COVID-19 Antigen Rapid Test  
(Nasopharyngeal Swab)

COVID-19 Antigen Rapid Test is a rapid chromatographic immunoassay for the qualitative detection of SARS-CoV-2 antigens present in human nasopharynx specimens.

**Catalog Number:** 07AG6000A

*For In Vitro Diagnostic Use Only*

**INTENDED USE**

The COVID-19 Antigen Rapid Test (Nasopharyngeal Swab) is a rapid chromatographic immunoassay for the qualitative detection of SARS-CoV-2 antigens in nasopharyngeal swab specimens from individuals with suspected SARS-CoV-2 infection in conjunction with clinical presentation and the results of other laboratory tests.

Results are for the detection of SARS-CoV-2 antigens. An antigen is generally detectable in upper respiratory specimens during the acute phase of infection. Positive results indicate the presence of viral antigens, but clinical correlation with 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. Negative results do not preclude SARS-CoV-2 infection and should not be used as the sole basis for treatment or patient management 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.

The COVID-19 Antigen Rapid Test is intended for use by trained clinical laboratory personnel.

**SUMMARY**

The novel coronaviruses belong to the β genus. COVID-19 is an acute respiratory infectious disease. People are generally susceptible. Currently, the patients infected by the novel coronavirus are the main source of infection; asymptomatic infected people can also be an infectious source. Based on the current epidemiological investigation, the incubation period is 1 to 14 days, mostly 3 to 7 days. The main manifestations include fever, fatigue and dry cough. Nasal congestion, runny nose, sore throat, myalgia and diarrhea are found in a few cases.

**PRINCIPLE**

The COVID-19 Antigen Rapid Test (Nasopharyngeal Swab) is a qualitative membrane-based immunoassay for the detection of SARS-CoV-2 antigens in human nasopharyngeal swab specimens. SARS-CoV-2 antibody is coated in the test line region. During testing, the specimen reacts with SARS-CoV-2 antibody-coated particles in the test. The mixture then migrates upward on the membrane by capillary action and reacts with the SARS-CoV-2 antibody in the test line region. If the specimen contains SARS-CoV-2 antigens, a colored line will appear in the test line region as a result of this. If the specimen does not contain antigens to SARS-CoV-2, no colored line will appear in the test line region, indicating a negative result. To serve as a procedural control, a colored line will always appear in the control line region, indicating that the proper volume of specimen has been added and membrane wicking has occurred.

**REAGENTS**

The test contains anti-SARS-CoV-2 antibody as the capture reagent and anti-SARS-CoV-2 antibody as the detection reagent.

**PRECAUTIONS**

1. This package insert must be read completely before performing the test. Failure to follow directions in the package insert may yield inaccurate test results.
2. For professional in vitro diagnostic use only. Do not use after expiration date.
3. Do not eat, drink or smoke in the area where the specimens or kits are handled.
4. Do not use test if pouch is damaged.
5. Handle all specimens as if they contain infectious agents. Observe established precautions against microbiological hazards throughout in the collection, handling, storage, and disposal of patient samples and used kit contents.
6. Wear protective clothing such as laboratory coats, disposable gloves and eye protection when specimens are
assayed.

7. Wash hands thoroughly after handling.

8. Please ensure that an appropriate quantity of sample is used for testing. Too much or too little sample size may lead to deviation of results.

9. Viral Transport Media (VTM) may affect the test result; extracted specimens for PCR tests cannot be used for the test.

10. The used test should be discarded according to local regulations.

11. Humidity and temperature can adversely affect results.

STORAGE AND STABILITY
Store as packaged in the sealed pouch at room temperature or refrigerated (2-30°C). The test is stable through the expiration date printed on the sealed pouch. The test must remain in the sealed pouch until use. DO NOT FREEZE. Do not use beyond the expiration date.

SPECIMEN COLLECTION, TRANSPORT AND STORAGE

Specimen Collection

Insert a sterile swab into the nostril of the patient, reaching the surface of the posterior nasopharynx.

Swab over the surface of the posterior nasopharynx.

Withdraw the sterile swab from the nasal cavity.

Specimen transport and storage
Specimens should be tested as soon as possible after collection.

If swabs are not being processed immediately, it is highly recommended that the swab sample is placed into a dry, sterile, and tightly sealed plastic tube for storage. The swab specimen in dry and sterile conditions is stable for up to 8 hours at room temperature and 24 hours at 2-8°C.

SPECIMEN PREPARATION

Only the extraction buffer and tubes provided in the kit are to be used for swab specimen preparation. Please refer to the Procedure card for detailed information of Specimen Extraction.

1. Place the swab specimen in the Extraction tube with Extraction Buffer (Approx. 350μl). Rotate the swab for approximately 10 seconds while pressing the head against the inside of the tube to release the antigen in the swab.

2. Remove the swab while squeezing the swab head against the inside of the Extraction tube as you remove it to expel as much liquid as possible from the swab. Discard the swab in accordance with your biohazard waste disposal protocol.

*NOTE: The storage of the specimen after extraction is stable for 2 hours at room temperature or 24 hours at 2-8°C.

MATERIALS

Material Provided
- Sterile swabs (x20)
- Specimen Extraction Tubes (x20)
- Extraction Buffer (x20)
- Test cassettes (x20)
- Tube holder
- Package Insert
- Procedure Card

Materials required but not provided
- Timer
COVID-19 Antigen Rapid Test (07AG6000A)

DIRECTIONS FOR USE
Allow the test, extracted specimen and/or controls to equilibrate to room temperature (15-30°C) prior to testing.

1. Remove the test cassette from the sealed foil pouch and use it within one hour. Best results will be obtained if the test is performed immediately after opening the foil pouch.

2. Invert the specimen extraction tube and add 3 drops of extracted specimen (approx. 100μl) to the specimen well (S) and then start the timer.

3. Wait for the colored line(s) to appear. Read the result at 15 minutes. Do not interpret the result after 20 minutes.

INTERPRETATION OF RESULTS

**POSITIVE**

Two distinct colored lines appear. One colored line should be in the control region (C) and another colored line should be in the Test region (T). A positive result in the Test region indicates detection of SARS-CoV-2 antigens in the sample.

**NOTE:** The intensity of the color in the test line region (T) will vary based on the amount of SARS-CoV-2 antigen present in the sample. Any shade of color in the test region (T) should be considered positive.

**NEGATIVE**

One colored line appears in the control region (C). No apparent colored line appears in the test line region (T).

**INVALID**

Control line fails to appear. Insufficient specimen volume or incorrect procedural techniques are the most likely reasons for control line failure. Review the procedure and repeat the test with a new test. If the problem persists, discontinue using the test kit immediately and contact your local distributor.

QUALITY CONTROL

**Internal Quality Control**

Internal procedural controls are included in the test. A colored line appearing in the control region (C) is an internal positive procedural control. It confirms sufficient specimen volume and correct procedural technique. A clear background is an internal negative procedural control. If the test is working properly, the background in the result area should be white to light pink and not interfere with the ability to read the test result.

**External Quality Control**

Positive/negative controls are not included in this kit. However, in compliance with Good Laboratory Practice (GLP), these controls are recommended.1
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LIMITATIONS
1. The test Procedure and the Interpretation of test Results must be followed closely when testing for the presence of SARS-CoV-2 antigens in the human nasopharyngeal specimens from suspected individuals. For optimal test performance, proper sample collection is critical. Failure to follow the procedure may give inaccurate results.
2. The performance of the COVID-19 Antigen Rapid Test (Nasopharyngeal swab) was evaluated using the procedures provided in this product insert only. Modifications to these procedures may alter the performance of the test. Viral Transport Media (VTM) may affect the test result; extracted specimens for PCR tests cannot be used for the test.
3. The COVID-19 Antigen Rapid Test (Nasopharyngeal swab) is for in vitro diagnostic use only. This test should be used for the detection of SARS-CoV-2 antigens in human nasopharyngeal specimens as an aid in the diagnosis of patients with suspected SARS-CoV-2 infection in conjunction with clinical presentation and the results of other laboratory tests. Neither the quantitative value nor the rate of increase in the concentration of SARS-CoV-2 antigens can be determined by this qualitative test.
4. The COVID-19 Antigen Rapid Test (Nasopharyngeal Swab) will only indicate the presence of SARS-CoV-2 antigens in the specimen and should not be used as the sole criteria for the diagnosis of SARS-CoV-2 infections.
5. The results obtained with the test should be considered along with other clinical findings from other laboratory tests and evaluations.
6. If the test result is negative or non-reactive and clinical symptoms persist, it is recommended to re-sample the patient a few days later and test again or test with a molecular diagnostic device to rule out infection in these individuals.
7. The test will show negative results under the following conditions: The concentration of the novel coronavirus antigens in the sample is lower than the minimum detection limit of the test.
8. 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 assay should be considered to rule out infection in these individuals.
9. Excess blood or mucin on the swab specimen may interfere with test performance and may yield a false positive result.
10. The accuracy of the test depends on the quality of the swab sample. False negatives may result from improper sample collection or storage.
11. Positive results of COVID-19 may be due to infection with non-SARS-CoV-2 coronavirus strains or other interference factors.

EXPECTED VALUES
The COVID-19 Antigen Rapid Test (Nasopharyngeal Swab) has been compared with a leading commercial RT-PCR test. The correlation between these two systems is no less than 98%.

PERFORMANCE CHARACTERISTICS
Sensitivity, Specificity and Accuracy
The COVID-19 Antigen Rapid Test (Nasopharyngeal Swab) has been evaluated with specimens obtained from patients. RT-PCR is used as the reference method for the COVID-19 Antigen Rapid Test (Nasopharyngeal Swab). Specimens were considered positive if RT-PCR indicated a positive result. Specimens were considered negative if RT-PCR indicated a negative result.

Nasopharyngeal Swab Specimen

<table>
<thead>
<tr>
<th>COVID-19 Antigen Rapid Test</th>
<th>RT-PCR</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>COVID-19 Antigen</td>
<td>80</td>
<td>1</td>
</tr>
<tr>
<td>Negative</td>
<td>3</td>
<td>120</td>
</tr>
<tr>
<td>Total</td>
<td>83</td>
<td>121</td>
</tr>
</tbody>
</table>

|                | Relative Sensitivity | 96.4% (95%CI*: 89.8%~99.2%) |
|                | Relative Specificity | 99.2% (95%CI*: 95.5%~99.9%) |
|                | Accuracy            | 98.0% (95%CI*: 95.1%~99.5%) |

*Confidence Intervals

Specificity Testing with Various Viral Strains
The COVID-19 Antigen Rapid Test was tested with the following viral strains. No discernible line at either of the test-line regions was observed at these concentrations:

<table>
<thead>
<tr>
<th>Description</th>
<th>Test Level</th>
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<tbody>
<tr>
<td>Adenovirus type 3</td>
<td>$3.16 \times 10^4$ TCID$_{50}$/ml</td>
</tr>
<tr>
<td>Adenovirus type 7</td>
<td>$1.58 \times 10^5$ TCID$_{50}$/ml</td>
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</table>
## COVID-19 Antigen Rapid Test (07AG6000A)

<table>
<thead>
<tr>
<th>Virus/Pathogen</th>
<th>TCID&lt;sub&gt;50&lt;/sub&gt;/ml</th>
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</thead>
<tbody>
<tr>
<td>Human coronavirus OC43</td>
<td>2.45 x 10&lt;sup&gt;6&lt;/sup&gt;</td>
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<tr>
<td>Influenza A H1N1</td>
<td>3.16 x 10&lt;sup&gt;5&lt;/sup&gt;</td>
</tr>
<tr>
<td>Influenza A H3N2</td>
<td>1 x 10&lt;sup&gt;5&lt;/sup&gt;</td>
</tr>
<tr>
<td>Influenza B</td>
<td>3.16 x 10&lt;sup&gt;5&lt;/sup&gt;</td>
</tr>
<tr>
<td>Human Rhinovirus 2</td>
<td>2.81 x 10&lt;sup&gt;4&lt;/sup&gt;</td>
</tr>
<tr>
<td>Human Rhinovirus 14</td>
<td>1.58 x 10&lt;sup&gt;6&lt;/sup&gt;</td>
</tr>
<tr>
<td>Human Rhinovirus 16</td>
<td>8.89 x 10&lt;sup&gt;6&lt;/sup&gt;</td>
</tr>
<tr>
<td>Measles</td>
<td>1.58 x 10&lt;sup&gt;4&lt;/sup&gt;</td>
</tr>
<tr>
<td>Mumps</td>
<td>1.58 x 10&lt;sup&gt;4&lt;/sup&gt;</td>
</tr>
<tr>
<td>Parainfluenza virus 2</td>
<td>1.58 x 10&lt;sup&gt;7&lt;/sup&gt;</td>
</tr>
<tr>
<td>Parainfluenza virus 3</td>
<td>1.58 x 10&lt;sup&gt;8&lt;/sup&gt;</td>
</tr>
<tr>
<td>Respiratory syncytial virus</td>
<td>8.89 x 10&lt;sup&gt;4&lt;/sup&gt;</td>
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</table>

TCID<sub>50</sub> = Tissue Culture Infectious Dose is the dilution of virus that under the conditions of the assay can be expected to infect 50% of the culture vessels inoculated.

LD<sub>50</sub> = Lethal Dose is the dilution of virus that under the conditions of the assay can be expected to kill 50% of the suckling mice inoculated.

### Precision

**Intra-Assay & Inter-Assay**

Within-run and Between-run precision has been determined by using three specimens of COVID-19 standard control. Three different lots of COVID-19 Antigen Rapid Test (Nasopharyngeal Swab) have been tested using negative SARS-CoV-2 antigen weak and SARS-CoV-2 antigen strong. Ten replicates of each level were tested each day for 3 consecutive days. The specimens were correctly identified &gt;99% of the time.

### Cross-reactivity

The following organisms were tested at 1.0x10<sup>8</sup> org/ml and all found to be negative when tested with the COVID-19 Antigen Rapid Test (Nasopharyngeal Swab):

- *Arcanobacterium*
- *Candida albicans*
- *Corynebacterium*
- *Escherichia coli*
- *Moraxella catarrhalis*
- *Neisseria lactamica*
- *Nesseria subllava*
- *Pseudomonas aeruginosa*
- *Staphylococcus aureus subsp aureus*
- *Staphylococcus epidermidis*
- *Streptococcus pneumoniae*
- *Streptococcus pygenes*
- *Streptococcus salivarius*
- *Streptococcus sp group F*

### BIBLIOGRAPHY

## Explanation of Symbols

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>DEFINITION</th>
<th>SYMBOL</th>
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<td>🔴</td>
<td>Caution, consult accompanying documents</td>
</tr>
<tr>
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<td>Lot Number</td>
<td>π</td>
<td>Contains sufficient for <code>&lt;n&gt;</code> tests</td>
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<tr>
<td>YYYY-MM-DD</td>
<td>Use by</td>
<td>2</td>
<td>Do not reuse</td>
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</tbody>
</table>

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