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

A. 510(k) Number:

k133038

B. Purpose for Submission:

Addition of Micafungin to the Sensititre® YeastOne® Susceptibility System

C. Measurand:

Micafungin 0.008 -16 µg/mL

D. Type of Test:

Quantitative Antimicrobial Susceptibility Test (AST) growth based

E. Applicant:

TREK Diagnostic Systems, Inc.

F. Proprietary and Established Names:

Sensititre® YeastOne® Susceptibility plates

G. Regulatory Information:

1. Regulation section:

   866.1640 Antimicrobial Susceptibility Test Powder

2. Classification:

   Class II

3. Product code:

   NGZ Susceptibility Testing - antifungal

4. Panel:

   83 Microbiology

H. Intended Use:

1. Intended use(s):

   The Sensititre® YeastOne® Susceptibility System is an *in vitro* diagnostic product for clinical susceptibility testing of *Candida* spp.

   This 510(k) is for Micafungin in the dilution range of 0.008 - 16 μg/ml is intended for testing *Candida* spp. on the Sensititre® YeastOne® Susceptibility system. The approved primary "Indications for Use" and clinical significance of Micafungin is for:
   C. albicans
   C. glabrata
   C. krusei
   C. parapsilosis
   C. tropicalis

2. Indication(s) for use:

   The Sensititre® YeastOne® Susceptibility System is an *in vitro* diagnostic product for clinical susceptibility testing of *Candida* spp.

   This 510(k) is for Micafungin in the dilution range of 0.008 - 16 μg/ml is intended for testing *Candida* spp. on the Sensititre® YeastOne® Susceptibility system. The approved primary "Indications for Use" and clinical significance of Micafungin is for:
   C. albicans
   C. glabrata
   C. krusei
   C. parapsilosis
   C. tropicalis

3. Special conditions for use statement(s):

   Prescription use only.

   The ability of the Sensititre YeastOne to detect resistance to Micafungin is unknown because resistant strains were not available at the time of comparative testing. For strains yielding results suggestive of a not susceptible category, organism identification and Micafungin should be retested and confirmed, and if the result is confirmed, the isolate should be submitted to a reference laboratory that will confirm results using a CLSI reference dilution method.

4. Special instrument requirements:

   Autoinoculator or Manual inoculation

   Manual readings only

I. Device Description:

The Sensititre® YeastOne® Susceptibility system is a micro-version of the broth dilution susceptibility test. Various antifungal agents are serially diluted to concentrations bridging the range of the clinical interest in autoclaved diluent, which contains a colorimetric growth indicating compound. Each micro-dilution plate is individually packaged in foil. After inoculation, plates are sealed with an adhesive seal, incubated at 35°C for 24 hours and examined for growth.

Substantial Equivalence Information:

1. Predicate device name(s):

   VITEK® AST-YS Fluconazole
   Sensititre YeastOne

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

   k061945

3. Comparison with predicate:

Similarities		
Item	Device	Predicate (VITEK) AST-YS Fluconazole (k061945)
Intended Use	Susceptibility testing for colonies of *Candida*	Same
Incubation	35°C	Same

Differences		
Item	Device	Predicate
Technology	Colorimetric test in which MIC's are determined by observing the lowest dilution of antimicrobial agents that maintains no color change indicating inhibition of growth. A color change from blue to pink indicates growth of organism.	The VITEK® 2 card is inoculated with a standardized organism suspension, incubated, and read throughout the incubation cycle. Results are automatically calculated once a predetermined growth threshold is reached.
Format	Micro tray with dried Antifungal Medium	VITEK® 2 AST test card with dried antifungal
Medium	Sensititre® yeast	VITEK® 2 Yeast Base broth

Differences		
Item	Device	Predicate
	susceptibility inoculum broth	
Antifungal	Micafungin	Fluconazole
Time to Results	24 hours	Up to 36 hours

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

Guidance for Industry and FDA Class II Special Controls Guidance Document: Antimicrobial Susceptibility Test (AST) Systems, August 28, 2009

CLSI M27-A3: Reference Method for Broth Dilution Antifungal Susceptibility Testing of Yeasts; Approved Standard - Third Edition, April, 2008

CLSI M27-S4: Reference Method for Broth Dilution Antifungal Susceptibility Testing of Yeasts; Fourth Informational Supplement, December, 2012

L. Test Principle:

The Sensititre YeastOne panel measures growth by colorimetric determination of REDOX state produced by the test organism rather than measuring the turbidity of the test medium. In the Sensititre panel as in most broth dilution tests the difference between wells in which growth occurs and those in which growth is inhibited is distinctive. However, the Sensititre panel produces an easily distinguished color change when light growth occurs.

M. Performance Characteristics (if/when applicable):

1. Analytical performance:

a. Precision/Reproducibility:

Reproducibility was conducted at three sites on 25 yeast isolates, performed over three days. The testing was performed using Autoinoculator and manual inoculation methods with manual reading of panels. The mode was determined and then the reproducibility was calculated based on ±1 one well of the mode. The reproducibility studies for both inoculation methods demonstrated acceptable performance at ≥95%.

b. Linearity/assay reportable range:

Not Applicable

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

Quality Control (QC) testing using the manual pipette inoculation was performed on

each day of clinical testing on the QC isolates using, *C. parapsilosis* ATCC 22019, and *C. krusei* ATCC 6258, as recommended in the CLSI standard M27. The following table represents the frequency of the results in both the reference method and the Sensititre YeastOne Susceptibility plates and the acceptable range. Quality Control was also performed at three sites using the Autoinoculator method. All results, including reference method, were read manually at 24 hrs. All results were within the specified range.

Quality Control Table

ORGANISM	**Conc µg/mL**	**Manual Inoculation Method**		**Autoinoculator Method**
		Reference	**Sensititre® YeastOne®**	**Sensititre® YeastOne®**
C. parapsilosis ATCC 22019 Expected Range : 0.5 – 2 µg/mL	0.25			
	0.5	1	20	53
	1	51	38	7
	2	8	2	0
C. krusei ATCC 6258 Expected Range : 0.12 – 0.5 µg/mL	0.12	54	59	60
	0.25	6	1	0
	0.5	0	0	0

Nephelometer was used at each site to standardize the inoculum. Colony counts from QC ATCC source were performed using direct inoculum 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:
Performance was established on the Sensititre YeastOne Susceptibility System for *Candida spp.* at three clinical sites. The CLSI reference method as described in the CLSI document M27 "Method for Broth Dilution Antifungal Susceptibility Testing of Yeasts" was compared to the Sensititre YeastOne Susceptibility System. A total of 220 fresh clinical and 95 challenge isolates of *Candida* species were tested on the

Sensititre YeastOne using manual and inoculation methods. All clinical isolates demonstrated growth in the growth control well.

EA was calculated when the results for the reference method and the Sensititre YeastOne were within +/- two doubling dilutions of the antifungal drug. The following tables present the performance of the Sensititre YeastOne Susceptibility System when read at 24 hours using manual inoculation methods as compared to the reference method when read at 24 hours. The results demonstrate acceptable performance.

Performance Summary read manually at 24 hours (Manual Inoculation)

	EA Total	**EA N**	**EA %**	**Eval EA Total**	**Eval EA N**	**Eval EA %**	**CA N**	**CA %**	**#R**	**min**	**maj**	**vmj**
C. albicans, C. tropicalis, C. krusei **(S=≤ 0.25, I=0.5, R=≥1** μg/mL**)**												
Clinical	145	145	100	96	96	100	145	100	0	0	0	0
Challenge	61	61	100	33	33	100	61	100	0	0	0	0
Combined	**206**	**206**	**100**	**129**	**129**	**100**	**206**	**100**	**1**	**0**	**0**	**0**
C. glabrata **(S=≤2, I=4, R=≥8** μg/mL**)**												
Clinical	15	15	100	8	8	100	14	93.3	2	1	0	0
Challenge	24	24	100	3	3	100	24	100	0	0	0	0
Combined	39	39	100	11	11	100	38	97.4	2	1	0	0
C. parasilopsis **(S=≤0.06, I=0.12, R=≥0.25** μg/mL**)**												
Clinical	60	60	100	60	60	100	60	100	0	0	0	0
Challenge	10	10	100	10	10	100	10	100	0	0	0	0
Combined	**70**	**70**	**100**	**70**	**70**	**100**	**70**	**100**	**0**	**0**	**0**	**0**

EA - Essential Agreement
CA - Category Agreement
R-resistant isolates
maj-major discrepancies
vmj-very major discrepancies
min- minor discrepancies

Category agreement (CA) is when the Sensititre panel result interpretation agrees exactly with the reference panel result interpretation. Evaluable EA is when the MIC result is on scale for both the Sensititre and the reference and have on-scale EA.

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 (MIC values in µg/mL):

Microorganism(s)	Susceptibility Interpretive Criteria		
	S	I	R
C. albicans, C. tropicalis, and C. krusei	≦ 0.25	0.5	≥ 1
C. parasilosis:	≦ 2	4	≥ 8
C. glabrata:	≦ 0.06	0.12	≥ 0.25

The ability of the Sensititre YeastOne to detect resistance to Micafungin is unknown because resistant strains were not available at the time of comparative testing. For strains yielding results suggestive of a not susceptible category, organism identification and Micafungin should be retested and confirmed, and if the result is confirmed, the isolate should be submitted to a reference laboratory that will confirm results using a CLSI reference dilution method.

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.