510(K) SUMMARY

This summary of 510(k) safety and effectiveness information is being submitted in accordance with the requirements of SMDA 1990 and 21 CFR 807.92.

The assigned 510(k) number is: __K133637___

DEC 18 2013

SUBMITTER
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DATE PREPARED

TRADE NAME
Alere™ Influenza A & B Test

COMMON NAME
Not Applicable

CLASSIFICATION NAME
Influenza virus serological reagents (per 21 CFR 866.3330)

CLASSIFICATION
Class I

PRODUCT CODE
GNX

PANEL
Microbiology

PREDICATE DEVICE
Alere™ Influenza A & B Test, K103610

DEVICE DESCRIPTION

The Alere™ Influenza A & B Test is an immunochromatographic membrane assay that uses highly sensitive monoclonal antibodies to detect influenza type A and B nucleoprotein antigens in nasal swab specimens. These antibodies and a control protein are immobilized onto a membrane support as three distinct lines and are combined with other reagents/pads to construct a Test Strip.

Nasal swab samples are added to a Coated Reaction Tube to which an extraction reagent has been added. An Alere™ Influenza A & B Test Strip is then placed in the Coated Reaction Tube holding the extracted liquid sample. Test results are interpreted at 10 minutes based on the presence or absence of pink-to-purple colored Sample Lines. The yellow Control Line turns blue in a valid test.

INTENDED USE

The Alere™ Influenza A & B Test is an *in vitro* immunochromatographic assay for the qualitative detection of influenza A and B nucleoprotein antigens in nasal swab specimens collected from symptomatic patients. It is intended to aid in the rapid differential diagnosis of influenza A and B viral infections. Negative test results are presumptive and should be confirmed by cell culture or an FDA-cleared influenza A and B molecular assay. Negative test results do not preclude influenza viral infection and should not be used as the sole basis for treatment or other patient management decisions.

COMPARISON TO THE PREDICATE

The Alere™ Influenza A & B Test under consideration in this special 510(k) submission is exactly the same as the currently 510(k) cleared Alere™ Influenza A & B Test in all aspects except for the addition of Influenza A H7N9 to the analytical reactivity table. There have been no other modifications to the test; the fundamental scientific technology of the test has not been altered. Both tests use lateral flow immunochromatographic technology. Both tests are rapid immunoassays that employ specific antibodies immobilized onto solid phases to capture and visualize influenza nucleoprotein antigens.

PERFORMANCE SUMMARY

CLINICAL STUDY

Alere™ Influenza A & B Test Performance vs. Viral Culture – Prospective Study

The clinical performance of the Alere™ Influenza A & B Test was established in a multi-center, prospective, clinical study conducted at seven U.S. trial sites during the 2008-2009 respiratory season.

A total of 478 prospective nasal swab specimens, collected from patients of all ages presenting with influenza-like symptoms, were evaluated in the Alere™ Influenza A & B Test and compared to viral culture. Forty-four percent (44%) of the population tested was < 5 years of age, 31% was 5 - < 18 years of age, and 25% was ≥ 18 years. A/H3 and A/H1 were the predominant influenza A subtypes observed during the times the specimens were collected.

Alere™ Influenza A & B Test performance versus viral culture, including 95% confidence intervals, is detailed below.

Alere™ Influenza A & B Test Performance vs. Culture

Influenza Type A

	Culture +	Culture -	
Alere +	45	18	63
Alere -	3	412	415
	48	430	478

Sensitivity: 93.8% (45/48) (95% CI: 83.2, 97.9%)
Specificity: 95.8% (412/430) (95% CI: 93.5, 97.3%)

Influenza Type B

	Culture +	Culture -	
Alere +	65	8	73
Alere -	19*	386	405
	84	394	478

Sensitivity: 77% (65/84) (95% CI: 67.4, 85.0%)
Specificity: 98.0% (386/394) (95% CI: 96.1, 99.0%)

* The nineteen samples that tested positive on culture for influenza B, but were negative on the Alere™ Influenza A & B Test, were also tested on an investigational RT-PCR assay. Ten (10) of these samples were negative for influenza B by PCR.

The rate of invalid results was 1.9% (9/487) with 95% CI: 1.0%, 3.5%.

ANALYTICAL STUDIES

ANALYTICAL SENSITIVITY

The Alere™ Influenza A & B Test limit of detection (LOD or C_{95}), defined as the concentration of influenza virus that produces positive Alere™ Influenza A & B Test results approximately 95% of the time, was identified by evaluating different concentrations of 2 subtypes of live influenza A and 2 strains of live influenza B in the Alere™ Influenza A & B Test. Multiple operators tested each concentration of the four influenza strains multiple times. The concentrations identified as the LOD (or C_{95}) levels for each strain tested are listed below.

Influenza Subtype	Concentration ($TCID_{50}$/ml)	# Detected per Total Tests	% Detected
Influenza A/HongKong/8/68	2.37×10^4	64/66	97%
Influenza A/PuertoRico/8/34	3.16×10^5	37/42	88%
Influenza B/Malaysia/2506/2004	3.00×10^6	19/20	95%
Influenza B/Lee/40	4.20×10^5	19/20	95%

ANALYTICAL REACTIVITY

The influenza A and B strains listed tested positive in the Alere™ Influenza A & B Test at the concentrations specified. Although the specific influenza strains causing infection in humans can vary year to year, all contain the conserved nucleoproteins targeted by the Alere™ Influenza A & B Test[1]. Performance characteristics of the Alere™ Influenza A & B Test for detecting influenza A virus from human specimens were established when H1 and H3 subtypes were prevalent. Performance characteristics of the test when other influenza A virus subtypes are emerging as human pathogens have not been established.

Influenza Strain	Concentration
Flu A/Port Chalmers/1/73 (H3N2)	5.6×10^5 $TCID_{50}$/ml
Flu A/WS/33 (H1N1)	5.0×10^4 $TCID_{50}$/ml
Flu A/Aichi/2/68 (H3N2)	3.0×10^4 $TCID_{50}$/ml
Flu A/Malaya/302/54 (H1N1)	6.0×10^5 $TCID_{50}$/ml
Flu A/New Jersey/8/76 (H1N1)	2.8×10^5 $TCID_{50}$/ml
Flu A/Denver/1/57 (H1N1)	8.9×10^3 $TCID_{50}$/ml
Flu A/Victoria/3/75 (H3N2)	1.8×10^4 $TCID_{50}$/ml

Flu A/Solomon Islands/3/2006 (H1N1)	1.5×10^5 $TCID_{50}$/ml
Flu A/Brisbane/10/07 (H3N2)	2.5×10^6 EIU_{50}/ml
Flu A/PuertoRico/8/34 (H1N1)	5.6×10^5 $TCID_{50}$/ml
Flu A/Wisconsin/67/2005 (H3N2)	1.3×10^5 $TCID_{50}$/ml
Flu A/Hong Kong/8/68 (H3N2)	7.9×10^3 $TCID_{50}$/ml
Flu A/California/04/2009 (H1N1)	1.4×10^5 $TCID_{50}$/ml
Flu A/ANHUI/1/2013 (H7N9)	8.7×10^6 EID_{50}/ml
Flu B/Florida/02/2006	1.4×10^4 $TCID_{50}$/ml
Flu B/Florida/04/2006	7.1×10^4 $TCID_{50}$/ml
Flu B/Florida/07/04	8.5×10^4 $TCID_{50}$/ml
Flu B/Malaysia/2506/04	1.5×10^6 $TCID_{50}$/ml
Flu B/Panama/45/90	1.7×10^4 $TCID_{50}$/ml
Flu B/R75	5.0×10^5 $TCID_{50}$/ml
Flu B/Russia/69	2.2×10^6 $TCID_{50}$/ml
Flu B/Taiwan/2/62	1.0×10^5 $TCID_{50}$/ml
Flu B/Mass/3/66	1.5×10^5 $TCID_{50}$/ml
Flu B/Lee/40	1.8×10^5 $TCID_{50}$/ml

The Alere™ Influenza A & B Test was used to test 55 archived respiratory patient specimens, confirmed to be positive for the 2009 H1N1 influenza virus by an FDA cleared RT-PCR assay. Overall, the Alere™ Influenza A & B Test detected 45% (25/55) of the RT-PCR assay positive specimens. The detection rate was 94% (16/17) with the higher titer specimens and 24% (9/38) with the lower titer specimens.

Although this test has been shown to detect the Flu A/California/04/2009 (H1N1) and A/Anhui/1/2013 (H7N9) viruses cultured from positive human specimens, the performance characteristics of this device with fresh (non-frozen) human specimens infected with these two influenza viruses have not been established. The Alere™ Influenza A & B test can distinguish between influenza A and B viruses, but it does not differentiate seasonal influenza A virus from influenza A 2009 H1N1 or influenza A H7N9. The ability to detect human infection with the 2009 H1N1 or H7N9 influenza virus in clinical specimens is unknown.

ANALYTICAL SPECIFICITY (CROSS-REACTIVITY)

To determine the analytical specificity of the Alere™ Influenza A & B Test, 54 commensal and pathogenic microorganisms (38 bacteria, 15 viruses and 1 yeast) that may be present in the nasal cavity or nasopharynx were tested. All of the following microorganisms were negative when tested at concentrations ranging from 10^8 to 10^{10} cells/ml, CFU/ml or IFU/ml (bacteria), 10^5 to 10^8 $TCID_{50}$/ml or $CEID_{50}$/ml (viruses), and 10^9 cells/ml (yeast).

Bacteria	Viruses	Yeast
Acinetobacter calcoaceticus	Adenovirus type 1	Candida albicans
Bacteroides fragilis	Adenovirus type 7	
Bordetella pertussis	Coronavirus OC43	
Chlamydia pneumoniae	Coronavirus 229E	
Corynebacterium diphtheria	Coxsackievirus B4	
Enterococcus faecalis	Cytomegalovirus (CMV) (Herpes V)	
Escherichia coli	Epstein Barr Virus	
Gardnerella vaginalis	Human metapneumovirus	
Haemophilus influenzae	Measles (Edmonston)	
Klebsiella pneumoniae	Mumps (Enders)	
Lactobacillus casei	Parainfluenza 1	

Lactobacillus plantarum
Legionella pneumophila
Listeria monocytogenes
Moraxella catarrhalis
Mycobacterium avium
Mycobacterium intracellulare
Mycobacterium tuberculosis
Mycoplasma pneumoniae
Neisseria gonorrhoeae
Neisseria meningitidis
Neisseria sicca
Neisseria subflava
Proteus vulgaris
Pseudomonas aeruginosa
Serratia marcescens
Staphylococcus aureus
Staphylococcus aureus (Cowan protein A producing strain)
Staphylococcus epidermidis
Streptococcus, Group A
Streptococcus, Group B
Streptococcus, Group C
Streptococcus, Group F
Streptococcus, Group G
Streptococcus mutans
Streptococcus pneumoniae
Streptococcus salivaris
Streptococcus sanguis
Parainfluenza 2
Parainfluenza 3
Respiratory Syncytial Virus type B
Rhinovirus type 1A

INTERFERING SUBSTANCES

The following substances, naturally present in respiratory specimens or that may be artificially introduced into the nasal cavity or nasopharynx, were evaluated in the Alere™ Influenza A & B Test at the concentrations listed below and were found not to affect test performance. Whole blood (1%) did not interfere with the interpretation of negative Alere™ Influenza A & B Test results, but did interfere with the interpretation of influenza A LOD (or C_{95}) positive samples. Therefore, visibly bloody samples may not be appropriate for use in this test.

Substance	Concentration
3 OTC nasal sprays	10%
3 OTC mouthwashes	10%
3 OTC throat drops	10%
4-acetamidophenol	10 mg/ml
Acetylsalicylic acid	20 mg/ml
Albuterol	20 mg/ml
Chlorpheniramine	5 mg/ml
Dexamethasone	5 mg/ml
Dextromethorphan	10 mg/ml
Diphenhydramine	5 mg/ml
Doxylamine succinate	1 mg/ml

Flunisolide	3 mg/ml
Guaiacol glycerol ether	20 mg/ml
Mucin	1%
Mupirocin	250 µg/ml
Oxymetazoline	10 mg/ml
Phenylephrine	10 mg/ml
Phenylpropanolamine	20 mg/ml
Rebetol® (Ribavirin)	500 ng/ml
Relenza® (Zanamivir)	20 mg/ml
Rimantadine	500 ng/ml
Tamiflu® (Oseltamivir)	100 mg/ml
Tobramycin	40 mg/ml
Triamcinolone	14 mg/ml

REPRODUCIBILITY

A reproducibility study of the Alere™ Influenza A & B Test was conducted by operators from 3 sites using panels of blind coded randomized specimens containing negative, high negative (below the limit of detection), low positive (at the limit of detection), and moderate positive (above the limit of detection) influenza A and B viral samples. Participants tested each sample multiple times on 5 different days. The detection rates for the influenza A moderate positive, low positive, and high negative samples were 99.2% (119/120), 94.2% (113/120) and 9.2% (11/120), respectfully. The detection rates for the influenza B moderate positive, low positive, and high negative samples were 99.2% (119/120), 96.7% (116/120) and 7.5% (9/120), respectfully. All of the negative samples (118) generated negative test results.

Signed _____ Date _____

Angela Drysdale
VP Regulatory and Clinical Affairs – Infectious Disease
Alere Scarborough, Inc.

1) Dowdle, W.R, Kendal, A.P., and Noble, G.R. 1980. Influenza Virus, p 836-884. Manual of Clinical Microbiology, 3rd edition, In Lennette, et. Al (ed.). American Society for Microbiology, Washington, D.C

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
10903 New Hampshire Avenue
Document Control Center – WO66-G609
Silver Spring, MD 20993-0002

December 18, 2013

ALERE SCARBOROUGH, INC.
ANGELA DRYSDALE
VP OF REGULATORY AND CLINICAL AFFAIRS - INFECTIOUS DISEASE
10 SOUTHGATE ROAD
SCARBOROUGH ME 04074

Re: K133637
Trade/Device Name: Alere™ Influenza A & B Test
Regulation Number: 21 CFR 866.3330
Regulation Name: Influenza virus serological reagents
Regulatory Class: I
Product Code: GNX
Dated: November 4, 2013
Received: November 27, 2013

Dear Ms. Drysdale:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Parts 801 and 809); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820); and if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

If you desire specific advice for your device on our labeling regulations (21 CFR Parts 801 and 809), please contact the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638 2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm.

Sincerely yours,

Sally A. Hojvat -S

Sally Hojvat, M.Sc., Ph.D
Director
Division of Microbiology Devices
Office of In Vitro Diagnostics
and Radiological Health
Center for Devices and Radiological Health

Enclosure

Indications For Use

510(k) Number (if known): K133637

Device Name: Alere™ Influenza A & B Test

Intended Use: The Alere™ Influenza A & B Test is an *in vitro* immunochromatographic assay for the qualitative detection of influenza A and B nucleoprotein antigens in nasal swab specimens collected from symptomatic patients. It is intended to aid in the rapid differential diagnosis of influenza A and B viral infections. Negative test results are presumptive and should be confirmed by cell culture or an FDA-cleared influenza A and B molecular assay. Negative test results do not preclude influenza viral infection and should not be used as the sole basis for treatment or other patient management decisions.

Prescription Use ___X___ AND/OR Over-The-Counter Use _____
(Part 21 CFR 801 Subpart D) (21 CFR 807 Subpart C)

(PLEASE DO NOT WRITE BELOW THIS LINE-CONTINUE ON ANOTHER PAGE IF NEEDED)

Concurrence of Center for Devices and Radiological Health (CDRH)

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