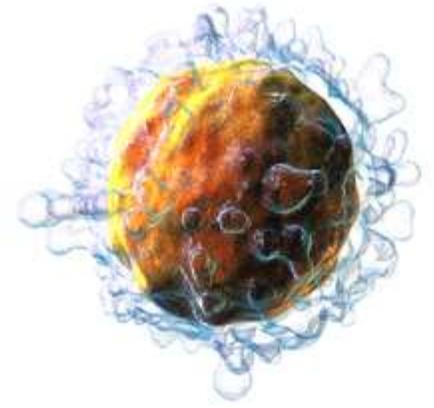


*A novel test for T cells shows great promise
in detecting immune status*



The Unsung Warriors Against COVID-19



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Antibodies often steal the spotlight when talking about immunity, but they are not the only protagonist in the immune system.

T cells are specialized defenders activated in the adaptive immune response. They multiply and differentiate into cytotoxic, helper, or regulatory T cells. These types of lymphocytes are critical in the identification, management, and clearance of infections.

New research shows that T cells are optimal targets for evaluating immunity to SARS-CoV-2 infection because of their critical role in the immune response. Up to this point, we have exclusively focused on the use of serological tests for an indication of prior COVID-19 infection. In the current state, the Food and Drug Administration (FDA) issues emergency use authorization (EUA) to over sixty serology products to detect SARS-CoV-2 antibodies. (1) Antibody testing for COVID-19 on the market may shortly be challenged by a new competitor: a novel test for the detection of T cells.

Adaptive Biotechnologies, an innovative biotechnology company based in Seattle, in collaboration with Microsoft, has developed a T cell-based clinical test that can detect an immune response to past COVID-19 infections. This test utilizes a unique T cell signature, developed via identified "shared" T

cell Receptors (TCRs) of multiple infected individuals worldwide. (2) If authorized by the Food and Drug Administration (FDA), T-Detect™ would become the first commercial product to detect T cell response to SARS-CoV-2. (3)



In a study by Gittelman et al., researchers analyzed T cell and antibody levels in 2,200 individuals from the municipality of Vo, Italy. Vo initially became famous as the location of Italy's first COVID-19 related fatality. Of the 2,200 samples, 70 were previously collected from confirmed PCR positive patients. T-Detect™ identified 97% of (68 of 70) individuals with previously confirmed PCR results, compared to 77% (54 of 70) from a positive serology test result. Additionally, this study observed more significant T cell detection in symptomatic versus asymptomatic patients, whereas antibody levels did not correlate with disease severity. (4, 5)

T cells' ability to detect the severity of the disease, unlike antibody's, can offer insight into the reason for a wide range of clinical presentations, from asymptomatic to severe illness or even death of individuals with different backgrounds. This new test may additionally help researchers measure long-term immunity or potential level of protection after infection or vaccination.

Middle East Respiratory Syndrome (MERS) and SARS-CoV-1 infections have previously indicated that coronavirus-specific T cells have long-term effectivity and contribute to protection even in individuals with minimal antibody production. (6, 7) If this test proves to be specific to COVID-19, a more sensitive method of measuring previous exposure will be available, potentially detecting cases faster and more accurately

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