



Sep 07, 2020

SensingSelf S1 Rapid Antigen Test (Saliva/Sputum/Stool)

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Coronavirus Method Development Community SensingSelfMission

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ABSTRACT

Summary:

The S1 COVID-19 Rapid Antigen test kit developed by Sensing Self Pte. Ltd. can quickly and qualitatively detect the spike glycoprotein of novel coronavirus (SARS-COV-2) in human saliva/sputum/stool samples. It can be used as an aid for COVID-19 diagnosis.

Objective:

According to the clinical trial plan, the S1 COVID-19 Rapid Antigen test kit or “test reagent”, is to test saliva/sputum/stool samples from healthy subjects and confirmed COVID-19 patients. Test results are compared with another commercial SARS-COV-2 nucleic acid detection kit with CFDA approval, which is defined as the “gold standard”. The sensitivity, specificity, and total agreement rate are used to evaluate the feasibility of the test reagent in clinical applications.

Method:

A collection of clinical samples were examined by the S1 COVID-19 Rapid Antigen test kit and the gold standard SARS-COV-2 nucleic acid detection kit in parallel, to calculate the clinical sensitivity, clinical specificity and total agreement rate of the test reagent.

Results:

Compared to the gold standard, the clinical sensitivity of test reagent reached 90.0%, the clinical specificity reached 100.0%, and the total coincidence rate reached 95.0%.

Conclusions:

The performance of test reagent has a high agreement rate with the gold standard, proving its good feasibility in diagnosing suspected COVID-19 cases.

EXTERNAL LINK

<http://www.sensingself.me>

DOI

dx.doi.org/10.17504/protocols.io.bj6ykrfw

PROTOCOL CITATION

Shripal C Gandhi, Santo Purnama, Keyur Patel, Praveen Sukumara, Dr Rinu R Ravi 2020. SensingSelf S1 Rapid Antigen Test (Saliva/Sputum/Stool). **protocols.io**
<https://dx.doi.org/10.17504/protocols.io.bj6ykrfw>

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KEYWORDS

Covid-19 Rapid Antigen Test, SARS-CoV-2 diagnosis, Sputum and Stool based detection , novel coronavirus, S protein, ACE2 receptor, SARS.CoV, chromatography test kit, novel coronavirus detection, detection of SARS-CoV-2, S1 COVID-19 Rapid Antigen test kit, COVID-19 diagnosis, COVID-19 cases

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CREATED

Aug 22, 2020

LAST MODIFIED

Sep 07, 2020

PROTOCOL INTEGER ID

40888

GUIDELINES

This product is suitable for the qualitative detection of novel coronavirus in Saliva/Sputum/Stool samples. It provides an aid in the diagnosis of infection with novel coronavirus.

MATERIALS TEXT

Materials needed for sample collection:

1. Disposable paper cup

Materials needed for sample preparation:

1. Disposable sample extraction tube
2. Cotton swab

Materials needed for performing the test procedure:

1. Disposable test card

Chemical Characterization: Substances List of ingredients:

1. PVC sheet

Component	CAS #	% W/V
PVC	9002-86-2	≤100%
Acrylic (Acrylate)	7910-7	<1%

2. Nitrocellulose membrane coated with a control line and a test line

Component	CAS #	% W/V
Nitrocellulose	9004-70-0	≤100%
Antibody	N/A	<3%
Disodium hydrogen phosphate	10039-32-4	<0.5%
Sodium dihydrogen phosphate	13472-35-0	<0.1%
NaCl	7647-14-5	<1%
Water	7732-18-5	> 95%

3. Absorbent Paper

Component	CAS #	% W/V
Cellulose microcrystalline	113669-95-7	≤100%

4. Fibreglass membrane

Component	CAS #	% W/V
Fiberglass	65997-17-3	≤100%

5. Desiccant

Component	CAS #	% W/V
Silica gel	112945-52-5	≤100%

6. Foil pouch and label

Component	CAS #
Poly(Ethylene Terephthalate)	25038-59-9
Aluminium	7429-90-5
Polypropylene	N/A

7. Reagent Solution / Buffer:

Component	CAS #	Concentration
NaCl	7647-14-5	136mM
Na ₂ HPO ₄	7758-79-4	8mM
KH ₂ PO ₄	7778-77-0	2mM
KCl	7447-40-7	2.6mM
Water	7732-18-5	> 95%

The test unit does not contain any human source material.

SAFETY WARNINGS

1. S1 COVID-19 Rapid Antigen test kit is only applicable to stool and sputum samples. Blood, serum, plasma, urine and other samples may cause abnormal results. Due to the large sampling difference of oropharyngeal swabs, abnormal results may also appear in the test using the oropharyngeal swabs. We recommend using stool samples first.
2. If the sputum sample is negative, it is recommended to use stool examination again, because the sputum sample varies greatly among individuals and there are many factors affecting the examination. If any sample tests positive, please go to the hospital for further clinical diagnosis.
3. Please make sure that a proper amount of sample is added for testing. Too much or too little sample may cause deviations in results.
4. For positive judgement, it can be confirmed as soon as both T and C-line appeared. That may be in 3-15 minutes after the sample added. For negative judgement, please wait for 15 minutes after the sample added, C-line appears while no T line appeared. The result is invalid after 20 minutes after the sample added.
5. If part of the test paper in the strip is out of the test window, or more than 2 mm of filter paper or latex pad is exposed in the test window, do not use. Otherwise, the test result is invalid and should replace with another new kit.

6. The test card is a disposable product. Please dispose of properly after use.

7. This test device is disposable, please use within the validity period. After use, the test reagent, sample and other waste should be treated in accordance with the relevant national regulations.

DISCLAIMER:

FOR INFORMATIONAL PURPOSES ONLY; USE AT YOUR OWN RISK

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BEFORE STARTING

1. Store as packaged in the hermetic bag at the specified temperature (2°C - 30°C or 38°F - 85°F) and avoid direct sunshine. The kit is stable within the expiration date printed on the labelling.

2. Once the hermetic bag is opened, the test should be used within one hour. Prolonged exposure to a hot and humid environment will cause product deterioration.

3. Check the lot number and expiration date printed on the labelling.

While collecting sputum is significantly easier than swabs, sputum samples can be difficult to work with. It is important to follow the sample collection guidelines to ensure that sputum, not saliva, is being collected.

SALIVA SAMPLE COLLECTION

- 1 Saliva should be collected with the assistance of a healthcare worker or technician.
- 2 Before collection, clean hands using alcohol-based sanitizer or soap and water (no fragrances) and wear appropriate PPE (at minimum, gloves and a mask).
- 3 While preparing collection materials, direct the sample provider to begin pooling saliva in their mouth. Saliva production can be stimulated by thinking about food (favorite foods, upcoming meals, etc.) or about the saliva collection itself.



This protocol is intended for the collection of the normal saliva that naturally pools into the mouth. No coughing or sniffing prior to sample collection is required. Ideally, water should be avoided 10 minutes prior to collection. Other drinks, food, and nasal sprays should be avoided for half an hour before sample collection.

- 4 Once you have pooled saliva in your mouth, gently expel saliva into the disposable paper cup.

SPUTUM SAMPLE COLLECTION

- 5 Educate the patient about the difference between sputum and oral secretions (saliva).
- 6 Rinse the mouth with clean water. This is important to make sure there won't be mouth bacteria in the sputum collected.
- 7 Put one hand over the mouth with a tissue and put the other hand on your stomach.
- 8 Cough deeply, so that you can really feel it in your stomach. Do not take shallow coughs from the throat or chest.



If you are having trouble-

1. Get a pat- ask somebody to pat you solidly up and down your back to help you release the sputum.
2. Stretch and try again- sometimes it helps to relax a bit. When you are ready, rinse and spit and try again.

- 9 Once the sputum (phlegm) is in your mouth, release it into the disposable paper cup.

STOOL SAMPLE COLLECTION

- 10 Use disposable gloves while handling a stool sample. Stools can contain material that spreads infection.
- 11 Do not collect the stool from the toilet. The stool must not have any contact with urine.



1. To ensure the stool does not come in contact with urine, pass urine before collecting the stool specimen.
2. To ensure that the stool does not come in contact with the toilet bowl or water, loosely drape a long section of plastic wrap over the rim on both sides of the toilet bowl creating a "pocket" in the centre.

- 12 With the help of a disposable sample extraction tube collect the required quantity of stool sample for further steps.

TEST PROCEDURE

- 13 Allow the test device and specimens to equilibrate to temperature (15°C - 30°C or 59°F - 86°F) prior to testing.
- 14 Stool Sample: Unscrew the sampling bottle, use the sampling rod to pick up **10 mg** to **50 mg** of fresh stool samples (equivalent to the size of a match head) or swab the stool with a cotton swab.

Sputum Sample: Unscrew the sampling bottle, use the sampling rod or a cotton swab to pick up **10 mg** to **50 mg** of fresh sputum samples.

- 15 Put the sample collected into the tube and shake and mix completely.
- 16 Take the test card from the packaging bag, place it on a table, cut off the protrusion of the collection tube, and add **3 Drops** of the sample into the sample hole vertically.
- 17 Wait for the appearance of the red stripe on T line, read the result in **00:15:00** minutes, and judge it invalid after **00:20:00** minutes.
- 18 Take the test card from the packaging bag, place it on a table, cut off the protrusion of the collection tube, and add **150 µl (approximately 3 drops)** of the sample into the sample hole vertically.

INTERPRETATION OF RESULTS

- 19 Positive (+): Both of T and C lines appear in **00:03:00** to **00:15:00** minutes.

Negative (-): C-line appears while no T line appears in **00:15:00** minutes after the sample added.

Invalid: As long as the C-line does not appear, it indicates that the test result is invalid, and should retest with another test card.

