



Jason Koski/Cornell University

Clockwise from top left: Cynthia Leifer, Gary Koretzky, Avery August and Deborah Fowell.

### Expert panel explains science behind COVID-19 vaccines

By Krishna Ramanujan | April 14, 2021

(<https://www.addtoany.com/share?url=https%3A%2F%2Fnews.cornell.edu%2Fstories%2F2021%2F04%2Fexpert-panel-explains-science-behind-covid-19-vaccines&title=Expert%20panel%20explains%20science%20behind%20COVID-19%20vaccines>)

COVID-19 vaccines, proven to be extremely safe, are effective at protecting the public in two ways: They shield most individuals from getting sick; and they reduce the chance that people will transmit the virus to others.

This was among the key messages relayed during “The Science Behind COVID-19 Vaccines,” a virtual Q&A-style panel discussion held April 12 with Cornell immunology experts, who answered common questions from the Cornell community and others about vaccines.

The morning after the event, the Centers for Disease Control and the Food and Drug Administration (FDA) released a **joint statement** (<https://www.cdc.gov/media/releases/2021/s0413-JJ-vaccine.html>) reporting that while 6.8 million doses of the Johnson & Johnson (J&J) single-dose vaccine have been administered, the federal agencies were reviewing data involving six reported U.S. cases of a rare and severe type of blood clot in individuals who received the J&J vaccine. All six cases occurred in women between the ages of 18 and 48 and symptoms occurred between 6 and 13 days after vaccination, according to the statement. The agencies recommended a pause in the use of this vaccine

“We did not know this information yesterday,” said Cynthia Leifer, professor in the Department of Microbiology and Immunology in the College of Veterinary Medicine, and moderator and a speaker at the panel discussion. “Clinical trials could not have detected these rare events. However, even after FDA approval through emergency use authorizations of the COVID-19 vaccines, the scientific community has continued its rigorous evaluation of the new vaccines. The pause announced today is a reflection of the caution we are taking to ensure safety.” She added that patience is required as scientists investigate and gather more information to better understand how these rare adverse reactions might be related to

vaccines.

“The fact that we were able to detect this problem and halt the use of the vaccine shows that the ongoing safety analysis is working to detect these types of events as early as possible,” she said.

In the discussion, panelist Deborah Fowell, professor and chair of the Department of Microbiology and Immunology, provided a brief overview of how the vaccines work. Vaccines, she said, contain “a small portion of the virus, or a protein from that virus, or the machinery to help make that protein in our own bodies.” Once introduced, vaccines activate the immune system to create a memory of these elements of the virus, so inoculated people who encounter the virus again respond quickly and are protected from getting sick, Fowell said.

Fundamental research in recent years has allowed immunologists to quickly pivot to develop COVID-19 vaccines, said panelist Avery August, professor in the Department of Microbiology and Immunology, Howard Hughes Medical Institute professor and vice provost for academic affairs.

Under normal circumstances, vaccines take years to develop, but scientists used prior knowledge to develop safe and effective vaccines in just under a year by simultaneously starting all the necessary steps – including animal testing, two phases of human clinical trials and manufacturing.

“We basically threw everything at the vaccine,” August said, adding that COVID-19 vaccines were held to the same rigorous standards as vaccines made under normal timeframes.

All three vaccines approved for use in the U.S. – the two-dose Pfizer and Moderna vaccines and the paused one-dose J&J vaccine – have greatly surpassed the initial bar of 50% efficacy set by the government, said Gary Koretzky, vice provost for academic integration, professor in the Department of Medicine at Weill Cornell Medicine, and adjunct professor in the Department of Microbiology and Immunology.

“Most importantly, the vaccines are nearly 100% effective in preventing death and severe complications of COVID-19,” Koretzky said. “We’re learning that as people become vaccinated, not only are they protected from getting the disease themselves, but they’re also protected from acquiring the virus and then giving it to others... not 100% [of the time], but really, really well.” That is key to stopping the pandemic, as asymptomatic transmission is one of the most serious problems with this particular virus, Koretzky noted.

He also mentioned that the vaccines are now known to provide immunity for at least 180 days. As time goes on, researchers will learn more about the duration of immunity and whether people will require booster shots.

Still, the vaccines have limitations: While nearly 100% effective in preventing severe complications, it’s not 100%; and it’s possible for the virus to mutate within infected people and create variants that vaccines don’t protect against. So far, current vaccines have proven protective against most of the circulating variants, August said, but the possibility of new variants emerging for which the vaccine is less protective remains.

For this reason, public health professionals are trying to vaccinate people quickly to stay ahead of variants. As close to 80% of the public becomes immune, either by vaccination or by recovering from COVID-19, we will approach herd or community immunity, Leifer said. That will indirectly protect individuals who cannot get a vaccine, because they are immunocompromised or have allergic reactions.

Vaccinated people should still adhere to guidelines for social distancing, washing hands and wearing masks for the time being, Leifer said.

Many people have reported lingering symptoms after contracting COVID-19, but anecdotal evidence has increasingly shown that vaccination reduces the symptoms for some so-called 'long-haulers', an encouraging sign that is now being studied, Koretzky said. "The jury's still out, but that would be a great benefit of these vaccines."

In spite of the positive results, many people remain hesitant to get vaccinated, Leifer said. When discussing reasons to get inoculated, the first step is simply to listen, she said.

"This virus came into the human population with not one single person on this Earth being protected, and it spread like wildfire," she said. With the flu, most people have some immunity from vaccines or previous infections, which provides a base level of protection in the population. Also, COVID-19 affects people more seriously and kills more frequently than the flu.

"The only way to get back to a new normal, whatever that will be, is to get as many people vaccinated as possible," Leifer said.



Cornell University

**MEDIA CONTACT**

**Abby Butler**

[ajb493@cornell.edu](mailto:ajb493@cornell.edu) (mailto:ajb493@cornell.edu)

📞 607-254-4799 (tel:607-254-4799)

**Get Cornell news delivered right to your inbox.**

**SUBSCRIBE** (/ABOUT/SUBSCRIBE-NEWSLETTER)

## YOU MIGHT ALSO LIKE



### Researchers create rapid tests, analytics for COVID-19

(/stories/2021/03/researchers-create-rapid-tests-analytics-covid-19)



### COVID-19 is transforming workplace culture

(/stories/2021/03/covid-19-transforming-workplace-culture)