Influenza A & B Ag Rapid Test Cassette (Swab) CE

INTENDED USE

The Influenza A & B Ag Rapid Test Cassette (Swab) is an *in vitro* immunochromatographic assay for the qualitative detection of influenza A (including the subtype H1N1) and B nucleoprotein antigens in nasopharyngeal swabs, nasal swabs, throat swabs or nasal aspirates specimens. It is intended to aid in the rapid differential diagnosis of influenza A and B viral infections.

SUMMARY AND EXPLANATION

Influenza is an acute and highly contagious viral infection of the respiratory tract. The causative agents of the disease are immunologically diverse, single-strand RNA virus known as influenza viruses. There are three types of influenza viruses: A, B and C.

Type A Viruses are the most prevalent and are associated with most serious epidemics, while Type B infection is generally milder. Type C virus have never been associated with a large epidemic of human disease. Both type A and B viruses can circulate simultaneously, but usually one type is dominant during a given season and particular epidemic area. The disease is easily transmitted through coughing and sneezing of aerosolized droplets containing live virus. Influenza outbreaks normally occur each year during fall and winter seasons. Rapid diagnosis of influenza infection will help healthcare professionals to treat patients and control the disease more efficiently and effectively.

PRINCIPLE OF THE TEST

The Influenza A&B Ag Rapid Test Cassette (Swab) is an immunochromatographic membrane assay that uses highly sensitive monoclonal antibodies to detect influenza type A and B nucleoprotein antigens in nasopharyngeal swabs, nasal swabs, throat swabs or nasal aspirates specimens. The test strip is composed of the following parts: namely sample pad, reagent pad, reaction membrane, and absorbing pad. The reagent pad contains the colloidal-gold conjugated with the monoclonal antibodies against Influenza virus A and B; the reaction membrane contains the secondary antibodies either for virus A or for B. The whole strip is fixed inside a plastic device. When the sample is added into the sample well, conjugates dried in the reagent pad are dissolved and migrate along with the sample. If influenza A presents in the sample, a complex formed between the anti-influenza A conjugate and the virus will be captured by the specific anti-influenza A monoclonal antibodies coated on the A region (A). If the sample contains influenza B, a complex formed between the anti-influenza B conjugate and the virus will be captured by the specific anti-influenza B monoclonal antibodies coated on the B region (B).

Results appear at 10 minutes in the form of a red line that develops on the membrane. To serve as a procedural control, a red line will always appear in the control region (C) indicating that proper volume of sample has been added and membrane wicking has occurred.

MATERIALS PROVIDED

20 Test cassettes
20 Sterile swabs
20 Extraction tubes and tips
1 Workstation
2 Buffers
1 Package inset

MATERIALS REQUIRED BUT NOT PROVIDED

1. Clock, timer, or stopwatch

WARNINGS AND PRECAUTIONS

1. For professional *in vitro* diagnostic use only.
2. The test cassette should remain in the sealed pouch until use.
3. Do not use kit past its expiration date.
4. Swabs, tubes and test cassettes are for single use only.
5. Solutions that contain sodium azide may react explosively with lead or copper plumbing. Use large quantities of water to flush discarded solutions down a sink.
6. Do not interchange or mix components from different kit lots.
7. Humidity and temperature can adversely affect results.
8. Used testing materials should be discarded in accordance with local regulations.

STORAGE AND STABILITY

1. The kit can be stored at room temperature or refrigerated (2-30℃).
2. Do not freeze any of the test kit components.
3. Do not use test cassette and reagents after expiration date.
4. Test cassettes that have been outside of the sealed pouch for more than 1 hour should be discarded.
5. Close the kit box and secure its contents when not in use.

SPECIMEN COLLECTION

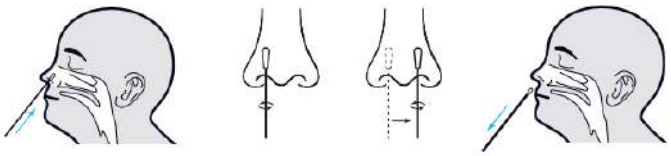
It is applicable to the diagnosis of the influenza virus A and B from the samples of nasopharyngeal swabs, nasal swabs, throat swabs or nasal aspirates. Use freshly collected samples for optimal test performance. Inadequate sample collection or improper sample handling may yield a false-negative result.

For Nasopharyngeal Swab Specimen Collection:

1. Using the sterile swab provided in the kit, carefully insert the swab in the patient's nostril.
2. Swab over the surface of the posterior nasopharynx and rotate the swab several times.
3. Withdraw the swab from the nasal cavity. The specimen is now ready for preparation using the extraction buffer provided in the test kit.

For Nasal Swab Specimen Collection:

1. Using the sterile swab provided in the kit, carefully insert the swab into one nostril of the patient. The swab tip should be inserted up to 2-4 cm until resistance is met.
2. Roll the swab 5 times along the mucosa inside the nostril to ensure that both mucus and cells are collected.
3. Using the same swab, repeat this process for the other nostril to ensure that an adequate sample is collected from both nasal cavities.
4. Withdraw the swab from the nasal cavity. The sample is now ready for processing using the Influenza A & B Ag Rapid Test Cassette (Swab).

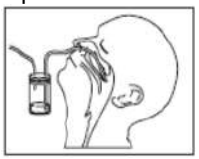


For Throat Swab Specimen Collection:

1. Deeply insert the sterilized swab into the throat and swab several times to collect the epidermal cells of the mucus. Caution has to be paid to avoid the swab to be contaminated with saliva.
2. Withdraw the swab from the throat. The sample is now ready for processing using the Influenza A & B Ag Rapid Test Cassette (Swab).

For Nasal Aspirates Specimen Collection:

Nasal aspirator is not provided in the kit. Collect nasal aspirate fluids according to the instructions for use of the used nasal aspirator.



SAMPLE PREPARATION PROCEDURE

Insert the test extraction tube into the workstation provided in the kit. Make sure that the tube is standing upright and reaches the bottom of the workstation. Add the sample buffer to extraction tube until it reaches the lower mark (about 13-17 drops, 0.5 mL)

For nasopharyngeal, nasal or throat swabs:

Insert the swab into the extraction tube which contains 0.5 mL of the extraction buffer. After mixing, squeeze the tube several times with fingers from outside of the tube to immerse the swab. Remove the swab. The extracted solution will be used as test sample.

For nasal aspirate fluids：

Add 0.5 mL of the nasal aspirate fluids into the extraction tube which contains 0.5 mL of the extraction buffer, and mix well to be used as test sample.

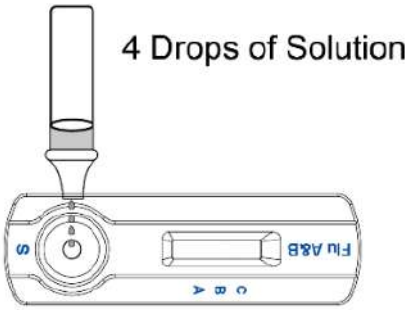
SPECIMEN TRANSPORT AND STORAGE

Specimens should be tested as soon as possible after collection. If transport of the samples is required, the following transport media are recommended and have been tested and shown not to interfere with the performance of the test: Hank's Balanced salt solution, M5 Media, or saline. Alternatively, samples may be stored refrigerated (2-8℃), or at room temperature(15-30℃), in a clean, dry, closed container for up to eight hours prior to testing. Nasal wash/aspirate specimens may also be stored frozen (-70℃ or colder) for up to one month.

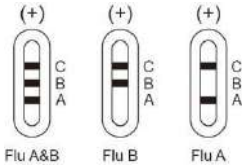
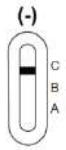
TEST PROCEDURE

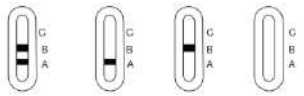
Allow the test cassette, test sample and buffer to equilibrate to room temperature (15-30°C) prior to testing.

1. Just prior to testing remove the test cassette from the sealed pouch and lay it on a flat surface.
2. Push the nozzle which contains the filter onto the extraction tube. Ensure the nozzle has a tight fit.
3. Hold the extraction tube vertically and add 4 drops (approximately 100 µL) of test sample solution tube into the sample well.
4. Start the timer.
5. Read the results at 10 minutes. Do not interpret the result after 20 minutes.



INTERPRETATION OF RESULTS

	**POSITIVE** **1. Flu A Positive:** The presence of two lines as control line (C) and A test line within the result window indicates a positive result for Influenza A viral antigen. **2. Flu B Positive:** The presence of two lines as control line (C) and B test line within the result window indicates a positive result for Influenza B viral antigen. **3. Flu A+B Positive:** The presence of three lines as control line (C), A test line and B test line within the result window indicates a positive result for Influenza A and Influenza B viral antigen.
	**NEGATIVE** The presence of only control band (C) within the result window indicates a negative result.

	**INVALID** If the control band (C) is not visible within the result window after performing the test, the result is considered invalid. Some causes of invalid results are because of not following the directions correctly or the test may have deteriorated beyond the expiration date. It is recommended that the specimen be re-tested using a new test.

NOTE:

1. The intensity of color in the test region (A/B) may vary depending on the concentration of analyses present in the specimen. Therefore, any shade of color in the test region (A/B) should be considered positive. Please note that this is a qualitative test only, and cannot determine the concentration of analytes in the specimen.
2. Insufficient specimen volume, incorrect operating procedure or expired tests are the most likely reasons for control band failure.

QUALITY CONTROL

A procedural control is included in the test. A red line appearing in the control line region (C) is the internal procedural control. It confirms sufficient specimen volume and correct procedural technique. Control standards are not supplied with this test. However, it is recommended that positive and negative controls are sourced from a local competent authority and tested as a good laboratory practice, to confirm the test procedure and verify the test performance.

LIMITATIONS

1. The Influenza A&B Ag Rapid Test Cassette (Swab) is for professional in vitro diagnostic use, and should only be used for the qualitative detection of influenza A and/or B.
2. The etiology of respiratory infection caused by microorganisms other than influenza A or B virus will not be established with this test. The Influenza A&B Ag Rapid Test Cassette (Swab) is capable of detecting both viable and non-viable influenza particles. The performance of the Influenza A&B Ag Rapid Test depends on antigen load and may not correlate with cell culture performed on the same specimen.
3. If the test result is negative and clinical symptoms persist, additional testing using other clinical methods is recommended. A negative result does not at anytime rule out the presence of influenza A and/or B viral antigens in specimen, as they may be present below the minimum detection level of the test. As with all diagnostic tests, a confirmed diagnosis should only be made by a physician after all clinical and laboratory findings have been evaluated.
4. The validity of Influenza A&B Ag Rapid Test Cassette (Swab) has not been proven for identification or confirmation of cell culture isolates.
5. Inadequate or inappropriate specimen collection, storage, and transport may yield false negative test result.
6. Although this test has been shown to detect cultured avian influenza viruses, including avian influenza A subtype H5N1 virus, the performance characteristics of this test with specimens from humans infected with H5N1 or other avian influenza viruses are unknown.
7. Performance characteristics for influenza A were established when influenza A/H3 and A/H1 were the predominant influenza A viruses in circulation. When other influenza A viruses are emerging, performance characteristics may vary.
8. Children tend to shed virus for longer periods of time than adults, which may result in differences in sensitivity between adults and children.
9. Positive and negative predictive values are highly dependent on prevalence. False positive test results are more likely during periods of low influenza activity when prevalence is moderate to low.

PERFORMANCE CHARACTERISTICS

1. Analytical Sensitivity

The minimum detection limit is 1.5 x 10^4 $TCID_{50}$/test for the Influenza A virus antigen and is 1.5 x 10^5 $TCID_{50}$/test for the Influenza B virus antigen.

2. Analytical Reactivity

The influenza A strain listed tested positive in the Influenza A&B Ag Rapid Test Cassette (Swab). Although the specific influenza strains causing infection in human can very, all contain the conserved nucleoproteins targeted by Influenza A&B Ag Rapid Test Cassette (Swab).

Strains	Sources	Subtypes	Concentration
Flu A/Hubei/PR 8/2001	Human	H1N1	1.8×10^4 $TCID_{50}$/test
Flu A/New Kaledonia/20/99	Human	H1N1	1.8×10^4 $TCID_{50}$/test
Flu A/Yamagata/32/89	Human	H1N1	1.8×10^4 $TCID_{50}$/test
Flu A/Beijing/262/95	Human	H1N1	1.8×10^4 $TCID_{50}$/test
Flu A/Singapore/1/57	Human	H2N2	3.0×10^4 $TCID_{50}$/test
Flu A/Hubei/3/2005	Human	H3N2	3.0×10^4 $TCID_{50}$/test
Flu A/Akita/1/94	Human	H3N2	3.0×10^4 $TCID_{50}$/test
Flu A/Iowa/15/30	Swine	H1N1	3.0×10^4 $TCID_{50}$/test
Flu A/Hongkong/168/93	Swine	H1N1	3.0×10^4 $TCID_{50}$/test
Flu A/Anhui/24/2004	Swine	H5N1	6.0×10^4 $TCID_{50}$/test
Flu A/Hubei/134/2000	Swine	H9N2	6.0×10^5 $TCID_{50}$/test
Flu A/Hubei/251/2001	Swine	H9N2	6.0×10^5 $TCID_{50}$/test
Flu A/Yuyao/1/2006	Chicken	H5N1	6.0×10^4 $TCID_{50}$/test
Flu A/Yuyao/2/2006	Chicken	H5N1	6.0×10^4 $TCID_{50}$/test
Flu A/Jiangsu/2/2004	Chicken	H5N1	6.0×10^4 $TCID_{50}$/test
Flu A/Hubei/216/83	Duck	H7N8	3.0×10^5 $TCID_{50}$/test
Flu A/Hubei/118/2003	Duck	H9N2	1.5×10^5 TC ID_{50}/test
Flu A/Hubei/155/2003	Duck	H9N2	6.0×10^5 $TCID_{50}$/test
Flu A/Hubei/137/1982	Duck	H10N4	3.0×10^5 $TCID_{50}$/test
Flu A/Singapore/3/97	Duck	H5N3	6.0×10^4 $TCID_{50}$/test
Flu A/Henan/1/2004	Tree sparrow	H5N1	6.0×10^5 $TCID_{50}$/test
Flu A/Henan/2/2004	Tree sparrow	H5N1	3.0×10^5 $TCID_{50}$/test
Flu A/Henan/4/2004	Tree sparrow	H5N1	6.0×10^4 $TCID_{50}$/test
Flu A/Wisconsin/66	Turkey	H9N2	6.0×10^4 $TCID_{50}$/test
Flu A/England/1/63	Turkey	H7N3	6.0×10^4 $TCID_{50}$/test
Flu A/Singapore/1/57	Bird	H5N1	6.0×10^4 $TCID_{50}$/test
Flu A/Hunan/71/2004	Bird	H5N1	6.0×10^4 $TCID_{50}$/test
Flu A/Shanxi/50/2006	Bird	H5N1	6.0×10^4 $TCID_{50}$/test
Flu A/Shanxi/42/2006	Bird	H5N1	$6.0\times10_4$ $TCID_{50}$/test
Flu A/Fujian/320/2004	Bird	H5N1	3.0×10^5 $TCID_{50}$/test

Influenza A&B Ag Rapid Test Cassette (Swab) can detect all nine influenza B strains.

3. Clinical Study Data Summary

The Influenza A&B Ag Rapid Test performance vs. Cell Culture

Kind of samples	Type	Sensitivity (%)	Specificity (%)	Accuracy (%)
Nasopharyngeal/Nasal Swab	A	98.0 (49/50)	98.0 (147/150)	98.0 (196/200)
	B	98.7 (77/78)	99.5 (199/200)	99.3 (276/278)

Throat Swab	A	98.3 (59/60)	98.4 (123/125)	98.3 (182/185)
	B	98.0 (98/100)	98.5 (191/194)	98.3 (289/294)
Nasal Aspirate	A	98.7 (77/78)	98.6(148/150)	98.7 (225/228)
	B	99.1 (109/110)	99.5 (197/198)	98.3 (306/308)

4. Analytical Specificity and Cross-reactivity

The Influenza A&B Ag Rapid Test Cassette (Swab) was evaluated with a total of 30 bacterial and viral isolates. Bacterial isolates were evaluated at a concentration between 10^7 and 10^9 or g/mL. Viral isolates were evaluated at a concentration of at least 10^4-10^8 $TCID_{50}$/mL. Adenovirus 18 and Parainfluenza virus 3 were tested at 10^2 $TCID_{50}$/mL. None of the organisms or viruses listed below gave a positive result in the Influenza A&B Ag Rapid Test Cassette (Swab).

Bacterial Panel:		**Viral Panel:**	
Acinetobacter calcoaceticus	Bacteroides fragilis	Human Adenovirus B	Human Rhinovirus 2
Neisseria gonorrhoeae	Neisseria meningitidis	Human Adenovirus C	Human Rhinovirus 14
Pseudomonas aeruginosa	Staphylococcus aureus	Adenovirus type 10	Human Rhinovirus 16
Streptococcus pneumoniae	Streptococcus sanguis	Adenovirus type 18	Measles
Proteus vulgaris	Streptococcus sp. Gp. B	Human Coronavirus OC43	Mumps
Streptococcus sp. Gp. C	Streptococcus sp. Gp. G	Human Coxsackievirus A9	Sendai virus
Mycobacterium tuberculosis	Mycoplasma orale	Coxsackievirus B5	Parainfluenza virus 2
		Human herpesvirus2	Parainfl uenza virus 3

5. Interfering Substances

Whole blood, and several over-the-counter (OTC) products and common chemicals were evaluated and did not interfere with the Influenza A&B Ag Rapid Test Cassette (Swab) at the levels tested: whole blood (2%); three OTC mouthwashes (25%); three OTC throat drops (25%); three OTC nasal sprays (10%); 4-Acetamidophenol (10 mg/mL); Acetylsalicylic Acid (20 mg/mL); Chlorpheniramine (5 mg/mL); Dextromethorphan (10 mg/mL); Diphenhydramine (5 mg/mL); Ephedrine (20 mg/mL); Guaiacol glyceryl ether (20 mg/mL); Oxymetazoline (10 mg/mL); Phenylephrine (100 mg/mL); and Phenylpropanolamine (20 mg/mL).

REFERENCES

1. Williams, KM, Jackson MA, Hamilton M. (2002) Rapid Diagnostic Testing for URIs in Children: Impact on Physician Decision Making and Cost. Infect. Med. 19(3): 109-111.
2. Dowdle, W.R, Kendal, A.P., and Noble, G.R. (1980). Influenza Virus, p 836-844. Manual of Clinical Microbiology, 3rd edition, in Lennette, et. al (ed.). American Society for Microbiology, Washington, D.C.
3. “Key Facts about Avian Influenza (Bird Flu) and Avian Influenza A (H5N1) Virus” CDC Publication, May 24, 2005. http://www.cdc.gov/flu/avian/gen-info/facts.htm
4. “Avian Influenza Infection in Humans” CDC Publication, May 24, 2005. http://www.cdc.gov/flu/avian/gen-info/avian-flu-humans.htm
5. “Updated Interim Guidance for Laboratory Testing of Persons with Suspected Infection with Avian Influenza A (H5N1) Virus in the United States” CDC Health Alert, June 7, 2006. http://www.phppo.cdc.gov/HAN/ArchiveSys/ViewMsgV.asp?AlertNum=00246

INDEX OF SYMBOLS

	Consult instructions for use		Tests per kit	EC REP	Authorized Representative
IVD	For *in vitro* diagnostic use only		Use by		Do not reuse
2°C 30°C	Store between 2~30°C	LOT	Lot Number	REF	Catalog#

Zhejiang Orient Gene Biotech Co.,Ltd
Address: 3787#, East Yangguang Avenue, Dipu Street, Anji 313300, Huzhou, Zhejiang, China
Tel: +86-572-5226111 Fax: +86-572-5226222
Website: www.orientgene.com

EC REP Shanghai International Holding Corp. GmbH (Europe)
Add: Eiffestrasse 80, 20537 Hamburg, Germany

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