Sienna™

COVID-19 Antigen Rapid Test Cassette (Saliva/ Nasopharyngeal Swab)

Instruction for use

Ref: 102261

A rapid test for the qualitative detection of Novel Coronavirus SARS-CoV-2 antigen in Saliva and/or Nasopharyngeal swab.

CE

For professional in vitro diagnostic use only

Store at 2°C – 30°C (36°F – 86°F)

CONTENT

1. INTENDED USE

The COVID-19 Antigen Rapid Test Cassette is a rapid chromatographic immunoassay for the qualitative detection of COVID-19 antigen in Saliva and Nasopharyngeal swab. The identification is based on the monoclonal antibodies specific for the Nucleocapsid (N) protein of SARS-CoV-2. It is intended to aid in the rapid diagnosis of COVID-19 infections.

1.1. Abbreviations

SARS-CoV-2: novel coronavirus

COVID-19: novel coronavirus pneumonia

1.2. Summary

The new coronavirus belongs to the coronavirus of the genus β. It has an envelope and the particles are round or elliptical. They are often polymorphic and have a diameter of 60-140 nm. Its genetic characteristics are significantly different from SARS-CoV and MERS-CoV. Current research shows that the homology with bat SARS-like corona virus (bat-SL-CoVZC45) is more than 85%. When isolated and cultured in vitro, the new coronavirus can be found in human respiratory epithelial cells in about 96 hours, while it takes about 6 days to separate and culture in VeroE6 and Huh-7 cell lines.

The new coronavirus (SARS-COV-2) antigen detection method can effectively reduce the false negatives of RT-PCR and false positives of antibody detection methods. The diagnosis is fast, accurate and requires low equipment and personnel, suitable for rapid investigation of suspected cases of novel coronavirus infection on a large scale. The rapid investigation of suspected cases is effective during outbreaks and also can be used as a supplementary test for nucleic acid testing to avoid the risk of new transmission caused by the discharge of false negative patients.

2. PRINCIPLE

The COVID-19 Antigen Rapid Test Cassette (Saliva/ Nasopharyngeal Swab) is a qualitative, lateral flow immunoassay for the detection of the N protein of SARS-CoV-2 in Saliva and Nasopharyngeal swab. In this test, antibody specific to the N protein of SARS-CoV-2 is separately coated on the test line regions of the test cassette. During testing, the extracted specimen reacts with the antibody to N protein of SARS-CoV-2 that are coated onto particles. The mixture migrates up the membrane to react with the antibody to N protein of SARS-CoV-2 on the membrane and generate one colored line in the test regions. The presence of this colored line of the test regions indicates a positive result. To serve as a procedural control, a colored line will always appear in the control region if the test has performed properly.

3. REAGENTS

The test cassette contains anti- SARS-CoV-2 Nucleocapsid protein particles and SARS-CoV-2 Nucleocapsid protein coated on the membrane.

4. PRECAUTIONS

1. For professional in vitro diagnostic use only.
2. Follow the instructions for use carefully. Reliability of assay results cannot be guaranteed if there is any deviation from the instructions in this instruction for use.
3. The test should remain in the sealed pouch until ready to use.
4. All specimens should be considered potentially hazardous and handled in the same manner as an infectious agents.
5. Avoid using bloody samples.
6. Wear protective clothing such as laboratory coats, disposable gloves and eye protection before testing.
7. The used tests, specimens and potentially contaminated material should be discarded according to the local regulations.
8. Humidity and temperature can adversely affect results.
9. Do not store this kit in frozen condition.
10. Do not use the product if package is damaged.
11. Do not use the product after expiration date.
12. Do not re-use the product.
13. Use only the extraction solution provided with the kit.
14. Read and interpret the results at 10 minutes, do not interpret the results after 20 minutes.
15. Do not eat, drink or smoke in the area where the specimens or kits are handled.

5. STORAGE AND STABILITY

Store as packaged at room temperature or refrigerated 2°C – 30°C (36°F – 86°F). 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.

6. SPECIMEN COLLECTION AND PREPARATION

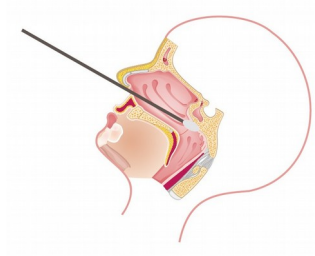
The COVID-19 Antigen Rapid Test Cassette (Saliva / Nasopharyngeal Swab) can be performed using Saliva and Nasopharyngeal Swab specimens. The quality of specimens obtained is of extreme importance. Detection of COVID-19 Antigen requires a vigorous and thorough collection technique that provides COVID-19 Antigen rather than just body fluids.

To collect Saliva Specimen:

Use the collection tube to collect saliva. Open the cap of the collection tube. Install saliva collector, put the collection tube with saliva collector close to lips and let the saliva flow into the collection tube. The volume of saliva needs to be between two scale marks (approx. 150-300 µl). If the volume of saliva is too much, use a dropper to remove the excess saliva until the final solution is between the two scale marks (approx. 150-300 µl).

To collect Nasopharyngeal swab Specimen:

Insert 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.



Please use as soon as possible after taking samples.

7. MATERIALS

7.1. Material Provided

102261		
Item number	Content	Quantity
1	Instruction for use	1 piece
2	Individually Pouched Test Cassettes	25 cassettes
3	Collection Tubes	25 tubes
4	Extraction Buffers (NaCl + Casein Sodium + Tris + Proclin 300)	25 tubes
5	Saliva Collectors	25 pieces
6	Sterile Swabs	25 pieces
7	Droppers	25 pieces
8	Workstation	1 piece

7.2. Materials required but not provided

Timer

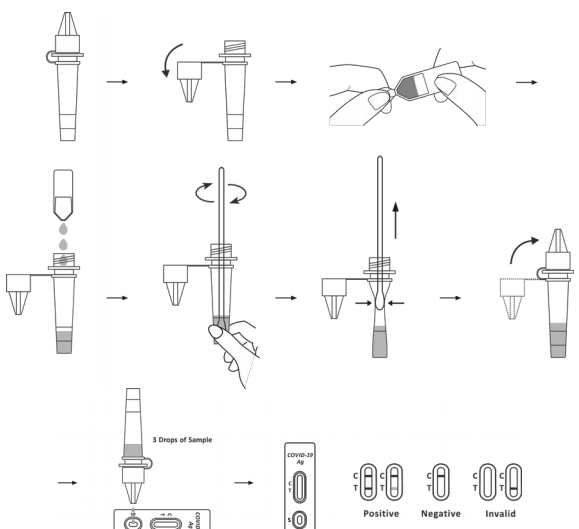
Gloves

8. DIRECTIONS FOR USE

Allow the test cassette, specimen, extraction buffer to equilibrate to room temperature 15°C – 30°C (59°F – 86°F) prior to testing.

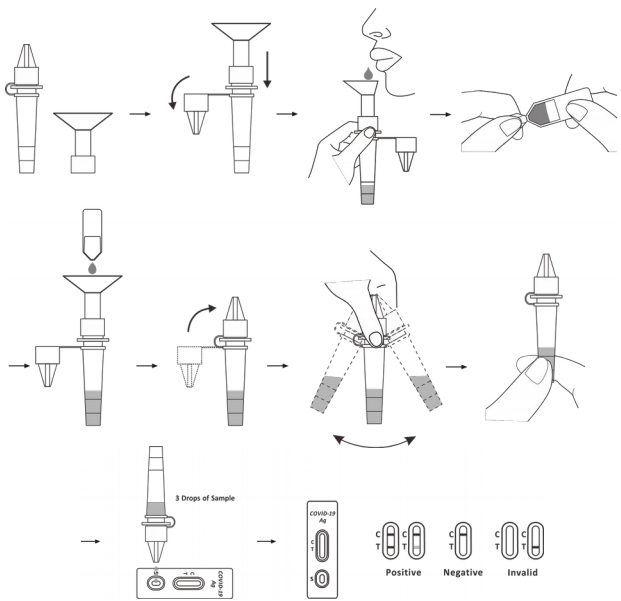
For Nasopharyngeal Swab Specimen:

1. Remove the test cassette from the sealed foil pouch and use it within one hour. Best results will be obtained if the assay is performed immediately after opening the foil pouch.
2. Place the extraction buffer in the workstation. Open the cap of the collection tube. Hold the extraction reagent bottle upside down vertically. Squeeze the bottle and let the solution drop into the extraction tube freely without touching the edge of the tube. Add all extraction buffer (Approx. 300µL) to the collection tube.
3. Place the swab specimen in the collection tube. Rotate the swab for approximately 10 seconds while pressing the head against the inside of the tube to release the antigen in the swab.
4. Remove the swab while squeezing the swab head against the inside of the extraction buffer 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.
5. Tighten cap on the specimen collection tube.
6. Add 3 full drops (approx. 80µL) of the solution to the sample well and then start the timer. Avoid trapping air bubbles in the sample well (S). Read the result at 10 minutes. Do not interpret the result after 20 minutes.



For Saliva Specimen:

1. Remove the test cassette from the sealed foil pouch and use it within one hour. Best results will be obtained if the assay is performed immediately after opening the foil pouch.
2. Open the cap of the collection tube. Install saliva collector, put the collection tube with saliva collector close to lips and let the saliva flow into the collection tube. The volume of saliva needs to be between two scale marks (approx. 150-300 µl).
3. Place the collection tube with saliva collector (containing the saliva specimen) in the workstation. Hold the extraction reagent bottle upside down vertically. Squeeze the bottle and let the solution drop into the extraction tube freely without touching the edge of the tube. Add all extraction buffer (Approx. 300µL) to the collection tube.
4. Discard the saliva collector, tighten the cap onto the specimen collection tube. Shake the specimen collection tube at least three times vigorously to mix the saliva and the extraction buffer, then squeeze bottom of the collection tube to ensure the saliva is thoroughly mixed.
5. Place the test cassette on a clean and level surface. Add 3 full drops (approx. 80µL) of the solution to the sample well (S) and then start the timer. Avoid trapping air bubbles in the sample well (S). Read the result at 10 minutes. Do not interpret the result after 20 minutes.



9. INTERPRETATION OF THE RESULTS

9.1	**NEGATIVE** One colored line appears in the control line region (C). No line appears in the test line region (T). A negative result indicates that COVID-19 antigen is not present in the specimen, or is present below the detectable level of the test.	
9.2	**POSITIVE:*** Two lines appear. One colored line should be in the control line region (C) and another apparent colored line should be in the test line region (T). A positive result indicates that COVID-19 was detected in the specimen. ***NOTE:** The intensity of the color in the test line region (T) will vary depending on the concentration of COVID-19 Antigen present in the specimen. Therefore, any shade of color in the test line region (T) should be considered positive.	
9.3	**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 the manufacturer or your supplier.	

10. QUALITY CONTROL

A procedural control is included in the test. A colored line appearing in the control line region (C) is considered an internal procedural control. It confirms adequate membrane wicking.

Control standards are not supplied with this kit; however, it is recommended that positive and negative controls be tested as good laboratory practice to confirm the test procedure and to verify proper test performance.

11. LIMITATIONS

1. This device is for professional in vitro diagnostic use only.
2. This device is only used for testing human saliva and/or nasopharyngeal swab specimens.
3. Neither the quantitative value nor the rate of increase in SAR-CoV-2 virus concentration can be determined by this qualitative test.
4. The accuracy of the test depends on the quality of the swab sample. False negatives may result from improper sample collection or storage.
5. The COVID-19 Antigen Rapid Test Cassette (Saliva/ Nasopharyngeal Swab) will only indicate the presence of SARS-CoV-2 in the specimen from both viable and non-viable SARS-CoV-2 coronavirus strains.
6. As with all diagnostic tests, all results must be interpreted together with other clinical information available to the physician.
7. A negative result obtained from this kit should be confirmed by PCR. A negative result may be obtained if the concentration of the SARS-CoV-2 virus present in the sample is not adequate or is below the detectable level of the test.
8. Excess blood or mucus on the saliva and/or swab specimen may interfere with test performance and may yield a false positive result.
9. A positive result for COVID-19 does not preclude an underlying co-infection with another pathogen, therefore the possibility of an underlying bacterial infection should be considered.
10. 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.
11. Positive results may be due to present infection with non-SARS-CoV-2 coronavirus strains, such as coronavirus HKU1, NL63, OC43, or 229E.
12. Results from antigen testing should not be used as the sole basis to diagnose or exclude SARS-CoV-2 infection or to inform infection status.
13. Extraction reagent has the ability to kill the virus, but it cannot inactivate 100% of the virus. The method of inactivating the virus can be referred to: what method is recommended by WHO/CDC, or it can be handled according to local regulations.

12. PERFORMANCE CHARACTERISTICS

12.1. Sensitivity, Specificity and Accuracy

The COVID-19 Antigen Rapid Test Cassette (Saliva/ Nasopharyngeal Swab) has been evaluated with saliva and nasopharyngeal swab specimens obtained from the patients. RT-PCR is used as the reference method for the COVID-19 Antigen Rapid Test Cassette (Saliva/ Nasopharyngeal Swab). Specimens were considered positive if PCR indicated a positive result.

Nasopharyngeal Swab Specimen

Method		RT-PCR		Total Results
	Results	Positive	Negative	
SiennaTM COVID-19 Antigen Rapid Test Cassette	Positive	134	0	134
	Negative	7	162	169
	Total Results	141	162	303

Relative Sensitivity:	95.0% (95% CI: 90.0% – 98.0%)
Relative Specificity:	>99,9% (95% CI: 98.2 – 100.0%)
Relative Accuracy:	97.7% (95% CI: 95.2% – 99.9%)

Saliva Specimen

Method		RT-PCR		Total Results
	Results	Positive	Negative	
SiennaTM COVID-19 Antigen Rapid Test Cassette	Positive	108	0	108
	Negative	12	162	174
	Total Results	120	162	282

Relative Sensitivity:	90.0% (95% CI 83.2% – 94.7%)
Relative Specificity:	>99.9% (95%CI: 98.2%-100.0%)
Relative Accuracy:	95.7% (95% CI: 92.7% – 97.8%)

Saliva / Nasopharyngeal Swab Specimen

Method		RT-PCR		Total Results
	Results	Positive	Negative	
SiennaTM COVID-19 Antigen Rapid Test Cassette	Positive	242	0	242
	Negative	19	324	343
	Total Results	261	324	585

Relative Sensitivity:	92.7% (95% CI 88.9% – 95.6%)
Relative Specificity:	>99.9% (95%CI: 99.1%-100.0%)
Relative Accuracy:	96.8% (95%CI: 95.0%-98.0%)

12.2. Limit of Detection

The LOD for the Sienna™ COVID-19 Antigen Rapid Test Cassette(Saliva/ Nasopharyngeal Swab) was established using serial dilutions of an inactivated viral sample. The material (ZeptoMetrix, 0810587CFHI) was supplied at a concentration of 1.15 x 10^7 $TCID_{50}$/mL. The Estimated LOD is 1000 $TCID_{50}$/mL.

SARS-CoV-2 tested($TCID_{50}$/mL)	Test Result
1.0×10^2 $TCID_{50}$/mL	15/15 Positive
3.0×10^3 $TCID_{50}$/mL	15/15 Positive
2.0×10^3 $TCID_{50}$/mL	15/15 Positive
1.5×10^3 $TCID_{50}$/mL	15/15 Positive
1.0×10^3 $TCID_{50}$/mL	15/15 Positive
$7.5x10^2$ $TCID_{50}$/mL	15/15 Negative

12.3. Interfering Substance

The following potentially interfering substances were added to SARS-CoV-2 negative and spiked positive specimens. No substances showed any interference with the test.

Ambroxol Hydrochloride Tablets (7.5 mg/mL)	Nasal antibiotic (Mupirocin Ointment)
Mometasone furoate nasal spray (0.05% g/g)	Oxymetazoline Hydrochloride Spray
Herbal cough syrup	Beclomethasone Dipropionate Nasal Aerosol
Dextromethorphan Hydrobromide Oral Solution (1.5 mg/ml)	Triamcinolone Acetonide Nasal Spray
Mucosolvan Ambroxol Hydrochloride Oral Solution	Azelastine Hydrochloride Nasal Spray
Nasal cleansing solution, NaCl (5 g/L)	Fluticasone Propionate Nasal Spray
Hyland's 4 Kids Cold Cough Liquid Safe Natural Relief	Physiological Seawater Nasal Spray
Durham's Canker-Rid	Tobramycin Eye Drops
Listerine mouthwash	Whole blood (4%)
Scope mouthwash	Mucin (0.05%)
Bilirubin(10mg/ml)	Triglyceride(5mg/ml)
Hemoglobin(5mg/ml)	HAMA

12.4. Cross Reactivity

The following potentially cross-reactive substances were added to SARS-CoV-2 negative and spiked positive specimens. The organisms or viruses do not cross-react.

List 1

Potential Cross-Reactant	Concentration	Results	
		Negative Specimen	Spiked with Positive Specimen
Parainfluenza Virus Type4a	1.6×10^{3} $TCID_{50}$/ml	Negative	Positive
Human Coxsackievirus	2.8×10^{5} $TCID_{50}$/ml	Negative	Positive
Mumps virus	2.8×10^{6} $TCID_{50}$/ml	Negative	Positive
Rhinovirus	20×10^{9} organisms/ml	Negative	Positive
Haemophilusparainfluenzae	6×10^{6} bacteria/ml	Negative	Positive
Staphylococcus aureus	6×10^{6} bacteria/ml	Negative	Positive
Neisseria meningitides	10^{5} organisms/ml	Negative	Positive
Streptococcus sp. Group A	10^{8} organisms/ml	Negative	Positive
Streptococcus sp. Group B	6×10^{6} bacteria/ml	Negative	Positive
Streptococcus sp. Group C	6×10^{6} bacteria/ml	Negative	Positive
Influenza A Virus H3N2	$CEID_{50} \geqq 10^{2}$ per 0.2 ml	Negative	Positive

List 2

Potential Cross-Reactant	Concentration	Results	
		Negative Specimen	Spiked with Positive Specimen
Adenovirus (e.g. C1 Ad. 71)-Type 7A	2.01×10^{4} U/ml	Negative	Positive
Enterovirus (e.g. EV68)	7.16×10^{4} $TCID_{50}$/ml	Negative	Positive
Human Metapneumovirus (hMPV)	5.43×10^{5} $TCID_{50}$/ml	Negative	Positive
Influenza A H1N1 (New Cal/20/99)	1.64×10^{6} U/ml	Negative	Positive
Influenza B (Florida/02/06)	2.01×10^{4} U/ml	Negative	Positive
Parainfluenza virus 1	1.30×10^{8} $TCID_{50}$/ml	Negative	Positive
Parainfluenza virus 2	1.64×10^{6} U/ml	Negative	Positive
Parainfluenza virus 3	9.44×10^{5} U/ml	Negative	Positive
Parainfluenza virus 4	4.03×10^{6} U/ml	Negative	Positive
Respiratory syncytial virus-Type A	5.43×10^{5} U/ml	Negative	Positive
Rhinovirus (Type 1A)	5.07×10^{4} U/ml	Negative	Positive
Bordetella pertussis	1.61×10^{9} CFU/ml	Negative	Positive
Candida albicans	8.96×10^{7} CFU/ml	Negative	Positive
Haemophilus influenzae	7.76×10^{7} CFU/ml	Negative	Positive
Legionella pneumophila	2.69×10^{9} CFU/ml	Negative	Positive
Mycobacterium tuberculosis	9.80×10^{6} CFU/ml	Negative	Positive
Mycoplasma pneumoniae	4.51×10^{7} CCU/ml	Negative	Positive
Pneumocystis jirovecii (PJP)-S. cerevisiae Recombinant	4.93×10^{7} CFU/ml	Negative	Positive

Potential Cross-Reactant	Concentration	Results	
		Negative Specimen	Spiked with Positive Specimen
Pseudomonas aeruginosa	1.21×10^9 CFU/ml	Negative	Positive
Staphylococcus epidermis	1.73×10^9 CFU/ml	Negative	Positive
Streptococcus pneumoniae	3.23×10^8 CFU/ml	Negative	Positive
Streptococcus pyogenes	2.34×10^8 CFU/ml	Negative	Positive
Streptococcus salivarius	1.17×10^8 CFU/ml	Negative	Positive
Human coronavirus 229E	5.96×10^4 $TCID_{50}$/ml	Negative	Positive
Human coronavirus OC43	1.50×10^5 $TCID_{50}$/ml	Negative	Positive
Human coronavirus NL63	2.43×10^4 $TCID_{50}$/ml	Negative	Positive
MERS-coronavirus	4.51×10^5 $TCID_{50}$/ml	Negative	Positive

List 3

Potential Cross-Reactant	Concentration	Results	
		Negative Specimen	Spiked with Positive Specimen
Escherichia coli	2.0×10^7 organisms/ml	Negative	Positive
Recombinant Hepatitis C Virus	1mg/ml	Negative	Positive
Recombinant Hepatitis B Virus	1 µg/ml	Negative	Positive
Recombinant Cytomegalo virus	0.066mg/ml	Negative	Positive
Recombinant Epstein-Barr Virus	0.4mg/ml	Negative	Positive
Recombinant Herpes Simplex Virus-2 (HSV-2)	0.11mg/ml	Negative	Positive
Recombinant Human Immunodeficiency Virus-1 (HIV-1)	0.407mg/ml	Negative	Positive

13. EXPLANATION OF THE SYMBOLS USED

IVD	For in vitro diagnostic use
REF	Catalogue number
LOT	Batch code
	Manufacturer
	Date of manufacture
	Use by
	Do not use if package is damaged
	Consult instruction for use
	Temperature limit at 2°C – 30°C.
	Contents sufficient for n tests
	Do not re-use
	Caution
	Keep dry
	Protect from direct sunlight
CE	CE Mark

14. REFERENCES

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15. DATE OF ISSUE

Sienna™ COVID-19 Antigen Rapid Test Cassette insert.

Version 3, April 18th, 2020

16. GENERAL INFORMATION

Manufacturer:

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Under the licence of:

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