-up Nanosafe Solutions has developed a range of antimicrobial, i.e., antiviral, antibacterial and antifungal water storage containers and launched it as "AqCure", which is based on the inherent antimicrobial properties of copper. AqCure is a patented technology in which active nano-copper is released in a sustainable manner from a polymer matrix. The released copper makes the outer and inner surface of the container antimicrobial, reducing transmission of microbes upon direct contact, and making the stored water microbiologically safe. Additionally, the released copper in water is within permissible limits and thus fortifies stored water as copper is also an essential micronutrient needed for growth.

Website Link:
https://home.iitd.ac.in/press-antim.php

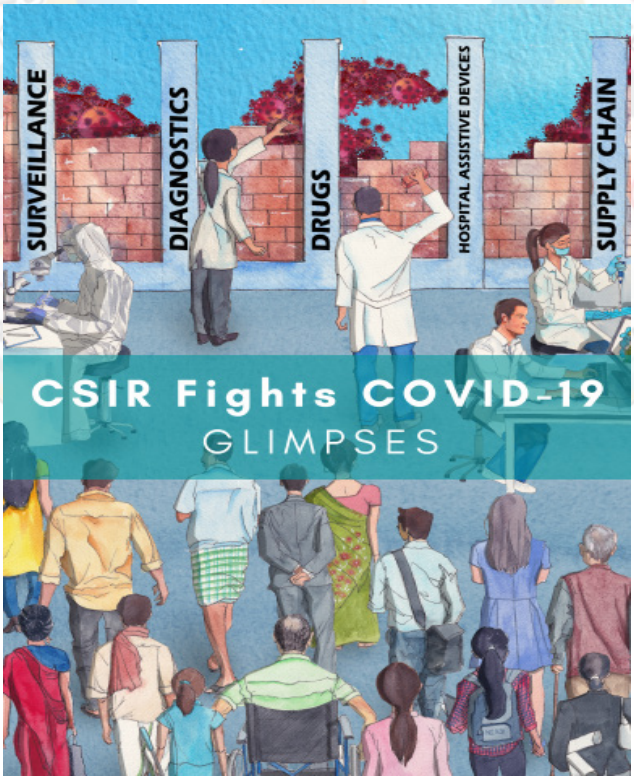
SCIENCE OUTREACH & POPULARISATION EFFORTS

Since the outbreak of COVID-19 pandemic, the Ministry has supported numerous research projects and technology interventions through its various Departments, Autonomous Organisations, Professional Bodies, Statutory Bodies, and Laboratories. In this science outreach and popularisation efforts, a number of knowledge and information products have been generated and released.

Efforts from Ministries, Departments & Scientific Organisations

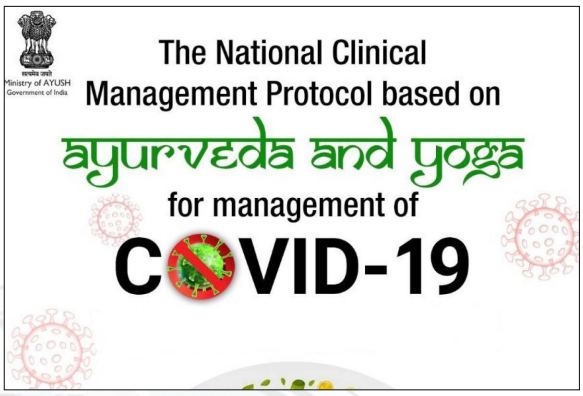
CSIR releases digital book 'CSIR Fights COVID-19'

CSIR Fights COVID-19, the digital book on CSIR's response to COVID-19, is an effort to convey the essence of the journey. The readers of this digital book will get a peek into the spirit of Council of Scientific & Industrial Research (CSIR) and about some of its COVID-19 contributions. By the initiative, CSIR aims to serve the resource as a template for facing future pandemics and calamities in times to come.



Website link:
https://www.niscair.res.in/includes/images/announcements/CSIR-COVID-efforts.pdf

National Clinical Management Protocol based on Ayurveda and Yoga for management of COVID-19 released



The "National Clinical Management Protocol based on Ayurveda and Yoga for the management of COVID-19" released by the Ministry of AYUSH on 7th October 2020 is a milestone in the rapidly evolving scenario of COVID-19 responses in the country.

The COVID-19 pandemic has created a global health crisis posing an unprecedented public health emergency. The number of deaths and people being infected are increasing daily throughout the globe. This situation is much more severe due to possible devastating situations because of several social and economic factors. Effective management to address this infection is still evolving and attempts are being made to integrate traditional interventions along with standard care.

Ayurveda and Yoga can certainly play a pivotal role to augment preventive measures provided in the guidelines by Ministry of Health and Family Welfare (MoHFW). The current understanding of COVID-19 indicates that good immune status is vital to prevention and to safeguard from disease progression. In this context Ministry of Ayush issued National Clinical Management Protocol based on Ayurveda and Yoga for management of COVID-19 in the form of a document. This consensus document is developed by expert committees from All India Institute of Ayurveda (AMA), Delhi; Institute of Post Graduate Training and Research in Ayurved (IPGTRA), Jamnagar; National Institute of Ayurveda (NIA), Jaipur; Central Council for Research in Ayurveda (CCRAS); Central Council for Research in Yoga and Naturopathy (CCRYN); and other national research organizations. This protocol is for management of mild COVID-19 cases. Moderate to severe COVID-19 individuals may have informed choice of treatment options. All severe cases will be referred.

This protocol and its annexure are approved by the Chairman, Interdisciplinary Committee for inclusion of Ayurveda and Yoga in the management of mild COVID-19 cases and approved by the empowered committee of the Interdisciplinary AYUSH Research and Development Taskforce on COVID-19, both constituted by the Ministry of AYUSH.

Website Link:
https://main.ayush.gov.in/event/national-clinical-management-protocol-based-ayurveda-and-yoga-management-covid-19

CSIR-NISCAIR comes up with information handbook on COVID-19 in Hindi

National Institute of Science Communication and Information resources (CSIR-NISCAIR) has published an information handbook on COVID-19 in Hindi. The handbook contains information on frequently asked questions and answers, myths and facts, various ongoing research and innovations, and CSIR's efforts towards the mitigation of COVID-19 disease.

Website link:
https://www.niscair.res.in/covidbulletin/hindicompendium

Use of Ayush-based solutions for strengthening immunity – A Public Awareness Campaign

Healthcare practices advocated by Ayush systems (namely Ayurveda, Yoga, Naturopathy, Unani, Siddha, Sowa-Rigpa and Homoeopathy) are known to promote general wellness. In fact, they exert a positive impact both on the mind and the body. These practices aim to go beyond the symptoms of the diseases and work on the overall strengths and weakness of an individual. They are normally free of side-effects, and their rewards are long-lasting.

COVID-19 has brought in new challenges before the healthcare system. With no definite cure for the disease, the healthcare systems all over world are stretched to their limits. The surest and safest way to service the pandemic is to avoid falling sick. As a result, immunity of a person has become the key factor in prevention and treatment of COVID-19.

The strength of AYUSH systems in strengthening the natural immune system of the human body is well known. They provide solutions for this using readily available herbs, condiments etc., many of which are also widely used in our day-to-day cooking. The fact that the AYUSH medicines and therapies have negligible side-effects is also a reason for their wide acceptability.

For many of us, our childhood memories include decoctions or medicines consumed to prevent disease like flu or viral infections. During the current pandemic also, the Ayush medicines and therapies have been extensively used, especially for prevention of the disease. Documented and undocumented reports about Ayush-based solutions helping both in prevention of and recovery from COVID-19 are increasingly seen in the public domain. Correct information about such solutions needs to be made available to the people across the country in easy formats, so that they can adopt them in their daily lives.

An effort has been made to compile some easy-to-adopt Ayush-based immunity building measures/solutions.

Last date to participate: 14th November 2020

Website Link:

https://www.mygov.in/group-issue/use-ayush-based-solutions-strengthening-immunity/?target=inapp&type=group_issue&nid=296661

https://static.mygov.in/rest/s3fs-public/mygov_159801941255063671.pdf

NITI Aayog initiates campaign to support senior citizens in fight against COVID-19

NITI Aayog initiates a nationwide campaign "Hum Honge Kamyaab" to support the senior citizens in our society through enabling the participants to take a pledge. In the pledge, an

individual takes undertaking that he/she will support senior citizens around, increase their awareness, and reach out to the isolated and the vulnerable.

Website Link:
https://pledge.mygov.in/seniorcitizens/

Drug Discovery Hackathon 2020 launched for drug discovery against COVID-19

Drug Discovery Hackathon 2020 (DDH2020) platform welcomes all those who wish to join the open-source drug discovery Hackathon against COVID-19. DDH2020 is a joint initiative of All India Council for Technical Education (AICTE) and Council of Scientific and Industrial Research (CSIR) and supported by Office of the Principal Scientific Adviser (PSA), Government of India; National Informatics Centre (NIC) and MyGov India.

The vision and mission of DDH2020 is to establish 'Open innovation Model' for *in silico* drug discovery against COVID-19 virus and will cover the various processes in drug discovery, including but not limited to, *in silico* screening of molecules, lead optimization and identification of drug-able non-toxic targets. The targets/tools/lead molecules identified through the process of DDH2020 will be further taken forward for synthesis followed by subsequent steps in routine drug discovery programme.

Objective of the hackathon is to identify drug candidates that are effective against coronavirus SARS-CoV-2 by employing a hackathon for *in-silico* drug discovery, followed up by chemical synthesis and biological testing.

The Hackathon consists of two major tracks:
Track-1 will primarily deal with drug design for anti-COVID-19 hit/lead molecule generation using tools such as molecular modelling, pharmacophore optimization, molecular docking, hit/lead optimization, etc.

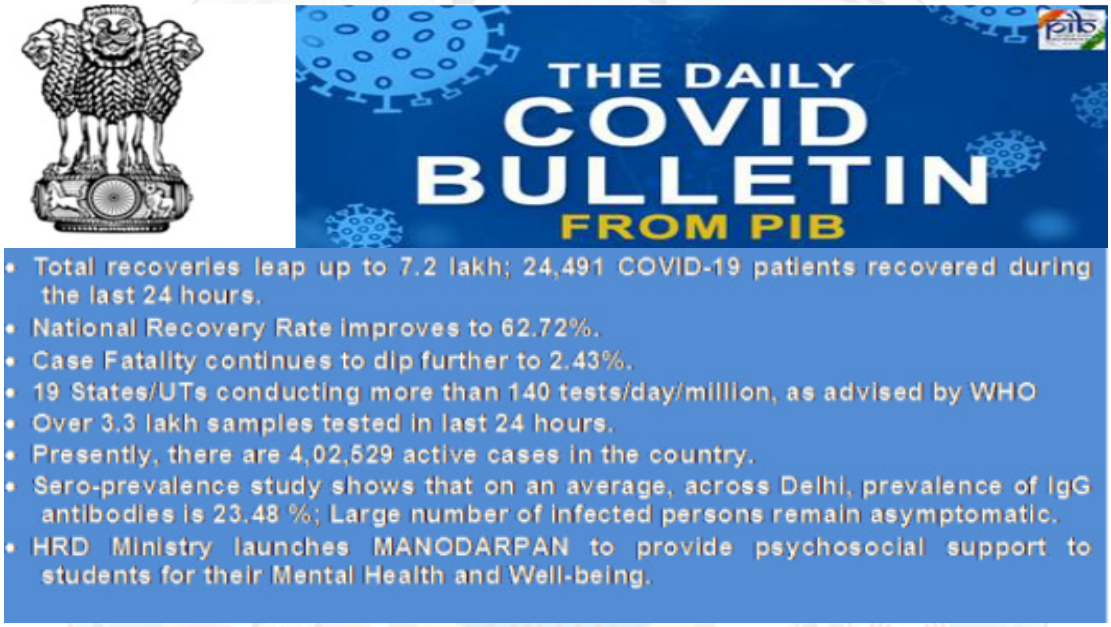
Track-2 will deal with designing/optimizing new tools and algorithms which will have an immense impact on expediting the process of in silico drug discovery. Novel or refined tools/ algorithms from Track-2 will help develop better models for predicting ADMET, in silico, thus improving screening efficiency.

Last date of submission for Phase-I: 31st October 2020

Website link:
https://innovateindia.mygov.in/ddh2020/

Press Information Bureau releases daily bulletin on COVID-19

Press Information Bureau (PIB), Government of India releases a daily bulletin on COVID-19. The bulletin contains press releases concerning COVID-19 issued in last 24 hours, inputs from PIB field offices and fact checks undertaken by PIB. The last release is dated 9th October 2020.



Website Link:
https://pib.gov.in/PressReleasePage.aspx?PRID=1663193

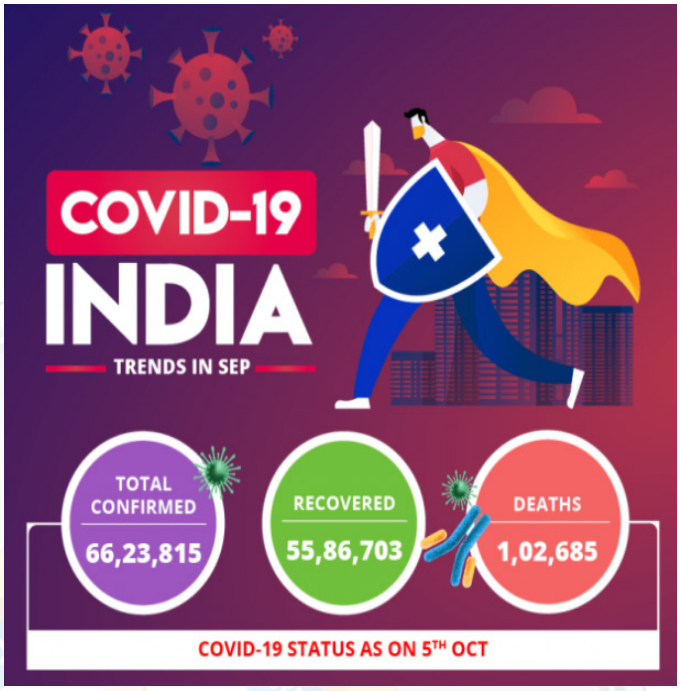
MyGOV initiates Jan Andolan for COVID-19-appropriate behaviour

Government of India takes an initiative through Jan Andolan to create awareness for practicing appropriate behaviour related to hygiene to protect oneself and the society from COVID-19 transmission.

Website Link:
https://pledge.mygov.in/janandolan-covid/

Government of India presents regular COVID-19 India factsheet

India's coronavirus cases have crossed 66-lakhs mark and as on 5th October 2020, stands at 66,23,815 cases out of which 55,86,703 have recovered. The recovery rate stands at 84.3% while the case fatality rate stands at 1.55%, one of the lowest in the world. Government of India, through its Open Government Data (OGD) Platform https://data.gov.in/ has taken the initiative to present the regular factsheet related to COVID-19.



The OGD platform is aimed at supporting Open Data initiative of Government of India. The portal is used by various Ministries, Departments, and their organizations, to publish datasets, documents, services, tools and applications collected by them for public use. It intends to increase transparency in the functioning of the Government and also opens avenues for many more innovative uses of Government data to give different perspective.

Website Link:
https://community.data.gov.in/covid-19-india-trends-in-september-2020/

CSIR-NISCAIR brings out fortnightly e-Newsletter on COVID-19

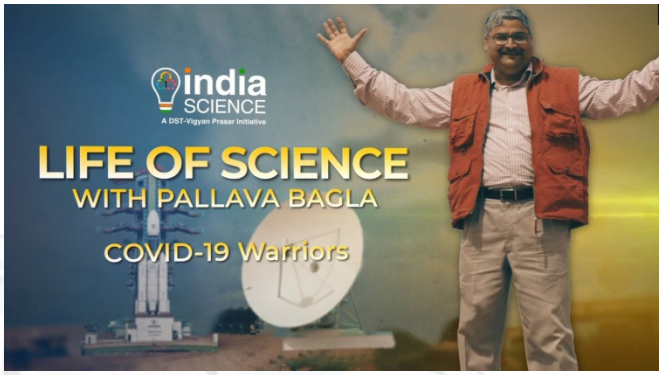
National Institute of Science Communication and Information Resources (CSIR-NISCAIR) is bringing out a fortnightly newsletter dedicated to the COVID-19 outbreak. The newsletter covers stories and information on various aspects, like research, technology and innovation efforts to fight the pandemic and related awareness and sensitisation information. The last edition has been published on 30th September 2020.

Website Link:
https://www.niscair.res.in/covidbulletin

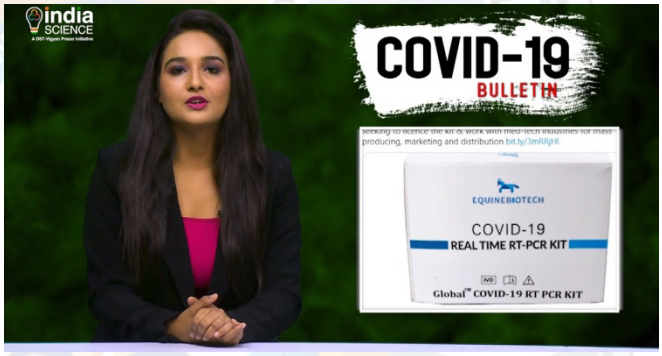
https://www.niscair.res.in/includes/images/covidbulletin/pdf/30september2020/30-september-2020.pdf

Efforts from Vigyan Prasar

India Science Channel



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



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

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

1. Weekly COVID-19 video bulletin: Produced in both Hindi and English on weekly basis from 7 July 2020, COVID-19 bulletin apprises the audience about the latest development happening in S&T in India that are helping in managing and overcoming the challenges thrown up by the pandemic. Vigyan Prasar produced daily COVID-19 Bulletin from 11th April to 06 July 2020. Thereafter, a weekly bulletin is being produced which provides the most important S&T updates for the country related toCOVID-19.

2. COVID-19 Explained - Short films to explain important research finding related to COVID-19 in layman's lingo produced on weekly basis. The subjects chosen for these short films cater to the curiosity of common man related to COVID-19.
3. Facebook live sessions on interviews of various stakeholders and media with DST Secretary.
4. Facebook and India Science live sessions on interviews of various resources person on COVID-19.

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India Science, Technology and Innovation (ISTI) Web Portal

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

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

The web portal provides all information related to COVID-19, its presentation of symptoms, transmission modes and mechanisms, and various models of protection of individuals, healthcare professionals and prevention from spreading to the community. The reasons, usefulness, and impact of social distancing have been communicated in an easy-to-understand manner.

The Research and Development efforts made at Ministry level and various funding organisations are enumerated here on as-and-when-available basis. The innumerable infographics have been provided here are sourced from various organisations for efficient delivery of the information and targeting the common people as the largest stakeholder. The frequently asked questions and myth busters are also answered here.

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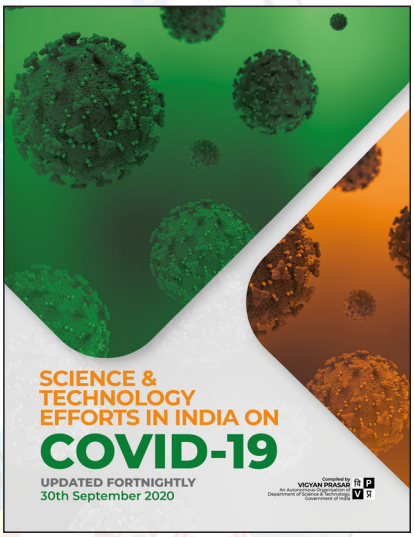
http://indiascienceandtechnology.gov.in/covid-19-the-pandemic

Fortnightly Publication of e-Newsletter on COVID-19

For the benefit of its stakeholders and target audience, Vigyan Prasar is bringing out a fortnightly e-Newsletter on the most relevant initiatives and efforts taken by Government of India through its various Science Ministries, Departments, and Funding Organisations. These organisations are continuously striving for combating the outbreak of COVID-19. These research-driven and technology-based interventions have been initiated to combat the outburst of the pandemic.



The e-Newsletter aims to 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 and making the nation Aatmanirbhar.

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Website link:
https://vigyanprasar.gov.in/covid19-newsletters/
http://www.indiascienceandtechnology.gov.in/covid-19-the-pandemic/newsletter-archive

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