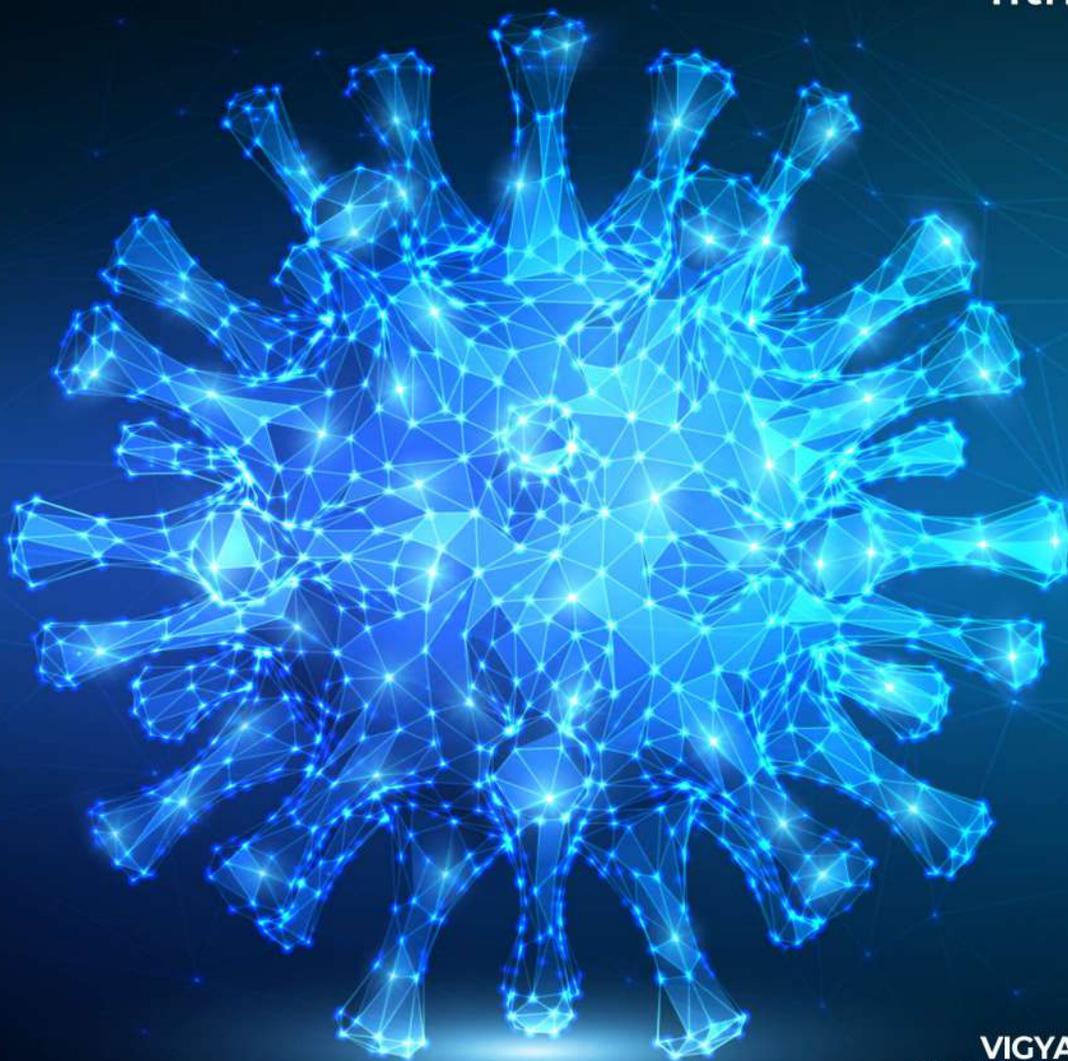




**SCIENCE &  
TECHNOLOGY  
EFFORTS IN INDIA ON  
COVID-19**

**UPDATED WEEKLY**

**11th June 2020**



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





सत्यमेव जयते  
**FOREWORD**

## डॉ हर्ष वर्धन Dr Harsh Vardhan

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

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

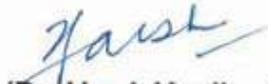
सबका साथ, सबका विकास, सबका विश्वास  
Sabka Saath, Sabka Vikas, Sabka Vishwas

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

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

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

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

  
(Dr. Harsh Vardhan)

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# PREFACE

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

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

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

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

Vigyan Prasar  
New Delhi

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# Dr Harsh Vardhan elected as Chair of Executive Board of WHO

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22<sup>nd</sup> May 2020, New Delhi

The Union Minister of Health & Family Welfare Dr Harsh Vardhan has been elected as Chair of the Executive Board of World Health Organization for the year 2020-21. This took place today during the 147th session of the Executive Board, in a meeting that was virtually held. He has replaced Dr Hiroki Nakatani of Japan.



Accepting the Chair of the Executive Board, Dr Harsh Vardhan paid tribute to the lakhs of people who have lost their lives due to the global COVID-19 pandemic. He requested all dignitaries present on the occasion to give a standing ovation to all the frontline health workers and other COVID Warriors by saluting their dignity, determination and dedication.

“I feel deeply honoured to have the trust and faith of all of you. India, and all my countrymen, too, feel privileged that this honour has been bestowed upon us,” he stated. Acknowledging that this is a great human tragedy and the next two decades may see many such challenges, he stated that “All these challenges demand a shared response, because these are shared threats requiring a shared responsibility to act.” He further added that “while this is the core philosophy of our alliance of member nations that comprise WHO; however, it needs a greater degree of shared idealism of nations.” He said that “The pandemic has made humanity acutely aware of the consequences of ignoring the strengthening and preparedness of our healthcare systems. In such times of global crisis, both risk management and mitigation would require further strengthening of global partnerships to re-energize interest and investment in global public health.”

Dr Harsh Vardhan also shared India’s experience of combating COVID-19. He noted that “We have a mortality of 3 per cent only. In a country of 1.35 billion, there are only 0.1 million cases of COVID-19. The recovery rate is above 40 per cent and the doubling rate is 13 days.”

As the new Chair of the Executive Board of WHO, Dr Harsh Vardhan underlined the need for higher commitments in respect of diseases that have plagued humankind for centuries, collaborations for supplementing each other by pooling of global resources, an aggressive roadmap to curtail deaths from diseases that can be eliminated, a fresh roadmap to address global shortages of medicines and vaccines and the need for reforms.



“I am sure that constant engagement with member states and other stakeholders will reinforce reforms and help accelerate progress towards achieving sustainable development goals and universal health coverage with the most productive, efficient and targeted utilization of resources. I will put myself to work to realise the collective vision of our organisation, to build the collective capacity of all our member nations and also build a heroic collective leadership,” he stated.

Dr Harsh Vardhan stated that WHO believes in the principle that the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition. “We, therefore, commit to work with the Member States; the Organization and the global community of partners for the efficient, effective and responsive discharge of public health obligations,” he added.

Dr Harsh Vardhan, while taking charge as the Chair of the EB, also shared his thoughts on the future health scenario of the world. “I believe that health is central to economic performance and to enhancing human capabilities. However, public health policy must be based and guided on a proper understanding of nature. This is also the underlying principle of the Indian



traditional systems of medicine based on holistic health and wellness, which I have lived and experienced,” he said. He also outlined the policy of India towards ‘Universal Health for All’ through national flagships programmes such as Ayushman Bharat with its twin pillars of Health & Wellness centres (HWCs) and Pradhan Mantri Jan Arogya Yojana (PMJAY), being led by the dynamic and visionary Prime Minister Mr Narendra Modi.

Reminiscing about his long-standing association with WHO, he expressed his gratitude for the strong support of WHO in India’s fight against Polio. “If it had not been for the support and morale boosting by friends in WHO, I would not have achieved what I did. If, today, Polio stands eradicated from India, I must admit, it could never have been possible without the perseverance of WHO,” he stated.



Dr Harsh Vardhan has also been a member of several prestigious committees of WHO like Strategic Advisory Group of Experts (SAGE) and the Global Technical Consultative Group (TCG) on Polio Eradication. He has also served as an Advisor to the WHO.

The Executive Board of WHO is composed of 34 technically qualified members elected for three-year term. The main functions of the Board are to implement the decisions and policies of the Health Assembly and advise and facilitate its work.

This is another feather in the cap of Dr Harsh Vardhan's illustrious career. He earned his graduation and post-graduation in medicine from G.S.V.M. Medical College, Kanpur in 1979 and 1983, respectively. He has been associated with public service since 1993 when he was elected to the Delhi Legislative Assembly. He served his constituency continuously for five terms until he was elected to the 16th Lok Sabha in May, 2014 from Chandni Chowk constituency. From 1993 to 1998, he served as the Minister of Health, Education, Law & Justice & Legislative Affairs for the Govt. of NCT of Delhi. In 1994, as the Delhi Health Minister, he oversaw the successful implementation of the pilot project of the Pulse Polio Programme which involved the mass immunisation of 1.2 million children up to the age of 3 in Delhi, laying the groundwork for a Polio-free India in 2014. He has championed the passing and implementation of the Delhi Prohibition of Smoking and Non-Smokers Health Protection Act, 1997, which was later replicated by several States in the country.

Dr Harsh Vardhan has been the Union Health Minister in 2014 and later took over as the Union Minister Science & Technology and Earth Sciences. He was also Union Minister for Environment, Forest and Climate Change. He was re-elected to the 17<sup>th</sup> Lok Sabha and sworn in on May 30<sup>th</sup>, 2019 as Union Cabinet Minister and was given the portfolios of Health and Family Welfare; Science and Technology and Earth Sciences.

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# Digital Conference on **‘RE-START – Reboot the Economy through Science, Technology and Research Translations’, organised to celebrate the National Technology Day**

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11th May 2020, New Delhi

The Union Minister of Science & Technology, Earth Sciences and Health & Family Welfare, Dr. Harsh Vardhan said on 11 May, 2020 that India’s fight against Covid-19 is moving fast ahead strongly and steadily. He was addressing a Digital Conference, RE-START – ‘Reboot the Economy through Science, Technology and Research Translations’, organised to celebrate the National Technology Day. The Conference was organised by the Technology Development Board (TDB) a statutory body of the Department of Science & Technology (DST) and Confederation of Indian Industry (CII).



While applauding the Ministry of Science & Technology’s response to epidemics like COVID in the country, Dr. Harsh Vardhan emphasized that the S&T response reflects the collaborative spirit of the entire S&T ecosystem. “Indian Government, academia, scientists, start-ups, entrepreneurs and industry have been working relentlessly to find solutions to combat this pandemic. We must appreciate the efforts of our scientists, our entrepreneurs and our institutions working to find quick and deployable solutions for Covid-19. New discoveries, industry partnerships, and enhanced researches have thus been rapidly developed and adopted,” said the Minister.



“Within a short period of time, the nation has been able to mobilize a number of researchers to develop new testing kits, protective equipment, respiratory devices, etc.,” he added.

The minister also apprised the audience about the ‘COVID-19 Task Force’ set up by the Government to map the COVID-19-related technology capabilities. “Our Government has vigorously

supported the 'Make in India' Programme. This has brought in scientific institutions and start-ups to develop the Covid-19 tests, masks, sanitizers, personal protective equipment (PPEs) and ventilators," he further added.

On the theme for the National Technology Day this year, Dr. Harsh Vardhan pointed out, "We need to mitigate the widespread economic impact and prepare for a stronger recovery using self-reliance as the new mantra. Thus, we look towards new opportunities to galvanize growth in the technological and industrial sector."



While delivering his special address, Dr. V K Saraswat, Member, NITI Aayog, pointed out the importance of new-age technologies and medical and manufacturing technologies in boosting the economy as the world adjusts to the new normal.

Principal Scientific Adviser to the Government of India, Professor K. Vijay Raghavan, pointed out how technology can change the way we live our lives and the way we do things in future, particularly so in the post-COVID era. He pointed out that this is an opportunity to gear up for the future that lies ahead, and a better-equipped R&D workforce and ecosystem will prepare India better for future challenges.



DST has stepped into its 50<sup>th</sup> year of existence. DST Secretary Professor Ashutosh Sharma thus underlined the significance of the National Technology Day in view of the challenges faced during these times of COVID-19. He further emphasized that the COVID-19 crisis had led R&D and technology

development to work in various modes. The private-public model has encouraged R&D to greater heights. Plausible translations, prototyping, start-ups, and Industry have seen immense growth. According to him, rebooting the economy requires new age technologies, appropriate national missions, programmes and schemes to get into quick action. He added that wherever readymade solutions are not available, research and development needs to be more profound, relevant, speedy, impactful and strongly connected to industry. The lessons learnt now would continue to assist us in addressing the overarching challenges of the future—sustainable development, climate change, industry 4.0, anti-microbial resistance, etc.

Dr. Saumya Swaminathan, Chief Scientist, World Health Organization, highlighted the steps taken internationally to combat the pandemic and the way forward. Dr. Swaminathan appreciated the way India has tackled the COVID-19 challenge.



DG, CII, Mr. Chandrajit Banerjee; President, CII, Mr. Vikram Kirloskar; and Dr. Neeraj Sharma, Secretary, TDB were also among those participating in the inaugural session.

In this occasion, Dr. Harsh Vardhan also inaugurated a virtual exposition of companies whose technologies have been supported by TDB. Various organizations and companies showcased their products in the exposition through a digital B2B lounge.

The conference has hence brought together Scientists, Technocrats, Government officials, Diplomats, WHO officials and dignitaries from national and international Industry, Research Institutions and Academic Institutions on a single platform to share their insights on the role played by S&T in the global healthcare crisis and to find solutions to address the current challenge.

The Conference also had technical sessions on 'Medicines & Medical Technologies'; 'Advanced Materials – New Technology Horizons'; 'Advanced Manufacturing Technologies for Sustainable Future & Global Innovation' and 'Technology Alliance for Global Economic Leadership'.

**Website link:**

<https://dst.gov.in/india-well-poised-reboot-economy-through-st-dr-harsh-varadhan>

# DR. HARSH VARDHAN LAUNCHES 'AYUSH SANJIVANI' APP AND INTER-DISCIPLINARY STUDIES INVOLVING AYUSH INTERVENTIONS FOR COVID-19

7th May 2020, New Delhi

*“The alliance between technology stakeholders will help the traditional knowledge of AYUSH to reach a large global population.”*

Dr. Harsh Vardhan, Union Health & Family Welfare Minister launched the 'AYUSH Sanjivani' App and two AYUSH-based studies related to COVID-19 situation on 7<sup>th</sup> May, 2020 in the presence of Shri Shripad Yesso Naik, MoS (I/c), AYUSH who participated through Video Conferencing from Goa.

Highlighting the importance of harnessing technology for COVID-19 response, the Union Health Minister said “The 'AYUSH Sanjivani' mobile app, which has been launched today, will help to generate data on acceptance and usage of AYUSH advocacies and measures among the population and its impact in prevention of COVID-19. It is developed by Ministry of AYUSH and MEITY and shall reach out to a target of 50 lakh people.”

Dr. Harsh Vardhan stated that COVID-19 management has provided a potent platform for alliance between MoHFW, MoAYUSH and technology organisations such as CSIR, ICMR, and UGC to not only develop AYUSH interventions and solutions but also help in promoting AYUSH knowledge for the larger good of the global community. These organisations are joining hands today and

The graphic is a promotional poster for the 'AYUSH Sanjivani' app. At the top left is the logo of the Ministry of AYUSH, and at the top right is the 'myGov' logo with the tagline 'मेरी सरकार'. The central text reads: 'Expanding Horizons of Age-Old Traditional Knowledge of Ayurveda with **AYUSH Sanjivani App**'. Below this, a central image shows a smartphone displaying the app's interface. Surrounding the phone are four icons with corresponding text: 1. A green hexagon with a virus icon: 'To generate data on acceptance & usage of AYUSH measures & its impact on prevention of COVID-19'. 2. A blue hexagon with a person icon: 'Provide AYUSH advisories related to immunity boosting measures'. 3. A red house icon: 'Promote AYUSH knowledge for larger good of the global community'. 4. A purple house icon: 'To develop AYUSH interventions & solutions; to reach out to target of 50 lakh people'. At the bottom, there is a 'Download Now!' button with the Google Play logo and the date 'Dated: 9 May, 2020'. The background features a faint watermark of a person meditating and the text 'GATHERING & TRADITIONAL PRACTICES FOR CORONA PREVENTION & MEDICATION'.

are being supported and guided by ICMR and DCGI in propagating the wholesomeness and holistic health benefits of the age-old traditional medicinal knowledge of Ayurveda, he added. In addition to the App, Dr. Harsh Vardhan also launched two more scientific studies. One is the collaborative clinical research study on Ayurveda interventions as prophylaxis and as an add-on to standard care to COVID-19, which shall be a joint initiative of Ministry of AYUSH, MoHFW and the Ministry of Science & Technology through Council of Scientific & Industrial Research (CSIR) with technical support of ICMR. The Interdisciplinary Ayush R&D Task Force headed by Dr Bhushan Patvardhan, Vice Chairman, University Grant Commission (UGC) has formulated and designed clinical research protocols for prophylactic studies and add-on interventions in COVID-19 positive cases through thorough review and consultative process of experts of high repute from different organisations across the country for studying four different interventions, viz., Ashwagandha, Yashtimadhu, Guduchi Pippali and a poly herbal formulation (AYUSH-64). This includes the following two areas:

- a. Ashwagandha for the Prophylaxis against SARS-COV-2 in subjects with increased risk during the COVID-19 Pandemic: A comparison with Hydroxychloroquine in the healthcare providers and
- b. Effectiveness of Ayurveda Formulation as an adjunct to 'Standard of Care' for the Treatment of Mild to Moderate COVID-19: A Randomized, Open Label, Parallel Efficacy, Active Control, Multi-Centre Exploratory Drug Trial.

Dr. Harsh Vardhan also launched the population-based interventional studies on impact of AYUSH-based prophylactic interventions for prevention of COVID-19 infection in high risk population. The core objectives comprise of assessment of preventive potential of AYUSH interventions for COVID-19 and to assess the improvement in quality of life in high risk population. The study will be carried out through four Research Councils under Ministry of AYUSH and National Institutes in 25 states across the country and several State Governments covering approximately 5 lakh people. The outcome of the study is expected to pave a new horizon in understanding the preventive potential of AYUSH interventions during pandemics like COVID-19 through scientific evidence.

Elaborating on the import of these studies, Dr. Harsh Vardhan stated that these studies shall re-establish the importance of AYUSH pathies with the help of rigour of CSIR, ICMR and DCGI. "This is truly a momentous day. The technology alliance provides valuable opportunity for such knowledge-based solutions to continue to benefit us even after the COVID-19 pandemic has passed, by possible integration of AYUSH in the mainstream scientific efforts," he added. "Let us also understand that the modern pathies of medicine and science are not in competition with those of AYUSH, but they complement and strengthen each other in intrinsic ways," Dr Harsh Vardhan stated. "Under the leadership of our beloved Prime Minister, AYUSH advisories for enhancing immunity during COVID-19 pandemic have been acknowledged the world over," he said.

Shri Rajesh Bhushan, OSD/Secretary (HFW), Shri Vaidya Rajesh Kotecha, Secretary, AYUSH, Dr. Shekhar C. Mande, Director General, CSIR, Dr. V. G. Somani, Drugs Controller General of India, and other senior officers of MoHFW and AYUSH were also present at the launch event.

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# DST & ITS AUTONOMOUS INSTITUTIONS ELEVATED SCIENCE AND TECHNOLOGY IN INDIA TO INTERNATIONAL LEVELS

## — DR. HARSH VARDHAN

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3rd May 2020, New Delhi

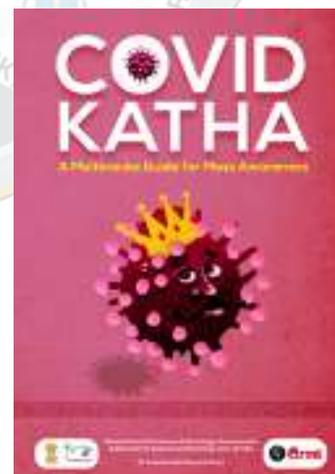
Union Minister of Science & Technology, Health & Family Welfare and Earth Sciences, Dr. Harsh Vardhan today interacted with Heads of all Autonomous Institutions (AIs) and Subordinate offices of Department of Science & Technology (DST) via Video Conferencing on the occasion of 49<sup>th</sup> DST Foundation Day (3<sup>rd</sup> May, 2020) about their S&T initiatives, particularly in relation to their endeavours for combating the COVID-19 outbreak.



The Minister also launched “COVID KATHA”, a multimedia guide on COVID-19 on this occasion. As DST enters 50 years of serving the nation through Science & Technology, the Golden Jubilee Celebrations were also launched, initiating myriad activities in different parts of the country throughout the year.

Secretary (DST), Professor Ashutosh Sharma highlighted the major initiatives of DST, its vision for next five years and the steps DST is taking to identify and map technologies from R&D labs, academic institutions, start-ups, and MSMEs to fund nearly market-ready solutions for diagnostics, testing, healthcare delivery, and equipment and supplies to combat COVID-19.

Senior scientists and officials from National Science & Technology Entrepreneurship Development Board (NSTEDB), Science for Equity, Empowerment & Development (SEED) and from Statutory Bodies like Science and Engineering Research Board (SERB), Technology Development Board (TDB) and the Survey of India (SoI) spoke about the different initiatives being taken to tackle the outbreak. Similarly, Directors of Autonomous Institutions like the Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), Thiruvananthapuram, International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) and Centre for Nano and Soft Matter Sciences (CeNS), Bengaluru, National Innovation Foundation (NIF), Ahmedabad and S. N.



Bose National Centre for Basic Sciences (SNBNCBS), Kolkata spoke about the preparations they have made to brace for the crisis.

During the interaction, Dr. Harsh Vardhan congratulated DST on the occasion of its 50<sup>th</sup> Foundation Day and said, “DST and its autonomous institutions have elevated Science & Technology in India to international levels and benefitted people across communities in myriad ways. DST provides the largest extramural research and development support in our country to strengthen national S&T capacity and capability through a competitive mode to scientists cutting across institutions and disciplines. DST’s efforts have helped India attaining 3<sup>rd</sup> position globally after China and US in terms of number of publications in science citation index journals.”

Praising the Indian scientists about their timely response in tackling COVID-19, he said, “Indian scientists have always risen to meet any challenge and this time also they have not disappointed the nation. We should remember that actions were needed with speed and scale at several fronts, which included: (i) Comprehensive mapping of our entire start-up ecosystem to identify and support relevant technology solutions ready for scaleup; (ii) Supporting industries and projects from academia and R&D labs working on modelling, properties of the virus and its impact, novel solutions, etc; (iii) Activation of relevant DST’s autonomous institutions in providing solutions. I am happy that our DST scientists achieved that despite the fact that we are running against time. Of particular mention here SCTIMST, Thiruvananthapuram which has already come up with over 10 effective products, several of which are of a breakthrough nature and are being commercialized rapidly.”

Dr. Harsh Vardhan said, “DST has contributed immensely to the S&T innovation space in our country over these 49 years. It has grown considerably with number of incubators and Start-Ups increasing significantly.” He highlighted some significant initiatives of DST and enumerated, “Schemes such as Augmenting Writing Skills through Articulating Research (AWSAR) launched to encourage young scientists to write popular science articles on their research pursuits; programme called National Initiative for Developing & Harnessing Innovations (NIDHI) to boost innovation and start-up activity, Million Minds Augmenting National Aspirations and Knowledge (MANAK) to encourage young students to think innovatively, a National Mission on Interdisciplinary Cyber-Physical Systems, new international S&T collaborations to connect with the best global science projects abroad such as participation in Thirty Meter Telescope Project; and India-Israel Industrial R&D and Technological Innovation Fund of USD 40 million have uplifted India’s science and technology efforts.”

Making a special mention about the National Mission on Quantum Technology and Application (NM-QTA) announced by the Finance Minister during budget this year at a cost of Rs. 8,000 Crores, Union Science & Technology Minister said, “Launch of NM-QTA is a leap into the future to promote and foster R&D in Quantum Technologies and related areas like quantum computing, quantum cryptography, quantum communication, quantum metrology and sensing, quantum enhanced imaging etc. I am sure DST will make the country proud by bringing the fruits of this cutting-edge technology for the benefit of common people.”

Concluding his remarks, Dr. Harsh Vardhan said, “The National policy on Scientific Social Responsibility which is being worked out by DST should be an embodiment of the principles of responsible innovation and social entrepreneurship which DST has imbibed over its 49-year journey. I am sure the document will inspire all the grantees of projects to reach out to stakeholders of Science and Society at large with all the tools, knowledge, manpower and infrastructure of S&T in the academia and R&D labs by choosing of one or more activities: scientific infrastructure sharing; mentoring/training of college/ university faculty; training on high end scientific skills and research; student internships; fostering research culture and many more.”

**Website link:**

<https://dst.gov.in/dst-its-autonomous-institutions-elevated-science-and-technology-india-international-levels-dr-harsh>

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# THE COUNTRY WILL BE SELF-RELIANT BY THE END OF MAY 2020 IN PRODUCING INDIGENOUS RAPID TEST AND RT-PCR DIAGNOSTIC KITS

## — DR. HARSH VARDHAN

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

- Dr. Harsh Vardhan

28th April 2020, New Delhi

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



Secretary, DBT, Dr. Renu Swarup informed that DBT has evolved a multi-pronged research strategy and action plan for immediate response as well as for long-term preparedness to tackle COVID-19. These multifaceted efforts include research towards development of candidate vaccines, therapeutics, and suitable animal models for COVID-19 as well as development of indigenous diagnostics and genomic studies on the host and pathogen. The DBT and its PSU,



Biotechnology Industry Research Assistance Council (BIRAC) has announced a COVID-19 Research Consortium Call to support diagnostics, vaccines, novel therapeutics, repurposing of drugs or any other intervention for control of COVID-19.

During interaction with DBT scientists, Union Minister was informed about various computational methods being



developed by DBT labs/AIs to predict potential antiviral drug molecules. In another strategy, surrogates of the virus are being developed representing one or more critical steps in virus lifecycle and inhibitors are being tested. Work is in progress to isolate neutralizing antibodies either from the patients recovered from COVID-19 or from human antibody libraries. Also, various AIs of DBT are

working on development of candidate vaccines which are at various stages of pre-clinical studies with an overall aim to demonstrate the proof of concept and immunogenicity and safety evaluation prior to clinical testing. At the moment, at least 9 of these studies are in early stages and one delivery and adjuvant system for improving the immunogenicity of candidate vaccine is at the advanced stage of development.

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



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

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



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

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

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

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

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**12th April 2020, New Delhi**

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

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

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



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

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

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

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

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

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

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

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

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

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

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

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



**Website link:**

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

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

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

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

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

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SCIENCE & TECHNOLOGY EFFORTS TO DEAL WITH COVID-19  
BY

## OFFICE OF THE PRINCIPAL SCIENTIFIC ADVISER (PSA)

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### **Industry Engagement facilitated by the Office of the Principal Scientific Adviser**

With the country facing an unprecedented crisis due to the coronavirus pandemic, the premier technical institutes have completely re-oriented their research ecosystem to develop solutions for the myriad issues that are coming up. This Herculean effort that lacks a parallel in modern history demands not only a significant commitment in terms of manpower and infrastructure but also a sizeable financial outlay. The industry has stepped up to do its part and help the country overcome this crisis by funding and collaborating on research projects with academia.

### **Infineon Technologies provides funding support to IIT Madras start-up to develop power backup system for ventilators**

COVID-19 is an infectious disease caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). While the majority of cases result in mild symptoms, some progress to acute respiratory distress syndrome, requiring mechanical ventilation. For such patients, ventilators have become the difference between life and death.

Reliable power backup for ventilators and Isolation homes in B & C towns, where power availability is not reliable or at the remote locations which are off-grid has become essential. This will save substantially the need for diesel generators for powering such systems in the rural areas. Towards this, Infineon Technologies AG, a German semiconductor manufacturer, is providing support to Cygni Energy, an IIT Madras incubated start-up, to develop a power backup system for the ventilators. The power backup for ventilators will be targeted towards in off-grid and weak-grid areas.

Cygni Energy Pvt. Ltd. is an IIT Madras incubated start-up, established about five years ago, working in the domain of efficient DC solar power backup. Cygni has numerous inventions in the area of solar-DC and is a pioneer in this field.

### **ICMR-approved probe-free RT-PCRs for diagnosis of COVID-19 developed at IIT Delhi**

The researchers at Kusuma School of Biological Sciences, IIT Delhi, have developed a probe-free technology for COVID-19 detection, and it is one of the firsts to be approved by ICMR. This will be more affordable and easily scalable as compared to the existing methods. Microsoft has offered the support for this project.

The sensitivity of this in-house assay is comparable to that of commercially available kits. This assay can be used both as a qualitative (yes or no) assay without the need for extensive instrumentation and it can also be used for quantitatively to assess virus loads. The team proposes the use of this assay for specific and affordable high throughput screening of

COVID-19. Time for assay is less than 2 hours. This is a probe-free assay (i.e., low cost) and is ideal for high-throughput, large-scale screening. This assay can be used as a regular PCR, i.e., it can be used in setting without a real-time PCR machine but with a regular PCR machine and agarose gel electrophoresis system. IIT Delhi KSBS Team working on this project consists of Prof. Vivekanandan Perumal, Dr Akhilesh Mishra, Dr Parul Gupta, Dr Sonam Dhamija, Prof. Manoj B. Menon, Prof. Bishwajit Kundu and Prof. James Gomes.



### Persistent Foundation supports TRAC study, a retrospective analysis for COVID-19

The Principal Scientific Adviser to the GoI, Dr K Vijay Raghavan, has constituted an S&T Core Group on COVID-19. Under the aegis of the S&T Core Group on COVID-19, a Task Force has been constituted focused on repurposing of drugs for COVID-19. The Nerve Center is located at Entrepreneurship Development Center (Venture Center), Pune. The team has gathered in-depth information on various drug candidates to allow informed decision making.

In order to design better trials and choose potential therapies effectively, there is a need to understand what kind of symptoms patients are presenting with, the kind of therapies being used by doctors for clinical management and their effects. In this context The TFORD has initiated a Retrospective Study in Pune recently to collect clinical management information for COVID-19 patients and to evaluate the efficacy and safety of currently used treatments for hospitalised COVID19 patients. This study, which aims to collect and curate clinical management information of COVID-19 patients will significantly aid in understanding which therapies could be most beneficial for the Indian population and going further aid in their testing through clinical trials. The study is being funded by Persistent Foundation.

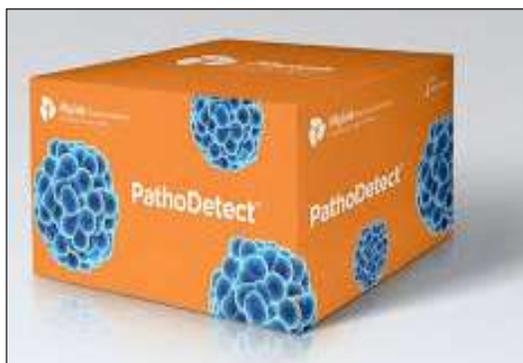


**Website Link:**  
<https://nclinnovations.org/covid19/trac/>

### Asian Paints supports MyLab Discovery Solutions to stock emergency supply of COVID-19 testing kit – PathoDetect

There has been a steady increase in testing capacity over the last few months in India. Currently, over one lakh daily tests are being performed every day. To help with this increased demand for testing India has been importing testing kits from China, Germany, South Korea and other

countries. However, these imported kits were not enough for a populous country like India. Thus, ICMR has been looking at indigenous testing kits to prepare itself to conduct mass testing and create an emergency supply bank to meet this requirement in the coming weeks.



MyLab Discovery Solutions, incubated at NCL Venture Center, has developed a COVID-19 testing kit, named PathoDetect, which has received approval from CDSCO in a record 6 weeks' time. PathoDetect offers an in vitro diagnostic real-time PCR assay for qualitative detection of the 2019-novel Coronavirus RNA in respiratory specimens and sera. The kit offers universal detection of SARS-like coronaviruses and specific detection of 2019-nCoV. Each indigenously produced PathoDetect kit can test 100 patients at 1/4th the cost of an existing kit, thus significantly reducing the financial burden on the government. Moreover, Mylab's PathoDetect kit is very simple to use and can significantly expedite the testing process, as it provides results in just 3 hours, compared to the 7+ hours required for existing kits in the market.

Asian Paints Limited has extended financial support to Mylab Discovery Solutions to manufacture and keep available an emergency stock of kits required to help in mass testing. The fund will help MyLab take the necessary inventory risks, plan supplies in advance and meet the growing needs. Currently, MyLab has an existing manufacturing capacity of 25,000 tests per day, which can be enhanced to 40,000 tests per day in the next 10 days by further automation.

### **Portable Fluorescence Reader to enable PCR-based tests for COVID-19 diagnosis, supported by Infineon Technologies**

The WHO-approved diagnostic test for COVID-19 is a reverse transcription-polymerase chain reaction (RT-PCR) test that requires high-end equipment, a number of lab accessories and skilled technicians to operate, along with approved testing kits. Only a limited number of labs in the country are equipped with RT-PCR facilities, and the goal of this project is to develop assays and instrumentation that result in cheaper testing kits that do not require these expensive set-ups.



These involve the use of cheaper and widely available PCR thermal cyclers for the RNA amplification process, in combination with intercalating dyes for detection (instead of conventional dyes that use a probe and are very expensive), as well as the development of a reader that measures the resultant fluorescence emissions. These fluorescence readers have been validated in diagnosing other diseases as part of previous research at Indian Institute of Science (IISc) and are currently in the process of being validated for COVID-19 testing. Infineon Technologies has provided a CSR grant for this project.

Please connect with Dr Sapna Poti ([sapnapoti@ia.iitm.ac.in](mailto:sapnapoti@ia.iitm.ac.in)) for further information on any of the industry engagement with S&T organisations.

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## SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

# DEPARTMENT OF SCIENCE AND TECHNOLOGY (DST)

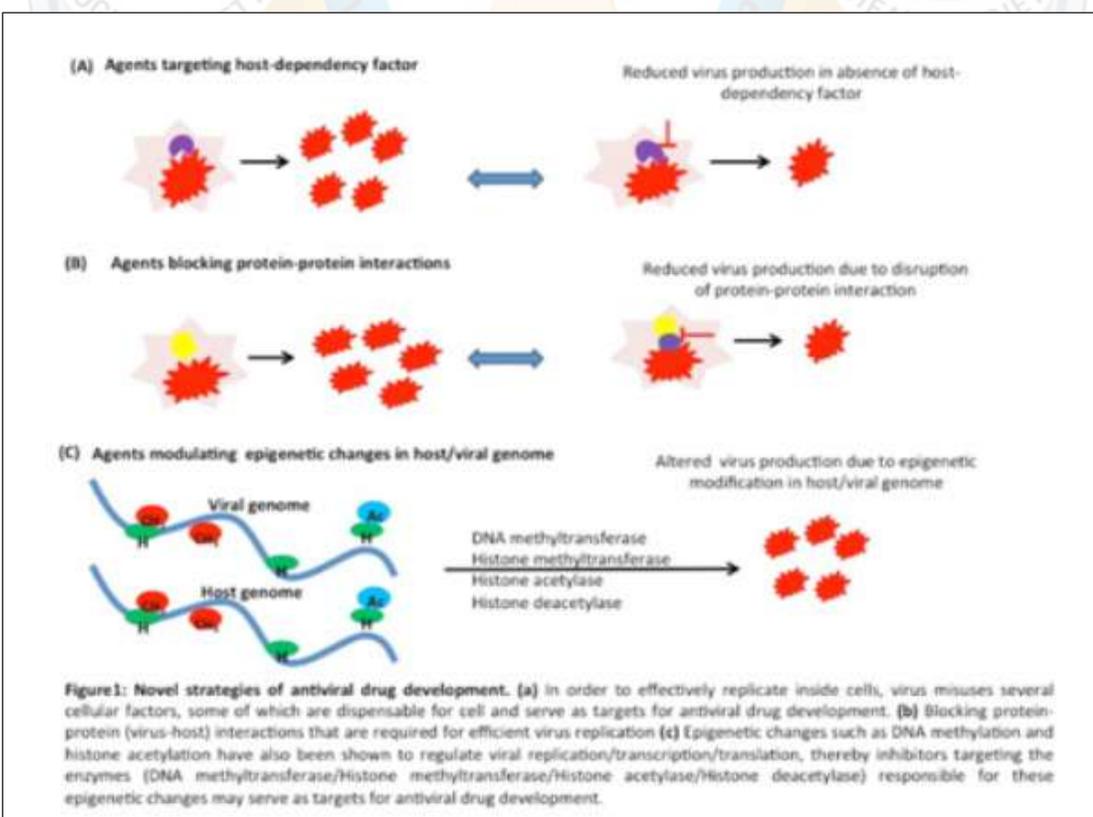
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### NCVTC to develop of host-directed antivirals for COVID-19

The Science and Engineering Research Board (SERB) has approved support for a study by the National Centre for Veterinary Type Cultures (NCVTC), ICAR-NRC from Hisar in Haryana, which will screen their library of 94 small molecule chemical inhibitors for antivirals against coronaviruses.

The molecules are known to inhibit cellular kinases, phosphatases, and epigenetic regulators such as histone methyl transferase, histone deacetylase, and DNA methyl transferase. The targets of these inhibitors are well characterized in cancer; however, their role in the virus lifecycle is not known. The selected candidates (hits) with anti-coronavirus activity will be studied for their molecular mechanism of action, besides examining generation of potential drug-resistant virus variants.

Classically, antiviral drugs are developed by directly targeting certain viral proteins. However, this strategy often fails due to the rapid generation of drug-resistant viruses. Unlike higher



organisms, a viral polymerase--the viral enzyme that synthesizes its nucleic acid (RNA)--does not have proofreading capacity. Therefore, RNA viruses such as the coronaviruses do not have the mechanisms to remove wrongly incorporated nucleotides (building blocks of viral RNA) during the synthesis of the viral genome. The lack of proofreading capacity results in the accumulation of point mutations in the viral genome. This leads to changes in viral proteins. The altered viral proteins may then become resistant to the available antiviral drugs. This intriguing ability of the viruses to rapidly and frequently change themselves is a big challenge for the scientists in developing antiviral drugs.

**Website link:**

<https://dst.gov.in/ncvtc-develop-host-directed-antivirals-covid-19>

## **Sree Chitra Tirunal Institute joins hands with Tata Sons to augment production of COVID-19 testing kits**

Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), Thiruvananthapuram, an institution of national importance, DST, Government of India, has entered into a partnership agreement with Tata Group for commercial production of COVID-19 testing kits. The kits will be based on RT-LAMP (Reverse Transcriptase Loop-Mediated Amplification) technology for COVID-19 detection, which can produce results in significantly less time, thereby increasing the throughput of labs in India. The tests are expected to get approval shortly, and production will commence soon after.

The RT-LAMP is a futuristic technology that can be adapted for a point-of-care setting. The 'Chitra Gene LAMP-N' test uses an isothermal setup to create copies of viral DNA for detection, which significantly reduces the complexity of the overall process compared to the prevalent Real-Time PCR technology. Additionally, the test also uses proprietary magnetic nanoparticle-based RNA extraction, which gives a highly purified and concentrated level of RNA from the swab sample.

"The mass production of RT-Lamp-based COVID-19 testing kits with the active support of the Tata Group will be a significant milestone for the Institute. I would like to commend the efforts of the research & development team of the Institute and the Tata Group in building this partnership at this critical time to serve the needs of the nation," said Dr. VK Saraswat, Member Niti Aayog and President, Sree Chitra Tirunal Institute for Medical Sciences and Technology.

**Website link:**

<https://dst.gov.in/sree-chitra-tirunal-institute-joins-hands-tata-sons-augment-production-covid-19-testing-kits>

## **COVID-19 testing & research lab at IASST will help treat positive cases early & combat the disease in North East**

Institute of Advanced Study in Science and Technology (IASST), Guwahati, an autonomous institute of the DST, Government of India in coordination with Guwahati Medical College & Hospital (GMCH) and National Health Mission has set up a COVID-19 testing and research laboratory. The lab will not only help identify and treat positive cases at an early stage but can also trigger collaborative research in the disease.



*Dr. Himanta Biswa Sarma inaugurating the COVID-19 testing laboratory at IASST, Guwahati in the presence of Director (Additional Charge) of the Institute Professor Horamba Baidung*

Inaugurating the laboratory, Dr Himanta Biswa Sarma, Minister, Health, Education, and Finance, Government of Assam said that this laboratory with a capacity of 1000 tests per day will boost the Government's fight against COVID-19. A higher testing rate will reduce the institutional quarantine duration for negative cases and will help to provide treatment to the positive cases at an early stage. Dr Sarma also expected that this facility would provide a unique platform to carry out collaborative research work between faculty of IASST and GMCH.

**Website link:**

<https://dst.gov.in/covid-19-testing-research-lab-iasst-will-help-treat-positive-cases-early-combat-disease-north-east>

## **SCTIMST providing voluntary service in efforts to combat COVID-19**

With the COVID-19 virus threat continuing to be a cause for concern, various employee organizations at the Sree Chitra Tirunal Institute of Medical Sciences and Technology (SCTIMST) joined hands to kick-start social service initiatives on a massive scale.

The employee bodies rallied under a single umbrella and initiated a WhatsApp group in a bid to provide the much-needed support to COVID-19-infected staff and those on quarantine, making sure that food, medicine, and groceries were made available to them.

Transportation, to staff working in COVID 19 labs, delivery of HCQ to quarantine staff were also ensured without any hassle. 'buddies@sctimst,' a WhatsApp group, took over coordination of volunteer work at all levels. The digital network helped in identifying service requirements for all people, irrespective of designations.



*Controlling Measures and Voluntary Activities by staff members of SCTIMST from March 25, 2020 till date*

**Website link:**

<https://dst.gov.in/sctimst-joins-hands-provide-voluntary-service-efforts-combat-covid-19>

## DST building resilience of SC & STs against COVID-19 through S&T interventions

The Science for Equity Empowerment and Development (SEED) division of the DST is providing grant-in-aid support to several Knowledge Institutions (KIs), and Science and Technology (S&T)-based Non-Government Organizations (NGOs) for the holistic development of SC and ST communities to help them tide over the nationwide lockdown that affected livelihood and economic condition of the communities.

The national lockdown had crippled mobility and human contact to an extent that it has presented a unique challenge to effectively respond to the needs of the SC and ST communities at grassroots. Besides, pre-existing challenges related to health, compromised dietary practices, poor affordability, low educational levels, and lack of awareness about healthcare and social services pose obstacles to reach relief and rehabilitation measures to the communities.

The support provided to the network of KIs and S&T-based NGOs by the SEED division has brought convergence among different stakeholders, especially the NGO network with grassroots presence and knowledge organizations, and they are working closely with these communities for implementing effective response, recovery and resilience strategies.



*3-D printed face shields*



*Foot-operated sanitizer dispenser*

### **Website link:**

<https://dst.gov.in/dst-building-resilience-sc-sts-against-covid-19-through-st-interventions>

## Research proposals invited for COVID-19 for bilateral collaboration in science between India & Australia

Hon'ble Prime Minister of India Shri Narendra Modi and the Hon Scott Morrison MP, Prime Minister of Australia jointly announced a Special COVID-19 Collaboration in 2020 during an India-Australia Leaders' Virtual Summit on 04 June 2020.

Accordingly, DST, Ministry of Science & Technology, GOI and Department of Industry, Science, Energy and Resources (DISER), Australia have invited joint research projects on COVID-19 from interested scientists and researchers under the Australia-India Strategic Research Fund (AISRF), a platform for bilateral collaboration in science, jointly managed and funded by the governments of India and Australia.

The research proposals are expected to focus on antiviral coatings, other preventive technologies, data analytics, modelling, AI applications, and screening and diagnostic testing as priority areas. The project duration would be for 12 months with maximum extension of 6 months.

More details are available on online: [dst.gov.in](https://dst.gov.in)

Last date for submission of online application: 2nd July 2020

**Website link:**

<https://dst.gov.in/research-proposals-invited-covid-19-bilateral-collaboration-science-between-india-australia>

## ARCI & Mekins develop UVC-based multipurpose disinfection cabinet for containing surface contamination of COVID-19

International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), an autonomous R&D Centre of DST, Government of India and MEKINS Industries have co-developed a UVC-based cabinet for disinfecting non-critical hospital items, laboratory wear, and PPEs in the research laboratories to prevent surface contamination of COVID-19.

It can also be used to disinfect items exhibited to customers in commercial establishments and several domestic items.

India was successful in controlling the spread of COVID-19 caused by the SARS-CoV-2 virus during the first few phases of lockdown due to strict implementation of COVID-19 guidelines. But, with relaxation of the lockdown, there is a chance of slow spread of disease due to the movement of people



across the country, and this is predicted to continue for some time. Transmission through surface contamination is an unpredictable risk in which common utilities play a key role.

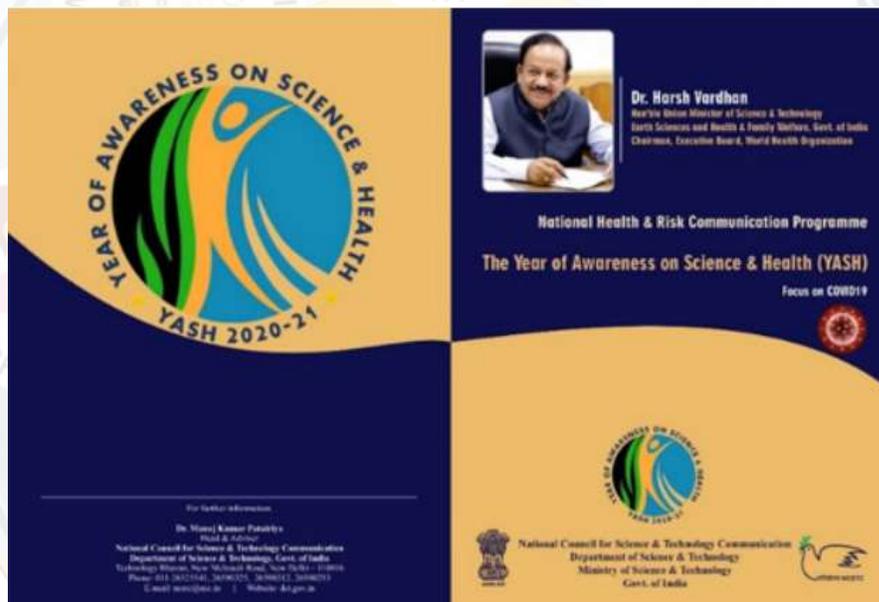
**Website link:**

<https://dst.gov.in/arci-mekins-develop-uvc-based-multipurpose-disinfection-cabinet-containing-surface-contamination>

## DST releases information brochure on health & risk communication programme focusing on COVID-19

The National Council for Science & Technology Communication (NCSTC), Department of Science & Technology (DST) has released an information brochure for a recently launched programme on health and risk communication 'Year of Awareness on Science & Health (YASH) with focus on COVID-19'. The brochure carries information on the genesis and need of such a mega programme in the country to address the issues of risks, crises, disasters, and uncertainties especially posed by the COVID-19 pandemic. The programme focuses on enhancing public understanding and awareness on science and health for better preparedness to cope with the present and future challenges.

Prof. Ashutosh Sharma, Secretary, DST said that a wide array of programmes and activities built around awareness and outreach have been envisaged involving print, electronic, digital, folk and interactive media to reach out to large cross-sections of the society under the campaign. He added that the logo of the YASH programme has been designed to create a wave of peace and bliss and depicts a sense of overcoming the situation at large and would act as a harbinger of taking forward the messages of science, health, risk and awareness.



### Website link:

<https://dst.gov.in/dst-releases-information-brochure-health-risk-communication-programme-focusing-covid-19>

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## SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

# DEPARTMENT OF BIOTECHNOLOGY (DBT)

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### **DBT-ILS scientists for designing probiotics to control coronavirus**

Researchers at the DBT's Institute of Life Sciences (DBT-ILS), Bhubaneswar have proposed that the infection and transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV2), the causative agent for COVID-19 pandemic may be controlled by bioengineered probiotics expressing human angiotensin-converting enzyme 2 (ACE2).



In a paper published in scientific journal Rio, a group of scientists led by Dr Shantibhusan Senapati noted that it has been experimentally proven that ACE2 binds to spike protein (SP) of SARS-CoV-2 making ACE2 as the entry receptor and said that this finding provides a strong rationale to target the SP-ACE2 interaction for developing therapeutics against SARS-CoV-2 infection.

Epithelial cells of intestine, lung, kidney and blood vessels profoundly express ACE2. Lungs have been the most affected organ for SARS-CoV-2 infection, but the human intestinal tract has also been speculated to be an alternate infection route for this virus. Probiotics are known to control multiple gut-associated illnesses. Engineered probiotics expressing ACE2 could be a potential bio-remedy to neutralize SARS-CoV-2. In addition to inhibiting viral entry, the probiotics might also confer innate immunity and have beneficial effects that control the dysbiosis in the SARS-CoV-2-infected patients.

Contact details: Dr Shantibhusan Senapati (Scientist E); Dr Mamoni Dash (Communication Officer)

**Website Link:**

<https://riojournal.com/article/54802/>

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

### **DBT-IBSD strengthens COVID-19 testing labs across northeast India**

The DBT's Institute of Bioresources and Sustainable Development (DBT-IBSD) has its head office in Imphal and three centres in Gangtok, Aizawl and Shillong, thus covering almost the entire north-east India.



The main institute and its centres are actively contributing to the fight against the COVID-19 pandemic in their respective states by assisting ICMR-recognised COVID-19 testing centres there by providing equipment, facility, consumables, trained manpower and distributing Institute-made hand sanitizer to protect frontline COVID-19 warriors.

Contact details: Director, Prof. Pulok Kumar Mukherjee, PhD, FRSC, FNASc E-mail: director.ibsd@nic.in

**Website Link:**

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

[https://vigyanprasar.gov.in/wp-content/uploads/vigyan\\_samachar\\_dbt\\_01S\\_05June2020.pdf](https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_01S_05June2020.pdf)

### **DBT-ILS selected as biorepository for COVID-19 samples**

The DBT's Institute of Life Sciences (ILS), Bhubaneswar has been selected for the establishment of a biorepository for COVID-19 clinical samples. More than 25,000 tests have been conducted by ILS using its BSL 3 facility.



The biorepository will collect, store and maintain clinical samples like throat swab, nasal swab, sputum, blood, urine and stool of COVID-19 patients and eventually use this as a resource for research and development activities related to COVID-19. The stored samples will be shared with academia, industry and commercial entities involved in the development of diagnostics, therapeutics and vaccines after scrutinizing the intent of the work and benefit to the society.

Contact details: Dr Shantibhusan Senapati (Scientist E); Dr Mamoni Dash (Communication Officer)

**Website Link:**

<https://timesofindia.indiatimes.com/city/bhubaneswar/ils-bhubaneswar-identified-for-establishment-of-covid-19-biorepository/articleshow/75970202.cms>

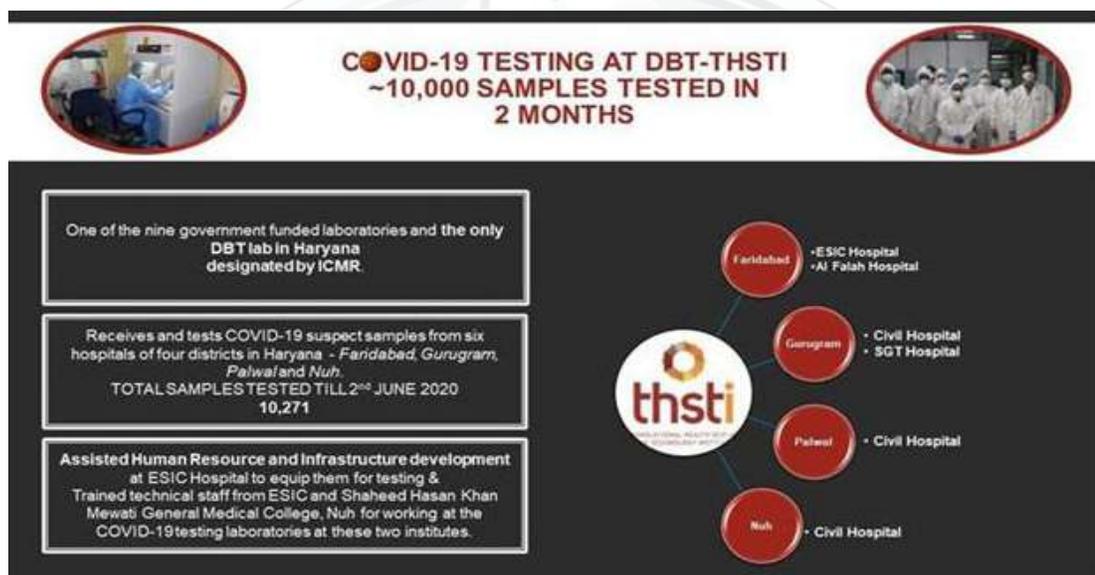
[https://vigyanprasar.gov.in/wp-content/uploads/vigyan\\_samachar\\_dbt\\_01S\\_05June2020.pdf](https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_01S_05June2020.pdf)

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

## THSTI's Bioassay lab completes testing for 10,000 COVID-19 samples

The Translational Health Science and Technology Institute (THSTI), Faridabad's Bioassay Laboratory touched the 10,000 mark for COVID-19 testing on 2<sup>nd</sup> June 2020 having tested 10,271 samples. The DBT's institute THSTI receives samples from four districts of Haryana including Palwal (Civil Hospital), Gurugram (Civil Hospital and SGT Hospital), Nuh (Mandikhera Civil Hospital) and Faridabad (ESIC Hospital and Al-Falah Hospital).

Following ICMR's approval, THSTI's Bioassay Laboratory was designated a COVID-19 testing laboratory in April. The Faridabad-based institute is the only DBT-funded lab designated for COVID-19 testing in the state. The team at THSTI is led by Dr. Guruprasad Medigeshi and has currently got about ten young researchers and scientists working.



Contact details: Dr. Siuli Mitra (smitra@thsti.res.in)

### Website Link:

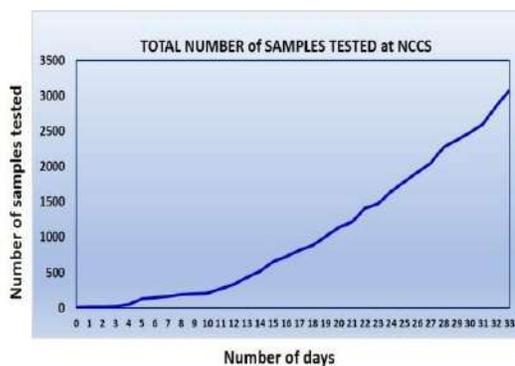
<https://thsti.in/covid/index.php/Home/testing>

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

## DBT-NCCS tests over 1000 samples for COVID-19 in under a week

The National Centre for Cell Science (NCCS) Pune, an autonomous institution of the DBT, Government of India, began testing samples for SARS-CoV-2 at the end of April 2020 to facilitate the ongoing COVID-19 surveillance. NCCS repurposed some of the laboratories to serve as a testing centre with extensive and speedy preparations soon after it was approved as a diagnostics facility by the DBT, the Indian Council of Medical Research (ICMR) and the Maharashtra State Government.

Initially, fewer samples were sent to this centre from within the Pune district of Maharashtra. However, with Maharashtra being the worst affected state in India, a large number of samples are required to be tested every day. Undaunted by this task, the team at NCCS accelerated and doubled its efforts and is now testing over two hundred samples per day from other districts of Maharashtra as well.



NCCS tested over a thousand samples in less than a week recently and has tested more than 3000 samples in a little over a month. The tireless and diligent efforts of scientists, technical and other staff have played a big role in this endeavour. A short video shared on the NCCS social media and website offers a glimpse into the activities of the diagnostics team.

**Website Link:**

<https://www.nccs.res.in/index.php/Events/Covid>

<https://youtu.be/ICgBoPiZNu4>

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

**COVID-19 testing effort at inStem – 10,000 samples and counting...**

Institute for Stem Cell Science & Regenerative Medicine (InStem) and National Centre for Biological Sciences (NCBS), Bengaluru have responded promptly to the unprecedented and urgent public health crisis by setting up a testing laboratory that contributes to almost 10% of Karnataka’s COVID-19 testing capacity.



The testing laboratory started on April 13, 2020 and reached a milestone of 10,000 on May 29, 2020. About 500 or more samples from various districts of Karnataka are being tested at the laboratory on daily basis. The level of commitment and support from the campus community has been outstanding. Faculty, young researchers, technical and administrative staff and laboratory support services have come forward to volunteer at all levels to implement the measures, working relentlessly for 14-16 hours a day throughout the week.

The rapidity with which the COVID-19 pandemic engulfed the entire world is alarming, to say the least. Understanding the spread by extensive widespread testing along with other measures emerged as an important step in the management of the pandemic. Since the state healthcare system is severely overburdened, research institutions have stepped in to fill this gap by offering available infrastructure, skilled researchers and resources.

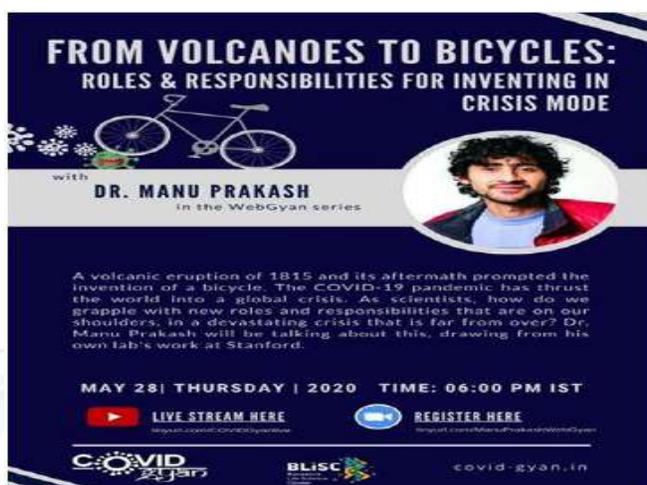
**Website Link:**

<https://www.instem.res.in/content/COVID-19-testing-effort-bangalore-life-science-cluster>

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

## COVID-19 outreach efforts at DBT's inStem

The third session of the COVID Gyan Web Gyan series was done by Dr Manu Prakash of Stanford University. Dr Prakash started his talk with the classic example of the 1815 volcanic eruption of Mt Tambora and its aftermath that prompted the invention of bicycle. Institute for Stem Cell Science & Regenerative Medicine (inStem) is one of the founding partners of COVID Gyan, a pan-institutional website that has been proactive in COVID-19 outreach efforts.



The COVID-19 pandemic has thrust the world into a global public health crisis. Dr Prakash elaborated on how scientists can navigate their new roles and responsibilities in these trying times. He also presented anecdotes from the global contribution and collaborative efforts at his laboratory, Prakash Lab, for combating COVID-19. He stated that as a conventional lab focused on developing frugal science-based solutions for medical problems in resource-constrained environments using open source platform, his lab members are now putting their efforts to explore innovative ways of tackling the nuanced requirements in face of COVID-19 emergency.

Furthermore, he spoke about 'pufferfish' (an open source to design simple, easy to assemble, cost effective ventilators for COVID-19) pneumomasks and N95 mask packaging. He also explained how a cotton candy machine working on simple rules of physics is used in his lab to create special fabric for N95 masks. The audience actively engaged in the session as Dr Prakash enthusiastically addressed their questions with gusto.

The 90 minutes' session was live streamed on COVID Gyan YouTube channel, with nearly 180 participants from India and across the globe. The session was moderated by Prof. Rajesh Gopakumar, ICTS-Bangalore and Prof. Arnab Bhattacharya, TIFR-Mumbai. This session was recorded on May 28, 2020 and can be watched here: <https://www.youtube.com/watch?v=XumUfL5CZ4M>.

### Website Link:

<https://www.youtube.com/watch?v=XumUfL5CZ4M>

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

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## SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

# COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH (CSIR)

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### CSIR-CMERI develops new indigenous ventilator

Researchers at Durgapur-based Central Mechanical Engineering Research Institute (CMERI) have indigenously developed a ventilator amid rising cases of COVID-19. The new ventilator was unveiled in the presence of Prof. (Dr) Harish Hirani, Director, CSIR-CMERI, and Dr Arunangshu Ganguly, Chairman and Managing Director, Health World Hospitals Pvt Ltd, Durgapur.

“The bellow design, controllers and embedded electronics of this ventilator have all been customised to ensure price efficacy as well as meeting the requirements of the relevant industries. The ventilator has undergone multiple technical and design changes after

adopting critical feedbacks from healthcare professionals of the Health World Hospital and Vivekananda Hospital, Durgapur. This ventilator costs around Rs. 80,000-90,000. The ventilator will be further upgraded to meet the requirements of various other patient’s parameters,” said Prof. Hirani.

“The efficacy of a ventilator for a patient is also correlated to the effective response of the attending healthcare personnel. Steadily, the approach of this Institute will be to harness artificial intelligence capabilities to automate the functioning of mechanical ventilators, so that the ventilators automatically respond to the fluctuating variables of a patient,” added Prof. Hirani.

**Website link:**

<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-3-03-June-20.pdf>

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



## CSIR lab to organize nationwide summer research training programme

The North East Institute of Science and Technology (NEIST) is working towards ameliorating the stagnancy created in the academic scenario of the nation due to COVID-19 pandemic. Jorhat-based CSIR-NEIST got the mandate from DG, CSIR Dr Shekhar C. Mande to organize and coordinate a country-wide CSIR-Summer Research Training Programme (CSIR-SRTP-2020). An online programme (CSIR-SRTP-2020) is going to be discharged through the faculties and mentors from 38 CSIR laboratories spread across the country. This was announced by the director of CSIR-NEIST Dr G Narahari Sastry.

As a prelude to this online programme, a website <http://www.neist.res.in/srtp2020/> has been launched where aspiring students can log on to avail the online application form and the detailed brochure of the programme. The registration process starts from May 28, 2020 which closes on 05 June, 2020.

The online programme has been designed for students pursuing such programmes as BSc, MSc, BTech/B.E., MCA, M.Tech, and M. Pharma and with excellent academic record throughout. The programme is also open to faculties from various colleges affiliated to UGC/AICTE/State/Central/Private Universities.

### Website link:

<https://vigyanprasar.gov.in/isw/CSIR-lab-organize-nationwide-summer-research-training-programme.html>

<http://www.rrljorhat.res.in/>

## भारतीय पेट्रोलियम संस्थान में शुरू हुआ कोविड-19 परीक्षणकेंद्र

कोविड-19 के प्रकोप से लड़ने के लिए कोरोना वायरस के संक्रमण का पता लगाना एक अहम कड़ी हो सकती है, जिसके लिए संदिग्ध रोगियों के नमूनों का परीक्षण महत्वपूर्ण साबित हो सकता है। यही कारण है कि देशभर में कोविड-19 की परीक्षण सुविधाओं को बढ़ाने के लिए निरंतर प्रयास किए जा रहे हैं। ऐसे ही एक प्रयास के तहत देहरादून स्थित भारतीय पेट्रोलियम संस्थान (आईआईपी) में भी अब कोविड-19 की एक नयी परीक्षण सुविधा शुरू की गई है।

देहरादून स्थित आईआईपीय वैज्ञानिक तथा औद्योगिक अनुसंधान संस्थान (सीएसआईआर)की एक घटक प्रयोगशाला है। इस प्रयोगशाला में रिवर्स ट्रांसक्रिप्शन पॉलिमरेज चेन रिएक्शन (आरटी-पीसीआर) पद्धति से कोविड-19 रोगियों के नमूनों का परीक्षण प्रारंभ किया गया है। आईआईपी के निदेशक डॉ अंजन रे ने कहा है कि "आईआईपी एक पेट्रोलियम संस्थान है। पर, कोविड-19 की मौजूदा चुनौती को देखते हुए संस्थान द्वारा यह पहल की गई है।"

इसके लिए संस्थान के परिसर में अत्याधुनिक जैव-सुरक्षा तकनीकों से लैस प्रयोगशाला स्थापित की गई है। बुधवार को उत्तराखंड के अपर स्वास्थ्य सचिव युगल किशोर पंत ने इस परीक्षण सुविधा का उद्घाटन करते हुए कहा कि "इस पहल से राज्य में कोविड-19 के परीक्षण में तेजी लाने में मदद मिल सकेगी।"

### Website link:

<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-I-04-June-20.pdf>

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

## Dengue drug enters Phase II clinical trial for COVID-19

Sun Pharma has announced that it has commenced Phase II clinical trial on AQCH, a phytopharmaceutical (plant derived) drug for treatment of COVID-19. The company received approval from the Drugs Controller General of India (DCGI) for conducting Phase II clinical trial in April this year. The research is being done in association with the CSIR and DBT.

The clinical trial will be conducted across 12 centres in 210 patients located in Delhi, Mumbai, Ahmedabad, and other places spread across the country. The treatment duration for patients will be 10 days. The results of the clinical trial are expected by October 2020. Human safety study of AQCH has already been completed and the drug has been found safe at the recommended dose for Phase II study. Since 2016, Sun Pharma has been working closely with DBT-International Centre for Genetic Engineering and Biotechnology (ICGEB), under the leadership of Dr. Navin Khanna, and CSIR-Indian Institute of Integrative Medicine (IIIM), Jammu, under the leadership of Dr. Ram Vishwakarma, to develop a phytopharmaceutical drug for dengue.

Dilip Shanghvi, Managing Director, Sun Pharma said, "This is the first phytopharmaceutical drug approved for clinical trials by the DCGI as a potential treatment for COVID-19. AQCH has shown anti-SARS-CoV-2 effects in *in-vitro* studies conducted in collaboration with ICGEB, Italy. These results, combined with information on mechanism of action through *in-vitro* and small animal studies, give us the confidence to evaluate this potential treatment option for COVID-19 patients."



**Website link:**

<https://vigyanprasar.gov.in/isw/Dengue-drug-enter-Phase-II-clinical-trial-for-COVID-19.html>

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

## WHO resumes hydroxychloroquine and chloroquine trials

World Health Organisation (WHO) has decided to resume hydroxychloroquine and chloroquine (HCQ/CQ) trails after Indian scientists have questioned its earlier decision to halt it temporarily. WHO had stopped the trails based on a study published in the journal *Lancet*.

This news has received overwhelming response from all spheres. "We're happy that the WHO resumed trials of hydroxychloroquine. I firmly believe that the WHO's decision was taken in haste. It was a kind of knee-jerk reaction. They should have analysed the data on their own before temporarily suspending trials," said Shekhar C Mande, Director General, Council of Scientific and Industrial Research (CSIR).

"I think that HCQ/CQ trails are of global importance and I am glad to see them resumed," said Dr Anurag Agarwal, Director, Institute of Genomics and Integrative Biology (IGIB), while speaking with *India Science Wire*.



Dr Mande, Dr Agarwal (IGIB), and Dr Rajeeva Karandikar from the Chennai Mathematical Institute (CMI) have written a joint letter to the WHO's chief scientist Dr Soumya Swaminathan, where they have pointed out several limitations in the study as the authors have themselves acknowledged it in the article. "This study is highly flawed and should not be used to judge CQ/HCQ effectiveness or toxicity. A high quality RCT is needed," tweeted Dr Agarwal.

**Website link:**

<https://vigyanprasar.gov.in/isw/WHO-resume-hydroxychloroquine-and-chloroquine-trial.html>

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

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

## लॉकडाउन में सुधरी पूर्व-मानसून हवा की गुणवत्ता

भारतीय विषविज्ञान संस्थान (आईआईटीआर), लखनऊ के शोधकर्ताओं द्वारा किए गए अध्ययन में मानसून-पूर्व हवा की गुणवत्ता में सुधार दर्ज किया गया है। पिछले वर्ष के मुकाबले इस वर्ष की समान अवधि में हवा में पाए जाने वाले सूक्ष्म कण (पीएम)-10 एवं पीएम-2.5, सल्फर-डाईऑक्साइड, नाइट्रोजन-डाईऑक्साइड, लेड व निकेल जैसी धातुओं और ध्वनि प्रदूषण के स्तर में उल्लेखनीय रूप से गिरावट दर्ज की गई है। लॉकडाउन के दौरान हवा की गुणवत्ता का आकलन करने के लिए लखनऊ में किए गए एक ताजा अध्ययन के बाद सीएसआईआर-आईआईटीआर के शोधकर्ता इस नतीजे पर पहुँचे हैं।

कोविड-19 को मद्देनजर रखते हुए शुरू हुए लॉकडाउन के दौरान 25 मार्च से 31 मई के बीच यह अध्ययन लखनऊ के आठ स्थानों पर किया गया है। इनमें चार आवासीय, तीन व्यावसायिक और एक औद्योगिक क्षेत्र शामिल हैं। अध्ययन में शामिल आठ स्थानों में से सात स्थलों पर वर्ष 1997 से नियमित रूप से वायु गुणवत्ता की निगरानी हो रही है। इसके अलावा, सीएसआईआर-आईआईटीआर, जो व्यावसायिक क्षेत्र में स्थित है, से भी प्रदूषण निगरानी के आंकड़े प्राप्त किए गए हैं। आवासीय इलाकों में अलीगंज, इंदिरा नगर, विकास नगर एवं गोमती नगर शामिल हैं। जबकि, व्यावसायिक इलाकों में सीएसआईआर-आईआईटीआर, चारबाग, आलमबाग और औद्योगिक इलाकों में अमौसी में यह अध्ययन किया गया है। इस अध्ययन से संबंधित लखनऊ शहर की परिवेशी वायु गुणवत्ता की मानसून-पूर्व मूल्यांकन रिपोर्ट एवं लॉकडाउन के दौरान गोमती नदी के जल की गुणवत्ता के आकलन की रिपोर्ट विश्व पर्यावरण दिवस के मौके पर जारी की गई है।

**Website link:**

<https://vigyanprasar.gov.in/isw/Pre-monsoon-air-quality-improved-this-time-over-last-year-hindi.html>

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

## Scientists develop indigenous nasopharyngeal swabs

In the current pandemic scenario, global supplies of nasopharyngeal (NP) swabs are not dependable resulting in supply chain delays, escalating prices and variable quality. CSIR-National Chemical Laboratory (CSIR-NCL), Pune, has developed an indigenous NP swab for collecting samples from the throat cavity of COVID-19 patients. The need for making available domestic technology for NP swabs was flagged by CSIR to NCL in mid-April.

Nasopharyngeal swab is a medical device with stringent specifications of quality, polymer grade, dimensions and sterilization. An NP swab consists of a cylindrical plastic stick with a brush-like tip of synthetic bristles/flocks. The flocking process helps align the fine bristles in





a parallel orientation on the stick head, much like a tooth brush, except that this has round uniform geometry and the NP swab bristles are of micron diameter.

The NCL team of polymer science and chemical engineering scientists - which included Dr Chandrashekhar V. Rode, Dr Prakash P. Wadgaonkar, and Dr Anuya A. Nisal - successfully worked out the detailed specifications of NP swab polymers and adhesives. The specifications included medical-grade materials that must be used for manufacture, the swab design and the packaging and sterilization protocols. “This is an excellent example of optimizing the polymer specifications and validating the chemical analysis of an urgently needed medical swab product in a very short time,” noted Dr. Ashwini Kumar Nangia, Director, NCL.

**Website link:**

<https://vigyanprasar.gov.in/isw/Scientists-develop-indigenous-nasopharyngeal-swabs.html>

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

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## SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

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

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### **Pregnant women with SARS-CoV-2 exposure**

ICMR - National Institute for Research in Reproductive Health (NIRRH) provided flowchart for pregnant women with SARS-CoV-2 exposure who has travelled to an affected country within the previous 14 days and have a close contact with a confirmed case of COVID-19 (i.e., less than 1 metre and for more than 15 minutes, living together, direct contact with body fluids).

**Website Link:**

<http://www.nirrh.res.in/wp-content/uploads/2020/04/Flowchart-Guidance-of-Management-of-Pregnant-Women-in-COVID-19-Pandemic.pdf>

### **Commerce and Industry Minister interacted with the captains of the Pharmaceutical industry and Office-bearers of the Pharma Associations**

The Commerce and Industry Minister Shri Piyush Goyal interacted with the captains of the Pharmaceutical industry and Office-bearers of the Pharma Associations through Video Conference. Shri Goyal lauded the pharma industry for making India proud by rising to the occasion during the COVID-19 crisis. India has been recognized as the 'Pharmacy of the World', as over 120 countries received some essential medicines during the last two months, including 40 of them getting them in the form of grant, free of cost. During the crisis, the officials of DGFT, MEA, Health and DoP worked round the clock to ensure that the export consignments are delivered at the earliest. The whole world appreciated India's gesture, and this has swelled India's goodwill and reputation.

**Website Link:**

<https://static.investindia.gov.in/s3fs-public/2020-05/PIB1628142.pdf>

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## SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

# DEFENCE RESEARCH AND DEVELOPMENT ORGANISATION (DRDO)

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### DIAT develops a microwave sterilizer to disintegrate Coronaviruses

Defence Institute of Advanced Technology (DIAT), Pune, a deemed university supported by DRDO has developed a microwave sterilizer named ATULYA to disintegrate COVID-19 causative agent. The virus gets disintegrated by differential heating in the range of 560° C to 600° C temperature.

The product is a cost-effective solution, which can be operated in portable or fixed installations. This system was tested for human/operator safety and has been found to be safe. Depending upon the size and shape of various objects, time of sterilisation is from 30 seconds to one minute. Approximate weight of the system is three kg and it can be used for non-metallic objects only.



Microwave Sterilizer Atulya

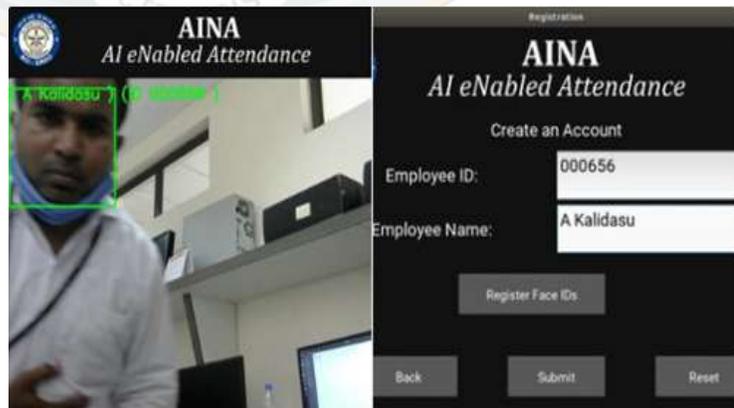
#### Website link:

[https://drdo.gov.in/sites/default/files/whats\\_new\\_document/DRDO\\_NL\\_June\\_2020.pdf](https://drdo.gov.in/sites/default/files/whats_new_document/DRDO_NL_June_2020.pdf)

<https://drdo.gov.in/whats-new/drdo-newsletter-june-2020>

### AI-based Contactless Attendance System

Research Centre Imarat (RCI) Hyderabad, a national DRDO Laboratory, has developed an AI-based Attendance Application (AINA) that allows non-contact-based personnel verification using facial features of the person. The need is felt due to COVID-19 pandemic which made it unsafe to use contact-based biometric verification.



Existing CCTV cameras can be utilized for capturing facial images. Facial features of several thousands of employees can be stored in the computer as facial features of each employee are encoded in a small (less than 25 KB) file.

The system is scalable since the time for identification and verification for each person remains constant, even as the number of registered personnel increases. It is secure because it works as a standalone system and does not require internet, since only the facial features are saved in encoded form and the actual face images need not be saved, thereby ensuring privacy and security. Moreover, the server for storing the facial feature database is placed within the organisation's premises.

AINA can be deployed with minimal upgradation to the legacy attendance infrastructure with RFID (Radio Frequency Identification) readers. It has a lightweight installation process and can be installed on a normal desktop computer with a GPU-based display adapter. It comes with a very intuitive and user-friendly GUI.

**Website link:**

<https://drdo.gov.in/sites/default/files/inline-files/AINA.pdf>

## **DRDO Newsletter enlists initiatives by its laboratories extending helping hand in fight against COVID-19**

DRDO is the apex body of research related to defence technologies in India. It publishes a monthly newsletter to communicate regularly with its stakeholders, subscribers and target audience, covering the significant happenings in the organisation in last one month. It is in its 40<sup>th</sup> year of publication.

DRDO has been in forefront of fight against COVID-19 since its detection in India. The premier R&D organisation has innovated and configured many products required immediately to control the pandemic from its existing arsenal of technologies and experience. These ingenious efforts have led to the development of many mitigation solutions, which have been passed on to the industry for mass production. Some of the products developed by DRDO to enhance operations and to control spread of the infection have been covered in the newsletter. Even as DRDO labs are engaged in providing technological solutions and have developed a number of mitigation products many of its labs are engaged in providing help to local administration in combat against COVID-19.



Contact Info: [director@desidoc.drdo.in](mailto:director@desidoc.drdo.in)

**Website Link:**

<https://drdo.gov.in/whats-new/drdo-newsletter-june-2020>

[https://drdo.gov.in/sites/default/files/whats\\_new\\_document/DRDO\\_NL\\_June\\_2020.pdf](https://drdo.gov.in/sites/default/files/whats_new_document/DRDO_NL_June_2020.pdf)

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# SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

## MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY (MeitY)

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### Call for Proposal to conduct ICT Grand Challenge to build suitable Work from Home (WFH) products or solutions

The Ministry of Electronics & Information Technology (MeitY) announces to develop innovative software product by organizing 1st ICT Grand Challenge through implementing agency in the specified areas. The objective



of ICTGC is to generate innovative technology/ solutions in the form of software products using emerging technology so as to address the COVID/social economic challenges and have potential for mass market leading to greater access of the products in a cost-effective manner. More scheme details of ICT Grand Challenge under National Policy on Software Products (NPSP) are available in the detailed document.

#### Broad area of call for proposal

The implementation agency is expected to prepare the detailed plan as per ICTGC scheme document for selecting the right Start-ups/MSMEs that have the potential to build the suitable Work from Home (WFH) products/solutions enabling employees to work and execute tasks remotely for seamless operations/business continuity of organizations in fully secure and reliable environment.

The software product must include but not limited to the following components:

1. Project Planning & Management tool
2. Business operations tool (Productivity and Work/Project management, Task Management & Reporting, Virtual Design & Development, Virtual Work Drives Software product/platform enabling the technical individual(s) & team(s) to support/assist customers remotely through on-demand remote support sessions with end-to-end security, set-up unattended remote access, manage remote PCs, laptops, mobile devices and servers effortlessly etc.)
3. Digital communication and real-time collaboration tool (Teams to meet, discuss in channels or with team members, collaborate, share, chat, deliver presentations, screen share with remote control, integrated task management etc.)
4. Remote monitoring & operations of industrial setups, machinery & equipment, as applicable

Contact Info: [ispr@meity.gov.in](mailto:ispr@meity.gov.in)

Last date of Application: 15th June 2020

**Website link:**

<https://ispr.gov.in/ictgc/documents.php>

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## SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

# OTHER SCIENTIFIC AND ACADEMIC INSTITUTIONS

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### **KAWACH mask, a product of IIT Delhi start-up ETEX boosting employment and making people Atmanirbhar**

Indian Institute of Technology Delhi (IITD) start-up ETEX has launched affordable and effective facemask, KAWACH, to provide protection against COVID-19. KAWACH mask is a multi-layer textile innovation for optimum protection at an affordable rate (Rs. 45 only), 98% Filtration protection against 3  $\mu\text{m}$  (micron) and 90% against 0.3  $\mu\text{m}$  (micron). Ultra-soft fibrous lightweight material (<15 g) and advanced knitting technology have been used to give extra comfort to the wearer. Its 3D-fit design, as par with N95, allows maximum face covering for protection. The mask has also been tested and approved by the NABL-accredited lab using international standards (ASTM F2299, ASTM F2101, IS 16289:2014, ASTM F1862/F1862M-13, 16 CFR Part-1610). KAWACH is primarily made from biodegradable materials to save the environment.



Within six weeks of launching the highly protective and affordable “Make in India” mask ‘KAWACH’, ETEX has scaled up production to ensure that the mask reaches the masses to protect them against COVID-19. So far, over a million masks have been distributed across the country.

**Website Link:**

<https://home.iitd.ac.in/press-kawach.php>

## IIT Gandhinagar develops an interactive COVID-19 dashboard to aid optimised testing and post-lockdown operations

Indian Institute of Technology Gandhinagar (IITGN) has developed an interactive 'COVID-19 Dashboard' that provides different epidemiological scenario-specific information at a city-scale. It is aimed at helping various stakeholders in optimised testing efforts and post-lockdown operations to contain community infection. The dashboard called 'MIR AHD COVID-19 Dashboard' is a city-scale project which integrates the complex social and transportation patterns with state-of-the-art epidemic spread models, in addition to testing and quarantining rates, and contact tracing rates. As cities prepare to open after current lockdowns, the recovery strategies have to account for social distancing, congestion-free transits and unusual traffic patterns these cities would witness with red and containment zones declared as a no-travel zone. This dashboard, first of its kind for Indian cities, assesses the local risk factors to give a city-scale projection of COVID-19 incidence while accounting for various social distancing scenarios. In addition to the epidemiological data, it also disseminates information about potential congestion zones and rerouting under different containment scenarios to the stakeholders.



### Website Link:

<https://news.iitgn.ac.in/2020/05/15/iitgn-researchers-develop-an-interactive-covid-19-dashboard-to-aid-optimised-testing-and-post-lockdown-operations/>

## IIT Kharagpur develops Sammarjak, the mechanised mobile broom for cleaning large public spaces

Indian Institute of Technology Kharagpur (IITKGP) has developed a vehicle-based mechanised broom Sammarjak MB 4.2 to clean the 2100 acre campus area. The technology has been successfully tested across the campus during the present lockdown situation and has planned to deploy the vehicle to be used on campus to adhere to social distancing norms.



This technology consists of two mechanized brooms in the front and one side, running on battery and solar power. It has the flexibility to move the dirt on roads in angular directions or in up and down direction to fit various road conditions.

### Website Link:

<https://kgpchronicle.iitkgp.ac.in/iit-kharagpur-develops-mechanized-mobile-broom-for-cleaning-large-spaces/>

## Central Pollution Control Board releases user manual for Android Mobile & Web Application for COVID-19 BMW Tracking App

Central Pollution Control Board (CPCB) released user Manual for Android Mobile and Web Application for COVID-19 BMW Tracking App. It is a software application for tracking of generation, collection and disposal of COVID-19 Bio-medical waste, generated at various Health Care facilities & Hospitals (HCF), Quarantine Centres, Isolation wards, Testing Labs, COVID-19 Sample Collection Centres and Urban Local Bodies involved in performing the duties of waste collection from Home Quarantine centres/homecare units. This application will enable information exchange between various stakeholders involved.



The User manual explains various sections of COVID-19 BMW tracking application for its users that is Waste Generator, Waste Handlers, Common Biomedical Waste Treatment Facilities (CBWTF), State Pollution Control Boards/Pollution Control Committees, and others. This manual also provides information on downloading and operating the application. The Tracking App is initially developed for android mobiles, however, IoT version is under progress. The Manual explains the process of collection of waste together with responsibilities of its stake holders.

### Website Link:

[https://cpcb.nic.in/uploads/Projects/Bio-Medical-Waste/VI\\_COVID-19\\_BMW\\_Tracking\\_App.pdf](https://cpcb.nic.in/uploads/Projects/Bio-Medical-Waste/VI_COVID-19_BMW_Tracking_App.pdf)

## Central Pollution Control Board releases pictorial guide on biomedical waste management including COVID-19 waste

Central Pollution Control Board (CPCB) has released a pictorial guide on Biomedical Waste Management (BMWM) Rules, 2016 (amended in 2018 & 2019), which is a product of joint research by the Centre for Chronic Disease Control (CCDC), Centre for Environmental Health (CEH), Public Health Foundation of India (PHFI) and Health Care Without Harm (HCWH). The guide is a compilation of important strategies that are keys to appropriate management of biomedical waste in India. The pictorial guide provides a quick, user-friendly view of the important elements of biomedical waste handling, treatment, and disposal through its illustrative components. These are based on the specifications provided in the BMWM Rules, 2016 and its subsequent amendments. Importantly, the guide also includes the provisions for COVID-19 waste management as prescribed in the Central Pollution Control Board Guidelines 2020.



### Website Link:

[https://cpcb.nic.in/uploads/Projects/Bio-Medical-Waste/Pictorial\\_guide\\_covid.pdf](https://cpcb.nic.in/uploads/Projects/Bio-Medical-Waste/Pictorial_guide_covid.pdf)

# SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

## PRIVATE SECTOR ENTERPRISES

### Noida-based company developing and manufacturing COVID-19 products

A Noida-based company named Karigar Niryat Private Limited is developing and manufacturing a number of products for COVID-19 warriors, like Coverall with Shoe covers, Eye Protection Goggles and Shield, Latex Surgical Gloves, 3-Ply Breathable Surgical Mask, Eco-friendly Disposable Bag, and Apron and Wrap. These COVID-19 technological interventions are cheaper, reusable and washable which automatically cut down the buyers' cost. The products are easy to move and comfortable to wear for long working hours as they facilitate evaporation of sweat. They also avoid skin issues that may develop due to heat and sweat and hence healthier. These products have been developed considering the environmental concerns too.



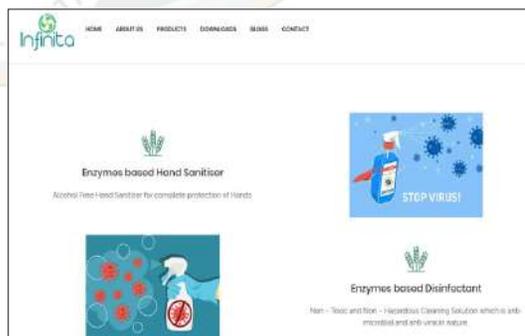
Contact info: [geetanjali@karigarexports.in](mailto:geetanjali@karigarexports.in)

**Website link:**

[http://www.karigarexports.in/covid19\\_special.php](http://www.karigarexports.in/covid19_special.php)

### Infinita Biotech manufacturing hand sanitizers and disinfectants

Being a Chemical and Biochemical Products manufacturing company, Vadodara-based Infinita Biotech is moving ahead in the industry related to providing cleaning, sanitising and disinfecting technologies and services. Cleaning helps wash off the germs, dirt and other organic materials of the surface. The products are made up of chemicals and biochemical materials that are safe to handle and kill germs also.



Contact info: [sales@infinitabiotech.com](mailto:sales@infinitabiotech.com)

**Website:**

<https://infinitabiotech.com/product/hand-sanitizers-and-disinfectants>

## Zero Contact Key for safe handling of doors developed by 3D Spectra Technologies LLP

3D Spectra Technologies LLP has developed an intelligent solution to minimize contact with germs-infected surfaces like door handles, etc. The product named 'ZERO CONTACT KEY' is a multipurpose device in the real sense. It can be used anywhere for no-contact operation of handles and latches for doors and windows, as well as storage cabinets, elevator buttons, and even electric switches and bathroom faucets.

This latest innovation from 3D Spectra Tech has comfortable, ergonomic design, extremely pocket-friendly, can be sterilised, durable and ideal for use in the post-COVID-19 world. This has been designed to eliminate any chances of infection through contact with contaminated surfaces.



Contact: [sales@3dspectratech.com](mailto:sales@3dspectratech.com)

**Website Link:**

[https://www.3dspectratech.com/covid-19-response-products/?utm\\_source=Linkedin&utm\\_medium=Socialmedia&utm\\_campaign=Post](https://www.3dspectratech.com/covid-19-response-products/?utm_source=Linkedin&utm_medium=Socialmedia&utm_campaign=Post)

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# SCIENCE OUTREACH & POPULARISATION EFFORTS

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

## Efforts from Science Ministries, Departments & Scientific Organisations

### Government of India invites to share your ideas & suggestions to help fight COVID-19 pandemic

Government of India is taking all necessary steps to ensure that every Indian is prepared well to face the challenge and threat posed by the pandemic of novel Coronavirus. The most important factor in preventing the spread of the virus locally is to empower the citizens with the right information and taking precautions as per the advisories being issued by Ministry of Health & Family Welfare. In order to involve the community in the fight against the virus, Government of India invites you to share your ideas and suggestions to help fight Coronavirus. These can include innovative and best practices regarding hygiene, handwashing, social distancing and preventing spread of rumours and being prepared rather than panicking, and at the same time, keeping calm and staying vigilant.

Last Date for Participation: 30<sup>th</sup> June 2020

**Prepare, Don't Panic!**

Give your ideas & suggestions  
to help fight **#CoronaVirus**



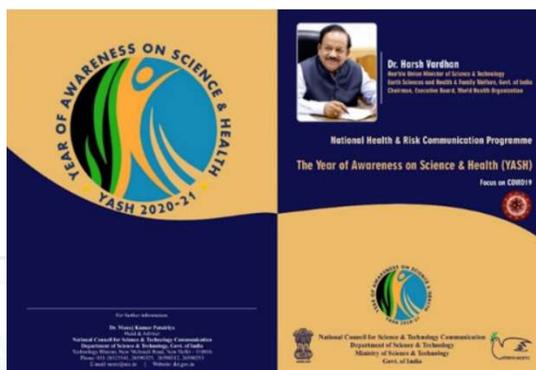
**Website link:**

<http://indiascienceandtechnology.gov.in/sites/all/themes/vigyan/images/covid19/Guidebook%20-%20New%20Normal.pdf>

[https://www.mygov.in/group-issue/share-your-ideas-suggestions-help-fight-coronavirus/?utm\\_source=webcampaign&group\\_issue&285571](https://www.mygov.in/group-issue/share-your-ideas-suggestions-help-fight-coronavirus/?utm_source=webcampaign&group_issue&285571)

## NCSTC comes up with an information brochure on health & risk communication scheme–Year of Awareness on Science & Health (YASH)

The National Council for Science & Technology Communication (NCSTC), Department of Science & Technology (DST) has released an information brochure for a recently launched programme on health and risk communication 'Year of Awareness on Science & Health (YASH) with focus on COVID-19'. The brochure carries information on the genesis and need of such a mega programme in the country to address the issues of risks, crises, disasters, and uncertainties especially posed by the COVID-19 pandemic. The programme focuses on enhancing public understanding and awareness on science and health for better preparedness to cope with the present and future challenges.



Contact Info: [ncstc@nic.in](mailto:ncstc@nic.in)

### Website Link:

<https://dst.gov.in/sites/default/files/YASH%20Brochure.pdf>

## CSIR-NISCAIR brings out weekly e-Newsletter on COVID-19

National Institute of Science Communication and Information Resources (CSIR-NISCAIR) has brought out newsletter dedicated to the COVID-19 outbreak. The Newsletter covers stories and information on various aspects, like research, technology and innovation efforts to fight out the pandemic and related awareness and sensitisation information.



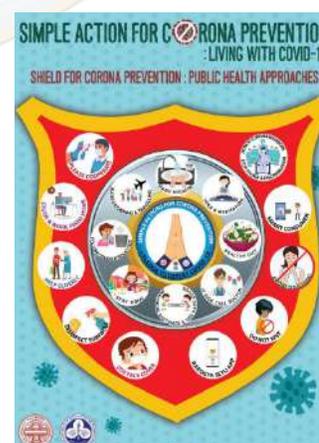
### Website Link:

<https://www.niscair.res.in/includes/images/covidbulletin/pdf/9june2020/9-june-2020.pdf>

<https://www.niscair.res.in/covidbulletin>

## Living with COVID-19: A Guide to New Normal

Nowadays, everywhere the only thing people are talking about is COVID-19 and numerous dos and don'ts that have brought life to a standstill, not just in the country but at a global level. In the wake of the COVID-19 outbreak, our lives have changed in ways we had never imagined before. The Union Ministry of Health in India has indicated that Indians would have to learn to live with coronavirus, and there might be no early tapering off of the



disease. This would require an adjustment to a new normal of several aspects of day-to-day life. Activities related to induce behavioural change regarding usage of masks at all public places will not only mean intensification of awareness drives but also access to key resources. To overcome the challenge, Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh and Panjab University (PU) have come up with an e-Book on the same topic. The book elaborates on various aspects of activities being touted as new normal, that is, living with COVID-19.

Contact Info: [khaiwal.ravindra@pgimer.edu.in](mailto:khaiwal.ravindra@pgimer.edu.in); [sumanmor@pu.ac.in](mailto:sumanmor@pu.ac.in)

**Website Link:**

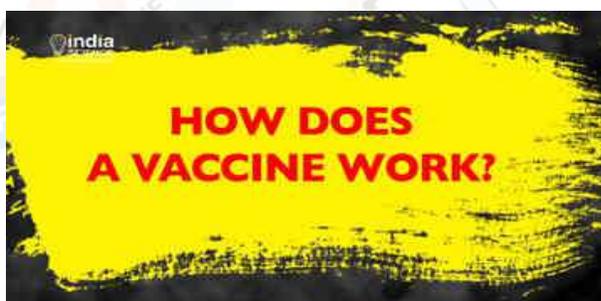
<http://indiascienceandtechnology.gov.in/sites/all/themes/vigyan/images/covid19/Guidebook%20-%20New%20Normal.pdf>

## 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 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 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. Daily video bulletin in Hindi and English;
2. COVID Explained - Short films to explain research project findings in layman's lingo;
3. Facebook live sessions on interviews of various stakeholders and media with DST Secretary.
4. Live of World Environment Day function

Contact info: [kapil@vigyanprasar.gov.in](mailto:kapil@vigyanprasar.gov.in)

**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 & 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 the COVID-19. These resources are generated by efforts made by numerous initiatives and schemes taken up by several Departments and Ministries of Government of India. These are being implemented by public-supported research institutions in India. The content presented here relies on the best available scientific understanding of the disease and its transmission.

भारतीय विज्ञान, प्रौद्योगिकी एवं नवाचार  
India Science, Technology & Innovation

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RESEARCH - FUNDING - ORGANISATIONS - SCHEMES - SCHOLARSHIPS - INNOVATIONS - TECHNOLOGIES - COVID-19: THE PANDEMIC -

**COVID-19**  
The Pandemic

Weekly Newsletter >

S&T Efforts >

Awareness >

Links & Resources >

**STI Repository**

The COVID-19 : The Pandemic is a dedicated section on the ISTI Portal provides information resources on science and technology efforts taken up by the Government of India through its various science Ministries, Departments, and scientific organizations. These organizations are geared for combating the epidemic of COVID-19 through research-driven and technology-based interventions.

CLICK TO KNOW MORE →

6862 Research Institutions    Annual Publications    Annual Patents Granted    5038 Atal Tinkering Labs

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

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

Contact Info: [kdgm@vigyanprasar.gov.in](mailto:kdgm@vigyanprasar.gov.in)

**Website link:**

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

### Weekly Publication of e-Newsletter on COVID-19

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



Contact Info: [kdgm@vigyanprasar.gov.in](mailto:kdgm@vigyanprasar.gov.in)

**Website link:**

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