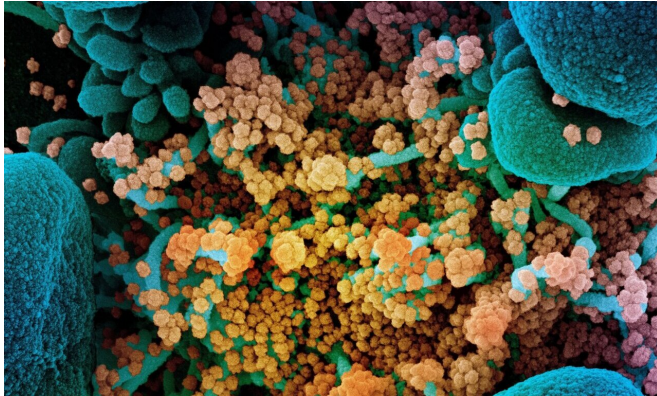


Altered immune signature linked to long COVID

15 April 2021, by Michael Addelman



Colorized scanning electron micrograph of a dying cell (blue) heavily infected with SARS-CoV-2 (yellow), the virus that causes COVID-19. Credit: NIAID Integrated Research Facility, Fort Detrick, Maryland.

University of Manchester scientists have discovered a persistent alteration in the immune system of patients, six months after they have been hospitalized for COVID-19, which could be associated with poorer health outcomes.

The study, published in the journal *Med*, examines the impact of a SARS-CoV-2 infection on the [immune system](#) of hospitalized patients in the period after a COVID-19 infection, once they have been discharged.

The team—based at the University's Lydia Becker Institute of Immunology and Inflammation and supported by the UK Coronavirus Immunology Consortium (UK-CIC)- identified an immunological [signature](#) occurring in some of the patients that was associated with unresolved chest X-rays, indicating those patients had a poorer clinical outcome.

The researchers therefore identified immune characteristics in convalescent COVID-19 patients

are associated with negative impacts on subsequent health.

The team compiled the immune cell characteristics of over 80 convalescent patients recruited from Manchester hospitals between July and October 2020.

They found that changes to B cells—a type of lymphocyte—that occur during the peak of COVID-19 hospitalization were largely restored by six months of convalescence. However, changes to T cells, another lymphocyte, persisted into COVID-19 convalescence.

Study author Dr. Joanne Konkell from The University of Manchester said: "Our study details persistent immune alterations in previously hospitalized COVID-19 patients up to six months after hospital discharge. Significantly, we outline an immune signature associated with poorer clinical outcomes in convalescent patients.

"Association, however, is not a causation, and what we now want to understand is what other long COVID symptoms this signature could be associated with and whether it could be used to identify the patients that should be most closely followed after hospital discharge."

The signature present in the group of patients with the poorer clinical outcome was characterized by the team as having high levels of cytotoxic T cells—which can destroy other cells—as well as elevated production of special types of proteins called type-1 cytokines.

Study author Dr. Madhvi Menon from The University of Manchester said: "It remains to be established if these immune alterations are unique to COVID-19, or whether they are also observed following other severe respiratory infections."

The team hoped the results can be fed into larger

UK wide studies, such as the University of Leicester led post-hospitalization COVID-19 study known as PHOSP-COVID

PHOSP-COVID aims to better understand the interactions between immune cell changes and long COVID symptoms, as well as examine the clinical utility of the immune signature defined.

"Follow-up studies will determine whether this signature can provide a tool to identify acute COVID-19 patients at risk of Long COVID, enabling close monitoring and improved clinical management.", said Dr. Menon.

Study author Dr. John Grainger from the University of Manchester and deputy Director of the Lydia Becker Institute said: "Given the vast numbers of previously infected individuals across the globe, it is vital to understand the impact of COVID-19 on the phenotype and functional potential of all immune [cells](#).

"This will allow for better understanding of the long-term impacts of being hospitalized with COVID-19 on subsequent anti-pathogen or auto-inflammatory responses."

The paper, "Alterations in T and B cell function persist in convalescent COVID-19 patients," is published in *Med*.

More information: Halima A. Shuwa et al. Alterations in T and B cell function persist in convalescent COVID-19 patients, *Med* (2021). [DOI: 10.1016/j.medj.2021.03.013](https://doi.org/10.1016/j.medj.2021.03.013)

Provided by University of Manchester

APA citation: Altered immune signature linked to long COVID (2021, April 15) retrieved 21 October 2022 from <https://medicalxpress.com/news/2021-04-immune-signature-linked-covid.html>

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