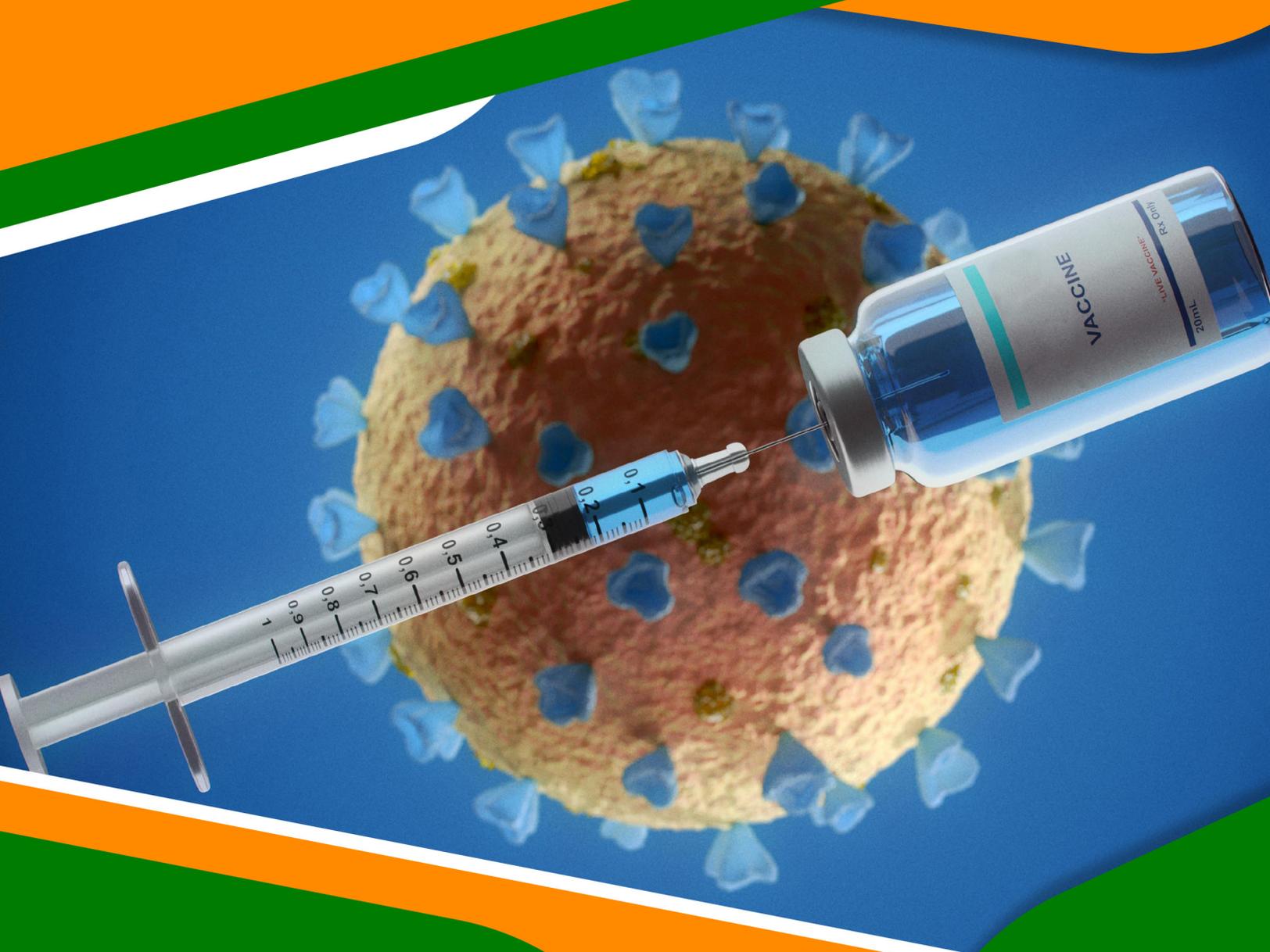


SCIENCE & TECHNOLOGY EFFORTS IN INDIA ON COVID-19

UPDATED WEEKLY
25th 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
व पृथ्वी विज्ञान मंत्री, भारत सरकार

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

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

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

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

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

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


(Dr. Harsh Vardhan)

कार्यालय: 348, ए-स्कंध, निर्माण भवन, नई दिल्ली-110011 • Office: 348, A-Wing, Nirman Bhawan, New Delhi - 110011

Tele: (O) : +91-11-23061661, 23063513 • Telefax: 23062358 • E-mail: hfwwminister@gov.in

निवास: 8, तीस जनवरी मार्ग, नई दिल्ली-110011 • Residence: 8, Tees January Marg, New Delhi - 110011

Tele: (R) : +91-11-23794649 • Telefax: 23794640

PREFACE

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

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

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

Dr Harsh Vardhan Launches DBT – AMTZ Mobile Diagnostic Unit for COVID-19 Testing - I-Lab

18th June 2020, New Delhi

The Minister for Science & Technology, Earth Sciences and Health & Family Welfare Dr Harsh Vardhan inaugurated and flagged off India's first I-Lab (Infectious disease diagnostic lab) for COVID-19 testing in rural and inaccessible areas of India. Secretary, Department of Biotechnology Dr Renu Swarup and other officials were present on the occasion. Dr Jitendar Sharma, CEO, Andhra Med Tech Zone CEO and senior officials from NITI Aayog, Ministry of Health & Family Welfare, MeITY, other ministries, ICMR, DST, CSIR etc. joined the function through web online.

Expressing his happiness to launch the I-Lab, a mobile testing facility, Dr Harsh Vardhan dedicated this to provide COVID-19 testing access to rural India. This mobile testing facility will be deployed through the DBT testing hubs to remote regions of the country for COVID-19 testing. He congratulated and appreciated the efforts of the DBT in tackling the pandemic and added that DBT coordinated in scaling-up testing for COVID-19 by reorienting premiere laboratories as COVID-19 testing centres in a hub-and-spoke model. There are now over 20 hubs in the country with 100 testing laboratories and these have tested more than 2,60,000 samples.



Dr Harsh Vardhan said, “This has been possible through the DBT-AMTZ COVID Command Consortia (COVID Medtech Manufacturing Development Consortia) to cope with the current situation in the country and move progressively towards a stage of self-sufficiency. The I-lab will be deployed through these hubs into remote and interior places.” The Minister appreciated the “Andhra med-tech zone team for building this unique, innovative facility for the country at the period of lockdown through tireless, dedicated and committed efforts.” He informed that AMTZ through the support of DBT has also established manufacturing facility for indigenous manufacturing of kits and reagents for various testing kits which were initially imported thereby helping us realise the vision of Pradhan Mantriji on ‘Make-in India’, ‘Make for India’. He pointed out that today there are 953 testing laboratories in all corners of the country and elaborated on “Various steps taken by the ministry and departments towards achieving research components indigenization and their in-house manufacturing.” Dr Harsh Vardhan emphasised that “In the near future with all these collective and cooperative efforts, India will achieve self-sufficiency in healthcare technologies leading towards Atma Nirbhar Bharat.”

Dr Renu Swarup said on the occasion that through the concerted efforts Indian scientists, the country has achieved a capacity of producing nearly 5 lakh testing kits per day, exceeding the target of having one lakh test kits by May 31, 2020. She pointed out that this I-Lab has been created in a record time of 8 days by the Andhra Pradesh Med-tech Zone team with the support of DBT under the National Biopharma Mission being implemented by the Public Sector BIRAC. She highlighted that the unit has biosafety facility and is capable of performing RT-PCR as well as ELISA tests.

DBT-AMTZ COMMANd

The Department of Biotechnology (DBT), Ministry of Science & Technology along with Andhra Pradesh Med-tech Zone (AMTZ) has initiated the DBT-AMTZ COMMANd [COVID Medtech Manufacturing Development] Consortia to address the shortage of critical healthcare technologies in India and move progressively towards a stage of self-sufficiency.

Under this Consortia, India’s first I-Lab has been built at AMTZ in record time of 8 days from the date of receipt of Automotive Chassis from Bharat Benz. This is a mobile diagnostic unit with biosafety facility. The I-Lab is a BSL-2 facility with on-site ELISA, RT-PCR, Bio chemistry analysers. It can run 50 RT-PCR reactions and about 200 ELISA in a day. Double set of machines can help increase the capacity to about 500 per day in 8 hours shift

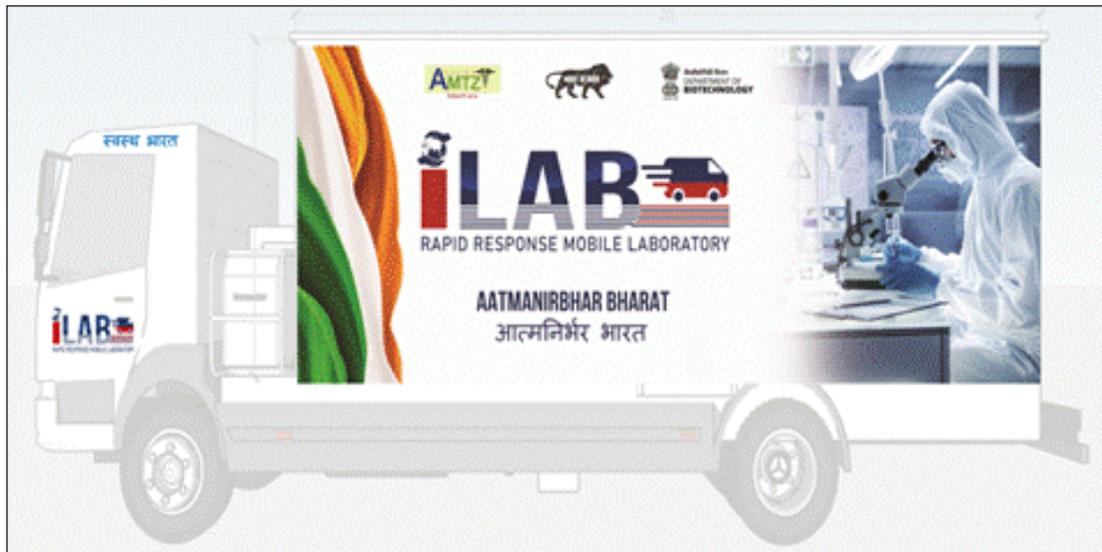
It can be deployed in remote areas and can be lifted from automotive chassis and can be put on goods train for sending to any location in the country. The BSL-2 Lab is as per NABL specifications and is being attached to DBT’s certified testing centres.

The Department of Biotechnology (DBT), under the Ministry of Science & Technology, promotes and accelerates the development of biotechnology in India, including growth and application of biotechnology in the areas of agriculture, healthcare, animal sciences, environment and industry.

AMTZ is Asia’s first medical equipment manufacturing ecosystem, uniquely dedicated for Medtech and supported by various Ministries.

INFECTIOUS DISEASE DIAGNOSTIC LABORATORY (I-LAB)

- To promote last-mile access of testing to rural India, DBT under the COVID-Command strategy has supported building of mobile testing labs through AMTZ.



- The unique feature of these mobile testing labs is their utility in diagnosing other infectious diseases beyond the COVID period

Specifications

- Automotive Chassis, Diagnostic Equipment, Clean Room, BSL-2 lab, bio-safety cabinets
- 25 Tests (RT-PCR) per I-Lab per day
- 300 ELISA tests/day
- Costs of additional test for other diseases for TB, HIV etc. to be as per CGHS rates.

Deployment

- The first I-Lab was launched in New Delhi on 18th June, 2020 by Dr Harsh Vardhan, Minister for Science & Technology, Earth Sciences and Health & Family Welfare.
- The Labs will be provided to the regional/City hubs and they will deploy it further in the interior, inaccessible parts of the region.



Dr Harsh Vardhan elected as Chair of Executive Board of WHO

22nd 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 17th Lok Sabha and sworn in on May 30th, 2019 as Union Cabinet Minister and was given the portfolios of Health and Family Welfare; Science and Technology and Earth Sciences.

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

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

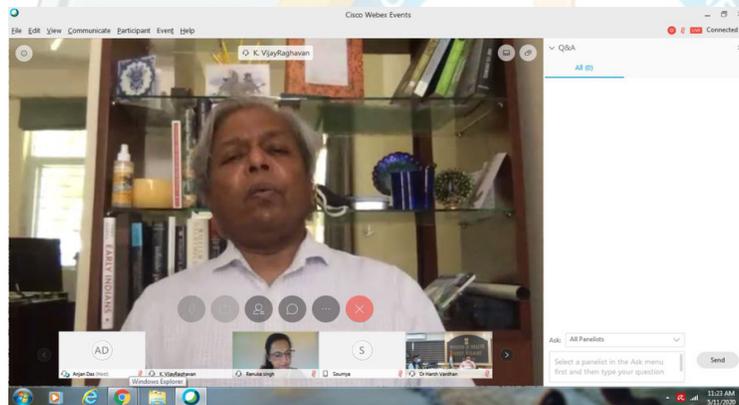
supported the 'Make in India' Programme. This has brought in scientific institutions and start-ups to develop the Covid-19 tests, masks, sanitizers, personal protective equipment (PPEs) and ventilators," he further added.

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 50th 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-1 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 7th 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. 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 hexagon with a group of people icon: 'Promote AYUSH knowledge for larger good of the global community'. 4. A purple hexagon with a person 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 a circular seal with text in Hindi.

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.

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

— DR. HARSH VARDHAN

3rd May 2020, New Delhi

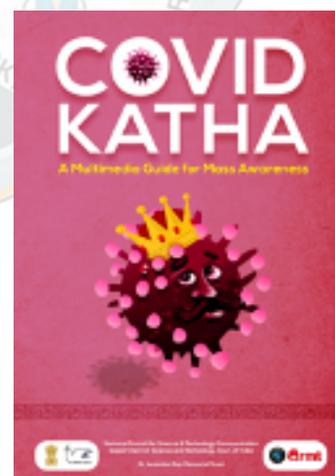
Union Minister of Science & Technology, Health & Family Welfare and Earth Sciences, Dr. Harsh Vardhan today interacted with Heads of all Autonomous Institutions (AIs) and Subordinate offices of Department of Science & Technology (DST) via Video Conferencing on the occasion of 49th DST Foundation Day (3rd 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 50th 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 3rd 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>

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

— DR. HARSH VARDHAN

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

- Dr. Harsh Vardhan

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.

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

12th April 2020, New Delhi

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

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

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



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

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

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

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

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

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

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

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

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

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

Dr. 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

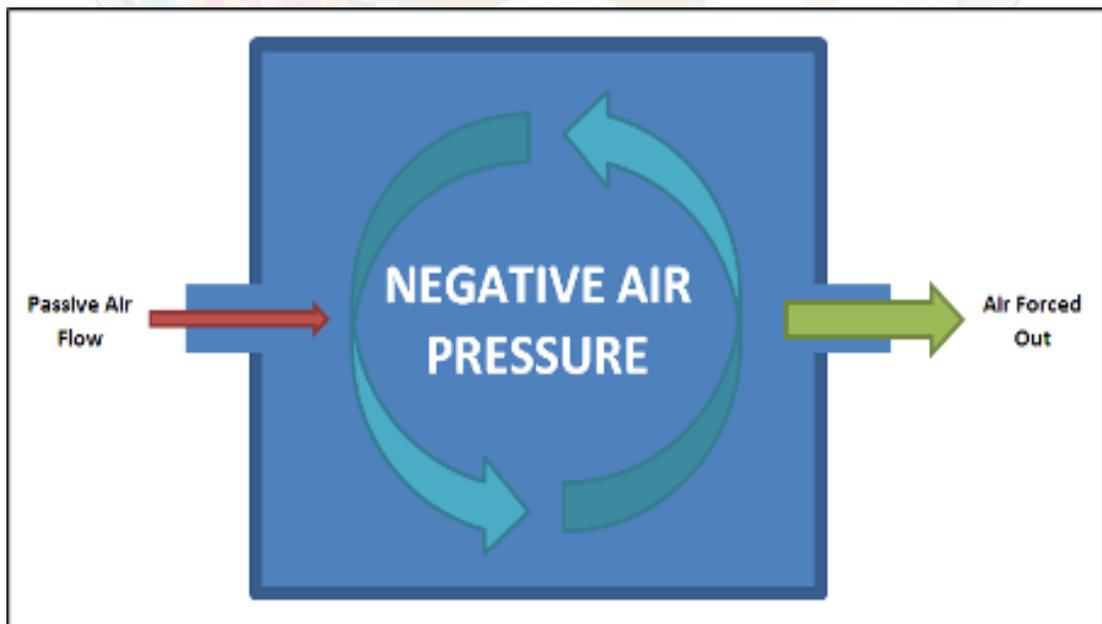
OFFICE OF THE PRINCIPAL SCIENTIFIC ADVISER (PSA)

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.

IIT Ropar develops negative pressure room, now developing negative pressure ambulance, isolation rooms & ICUs

During the unprecedented COVID-19 crisis, CII has significantly contributed in building collaborations wherever possible between companies and academic institutions. In partnership with ACMA, SIAM, IMTMA and SIDM, CII formed a network of companies for augmenting the inventory of ventilators through manufacturing by utilising their resources such as plant and machinery and highly skilled manpower to mass-manufacture ventilators or through import. Parallely, with the support of the PSA's office, a consortium of innovative COVID-19 technologies, offered by industry and start-ups incubated by national research laboratories, government agencies and academic institutions was also formed to make technologies available for industry partnerships.





IIT Ropar has signed a technology transfer agreement with Espee Industries, Chandigarh for the manufacturing of UV-C Sterilization Unit that can kill microbes. Further, the Institute has also developed a design of a Negative Pressure Room (NPR) to prevent the transmission of COVID-19 through the air at isolation wards and testing labs. This technology will prevent the most vulnerable medical staff from infection. IIT Ropar is installing these low-cost negative pressure cabins in the COVID-19 wards of the medical centres in Rupnagar through the CSR support from Ansys Inc. In addition, it is jointly developing the country's first negative pressure ambulance, isolation room and ICU rooms (fully equipped with medical facilities) with Bafna Healthcare Pvt. Ltd., Faridabad, under an exclusive MoU signed with the company. Researchers at the Institute have also developed anti-microbial coatings for PPE kits and disinfectant spray in tunnels. This technology has received a lot of traction and active technology transfer negotiations are underway.

IISc working on novel ventilator design through 'Project Praana,' supported by SBI Foundation and Infineon Technologies

Project Praana has developed a novel design to build an emergency electro-mechanical ventilator for the COVID-19 crisis, using components available in India. The ventilator will have the functionality, look, feel, and safety standards of a commercially available ventilator in the market. The hardware framework is designed to immediately meet the key functionality requirements of an ICU-grade ventilator, while it can also support future add-on features available in advanced commercial ventilators.

The main features of this project are the novel design for robust and safe operation, easy sourcing of components, rapid scaling up in terms of manufacturing and deployment of the product, and simple user interface. Though it is not a stop-gap solution or a 'low cost' ventilator, it is expected to be priced in the range of Rs. 1.5 to 2 lakh per unit, which is substantially lower than currently priced models in the Indian market.

The project has successfully realised a full proof-of-concept for the new design on a benchtop experimental setup. Project Praana is being supported at Indian Institute of Science (IISc), Bengaluru; CSR funds from SBI Foundation; and Infineon Technologies India Pvt Ltd.

Capgemini supports IISc for antibody testing for COVID-19

After infection with SARS-CoV-2, the human body generates virus-specific antibodies that usually prevent another infection. However, it is still unclear how quickly and how often this immunity is generated. COVID-19 antibody-based serological tests are designed to detect these virus-specific antibodies in a blood sample, in contrast to the PCR tests that are used to detect the presence of viral RNA in nasal swabs.

Antibody or serological tests are relatively cheaper, faster and easier and can detect whether a person was infected with the virus in the past (even if they have completely recovered from COVID-19 and have never been tested for the virus). This information is helpful in determining the prevalence of the disease in the community and designing vaccination studies. Since infected individuals are unlikely to get re-infected for at least another 8-9 months, it has been suggested that these tests could also be used as immunity passports for people to resume work. However, these tests can suffer from poor sensitivity and specificity, which can complicate interpretation of the data.

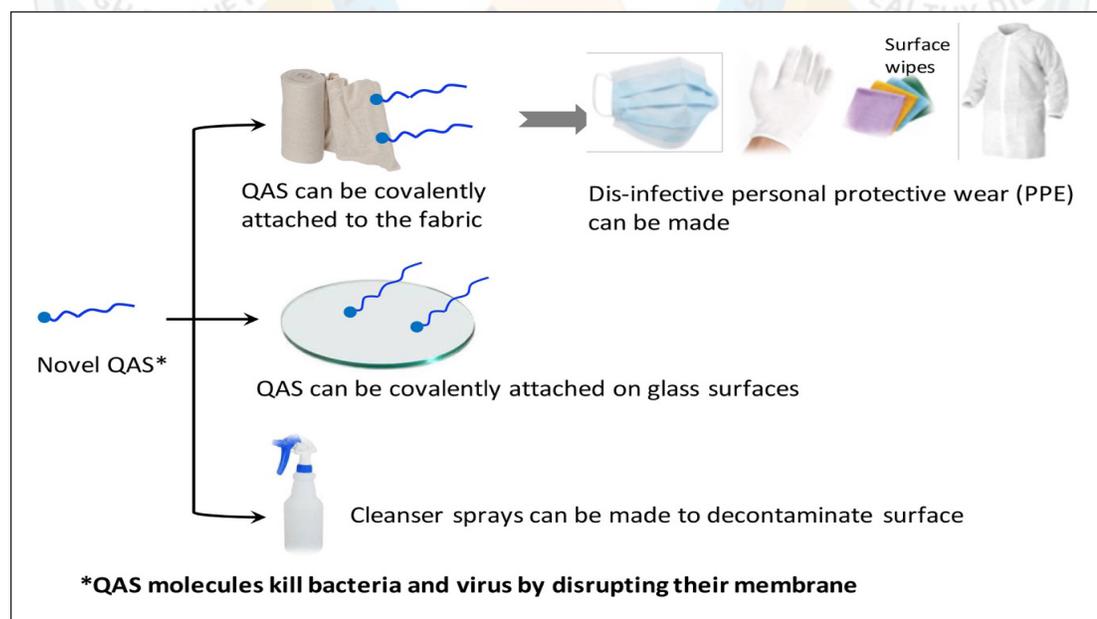
Conventionally, native antigen proteins are used for serological testing, but these have poor performance when produced in large quantities. The team at IISc has proposed an alternative to this by using a combination of several small peptide immunogens (15-30 amino acids long) that are specific to SARS-CoV-2 that can be used to reduce false positives. The team has shortlisted a few peptides that would give higher specificity to these antibody tests as compared to the currently available ones. As these peptides can be chemically synthesised with high quality, the tests are expected to be highly reproducible with longer shelf life. They will be developed in two conventional formats—a high sensitivity ‘ELISA’ format and a rapid test version. CapGemini Corporation India is supporting this effort with funds for development of the test.

NCBS and inStem are working on disinfection technologies

A team led by Praveen Vemula of Institute for Stem Cell Science & Regenerative Medicine (inStem) and Satyajit Mayor of National Centre for Biological Sciences (NCBS) is leading the effort at our centres to develop effective disinfecting technologies.

Given the acute shortage of masks and protective gear envisaged for battling the COVID-19 epidemic, there is need for a rapidly-deployable method for disinfectives capable of neutralising the virus on contact on any surface. The team has developed a low-molecular-weight quarternary ammonium salt (QAS) which can be attached to fabric by heating at 56 degrees Celsius. It is currently also in the process of testing its effectiveness against the coronavirus. This compound can be made at an industrial scale and a Hyderabad-based company is willing to produce high quantities of the compound.

The developed product will provide an immense boost to the longevity of protective equipment in an extremely economical manner, rendering protective equipment more accessible and reusable.



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

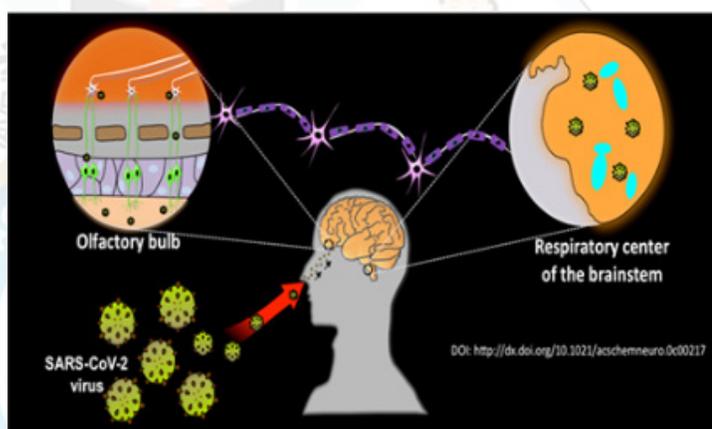
SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

DEPARTMENT OF SCIENCE AND TECHNOLOGY (DST)

SERB-supported study shows that collapse of respiratory centre in the brain may cause breakdown of COVID-19 patients

The team of researchers at CSIR-Indian Institute of Chemical Biology (IICB), Kolkata has explored the neuro-invasive potential of SARS-CoV-2 and suggested that the virus may infect respiratory centre of the brain and attention should be focused on the respiratory centre of the central nervous system to search for mortality due to COVID-19.



The paper published in ACS Chemical Neuroscience and supported by Science & Engineering Research Board (SERB), a Statutory Body of the Department of Science & Technology (DST), implies that SARS-CoV-2 virus might enter the human brain through the nose and reaches the olfactory bulb of the brain. From there, SARS-CoV-2 virus might infect PreBötzinger complex (PBC), the primary centre of the brain that controls the respiratory rhythm generation. This explains that collapse of the respiratory centre in the brain may be responsible for breakdown of COVID-19 patients.

Contact Info: Dr. Prem Prakash Tripathi, prem.tripathi@iicb.res.in

Website link:

<https://dst.gov.in/serb-supported-study-shows-collapse-respiratory-center-brain-may-cause-breakdown-covid-19-patients>

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

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>



SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

DEPARTMENT OF BIOTECHNOLOGY (DBT)

DBT-BIRAC supports a new non-alcoholic disinfectant to stop COVID-19 spread

Hospital-acquired infections affect millions of people worldwide. In the present juncture, when the COVID-19 pandemic is sweeping across the world, transmission through contact is very high and the risk is even higher while visiting the hospitals.

To tackle this issue, the DBT's Biotechnology Industry Research Assistance Council (DBT-BIRAC) is supporting a new non-alcoholic aqueous-based colloidal silver solution developed by Weinnovate BioSolutions from its NanoAgCide™ technology for disinfecting hands and environmental surfaces.

Silver nanoparticles have antiviral efficacy against many viruses such as HIV, Hepatitis B, Herpes simplex virus, and Influenza virus. Recent reports have suggested the role of silver nanoclusters in inhibiting the proliferation of Coronavirus also. Nanoparticles are rapidly emerging as an effective solution to a variety of issues related to COVID-19, from disinfection to imaging. Silver nanoparticles-based materials will be able to prevent the contact infection of healthcare workers, besides preventing patient infection. Colloidal silver can affect COVID-19 spread by blocking the RNA replication and reduce infectivity by blocking the surface glycoproteins.

This proprietary technology is gentle on the skin and doesn't require any special arrangement for storage unlike the alcohol-based sanitizers which are highly inflammable making their production, transportation and storage a risky affair. Another major advantage is that the solution releases the silver nanoparticles on the surface in a slow and sustained manner which ensures its effectiveness for a longer duration.

The product is priced at Rs. 450 for a 500ml bottle. An Indian patent has been filed for the process of making the colloidal silver and a test license has been granted for making hand sanitizers and disinfectants. The start-up aims to manufacture 200 litres or more of colloidal silver solution per day to cater to the demand of hand sanitization and disinfection.



Innovativeness:

- Safe: Aqueous based, no hazardous chemicals;
- Effective against bacteria, spores and viruses;
- Can be used on all surfaces;
- Stays on the surface for a longer time;
- More effective;
- Non-Inflammable.

Contact Info: Dr Shirshendu Mukherjee (mdpmubmgf@birac.nic.in); Dr Hafsa Ahmad (nbm9@birac.nic.in); Ms Ginny Bansal (pmubmgf6@birac.nic.in)

Website link:

https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_01S_22June2020.pdf

<https://www.birac.nic.in/>

https://birac.nic.in/webcontent/1589286696_Potential_COVID_19%20Solutions_20200512.pdf

DBT-InStem scientists test new algorithm for COVID-19 testing

Researchers at the DBT's Bengaluru-based Institute for Stem Cell Science & Regenerative Medicine (DBT-InStem) is in the process of writing a new chapter in the history of sample testing in collaboration with their colleagues in Tata Institute of Fundamental Research's National Centre for Biological Sciences (NCBS) and IIT, Mumbai.



Random pooling of test samples is an important testing strategy

for community surveillance and wide coverage during epidemics. However, this approach is relevant only in areas with low levels of infection and not effective when prevalence rates are close to or higher than 5% in a population. Researchers are working towards developing smart pooling strategies that overcome this limitation.

In a method known as combinatorial tapestry pooling, individual samples are pooled together with various combinations. Thus, each pool comprises a combination of different individual samples. No two pools are identical. This is designed and achieved using sophisticated computerized algorithms, which once developed, can be executed by individuals trained in sampling and running diagnostic RT-PCR-based assays using automated approaches.

The major advantage of this effort is that depending on the combination of pools in the matrix, it is even possible to identify individual samples that are positive, thereby eliminating the requirement for second-round testing of individual samples in pools and thus provide for faster reporting.

Theorists at NCBS and IIT Mumbai have developed one such algorithm, which is currently being experimentally tested in the laboratories at inStem. It involves matrices of increasing complexity and samples of known status. Two matrices have been tested successfully. More are in the pipeline.

Meanwhile, activity in the COVID-19 testing laboratory jointly run by DBT-InStem and NCBS at the Bangalore Life Science Campus continues without a break. Testing is primarily driven by volunteers drawn from students, staff and the laboratory. It has continued to process 300-500 samples a day. The laboratory functions seven days a week with volunteers managing fatigue and many other constraints as they strive to fulfil their commitment to the effort. They are, among other things, learning how to strike a balance between the responsibility and their ownership of the testing effort with the tug of their research, as activities cautiously ramp up in the laboratories on campus. A wonderful story on this future generation of research leaders, their motivation and the impact of this experience in their lives, is in the making.

Contact Info: Amrita Tripathy (tripathya@instem.res.in)

Website link:

https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_02S_22June2020.pdf

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

Jeevtronics: Hand-cranked ‘SanMitra 1000 HCT’ defibrillator for sudden cardiac arrest, a potential COVID-19 solution

Biotechnology Industry Research Assistance Council (BIRAC)-supported start-up Jeevtronics has developed the world’s first hand-cranked defibrillator since sequestration areas inside hospitals for corona victims need lots of defibrillators. The “SanMitra 1000 HCT” defibrillator is particularly useful for COVID-19-like situations. This device is a dual-powered (Hand-Cranked and Grid) defibrillator. This defibrillator works both on grid electricity and on a built-in hand-cranked generator. Thus, it is more reliable than traditional defibrillators.



This low-cost device does not need a battery replacement and can be powered in a few seconds by rotating a small hand paddle. It is proving to be a lifesaver in regions where electricity is scarce. Defibrillators powered by electricity are common at airports and hospitals, but this ‘Made in India’ machine is cost effective as compared to the imported electric defibrillators. This light-weight innovation does not require inverter backup and has been engineered to be most suitable for ambulances wherein it can withstand high/low temperatures, vibrations, water ingress etc. Thus, this defibrillator is a step forward in affordable lifesaving technology.

Some of the important features of the machine are bi-phasic, light weight, low cost, no inverter back-up required, useful for ambulances, hospitals, off-grid locations, disaster relief, can be used by armed forces, stadium etc.

The Coronavirus outbreak has brought life to a near standstill in most parts of the world. Elderly people, pregnant women and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness.

Contact Info: Dr Shirshendu Mukherjee (mdpmubmgf@birac.nic.in); Dr Hafsa Ahmad, (nbn9@birac.nic.in); Ms Ginny Bansal (pmbmgf6@birac.nic.in)

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https://birac.nic.in/webcontent/1589286696_Potential_COVID_19%20Solutions_20200512.pdf

DBT's BIRAC recommended funding support for development of DNA Vaccine Candidate for COVID-19

The DBT's Biotechnology Industry Research Assistance Council (BIRAC), New Delhi has recommended funding support for development of DNA vaccine candidate for COVID-19 under the National Biopharma Mission as part of its COVID Research Consortium Initiative. The proposed DNA vaccine candidate of Zydus comprises of a DNA plasmid vector, carrying the gene, encoding the spike protein of the SARS-CoV-2 virus. The S protein of the virus includes the receptor binding domain (RBD), responsible for binding to the human angiotensin converting enzyme (ACE)-2 receptor which mediates the entry of the virus inside the cell.



The spike protein of SARS-CoV-2 virus would be designed and synthesized in a suitable plasmid and transformation in a prokaryotic system. The immunogenicity potential of the plasmid DNA would be evaluated in suitable animal model in a dose ranging studies using different formulations. Once the proof-of-concept is established, preclinical toxicology studies would be taken up. Simultaneously, production of plasmid DNA would be scaled up and subsequently manufactured under cGMP conditions for clinical trials.

The COVID-19 pandemic has been one of the major healthcare crises in recent times with over 3 million people being infected with the disease globally and 417,000 people succumbing to it. There is an urgent need to accelerate the development of vaccines, which will provide a long-term solution to the infection. Zydus is developing an effective DNA vaccine against SARS-CoV-2 infection. It also has the necessary infrastructure and capabilities to manufacture large quantities of the vaccine. Recently, this candidate was recommended funding support under the DBT-BIRAC COVID Research Consortium via DBT's National Biopharma Mission.

Contact Info: Dr Shirshendu Mukherjee (mdpmubmgf@birac.nic.in); Dr Hafsa Ahmad, (nbm9@birac.nic.in); Ms Ginny Bansal (pmbmgf6@birac.nic.in)

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SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH (CSIR)

CDRI to carry Phase III clinical trials of Umifenovir

The Central Drug Research Institute (CDRI), Lucknow, has received permission from Drug Controller General of India (DCGI) for carrying out Phase III clinical trials to test the efficacy, safety and tolerability of the antiviral drug Umifenovir. The Phase III activities will be carried out at King George's Medical University (KGMU), Dr Ram Manohar Lohia Institute of Medical Sciences (RMLIMS) and Era's Lucknow Medical College and Hospital, Lucknow.

Umifenovir is mainly used for treatment of influenza and is available in China and Russia, with the brand name of Arbidol and has recently come into prominence due to its potential use for COVID-19 patients. To evaluate its efficacy in Indian patients, CDRI has taken up the clinical trial.

These will be randomised, which means the drug would be tested in random manner, double blind, placebo-controlled trials. "This drug has a good safety profile and acts by preventing entry of virus into human cells and also by priming the immune system. Hopefully we will complete the trials in the next two months," said Dr Ravishankar Ramachandran, Nodal Scientist, CDRI.

Prof. Tapas Kundu, Director, CSIR-CDRI, said that all the raw materials for the drug are indigenously available and if the clinical trial is successful, Umifenovir can be a safe, efficacious, affordable drug against COVID-19 and can be part of the national programme against COVID-19. Prof. Kundu also added that this drug has the potential for prophylactic use.

Dr Shekhar Mande, Director General, CSIR, told that this clinical trial is an integral part of the CSIR's strategy of repurposing drugs for COVID-19.

The clinical trial application was processed on high priority as per the DCGI initiative against COVID-19. The next steps of the trial are being fast-tracked to enable the availability of the drug to Indian patients as soon as possible.

Website Link:

<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-1-17-June-20.pdf>

<https://cdri.res.in/Home.aspx>

Over 16,000 applications received for CSIR's Summer Research Training Programme

The CSIR has received an overwhelming response by way of over 16,000 applications from all across the country for its Summer Research Training Programme (CSIR-SRTP). It is informed by Dr. G. Narahari Sastry, Director, CSIR-North East Institute of Science and Technology (NEIST), Jorhat, Assam.

Dr Sastry was speaking on the occasion of the curtain raiser of CSIR-SRTP (2020) hosted by CSIR-NEIST, the coordinating institute of the programme. The event was inaugurated online by Dr Shekhar C. Mande, DG, CSIR, and Secretary, Department of Scientific and Industrial Research (DSIR), Government of India.

“The concept of this online Summer Research Training Programme started budding with the lockdown triggered by the COVID-19 pandemic that sent the academic scenario throughout the country into doldrums. To dissolve the lull created by the pandemic in the academics of the nation and to uplift the constructive spirit among the students fraternity of the country, Dr Shekhar C. Mande has given the mandate to CSIR-NEIST to conceptualize this programme, which is happening for the first time in the academic history of India,” said Dr G. Sastry.

The last date of receiving the applications was extended from 5 June to 8 June, 2020. Dr Sastry lauded the dedicated team of CSIR-NEIST for accomplishing the Herculean task of processing the plethora of applications on war-footing in a span of two days and then having the list of shortlisted candidates declared by 10 June, 2020.

Dr Sastry concluded by saying that the best of the innovation in science and technology have come about during the times of war, pandemic, and natural disasters. Therefore, this pandemic has posed a challenge and given an opportunity to science and technology to give its best.

Website Link:

<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-4-17-June-20.pdf>

<http://neist.res.in/srtp2020/>

NRDC licenses manufacturing know-how of NavRakshak to MSMEs

The National Research Development Corporation (NRDC) has licensed the manufacturing know-how of NavRakshak, a Personal Protective Equipment (PPE) Suit, to five companies in the Ministry of Micro, Small and Medium Enterprises (MSME) sector. The move is expected to increase the production of the same to meet the ongoing country-wide demand of quality PPE kits.

NavRakshak is cost-effective as it does not require any major capital investment and can be adopted even by gown manufacturing units using basic stitching expertise. “The technology and quality of fabric is so superior that there is no need of sealing around the seam of the PPE suit, thus eliminating the need of importing costly sealing machines and tapes,” said Dr H Purushotham, Director, NRDC. The PPE fabric does not require any lamination with polymer or plastic-like film. This enables the PPE to permeate heat and moisture from the skin of the user. It gives protection but does not compromise on comfort. This uniqueness of the PPE makes it way different from the existing PPEs being used.

NavRakshak has been designed by a Naval doctor incorporating personal experience in using the PPE for the comfort and protection of the doctors. The enhanced breathability factor in the PPE suit makes it an attractive proposition considering that frontline health workers use it for long hours.

The PPE suit is available in single-ply as well as double-ply versions as per the need of end-use conditions. It also comes with a head gear, face mask and shoe cover up to the mid-thigh level. A patent application has been filed for NavRakshak PPE by the inventors through NRDC.

The manufacturing know-how of NavRakshak PPE has been developed at the Innovation Cell of the Institute of Naval Medicine, INHS Asvini Hospital (Mumbai) of the Indian Navy from where the name 'NavRakshak' is derived. The PPE has been tested and certified at the Institute of Nuclear Medicine and Allied Sciences (INMAS), Defence Research Development Organisation (DRDO). DRDO is one of the nine National Accreditation Boards for testing and Calibration Laboratory (NABL) accredited labs authorised by the Ministry of Textiles for PPE prototype sample testing as per the prevailing ISO standards and guidelines of the Ministry of Health and Family Welfare/Ministry of Textile. NavRakshak has been found to meet the synthetic blood penetration resistance criteria for the fabric, suit, and seam.

Website Link:

<https://pib.gov.in/PressReleasePage.aspx?PRID=1632335>

http://nrdcindia.com/assets/vendor/filemanager/userfiles/Latest_News/Technology_Write_up_for_NavRakshak.pdf

सीएसआईआर-सीमैप ने व्यावसायिक उत्पादन के लिए सौपी सैनिटाइजर बनाने की तकनीक

लखनऊ स्थित केंद्रीय औषधीय एवं सगंध पौधा संस्थान (सीएसआईआर-सीमैप) द्वारा विकसित सैनिटाइजर को व्यावसायिक उत्पादन के लिए लखनऊ की ही कंपनी मेसर्स बी. केयर श्योर लाइफ क्योर एलएलपी को हस्तांतरित किया गया है। इस हर्बल सैनिटाइजर को बनाने वाले वैज्ञानिकों का कहना है कि यह सैनिटाइजर खुशबूदार है और त्वरितरूप से प्रभावी है, जिसमें 70 प्रतिशत अल्कोहल की मात्रा है। सैनिटाइजर की तकनीक को हस्तांतरित करने से संबंधित समझौते पर कंपनी के निदेशक प्रबंध पंकज सिन्हा और सीएसआईआर-सीमैप के प्रशासनिक अधिकारी भास्कर ज्योतिदेउरी ने हस्ताक्षर किए हैं। सीएसआईआर-सीमैप के निदेशक डॉ. प्रबोध कुमार त्रिवेदी और पंकज सिन्हा द्वारा समझौता पत्र को साझा किया गया है। संस्था जल्द ही अपनी निर्माण सुविधा में इस उत्पाद का उत्पादन शुरू करेगी।

Website Link:

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

<https://twitter.com/CSIRCIMAP/status/1272547606866976769>

Webinar on Environmental Perspectives of COVID-19

The world has changed within a period of few months. The global outbreak of Coronavirus disease (COVID-19) has thrown up many unforeseen challenges of unprecedented scale before humankind. As a control measure, different countries including India called for a prolonged lockdown to prevent the spread of the disease. The lockdown led to closure of all the industrial and developmental activities and vehicular movement. Along with major economic and social disruption, the lockdown also showered unexpected gains in improving the global environment such as clean air and water.

CSIR-National Institute of Science, Technology and Development Studies (NISTADS) has organized a webinar on World Environment Day (5th June) to bring together thought leaders who can enrich this discourse and provide their insights into the new approaches the country should adopt for sustainable techno-socio-economic development.

The poster is for a webinar titled "Environmental Perspectives of COVID-19: A ray of Bloom in gloom". It is organized by CSIR-National Institute of Science, Technology and Development Studies (NISTADS) on World Environment Day, June 5, 2020, from 11:00 AM to 1:00 PM. The poster lists several distinguished speakers, a chairperson, a moderator, and co-ordinators. The speakers include Dr. Krishna Srinivasan (Head of Expiration, UNDP), Dr. A.S. Rao (Professor & Head, Department of Botany, University of Delhi), and Dr. Jagdish Chakrabarti (Centre for Forest, Insect, & Governance, TERI University). The chairperson is Prof. Rangana Agrawal (Director, CSIR-NETAG, & CSIR-MSGAR). The moderator is Prof. Subh Chatterjee (Chief Scientist, CSIR-NETAG). The co-ordinators are Dr. Madhulika Shrivastava (Principal Scientist, CSIR-NETAG) and Dr. Shiv Narayan Mishra (Scientist, CSIR-NISTADS). The poster also features logos of CSIR, NISTADS, and a globe.



“We have seen positive impact even during the pandemic, nature is healing, we all are experiencing clean air, and clean water. An Important Question is now to make it sustainable even after when all get back to work after lockdown. It is golden opportunity to work upon on the strategies how to retain these gains when severity of the COVID will be reduced,” said Dr Ranjana Aggarwal, director, CSIR-NISTADS.

“Dynamic leadership can bring significant policy inputs for future strategies to retain this gain and overcome challenges of increase water consumption and hazardous medical waste problems,” said Dr. Sujit Bhattacharya, Chief Scientist, CSIR-NISTADS, in his introductory remarks during the webinar.

Dr Madhulika Bhati, Principal Scientist, CSIR-NISTADS; Dr Krishnan Srinivasaraghavan, Head of Exploration, Country Accelerator Lab, UNDP India; Dr S.K. Tyagi, Former Additional Director of Central Pollution Control Board; Dr K.S. Rao, Professor & Head, Department of Botany, Delhi University; and Dr Yogesh Ghokale, Senior Fellow with The Energy and Resources Institute (TERI) were among the experts who expressed their views during the event. This webinar ended with interactive question-and-answer session.

Website Link:

<https://nistads.res.in/sites/default/files/special%20events/World%20Environment%20Day%20Report.pdf>

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

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

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

ICMR invites Expression of Interest (EOI) for transfer of technology for development of equine anti-serum against SARS-CoV-2

ICMR, the apex body of medical research in India, invites Expression of Interest (EOI) through email from experienced Indian agencies for undertaking transfer of technology for development of equine anti-serum against SARS-CoV-2. The EOI Document containing the details of qualification criteria, submission details, brief objective and scope of work and evaluation criteria etc. are available at ICMR website.

Last Date of Submission: 26th June 2020

Website Link:

https://www.icmr.gov.in/pdf/tender/EOI_%20Technology_Transfer_17062020.pdf

Updated Advisory for managing healthcare workers working in COVID and Non-COVID areas of the hospital

The healthcare personnel working in hospitals are at increased risk of acquiring the COVID-19 disease, if there is a breach in the personal protection while managing patients. The healthcare workforce is a valuable and scarce resource. Large number of COVID-19-affected health personnel getting isolated for treatment and their close contacts undergoing quarantine affects the health and the hospital service delivery.

Ministry of Health & Family Welfare (MoHFW) has released the updated advisory for managing healthcare workers working in COVID and Non-COVID areas of the hospital. The purpose of the document is to provide guidance on preventive measures, isolation and quarantine of healthcare functionaries.

Website Link:

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

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

MINISTRY OF AYUSH

National repository of AYUSH COVID-19 clinical and other R&D initiatives

AYUSH Research Portal is aimed at disseminating the knowledge of AYUSH systems and the current research updates purely meant for academic purpose. In this portal, users can search AYUSH terminology, research articles, journals etc. You can also search information the Ayurveda, yoga, naturopathy, Unani, Siddha, Homeopathy etc., and information about the clinical research, pre-clinical research, drug research and fundamental research.



This initiative aims to collate the current research and clinical activities and updates related to the COVID-19 pandemic.

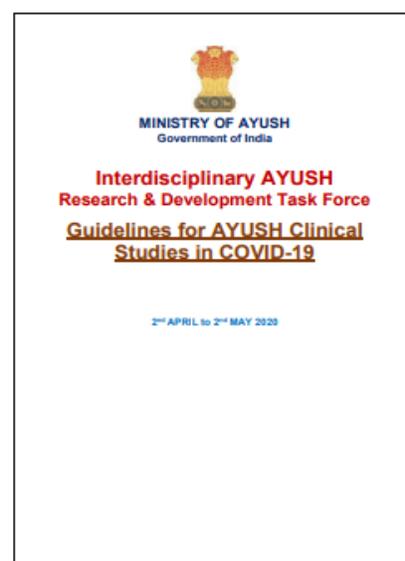
Website link:

<http://ayushportal.nic.in/Covid.aspx#tabs>

Ministry of AYUSH releases guidelines for AYUSH Clinical Studies related to COVID-19

CoronaVirus Disease-19 (COVID-19) pandemic is a challenge to public health worldwide. In spite of implementation of prophylactic strategies such as promotion of hygiene, social distancing and global lockdown, the spread of disease remains a challenge. There is no 'Standard of Care' available in view of inadequate evidence on existing medicines and their limitations. This is an opportune time when AYUSH concepts and interventions should be evaluated for developing better arsenals to prevent and treat the disease. With this objective, the Ministry of AYUSH has constituted an Interdisciplinary AYUSH Research and Development Task Force for facilitating research on COVID-19.

The pandemic has however raised complex issues for health systems, communications, research infrastructure,



and research governance frameworks. On the background of rapidly evolving scientific and ethical uncertainties, it is a challenge to design research that can yield scientifically valid results. The other short-term challenges include time available to design a study and lack of resources to conduct the study. Any research which is planned during such period should be based on thorough understanding of the disease and its importance as a public health challenge. The AYUSH Task Force has therefore recommended development of a guidance document for researchers that will discuss methodological components of a protocol for evaluating AYUSH interventions in COVID-19.

Website link:

<https://www.AYUSH.gov.in/docs/clinical-protocol-guideline.PDF>

Ministry of AYUSH issues advisory for meeting the challenge arising out of spread of Novel Coronavirus in India

The holistic approach of AYUSH systems of medicine gives focus on prevention through lifestyle modification, dietary management, prophylactic interventions for improving the immunity and simple remedies based on presentations of the symptoms.

For instance, emphasis on avoidance of causative factors and enhancing the immunity against host of infections are characteristics of Ayurveda management. The preventive aspect of Homoeopathy is well known, and historically, Homoeopathy has reportedly been used for prevention during the epidemics of Cholera, Spanish Influenza, Yellow fever, Scarlet fever, Diphtheria, Typhoid etc. The Genus Epidemicus (GE) is the remedy found to be most effective for a particular epidemic once data have been gathered from several cases. It was reported that, during recent past, GE had been used during various disease outbreak for preventing the spreading of diseases like Chikungunya, Dengue Fever, Japanese Encephalitis and Cholera with good results.

The AYUSH approach to manage the outbreak broadly comprise of:

- Preventive and prophylactic;
- Symptom management of COVID-19-like illnesses; and
- Add on interventions to the conventional care.

Website Link:

<https://www.AYUSH.gov.in/docs/125.pdf>

Notification issued for undertaking research on COVID-19 through Ayurveda, Unani, Siddha and Homoeopathy systems by Ministry of AYUSH

In the wake of COVID-19 caused by SARS-CoV-2, there has been surge in proposals received by Ministry of AYUSH claiming possible treatment of COVID-19. At present, there is no approved treatment for COVID-19 infection. Indian Traditional Medicines have wide potential for usage in such conditions owing to their longstanding use in the community, huge number of ancient references and large number of publications in scientific journals on their phyto-chemical constituents, mode of action, clinical efficacy etc. At the same time, it is also essential to have scientific evidence on use of any Ayurveda, Unani, Siddha or Homeopathy formulation on prevention/ management of COVID-19. Therefore, it is felt necessary to make serious efforts for development of drugs based on any of AYUSH systems recognized under Drugs and Cosmetics Act, 1940.

There are no specific regulatory provisions in the Drugs & Cosmetics Rules 1945, for conduct of clinical trials of Ayurveda, Siddha, Unani and Homeopathy drugs. At the same time, it is also necessary that the clinical data generated is scientifically valid and credible. In this context the Ministry has undertaken consultation with DCGI, CDSCO as well as other research experts.

In the above background and based on the consultation of CDSCO, the Ministry of AYUSH with the approval of Minister of State Independent Charge of AYUSH notifies that the scientists, researchers, clinicians of any of recognized systems of medicine under IMCC Act 1970, HCC Act 1973 and NMC Act 2019 (formerly IMC Act 1956) can undertake research on COVID-19 through Ayurveda, Siddha, Unani and Homeopathy systems including prophylactic measures, intervention during the quarantine, asymptomatic and symptomatic cases of COVID-19, public health research, survey, lab-based research etc. to generate evidence.

While undertaking research, it is mandatory for the organizations to comply with the following conditions:

- The proposal should be approved by their scientific advisory bodies and Institutional Ethics Committees.
- If it is clinical trial, the project should be registered with CTRI.
- The sample size should be based on statistical justification.
- The clinical research should be conducted as per AYUSH guidelines for Clinical Research or ICMR guidelines.
- It should be complied with relevant regulations for Bio-medical and Health Research.
- It should be complied to Good Clinical Practice Guidelines.
- It should be complied to National Ethical Guidelines for Bio-medical and Health Research on Human Participation published by ICMR.
- It should be complied with any other relevant regulations in force.
- AYUSH-registered practitioner/expert should be part of the study team at each site.

Website link:

<https://www.AYUSH.gov.in/docs/127.pdf>

Ayurveda's immunity boosting measures for self-care during COVID-19 crisis

In the wake of the COVID-19 outbreak, entire mankind across the globe is suffering. Enhancing the body's natural defence system (immunity) plays an important role in maintaining optimum health.

We all know that prevention is better than cure. While there is no medicine for COVID-19 as of now, it will be good to take preventive measures which boost our immunity in these times.

Ayurveda, being the science of life, propagates the gifts of nature in maintaining healthy and happy living. Ayurveda's extensive knowledge base on preventive care derives from the concepts of "Dinacharya" - daily regimes and "Ritucharya" - seasonal regimes to maintain healthy life. It is a plant-based science. The simplicity of awareness about oneself and the harmony each individual can achieve by uplifting and maintaining his or her immunity is emphasized across Ayurveda's classical scriptures.

Ministry of AYUSH recommends a series of self-care guidelines for preventive health measures and boosting immunity with special reference to respiratory health. These are supported by Ayurvedic literature and scientific publications.

Website link:

<https://www.AYUSH.gov.in/docs/123.pdf>

Tentative proposed list of projects related to COVID-19 to be funded by Ministry of AYUSH

Ministry of AYUSH has shortlisted eight projects to be funded which are related to COVID-19. The research activities would be in concordance with interventional studies, drug trials, efficacy evaluation and impact assessment. Following are the titles of the proposed projects.

- Clinical research studies on Ayurveda interventions as prophylaxis and as an add-on to standard care to COVID-19: Collaborative clinical studies as a joint initiative of Ministry of AYUSH, Ministry of Health and Family Welfare (MoHFW) and the Ministry of Science & Technology through Council of Scientific & Industrial Research (CSIR) with technical support of ICMR.
- Population-based interventional studies on impact of AYUSH-based prophylactic interventions.
- AyushSanjivani application-based study for impact assessment of acceptance and usage of AYUSH advisories in its role in prevention of COVID-19.
- Drug Trial to Evaluate Efficacy and Safety of an Ayurvedic Formulation AYUSH-64 as Adjunct Treatment to Standard in COVID-19.
- Evaluation of Efficacy and Safety of Ayurveda Intervention (Ayush-64) add-on therapy for patients with COVID-19 infection (Stage I)-A Randomized controlled clinical trial.
- Evaluation of the efficacy of an Ayurvedic intervention (Chyawanprash) in the prevention of COVID-19 among Healthcare Personnel.
- Impact of Ayurvedic Interventions in prevention of COVID-19 infection in identified containment area.
- Interventional study on the effect of AYUSH as a prophylactic measure among high-risk population (Healthcare Workers/Containment Zone population) exposed to COVID-19.

Website link:

<https://health.ncog.gov.in/ayush-covid-dashbaord/#>

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

DEFENCE RESEARCH AND DEVELOPMENT ORGANISATION (DRDO)

Versatile body sanitization kiosk (VerBSak)

High Energy Materials Research Laboratory (HEMRL), Pune has made a Kiosk for COVID-19 Sample collection. It is made up of fibre-reinforced plastic (FRP) having chamber 0.9m x 0.9m x 2m with a single door. Provision for collection of COVID-19 samples has been provided from outside as well as from inside. One of the walls has been made of transparent glass/ polycarbonate on which a pair of long cuff gloves can be assembled.

The design enables assembly of the chamber in few hours and is easy to shift from one place to another. It is equipped with a fog generator of capacity of about 5-6 L/hr. Audio and video system for communication between patient and medical staff collecting sample is also provided. In the diagnostic centres and hospitals, the suspected patient can be made to enter the kiosk and sit comfortably thereby isolating him from the medical staff. The kiosk enables health workers/doctors to collect the samples of the patients using the long cuffs from outside without the need of PPE kits. With small modifications it can be used for individual disinfection in different premises like restaurants, food and medical industry, etc.

The fog generator used in VerBSak is an ultrasonic transducer-based humidifier that generates fog of 1 to 5 μm aerosols. The fog generator operates for 30-50s for sanitization during which the chamber gets completely sanitized. After preset time, the fog generation automatically stops with a buzzing sound.

Website link:

<https://drdo.gov.in/sample-collection-enclosures>



Crowd temperature monitoring system

A crowd temperature monitoring system has been developed using expertise in infrared imaging for missile applications. A DRDO lab, in collaboration with an industry partner, has innovated and developed algorithms for thermography in outdoor conditions. Advanced face detection techniques have been used over thermal images.

The system consists of a thermal camera and a desktop/laptop computer. Artificial Neural Network, trained with a very large in-house thermal database, allows face recognition directly on the running video from the IR thermal camera. A large number of people can be thermally profiled outdoors without disturbing their movements. Persons showing more than pre-set thermal threshold can be earmarked, recorded and real-time inputs can be given to authorities.

The first system developed by DRDO using its hardware and software resources has already been deployed at the Hyderabad-based laboratory. Test results show that the system can be used in indoor environments as well as in areas where a large number of people may have to gather/move regularly.



Website link:
<https://drdo.gov.in/crowd-temperature-monitoring-system>

Acoustic Throat Infection Analyser (ATIA)

Naval Physical and Oceanographic Laboratory (NPOL), Kochi has developed a Throat Infection Analyser (ATIA) using acoustic data processing techniques used in defence applications. The ATIA aims to detect upper respiratory tract infections by non-invasive means of acoustic scanning of word(s) spoken by a person. It has been proven that the COVID-19 (SARS-CoV-2) virus infection develops initially in upper respiratory tract and detection of infection may give early information even before symptoms like fever etc. develops. For day-to-day office work, this could give non-contact screening of personnel entering an establishment.





Initially using a microphone connected to computer/mobile etc. voice samples for healthy person are recorded as per SOP and added in the data base. The recorded data is subjected to acoustic analysis techniques. For carrying out the analysis, signal processing techniques such as Spectrum analysis, Tonal analysis, Modulation and Phase analysis, Mel Frequency Cepstral Coefficients (MFCC) analysis are carried out to generate results for a person.

At any point of time, live voice samples of a person can be compared with the database and distortion in voice due to throat infection is easily captured. The technique can have potential applications in hospitals/clinics, industries/offices and also in overall pandemic management. However, initial recording of voice samples is required.

Website link:

<https://drdo.gov.in/acoustic-throat-infection-analyser-atia>

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY (MeitY)

Joint statement from founding members of GPAI on leveraging AI towards COVID-19 mitigation

India, Australia, Canada, France, Germany, Italy, Japan, Mexico, New Zealand, the Republic of Korea, Singapore, Slovenia, the United Kingdom, the United States of America, and the European Union have come together to create the Global Partnership on Artificial Intelligence (GPAI or Gee-Pay). GPAI aims to support the responsible and human-centric development and use of AI in a manner consistent with human rights, fundamental freedoms, and their shared democratic values, as elaborated in the OECD Recommendation on AI. To this end, GPAI also look forward to working with other interested countries and partners.

GPAI is an international and multi-stakeholder initiative to guide the responsible development and use of AI, grounded in human rights, inclusion, diversity, innovation, and economic growth. In order to achieve this goal, the initiative will look to bridge the gap between theory and practice on AI by supporting cutting-edge research and applied activities on AI-related priorities.

In collaboration with partners and international organizations, GPAI will bring together leading experts from industry, civil society, governments, and academia to collaborate across four Working Group themes: 1) Responsible AI; 2) Data Governance; 3) The Future of Work; and 4) Innovation & Commercialization. Critically, in the short-term, GPAI's experts will also investigate how AI can be leveraged to better respond to and recover from COVID-19.

GPAI will be supported by a Secretariat, to be hosted by the OECD in Paris, as well as by two Centres of Expertise – one each in Montréal and Paris. The relationship with the OECD will bring strong synergies between GPAI's scientific and technical work and the international AI policy leadership provided by the OECD, strengthening the evidence base for policy aimed at responsible AI. The Centres will provide administrative and research support for the practical projects undertaken or assessed by Working Group experts from various sectors and disciplines. The Centres will also plan the annual GPAI Multi-stakeholder Experts Group Plenary, the first of which will be hosted by Canada in December 2020.



Website link:

https://meity.gov.in/writereaddata/files/Joint_Statement_on_Launch_GPAI.pdf

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

OTHER SCIENTIFIC AND ACADEMIC INSTITUTIONS

NIPER Mohali develops Immunity Booster Herbal Tea

Low or weak immunity makes a person more vulnerable to viral/bacterial infections like the COVID-19. As no new effective drugs and vaccine are available yet to treat the disease, it is important to strengthen our immunity. Considering the challenge, National Institute of Pharmaceutical Education and Research (NIPER) at SAS Nagar (Mohali) has developed Immunity Booster Herbal Tea. The formula has been designed to achieve maximum immune boosting effect.



The five potential immune booster herbs that are used in the form of herbal tea bags are 1. Ashwagandha (*Withania somnifera*) 2. Giloe (*Tinospora cordifolia*) 3. Mulethi (*Glycyrrhiza glabra*) 4. Tulsi (*Ocimum species*) and 5. Green Tea (*Camellia sinensis*). It is recommended to take the tea three times a day. Children and aged persons can also consume the tea without any problem. It feels soothing on throat and can help the body to fight seasonal flu also. It is an in-house preparation with all the herbs collected/procured from within the NIPER medicinal plant garden on the campus.

Website Link:

<http://www.niper.nic.in/Immune%20booster%20Herbal%20Tea-NIPER.pdf>

IIT Hyderabad develops low cost COVID-19 detection kit

Indian Institute of Technology (IIT) Hyderabad has developed a low cost COVID-19 detection kit in collaboration with Bhabha Atomic Research Centre (BARC), Mumbai that can deliver results within 20 minutes.

The diagnostic test method is not based on the Reverse Transcription Polymerase Chain Reaction (RT-PCR) - the method currently being used for COVID-19 testing. The test kit has been developed at a cost of Rs. 550 and it can be reduced to up to Rs. 350 when taken to mass production.

Website Link:

<https://iith.ac.in/news/2020/06/10/Covid19-detection-kit/>

https://m.timesofindia.com/india/researchers-at-iit-hyderabad-develop-low-cost-test-kit-that-can-detect-covid-19-within-20-minutes/amp_articleshow/76234658.cms

IIT-Palakkad develops ultrasound for COVID-19 screening

Indian Institute of Technology (IIT), Palakkad has developed ultrasound for COVID-19 screening. This is an automated lung ultrasound (LUS) for COVID-19 screening and monitoring through cloud-based image analysis and scoring system using image processing and machine learning techniques. The technology and the App, the first of its kind in India, are now available for clinicians to perform automated analysis by just uploading the ultrasound video.



Website Link:

<https://iitpkd.ac.in/news/iit-palakkad-develops-ultrasound-covid-19-screening>

<https://www.thehindu.com/news/national/kerala/coronavirus-iit-palakkad-develops-ultrasound-for-covid-19-screening/article31878985.ece>

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

PRIVATE SECTOR ENTERPRISES

HLL Lifecare Limited introduces 'Makesure' rapid diagnostic antibody kit for COVID-19 detection

HLL Lifecare Limited, a Central Government Enterprise under Ministry of Health and Family Welfare, is an Indian healthcare product manufacturing company based in Thiruvananthapuram. It has developed a rapid antibody diagnostic kit for COVID-19.

This is a one-step detection kit for novel Coronavirus with which IgM/IgG Antibody is detected from the human serum, plasma and/or whole

blood obtained from the patient with signs and symptoms of respiratory infection. The kit manufactured at HLL's rapid diagnostic kit manufacturing facility in Manesar, Haryana has been validated and approved by NIV Pune and ICMR for use in India.



This device is designed to aid in the rapid differential diagnosis of COVID-19 infections in large population screening. This will support in the management of control and treatment of COVID-19. The test result can be obtained from the sample within 15-20 minutes.

HLL is the first Government of India enterprise to receive the approval from ICMR for manufacturing and supplying the rapid antibody kit for COVID-19 detection. The kit will be marketed under the brand name of 'MakeSure' COVID IgM/IgG Antibody detection. The principle of this kit is based on Antibody capture immunochromatographic assay for the simultaneous detection of IgM & IgG antibodies to COVID-19 virus in human serum, plasma and/or whole blood samples.

HLL is also planning to develop and manufacture Viral Transport Medium which is in short supply in the country. As the molecular test volume picks up it will be required in huge quantities. HLL also started manufacturing hand sanitizer, 'Medigard' in its manufacturing facilities in Peroorkkada, Trivandrum and Belgaum, Karnataka factories.

Website link:

<http://www.lifecarehll.com/media/reportview/reference/bd686fd640be98efaae0091fa301e613hYiF>

Labcare develops one-step rapid card test for COVID-19 in human serum/plasma/whole blood

The Accucare COVID-19 IgG/IgM Cassette Rapid Test is a lateral flow immunoassay for qualitative detection of antibodies to novel coronavirus (SARS-CoV-2) in serum, plasma and whole blood specimens. It is intended to be used as an aid in the diagnosis of SARS-CoV-2 viral infections. Any reactive specimen with the Accucare COVID-19 IgG/IgM Cassette Rapid Test must be confirmed with alternative testing method(s).



The test cassette consists of: 1) a burgundy-coloured conjugate pad containing SARS-CoV-2 recombinant antigens conjugated with colloidal gold (SARS-CoV-2 conjugates) and rabbit IgG-gold conjugates; 2) a nitrocellulose membrane strip containing an IgG line (G Line) coated with anti-human IgG, an IgM line (M Line) coated with anti-human IgM, and the C line (C Line) coated with goat anti-rabbit IgG.

When an adequate volume of test specimen is dispensed into the sample well of the test cassette, the specimen migrates by capillary action along the cassette. The anti-SARS-CoV-2 virus IgG, if present in the specimen, will bind to the SARS-CoV-2 conjugates. The immunocomplex is then captured by the anti-human IgG line, forming a burgundy coloured G line, indicating a SARS-CoV-2 virus IgG positive test result suggesting a secondary infection or previous infection.

IgM anti-SARS-CoV-2 virus, if present in the specimen, will bind to the SARS-CoV-2 conjugates. The immunocomplex is then captured by the anti-human IgM line, forming a burgundy coloured M line, indicating a SARS-CoV-2 virus IgM positive test result suggesting a fresh primary infection.

If both G line and M line are visible, the test result suggests late primary or early secondary SARS-CoV-2 infection. Absence of both test bands (G and M) suggests a negative result. The test contains an internal control (C line) which should exhibit a burgundy coloured band of goat anti-rabbit IgG/rabbit IgG-gold conjugate immunocomplex regardless of the colour development on any of the test bands (G and M). Otherwise, the test result is invalid and the specimen must be retested again.

Contact Info: accucare@labcarediagnostics.com

Website link:

<http://www.labcarediagnostics.com/pdf/Rapid%20Tests/Coronavirus-IFU-New-converted.pdf>

Pune-based companies develop ImmunoQuick Rapid COVID-19 Test kit

With the collaborative efforts of ImmunoScience India Pvt. Ltd. and Biolinx Labsystems Pvt Ltd. a COVID-19 antibody test has been developed, which has been named as ImmunoQuick®. It had been developed on an urgent basis, starting in March. It has now been approved by the ICMR-National Institute of Virology and received registration from Central Drugs Standards Organisation (CDSCO) on April 16, 2020.

Unlike ordinary antibody tests, ImmunoQuick COVID-19 test separates the 2 sorts of antibodies—IgM and IgG—into separate bands. This has enormous advantages because clinicians can now separate patients into early infections, active patients and resolved/cured patients.

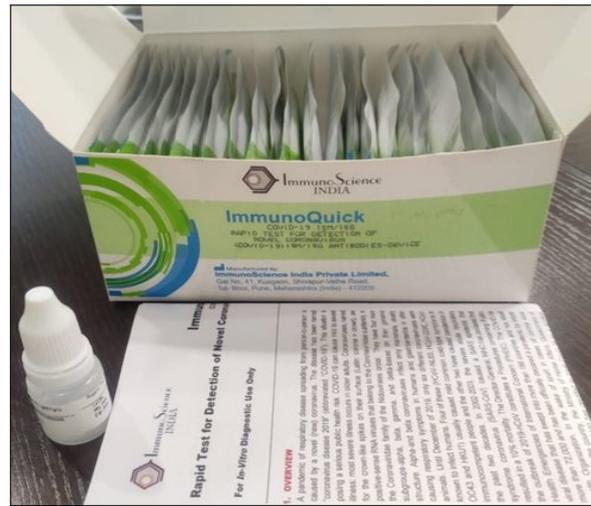
Contact Info: info@biolinx.net

Website link:

<https://pdf.indiamart.com/impdf/22254208997/>

[SELLER-3499228/covid-19-rapid-test-kit.pdf](https://www.biolinxlabsystem.com/new-items.html)

<https://www.biolinxlabsystem.com/new-items.html>



SCIENCE OUTREACH & POPULARISATION EFFORTS

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 presents regular COVID-19 India Factsheet

India's coronavirus cases have crossed 4-lakhs mark and now, as on 22nd June 2020, 8:00 AM, stands at 4,25,282 cases out of which 1,74,387 are active cases. India is showing progress in recovery rate and is now at 56%. Government of India, through its Open Government Data (OGD) Platform <https://data.gov.in/> has taken the initiative to present the regular factsheet related to COVID-19.

OGD platform is aimed at supporting Open Data initiative of Government of India. The portal is used by various Ministries, Departments, and their organizations, to publish datasets, documents, services, tools and applications collected by them for

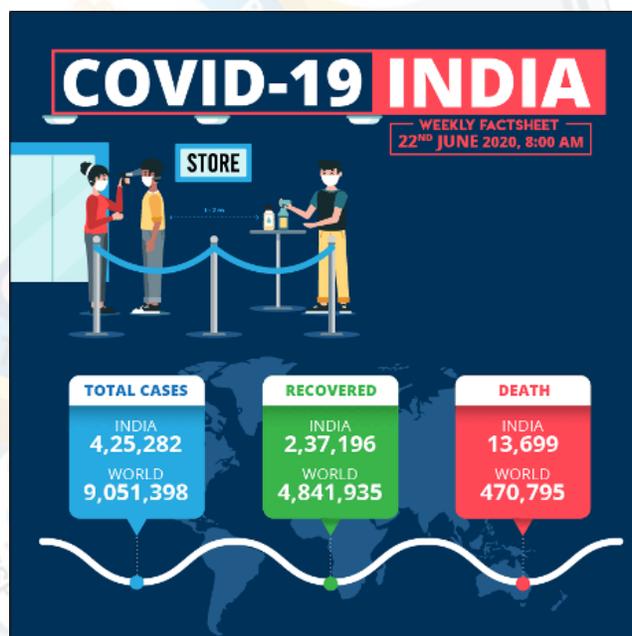
public use. It intends to increase transparency in the functioning of Government and also opens avenues for many more innovative uses of Government Data to give different perspective.

Website Link:

<https://community.data.gov.in/covid-19-india-factsheet-as-on-22nd-june-2020-800-am/>

Government of India invites citizens to share their 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 growing 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 (MoHFW). In order to involve the community in the fight against the virus, myGov has called for participation by inviting citizens to share their ideas and suggestions to help fight Coronavirus. These can include innovative and best practices regarding hygiene, hand washing, 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: 30th June 2020

Website link:

https://www.mygov.in/group-issue/share-your-ideas-suggestions-help-fight-coronavirus/?utm_source=webcampaign&group_issue&285571

IJMR publishes a special issue on COVID-19 (Part-II)

Indian Journal of Medical Research (IJMR), a publication of ICMR, is a peer-reviewed online journal with monthly print-on-demand compilation of issues. The COVID-19 pandemic has created opportunities to build an improved response mechanism for future pandemics. Concerted, well-funded, comprehensive, planned, and all-encompassing activities should facilitate building sustained institutional capacity to provide a swift and effective nationwide response to disease outbreaks. This could be done through access to appropriate technologies and improved logistics for efficient supply chains. These will also promote developing multi-sectoral stakeholder consortia at national and state levels to coordinate actions and launch a comprehensive whole-of-the-society response to emerging infections.



Overall and long-term target should be to encourage and ensure convergence of all stakeholders for human health, animal health and environment to collaborate in implementing the One Health approach and protecting human life, reduce misery and avoid damage to the national economy. These are doable actions. The national will and determination are vital to mitigate the severe impact of pandemics, such as COVID-19 in India.

India's COVID-19 Containment Strategy has been aligned with WHO's Strategic Preparedness and Response Plan for COVID-19. During the ongoing pandemic, India could successfully and rapidly scale-up several important interventions.

Website Link:

<http://www.ijmr.org.in/>

Government of India invites citizens to share their valuable ideas & suggestions on topics of importance

Government of India initiates an open and free-flowing discussion forum where the citizens can share their valuable ideas and suggestions on any subject of Governance and Policy-making, ideas which will help in building a New India by 2022. This forum is meant for those themes and topics which are not a part of other discussions on MyGov and yet may hold importance for citizens.

Last Date for Participation: 30th June 2020



Website Link:

<https://www.mygov.in/group-issue/mygov-idea-box/>

IIT Kanpur brings out special issue of R&D newsletter on research and innovation related to COVID-19

The R&D newsletter released regularly by Indian Institute of Technology Kanpur (IITK) covers research and development activities of the institutions which are aimed at innovation and technology development through interaction with universities, governments and industries to meet the needs of the society as well as industries. The Institution's latest issue of R&D newsletter is dedicated to the research and innovation initiatives taken towards the technological interventions in fighting against the COVID-19 pandemic.

Contact Info: dord@iitk.ac.in; ardr@iitk.ac.in

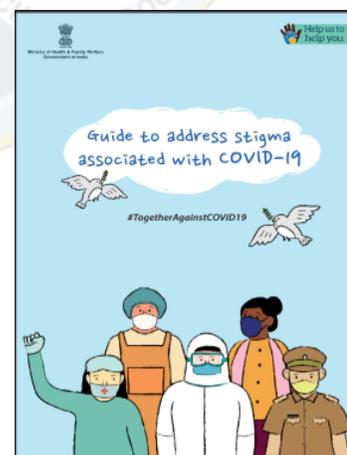
Website Link:

<https://www.iitk.ac.in/dord/newsletter/May2020/May2020.pdf>



Ministry of Health releases a guide to address stigma associated with COVID-19

COVID-19 pandemic is a public health emergency that is causing a stressful and a difficult time for everyone. During this crisis, rumours and misinformation create more stress and can hamper COVID-19 recovery. To combat this misinformation, Ministry of Health and Family Welfare (MoHFW) issued a guide to address stigma associated with COVID-19. This guide for preventing and addressing social stigma associated with COVID-19 is intended to support governments, media and local organisations.



Website Link:

<https://www.mohfw.gov.in/pdf/GuidetoaddressstigmaassociatedwithCOVID19.pdf>

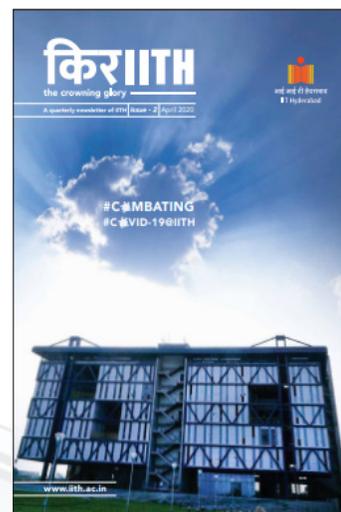
IIT Hyderabad brings out newsletter, KIRIITH, dedicated to COVID-19

Though COVID-19 outbreak has shaken the world economically and emotionally, it has given a chance to come together and create a better ecosystem, unaffected by any such or even worse situation which can erupt in future. The second issue of quarterly newsletter of Indian Institute of Technology Hyderabad (IITH) is dedicated to COVID-19 which encapsulates the S&T efforts taken by the institution towards combating the pandemic.

Contact Info: pro@iith.ac.in

Website Link:

<https://iith.ac.in/assets/files/newsletters/Kiriith-2nd-Issue.pdf>



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

National Institute of Science Communication and Information Resources (CSIR-NISCAIR) is bringing out a newsletter dedicated for 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/covidbulletin/view/8>

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



An illustrative guide on COVID Appropriate Behaviours issued by Ministry of Health and Family Welfare

The COVID-19 pandemic has led to unprecedented and unanticipated challenges requiring collective action and support from all. While all necessary measures to fight the spread of Novel Coronavirus are being effectively led by the Government, there is a need to reinforce the importance of preventive measures and practices in a sustained manner to deal with the disease over the long run.

To address the challenge, Ministry of Health and Family Welfare (MoHFW) has released an illustrative guide on COVID-appropriate behaviours that are critical to winning this fight against COVID-19. This guidebook outlines a comprehensive list of 15 preventive behavioural practices which are critical to winning the fight against the deadly virus. This fight can be won only when everyone knows their roles and the goal.

Website Link:

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



Rajiv Gandhi Central University, Arunachal Pradesh announces Online International COVID-19 Awareness Quiz 2020

As we are aware that the entire world has been facing the challenges passed by the ongoing COVID-19 pandemic on different facets of life, the entire global society has been affected since the outbreak of COVID-19 on account of the contagious, pervasive and deadly nature of this pandemic.

Therefore, social sensitization through awareness campaign on this pandemic can be a stepping stone to defeat it. In this regard Rajiv Gandhi Central University, Arunachal Pradesh has come forward with a noble gesture in spreading awareness in the direction of sensitizing the society and further to make every citizen of the world a corona warrior by organising online international COVID-19 awareness Quiz 2020.

Quiz end date: 30th June 2020

Contact Info: vinod.yadav@rgu.ac.in; mumbai.datacenter@gmail.com

Website Link:

https://www.rgu.ac.in/uploads/NewsFile/NoticeBoard_2195.pdf

<https://docs.google.com/forms/d/e/1FAIpQLSfBRZ6RuMttam6-M7uoHWGgsyrDLluBj5QZwAE43fcObxr9g/viewform>

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. Face book live sessions on interviews of various stakeholders and media with DST Secretary.



Contact info: 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.



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

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

Contact Info: kdgm@vigyanprasar.gov.in

Website link:

<http://indiainscienceandtechnology.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

Website link:

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

