

Dr. Kizzmekia (“Kizzy”) Shanta Corbett: Professor and Vaccine Research Scientist

The NCSS Editors¹

Even before the first U.S. death from the mysterious, new coronavirus, Dr. Kizzmekia S. Corbett and Dr. Barney Graham were in a race against the clock. In 2020, they were research team members at the National Institutes of Health’s (NIH’s) Vaccine Research Center in Bethesda, Maryland.

On a Saturday morning in early January of that year, Chinese scientists posted on the Internet the genetic sequence of the rapidly spreading virus that causes the COVID-19 disease. Other researchers could now understand the mysterious, deadly illness that would soon spread across the globe. By the end of the weekend, Graham and Corbett, aided by years of research,² were able to use the genetic code of the coronavirus (named SARS-CoV-2) to design the basic molecular structure for lifesaving vaccines. Humanity’s war against the pandemic had begun.

This innovation would turn out to be one of the monumental achievements of modern medicine.

“Their names will be in the history books,” said Dr. Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases (NIAID). “Kizzmekia and Barney have made contributions to human health that few others could claim,” said NIH Director Dr. Francis Collins.

Just days after Graham and Corbett shared their design, collaborators at the biotech company Moderna were able to manufacture the first doses of the coronavirus vaccine. After these initial tests for safety and efficacy, the first human trials began just 65 days later. It was, by far, the fastest vaccine development process in history.

Graham and Corbett’s design ended up forming the backbone of successful messenger RNA (mRNA) vaccines in use today. (Pfizer’s vaccine, developed separately, relies on a nearly identical design.)

Graham, deputy director of the NIH Vaccine Research Center, and Corbett, who was the scientific lead of the coronavirus research team in Graham’s Viral Pathogenesis Laboratory, made versions of a spike protein based on prior work from other coronaviruses. (Now in 2021, Dr. Corbett is a professor at Harvard University. Dr. Graham continues as head of the laboratory at NIH.)

For both scientists, the results were beyond their wildest expectations. “Getting 94 percent [efficacy] is kind of rare in vaccines. I was expecting 70 percent and hoping for 80 percent,” Graham said.

“It was the first time in ten months where I was actually able to breathe,” Corbett recalled. “I shed every tear I had wanted to shed over the last year” of nonstop, high-

pressure scientific work to save lives. She added, “This moment has transformed virology and vaccinology in a way that no one will be able to ignore.” 🌍



Courtesy National Institute of Health/Dr. Corbett

Notes

1. Based on the article, “2021 Finalist: Covid 19 Response, Kizzmekia S. Corbett, Ph.D., Barney S. Graham, M.D., Ph.D.,” at <https://servicetoamericamedals.org/honorees/corbett-graham>. The Samuel J. Heyman Service to America Medals are awarded to “highlight excellence in our federal workforce and inspire other talented and dedicated individuals to go into public service.”
2. For another scientist, **Katalin Karikó**, the successful vaccine against COVID-19 was a validation of 40 years of hard work, and it opens the door to a new generation of medicines. “Redemption’: How a Scientist’s Unwavering Belief in mRNA gave the World a Covid-19 Vaccine,” by Sarah Newey and Paul Neuki, *The Telegraph* (December 2, 2020), <https://www.telegraph.co.uk/global-health/science-and-disease/redemption-one-scientists-unwavering-belief-mrna-gave-world/>.

Sidebar 1:

Quick Facts about Dr. Kizzmekia S. Corbett (for Teachers)

Kizzmekia “Kizzy” Shanta Corbett (born January 26, 1986) is an American viral immunologist. She is the Shutzer Assistant Professor at the Harvard Radcliffe Institute and assistant professor of immunology and infectious diseases at Harvard T.H. Chan School of Public Health. She joined Harvard following six years at the Vaccine Research Center (VRC) at the National Institute of Allergy and Infectious Diseases, National Institutes of Health (NIAID NIH) based in Bethesda, Maryland.

Dr. Corbett earned a Ph.D. in microbiology and immunology from the University of North Carolina at Chapel Hill (UNC-Chapel Hill) in 2014. Appointed to the VRC in 2014, she was the scientific lead of the VRC’s Coronavirus Team, with research efforts aimed at propelling novel coronavirus vaccines, including a COVID-19 vaccine. In February 2021, Dr. Corbett was highlighted in the *Time’s* “Time100 Next” list under the category of “Innovators,” with a profile written by Anthony Fauci, director of NIAID NIH.

In addition to her groundbreaking work on COVID-19 vaccines, Dr. Corbett holds a portfolio with the U.S. Patent Office which includes concepts for “universal” coronavirus and influenza vaccines (aiming to combat *all* forms and variants of those diseases) and novel therapeutic antibodies. In all, she has over 15 years of experience studying dengue virus, respiratory syncytial virus, influenza virus, and coronaviruses, garnering several prestigious awards, including the Benjamin Franklin Next Gen Award and the Salzman Memorial Award in Virology. Combining her research goals with her knack for mentorship, Dr. Corbett invests much of her time in underserved communities as an advocator of STEM education and vaccine awareness.

Sources for this sidebar: Wikipedia; T. H. Chan School of Public Health, Harvard University; *NIH Record*, nihrecord.nih.gov/2020/12/11/corbett-recounts-quest-covid-vaccine.

Sidebar 2:

Recommended Resources for Social Studies Teachers about Vaccines and Public Health

“Hilleman: A Perilous Quest to Save the World’s Children,” a film by Donald Rayne Mitchell (67 minutes, color, 2016, Stream \$2.99; DVD \$15), <http://firstrunfeatures.com/hilleman.html>. Trailer and streaming at vimeo.com/ondemand/hilleman. “The 20th century was a dangerous time to be young: a multitude of diseases too often kept children from reaching even their teenage years. Millions suffered and died. From that environment, one man would emerge to lead a revolution in vaccine innovation that would save many millions of young lives every year.” Maurice Hilleman is considered by many to be the father of modern vaccines. He developed many of the vaccines that are routinely given to children today.

The Vaccine Makers Project provides teaching resources (including nifty animations of microscopic events), hosts an essay contest, and published the documentary “Hilleman,” above. Visit vaccinemakers.org.

Sandra W. Moss, M.D., “Yellow Fever in Philadelphia, 1793” (Book Review), *Middle Level Learning* no. 31 (January February 2008), 5–8, <https://www.socialstudies.org/middle-level-learning/31>.

Dorit Reiss, “Regulating Vaccines and COVID-19 (Lessons on the Law),” *Social Education* 85, no. 3 (May/June 2021), 129–132, <https://www.socialstudies.org/social-education/85/3/regulating-vaccines-and-covid-19>. Enter the search terms such as “epidemic” and “pandemic” to find other related articles and teaching activities published by NCSS.

Sidebar 3:

Dr. Kizzy Corbett

(A Handout for Students)

Kizzmekia Shanta Corbett was born on Sunday, January 26, 1986, in Hurdle Mills, North Carolina. Kizzy grew up in a large family of step-siblings and foster siblings, led by her loving mother, Rhonda Brooks.

Kizzy went to Oak Lane Elementary School in Roxboro, North Carolina. Her friends called her “Kizzy.” Then she attended A.L. Stanback Middle School. Her fourth grade teacher, Myrtis Bradsher, recalled seeing Corbett’s talent at an early age. “I always thought she is going to do something one day. She dotted i’s and crossed t’s. The best in my 30 years of teaching,” said Ms. Bradsher in a 2020 interview with *The Washington Post*.



Photo by Chia-Chi Charlie Chang at nihrecord.nih.gov/2020/12/11/corbett-recounts-quest-covid-vaccine. Courtesy of the *NIH Record*

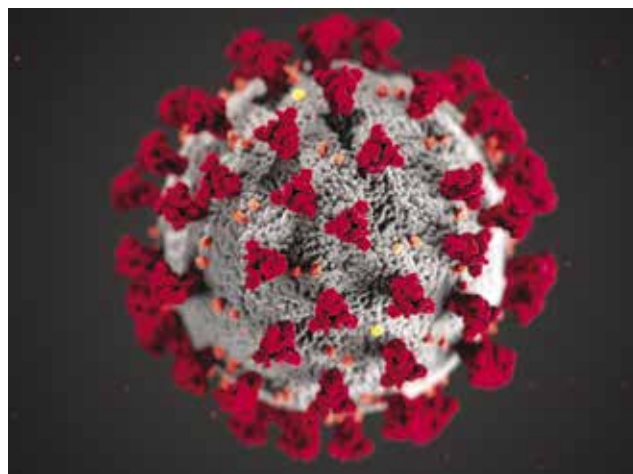
While in high school, Kizzy realized that she wanted to be a scientist. During the summers, she worked in research laboratories. She graduated from Orange High School in Hillsborough, North Carolina, in 2004.

Kizzmekia went on to college, and graduated from The University of Maryland, Baltimore County (UMBC). Then she went to graduate school. In 2014, Kizzmekia Corbett received doctorate degree, a Ph.D. in microbiology and

immunology, from the University of North Carolina at Chapel Hill. For her doctoral work, she went to Sri Lanka to study a viral disease.

At the National Institutes of Health (NIH) in Bethesda, Maryland, Dr. Corbett went to work with the Vaccine Research Center. She became the scientific leader of the Coronavirus Team. Her research focused on how to make vaccines against viruses, which are sub-microscopic in size.

In 2019, nobody knew that a new kind of coronavirus was about to make many people sick and cause many deaths. (“Corona” means circular, like a crown.) By the spring of 2020, a world-wide disease, a pandemic, had taken hold. Schools, playgrounds, and summer camps closed. Mayors told their residents to stay off the streets. Businesses closed, and many parents lost their jobs. Nobody wanted to catch this invisible disease called COVID-19.



Computer model of a coronavirus by the U.S. Centers for Disease Control and Prevention.

Dr. Corbett and her Coronavirus Team were suddenly in the spotlight. Their jobs sped up. They worked tirelessly to understand this new

Flickr.com/NIH Image Gallery



Dr. Anthony Fauci, Director of the National Institute of Allergy and Infectious Diseases, receives the Moderna COVID-19 vaccine at the COVID-19 Vaccine Kick-Off event at the National Institutes of Health on 12/22/20.

virus. In just a few months, the team created the molecular building blocks that would allow companies to manufacture vaccines. These vaccines were tested for safety and effectiveness. In less than a year, millions of doses of life-saving vaccines were produced. Dr. Corbett and her team had saved millions of lives.

Society is beginning to recognize what Dr. Corbett and her team of scientists accomplished. She has won many awards. In recognition of her work on the vaccine, Orange County, North Carolina, named January 12, 2021, "Dr. Kizzy Corbett Day." In February 2021, Dr. Corbett was highlighted in *Time* magazine as a leading innovator in the world. Dr. Anthony Fauci, director of the National Institutes for Allergy and Infectious Diseases at NIH, wrote the article about her.

Dr. Corbett is now a professor at the Harvard T.H. Chan School of Public Health in Boston, Massachusetts. She invests part of her time in underserved communities. She advocates for STEM education and public health, including vaccine awareness. For example, we should wash our hands before eating food. We should wear a face mask when it helps prevent the spread of a disease. We should get vaccinated to prevent illnesses.

Children and adults don't have to look back very far in history to understand the dangers of viral diseases and the importance of vaccines. We are lucky to be living in an age in which we understand the causes of disease. Now we know how to fight back with technology. Let's say, "Thank You!" to a scientist and hero of our time, Dr. Kizzmekia Shanta Corbett.