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PHARMA HIGHLIGHTS

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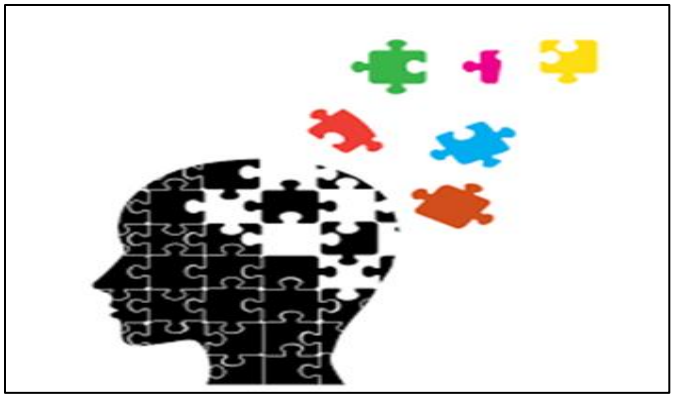
Alzheimer's Disease Vaccine



The 6th leading cause of death in USA is Alzheimer's disease. Also, the death rate of this disease is increased by 146% between 2000-2018. By 2050, 13.8 million people will get this disease worldwide. This neurodegenerative disease known as Alzheimer's disease not only kills the neuron cells in our brain but also takes away patients thinking, remembering and decision taking power. It is a progressive disorder and lasts a lifetime. Alzheimer is the cause of 50-70% dementia. Memory loss is the primary symptoms and patient will be seen often depressed, having mood swing and apathy. But patient will have some skills alive such as singing, writing or reading as these parts are controlled by other parts of the brain which gets affected later. Repeating the same thing, forgetting conversation, names, places etc. is the most common problem a patient with Alzheimer will face. Age is one of the major risk factors of this disease. People will less likely to get Alzheimer genetically. Family history is also an issue.

Beta amyloid (Aβ) protein and Tau protein are responsible for this disease. Aβ protein forms a plaque in the brain that gives toxic effect on neuron cells and disrupts cell to cell communication. Tau protein changes its own shape and by forming neurofibrillary tangles it disrupts the transport system of neuron. These two proteins are responsible for this progressive disease by causing cell death.

There is currently no treatment available of this disease. Drugs like donepezil hydrochloride can halt the progression of this disease for a while and reduce the symptoms but can't cure it. Maintaining proper diet, exercising regularly and leading a healthy lifestyle can decrease the possibility of Alzheimer's disease. Quitting smoking can also help a person to avoid this disease.

The vaccine of Alzheimer's disease, E22W42 DC, is made by a team led by Dr. Chuanhai Cao, PhD, collaborating with Tianjin University of Chinese Medicine & Michigan State University. E22W42 DC is a dendritic vaccine which gives rise to specific antibody to beta amyloid and stops the clump that forms because of beta amyloid.

E22W42 DC vaccine is made by using modified beta amyloid sensitized dendritic cells which is derived from mouse bone marrow. Dendritic cells are phagocytic cells which induce adaptive immunity, T cell & B cell to destroy harmful compounds in our body. Similarly, E22W42 DC vaccine induces both innate and adaptive immunity against beta amyloid as it contains dendritic cells. In animal trial, E22W42 DC vaccine slowed memory impairment in Alzheimer transgenic mice. The mice showed higher level of anti-beta amyloid antibodies after vaccination.

The unavailability of treatment has made this disease fatal. Like HIV, this disease is uncurable and deadly. Dr. Chuanhai Cao and his team are working hard for this vaccine and currently, it is in animal trial phase where they got a very positive result which is going to burn the light of hope for us.

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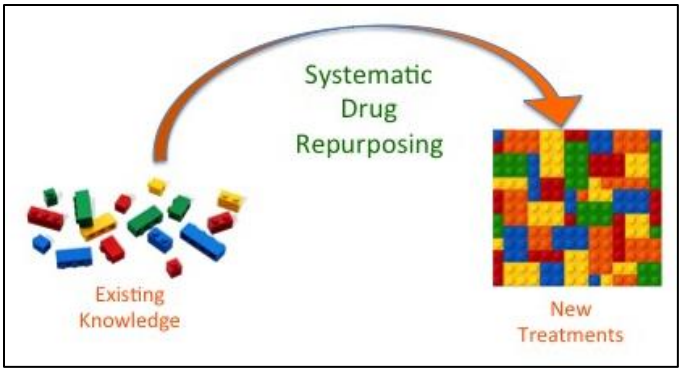
Drug Repurposing: The Shortest New Drug Discovery System



As desperate situations call for desperate measures, this year 2020 is no different as people all over the world are experiencing a desperate moment of a pandemic with millions of people already affected with COVID-19 and the world is at its peak demand so far for the development of new vaccine or treatment for COVID-19. However, this is yet another challenge as traditional de novo drug discovery and development system is a costly and lengthy process that takes around 10-15 years to put a new drug on market. Therefore, in such desperate times, drug repurposing, a short and low-cost drug discovery system

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is the alternative for finding a treatment for COVID-19 and other diseases as well. Drug repurposing is a process that targets already existing drugs on the market for new indications different from their primary indications. Such drug molecules might have failed to produce the intended therapeutic effects in specific disease conditions and are instead effective in treating other different diseases. Drug repurposing is mainly done in three approaches i.e. computational, biological experimental and mixed approaches with computational approach being more less costly and comprising a variety of in-silico methods like molecular docking that targets complementarity binding site between drug and receptors For example, umifenovir (membrane fusion inhibitor) and lopinavir/ritonavir combination (both indicated for influenza and HIV) have been considered for clinical trials against pneumonia associated with COVID-19. Remdesivir (a viral RNA polymerase inhibitor) primarily studied against Ebola virus infection is also under clinical studies and apparently being used in hospitals in COVID-19 in-patients following its emergency FDA approval. In addition, according to the Oxford University Research Team, dexamethasone, an anti-inflammatory agent primarily indicated in asthma and allergic patients is under clinical activity and it is showing promising results in severely affected COVID-19 patients. On the other hand, drug repurposing has been employed in discovering treatments for both acute and chronic diseases like in oncology field where many anticancer drugs like antihyperlipidemic drugs rosuvastatin and pitavastatin have been repurposed to treat cancer. Sildenafil was repurposed from angina and hypertension to erectile dysfunction and thalidomide was repurposed from morning sickness to erythema nodosum leprosum.

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Simple Blood Test for Early Detection of Breast Cancer

Breast cancer is the most frequent cancer among women, impacting 2.1 million women each year, and also causes the greatest number of cancer-related deaths among women. Early diagnosis strategies of breast cancer focus to reduce the risks of death and to allow for more effective treatment to be used by increasing Mammograms can detect cancer 3 years earlier. But a mammogram is uncomfortable for most women and takes few weeks to get the results. That's why, scientists at the University of Nottingham developed a new blood test that could detect the early stages (5 years earlier) of breast cancer. This method proceeds by detecting specific immune molecules, called autoantibodies, arise as a response to developing the disease and can be screened for in the blood. In a pilot study, the researchers tested blood samples from 180 participants (90 of who had breast cancer and 90 didn't) for the presence of nine autoantibodies. They used screening technology (protein microarray) that permitted them to screen the blood samples quickly for the presence of autoantibodies against 40 TAAs related to breast cancer, and also 27 TAAs that were not known to be connected with the disease. The scientists distinguished three groups of TAAs against which to test for autoantibodies. The accuracy of the test improved in the groups that contained more TAAs. The group of five TAAs accurately detect breast cancer in 29% of the samples from the cancer patients and effectively-identified 84% of the control samples as being cancer-free. The group of seven TAAs effectively identify cancer in 35% of cancer samples and no cancer in 79% of control samples. The group of nine antigens effectively-recognized cancer in 37% of cancer samples and no cancer in 79% of the controls. More research is presently expected to additionally build up the test, see how much sooner this test could detect breast cancer, and how it could be used in clinics. Researchers are arranging a bigger subsequent experiment using samples from 800 individuals to improve the accuracy of the test.

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Is Migraine Pain Finally on the Verge of Ending?

"Migraine" or "Headache disorder" is one of the most common words among half of the adult population. This migraine is a primary headache disorder and most common in women because of hormone influences usually by a factor of about 2:1. Migraine is usually caused by the activation of a mechanism deep in the brain, which leads to release of pain-producing inflammatory substances around the nerves and blood vessels of the head. But do we know exactly how many people are being affected by migraine throughout the world? Globally, it has been estimated that the prevalence among adults of current headache disorder is about 50%. Half to three-quarters of adults who are ageing 18-65 years in the world have headache in the last year, and among those individuals, 30% or more have reported migraine. So, at this point, you might be asking for effective treatment to get out of this pain, right?

As weal and woe come by turns, there is also a ray of hope. Eventually, the efforts that were initiated decades ago are finally being translated into benefits for individuals affected by migraines. With the approval of three monoclonal antibodies that target calcitonin gene-related peptide 1, the first specific treatment for migraine prevention. For decades, headache specialists were limited to hoping for a 50% reduction in attack frequency when prescribing the preventive drug for migraines and drugs were not developed enough to treat migraines. But recently, in a large randomized controlled trial, it has been shown that nearly 22% of individuals with chronic migraines experienced ≥75% reduction in monthly migraine days by month 3 of treatment with subcutaneous erenumab 140mg. On the other hand, patients with episodic migraine who received subcutaneous galcanezumab (120mg or 240 mg) experienced a ≥75% response in ≥1 month during the 6-month observation period. Even more impressive is that 15% of the patients receiving galcanezumab became migraine free for at least one month. Moreover, noninvasive vagal nerve stimulation delivered with two-short duration stimulations at the neck level has proved effective in treating of migraine attacks; one third of patients achieved pain free status at 2hr. So, it can be said that scientists have already started finding way of getting out of migraine and after all these we can hope that migraine is almost on its verge of ending.

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