AAZ
Votre santé sous contrôle

CE 0459

ALL IN TRIPLEX®

Nasal test kit COVID-19 & Influenza A/B & RSV all in one
REF: TR-CGR-001
Instructions for use

INTENDED USE

ALL IN TRIPLEX® is a rapid test, **specially designed and secured for use in children** from 1 month of age or in adults, for the detection of the N protein of SARS-CoV-2, Influenza A, Influenza B and RSV in nasal secretions.
ALL IN TRIPLEX® is a rapid test that assists in the diagnosis of SARS-CoV-2, Influenza A, Influenza B and RSV infections.
ALL IN TRIPLEX® is a test for professional use only.
ALL IN TRIPLEX® detects SARS-CoV-2 and new variants in which the synthesis of nucleoprotein N is not affected (alpha, beta, gamma, delta and omicron variants).

INTRODUCTION

SARS-CoV-2 was identified in 2019, it belongs to the β-coronavirus familly. It is the pathogen causing an emerging atypical pneumonia, coronavirus disease 2019 (Covid-19).
Several SARS-CoV-2 variants, called alpha, beta, gamma, delta and omicron have been identified by viral genome sequencing. Their RNAs have multiple mutations and deletions resulting in deletions or amino acid changes in the S (Spike) protein.
Currently, patients infected with SARS-CoV-2 are the main source of transmission: infected persons, who are asymptomatic, can also be a source of infection. Based on the current epidemiological survey, the incubation period can range from 1 to 14 days but is usually 3 to 7 days.
The main symptoms are fever or the feeling of fever and cough. Sudden loss of smell, without nasal obstruction, and total loss of taste are also symptoms that have been observed in patients. In people with more severe forms, breathing difficulties are present, which can lead to hospitalisation in intensive care and death.
Influenza is an acute, highly contagious viral infection of the respiratory tract. The agents responsible for the infection are immunologically divergent single-stranded RNA viruses, called influenza viruses. There are three types of influenza virus: A, B and C. Type A viruses are the most common and are associated with the most severe epidemics, while type B infection is generally milder. Type C viruses have never been associated with a major epidemic of human disease. Type A and B viruses can circulate simultaneously, but usually one type is dominant in a given season and in a particular epidemic area. The disease is easily transmitted by coughing and sneezing droplets containing virus. Influenza epidemics normally occur each year during the autumn and winter seasons.
Respiratory syncitial virus (RSV) is a major cause of respiratory disease in all ages. It is the most common cause of severe respiratory tract infections in paediatrics, especially in children under 4 years of age. It also causes severe problems for the elderly and immunocompromised, resulting in high mortality rates. Bronchiolitis is one of the most severe conditions in children aged 2-6 months. The condition is less severe in older children and adults, being limited to nasal secretions and a cold-like discharge.
ALL IN TRIPLEX® has been designed to detect the SARS-CoV-2 Nucleocapsid Protein as well as specific target antigens of Influenza A, Influenza B and RSV.
ALL IN TRIPLEX® detects alpha, beta, gamma, delta and omicron variants with the same performance as other known strains of SARS-CoV-2. Mutations in Spike protein synthesis do not affect test performance. The nucleocapsid (N) protein of SARS-CoV-2 is usually detectable in upper respiratory tract specimens during the acute phase of infection.

PRINCIPLE OF THE TEST

ALL IN TRIPLEX® is a triple lateral flow immunochromatographic test that uses highly sensitive monoclonal antibodies to detect specific target antigens for each virus (SARS-CoV-2, Influenza A, Influenza B and RSV) in a nasal sample. The test uses monoclonal antibodies directed against target antigens for each virus and fixed at the test site (T) on a nitrocellulose strip. A monoclonal antibody directed against target antigens for each virus and labelled with colloidal gold is used as a lyophilised conjugate.
In the test, antigens in the sample interact with the antigen-specific monoclonal antibodies conjugated to the colour particles to form a coloured antibody-antigen complex. This complex migrates by capillary action across the membrane to the test line (T) where it is captured by the antigen-specific monoclonal antibodies bound to the membrane**.**
A coloured test line will appear in the results window (T) if antigens for any of the viruses are present in the sample. The intensity of the coloured test line will vary according to the amount of antigen present in the sample.
If no antigen is present in the sample, no colour will appear on the test line (T). The control line is used as a procedural control and should always appear in the control area (C) if the test procedure is performed correctly.

MATERIALS PROVIDED

- 10 Individually packed tests
- Package insert

MATERIALS REQUIRED BUT NOT PROVIDED

- Clock, timer or stopwatch

STORAGE AND STABILITY

The kit can be stored at room temperature or refrigerated (2-30°C). Do not freeze the kit. The kit is stable until the expiry date indicated on the sachet. DO NOT REMOVE THE KIT FROM THE SEALED SACHET UNTIL JUST BEFORE CARRYING OUT THE TEST.

PRECAUTIONS

- The test device should remain in the sealed pouch until use.
- Do not use the kit after the expiry date, do not use the kit with a hole or damage in the bag.
- Incorrect results may be obtained if the kit is stored incorrectly.
- The kit is for single use only. It should not be removed from the bag until just before testing (to avoid cross-contamination).
- Avoid skin or eye contact with the pad in the dosette before, during or after the test.
- If the solution comes into contact with the skin or eyes, rinse thoroughly with water.
- For accurate results, do not use samples that contain blood or are too viscous.
- Wear appropriate protective clothing, gloves and eye/face protection when handling the contents of this kit. The used kit should be disposed of in accordance with local regulations.

TEST PROCEDURE

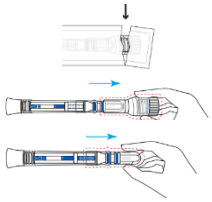
Ensure that the ALL IN TRIPLEX® kit is at room temperature (15-30°C) before testing. Humidity and temperature may affect the results.

1. Ask the patient to blow his nose.

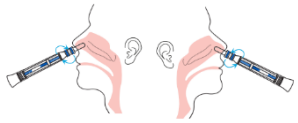
2. Remove the test from the sealed sachet just before use.

3. Remove the extraction tube from the test.

4. Remove the protective cap.



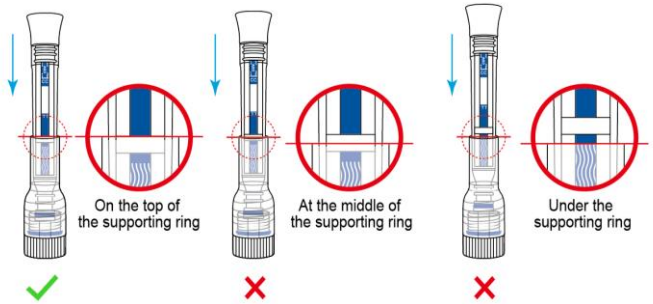
5. Gently insert the collection tube (foam) into the left nostril until there is resistance (approximately 1 to 2 cm into the nostril). Rotate in the nostril for 15 seconds, rubbing the collection area against the inside wall of the nostril. Repeat the same operation in the right nostril. It is important to obtain as much secretion as possible.



6. Insert the test point down into its holder on a table.

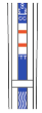
7. Press **hard** on the test to pierce the lid of the diluent pod and insert the test all the way **into the holder**.

8. Read the results at 15 minutes. Do not interpret results after 20 minutes.

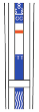


RESULT INTERPRETATION

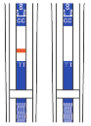
For COVID-19 test :



POSITIVE : Two colored bands appear on the membrane. One band appears in the control region (C) and another band appears in the test region (T).

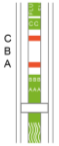


NEGATIVE : Only one colored band appears, in the control region (C). No apparent colored band appears in the test region (T).

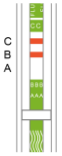


INVALID : Control band fails to appear. Results from any test which has not produced a control band at the specified read time must be discarded. Please review the procedure and repeat with a new test. If the problem persists, discontinue using the kit immediately and contact your local distributor.

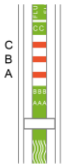
For Influenza A/B test :



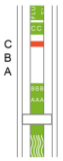
INFLUENZA A POSITIVE : One colored band appears in the control region (C), and another colored band in the A region (A).



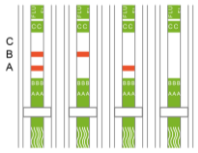
INFLUENZA B POSITIVE : One colored band appears in the control region (C), and another colored band in the B region (B).



INFLUENZA A+B POSITIVE : One colored band appears in the control region (C), and two other colored bands appear in both A region (A) and B region (B).
NOTE : Co-infection with influenza A and B is rare. A clinical specimen that generates positive results for both A and B should be considered an invalid result, and another test should be performed. If the test is again positive for both influenza A and B, the specimen should be re-tested by another method prior to reporting of results.

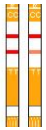


NEGATIVE : Only one colored band appears in the control region (C), and band appears neither in the A region (A) nor B region (B).



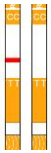
INVALID : No colored band appears in the control region (C), whether a test band(s) is present or not. Repeat invalid tests with a new sample, new test device and reagent. Insufficient sample volume, inaccurate operating procedure or expired tests may yield an invalid result. Contact your local distributor if the problem continues.

For RSV test :



POSITIVE : Two colored bands appear on the membrane. One band appears in the control region (C) and another band appears in the test region (T).

NEGATIVE : Only one colored band appears, in the control region (C). No apparent colored band appears in the test region (T).



INVALID : Control band fails to appear. Results from any test which has not produced a control band at the specified read time must be discarded. Please review the procedure and repeat with a new test. If the problem persists, discontinue using the kit immediately and contact your local distributor.

NOTE :
The color intensity in the test region(s) may vary depending on the concentration of analytes present in the specimen. Note that this is a qualitative test only, and cannot determine the concentration of analytes in the specimen.

QUALITY CONTROL

Internal quality control
Internal quality control is included in the test. The appearance of a red control line (C) confirms that a sufficient volume of sample has been used and that the test procedure has been followed correctly.

LIMITATIONS OF THE TEST

1. **ALL IN TRIPLEX®** Test Kit is for professional *in vitro* diagnostic use, and should only be used for the qualitative detection of viral antigens specific for SARS-CoV-2, Influenza A virus, Influenza B virus and respiratory syncytial virus. The intensity of color in a positive band should not be evaluated as “quantitative or semi-quantitative”.
2. Both viable and nonviable viruses are detectable with the kit.
3. As with all diagnostic tests, a definitive clinical diagnosis should not be based on the results of a single test, but should only be made by the physician after all clinical and laboratory findings have been evaluated.
4. Failure to follow the TEST PROCEDURE and RESULT INTERPRETATION may adversely affect test performance and/or invalidate the test result.
5. Results obtained with this assay, particularly in the case of weak test lines that are difficult to interpret, should be used in conjunction with other clinical information available to the physician.
6. Negative results do not preclude viral infections and should be confirmed via molecular assay.

PERFORMANCE CHARACTERISTICS

Test performance :
For the detection of SARS-CoV-2 antigen :
A total of 612 clinical specimens were collected to verify the performance of COVID-19 Antigen Test. Individuals who are suspected of COVID-19 were enrolled in this study.107 positive specimens and 505 negative specimens were confirmed by RT-PCR. The study population comprised 60 minors aged between 1 month and 17 years.

Table 1 : Clinical Summary of COVID-19 Antigen

		RT-PCR		Total
		Positive	Negative	
COVID-19 test	**Positive**	101	0	101
	Negative	6	505	511
	Total	107	505	612

Relative Sensitivity : 94,39 % (88,3 % - 97,4 %)*
Relative Specificity : 100 % (99,2 % - 100 %)*
* 95 % Confidence Interval

For the detection of FLU A/B antigen :
A total of 263 clinical specimens were collected, to verify the performance of Influenza A/B Antigen Test. 91 were found to be positive by RT-PCR and 172 were found to be negative by RT-PCR. The study population included only minors aged between 16 days and 16 years.

Table 2 : Clinical Summary of Influenza A/B

		RT-PCR		Total
		Positive	Negative	
Influenza A/B Test	**Positive**	84	0	84
	Negative	7	172	179
	Total	91	172	263

Relative Sensitivity : 92,3 % (84,8 % - 96,9 %)*
Relative Specificity : 100 % (97,8 % - 100 %)*
* 95 % Confidence Interval

For the detection of Respiratory Syncytial Virus (RSV) antigen :
A total of 263 clinical specimens were collected, to verify the performance of Respiratory Syncytial Virus Antigen Test. 39 were found to be positive by RT-PCR and 224 were found to be negative by RT-PCR. The study population included only minors aged between 16 days and 16 years.

Table 3 : Clinical Summary of RSV

		RT-PCR		Total
		Positive	Negative	
Respiratory Syncytial Virus Test	**Positive**	34	0	34
	Negative	5	224	229
	Total	39	224	263

Relative Sensitivity : 87.2 % (72.6 % - 95.7 %)*
Relative Specificity : 100 % (98.3 % - 100 %)*
* 95 % Confidence Interval

Limit of detection (LoD)
The minimum detectable concentrations for each virus are (in $TCID_{50}$/mL) :

- SARS-CoV-2 : 1 x $10^{2,4}$
- Influenza A (H1N1) : 1.0x10^{4}
- Influenza A (H3N2) : 4.3x10^{4}
- Influenza B (Victoria) : 2.2x10^{5}
- Influenza B (Yamagata) : 2.5x10^{5}
- RSV (type A) : 7.5x10^{3}
- RSV (type B) : 6.0x10^{3}

Cross Reactivity :
Cross reactivity with the following organisms has been studied. Samples positive for the following organisms were found negative when tested with the **ALL IN TRIPLEX®** Test Kit.

HCoV-229E	Adenovirus 4	*Candida albicans*
HCoV-OC43	Adenovirus 5	*Chlamydia pneumoniae*
HCoV-NL63	Adenovirus 7	*Group C Streptococcus*
Norovirus	Adenovirus 55	*Haemophilus influenzae*
Parainfluenza virus 1	Epstein-Barr virus	*Legionella pneumophila*
Parainfluenza virus 2	Enterovirus EV70	*Mycoplasma pneumoniae*
Parainfluenza virus 3	Enterovirus EV71	*Mycobacterium tuberculosis*
Parainfluenza virus 4	Enterovirus A16	*Staphylococcus aureus*
Rhinovirus A30	Enterovirus A24	*Staphylococcus epidermidis*
Rhinovirus B52	Enterovirus B1	*Streptococcus agalactiae*
Adenovirus 1	Echovirus 6	*Streptococcus pneumoniae*
Adenovirus 2	*Bordetellapara pertussis*	*Streptococcus pyogenes*
Adenovirus 3	*Bordetella pertussis*	

NOTE :
For COVID-19 test : detection of SARS-CoV-2 is not cross-reactive with INFLUENZA A, INFLUENZA B, respiratory syncytial virus and adenoviruses.

For FLU A/B test : The detection of INFLUENZA A is not cross-reactive with INFLUENZA B, respiratory syncytial virus or SARS-CoV-2. Detection of INFLUENZA B is not cross-reactive with INFLUENZA A, respiratory syncytial virus or SARS-CoV-2.

For RSV test : RSV detection is not cross-reactive with INFLUENZA A, INFLUENZA B and SARS-CoV-2.

Interfering Substances
The following substances, naturally present in respiratory specimens or that may be artificially introduced into the respiratory tract, were evaluated at the concentrations listed below. None of them were found to affect test performance of the kit.

Substance	Concentration	Substance	Concentration
3 OTC nasal sprays	10%	Guaiacol glyceryl ether	20mg/mL
3 OTC mouth washes	10%	Mucin	1%
3 OTC throat drops	10%	Whole blood	4%
4-acetamidophenol	10 mg/mL	Mupirocin	250µg/mL
Acetylsalicylic acid	10 mg/mL	Oxymetazoline	25µg/mL
Albuterol	10 mg/mL	Phenylephrine	10 mg/mL
Chlorpheniramine	5 mg/mL	Phenylpropanolamine	1mg/mL
Dexamethasone	50µg/mL	Zanamivir	10mg/mL
Dextromethorphan	10µg/mL	Adamantanamine	500 ng/mL
Diphenhydramine	5 mg/mL	Oseltamivir phosphate	10mg/mL
Doxylamine succinate	1 mg/mL	Tobramycin	10mg/mL
Flunisolide	25µg/mL	Triamcinolone	14mg/mL

GLOSSARY OF SYMBOLS

	Read the instructions for use		Expiry date
IVD	For *in vitro* diagnostic use only	LOT	Batch number
2°C - 30°C	Store between 2 and 30°C	Σ	Number of tests per kit
	Manufacturer	REF	Reference
	Do not reuse	CE	CE marking

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