

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

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

K051311

**B. Purpose for Submission:**

To add levofloxacin to the MicroScan® Synergies plus™ Gram-Positive MIC/Combo Panels

**C. Measurand:**

Levofloxacin at 0.03 – 16 µg/mL

**D. Type of Test:**

Quantitative and Qualitative growth based detection algorithm using optics light detection

**E. Applicant:**

Dade Behring Inc,  
MicroScan®

**F. Proprietary and Established Names:**

MicroScan® Synergies plus™ Gram-Positive MIC/Combo Panels

**G. Regulatory Information:**

1. Regulation section:

866.1645 - Fully automated short-term incubation cycle antimicrobial susceptibility system  
866.1640 - Antimicrobial Susceptibility Test Powder

2. Classification:

Class II

3. Product code:

LON – Automated AST system short incubation

LRG-Instrument for Auto Reader & Interpretation of Overnight Antimicrobial Susceptibility Systems

JWY - Manual Antimicrobial Susceptibility Test Systems

LTT – Panels, Test, Susceptibility, Antimicrobial

LTW – Susceptibility Test Cards, Antimicrobial

4. Panel:  
83 Microbiology

#### **H. Intended Use:**

1. Intended use(s):

For use with MicroScan® Synergies plus™ Panels read on the WalkAway® -SI System ( including upgraded WalkAway® -40 or WalkAway® -96 to meet WalkAway® SI equivalence). MicroScan® panels are designed for use in determining quantitative and/or qualitative antimicrobial agent susceptibility and/or identification to the species level of colonies, grown on solid media, of rapidly growing aerobic and facultative anaerobic gram-positive cocci and Listeria.

2. Indication(s) for use:

The testing of levofloxacin at concentrations of 0.03 – 16 µg/mL to the gram-positive test panel for testing Enterococcus and Staphylococcus at 4.5-16 hours or 16-20 hours for a overnight reading.

3. Special conditions for use statement(s):

- Turbidity method of inoculum preparation only
- For prescription use only

4. Special instrument requirements:

Not Applicable

#### **I. Device Description:**

Each panel contains two control wells: a negative control well, and a growth control well (contains test medium without antibiotic). Antibiotics are diluted in water, buffer, or minute concentrations of broth to selected concentrations prior to dehydration of the panels. The panel is rehydrated and inoculated at the same time with 0.1 ml of suspension prepared by the turbidity method (inoculum prepared in 0.4% saline with PLURONIC®, then 0.1ml transferred to 25ml of inoculum Synergies plus Pos Broth with PLURONIC®) for a final inoculum concentration of  $3-7 \times 10^5$  CFU/ml. Panels are incubated in a Walk-Away® System and read periodically starting at 4.5 hours until sufficient growth to determine the MIC. Alternately the panels may be incubated at 35° C in a non-CO<sub>2</sub> for 16-20 hours and

read by visual observation of growth.

**J. Substantial Equivalence Information:**

1. Predicate device name(s):

MicroScan® Dried Gram-Positive and Gram-Negative MIC/Combo Panels

2. Predicate 510(k) number(s):

k862140

k020185

3. Comparison with predicate:

<b>Similarities</b>		
<b>Item</b>	<b>Device</b>	<b>Predicate</b>
Intended use	MicroScan® panels are designed for use in determining quantitative and/or qualitative antimicrobial agent susceptibility and/or identification to the species level of colonies, grown on solid media, of rapidly growing aerobic and facultative anaerobic organisms	Same
Specimen	Isolated colonies from culture used	Same
Inoculum	Inoculum density to 0.5 McFarland standard	Same
Incubation	<16 hours 16 – 24 hours	Same
Results	Quantitative with qualitative interpretations	Same
Technology	Growth based	same
<b>Differences</b>		
<b>Item</b>	<b>Device</b>	<b>Predicate</b>
Panels	Dried levofloxacin in water	Dried clindamycin or gentamicin in broth
Reading	Uses both an early read and overnight methods in the same system	Overnight system uses only the overnight reading methods and <16 hour instruments use only the <16 hour read methods
Inoculum preparation	Turbidity method of inoculation only.	Inoculum prepared from isolated colonies using either the Turbidity method or Prompt® system
Instrument	WalkAway® -SI System or equivalent	AutoScan® -4 or WalkAway®
Antibiotic	Levofloxacin at 0.03-16 µg/mL	Different concentrations depending on the antibiotic

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

Class II Special Controls Guidance Document: Antimicrobial Susceptibility Test (AST) Systems; Guidance for Industry and FDA”; Clinical and Laboratory Standards Institute (CLSI) M7 (M100-S15) “Methods for Dilution Antimicrobial Susceptibility Tests for Bacteria That Grow Aerobically; Approved Standard”.

**L. Test Principle:**

The WalkAway® SI uses a Colorimetric Optics System consisting of a color wheel/lamp assembly and a Photosensor. There is an initial read at 2.5 hours with a possible final read at 4.5, 5.5, 6.5, 8, 12, 16, or 18 hours (overnight instrument readings, manual readings) depending on the growth rate of the organism being tested. The time of final read is dependent on the growth rate of the organism and the sensitivity of the automatic reader since cell densities below  $2 \times 10^7$  cells/ml are not detected.

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

1. Analytical performance:

a. *Precision/Reproducibility:*

Reproducibility was demonstrated using 10 isolates tested at 3 sites on 3 separate days in triplicate. The study included the testing on the WalkAway® SI read at <16 hours, WalkAway® 16-18 hour readings and manual readings at 16-20 hours incubation. The WalkAway® SI had 10 results that were not readable at <16 hours. All results were >95% reproducible. Although reproducible results were obtained with all methods of reading the <16 hour readings produced a slight trend for a more susceptible result if only by one dilution.

b. *Linearity/assay reportable range:*

Not Applicable

c. *Traceability, Stability, Expected values (controls, calibrators, or methods):*

The recommended QC isolate was tested a sufficient number of times with acceptable results on all testing days with the reference method. There were no QC results that did not provide a result in the 4.5-16 hour window. Quality control results demonstrated the ability of the different reading parameters (manual and instrument) to produce acceptable results. The following table provides the frequency of the results in each concentration tested with the expected range stated.

Results					
Organism	Conc in $\mu\text{g/mL}$	# reference	MicroScan®		
			Manual overnight	Instrument overnight	<16h instrument
<i>E. faecalis</i> ATCC 29212 Range 0.25-2 $\mu\text{g/mL}$	$\leq 0.12$				
	0.25				
	0.5	40	31	19	80
	1	44	52	65	4
	2		1		
	4				
<i>S. aureus</i> ATCC 29213 Range 0.06-0.5 $\mu\text{g/mL}$	$\leq 0.03$				
	0.6				
	0.12	64	40	35	72
	0.25	19	43	48	12
	0.5	1	1	1	
	1				

There is a tendency of the <16 hours results to be one dilution more susceptible but still be in the acceptable range. This was observed in the reproducibility data as well.

Inoculum density control: A turbidity meter was used for the turbidity inoculation method.

*d. Detection limit:*

Not Applicable

*e. Analytical specificity:*

Not Applicable

*f. Assay cut-off:*

Not Applicable

2. Comparison studies:

*a. Method comparison with predicate device:*

Clinical testing was conducted at three sites using fresh isolates supplemented with stock isolates. A total of 549 gram-positive isolates were tested of which 476 were fresh isolates. There were 75 challenge isolates tested at one site and compared to the reference broth dilution result mode that was determined by

previous testing of each isolate multiple times in the recommended reference panel. The Synergies plus™ readings were obtained at times between 4.5 and 16 hours of incubation for >95% of the results. An additional comparison was done with readings on the instrument after overnight incubation and also read manually when incubated 16 - 18 hours. Performance by these alternate reading methods was also acceptable with no apparent differences or trends. The recommended CLSI reference method was followed with the exception of the use of a small amount (0.1%) of Pluronic in the final inoculum. A validation of the use of Pluronic in the frozen reference panels was conducted. Similar calculations for the different reading methods were performed with very little difference. QC was also performed with no difference apparent in the results.

The chart below demonstrates the performance of all three reading methods (Synergies plus™ readings at <16 hours, overnight on the WalkAway® and manually read at 18 hours using the touchScan®-SR) when compared to the reference method.

	total	EA	%EA	Total evaluable	EA of evaluable	%EA	CA	%CA	#R	min	maj	vmj
< 16h	621	613	98.7	431	424	98.4	602	96.9	250	16	1	2
Overnight instrument	624	618	99.0	431	426	98.8	618	99.0	250	12	0	1
Overnight manual	624	619	99.2	430	426	99.1	609	97.6	250	14	0	1

**EA**-Essential Agreement  
**CA**-Category Agreement  
**R**-resistant isolates

**maj**-major discrepancies  
**vmj**-very major discrepancies  
**min**- minor discrepancies

Evaluable results are those that fall within the test range of the reference method and could also be on-scale with the new device if within the plus/minus one dilution variability. EA is when there is agreement between the reference method and the MicroScan® within plus or minus one serial two-fold dilution of antibiotic. CA is when the interpretation of the reference method agrees exactly with the interpretation of the MicroScan® result.

b. *Matrix comparison:*

Not Applicable

3. Clinical studies:

a. *Clinical Sensitivity:*

Not Applicable

b. *Clinical specificity:*

Not Applicable

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

Not Applicable

4. Clinical cut-off:

Not Applicable

5. Expected values/Reference range:

Staphylococcus spp. and Enterococcus spp. interpretive criteria:

$\leq 2$  (Susceptible), 4 (Intermediate),  $\geq 8$  (Resistant)

All values are included in the package insert.

**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.