

Immune response to COVID-19 reduced in patients with blood cancers

January 6 2021



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Patients with blood cancers such as leukemia vary in their immune response to COVID-19 and can struggle to clear infection for very many weeks, according to new research published in *Cancer Cell*. By contrast, most patients with solid tumors, even those with advanced cancer, can mount an effective and lasting immune defense.

Researchers from King's College London and the Francis Crick Institute have been studying the way SARS-CoV-2 impacts the immune system through the COVID-IP project and have already identified immune signatures that are associated with severe disease and hospitalization. Their latest collaboration, funded by Cancer Research UK, called SOAP, specifically looks at people with [cancer](#) to see if their [immune system](#) responds differently to the coronavirus and if there are any long-term effects.

Until now, doctors have had very little information about how COVID-19 might impact patients with cancer and many have faced delays with treatment. So it's vital to build a picture of cancer-specific infection and immunity that could help inform treatment strategies. This is all the more relevant given the UK government's renewed advice on shielding.

The team led by Dr. Sheeba Irshad, in collaboration with Professor Adrian Hayday, Dr. Piers Patten, and staff at Guy's and St Thomas' and King's College Hospitals, analyzed the blood of 76 cancer patients—41 who had COVID-19 and 35 who had not been exposed to the virus. 23 of the people with cancer had solid tumors, and 18 had [blood cancers](#).

When they compared samples with the immune signatures from COVID-19 patients without cancer, they saw that patients with solid tumors had a similar [immune response](#) to those without cancer, regardless of cancer stage or if they were undergoing treatment. These patients were still able to mount an effective and lasting antibody response.

However, the immune response of patients with blood cancers varied considerably, particularly for patients with cancers that affect B-cells, which are crucial for mounting an antibody defense. In most, the response to infection was less pronounced and took longer to develop.

Some patients struggled to clear the infection and others developed no antibodies at all, meaning that certain patients with blood cancer had an active coronavirus infection for more than 10 weeks.

Sheeba Irshad, SOAP project lead at King's College London, said: "Whilst we need to maintain caution, our study provides some confidence and reassurance to care providers that many of our patients with solid cancers will mount a good immune response against the virus, develop antibodies that last and hopefully resume their cancer treatment as soon as possible.

"These conclusions imply that many patients despite being on immunosuppressive therapies will respond satisfactorily to COVID-19 vaccines. For patients with blood cancers, especially those with B-cell malignancies, this may not hold true even in the era of COVID-19 vaccines. Our work suggests that they may be susceptible to persistent infection despite developing antibodies, so the next [and ongoing] stage of our study will focus on monitoring their response to the vaccines. At present the best way to protect them may be to vaccinate all the carers to achieve herd immunity in the clinic."

COVID-IP project lead Adrian Hayday, who heads the Crick's Immunosurveillance Laboratory and is Professor of Immunobiology at King's College London, said: "This study is a prime example of a fast-tracked collaboration between basic scientists and clinical teams that in a short space of time revealed several unexpected findings that are highly informative and very helpful clinically.

"The COVID-IP study was made possible because of technologies originally used to track the immune response in [patients](#) receiving cancer immunotherapies and we've been able to adapt this work to further understand the impact of SARS-CoV-2."

The next phase of the SOAP study will be monitoring the immune responses of [cancer patients](#) to the COVID-19 vaccine.

More information: Sultan Abdul-Jawad , et al. Acute immune signatures and their legacies in severe acute respiratory syndrome coronavirus-2 infected cancer patients, *Cancer Cell* 2021. [DOI: 10.1016/j.ccell.2021.01.001](#)

Provided by The Francis Crick Institute

Citation: Immune response to COVID-19 reduced in patients with blood cancers (2021, January 6) retrieved 9 April 2024 from <https://medicalxpress.com/news/2021-01-immune-response-covid-patients-blood.html>

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