

**510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION  
DECISION SUMMARY  
ASSAY ONLY TEMPLATE**

**A. 510(k) Number:**

K081030

**B. Purpose for Submission:**

Request for removal of the requirement for culture confirmation of influenza A and B negative sample results from intend use of K073029 and adding the use of the bioMerieux EasyMag nucleic acid purification method.

**C. Measurand:**

See K073029

**D. Type of Test:**

See K073029

**E. Applicant:**

Prodesse Incorporated

**F. Proprietary and Established Names:**

ProFlu™ Plus

Common Name: Respiratory Viral Panel (RVP) Multiplex Nucleic Acid Detection Assay

**G. Regulatory Information:**

1. Regulation section:  
21 CFR 866.3980, Respiratory viral panel multiplex nucleic acid assay
2. Classification:  
Class II
3. Product code:  
OCC
4. Panel:  
Microbiology (83)

**H. Intended Use:**

1. Intended use(s):

The ProFlu+™ Assay is a multiplex Real Time 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 negative RSV results be confirmed by culture.

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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 infections 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.

2. Indication(s) for use:  
Same as Intended Use.
3. Special conditions for use statement(s):  
For prescription use only
4. Special instrument requirements:  
Cepheid SmartCycler II Real Time Instrument

## **I. Device Description:**

See K073029

## **Materials Provided**

See K073029

## **Materials Required But Not Provided**

### ***Plasticware and consumables***

- Polyester, rayon or nylon tipped nasopharyngeal swabs
- RNase/DNase-free 1.5 mL polypropylene microcentrifuge tubes
- Sterile RNase/DNase-free filter or positive displacement micropipettor tips
- MagNA Pure LC System Disposables (Reagent Tubes, Reaction Tips, Tip Trays, Cartridges) or easyMAG System Disposables (Sample Vessels and Tips)
- Biohit Pipette Tips for use with easyMAG System
- Greiner Break Four uncoated plates for use with easyMAG System
- Cepheid PCR reaction tubes, 25 µL
- Parafilm<sup>®</sup> M or MagNA Pure LC Cartridge Seals

### ***Reagents***

- Roche MagNA Pure LC Total Nucleic Acid Isolation Kit (*Roche Cat. # 03038505001*) for 192 isolations or bioMérieux NucliSENS easyMAG reagents (*Buffer 1 Cat. # 280130, Buffer 2 Cat. # 280131, Buffer 3 Cat. # 280132, Magnetic Silica Cat. # 280133, and Lysis Buffer Cat. # 280134*)
- Micro Test<sup>™</sup> M4 Viral Transport Medium (*Remel, Inc. Cat. # 12500*) or *BD Universal Viral Transport medium (UTM; Becton, Dickinson and Co. Cat. # 220220)*
- Molecular Grade Water (RNase/DNase Free)*

- Extraction *Control* (e.g. *previously characterized positive sample*)

***Equipment***

- 70°C Freezer
- Roche MagNA Pure LC System with software version 3.0.11 or bioMérieux NucliSENS easyMAG System with Software version 1.0.1
- Biohit multi-channel pipettor for use with easyMAG System
- Cepheid SmartCycler II Real Time Instrument with Dx Software version 1.7b
- Micropipettors (range between 1-10 µL, 10-200 µL and 100-1000 µL)
- Mini-centrifuge with adapter for Cepheid Reaction Tubes
- Cepheid cooling block
- Cepheid cooling block

**Interpretation of Specimen Results**

See K073029

**J. Substantial Equivalence Information:**

- Predicate device name(s):  
xTAG™ RVP (Respiratory Viral Panel)  
Common Name: Respiratory Viral Panel (RVP) Multiplex Nucleic Acid  
Detection Assay
- Predicate 510(k) number(s):  
k063765
- Comparison with predicate:  
See K073029

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

See K073029

**L. Test Principle:**

See K073029

**M. Performance Characteristics (if/when applicable):**

**Expected Values**

See K073029

**Clinical Performance**

See K073029

## Results from Prospective Study

See K073029

### Reproducibility

See K073029 and comparing the ProFlu+ reproducibility, defined in this study as the closeness of agreement of repeated testing where only the extraction conditions are changed (easyMAG vs. MagNA Pure).

**Table 1: Extraction equivalence reproducibility study – average C<sub>T</sub> values for both MagNA Pure LC (MP) and easyMAG (EM) across days**

Virus and Level	Average C <sub>T</sub> s		Standard Deviation		95% Confidence Interval	
	MP	EM	MP	EM	MP	EM
IA Low	31.43	29.90	0.35	0.15	31.21 - 31.65	29.81 - 29.99
IA Med	29.22	27.72	0.23	0.18	29.08 - 29.36	27.61 - 27.83
RA Low	28.69	27.19	1.07	0.88	28.03 - 29.35	26.64 - 27.74
RA Med	25.91	24.9	0.64	0.36	25.51 - 26.31	24.68 - 25.12

### Analytical Sensitivity

Analytical sensitivity (LoD) as defined as the lowest concentration at which ≥ 95% of all replicates tested positive, ranged from 10<sup>2</sup> – 10<sup>1</sup> TCID<sub>50</sub>/mL.

See K073029 and determining and comparing the Limits of Detection (LoDs) for Influenza A, Influenza B, RSV A and RSV B on each automated extractor.

**Table 2: LoD Summary for both MagNA Pure LC (MP) and easyMAG (EM)**

Organism	LoD TCID <sub>50</sub> /mL		Positivity		% Positive	
	MP	EM	MP	EM	MP	EM
Influenza A	1 x 10 <sup>2</sup>	1 x 10 <sup>2</sup>	10/10	9/9 <sup>a</sup>	100%	100%
Influenza B	1 x 10 <sup>1</sup>	1 x 10 <sup>1</sup>	9/10 <sup>b</sup>	10/10	90%	100%
RSV A	1 x 10 <sup>1</sup>	1 x 10 <sup>1</sup>	10/10	10/10	100%	100%
RSV B	1 x 10 <sup>1</sup>	1 x 10 <sup>1</sup>	10/10	10/10	100%	100%

<sup>a</sup> One sample was positive for both IA (expected) and RSV(suspected contamination). The sample was still positive in both the IA and RSV channel after repeat testing in duplicate and therefore, was an invalid sample and was excluded from analysis.

<sup>b</sup> One replicate was negative for IB on the MP only. Repeat testing in duplicate of the extracted nucleic acid gave positive results for IB (original data, not repeat was used for analysis).

**Table 3: LoD Study – Average C<sub>T</sub> Values for both MagNA Pure LC (MP) and easyMAG (EM)**

Organism	Concentration TCID <sub>50</sub> /mL	Number of Positive Samples		Average C <sub>T</sub>	
		MP	EM	MP	EM
Influenza A	1 x 10 <sup>2</sup>	10	9 <sup>a</sup>	32.98	31.53
	1 x 10 <sup>1</sup>	8	5	38.06	38.04
	1 x 10 <sup>0</sup>	0	0	NA <sup>b</sup>	NA <sup>b</sup>
Influenza B	1 x 10 <sup>1</sup>	9 <sup>c</sup>	10	29.91	29.39
	1 x 10 <sup>0</sup>	0	0	NA <sup>b</sup>	NA <sup>b</sup>
	1 x 10 <sup>-1</sup>	0	0	NA <sup>b</sup>	NA <sup>b</sup>
RSV A	1 x 10 <sup>1</sup>	10	10	29.22	29.96
	1 x 10 <sup>0</sup>	3	5	33.8	34.22
	1 x 10 <sup>-1</sup>	2	0	33.45	NA <sup>b</sup>
RSV B	1 x 10 <sup>2</sup>	10	10	28.65	27.19
	1 x 10 <sup>1</sup>	10	10	33.39	32.55
	1 x 10 <sup>0</sup>	4	7	37.13	38.41

<sup>a</sup> One sample was positive for both IA (expected) and RSV(suspected contamination). The sample was still positive in both the IA and RSV channel after repeat testing in duplicate and therefore, was an invalid sample and was excluded from analysis.

<sup>b</sup> NA: Not Applicable. No positive samples for that specific target at the specific concentration.

<sup>c</sup> One replicate extraction was negative for IB on MP only. Repeat testing in duplicate of the extract gave positive results for IB. The repeat testing results were not included in the analysis for MP.

**Reactivity**

See K073029

**Analytical Specificity**

See K073029

**Competitive Inhibition**

See K073029

**Carry-over/Contamination**

See K073029

**N. Proposed Labeling:**

The labeling is sufficient and it satisfies the requirements of 21 CFR Part 809.10.

**O. Conclusion:**

The submitted information in this premarket notification is complete and supports a substantial equivalence decision.