COVID-19
International Research Update

Compiled by: Assam Rural Infrastructure and Agricultural Services (ARIAS) Society

:........................................::Team........................................:::

1. Laya Madduri, IAS, State Project Director, ARIAS Society
2. Parijat Chowdhury, Sr. ICT & Infra Specialist, ACCSDP
3. Nibha Kumari, Agri Marketing Specialist, ASAMB-APART
4. Baljeet Singh, Market Analyst & Operations Specialist, APART

March 2020
<table>
<thead>
<tr>
<th>Sl.</th>
<th>Title</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>WHO Director-General’s opening remarks at the media briefing on COVID-19</td>
<td>03</td>
</tr>
<tr>
<td>2</td>
<td>UC Davis launches two clinical studies to treat COVID-19</td>
<td>03</td>
</tr>
<tr>
<td>3</td>
<td>USFDA update on COVID-19</td>
<td>04</td>
</tr>
<tr>
<td>4</td>
<td>Coronavirus: The woman behind India’s first testing kit</td>
<td>04</td>
</tr>
<tr>
<td>5</td>
<td>Russian scientists take the first photo of a novel coronavirus and fully decode its genome</td>
<td>04</td>
</tr>
<tr>
<td>6</td>
<td>Russia plans to start series production of new vaccine against coronavirus in 1.5 years</td>
<td>04</td>
</tr>
<tr>
<td>7</td>
<td>Australian researchers to trial BCG vaccine for COVID-19</td>
<td>05</td>
</tr>
<tr>
<td>8</td>
<td>University of Birmingham joins COVID-19 genome sequencing alliance to map spread of coronavirus</td>
<td>06</td>
</tr>
<tr>
<td>9</td>
<td>University Of Glasgow Leads Covid-19 Research Response In Scotland</td>
<td>07</td>
</tr>
<tr>
<td>10</td>
<td>Germany : DZIF Coronavirus Researchers use “Fast Track”</td>
<td>08</td>
</tr>
<tr>
<td>11</td>
<td>WHO says early data show some drugs ‘may have an impact’ on coronavirus, but more research is needed</td>
<td>10</td>
</tr>
<tr>
<td>12</td>
<td>USA: Study will test if hydroxychloroquine can prevent COVID-19</td>
<td>10</td>
</tr>
<tr>
<td>13</td>
<td>USA: Florida Research Company Prepares for COVID-19 Vaccine, Treatment Clinical Trials</td>
<td>10</td>
</tr>
<tr>
<td>14</td>
<td>Europe : Severe COVID-19 cases to be offered new clinical trial programme</td>
<td>11</td>
</tr>
<tr>
<td>15</td>
<td>USA Free access to AI Clinical Research Navigator tool for COVID-19 researchers</td>
<td>12</td>
</tr>
<tr>
<td>16</td>
<td>The US Army's Virus Research Lab Gears Up to Fight Covid-19</td>
<td>12</td>
</tr>
<tr>
<td>17</td>
<td>Rapid COVID-19 escalation pushes world past 900,000 cases/ COVID-19 detected in cat &amp; dogs</td>
<td>13</td>
</tr>
<tr>
<td>18</td>
<td>Germany :COVID-19: Study Reports High Viral Shedding Among Early-Stage Patients</td>
<td>13</td>
</tr>
<tr>
<td>19</td>
<td>Australia begins animal trials for COVID-19 vaccine</td>
<td>13</td>
</tr>
<tr>
<td>20</td>
<td>DRDO develops bio suits for doctors, paramedics engaged in treating coronavirus patients</td>
<td>14</td>
</tr>
<tr>
<td>21</td>
<td>USA : COVID-19 vaccine candidate shows promise</td>
<td>15</td>
</tr>
<tr>
<td>22</td>
<td>British Colombia: Trial drug can significantly block early stages of COVID-19 in engineered human tissues</td>
<td>15</td>
</tr>
<tr>
<td>23</td>
<td>University of California: Removing the novel coronavirus from the water cycle</td>
<td>16</td>
</tr>
<tr>
<td>24</td>
<td>Common Anti-Parasitic Drug May Help In Stopping Novel Coronavirus, Says Australian Scientists’ Research</td>
<td>17</td>
</tr>
<tr>
<td>25</td>
<td>Study lists 69 existing drugs to target novel coronavirus</td>
<td>17</td>
</tr>
<tr>
<td>26</td>
<td>Researchers announce promising coronavirus vaccine candidate</td>
<td>17</td>
</tr>
</tbody>
</table>
COVID-19 International Research follow up


WHO Director General has called upon all countries who have introduced so-called “lockdown” measures to use this time to attack the virus through following six key actions:

1. First, expand, train and deploy your health care and public health workforce;
2. Second, implement a system to find every suspected case at community level;
3. Third, ramp up the production, capacity and availability of testing;
4. Fourth, identify, adapt and equip facilities you will use to treat and isolate patients;
5. Fifth, develop a clear plan and process to quarantine contacts and;
6. Sixth, refocus the whole of government on suppressing and controlling COVID-19.

These measures are the best way to suppress and stop transmission, so that when restrictions are lifted, the virus doesn’t resurge.


26th March 2020: UC Davis launches two clinical studies to treat COVID-19

Remdesivir study: UC Davis is one of approximately 75 sites worldwide evaluating the benefits of Remdesivir for severe COVID-19 infection. Remdesivir is an investigational broad-spectrum antiviral treatment developed by Gilead Sciences Inc. It was previously tested in humans with Ebola virus disease and has shown promise in animal models for treating Middle East respiratory syndrome (MERS) and severe acute respiratory syndrome (SARS), which are caused by other coronaviruses.UC Davis physicians used remdesivir in February, with emergency approval from the Food and Drug Administration, to treat a critically ill patient who was the first known case of community-acquired infection in the U.S. The patient has since returned home to recover. The study will enroll up to 440 patients over the next several months, including about 10 or more at UC Davis. Among other criteria, participants must be 18 years of age or older, have a confirmed SARS-CoV-2 test and poor lung function.

Sarilumab study: UC Davis is one of up to 50 sites in the U.S. assessing sarilumab, a drug jointly developed by Regeneron and Sanofi pharmaceutical companies for the treatment of rheumatoid arthritis. The drug is a human monoclonal antibody that blocks the receptor for interleukin-6 (IL-6), a cytokine that plays an important role in the body's immune response and in generating fever and acute inflammation. The study will evaluate whether the drug can control the progression of the inflammatory response in the lungs of patients with severe COVID-19 infection. Approximately 400 hospitalized patients age 18 and older with acute COVID-19 infection can be enrolled in the study nationwide. Individuals will be grouped according to the severity of their illness and progression of symptoms, from severe to critical to having multi-system organ failure as well as whether cortisone drugs were used to reduce inflammation. The researchers will be determining whether the health of individuals with high IL-6 levels and severe/critical levels of infection improve with the drug.

27th March 2020: USFDA update on COVID-19: The FDA issued a letter to stakeholders about the imminent threat to the health of consumers who may take chloroquine phosphate products used to treat disease in aquarium fish, thinking the products are interchangeable with FDA-approved drugs (used to treat malaria and certain other conditions in humans) that are being studied as a COVID-19 treatment for humans. Chloroquine products sold for aquarium use have not been evaluated by the FDA to determine whether they are safe, effective, properly manufactured, and adequately labeled for use in fish—let alone humans. 


28th March 2020: Coronavirus: The woman behind India's first testing kit: India has been criticized for its poor record of testing people in the battle against coronavirus. That, however, is set to change, thanks in large part to the efforts of one virologist, who delivered on a working test kit, just hours before delivering her baby. On Thursday (26th March 2020), the first made-in-India coronavirus testing kits reached the market, raising hopes of an increase in screening of patients with flu symptoms to confirm or rule out the COVID-19 infection. Mylab Discovery, in the western city of Pune, became the first Indian firm to get full approval to make and sell testing kits. It shipped the first batch of 150 to diagnostic labs in Pune, Mumbai, Delhi, Goa and Bengaluru (Bangalore) this week. "Our manufacturing unit is working through the weekend and the next batch will be sent out on Monday," Dr Gautam Wankhede, Mylab's Director for medical affairs, told the BBC on Friday. The molecular diagnostic company, which also makes testing kits for HIV and Hepatitis B and C, and other diseases, says it can supply up to 100,000 Covid-19 testing kits a week and can produce up to 200,000 if needed. Each Mylab kit can test 100 samples and costs 1,200 rupees ($16; £13) - that's about a quarter of the 4,500 rupees that India pays to import Covid-19 testing kits from abroad.


28th March 2020: Russian scientists take the first photo of a novel coronavirus and fully decode its genome: Russian scientists have managed to sequence the first complete genome of the coronavirus, the Russian Health Ministry confirmed on March 19. "This coronavirus is new to us, so it is essential to have an opportunity to identify the path of its spread and entry into the territory of our country, and its mutations. This information will help develop vaccines and antiviral drugs to treat the coronavirus," said Dmitry Lioznov, acting head of the Smorodintsev Research Institute of Influenza, whose specialists decoded the genome. Soon, this data will be sent to the World Health Organization database so that scientists from other countries can have access to it. In the meantime, scientists from the VECTOR State Research Center of Virology and Biotechnology in Novosibirsk have managed to take pictures of COVID-19 under a microscope.

Accessed on 28 March 2020, 6:00 PM

28th March 2020: Russia plans to start series production of new vaccine against coronavirus in 1.5 years: Russia will need about 1.5-2.5 years in order to create a vaccine against coronavirus and launch it into a series production, according to recent statements made by Dmitry Lioznov, an acting Director of the Smorodintsev Research Institute of Influenza, one of Russia's leading research institutions in the field of influenza treatment.
According to Dr. Lioznov, despite the fact that the development of vaccine is usually a quick process for scientists, it is followed by the long procedure of its pre-clinical studies on animals as well as studies on volunteers. So far, scientists at the Smorodintsev Institute have already completed the decoding of the COVID-19 genome taken from the biomaterial of a Russian patient and are ready to begin its pre-clinical studies. Dr. Lioznov comments: “Now it’s difficult to say how much the strain, deciphered in Russia differs from the first sample of the coronavirus, deciphered in China. Now the WHO genetics bank has sequences of several hundred samples obtained in different countries. The variability of the virus, its evolution is necessary both for predicting its spread and for creating an effective vaccine and drugs, but comparing the gene structure of different strains, taken from different patients is a laborious process, which requires the use of special computer programs. This work is ongoing.”


29th March 2020: Australian researchers to trial BCG vaccine for COVID-19: Researchers at the Murdoch Children’s Research Institute in Australia are set to conduct a randomised, multi-centre clinical trial to test the use of tuberculosis vaccine BCG against COVID-19. The BRACE trial is intended for healthcare workers. It is based on previous study findings that BCG decreases the level of virus in patients infected by viruses similar to SARS-CoV-2. Murdoch Children’s Research Institute director Kathryn North said: “This trial will allow the vaccine’s effectiveness against Covid-19 symptoms to be properly tested, and may help save the lives of our heroic frontline healthcare workers.” The controlled trial is expected to enrol approximately 4,000 healthcare workers at hospitals across Australia, including the Melbourne Campus’ Royal Children’s Hospital. BCG will be assessed for its ability to mitigate the prevalence and severity of Covid-19 symptoms. More than 130 million babies currently receive the BCG vaccination for tuberculosis each year. The vaccine is said to enhance ‘frontline’ immunity. The improved immunity is expected to provide the time required to develop and validate a specific vaccine for Covid-19 infection. The BRACE study is based on an existing trial at the institute, which led to human ethics approvals. The existing trial is being conducted at sites across Australia. North added: “Using rapidly sourced and immediately deployable funds, we will be relentless in our pursuit of preventions and treatments for this unprecedented pandemic. “These trials will allow the rapid advancement of the most promising candidates to clinical practice, giving us the most number of shots on goal against Covid-19 as possible.” Trials of potential vaccine candidates for Covid-19 are already underway in the US and China.

30 March 2020: University of Birmingham joins COVID-19 genome sequencing alliance to map spread of coronavirus: The Government and the UK’s Chief Scientific Adviser have today (Monday 23 March) backed the UK’s leading clinicians and scientists to map how COVID-19 spreads and evolves using whole-genome sequencing. Through a £20 million investment, the consortium will look for breakthroughs that help the UK respond to this and future pandemics, and save lives.

The COVID-19 Genomics UK Consortium - COG-UK - comprised of the NHS, Public Health Agencies and academic institutions – including the University of Birmingham - will deliver large scale, rapid sequencing of the cause of the disease and share intelligence with hospitals, regional NHS centres and the Government.

Samples from patients with confirmed cases of COVID-19 will be sent to a network of sequencing centres which currently includes Birmingham, Belfast, Cambridge, Cardiff, Edinburgh, Exeter, Glasgow, Liverpool, London, Norwich, Nottingham, Oxford and Sheffield. The Wellcome Trust Sanger Institute will provide large-scale sequencing capacity and additional support.

The University of Birmingham, led by Nick Loman, Professor of Microbial Genomics and Bioinformatics in the Institute of Microbiology and Infection, have deployed a real-time genome sequencing facility established at the University capable of sequencing genomes of the virus causing COVID-19 from patients in the West Midlands in less than 24 hours.

Professor Loman says: “This is a remarkable collaboration which brings together Birmingham and the UK’s incredible depth of expertise and knowledge in viral sequencing and genomics. An open and distributed model of sequencing involving both academia, the NHS and our public health bodies is the right way to ensure results are delivered quickly to decision-makers. We are now well positioned to return deep insights into understanding the rapidly-accelerating pandemic of COVID-19, easily the most pressing infectious disease emergency we have faced in two generations in the UK.

“The government’s investment is well-timed to accelerate the pace of viral genome sequence production and ensure this information is openly available to epidemiologists and virologists worldwide. This will provide an unprecedented real-time view of COVID-19 virus evolution.”

Understanding viral evolution is important for understanding how the virus is spreading in local, national and international settings. It provides valuable epidemiological information revealing the chains of transmission that must be stopped in order to stop this outbreak.

We also stand to observe how the virus adapts to a human host over time, and how human interventions including drug treatments and eventually vaccines, exert pressure on the virus.

Accessed on: 30th March 2020, 5:00 PM IST
30 March 2020: University Of Glasgow leads COVID-19 research response in Scotland: The MRC-University of Glasgow Centre for Virus Research (CVR) is at the heart of COVID-19 research response in Scotland and the UK. Covid-19 is a new disease in humans, caused by a member of the coronavirus family of viruses. Thought to have originated in bats, it was first recorded in humans in China in late 2019, and can cause a fever, cough and breathing problems. Experts currently think around 80% of cases are mild, however a small portion of infected people go on to have complications such as pneumonia, and require a period of hospitalisation.

So far, it has spread to most countries around the world, and has already affected more than 300,000 people, several thousands in the UK. The WHO currently estimate the death rate at 3.4%, however scientists believe the real mortality rate may be lower as there is evidence that not everyone with mild forms of the disease have been tested.

Scientists at the CVR are working in partnership with colleagues across the UK on a range of research areas related to the new coronavirus, including working closely with colleagues in Public Health England to understand linkages across the UK in an effort to shut down ongoing transmission in real-time. Research areas include fundamental studies to understand the nature of SARS-CoV-2, the coronavirus which causes COVID-19, genomic sequencing and bioinformatics analyses of the virus from patient samples, and the identification of potential therapies.

Professor Massimo Palmarini, Director of the CVR, said: “The CVR and its scientists are at the centre of Scotland’s – and the UK’s – response to the current coronavirus outbreak. As the largest group of virologists in the UK with the facilities to handle samples from infected patients, we are well placed to conduct pivotal research into emerging diseases such as COVID-19.

“In the coming weeks and months, our scientists will continue to work in collaboration with NHS Scotland, sequencing the virus, as well as conducting further research into SARS-CoV-2, its mechanisms of action and potential therapies.”

In early March 2020, CVR scientists working in partnership with the NHS Greater Glasgow & Clyde West of Scotland Specialist Virology Centre, rapidly sequenced the virus from the first COVID-19 patient confirmed in Scotland.

Professor Emma Thomson, Dr Ana Da Silva Filipe and a team of scientists at the Centre, will continue to rapidly sequence SARS-CoV-2 virus from COVID-19 samples obtained from patients, from across Scotland, as long as the outbreak lasts. This genomic information will be made publically available immediately following sequencing and genomic analysis.

Reports on the five genomes sequenced to date are available at these two sites:

The rapid sequencing of COVID-19 samples is essential to further research into the virus. Scientists from around the world are able to extract information from the genetic code – or blueprint – of this new coronavirus, that will ultimately help the creation of vaccines.

Dr Ana Filipe, Head of the CVR's Viral Genomics facility who led the efforts to rapidly sequence this virus said: “The rapid turnaround of the sample and interpretation of the data was only possible due to excellent coordination between clinicians, diagnostic labs, and research partners. These collaborations are critically important to ensuring an effective response to outbreaks like this. Equally important is the trend of open sharing of reagents and protocols amongst researchers and the public sharing of sequencing data, which has been a defining feature of the response to recent viral epidemics”.

The CVR is also working to develop a toolbox of reagents that will help current and future studies of this virus. This includes a partnership with the MRC Phosphorylation Unit at the University of Dundee to generate antibodies against SARS-CoV-2. All of these reagents will be made available to the research community.

The MRC-University of Glasgow Centre for Virus Research (CVR) was established in 2010 and represents the UK's largest grouping of human and veterinary virologists. The CVR is embedded within the Institute of Infection, Immunity and Inflammation at the University of Glasgow which provides excellent research opportunities to investigate virus-host interactions and immune response to virus infection. The Centre is funded by the Medical Research Council, the UK's leading publicly funded biomedical research organisation, and by a variety of other funding bodies including the Wellcome Trust, the BBSRC, EU and others.

Source: [https://www.gla.ac.uk/news/headline_714460_en.html](https://www.gla.ac.uk/news/headline_714460_en.html)
Accessed on: 30th March 2020, 6:15 PM IST

GERMANY: DZIF Coronavirus Researchers use “Fast Track”

Research has been called to develop drugs, vaccines and testing methods as quickly as possible to fight the SARS-coronavirus-2. A fast-track procedure has made additional funding available to scientists at the German Center for Infection Research (DZIF) for this purpose.

The research package put together by scientists at the DZIF is pursuing ambitious goals: New diagnostic testing methods, antiviral drugs and a vaccine against the virus are on the agenda. “We are optimistic that our research work at the DZIF can make substantial contributions in the fight against the virus,” explains Prof. Stephan Becker from Marburg University. He is the Coordinator of the DZIF research area "Emerging Infections”.

Prevention: Vaccines do not assemble themselves on their own

DZIF scientists in Munich, Marburg and Hamburg use the expertise previously acquired from developing a vaccine against MERS, a different type of coronavirus. They are using the same vector virus, a smallpox virus which has been modified and rendered harmless, into which they now insert the genetic information of a SARS-CoV-2 surface protein instead of the previously inserted MERS information. The scientists selected a so-called spike protein, which lies on the
surface of the virus and enables the virus to enter human cells, to use as a suitable building block.

“This may initially sound like simple assembly work, but it does require a substantial amount of meticulous research work,” explains Prof. Gerd Sutter, virologist at LMU Munich. First we need to synthesise both the vector and the corona spike protein genes. Then we have to assemble these genetic building blocks in such a way that they can finally be administered as a recombinant vaccine. The resulting vaccine virus should be able to penetrate into the cells and produce the virus’s spike protein in the cells so as to stimulate the vaccinated person’s immune system. Whether this is effective will first have to be tested in a cell model and subsequently in animal models and on humans.

“These precise testing systems have to developed alongside each other,” adds Prof. Stephan Becker from Marburg University. “We also do this at the DZIF.” Research questions include: Which antibodies are developed in the animal model and subsequently in humans? Are the number of antibodies produced sufficient to provide protection against the virus and how long does this vaccine protection last? At the University Medical Center Hamburg-Eppendorf, Prof. Marylyn Addo is leading a research group which is conducting parallel analyses of patient biosamples so as to determine the human body’s immune response more precisely. These are important investigations which pave the way to an effective vaccine. “If the current plan works, we should have a vaccine that works in animal models in early 2021,” Addo hopes. Prof. Marylyn Addo will lead the clinical trials at the University Medical Center Hamburg-Eppendorf (UKE). She substantially contributed towards the development of the Ebola and MERS vaccines which are both still undergoing clinical trials.

**Treatment: Emergency drugs**

The development of antiviral drugs could be faster than the development of a new vaccine. The scientists develop in vitro assays and animal models to serve as a basis for testing antiviral substances. Especially agents which have already been approved for other indications hold promise as drugs which could be used in the short term.

**Diagnosis: Rapid and safe tests**

Shortly after the outbreak in China in January 2020, DZIF scientists at Charité – Universitätsmedizin Berlin developed the first test for SARS-CoV-2. Using the virus's genetic information, Prof. Christian Drosten and his team succeeded in developing a test based on the PCR (polymerase chain reaction) technique. The test is currently being used worldwide. Now the aim is to refine the test methods as well as to develop and validate new tests which can be used to determine immune responses in the human body. “We will only be able to develop a vaccine once we know what happens inside the patient’s body,” Drosten explains.

**Source:** [https://www.dzif.de/en/dzif-coronavirus-researchers-use-fast-track](https://www.dzif.de/en/dzif-coronavirus-researchers-use-fast-track)

Accessed on: 30th March 2020, 4:00 PM IST
31st March 2020: WHO says early data show some drugs ‘may have an impact’ on coronavirus, but more research is needed: World Health Organization officials said early research shows that some drugs “may have an impact” on fighting the coronavirus, but the data are extremely preliminary and more research needs to be done to determine whether the treatments can reliably fight COVID-19. There is “some preliminary data from non-randomized studies, observational studies, that indicate some drugs and some drug cocktails may have an impact,” Dr. Mike Ryan, executive director of WHO’s health emergencies program, said during a press briefing at the agency’s headquarters Monday.

WHO urged countries to stop using medicines that are not proven to be effective against COVID-19. Chloroquine has gained a lot of attention after a small study of 36 COVID-19 patients published on March 17th in France found that most patients taking the drug cleared the coronavirus from their system a lot faster than the control group. Adding azithromycin, commonly known as a Z-Pak, to the mix “was significantly more efficient for virus elimination,” the researchers said. A small study in China also found that combining chloroquine with azithromycin was “found to be more potent than chloroquine.” Scientists and infectious disease experts say the study’s findings were not definitive and a large-scale trial is needed to see whether the drugs are effective. World health officials are testing four of the most promising drugs to fight COVID-19, including chloroquine and hydroxychloroquine, which are anti-malarial drugs.

Source:https://www.cnbc.com/2020/03/30/who-says-early-data-shows-some-drugs-may-have-an-impact-on-coronavirus-but-more-research-is-needed.html
Accessed on: 31st March 2020, 11:00 AM IST

USA: Study will test if hydroxychloroquine can prevent COVID-19: The anti-malaria drug hydroxychloroquine has made headlines in recent weeks for its potential to help with the new coronavirus disease, COVID-19, though its benefits remain unproven. Now, a new study will test whether the drug can prevent COVID-19 transmission. For the study, researchers in New York and Washington state plan to enroll 2,000 participants who are close contacts of people with confirmed or pending COVID-19 diagnoses.

Participants will be randomly assigned to take either hydroxychloroquine or a placebo for two weeks, and they will be tested daily for COVID-19, according to a statement from the University of Washington (UW), which will collaborate on the study with New York University (NYU). The trial is expected to last eight weeks, and researchers hope to have the results by summer. The Centers for Disease Control and Prevention (CDC) has warned that hydroxychloroquine and the related drug chloroquine should only be used as prescribed medications under the supervision of a health care provider. In addition, people should never ingest non-pharmaceutical forms of chloroquine phosphate.

Accessed on: 31st March 2020 at 11:30 AM IST

USA: Florida Research Company Prepares for COVID-19 Vaccine, Treatment Clinical Trials: Pharmaceutical companies are currently working with existing products and creating new mixes to see what may pass clinical tests and prove viable. Carlos Orantes is CEO of Amplify Clinical, the company that owns Meridien Research and Neuro Studies in Central Florida. The
company is among thousands now working to be involved in clinical testing of potential vaccines and treatments for COVID-19.

“Right now, more than ever, we need everybody to be collaborating, to accelerate, to do it right and do it fast,” Orantes said. “Research is done right, but not fast because there’s so much risk involved and time involved, but right now we don’t have the time, we have to act quickly.” Orantes said treatments and medications can typically take 7 to 10 years - vaccines typically take 1-2 years and more than $1 billion to develop. He estimates many of the nation’s 75,000-80,000 clinical trial firms in the United States could have a role in testing potential vaccines and treatments. The Food and Drug Administration issued an emergency authorization allowing hydroxychloroquine and chloroquine to be used for potential coronavirus treatment. The drugs have long been used for malaria.

Clinical trials often happen in phases. In this case, pharmaceutical companies may experiment to come up with various treatments or vaccines, which companies will then put through clinical trials. Phase I is the very start of a test phase with a small group of human volunteers. Each phase of the clinical can take months to conduct and analyze, with each round using a larger pool of volunteers. Johnson & Johnson announced it has made strides in developing a vaccine for COVID-19, which could be available by early 2021. The National Institute of Allergy and Infectious Diseases also started a clinical trial of a potential vaccine.

Accessed on: 31st March 2020, 4:45 PM IST

Europe: Severe COVID-19 cases to be offered new clinical trial programme: Clinical trials investigating the efficacy of using the rheumatoid arthritis drug, Kevzara, in patients hospitalised with severe COVID-19 have now been expanded to include the EU. The clinical programme that is being run by the pharmaceutical company Sanofi for all countries outside the US is the second trial as part of the Kevzara COVID-19 programme, which was first trialled this month in the US. To qualify, patients must have pneumonia and be hospitalized with laboratory-confirmed COVID-19 that is classified as “severe or critical,” or be suffering from multi-organ dysfunction.

After receiving the study dose, patients will be assessed for 60 days, unless they die or are discharged before that. The trial will be conducted in Italy, Spain, Germany, and France as well as Canada, Russia, and the US, and is expected to enroll about 300 patients. According to a preliminary study, the drug, which is currently approved in multiple countries to treat adults with moderately to severely active rheumatoid arthritis, may be able to calm the overactive inflammatory response in the lungs of patients who are severely or critically ill with COVID-19 infection. In a 21-patient cohort infected with COVID-19, patients were found to have experienced rapidly reduced fevers and 75% of them reduced their need for supplemental oxygen within days of receiving a similar medication. “Despite this encouraging finding, it’s imperative to conduct a properly designed, randomised trial to understand the true impact of Kevzara, which we are now doing through this global clinical trial program,” said George D. Yancopoulos, co-founder, president, and chief scientific officer of Regeneron, the biotechnology
company responsible for running the clinical trial in the US. For the moment, the use of Kevzara to treat the symptoms of COVID-19 has not been evaluated by any regulatory authority.

Accessed on: 31st March 2020 5:30 PM IST

1 April 2020: USA- Free access to AI Clinical Research Navigator tool for COVID-19 researchers: In light of the COVID-19 pandemic, the creators of the Clinical Research Navigator (CRN) tool have offered free access to their system for biomedical researchers. Expert System Enterprise, an artificial intelligence (AI) company, has offered biomedical researchers free access to its AI-based Clinical Research Navigator (CRN) tool, effective immediately through at least 1st July 2020. CRN contains over 100 million documents and reference information on 12 million clinical researchers, updated in near real-time and structured so it is searchable by disease, drug, mechanism of action, organization, researcher and geography.

The system constantly monitors and mines biomedical content from an array of sources, including MEDLINE publications, clinical trials, National Institutes of Health-funded research, US patents, news and social media streams. CRN then aggregates and sorts the information based on the searchable fields listed above. Using natural language processing (NLP) the technology recognizes related terms (eg, COVID-19, coronavirus and SARS-CoV-2) and puts them into context.

Accessed on: 1st April 2020, 4:15 PM IST

The US Army's Virus Research Lab gears up to fight COVID-19: The Pentagon's Institute of Infectious Diseases has been handling the world's most dangerous organisms for decades. Now they're researching the new coronavirus. Today, the germ warriors of USAMRIID are hunkering down to fight the novel coronavirus. They are figuring out how it spreads, and learning how it infects different lab animals. This information is vital in order to accurately test new vaccines and therapeutics against the virus. One of their main tasks will be to develop an animal model which can be used to test possible treatments before they reach human clinical trials. Senior science adviser Louise Pitt directs the aerobiology lab at USAMRIID and has worked on Ebola, anthrax, ricin and the Marburg virus in her 30-year career here. Pitt says her team is gearing up for an expected rush of work in the coming weeks as more vaccines and drugs candidates that are being advanced by academic and commercial labs come online. (Their lab has several dozen cooperative agreements to test contenders that arise from separate agencies, labs, and universities.)

Source:  https://www.wired.com/story/the-us-armys-virus-research-lab-gears-up-to-fight-covid-19/
Accessed on: 1st April 2020, 5:00 PM IST
1st April, 2020: Rapid COVID-19 escalation pushes world past 900,000 cases/ COVID-19 detected in cat & dogs: Spurred mainly by rapidly growing pandemic activity across Europe and the United States, the global total today is at 926,924 cases in 180 countries, which includes 46,252 deaths, according to the Johns Hopkins online dashboard. India is just a few days into a 21-day lockdown, which stranded migrant workers without food and shelter and triggered other problems. The country now has 1,998 cases, 601 of them reported today. In Hong Kong today, health officials reported the first COVID-19 detection in a cat, which belongs to an owner who tested positive for the virus. The cat’s oral, nasal, and rectal samples were positive for the virus. The cat hasn’t shown any clinical signs and will be quarantined. Two dogs in Hong Kong were positive for the virus in earlier instances, one of which was also positive on a serology test.

Accessed on 2nd April 2020 at 07:34 AM IST

Germany: COVID-19: Study reports high viral shedding among early-stage patients: A detailed virological analysis of nine patients in Germany has revealed that COVID-19 infected people ‘shed’ or excrete more viral particles during the first week of symptoms. The study also highlights that the novel coronavirus SARS-CoV-2 actively replicates in the upper respiratory tract of the patients and hence results in high levels of shedding during the early stages of infection, when the patients have mild symptoms. In the study, the German scientists analysed the throat and lung samples, sputum (mucus from the respiratory tract), and stool, blood and urine from the patients diagnosed with COVID-19 in Munich. The scientists were able to isolate the infectious form of the virus from the throat and lung samples until eight days of symptoms. Only two of the nine patients, who showed early signs of pneumonia, continued to shed high levels of the virus until day 10 or 11.

The analysis also shows that the virus was present in sputum of patients even after the end of symptoms. Interestingly, the virus was not detected in blood or urine samples. The researchers report that they did not find any replicating form of the virus in the stool samples, even though it contained high concentrations of viral particles. Therefore, the evidence so far suggests that the novel coronavirus may not be transmissible via stool. However, researchers say that larger sample studies are necessary to test this theory. Overall, the study suggests that patients with early-stage symptoms are likely to shed more of SARS-CoV-2 in the first week. However, studies have also shown that infected people can continue to shed coronavirus for up to 8 days after symptoms have disappeared.

Accessed on: 2nd April 2020 , 6:15 PM IST

Australia begins animal trials for COVID-19 vaccine: Trials on ferrets expected to take 3 months, says Australia's science agency: Australia's science agency announced on Thursday it has begun trials on ferrets to produce a vaccine against the novel coronavirus. A statement released by the Commonwealth Scientific and Industrial Research Organization (CSIRO) - the country's national science agency - said that scientists have commenced the first stage of testing for potential vaccines. "We have started pre-clinical trials for two vaccine candidates," it added. "The testing [is] expected to take three months," the statement said, adding that the
process was underway at the CSIRO's high-containment biosecurity facility in Geelong, Victoria. The statement said the CSIRO established its biological model last February but that its researchers have been studying the coronavirus since January."It is the first in the world to confirm ferrets react to SARS-CoV-2 [the virus that causes COVID-19]," the statement added.

Accessed on: 2nd April 2020, 7:00 PM IST

3rd April 2020: DRDO develops game-changing bio suit for doctors, health workers to keep them safe from coronavirus: Defence Research and Development Organisation (DRDO) has developed a bio-suit to keep the medical, paramedical and other personnel engaged in combating COVID-19 safe from the deadly virus. Scientists at various DRDO laboratories have applied their technical know-how and expertise in textile, coating and nanotechnology to develop the Personal Protective Equipment (PPE) having a specific type of fabric with coating.

Efforts to ramp up capacity to 15,000 suits per day: The suit has been prepared with the help of the industry and subjected to rigorous testing for textile parameters as well as protection against synthetic blood. The protection against synthetic blood exceeds the criteria defined for body suits by Ministry of Health and Family Welfare (MoHFW). The DRDO is making all efforts to ensure that these suits are produced in large numbers and serve as a robust line of defence for the medics, paramedics and other personnel in the front line combating COVID-19. The industry is geared up for production of the suit in large quantities. Kusumgarh Industries is producing the raw material, coating material, with the complete suit being manufactured with the help of another vendor. The current production capacity is 7,000 suits per day. Another vendor is being brought in with the experience in garment technology and efforts are on to ramp up the capacity to 15,000 suits per day.

The game-changer for the textile industry: The bio-suit production in the country by DRDO industry partners and other industries are being hampered due to non-availability of seam sealing tapes. The DRDO has prepared a special sealant as an alternative to seam sealing tape based on the sealant used in submarine applications. Presently, bio suits prepared using this glue for seam sealing by an industry partner has cleared test at Southern India Textile Research Association (SITRA) Coimbatore. This can be a game-changer for the textile industry. The DRDO can mass produce this glue through the industry to support the seam sealing activity by suit manufacturers. The DRDO has developed a number of products and technologies for defence against Chemical, Biological, Radiological and Nuclear (CBRN) agents. Defence Research and Development Establishment (DRDE) Gwalior, a laboratory of DRDO, has developed Chemical, Biological, Radiological and Nuclear (CBRN) Permeable Suit Mk V. Fifty-three thousand suits have been supplied to Army and National Disaster Response Force (NDRF). For first responders attending to radiological emergencies, a reusable suit has been developed by Institute of Nuclear Medicine & Allied Sciences (INMAS) Delhi. Aerial Delivery Research and Development Establishment (ADRDE) Agra has developed various types of parachutes with fabrics similar to protective technical textiles.

USA: COVID-19 vaccine candidate shows promise: University of Pittsburgh, School of Medicine scientists today announced a potential vaccine against SARS-CoV-2, the new coronavirus causing the COVID-19 pandemic. When tested in mice, the vaccine, delivered through a fingertip-sized patch, produces antibodies specific to SARS-CoV-2 at quantities thought to be sufficient for neutralizing the virus. The researchers were able to act quickly because they had already laid the groundwork during earlier coronavirus epidemics. Compared to the experimental mRNA vaccine candidate that just entered clinical trials, the vaccine described in this paper -- which the authors are calling PittCoVacc, short for Pittsburgh Coronavirus Vaccine -- follows a more established approach, using lab-made pieces of viral protein to build immunity. It’s the same way the current flu shots work.

The researchers also used a novel approach to deliver the drug, called a microneedle array, to increase potency. This array is a fingertip-sized patch of 400 tiny needles that delivers the spike protein pieces into the skin, where the immune reaction is strongest. The patch goes on like a Band-Aid and then the needles - which are made entirely of sugar and the protein pieces -- simply dissolve into the skin. When tested in mice, PittCoVacc generated a surge of antibodies against SARS-CoV-2 within two weeks of the microneedleprick. Importantly, the SARS-CoV-2 microneedle vaccine maintains its potency even after being thoroughly sterilized with gamma radiation -- a key step toward making a product that’s suitable for use in humans. They are now in the process of applying for an investigational new drug approval from the U.S. Food and Drug Administration in anticipation of starting a phase I human clinical trial in the next few months.

Source: [https://www.sciencedaily.com/releases/2020/04/200402144508.htm](https://www.sciencedaily.com/releases/2020/04/200402144508.htm)
Accessed on 3rd April 2020 at 3:00 PM IST

British Colombia: Trial drug can significantly block early stages of COVID-19 in engineered human tissues: An international team has found a trial drug that effectively blocks the cellular door SARS-CoV-2 uses to infect its hosts. The study provides new insights into key aspects of SARS-CoV-2, the virus that causes COVID-19, and its interactions on a cellular level, as well as how the virus can infect blood vessels and kidneys.

ACE2 - a protein on the surface of the cell membrane - is now at centre-stage in this outbreak as the key receptor for the spike glycoprotein of SARS-CoV-2. In earlier work, at the University of Toronto and the Institute of Molecular Biology in Vienna first identified ACE2, and found that in living organisms, ACE2 is the key receptor for SARS, the viral respiratory illness recognized as a global threat in 2003. The new study provides very much needed direct evidence that a drug - called APN01 (human recombinant soluble angiotensin-converting enzyme 2 - hrsACE2) - soon to be tested in clinical trials by the European biotech company Apeiron Biologics, is useful as an antiviral therapy for COVID-19. Now its known that a soluble form of ACE2 that catches the virus away, could be indeed a very rational therapy that specifically targets the gate the virus must take to infect humans.

Source: [https://www.sciencedaily.com/releases/2020/04/200402144526.htm](https://www.sciencedaily.com/releases/2020/04/200402144526.htm)
Accessed on: 3rd April at 3:30 PM IST
British Colombia: Trial drug can significantly block early stages of COVID-19 in engineered human tissues

An international team has found a trial drug that effectively blocks the cellular door SARS-CoV-2 uses to infect its hosts. The study provides new insights into key aspects of SARS-CoV-2, the virus that causes COVID-19, and its interactions on a cellular level, as well as how the virus can infect blood vessels and kidneys. ACE2 - a protein on the surface of the cell membrane - is now at centre-stage in this outbreak as the key receptor for the spike glycoprotein of SARS-CoV-2.

In earlier work, at the University of Toronto and the Institute of Molecular Biology in Vienna first identified ACE2, and found that in living organisms, ACE2 is the key receptor for SARS, the viral respiratory illness recognized as a global threat in 2003. The new study provides very much needed direct evidence that a drug -- called APN01 (human recombinant soluble angiotensin-converting enzyme 2 -- hrsACE2) -- soon to be tested in clinical trials by the European biotech company Apeiron Biologics, is useful as an antiviral therapy for COVID-19. Now its known that a soluble form of ACE2 that catches the virus away, could be indeed a very rational therapy that specifically targets the gate the virus must take to infect humans.

Source: https://www.sciencedaily.com/releases/2020/04/200402144526.htm
Accessed on 4th April 2020 at 3:30 PM IST

4th April 2020: University of California: Removing the novel coronavirus from water cycle: Scientists know that coronaviruses, including the SARS-CoV-19 virus responsible for the COVID-19 pandemic, can remain infectious for days or even longer in sewage and drinking water. Two researchers, Haizhou Liu, an Associate Professor of Chemical and Environmental Engineering at the University of California, Riverside; and Professor Vincenzo Naddeo, Director of the Sanitary Environmental Engineering Division at the University of Salerno, have called for more testing to determine whether water treatment methods are effective in killing SARS-CoV-19 and coronaviruses in general.

The virus can be transported in microscopic water droplets, or aerosols, which enter the air through evaporation or spray, the researchers wrote in an editorial for Environmental Science: Water Research & Technology, a leading environmental journal of the Royal Society of Chemistry in the United Kingdom. Fortunately, most water treatment routines are thought to kill or remove coronaviruses effectively in both drinking and waste water. Oxidation with hypochlorous acid or peracetic acid, and inactivation by ultraviolet irradiation, as well as chlorine, are thought to kill coronaviruses. In waste water treatment plants that use membrane bioreactors, the synergistic effects of beneficial microorganisms and the physical separation of suspended solids filter out viruses concentrated in the sewage sludge. However, since most of these methods have not been studied for effectiveness specifically on SARS-CoV-19 and other coronaviruses, additional research is required.

Source: https://www.sciencedaily.com/releases/2020/04/200403132347.htm
Accessed on 4th April 2020 at 6:00 PM IST
Common Anti-Parasitic Drug May Help In Stopping Novel Coronavirus, Says Australian Scientists' Research: Amid a barrage of research on finding treatment for new coronavirus, Australian scientists have found that a common anti-parasitic drug killed SARS-CoV-2 virus, growing in cell culture, within 48 hours in lab settings. Ivermectin is an FDA-approved anti-parasitic drug that has also been shown to be effective in vitro against a broad range of viruses including HIV, dengue, influenza and zika virus.

Published in the journal Antiviral Research, the study from Monash University showed that a single dose of Ivermectin could stop the coronavirus growing in cell culture effectively eradicating all genetic material of the virus within two days. However, it is cautioned that the tests conducted in the study were in vitro and that trials needed to be carried out in people.

Accessed on: 4th April 2020 at 6:45 PM IST

5 April 2020: Study lists 69 existing drugs to target novel coronavirus: Scientists mapped out human proteins that interact with those of the virus: In a breathtaking feat, nearly a hundred scientists from across the globe worked together to study the genes of the coronavirus (SARS-CoV-2) and have published a list of drugs that can be re-purposed to treat COVID-19. They have also mapped out the human proteins that interact with those of the virus.

The proteins of the virus must attach to the human proteins to cause the infection. The team studied 26 coronavirus genes that help in the production of these proteins. It also studied human proteins and found 332 SARS-CoV-2 and human protein interactions. The team then listed 67 human proteins that can be targeted by 69 drugs to fight the infection. These drugs include the existing FDA-approved drugs, drugs under clinical trials and/or preclinical compounds. When the virus invades the cells, it hijacks the cells' molecular machinery to replicate itself because it cannot do this on its own. The drugs we have identified may be able to inhibit these molecular machines so that the virus can no longer use them for its own survival. Thus, we hope some of these drugs will be able to decrease viral load and disease severity for patients. The list includes unexpected candidates such as entacapone used to treat Parkinson’s disease and antiviral medication named ribavirin, which was administered to Nipah patients in Kerala during the 2018 outbreak. Chloroquine, an antimalarial drug, and metformin, used to treat diabetes, were also found on the list. It was said future studies are geared up to more deeply understand the exact molecular mechanisms used by the coronavirus to drive disease in humans. This could reveal additional drug targets and drugs to treat COVID-19.

Note: The study was posted on preprint server bioRxiv on March 27, which is yet to be peer-reviewed and published in a scientific journal.

Source:  [https://www.thehindu.com/sci-tech/health/existing-drugs-that-prevent-coronavirus-replication-identified/article31258840.ece](https://www.thehindu.com/sci-tech/health/existing-drugs-that-prevent-coronavirus-replication-identified/article31258840.ece)
Accessed on 5th April 2020 at 6:00 PM IST

Researchers announce promising coronavirus vaccine candidate: The drug is delivered through a band-aid-like patch — not a needle. Researchers at the University of Pittsburgh, School of Medicine announced today that they have developed a promising new COVID-19 vaccine candidate.
Early animal trials have shown promise so far, but human trials are still in the planning stages. The researchers already had a big leg up from past epidemics. From previous experience on SARS-CoV in 2003 and MERS-CoV in 2014, these two viruses, which are closely related to SARS-CoV-2, teach us that a particular protein, called a spike protein, is important for inducing immunity against the virus," Gambotto explained. "We knew exactly where to fight this new virus.

The vaccine dubbed “PittCoVacc” (Pittsburgh Coronavirus Vaccine) works in the same basic way as a flu shot: By injecting lab-made pieces of viral protein into the body to help it build an immunity. When tested in mice, the researchers found that the number of antibodies capable of neutralizing the deadly SARS-CoV-2 virus surged two weeks after delivery. Instead of being delivered through a needle, the new drug is administered through a microneedle array, a Band-Aid like patch made up of 400 tiny microneedles. Once the patch is applied, the microneedles, which are made entirely of sugar and protein dissolve, leaving no trace behind. According to the researchers, these patches can be easily manufactured in massive “cell factories” at an industrial scale. The vaccine doesn’t even need to be refrigerated during storage or transport — a massive complication for other vaccines. Before starting human trials, the researchers are currently applying for drug approval from the US Food and Drug Administration.

Accessed on 5th April 2020 at 6:30 PM IST