510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION
DECISION SUMMARY
DEVICE ONLY TEMPLATE

A. 510(k) Number: K062109

B. Purpose for Submission:
Expand the Indications for Use claim to add nasal swabs specimens, modify cautions statement, include 2 additional influenza A strains in the Analytical Reactivity claim, support use of additional transport media and update the labeling in compliance with FDA Guidance

C. Analyte:
Influenza Type A nucleoprotein antigens

D. Type of Test:
Lateral flow immunochromatographic assay

E. Applicant:
Binax, Inc.

F. Proprietary and Established Names:
BinaxNOW Influenza A & B

G. Regulatory Information:

1. Regulation section:
   21 CFR Part 866.3330

2. Classification:
   Antigens, CF (including CF Control), Influenza virus A, B, C

3. Product Code:
   GNX

4. Panel:
   83 Microbiology

H. Intended Use:

1. Intended use(s):

   The BinaxNOW® Influenza A & B Test is an *in vitro* immunochromatographic assay for the qualitative detection of influenza A and B nucleoprotein antigens in nasopharyngeal (NP) swab, nasal swab, and nasal wash/aspirate specimens. It is intended to aid in the rapid differential diagnosis of influenza A and B viral infections. Negative results do not preclude influenza virus infection and should not be used as the sole basis for treatment or other management decision.

Caution: Assay sensitivity for nasal wash/aspirate samples was determined primarily using archived specimens.
Users may wish to establish the sensitivity of these specimens on fresh samples.

2. Indication(s) for use: NA

3. Special condition for use statement(s):
Prescription use only

4. Special instrument Requirements: NA

I. Device Description:

See: http://www.fda.gov/cdrh/reviews/K041049.pdf

J. Substantial Equivalence Information:

Predicate device name(s): BinaxNOW Influenza A & B

1. Predicate K number(s): K041049

2. Comparison with predicate:

A total of 1183 prospective specimens collected from children (less than 18 years of age) and adults (18 years or older) were evaluated in the BinaxNOW® Influenza A & B Test and compared to culture/DFA. Evaluated specimens include nasopharyngeal, nasal, and throat swabs and nasal wash/aspirates collected from patients presenting with influenza-like symptoms. Forty-three percent (43%) of the population tested was male, 57% female, 52% pediatric (< 18 years), and 48% adult (≥ 18 years). No differences in test performance were observed based on patient age or gender. A/H3 and A/H1 were the predominant influenza subtypes observed during this time.

K. Standard/Guidance Document Referenced (if applicable):

NA

L. Test Principle:

See: http://www.fda.gov/cdrh/reviews/K041049.pdf

M. Performance Characteristics (if/when applicable):

1. Analytical performance:

a. ***Precision/Reproducibility:***

A blind study of the BinaxNOW® Influenza A & B Test was conducted at 3 separate sites using panels of blind coded specimens containing negative, low positive, and moderate positive samples. Participants tested each sample multiple times on 3 different days. There was 96.8% (242/250) agreement with expected test results, with no significant differences within run (replicates tested by one operator), between run (3 different days), between sites (3 sites), or between operators (6 operators).

b. Linearity/assay reportable range: NA

c. Traceability, Stability, Expected values (controls, calibrators, or method):
NA

d. Detection limit:
The BinaxNOW® test limit of detection (LoD), defined as the concentration of influenza virus that produces positive BinaxNOW® test results approximately 95% of the time, was identified by evaluating different concentrations of inactivated Flu A/Beijing and inactivated Flu B/Harbin in the BinaxNOW® test.

Twelve (12) different operators each interpreted 2 devices run at each concentration for a total of 24 determinations per level. The following results identify a concentration of 1.03×10^2 ng/ml as the LoD for Flu A/Beijing and 6.05×10^1 ng/ml for Flu B/Harbin.

e. Assay cut-off:

NA

Comparison studies:

f. Method comparison with predicate device:
See J.3 above

g. Matrix comparison: NA

2. Clinical studies:

BinaxNOW® Influenza A & B Test Performance vs. Cell Culture / DFA – Prospective Study
A total of 1183 prospective specimens collected from children (less than 18 years of age) and adults (18 years or older) were evaluated in the BinaxNOW® Influenza A & B Test and compared to culture/DFA. Evaluated specimens include nasopharyngeal, nasal, and throat swabs and nasal wash/aspirates

collected from patients presenting with influenza-like symptoms. Forty-three percent (43%) of the population tested was male, 57% female, 52% pediatric (< 18 years), and 48% adult (≥ 18 years). No differences in test performance were observed based on patient age or gender. A/H3 and A/H1 were the predominant influenza subtypes observed during this time.

BinaxNOW® A & B Test performance by sample type versus cell culture/DFA, including 95% confidence intervals, is listed below.

BinaxNOW® Influenza A & B Test Performance vs. Cell Culture/DFA for Detection of Flu A

	Test Sensitivity				Test Specificity			
Sample	**+/+**	**-/+**	**% Sens**	**95% CI**	**-/-**	**+/-**	**% Spec**	**95% CI**
NP Swab	53	16	77%	65-86%	278	3	99%	97-100%
Nasal Swab	85	17	83%	74-90%	378	16	96%	93-98%
Overall	162	53	75%	69-81%	947	21	98%	97-99%

BinaxNOW® Influenza A & B Test Performance vs. Cell Culture/DFA for Detection of Flu B

	Test Sensitivity				Test Specificity			
Sample	**+/+**	**-/+**	**% Sens**	**95% CI**	**-/-**	**+/-**	**% Spec**	**95% CI**
NP Swab	2	2	50%	9-91%	346	0	100%	99-100%
Nasal Swab	9	4	69%	39-90%	481	2	100%	98-100%
Overall	13	17	43%	26-62%	1150	3	100%	99-100%

BinaxNOW® Influenza A & B Test Performance vs. Cell Culture / DFA – Retrospective Study

A total of 293 retrospective frozen clinical samples were evaluated in the BinaxNOW® Influenza A & B Test and compared to culture/DFA. All clinical samples were collected from symptomatic patients at multiple physician offices, clinics and hospitals located in the Southern, Northeastern and Midwestern regions of the United States and from one hospital in Sweden. Fifty-three percent (53%) of the population tested was male, 47% female, 62% pediatric (<18 years) and 38% adult (≥ 18 years). Nasal wash/aspirate specimens comprised approximately 61% of the samples tested, while NP swabs represented 39%. No differences in test performance were observed based on patient age and gender or based on sample type tested.

BinaxNOW® A & B Test performance by sample type versus cell culture/DFA, including 95% confidence intervals, is listed below.

BinaxNOW® Influenza A & B Test Performance vs. Cell Culture/DFA for Detection of Flu A

	Test Sensitivity				Test Specificity			
Sample	**+/+**	**-/+**	**% Sens**	**95% CI**	**-/-**	**+/-**	**% Spec**	**95% CI**
NP Swab	19	8	70%	50-86%	77	9	90%	81-95%
Wash/Aspirate	51	6	89%	78-96%	117	6	95%	89-98%
Overall	70	14	83%	73-90%	194	15	93%	88-96%

BinaxNOW® Influenza A & B Test Performance vs. Cell Culture/DFA for Detection of Flu B

	Test Sensitivity				Test Specificity			
Sample	**+/+**	**-/+**	**% Sens**	**95% CI**	**-/-**	**+/-**	**% Spec**	**95% CI**
NP Swab	0	0	N/A	N/A	111	2	98%	93-100%
Wash/Aspirate	8	7	53%	27-78%	155	10	94%	89-97%
Overall	8	7	53%	27-78%	266	12	96%	92-98%

Analytical Sensitivity:

The BinaxNOW® test limit of detection (LOD), defined as the concentration of influenza virus that produces positive BinaxNOW® test results approximately 95% of the time, was identified by evaluating different concentrations of inactivated Flu A/Beijing and inactivated Flu B/Harbin in the BinaxNOW® test.

Twelve (12) different operators each interpreted 2 devices run at each concentration for a total of 24 determinations per level. The following results identify a concentration of 1.03×10^2 ng/ml as the LOD for Flu A/Beijing and 6.05×10^1 ng/ml for Flu B/Harbin.

Influenza A/Beijing		
Concentration (ng/ml)	**# Detected**	**% Detected**
1.03×10^2 (LOD)	23/24	96
5.60×10^1 (Cut-off)	*	50

Influenza B/Harbin		
Concentration (ng/ml)	**# Detected**	**% Detected**
6.05×10^1 (LOD)	23/24	96
2.42×10^1 (Cut-off)	11/24	46

3.27×10^1 (High Neg)	4/24	17
True Negative	0/24	0

1.51×10^1 (High Neg)	6/24	25
True Negative	0/24	0

*Linear regression was used to calculate a line equation, which was then used to project the cutoff concentration of Flu A/Beijing.

a. Other clinical supportive data (when a and b are not applicable):

3. Clinical cut-off: NA

4. Expected values/Reference range:

The prevalence of influenza varies from year to year, with outbreaks typically occurring during the fall and winter months.[1] The rate of positivity found in influenza testing is dependent on many factors including the method of specimen collection, the test method used, geographic location, and the disease prevalence in specific localities. Type A viruses are typically associated with most serious influenza epidemics, while Type B are typically milder. In multi-center clinical studies conducted by Binax outside the U.S. during the 2004 respiratory season and in the US during the 2004-2005 respiratory season, the average prevalence of influenza A (as determined by viral cell culture) was 18%. The average prevalence of influenza B was 3%.

N. Conclusion:

The submitted material in this premarket notification is complete and supports a substantial equivalence decisio