Medical Xpress

Immunological memory after SARS-CoV-2 infection recovery

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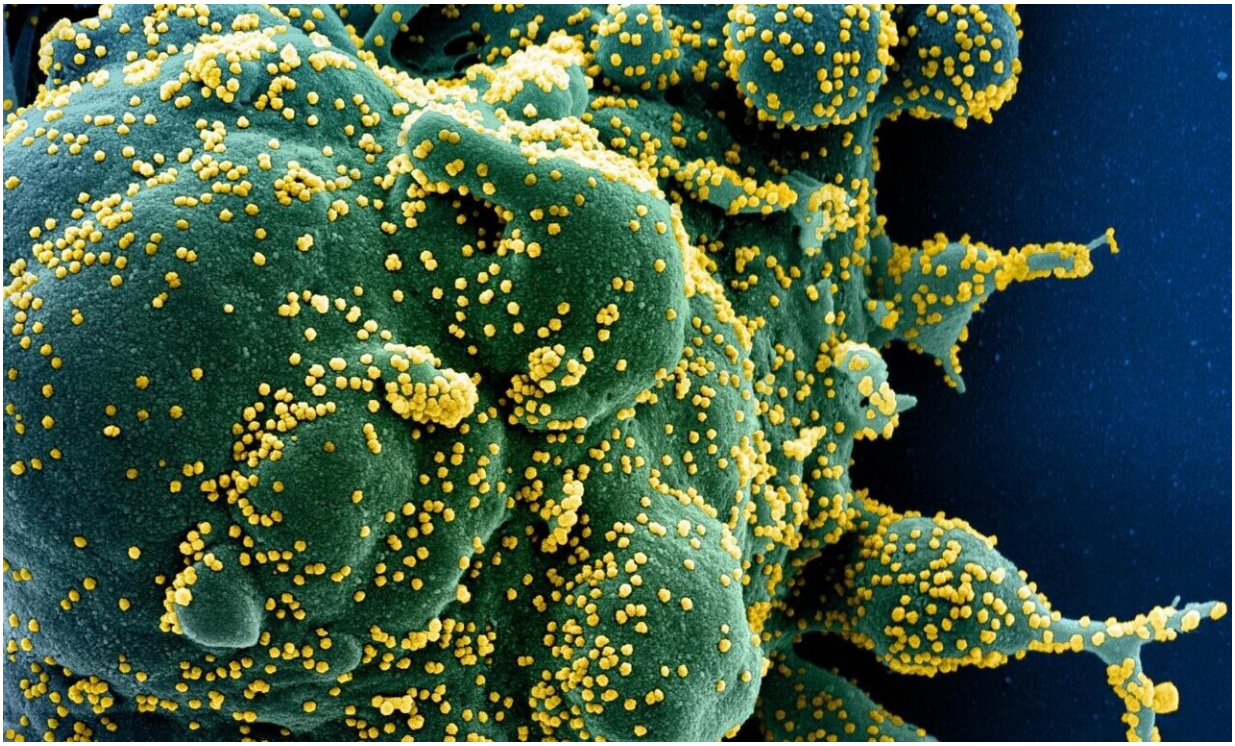

Colorized scanning electron micrograph of an apoptotic cell (green) heavily infected with SARS-COV-2 virus particles (yellow), isolated from a patient sample. Image captured at the NIAID Integrated Research Facility (IRF) in Fort Detrick, Maryland. Credit: NIH/NIAID

Until now, it was unclear whether a survived SARS-CoV-2 infection or COVID-19 leads to a persistent immunological memory and thus can

protect against a new infection. Several studies had shown that SARS-CoV-2 specific antibodies are only detectable for a few months in many people who have survived COVID-19 and may therefore only provide temporary protection against re-infection. A research team at the Medical Center—University of Freiburg led by Dr. Maike Hofmann, Dr. Christoph Neumann-Haefelin and Prof. Dr. Robert Thimme has now been able to show: after recovery from SARS-CoV-2 infection, immune cells are formed which remain in the body and could mediate a rapid immune response in case of re-infection. The Freiburg study was published in the online edition of the renowned scientific journal *Nature Medicine* on November 12, 2020.

"These so-called memory T-cells after SARS-CoV-2 infection look similar to those after a real flu. We are therefore confident that the majority of people who have survived SARS-CoV-2 infection have some protection against re-infection with SARS-CoV-2," explains Dr. Hofmann, a scientist at the Department of Medicine II at the Medical Center—University of Freiburg.

Professor Thimme, Medical Director of the Department of Medicine II, emphasizes how important a good translational research environment such as that at the Medical Center—University of Freiburg is in the current situation: "In order to obtain robust research results within a few months, close networking between clinic and science at the highest level is a basic requirement: On the one hand, patients with COVID-19 are treated on our wards and continue to be cared for in a special outpatient clinic even after the infection has healed. On the other hand, our clinic has great expertise in the analysis of immune cells in viral infections such as hepatitis B and C."

The Medical Center—University of Freiburg is not involved in the development of vaccines against SARS-CoV-2. However, Dr. Neumann-Haefelin, Head of the Gerok Liver Center at the University Hospital

Freiburg, is optimistic: "Our results suggest that immunity against SARS-CoV-2 can be achieved after an infection. Similarly, vaccines currently being tested in trials could provide significant protection against SARS-CoV-2".

"The deciphering of complex immune responses has long been part of the research focus of the University and the Medical Center—University of Freiburg. Thanks to the high scientific quality onsite, we can now make an important contribution to the corona pandemic," says Prof. Dr. Norbert Südkamp, Dean of the Medical Faculty at the Albert-Ludwigs-University of Freiburg.

More information: Isabel Schulien et al, Characterization of pre-existing and induced SARS-CoV-2-specific CD8+ T cells, *Nature Medicine* (2020). DOI: 10.1038/s41591-020-01143-2

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