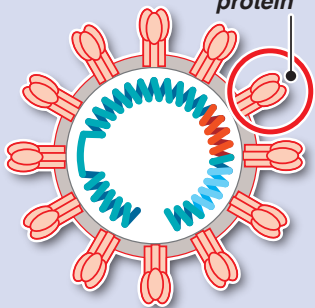


# How mRNA vaccines work

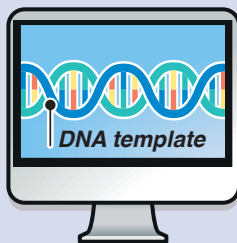
Messenger RNA vaccines carry genetic instructions which enable a recipient's cells to make proteins that prime the immune system

**Coronavirus**

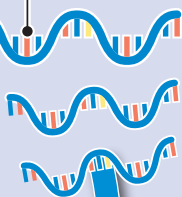
**"Spike" protein**



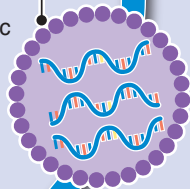
**1. RNA vaccine:** Messenger RNA (mRNA) is made from DNA template – mRNA contains sequence that codes for virus spike protein



**Synthetic mRNA sequence**



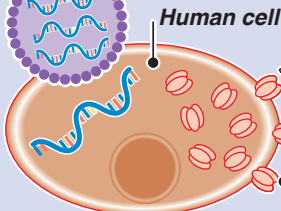
**2. RNA sequence:** Blueprint for making spike protein is packaged in microscopic oily-lipid droplets for delivery



**mRNA lipid nanoparticles**

**3. Vaccination:** Recipient cells read mRNA sequence and produce millions of copies of spike protein

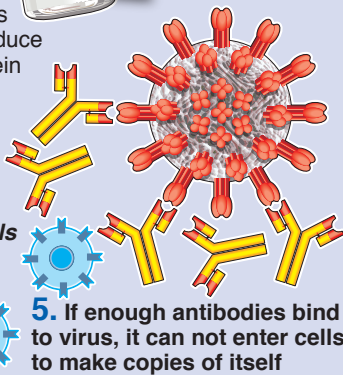
**Human cell**



**Antibodies**

**Protein**

**T cells**



**4. Viral protein:** Displayed on surface of cell, it stimulates immune system to produce antibodies

**5. If enough antibodies bind to virus, it can not enter cells to make copies of itself**