# THE VALUE OF mRNA VACCINES

mRNA is genetic material that is translated from DNA to make proteins in our cells. Creating and encoding different kinds of mRNA is by no means new technology and is game-changing in the field of therapeutics due to how easily it can be synthesized and edited. This ability to edit mRNA quickly is what makes it such a powerful tool against pathogens. If the pathogen mutates then we can easily update the mRNA to create a better target for the vaccine or drug. Think of it like adjusting a recipe.
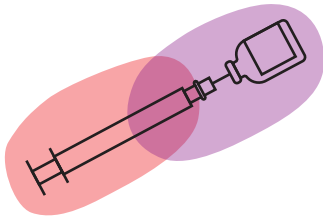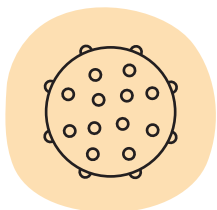
DEVELOPING AN mRNA VACCINE

BAKING A CAKE

PRE-DETERMINED GUIDELINES

We have the basic building blocks and understanding of how to generally develop a vaccine.

When baking a cake, you have a basic outline as determined by your recipe.

SPECIFIC BUILDING BLOCK
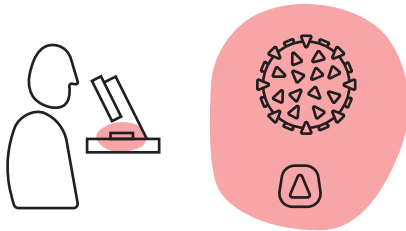
When a virus emerges, scientists must simply characterize its unique protein structure and translate it into its corresponding mRNA sequence.
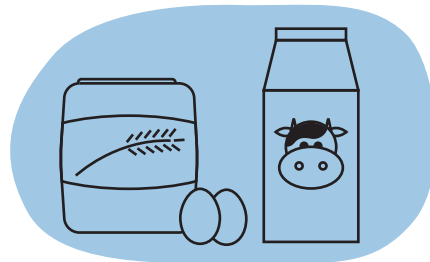
As outlined by your recipe, you must gather certain ingredients such as flour, milk, fat, sugar, etc.

FINAL OUTCOME

This custom sequence is then applied to vaccines and is able to be distributed for immunity (after a clinical trial to confirm safety). A person's white blood cells ingest the mRNA, produce the virus's protein, and are able to train the immune system to recognize and fight it.
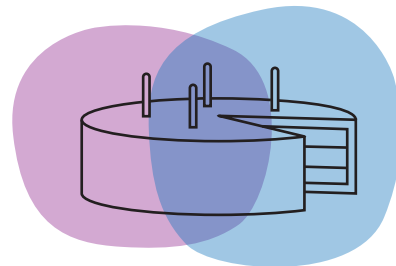
These ingredients are combined and baked and you have a delicious cake that you can share with your friends!

ADAPTATIONS

If down the line the virus adapts or a similar one emerges, the protein structure just needs to be tweaked in the vaccination to be effective. This streamlines the process and helps the world fight pandemics with safe and proven vaccines.

For your friend's birthday you want to bake her the cake, but she's lactose intolerant. Instead of creating a totally new recipe from scratch, you simply have to tweak the type of milk you use in your existing one and continue with the process.