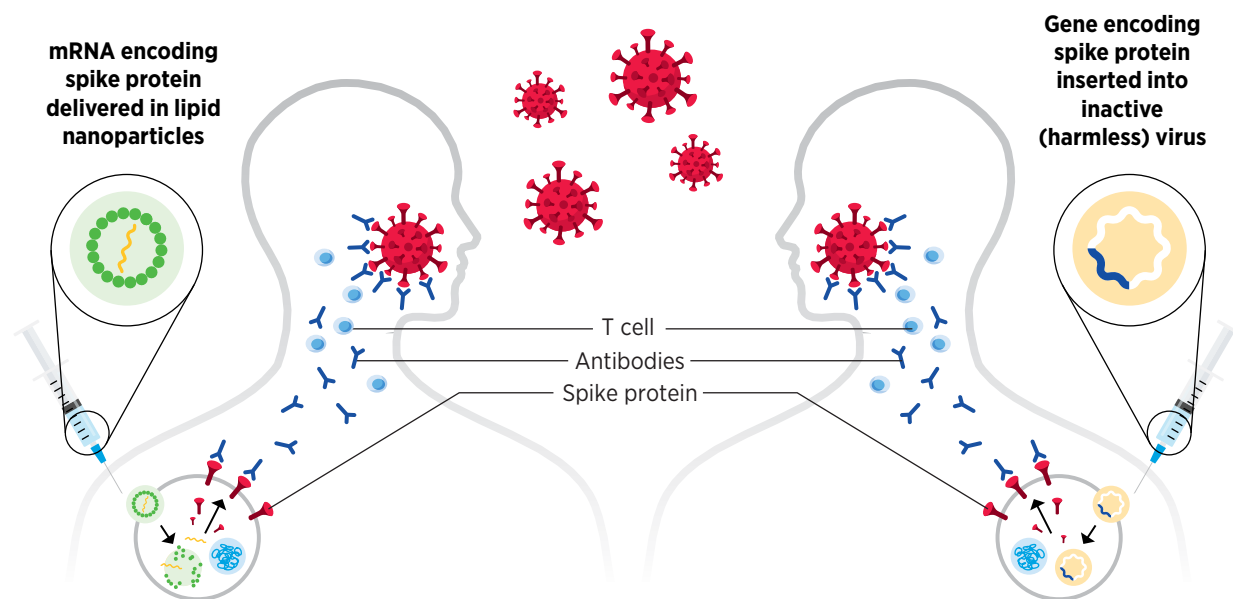


FIGURE 3 HOW THE SARS-COV-2 VACCINES WORK



BNT162b2 (Pfizer-BioNTech) and mRNA-1273 (Moderna) are mRNA vaccines. Instructions encoded in mRNA vaccines for SARS-CoV-2 serve as a blueprint for cells to make SARS-CoV-2 spike protein. The mRNA is delivered via lipid nanoparticles, which increase the uptake of the mRNA molecules into cells once an individual is vaccinated. Importantly, the mRNA does not interact with an individual's genetic material or DNA. Once the mRNA is inside the individual's cells, the cellular machinery called ribosome reads the vaccine-derived mRNA as a set of instructions, much like it does for any cellular mRNA, to make the viral spike protein. The immune system sees these protein molecules as foreign invaders, which triggers the activation of the body's defense mechanisms including activation of B and T cells, which further leads to the production of antibodies and memory cells that protect against future

SARS-CoV-2 infection. In other words, if the person is exposed to SARS-CoV-2 subsequently, the immune system will recognize it and eliminate any infected cells and the viral particles.

JNJ-78436735 (Janssen) is a viral-vector vaccine, which uses a different approach than the mRNA vaccines but instructs a recipient's cells to make the same SARS-CoV-2 spike protein. The vaccine comprises a harmless (inactivated) form of an adenovirus (virus that causes common colds) which is engineered to carry the genetic code of the SARS-CoV-2 spike protein. Once an individual is vaccinated the code is taken up by the individual's cells and instructs the cells to produce the spike protein, which in turn activates the immune system by creating antibodies and memory cells to protect against an actual SARS-CoV-2 infection.