K131728

510(k) Summary

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Device Name:

Trade name – **Quidel Molecular Influenza A + B Assay**
Classification name – Respiratory viral panel multiplex nucleic acid assay
Product Code – OZE
Subsequent Product Code - OOI
Regulation – 21 CFR 866.3980
Classification – Class II

Device Description:

The Quidel Molecular Influenza A+B Assay detects viral nucleic acids that have been extracted from a patient sample using the NucliSENS® easyMAG® automated extraction platform. A multiplex real-time RT-PCR reaction is carried out under optimized conditions in a single tube generating amplicons for each of the target viruses present in the sample. This reaction is performed utilizing the Life Technologies QuantStudio™ Dx, the Applied Biosystems® 7500 Fast Dx, or the Cepheid SmartCycler® II platform. Identification of influenza A occurs by the use of target specific primers and a fluorescent-labeled probe that hybridizes to a conserved influenza A sequence within the matrix protein gene. Identification of influenza B occurs by the use of target specific primers and fluorescent-labeled probes that will hybridize to a conserved influenza B sequence within the neuraminidase gene.

The following is a summary of the procedure:

1. **Sample Collection:** Obtain nasal swab and nasopharyngeal swab specimens using standard techniques from symptomatic patients. These specimens are transported, stored, and processed according to established laboratory procedures.

2. **Nucleic Acid Extraction:** Extract Nucleic Acids from the specimens with the NucliSENS® easyMAG® System following the manufacturer's instructions using the appropriate reagents.

   Prior to the extraction procedure add 20 µL of the Process Control (PRC) to each 180 µL aliquot of specimen. The PRC serves to monitor inhibitors in the extracted specimen, assures that adequate amplification has taken place and that nucleic acid extraction was sufficient.

3. **Rehydration of Master Mix:** Rehydrate the lyophilized Master Mix using 135µL of Rehydration Solution. The Master Mix contains oligonucleotide primers, fluorophore and quencher-labeled probes targeting highly conserved regions of the influenza A and influenza B viruses as well as the process control sequence. The primers are complementary to highly specific and conserved regions in the genome of these viruses. The probes are dual labeled with a reporter dye attached to the 5-end and a quencher attached to the 3'-end. The rehydrated Master Mix is sufficient for eight reactions.

4. **Nucleic Acid Amplification and Detection:** Add 15 µL of the rehydrated Master Mix to each reaction tube or plate well. 5 µL of extracted nucleic acids (specimen with PRC) is then added to the reaction tube or plate well. Place the tube into the Cepheid SmartCycler® II instrument, or place the plate into either the Applied Biosystems® 7500 Fast Dx instrument or Life Technologies QuantStudio™ Dx.

Once the reaction tube or plate is added to the instrument, the assay protocol is initiated. This protocol initiates reverse transcription of the RNA targets generating complementary DNA, and the subsequent amplification of the target sequences occurs. The Quidel Molecular Influenza A+B Assay is based on TaqMan® chemistry, and uses an enzyme with reverse transcriptase, DNA polymerase, and 5'-3' exonuclease activities. During DNA amplification, this enzyme cleaves the probe bound to the complementary DNA sequence, separating the quencher dye from the reporter dye. This step generates an increase in fluorescent signal upon excitation by a light source of the appropriate wavelength. With each cycle, additional dye molecules are separated from their quenchers resulting in additional signal. If sufficient

fluorescence is achieved the sample is reported as positive for the detected target sequence

Intended Use:

The Quidel Molecular Influenza A+B Assay is a multiplex Real Time RT-PCR assay for the in vitro qualitative detection and differentiation of influenza A and influenza B viral RNA in nasal and nasopharyngeal swabs from patients with signs and symptoms of respiratory infection. This test is intended for use as an aid in the differential diagnosis of influenza A and influenza B viral infections in humans in conjunction with clinical and epidemiological risk factors. The assay does not detect the presence of influenza C virus.

Negative results do not preclude influenza virus infection and should not be used as the sole basis for diagnosis, treatment or other patient management decisions.

Performance characteristics for influenza A were established during the 2011 and 2013 influenza seasons when influenza A/H3 and 2009 H1N1 influenza were the predominant influenza A viruses in circulation. When other influenza A viruses are emerging, performance characteristics may vary.

If infection with a novel influenza A virus is suspected based on current clinical and epidemiological screening criteria recommended by public health authorities, specimens should be collected with appropriate infection control precautions for novel virulent Influenza viruses and sent to state or local health department for testing. Viral culture should not be attempted in these cases unless a BSL 3+ facility is available to receive and culture specimens.

The assay can be performed using the Life Technologies QuantStudio™ Dx, the Applied Biosystems® 7500 Fast Dx, or the Cepheid SmartCycler® II.

Conditions for Use:

For prescription use only.

Device Comparison

The Quidel Molecular Influenza A+B Assay was compared to Prodesse ProFlu+ ("Comparator Device"). The characteristics of Quidel Molecular Influenza A+B Assay ("Subject Device") and the two predicates, Quidel Molecular Influenza A+B Assay (previously cleared for use with two other instruments) and the Prodesse ProFlu+ are described in the table below:

Device Comparison			
Item	**Subject Device** Quidel Molecular Influenza A+B Assay	**Comparator Device** Quidel Molecular Influenza A+B Assay (k112172, k113777)	**Comparator Device** Prodesse ProFlu+ (k092500)
Intended Use	The Quidel Molecular Influenza A+B Assay is a multiplex Real Time RT-PCR assay for the *in vitro* qualitative detection and differentiation of influenza A and influenza B viral RNA in nasal and nasopharyngeal swabs from patients with signs and symptoms of respiratory infection. This test is intended for use as an aid in the differential diagnosis of influenza A and influenza B viral infections in humans in conjunction with clinical and epidemiological risk factors. The assay does not detect the presence of influenza C virus. Negative results do not preclude influenza virus infection and should not be used as the sole basis for diagnosis, treatment or other patient management	The Quidel Molecular Influenza A+B Assay is a multiplex Real Time RT-PCR assay for the in vitro qualitative detection and differentiation of influenza A and influenza B viral RNA in nasal and nasopharyngeal swabs from patients with signs and symptoms of respiratory infection. This test is intended for use as an aid in the differential diagnosis of influenza A and influenza B viral infections in humans in conjunction with clinical and epidemiological risk factors. The assay does not detect the presence of influenza C virus. Negative results do not preclude Influenza virus infection and should not be used as the sole basis for diagnosis, treatment or other patient management	The ProFlu™+ Assay is a multiplex Real-Time PCR (RT-PCR) *in vitro* diagnostic test for the rapid and qualitative detection and discrimination of Influenza A Virus, Influenza B Virus, and Respiratory Syncytial Virus (RSV) nucleic acids isolated and purified from nasopharyngeal (NP) swab specimens obtained from symptomatic patients. This test is intended for use to aid in the differential diagnosis of Influenza A, Influenza B and RSV viral infections in humans and is not intended to detect Influenza C. Negative results do not preclude influenza or RSV virus infection and should not be used as the sole basis for treatment or other management decisions. It is recommended that

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	decisions. Performance characteristics for influenza A were established during the 2011 and 2013 influenza seasons when influenza A/H3 and 2009 H1N1 influenza were the predominant influenza A viruses in circulation. When other influenza A viruses are emerging, performance characteristics may vary. If infection with a novel influenza A virus is suspected based on current clinical and epidemiological screening criteria recommended by public health authorities, specimens should be collected with appropriate infection control precautions for novel virulent Influenza viruses and sent to state or local health department for testing. Viral culture should	decisions. Performance characteristics for influenza A were established during the 2011 influenza season when influenza A/H3 and 2009 H1N1 influenza were the predominant influenza A viruses in circulation. When other influenza A viruses are emerging, performance characteristics may vary. If infection with a novel influenza A virus is suspected based on current clinical and epidemiological screening criteria recommended by public health authorities, specimens should be collected with appropriate infection control precautions for novel virulent Influenza viruses and sent to state or local health department for testing. Viral culture should not be attempted in	negative RSV results be confirmed by culture. Performance characteristics for Influenza A Virus 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. If infection with a novel Influenza A virus is suspected based on current clinical and epidemiological screening criteria recommended by public health authorities, specimens should be collected with appropriate infection control precautions for novel virulent Influenza viruses and sent to state or local health department for testing. Viral culture should not be

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	not be attempted in these cases unless a BSL 3+ facility is available to receive and culture specimens. The assay can be performed using either the Life Technologies QuantStudio™ Dx; the Applied Biosystems® 7500 Fast Dx, or the Cepheid SmartCycler® II.	these cases unless a BSL 3+ facility is available to receive and culture specimens.	attempted in these cases unless a BSL 3+ facility is available to receive and culture specimens.
Assay Target	Influenza A virus, influenza B virus	Influenza A virus, influenza B virus	Influenza A virus, influenza B virus, respiratory syncytial virus
Sample Types	nasal swab and nasopharyngeal swab	nasal swab and nasopharyngeal swab	nasopharyngeal swab
Extraction Methods	bioMérieux easyMAG® Automated Magnetic Extraction Reagents	bioMérieux easyMAG Automated Magnetic Extraction Reagents	Roche MagNA Pure LC Total Nucleic Acid Isolation Kit or the bioMérieux easyMAG Automated Magnetic Extraction Reagents
Assay Methodology	PCR-based system for detecting the presence or absence of viral RNA in clinical specimens	PCR-based system for detecting the presence or absence of viral RNA in clinical specimens	PCR-based system for detecting the presence or absence of viral RNA in clinical specimens
Detection	Multiplex assay using	Multiplex assay using	Multiplex assay using

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Techniques	different reporter dyes for each target	different reporter dyes for each target	different reporter dyes for each target
Viral Targets	Influenza A: Matrix Gene; Influenza B: conserved influenza B sequence within the neuraminidase gene	Influenza A: Matrix Gene; Influenza B: conserved influenza B sequence within the neuraminidase gene	Influenza A: Matrix Gene; Influenza B: Non-structural NS1 and NS2
LoD	The analytical sensitivity (limit of detection or LoD) of the Quidel Molecular Influenza A+B assay was determined using quantified ($TCID_{50}$/mL) cultures of five (5) influenza A strains, three (3) influenza B strains, serially diluted in negative nasopharyngeal matrix. Each dilution was extracted using the NucliSENS easyMAG System and tested in replicates of 20 per concentration of virus on the Life Technologies QuantStudio™ Dx; the Applied Biosystems® 7500 Fast Dx, or the Cepheid SmartCycler® II.	The analytical sensitivity (limit of detection or LoD) of the Quidel Molecular Influenza A+B assay was determined using quantified ($TCID_{50}$/mL) cultures of 3 influenza A strains (1 H1N1, 1 2009H1N1 and 1 H3N2), 3 influenza B strains, serially diluted in negative nasopharyngeal matrix. Each dilution was extracted using the NucliSENS easyMAG System and tested in replicates of 20 per concentration of virus on the Applied Biosystems® 7500 Fast Dx platform and the Cepheid SmartCycler II. Analytical sensitivity (LoD), as defined as	The analytical sensitivity (limit of detection or LoD) of the ProFlu+ Assay was determined using quantified ($TCID_{50}$/mL) cultures of 4 Influenza A (2 H1N1 and 2 H3N2), 2 Influenza B, 2 Respiratory Syncytial Virus Type A, and 2 Respiratory Syncytial Virus Type B strains serially diluted in nasopharyngeal clinical matrix. Each viral strain was extracted using the Roche MagNA Pure LC instrument and tested in replicates of 20 per concentration of virus. Analytical sensitivity (LoD), as defined as the lowest concentration at

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	Analytical sensitivity (LoD), as defined as the lowest concentration at which 95% of all replicates tested positive, ranged from 10^1 to 10^0 $TCID_{50}$/mL.	the lowest concentration at which 95% of all replicates tested positive, ranged from 10^1 to 10^0 $TCID_{50}$/mL.	which 95% of all replicates tested positive, ranged from 10^2 to 10^{-1} $TCID_{50}$/mL.

Analytical Performance:

Precision/Reproducibility:

The reproducibility of the Quidel Molecular Influenza A and B Assay was evaluated at 3 laboratory sites. Reproducibility was assessed using a panel of 4 simulated samples. The panels consisted of 2 positive samples (above LoD), a high negative (0.3x LoD) sample and a negative sample for each virus, influenza A (A/Mexico/4108/2009) and influenza B (B/Florida/04/2006). Panels and controls were tested at each site by 2 operators for 5 days (triplicate testing x 2 operators x 5 days x 3 sites = 90 results per level for each virus). The panels and controls were extracted using the bioMérieux easyMAG® system and tested on the Life Technologies QuantStudio™ Dx.

Reproducibility Results - Life Technologies QuantStudio™ Dx												
Panel Member ID	Site 1			Site 2			Site 3			Combined Site Data		
	Rate of Detection	AVE Ct	%CV	Rate of Detection	AVE Ct	%CV	Rate of Detection	AVE Ct	%CV	Rate of Detection	AVE Ct	%CV
Influenza A High Negative (0.3 x LoD)	25/30	37.4 *	3.8	13/30	38.2 *	2.6	4/28**	37.5 *	4.2	42/88**	37.2	3.6
Influenza A Positive 1	30/30	27.5	2.5	30/30	27.7	2.1	29/29**	27.9	4.3	89/89**	27.7	3.1
Influenza A Positive 2	30/30	26.4	1.7	30/30	26.4	1.8	30/30	27.0	6.1	90/90	26.6	3.9
Influenza	0/30	N/A	N/A	0/30	N/A	N/A	0/30	N/A	N/A	0/90	N/A	N/A

Reproducibility Results - Life Technologies QuantStudio™ Dx												
Panel Member ID	Site 1			Site 2			Site 3			Combined Site Data		
	Rate of Detection	AVE Ct	%CV	Rate of Detection	AVE Ct	%CV	Rate of Detection	AVE Ct	%CV	Rate of Detection	AVE Ct	%CV
A Negative												
Influenza B High Negative (0.3 x LoD)	28/30	37.7 *	3.1	23/30	37.8 *	3.6	14/28**	37.7 *	2.7	65/88**	37.7	3.2
Influenza B Positive 1	30/30	25.8	1.8	30/30	25.4	1.5	29/29	25.9	8.7	89/89**	25.7	5.2
Influenza B Positive 2	30/30	24.4	1.8	30/30	24.0	1.7	30/30	24.9	8.8	90/90	24.4	5.5
Influenza B Negative	0/30	N/A	N/A	0/30	N/A	N/A	0/30	N/A	N/A	0/90	N/A	N/A
Influenza A Positive Control	30/30	28.7	2.7	30/30	30.7	2.1	30/30	31.7	9.2	90/90	30.4	7.1
Influenza B Positive Control	30/30	27.9	1.2	30/30	27.5	1.8	30/30	29.9	6.9	90/90	28.7	6.6
Negative Control	0/30	N/A	N/A	0/30	N/A	N/A	0/30	N/A	N/A	0/90	N/A	N/A

*Average Ct of positive results only

** One or more of the replicates was invalid due to non-detection of the PRC

Upon review of the Life Technologies QuantStudio™ Dx reproducibility data it was determined that the concentration of the positive samples was higher than expected. A supplemental study was conducted internally using a near-LoD specimen. In this study, a sample with a low positive concentration (2x LoD) for influenza A and for influenza B and a negative sample were each extracted on three bioMérieux easyMAG® systems and then tested on three Life Technologies QuantStudio™ Dx platforms. The two samples and controls were tested by two operators per instrument for five days, each sample tested in 3 replicates, for a total of 90 results per sample for each virus for each instrument (2 operators x 5 days x 3 instruments x 3 replicates). This data is presented separately as a supplemental study.

Reproducibility Results - Life Technologies QuantStudio™ Dx – Supplemental Study												
Panel Member ID ($TCID_{50}$/mL)	QuantStudio™ #1			QuantStudio™ #2			QuantStudio™ #3			Combined Instrument Data		
	Rate of Detection	AVE Ct	%CV	Rate of Detection	AVE Ct	%CV	Rate of Detection	AVE Ct	%CV	Rate of Detection	AVE Ct	%CV
Influenza A Low Positive (3.90E+01)	30/30	35.1	3.5	30/30	33.7	4.6	30/30	35.7	3.1	90/90	34.8	4.4
Influenza A Negative	0/30	N/A	N/A	0/30	N/A	N/A	0/30	N/A	N/A	0/90	N/A	N/A
Influenza B Low Positive (2.01E+02)	30/30	35.2	3.1	30/30	34.5	3.2	30/30	35.6	2.7	90/90	35.1	3.2
Influenza B Negative	0/30	N/A	N/A	0/30	N/A	N/A	0/30	N/A	N/A	0/90	N/A	N/A
Influenza A Positive Control	30/30	31.0	4.6	30/30	30.9	6.1	30/30	31.3	4.0	90/90	31.1	5.0
Influenza B Positive Control	30/30	27.7	1.5	30/30	27.7	3.2	30/30	28.1	1.3	90/90	27.8	2.3
Negative Control	0/30	N/A	N/A	0/30	N/A	N/A	0/30	N/A	N/A	0/90	N/A	N/A

The data from the combined sites indicates that the Quidel Molecular Influenza A + B Assay generates reproducible results for both influenza A and influenza B viruses when tested with the Life Technologies QuantStudio™ Dx.

Limit of Detection

The analytical sensitivity (limit of detection or LoD) of the Quidel Molecular Influenza A+B Assay was determined using quantified ($TCID_{50}$/mL) cultures of five influenza A strains and three influenza B strains, serially diluted in negative nasopharyngeal matrix. Each dilution was extracted using the NucliSENS® easyMAG® System in replicates of 20 per concentration of virus and tested on both the Cepheid SmartCycler® II, the Applied Biosystems® 7500 Fast Dx, and the Life Technologies QuantStudio™ Dx platforms. Analytical sensitivity (LoD) is defined as the lowest concentration at which at least 95% of all replicates tested positive. The demonstrated LoD for each of the three instruments is shown below.

Strain	**Final LOD ($TCID_{50}$/mL) Cepheid SmartCycler® II (K113777)**	**Final LOD ($TCID_{50}$/mL) Applied Biosystems® 7500 Fast Dx (K112172)**	**Final LOD ($TCID_{50}$/mL) Life Technologies QuantStudio™ Dx (K131728)**
A/Mexico/4108/2009 (H1N1)	2.40E+01	4.80E+01	2.0E+01
A1/Mal/302/54 (H1N1)	7.00E+00	1.60E+01	N/A
A/Victoria/3/75 (H3N2)	3.10E+01	9.20E+01	N/A
A/Brisbane/59/2007 (H1N1)	N/A	3.33E+01	1.00E+02
A/Brisbane (H3N2)	N/A	1.00E+01	5.00E+01
B/RCHIN 8/05	1.80E+00	1.20E+01	N/A
B/Brisbane '09-'10 Vaccine Strain	N/A	1.50E+02	1.00E+02
B/Florida/04/2006	6.00E+00	4.30E+01	1.00E+02
B/Malaysia/25/06/04	1.30E+00	5.70E+00	1.00E+00

Analytical reactivity (inclusivity)

The reactivity of the Quidel Molecular Influenza A+B Assay was evaluated against multiple strains of influenza A and influenza B viruses. The clinical influenza panel consisted of ten Influenza A subtype H1N1, two Influenza A subtype 2009H1N1, eight Influenza A subtype H3N2, two Influenza A subtype H5N1, and 13 Influenza B strains. An additional panel of non-clinical restricted isolates was also tested. Each panel member was extracted using the NucliSENS® easyMAG® instrument and tested in triplicate on both the Cepheid SmartCycler® II and Applied Biosystems® 7500 Fast Dx platforms.

In 2013 additional studies were performed using two new and unique strains of influenza A virus (H3N2v and H7N9). Six (6) isolates of the H3N2v strain were extracted using the NucliSENS® easyMAG® instrument and tested in triplicate on both the Life Technologies QuantStudio™ Dx and the Applied Biosystems® 7500 Fast Dx platforms. An inactivated isolate of H7N9 was extracted using the NucliSENS® easyMAG® instrument and tested in triplicate on both the Life Technologies QuantStudio™ Dx and Applied Biosystems® 7500 Fast Dx platforms.

The Quidel Molecular Influenza A+B Assay detected 100% of the influenza A (45/45) and influenza B strains (15/15) at 2 to 3x LoD levels including pandemic and avian influenza A strains and recent circulating influenza A variant strains.

Influenza A Viruses				
Subtype	**Strain**	**$TCID_{50}$/mL**	**A**	**B**
2009 H1N1	H1N1 A/California/07/2009	1.45E+02	Positive	Negative
H1N1	A/New Caledonia/20/1999	1.12E+02	Positive	Negative
H1N1	A/New Jersey/8/76	3.80E+02	Positive	Negative
H1N1	A/PR/8/34	5.89E+02	Positive	Negative
H1N1	A/NWS/33	NA	Positive	Negative
H1N1	A/Denver/1/57	1.26E+02	Positive	Negative
H1N1	A/FM/1/47	3.80E+02	Positive	Negative
2009 H1N1	A/Mexico/4108/2009	1.40E+02	Positive	Negative
H1N1	A1/Mal/302/54	4.19E+02	Positive	Negative
H1N1	A/Taiwan/42/06	3.39E+02	Positive	Negative
H1N1	A/Brisbane/59/07	7.24E+01	Positive	Negative
H1N1	A/Solomon Islands/3/06	1.41E+01	Positive	Negative
H3N2	A/WI/629-2/2008 (H3N2)	2.00E+02	Positive	Negative
H1N1	A/WI/629-S7(D02473)/2009 (H1N1pdm)	2.00E+02	Positive	Negative
H1N1	A/WI/629-S5 (D02312)/2009 (H1N1pdm)	2.00E+02	Positive	Negative
H3N2	A/Hong Kong/8/68	1.15E+02	Positive	Negative
H3N2	A/Wisconsin/67/2005	7.24E+02	Positive	Negative
H3N2	A/Aichi/2/68	4.17E+02	Positive	Negative
H3N2	A/Port Chalmers/1/73	4.57E+02	Positive	Negative
H3N2	A/Perth/16/2009	9.83E+02	Positive	Negative
H3N2	A/Uruguay/7/16/2007	1.03E+02	Positive	Negative
H3N2	A/Victoria/3/75	2.19E+02	Positive	Negative
H3N2	A/Brisbane/10/07	4.17E+02	Positive	Negative
H3N2v	A/Indiana/10/11	5.90E+01	Positive	Negative
H3N2v	A/Kansas/13/9	4.90E+01	Positive	Negative
H3N2v	A/Pennsylvania/14/10	4.80E+01	Positive	Negative
H3N2v	A/Victoria/361/11	5.20E+01	Positive	Negative
H3N2v	A/Minnesota/11/10	4.60E+01	Positive	Negative
H3N2v	A/West Virginia/6/11	5.00E+01	Positive	Negative
H7N9*	A/ANHUI/1/2013	3.95E+03*	Positive	Negative

* Inactivated virus – relative EID_{50} Titer/mL

Influenza B Viruses			
Strain	**$TCID_{50}$/mL**		
		A	**B**
B/HongKong/5/72	6.67E+02	Negative	Positive
B/Panama/45/90	1.02E+02	Negative	Positive
B/Florida/02/2006	3.16E+02	Negative	Positive
B/Florida/04/2006	3.80E+02	Negative	Positive
B/Florida/07/2004	1.26E+02	Negative	Positive
B/Malaysia/25/06/04	3.41E+02	Negative	Positive
B/Maryland/1/59	1.15E+02	Negative	Positive
B/Allen/45	4.17E+02	Negative	Positive
B/Taiwan/2/62	1.51E+02	Negative	Positive
B/Russia/69	2.19E+02	Negative	Positive
B/Mass/3/66	1.38E+02	Negative	Positive
B/Lee/40	1.95E+02	Negative	Positive
B/GL/1739/54	6.30E+02	Negative	Positive

The following avian strains were tested as cultured isolates in a BS-3 facility.

Non-clinical Restricted Influenza A Viruses				
Subtype	**Strain**	**$TCID_{50}$/mL**		
			A	**B**
H2N2	A/Mallard/NY/6750/78 (H2N2)	2.00E+02	Positive	Negative
H7N3	A/Chicken/NJ/15086-3/94 (H7N3)	2.00E+02	Positive	Negative
H9N2	A/Chicken/NJ/12220/97 (H9N2)	2.00E+02	Positive	Negative
H4N8	A/Mallard/OH/338/86 (H4N8)	2.00E+02	Positive	Negative
H6N2	A/Chicken/CA/431/00 (H6N2)	2.00E+02	Positive	Negative
H8N4	A/Blue Winged Teal/LA/B174/86 (H8N4)	2.00E+02	Positive	Negative
H5N1	A/Anhui/01/2005(H5N1)-PR8-IBCDC-RG5	2.00E+02	Positive	Negative
H10N7	A/GWT/LA/169GW/88 (H10N7)	2.00E+02	Positive	Negative
H11N9	A/Chicken/NJ/15906-9/96 (H11N9)	2.00E+02	Positive	Negative
H12N5	A/Duck/LA/188D/87 (H12N5)	2.00E+02	Positive	Negative
H13N6	A/Gull/MD/704/77 (H13N6)	2.00E+02	Positive	Negative
H14N5	A/Mallard/GurjevRussia/262/82 (H14N5)	2.00E+02	Positive	Negative
H15N9	A/Shearwater/Australia/2576/79 (H15N9)	2.00E+02	Positive	Negative
H16N3	A/Shorebird/DE/172/2006(H16N3)	2.00E+02	Positive	Negative

Carryover and Cross-contamination Studies

An internal study was completed with the Cepheid SmartCycler® II, the Applied Biosystems® 7500 Fast Dx, and Life Technologies QuantStudio™ Dx platform where a number of PCR reactions were performed in five separate extractions and PCR runs. Each extraction run had alternating high positive and high negative samples within the same disposable. Each PCR run had alternating high positive and negative samples. All the high positive samples were positive for influenza A and influenza B (100%). All of the high negative samples were negative for influenza A and influenza B. The data demonstrates that no carry-over or cross contamination was observed with the bioMérieux NucliSENS® easyMAG® automated nucleic acid extraction instrument and the Cepheid SmartCycler® II instrument, the Applied Biosystems® 7500 Fast Dx, or Life Technologies QuantStudio™ Dx platform.

Analytical Specificity (Cross-reactivity)

Please see K113777 for Analytical Specificity (Cross-Reactivity) studies.

Analytical Specificity – Interfering Substances

Please see K113777 for Analytical Specificity (Interfering Substances) studies.

Clinical Performance:

Performance characteristics of the Quidel Molecular Influenza A + B Assay using the Life Technologies QuantStudio™ Dx were established during a prospective study during the 2013 respiratory virus season (January to March 2013). Six hundred and thirty-one (631) fresh swab specimens that were collected for routine respiratory virus testing were used for this study at three sites across the United States. A single specimen was collected per patient. The specimens were extracted with the bioMérieux easyMAG® and tested with Quidel Molecular Influenza A + B Assay using the Life Technologies QuantStudio™ Dx. The specimens were also tested with a high performance FDA-cleared Influenza A and B molecular test.

The gender and age demographics

Age and Gender Distribution		
Sex	F	M
Total	339	292
≤ 5 years	124 (36.6%)	103 (35.3%)
6 – 21 years	90 (26.5%)	103 (35.3%)
22 – 59 years	67 (19.8%)	47 (16.1%)
≥ 60 years	58 (17.1%)	39 (13.4%)
Total	339	292

Six hundred and thirty-one (631) fresh swab specimens were tested by both the subject and comparator device for influenza A and influenza B viral RNA. Four (4) of these specimens were invalid on initial testing with the subject device (0.6%, 95% CI: 0.2% to 1.6%). Re-testing of the specimens according to the Interpretation algorithm described above also yielded invalid results. Eight (8) specimens were invalid on initial and repeat testing (as per the device's PI) on the comparator device (1.3%, 95% CI: 0.6% to 2.5%). A total of twelve (12) invalid specimens have been removed from additional analysis. The table below details the performance of the Quidel Influenza A + B Assay on the QuantStudio™ Dx with the remaining 619 specimens when compared to a commercially available FDA-cleared RT-PCR influenza detection device.

Influenza A			
	Comparator: FDA-cleared RT-PCR device		
Quidel Molecular	Positive	Negative	Total
Positive	204	33	237
Negative	0	382	382
Total	204	415	619
			95% CI
Positive Percent Agreement	204/204	100%	98.2% to 100%
Negative Percent Agreement	382/415	92.0%	89.0% to 94.3%

Influenza B			
	Comparator: FDA-cleared RT-PCR device		
Quidel Molecular	Positive	Negative	Total
Positive	106	10	116
Negative	1	502	503
Total	107	512	619
			95% CI
Positive Percent Agreement	106/107	99.1%	94.9% to 99.8%
Negative Percent Agreement	502/512	98.0%	96.4% to 98.9%

The prospective clinical study had a dual infection rate for Influenza A and Influenza B of 1.8% (11/631, 95% CI: 1.0% to 3.1%) using the Quidel Molecular Influenza A + B Assay. Three (3) of these dual infections were concordant with the FDA-cleared RT-PCR device comparator assay. Six (6) of

these dual infections were discordant with the influenza A results from the FDA-cleared RT-PCR device comparator assay. Two (2) of these dual infections were discordant with the influenza B results from the FDA-cleared RT-PCR device comparator assay.

Conclusion

When performed on the Life Technologies QuantStudio™ Dx, the Quidel Molecular Influenza A + B Assay yielded good positive and negative percent agreement when compared to a 510(k) cleared molecular device.

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

August 29, 2013

Ronald H. Lollar
Senior Director, Clinical and Regulatory Affairs
Quidel Corporation
1055 East State Street, Suite 100
Athens, OH 45701

Re: K131728
Trade/Device Name: Quidel Molecular Influenza A + B Assay
Regulation Number: 21 CFR 866.3980
Regulation Name: Respiratory viral panel multiplex nucleic assay
Regulatory Class: Class II
Product Code: OZE, OOI
Dated: June 11, 2013
Received: June 12, 2013

Dear Mr. Lollar:

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 Part 801); 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 regulation (21 CFR Part 801), 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 A. Hojvat, M. Sc., Ph.D.
Director, Division of Microbiology Devices
Office of In Vitro Diagnostics and
Radiological Health (OIR)
Center for Devices and Radiological Health

Enclosure

Indications for Use

510(k) Number (if known): k131728

Device Name: Quidel Molecular Influenza A+B Assay

Indications For Use:

The Quidel Molecular Influenza A+B Assay is a multiplex Real Time RT-PCR assay for the in vitro qualitative detection and differentiation of influenza A and influenza B viral RNA in nasal and nasopharyngeal swabs from patients with signs and symptoms of respiratory infection. This test is intended for use as an aid in the differential diagnosis of influenza A and influenza B viral infections in humans in conjunction with clinical and epidemiological risk factors. The assay does not detect the presence of influenza C virus.

Negative results do not preclude influenza virus infection and should not be used as the sole basis for diagnosis, treatment or other patient management decisions.

Performance characteristics for influenza A were established during the 2011 and 2013 influenza seasons when influenza A/H3 and 2009 H1N1 influenza were the predominant influenza A viruses in circulation. When other influenza A viruses are emerging, performance characteristics may vary.

If infection with a novel influenza A virus is suspected based on current clinical and epidemiological screening criteria recommended by public health authorities, specimens should be collected with appropriate infection control precautions for novel virulent Influenza viruses and sent to state or local health department for testing. Viral culture should not be attempted in these cases unless a BSL 3+ facility is available to receive and culture specimens.

The assay can be performed using either the Life Technologies QuantStudio™ Dx, the Applied Biosystems® 7500 Fast Dx, or the Cepheid SmartCycler® II.

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

Tamara V. Feldblyum -S
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