Pin-prick blood test identifies immunity to COVID-19

September 23 2022

A finger prick blood sample being collected for COVID T cell test. Credit: ImmunoServe Ltd

A finger-prick blood test can identify people most at risk of being reinfected with COVID-19. The simple test, developed by a small

biotech firm based in Cardiff (ImmunoServ Ltd) in close collaboration with Cardiff University researchers, measures the presence of immune T cells that can recognize SARS-CoV-2.

More than 300 volunteers were recruited from across the U.K. in early 2022 to assess the novel test. Individuals with the largest T cell response to the virus were best protected from COVID-19 over the following three months, regardless of their levels of antibodies to the virus.

The finger-prick tests will help determine which individuals are most vulnerable, and who might need more focused interventions such as repeated booster vaccinations.

Writing in *Nature Communications*, the Cardiff team note the test brings the focus away from "just measured" antibody responses to take into account T cell mediated immunity.

Previous efforts to identify those least protected from reinfection have focused on quantifying antibodies recognizing the surface spike protein of SARS-CoV2.

Although measuring antibodies on a larger scale in a population is relatively easy, the levels do not give the full picture of protection from re-infection, especially as variants of SARS-CoV-2 emerge.

Dr. Martin Scurr, lead author, said the study highlighted the potential for more accurate assessment of an individual's immunity to COVID-19.

"Many individuals worry about their risk of contracting COVID-19, whether they have been previously vaccinated or not. Our test identified that it is the level of T cell response induced by prior vaccination or infection that associated with the risk of that individual contracting COVID-19 in the months following the blood test."

Historically, large-scale testing for T cell responses to SARS-CoV-2 has proven challenging until now. With funding support from the U.K.-Government's InnovateUK research council, a new T cell test was developed by Wales-based biotechnology ImmunoServ Ltd, collaborating with Cardiff University.

The test used a simple finger-prick blood sample collected at home and sent to a laboratory by post allowing anyone within the U.K. to be part of the study.

The Cardiff team say their work highlights the need to assess how long immune responses persist in the population, with uncertainty around whether repeated booster vaccinations will be required in future, and who will need them.

Andrew Godkin, Professor of Experimental Medicine and Immunology at Cardiff University and co-senior author of the work, added: "Long-term immunity screening using such a test would allow us to monitor longevity of responses that prevent COVID-19 and identify the most vulnerable members of our society who may need earlier booster vaccinations."

The SARS-CoV-2 T cell test used in this study is straightforward, and economical. The research that led to the discovery has been published in *Nature Communications*, a peer-reviewed publication that specializes in reporting novel biomedical and scientific discoveries.

More information: Martin J. Scurr et al, Magnitude of venous or capillary blood-derived SARS-CoV-2-specific T cell response determines COVID-19 immunity, *Nature Communications* (2022). DOI: 10.1038/s41467-022-32985-8

Provided by Cardiff University