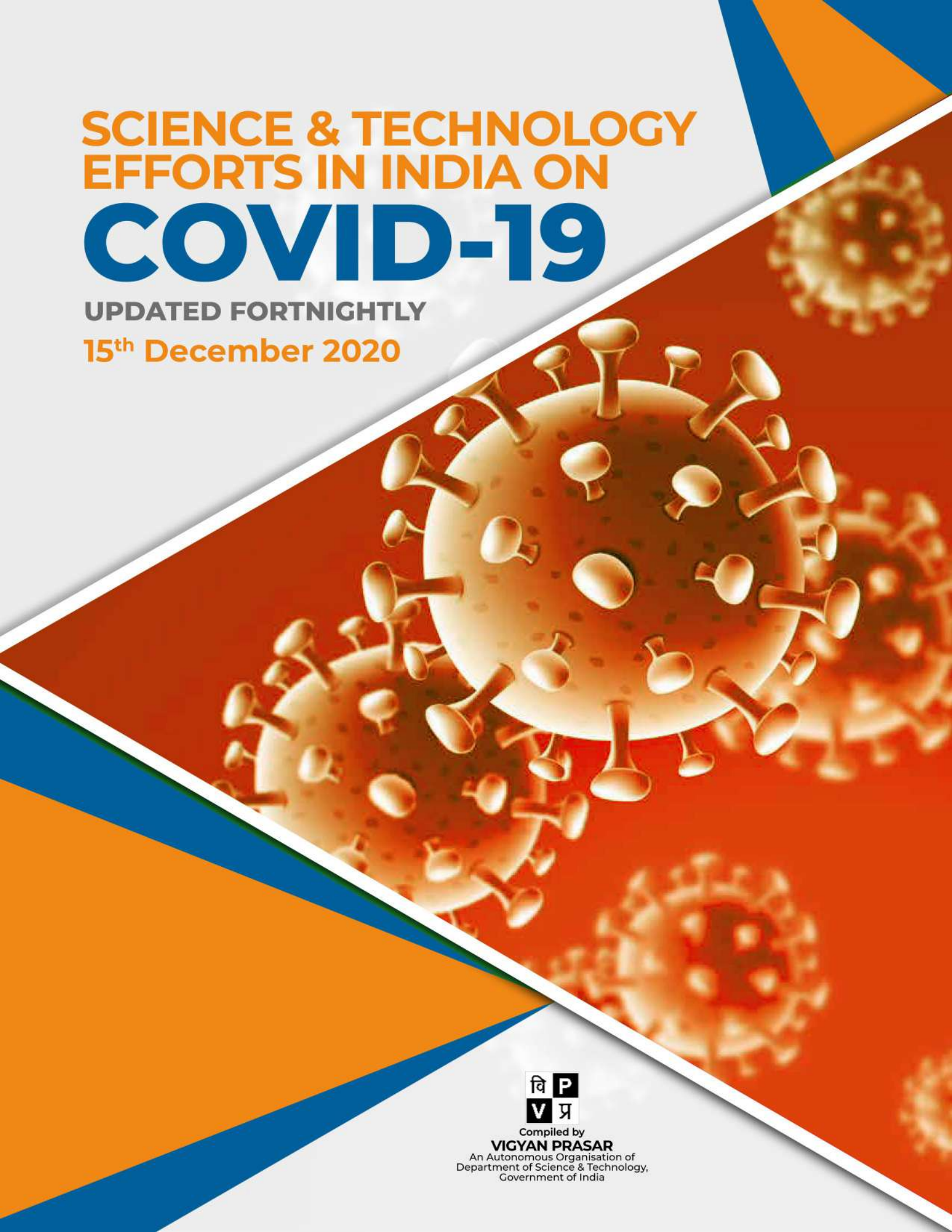
SCIENCE & TECHNOLOGY EFFORTS IN INDIA ON COVID-19

UPDATED FORTNIGHTLY

15th December 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

15 Dec 2020

Government launches Mission COVID Suraksha to accelerate Indian COVID-19 Vaccine Development

29th November 2020, New Delhi

The Government of India has announced the third stimulus package of Rs. 900 Crore for the Mission COVID Suraksha- The Indian COVID-19 Vaccine Development Mission. This grant will be provided to the Department of Biotechnology (DBT) for Research & Development of Indian COVID-19 vaccines.

The COVID-19 Vaccine development Mission with end-to-end focus from preclinical development through clinical development and manufacturing and regulatory facilitation for deployment would consolidate all available and funded resources towards an accelerated product development. This will help accelerate development of approximately 5-6 vaccine candidates and ensure that these are brought closer to licensure and introduction in market for consideration of regulatory authorities for introduction in public health systems to combat further spread of COVID-19 infection.

The important objectives of the fund will be accelerating pre-clinical and clinical development; licensure of COVID-19 vaccine candidates that are currently in clinical stages or ready to enter clinical stage of development, establishing clinical trial sites, and strengthening the existing immunoassay laboratories, central laboratories and suitable facilities for animal studies, production facilities and other testing facilities to support COVID-19 vaccine development. The other important objective will be supporting development of common harmonized protocols, trainings, data management systems, regulatory submissions, internal and external quality management systems and accreditations. Capabilities for process development, cell line development and manufacturing of GMP batches for animal toxicology studies and clinical trials will also be supported under the Mission. A key element will be development of suitable

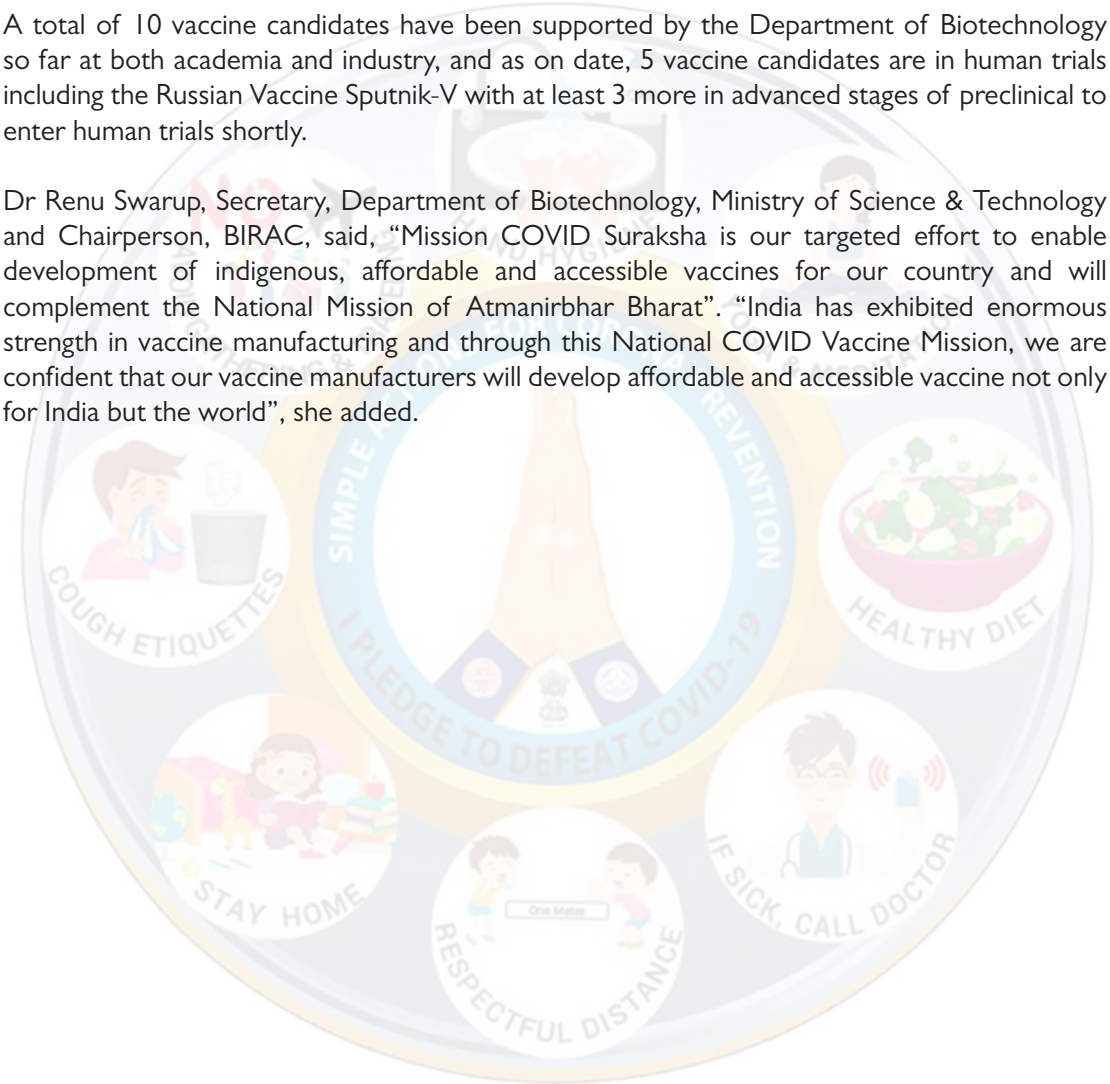
Target Product Profile so that vaccines being introduced through the mission have preferred characteristics applicable for India.

Led by Department of Biotechnology and implemented by a dedicated Mission Implementation Unit at Biotechnology Industry Research Assistance Council (BIRAC), the existing activities under National Bio Pharma Mission (NBM) and Ind-CEPI Mission will provide complementary strengths to this Mission.

Phase-I of the COVID Suraksha Mission has been allotted Rs. 900 Crore for a period of 12 months.

A total of 10 vaccine candidates have been supported by the Department of Biotechnology so far at both academia and industry, and as on date, 5 vaccine candidates are in human trials including the Russian Vaccine Sputnik-V with at least 3 more in advanced stages of preclinical to enter human trials shortly.

Dr Renu Swarup, Secretary, Department of Biotechnology, Ministry of Science & Technology and Chairperson, BIRAC, said, “Mission COVID Suraksha is our targeted effort to enable development of indigenous, affordable and accessible vaccines for our country and will complement the National Mission of Atmanirbhar Bharat”. “India has exhibited enormous strength in vaccine manufacturing and through this National COVID Vaccine Mission, we are confident that our vaccine manufacturers will develop affordable and accessible vaccine not only for India but the world”, she added.



PM interacts with three teams working on developing & manufacturing COVID-19 vaccine

30th November 2020

The Prime Minister had virtual meetings with 3 teams working on developing and manufacturing vaccine for COVID-19. These teams were from Gennova Biopharmaceuticals Ltd Pune, Biological E Ltd Hyderabad and Dr. Reddy's Laboratories Ltd Hyderabad.

The PM appreciated the efforts being taken by the scientists in these companies to come out with a vaccine solution to tackle COVID-19. The potential of various platforms for vaccine development was also discussed.

PM also asked the companies to come out with their suggestions and ideas regarding the regulatory processes and related matters. He also suggested that they should take extra efforts to inform the general public in simple language about the vaccine and related matters such as its efficacy etc. Matters relating to logistics, transport, cold chain etc. with respect to delivering the vaccines were also discussed. All the vaccine candidates discussed are at different stages of trials and detailed data and results are expected early next year onwards.

The PM advised all the departments concerned to engage with the manufacturers and seek to resolve matters so that the efforts by these companies bear fruit in order to serve the needs of the country and the entire world.

Multilateral cooperation is the key to overcoming global challenges such as COVID-19: Dr Harsh Vardhan

24th November 2020, New Delhi

"Our premier institution – the Indian Council of Medical Research (ICMR) - is involved in the trial of COVID-19 vaccines' executions. India is also hosting clinical trials for all the major vaccine contenders. About 30 vaccines are in different stages of development in India. Two of them are in the most advanced stage of development - COVAXIN developed through ICMR-Bharat Biotech collaboration and COVISHIELD from the Serum Institute of India. The Institute, world's largest vaccine manufacturer, is conducting trials for the vaccine developed by Oxford University. Both are in Phase-III clinical trial stage. One of our pharma giants, Dr. Reddy's Laboratories, will distribute the Russian vaccine in India after conducting final-stage human trials and receiving regulatory approval". Dr. Harsh Vardhan, Minister for Health and Family Welfare, Science & Technology and Earth Sciences said this in his inaugural speech at the First Virtual SCO Young Scientist Conclave, held virtually on 24 November. He said, "The broad aim of this conclave is to bring brightest young minds from SCO (Shanghai Cooperation Organization) on a common platform to harness their knowledge for addressing common societal challenges through research and innovation".

Dr Harsh Vardhan said, "In response to COVID-19, India has put to use its significant scientific calibre. From the development of indigenous vaccines, novel point-of-care diagnostics and therapeutic formulations based on traditional knowledge, to establishing research resources, Indian R&D entities, both public and private, have been working relentlessly to develop effective interventions for combating the pandemic". "With the help of Government support, more than 100 startups have provided innovative products and solutions to tackle COVID-19," he pointed out.

The Minister extended “a special request to the young scientists of SCO” that for the welfare of the world, for human welfare, “they should come forward and join hands for developing solutions for our common societal challenges including current pandemic of Corona”. Saying that “The COVID-19 pandemic is a test”, he emphasised, “It demonstrated that multilateral cooperation is the key to overcoming such global challenges.”

Dr Harsh Vardhan informed that Indian Government had announced a US Dollars 12 Crore grant for COVID-19 vaccine research. “This is being provided for COVID Suraksha Mission (mission for protection from COVID) and is to be used purely for research and development in this field”, he said. Stating that “Innovation is the key driver for enhancing productivity and prosperity”, he told the audience, “India has emerged a hub for start-ups and innovation. Indian youngsters have distinguished themselves due to their futuristic and out-of-the-box thinking.”

He also pointed out, “To give young talent opportunities and leadership in challenging areas of science, India has established five specialised research laboratories. Each laboratory deals with a focussed area of science - artificial intelligence, quantum technologies, cognitive technologies, asymmetric technologies and smart materials”. “As per the norms laid out, everyone, including Director at these laboratories is under 35 years of age”, he said.

Dr Harsh Vardhan recalled that at the recently held SCO heads of States Summit Meeting on 10th November, 2020, India had proposed creating a Special Working Group on Innovation and Start-ups to share our rich experience in the start-up ecosystem. “We have also proposed a Working Group on Traditional Medicine, so that the knowledge of traditional and ancient medicine is spread across SCO countries and the headway in contemporary medicine can complement each other”, the Minister added. “The growth of SCO depends on its success in science, technology and innovation sector. There is a need to transform this landscape”, he emphasised.

The Science & Technology Minister congratulated all the young scientists who have been nominated for this first ever SCO Young Scientists Conclave, hosted by India and expressed his thanks to "My own organizations Department of Science and Technology and Indian Institute of Chemical Technology and Ministry of External Affairs for hosting this Conclave despite the challenges and obstacles posed by the COVID-19 pandemic." He underlined, "The motto for the young scientists should be to Innovate, Patent, Produce and Prosper. These four steps will lead our countries towards faster development."

Mr. Vladimir Norov, Secretary General, Shanghai Cooperation Organization; Dr S. Chandrasekhar, Director, CSIR-Indian Institute of Chemical Technology, Hyderabad; Mr. Vikas Swarup, Secretary (WEST), Ministry of External Affairs, Government of India; Prof. Ashutosh Sharma, Secretary, Dept. of Science and Technology, Government of India; Mr. Sanjeev Kumar Varshney; Head, International Cooperation Division, DST; nominated young scientist from SCO Member states; Senior experts/mentors from SCO Member states; representatives from SCO member states scientific ministries; India's Heads of Missions/Ambassadors, and Science Counsellor in SCO Countries were among the dignitaries who joined the event virtually.

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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-newsletter

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SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

DEPARTMENT OF SCIENCE AND TECHNOLOGY (DST)

Experts discuss how STIP 2020 can help the country become future-ready & face situations like COVID-19

Dr V.K. Saraswat, Member, Niti Aayog highlighted how COVID-19 created opportunities and will have profound long-term consequences while Prof. Ashutosh Sharma, Secretary, Department of Science & Technology (DST), underlined how the new Science, Technology and Innovation Policy (STIP) 2020 would make us future-ready to face such situations, at a webinar.

COVID-19 has hugely impacted the world, but it has also shown us the way forward, Dr Saraswat said at the webinar on DST Golden Jubilee Discourse Series - On the other side of the Pandemic - organised by National Council for Science & Technology Communication and Vigyan Prasar.

Website link:
https://dst.gov.in/experts-discuss-how-stip-2020-can-help-country-become-future-ready-face-situations-covid-19

Indian economy to bounce back soon from effects of COVID-19: NITI Aayog Vice Chairman

At a webinar organized to celebrate 50 years of the DST, Vice-Chairman, NITI Aayog, Dr Rajiv Kumar emphasised that the Indian economy would be among the top economies in the world in the next few years using science, technology, and innovation in all sectors, bouncing back soon after the effects of COVID-19.

"Steps and reforms have been taken by the Government in all the sectors, like agriculture, modern medicine, traditional medicine, New Education Policy, Small & Medium Enterprises, labour sector and so on, to target being among the world's top three economies possible," he said at the webinar on DST Golden Jubilee Discourse Series - On the other side of the Pandemic - organised by National Council for Science & Technology Communication and Vigyan Prasar.

Website link:
https://dst.gov.in/indian-economy-bounce-back-soon-effects-covid-19-niti-aayog-vice-chairman

BY

DEPARTMENT OF BIOTECHNOLOGY (DBT)

DBT-IBSD COVID-19 testing laboratory tests 2,637 samples

The COVID-19 testing laboratory set up jointly by DBT-Institute of Bioresources and Sustainable Development (DBT-IBSD) and Jawaharlal Nehru Institute of Medical Sciences (JNIMS) at Imphal, Manipur, which was accorded approval by ICMR on July 11, 2020, has initiated independent testing and is reporting directly to ICMR.

The total number of samples tested so far is 2,637. IBSD is taking care of two COVID-19 testing centres - Kangpokpi and Pherzawl districts of Manipur.

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

Website link:
https://ibsd.gov.in/

DBT-IBSD study identifies a potential bio-molecule to prevent COVID-19

Traditional fermented foods where lactic acid bacteria are present have become widely popular because of their diverse benefits on human health. The presence of beneficial microorganisms and their bioactive metabolites can have a positive impact on health through different mechanisms. These benefits include antimicrobial, antioxidant, anticancer, antihypertensive, immunomodulatory, and many more. Some of these benefits are due to bioactive peptides produced during fermentation.

A study by researchers from DBT-Institute of Bioresources and Sustainable Development (DBT-IBSD)'s regional centre at Sikkim led to the identification of a potential bioactive peptide that can inhibit key receptors of SARS-CoV-2. They were studying peptides from cheese produced from soya milk using a lactic acid bacterium called Lactobacillus delbrueckii WS4. The bacterium was isolated from chhurpi, a traditional fermented milk product popularly consumed in Sikkim Himalayan region.

The scientists screened more than 1,400 peptides formed during soy milk fermentation for their binding affinity to two major drug targets of SARS-CoV-2: Spike glycoprotein (S1) and Main protease (3CLpro). One peptide having amino acid sequence KFVPKQPNMIL was identified to be potential in interacting with the critical S1-receptor-binding domain (RBD) as well as the active site amino acids of 3CLpro. The peptide was also shown to have considerable affinity towards the RBD and 3CLpro of other coronaviruses such as SARS-CoV, MERS-CoV, and HCoV-HKU1. The findings suggest that the soy cheese produced using Lb. delbrueckii WS4 could be used as a prophylactic against SARS-CoV-2 and other related viral infections.

North East India boasts of a diverse food culture comprising fermented and non-fermented ethnic foods. Such foods can be explored for the discovery and evaluation of potential bioactive peptides towards the development of peptide-based therapeutics to combat emerging infectious diseases. Application of specific strains from traditional fermented foods can lead to the development of functional foods with specific bioactive peptides. The researchers have published the outcome of their work in "*Frontiers in Molecular Biosciences*".

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

Website link:
https://www.frontiersin.org/articles/10.3389/fmolb.2020.601753/abstract
https://ibsd.gov.in/

inStem's campaign for promoting #Unite2FightCorona

In the continuing efforts for the #Unite2FightCorona campaign run by the DBT on social media, it's Institute for Stem Cell Science & Regenerative Medicine (DBT-inStem), Bengaluru, has been proactively promoting the hashtag #Unite2FightCorona through various in-house contents – posters, artwork, photographs and videos; thus emphasizing on the three basic rules: #WearAMask, #HandHygiene, and #PhysicalDistancing as a precautions to protect from SARS-CoV-2 infection.

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Website link:
https://instem.res.in/

Popular science talk on second wave of the COVID-19 pandemic and the emerging threat of AMR

In the wake of World Antimicrobial Awareness Week (WAAW), Dr Arvind Sahu and Dr Rajesh Karyakarte discussed about the second wave of the COVID-19 pandemic vis-a-vis the emerging threat of antimicrobial resistance (AMR) at a webinar by 'Bhavatal', an initiative in Pune that is involved in science popularization through the local language.

Webinar in Marathi to create awareness about the second wave of the COVID-19 pandemic and the emerging threat of antimicrobial resistance

Dr Sahu is a scientist at the National Centre for Cell Science (DBT-NCCS), Pune. An expert in the field of complement biology, he studies how the immune system interacts with and tackles infections such as those caused by viruses. Dr Rajesh Karyakarte is the Head of the Department of Microbiology at the B. J. Medical College, Pune. This webinar was conducted in Marathi and was held on 27th November 2020.

The fear of the world being engulfed by a second wave of COVID-19 is among the most discussed topics, of late. However, another threat that has been looming large over us, but has not received the attention that it urgently deserves, is AMR. AMR occurs when disease-causing microorganisms like bacteria, fungi and other parasites that could earlier be inhibited or killed by antimicrobial drugs, develop resistance following exposure to these drugs over time and eventually become immune to them.

The COVID-19 pandemic crossing paths with AMR could present a bigger challenge because any co-infection with antibiotic-resistant bacteria might worsen the prognosis of COVID-19 patients. Conversely, the increased use of antimicrobials to manage COVID-19 could potentially accelerate the development of AMR. AMR is the key reason behind the increasing risk of life-threatening infections. Therefore, the mechanisms leading to the emergence of such drug resistance is a subject of intense research.

While clinicians and scientists recognize the gravity of this situation, there is widespread ignorance about AMR among other stakeholders, including the general public. This is especially disturbing since the latter could inadvertently contribute to AMR out of sheer ignorance. Therefore, the WHO has been annually holding the World Antimicrobial Awareness Week (WAAW) over the past 5 years to increase awareness about this global health threat and to encourage best practices among the general public, health workers and policy makers to prevent the spread of AMR. WAAW was held from 18-24 November this year.

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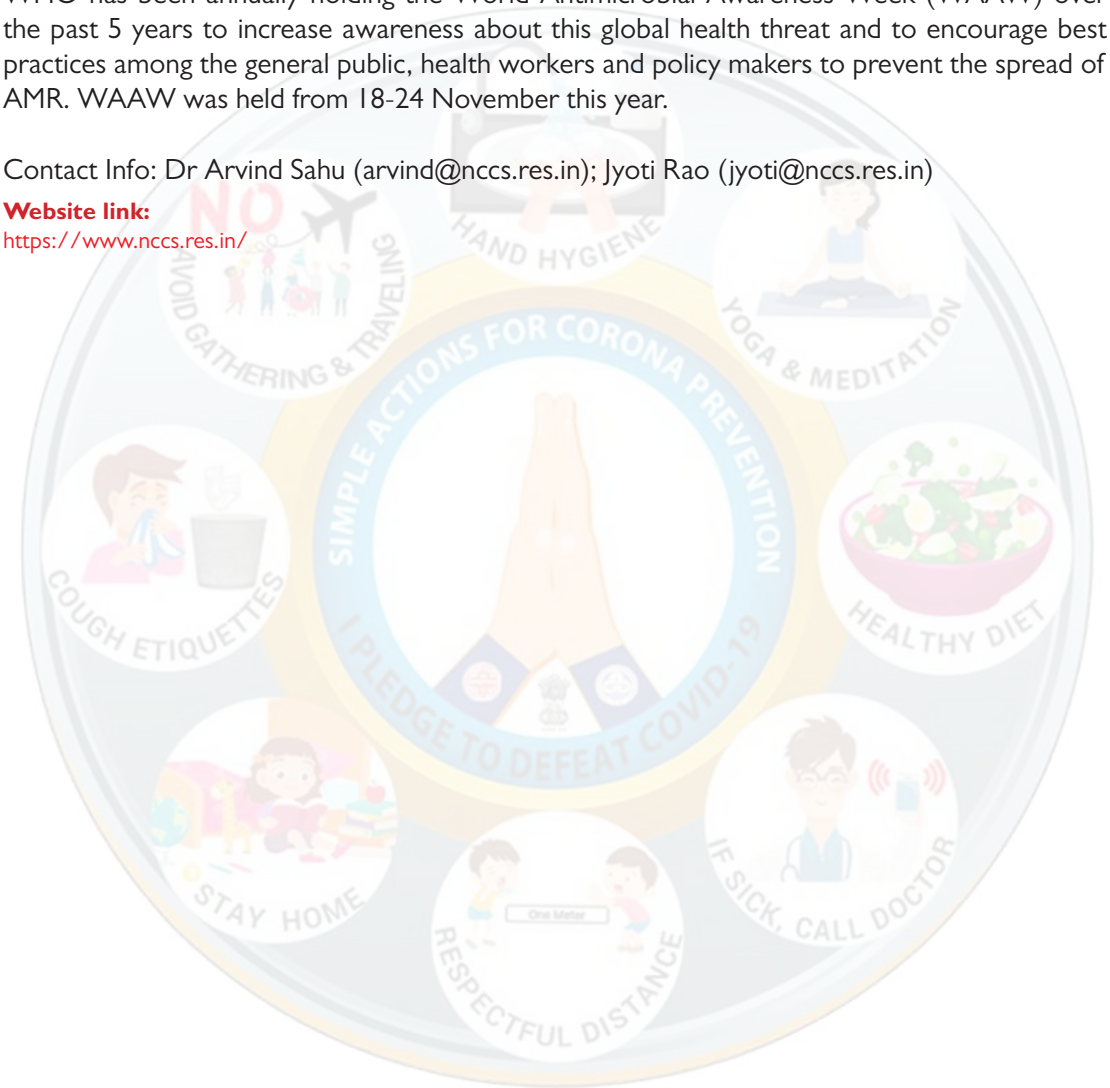


SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH (CSIR)

CSIR chief slams 'faulty' Chinese report on COVID-19 origin

According to South China Morning Post, a paper from researchers in China, proposed that the first transmission of SARS-CoV-2 may have taken place on the Indian subcontinent. The report was based on research into strains of the virus provided by 17 countries and regions, and claimed to trace the earliest outbreak to India or Bangladesh.

Slamming a recent Chinese research report which claimed that COVID-19 had origins in India or Bangladesh, CSIR Director-General Dr Shekhar C Mande on December 1, 2020said that the study was shoddily done and was riddled with errors.

"There is a paper which is under consideration of publication in Lancet. It has not been peer-reviewed yet, so we can't say what the peer review system will do to it. But it claims that the origin of the SARS-CoV-2 virus is in India, and having read the paper myself fully and thoroughly understood what it says, the study is very shoddily done. The analysis was very badly done, and I don't think it will stand the scrutiny of a peer review system," Dr Mande told ANI.

Dr Mande further said that the Chinese reported a high monkey-human interaction in India, which had nothing to do with the virus.

"The combination of methodologies that they have used to show that the virus originates in India or Bangladesh is quite faulty, it is not right. For example, they have taken sequences from one database. That database has only selective sequences that have been submitted. So it is not a random sample of sequence," he said.

He further informed that there were too many loopholes in the study and therefore its veracity could not be confirmed, adding that it can be comfortably said that the study is wrong. During a media briefing on November 30, World Health Organisation (WHO) Director-General Tedros Adhanom Ghebreyesus said that some countries are politicising the origin of the virus.

"We're doing everything to make sure that we know the origin. Some have been politicising this. Our position is very clear that we'll start the study from Wuhan, know what has happened there and based on findings, to explore if there're other avenues," said Ghebreyesus.

Commenting on Ghebreyesus' statement, Dr Mande said, "WHO goes very rationally about finding these things. We don't need to bring any political angle to it, what we want is to go to the bottom of the truth and there is science behind it. Scientifically, we explore every question and try to see where the origin of the virus is, and today the consensus is that the origin of the virus is in Wuhan province of China. So there is a general consensus in the world and it is what we would like to trust," he further said.

Taking to Twitter, Dr Mande shared the link of the study saying, "Plenty of glaring errors in the study. I've pointed out in a series of my tweets that the study design, conduct and analysis are faulty. Hopefully the scientific world will reject the hypothesis."

The deadly virus which emerged in China's Wuhan province has now infected more than 63 million people worldwide and claimed the lives of more than 1.4 million.

Website Link:
https://www.csir.res.in/slider/csir-chief-slams-%E2%80%98faulty%E2%80%99-chinese-report-covid-19-origin

CSIR-CCMB and Apollo Hospitals join hands for development of rapid, cost-effective kits

A rapid, cost-effective kit has been developed by CSIR-CCMB in collaboration with Apollo Hospitals that will focus on scaling up manufacturing and commercialization of the tests jointly. The rapid, safe and cost-effective DArRT-PCR tests will be available nationally through the Apollo Hospitals network.

In yet another endeavour to bring down the cost of COVID-19 testing, Hyderabad-based CSIR-Centre for Cellular & Molecular Biology (CCMB) and the Apollo Hospitals Enterprise on December 10 announced a collaboration for joint manufacturing and commercialization of an innovative dry swab test, Direct Amplification rapid RT-PCR (DArRT-PCR) - for SARS-CoV-2 detection.

The DArRT-PCR test allows for rapid, safer and more cost-effective SARS-COV-2 testing. The sample collection centres can send dry nasal or oropharyngeal swabs to testing centres with no need for the imported and expensive Viral Transport Medium. The biological sample can be directly isolated from the patient swabs, and test can be conducted using a one-step protocol.

Website link:
https://www.csir.res.in/slider/csir-ccmb-and-apollo-hospitals-join-hands-development-rapid-cost-effective-kits

CSIR-CCMB Successfully tested REME- PHI technology capable of combating the SARS-CoV-2 virus

In the battle against the on-going pandemic, ZECO Aircon Limited, (a leading Indian manufacturer of air management systems and the exclusive distributor of RGF in India) in collaboration with RGF Environmental Group, a US-based environmental design and manufacturing company, has successfully tested it's REME along with PHI technology with CCMB-CSIR laboratory (as per ICMR directives), in a study conducted that revealed the efficiency of REME-HALO with PHI cell on SARS-CoV-2 virus.

This technology was found to be capable of neutralizing active SARS-CoV-2 virus by 97.48% at 15 minutes of activation of REME-PHI Cell on surfaces. REME with PHI is an "active" solution that neutralizes SARS-CoV-2 within the occupied space, eliminating the need for virus particles to travel through the HVAC system air filters or passive UV air purification system.

The test was performed in short intervals of 15 minutes each and the same viral reduction was observed by the laboratory for up to 60 minutes. The experiment was completed in duplicates and the values were averaged to calculate percentage viral reduction.

In September 2020, RGF had performed another test, at the innovative Bioanalysis Laboratories in Cypress, California, US, which looked at neutralizing the virus within the occupied space in the air and on the surface.

Commencing in March 2020, the study was overseen by Dr James Marsden, Executive Director of Science and technology at RGF. "The study shows the REME-HALO to be effective in combating the SARS-CoV-2 virus and emerges as a valuable solution to immediately improve the indoor air quality of residential and commercial spaces and protect occupants against exposure to the SARS-CoV-2 virus." The studies are still underway.

The test procedure used the SARS-CoV-2 virus inside a large chamber (1280 cu.ft) representing a real-world air-conditioned office or home. The virus was nebulized into the space simulating a sneeze or cough from an infected person. With the REME-HALO operating inside the chamber the virus was reduced on contact, resulting in a 99.9% reduction of the virus within the simulated real-world space, from air as well as surfaces.

"From public places, to residential and commercial spaces, REME-PHI is a tested and proven solution that neutralizes the virus from air and surfaces, which is required to get India back to work," said Kartik Singhal, Director, ZECO Aircon Ltd., India.

Website Link:

https://www.csir.res.in/sites/default/files/1%20to%205%20December%202020%20news%20bulletin.pdf

CSIR-CFTRI signs MOU with Clevergene, Bengaluru

As part of various initiatives towards mitigating COVID-19, CSIR-Central Food Technological Research Institute signed an MoU recently with Clevergene, a Bengaluru-based company for sequencing of the SARS-CoV-2 genome. It is expected that the study would provide insights into virus genome changes (mutations), evolution, epidemiology, and provide an understanding of the spatial and temporal information on infection dynamics of the SARS-CoV-2.

Further, under the MoU, the development of novel diagnostics and vaccines for COVID-19 is envisaged. CSIR-CFTRI has also established a COVID Testing Centre in Mysuru, and on an average, more than 1000 samples are tested in a day. Further, CFTRI is also working on the development of novel dipstick and aptamer-based diagnostics in collaboration with private parties. Clevergene is a tech company offering genomics services for contract research and genetic diagnostics.

The MoU was exchanged recently between Dr B. Manohar, Chief Scientist and Adviser (M&A), and Mr. Tony Jose, Co-Founder, and CEO, Clevergene, in a brief function held in the Institute. Dr Prakash M. Halami, Chief Scientist and Nodal Officer and Dr P. V. Ravindra, In-charge Coordinator, CFTRI-COVID Testing Laboratory were present.

Website Link:

https://www.thehindu.com/sci-tech/science/cftri-to-sequence-sars-cov-2-genome/article33282295.ece

CSIR to decide on human clinical trials of Molnupiravir – a drug that blocks SARS-CoV-2 in 24 hours

A decision on conducting human clinical trials with a new promising antiviral drug, Molnupiravir, will be taken at the strategic group meeting of the CSIR. A study published in Nature Microbiology shows how this repurposed drug suppresses SARS-CoV-2 transmission within 24 hours.

Dr Shekhar Mande, Director General CSIR told that this is an exciting development. "Researchers in the US have shown how the transmission is blocked in ferrets. It is like any other anti-flu drug and was on our list of drugs to go into clinical trials. We will take it up soon. A meeting will be held this evening (December 7) to decide," Dr Mande said.

The study published by researchers at the Institute for Biomedical Sciences, Georgia State University, claims that a new antiviral drug has been designed which successfully suppresses the SARS-CoV-2 virus and inhibits transmission within 24 hours. According to the researchers, this is the first oral antiviral drug to quickly block SARS-CoV-2.

Molnupiravir is being developed by the biotechnology firm Ridgeback Biotherapeutics in collaboration with pharmaceutical firm Merck. By taking the drug orally, treatment can be initiated early for preventing the condition of the patient from becoming severe.

Dr Mande explained that the drug is basically an inhibitor of RNA in cells and does not allow it to make copies of the virus. “Other drugs also do something similar but it is exciting to see that transmission being blocked in ferrets.”

There is a basket of drugs which are under consideration. There are several on the priority list — for instance, the drug umifenovir which is mainly used for treatment of influenza has potential to be used against COVID-19 and is undergoing clinical trials, Dr Mande said.

Website Link:

https://indianexpress.com/article/india/molnupiravir-human-clinical-trials-covid-19-7094903/

BY

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

ICMR issues advisory on use of Dry Swab RNA Extraction Free RTPCR Method

CSIR-CCMB Hyderabad has developed RNA extraction-free dry swab method for RTPCR-based detection of SARS-CoV-2. The method will save time and reduce cost as compared to standard PCR test using Viral Transport Medium (VTM) and RNA extraction.

This method involves collection of a VTM-less dry oropharyngeal/nasopharyngeal swab from suspect SARS-CoV-2 patients. The swab is then transported to the lab wherein Tris-EDTA - Proteinase K buffer is added, and the sample is incubated for 30 minutes at room temperature. The sample is then subjected to heat inactivation at 98oC for 6 minutes. The extract is then used for RTPCR.

Considering its lesser cost and quick turn-around, the dry swab variant method can be used as a screening tool only in settings where automated RNA extraction is not available.

Website Link:
https://www.icmr.gov.in/pdf/covid/techdoc/Advisory_Dry_Swab_RNAExtraction_26112020.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.

Website Link:
https://www.icmr.gov.in/pdf/tender/Revised_EOI_for_Ag_kit_validation_02122020.pdf

MoHFW releases SOP on Preventive Measures in markets to contain spread of COVID-19

The Ministry of Health and Family Welfare (MoHFW), in recognition of the fact that marketplaces are visited by large number of people for their daily needs, shopping, entertainment, and food, has designed a protocol to contain the spread of COVID-19. Amid COVID-19 pandemic, with gradual opening of economic activities, markets are witnessing high footfalls. Such large

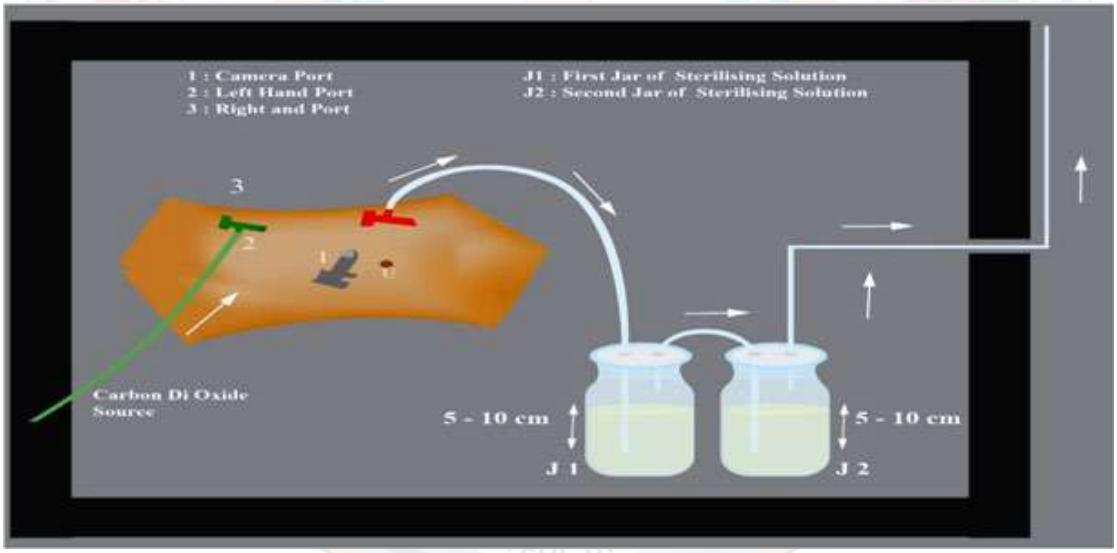
gatherings, without observance of COVID-19-appropriate behaviour have the potential to spread Coronavirus disease. Various generic precautionary measures to be adopted in addition to specific measures to be ensured at marketplaces to prevent spread of COVID-19. These guidelines shall be applicable to both retail and wholesale markets. Some of the bigger markets may also have malls/hyper/supermarkets in them. Similarly, for offices, religious places/places of worship, training institutes, yoga institutes and gymnasiums, cinema halls/theatres and any other specific activities which are part of these markets or are situated within the market complex, specific guidelines issued from time to time by the Ministry shall be applicable. Market places in containment zones shall remain closed. Only those outside containment zones will be allowed to open-up.

Website Link:
https://www.mohfw.gov.in/pdf/4SoPstobefollowedinShoppingMalls.pdf
https://www.pib.gov.in/PressReleasePage.aspx?PRID=1677644

SCIENTIFIC AND ACADEMIC INSTITUTIONS

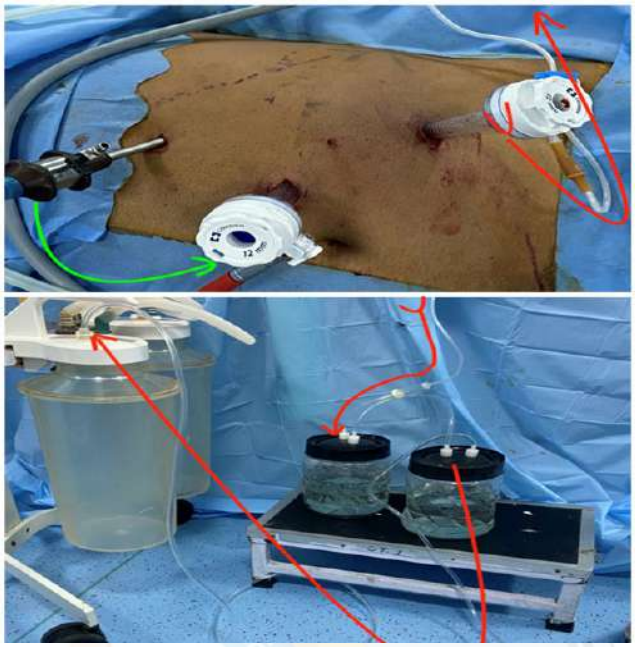
Simple device to keep healthcare workers safe during laparoscopic surgeries in COVID-19 pandemic

In the time of COVID-19 pandemic, various national and international surgical societies have advised against performing elective surgical procedures. Current focus of surgical management is on emergencies and oncological surgeries. There is a concern that body fluid may harbour Coronavirus, hence laparoscopic plume (smoke + aerosol) may contaminate the operation theatre environment and personnel in operation theatre are at risk of acquiring this virus. With proper management of the surgical plume, the concern of spread of virus by aerosol can be alleviated and all the benefits of laparoscopy can be extended to our patient in need of a surgery that can't be delayed.



As rightly said by our honourable Prime Minister, this pandemic time should not be wasted; rather, we need to utilise it in appropriate way, to help needy people. In crux, we need to convert this disaster into an opportunity. With this motivation, Iscon Surgicals, Jodhpur has tried to add safety measure with a small device to alleviate risk of acquiring coronavirus to healthcare workers. They have developed a simple device that and can be made with readily available material. In the device, tubing (intravenous set) is connected to a laparoscopic port for controlled release of pneumoperitoneum into two successive sealed jars containing a virucidal agent like sodium hypochlorite. The exit tube from the second jar is to connect with suction tubing or closed tubing for proper disposal. Such a system, in conjunction with general measures like having minimum number of personnel in operating room, use of PPE (personal protective

equipment) by all personnel, tight port placement to reduce leak at port site, keeping insufflation pressures at minimum, surgery in expert hands to reduce operative time, minimal use of energy devices at lowest possible settings, will definitely make laparoscopy safe and patients can avail all the benefits of a minimally invasive procedure.



The device was manufactured under the leadership of Mr. N.K. Jain.

This was published in prestigious journal Indian J Surg.[Choudhary GR, Ranjan DK. Simple Device Design for Plume Management after Pneumoperitoneum in Laparoscopy in COVID-19 Outbreak (published online ahead of print, 2020 Jun 25)]. [Indian J Surg. 2020;1-2. doi:10.1007/s12262-020-02477-4]

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https://www.aiimsjodhpur.edu.in/

IIT Madras becomes a fount of innovation to take on COVID-19

IIT Madras has done various innovations to tackle COVID-19 situation. In the last six months, their researchers' vigour and passion led to some path-breaking COVID-related innovations. Three such initiatives that had a big impact during the pandemic times is now the hallmark of IIT Madras. The first one is Helyxon, a healthcare start-up based out of the IIT Madras Research Park, developed and deployed remote patient monitoring solutions for COVID-19. Second is IIT Madras-incubated start-up - Modulus Housing - a portable hospital unit that can be installed anywhere within two hours by four people. Lastly, researchers at the institute developed nano-coated filters for healthcare workers treating COVID-19 patients. Like these, many other innovations have also been done by the institutes to overcome this situation.

Website Link:
https://www.iitm.ac.in/happenings/press-releases-and-coverages/iit-madras-becomes-fount-innovation-take-covid-19

SCIENCE OUTREACH & POPULARISATION EFFORTS

Since the outbreak of the 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

Mitigation & Management of COVID-19 Practices from India's States & Union Territories

The compendium details information about various practices and initiatives implemented by States, Districts and Cities in India for containing and managing the COVID-19 outbreak. It is important to note that these initiatives are not being termed as 'best practices' by NITI Aayog as that would require a separate and comprehensive evaluation exercise as well as longer-term follow-up. Moreover, in a rapidly evolving situation, it can be challenging to consistently and fully correlate practices with outcomes - a practice might yield good results for a certain period of time but cease to do so thereafter.

All case studies/reports/papers highlighting practices/interventions/models implemented by State or Sub-State Governments on their own or in collaboration with civil society, private sector, volunteers were included in this review. Case studies/reports/papers focusing on interventions implemented by civil society organizations, private sector or individuals independent of any partnership with State/Local Governments were excluded from this review.

Practices have been categorized into the following broad themes: public health and clinical response, governance mechanisms, digital health, integrated models as well 10 Report on Mitigation and Management of COVID-19 as welfare of migrants and other vulnerable groups. While governance and technology cut across several themes, they have been included separately to highlight certain practices adopted by States which pertain primarily to putting in place governance mechanisms or leveraging technology for COVID-19 containment and management.

A summary of the relevant Government of India guidelines has been included for the aforementioned categories, wherever applicable. It is important to note that these guidelines are continually revised based on the emerging scenario with respect to the COVID-19 outbreak.

Website Link:
https://niti.gov.in/sites/default/files/2020-11/Report-on-Mitigation-and-Management-of-COVID19.pdf
https://niti.gov.in/report-mitigation-and-management-covid-19-web

'Share your Story' On Appropriate Behaviour During COVID-19

We all know India's coronavirus fight is people-driven. With the view of upcoming festivals and winter season around the corner, we need to constantly make people aware of the various efforts they are taking to protect themselves and the collective efforts they are taking to fight against this virus and help save many lives and to crowdsource behavioural discipline from citizens across the country and recognize the key contributors.

'Share your story' will help us get real-life stories of citizens on how they are protecting themselves and also protecting their friends, relatives and neighbours to fight against the spread of this deadly virus.

The best 5 stories will receive a certificate.

The last date for submission is 31st December 2020.

Website link:
https://www.mygov.in/task/%E2%80%98share-your-story%E2%80%99-appropriate-behavior-during-covid-19/?target=inapp&type=task&nid=298631

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 26th November 2020.

Website link:
https://pib.gov.in/PressReleasePage.aspx?PRID=1680027

Government of India presents regular COVID-19 India factsheet

India's coronavirus cases have crossed 94-lakhs mark, and as on 2nd December 2020, 08:00 AM, stands at 94,99,413 cases out of which 89,32,647 have recovered. The recovery rate stands at 94.03% while the case fatality rate stands at 1.45%, 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-november2020/

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

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

1. Weekly COVID-19 video bulletin: Produced in both Hindi and English 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 to COVID-19 front.
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 this short film caters 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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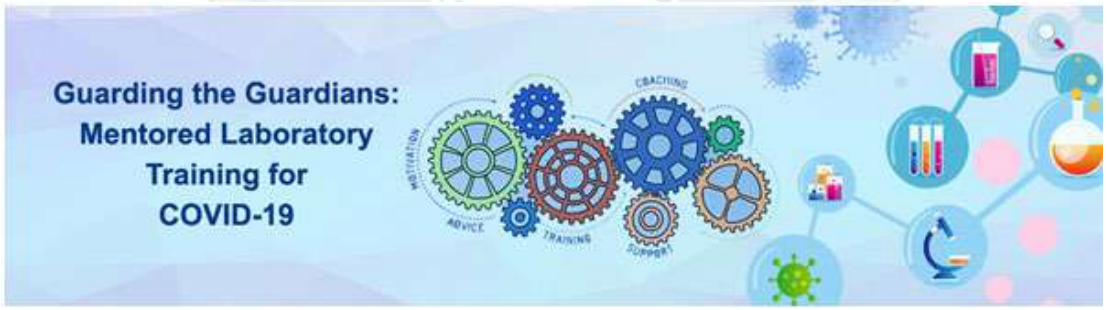
Website Link:
https://www.indiascience.in/

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. Around

2000 stories related to S&T efforts towards mitigating the COVID-19 pandemic have been captured on the portal.

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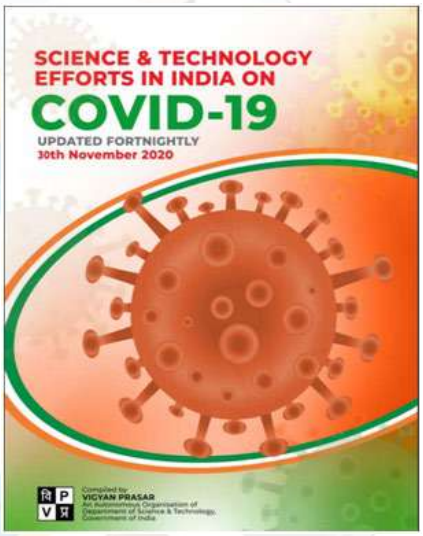
Website link:
http://indiascienceandtechnology.gov.in/covid-19-the-pandemic

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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