

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

A. 510(k) Number:

K063564

B. Purpose for Submission:

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

C. Measurand:

Chloramphenicol (4-16 µg/mL)

D. Type of Test:

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 with Chloramphenicol (4-16 µg/mL)

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

4. Panel:
83 Microbiology

H. Intended Use:

1. Intended use(s):
The testing of chloramphenicol is 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 identification to the species level of colonies, grown on solid media, of rapidly growing aerobic and facultative anaerobic gram-positive cocci and Listeria; the panels also provide quantitative and/or qualitative antimicrobial agent susceptibility for enterococci and staphylococci.
2. Indication(s) for use:
The testing of chloramphenicol at concentrations of 4-16 µg/mL to the gram-positive test panel for 4.5-16 hours or 16-20 hours for an 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:

This submission is for the AST system only. The ID system was not reviewed.

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 0.1 ml transferred to 25 ml 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-CO₂ for 16-18 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:

Similarities		
Item	Device	Predicate
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 – 18 hours	Same
Results	Qualitative interpretations	Same
Technology	Growth based	Same
Differences		
Item	Device	Predicate
Panels	Dried chloramphenicol in water	Dried clindamycin or gentamicin in broth
Reading	Uses both an early read and overnight read 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	chloramphenicol at 4-16 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-S16) “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 2×10^7 cells/ml are not detected.

M. Performance Characteristics (if/when applicable):

1. Analytical performance:

a. Precision/Reproducibility:

Reproducibility was demonstrated using ten 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. Reproducibility was determined using only category results since less than 5 dilutions will be the panel format. All results were >95% reproducible. Observations for trending demonstrated a trend for the ≤ 16 hour readings to provide a more susceptible result when there was a difference at all.

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. 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 with the expected range stated.

Results					
Organism	Conc in $\mu\text{g/ml}$	# reference	MicroScan®		
			Manual overnight	Instrument overnight	4.5-18h instrument
<i>E. faecalis</i> ATCC 29212 Range 4-16 $\mu\text{g/mL}$	≤ 4	30	65	76	110
	8	75	47	35	1
	16				
	>16				
<i>S. aureus</i> ATCC 29213 Range 2-16 $\mu\text{g/mL}$	≤ 4	1	10	10	72
	8	93	89	86	28
	16	1	1		
	>16			3	

There appears to be a trend for the ≤ 16 hour readings to be more susceptible than the reference method by one dilution for both the ATCC *S. aureus* and the *E. faecalis*. The *E. faecalis* also appears to trend to a more susceptible result for all MicroScan® readings when compared to the mode of the reference method.

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:*

A total of 575 gram-positive isolates were tested of which 495 were fresh isolates. A comparison was made to the standard reference method result performed as described in the CLSI document M7 except for the modification described in the submission. The reference panels were inoculated with a very small amount of PLURONIC® in water and added to the frozen reference panels containing the antibiotic in broth. The use of PLURONIC® water is not part of the reference method but MicroScan® uses it in very small amounts as a wetting solution for

inoculation of the panels with the small volume of inocula used. A validation of the use of chloramphenicol with PLURONIC® was conducted demonstrating that there was no difference in the results with and without PLURONIC®. The Synergies plus™ readings were obtained at times between 4.5 and 16 hours of incubation for > 95% of the results.

Performance of the different read methods was based on category agreement only since only 3 dilutions of chloramphenicol are tested and a category result only will be provided. Essential Agreement (EA) can't be determined with less than 5 dilutions of antibiotic to evaluate. 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 but when differences occurred the <16 hour readings were more susceptible.

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 result of clinical and challenge isolates.

	total	CA	%CA	#R	min	maj	vmj
<16 h	644	619	96.1	46	21	2	2
Overnight Instrument	650	621	95.5	46	22	7	0
Overnight manual	650	627	96.5	46	17	4	0

CA-Category Agreement

R-resistant isolates

vmj-very major discrepancies

min- minor discrepancies

maj-major discrepancies

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:

≤ 8 (susceptible)
16 (intermediate)
≥ 32 (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.