ICMR drafts standard treatment guidelines for AB-PMJAY
Source: - APN News, 28 Jan 2020

We all know that the Ayushman Bharat Yojana is primarily implemented to help the poor and vulnerable families in rural and urban India to seek free healthcare services. However, for this scheme to serve better to the said people, the National Health Authority (NHA) has embraced the Standard Treatment Guidelines (STGs), which are drafted by the Indian Council of Medical Research Institute (ICMR). In fact, NHA and ICMR putting efforts to continuously update the STGs imposed on the Ayushman Bharat – Prime Minister Jan Arogya Yojana (AB-PMJAY) so that the scheme is more effective. The scheme basically provides health coverage of up to INR 5 lakhs to over millions of families across the country every year. Up till now, the ICMR has drafted STGs for 30 treatment modalities, some of which include –

- Cataract
- COPD
- Hysterectomy
- Hemodialysis
- Emergency management of ureteric stones
- Respiratory failure due to any cause
- PTCA
- Systemic thrombolysis
- Coronary artery bypass grafting (CABG)
- Low cardiac output IABP inspection post-operation
- Asthma
- Epilepsy
- Stroke
- D&C

NHA has implemented STGs in the health conditions mentioned above and plans to increase the same in the near future. This will only help the patients get the necessary medical assistance as per the standard guidelines. On the other hand, it is beneficial for the doctors as well, since they no longer will have to deal with the medico-legal cases. The hospital that is treating the patient will know what the requirements are and adhere to necessary medication.

According to medical research bodies, STGs are nothing but standard treatment schedules, standard treatment protocols, or therapeutic guidelines. Basically, STGs are just procedures implemented to help the medical practitioners and patients undergoing the treatment to make an informed decision regarding the necessary healthcare services for their health conditions.

Plant Virus Inspires design of new Vaccine against Malaria
Source: - Med India, 28 Jan 2020

Novel, second-generation, plant virus based malaria vaccine candidate could provide protection from Plasmodium falciparum malaria, according to a study that appears in the upcoming issue of the *Proceedings of the National Academy of Sciences*. Malaria, infecting approximately 228 million individuals in 2018, remains a meaningful threat to public health and regional stability. Large human populations live in malaria-infested regions of Africa, Southeast Asia and South America, where mosquitoes continuously transmit the malaria parasites from sick to healthy individuals. Though infection rates have been decreasing, this decline has stagnated in recent years, necessitating novel interventions. While malaria has been eradicated from the United States, it remains one of the top five infectious disease threats to deployed Service Members. The first generation malaria vaccine, RTS,S (Mosquirix), developed through a collaboration between GlaxoSmithKline Vaccines and the Walter Reed Army Institute of Research, is based on the circumsporozoite protein of Plasmodium falciparum. While RTS,S has conferred high level protection in controlled human malaria infection trials, its potency and duration of protection against natural malaria infection needs to be improved. In an attempt to develop a second-generation CSP-based malaria vaccine, Dr. Sheetij Dutta's laboratory at the WRAIR Malaria Biologics Branch, has used the nano-sized disk and rod shaped particles of the tobacco mosaic virus.

TMV was one of the earliest known viruses that causes mottling of tobacco leaves; this research shows that the TMV coat protein can also be highly effective as a vaccine scaffold to refocus the host immune system to the most vulnerable epitopes on CSP. Since the TMV-based malaria vaccine was produced using recombinant DNA technology in bacterial cells, it is non-infectious to humans and will pose no risk to plants. Dutta added, "The TMV-malaria vaccine showed a 10X improvement over a comparator vaccine in mice, and the superiority of this vaccine was confirmed in Rhesus monkeys. Serum antibodies from the vaccinated monkeys potently blocked

parasite entry into human liver cells up to 11 months following vaccine administration. We are now exploring the utility of TMV particles for rational design of second generation vaccines against other infectious diseases".

Scientists discover how malaria parasites import sugar
Source: - Science Daily, 29 Jan 2020

The consumption of sugar is a fundamental source of fuel in most living organisms. In the malaria parasite Plasmodium falciparum, the uptake of glucose is essential to its life cycle. Like in other cells, sugar is transported into the parasite by a transport protein -- a door designed for sugar to pass through the cell membrane. The details in how this door works has now been revealed.

"By elucidating the atomic structure of the sugar-transporting-protein PfHT1, we can better understand how glucose is transported into the parasite," says David Drew, Wallenberg Scholar at the Department of Biochemistry and Biophysics and leading the study at Stockholm University. The main goal of the research is basic understanding of this important biological process, but with the potential for development of new antimalarial drugs. Malaria kills almost half a million persons each year, according to the WHO. By blocking the door for sugar, it has been shown that one can stop the growth of the malaria parasites. "It's a long process from a compound with antimalarial activity to a drug that can be taken in the clinic. However, with this knowledge one can improve known antimalarial compounds so that they are more specific to the malarial transporter, so they do not have the side-effect of stopping sugar transport into our own cells. As such, this knowledge increases the likelihood that more specific compounds can be developed into a successful drug," says David Drew. Despite million's years of evolution between parasites and humans the research show that glucose is surprisingly captured by the sugar transporting protein in malaria parasites in a similar manner as by transporters in the human brain. "This conservation reflects the fundamental importance of sugar uptake -- basically, nature hit on a winning concept and stuck with it," says David Drew. However, the malaria parasite is more flexible. Other sugars, such as fructose, can also be imported. This flexibility could give a selective advantage to the malaria parasite so that it can survive under conditions when its preferred energy source glucose is unavailable.

"Every biochemistry student is taught about the process of sugar transport and it is exciting to add another important piece to this puzzle," says Lucie Delemotte, Associate Professor of Biophysics at KTH Royal Institute of Technology and Science for Life Laboratory Fellow, who collaborated on this project.

Hyderabad's Indian Council of Medical Research facility to be made testing centre for Coronavirus

Source: - the New Indian Express, 29 Jan 2020

HYDERABAD: The Union Ministry of Health and Family Welfare has declared that apart from the National Institute of Virology, Pune, one of Hyderabad's Indian Council of Medical Research (ICMR) facilities will be turned into a testing centre for Coronavirus.

Hyderabad is one among the four cities, apart from Alleppey, Mumbai, and Bengaluru, where testing for Coronavirus will be done in their respective ICMR institutes.

Dr K Shankar, superintendent, Government Fever Hospital said, "Most probably, the testing procedure will be started in the ICMR lab at Gandhi Hospital within ten days. The laboratory will be checked, revamped and funds will be issued. There are three existing ICMR facilities in Osmania General Hospital, Gandhi Hospital and one hospital in Warangal."

On Tuesday, Dr Shankar said that in case patients increase, the State is willing to purchase testing kits from the Centre and run tests at the State's own facilities. Health Minister Eatala Rajender issued a statement saying, "There are no confirmed cases of Coronavirus in the State. Only suspected patients have been kept in isolation. The public should not panic as the State health department is well- equipped to tackle any possibility of an outbreak."

सरकार की सलाह- कोरोना वायरस से बचना है? अपनाएं होम्योपैथिक-यूनानी फॉर्मूला

Source:- Aajtak.in, 30 Jan 2020

(Corona virus) आयुष मंत्रालय के अंतर्गत रिसर्च काउंसिल ने आयुर्वेद, होम्योपैथी और यूनानी चिकित्सा के फायदों के फायदों के बारे में बताते हुए एडवाइजरी जारी की है. चीन के वुहान शहर से फैला रहा कोरोना वायरस (corona virus) अब तक करीब 132 लोगों की जान ले चुका है. कोरोना वायरस के कई मामले चीन से बाहर भी देखने को मिल रहे हैं. चीन की सीमाओं के

बाहर वायरस का खतरा बढ़ते देख भारतीय हवाई अड्डों पर हाई अलर्ट जारी कर दिया गया है. आयुष मंत्रालय (Ministry of AYUSH) के अंतर्गत रिसर्च काउंसिल ने आयुर्वेद, होम्योपैथी और यूनानी चिकित्सा (Unani Medicines) के फायदों के फायदों के बारे में बताते हुए एडवाइजरी भी जारी की है.

कोरोना वायरस के लिए बताई गईं सावधानियां-

- स्वच्छ रहें और अपने आस-पास गंदगी न फैलने दें
- करीब 20 सेकेंड तक साबुन से अच्छी तरह हाथ धोएं.
- 1 लीटर गर्म पानी में मुस्ता, पर्पत, उशीर और चंदन जैसी चीजों को मिलाकर बॉटल में रख लें और प्यास लगने पर इसे पीएं.
- आंख, नाक या मुंह पर हाथ लगाने के तुरंत बाद हाथ धोएं.
- रोगी व्यक्ति के संपर्क में आने से बचें.
- खांसी या छींकते समय मुंह पर हाथ जरूर रखें. इसके बाद साबुन से हाथ अच्छी तरह धोएं.
- सार्वजनिक स्थल और कार्य स्थल के अलावा बाहर घूमते वक्त मुंह पर N95 मास्क जरूर पहनें.
- कोरोना वायरस के लक्षण दिखने पर मास्क पहनें और अपने नजदीकी अस्पताल में संपर्क करे.

Scientists boost gene-editing tools to new heights in human stem cells
Source: - Science Daily, 30 Jan 2020

During the past decade, the gene editing tool CRISPR has transformed biology and opened up hopeful avenues to correct deadly inherited diseases. Last fall, scientists began the first human clinical trials using CRISPR to combat diseases like cancer. They remove some of a person's cells, CRISPR edit the DNA, and then inject the cells back in, where hopefully, they will cure the disease.

But along with this promise of regenerative, personalized medicine, CRISPR can also have significant safety limitations. CRISPR may not edit in the right place (so-called off-target gene effects) or not being terribly efficient (successful editing may only be achieved in about 10% of the time for every available cell target). These limitations have frustrated scientists such as Arizona State University's David Brafman, a cell bioengineer. Brafman initial hopes are to use

gene editing to get at the heart of uncovering the causes of studies in his lab of neurodegenerative diseases like Alzheimer's. "We study neurodegenerative diseases like Alzheimer's and use stem cells to study specific mutations or risk factors associated with Alzheimer's disease," said Brafman, a biomedical engineering faculty member in ASU's Ira A. Fulton Schools of Engineering. "We are not necessarily a gene-editing tool development lab, but we were running into difficulty generating stem cell lines by using a traditional CRISPR-based editing approach. For reasons that are still unknown, stem cells are really resistant to that sort of genetic modification."

Green light means go

Now, Brafman, using a new update to the CRISPR base editing technology originally developed in the lab of David Liu at Harvard, has vastly outperformed previous efforts by making highly accurate, single DNA base editing with an efficiency of up to 90% of human stem cells. The results were published in the journal *Stem Cell Reports*. "Previously, with CRISPR, it's just been a random guess," said Brafman. "And so, if you are picking at random stem cells and the efficiency is low, you'll likely get only 10% or 5% because you have no idea if the edits have been made -- the cell isn't telling you." Brafman's lab has developed a new TREE method (an acronym short for transient reporter for editing enrichment, or TREE), which allows for bulk enrichment of DNA base-edited cell populations -- -and for the first time, high efficiency in human stem cell lines.

""Most of the studies are done in immortalized cell lines or cancer cell lines, which are relatively easy to edit," said Brafman. "This is the first example of using base editors in pluripotent stem cells, which is a very valuable cell population to genetically modify. We envision this method will have important implications for the use of human stem cell lines in developmental biology, disease modeling, drug screening and tissue engineering applications," Last year, they had shown that their TREE approach can work in human cell lines, but wanted to further push the technology further to find a way to rapidly and efficiently edit human stem cell lines. Unlike CRISPR, which cuts across both DNA stands, their TREE method only makes a single strand nick in DNA. For example, when a single DNA base is successfully edited from a C to a T, a protein gives off a signal, turning from blue to green. "Now, if a cell is telling you, 'if I'm glowing green I have a 90% chance of being edited you are going to have better luck identifying edited populations," said Brafman. "Then, you can exclude all of the cells that are not edited. We

isolate single cells that are glowing green, then grow those up into clonal populations that you are able to expand indefinitely."

Targeting Alzheimer's

Pluripotent stem cells are valued for regenerative medicine because they have the ability to become or differentiate into any cell type in the human body. Brafman explains that there are two general sources, "embryonic stem cells, which are derived from the inner cell mass of a preimplantation blastocyst, and then there are induced pluripotent stem cells, which are derived from taking somatic cells like skin or blood from patients." Brafman's lab uses the induced pluripotent stem cells for their research. "For this study, we used pluripotent stem cells from both healthy patients and then patients with Alzheimer's disease. Some of the genes that we were interested in modulating are related to Alzheimer's disease. The majority of the patients suffering from Alzheimer's disease suffer from late onset, or sporadic Alzheimer's disease." To provide their proof-of-concept, they targeted the APOE gene, which can come in three flavors. One of the three gene variants, called APOE4, has been associated with a higher risk for late onset Alzheimer's disease. For the study, they introduced single DNA based edits into the APOE gene. "That's why we are interested in having these cells," said Brafman. "They are representative of the neurons and the various cell types in the central nervous system with patients with these various risk factors. Then, we can understand why an APOE variant can increase or decrease risk, and then we can start targeting those pathways that are affected." Not only could TREE make single DNA edits to the APOE4 gene, but unlike CRISPR, make highly accurate corrections to both copies of the APOE4 gene that humans possess.

"The traditional CRISPR approach is that you have to edit once to get a heterozygous edit , then isolate that clone, edit again to get another heterozygous edit," said Brafman. "So, it's very inefficient in that way. We are generating homozygous edits at an efficiency approaching 90%. I haven't seen any other technologies that can do that in pluripotent stem cells." In addition, TREE could also be used to engineer critical gene knockout mutations into stem cell lines. "The most fundamental experiment you can do if a gene has important implications in disease, development or physiology is knock it out," said Brafman. That opens up a whole bunch of questions that we can address. Using APOE as a case study, now we can knock out APOE in these cells if you don't have APOE at all. Is it beneficial? Detrimental? Or no difference?"

Complex cases

While diseases like sickle-cell anemia or cystric fibrosis are caused by single mutations in DNA, for most diseases and leading causes of death, like heart disease or high blood pressure, are complex, and involve multiple genes. Brafman wanted to also address the complex, root causes of Alzheimer's. "Especially as it related to Alzheimer's disease, there can be multiple risk factors that act in concert, so we wanted a way to introduce multiple edits simultaneously in pluripotent stem cells. Because otherwise, you would have to take this sequential iterative approach, where you introduce one edit, isolate a clonal population introduce another edit, and so on. They successfully demonstrated that TREE could be used to make new stem cell lines that had been simultaneously edited at multiple gene locations. Their results showed that more than 80% of stem clones had been targeted at all three different gene sites, and with all clones editing both gene copies. "We found that if you multiplex you still get the same efficiency of editing as you would if you just edited a single allele," said Brafman. "Now, we can use these cells as in vitro models to study the disease and screen drugs." Brafman is hopeful that their new tools will generate excitement in the gene editing community, and spur others on to make new discoveries. "We want to keep expanding on that toolbox," said Brafman. "We've already gotten a high level of interest from other scientists who will be using this to generate their own cell lines. That's a good thing."

Coronavirus: Anticipating rise in samples to be tested, says ICMR lead epidemiologist

Source:- The Indian Express, 01 Feb 2020

“This is a constantly evolving outbreak, and we are not sure what numbers of (suspected cases) we are looking at. We are anticipating an increase in the number of samples to be tested,” said Dr R R Gangakhedkar, Head of Epidemiology and Communicable Diseases at ICMR in an interview.

The number of samples to be tested of suspected coronavirus infections is expected to go up and the government is enhancing its capacity to ensure that any possible spread in the country is arrested, the lead epidemiologist at the Indian Council of Medical Research said on Friday. “Our preparedness levels are high, nationally. At NIV (National Institute of Virology), Pune, about 750 samples can be tested every day. Each test takes about four hours. As of today, we have reagents (chemicals needed for tests) to carry out at least 10,000 diagnostic tests,” he said. Till

Friday morning, 70 cases of suspected infection were tested. All but one has come out negative. The one positive case is that of a Kerala student, who had recently returned from Wuhan — the Chinese city that is the epicentre of the coronavirus outbreak. Gangakhedkar said everyone who had travelled to Wuhan and was showing symptoms of infection would be screened and tested. “Early diagnosis is crucial. The longer it takes to diagnose or trace the contacts (of an infected person), the greater is the chance that the disease can spread to more people. Hence, all symptomatics (people with symptoms) who travelled to Wuhan and returned will be screened and tested,” he said.

He said efforts were being made to ensure that diagnostic services were available in all parts of the country. “We have a network of 106 virus research and diagnostic laboratories. NIV in Pune is the nodal laboratory where presently samples are being screened and tested. Another 12 laboratories, close to international airports, will also start screening samples,” he said. He added that Indian students in different institutions in Wuhan, who are being brought back, will be kept under observation in isolation, but admitted that keeping everyone returning from China in isolation was not possible.

“Those who come from Wuhan will be kept under observation. Those who are asymptomatic (not showing symptoms) and are coming from other parts of China and certain ports will be asked to stay within their homes for at least 14 days,” he said.