Novel Coronavirus (SARS-Cov-2) Antigen Rapid Test Device (saliva) Package Insert

A RAPID TEST FOR THE QUALITATIVE DETECTION OF NOVEL CORONAVIRUS ANTIGENS IN HUMAN SALIVA.

For professional In Vitro Diagnostic Use Only.

INTENDED USE

The Novel Coronavirus (SARS-Cov-2) Antigen Rapid Test Device (saliva) is an *in vitro* diagnostic test for the qualitative detection of novel coronavirus antigens in human saliva, using the rapid immunochromatographic method. The identification is based on the monoclonal antibodies specific for the novel coronvirus antigen. It will provide information for clinical doctors to prescribe correct medications.

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 Novel Coronavirus (SARS-Cov-2) Antigen Rapid Test device (saliva) is an immunochromatographic membrane assay that uses highly sensitive monoclonal antibodies to Novel coroinavirus.

The test strip is composed of the following three parts, namely sample pad, reagent pad and reaction membrane. The reagent membrane contains the colloidal-gold conjugated with the monoclonal antibodies against Novel coroinavirus; the reaction membrane contains the secondary antibodies for Novel coroinavirus, and the polyclonal antibodies against the mouse globulin, which are pre-immobilized on the membrane.

When the test device was inserted into saliva sample,conjugates dried in the reagent pad are dissolved and migrate along with the sample. If Novel coroinavirus is present in the sample, a complex formed between the anti- Novel coroinavirus conjugate and the virus will be caught by the specific anti- Novel coroinavirus monoclonal coated on the T region.

Whether the sample contains the virus or not, the solution continues to migrate to encounter another reagent (an anti-mouse IgG antibody) that binds the remaining conjugates, thereby producing a red line on the region C.

REAGENTS

The reagent membrane contains the colloidal-gold conjugated with the monoclonal antibodies against Novel coroinavirus; the reaction membrane contains the secondary antibodies for Novel coroinavirus,and the polyclonal antibodies against the mouse globulin, which are pre-immobilized on the membrane.

PRECAUTIONS

- For *in vitro* diagnostic use only.
- Do not use after the expiration date.
- Ensure foil pouch containing test device is not damaged before opening for use.
- Perform test at room temperature 15 to 30°C.
- Wear gloves when hanging the samples, avoid touching the reagent membrane and sample window.
- All samples and used accessories should be treated as infectious and discarded according to local regulations.
- Avoid using bloody samples.

STORAGE AND STABILITY

Store The Novel Coronavirus (SARS-Cov-2) Antigen Rapid Test device (saliva) at room temperature or refrigerated (2-30°C). Do not freeze. All reagents are stable until the expiration dates marked on their outer packaging and buffer vial.

SPECIMEN COLLECTION AND PREPARATION

1. Specimen collection:

The oral fluid specimen should be collected using the collection tools provided with the kit.Follow the detailed Directions for Use below.No other collection tools should be used with this assay. Oral fluid collected at any time of the day may be used.

2. Specimen preparation:

There are two methods to collect saliva, when the saliva is collected, follow the each direction to prepare the specimen with buffer provided with the kit.

MATERIALS

Materials provided

- Test device
- Saliva collector
- Extraction buffer
- Package Insert
- Nozzle
- Extraction tube
- Tube stand*
- Saliva collect cup/bag
- Dropper
- Plastic bag

*The 20-test package contains the tube stand，the 1-test and 5-test package use the test box itself as tube stand.

Materials required but not provided

- Timer

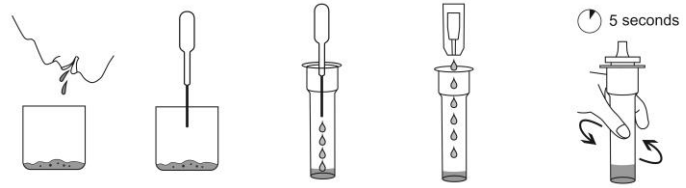
DIRECTIONS FOR USE

Allow the test device, specimen, extraction buffer to equilibrate to room temperature (15-30°C) prior to testing.Do not place anything in the mouth including food,drink,gum, tobacco,water and mouthwash products for at least 10 minutes prior to collection of oral fluid specimen.

Saliva can be collected by saliva collector or saliva collect cup：

For saliva collect cup：

1. Spit enough saliva into the saliva collect cup/bag.
2. draw the saliva from the cup with a dropper, transfer 4 drops of saliva to the extraction tube.
3. Take out an extraction tube and a bottle of extraction buffer, remove the extraction buffer bottle cap, add all the extraction buffer into the extraction tube.
4. Take out a nozzle and close into the extraction tube, gently shake the extraction tube vertically for about 5 seconds to allow saliva mix well with extraction buffer.
5. Fold the used cup/bag in half and discard it into the plastic bag as medical waste in accordance with local regulations



For saliva collector*：

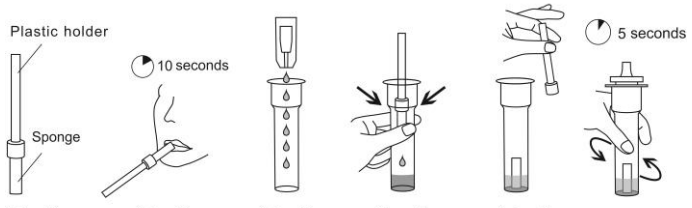
1.Insert the sponge of saliva collector into the mouth, actively swab the inside of the mouth and tongue to collect oral fluid for approximately 10 seconds until the sponge becomes soft and fully saturated,The sponge will be free from hard spots when fully saturated.

2. Take out an extraction tube and a bottle of extraction buffer, remove the extraction buffer bottle cap, add all the extraction buffer into the extraction tube. Remove the collector from the mouth and put the saturated saliva collector into the extraction tube.

4. Squeeze the wall of the extraction tube against the sponge by hand, so that the saliva in the sponge of the saliva collector flows into the extraction tube, fix sponge across the tube wall to separate sponge and plastic holder. After separation, discard plastic holder and leave sponge in the tube.

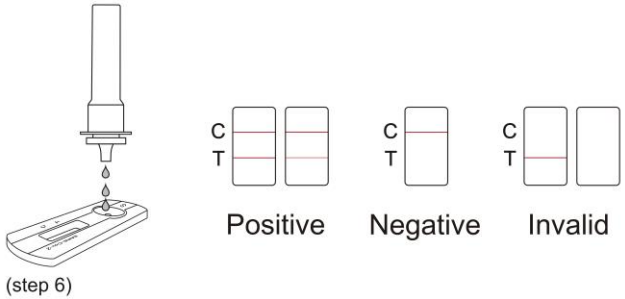
5. Take out a nozzle and close into the extraction tube, gently shake the extraction tube vertically for about 5 seconds to allow saliva mix well with extraction buffer.

***:Since there are some differences in saliva of each person, the adsorption capacity of the sponge for different people will be different. We recommend using saliva collect cup/bag and dropper when collecting saliva.**



When the sample is ready, take the following procedures to complete the test:

1. Remove the test device from the sealed foil pouch and use it as soon as possible. Best results will be obtained if the assay is performed immediately after opening the foil pouch. Put the test device on a clean and flat surface.
2. Transfer 3 drops of sample into the sample well of test device vertically, start the timer.
3. Read the result at 10~20 minutes. Don't interpret the result after 20 minutes.



INTERPRETATION OF RESULTS

(Please refer to the illustration above)

POSITIVE: Two red lines appear. One red line appears in the control region(C), and one red line in the test region(T). The shade of color may vary，but it should be considered positive whenever there is even a faint line.

NEGATIVE: Only one red line appears in the control region(C), and no line in the test region(T). The negative result indicates that there are no Novel coroinavirus particles in the sample or the number of viral particles is below the detectable range.

INVALID: No red line appears in the control region(C). The test is invalid even if there is a line on test region(T). Insufficient sample volume or incorrect procedural techniques are the most likely reasons for control line failure. Review the test procedure and repeat the test using a new test device. If the problem persists, discontinue using the test kit immediately and contact your local distributor.

LIMITATIONS

- The Novel Coronavirus (SARS-Cov-2) Antigen Rapid Test device (saliva) is an acute-phase screening test for qualitative detection. Sample collected may contain antigen concentration below the reagent's sensitivity threshold, so a negative test result does not exclude infection with novel coronavirus.
- The Novel Coronavirus (SARS-Cov-2) Antigen Rapid Test device (saliva) detects viable and non-viable novel coronavirus antigen. Test performance depends on antigen load in the sample and may not correlate with cell culture performed on the same sample. A positive test does not rule out the possibility that other pathogens may be present, therefore, the results must be compared with all other available clinical and laboratory information to make an accurate diagnosis.
- A negative test result may occur if the level of extracted antigen in a specimen is below the sensitivity of the test or if poor quality specimen is obtained.
- Performance of the test has not been established for monitoring antiviral treatment of novel coronavirus.
- Positive test results do not rule out co-infections with other pathogens.
- Negative test results are not intended to rule in other coronavirus infection except the SARS-Cov-2.
- Children tend to shed virus for longer periods of time than adults, which may result in differences in sensitivity between adults and children List.
- The concentration of virus in saliva is greatly affected by factors such as meals, diet, smoking, breath fresheners, etc. Therefore, please strictly follow this manual before collecting samples

A negative result may occur if the concentration of antigen in a specimen is below the detection limit of the test or if the specimen was collected or transported improperly, therefore a negative test result does not eliminate the possibility of SARS-Cov-2 infection, and should be confirmed by viral culture or PCR.

PERFORMANCE CHARACTERISTICS

Clinical Evaluation

Clinical evaluation was performed to compare the results obtained by Novel Coronavirus (SARS-Cov-2) Antigen Rapid Test device (saliva) and PCR. The results were summarized below:

Table: Novel Coronavirus (SARS-Cov-2) Antigen Rapid Test device (saliva) vs. PCR

Method		2019-nCoV Nucleic Acid Test Kit (RT-PCR)		Total Results
The Novel Coronavirus (SARS-Cov-2) Antigen Rapid Test device (saliva)	Results	Positive	Negative	
	Positive	62	0	62
	Negative	4	156	160
Total Results		66	156	222

Clinical sensitivity = 62/66= 93.94 % (95%CI*84.99% to 98.06%)

Clinical specificity =156/156＞99.9% (95%CI* 98.98% to 100%)

Accuracy: (62+156)/ (62+0+4+156) *100%=98.20% (95%CI* 95.29% to 99.46%)

*Confidence Interval

Limit of Detection (LoD)

2019-nCoV Strain Tested	Realy Tech product				
Stock 2019-nCoV Concentration	1 X 10^5 $TCID_{50}$/mL				
Dilution	1/100	1/200	1/400	1/800	1/1600
Concentration in Dilution tested ($TCID_{50}$/ml)	1X10^3	5X10^2	2.5X 10^2	1.25X10^2	62.5
Call rates of 20 replicates near cut-off	100(20/20)	100(20/20)	100(20/20)	95(19/20)	10(2/20)
Limit of detection (LoD) per Virus Strain	1.25 X 10^2 $TCID_{50}$/mL				

Cross Reaction

The test results are below the corresponding concentration of the substances in the table below, which has no effect on the negative and positive test results of this reagent, and there is no cross-reaction.

Virus/Bacteria/Parasite	Strain	Concentration
MERS-coronavirus	N/A	72 μg/mL
Adenovirus	Type 1	1.5 x $10^6$$TCID_{50}$/mL
	Type 3	7.5 x $10^6$$TCID_{50}$/mL
	Type 5	4.5 x $10^6$$TCID_{50}$/mL
	Type 7	1.0 x $10^6$$TCID_{50}$/mL
	Type 8	1.0 x $10^6$$TCID_{50}$/mL
	Type 11	2.5 x $10^6$$TCID_{50}$/mL
	Type 18	2.5 x $10^6$$TCID_{50}$/mL
	Type 23	6.0 x $10^6$$TCID_{50}$/mL
	Type 55	1.5 x $10^6$$TCID_{50}$/mL
Influenza A	H1N1 Denver	3.0 x $10^8$$TCID_{50}$/mL
	H1N1 WS/33	2.0 x $10^8$$TCID_{50}$/mL

	H1N1 A/Mal/302/54	1.5 x 10^8TCID$_{50}$/mL
	H1N1 New Caledonia	7.6 x 10^8TCID$_{50}$/mL
	H3N2 A/Hong Kong/8/68	4.6 x 10^8TCID$_{50}$/mL
Influenza B	Nevada/03/2011	1.5 x 10^8TCID$_{50}$/mL
	B/Lee/40	8.5 x 10^8TCID$_{50}$/mL
	B/Taiwan/2/62	4.0 x 10^8TCID$_{50}$/mL
Respiratory syncytial virus	N/A	2.5 x 10^6TCID$_{50}$/mL
Legionella pneumophila	Bloomington-2	1 x 10^5 PFU/mL
	Los Angeles-1	1 x 10^5 PFU/mL
	82A3105	1 x 10^5 PFU/mL
Rhinovirus A16	N/A	1.5 x 10^6TCID$_{50}$/mL
Mycobacterium tuberculosis	K	1 x 10^5PFU/mL
	Erdman	1 x 10^5PFU/mL
	HN878	1 x 10^5PFU/mL
	CDC1551	1 x 10^5PFU/mL
	H37Rv	1 x 10^5PFU/mL
Streptococcus pneumonia	4752-98 [Maryland (D1)6B-17]	1 x 10^5PFU/mL
	178 [Poland 23F-16]	1 x 10^5PFU/mL
	262 [CIP 104340]	1 x 10^5PFU/mL
	Slovakia 14-10 [29055]	1 x 10^5PFU/mL
Streptococcus pyrogens	Typing strain T1 [NCIB 11841, SF 130]	1 x 10^5PFU/ml
Mycoplasma pneumoniae	Mutant 22	1 x 10^5PFU/ml
	FH strain of Eaton Agent [NCTC 10119]	1 x 10^5PFU/ml
	36M129-B7	1 x 10^5PFU/ml
Coronavirus	229E	1.5 x10^6TCID$_{50}$/ml
	OC43	1.5 x10^6TCID$_{50}$/ml
	NL63	1.5 x 10^6TCID$_{50}$/ml
	HKU1	1.5 x 10^6TCID$_{50}$/ml
Human etapneumovirus (hMPV) 3 Type B1	Peru2-2002	1.5 x 10^6TCID$_{50}$/ml
Human Metapneumovirus (hMPV) 16 Type A1	IA10-2003	1.5 x 10^6TCID$_{50}$/ml
Parainfluenza virus	Type 1	1.5 x 106TCID$_{50}$/ml
	Type 2	1.5 x 106TCID$_{50}$/ml
	Type 3	1.5 x 106TCID$_{50}$/ml
	Type 4A	1.5 x 106TCID$_{50}$/ml

Interfering Substances Reaction

When tested using the Novel Coronavirus (SARS-Cov-2) Antigen Rapid Test Device (saliva), there was no interference between the device reagents and the Potential interference substances listed in below table that would create false positive or negative results for SARS-Cov-2 antigen.

Substance	Concentration	Substance	Concentration
Mucin	100μg/mL	Acetylsalicylic acid	3.0 mM
Whole Blood	5% (v/v)	Ibuprofen	2.5 mM
Biotin	100μg/mL	Mupirocin	10 mg/mL
Neo-Synephrine (Phenylephrine)	5%(v/v)	Tobramycin	10μg/mL
Afrin Nasal Spray (Oxymetazoline)	5%(v/v)	Erythromycin	50uM
Saline Nasal Spray	5%(v/v)	Ciprofloxacin	50uM
Homeopathic	5%(v/v)	Ceftriaxone	110mg/mL
Sodium Cromoglycate	10 mg/mL	Meropenem	3.7μg/mL
Olopatadine Hydrochloride	10 mg/mL	Tobramycin	100μg/mL
Zanamivir	5 mg/mL	Histamine Hydrochloride	100μg/mL
Oseltamivir	10 mg/mL	Peramivir	1mmol/mL
Artemether-lumefantrine	50uM	Flunisolide	100μg/mL
Doxycycline hyclate	50uM	Budesonide	0.64nmol/ L
Quinine	150uM	Fluticasone	0.3ng/mL
Lamivudine	1 mg/mL	Lopinavir	6μg/mL
Ribavirin	1 mg/mL	Ritonavir	8.2mg/mL
Daclatasvir	1 mg/mL	Abidor	417.8ng/mL
Acetaminophen	150uM	Pooled human nasal wash	N/A

SYMBOL

Symbol	Meaning	Symbol	Meaning
IVD	In vitro diagnostic medical device		Storage temperature limit
	Manufacturer	EC REP	Authorized representative in the European Community
	Date of Manufacture		Use by date
	Do not reuse		Consult instruction for use
LOT	Batch code	CE	Meet the requirements of EC Directive 98/79/EC

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Number:1101431601
Version:1.3
Effective Date:2021-01-14