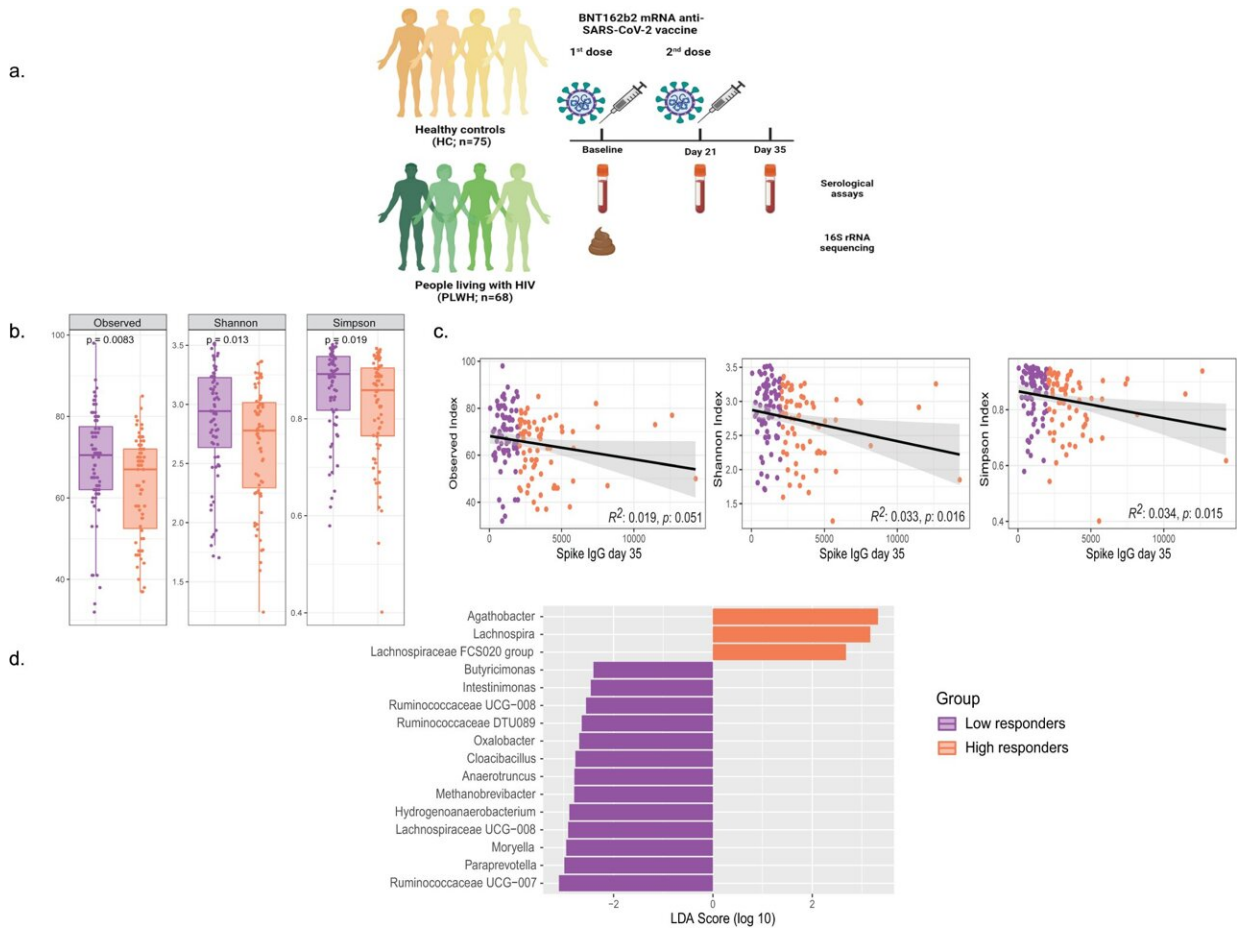


# Researchers find gut microbes can affect COVID vaccine response

January 4 2024



Changes in alpha diversity and bacterial genus from fecal samples collected at the baseline, to predict spike IgG titers in individuals. a Study design. b Alpha diversity decreased significantly in individuals with high spike IgG titers in the whole cohort (n = 143). c Linear regression relationship between alpha diversity values and spike IgG levels in all the individuals. d Differentially abundant bacterial genus between individuals with high and low antibodies as detected by

Linear Discriminant Analysis Effect Size (LEfSe). Credit: *npj Biofilms and Microbiomes* (2023). DOI: 10.1038/s41522-023-00461-w

Researchers from Karolinska Institutet in Sweden have discovered that the gut microbiome can influence how well people respond to mRNA COVID vaccines. The study, [published](#) in the journal *npj Biofilms and Microbiomes*, suggests that certain bacteria in the gut can enhance the immune response to the vaccine, whereas other bacteria may weaken it.

The gut microbiome is the collection of microorganisms that live in our digestive tract. It plays an important role in many aspects of our health, such as digestion, metabolism, and immunity. The researchers wanted to find out if the gut microbiome also affects the response to mRNA COVID vaccines. To do this, they collected stool samples from 68 people living with HIV and 75 healthy individuals before their first mRNA COVID [vaccine](#) dose.

The researchers analyzed the [microbiome composition](#) using a technique called 16S rRNA sequencing, which identifies the types and relative abundance of bacteria in the samples. They also measured the levels of antibodies and [immune cells](#) that were produced after the vaccination.

"We correlated the microbial composition with immune responses and patient characteristics. This comprehensive analysis included age, gender, [body mass index](#) and clinical factors for people living with HIV, aiming to understand the complex relationship between [gut microbes](#) and vaccine efficacy," says principal investigator Piotr Nowak, senior physician and associate professor at Karolinska Institutet's Department of Medicine, Huddinge.

The results showed that the initial makeup of the gut microbiome could

predict the [immune response](#) to the vaccine in both groups. They found that a less diverse gut microbiome was associated with a stronger vaccine response, marked by higher levels of spike protein antibodies and spike specific CD4 T-cells. These are key components of the immune system that help to neutralize the virus and prevent severe infection.

The researchers also identified specific bacteria that were linked with better or worse vaccine responses. For example, they found that *Lactobacillus*, *Bacteroides*, and *Lachnospira* were associated with higher antibody and immune cell levels, while *Cloacibacillus* was associated with lower antibody levels. They also found that *Bifidobacterium* and *Faecalibacterium* were microbial markers of individuals with higher antibody levels.

According to the researchers, the study highlights the significant role of the gut microbiome in the effectiveness of mRNA COVID vaccines. The findings could lead to developing microbiota-focused treatments to enhance vaccine responses, especially in groups that may have weaker responses, such as the elderly or immunocompromised individuals. The potential strategies could include changing the diet or taking probiotics to improve the [gut microbiome](#) and immunity, the researchers suggest.

**More information:** Shilpa Ray et al, Impact of the gut microbiome on immunological responses to COVID-19 vaccination in healthy controls and people living with HIV, *npj Biofilms and Microbiomes* (2023). [DOI: 10.1038/s41522-023-00461-w](https://doi.org/10.1038/s41522-023-00461-w)

Provided by Karolinska Institutet

Citation: Researchers find gut microbes can affect COVID vaccine response (2024, January 4) retrieved 28 April 2024 from

<https://medicalxpress.com/news/2024-01-gut-microbes-affect-covid-vaccine.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.