510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION
DECISION SUMMARY
ASSAY AND INSTRUMENT

I Background Information:

A 510(k) Number

K211759

B Applicant

Selux Diagnostics, Inc.

C Proprietary and Established Names

Selux AST System; Model AST Gen 1.0

D Regulatory Information

Product Code(s)	Classification	Regulation Section	Panel
LON	Class II	21 CFR 866.1645 - Fully Automated Short-Term Incubation Cycle Antimicrobial Susceptibility System	MI - Microbiology
LTT	Class II	21 CFR 866.1640 - Antimicrobial susceptibility test powder	MI - Microbiology
LTW	Class II	21 CFR 866.1640 - Antimicrobial susceptibility test powder	MI - Microbiology

II Submission/Device Overview:

A Purpose for Submission:

To obtain substantial equivalence determination for Gram-positive organisms tested with the Selux AST System to determine the minimum inhibitory concentration of specific antimicrobials with specific Gram-positive organisms.

B Measurand:

Antimicrobial	Reporting Range
Ampicillin	≤0.25 to ≥128 µg/mL
Ceftaroline	≤0.06 to ≥32 µg/mL
Clindamycin	≤0.03 to ≥16 µg/mL
Daptomycin	≤0.06 to ≥32 µg/mL

Antimicrobial	Reporting Range
Delafloxacin	≤0.008 to ≥8 µg/mL
Eravacycline	≤0.002 to ≥0.5 µg/mL
Erythromycin	≤0.06 to ≥32 µg/mL
Linezolid	≤0.25 to ≥32 µg/mL
Levofloxacin	≤0.06 to ≥32 µg/mL
Minocycline	≤0.12 to ≥64 µg/mL
Oxacillin	≤0.03 to ≥32 µg/mL
Penicillin	≤0.03 to ≥64 µg/mL
Trimethoprim	≤0.25 to ≥64 µg/mL
Vancomycin	≤0.12 to ≥128 µg/mL
Cefoxitin Screen	SN or SP

C Type of Test:

Quantitative and qualitative antimicrobial susceptibility test (AST) system that utilizes colorimetric, oxidation-reduction and growth-based techniques to determine the minimum inhibitory concentration (MIC) of specific antimicrobials to specific organisms.

III Intended Use/Indications for Use:

A Intended Use(s):
The Selux AST System is intended to be used for the automated quantitative or qualitative susceptibility testing for most clinically significant aerobic microorganisms. The Selux AST System does not provide organism identification.

B Indication(s) for Use:
The Selux Gram-Positive Panel is intended for use with the Selux AST System as an *in vitro* test to determine the susceptibility of isolated colonies of specific *Staphylococcus* species and *Enterococcus* species to specific antimicrobial agents when used as instructed.

The Selux Gram-Positive Panel is a quantitative test for the following antimicrobial agents with the specific organisms identified below:

- Ampicillin: *Enterococcus faecium, Enterococcus faecalis*
- Clindamycin: *Staphylococcus aureus, Staphylococcus epidermidis*
- Ceftaroline: *Staphylococcus aureus*
- Daptomycin: *Staphylococcus aureus, Enterococcus faecalis*
- Delafloxacin: *Staphylococcus aureus, Staphylococcus haemolyticus, Enterococcus faecalis*
- Eravacycline: *Staphylococcus aureus, Enterococcus faecalis*
- Erythromycin: *Staphylococcus aureus*
- Linezolid: *Staphylococcus aureus, Staphylococcus epidermidis, Staphylococcus haemolyticus, Enterococcus faecium, Enterococcus faecalis*
- Levofloxacin: *Enterococcus faecium, Enterococcus faecalis,* methicillin-susceptible *Staphylococcus aureus*
- Minocycline: Staphylococcus aureus
- Oxacillin: *Staphylococcus aureus, Staphylococcus lugdunensis*

- Penicillin: *Enterococcus faecium, Enterococcus faecalis, Staphylococcus aureus*
- Trimethoprim: *Staphylococcus aureus*, Coagulase-Negative Staphylococci (including *S. capitus, S. haemolyticus, S. saprophyticus, S. simulans*)
- Vancomycin: *Staphylococcus aureus*, Coagulase-Negative Staphylococci (CoNS) (including *S. capitus, S. cohnii, S. epidermidis, S. haemolyticus, S. hominis, S. intermedius* group*, S. lugdunensis, S. saprophyticus, S. schleiferi, S. simulans*) *Enterococcus faecium, Enterococcus faecalis*

The Selux Gram-Positive Panel is a qualitative test for the following antimicrobial agents with the specific target organisms identified below:

- Cefoxitin Screen to predict *mecA*-mediated oxacillin resistance: *Staphylococcus aureus, Staphylococcus lugdunensis*

C Special Conditions for Use Statement(s):
Rx - For Prescription Use Only

The following limitations were added to the device labeling based on performance demonstrated in the current submission:

- The ability of the Selux AST system to detect resistance in the following antimicrobial/organism combinations is unknown because an insufficient number of resistant isolates were available at the time of comparative testing.
  - Ampicillin: *Enterococcus faecalis*
  - Cefoxitin Screen: *Staphylococcus lugdunensis*
  - Ceftaroline: *Staphylococcus aureus*
  - Eravacycline: *Enterococcus* spp.
  - Linezolid: *Enterococcus* spp., *Staphylococcus* spp.
  - Minocycline: *Staphylococcus* spp.
  - Vancomycin: *Staphylococcus* spp.

- The current absence of daptomycin-resistant isolates precludes defining any results other than “Susceptible”. Isolates yielding results other than “Susceptible” should be submitted to a reference laboratory for further testing. A single non-susceptible strain of S. aureus provided a potential very major error during the comparative testing.

- Perform an alternative method of testing prior to reporting results for the following antibiotic/organism combination(s):
  - Clindamycin: *Staphylococcus epidermidis* when the Selux MIC is 4 µg/mL due to the occurrence of two major errors
  - Delafloxacin: *Staphylococcus haemolyticus* when the Selux MIC is 0.25 µg/mL or 0.5 µg/mL due to the <90% CA caused by six minor errors
  - Eravacycline: *Enterococcus faecium*
  - Erythromycin: *Enterococcus* spp.
  - Levofloxacin: *Enterococcus faecium* when the Selux MIC is 2 µg/mL due to two very major errors

- Oxacillin: *Staphylococcus* spp., except *S. aureus* and S. *lugdunensis; Staphylococcus aureus* when the Selux MIC is ≤0.12 µg/mL; *Staphylococcus lugdunensis* when the Selux MIC is 8 µg/mL
- Penicillin: *Enterococcus faecium* when the Selux MIC is ≥32 µg/mL due to three major errors; *Staphylococcus aureus* when the Selux MIC is ≥4 µg/mL
- Trimethoprim: Coagulase-Negative staphylococci (*S. epidermidis, S. hominis, S. intermedius group, S. lugdunensis,* and *S. schleiferi*)
- Vancomycin: *Enterococcus faecium* when the Selux MIC is >64 µg/mL due to two major errors

D Special Instrument Requirements:

Selux AST System, Software version 1, subversion 8.165

IV Device/System Characteristics:

A Device Description:

The Selux AST System is an antimicrobial susceptibility test (AST) system that consists of a Sample Prep Station, an Inoculator, an Analyzer, a computer workstation, and the reagents and consumables required to perform AST testing. The system is operated via software that guides users through the manual sample preparation process and operates the automated Inoculator and Analyzer. The software includes an algorithm that enables the system to determine the susceptibility of an organism to the variety of antimicrobials provided in the Selux AST panels. The system is designed so that only Gram stain information is required to initiate testing to select the gram-negative or gram-positive antimicrobial panel. While complete system testing can be performed without species-level identification, this information is required for the system to report susceptibility results. Species identification information can be either manually input to the Selux system or automatically downloaded from the laboratory information system (LIS) at any time, once the sample ID is entered into the LIS.

The Selux AST Systems provides the following consumables: AST panels, panel lids, tubes and caps for sample prep, troughs for inoculator, McFarland Standards for densitometer performance checks, inoculator pipette tips, inoculator waste bins, inoculator growth media, inoculator cleaning solution, analyzer reagent packs, analyzer liquid waste disinfectant tablets, analyzer absorbent waste pads, and an analyzer solid waste bag.

The Selux AST System is divided into three primary AST steps performed at three different stations: workbench (for sample preparation), inoculator (for inoculation), and analyzer (for antimicrobial susceptibility testing).

Workbench (sample preparation)
The Workbench's graphical user interface (GUI) is accessed via a web application to guide users through the concentrated inoculum solution preparation (using the densitometer), panel selection, and carrier loading. The barcode scanner is used to register each carrier and panel, as well as associate them with each sample. During sample preparation, panels on the carriers are exposed to an ionizer to remove any latent ionic charge which may interfere with the

assay. The saline pump is used to dispense saline aliquots for concentrated inoculum preparation and McFarland standards used for densitometer calibration.

Selux panels are 384-well polystyrene microplates that contain dehydrated antimicrobials and are sealed with a desiccant in air-impermeable foil pouches to provide room-temperature stability.

The Selux AST System provides two types of carriers: standard carriers which hold up to four panels and can be used to test 1 – 4 samples at a time and multiplex carriers which are used when two or more different quality control (QC) organisms are being tested.

Panel inoculator
The Selux panel is inoculated by the Selux benchtop inoculator, an automated liquid handler. The inoculator dilutes and transfers the concentrated inoculum solution into each panel. The user interacts with the system through a GUI that runs on the built-in, touch screen monitor. The inoculator ensures proper inoculation for each panel by reading the panel barcodes prior to initiating its filling sequence. Further, the inoculator creates sterile assay control wells as well as special test wells by directly pipetting microorganisms from the concentrated inoculum solution into specific resistance detection wells on each panel that require high microorganism concentrations.

AST Analyzer
The analyzer fully automates antimicrobial susceptibility testing requiring no user intervention after the inoculated carrier is loaded. The analyzer is divided into three levels: upper floor, lower floor, and reagent/waste. The upper floor contains the carrier loading bays. A robotic panel gripper picks panels and moves them between positions. A multi-channel bulk solution dispenser adds reagents to specified wells on each panel. The panels are placed into orbital shaking incubators and read by a multimode microplate reader to record absorbance and fluorescence measurements. When ready, the panels are moved to the lower floor by an elevator gantry. The lower floor also contains a robotic panel gripper. It contains a fluid handling station that dispenses and aspirates reagents. It also contains orbital shaker mixing stations, for use in the assay binding steps, and a plate reader with time-resolved fluorescence detection capabilities. The reagent/waste level contains drawers users can open to replace the liquid analyzer reagent pack consumables and to access waste.

The Selux AST System with the Gram-Positive Panel can determine the MIC of various antimicrobials when tested against specific organisms (**Table 1**).

Table 1. Reportable MIC Ranges and Organism-Specific Breakpoints for Antimicrobials included in the Selux AST System, Gram-Positive Panel

Antimicrobial	**Indicated Organism**	**Selux AST System Reportable Range (µg/mL)**	**FDA-Recognized/Approved Breakpoints (µg/mL)**		
			S	**I**	**R**
Ampicillin	*E. faecium, E. faecalis*	≤0.25 to ≥128	≤8	-	≥16
Ceftaroline	*S. aureus*	≤0.06 to ≥32	≤1	2	≥4
Clindamycin	*S. aureus, S. epidermidis*	≤0.03 to ≥16	≤0.5	1-2	≥4

Antimicrobial	Indicated Organism	Selux AST System Reportable Range (µg/mL)	FDA-Recognized/Approved Breakpoints (µg/mL)		
			S	I	R
Daptomycin	*E. faecalis*	≤0.06 to ≥32	≤2	4	≥8
	S. aureus	≤0.06 to ≥32	≤1	-	-
Delafloxacin	*E. faecalis*	≤0.008 to ≥8	≤0.12	0.25	≥0.5
	S. aureus, S. haemolyticus	≤0.008 to ≥8	≤0.25	0.5	≥1
Eravacycline	*E. faecalis*	≤0.002 to ≥0.5	≤0.06	-	≥0.12
	S. aureus	≤0.002 to ≥0.5	≤0.06	-	≥0.12
Erythromycin	*S. aureus*	≤0.06 to ≥32	≤0.5	1-4	≥8
Linezolid	*E. faecium, E. faecalis*	≤0.25 to ≥32	≤2	4	≥8
	S. aureus, S. epidermidis, S. haemolyticus	≤0.25 to ≥32	≤4	-	≥8
Levofloxacin	*E. faecium, E. faecalis*	≤0.06 to ≥32	≤2	4	≥8
	Methicillin-susceptible *S. aureus*	≤0.06 to ≥32	≤2	4	≥8
Minocycline	*S. aureus*	≤0.12 to ≥64	≤4	8	≥16
Oxacillin	*S. aureus*	≤0.03 to ≥32	≤2	-	≥4
	S. lugdunensis	≤0.03 to ≥32	≤2	-	≥4
Penicillin	*E. faecium, E. faecalis*	≤0.03 to ≥64	≤8	-	≥16
	S. aureus	≤0.03 to ≥64	≤0.12	-	≥0.25
Trimethoprim	*Staphylococcus* spp.	≤0.25 to ≥64	≤8	-	≥16
Vancomycin	*E. faecium, E. faecalis*	≤0.12 to ≥128	≤4	8-16	≥32
	S. aureus	≤0.12 to ≥128	≤2	4-8,	≥16
	Staphylococcus spp. other than *S. aureus*	≤0.12 to ≥128	≤4	8-16	≥32
Cefoxitin Screen	*S. aureus*	SN (negative) / SP (positive)	n/a		
	S. lugdunensis	SN (negative) / SP (positive)	n/a		

n/a: FDA breakpoints not applicable because Cefoxitin Screen is a qualitative test based on an MIC value of 4 µg/mL with results reported either as SN (screen negative) or SP (screen positive)
(-) Indicates that a corresponding MIC is not defined for that category.

B Principle of Operation:

The Selux AST test requires that the Gram type of the organism be known prior to testing as the information is necessary to select the proper AST panel to use (i.e., gram-positive or gram-negative). The organism identification (ID) is not needed for Selux AST processing to be performed; however, the organism ID is necessary for a final result to be reported.

The Selux AST System performs antimicrobial susceptibility testing similar to the gold-standard broth microdilution method. To get an accurate reading of microbial growth, the sufficient growth assay monitors growth in dedicated AST panel wells that contain organisms and cation-adjusted Mueller-Hinton Broth but no antimicrobials or probes. Sufficient growth assay wells are monitored by fluorescence to those wells which the standard metabolism-based viability assay pair resazurin/methylene blue have been added and/or by optical absorbance. Two probe-based assays, a viability assay and a surface area assay, commence across all wells in the panel after the threshold in the sufficient growth well has been met. The viability and surface area assays are performed in each AST panel well, providing two complementary datasets for each well.

These data are input to an MIC-determining algorithm that provides results when organism IDs are available.

C Instrument Description Information:

1. Instrument Name:

   Selux AST System

2. Specimen (Organism/Colony) Identification:

   An order request is sent from the Laboratory Identification System (LIS), and the accession identifiers and other information related to the specimen are received and stored by the Site Service into the Site Database. A medical technologist will prepare one or more samples and insert them into the Selux carrier under the guidance of the Sample Preparation web interface. For the inoculator, users use the Sample Prep GUI to select the sample(s) to test and determine the appropriate Carrier to use. The user utilizes an included barcode scanner to scan Carrier Barcodes, accession information from barcoded agar plates, or concentrated inoculum tubes, depending on the laboratory workflow. The user then selects the appropriate panel type and loads it into the appropriate sample number on the carrier. The inoculator ensures proper inoculation for each panel by reading the panel barcodes prior to initiating its filler sequence. If the Selux AST system is connected to a LIS, it will attempt to obtain the organism identification if it was part of an LIS order during the user-entered sample accession. If no matching order request is found or the system is not connected to an LIS, the user can enter the organism identification in the results page any time after sample preparation. If an accession enters the Selux AST System through the LIS, the Selux AST System will check that accession against the one the user provided. The user will be alerted during Results Review of any organism identification discrepancies that must be manually resolved.

3. Specimen (Organism/Colony) Sampling and Handling:

   Samples are prepared using the Selux Workbench. The user prepares a concentrated inoculum solution and uses the Selux-provided densitometer to ensure the proper microorganism turbidity has been achieved. After preparing the concentrated inoculum and placing in the Inoculator, the remaining steps are carried out by automated Selux processes. The user is required to move inoculated panels from the Inoculator to the Analyzer.

4. Calibration:

   The Selux AST System is setup and installed exclusively by trained service personnel. No changes or modifications are to be made to the System configuration after service personnel have completed setup procedures unless those activities and procedures are performed by Selux Service personnel.

   In addition, the densitometer should be calibrated weekly by the users to verify accuracy using Selux-provided McFarland standards.

5. Quality Control:

The Selux AST System software contains Quality Control (QC) Sets (A, B, C) so that when selected, specific QC strains for testing are listed (**Table 2**). Concentrated inocula are prepared by the user similar as for clinical samples. The QC report lists several descriptors, including the expected QC range, actual MIC value and result status (pass/fail) for each tested antimicrobial agent. Pass/fail status is determined by the whether the actual MIC result falls within the expected QC range (pass) or outside of the expected QC range (fail).

Table 2. CLSI-Recommended QC Organisms for Gram-Positive Antimicrobials

Antimicrobial	Abbreviation	QC Set	QC Strain	Expected QC Range/Result
Ampicillin	AMP	A	ATCC-29212	0.5-2 µg/mL
Clindamycin	CLI	A	ATCC-29213	0.06-0.25 µg/mL
Ceftaroline	CPT	A	ATCC-29213	0.12-0.5 µg/mL
Daptomycin	DAP	A	ATCC-29212	1-4 µg/mL
Delafloxacin	DFX	A	ATCC-29212	0.016-0.06 µg/mL
Eravacycline	ERV	A	ATCC-29212	0.016-0.06 µg/mL
Erythromycin	ERY	A	ATCC-29212	1-4 µg/mL
Linezolid	LNZ	A	ATCC-29213	1-4 µg/mL
Levofloxacin	LVX	A	ATCC-29212	0.25-2 µg/mL
Minocycline	MIN	A	ATCC-29212	1-4 µg/mL
Oxacillin	OXA	A	ATCC-29213	0.12-0.5 µg/mL
Penicillin	PEN	A	ATCC-29213	0.25-2 µg/mL
Trimethoprim	TMP	A	ATCC-29213	1-4 µg/mL
Vancomycin	VAN	A	ATCC-29213	0.5-2 µg/mL
Cefoxitin Screen	FOX SCN	A	ATCC-29213	Negative
		C	ATCC-43300	Positive

V Substantial Equivalence Information:

A Predicate Device Name(s):

Bd Phoenix Automated Microbiology System - Vancomycin (0.5-32 µg/mL)

B Predicate 510(k) Number(s):

K131331

C Comparison with Predicate(s):

Device & Predicate Device(s):	Device: K211759	Predicate: K131331
Device Trade Name	Selux AST System	BD Phoenix Automated Microbiology System- Vancomycin 0.5-32 µg/mL
General Device Characteristic Similarities		
Intended Use / Indications for Use	The Selux AST System is intended to be used for the automated quantitative	The BD Phoenix Automated Microbiology System is intended for the

Device & Predicate Device(s):	Device: K211759	Predicate: K131331
	or qualitative susceptibility testing for most clinically significant aerobic microorganisms. The Selux AST System does not provide organism identification. The Selux Gram-Positive Panel is intended for use with the Selux AST System as an *in vitro* test to determine the susceptibility of isolated colonies of specific *Staphylococcus* species and *Enterococcus* species to specific antimicrobial agents when used as instructed.	*in vitro* rapid identification (ID) of gram positive bacteria from pure culture belonging to the genera *Staphylococcus, Enterococcus*, other gram positive cocci and gram positive bacilli. The BD Phoenix Automated Microbiology System is also intended for the quantitative determination of antimicrobial susceptibility by minimal inhibitory concentration (MIC) of most gram positive bacteria isolates from pure culture belonging to the genera *Staphylococcus and Enterococcus*.
Sample	Bacterial colonies isolated from culture	Same
Technology	Automated growth-based detection using metabolic indicators to detect organism growth	Automated growth based enhanced by use of a redox indicator (colorimetric oxidation-reduction) to detect organism growth
Panel Type	Gram-positive	Same
Read Method	Automated	Same
Inoculation Method	Automated	Same
Result Reported	Report results as minimum inhibitory concentration (MIC) and categorical interpretation (S, I, R, NS)	Report results as minimum inhibitory concentration (MIC) and categorical interpretation (S, I, R)
Indicated Species	Specific *Staphylococcus* spp. and *Enterococcus* spp.	*Staphylococcus* spp. and *Enterococcus* spp.
General Device Characteristic Differences		
Antimicrobial Agent and Reporting Range	Ampicillin ≤0.25 to ≥128 µg/mL Ceftaroline ≤0.06 to ≥32 µg/mL Clindamycin ≤0.03 to ≥16 µg/mL Daptomycin ≤0.06 to ≥32 µg/mL Delafloxacin ≤0.008 to ≥8 µg/mL Eravacycline ≤0.002 to ≥0.5 µg/mL Erythromycin ≤0.06 to ≥32 µg/mL Linezolid ≤0.25 to ≥32 µg/mL Levofloxacin ≤0.06 to ≥32 µg/mL Minocycline ≤0.12 to ≥64 µg/mL Oxacillin ≤0.03 to ≥32 µg/mL Penicillin ≤0.03 to ≥64 µg/mL	Vancomycin 0.5-32µg/mL

Device & Predicate Device(s):	Device: K211759	Predicate: K131331
	Trimethoprim ≤0.25 to ≥64 µg/mL Vancomycin ≤0.12 to ≥128 µg/mL Cefoxitin Screen S/R	
IVD Functions	AST	ID and AST
Instrument	Selux AST System	BD Phoenix Automated Microbiology System

VI Standards/Guidance Documents Referenced:

- FDA Class II Special Controls Guidance Document: Antimicrobial Susceptibility Test (AST) Systems; Guidance for Industry and FDA (Issued August 28, 2009)
- CLSI M100-M30, "Performance Standards for Antimicrobial Susceptibility Testing"; Thirtieth Edition (January 2020)

VII Performance Characteristics (if/when applicable):

A Analytical Performance:

1. Precision/Reproducibility:
   Reproducibility testing for the Selux AST System with the Gram-Positive Panel was conducted at 3 testing sites (2 external and 1 internal site). Panel members generally consisted of species indicated for use with each respective antimicrobial. To accommodate the numerous antimicrobial/organism combinations being tested concurrently, up to three non-indicated species, within an indicated genus or family, were considered acceptable for testing. Reproducibility was determined from the total number (and percent) of results that fell within one dilution (+/- one doubling dilution) of the modal MIC result for quantitative assays or the number of results that were in category agreement for qualitative assays divided by the total number of results. Reproducibility was evaluated between sites (inter-site) and within sites (intra-site). Both best-case (assumes that off-scale results are within one dilution of the mode) and worst-case (assumes that off-scale results are more than one dilution of the mode) performance was determined for each antimicrobial, as outlined in the AST Special Controls Guidance.

   In the initial study, inter-site reproducibility was evaluated at three sites by testing at least 25 isolates with on-scale MIC values for each antimicrobial, for a minimum of 75 results per antimicrobial (25 isolates x 3 sites = 75 results/antimicrobial). In general, best-case inter-site reproducibility was acceptable (≥95%) and a sufficient number of results obtained (≥75 results). However, antimicrobials with inter-site worst-case reproducibility of <89% or an insufficient number of results generated (i.e., <75) in the initial study were further evaluated in a supplemental study in which testing was performed with three instruments. Data from both studies are collated and summarized in **Table 3**. Performance is summarized for each antimicrobial tested with all organisms as well as indicated organisms only. Inter-site reproducibility was determined to be acceptable.

Table 3. Inter-site Reproducibility of Selux AST System

	All organisms (combined)		Indicated organisms only	
Antimicrobial	**Best-case (%)**	**Worst-case (%)**	**Best-case (%)**	**Worst-case (%)**
Ampicillin [a]	72/75 (96)	72/75 (96)	68/69 (98.6)	68/69 (98.6)
Cefoxitin screen	74/75 (98.7)	74/75 (98.7)	74/75 (98.7)	74/75 (98.7)
Ceftaroline [a]	74/75 (98.7)	74/75 (98.7)	74/75 (98.7)	74/75 (98.7)
Clindamycin	78/81 (96.3)	78/81 (96.3)	63/66 (95.5)	63/66 (95.5)
Daptomycin	77/78 (98.7)	77/78 (98.7)	77/78 (98.6)	77/78 (98.6)
Delafloxacin	144/144 (100)	144/144 (100)	144/144 (100)	144/144 (100)
Eravacycline	78/78 (100)	78/78 (100)	78/78 (100)	78/78 (100)
Erythromycin	141/144 (97.9)	136/144 (94.4)	141/144 (97.9)	136/144 (94.4)
Levofloxacin	76/78 (97.4)	76/78 (97.4)	76/78 (97.4)	76/78 (97.4)
Linezolid	77/78 (98.7)	77/78 (98.7)	56/57 (98.2)	56/57 (98.2)
Minocycline [a]	73/75 (97.3)	73/75 (97.3)	64/66 (97.0)	64/66 (97.0)
Oxacillin	76/78 (97.4)	75/78 (96.2)	76/78 (97.4)	75/78 (96.2)
Penicillin	74/78 (94.9)	70/78 (89.7)	74/78 (94.9)	70/78 (89.7)
Trimethoprim	77/81 (95.1)	74/81 (91.4)	77/81 (95.1)	74/81 (91.4)
Vancomycin	79/80 (98.8)	75/80 (93.8)	79/80 (98.8)	75/80 (93.8)

[a] In instances where the original study had lower than the required number, supplemental testing was conducted and data collated with original data.

Intra-site reproducibility was evaluated by testing a minimum of five isolates in triplicate on three days at one internal site for each antimicrobial to generate a minimum of 45 results per antimicrobial (5 isolates x 3 replicates x 3 days = 45 results/antimicrobial). In general, best-case intra-site reproducibility was acceptable (≥95%) and a sufficient number of results obtained (≥45 results). However, antimicrobials with worst-case reproducibility <89% or an insufficient number of results generated (i.e., <45) in the initial study were further evaluated in a supplemental study. Data from both studies are collated and summarized in **Table 4**. Performance is summarized for each antimicrobial tested with all organisms as well as indicated organisms only. Intra-site reproducibility was determined to be acceptable.

Table 4. Intra-site Reproducibility of Selux AST System

	All organisms (combined)		Indicated organisms only	
Antimicrobial	**Best-case (%)**	**Worst-case (%)**	**Best-case (%)**	**Worst-case (%)**
Ampicillin	45/45 (100)	45/45 (100)	45/45 (100)	45/45 (100)
Cefoxitin screen	47/47 (100)	47/47 (100)	47/47 (100)	47/47 (100)
Ceftaroline [a]	48/49 (98.0)	48/49 (98.0)	48/49 (98.0)	48/49 (98.0)
Clindamycin	54/54 (100)	54/54 (100)	36/36 (100)	36/36 (100)
Daptomycin	74/74 (100)	74/74 (100)	65/65 (100)	65/65 (100)
Eravacycline	103/103 (100)	99/103 (96.1)	103/103 (100)	99/103 (96.1)
Erythromycin [b]	44/47 (93.6)	42/47 (89.4)	44/47 (93.6)	42/47 (89.4)
Linezolid	62/63 (98.4)	62/63 (98.4)	53/54 (98.1)	53/54 (98.1)
Oxacillin	62/65 (95.4)	62/65 (95.4)	62/65 (95.4)	62/65 (95.4)
Vancomycin	83/83 (100)	79/83 (95.2)	83/83 (100)	79/83 (95.2)

[a] In instances where the original study had lower than the required number, supplemental testing was conducted and data collated with original data.

[b] The best-case intra-site reproducibility for erythromycin is 93.6%, which is <95%; however, reproducibility testing at two other sites were 100%, which is acceptable.

2. Linearity:

   Not applicable

3. Analytical Specificity/Interference:

   Not applicable

4. Assay Reportable Range:

   Not applicable

5. Traceability, Stability, Expected Values (Controls, Calibrators, or Methods):

   Quality Control Testing. Quality control testing was performed each day that testing was conducted. CLSI recommended QC strains for each antimicrobial were tested a sufficient number of times (i.e., at least 20 times/site) at each testing site using the Selux AST System as well as the reference site using the broth microdilution reference method.

   QC expected ranges and results for the quantitative Selux AST System assays are summarized in **Table 5**. For all antimicrobials, greater than 95% of results were within the expected range, which is acceptable.

Table 5. QC Expected Ranges and Results for the Quantitative Selux AST System Assays

Antimicrobial	QC Organism	Expected Range (µg/mL)	No. in Range (%)	
			Reference	Selux
Ampicillin	*E. faecalis* ATCC 29212	0.5 – 2	31/31 (100)	190/191 (99.5)
Ceftaroline	*S. aureus* ATCC 29213	0.12 – 0.5	26/26 (100)	190/191 (99.5)
Clindamycin	*S. aureus* ATCC 29213	0.06 – 0.25	26/26 (100)	190/191 (99.5)
Daptomycin	*E. faecalis* ATCC 29212	1 – 4	16/16 (100)	81/82 (98.8)
Delafloxacin	*E. faecalis* ATCC 29212	0.016 – 0.12	31/31 (100)	190/191 (99.5)
Eravacycline	*E. faecalis* ATCC 29212	0.016 – 0.06	31/31 (100)	187/191 (97.9)
Erythromycin	*E. faecalis* ATCC 29212	1 – 4	30/31 (96.8)	187/191 (97.9)
Levofloxacin	*E. faecalis* ATCC 29212	0.25 – 2	31/31 (100)	191/191 (100)
Linezolid	*S. aureus* ATCC 29213	1 – 4	31/31 (100)	189/191 (99.0)
Minocycline	*E. faecalis* ATCC 29212	1 – 4	16/16 (100)	82/82 (100)
Oxacillin	*S. aureus* ATCC 29213	0.12 – 0.5	28/28 (100)	189/191 (99.0)
Penicillin	*S. aureus* ATCC 29213	0.25 – 2	30/30 (100)	191/191 (100)
Trimethoprim	*S. aureus* ATCC 29213	1 – 4	11/11 (100)	82/82 (100)
Vancomycin	*S. aureus* ATCC 29213	0.5 – 2	31/31 (100)	189/191 (99.0)

QC expected and actual results with Cefoxitin Screen are summarized in **Table 6.** The Selux AST System reported nine false positive results when testing cefoxitin with the negative QC organism, *S. aureus* ATCC 29213. The false positive results occurred at a single testing site

(six of the nine failures occurred on successive days of testing). Data from samples tested on days in which QC failed were excluded from the clinical analysis. Failures with this organism could not be replicated during investigative testing which comprised of 48 individual runs, each with a separate McFarland inoculum preparation, as performance was 100% (48/48). Overall, QC was determined to be acceptable.

Table 6. QC Expected and Actual Results for the Selux AST System with Cefoxitin Screen

Antimicrobial	QC Organism	Expected Result	No. Correct (%)	
			Reference	Selux
Cefoxitin Screen	*S. aureus* ATCC 29213	Negative	10/11 (90.9)	73/82 (89.0)
Cefoxitin Screen	*S. aureus* ATCC 43300	Positive	11/11 (100)	83/83 (100)

Inoculum Density Check: The Selux AST System has an onboard densitometer and liquid handler that prepares and transfers a McFarland inoculum preparation into each panel. To verify the microorganism turbidity, quantitative culture was performed to determine the inoculum densities of all QC and reproducibility samples as well as a minimum of 10% of the clinical and challenge isolates. The microorganism concentrations for samples tested with the Selux AST System ranged from 5.0×10^4 to 4.5×10^6 CFU/mL and with the reference method ranged from 3.5×10^4 to 1.2×10^6 CFU/mL which are equivalent to an 0.5 McFarland suspension (*E. coli* ATCC 25922 approximately 5×10^5 CFU/mL).

Device Failure: There were no device failures encountered during initial testing with the Selux AST System. However, three device failures were observed in the supplemental and additional independent validation studies. All were detected at the time of failure by the system and resulted in faulted panels, thus had no impact on results. Two failures were due to an issue with the controller board of an off-the-shelf Inoculator component, a dual pressure/vacuum source, that was resolved by replacing the controller board. A software update was released to correct the issue. The third failure was a damaged cable supplying signal and power to a z-axis motor in the Selux Analyzer. No failures were observed in subsequent processing after the cable was replaced.

Growth Failure Rate: There were no growth failures on the Selux AST System. All samples that generated reference method results also generated Selux results.

Purity Check: Purity plates were prepared from the inoculum suspensions of every sample tested. AST results were only reported for pure isolates; data generated from plates that generated multiple colony morphologies was excluded from analyses.

6. Detection Limit:

   Not applicable

7. Assay Cut-Off:

   Not applicable

8. Accuracy (Instrument):

Not applicable

9. Carry-Over/Cross-Contamination:

Cross-contamination with the Selux AST System was evaluated by testing first with the Selux Inoculator and then with the entire Selux AST System (Inoculator and Analyzer).

Cross-Contamination Study for Selux Inoculator. The purpose of this study was to evaluate the possible occurrence of cross-contamination of the Selux Inoculator during Selux multiplex testing with various organisms. The Selux AST System instructions for use and user interface were followed to inoculate individual panels using one QC isolate (*E. faecalis* ATCC 2922, *K. pneumoniae* ATCC BAA-2814, *S. aureus* ATCC 29213 or *E. coli* ATCC 25922) and one sterile saline sample (media only) in adjacent panels. Inoculated panels were incubated overnight under standard growth-promoting conditions and the presence/absence of growth was visually evaluated in wells inoculated with sterile saline.

The first set of testing included 12 total inoculator runs, with 2 gram-positive isolates/saline samples and 2 gram-negative isolates/saline samples over three days. Purity plates were conducted for all samples. This set of testing yielded growth in two wells on the saline plate (2/1920 wells) and the cross-contamination study protocol was repeated for two additional sets of testing. No additional growth occurred in any of the saline wells during the final testing. MALDI-TOF species identification of the two wells with growth indicated that the contaminants were *S. epidermidis* and *S. aureus*. Even though a root cause of the *S. epidermidis* contamination was not determined, it was likely caused by user contamination whereas *S. aureus* could have been due to cross contamination during sample preparation or the inoculation process. The final contamination rate across all three rounds of testing was determined to be 2/5760 wells (0.03%) which was determined to be acceptable.

Cross-Contamination Study for Selux AST System (Inoculator and Analyzer). The purpose of this study was to evaluate the potential for cross-contamination during testing with the entire Selux AST system (Inoculator and Analyzer). Two representative clinical samples, *E. coli* and *S. aureus,* were used for testing. Testing comprised of 10 panels; five panels with *E. coli* and five panels with *S. aureus*. The strains were processed to allow the gram-negative and gram-positive samples to be alternated during inoculator processing. Purity plates were prepared from the diluted troughs in the Selux inoculator. The MIC results from the AST testing were compared to reference results from the Selux reference database. Performance was evaluated by reviewing purity plates and AST results. The criteria to evaluate the performance was set as acceptable for zero purity plate contamination caused by the other species and >90% essential agreement (EA) compared with BMD results.

The purity plates did not show evidence of cross-contamination between *E. coli* and *S. aureus* (i.e., single morphology colonies on each representative plate) and MIC results from each species demonstrated 100% EA to the reference result. Additionally, the system did not report any faults due to high background or viability contamination.

B Comparison Studies:

1. Method Comparison with Predicate Device:

Clinical performance testing on the Selux AST System was initially performed at three U.S. test sites (2 external, 1 internal). For instances in which testing was required to supplement existing data from the original study and support specific claims, testing was performed on three Selux AST System instruments at two testing sites.

Performance was evaluated using contemporary and stock frozen clinical isolates as well as challenge isolates, which were selected for their resistance profiles. Clinical isolates of non-fastidious bacteria were recovered from cultures of clinical specimens (e.g., blood, stool, urine, respiratory, wound, aspirates) from diverse geographic locations across the U.S.

Contemporary frozen isolates were defined as isolates that had been collected and frozen within six months of testing while stock frozen isolates were tested six or more months after collection.

A total of 706 clinical (193 contemporary and 513 stock) and 159 challenge *Staphylococcus* spp. and *Enterococcus* spp. isolates were tested to evaluate the Selux AST System performance for 14 antimicrobials and one screening test using the Selux Gram-Positive panel. Depending on the spectrum of activity, breakpoints and the claimed organisms (species/group) for each antimicrobial on the panel, the number of datapoints for the various antimicrobial-organisms tested varied and ranged from 39 (e.g. *S. lugdunensis*/Oxacillin) to 311 (e.g. *Staphylococcus*/Clindamycin). Selux results were compared to the modal value of triplicate broth microdilution reference results performed at an independent reference laboratory.

Performance was determined generally based on criteria outlined in the Class II Special Controls Guidance Document: Antimicrobial Susceptibility Test (AST) Systems including essential agreement (EA), categorical agreement (CA), and categorical errors (minor, major and very major errors). EA was calculated as the percentage of Selux MIC results that were within plus or minus one serial two-fold dilution of the reference result. CA was calculated as the percentage of Selux interpretive results (S/I/R) that were identical to the interpretive results of the reference result. EA of evaluable results (on-scale Selux and reference results or results in which an off-scale result was at least two doubling dilutions from the on-scale result) were also calculated. Performance was considered acceptable if the EA and CA were ≥90%, major error rate was ≤3%, and very major error rate was ≤2%.

A trending analysis using combined clinical and challenge isolate results was also conducted to evaluate antimicrobial-organism combinations for which Selux MIC results were determined to be one or more doubling dilutions lower or higher than the reference result. MIC results that were off-scale for both the reference and Selux were not considered in the trending analysis. Antimicrobial-organism combinations for which the difference between the percentage of isolates with higher or lower MIC values was ≥ 30% with a statistically significant confidence interval were considered to have evidence of trending and is addressed in the labeling.

A high level summary of the performance of the Selux AST System is described below for each antimicrobial and indicated species. Complete details and results including EA, CA and error rate analyses are summarized in **Tables 7** and **8** and trending analyses are summarized in **Table 9**.

Ampicillin. A total of 299 *Enterococcus* spp. (115 *E. faecalis* and 184 *E. faecium*) isolates were evaluated with ampicillin. The combined results from clinical and challenge isolate testing demonstrated an EA of 98.3% and CA of 100%, which is acceptable. There were no minor, major or very major errors. Overall, performance is acceptable. A limitation statement is included in the device labeling to address the lack of testing with resistant *E. faecalis* isolates.

Analysis of trending indicated that MIC values for *Enterococcus* spp. tended to be one doubling dilution lower than the reference MIC value. The following statement is included as a footnote to the AST performance table:

> Selux MIC values for the following antimicrobial/organism combinations tended to be one doubling dilution lower than the reference MIC value:
> - Ampicillin: *Enterococcus* spp.

Cefoxitin Screen. A total of 151 *S. aureus* isolates were evaluated with the cefoxitin screen. The combined results from clinical and challenge isolate testing demonstrated an CA of 98.7%, which is acceptable. There was one major error (1/71 = 1.4%) and one very major error (1/80 = 1.3%), which is acceptable.

A total of 24 *S. lugdunensis* isolates were evaluated with the cefoxitin screen. The combined results from clinical and challenge isolate testing demonstrated an CA of 95.8%, which is acceptable. There were no very major errors; however, there was one major error (1/23 = 4.3%), which was considered a random error. The following footnote to the performance table is included in the device labeling to address the major error:

> When evaluating Selux AST System performance, there was a single major error (MAJ) that resulted in an unacceptable MAJ rate of 4.3% (1/23) when cefoxitin screen was tested with *Staphylococcus lugdunensis*.

In addition, a limitation statement is included in the device labeling to address the lack of testing with resistant *S. lugdunensis* isolates**.**

Ceftaroline. A total of 138 *S. aureus* isolates were evaluated with the ceftaroline. The combined results from clinical and challenge isolate testing demonstrated an EA and CA of 98.6%, which is acceptable. There was one major error (1/134 = 0.7%), one minor error and no very major errors. Overall, performance is acceptable. A limitation statement is included in the device labeling to address the lack of testing with resistant *S. aureus* isolates.

There was no evidence of trending observed for *S. aureus* with ceftaroline.

Clindamycin. A total of 311 *Staphylococcus* spp. isolates (including 145 *S. aureus* and 55 *S. epidermidis*) were evaluated with clindamycin. The combined results from clinical and

challenge isolate testing demonstrated an EA of 95.8% and an CA of 97.1%, which is acceptable. When evaluating results by individual species, *S. aureus* had one minor error and one major error (1/118 = 0.8%), which is acceptable. *S. epidermidis* had two minor errors and two major errors (2/31 = 6.5%) at a Selux MIC value of 4 µg/mL, which is not acceptable. The following limitation is included in the device labeling to restrict reporting of *S. epidermidis* due to the observed major errors:

> Perform an alternative method of testing prior to reporting results for the following antibiotic/organism combination(s):
>
> - Clindamycin: *Staphylococcus epidermidis* when the Selux MIC is 4 µg/mL due to the occurrence of two major errors

There was no evidence of trending observed for *S. aureus* or *S. epidermidis* with clindamycin.

Daptomycin. A total of 116 *E. faecalis* isolates were evaluated with daptomycin. The combined results from clinical and challenge isolate testing demonstrated an EA of 94.0% and an CA of 100%. There were no minor, major or very major errors. Overall, performance is acceptable.

A total of 134 *S. aureus* isolates were evaluated with daptomycin. The combined results from clinical and challenge isolate testing demonstrated an EA of 98.5% and an CA of 99.3%. There was one very major error (1/1 = 100%) and no major or minor errors. The following limitation is included in the device labeling to address the single non-susceptible isolate that was found to be susceptible by Selux (potential very major error since no other category is defined other than "susceptible only"):

> The current absence of daptomycin-resistant isolates precludes defining any results other than "Susceptible". Isolates yielding results other than "Susceptible" should be submitted to a reference laboratory for further testing. A single non-susceptible strain of *S. aureus* provided a potential very major error during the comparative testing.

There was no evidence of trending observed for *E. faecalis* or *S. aureus* with daptomycin.

Delafloxacin. A total of 180 *E. faecalis* isolates were evaluated with delafloxacin. The combined results from clinical and challenge isolate testing demonstrated an EA of 97.2% and CA of 91.1%. There were two major errors (2/128 =1.6%) and no very major or minor errors. Overall, performance is acceptable.

A total of 229 *Staphylococcus* spp. isolates (218 *S. aureus* and 11 *S. haemolyticus*) were evaluated with delafloxacin. The combined results from clinical and challenge isolate testing demonstrated an EA of 99.1% and CA of 94.2%. There were no major, very major or minor errors, which is acceptable. When evaluating results by individual species, *S. haemolyticus* had a CA of 45.5% due to six minor errors at Selux MIC values of 0.25 µg/mL and 0.5 µg/mL. The following limitation is included in the device labeling to restrict reporting of *S. haemolyticus* due to the observed low CA:

Perform an alternative method of testing prior to reporting results for the following antibiotic/organism combination(s):
Delafloxacin: *Staphylococcus haemolyticus* when the Selux MIC is 0.25 µg/mL or 0.5 µg/mL due to the <90% CA caused by six minor errors

Analysis of trending indicated that MIC values for *S. haemolyticus* tended to be one doubling dilution lower than the reference MIC value. The following statement is included as a footnote to the AST performance table:

Selux MIC values for the following antimicrobial/organism combinations tended to be one doubling dilution lower than the reference MIC value:

- Delafloxacin: *Staphylococcus haemolyticus*

Eravacycline. A total of 287 *Enterococcus* spp. (114 *E. faecalis* and 173 *E. faecium*) isolates were evaluated with eravacycline. The combined results from clinical and challenge isolate testing demonstrated a CA of 97.6% but an EA of 86.4% due to *E. faecium* which had an EA of 81.5%. In addition, *E. faecium* had five major errors (5/168 = 3.0%) and two very major errors (2/5 = 40%), which is not acceptable. In addition to a limitation to address the lack of testing with resistant *Enterococcus* spp. isolates, the following limitation is included in the device labeling to restrict reporting of *E. faecium* due to unacceptable performance:

Perform an alternative method of testing prior to reporting results for the following antibiotic/organism combination(s):
Eravacycline: *Enterococcus faecium*

A total of 118 *S. aureus* isolates were evaluated with eravacycline. The combined results from clinical and challenge isolate testing demonstrated an EA and CA of 100%. There were no major or very major errors. Overall, performance is acceptable.

Analysis of trending indicated that MIC values for *Enterococcus faecalis* tended to be one doubling dilution lower than the reference MIC value while MIC values for *S. aureus* tended to be one doubling dilution higher than the reference MIC value The following statements are included as a footnote to the AST performance table:

Selux MIC values for the following antimicrobial/organism combinations tended to be one doubling dilution lower than the reference MIC value:

- Eravacycline: *Enterococcus* spp.

Selux MIC values for the following antimicrobial/organism combinations tended to be one doubling dilution higher than the reference MIC value:

- Eravacycline: *Staphylococcus aureus*

Erythromycin. A total of 280 *Enterococcus* spp. (182 *E. faecalis* and 98 *E. faecium*) isolates were evaluated with erythromycin. The combined results from clinical and challenge isolate testing demonstrated an EA of 83.9% and CA of 85.4%, which is not acceptable. When evaluating results by individual species, *E. faecalis* had an EA of 81.3% and CA of 83.5% with 28 minor errors and two major errors (2/26 =7.6%), which is not acceptable. *E. faecium* had an EA and CA of 88.8% with 11 minor errors, which is not acceptable. The following

limitation is included in the device labeling to restrict reporting of *Enterococcus* spp. due to the observed low EA and CA:

> Perform an alternative method of testing prior to reporting results for the following antibiotic/organism combination(s):
> Erythromycin: *Enterococcus* spp.

A total of 220 *Staphylococcus* spp. (including 145 *S. aureus*) isolates were evaluated with erythromycin. The combined results from clinical and challenge isolate testing demonstrated an EA of 92.7% and CA of 94.6%. There were seven minor errors, five major errors (5/92 = 5.4%), and no very major errors. Since all five major errors were from non-indicated *Staphylococcus* spp. (i.e., non-*S. aureus* isolates), performance with erythromycin is acceptable.

Analysis of trending indicated that MIC values for *S. aureus* tended to be one doubling dilution lower than the reference MIC value. The following statement is included as a footnote to the AST performance table:

> Selux MIC values for the following antimicrobial/organism combinations tended to be one doubling dilution lower than the reference MIC value:
> - Erythromycin: *Staphylococcus aureus*

Levofloxacin. A total of 281 *Enterococcus* spp. (184 *E. faecalis* and 97 *E. faecium*) isolates were evaluated with levofloxacin. The combined results from clinical and challenge isolate testing demonstrated an EA of 96.8% and CA of 96.8%. When evaluating results by individual species, *E. faecalis* had one minor error and two major errors (2/141 =1.4%), and no very major errors, which is acceptable. *E. faecium* had four minor errors and two very major errors (2/86 = 2.3%) at a Selux MIC value of 2 µg/mL, which is not acceptable. The following limitation is included in the device labeling to restrict reporting of *E. faecium* due to the observed very major errors:

> Perform an alternative method of testing prior to reporting results for the following antibiotic/organism combination(s):
> Levofloxacin: *Enterococcus faecium* when the Selux MIC is 2 µg/mL due to two very major errors

A total of 135 methicillin-susceptible *S. aureus* isolates were evaluated with levofloxacin. The combined results from clinical and challenge isolate testing demonstrated an EA of 97.8% and CA of 96.3%. There was one major error (1/82 = 1.2%), four minor errors, and no very major errors, which is acceptable.

Analysis of trending indicated that MIC values for *E. faecalis, E. faecium* and *S. aureus* tended to be one doubling dilution lower than the reference MIC value. The following statement is included as a footnote to the AST performance table:

> Selux MIC values for the following antimicrobial/organism combinations tended to be one doubling dilution lower than the reference MIC value:

- Levofloxacin: *Enterococcus faecalis, Enterococcus faecium*, *Staphylococcus aureus*

Linezolid. A total of 228 *Staphylococcus* spp. (including 127 *S. aureus*, 26 *S. epidermidis* and 12 *S. haemolyticus*) isolates were evaluated with linezolid. The combined results from clinical and challenge isolate testing demonstrated an EA of 97.8% and CA of 99.6%. When evaluating results by individual species, *S. aureus* had one major error (1/125 = 0.8%) and no minor or very major errors, which is acceptable. A limitation statement is included in the device labeling to address the lack of testing with resistant *Staphylococcus* spp. isolates.

A total of 299 *Enterococcus* spp. (117 *E. faecalis* and 182 *E. faecium*) isolates were evaluated with linezolid. The combined results from clinical and challenge isolate testing demonstrated an EA of 96.0% and CA of 98.3%. When evaluating results by individual species, *E. faecium* had three major errors (3/180 = 1.7%), two minor errors and no very major errors, which is acceptable. A limitation statement is included in the device labeling to address the lack of testing with resistant *Enterococcus* spp. isolates.

Analysis of trending indicated that MIC values for *S. haemolyticus* tended to be one doubling dilution lower than the reference MIC value. The following statement is included as a footnote to the AST performance table:

> Selux MIC values for the following antimicrobial/organism combinations tended to be one doubling dilution lower than the reference MIC value:
> - Linezolid: *Staphylococcus haemolyticus*

Minocycline. A total of 217 *Staphylococcus* spp. (including 113 *S. aureus*) isolates were evaluated with minocycline. The combined results from clinical and challenge isolate testing demonstrated an EA of 96.7% and CA of 98.6%. When evaluating results by individual species, *S. lugdunensis*, a non-indicated species, had one very major error (1/1 = 100%). Since this species is not indicated for use with minocycline, performance with minocycline is acceptable.

A limitation statement is included in the device labeling to address the lack of testing with resistant *Staphylococcus* spp. isolates.

Analysis of trending indicated that MIC values for *Staphylococcus* spp. tended to be one doubling dilution higher than the reference MIC value. The following statement is included as a footnote to the AST performance table:

> Selux MIC values for the following antimicrobial/organism combinations tended to be one doubling dilution higher than the reference MIC value:
> - Minocycline: *Staphylococcus* spp.

Oxacillin. A total of 124 CoNS isolates [including *S. capitus, S. cohnii, S. epidermidis, S. haemolyticus, S. hominis, S. intermedius group, S. saprophyticus, S. schleiferi, S. simulans,* and Coagulase-negative *Staphylococcus* (not speciated)] were evaluated with oxacillin. The combined results from clinical and challenge isolate testing demonstrated an EA of 83.9% and CA of 93.6%, which is not acceptable. There were a total of four major errors (4/44 =

9.1%) and four very major errors (4/80 = 5.0%) for the entire reporting group, which is not acceptable. The following limitation is included in the device labeling to restrict reporting of certain *Staphylococcus* spp. due to unacceptable performance:

> Perform an alternative method of testing prior to reporting results for the following antibiotic/organism combination(s):
> - Oxacillin: *Staphylococcus* spp., except *S. aureus* and *S. lugdunensis*

A total of 122 *S. aureus* isolates were evaluated with oxacillin. The combined results from clinical and challenge isolate testing demonstrated an EA of 85.3% and CA of 99.2%. There was one very major error (1/49 = 2.0%) and no minor or major errors. Analysis of performance using truncated reporting ranges (down to ≤0.12µg/mL) improved the EA to 93.4%. The following limitation statement is included in the device labeling to restrict reporting of *S. aureus* due to the low EA:

> Perform an alternative method of testing prior to reporting results for the following antibiotic/organism combinations:
> - Oxacillin: *Staphylococcus aureus* when the Selux MIC is ≤0.12 µg/mL

In addition, the following footnote to the performance table is included in the device labeling to describe the truncation and limitation statement for *S. aureus* with oxacillin:

> Using the full reporting range resulted in an unacceptable EA of 85.3% when oxacillin was tested with *Staphylococcus aureus*. Performance analysis using a truncated reporting range with a minimum MIC of 0.25 µg/mL improved EA to 93.4%.

A total of 39 *S. lugdunensis* isolates were evaluated with oxacillin. The combined results from clinical and challenge isolate testing demonstrated an EA of 89.7% and CA of 94.9. There were two major errors (2/36 = 5.6%) at Selux MIC values of 8 and 16 µg/mL and no minor or very major errors. The following limitation statement is included in the device labeling to restrict reporting of *S. lugdunensis* due to the observed major errors:

> Perform an alternative method of testing prior to reporting results for the following antibiotic/organism combinations:
> - Oxacillin: *Staphylococcus lugdunensis* when the Selux MIC is ≥8 µg/mL

There was no evidence of trending observed for *S. aureus* or *S. lugdunensis* with oxacillin.

Penicillin. A total of 238 *Enterococcus* spp. (117 *E. faecalis* and 121 *E. faecium*) isolates were evaluated with penicillin. The combined results from clinical and challenge isolate testing demonstrated an EA of 93.7% and CA of 98.3%. When evaluating results by individual species, *E. faecalis* had one major (1/116 =0.9%), which is acceptable. *E. faecium* had three major errors (3/17 = 17.6%) at Selux MIC values ≥32 µg/mL, which is not acceptable. The following limitation is included in the device labeling to restrict reporting of *E. faecium* due to the observed major errors:

Perform an alternative method of testing prior to reporting results for the following antibiotic/organism combination(s):

- Penicillin: *Enterococcus faecium* when the Selux MIC is ≥32 µg/mL due to three major errors

A total of 204 *Staphylococcus* spp. (all *S. aureus*) isolates were evaluated with penicillin. The combined results from clinical and challenge isolate testing demonstrated an EA of 84.3% and CA of 98.0%, which is not acceptable. Analysis of performance using truncated reporting ranges (up to ≥4 µg/mL) improved the EA to 91.2%. There were no major errors but four very major errors (4/163 = 2.5%). The following limitation is included in the device labeling to restrict reporting of *S. aureus* due to the low EA:

Perform an alternative method of testing prior to reporting results for the following antibiotic/organism combination(s):

- Penicillin: *Staphylococcus aureus* when the Selux MIC is ≥4 µg/mL

In addition, the following footnote to the performance table is included in the device labeling to describe the truncation and limitation statement for *S. aureus* with penicillin:

Using the full reporting range resulted in an unacceptable EA of 84.3% when penicillin was tested with *Staphylococcus aureus*. Performance analysis using a truncated reporting range with a maximum MIC of 2 µg/mL improved EA to 91.2%.

Analysis of trending indicated that MIC values for *E. faecium* tended to be one doubling dilution lower than the reference MIC value. The following statement is included as a footnote to the AST performance table:

Selux MIC values for the following antimicrobial/organism combinations tended to be one doubling dilution lower than the reference MIC value:

- Penicillin: *Enterococcus faecium*

Trimethoprim. A total of 215 *Staphylococcus* spp. [including 127 *S. aureus* and 88 CoNS: *S. capitus* (3), *S. epidermidis* (23), *S. haemolyticus* (11), *S. hominis* (6), *S. intermedius* (4), *S. lugdunensis* (23), *S. saprophyticus* (8), *S. schleiferi* (3), and *S. simulans* (7)] isolates were evaluated with trimethoprim. The combined results from clinical and challenge isolate testing demonstrated an EA of 91.1% and CA of 98.1%. When evaluating results by individual species, *S. epidermidis* and *S. hominis* each had one very major error (1/13 = 7.7% and 1/4 = 25%) and *S. intermedius* had two major errors (2/3 = 66.6%) while *S. lugdunensis* and *S. schleiferi* each had EA <90%, which are not acceptable. The following limitation is included in the device labeling to restrict reporting of specific CoNS species due to unacceptable performance:

Perform an alternative method of testing prior to reporting results for the following antibiotic/organism combination(s):

- Trimethoprim: Coagulase-Negative Staphylococci (*S. epidermidis, S. hominis, S. intermedius group, S. lugdunensis,* and *S. schleiferi*)

Analysis of trending indicated that MIC values for *S. capitus* and *S. haemolyticus* tended to be one doubling dilution lower than the reference MIC value. The following statement is included as a footnote to the AST performance table:

> Selux MIC values for the following antimicrobial/organism combinations tended to be one doubling dilution lower than the reference MIC value:
> - Trimethoprim: *S. capitus, S. haemolyticus*

Vancomycin. A total of 199 *Enterococcus* spp. (101 *E. faecalis* and 98 *E. faecium*) isolates were evaluated with vancomycin. The combined results from clinical and challenge isolate testing demonstrated an EA of 94.0% and CA of 98.0%. When evaluating results by individual species, *E. faecalis* had two minor errors, which is acceptable. *E. faecium* had two major errors (2/39 = 5.1%) at Selux MIC values >64 µg/mL, which is not acceptable. The following limitation is included in the device labeling to restrict reporting of *E. faecium* due to the observed major errors:

> Perform an alternative method of testing prior to reporting results for the following antibiotic/organism combination(s):
> - Vancomycin: *Enterococcus faecium* when the Selux MIC is >64 µg/mL due to two major errors

A total of 349 *Staphylococcus* spp. (including 238 *S. aureus* and 111 CoNS: *S. capitus* (7), *S. cohnii* (3), *S. epidermidis* (31), *S. haemolyticus* (14), *S. hominis* (7), *S. intermedius* (5), *S. lugdunensis* (24), *S. saprophyticus* (8), *S. schleiferi* (5), *S. simulans* (6) and one non-speciated CoNS) isolates were evaluated with vancomycin. The combined results from clinical and challenge isolate testing demonstrated an EA of 98.9% and CA of 99.4%. When evaluating results by individual species, *S. aureus* had one major error (1/235 = 0.4%) and one minor error, which is acceptable. A limitation statement is included in the device labeling to address the lack of testing with resistant *Staphylococcus* spp.

Analysis of trending indicated that MIC values for *Staphylococcus* spp. and *E. faecalis* tended to be one doubling dilution higher than the reference MIC value. The following statement is included as a footnote to the AST performance table:

> Selux MIC values for the following antimicrobial/organism combinations tended to be one doubling dilution higher than the reference MIC value:
> - Vancomycin: *Staphylococcus* spp. and *Enterococcus faecalis*

Table 7. Selux AST System – Gram-Positive Panel Performance of Quantitative Assays

Sample Type	Total	No.EA	EA %	Eval EA Tot	No. Eval EA	Eval EA %	No. CA	CA %	No. R/NS	No. S	min	major	vmj
Ampicillin – *Enterococcus* spp. [Breakpoints (µg/mL): 8 (S), -, 16 (R)]													
Clinical	284	279	98.2	164	159	97.0	284	100	152	132	0	0	0
Challenge	15	15	100	10	10	100	15	100	11	4	0	0	0
Combined	299	294	98.3	174	169	97.1	299	100	163	136	0	0	0
Ceftaroline – *S. aureus* [Breakpoints (µg/mL): 1 (S), 2 (I), 4 (R)]													
Clinical	107	105	98.1	107	105	98.1	105	98.1	1	103	1	1	0
Challenge	31	31	100	31	31	100	31	100	0	31	0	0	0

Sample Type	Total	No.EA	EA %	Eval EA Tot	No. Eval EA	Eval EA %	No. CA	CA %	No. R/NS	No. S	min	major	vmj
Combined	138	136	98.6	138	136	98.6	136	98.6	1	134	1	1	0
Clindamycin – *Staphylococcus* spp. [Breakpoints (µg/mL): 0.5 (S), 1-2 (I), 4 (R)]													
Clinical	260	247	95	165	152	92.1	252	96.9	51	207	4	3	1
Challenge	51	51	100	23	23	100	50	98.0	22	28	1	0	0
Combined	311	298	95.8	188	175	93.1	302	97.1	73	235	5	3	1
Daptomycin – *E. faecalis* [Breakpoints (µg/mL): 2 (S), 4 (I), 8 (R)]													
Clinical	111	104	93.7	111	104	93.7	111	100	0	111	0	0	0
Challenge	5	5	100	5	5	100	5	100	0	5	0	0	0
Combined	116	109	94.0	116	109	94.0	116	100	0	116	0	0	0
Daptomycin – *S. aureus* [Breakpoints (µg/mL): 1 (S), -, -]													
Clinical	107	105	98.1	107	105	98.1	106	99.1	1	106	NA	0	1
Challenge	27	27	100	27	27	100	27	100	0	27	NA	0	0
Combined	134	132	98.5	134	132	98.5	133	99.3	1	133	NA	0	1
Delafloxacin – *E. faecalis* [Breakpoints (µg/mL): 0.125 (S), 0.25 (I), 0.5 (R)]													
Clinical	175	170	97.1	175	170	97.1	159	90.9	35	126	14	2	0
Challenge	5	5	100	5	5	100	5	100	3	2	0	0	0
Combined	180	175	97.2	180	175	97.2	164	91.1	38	128	14	2	0
Delafloxacin – *S. aureus* and *S. haemolyticus* [Breakpoints (µg/mL): 0.25 (S), 0.5 (I), 1 (R)]													
Clinical	209	207	99.0	60	58	96.7	196	93.8	8	181	13	0	0
Challenge	20	20	100	17	17	100	20	100	6	10	0	0	0
Combined	229	227	99.1	77	75	97.4	216	94.3	14	191	13	0	0
Eravacycline – *E. faecalis* and *E. faecium* [Breakpoints (µg/mL): 0.0625 (S), -, 0.125 (R)]													
Clinical	284	245	86.3	283	244	86.2	277	97.5	6	278	0	5	2
Challenge	3	3	100	3	3	100	3	100	0	3	0	0	0
Combined	287	248	86.4[1]	286	247	86.4	280	97.6	6	281	0	5	2
Eravacycline – *S. aureus* [Breakpoints (µg/mL): 0.0625 (S), -, 0.125 (R)]													
Clinical	106	106	100	106	106	100	106	100	2	104	0	0	0
Challenge	12	12	100	12	12	100	12	100	0	12	0	0	0
Combined	118	118	100	118	118	100	118	100	2	116	0	0	0
Erythromycin – *Enterococcus* spp. [Breakpoints (µg/mL): 0.5 (S), 1-4 (I), 8 (R)]													
Clinical	249	207	83.1	116	74	63.8	211	84.7	151	29	36	2	0
Challenge	31	28	90.3	8	5	62.5	28	90.3	25	1	3	0	0
Combined	280	235	83.9[1]	124	79	63.7	239	85.4	176	30	39	2	0
Erythromycin – *Staphylococcus* spp. [Breakpoints (µg/mL): 0.5 (S), 1-4 (I), 8 (R)]													
Clinical	181	165	91.2	94	78	83.0	169	93.4	84	92	7	5	0
Challenge	39	39	100	4	4	100	39	100	39	0	0	0	0
Combined	220	204	92.7	98	82	83.7	208	94.6	123	92	7	5	0
Levofloxacin – *Enterococcus* spp. [Breakpoints (µg/mL): 2 (S), 4 (I), 8 (R)]													
Clinical	249	241	96.8	151	143	94.7	242	97.2	104	143	4	2	1
Challenge	32	31	96.9	8	7	87.5	30	93.8	25	6	1	0	1
Combined	281	272	96.8	159	150	94.3	272	96.8	129	149	5	2	2
Levofloxacin – methicillin-susceptible *S. aureus* [Breakpoints (µg/mL): 2 (S), 4 (I), 8 (R)]													
Clinical	107	104	97.2	95	92	96.84	103	96.26	18	80	3	1	0
Challenge	28	28	100	9	9	100	27	96.43	25	2	1	0	0
Combined	135	132	97.78	104	101	97.12	130	96.3	43	82	4	1	0
Linezolid – *Enterococcus* spp. [Breakpoints (µg/mL): 2 (S), 4 (I), 8 (R)]													
Clinical	284	272	95.8	284	272	95.8	279	98.2	0	283	2	3	0
Challenge	15	15	100	14	14	100	15	100	1	14	0	0	0

Sample Type	Total	No.EA	EA %	Eval EA Tot	No. Eval EA	Eval EA %	No. CA	CA %	No. R/NS	No. S	min	major	vmj
Combined	299	287	96.0	298	286	96.0	294	98.3	1	297	2	3	0
Linezolid – *Staphylococcus* spp. [Breakpoints (µg/mL): 4 (S), -, 8 (R)]													
Clinical	202	197	97.5	192	187	97.4	201	99.5	3	199	0	1	0
Challenge	26	26	100	26	26	100	26	100	0	26	0	0	0
Combined	228	223	97.8	218	213	97.7	227	99.6	3	225	0	1	0
Minocycline – *Staphylococcus* spp. [Breakpoints (µg/mL): 4 (S), 8 (I), 16 (R)]													
Clinical	206	199	96.6	19	12	63.2	203	98.5	2	202	2	0	1
Challenge	11	11	100	6	6	100	11	100	0	11	0	0	0
Combined	217	210	96.8	25	18	72	214	98.6	2	213	2	0	1
Oxacillin –*S. aureus* [Breakpoints (µg/mL): 2 (S), -, 4 (R)]													
Clinical	97	83	85.6	63	49	77.8	96	99.0	38	59	0	0	1
Challenge	25	21	84	16	12	75	25	100	11	14	0	0	0
Combined	122	104	85.3[1]	79	61	77.2	121	99.2	49	73	0	0	1
Oxacillin – *S. lugdunensis* [Breakpoints (µg/mL): 2 (S), -, 4 (R)]													
Clinical	38	34	89.5	37	33	89.2	36	94.7	3	35	0	2	0
Challenge	1	1	100	1	1	100	1	100	0	1	0	0	0
Combined	39	35	89.7	38	34	89.5	37	94.9	3	36	0	2	0
Oxacillin – Coagulase-negative *Staphylococci* except *S. lugdunensis* [Breakpoints (µg/mL): 0.25 (S), -, 0.5 (R)]													
Clinical	115	96	83.5	72	53	73.6	107	93.0	72	43	0	4	4
Challenge	9	8	88.9	2	1	50	9	100	8	1	0	0	0
Combined	124	104	83.9[1]	74	54	73.0	116	93.6	80	44	0	4	4
Penicillin – *Enterococcus* spp. [Breakpoints (µg/mL): 8 (S), -, 16 (R)]													
Clinical	220	205	93.2	140	125	89.3	216	98.2	93	127	0	4	0
Challenge	18	18	100	8	8	100	18	100	12	6	0	0	0
Combined	238	223	93.7	148	133	89.9	234	98.3	105	133	0	4	0
Penicillin – *Staphylococcus* spp. [Breakpoints (µg/mL): 0.125 (S), -, 0.25 (R)]													
Clinical	198	166	83.8	156	124	79.5	194	98.0	157	41	0	0	4
Challenge	6	6	100	4	4	100	6	100	6	0	0	0	0
Combined	204	172	84.3[1]	160	128	80	200	98.0	163	41	0	0	4
Trimethoprim – *Staphylococcus* spp. [Breakpoints (µg/mL): 8 (S), -, 16 (R)]													
Clinical	185	167	90.3	154	136	88.3	182	98.4	21	164	0	2	1
Challenge	30	29	96.7	19	18	94.7	29	96.7	12	18	0	0	1
Combined	215	196	91.2	173	154	89.0	211	98.1	33	182	0	2	2
Vancomycin – *Enterococcus* spp. [Breakpoints (µg/mL): 4 (S), 8-16 (I), 32 (R)]													
Clinical	149	141	94.6	105	97	92.4	145	97.3	47	100	2	2	0
Challenge	50	46	92	33	29	87.9	50	100	17	33	0	0	0
Combined	199	187	94.0	138	126	91.3	195	98.0	64	133	2	2	0
Vancomycin –*S. aureus* [Breakpoints (µg/mL): 2 (S), 4-8 (I), 16 (R)]													
Clinical	199	197	99.0	199	197	99.0	197	99.0	0	199	1	1	0
Challenge	39	39	100.0	39	39	100.0	39	100.0	0	36	0	0	0
Combined	238	236	99.2	238	236	99.2	236	99.2	0	235	1	1	0
Vancomycin – Coagulase-negative *Staphylococci* [Breakpoints (µg/mL): 4 (S), 8-16 (I), 32 (R)]													
Clinical	99	97	98.0	99	97	98.0	99	100.0	0	99	0	0	0
Challenge	12	12	100.0	12	12	100.0	12	100.0	0	12	0	0	0
Combined	111	109	98.2	111	109	98.2	111	100.0	0	111	0	0	0

EA – Essential Agreement
CA – Category Agreement
EVAL – Evaluable isolates
R – Resistant isolates
N – Non-susceptible isolates
S – Susceptible isolates
min – minor errors
maj – major errors
vmj – very major errors

Essential Agreement (EA) occurs when there is agreement between the reference method and Selux MIC results within plus or minus one serial two-fold dilution of the antibiotic. Evaluable results are those that are on-scale for both the Selux and the reference method or those in which an off-scale result is at least two doubling dilutions from the on-scale result. Category Agreement (CA) occurs when the interpretation of the reference method and Selux result are in exact agreement.

[1]EA performance (<90%) is addressed in limitation statements, described above, and in the device labeling.

Table 8. Selux AST System – Gram-Positive Panel Performance of Cefoxitin Screen

Sample Type	Total	No. CA	CA %	No. R	No. S	major	vmj
Cefoxitin Screen – *S. aureus* and *S. lugdunensis* [Breakpoints (µg/mL): 8 (S), -, 16 (R)]							
Clinical	130	127	97.7%	40	90	2	1
Challenge	45	45	100%	41	4	0	0
Combined	175	172	98.3%	81	94	2	1

Table 9. Selux AST System – Gram-Positive Panel Trending

Drug	Organism Name	Total On Scale for Trending	≥ 1 Dilution Lower # (%)	Exact #	≥ 1 Dilution Higher # (%)	Percent Difference (95% CI)	Statistically Significant Trending Noted
Ampicillin	*Enterococcus faecalis*	115	83 (72.17)	24	8 (6.96)	-65% (-73% to -54%)	Yes
Ampicillin	*Enterococcus faecium*	184	120 (65.22)	36	28 (15.22)	-50% (-58% to -41%)	Yes
Ceftaroline	*Staphylococcus aureus*	138	38 (27.54)	89	11 (7.97)	-20% (-28% to -11%)	No
Clindamycin	*Staphylococcus aureus*	144	35 (24.3)	61	48 (33.3)	9% (-1% to 19%)	No
Clindamycin	*Staphylococcus epidermidis*	55	22 (40)	14	19 (34.6)	-5% (-23% to 12%)	No
Daptomycin	*E. faecalis*	116	23 (19.8)	49	44 (37.9)	18% (% to 29%)	No
Daptomycin	*S. aureus*	134	12 (9.0)	111	11 (8.2)	-1% (-8% to 6%)	No
Delafloxacin	*Enterococcus faecalis*	180	45 (25)	114	21 (11.67)	-13% (-21% to -5%)	No
Delafloxacin	*Staphylococcus aureus*	75	9 (12)	38	28 (37.33)	25% (12% to 38%)	No
Delafloxacin	*Staphylococcus haemolyticus*	8	7 (87.5)	1	0 (0)	-88% (-98% to -40%)	Yes
Eravacycline	*Enterococcus faecalis*	114	64 (56.14)	46	4 (3.51)	-53% (-62% to -42%)	Yes
Eravacycline	*Staphylococcus aureus*	118	10 (8.47)	56	52 (44.07)	36% (25% to 45%)	Yes
Erythromycin	*Staphylococcus aureus*	114	58 (50.88)	40	16 (14.04)	-37% (-47% to -25%)	Yes
Levofloxacin	*Enterococcus faecalis*	184	79 (42.93)	88	17 (9.24)	-34% (-42% to -25%)	Yes
Levofloxacin	*Enterococcus faecium*	97	87 (89.69)	5	5 (5.15)	-85% (-90% to -75%)	Yes
Levofloxacin	*Staphylococcus aureus*	108	45 (41.67)	57	6 (5.56)	-36% (-46% to -25%)	Yes

Drug	Organism Name	Total On Scale for Trending	≥ 1 Dilution Lower # (%)	Exact #	≥ 1 Dilution Higher # (%)	Percent Difference (95% CI)	Statistically Significant Trending Noted
Linezolid	*Enterococcus faecalis*	117	37 (31.62)	72	8 (6.84)	-25% (-34% to -15%)	No
Linezolid	*Enterococcus faecium*	182	51 (28.02)	88	43 (23.63)	-4% (-13% to 5%)	No
Linezolid	*Staphylococcus aureus*	127	29 (22.83)	89	9 (7.09)	-16% (-24% to -7%)	No
Linezolid	*Staphylococcus epidermidis*	26	6 (23.08)	16	4 (15.38)	-8% (-29% to 14%)	No
Linezolid	*Staphylococcus haemolyticus*	12	7 (58.33)	4	1 (8.33)	-50% (-73% to -12%)	Yes
Minocycline	*Staphylococcus aureus*	108	1 (0.93)	7	100 (92.59)	92% (84% to 95%)	Yes
Oxacillin	*Staphylococcus aureus*	114	51 (44.74)	30	33 (28.95)	-16% (-28% to -3%)	No
Oxacillin	*Staphylococcus lugdunensis*	39	7 (17.95)	15	17 (43.59)	26% (5% to 43%)	No
Penicillin	*Enterococcus faecalis*	117	31 (26.5)	80	6 (5.13)	-21% (-30% to -12%)	No
Penicillin	*Enterococcus faecium*	114	82 (71.93)	14	18 (15.79)	-56% (-65% to -44%)	Yes
Penicillin	*Staphylococcus aureus*	191	58 (30.37)	67	66 (34.55)	4% (-5% to 13%)	No
Trimethoprim	*Staphylococcus aureus*	127	27 (21.26)	74	26 (20.47)	-1% (-11% to 9%)	No
Trimethoprim	*Staphylococcus capitus*	3	3 (100)	0	0 (0)	-100% (-100% to -21%)	Yes
Trimethoprim	*Staphylococcus haemolyticus*	7	5 (71.43)	1	1 (14.29)	-57% (-81% to -6%)	Yes
Trimethoprim	*Staphylococcus saprophyticus*	7	0 (0)	6	1 (14.29)	14% (-23% to 51%)	No
Trimethoprim	*Staphylococcus simulans*	6	3 (50)	2	1 (16.67)	-33% (-67% to 17%)	No
Vancomycin	*Staphylococcus aureus*	238	12 (5.04)	127	99 (41.6)	37% (30% to 43%)	Yes
Vancomycin	Coagulase-Negative *Staphylococci*	111	3 (2.7)	41	67 (60.36)	58% (47% to 66%)	Yes
Vancomycin	*Enterococcus faecalis*	98	13 (13.27)	41	44 (44.9)	32% (19% to 43%)	Yes
Vancomycin	*Enterococcus faecium*	76	34 (44.74)	8	34 (44.74)	0% (-15% to 15%)	No

Characterized Resistance Mechanisms. The molecular characteristics of the challenge isolates evaluated in the clinical study, provided by the FDA-CDC AR Isolate Bank, are provided in **Table 10**.

Table 10. Molecular characteristics of resistance markers in challenge isolates.

Antimicrobial	Drug-Class Specific Resistance Mechanism
Ampicillin	no molecularly characterized mechanisms
Clindamycin	erm(A), mph(C), msr(A), erm(C)
Ceftaroline	blaI, mecA, DHA1
Daptomycin	no molecularly characterized mechanisms
Delafloxacin	norA
Eravacycline	no molecularly characterized mechanisms
Erythromycin	erm(A), erm(C), mph(C), msr(A), erm(B), Inu(B), lsa(E)
Cefoxitin Screen	blaI, mecA, Z, DHA1
Linezolid	no molecularly characterized mechanisms
Levofloxacin	norA
Minocycline	tet(38), tet(K)
Oxacillin	blaI, mecA, Z, DHA1
Penicillin	mecA
Trimethoprim	no molecularly characterized mechanisms
Vancomycin	VanA, VanB

Non-indicated species. As required under 511A(b)(2)(C)(ii)(I) of the Federal Food, Drug and Cosmetic Act, the following statement is included in the Precautions section of the device labeling to address testing and reporting of non-indicated species:

> Per the FDA-Recognized Susceptibility Test Interpretive Criteria Website, the safety and efficacy of antimicrobial drugs, for which antimicrobial susceptibility is tested by this AST device, may or may not have been established in adequate and well-controlled clinical trials for treating infections due to microorganisms outside of those found in the indications and usage in the drug label. The clinical significance of susceptibility information in those instances is unknown. The approved labeling for specific antimicrobial drugs provides the uses for which the antimicrobial drug is approved.

2. Matrix Comparison:

   Not applicable

C Clinical Studies:

1. Clinical Sensitivity:

   Not applicable

2. Clinical Specificity:

   Not applicable

3. Other Clinical Supportive Data (When 1. and 2. Are Not Applicable): \

Not applicable

D Clinical Cut-Off:

Not applicable.

E Expected Values/Reference Range:

The FDA-recognized/approved susceptibility interpretive criteria for the antimicrobials evaluated with the Selux AST System are listed in **Tables 11** and **12** below:

Table 11. FDA-Approved or Recognized Interpretive Criteria[1]

Antimicrobial	Organism	Minimum Inhibitory Concentration (µg/mL)		
		S	I	R
Ampicillin	*Enterococcus* spp.	≤8	-	≥16
Ceftaroline	*Staphylococcus aureus*	≤1	2	≥4
Clindamycin	*Staphylococcus* spp.	≤0.5	1–2	≥4
Daptomycin	*Enterococcus faecalis*	≤2	4	≥8
	Staphylococcus aureus	≤1	-	-
Delafloxacin	*Enterococcus faecalis*	≤0.12	0.25	≥0.5
	Staphylococcus aureus *Staphylococcus haemolyticus*	≤0.25	0.5	≥1
Eravacycline	*Enterococcus faecium* *Enterococcus faecalis* *Staphylococcus aureus*	≤0.06	-	≥0.12
Erythromycin	*Staphylococcus* spp.	≤0.5	1–4	≥8
Linezolid	*Enterococcus* spp.	≤2	4	≥8
	Staphylococcus spp.	≤4	-	≥8
Levofloxacin	*Enterococcus* spp. Methicillin-susceptible *Staphylococcus aureus*	≤2	4	≥8
Minocycline	*Staphylococcus* spp.	≤4	8	≥16
Oxacillin	*Staphylococcus aureus* *Staphylococcus lugdunensis*	≤2	-	≥4
Penicillin	*Enterococcus* spp.	≤8	-	≥16
	Staphylococcus aureus	≤0.12	-	≥0.25
Trimethoprim	*Staphylococcus* spp.	≤8		≥16
Vancomycin	*Enterococcus* spp. *Staphylococcus* spp. other than *Staphylococcus aureus*	≤4	8–16	≥32
	Staphylococcus aureus	≤2	4–8	≥16

S = Susceptible; I = Intermediate; R = Resistant

[1] FDA-Recognized Antimicrobial Susceptibility Test Interpretive Criteria Website
https://www.fda.gov/Drugs/DevelopmentApprovalProcess/DevelopmentResources/ucm4 10971.htm

Table 12. FDA-Approved or Recognized Interpretive Criteria[1]

Antimicrobial	Organism	Screen Result	
Cefoxitin Screen	*Staphylococcus aureus,* *Staphylococcus lugdunensis*	SN	SP

SN = Screening Test Negative; SP = Screening Test Positive
[1] FDA-Recognized Antimicrobial Susceptibility Test Interpretive Criteria Website
https://www.fda.gov/Drugs/DevelopmentApprovalProcess/DevelopmentResources/ucm4 10971.htm

F Other Supportive Instrument Performance Characteristics Data:

Not applicable

VIII Proposed Labeling:

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

IX Conclusion:

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

To support the implementation of changes to FDA-recognized susceptibility test interpretive criteria (i.e., breakpoints), this submission included a breakpoint change protocol that was reviewed and accepted by FDA. This protocol addresses future revisions to device labeling in response to breakpoint changes that are recognized on the FDA STIC webpage (https://www.fda.gov/Drugs/DevelopmentApprovalProcess/DevelopmentResources/ucm410971.htm). The protocol outlined the specific procedures and acceptance criteria that Selux intends to use to evaluate the Selux AST System when revised breakpoints for the following antimicrobials are published on the FDA STIC webpage: Ampicillin, Ceftaroline, Clindamycin, Daptomycin, Delafloxacin, Eravacycline, Erythromycin, Linezolid, Levofloxacin, Minocycline, Oxacillin, Penicillin, Trimethoprim, Vancomycin, and Cefoxitin Screen.

The breakpoint change protocol included with the submission indicated that if specific criteria are met, Selux will update the device label to include (1) the new breakpoints, (2) an updated performance section after re-evaluation of data in this premarket notification with the new breakpoints, and (3) any new limitations as determined by their evaluation.