12. The target detection object of this product is IgM/IgG antibodies to the SARS-CoV-2. The positive results do not directly reflect the presence of SARS-CoV-2 in the specimen of the patient.
13. The kit shall should be used within 30 minutes after the aluminum foil bag is opened.
14. Testing should not be performed when the ambient temperature is higher than 30 ℃ or the relative humidity is higher than 70%.
15. The test should not be used for screening of donated blood.

5. CONDITIONS OF AUTHORIZATION FOR LABORATORIES

The LYHER Novel Coronavirus (2019-nCoV) IgM/IgG Antibody Combo Test Kit (Colloidal Gold) Letter of Authorization, along with the authorized Fact Sheet for Healthcare Providers, the authorized Fact Sheet for Recipients, and authorized labeling are available on the FDA website:
https://www.fda.gov/medical-devices/coronavirus-disease-2019-covid-19-emergency-use-authorizations-medical-devices/vitro-diagnostics-euas

Authorized laboratories using the LYHER Novel Coronavirus (2019-nCoV) IgM/IgG Antibody Combo Test Kit (Colloidal Gold) ("your product" in the conditions below), must adhere to the Conditions of Authorization indicated in the Letter of Authorization as listed below:

1. Authorized laboratories* using your product will include with test result reports, all authorized Fact Sheets. Under exigent circumstances, other appropriate methods for disseminating these Fact Sheets may be used, which may include mass media.
2. Authorized laboratories using your product will use your product as outlined in the Instructions for Use. Deviations from the authorized procedures, including the authorized clinical specimen types, authorized control materials, authorized other ancillary reagents and authorized materials required to use your product are not permitted.
3. Authorized laboratories that receive your product will notify the relevant public health authorities of their intent to run your product prior to initiating testing.
4. Authorized laboratories using your product will have a process in place for reporting test results to healthcare providers and relevant public health authorities, as appropriate.
5. Authorized laboratories will collect information on the performance of your product and report to DMD/OHT7-OIR/OPEQ/CDRH (via email: CDRH-EUA-Reporting@fda.hhs.gov) and Hangzhou Laihe Biotech (email: office@lyher.com; toll-free number: 1-888-291-2286) any suspected occurrence of false positive or false negative results and significant deviations from the established performance characteristics of your product of which they become aware.
6. All laboratory personnel using your product must be appropriately trained in immunoassay techniques and use appropriate laboratory and personal protective equipment when handling this kit and use your product in accordance with the authorized labeling. All laboratory personnel using the assay must also be trained in and be familiar with the interpretation of results of the product.
7. Hangzhou Laihe Biotech Co., Ltd., authorized distributors, and authorized laboratories using your product will ensure that any records associated with this EUA are maintained until otherwise notified by FDA. Such records will be made available to FDA for inspection upon request.

***The letter of authorization refers to, "Laboratories certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA), 42 U.S.C. §263a, that meet requirements to perform moderate or high complexity tests" as "authorized laboratories."**

6. PERFORMANCE CHARACTERISTICS

6.1 CLINICAL PERFORMANCE

A total of 527 prospective and retrospective samples were obtained for this study. The PCR positive samples were collected at four medical centers. Prospective specimens include samples from patients who tested positive for SARS-CoV-2 using nucleic acid tests, samples from patients who recovered from COVID-19, and samples from individuals who had contact with COVID-19 patients but tested negative with a SARS-CoV-2 nucleic acid test. The SARS-CoV-2 negative specimens include specimens that tested negative by a local hospital, specimens from patients with other respiratory infections, and random specimens collected prior to August 2019.

Among the 178 specimens that were PCR positive, 90 were from patients who were still in quarantine and 88 were from recovered patients. Among the 349 negative specimens in this trial, 239 of them were from patients with coronavirus infections not caused by SARS-CoV-2, and 110 of them were patients with other respiratory tract infections (all 110 cases were retrospective frozen specimens collected before August 2019).

Positive Results by Days After Onset of Symptoms (n=178)

Days from Symptoms Onset to Blood Collection	Number of PCR Positive Sample	LYHER IgM/IgG Antibody Combo Test Result				Positive Percent Agreement	
		IgM+	IgG+	Both IgM/IgG+	Both IgM/IgG-	IgM	IgG
≤ 6 days	23	23	0	0	0	23/23=100%	0/23=0.00%
7 – 14 days	21	5	0	13	3	18/21=85.71%	16/21=76.19%
>14 Days	134	2	1	131	0	133/134=99.25%	132/134=98.50%

Negative Results (n=349)

Number of PCR Negative Sample	LYHER IgM/IgG Antibody Combo Test Result				Negative Percent Agreement	
	IgM-	IgG-	Both IgM/IgG+	Both IgM/IgG-	IgM	IgG
349	347	347	0	347	347/349=99.43%	347/349=99.43%

Independent Clinical Agreement Validation

The LYHER Novel Coronavirus (2019-nCoV) IgM/IgG Antibody Combo Test Kit (Colloidal Gold) was tested on 6/10/2020 at the Frederick National Laboratory for Cancer Research (FNLCR) sponsored by the National Cancer Institute (NCI). The test was validated against a panel of previously frozen samples consisting of 30 SARS-CoV-2 antibody-positive serum samples and 80 antibody-negative serum and plasma samples. Each of the 30 antibody-positive samples were confirmed with a nucleic acid amplification test (NAAT) and both IgM and IgG antibodies were confirmed to be present in all 30 samples. The presence of antibodies in the samples was confirmed by several orthogonal methods prior to testing with the COVID-19 IgG/IgM Rapid Test Cassette (Serum/Plasma). The presence of IgM and IgG antibodies specifically was confirmed by one or more comparator methods. Antibody-positive samples were selected at different antibody titers.

All antibody-negative samples were collected prior to 2020 and include: i) Seventy (70) samples selected without regard to clinical status, “Negatives” and ii) Ten (10) samples selected from banked serum from HIV+ patients, “HIV+”. Testing was

performed by one operator using one lot of the COVID-19 IgG/IgM Rapid Test Cassette (Serum/Plasma). Confidence intervals for sensitivity and specificity were calculated per a score method described in CLSI EP12-A2 (2008).

For evaluation of cross-reactivity with HIV+, it was evaluated whether an increased false positive rate among antibody-negative samples with HIV was statistically higher than the false positive rate among antibody-negative samples without HIV (for this, a confidence interval for the difference in false positive rates was calculated per a score method described by Altman). The results and data analysis are shown in the tables below.

Summary Results

COVID-19 IgG/IgM Rapid Test Cassette (Serum/Plasma)		Comparator Method			
		Positive (IgM/IgG) +	Negative (IgM/IgG)-	Negative, HIV+	Total
Positive	IgM +/ IgG+	29	0	0	29
	IgM+, IgG-	0	0	0	0
	IgM-, IgG+	1	1	0	2
Negative	IgM- / IgG)-	0	69	10	79
Total (n=110)		30	70	10	110

Summary Statistics

Measure	Estimate	Confidence Interval
IgM Sensitivity	96.7% (29/30)	(83.3%; 99.4%)
IgG Sensitivity	100% (30/30)	(95.4%; 100%)
(IgM+ or IgG+; Total) Sensitivity (PPA)	100% (30/30)	(88.7%; 100%)
(IgM-/IgG-; Total) Specificity (NPA)	98.8% (79/80)	(93.3%; 99.8%)
Cross-reactivity with HIV+	0% (0/10) not detected	

6.2 CROSS-REACTIVITY

Cross-reactivity of the LYHER® Novel Coronavirus (2019-nCoV) IgM/IgG Antibody Combo Test Kit was evaluated in two studies using a total of 137 serum or plasma samples which contain antibodies to the pathogens listed below. All 137 specimens were negative by the LYHER® Novel Coronavirus (2019-nCoV) IgM/IgG Antibody Combo Test Kit. The data are summarized in the following table:

No.	Type of Specimens	Number of Samples	LYHER IgM/IgG Antibody Combo Test Result	
			Total IgM Neg	Total IgG Neg
H1N1-1~H1N1-3	Anti-H1N1 IgM and IgG Positive	3	3	3
H3N2-1	Anti-H3N2 IgM and IgG Positive	1	1	1
H5N1-1~H5N1-2	Anti-H5N1 IgM and IgG Positive	2	2	2
H7N9-1~H7N9-2	Anti-H7N9 IgM and IgG Positive	2	2	2
Yamagata-1	Anti-Yamagata IgM and IgG	1	1	1

	Positive			
Victoria-1~Victoria-4	Anti-Victoria IgM and IgG Positive	4	4	4
RSV-1~RSV-2	Anti-RSV IgM and IgG Positive	2	2	2
RUB-1~RUB-4	Anti-RUB IgM and IgG Positive	4	4	4
CMV-1~CMV-5	Anti-CMV IgM and IgG Positive	5	5	5
VZV-1~VZV-3	Anti-VZV IgM and IgG Positive	3	3	3
HSV-1~HSV-6	Anti-HSV IgM and IgG Positive	6	6	6
EBV-1~EBV-5	Anti-EBV IgM and IgG Positive	5	5	5
Rotavirus-1~Rotavirus-10	Rotavirus Antigen Test Positive	10	10	10
Adenovirus-1~Adenovirus-2	Anti-Adenovirus IgM and IgG Positive	2	2	2
Measles-1	Anti-Measles IgM and IgG Positive	1	1	1
Enterovirus-1~Enterovirus-3	Anti-Enterovirus IgM and IgG Positive	3	3	3
Mumps-1~Mumps-3	Anti-Mumps IgM and IgG Positive	3	3	3
HIV-1	Anti-HIV IgM and IgG Positive	1	1	1
Bacterium.P-1~Bacterium.P-2	Bacteriologic Test Positive	2	2	2
Chlamydia-1~Chlamydia-3	Anti-Chlamydia IgM and IgG Positive	3	3	3
M.P-1	Anti-Mycoplasma Pneumoniae IgM and IgG Positive	1	1	1
Legionella-1~Legionella-2	Anti-Legionella IgM and IgG Positive	2	2	2
Strep.P-1	Streptococcus Pneumoniae Antigen Test Postive	1	1	1
Staphyl.-1~Staphyl.-2	Bacteria culture result Positive	2	2	2
RF-1~RF-2	Anti-RF IgM and IgG Positive	2	2	2
ANA-1	ANA Positive	1	1	1

Sample Category	**Number of Samples**	**LYHER IgM/IgG Antibody Combo Test Result**					
		IgM			**IgG**		
		Pos	**Neg**	**%CR**	**Pos**	**Neg**	**%CR**
Anti-influenza A IgG Positive	5	0	5	0%	0	5	0%
Anti-influenza A IgM Positive	5	0	5	0%	0	5	0%
Anti-influenza B IgG Positive	5	0	5	0%	0	5	0%
Anti-influenza B IgM Positive	5	0	5	0%	0	5	0%
Anti-HCV IgG Positive	5	0	5	0%	0	5	0%
Anti-HCV IgM Positive	5	0	5	0%	0	5	0%
Anti-HBV IgG Positive	5	0	5	0%	0	5	0%
Anti-HBV IgM Positive	5	0	5	0%	0	5	0%
ANA Positive	5	0	5	0%	0	5	0%
Anti-respiratory syncytial virus IgG Positive	5	0	5	0%	0	5	0%

Anti-respiratory syncytial virus IgM Positive	5	0	5	0%	0	5	0%
Anti- Haemophilus influenzae IgG Positive	5	0	5	0%	0	5	0%
Anti- Haemophilus influenzae IgM Positive	5	0	5	0%	0	5	0%

Key to Symbols Used

For Prescription Use Only


Caution


Warning


Manufacturer


Date when the medical device was manufactured


Consult Instructions For Use

In Vitro Diagnostic Medical Device

Lot number


Use by

Temperature Limitation(2-30℃)

Catalogue Number


Corrosive


Do not reuse


Do not use if package is damaged


Keep dry

IN VITRO DIAGNOSTIC MEDICAL DEVICE TECHNICAL ASSISTANCE

For technical assistance, call Laihe Technical Services at +86 571 8665 8001 or +1 (888) 291 - 2286, email office@lyher.com or chenyaohua9569@dingtalk.com, or visit Laihe website at http:// www.lyherbio.com

Hangzhou Laihe Biotech Co., Ltd.

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March 2020 22-202003/R1

CFUS Anti-SARS-CoV-2 Reference Material Kit Series 1000

CFUS Series 1000

About this package insert

Thank you for your interest in this LYHER® product. This package insert consists of two pages.

The first page contains the product name, the LYHER logo, and contact information.

The second page contains the complete package insert text. If the package insert you view or print does not contain two pages, or if you experience any problems, please email us at office@LYHER.com, or call us at +1 (888) 291-2286.

A printed package insert will be sent to you upon request.

Key to Symbols Used

For Prescription Use Only

In Vitro Diagnostic Medical Device

Warning

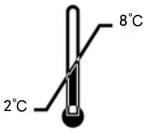

Manufacturer


Date when the medical device was manufactured

Lot number


Use by


Consult Instructions For Use



Temperature Limitation (2 to 8℃)


Keep dry

Hangzhou Laihe Biotech Co.,Ltd.
Address: 1st Floor, Room 505-512 5th Floor, No.2B Building, No.688 Bin'an Road, Changhe Jiedao,Binjiang District, Hangzhou, ZheJiang, PRC.
Phone: +1 (888)291-2286
Email: office@LYHER.com

CFUS Anti-SARS-CoV-2 Reference Material Kit Series 1000

For use under an Emergency Use Authorization (EUA) only For in vitro diagnostic use only. Rx only

NAME AND INTENDED USE

This product, CFUS Anti-SARS-CoV-2 Reference Material Kit Series 1000, is formulated for use with the LYHER Novel Coronavirus (2019-nCoV) IgM/IgG Antibody Combo Test Kit under the Emergency Use Authorization only.

PRODUCT DESCRIPTION

CFUS Series 1000 includes both antibody positive and negative reference materials. The positive is manufactured from human serum or plasma reactive for SARS-CoV-2 IgG/IgM and nonreactive for HBsAg and antibodies to HIV 1 and 2, HTLV I and II, and HCV. There is a single vial of positive reference material (red cap) contained within each kit.

The negative reference material is manufactured from human serum or plasma nonreactive for antibodies to SARS-CoV-2, as well as HBsAg and antibodies to HIV 1 and 2, HTLV I and II, and HCV. There is a single vial of negative reference material (clear caps) contained within each kit.

PACKAGE DETAIL:

Positive (Red caps):	1 x 1.0 mL vials
Negative (Clear caps):	1 x 1.0 mL vials

This control contains stabilizers (EDTA, buffering agents), and 0.1% ProClin® (5- chloro-2-methyl- 4-isothiazolin-3-one & 2-methyl-4-isothiazolin-3-one) as preservative.

WARNINGS AND PRECAUTIONS

CAUTION: Handle CFUS Series 1000 and all human blood products as though capable of transmitting infectious agents.

-This product has not been FDA cleared or approved;

-This product has been authorized by FDA under an EUA for use by laboratories certified under CLIA, that meet requirements to perform moderate or high complexity tests;

-This product is only authorized for the duration of the declaration that circumstances exist justifying the authorization of emergency use of in vitro diagnostics for detection and/or diagnosis of COVID-19 under Section 564(b)(1) of the Federal Food, Drug and Cosmetic Act, 21 U.S.C. § 360bbb-3(b)(1), unless the authorization is terminated or revoked sooner.

Safety Precautions

Use the Centers for Disease Control (CDC) recommended universal precautions for handling this product and human blood[1]. Do not pipette by mouth; do not eat or drink in areas where specimens are being handled. Clean any spillage by immediately wiping up with 0.5% sodium hypochlorite solution. Dispose of all specimens, reference materials, and other materials used in testing as though they contain infectious agents.

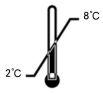
Handling Precautions

Do not use CFUS Series 1000 beyond the expiration date. Avoid microbial contamination of the reference materials when opening and closing the vials.

INDICATIONS OF REAGENT INSTABILITY OR DETERIORATION

Alterations in physical appearance may indicate instability or deterioration of CFUS Series 1000. Solutions that are visibly turbid should be discarded.

STORAGE INSTRUCTIONS



Store CFUS Series 1000 at 2-8°C. Do not use beyond expiration date. Once opened, vials should be stored at 2-8°C and discarded after 30 days or by the expiration date, whichever comes first. After opening, record the date opened and the expiration date on the vial. Multiple freeze-thaw cycles are not recommended and may have variable adverse effects on test results. To prevent leakage, store vials upright.

INSTRUCTIONS FOR USE

Allow the reference materials to reach room temperature prior to use, then return controls to refrigerated storage immediately after use. Mix the contents of the vials by gently swirling. Follow the steps written in the package insert of LYHER Novel Coronavirus (2019-nCoV) IgM/IgG Antibody Combo Test Kit (Colloidal Gold). Use the external control reference daily when there is testing performed.

INTERPRETATION OF RESULTS

Positive external control reference should give positive results for both IgM and IgG; negative external control reference should give negative results. If the result is not as expected, do not proceed the testing and contact LYHER immediately.

LIMITATIONS OF THE PROCEDURE

Test procedures and interpretation of results provided by LYHER must be followed closely. Any deviation from the procedure indicated in the package insert may produce unreliable results. CFUS Series 1000 is not a calibrator and should not be used for assay calibration. This external control reference kit is for exclusive use with the LYHER Novel Coronavirus (2019-nCoV) IgM/IgG Antibody Combo Test Kit (Colloidal Gold).

Adverse shipping and storage conditions or use of outdated product may produce erroneous results.

EXPECTED RESULTS

Specific levels of reactivity will vary among different procedures, different lot numbers and different laboratories. Procedures for implementing a quality assurance program and monitoring test performance on a routine basis must be established by each authorized laboratory. Authorized laboratories should follow the range of acceptable values established by LYHER.

REFERENCES

1. Siegel JD, Rhinehart E, Jackson M, Chiarello L, and the Healthcare Infection Control Practices Advisory Committee, 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings.

For assistance, contact LYHER Technical Support at +1 888.291.2286

Hangzhou Laihe Biotech Co.,Ltd.
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Phone: +1 (888)291-2286
Email: office@LYHER.com

LHZG Series 2000 - Anti-SARS-CoV-2 Reference Material Kit

For in vitro diagnostic use only. Rx only.
For Emergency Use Authorization (EUA) only.

INTENDED USE

This product, LHZG Anti-SARS-CoV-2 Reference Material Kit Series 2000, is formulated for use with the LYHER Novel Coronavirus (2019-nCoV) IgM/IgG Antibody Combo Test Kit under the Emergency Use Authorization only.

LHZG Series 1200 includes includes both antibody positive and negative reference materials. The positive is manufactured from humanized anti-SARS-CoV-2 IgG/IgM monoclonal antibodies in newborn calf serum buffer.

The negative reference material is manufactured from newborn calf serum buffer with no reactive antibodies to SARS-CoV-2.

All test results should be within the required reference range

PACKAGE SPECIFICATION

Each box includes a total number of 10 tubes (5 positive and 5 negative)

- Positive: 200uL x 5 vials
- Negative: 200uL x 5 vials

STORAGE INSTRUCTIONS

LHZG Series 2000 can be stored at -20±5°C until expiration date, and at 2-8°C for 1 month. DO NOT use beyond expiration date. Once opened, vials should be stored at 2-8°C and discarded after 30 days or by the expiration date, whichever comes first. After opening, record the date opened and the expiration date on the vial. Multiple freeze-thaw cycles are not recommended and may have variable adverse effects on test results. To prevent leakage, store vials upright.

WARNINGS AND PRECAUTIONS

For in vitro diagnostic use only. For Emergency Use Authorization (EUA) only.

- This product has not been FDA cleared or approved; this product has been authorized by FDA under an EUA for use by laboratories certified under CLIA, that meet requirements to perform moderate or high complexity tests.
- This product is only authorized for the duration of the declaration that circumstances exist justifying the authorization of emergency use of in vitro diagnostics for detection and/or diagnosis of COVID-19 under Section 564(b)(1) of the Federal Food, Drug and Cosmetic Act, 21 U.S.C. § 360bbb-3(b)(1), unless the authorization is terminated or revoked sooner.
- As with any test procedure, good laboratory practice is essential to the proper performance of this test. The test should be performed by qualified and trained staff to avoid the risk of erroneous results.
- Work area must be considered potential sources of contamination. Change gloves after contact with potential contaminants (specimens) before handling unopened reagents, or specimens.
- Once the product is opened, please store it under the condition of 2-8℃. The shelf life is one month.

Handling Precautions

Do not use LYHER reference materials beyond the expiration date. Avoid microbial contamination of the reference materials when opening and closing the vials.

INDICATIONS OF REAGENT INSTABILITY OR DETERIORATION

Alterations in physical appearance may indicate instability or deterioration of LHZG Series 2000. Solutions that are visibly turbid should be discarded.

INSTRUCTION FOR USE

Allow the reference materials to reach room temperature prior to use.

1. Pipette 10 µL of positive control or negative control into sample well (S) with the pipette.
2. Add vertically 2 drops (about 100µL) of specimen diluent.
3. Record results at 10 minutes.
4. Return controls to refrigerated storage immediately after use.

Use the external control reference daily when there is testing performed.

INTERPRETATION OF RESULTS

Positive external control reference should give positive results for both IgM and IgG; negative external control reference should give negative results. If the result is not as expected, do not proceed the testing and contact LYHER immediately.

SAFETY PRECAUTIONS

Use the Centers for Disease Control (CDC) recommended universal precautions for handling this product and human blood1. Do not pipette by mouth; do not eat or drink in areas where specimens are being handled. Clean any spillage by immediately wiping up with 0.5% sodium hypochlorite solution. Dispose of all specimens, reference materials, and other materials used in testing as though they contain infectious agents.

LIMITATION OF THE PROCEDURE

Test procedures and interpretation of results provided by LYHER must be followed closely. Any deviation from the procedure indicated in the package insert may produce unreliable results. LHZG Series 2000 is not a calibrator and should not be used for assay calibration. This external control reference kit is for exclusive use with the LYHER Novel Coronavirus (2019-nCoV) IgM/IgG Antibody Combo Test Kit (Colloidal Gold). Adverse shipping and storage conditions or use of outdated product may produce erroneous results.

EXPECTED RESULTS

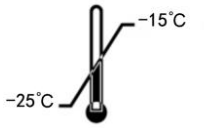
Specific levels of reactivity will vary among different procedures, different lot numbers and different laboratories. Procedures for implementing a quality assurance program and monitoring test performance on a routine basis must be established by each authorized laboratory. Authorized laboratories should follow the range of acceptable values established by LYHER.

REFERENCES

1. Siegel JD, Rhinehart E, Jackson M, Chiarello L, and the Healthcare Infection Control Practices Advisory Committee, 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings.

For assistance, contact LYHER Technical Support at +1 888.291.2286

Key to Symbols Used

				
For Prescription Use Only	In Vitro Diagnostic Medical Device	Warning	Manufacturer	Date when the medical device was manufactured
				
Lot number	Use by	Consult Instructions For Use	Temperature Limitation (-25 to -15℃)	Keep dry

Hangzhou Laihe Biotech Co.,Ltd.
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