RNA VACCINES

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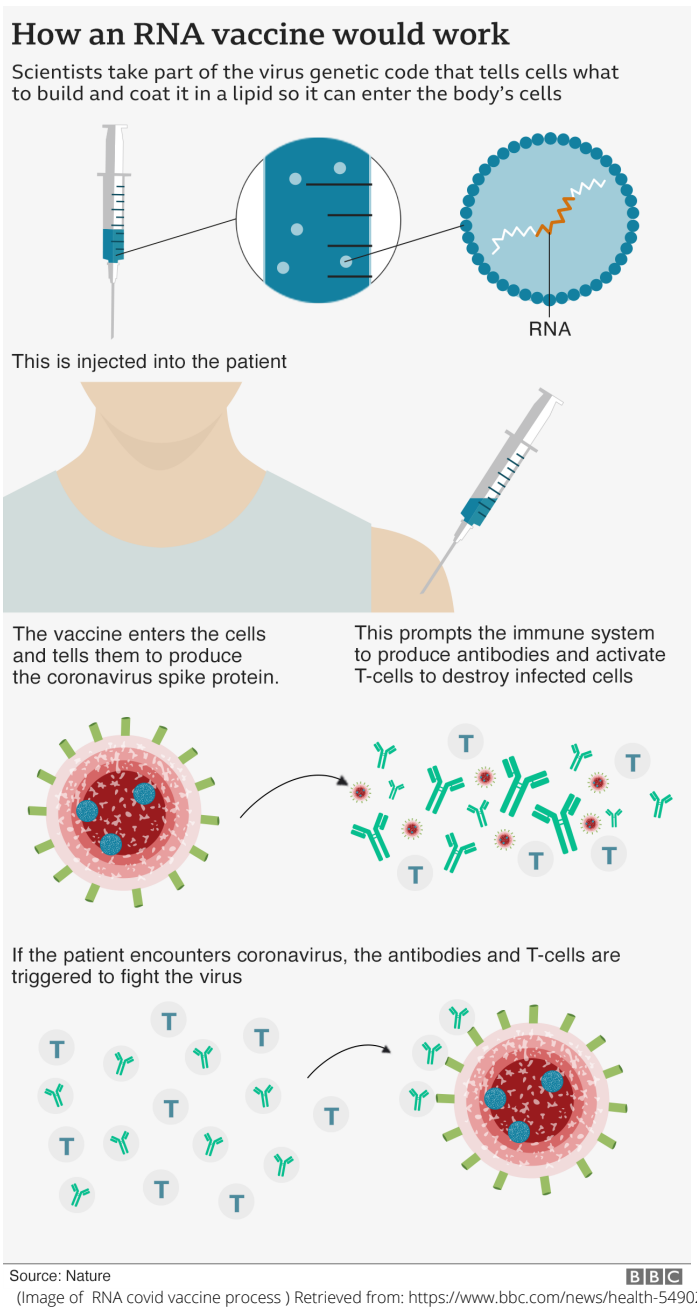
WHAT ARE RNA VACCINES?

RNA vaccines work due to an mRNA strand that codes for an antigen of a specific disease. When this strand is inside the body, certain cells are in charge of producing that antigen by using the genetic information. Then, the antigen is displayed on the cell surface, so the inmune system can recognize it. The main difference between RNA vaccines and conventional ones is in the contents of the actual vaccine. A normal vaccine inserts the inactivated protein of the virus or the inactivated virus itself, whereas RNA vaccines insert an mRNA sample of the virus which then goes through the process of translation in order to create the spike protein.

TRANSLATION STEPS:



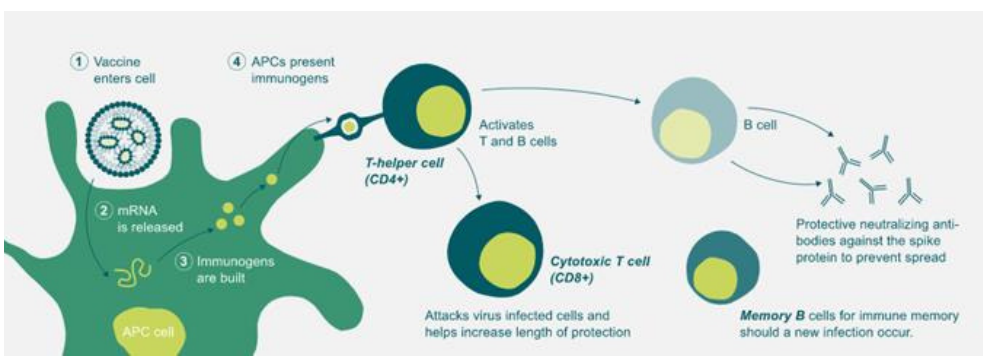
(Image of RNA covid vaccine process) Retrieved from: https://www.bbc.com/news/health-54902908

Initiation: Once the vaccine is injected into the body, the sample of mRNA travels to the ribosomes inside the cell and begins detecting and providing instructions for the production of antigens.

Elongation: The strand of mRNA gets divided into sections made up of codons (1 codon = 3 nucleotides) that are complementary to the anticodons. These are found by the tRNA along with the matching amino acid, which allows the protein to be formed and attached.

Termination: Once the spike protein has been successfully made and recognized, the body produces antibodies and activates certain t-cells that are ready for encountering and fighting the virus if the body were to get infected.

HOW THE BODY REACTS:



Through RNA vaccines, the protein that is made in the ribosomes from the original mRNA sample is called the "spike protein". This is designed to give the human body a defensive response, since this protein is detected as an antigen. In order for the human body to prevent or fight off the virus, the T cells and the B cells are targeted and triggered into creating an immune response. These cells are approached in order to produce long-living memory versions of them, so they are ready for future encounters with the virus. Once a person is vaccinated, their T cells develop defensive mecanisms by being prepared to attack these infected cells, as well as helping the B cells to produce antibodies for avoiding any chance of infection possible.

WHY IS IT SAFE?

RNA vaccines are even safer than conventional ones, because they use a non-infectious element, and the actual virus is not inserted into the body. These vaccines have been through many tests and safety assessments that have approved of how secure it really is, including the outcomes of no concerning side affects. Furthermore, they have some benefits including shorter manufacturing times and controllable production factors.

Sources:

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