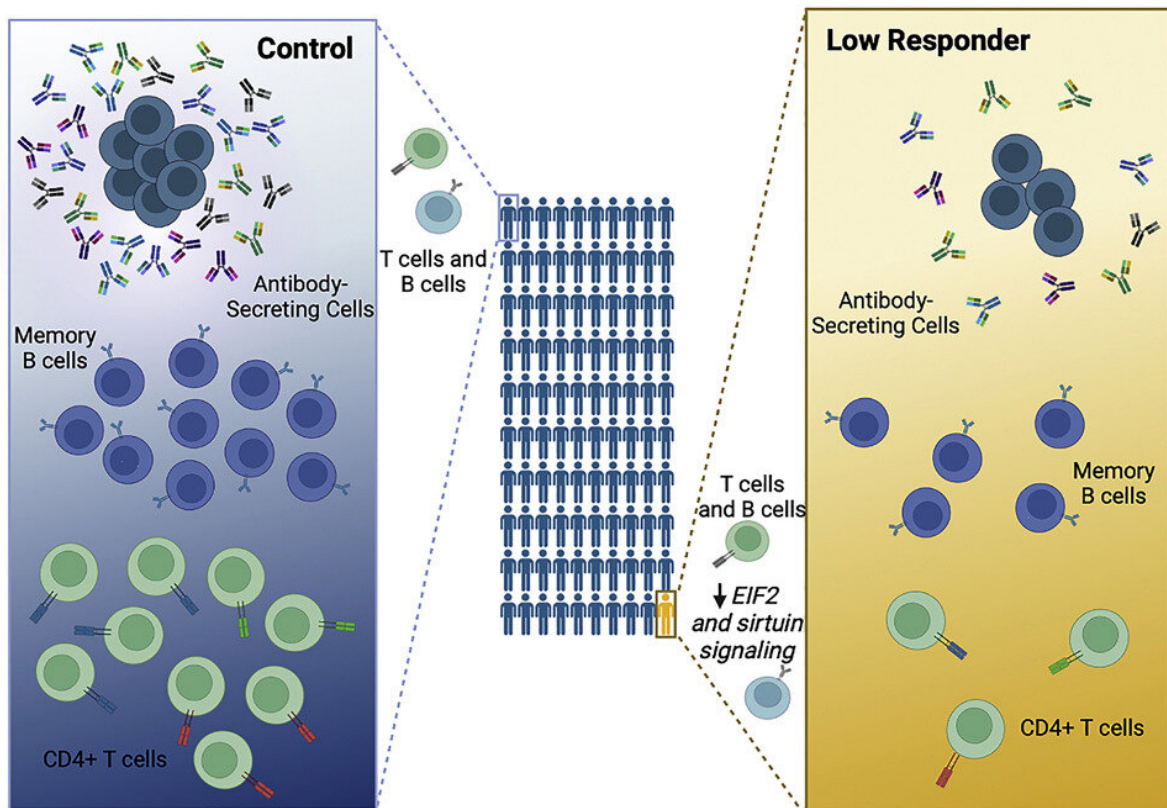


Study shows some health care workers produced a low response to COVID-19 vaccinations

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Credit: *iScience* (2022). DOI: 10.1016/j.isci.2022.105209

A subset of health care workers vaccinated against COVID-19 had unexpectedly low responses to the immunizations, according to Cedars-Sinai investigators. The findings of the new study are published in *iScience*.

In a matched control study, investigators compared the [vaccine](#) responses among a group of Cedars-Sinai health care workers who were generally in good health. The study participants received the BNT162b2 vaccine produced by Pfizer Inc., and their average age was 48.

"It turns out that a small percentage of the health care worker population we studied did not have a robust response to the BNT162b2 vaccine. After vaccination, they produced lower levels of antibodies to the [spike protein](#) found on the surface of SARS-CoV-2, the virus that causes COVID-19. That low response persisted even after they received second and third booster doses," said Peter Chen, MD, who holds the Medallion Chair in Molecular Medicine at Cedars-Sinai and is one of the study's senior authors.

Investigators noted that the "low responders" in the study were relatively young, but their immune systems reacted to the vaccine as if they were much older.

"The low responders had lymphocytes, [white blood cells](#) that are part of the [immune system](#), with characteristics more typically observed in older people or individuals with chronic diseases. We know [older people](#) also tend to mount weaker responses to vaccines, so our data suggests this

subset of health care workers could have [immune cells](#) that had prematurely aged and were therefore less responsive to vaccination," said Helen Goodridge, Ph.D., a co-senior author of the study, a professor of Biomedical Sciences and a research scientist in the Cedars-Sinai Board of Governors Regenerative Medicine Institute.

This study is part of the ongoing Coronavirus Risk Associations and Longitudinal Evaluation (CORALE) project led by Cedars-Sinai. Investigators say this study finding of a low vaccine response among otherwise healthy people requires further research.

"We would like to study the pathways that led to the premature aging phenotype to determine if it is specifically responsible for lower antibody levels after vaccination and then try and develop a therapeutic intervention to reverse this effect," said Susan Cheng, MD, MPH, the Erika J. Glazer Chair in Women's Cardiovascular Health and Population Science and a corresponding author of the study.

"Also, our study did not evaluate the lymphocytes that are responsible for killing the cells that are already infected with the SARS-CoV-2 virus; this is an important element of immunity against COVID-19," said Cheng, who is also director of the Institute for Research on Healthy Aging in the Department of Cardiology at the Smidt Heart Institute. Investigators emphasize that while some people's immune systems have a low antibody response to the vaccine, the evidence that vaccination is a very effective tool for preventing serious illness and death from COVID-19 remains strong.

"We should all get vaccinated because the BNT162b2 vaccine we studied still provided some immunity in most of the low responders. This group still had [memory cells](#) that can generate more [antibodies](#) when attacked by the virus, even if at a lower level," said Chen, director of Pulmonary and Critical Care Medicine at Cedars-Sinai.

More information: Yapei Huang et al, Evidence of premature lymphocyte aging in people with low anti-spike antibody levels after BNT162b2 vaccination, *iScience* (2022). [DOI: 10.1016/j.isci.2022.105209](https://doi.org/10.1016/j.isci.2022.105209)

Provided by Cedars-Sinai Medical Center

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