

Japan develops 20-min test to detect antibodies against SARS-CoV-2

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The test can now be used for evaluating the effectiveness of SARS-CoV-2 vaccines based on the antibody response



A team of scientists from Japan, at Hokkaido University's Faculty of Engineering, has developed a 20-minute test to detect and quantify antibodies against SARS-CoV-2 in human serum. It is called non-competitive fluorescence polarization immunoassay (FPIA).

FPIA requires fluorescently-labelled recombinant SARS-CoV-2 spike proteins (F-RBD) and human serum to be mixed together for the test. Individuals who have been infected with or vaccinated against SARS-CoV-2 will have anti-spike protein antibodies in their serum.

When these antibodies bind to F-RBD, polarised light is emitted, while F-RBD alone emits depolarized light. By measuring the degree of polarisation using a fluorescence polarization analyser, the concentration of antibodies can be determined.

The scientists optimised the test and evaluated it using samples of human serum from individuals diagnosed with COVID-19 and from those who had not been infected by SARS-CoV-2.

The test was demonstrated to be highly accurate, quick and easy to perform, with high throughput. This test requires about 20 minutes to complete, compared to about 2 hours for other tests; furthermore, the equipment required for the test is highly portable, weighing only 4.3 kg.

Taken all together, these features make the test an excellent option for detecting and quantifying antibodies against SARS-CoV-2. The test can now be used for two purposes: screening large populations to determine the exact extent of the pandemic, and from evaluating the effectiveness of SARS-CoV-2 vaccines based on the antibody response.