mRNA Vaccines

Good evening everyone,

Today is as good a day as any to discuss mRNA vaccines. The first doses of the COVID19 vaccines have been injected into patients; so let's do a deep dive into how they work. First this post will discuss the COVID19 vaccine and how it works. From there I will explore the idea that these vaccines can change the course of medicine as we know it.

First and foremost, I should define DNA and RNA. DNA is deoxy Ribonucleic Acid, while RNA is Ribonucleic Acid. DNA is the building block for life on earth. DNA is a molecule which is formed into genes which operate cells while RNA gives the DNA instructions. Hence the vaccine under discussion is an mRNA vaccine. One particular function that RNA gives instructions on is immune response: a particular subject of importance to this post.

According to the CDC,"mRNA vaccines are a new type of vaccine to protect against diseases." "To trigger an immune response many vaccines put a weakened or inactive germ into our bodies "the CDC also states that the mRNA vaccine is not made up of weakened or inactive viruses. Instead, "COVID-19 mRNA vaccines are given in the upper arm muscle. Once the instructions (mRNA) are inside the muscle cells, the cells use them to make the protein piece. After the protein piece is made, the cell breaks down the instructions and gets rid of them." Furthermore, the post describes the cells as not recognizing the protein and the body subsequently build up an immune response similar to an actual COVID19 infection. Naturally, those who have received this vaccine have gained increased immune protection from COVID19 because their bodies will know how to fight it off.

My interest in mRNA vaccines will continue to grow. Undoubtedly, I will do my patriotic duty and receive the two shots. More promising still after reading Diane Kwon's Scientist Magazine's "THE Promise of mRNA vaccines" it has become clear to me that COVID19 is not the only disease that could be vanquished by such a technology. The article states that clinical trials are under way for testing the vaccine against rabies, zika virus and influenza (the flu). Kwon further states, "It could, in theory, be used to engineer any protein the body needed to boost immunity against pathogens and fight diseases such as cancer and rare genetic conditions. Naturally, if other mRNA vaccines prove as successful as the COVID19 vaccine, they will unlock a new paradigm in medicine.

After reading both the CDC and Quan's article, my confidence in MRNA technology has been raised. The idea that an MRNA molecule giving cells instructions for making a virus's protein in order to fight it off sounds much more efficient than storing samples of a virus and making a vaccine from it. The use of MRNA technology to potentially fight the zika virus, influenza and rabies also sounds exciting. Besides those three viruses, I wonder if this technology can be used to fight HIV AIDS as well. If that were not enough for changing medicine, the idea of vaccines fighting cancer is eyebrow raising as well. In short, MRNA vaccines are a new scientific wonder which will hopefully benefit human kind for generations to come.