Celltrion DiaTrust™ COVID-19 Ag Rapid Test

For use under the Emergency Use Authorization (EUA) only

For in vitro diagnostic use

For Prescription Use only

INTENDED USE

Celltrion DiaTrust™ COVID-19 Ag Rapid Test is a rapid test based on lateral flow immunoassay intended for the qualitative detection of nucleocapsid and receptor binding domains (RBDs) from the SARS-CoV-2 in human nasopharyngeal swab specimens directly collected from individuals who are suspected of COVID-19 by their healthcare provider within the first seven days of symptom onset, or from individuals without symptoms or other epidemiological reasons to suspect COVID-19 when tested twice over two or three days with at least 24 hours and no more than 48 hours between tests. Testing is limited to laboratories certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA), 42 U.S.C. §263a, that meet the requirements to perform high complexity, moderate complexity, or waived tests. This test is authorized for use at the Point of Care (POC), i.e., in patient care settings operating under a CLIA Certificate of Waiver, Certificate of Compliance, or Certificate of Accreditation.

The Celltrion DiaTrust™ COVID-19 Ag Rapid Test does not differentiate between SARS-CoV and SARS-CoV-2.

Results are for the identification of SARS-CoV-2 nucleocapsid and RBD protein antigen. Antigen is generally detectable in human nasopharyngeal swab specimens during the acute phase of infection. Positive results indicate the presence of viral antigens, but clinical correlation with the patient history and other diagnostic information is necessary to determine infection status. Positive results do not rule out bacterial infection or co-infection with other viruses. The agent detected may not be the definite cause of disease. Laboratories within the United States and its territories are required to report all results to the appropriate public health authorities.

Negative results should be treated as presumptive and confirmation with a molecular assay, if necessary, for patient management may be performed. Negative results do not rule out SARS-CoV-2 infection and should not be used as the sole basis for treatment or patient management decisions, including infection control decisions. Negative results should be considered in the context of a patient's recent exposures, history and the presence of clinical signs and symptoms consistent with COVID-19. For serial testing programs, additional confirmatory testing with a molecular test for negative results may be necessary, if there is a high likelihood of SARS-CoV-2 infection, such as in an individual with a close contact with COVID-19 or with suspected exposure to COVID-19 or in communities with high prevalence of infection. Additional confirmatory testing with a molecular test for positive results may also be necessary, if there is a low likelihood of SARS-CoV-2 infection, such as in individuals without known exposures to SARS-CoV-2 or residing in communities with low prevalence of infection.

The Celltrion DiaTrust™ COVID-19 Ag Rapid Test is intended for use by medical professionals or trained operators who are proficient in performing tests, trained clinical laboratory personnel, or individuals trained in POC settings. In the United States, the Celltrion DiaTrust™ COVID-19 Ag Rapid Test is only for use under the Food and Drug Administration's Emergency Use Authorization.

SUMMARY AND EXPLANATION

Coronavirus is a group of viruses that belongs to the Family Coronaviridae; a type of RNA virus of 27~32 kb commonly found in birds and mammals including human. Coronavirus is divided into four genera: alpha, beta, gamma and delta. The virus causes illness ranging from the common cold to more severe

diseases such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV).

Coronavirus disease 2019 (COVID-19) is a new strain caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The disease originated from Wuhan city of China in December 2019. The World Health Organization (WHO) publicly named this virus 'COVID-19' and declared it a pandemic and a Public Health Emergency of International Concern. The infection is typically spread from one person to another via direct contact or respiratory droplets from cough or sneeze. Latent period from exposure to onset of symptoms is between one to fourteen days (four to seven days on average). Common symptoms and signs of infection include fever, cough, shortness of breath and breathing difficulties. In severe cases, infections can cause pneumonia, severe acute respiratory syndrome, kidney failure and even death.

Due to the wide variety of symptoms, it is difficult to differentiate COVID-19 from other existing respiratory viruses or bacteria. Diagnosing COVID-19 through isolating the virus or detecting specific genes from the collected respiratory droplet specimens is a challenge in terms of time and accessibility as it requires long hours, well-equipped laboratory and advanced technology which are often not available to many public. The test is designed to detect antigen to SARS-CoV-2, and it will help assess if an individual has COVID-19 antigen within 15 minutes.

TEST PRINCIPLE

The Celltrion DiaTrust™ COVID-19 Ag Rapid Test is a lateral flow immunoassay test. The Celltrion DiaTrust™ COVID-19 Ag Rapid Test is designed to detect antigen from the SARS-CoV-2 in human nasopharyngeal swab specimens from patients who are suspected of COVID-19 by their healthcare provider within the first seven days of symptom onset, or from individuals without symptoms or other epidemiological reasons to suspect COVID-19 when tested twice over two or three days with at least 24 hours and no more than 48 hours between tests. The Celltrion DiaTrust™ COVID-19 Ag Rapid Test is validated for use from direct specimens testing without transport media.

A nitrocellulose membrane strip in the device having a test line and a control line, wherein the test line is pre-coated with anti-mouse monoclonal antibody to SARS-CoV-2 to detect SARS-CoV-2 nucleocapsid and RBDs from the SARS-CoV-2 spike proteins, and the control line is coated with goat anti-mouse IgG. When the extracted swab specimen is dispensed into to the sample well, the specimen migrates towards the conjugate pad, which contains conjugated antibodies with colloidal gold directed against the SARS-CoV-2 antigen. When the sample contains SARS-CoV-2 antigens, an antigen-antibody-conjugate complex is formed. The sample-conjugate complex then passes over the membrane until it reaches the capture zone (test line) Here, the complex is bound to immobilized antibodies and form visible colored band in the test line. The sample then migrates across the membrane along the strip until it reaches the control line where excess conjugate binds and produces a second visible line on the membrane. This control line indicates that the sample has migrated across the membrane as intended and indicates that the test was correctly performed.

MATERIALS PROVIDED

- Test devices packaged individually in aluminum pouch (25 test/box)
- Disposable test tube with 0.3 mL of extraction buffer (25 ea/box)
- Filter cap (25 ea/box)
- Sterilized swabs for specimen collection (25 ea/box)
- Quick reference instruction (1 ea)
- Positive control swab (1 ea/box)
- Negative control swab (1 ea/box)

MATERIALS REQUIRED BUT NOT PROVIDED

- Timer
- Any necessary personal protective equipment

REAGENT STORAGE AND STABILITY

An unopened test device should be stored at 2 - 30°C (36 - 86°F). The shelf-life of the test device is 10 months and it is stable until the expiration date marked on the label. An opened test device is stable up to 1 hour after released from the aluminum pouch.

SPECIMEN STORAGE AND STABILITY

Nasopharyngeal specimens should be tested immediately after collection. If immediate testing is not possible, specimens should be stored immediately into extraction buffer and may be stored for up to 4 hours until testing. If testing cannot be performed within this time, a new specimen should be collected and tested.

QUALITY CONTROL

An external positive control is needed to confirm that the device performs as intended and that the test procedure is conducted correctly. 0.1 µg/mL of non-infectious recombinant SARS-CoV-2 RBD antigen and 0.1 µg/mL non-infectious recombinant SARS-CoV-2 nucleoprotein antigen is dried onto the swab. This control swab should be tested once with every new lot and shipment, on a daily basis, for each new user, or according to the quality control procedures established for each laboratory.

A sterile swab is included as an external negative control to confirm that the device performs as intended and that the test procedure is conducted correctly. This control swab should be tested once with every new lot and shipment, on a daily basis, for each new user, or according to the quality control procedures established for each laboratory.

A procedural internal control is built in the 'control line (c)' of the device and is used to ensure that the applied specimen has migrated well into the device and the test procedure was properly done. It is coated with goat anti-mouse IgG and a colored line will always appear when the test is performed properly.

CHEMICAL HAZARD AND SAFETY INFORMATION

Hazardous ingredients for the extraction buffer

Chemical Name (CAS)	Material Safety Data Sheet	GHS Code for each ingredient	Conc.
Sodium Azide (26628-22-8)	Material Safety Data Sheet	Acute Tox.2 (oral), H300 Acute Tox.1 (dermal), H310	0.09%

The extraction buffer solution in the extraction buffer tube contains a hazardous ingredient as shown in above table. If the extraction buffer solution contacts the skin or eye, immediately wash with plenty of running water. In case the irritation persists, please seek medical advice at: https://www.poison.org/contact-us or 1-800-222-1222

PRECAUTIONS AND WARNINGS

- For use under Emergency Use Authorization Only.
- For in vitro diagnostic use only.
- For prescription use only.
- Read all instructions completely and carefully and follow all instructions. Failure to follow all instructions may result in inaccurate test results.
- This product has not been FDA cleared or approved, but has been authorized by FDA under an Emergency Use Authorization (EUA) for use by laboratories certified under the CLIA that meet the requirements to perform high or moderate complexity, or waived tests. This product is authorized for use at the Point of Care (POC), i.e., in patient care settings operating under a CLIA Certificate of Waiver, Certificate of Compliance, or Certificate of Accreditation.
- This product has been authorized only for the detection of proteins from SARS-CoV-2, not for any other viruses or pathogens
- The emergency use of this product is only authorized for the duration of the declaration that circumstances exist justifying the authorization of emergency use of *in vitro* diagnostic tests 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 declaration is terminated or the authorization is revoked sooner.
- Use appropriate precautions in the collection, handling and storage of patient samples. Refer to CDC Interim Guidelines for Collection, Handling and Transportation of clinical specimens from persons with Coronavirus Disease 2019 (COVID-19) at https://www.cdc.gov/coronavirus/2019-nCoV/lab/guidelines-clinical-specimens.html, and to WHO's Interim guidance for Laboratory testing for coronavirus disease (COVID-19) in suspected human cases at http://www.who.int/publications-detail/laboratory-testing-for-2019-novel-coronavirus-in-suspected-human-cases-20200117, as amended and supplemented. Refer to the WHO website for additional publications.
- Federal Law restricts this device to sale by or on the order of a licensed practitioner (US only).
- Laboratories within the United States and its territories are required to report all results to the appropriate public health laboratories.
- This test has been authorized only for the detection of proteins from SARS-CoV-2, not for any other viruses or pathogens.
- Do not use the test device beyond the expiration date.
- Keep sealed until usage, and once opened use immediately.
- Do not use the test device if the pouch is damaged or the device is seriously broken.
- Do not re-use the device.
- Handle all specimens safely as potentially infectious.
- All samples, even after the extraction procedure, and reagents containing biological materials used for the assay must be considered as potentially able to transmit infectious agents; accordingly samples, reagents and the waste must be handled with utmost care and disposed of in compliance with the laboratory guidelines and the statutory provisions in force in each country.
- This test is intended for assessment of coronavirus infection by detecting COVID-19 antigen, but should not be used as a sole criterion for the determination of SARS-CoV-2 infection. Other methods and clinical information (signs and symptoms) should be used and considered for diagnosis.
- Discard Celltrion DiaTrust™ COVID-19 Ag Rapid Test in accordance with local, state and federal regulations or accreditation requirements.

Safety Precautions

- Specimens may be infectious. Use Universal Precautions when performing this assay.

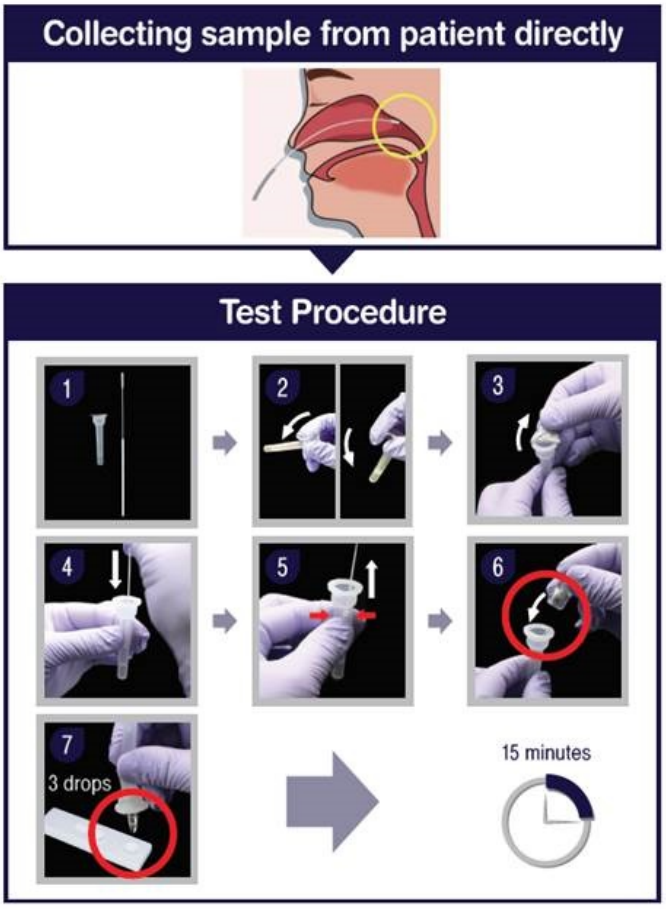
- Use routine laboratory precautions. Do not eat, drink, or smoke in the area where samples are being handled and testing is being conducted. Avoid any contact between hands, eyes or mouth during sample collection and testing.
- Wear personal protective equipment (PPE) in accordance with laboratory and institutional policies, such as laboratory coats, disposable gloves, and eye protection when handling patient samples.
- Wash hands thoroughly after handling specimens and used cartridge.
- Dispose of used test device in a biohazard waste container. Proper handling and disposal methods should be established according to local regulations.
- Avoid splashing or aerosolization of samples or reagents as droplets are a means of transmission of SARS-CoV-2 virus. All drops and spills must be wiped up with an appropriate disinfectant such as a sodium hypochlorite solution with 0.5% active chlorine, and all soiled materials must be disposed of as infectious waste.

TEST PROCEDURE

1. Specimen collection (CDC guideline):

   Use only the swabs provided with the test kit (FA/FANAB01 and Miraclean Technology, Item No. 96000) for specimen collection. Make sure extraction buffer tube and filter cap is also readily available before starting sample collection, as collected swab sample need to be immediately inserted into the extraction buffer tube for sample extraction. After swabbing, immediately insert the swab into extraction buffer tube. Do not leave the sampled swab dry in open air as it may affect the performance of the test.

   Gently and slowly insert a sterile nasal swab through the nostril parallel to the palate (not upwards) until resistance is encountered or the distance is equivalent to that from the ear to the nostril of the patient, indicating contact with the nasopharynx. Swab should reach depth equal to distance from nostrils to outer opening of the ear. Gently rub and roll the swab. Leave swab in place for several seconds to absorb secretions. Slowly remove swab while rotating it. Specimens can be collected from both sides using the same swab, but it is not necessary to collect specimens from both sides if the swab is saturated with fluid from the first collection. If a deviated septum or blockage create difficulty in obtaining the specimen from one nostril, use the same swab to obtain the specimen from the other nostril.



NOTE: Do not store the swab without extraction buffer. Swabs may be stored in extraction buffer up to 4 hours after collection in room temperature. However, it is highly recommended to perform test immediately after collection for the best results.

2. Test method

   1) Prepare an aluminum pouch containing the test device and place it on the testing surface along with the test tube filled with the extraction buffer and filter cap. In case the tests were refrigerated, keep them ambient for 30 minutes to let it reach the room temperature.
   2) Release the test device from the aluminum pouch and place it on a flat surface just prior to starting test.
   3) Collect the buffer fluid at the bottom of the test tube by shaking it and then peel off the seal of the test tube. Insert the tip of the swab with the patient specimen and move the swab up and down more than 10 times to ensure sufficient sample extraction.
   4) Remove the swab while pressing against the sides of the tube to ensure maximum amount of liquid has been squeezed from the swab.
   5) Equip the filter cap on the test tube and immediately dispense three drops of sample extracts (100 µL) into the sample well of the device. (If you have dropped the test device after sample application, please discard the device and restart the test using new device.)
   6) Read results 15 minutes after applying the sample. Do not read results after 20 minutes. Note: False negative or false positive results could occur if the results are read before 15 minutes or after 20 minutes.

*** Avoid swabbing and inserting excessive amount of nasopharyngeal specimen into the test tube, as it may block the filter cap when dispensing sample extracts.*

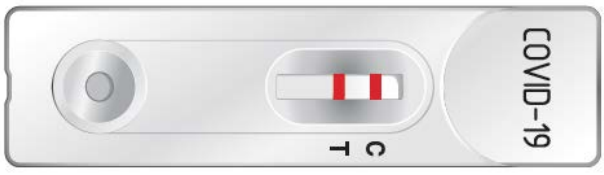
INTERPRETATION OF RESULTS

All test controls should be examined prior to interpretation of patient results. If the controls are not valid, the patient results cannot be interpreted.

1) Celltrion DiaTrust™ COVID-19 Ag Rapid Test Controls – positive and negative:

Celltrion DiaTrust™ COVID-19 Ag Rapid Test contains one positive and one negative control to ensure that the test device is working as intended, and the test is correctly performed.

A positive control swab will give two colored lines in both test line and control line indicating a positive result.



A negative control will give a single colored control line indicating a negative result.

were not available for wet testing, *in silico* analysis using the Basic Local Alignment Search Tool (BLAST) managed by the National Center for Biotechnology Information (NCBI) was used to assess the degree of protein sequence homology.

Human coronavirus HKU1: 12% homology was found between SARS-CoV-2 Receptor Binding Domain spike proteins and HKU1 spike protein, and 32% homology was found between SARS-CoV-2 Nucleocapsid protein and HKU1 Nucleocapsid protein. Therefore, cross-reactivity is highly unlikely but cannot be ruled out.

Pneumocystis jirovecii: No sequence homology was found between SARS-CoV-2 RBD spike protein / nucleocapsid protein and *P. jirovecii*. Therefore, there is no cross-reactivity.

Mycobacterium tuberculosis: There was 45.6% homology across 9% of the whole sequence between *M. tuberculosis* and SARS-CoV-2 RBD spike protein. No similarity was found between *M. tuberculosis* and SARS-CoV-2 NP. Therefore, cross-reactivity is highly unlikely but cannot be ruled out.

SARS-CoV: 72% homology was found between SARS-CoV-2 Receptor Binding Domain spike proteins and SARS-CoV spike protein, and 96% homology was found between SARS-CoV-2 Nucleocapsid protein and SARS-CoV Nucleocapsid protein. Therefore, cross-reactivity is highly likely.

Note: The Celltrion DiaTrust™ COVID-19 Ag Rapid Test does not differentiate between SARS-CoV and SARS-CoV-2.

4) Endogenous interference substances study:

Testing to evaluate interference of the Celltrion DiaTrust™ COVID-19 Ag Rapid Test was performed.

Extraction buffer was used as negative sample. Positive standard materials were spiked into negative sample and were diluted to prepare a low concentration level (6.3×10^1 $TCID_{50}$/mL, approx. 2xLoD) for testing.

Potential interfering substances were added to the negative and positive samples and were tested using the Celltrion DiaTrust™ COVID-19 Ag Rapid Test in 3 replicates. The test results demonstrated that 41 interfering substances (table below) did not affect the performance of Celltrion's DiaTrust™ COVID-19 Ag Rapid Test.

No.	Interfering substances	Testing conc.	Negative	Negative + Interfering substances	Low positive	Low pos. + Interfering substances
1	Whole blood	4%	3/3*	3/3*	3/3**	3/3**
2	Mucin	0.5%	3/3*	3/3*	3/3**	3/3**
3	Chloraseptic	1.5 mg/mL	3/3*	3/3*	3/3**	3/3**
4	NeilMed NasoGel	5% v/v	3/3*	3/3*	3/3**	3/3**
5	CVS Nasal drops	15% v/v	3/3*	3/3*	3/3**	3/3**
6	Afrin (Oxymetazoline)	15% v/v	3/3*	3/3*	3/3**	3/3**
7	Sodium cromoglycate (CVS nasal spray, Cromolyn)	15% v/v	3/3*	3/3*	3/3**	3/3**
8	Zicam	15% v/v	3/3*	3/3*	3/3**	3/3**
9	Homeopathic (Alkalol)	1:10 dilution	3/3*	3/3*	3/3**	3/3**
10	Sore throat Phenol Spray	15% v/v	3/3*	3/3*	3/3**	3/3**
11	Tobramycin	5 µg/mL	3/3*	3/3*	3/3**	3/3**
12	Mupirocin	10 mg/mL	3/3*	3/3*	3/3**	3/3**
13	Fluticasone Propionate	5% v/v	3/3*	3/3*	3/3**	3/3**
14	Tamiflu (Oseltamivir Phosphate)	5 mg/mL	3/3*	3/3*	3/3**	3/3**
15	Albumin, human	3000	3/3*	3/3*	3/3**	3/3**

No.	Interfering substances	Testing conc.	Negative	Negative + Interfering substances	Low positive	Low pos. + Interfering substances
		mg/dL				
16	Bilirubin	500 µmol/L	3/3*	3/3*	3/3**	3/3**
17	Hemoglobin	500 mg/dL	3/3*	3/3*	3/3**	3/3**
18	Cholesterol	20 µmol/L	3/3*	3/3*	3/3**	3/3**
19	Triglyceride	1000 mg/dL	3/3*	3/3*	3/3**	3/3**
20	Biotin	0.75 mg/mL	3/3*	3/3*	3/3**	3/3**
21	Sodium citrate	25 mg/mL	3/3*	3/3*	3/3**	3/3**
22	Heparin	100 U/mL	3/3*	3/3*	3/3**	3/3**
23	EDTA	5 µmol/L	3/3*	3/3*	3/3**	3/3**
24	K3-EDTA	20 mg/mL	3/3*	3/3*	3/3**	3/3**
25	Diphenhydramine hydrochloride	5 mg/mL	3/3*	3/3*	3/3**	3/3**
26	Acetaminophen	199 µmol/L	3/3*	3/3*	3/3**	3/3**
27	Acetylsalicylic acid	3.62 mmol/L	3/3*	3/3*	3/3**	3/3**
28	Ibuprofen	2.425 mmol/L	3/3*	3/3*	3/3**	3/3**
29	Olopatadine hydrochloride	5 mg/mL	3/3*	3/3*	3/3**	3/3**
30	Hanmi Ko-and-Cool Nasal Spray (Chlorpheniramine Maleate 250 mg/ 100 mL, Xylometazoline Hydrochloride 0.1 g/100 mL)	10%(v/v)	3/3*	3/3*	3/3**	3/3**
31	Samchundang Narista-S Nasal Spray (Chlorpheniramine Maleate 2.5 mg/mL, Dipotassium Glycyrrhizinate 3 mg/mL, Naphazoline Hydrochloride 0.5 mg/mL)	10%(v/v)	3/3*	3/3*	3/3**	3/3**
32	Sodium chloride	20 mg/mL	3/3*	3/3*	3/3**	3/3**
33	Zanamivir	5 mg/mL	3/3*	3/3*	3/3**	3/3**
34	Oseltamivir	10 mg/mL	3/3*	3/3*	3/3**	3/3**
35	Artemether-lumefantrine	50 µmol/L	3/3*	3/3*	3/3**	3/3**
36	Doxycycline hyclate	70 µmol/L	3/3*	3/3*	3/3**	3/3**
37	Quinine	150 µmol/L	3/3*	3/3*	3/3**	3/3**
38	Lamivudine	1 mg/mL	3/3*	3/3*	3/3**	3/3**
39	Erythromycin	81.6 µmol/L	3/3*	3/3*	3/3**	3/3**
40	Ciprofloxacin	30.2 µmol/L	3/3*	3/3*	3/3**	3/3**
41	Rheumatoid factor positive plasma	10%(v/v)	3/3*	3/3*	3/3**	3/3**

*: Negative / **: Positive

5) High-dose Hook effect

Pooled nasopharyngeal specimens was used as clinical matrix, and SARS-CoV-2 virus inactivated by beta-Propiolactone (BPL) was spiked to make various high concentration levels of SARS-CoV-2 antigens. Prepared samples of each concentration levels were tested using Celltrion DiaTrust™ COVID-19 Ag Rapid Test in 3 replicates following instructions.

No high-dose hook effect was observed up to 6.3×10^5 $TCID_{50}$/mL, approx. 20,000xLoD.

SARS-CoV-2 inactivated virus (6.3×10^5 $TCID_{50}$/mL)		
$TCID_{50}$/mL (concentration)	**Test results (No. of positives/ No. of replicates)**	
	Lot 1	**Lot 2**
3.2×10^1 [1xLoD]	3/3	3/3
1.3×10^2 [4xLoD]	3/3	3/3
1.5×10^4 [500xLoD]	3/3	3/3
6.3×10^5 [20,000xLoD]	3/3	3/3

6) Specimen stability

Nasopharyngeal swab samples were collected from healthy donors and were used as negative sample. Positive materials were prepared using the SARS-CoV-2 inactivated virus (NMC-nCoV02 #24, 6.3×10^5 $TCID_{50}$/mL) diluted to low positive concentration (6.3×10^1 $TCID_{50}$/mL, approx. 2xLoD) in negative sample, and 20 µL of the prepared low positive materials were coated on the swab to be used as positive sample.

Prepared negative and positive samples were mixed in extraction buffer and capped as per the instructions for use and stored in room temperature (30°C) for various time periods; immediately, and 1, 2, 3, 4, 6 hours after preparation. Samples of each conditions were tested in 5 replicates for negative samples and 10 replicates for low positive samples following the instructions, using randomly selected samples of the Celltrion DiaTrust™ COVID-19 Ag Rapid Test.

Test results showed that collected nasopharyngeal swab specimen in extraction buffer is stable for testing up to 4 hours after collection in room temperature. However, it is highly recommended to perform test immediately after collection for the best results.

Time periods after storage in room temperature	**Test result**	
	Negative (No. of negative/ No. of replicates)	**Low Positive** (No. of positive/ No. of replicates)
Immediately	5/5	10/10
1 hour	5/5	10/10
2 hours	5/5	10/10
3 hours	5/5	10/10
4 hours	5/5	10/10
6 hours	5/5	8/10

7) Clinical evaluation

The clinical evaluation of the Celltrion DiaTrust™ COVID-19 Ag Rapid Test was evaluated by testing a total of 133 prospectively collected direct nasopharyngeal swab samples, consisted of 30 positive and 103 negative samples from suspected COVID-19 patients in United States within 7 days of symptom onset. Direct nasopharyngeal swabs were collected from each patient, eluted in the extraction buffer and tested with the device immediately. Results of each samples were confirmed by a high-sensitivity FDA authorized RT-PCR assay.

According to the test results, clinical performance results of the Celltrion DiaTrust™ COVID-19 Ag Rapid Test was as follows:

Test result		RT-PCR		Total
		Positive	Negative	
Celltrion DiaTrust™ COVID-19 Ag Rapid Test	Positive	28	1	29
	Negative	2	102	104
Total		30	103	133

Parameter	Proportion (%)	95% Confidence Interval
Sensitivity	28/30 (93.33%)	78.7 – 98.2%
Specificity	102/103 (99.03%)	94.7 – 99.8%
Positive Predictive Value	28/29 (96.55%)	82.8 – 99.4%
Negative Predictive Value	102/104 (98.08%)	93.3 – 99.5%
Prevalence	22.56%	16.3 – 30.4%

Day Since Symptom Onset	Cumulative RT-PCR (+)	Cumulative Celltrion DiaTrust™ COVID-19 Ag Rapid Test Positive (+)	PPA	95% Confidential interval	
1	3	3	100.0%	43.9%	100%
2	9	9	100.0%	70.1%	100%
3	15	14	93.33%	70.2%	98.8%
4	24	23	95.83%	79.8%	99.3%
5	26	25	96.15%	81.1%	99.3%
6	27	26	96.30%	81.7%	99.3%
7	30	28	93.33%	78.7%	98.2%

Patient demographics are available for the 30 samples used in the analysis of patients with symptom onset within the previous seven (7) days. The table below shows the positive results broken down by age of patient.

Age Group	Celltrion DiaTrust™ COVID-19 Ag Rapid Test		
	Total number	Positive	Prevalence
≤5 Years of Age	0	0	N/A
6-21 Years of Age	1	1	100%
22-59 Years of Age	25	24	96%
≥60 Years of Age	4	3	75%

Celltrion DiaTrust™ COVID-19 Ag Rapid Test was demonstrated at near patient or Point of Care (POC) testing that non-laboratory personnel can perform the test accurately in the intended use environment. In addition, the robust use of Celltrion DiaTrust™ COVID-19 Ag Rapid Test for near patient or Point of Care (POC) testing was demonstrated by nine (9) Flex studies.

The performance of this test has not yet been clinically validated for use in patients without signs and symptoms of respiratory infection or for serial screening applications and performance may differ in these populations.

ASSISTANCE

If you have any questions regarding the use of this product or if you want to report a test system problem, please contact Humasis Co., Ltd. (via email: info@humasis.com, via phone: +82-31-8085-6284) or Celltrion USA, Inc. (via email: Diatrust@celltrion.com, or via phone: (201) 499-1844). Test system problems may also be reported to the FDA through the MedWatch medical products reporting program (phone: 800.FDA.1088; fax: 800.FDA.0178; http://www.fda.gov/medwatch).

REFERENCES

[1] Zhu N, Zhang D, Wang W, et al. A Novel Coronavirus from Patients with Pneumonia in China, 2019. N Engl J Med 2020.

[2] Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet 2020.

[3] Kang CK, Song KH, Choe PG, et al. Clinical and Epidemiologic Characteristics of Spreaders of Middle East Respiratory Syndrome Coronavirus during the 2015 Outbreak in Korea. J Korean Med Sci 2017; 32:744-9.

[4] WHO, Novel Coronavirus (2019-nCoV) situation reports. Available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situationreports/ (Accessed at 2 Feb, 2020).

QUICK REFERENCE INSTRUCTION
Celltrion DiaTrust™ COVID-19 Ag Rapid Test

For use under the Emergency Use Authorization (EUA)
only For in vitro diagnostic use
For Prescription Use only

Please refer to the package insert for detailed assay instructions, cautions, limitations and warnings.

INTENDED USE

Celltrion DiaTrust™ COVID-19 Ag Rapid Test is a rapid test based on lateral flow immunoassay intended for the qualitative detection of nucleocapsid proteins and receptor binding domains (RBDs) from the SARS-CoV-2 spike proteins in human nasopharyngeal swab specimens directly collected from individuals who are suspected of COVID- 19 by their healthcare provider within the first seven days of symptom onset, or from individuals without symptoms or other epidemiological reasons to suspect COVID-19 when tested twice over two or three days with at least 24 hours and no more than 48 hours between tests. Testing is limited to laboratories certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA), 42 U.S.C. §263a, that meet the requirements to perform high complexity, moderate complexity, or waived tests. This test is authorized for use at the Point of Care (POC), i.e., in patient care settings operating under a CLIA Certificate of Waiver, Certificate of Compliance, or Certificate of Accreditation.

The Celltrion DiaTrust™ COVID-19 Ag Rapid Test does not differentiate between SARS-CoV and SARS-CoV-2.

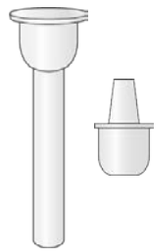
Results are for the identification of SARS-CoV-2 nucleocapsid and RBD protein antigen. Antigen is generally detectable in human nasopharyngeal swab specimens during the acute phase of infection. Positive results indicate the presence of viral antigens, but clinical correlation with the patient history and other diagnostic information is necessary to determine infection status. Positive results do not rule out bacterial infection or co-infection with other viruses. The agent detected may not be the definite cause of disease. Laboratories within the United States and its territories are required to report all results to the appropriate public health authorities.

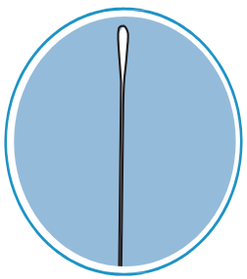
Negative results should be treated as presumptive and confirmation with a molecular assay, if necessary, for patient management may be performed. Negative results do not rule out SARS-CoV-2 infection and should not be used as the sole basis for treatment or patient management decisions, including infection control decisions. Negative results should be considered in the context of a patient's recent exposures, history and the presence of clinical signs and symptoms consistent with COVID-19.

For serial testing programs, additional confirmatory testing with a molecular test for negative results may be necessary, if there is a high likelihood of SARS-CoV-2 infection, such as in an individual with a close contact with COVID-19 or with suspected exposure to COVID-19 or in communities with high prevalence of infection. Additional confirmatory testing with a molecular test for positive results may also be necessary, if there is a low likelihood of SARS-CoV-2 infection, such as in individuals without known exposures to SARS-CoV-2 or residing in communities with low prevalence of infection.

The Celltrion DiaTrust™ COVID-19 Ag Rapid Test is intended for use by medical professionals or trained operators who are proficient in performing tests, trained clinical laboratory personnel, or individuals trained in POC settings. In the United States, the Celltrion DiaTrust™ COVID-19 Ag Rapid Test is only for use under the Food and Drug Administration's Emergency Use Authorization.

MATERIAL PROVIDED



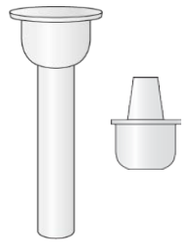


1. Test device (25ea) **2. Test tube filled with extraction buffer and filter cap (25 ea.)** **3. NPS swab (25ea)**

4. Quick reference instruction (1ea) **5. Positive control swab (1ea)** **6. Negative control swab (1ea)**

TESTING PROCEDURE

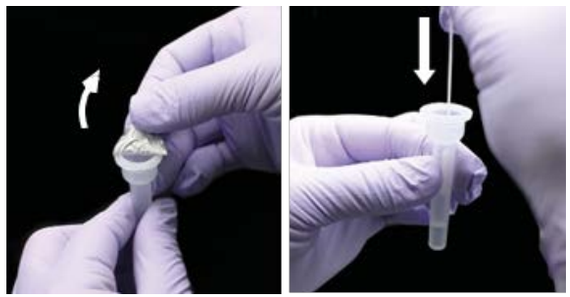
1) Prepare an aluminum pouch containing the test device and place it on the testing surface along with the test tube filled with the extraction buffer and filter cap. In case the tests were refrigerated, keep them ambient for 30 minutes to let it reach the room temperature.



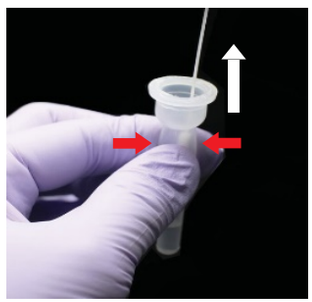
2) Release the test device from the aluminum pouch and place it on a flat surface just prior to starting test.

3) Collect the specimen by following CDC guidelines. After swabbing, immediately insert the swab into extraction buffer tube. Do not leave the sampled swab dry in open air as it may affect the test's performance. If specimens are not tested before 4 hours when stored in extraction buffer, a new specimen should be collected and retested.

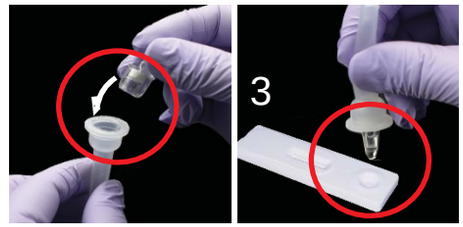
4) Collect the buffer fluid at the bottom of the test tube by shaking it and then peel off the seal of the test tube. Insert the tip of the swab with the patient specimen and move the swab up and down more than 10 times to ensure sufficient sample extraction.



5) Remove the swab while pressing against the sides of the tube to ensure maximum amount of liquid has been squeezed from the swab.

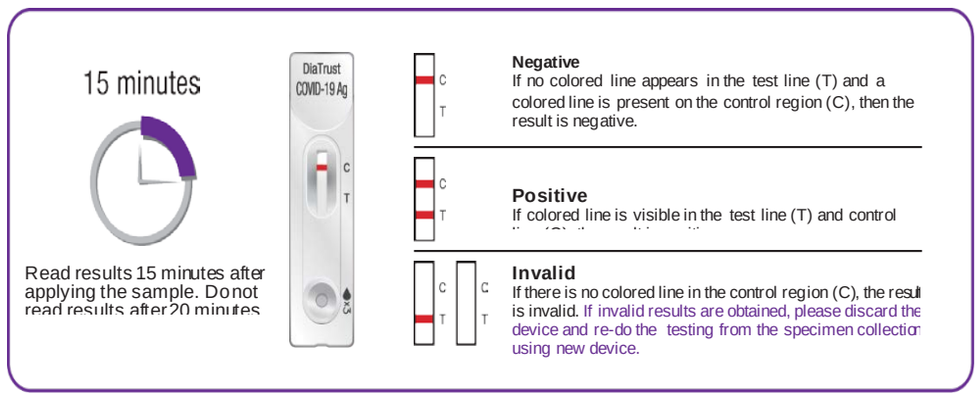


6) Equip the filter cap on the test tube and immediately dispense three drops of sample extracts (100 μL) into the sample well of the device.
(If you have dropped the test device after sample application, please discard the device and restart the test using new device.)



7) Read results 15 minutes after applying the sample. Do not read results after 20 minutes.

RESULT INTERPRETATION



Note: A negative result is presumptive and confirmation with a molecular assay, if necessary, for patient management may be performed.

Note: For serial testing programs, additional confirmatory testing with a molecular test for negative results may be necessary after second negative result for asymptomatic patients, if there is a high likelihood of SARS-CoV-2 infection, such in an individual with as a close contract with COVID-19 or with suspected exposure to COVID-19 or in communities with high prevalence of infection. Additional confirmatory testing with a molecular test for positive results may also be necessary, if there is a low likelihood of SARS-CoV-2 infection, such as in individuals without known exposures to SARS-CoV-2 or residing in communities with low prevalence of infection.

STORAGE AND STABILITY

An unopened test device should be stored at 2 - 30℃ (36 - 86°F).The shelf-life of the test device is 10 months and it is stable until the expiration date marked on the label. An opened test device is stable up to 1 hour after released from the aluminum pouch.

EXTERNAL QUALITY CONTROL

It is recommended that positive and negative external control swabs are run once with every new lot, shipment, and each new user. External positive and negative control swabs are provided in the kit. The external control should be tested using the nasopharyngeal swab test procedure provided in the instructions for use or the quick reference instruction.

ASSISSTANCE

If you have any questions regarding the use of this product or if you want to report a test system problem, please contact Humasis Co., Ltd. (via email: info@humasis.com, via phone: +82-31-8085-6284) or Celltrion USA, Inc. (via email: Diatrust@celltrion.com, or via phone: (201) 499-1844).

The full Instructions for use can be found at the following website: <www.DiaTrustCOVID.com>

A paper copy of the instructions for use can be requested without additional cost. Please contact Celltrion USA, Inc. at <(201) 499-1844> or <Diatrust@celltrion.com> to obtain a copy free of charge.

In the USA, this product has not been FDA cleared or approved; but has been authorized by FDA under an EUA for use by authorized laboratories; use by laboratories certified under the CLIA, 42 U.S.C. §263a, that meet requirements to perform moderate, high or waived complexity tests. This product is authorized for use at the Point of Care (POC), i.e., in patient care settings operating under a CLIA Certificate of Waiver, Certificate of Compliance, or Certificate of Accreditation.
This product has been authorized only for the detection of proteins from SARS-CoV-2, not for any other viruses or pathogens; and in the USA, - the emergency use of 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 the virus that causes COVID-19 under Section 564(b)(1) of the Federal Food, Drug and Cosmetic Act, 21 U.S.C. § 360bbb-3(b)(1), unless declaration is terminated or the authorization is revoked sooner.

Humasis Co., Ltd.
Rm. 114, 502, 504, 604, 604-1, B03-1, B03-2,
88, Jeonpa-ro, Dongan-gu, Anyang-si, Gyeonggi-do, 14042, Republic of Korea

Distributed by Celltrion USA, Inc.
One Evertrust Plaza Suite 1207, Jersey City, New Jersey, 07302, USA
Tel: (201) 499-1844
Fax: (201) 603-6767
Email: Diatrust@celltrion.com
www.DiaTrustCOVID.com

CELLTRION USA
CELLTRION