

Female scientists and vaccine research

My name is Elizabeth Wynn,

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As I said, she had personal experience with smallpox and she was very keen to spare her children this. So she had one of her children inoculated with them with this variolation process, with the making a small incision, introducing smallpox that way. So she had one child go through that process while they were in the Ottoman Empire and the other after she had returned to the UK. She had a doctor do this in the presence of medical witnesses and this is the first recorded case of this procedure happening in the UK. Both of her children survived and they gained immunity to smallpox, they never contracted the disease. And so Lady Montague was a huge proponent of this and she was a real advocate for bringing this practice to the UK.

As I said, she had her own children inoculated. She also convinced an experiment to take place, which nowadays would be considered extremely unethical. So this was at Newgate Prison: seven prisoners who were due to be executed were given the choice instead to undergo this variolation to see if they survived. And they all took that opportunity and they did all survive. So these two public demonstrations, I guess, Lady

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They both had a personal interest in whooping cough, both had contracted and survived as children. And at this time in the 1930s, there was a large outbreak going on in the city where they li

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So, as I said, they expanded their lab and one notable individual they recruited to their lab was Loney Clinton Gordon. So she was a chemist who joined their lab in 1944 and one of the big contributions she made was testing thousands of culture plates to discover the best medium for growing pertussis. So this was important for quickly developing large amounts of the organism so that they could use it for vaccine production.

In addition to developing the first working pertussis vaccine, this lab also went on to develop the first combined DTP vaccine, so diphtheria, tetanus and pertussis in 1949 and that's still commonly given as a triple vaccine dose.

One other thing I wanted to mention before I moved on, Kendrick and Eldering, neither of them married, and when I was doing research on this talk, I found a line that said they formed a lifelong friendship and lived together until Kendrick's death and, you know, draw whatever inferences you want from that, but I'm just going to say Happy

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After working on polio, she continued to research infectious diseases for the rest of her career, including rubella and measles. She became the first female professor at Yale School of Medicine and later the first woman in the entirety of Yale University to hold an endowed chair.

Isabel Morgan was another important female researcher in the story of the polio vaccine. She was actually the daughter of a Nobel Prize winner herself, so perhaps it's unsurprising she went into science, though she was a researcher rather than a doctor. She had a PhD in bacteriology. She worked at the Rockefeller Institute for a while before moving to John Hopkins, and there some of the key discoveries she made were identifying the three serotypes of poliovirus, so it's necessary to have antibodies for all three types in order

<sup>1</sup> *Polio: An American Story* by David M. Oshinsky

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Moving on now from historical examples to the present day. Obviously we're all aware of COVID-19 vaccines and there have been many incredible female researchers working on these. I've selected a few of them to talk about, some who I think are the most prominent, but this is in no way a comprehensive list of all the women who are working on COVID-19. There are also a couple of names in here that I had to look up the pronunciation for, and I am doing my best, but apologies if I don't get it quite right on some of these names.

I'm going to start with Kizzmekia Corbett, who's an American viral immunologist at the Vaccine Research Center in America, the National Vaccine Research Center. And she is the scientific lead on their coronavirus team. There she has been central to the development of the Moderna virus vaccine and the Eli Lilly therapeutic monoclonal antibody.

Sarah Gilbert, I think made a big splash over here, being an English vaccinologist working at Oxford University. She's co-founder of a company called Vaccitech and, of course, co-developed the Oxford-AstraZeneca COVID-19 vaccine. That's actually the one I got.

Kathrin Jansen is the head of vaccine research and development at Pfizer, so unsurprisingly, she worked on the Pfizer-BioNTech COVID-19 vaccine.

Katalin Karikó, the co-founder and former CEO of RNARx before becoming the senior vice president of BioNTech. Her patent on nucleoside modifications relating to RNA-mediated immune activation was licensed for both Moderna and the BioNTech vaccine. So her research has been fundamental to the development of a couple of vaccines.

Nita Patel, an Indian American physician and vaccinologist, and she leads vaccine development at Novavax. At Novavax she oversaw the development of their COVID-19 vaccine,<sup>3</sup> 285.65 Tm0 g0 Gu51 0 0 1 181.46 451.27 Tm0 g0 G[]TJET@.00000912 0 612 792 ,os1it G

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vaccine, BioNTech plans to use to pursue its original goal, which was creating an mRNA-based cancer vaccine.

That was just a quick rundown of a few of the many female scientists who are working on current COVID-19 vaccines. But it's not just the scientists who are working