Certificate of Analysis for NR-45905

Staphylococcus aureus, Strain IL (Isolate F)

Catalog No. NR-45905

Product Description: *Staphylococcus aureus* (*S. aureus*), strain IL (isolate F) was isolated in Illinois, USA, on April 27, 1999, from a peripheral blood sample of a 63-year-old female with bacteremia and a history of end-stage renal disease, intravascular access, failed arteriovenous grafts, multiple central venous catheter-associated infections and intermittent vancomycin treatment. *S. aureus*, strain IL (isolate F) is a vancomycin-intermediate *S. aureus* (VISA) strain.

Lot[1]: 70003988 **Manufacturing Date: 31MAR2017**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-positive cocci	Gram-positive cocci
Colony morphology[2]	Report results	Circular, convex, entire, smooth, opaque and cream (Figure 1)
Motility (wet mount)	Report results	Non-motile
Hemolysis[3]	Report results	β-hemolytic
Biochemical characterization		
Catalase	Positive	Positive
Coagulase[4]	Report results	Positive
VITEK® 2 Compact (GP card)	≥ 90% probability of being *S. aureus*	*S. aureus* (95% probability)[5]
Antibiotic Susceptibility Profile		
VITEK® (AST-GP71 card)[6]		
Beta-lactamase[7]	Report results	Positive
Cefoxitin screen	Report results	Positive
Benzylpenicillin	Report results	Resistant (≥ 0.5 µg/mL)
Oxacillin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 0.5 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Levofloxacin	Report results	Resistant (≥ 8 µg/mL)
Moxifloxacin	Report results	Resistant (≥ 8 µg/mL)
Clindamycin (inducible resistance)	Report results	Negative
Erythromycin	Resistant	Resistant (≥ 8 µg/mL)
Clindamycin	Resistant	Resistant (≥ 8 µg/mL)
Quinupristin/dalfopristin	Sensitive	Sensitive (≤ 0.5 µg/mL)
Linezolid	Sensitive	Sensitive (= 2 µg/mL)
Daptomycin	Non-susceptible	Non-susceptible (= 4 µg/mL)
Minocycline	Report results	Sensitive (≤ 0.5 µg/mL)
Tetracycline	Report results	Sensitive (≤ 1 µg/mL)
Tigecycline	Report results	Sensitive (≤ 0.12 µg/mL)[8]
Nitrofurantoin	Report results	Sensitive (≤ 16 µg/mL)
Rifampicin	Report results	Resistant (≥ 32 µg/mL)
Trimethoprim/sulfamethoxazole	Sensitive	Sensitive (≤ 10 µg/mL)
Etest® antibiotic test strips[9]		
Chloramphenicol[10]	Report results	Sensitive (= 3-4 µg/mL)
Teicoplanin[10]	Report results	Sensitive (= 2 µg/mL)[11]
Vancomycin[10]	Intermediate	Intermediate (= 3 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 800 base pairs)	≥ 99% sequence identity to *S. aureus* type strain (GenBank: L37597)	100% sequence identity to *S. aureus* type strain (GenBank: L37597)
Purity (post-freeze)[12]	Consistent with expected colony morphology	Consistent with expected colony morphology[13]
Viability (post-freeze)[2]	Growth	Growth

BEI Resources
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[1]*S. aureus*, strain IL (isolate F) was deposited to BEI Resources as part of the NARSA collection. NR-45905 was produced by inoculation of the deposited material into Tryptic Soy broth and grown 1 day at 37°C in an aerobic atmosphere. The material from the initial growth was passaged once in Tryptic Soy broth for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles which were grown 1 day at 37°C in an aerobic atmosphere to produce this lot.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar with 5% defibrinated sheep blood
[4]4 hours at 37°C in rabbit serum with 0.15% EDTA (Coagulase Plasma BBL™ 240827)
[5]Percent probabilities above 90% indicate a close match to the typical biochemical pattern for the given organism, with a percent probability of 99% being a perfect match between the test reaction pattern and the unique biochemical pattern of the given organism or organism group. For additional information, please refer to O'Hara, C. M. and J. M. Miller. "Evaluation of the VITEK 2 ID-GNB Assay for Identification of Members of the Family Enterobacteriaceae and Other Nonenteric Gram-Negative Bacilli and Comparison with the VITEK GNI+ Card." J. Clin. Microbiol. 41 (2003): 2096-2101. PubMed: 12734254.
[6]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S22 (2012)
[7]The production of beta-lactamase was detected using a Cefinase™ Paper Disc (BBL™ 231650).
[8]MIC Interpretation Guideline: EUCAST Version 4.0 (2014)
[9]1 day at 37°C in an aerobic atmosphere on Mueller Hinton agar
[10]For both chloramphenicol (bioMérieux Etest® 412308) and teicoplanin (bioMérieux Etest® 412459), a MIC ≤ 8 µg/mL is sensitive, a MIC = 16 µg/mL is intermediate and a MIC ≥ 32 µg/mL is resistant. For vancomycin (bioMérieux Etest® 412486), a MIC ≤ 2 µg/mL is sensitive, a MIC = 4-8 µg/mL is intermediate and a MIC ≥ 16 µg/mL is resistant.
[11]*S. aureus*, strain IL (isolate F) was deposited as having an intermediate susceptibility to teicoplanin. Antibiotic susceptibility testing using bioMérieux Etest® antibiotic test strips and performed in duplicate determined that strain IL (isolate F) is sensitive to teiocoplanin. For additional information on susceptibility testing of glycopeptide intermediate *S. aureus* (GISA) strains, please refer to Walsh, T. R., et al. "Evaluation of Current Methods for Detection of Staphylococci with Reduced Susceptibility to Glycopeptides." J. Clin. Microbiol. 39 (2001): 2439-2444. PubMed: 11427551.
[12]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere on Tryptic Soy agar with 5% defibrinated sheep blood.
[13]A second colony type consistent with the *S. aureus* small-colony variant phenotype was observed after an extended incubation on Tryptic Soy agar with 5% defibrinated sheep blood. VITEK® MS (MALDI-TOF) analysis identified the cells from this colony type as *S. aureus*. The small-colony variant phenotype has a reduced susceptibility to a number of antibiotics, including vancomycin and the small-colony variant cells may aid in the survival of vancomycin-susceptible cells. For additional information, please refer to Lenhard, J. R., et al. "Evolution of *Staphylococcus aureus* Under Vancomycin Selective Pressure: The Role of the Small-Colony Variant Phenotype." Antimicrob. Agents Chemother. 59 (2015): 1347-1351. PubMed: 25451045.

Figure 1: Colony Morphology

Date: 21 JUN 2017

Signature:

BEI Resources Authentication

ATCC®, on behalf of BEI Resources, hereby represents and warrants that the material provided under this certificate has been subjected to the tests and procedures specified and that the results described, along with any other data provided in this certificate, are true and accurate to the best of ATCC®'s knowledge.

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