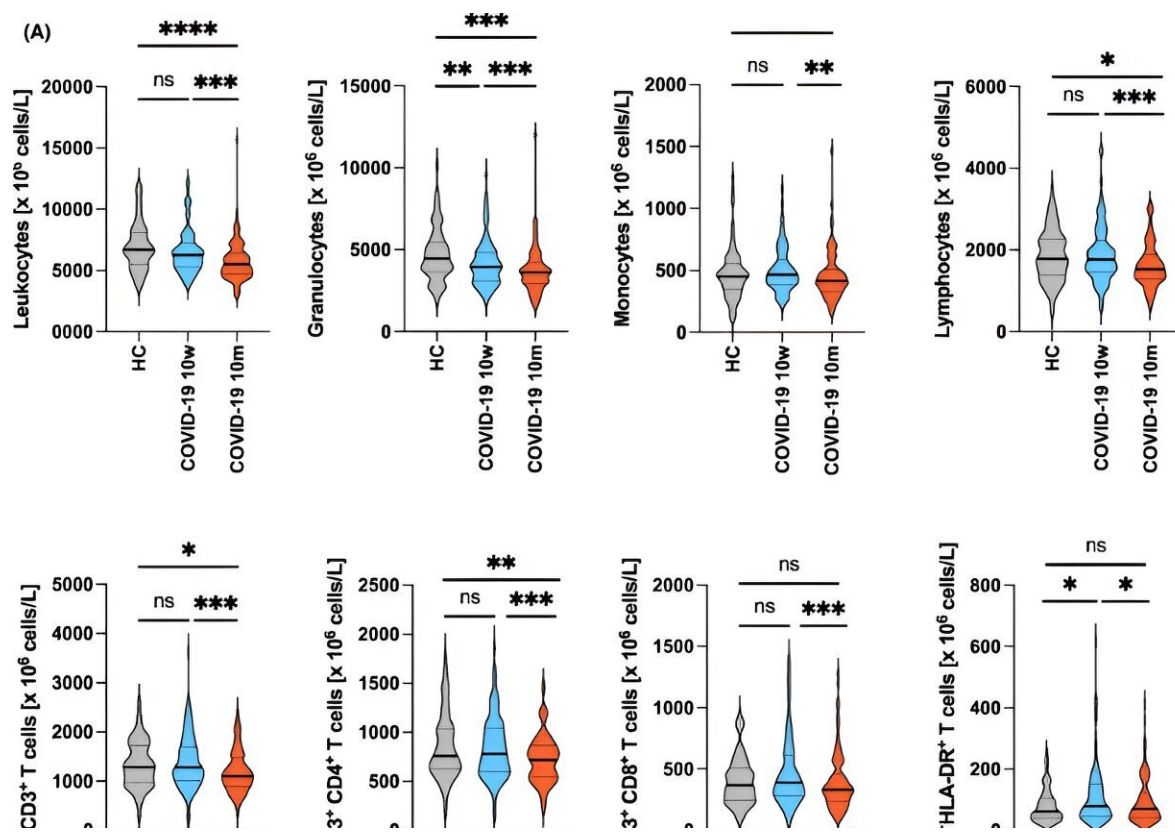


# Even mild SARS-CoV-2 infections have a long-term impact on the immune system, finds study

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Impact of primary SARS-CoV-2 infection on leukocyte subpopulations as determined after 10 weeks and 10 months. Shown are absolute values of the indicated leukocyte populations in peripheral blood (y-axes) of noninfected control subjects (HC, gray) and COVID-19 convalescent subjects (COVID-19) 10 w (blue) and 10 m (red) after infection (x-axes). Credit: *Allergy* (2024). DOI: 10.1111/all.16210

In a study recently [published](#) in *Allergy*, a MedUni Vienna research team shows that COVID-19 leads to considerable long-term changes in the immune system, even in mild cases. The findings could help to better understand the long-term consequences of an infection with SARS-CoV-2.

As part of the study, the team led by first authors Bernhard Kratzer and Pia Gattinger and principal investigators Rudolf Valenta and Winfried Pickl (all from MedUni Vienna's Center for Pathophysiology, Infectiology and Immunology) examined relevant immune parameters in 133 subjects who had recovered from COVID-19 and 98 subjects without the infection.

The number and composition of various immune cells as well as cytokines and [growth factors](#) in the [blood](#), which play a decisive role in the regulation of cell growth, were analyzed in the recovered patients 10 weeks and 10 months after their [initial infection](#).

As no COVID-19 vaccines were available during the observational time period in 2020, all participants remained unvaccinated. This allowed the study authors to investigate the long-term effects of SARS-CoV-2 infection without the influence of vaccines.

## **Significant reduction of immune cells in the blood**

"Not entirely unexpectedly, 10 weeks after the infection, the convalescent patients showed clear signs of immune activation of both their T and B cells, in contrast to healthy study subjects," reports Pickl. In addition, the cytokines and growth factors in the blood were typical for remnants of an acute inflammatory process.

A comparison with the patient samples obtained 10 months after the COVID-19 disease revealed an unexpected picture to the researchers. "Even after mild disease progression, we found a significant reduction of immune cells in the blood," says Pickl.

In addition, the well-known drop in SARS-CoV-2-specific antibodies and an astonishing change in growth factor patterns in the blood were observed. For COVID-19 convalescent subjects, this means that their immune system may no longer be responding optimally to new challenges. This may provide an explanation for some of the observed sequelae of COVID-19, such as long COVID.

According to the researchers, the long-term consequences of COVID-19 are presumably caused by an infection and the resulting long-term impairment of the function of the [bone marrow](#), the central production site of immune cells.

"Our results provide a possible explanation that certain long-term consequences of COVID-19 could be related to the damage to the cellular [immune system](#) caused by SARS-CoV-2 and the apparently reduced maturation and/or emigration of immune cells from the bone marrow," claim Pickl and Valenta.

This hypothesis forms the basis for further research in order to achieve a better understanding of the mechanisms underlying long COVID.

**More information:** Bernhard Kratzer et al, Differential decline of SARS-CoV-2-specific antibody levels, innate and adaptive immune cells, and shift of Th1/inflammatory to Th2 serum cytokine levels long after first COVID-19, *Allergy* (2024). [DOI: 10.1111/all.16210](https://doi.org/10.1111/all.16210)

Provided by Medical University of Vienna

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