

Dr. Kizzmekia “Kizzy” Corbett is an American immunologist, meaning a scientist who studies the immune system—the system of cells, tissues, and biological processes that protect the body from disease-causing organisms such as viruses and bacteria. She is known for her scientific work on viral immunology and vaccine development, particularly for her role in the research that led to the Moderna COVID-19 vaccine, one of the first vaccines developed to protect humans against the disease COVID-19.

Kizzmekia Corbett was born on January 26, 1986, in Hurdle Mills, North Carolina, United States. She grew up in a rural area and attended local public schools. From an early age she showed interest in science and mathematics. During high school she participated in programs that exposed students to laboratory research, including a summer science program connected with the University of North Carolina at Chapel Hill. These early experiences introduced her to the practice of scientific experimentation and biomedical research.

She later attended the University of Maryland, Baltimore County (UMBC), where she studied biological sciences, the scientific study of living organisms and their biological processes. At UMBC she was part of the Meyerhoff Scholars Program, an academic program designed to prepare students for advanced degrees in science, technology, engineering, and mathematics. Programs of this type emphasize undergraduate research, mentorship, and advanced academic training.

After completing her undergraduate degree, Corbett pursued doctoral studies at the University of North Carolina at Chapel Hill, where she earned a Ph.D. in microbiology and immunology. Microbiology is the study of microscopic organisms such as viruses, bacteria, and fungi, while immunology focuses on how the immune system detects and responds to these organisms. During her doctoral research she studied how viruses infect cells and how immune responses can be directed to prevent infection.

Following her doctoral training, Corbett joined the Vaccine Research Center (VRC) at the National Institute of Allergy and Infectious Diseases (NIAID), which is part of the National Institutes of Health (NIH) in the United States. The NIH is a major government biomedical research organization responsible for conducting and supporting research related to human health and disease. The Vaccine Research Center focuses specifically on the development of vaccines against infectious diseases.

At the Vaccine Research Center, Corbett worked on research related to coronaviruses, a family of viruses that infect animals and humans. Coronaviruses are named for the crown-like appearance of their surface structures when viewed under a microscope. These surface structures are called spike proteins, which are proteins that allow the virus to attach to and enter human cells.

Understanding the structure and behavior of the spike protein became central to vaccine development. A vaccine is a biological preparation that stimulates the immune system to

recognize and defend against a particular pathogen. A pathogen is a microorganism capable of causing disease. Vaccines typically work by introducing a harmless component or weakened form of the pathogen so that the immune system learns to recognize it and respond quickly if exposure occurs later.

Corbett was part of a team of scientists studying how coronavirus spike proteins function and how they can be stabilized in a form that triggers a strong immune response. Stabilization refers to modifying the protein so it remains in a specific structural configuration that the immune system can recognize effectively. This research became critical when the virus SARS-CoV-2 emerged in late 2019. SARS-CoV-2 is the coronavirus responsible for the disease COVID-19, a respiratory illness that spread globally beginning in 2020.

Because the Vaccine Research Center had already been studying coronavirus spike proteins from earlier outbreaks such as SARS-CoV-1 (the virus responsible for the 2003 SARS outbreak) and MERS-CoV (Middle East Respiratory Syndrome coronavirus), scientists had knowledge about how to design vaccines targeting the spike protein. Using this research foundation, the NIH collaborated with the biotechnology company Moderna to develop an mRNA vaccine against SARS-CoV-2.

An mRNA vaccine uses messenger RNA, which is a molecule that carries genetic instructions from DNA to the cell's protein-producing machinery. Instead of injecting a weakened virus, an mRNA vaccine delivers instructions that allow human cells to produce a harmless version of the viral spike protein. When the immune system detects this protein, it produces antibodies, which are specialized proteins that recognize and neutralize pathogens. This process trains the immune system to respond quickly if the real virus enters the body.

The vaccine developed through this collaboration became known as the Moderna COVID-19 vaccine, officially designated mRNA-1273. Clinical trials—scientific studies conducted with human participants to evaluate safety and effectiveness—began in 2020. Results from these trials showed that the vaccine significantly reduced the risk of developing symptomatic COVID-19 infection.

Corbett's role in this research involved leadership in the viral immunology team that studied coronavirus spike protein design and immune responses to vaccines. Her work contributed to the rapid development timeline of the vaccine, which moved from genetic sequencing of the virus to clinical trials in a matter of months. Vaccine development typically takes several years, but the prior research on coronavirus spike proteins allowed scientists to move quickly once the new virus was identified.

In 2021, Corbett joined the Harvard T.H. Chan School of Public Health as an assistant professor of immunology and infectious diseases. A professor at a research university conducts scientific studies, teaches graduate students, and leads research laboratories focused on specific areas of science. Her research continues to focus on vaccine design,

immune responses to viral infections, and improving vaccine strategies for emerging infectious diseases.

Corbett's work is part of the broader field of infectious disease research, which studies diseases caused by pathogens such as viruses, bacteria, parasites, and fungi. Scientists in this field investigate how pathogens spread, how the immune system responds, and how vaccines or medicines can prevent or treat disease.

Her career illustrates the connection between basic scientific research—the study of fundamental biological processes—and applied biomedical innovation, which involves turning scientific discoveries into medical tools such as vaccines and treatments. Research on coronavirus spike proteins conducted years before the COVID-19 pandemic created the scientific foundation that allowed rapid vaccine development once the new virus emerged.