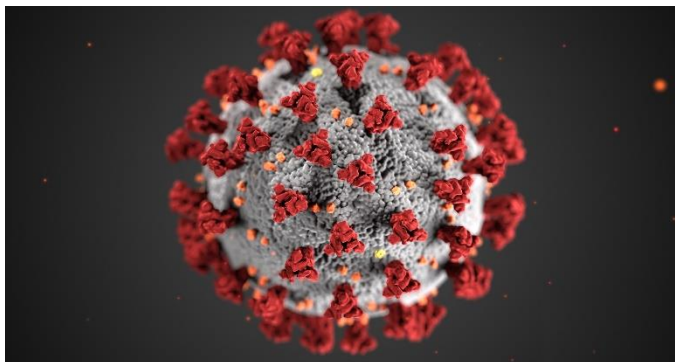


Coronavirus Update



Coronaviruses (CoV) are a large family of viruses that cause illness ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). A novel coronavirus (nCoV) is a new strain that has not been previously identified in humans and the outbreak of coronavirus disease (COVID-19) was first reported from Wuhan, China, on 31 December 2019. Till date, 110,066 cases of the COVID-19 have been reported worldwide. Among them there are currently 43,958 active cases (currently infected) of which 86% of the patients are in mild condition and 14% have been reported to be in severe or critical condition. The rest of the reported cases (66,108 cases) are now closed among which 94% of the patients have recovered while 6% of the patients have died. Hence, the COVID-19 has caused 3,830 deaths till now. As of 9th March 2020, 3 COVID-19 cases have been reported in

Bangladesh, among which two have flown from Italy recently while the third person is a family member of the two.

Coronaviruses are zoonotic, meaning they are transmitted between animals and people. Those who are infected with COVID-19 may have little to no symptoms because they are very similar to a cold or flu. Symptoms take 2 to 14 days to appear after exposure to COVID-19. Common signs of infection include respiratory symptoms, fever, cough, shortness of breath and breathing difficulties. In more severe cases, infection can cause pneumonia, severe acute respiratory syndrome, kidney failure and even death. Coronavirus infections are diagnosed by a health care provider based on the symptoms of the patient and are confirmed through laboratory tests. For now, there is no specific treatment or vaccine for COVID-19.

However, since prevention is better than cure, researchers and healthcare professionals are emphasizing on taking the prevention methods seriously. Standard recommendations to prevent infection spread include regular hand washing and sanitizing, covering mouth and nose when coughing and sneezing, avoiding close contact with anyone showing symptoms such as coughing or sneezing, and thoroughly cooking meat and eggs. In addition, zinc lozenges have been proven to be effective in blocking coronavirus (and most other viruses) from multiplying in throat and nasopharynx.

Written by: Syeda Maliha Ahmed (TA)

Improving Gene Therapy with Plant-Based Relatives of Cholesterol



Genetic diseases often result from small errors in individual genes, so if those genes could be replaced or enhanced with the right version of the gene, the disease would theoretically be cured. One of the methods suggested was using nanoparticles using molecules carrying the gene therapies. The nanoparticles would also contain plant-based cholesterol derivatives to be able to

get where they need to be more efficiently. The plant-based cholesterol relatives give the nanoparticles a shape that helps them move around with ease. Nanoparticles loaded with mRNA triggers cells to use it to generate the right version of a protein coded for by that mRNA. In cystic fibrosis, that means that cells can then use a functional chloride channel and will regulate water transport correctly, improving respiratory function and relieving disease symptoms. Cholesterol adds stability to nanoparticles that transport genetic material. The phytosterols make the nanoparticles go from a spherical to a polyhedral shape, which enables them to move faster. The nanoparticles perform better when they can move faster, because they must get away from a cellular compartment called an endosome and get to the cytosol where they need to be more efficiently.

Written by: Nuzhat Zahin (TA)

Is a Vaccine for Colorectal Cancer Possible?



Researchers collaborating to invent the first vaccine capable of preventing colorectal cancer are preparing to move their investigations from animal models to human trials. According to the American Cancer Society (ACS), colorectal cancer is the second leading cause of deaths from cancer for men and women in the US combined. Reports of the ACS, approximately 4% of men and women in the US will develop colorectal cancer at some point in their lifetime.

Researchers have tested the vaccine in mice models so far. It was found that if the vaccine is administered before giving mice a chemical that caused the development of polyps (and eventually colon cancer), 80% of the polyps could be prevented from becoming colon cancer. Additionally, it was determined that in mice whose genes had been changed to make them develop polyps and then colon cancer, the vaccine prevented 50% from developing pre-cancerous polyps.

This success was hard-won, as developing a cancer vaccine is anything but easy. However, in a cancer cell, the proteins look very similar to healthy proteins, so the immune system doesn't know to attack them. That means that the vaccine has to consider this factor.

The researchers hope to move their work forward, saying a colorectal cancer vaccine could change millions of people's lives.

Written by: Syeda Fahria Hoque Mimmi (TA)

Brain Scans Reveal There are Two Kinds of Schizophrenia



Schizophrenia is a chronic neurological disorder that affects around 3.5 million people in the US; three quarters of them developing the condition between the ages of 16 and 25. Now, contrary to previous knowledge, researchers have found that there may be two different varieties of the disorder. The researchers applied a machine learning method, HYDRA (Heterogeneity through Discriminate Analysis) to over 307 MRI scans from patients with schizophrenia alongside 364 scans from healthy control subjects. Then each brain was categorized into neuroanatomical subtypes.

In the end, it was found that not only did 40% of the patients with schizophrenia have relatively normal amounts of grey matter in their brains, but they also displayed small increases in grey matter in a central area known as the striatum when compared to those in the control group. These findings remained same even after adjusting results for factors including medications taken and age.

According to the researchers it is too early to say exactly what separates these two kinds of schizophrenia, but these findings provide new research pathways to better understand why some treatments work on some patients and not others, as well as ways to develop new, more personalized treatments.

The treatments for schizophrenia work really well in a minority of people, pretty well in most people, and hardly at all in a minority of people. So, it becomes a matter of trial and error. Now that the biology behind this disorder is understandable, the researchers are anticipating that one day the disorder will have more informed, personalized approaches to treatment.

Written by: Rakhi Chowdhury (TA)