In standard vaccination, an inactivated piece of a pathogen, called an antigen, is injected into the body to produce an immune response. RNA-based vaccines are a potential game-changer because only the pathogen’s genetic code is needed to build immunity. Scientists in China released the genetic sequence of SARS-CoV-2 (the virus that causes COVID-19) in January 2020, which kicked off research around the globe for a potential vaccine.

RNA vaccines work by introducing into the body an mRNA sequence containing genetic instructions for the pathogen-specific antigen. Once inside the vaccinated person’s own cells, the mRNA provides instructions for the body to produce the antigen itself to potentially generate a strong immune response.

Since SARS-CoV-2 is a novel virus, scientists have yet to determine whether a vaccine can produce durable immunity to the infection. There is still much work to be done in developing RNA vaccine platforms, which are advancing at a rapid pace. With the current urgent crisis, however, we are working to develop these novel technologies as quickly as possible to potentially produce a safe and effective vaccine.

Pfizer COVID-19 Response: mRNA Vaccine

With unprecedented speed, Pfizer is joining forces with German biotech BioNTech to co-develop a potential messenger RNA-based (mRNA) coronavirus vaccine to prevent COVID-19. The partnership will help accelerate development of BioNTech’s potential first-in-class COVID-19 mRNA vaccine program, BNT162, which is expected to enter testing in human subjects by the end of April 2020. We’ve been working with our German partners since 2018 to develop an mRNA influenza vaccine, enabling us to quickly mobilize our expertise and collective resources to battle COVID-19.

Pfizer will be leveraging its expertise in five key areas:

1. Assay development and high-throughput clinical testing: We’re sharing our tools and insights, which are critical to developing the potential vaccine.

2. Infectious-disease vaccine experience: Pfizer has fought and won battles against smallpox, polio and invasive pneumococcal disease, and now we’re taking on COVID-19.

3. Clinical development: We have extensive experience in designing and executing the very large field trials necessary to gather the data to license a prophylactic infectious disease vaccine.

4. Regulatory approvals: We’re providing our knowledge of how to navigate relationships with regulators and other public health organizations to meet or exceed their requirements.

5. Manufacturing: As one of the largest manufacturers of vaccines and therapeutics, we’re helping our partners scale up and using our manufacturing capacity to rapidly get a potential preventive vaccine to the public as quickly as possible.

The science of mRNA vaccines

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