

Quantitative IgG antibodies to Spike protein of SARS-CoV-2

(MSH Test code: COVQI)

SARS-COV-2 BINDING ANTIBODY CONCENTRATION			
International Units per mL (New units)	AU/mL	Clinical Interpretation	Titer Estimates (based on AU/mL)
< 25 IU/mL	< 5	Negative	< 80
25–79 IU/mL	5-15	Weak Positive	80 - 160
80-199 IU/mL	16-39	Moderate Positive	320 - 960
≥ 200 IU/mL	≥ 40	Strong Positive	960 - ≥ 2880

Interpretive Comments
<p>Negative (<25 IU/mL): IgG antibodies to SARS- CoV-2 virus may be present below the level of the detection of this assay. Reliable negative test results are obtained in samples collected from persons who are immunologically competent with blood samples obtained at least 14 days after infection (even if no symptoms were apparent.) Corresponding serum AU/mL values are <5. More information is available below.</p>
<p>Weak Positive (25–79 IU/mL): IgG binding antibodies levels of 25 to 79 IU/mL may indicate an early or borderline immune humoral response. Corresponding serum AU/mL values range from 5-15. Most samples within this range also showed serum titers from 80 and 160. Follow-up testing is may be indicated in 10 to 14 days if recent infection is suspected. The value represents presence or a humoral immune response to COVID-19 antigens only. The IgG concentration does not represent level of immunity or protection against to SARS-CoV-2 reinfection.</p>
<p>Moderate Positive (80-199 IU/mL): IgG binding antibody levels of 80-199 IU/mL confirm the presence of circulating IgG antibodies binding to the Spike protein of SARS-CoV-2 at moderate to high levels. Corresponding serum AU/mL values range from 16-39 and serum titers from 320 to 960. The value represents presence or a humoral immune response to COVID-19 antigens only and does not indicate immunity to COVID-19 reinfection.</p>
<p>Strong positive (≥200 IU/mL): IgG antibody values at and greater than 200 IU/mL confirm the presence of high levels of circulating IgG antibodies binding to the Spike protein of SARS-CoV-2. Corresponding serum AU/mL values are ≥40 and serum measured titers range from 960 to above 2880. The measured IgG concentration only measures humoral immune response to COVID-19 antigens. This does not indicate immunity to COVID-19 reinfection.</p>

Frequently Asked Questions

What is measured by this test?

The assay measures the level of IgG antibodies to SARS-CoV-2 in the test sample (serum or plasma) obtained in the patient's blood on the day the sample was collected.

What are IU/mL?

International Units per mL.

Are test results from different assays comparable?

The quantitative IU/mL values obtained with different assay methods or kits may be different and cannot be used interchangeably

Traceability: The new test results are based on calibrators standardized (traceable to) against the 1st WHO International Standard Anti-SARS-CoV-2 Immunoglobulin (NIBSC 20/136 Reference Material) and to the Human SARS-CoV-2 Serological National Standard obtained from the Frederick National Laboratory for Cancer Research (FNLCR) to define values in IU/mL.

How is the new quantitative test different from the original MSH Quantitative test?

The reagents used in this modification of the MSH quantitative SARS-CoV-2 IgG Antibody assay (MSH-LDT) are those from the now commercially available kit approved under EUA by FDA called Covid Seroklir. This modification was validated and demonstrated to give equivalent results to the original method. This modification has been approved by the NYSDOH to be performed at MSH Clinical Labs as a quantitative assay of IgG antibodies against SARS-Cov-2 binding to Spike protein antigens. To date the FDA has not approved any ELISA quantitative test for SARS-CoV-2. This test has not been reviewed by the FDA. The measured concentration of antibody reflects the immune response but have not been demonstrated to measure immunity from reinfection with COVID-19 at this time.

How is the test performed?

Methodology: A fixed concentration of recombinant SARS-CoV-2 Spike protein pre-coated onto a 96-well microplate binds (captures) circulating antibodies present in the blood sample that are directed against the Spike protein of the virus. Unbound antibodies (and other substances) in the blood sample being tested are removed from the wells by three consecutive washes. The captured IgG that remain in the wells is marked using an enzyme-linked monoclonal antibody specific for human IgG added to all the wells in the test plate. Unbound enzyme-linked antibody is removed by washing followed by addition of and incubation with substrate for 10 minutes. During the incubation with substrate a color reaction occurs the intensity of which is proportional to the amount of IgG captured from the test sample. Color development reaction is stopped adding an acid solution and the color intensity measured at OD 450 nm on an ELISA plate reader. The concentration values of Anti-SARS-CoV IgG in each well is extrapolated from a 4PL calibration curve using known calibrators of known concentrations of monoclonal IgG specific for CORONAVIRUS. Negative and positive controls, and unknown samples which are included on each test plate are read also read using the same curve and the results are expressed in international units per milliliter (IU/mL). This test reliably detects and measures IgG antibodies to antigenic determinants of the Spike protein of SARS-CoV-2 in human serum and plasma.

What does it mean if I have a negative test result?

In this immunological assay system a negative test result indicates that IgG antibodies to SARS-CoV-2 virus are either absent or below the level of detection of this test. Thus a negative result may indicate the absence of an immune response to Spike protein of the SARS-CoV-2 virus as would be expected after infection or exposure to the virus or an early response not yet detectable by the assay. Reliable negative test results are obtained from samples collected from persons who are immunologically competent and at least 14 days after infection (even if no symptoms were apparent) At present it is not known if and at which levels antibodies to SARS-CoV-2 IgG detected by this assay confer immunity to reinfection by the COVID-19 virus.

What does it mean if I have a positive test result?

A positive result may be also be due to current or past infection with non-SARS-CoV-2 corona virus strains such as HKU1, NL63, OC43, or 229E. Results from antibody testing should not be used as the sole basis to diagnose or exclude SARS-CoV-2 infection or to inform infection status. It is unknown for how long antibodies persist following infection and if the presence of antibodies confers protective immunity against reinfection with COVID-19.

It is important to consider the patient's clinical history and prevalence of local disease, as well as any other pertinent clinical information in assessing the need for a second but different serology test to confirm an immune response to SARS-CoV-2.

Immune response: This test should only be used for testing samples collected at least 15 days after symptom onset. High levels of IgG to SARS-CoV-2 have been demonstrated to remain detectable for up to 3 months in most patients who recover from COVID-19. The performance of this test in samples collected less than 15 days after symptom onset has not been established. The clinical applicability of a quantitative result is currently unknown and should not be interpreted as an indication or degree of immunity nor protection from reinfection, nor compared to other SARS-CoV-2 IgG antibody assays. Laboratories within the United States and its territories are required to report all results to the appropriate public health authorities as required

RELIABLE TEST RESULTS: Samples collected 15 days after symptom onset. The performance of this test in samples collected less than 15 days after symptom onset has not been established. The clinical applicability of a quantitative result is currently unknown and cannot be interpreted as an indication or degree of immunity nor protection from reinfection, nor compared to other SARS-CoV-2 IgG antibody assays. Laboratories within the United States and its territories are required to report all results to the appropriate public health authorities as required.

After vaccination samples: Two to 3 weeks following full vaccination, a patient's immunological response may be assessed by measuring the IgG antibodies to the SARS-CoV-2 of the spike protein level in serum/plasma. An absence of antibody formation post vaccination may relate to immune deficiency disorders, either congenital or acquired, or iatrogenic due to immunosuppressive drugs.

Where can I go for updates and more information?

The most up-to-date information on COVID-19 is available at the [Centers for Disease Control and Prevention website](#). In addition, please also contact your health care provider with any questions/concerns.

People who have been exposed to COVID-19 should quarantine for 14 days to avoid infecting others in this time period when they might be becoming sick themselves.

Covid Seroklir Semi-Quantitative ELISA Fact Sheet for healthcare providers:
<https://www.fda.gov/media/144008/download>

Covid Seroklir Semi-Quantitative ELISA method information for healthcare providers can be found at: <https://www.fda.gov/media/144010/download>