Certificate of Analysis for NR-45884

Staphylococcus aureus, Strain NRS49

Catalog No. NR-45884

Product Description: *Staphylococcus aureus (S. aureus)*, strain NRS49 was isolated in August 1997 from the blood of a 45-year-old male cancer patient with septicemia in South Korea.

Lot[1]: 70011110 **Manufacturing Date: 13DEC2017**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-positive cocci	Gram-positive cocci
Colony morphology[2]	Report results	Circular, convex, entire, smooth 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)	*S. aureus* (≥ 89%)	*S. aureus* (99%)
Antibiotic Susceptibility Profile[5]		
VITEK® (AST-GP71 card)		
Beta-lactamase[6]	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 (= 4 µg/mL)
Clindamycin (inducible resistance)	Report results	Negative
Erythromycin	Report results	Resistant (≥ 8 µg/mL)
Clindamycin	Report results	Resistant (≥ 8 µg/mL)
Quinupristin/dalfopristin	Sensitive	Sensitive (= 0.5 µg/mL)
Linezolid	Report results	Sensitive (= 2 µg/mL)
Daptomycin	Non-susceptible	Susceptible (= 1 µg/mL)[7]
Vancomycin	Report results	Intermediate (4 µg/mL)
Minocycline	Report results	Resistant (≥ 16 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tigecycline	Report results	Resistant (= 1 µg/mL)[8]
Nitrofurantoin	Report results	Sensitive (≤ 16 µg/mL)
Rifampicin	Report results	Sensitive (≤ 0.5 µg/mL)
Trimethoprim/sulfamethoxazole	Sensitive	Sensitive (≤ 10 µg/mL)
Etest® antibiotic test strips[9]		
Chloramphenicol	Report results	Sensitive (= 8 µg/mL)
Teicoplanin	Intermediate	Sensitive (= 4-6 µg/mL)[10]
Vancomycin	Intermediate	Intermediate (= 6 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 830 base pairs)	≥ 99% sequence identity to *S. aureus* type strain (GenBank: L37597)	100% sequence identity to *S. aureus* type strain (GenBank: L37597)[11]
Purity (post-freeze)[12]	Consistent with expected colony morphology	Consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

BEI Resources
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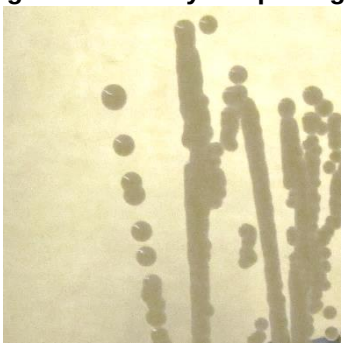
[1]*S. aureus*, strain NRS49 was deposited to BEI Resources as part of the NARSA collection. NR-45884 was produced by inoculation of the deposited material into Tryptic Soy broth and grown 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles which were grown 1 day 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 plasma with 0.15% EDTA (Coagulase Plasma BBL™ 240827)
[5]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S22 (2012)
[6]The production of beta-lactamase was detected using a Cefinase™ Paper Disc (BBL™ 231650).
[7]*S. aureus*, strain NRS49 was deposited as having an intermediate susceptibility to glycopeptides and non-susceptible to daptomycin. Antibiotic susceptibility testing performed in duplicate identified strain NRS49 as susceptible to daptomycin. Studies have demonstrated a correlation between reduced daptomycin susceptibility and vancomycin resistance in vancomycin hetero-intermediate and intermediate staphylococcal species. Reduced sensitivity to these antibiotics is believed to be due to a thickening of the cell wall. For additional information, please refer to Tran, T. T., J. M. Munita and C. A. Arias. "Mechanisms of Drug Resistance: Daptomycin Resistance." Ann. N. Y. Acad. Sci. 1354 (2015): 32-53. PubMed: 26495887.
[8]MIC Interpretation Guideline: EUCAST Version 4.0 (2014)
[9]1 day at 37°C in an aerobic atmosphere on Mueller Hinton agar
[10]*S. aureus*, strain NRS49 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 NRS49 is sensitive to teicoplanin. 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.
[11]Also consistent with other *Staphylococcus* species
[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.

Figure 1: Colony Morphology



Heather Couch
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Program Manager or designee, ATCC Federal Solutions

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Support Provided by NIAID

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