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2019-nCoV IgG / IgM Detection Kit (Colloidal Gold-Based) Instructions for Use (Version 2.0)

PRODUCT NAME
2019-nCoV IgG / IgM Detection Kit (Colloidal Gold-Based).

CATALOG NUMBER & SIZE
C6603C: 50 tests / kit.

INTENDED USE
The Vazyme 2019-nCoV IgG / IgM Detection Kit (Colloidal Gold-Based) is an in vitro diagnostic test intended for the qualitative detection of IgG / IgM antibodies to SARS-CoV-2 (or 2019-nCoV) in human serum, plasma, and whole blood (venipuncture) samples collected by healthcare professionals at the point-of-care. It is intended to be used as an aid in the diagnosis of patients with suspected SARS-CoV-2 infection in conjunction with clinical symptoms and other clinical or laboratory tests. Results from the Vazyme 2019-nCoV IgG / IgM Detection Kit (Colloidal Gold-Based) should not be used as the sole basis for diagnosis of a SARS-CoV-2 infection.
For prescription use only. For in vitro diagnostic use only.
Results are for the detection of 2019-nCoV antibodies. The 2019-nCoV antibody IgM and IgG are generally detectable in blood several days after the acute phase of infection. Positive results of IgM and IgG indicative of active infection.
Laboratories within the United States and its territories are required to report all positive results to the appropriate public health authorities.
Negative results do not preclude 2019-nCoV infection and should not be used as the sole basis for patient management decisions. Negative results must be combined with clinical observations, patient history, and epidemiological information.

BACKGROUND
The SARS-CoV-2 virus belongs is a betacoronavirus; it has an envelope, its particles are round or oval, it is often polymorphic, and its diameter is 60-140nm. Its genetic characteristics are significantly different from SARS-CoV and MERS-CoV. Current research shows that it has more than 85% homology with bat SARS-like coronavirus (bat-SL-CoVZC45). After infection with SARS-CoV-2, common symptoms are fever, fatigue, dry cough, dyspnea etc. Some patients present with more severe symptoms which include acute respiratory distress syndrome, septic shock, metabolic acidosis that is difficult to correct, and coagulation disorders. Some patients have mild symptoms and no fever. Most patients have a good prognosis, while a few are in critical condition or even die.
Both IgM and IgG are immunoglobulins that are produced by the immune system to provide protection against SARS-CoV-2. The level of IgM antibody begins to rise within 1 week and achieves the peak at 2-3 weeks after the initial infection. IgG appears later than IgM (usually in 14 days after infection) and achieves the peak at 5 weeks, lasting for 6 months or even several years.

PRINCIPLE OF DETECTION
This product is based on capture and solid-phase immunochromatography methods for determination. The specimen (whole blood / serum / plasma) flows from the blood separator through to the conjugate release pad (which causes the conjugation reaction between IgM / IgG antibodies in the specimen and the antigen colloidal gold of SARS-CoV-2 to form an immune complex of IgM / IgG antibody and colloidal gold-labeled antigen) due to capillary action. It then migrates to a capture zone of nitrocellulose membrane-immobilized antibody (mouse-anti-human IgM antibody, T1 line) to form an immune complex of colloidal gold-labeled antigen, IgM antibody and mouse-anti-human IgM antibody, thereby generating a T1 red line. The unreacted immune complex continues to flow upward and will be captured by the mouse-anti-human IgG antibodies (T2 line) to form an immune complex of colloidal gold-labeled antigen, IgG antibody and mouse-anti- human IgG antibody, thereby generating a T2 red line. The remaining uncaptured immune complex moves upward, combining with C line (quality control line) to indicate the completion of this reaction.

COMPONENTS PROVIDED IN THIS KIT

Component	Ingredients
Test Cassette	Aluminum foil pouch, desiccant, test strip and plastic card. Test strip composing blotting paper, nitrocellulose membrane, specimen separator, colloidal gold-labeled pad and PVC. T1 line (Test line) coating 1.0 mg/mL mouse-anti-human IgM antibody. T2 line (Test line) coating 1.0 mg/mL mouse-anti-human IgG antibody. C line (quality control line) coating 1.0 mg/mL actin protein C. Conjugate release pad containing 40 OD SARS-CoV-2 antigen-colloidal gold conjugate complex.
Specimen Dilution	HEPES Buffer containing casein (0.1 M), 5 mL/bottle.
Dropper	50 droppers/pack.

Note: Do not interchange the components from different batches.

MATERIALS REQUIRED BUT NOT PROVIDED
Clock or timer

STORAGE & SHELF LIFE
This kit should be stored at 4°C~30°C for 18 months in a sealed condition. Once the inner packaging of the strip is opened (4°C~30°C, humidity < 65%), it must be used within 1 hour. The opened specimen dilution buffer should be stored at 4°C, and it is valid within 1 month of opening. It is recommended to mark the opening date of the specimen dilution buffer.

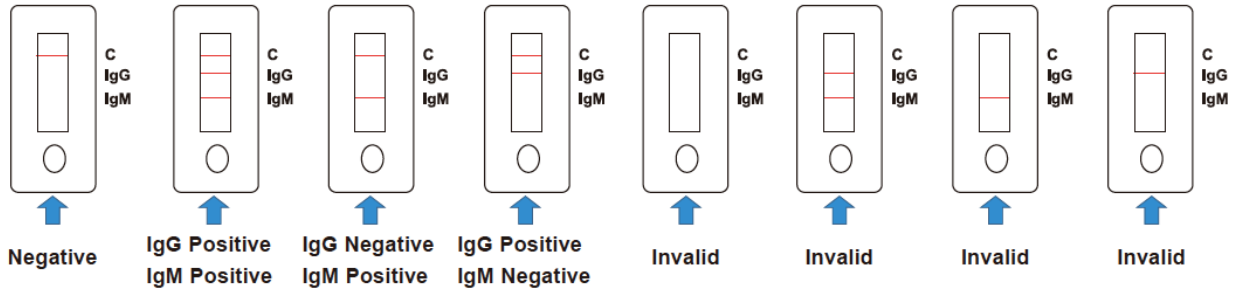
SAMPLING & HANDLING
1. Suitable specimen types include serum, plasma, and whole blood.
2. Sediment and suspended matter in the specimen may affect the test result. Those should be removed by centrifugation at 3000 g for 10 minutes.

3. Severe hematolytic, lipemic and turbid specimens should not be used.
4. Whole blood/plasma specimens can be treated with heparin sodium or EDTA anticoagulant. After specimen collection, the test should be completed within the same day. If not, please store the specimens using as the following protocol:
For whole blood specimens, store at 2°C ~8°C for 3 days.
For Serum/plasma specimens, store at 2°C ~8°C for 7 days, or at < -20°C for 12 months.
5. Specimens must be fully restored to room temperature (18°C -28°C) before testing. Freeze-preserved specimens should be completely melted, reheated and mixed thoroughly before use.

DIRECTIONS

Read the instructions carefully before use.
1. The test strips must be at room temperature before use, and the test must be operated at room temperature.
2. Remove the test strips from the foil pouch and place on a flat, dry table.
3. Using the dropper provided, add 1 drop (about 20 μL) of the serum, plasma, or whole blood specimens to the oval sample slot. Then add 2-3 drops of dilution buffer (about 60 μL) to the sample. Begin timing.
4. Read the results after 10 minutes.

INTERPRETING TEST RESULTS



The test results are analyzed as follows:
1. Negative result: Only one red quality control line (C line) appears in the detection area.
2. IgM positive, IgG positive result: Three clear red lines appear in the detection area, one is the quality control line (C line), one is T2 detection line, and the other is T1 detection line.
3. IgM positive, IgG negative result: Two clear red lines appear in the detection area, one is the quality control line (C line) and another is T1 detection line.
4. IgM negative, IgG positive result: Two clear red lines appear in the detection area, one is the quality control line (C line) and another is T2 detection line.
5. Invalid result: No red quality control line (C line) appears in the detection area (e.g. without any red lines or only test lines (T1, T2 line)), indicating that the test error or the test result is invalid, and the test should be retested.

LIMITATIONS OF TEST METHODS

1. The test results of this product are only for clinical reference and should not be used as the only basis for clinical diagnosis and treatment. The clinical management of patients should be considered in combination with their signs / symptoms, medical history, treatment reactions and epidemiology and other laboratory tests. It is recommended to repeat the test for suspicious samples at intervals.
2. The accuracy of detection is affected by the sample collection process. Improper sample collection and storage process will affect the test results and should avoid high temperature and direct sunlight.
3. This production provides a qualitative test for the SARS-CoV-2 IgM antibody and IgG antibody in the sample, but not quantified detection.
4. Due to the limitation of the testing methodologies, it cannot rule out the possibility of a SARS-CoV-2 infection based on negative results. It is recommended to combine other test results and clinical symptoms to make an accurate diagnosis.

PRODUCT PERFORMANCE INDICATORS

1. Lowest limit of detection
Test with the in-house LOD references. S1 and S2 are positive for SARS-CoV-2 IgG antibody, negative for IgM antibody; S3 is negative for SARS-CoV-2 IgG/IgM antibodies; S4 and S5 are positive for SARS-CoV-2 IgM antibody, negative for IgG antibody; and S6 is negative for SARS-CoV-2 IgG/IgM antibodies.
2. Negative coincidence rate
Test with the in-house negative references and the results are all negative for SARS-CoV-2 IgG/IgM antibodies, with a coincidence rate of 100%.
3. Positive coincidence rate
Test with the in-house positive references. PC01-PC05 are all positive for SARS-CoV-2 IgG/IgM antibodies, with a coincidence of 100%; PC06-PC10 are all negative for SARS-CoV-2 IgG antibody and all positive for IgM antibody, with a coincidence rate of 100%; PC11-PC15 are all negative for SARS-CoV-2 IgM antibody, and all positive for IgG antibody, with a coincidence rate of 100%.
4. Precision
Intra-batch difference: Test with the in-house repetitive references. CV1 and CV2 are positive for SARS-CoV-2 IgG antibody and negative for IgM antibody; CV3 and CV4 are negative for SARS-CoV-2 IgG antibody and positive for IgM antibody, with uniform color development.
Inter-batch difference: Test with the in-house repetitive references. The results of the kit of three batch numbers: CV1 and CV2 are positive for SARS-CoV-2 IgG antibody and negative for IgM antibody; CV3 and CV4 are negative for SARS-CoV-2 IgG antibody and positive for IgM antibody, with uniform color development.
5. Analytical Specificity
5.1 Cross-reactivity Specificity
This product will not cross react with positive samples of human coronavirus HKU1, NL63, OC43, 229E, influenza A H1N1 virus, seasonal H1N1 influenza virus, H3N2, H5N1, H7N9, influenza B Yamagata, Victoria, respiratory syncytial virus, parainfluenza virus, rhinovirus species A, B and C, adenovirus types 1, 2, 3, 4, 5, 7 and 55, coxsackievirus (enterovirus species B), enterovirus 71 (enterovirus species A), enterovirus 68 (EV-D68)

(enterovirus species D), EB virus, measles virus, human cytomegalovirus, rotavirus, norovirus, mumps virus, varicella-zoster virus, mycoplasma pneumoniae, chlamydia pneumoniae IgG/IgM antibodies.
5.2 Class Specificity
There is no cross reaction between SARS-CoV-2 specific IgG antibody and specific IgM antibody at high concentrations.
5.3 Interferents
When bilirubin ⩽0.2 g/L, triglyceride ⩽10 g/L, hemoglobin ⩽5 g/L, rheumatoid factor ⩽500 IU/mL, antinuclear antibody titer ⩽1:240, anti-mitochondrial antibody titer ⩽1:160, HAMA ⩽20 ng/mL, total IgG ⩽50 mg/L and total IgM ⩽5 mg/L, they will not interfere with the test results. Oseltamivir, levofloxacin, ceftriaxone, zanamivir, interferon alpha (IFN-α), ribavirin, peramivir, lopinavir, ritonavir, arbidol, azithromycin, meropenem, tobramycin, histamine hydrochloride, phenylephrine, oxymetazoline, sodium chloride, beclomethasone, dexamethasone, flunisolide, triamcinolone acetonide, budesonide, mometasone and fluticasone have no effect on the test results.
6. Hook Effect
Hook effect will occur at the concentration levels that exceed the lowest limit of detection of IgG antibody of this product by more than 1280 times and the lowest limit of detection of IgM antibody by more than 640 times. If SARS-CoV-2 infection is highly suspected but the antibody test result is negative, the sample should be re-tested after dilution.
7. After the specific IgM positive sample is destroyed, the IgM antibody test result is negative, and the IgG antibody test is not affected.
8. Heparin sodium and EDTA anticoagulants have no effect on the detection of this kit.
9. The precision test is conducted by different test personnel at a different time with this kit, and the results comply with product performance requirements.
10. For virus infection samples from different regions, the lowest limit of detection and detection repeatability of the reagents comply with the requirements.
11.Clinical Study
The clinical trial of this product was carried out at 5 sites based on the criteria for disease confirmation/exclusion specified in the “Diagnosis and Treatment Protocol for Novel Coronavirus Pneumonia.” The enrolled cases were suspected cases of SARS-CoV-2 infection, and included 201 confirmed cases and 369 excluded cases, with 51 early cases in confirmed cases. Clinical sensitivity of this product: 91.54% (95% CI: 86.87%, 94.65%) and specificity: 97.02% (95% CI: 94.74%, 98.33%). The sample types for clinical evaluation were serum and plasma. After a preliminary evaluation, it was confirmed that the clinical performance of the product meets the emergency needs of the COVID-19 epidemic. The clinical data for the product after marketing will be further collected to confirm the clinical performance of the product.

NOTIFICATION FOR SARS-CoV-2 ANTIBODY TESTS

1. This test has not been reviewed by the FDA.
2. Negative results do not rule out SARS-CoV-2 infection, particularly in those who have been in contact with the virus. Follow-up testing with a molecular diagnostic should be considered to rule out infection in these individuals.
3. 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.
4. Positive results may be due to past or present infection with non-SARS-CoV-2 coronavirus strains, such as coronavirus HKU1, NL63, OC43, or 229E.
5. This kit is not for the screening of donated blood.
6. This kit is only for in vitro diagnosis and is not intended for at home testing.

PRECAUTIONS AND WARNINGS

1. This test kit is intended to be used by suitably qualified healthcare practitioners only. Read the instructions carefully before use and conduct the test strictly in accordance with the kit instructions.
2. Use appropriate personal protective equipment (PPE) when collecting and handling specimens per the current CDC guidelines for COVID-19 infection control precautions.
3. Samples and controls should always be treated as if infectious and biohazardous in accordance with safe laboratory procedures.
4. Dispose of waste in compliance with local, state, and federal regulations.
5. Safety Data Sheets are available upon request.
6. Laboratories and health care facilities are required to report all positive results to the appropriate public health authorities.
7. Do not use if the product is expired or damaged.
8. Only use the diluent provided in the kit package. Other diluents may result in poor performance of the product.
9. Cassettes are intended for single use only. Do not reuse.
10. After opening the inner packaging and performing specimen dilution, follow the storage instructions as outlined in this IFU.
11. Proper specimen collection, storage, and transport are critical to the performance of this test. Inadequacy can result in a false result.
12. Retest if any results are invalid (control line is not visible).
13. Testing is limited to laboratories certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA), 42 U.S.C. §263a, to perform high complexity tests.

REFERENCES

1. Hui DS, et al. (2020). The continuing 2019-nCoV epidemic threat of novel coronaviruses to global health-The latest 2019 novel coronavirus outbreak in Wuhan, China. International Journal of Infectious Diseases, 91, 264–266.
2. Templeton KE, et al. (2004). Rapid and sensitive method using multiplex real-time PCR for diagnosis of infections by influenza A and influenza B viruses, respiratory syncytial virus, and parainfluenza viruses 1, 2, 3 and 4. Journal of clinical microbiology 42(4): 1564-1569.
3. Smith AB, et al. (2003). Rapid detection of influenza A and B viruses in clinical specimens by Light Cycler real time RT-PCR. Journal of Clinical Virology 28(1): 51-58.

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DATE OF APPROVAL AND MODIFICATION OF INSTRUCTION

April 23, 2020

DATE OF MANUFACTURE AND EXPIRATION

See packaging.

Symbols

CE	Conformity of European
IVD	For in vitro diagnostic use only
30°C 4 °C	Store between 4-30°C

Σ	Tests per kit
REF	Catalog #
LOT	Lot Number

	Manufacturer
	Expire Date
	Consult instructions for use

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