510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION
DECISION SUMMARY

A. 510(k) Number:

K183298

B. Purpose for Submission:

To obtain a susbstantial equivalence determination for Omadacycline Antimicrobial Susceptibility Test Disk

C. Measurand:

Omadacycline 30µg

D. Type of Test:

Antimicrobial Susceptibility Test Disks

E. Applicant:

Hardy Diagnostics

F. Proprietary and Established Names:

HardyDisk AST Omadacycline 30µg (OMC30)

G. Regulatory Information:

1. Regulation section:

   21 CFR 866.1620 Antimicrobial Susceptibility Test Disc

2. Classification:

   Class II

3. Product code:

   JTN

4. Panel:

83, Microbiology

H. Intended Use:

1. Intended use(s):

HardyDisk AST Disks are used for semi-quantitative *in vitro* susceptibility testing by the agar diffusion test procedure (Kirby-Bauer) of rapidly growing and certain fastidious bacterial pathogens. Standardized methods for agar diffusion testing have been described for *Enterobacteriaceae, Staphylococcus* spp., *Pseudomonas* spp., *Acinetobacter* spp., *Listeria monocytogenes, Enterococcus* spp., and by modified procedures, *Haemophilus* spp., *Neisseria gonorrhoeae, N. meningitidis* and *Streptococcus* spp., including *Streptococcus pneumoniae.*

2. Indication(s) for use:

HardyDisk AST Disks are used for semi-quantitative *in vitro* susceptibility testing by the agar diffusion test procedure (Kirby-Bauer) of rapidly growing and certain fastidious bacterial pathogens. Standardized methods for agar diffusion testing have been described for *Enterobacteriaceae, Staphylococcus* spp., *Pseudomonas* spp., *Acinetobacter* spp., *Listeria monocytogenes, Enterococcus* spp., and by modified procedures, *Haemophilus* spp., *Neisseria gonorrhoeae, N. meningitidis* and *Streptococcus* spp., including *Streptococcus pneumoniae.*

Use of HardyDisk AST Omadacycline 30µg (OMC30) for in vitro agar diffusion susceptibility testing is indicated when there is the need to determine the susceptibility of bacteria to Omadacycline.

HardyDisk AST Omadacycline at concentration 30µg can be used to determine the zone diameter (mm) of Omadacycline against the following bacteria for which Omadacycline has been shown to be active both clinically and *in vitro*:

Staphylococcus aureus (methicillin-susceptible and resistant isolates)
Staphylococcus lugdunensis
Enterococcus faecalis
Streptococcus anginosus group (includes *S. anginosus, S. intermedius,* and *S. constellatus*)
Streptococcus pneumoniae
Streptococcus pyogenes
Haemophilus influenzae
Haemophilus parainfluenzae
Enterobacter cloacae
Klebsiella pneumoniae

3. Special conditions for use statement(s):

   For prescription use only

4. Special instrument requirements:

   Not applicable.

I. Device Description:

HardyDisk AST Disks utilize 6-mm diameter white filter paper disks. The disks are prepared by impregnating absorbent paper with a known concentration of 30µg Omadacycline. The disks are marked with the code OMC30, on both sides.

HardyDisk AST Disks are supplied in plastic cartridges containing 50 disks each. They are also packaged as one cartridge per vial with desiccant or five cartridges per vial with desiccant.

J. Substantial Equivalence Information:

1. Predicate device name(s):

   HardyDisk Tigecycline 15µg

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

   K062245

3. Comparison with predicate:

Table 1: Comparison with the Predicate

Similarities		
Item	**Device K183298 HardyDisk Omadacycline 30µg**	**Predicate K062245 HardyDisk Tigecycline 15µg**
Test Method	Antimicrobial Susceptibility Testing using paper disks impregnated with an antimicrobial agent	Same
Methodology	Kirby-Bauer Disk Diffusion Susceptibility Test Protocol requires the user to determine categorical interpretations (S/I/R) using the measured zone diameters.	Same
Inoculum	Prepared from pure isolated colonies to match the turbidity equivalent of a 0.5 McFarland in Tryptic Soy Broth.	Same
Inoculation Method	Dip a sterile swab into the prepared inoculum and streak an appropriate agar plate's surface three times. Add the disks impregnated with the antimicrobial agent to the surface of the plate. Incubate the agar plate agar side up in a 35 ± 2°C incubator for 16-18 hours.	Same
Reading Method	The user will interpret the zone diameters according established interpretive criteria for the drug.	Same

Differences		
Item	Device	Predicate
Product Name	HardyDisk Omadacycline 30µg (OMC30)	HardyDisk Tigecycline
Antimicrobial Agent	Omadacycline	Tigecycline
Concentration	30µg	15µg

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

CLSI M100 28th Edition, Performance Standards for Antimicrobial Susceptibility Testing

L. Test Principle:

The HardyDisk AST Disk is based on the agar diffusion (Kirby-Bauer) methodology. It utilizes dried filter paper disks impregnated with a known concentration of an antimicrobial agent that are placed onto the test medium surface. Mueller Hinton agar is recommended for

agar diffusion testing of non-fastidious organisms and Mueller Hinton with 5% Sheep Blood is recommended for *Streptococcus* spp. Three to five similar colonies are transferred to 4-5 mL of a suitable broth medium. The broth is incubated at 35°C for 2-6 hours to develop a turbidity that exceeds or is equivalent to a 0.5 McFarland standard. Alternatively, a direct broth or saline suspension of colonies may be prepared from an overnight culture. The final inoculum density should be equivalent to a 0.5 McFarland turbidity standard. The inoculum density may also be standardized photometrically.

Within 15 minutes of inoculum preparation, the Mueller Hinton agar plate is streaked with an inoculated swab to obtain an even inoculation of organism. Disks are aseptically placed onto the agar surface with a disk dispenser and the disks are pressed down with a sterile needle or forceps to make contact with the agar surface. Agar plates are incubated in an ambient air incubator at 35±2°C for 16 - 18 hours. Fastidious organisms are tested using appropriate media incubated in an atmosphere enriched with 5% CO_2, as recommended in the CLSI M02 approved standard document.

After incubation the agar medium is examined for a zone of inhibition around the disks. The zones of inhibition are measured to the nearest millimeter and compared to recognized zone size ranges for the antimicrobial agent being tested.

M. Performance Characteristics (if/when applicable):

Descriptive characteristics were sufficient for the HardyDisk Omadacycline 30µg (OMC30) disk based on extensive data from several microbiology disk studies evaluated by CDER which were used to generate the breakpoints and quality control (QC) expected ranges used for this subject device. The disk data used to support this submission included data from testing organisms shown to be active in vitro and in clinical infections within the spectrum of activity of Omadacycline and as noted in the device's intended use.

Data obtained from reproducibility, quality control, and disk to MIC correlation studies was generated in accordance with the CDER Clinical/Antimicrobial guidance, *Microbiology Data for Systemic Antibacterial Drugs- Development, Analysis, and Presentation* to ensure precise, accurate, and reproducible results.

For this review, the interpretative criteria are applied broadly to the *Enterobacteriaceae* family according to the FDA STIC website. Testing has been expanded to include members of the family and is not limited only to the indicated species. To address the unknown clinical utilty of omadacycline to organisms outide of the drug's indication for use, the following statements are added as footnotes to the Omadacycline 30µg interpretative criteria table in the HardyDisk AST package insert:

- *The safety and efficacy of omadacycline in treating Acute Bacterial Skin and Skin Structure Infections (ABSSSI) infections due to Gram-negative organisms other than K. pneumoniae and E. cloacae and Gram-positive organisms other than S. aureus (MRSA and MSSA), S. lugdunensis, E. faecalis, S. anginosus group, and S. pyogenes may or may not have been established in adequate and well-controlled*

clinical trials. The clinical significance of susceptibility information in such instances is unknown.

- *The safety and efficacy of omadacycline in treating Community-Acquired Bacterial Pneumonia (CABP) infections due to Gram-negative organisms other than K. pneumoniae and Haemophilus spp. and Gram-positive organisms other than S. aureus (MSSA only) and S. pneumoniae may or may not have been established in adequate and well-controlled clinical trials. The clinical significance of susceptibility information in such instances is unknown.*

- *Omadacycline is not active in vitro against Morganella spp., Proteus spp., and Providencia spp.*

1. Analytical performance:

   a. Precision/Reproducibility:

   Not applicable

   b. Linearity/assay reportable range:

   Not applicable

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

   Not applicable

   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:

   Not applicable

   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:

The Omadacycline interpretative criteria for disk diffusion is shown in Table 2 and 3 below.

Table 2: Disk Diffusion Interpretative Criteria (Zone diameter in mm) for Omadacycline [a] - Acute Bacterial Skin and Skin Structure Infections (ABSSSI)

Organism(s)	Susceptible	Intermediate	Resistant
Enterobacteriaceae[b,c]	≥15	16-17	≤18
S. aureus (including MRSA isolates)	≥18	19-20	≤21
S. lugdunensis	≥25	26-28	≤29
E. faecalis	≥15	16-17	≤18
S. anginosus group[d]	≥17	18-23	≤24
S. pyogenes	≥15	16-18	≤19

Table 3: Disk Diffusion Interpretative Criteria (Zone diameter in mm) for Omadacycline [a] - Community Acquired Bacterial Pneumoniae (CABP)

Organism(s)	Susceptible	Intermediate	Resistant
Enterobacteriaceae[e,c]	≥15	16-17	≤18
S. aureus (MSSA isolates only)	≥20	21-22	≤23
Haemophilus spp.[f]	≥16	17-19	≤20
S. pneumoniae	≥16	17-19	≤20

[a] FDA-recognized Antimicrobial Susceptibility Test Interpretive Criteria Website

https://www.fda.gov/Drugs/DevelopmentApprovalProcess/DevelopmentResources/ucm575163.htm. The QC strains and expected ranges are the same as recommended in CLSI M100 29th edition.
[b] *K. pneumoniae* and *E. cloacae* only.
[c] Omadacycline is not active *in vitro* against *Morganella* spp., *Proteus* spp., and *Providentia* spp.
[d] *S. anginosus* group includes *S. anginosus, S. intermedius,* and *S. constellatus*.
[e] *K. pneumoniae* only.
[f] *Haemophilus* spp. includes *H. influenzae*, and *H. parainfluenza.*

N. Proposed Labeling:

The labeling supports the finding of substantial equivalence for this device.

O. Conclusion:

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