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Certificate of Analysis for NR-51829

Pseudomonas aeruginosa MRSN Diversity Panel

Catalog No. NR-51829
This reagent is the tangible property of the U.S. Government.

Product Description:
The *Pseudomonas aeruginosa (P. aeruginosa)* MRSN strains that comprise NR-51829 were isolated between 2004 and 2017 as part of a surveillance program in the United States.

Lot: 70078164 **Manufacturing Date: 2022 to 2025**

QC testing was performed, and the results are provided on the Certificate of Analysis for each isolate.

/Sonia Bjorum Brower/
Sonia Bjorum Brower 20 OCT 2025
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Certificate of Analysis for NR-51515

Pseudomonas aeruginosa, Strain MRSN 315

Catalog No. NR-51515

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 315 was isolated in 2010 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa,* strain MRSN 315 was deposited as multi-locus sequence type (MLST) ST 108, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin and intermediately resistant to imipenem. NR-51515 was produced by inoculation of BEI Resources seed lot 70024585 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70059686 **Manufacturing Date: 05APR2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, undulate, smooth and green
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 1 µg/mL)
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ceftriaxone	Report results	Resistant (32 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Meropenem	Sensitive	Sensitive (0.5 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	80 µg/mL[3]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1480 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 315 (GenBank: RXUI01000038.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 315 (GenBank: RXUI01000038.1)
Purity	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar		
Viability	Growth	Growth

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[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[3]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

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Certificate of Analysis for NR-51516

Pseudomonas aeruginosa, Strain MRSN 317

Catalog No. NR-51516

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 317 was isolated in 2010 from a human wound sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 317 was deposited as multi-locus sequence type (MLST) ST 137, sensitive to amikacin, gentamicin and tobramycin and resistant to aztreonam, cefepime, ceftazidime, ciprofloxacin, imipenem, levofloxacin, meropenem and piperacillin/tazobactam. NR-51516 was produced by inoculation of BEI Resources seed lot 70024587 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70059462 **Manufacturing Date: 15MAR2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth, mucoid and cream
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (32 µg/mL)
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Intermediate	Intermediate (4 µg/mL)[3]
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	2 to 3 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 317 (GenBank: RXUH01000043.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 317 (GenBank: RXUH01000043.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

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[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using a combination of bioMérieux VITEK® 2 GN81 and ETEST®.
[3]*P. aeruginosa*, strain MRSN 317 was deposited as resistant to meropenem, but showed a MIC of 4 µg/mL (interpreted as intermediately resistant) for lot 70024586 during QC testing.
[4]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

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Certificate of Analysis for NR-51517

Pseudomonas aeruginosa, Strain MRSN 321

Catalog No. NR-51517

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 321 was isolated in 2010 from a human wound sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 321 was deposited as multi-locus sequence type (MLST) ST 663, sensitive to amikacin, ciprofloxacin, gentamicin, levofloxacin and tobramycin and resistant to aztreonam, cefepime, ceftazidime, imipenem, meropenem and piperacillin/tazobactam. NR-51517 was produced by inoculation of BEI Resources seed lot 70024589 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70060197 **Manufacturing Date: 21APR2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, entire, smooth, mucoid and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Intermediate (12 to 16 µg/mL)[3]
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1480 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 321 (GenBank: RXUG01000033.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 321 (GenBank: RXUG01000033.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

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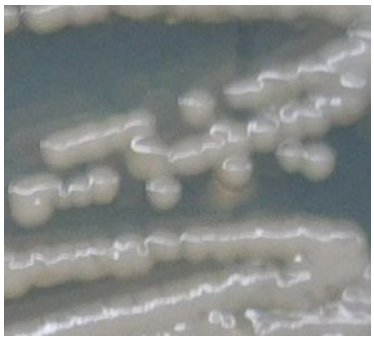
[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using a combination of bioMérieux VITEK® 2 GN81 and ETEST®.
[3]*P. aeruginosa*, strain MRSN 321 was deposited as resistant to cefepime, but showed a MIC of 12 to 16 µg/mL (interpreted as intermediately resistant) for this lot during QC testing.
[4]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51518

Pseudomonas aeruginosa, Strain MRSN 552

Catalog No. NR-51518

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 552 was isolated in 2010 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 552 was deposited as multi-locus sequence type (MLST) ST 1654, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin and resistant to imipenem and meropenem. NR-51518 was produced by inoculation of BEI Resources seed lot 70024591 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70064249 **Manufacturing Date: 25OCT2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Meropenem	Resistant	Resistant (8 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	80 µg/mL[3]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 552 (GenBank: RXTP01000033.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 552 (GenBank: RXTP01000033.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

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[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[3]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

Figure 1: Colony Morphology

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Certificate of Analysis for NR-51519

Pseudomonas aeruginosa, Strain MRSN 994

Catalog No. NR-51519

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 994 was isolated in 2010 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 994 was deposited as multi-locus sequence type (MLST) ST 27, sensitive to amikacin, gentamicin and tobramycin and resistant to aztreonam, ceftazidime, ciprofloxacin, cefepime, imipenem, levofloxacin, meropenem and piperacillin/tazobactam. NR-51519 was produced by inoculation of BEI Resources seed lot 70024593 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70055209 **Manufacturing Date: 24AUG2022**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, undulate, smooth and green
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)[3]
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1480 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 994 (GenBank: RXSX01000034.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 994 (GenBank: RXSX01000034.1)
Purity (post-freeze) 7 days at 37°C in an aerobic atmosphere with 5% CO_2 on Tryptic Soy agar with 5% defibrinated sheep blood	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)	Growth	Growth

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[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[3]*P. aeruginosa*, strain MRSN 994 was deposited as resistant to cefepime, but showed a MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70024592 during QC testing.
[4]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

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Certificate of Analysis for NR-51520

Pseudomonas aeruginosa, Strain MRSN 1344

Catalog No. NR-51520

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1344 was isolated in 2010 from a human sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 1344 was deposited as multi-locus sequence type (MLST) ST 3003, sensitive to amikacin, aztreonam, ceftazidime, gentamicin, imipenem, meropenem, piperacillin/tazobactam and tobramycin and resistant to cefepime, ciprofloxacin and levofloxacin. NR-51520 was produced by inoculation of BEI Resources seed lot 70024595 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70067734 **Manufacturing Date: 12APR2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony Type 1: Circular, low convex, undulate, smooth and green Colony Type 2: Circular, low convex, entire, smooth and cream
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (97%)
Antibiotic Susceptibility Profile[2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)[4]
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Resistant	Resistant (32 µg/mL)
Ciprofloxacin	Intermediate	Intermediate (2 µg/mL)[5]
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Intermediate	Intermediate (4 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	160 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 1344 (GenBank: RXWG01000136.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 1344 (GenBank: RXWG01000136.1)

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TEST	SPECIFICATIONS	RESULTS
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Two colony types were observed. Plating of the individual colony types showed that colony type 1 stayed true and colony type 2 reverted to colony type 1. VITEK® MS (MALDI-TOF) analysis identified cells from both colony types as *P. aeruginosa*.
[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[3]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[4]*P. aeruginosa*, strain MRSN 1344 was deposited as resistant to cefepime, but showed a MIC of 8 µg/mL (interpreted as sensitive) for lot 70024594 during QC testing.
[5]*P. aeruginosa*, strain MRSN 1344 was deposited as resistant to ciprofloxacin, but showed a MIC of 2 µg/mL (interpreted as intermediately resistant) for lot 70024594 during QC testing.
[6]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*; however, most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

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Certificate of Analysis for NR-51521

Pseudomonas aeruginosa, Strain MRSN 1356

Catalog No. NR-51521

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1356 was isolated in 2010 from a human sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 1356 was deposited as multi-locus sequence type (MLST) ST 3031, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51521 was produced by inoculation of BEI Resources seed lot 70024597 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70067735 **Manufacturing Date: 12APR2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, flat, undulate, smooth, opaque and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Meropenem	Sensitive	Sensitive (1 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	80 µg/mL[3]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1480 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 1356 (GenBank: RXWE01000167.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 1356 (GenBank: RXWE01000167.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

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[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[3]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

Figure 1: Colony Morphology

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Certificate of Analysis for NR-51522

Pseudomonas aeruginosa, Strain MRSN 1380

Catalog No. NR-51522

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1380 was isolated in 2010 from a human sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 1380 was deposited as multi-locus sequence type (MLST) ST 241, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, imipenem, meropenem, piperacillin/tazobactam and tobramycin. NR-51522 was produced by inoculation of BEI Resources seed lot 70024599 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70067736 **Manufacturing Date: 03APR2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony Type 1: Circular, slight peaked, undulate, smooth and cream (Figure 1) Colony Type 2: Circular, convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (95%)
Antibiotic Susceptibility Profile[2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Resistant	Resistant (16 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Meropenem	Sensitive	Sensitive (1 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	80 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 1380 (GenBank: RXWD01000040.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 1380 (GenBank: RXWD01000040.1)

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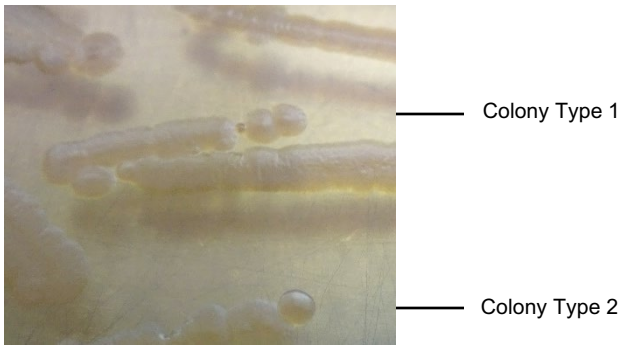
TEST	SPECIFICATIONS	RESULTS
Purity 7 days at 37°C in an aerobic atmosphere with 5% CO_2 on Tryptic Soy agar with 5% defibrinated sheep blood	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Two colony types were observed. VITEK® MS (MALDI-TOF) analysis identified cells from both colony types as *P. aeruginosa.*
[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[3]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[4]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51523

Pseudomonas aeruginosa, Strain MRSN 1388

Catalog No. NR-51523

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1388 was isolated in 2010 from a human sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 1388 was deposited as multi-locus sequence type (MLST) ST 1105, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin and resistant to imipenem. NR-51523 was produced by inoculation of BEI Resources seed lot 70024601 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70067737 **Manufacturing Date: 04APR2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 1 µg/mL)
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (≤ 1 µg/mL)
Ceftriaxone	Intermediate	Resistant (16 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	Resistant (160 µg/mL)[3]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 1388 (GenBank: RXWC01000034.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 1388 (GenBank: RXWC01000034.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

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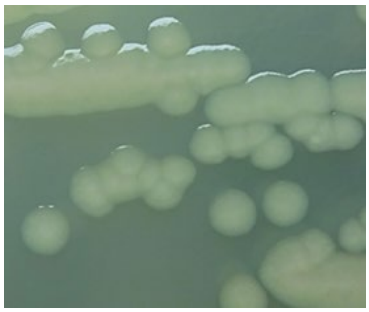
[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[3]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51524

Pseudomonas aeruginosa, Strain MRSN 1583

Catalog No. NR-51524

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1583 was isolated in 2010 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 1583 was deposited as multi-locus sequence type (MLST) ST 3005, sensitive to amikacin, aztreonam, cefepime, ceftazidime, gentamicin, imipenem, meropenem, piperacillin/tazobactam and tobramycin, intermediately resistant to levofloxacin and resistant to ciprofloxacin. NR-51524 was produced by inoculation of BEI Resources seed lot 70024603 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. After a hold at room temperature for 1 day, broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70064250 **Manufacturing Date: 26OCT2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, entire, smooth and green
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (97%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Report results	Sensitive (4 µg/mL)[3]
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Intermediate	Intermediate (2 µg/mL)[4]
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Levofloxacin	Intermediate	Intermediate (4 µg/mL)
Meropenem	Sensitive	Sensitive (1 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (16 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 1583 (GenBank: RXVX01000155.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 1583 (GenBank: RXVX01000155.1)
Purity 7 days at 37°C in an aerobic atmosphere with 5% CO_2 on Tryptic Soy agar with 5% defibrinated sheep blood	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology

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TEST	SPECIFICATIONS	RESULTS
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa*, strain MRSN 1583 was deposited as sensitive to cefepime but showed MICs of 8 µg/mL (interpreted as sensitive), 16 µg/mL (interpreted as intermediately resistant) and 32 µg/mL (interpreted as resistant) for lot 70024602 during QC testing, resulting in an inconclusive result.

[4]*P. aeruginosa*, strain MRSN 1583 was deposited as resistant to ciprofloxacin, but showed a MIC of 8 µg/mL (interpreted as intermediately resistant) for lot 70024602 during QC testing.

[5]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

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Certificate of Analysis for NR-51525

Pseudomonas aeruginosa, Strain MRSN 1601

Catalog No. NR-51525

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1601 was isolated in 2010 from a human wound sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 1601 was deposited as multi-locus sequence type (MLST) ST 3032, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51525 was produced by inoculation of BEI Resources seed lot 70024605 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70068143 **Manufacturing Date: 01MAY2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Irregular, flat, undulate, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Ceftazidime	Sensitive	Sensitive (8 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.25 µg/mL)
Meropenem	Sensitive	Sensitive (1 µg/mL)
Piperacillin/tazobactam	Intermediate	Intermediate (64 µg/mL)[4]
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (1430 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 1601 (GenBank: RXVW01000143.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 1601 (GenBank: RXVW01000143.1)
Purity	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
7 days at 37°C in an aerobic atmosphere with 5% CO_2 on Tryptic Soy agar with 5% defibrinated sheep blood		
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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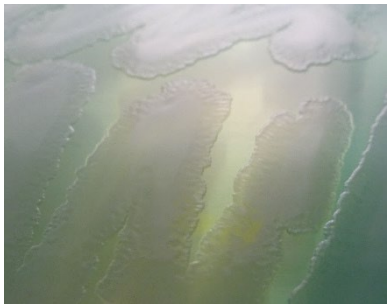
[4]*P. aeruginosa*, strain MRSN 1601 was deposited as sensitive to piperacillin/tazobactam, but showed a MIC of 64 µg/mL (interpreted as intermediately resistant) for lot 70024604 during QC testing.

Figure 1: Colony Morphology



/Sonia Bjorum Brower/
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SUPPORTING INFECTIOUS DISEASE RESEARCH

Certificate of Analysis for NR-51526

Pseudomonas aeruginosa, Strain MRSN 1612

Catalog No. NR-51526

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1612 was isolated in 2010 from a human ear sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 1612 was deposited as multi-locus sequence type (MLST) ST 207, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51526 was produced by inoculation of BEI Resources seed lot 70024607 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70068144 **Manufacturing Date: 01MAY2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Irregular, flat, undulate, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 1 µg/mL)
Ceftazidime	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (≤ 0.12 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 1612 (GenBank: RXVV01000058.1)	99.8% sequence identity to *P. aeruginosa*, strain MRSN 1612 (GenBank: RXVV01000058.1)
Purity	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar		
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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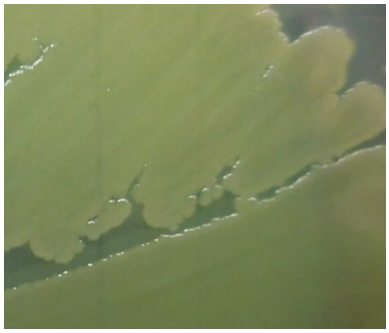
Certificate of Analysis for NR-51526

Figure 1: Colony Morphology



/Sonia Bjorum Brower/
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Certificate of Analysis for NR-51527

Pseudomonas aeruginosa, Strain MRSN 1613

Catalog No. NR-51527

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1613 was isolated in 2010 from a human sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 1613 was deposited as multi-locus sequence type (MLST) ST 2952, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51527 was produced by inoculation of BEI Resources seed lot 70024609 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70068146 **Manufacturing Date: 03MAY2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Irregular, low convex, undulate, rough and cream to green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1480 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 1613 (GenBank: RXVU01000026.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 1613 (GenBank: RXVU01000026.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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Certificate of Analysis for NR-51527

Figure 1: Colony Morphology

/Sonia Bjorum Brower/
Sonia Bjorum Brower 12 JUN 2025
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Certificate of Analysis for NR-51528

Pseudomonas aeruginosa, Strain MRSN 1617

Catalog No. NR-51528

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1617 was isolated in 2010 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 1617 was deposited as multi-locus sequence type (MLST) ST 390, sensitive to amikacin, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, meropenem and tobramycin, intermediately resistant to levofloxacin and piperacillin/tazobactam and resistant to aztreonam. NR-51528 was produced by inoculation of BEI Resources seed lot 70024611 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70068147 **Manufacturing Date: 03MAY2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream to green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (8 µg/mL)
Ceftazidime	Sensitive	Sensitive (8 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (1 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (2 µg/mL)[4]
Meropenem	Sensitive	Sensitive (1 µg/mL)
Piperacillin/tazobactam	Sensitive	Intermediate (32 µg/mL)[5,6]
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (1440 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 1617 (GenBank: RXVT01000125.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 1617 (GenBank: RXVT01000125.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar with 5% defibrinated sheep blood	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics

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were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

[4]*P. aeruginosa*, strain MRSN 1617 was deposited as intermediately resistant to levofloxacin, but showed a MIC of 2 µg/mL (interpreted as sensitive) for lot 70024610 during QC testing.

[5]*P. aeruginosa*, strain MRSN 1617 was deposited as intermediately resistant to piperacillin/tazobactam, but showed a MIC of 16 µg/mL (interpreted as sensitive) for lot 70024610 during QC testing.

[6]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

Figure 1: Colony Morphology

/Sonia Bjorum Brower/
Sonia Bjorum Brower 12 JUN 2025
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Certificate of Analysis for NR-51529

Pseudomonas aeruginosa, Strain MRSN 1688

Catalog No. NR-51529

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1688 was isolated in 2010 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 1688 was deposited as multi-locus sequence type (MLST) ST 699, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51529 was produced by inoculation of BEI Resources seed lot 70024613 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70068560 Manufacturing Date: 15MAY2024

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, undulate, opaque and cream to green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 1 µg/mL)
Ceftazidime	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Meropenem	Sensitive	Sensitive (1 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1480 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 1688 (GenBank: RXVM01000049.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 1688 (GenBank: RXVM01000049.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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Figure 1: Colony Morphology

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Certificate of Analysis for NR-51530

Pseudomonas aeruginosa, Strain MRSN 1739

Catalog No. NR-51530

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1739 was isolated in 2010 from a human blood sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 1739 was deposited as multi-locus sequence type (MLST) ST 463, sensitive to amikacin, intermediately resistant to ceftazidime and piperacillin/tazobactam and resistant to aztreonam, cefepime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem and tobramycin. NR-51530 was produced by inoculation of BEI Resources seed lot 700214615 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70067440 **Manufacturing Date: 29MAR2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony Type 1: Circular, convex, entire, smooth and cream to green Colony Type 2: Circular, slight peaked, undulate, smooth and cream to green
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[2,3]		
Amikacin	Sensitive	Sensitive (4 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Report results	Sensitive (8 µg/mL)[4]
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Report results	Sensitive (8 µg/mL)[5]
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Report results	Intermediate (32 µg/mL)[6]
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[7]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 1739 (GenBank: RXVL01000104.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 1739 (GenBank: RXVL01000104.1)

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Certificate of Analysis for NR-51530

TEST	SPECIFICATIONS	RESULTS
Purity 7 days at 37°C in an aerobic atmosphere with 5% CO_2 on Tryptic Soy agar with 5% defibrinated sheep blood	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Two colony types were observed. VITEK® 2 (GN card) analysis identified cells from both colony types as *P. aeruginosa*.
[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[3]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[4]*P. aeruginosa*, strain MRSN 1739 was deposited as resistant to cefepime, but showed MICs of 4 µg/mL and 8 µg/mL (both interpreted as sensitive) and 16 µg/mL (interpreted as intermediately resistant) for lot 70024614 during QC testing, resulting in an inconclusive result.
[5]*P. aeruginosa*, strain MRSN 1739 was deposited as intermediately resistant to ceftazidime, but showed MICs of 4 µg/mL (interpreted as sensitive) and 16 µg/mL (interpreted as intermediately resistant) for lot 70024614 during QC testing, resulting in an inconclusive result.
[6]*P. aeruginosa*, strain MRSN 1739 was deposited as intermediately resistant to piperacillin/tazobactam, but showed MICs of 16 µg/mL (interpreted as sensitive) and 32 µg/mL (interpreted as intermediately resistant) for lot 70024614 during QC testing, resulting in an inconclusive result.
[7]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

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Certificate of Analysis for NR-51531

Pseudomonas aeruginosa, Strain MRSN 1899

Catalog No. NR-51531

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1899 was isolated in 2010 from a human sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 1899 was deposited as multi-locus sequence type (MLST) ST 1074, sensitive to amikacin, aztreonam, cefepime, ceftazidime, gentamicin, imipenem, meropenem, piperacillin/tazobactam and tobramycin and resistant to ciprofloxacin and levofloxacin. NR-51531 was produced by inoculation of BEI Resources seed lot 70024617 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy with 5% defibrinated sheep blood agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70068561 **Manufacturing Date: 10MAY2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony Type 1: Circular, convex, entire, smooth and cream (Figure 1) Colony Type 2: Irregular, low convex, undulate, opaque and cream to green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3,4]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Intermediate	Intermediate (2 µg/mL)[5]
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Intermediate	Intermediate (4 µg/mL)[6]
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 315 (GenBank: RXVD01000045.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 315 (GenBank: RXVD01000045.1)
Purity		
7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability		
1 day at 37°C in an aerobic atmosphere with 5% CO_2 on Tryptic Soy agar	Growth	Growth

[1]Two colony types were observed. Plating of the individual colony types showed that they did not revert to the mixed colony type. VITEK® MS (MALDI-TOF) analysis identified cells from both colony types as *P. aeruginosa*.

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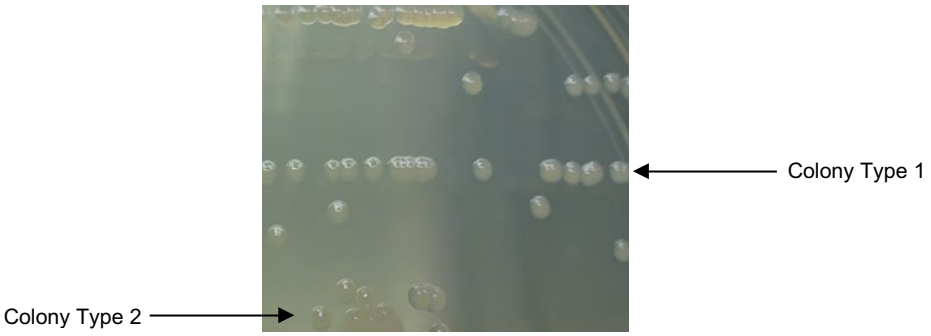
[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[3]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[4]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to ampicillin, amoxicillin, amoxicillin/clavulanic acid, ceftriaxone, cefuroxime, cefoxitin, chloramphenicol, ertapenem, nitrofurantoin, tetracycline, tigecycline, and trimethoprim/sulfamethoxazole. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested.
[5]*P. aeruginosa*, strain MRSN 1899 was deposited as resistant to ciprofloxacin, but showed a MIC of 2 µg/mL (interpreted as intermediately resistant) for lot 70024616 during QC testing.
[6]*P. aeruginosa* MRSN 1899 was deposited as resistant to levofloxacin, but showed a MIC of 4 µg/mL (interpreted as intermediately resistant) for lot 70024616 during QC testing.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51532

Pseudomonas aeruginosa, Strain MRSN 1902

Catalog No. NR-51532

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1902 was isolated in 2010 from a human sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 1902 was deposited as multi-locus sequence type (MLST) ST 3008, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin and resistant to imipenem. NR-51532 was produced by inoculation of BEI Resources seed lot 70024619 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70068562 Manufacturing Date: 24MAY2024

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, undulate, mucoid and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Meropenem	Sensitive	Sensitive (2 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 1902 (GenBank: RXVC01000040.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 1902 (GenBank: RXVC01000040.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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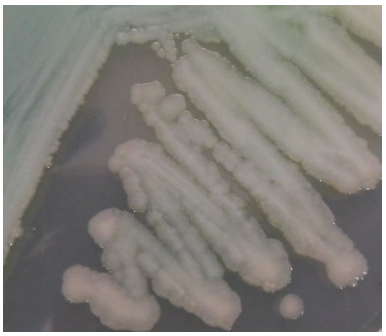
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51533

Pseudomonas aeruginosa, Strain MRSN 1906

Catalog No. NR-51533

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1906 was isolated in 2010 from a human sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN was deposited as multi-locus sequence type (MLST) ST 244, sensitive to amikacin, aztreonam, cefepime, ceftazidime, imipenem, meropenem and piperacillin/tazobactam and resistant to ciprofloxacin, gentamicin, levofloxacin and tobramycin. NR-51533 was produced by inoculation of BEI Resources seed lot 70024621 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70059158 **Manufacturing Date: 03MAR2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, slight peaked, undulate, mucoid and green
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Amoxicillin/clavulanic Acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 1 µg/mL)
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (≤ 1 µg/mL)
Ceftriaxone	Resistant	Resistant (32 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (1 µg/mL)[3]
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Levofloxacin	Intermediate	Intermediate (4 µg/mL)
Meropenem	Sensitive	Sensitive (1 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (16 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 1906 (GenBank: RXVB01000063.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 1906 (GenBank: RXVB01000063.1)
Purity 7 days at 37°C in an aerobic atmosphere with 5% CO_2 on Tryptic Soy agar with 5% defibrinated sheep blood	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

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[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81and ETEST®.
[3]*P. aeruginosa*, strain MRSN 1906 was deposited as resistant to ciprofloxacin, but showed a MIC of 1 µg/mL (interpreted as sensitive) for lot 70024620 during QC testing.
[4]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

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Certificate of Analysis for NR-51534

Pseudomonas aeruginosa, Strain MRSN 1925

Catalog No. NR-51534

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1925 was isolated in 2010 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 1925 was deposited as multi-locus sequence type (MLST) ST 155, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51534 was produced by inoculation of BEI Resources seed lot 70024623 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70072052 **Manufacturing Date: 17OCT2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony Type 1: Circular, low convex, entire, smooth and cream to green (Figure 1) Colony Type 2: Circular, flat, undulate, smooth, translucent and cream to green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3,4]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 1 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (≤ 0.12 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1480 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 1925 (GenBank: RXVA01000092.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 1925 (GenBank: RXVA01000092.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Two colony types were observed. Plating of the individual colony types showed that they did not revert to the mixed colony type. VITEK® MS (MALDI-TOF) analysis identified cells from both colony types as *P. aeruginosa*.

[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System

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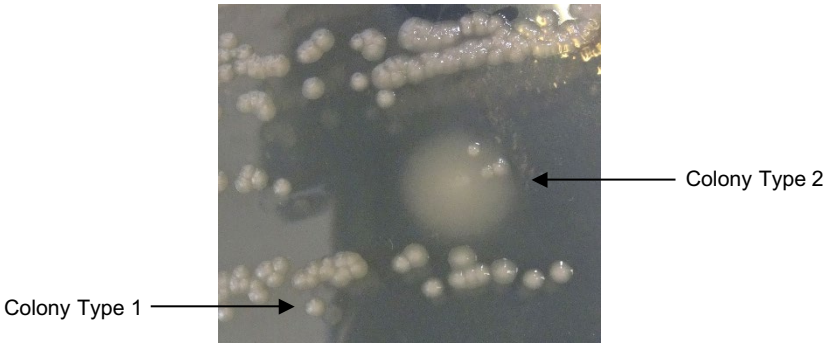
on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[3]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[4]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51535

Pseudomonas aeruginosa, Strain MRSN 1938

Catalog No. NR-51535

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1938 was isolated in 2010 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 1938 was deposited as multi-locus sequence type (MLST) ST 677, amikacin, aztreonam, cefepime, ceftazidime and piperacillin/tazobactam, intermediately resistant to meropenem and resistant to ciprofloxacin, gentamicin, imipenem, levofloxacin and tobramycin. NR-51535 was produced by inoculation of BEI Resources seed lot 70024625 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70072053 **Manufacturing Date: 17OCT2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony Type 1: Circular, low convex, undulate, smooth and brown (Figure 1) Colony Type 2: Circular, low convex, entire, smooth, translucent and brown (Figure 1) Colony Type 3: Circular, low convex, entire, smooth, opaque and brown (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3,4]		
Amikacin	Sensitive	Sensitive (4 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Intermediate	Resistant (8 µg/mL)[5]
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1480 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 1938 (GenBank: RXUZ01000154.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 1938 (GenBank: RXUZ01000154.1)
Purity		
7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

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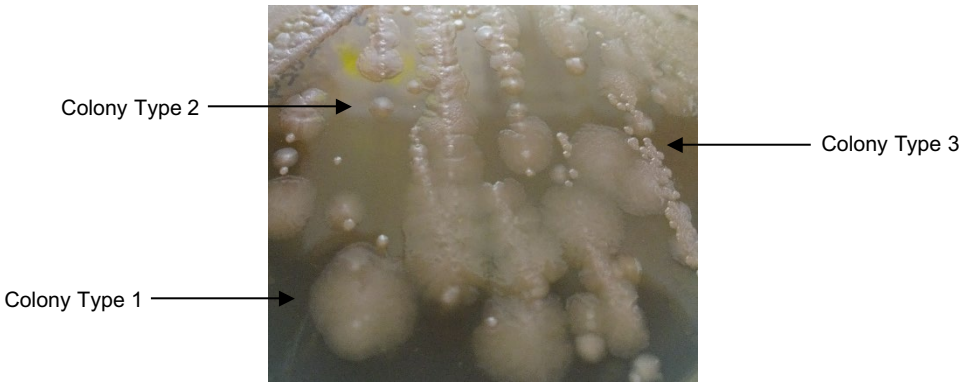
[1]Three colony types were observed. Plating of the individual colony types showed that they did revert to the mixed colony type. VITEK® MS (MALDI-TOF) analysis identified cells from all three colony types as *P. aeruginosa*.
[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[3]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[4]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.
[5]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51536

Pseudomonas aeruginosa, Strain MRSN 1948

Catalog No. NR-51536

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1948 was isolated in 2010 from a human wound sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 1948 was deposited as multi-locus sequence type (MLST) ST 845, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51536 was produced by inoculation of BEI Resources seed lot 70024945 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70072054 **Manufacturing Date: 16OCT2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, slightly peaked, undulate, rough and green
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Meropenem	Sensitive	Sensitive (0.25 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 1948 (GenBank: RXUY01000152.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 1948 (GenBank: RXUY01000152.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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Certificate of Analysis for NR-51536

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Sonia Bjorum Brower 15 MAY 2025
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SUPPORTING INFECTIOUS DISEASE RESEARCH

Certificate of Analysis for NR-51537

Pseudomonas aeruginosa, Strain MRSN 2101

Catalog No. NR-51537

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 2101 was isolated in 2011 from a human sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 2101 was deposited as multi-locus sequence type (MLST) ST 827, sensitive to amikacin, aztreonam, cefepime, ceftazidime, gentamicin, imipenem, meropenem, piperacillin/tazobactam and tobramycin. NR-51537 was produced by inoculation of BEI Resources seed lot 70024947 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70072055 **Manufacturing Date: 16OCT2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, slight peaked, undulate, rough and cream
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 2101 (GenBank: RXUT01000129.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 201 (GenBank: RXUT01000129.1)[4]
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to ampicillin, amoxicillin, amoxicillin/clavulanic acid, ceftriaxone, cefuroxime, cefoxitin, chloramphenicol, ertapenem, nitrofurantoin, tetracycline, tigecycline, and trimethoprim/sulfamethoxazole. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested.

[4]Also consistent with other *Pseudomonas* species

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Certificate of Analysis for NR-51537

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Certificate of Analysis for NR-51538

Pseudomonas aeruginosa, Strain MRSN 2108

Catalog No. NR-51538

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 2108 was isolated in 2011 from a human tissue sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 2108 was deposited as multi-locus sequence type (MLST) ST 3037, sensitive to amikacin, gentamicin and tobramycin, intermediately resistant to ceflazidime and piperacillin/tazobactam and resistant to aztreonam, cefepime, ciprofloxacin, imipenem, levofloxacin and meropenem. NR-51538 was produced by inoculation of BEI Resources seed lot 70024948 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70072056 **Manufacturing Date: 09OCT2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony type 1: Circular, low convex, entire, smooth and cream Colony type 2: Irregular, flat, undulate and opaque
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3,4]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)[5]
Ceftazidime	Report results	Intermediate (16 µg/mL)[6]
Ciprofloxacin	Report results	Resistant (≥ 4 µg/mL)[7]
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Piperacillin/tazobactam	Intermediate	Inconclusive[8]
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 2108 (GenBank: RXUS01000042.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 2108 (GenBank: RXUS01000042.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Two colony types were observed. Plating of the individual colony types showed that they reverted to the mixed colony type. VITEK® MS (MALDI-TOF) analysis identified cells from both colony types as *P. aeruginosa*.

[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

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[3]Antibiotic susceptibility was tested using a combination of bioMérieux VITEK® 2 GN81 and ETEST®.
[4]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.
[5]*P. aeruginosa*, strain MRSN 2108 was deposited as resistant to cefepime, but showed a MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70024948 during QC testing.
[6]*P. aeruginosa*, strain MRSN 2108 was deposited as intermediately resistant to ceftazidime but showed MICs of 16 µg/mL (interpreted as intermediately resistant) and 32 µg/mL (interpreted as resistant) for lot 70024948 during QC testing, resulting in an inconclusive result.
[7]*P. aeruginosa*, strain MRSN 2108 was deposited as resistant to ciprofloxacin but showed MICs of ≤ 1 µg/mL (interpreted as sensitive), 2 µg/mL (interpreted as intermediately resistant) and 4 µg/mL (interpreted as resistant) for lot 70024948 during QC testing, resulting in an inconclusive result. QC testing of lot 70072056 showed MICs of 64 µg/mL (interpreted as intermediately resistant) and 128 µg/mL (interpreted as resistant), resulting in an inconclusive result. Testing was performed in duplicate.
[8]*P. aeruginosa*, strain MRSN 2108 was deposited as intermediately resistant to piperacillin/tazobactam but showed MICs of 64 µg/mL (interpreted as intermediately resistant) and 128 µg/mL (interpreted as resistant) for lot 70072056 during QC testing, resulting in an inconclusive result. Testing was performed in duplicate.

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Certificate of Analysis for NR-51539

Pseudomonas aeruginosa, Strain MRSN 2144

Catalog No. NR-51539

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 2144 was isolated in 2010 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 2144 was deposited as multi-locus sequence type (MLST) ST 179, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51539 was produced by inoculation of BEI Resources seed lot 70024951 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70072057 **Manufacturing Date: 09OCT2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony Type 1: Irregular, flat, entire, smooth and cream (Figure 1) Colony Type 2: Circular, convex, entire, smooth, and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3,4]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 1 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (≤ 0.12 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1420 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 2144 (GenBank: RXUR01000085.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 2144 (GenBank: RXUR01000085.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Two colony types were observed. Plating of the individual colony types showed that they did revert to the mixed colony type. VITEK® MS (MALDI-TOF) analysis identified cells from both colony types as *P. aeruginosa*.

[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[3]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

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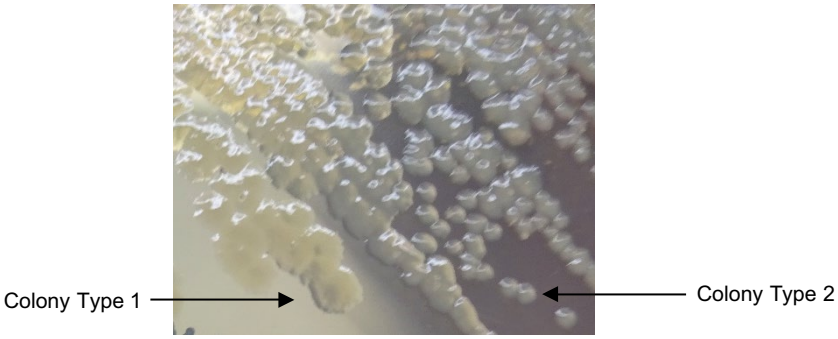
[4]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51540

Pseudomonas aeruginosa, Strain MRSN 2444

Catalog No. NR-51540

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 2444 was isolated in 2009 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 2444 was deposited as multi-locus sequence type (MLST) ST 654, sensitive to amikacin, cefepime, ceftazidime and piperacillin/tazobactam, intermediately resistant to aztreonam and resistant to ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem and tobramycin. NR-51540 was produced by inoculation of BEI Resources seed lot 70024953 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70064787 **Manufacturing Date: 15NOV2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, undulate, opaque and cream
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Intermediate	Intermediate (32 µg/mL)[3]
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (8 µg/mL)
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Sensitive	Intermediate (32 µg/mL)[4]
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 2444 (GenBank: RXUP01000183.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 2444 (GenBank: RXUP01000183.1)
Purity		
11 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology

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Certificate of Analysis for NR-51540

TEST	SPECIFICATIONS	RESULTS
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[3]*P. aeruginosa*, strain MRSN 2444 was deposited as sensitive to amikacin, but showed a MIC of 32 µg/mL (interpreted as intermediately resistant) for lot 70024952 during QC testing.
[4]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.
[5]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

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Sonia Bjorum Brower 16 FEB 2024
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Certificate of Analysis for NR-51541

Pseudomonas aeruginosa, Strain MRSN 3587

Catalog No. NR-51541

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 3587 was isolated in 2011 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 3587 was deposited as multi-locus sequence type (MLST) ST 175, sensitive to amikacin, cefepime, ceftazidime, gentamicin, piperacillin/tazobactam and tobramycin, intermediately resistant to ciprofloxacin, imipenem and levofloxacin and resistant to aztreonam and meropenem. NR-51541 was produced by inoculation of BEI Resources seed lot 70026688 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70059463 **Manufacturing Date: 15MAR2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony Type 1: Irregular, raised, undulate, mucoid and ground-glass (Figure 1) Colony Type 2: Circular, low convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (1 µg/mL)[4]
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Intermediate	Resistant (≥ 8 µg/mL)[5]
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (16 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1480 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 3587 (GenBank: RXUU01000133.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 3587 (GenBank: RXUU01000133.1)

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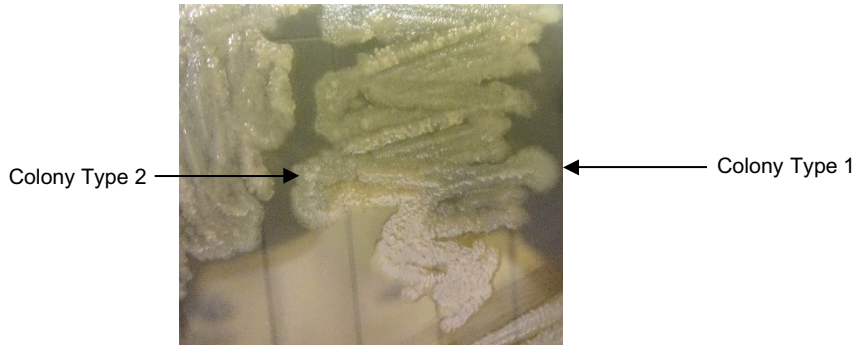
Certificate of Analysis for NR-51541

TEST	SPECIFICATIONS	RESULTS
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Two colony types were observed. VITEK® 2 (GN card) analysis identified cells from all three colony types as *P. aeruginosa*.
[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[3]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[4]*P. aeruginosa*, strain MRSN 3587 was deposited as intermediately resistant to ciprofloxacin, but showed a MIC of 1 µg/mL (interpreted as sensitive) for lot 70026687 during QC testing.
[5]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.
[6]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51542

Pseudomonas aeruginosa, Strain MRSN 3705

Catalog No. NR-51542

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 3705 was isolated in 2011 from a human respiratory sample in Guam as part of a global surveillance program. *P. aeruginosa*, strain MRSN 3705 was deposited as multi-locus sequence type (MLST) ST 2031, sensitive to amikacin, gentamicin, imipenem, meropenem and tobramycin and resistant to aztreonam, ceftazidime, ciprofloxacin, levofloxacin and piperacillin/tazobactam, with intermediate resistance to cefepime. NR-51542 was produced by inoculation of BEI Resources seed lot 70024957 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70064788 **Manufacturing Date: 10NOV2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Irregular, convex, undulate, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)[3]
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Intermediate	Intermediate (2 µg/mL)[4]
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Intermediate	Intermediate (4 µg/mL)[5]
Meropenem	Sensitive	Sensitive (0.5 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	160 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1410 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 3705 (GenBank: RXUB01000158.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 3705 (GenBank: RXUB01000158.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology

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TEST	SPECIFICATIONS	RESULTS
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[3]*P. aeruginosa*, strain MRSN 3705 was deposited as resistant to cefepime but showed a MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70024956 during QC testing.
[4]*P. aeruginosa*, strain MRSN 3705 was deposited as resistant to ciprofloxacin but showed a MIC of 2 µg/mL (interpreted as intermediately resistant) for lot 70024956 during QC testing.
[5]*P. aeruginosa*, strain MRSN 3705 was deposited as resistant to levofloxacin, but showed a MIC of 4 µg/mL (interpreted as intermediately resistant) for lot 70024956 during QC testing.
[6]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

Figure 1: Colony Morphology

/Sonia Bjorum Brower/
Sonia Bjorum Brower 19 FEB 2024
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Certificate of Analysis for NR-51543

Pseudomonas aeruginosa, Strain MRSN 4841

Catalog No. NR-51543

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 4841 was isolated in 2011 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 4841 was deposited as multi-locus sequence type (MLST) ST 235, sensitive to amikacin, imipenem and tobramycin, intermediately resistant to ceftazidime, gentamicin, meropenem and piperacillin/tazobactam and resistant to aztreonam, cefepime, ciprofloxacin and levofloxacin. NR-51543 was produced by inoculation of BEI Resources seed lot 70024959 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70072060 **Manufacturing Date: 17OCT2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony type 1: Circular, convex, entire, smooth and cream (Figure 1) Colony type 2: Small circular, convex, entire, smooth and white (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3,4]		
Amikacin	Intermediate	Intermediate (32 µg/mL)[5]
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (64 µg/mL)
Ceftazidime	Resistant	Sensitive (3 µg/mL)[6]
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Intermediate	Resistant (≥ 16 µg/mL)[7]
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Sensitive	Intermediate (4 µg/mL)[7,8]
Piperacillin/tazobactam	Intermediate	Intermediate (32 µg/mL)
Tobramycin	Sensitive	Sensitive (4 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1450 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 4841 (GenBank: RXTT01000078.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 4841 (GenBank: RXTT01000078.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Two colony types were observed. VITEK® MS (MALDI-TOF) analysis identified cells from both colony types as *P. aeruginosa*.
[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[3]Antibiotic susceptibility was tested using a combination of bioMérieux VITEK® 2 GN81 and ETEST®.

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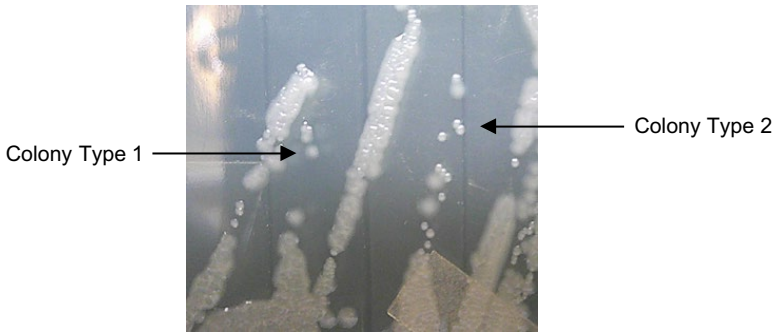
[4]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.
[5]*P. aeruginosa* MRSN 4841 was deposited as sensitive to amikacin, but showed a MIC of 32 µg/mL (interpreted as intermediately resistant) for lot 70024958 during QC testing.
[6]*P. aeruginosa* MRSN 4841 was deposited as intermediately resistant to ceftazidime, and was found to be intermediately resistant for lot 70024958, but showed a MIC of 3 µg/mL (interpreted as sensitive) for lot 70072060 during QC testing.
[7]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.
[6]*P. aeruginosa* MRSN 4841 was deposited as intermediately resistant to meropenem, but showed a MIC of 2 µg/mL (interpreted as sensitive) for lot 70024958 during QC testing.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51544

Pseudomonas aeruginosa, Strain MRSN 5498

Catalog No. NR-51544

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 5498 was isolated in 2005 from a human tissue sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 5498 was deposited as multi-locus sequence type (MLST) ST 3014, sensitive to amikacin and ceftazidime and resistant to ciprofloxacin, cefepime, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51544 was produced by inoculation of BEI Resources seed lot 70024961 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70072061 Manufacturing Date: 17OCT2024

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony type 1: Circular, low convex, entire, smooth and cream (Figure 1) Colony type 2: Circular, convex, entire, smooth and white (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3,4]		
Amikacin	Sensitive	Sensitive (16 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Resistant	Resistant(≥ 16 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 5498 (GenBank: RXTS01000053.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 5498 (GenBank: RXTS01000053.1)
Purity		
7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Two colony types were observed. The 16S ribosomal RNA gene of each colony type was sequenced and found to be consistent with the other colony type and *P. aeruginosa* (GenBank: RXTS01000053.1).

[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

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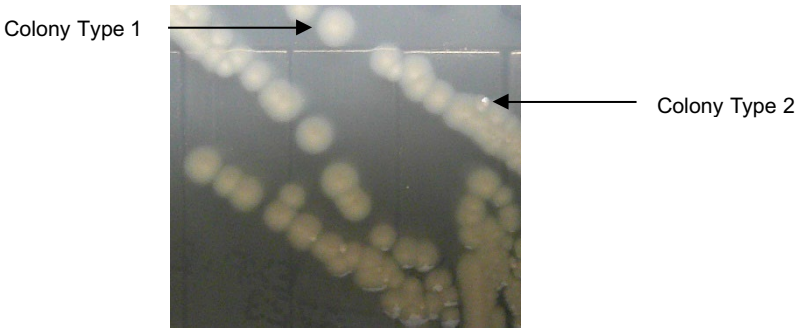
[3]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[4]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

Figure 1: Colony Morphology



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SUPPORTING INFECTIOUS DISEASE RESEARCH

Certificate of Analysis for NR-51545

Pseudomonas aeruginosa, Strain MRSN 5508

Catalog No. NR-51545

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 5508 was isolated in 2005 from a human fluid sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 5508 was deposited as multi-locus sequence type (MLST) ST 3002, sensitive to amikacin, aztreonam, gentamicin and tobramycin, intermediately resistant to ciprofloxacin and levofloxacin and resistant to cefepime, ceftazidime, imipenem, meropenem and piperacillin/tazobactam. NR-51545 was produced by inoculation of BEI Resources seed lot 70024963 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70072062 **Manufacturing Date: 17OCT2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 4 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)[4]
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.5 µg/mL)[5]
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Levofloxacin	Sensitive	Sensitive (2 µg/mL)[6]
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 5508 (GenBank: RXTR01000155.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 5508 (GenBank: RXTR01000155.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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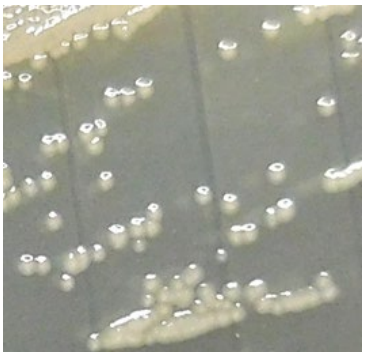
[4]*P. aeruginosa*, strain MRSN 5508 was deposited as resistant to cefepime, but showed a MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70024962 during QC testing.
[5]*P. aeruginosa*, strain MRSN 5508 was deposited as intermediately resistant to ciprofloxacin, but showed a MIC of ≤ 0.5 µg/mL (interpreted as sensitive) for lot 70024962 during QC testing.
[6]*P. aeruginosa*, strain MRSN 5508 was deposited as intermediately resistant to levofloxacin, but showed a MIC of 1 µg/mL and 2 µg/mL (interpreted as sensitive) for lot 70024962 during QC testing.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51546

Pseudomonas aeruginosa, Strain MRSN 5519

Catalog No. NR-51546

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 5519 was isolated in 2004 from a human wound sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 5519 was deposited as multi-locus sequence type (MLST) ST 235, resistant to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51546 was produced by inoculation of BEI Resources seed lot 70024966 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70063499 **Manufacturing Date: 15SEP2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, undulate, opaque and cream
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Resistant	Resistant (≥ 64 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (12 to 16 µg/mL)[3]
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1400 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 5519 (GenBank: RXTQ01000082.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 5519 (GenBank: RXTQ01000082.1)
Purity		
7 days at 37°C in an aerobic atmosphere with 5% CO_2 on Tryptic Soy agar with 5% defibrinated sheep blood	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

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[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[3]*P. aeruginosa*, strain MRSN 5519 was deposited as resistant to cefepime, but showed a MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70024965 during QC testing.
[4]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

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Certificate of Analysis for NR-51547

Pseudomonas aeruginosa, Strain MRSN 5524

Catalog No. NR-51547

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 5524 was isolated in 2004 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 5524 was deposited as multi-locus sequence type (MLST) ST 235, sensitive to amikacin, intermediately resistant to ceftazidime and resistant to aztreonam, ciprofloxacin, cefepime, gentamicin, imipenem, levofloxacin, meropenem, tobramycin and piperacillin/tazobactam. NR-51547 was produced by inoculation of BEI Resources seed lot 70024968 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70064247 **Manufacturing Date: 25OCT2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Sensitive	Sensitive (16 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Intermediate	Intermediate (16 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (1 µg/mL)[3]
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Levofloxacin	Sensitive	Sensitive (2 µg/mL)[4]
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1480 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 5524 (GenBank: RXTO01000087.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 5524 (GenBank: RXTO01000087.1)
Purity		
7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology

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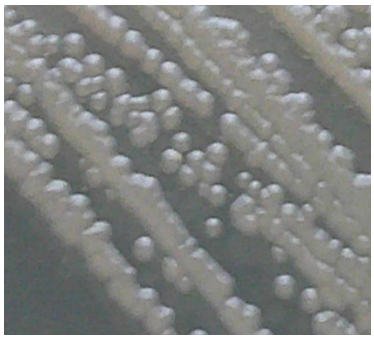
TEST	SPECIFICATIONS	RESULTS
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[3]*P. aeruginosa*, strain MRSN 5524 was deposited as resistant to ciprofloxacin, but showed a MIC of 0.5 µg/mL (interpreted as sensitive) for lot 70024967 during QC testing.
[4]*P. aeruginosa*, strain MRSN 5524 was deposited as resistant to levofloxacin, but showed a MIC of 2 µg/mL (interpreted as sensitive) for lot 70024967 during QC testing.
[5]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51548

Pseudomonas aeruginosa, Strain MRSN 5539

Catalog No. NR-51548

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 5539 was isolated in 2005 from a human tissue sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 5539 was deposited as multi-locus sequence type (MLST) ST 235, sensitive to amikacin and tobramycin and resistant to aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem and piperacillin/tazobactam. NR-51548 was produced by inoculation of BEI Resources seed lot 70024970 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70065653 Manufacturing Date: 24JAN2024

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, undulate, rough and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Sensitive	Sensitive (8 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)[3]
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Sensitive	Sensitive (2 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1410 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 5539 (GenBank: RXTN01000066.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 5539 (GenBank: RXTN01000066.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

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[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[3]*P. aeruginosa*, strain MRSN 5539 was deposited as resistant to cefepime, but showed a MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70024969 during QC testing.
[4]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*; however, most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

Figure 1: Colony Morphology

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Certificate of Analysis for NR-51549

Pseudomonas aeruginosa, Strain MRSN 6220

Catalog No. NR-51549

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 6220 was isolated in 2011 from a human wound sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 6220 was deposited as multi-locus sequence type (MLST) ST 244, resistant to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51549 was produced by inoculation of BEI Resources seed lot 70024974 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70059159 **Manufacturing Date: 03MAR2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, undulate, rough and green
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Resistant	Resistant (≥ 64 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[3]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 6220 (GenBank: RXTM01000189.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 6220 (GenBank: RXTM01000189.1)
Purity 7 days at 37°C in an aerobic atmosphere with 5% CO_2 on Tryptic Soy agar with 5% defibrinated sheep blood	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

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[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[3]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

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Certificate of Analysis for NR-51550

Pseudomonas aeruginosa, Strain MRSN 6241

Catalog No. NR-51550

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 6241 was isolated in 2011 from a human wound sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 6241 was deposited as multi-locus sequence type (MLST) ST 3043, sensitive to amikacin and resistant to aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51550 was produced by inoculation of BEI Resources seed lot 70024976 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70060471 **Manufacturing Date: 03MAY2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, undulate, smooth and cream
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (97%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Sensitive	Sensitive (16 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Report results	Intermediate (2 µg/mL)[3]
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Levofloxacin	Intermediate	Resistant (≥ 8 µg/mL)[4,5]
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1480 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 6241 (GenBank: RXTL01000085.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 6241 (GenBank: RXTL01000085.1)
Purity		
7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology

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TEST	SPECIFICATIONS	RESULTS
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[3]*A. baumannii*, strain MRSN 6241 was deposited as resistant to ciprofloxacin but showed MICs of 1 µg/mL (interpreted as sensitive) and 2 µg/mL (interpreted as intermediately resistant) for lot 70024975 during QC testing, resulting in an inconclusive result. Testing was performed in duplicate.
[4]*A. baumannii*, strain MRSN 6241 was deposited as resistant to levofloxacin, but showed a MIC of 4 µg/mL (interpreted as intermediately resistant) for lot 70024975 during QC testing. Testing was performed in duplicate.
[5]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.
[6]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

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Certificate of Analysis for NR-51551

Pseudomonas aeruginosa, Strain MRSN 6678

Catalog No. NR-51551

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 6678 was isolated in 2012 from a human tissue sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 6678 was deposited as multi-locus sequence type (MLST) ST 235, sensitive to amikacin and resistant to aztreonam, cefepime, ceftazidime, ciprofloxacin, imipenem, gentamicin, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51551 was produced by inoculation of BEI Resources seed lot 70024978 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70060472 **Manufacturing Date: 03MAY2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Sensitive	Sensitive (16 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)[3]
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1480 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 6678 (GenBank: RXTK01000084.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 6678 (GenBank: RXTK01000084.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

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[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[3]*P. aeruginosa*, strain MRSN 6678 was deposited as resistant to cefepime, but showed a MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70024977 during QC testing.
[4]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*; however, most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

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Certificate of Analysis for NR-51552

Pseudomonas aeruginosa, Strain MRSN 6695

Catalog No. NR-51552

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 6695 was isolated in 2012 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 6695 was deposited as multi-locus sequence type (MLST) ST 497, sensitive to amikacin, gentamicin and tobramycin and resistant to aztreonam, cefepime, ceftazidime, ciprofloxacin, imipenem, levofloxacin and meropenem. NR-51552 was produced by inoculation of BEI Resources seed lot 70024980 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70071507 **Manufacturing Date: 27SEP2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony type 1: Circular, low convex, entire, rough and cream (Figure 1) Colony type 2: Circular, convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3,4]		
Amikacin	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)[5]
Ceftazidime	Intermediate	Inconclusive[6]
Ciprofloxacin	Sensitive	Sensitive (1 µg/mL)[7]
Gentamicin	Sensitive	Sensitive (4 µg/mL)
Levofloxacin	Intermediate	Intermediate (4 µg/mL)[8]
Meropenem	Intermediate	Intermediate (4 µg/mL)[9]
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 6695 (GenBank: RXTJ01000040.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 6695 (GenBank: RXTJ01000040.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Two colony types were observed. VITEK® MS (MALDI-TOF) analysis identified cells from both colony types as *P. aeruginosa*.
[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[3]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81 and ETEST®.

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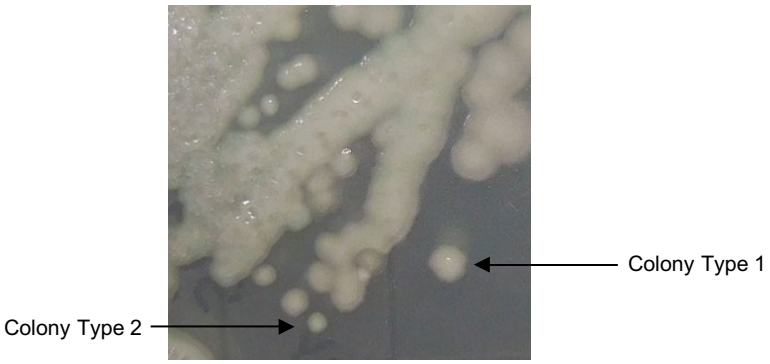
[4]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.
[5]*P. aeruginosa*, strain MRSN 6695 was deposited as resistant to cefepime, but showed a MIC of 8 µg/mL (interpreted as sensitive) for lot 70024979 during QC testing.
[6]*P. aeruginosa*, strain MRSN 6695 was deposited as resistant to ceftazidime and was found to be intermediately resistant for lot 70024979, but showed a MIC of 8 µg/mL (interpreted as sensitive) and 12 µg/mL (interpreted as intermediately resistant) for lot 70024979 during QC testing.
[7]*P. aeruginosa*, strain MRSN 6695 was deposited as resistant to ciprofloxacin, but showed a MIC of 1 µg/mL (interpreted as sensitive) for lot 70024979 during QC testing.
[8]*P. aeruginosa*, strain MRSN 6695 was deposited as resistant to levofloxacin, but showed a MIC of 4 µg/mL (interpreted as intermediately resistant) for lot 70024979 during QC testing.
[9]*P. aeruginosa*, strain MRSN 6695 was deposited as resistant to meropenem, but showed a MIC of 4 µg/mL (interpreted as intermediately resistant) for lot 70024979 during QC testing.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51553

Pseudomonas aeruginosa, Strain MRSN 6739

Catalog No. NR-51553

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 6739 was isolated in 2011 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 6739 was deposited as multi-locus sequence type (MLST) ST 3015, sensitive to amikacin, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin and intermediately resistant to aztreonam. NR-51553 was produced by inoculation of BEI Resources seed lot 70024983 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70071508 **Manufacturing Date: 27SEP2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (16 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (8 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (3 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Meropenem	Sensitive	Sensitive (2 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1440 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 6739 (GenBank: RXTI01000034.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 6739 (GenBank: RXTI01000034.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81 and ETEST®.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested.

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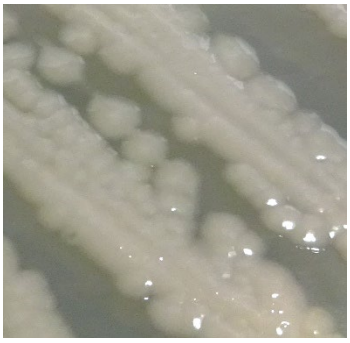
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51554

Pseudomonas aeruginosa, Strain MRSN 7014

Catalog No. NR-51554

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 7014 was isolated in 2012 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 7014 was deposited as multi-locus sequence type (MLST) 1129, sensitive to amikacin and tobramycin, intermediately resistant to ciprofloxacin and gentamicin and resistant to aztreonam, ceftazidime, cefepime, imipenem, levofloxacin, meropenem and piperacillin/tazobactam. NR-51554 was produced by inoculation of BEI Resources seed lot 70024985 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70064789 **Manufacturing Date: 15NOV2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Sensitive	Sensitive (16 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (32 µg/mL)
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (1 µg/mL)[3]
Gentamicin	Intermediate	Intermediate (8 µg/mL)
Levofloxacin	Intermediate	Intermediate (4 µg/mL)[4]
Meropenem	Intermediate	Intermediate (4 µg/mL)[5]
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (> 256 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	80 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1440 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 7014 (GenBank: RXTH01000036.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 7014 (GenBank: RXTH01000036.1)
Purity		
7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology

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Certificate of Analysis for NR-51554

TEST	SPECIFICATIONS	RESULTS
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using a combination of bioMérieux VITEK® 2 GN81 and ETEST®.
[3]*P. aeruginosa*, strain MRSN 7014 was deposited as intermediately resistant to ciprofloxacin but showed a MIC of 1 µg/mL (interpreted as sensitive) for lot 70024984 during QC testing.
[4]*P. aeruginosa*, strain MRSN 7014 was deposited as resistant to levofloxacin but showed a MIC of 4 µg/mL (interpreted as intermediately resistant) for lot 70024984 during QC testing.
[5]*P. aeruginosa*, strain MRSN 7014 was deposited as resistant to meropenem, but showed a MIC of 4 µg/mL (interpreted as intermediately resistant) for lot 70024984 during QC testing.
[6]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

Figure 1: Colony Morphology

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Certificate of Analysis for NR-51555

Pseudomonas aeruginosa, Strain MRSN 8130

Catalog No. NR-51555

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 8130 was isolated in 2012 from a human blood sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 8130 was deposited as multi-locus sequence type (MLST) ST 446, sensitive to amikacin, ceftazidime and gentamicin and resistant to aztreonam, cefepime, ciprofloxacin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51555 was produced by inoculation of BEI Resources seed lot 70024987 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 2 days at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70065654 **Manufacturing Date: 20JAN2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Intermediate	Sensitive (16 µg/mL)[3,4]
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1440 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 8130 (GenBank: RXTG01000156.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 8130 (GenBank: RXTG01000156.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

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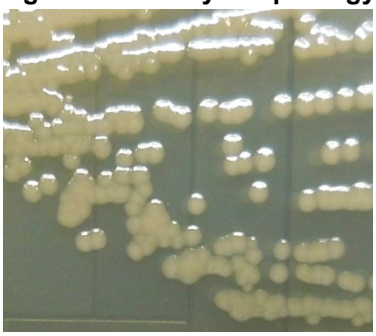
[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[3]*P. aeruginosa*, strain MRSN 8130 was deposited as sensitive to amikacin, but showed a MIC of 32 µg/mL (interpreted as intermediately resistant) for lot 70024986 during QC testing.
[4]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.
[5]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

Figure 1: Colony Morphology



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Sonia Bjorum Brower 27 MAR 2024
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Certificate of Analysis for NR-51556

Pseudomonas aeruginosa, Strain MRSN 8136

Catalog No. NR-51556

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 8136 was isolated in 2012 from a human wound sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 8136 was deposited as multi-locus sequence type (MLST) ST 381, sensitive to amikacin, gentamicin and tobramycin, intermediately resistant to piperacillin/tazobactam and resistant to aztreonam, cefepime, ceftazidime, ciprofloxacin, imipenem, levofloxacin and meropenem. NR-51556 was produced by inoculation of BEI Resources seed lot 70024989 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70070583 **Manufacturing Date: 14AUG2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (16 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Sensitive	Intermediate (6 µg/mL)[4]
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)[5]
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1410 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 8136 (GenBank: RXTF01000062.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 8136 (GenBank: RXTF01000062.1)
Purity 11 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81 and ETEST®.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics

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were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

[4]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

[5]*P. aeruginosa*, strain MRSN 8136 was deposited as intermediately resistant to piperacillin/tazobactam, but showed a MIC of ≥ 128 µg/mL (interpreted as resistant) for lot 70024988 during QC testing.

/Sonia Bjorum Brower/
Sonia Bjorum Brower 16 JUN 2025
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Certificate of Analysis for NR-51557

Pseudomonas aeruginosa, Strain MRSN 8139

Catalog No. NR-51557

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 8139 was isolated in 2012 from a human wound sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 8139 was deposited as multi-locus sequence type (MLST) ST 1503, sensitive to amikacin, aztreonam, ceftazidime, cefepime, gentamicin, piperacillin/tazobactam and tobramycin, and intermediately resistant to ciprofloxacin, levofloxacin and meropenem, and resistant to imipenem. NR-51557 was produced by inoculation of BEI Resources seed lot 70024991 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70071509 **Manufacturing Date: 27SEP2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Intermediate	Sensitive (1 µg/mL)[4,5]
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Intermediate	Intermediate (4 µg/mL)
Meropenem	Intermediate	Intermediate (4 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 8139 (GenBank: RXTE01000162.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 8139 (GenBank: RXTE01000162.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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[4]*P. aeruginosa*, strain MRSN 8139 was deposited as intermediately resistant to ciprofloxacin, but showed a MIC of 1 µg/mL (interpreted as sensitive) for lot 70024990 during QC testing.
[4]Susceptibilty result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

Figure 1: Colony Morphology

/Sonia Bjorum Brower/
Sonia Bjorum Brower 21 FEB 2025
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Certificate of Analysis for NR-51558

Pseudomonas aeruginosa, Strain MRSN 8141

Catalog No. NR-51558

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 8141 was isolated in 2012 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 8141 was deposited as multi-locus sequence type (MLST) ST 3043, sensitive to amikacin and resistant to aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51558 was produced by inoculation of BEI Resources seed lot 70024993 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70063498 **Manufacturing Date: 20SEP2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[1]	Report results	Colony type 1: Irregular, low convex, undulate, smooth and cream Colony type 2: Circular, convex, entire, smooth and cream
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3]		
Amikacin	Sensitive	Sensitive (16 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Intermediate	Intermediate (2 µg/mL)[4]
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1480 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 8141 (GenBank: RXTD01000088.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 8141 (GenBank: RXTD01000088.1)
Purity		
7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology

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Certificate of Analysis for NR-51558

TEST	SPECIFICATIONS	RESULTS
Viability	Growth	Growth

[1]Two colony types were observed. Plating of the individual colony type showed that they (did or did not) revert to the mixed colony type. VITEK® MS (MALDI-TOF) analysis identified cells from both colony types as *P. aeruginosa*.

[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[3]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[4]*P. aeruginosa*, strain MRSN 8141 was deposited as resistant to ciprofloxacin, but showed a MIC of 2 µg/mL (interpreted as intermediately resistant) for lot 70024992 during QC testing.

[5]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

/Sonia Bjorum Brower/
Sonia Bjorum Brower 22 JAN 2024
Technical Manager or designee, ATCC Federal Solutions

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Certificate of Analysis for NR-51559

Pseudomonas aeruginosa, Strain MRSN 8912

Catalog No. NR-51559

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 8912 was isolated in 2007 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 8912 was deposited as multi-locus sequence type (MLST) ST 532, sensitive to amikacin and ceftazidime and resistant to aztreonam, cefepime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, tobramycin and piperacillin/tazobactam. NR-51559 was produced by inoculation of BEI Resources seed lot 70024995 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70071510 **Manufacturing Date: 27SEP2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony type 1: Circular, low convex, undulate, smooth and cream (Figure 1) Colony type 2: Circular, low convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3,4]		
Amikacin	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)[5]
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Intermediate	Intermediate (2 µg/mL)[6]
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 8912 (GenBank: RXTC01000070.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 8912 (GenBank: RXTC01000070.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Two colony types were observed. VITEK® MS (MALDI-TOF) analysis identified cells from both colony types as *P. aeruginosa*.
[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[3]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

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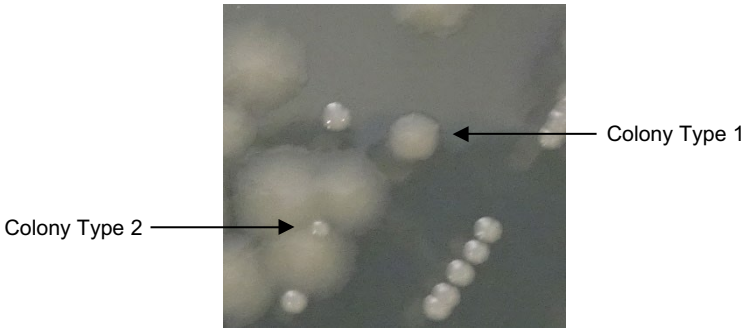
[4]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

[5]*P. aeruginosa*, strain MRSN 8912 was deposited as resistant to cefepime, but showed an MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70024994 during QC testing.

[6]*P. aeruginosa*, strain MRSN 8912 was deposited as resistant to ciprofloxacin, but showed an MIC of 2 µg/mL (interpreted as intermediately resistant) for lot 70024994 during QC testing.

Figure 1: Colony Morphology



/Sonia Bjorum Brower/
Sonia Bjorum Brower 16 MAY 2025
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Certificate of Analysis for NR-51560

Pseudomonas aeruginosa, Strain MRSN 8914

Catalog No. NR-51560

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 8914 was isolated in 2007 from a human bone sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 8914 was deposited as multi-locus sequence type (MLST) ST 1419, intermediately resistant to amikacin and ceftazidime and resistant to aztreonam, cefepime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51560 was produced by inoculation of BEI Resources seed lot 70024997 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70065860 **Manufacturing Date: 24JAN2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Irregular, convex, undulate, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Resistant	Resistant (≥ 64 µg/mL)[3]
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (32 µg/mL)[4]
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 8914 (GenBank: RXTB01000215.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 8914 (GenBank: RXTB01000215.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

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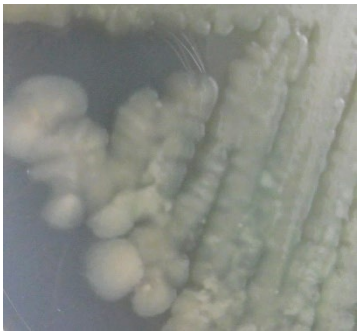
[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[3]*P. aeruginosa*, strain MRSN 8914 was deposited as intermediately resistant to amikacin, but showed a MIC of ≥ 64 µg/mL (interpreted as resistant) for lot 70024996 during QC testing.
[4]*P. aeruginosa*, strain MRSN 8914 was deposited as intermediately resistant to ceftazidime, but showed a MIC of 32 µg/mL (interpreted as resistant) for lot 70024996 during QC testing.
[5]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

Figure 1: Colony Morphology



/Sonia Bjorum Brower/
Sonia Bjorum Brower 26 MAR 2024
Technical Manager or designee, ATCC Federal Solutions

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Certificate of Analysis for NR-51561

Pseudomonas aeruginosa, Strain MRSN 8915

Catalog No. NR-51561

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 8915 was isolated in 2007 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 8915 was deposited as multi-locus sequence type (MLST) ST 111, sensitive to amikacin, aztreonam, cefepime and ceftazidime and resistant to ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51561 was produced by inoculation of BEI Resources seed lot 70025000 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70064790 **Manufacturing Date: 15NOV2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (95%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Intermediate	Intermediate (32 µg/mL)[3]
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)[4]
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Resistant	Resistant (32 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (8 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (1450 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 8915 (GenBank: RXTA01000182.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 8915 (GenBank: RXTA01000182.1)
Purity		
7 days at 37°C in an aerobic atmosphere with 5% CO_2 on Tryptic Soy agar with 5% defibrinated sheep blood	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology

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Certificate of Analysis for NR-51561

TEST	SPECIFICATIONS	RESULTS
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[3]*P. aeruginosa,* strain MRSN 8915 was deposited as sensitive to amikacin, but showed a MIC of 32 µg/mL (interpreted as intermediately resistant) for lot 70024999 during QC testing.
[4]*P. aeruginosa,* strain MRSN 8915 was deposited as sensitive to cefepime, but showed a MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70024999 during QC testing.
[5]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

/Sonia Bjorum Brower/
Sonia Bjorum Brower 19 FEB 2024
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Certificate of Analysis for NR-51562

Pseudomonas aeruginosa, Strain MRSN 9718

Catalog No. NR-51562

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 9718 was isolated in 2012 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 9718 deposited as multi-locus sequence type (MLST) ST 1601, sensitive to amikacin, aztreonam, ceftazidime, ciprofloxacin, cefepime, gentamicin, imipenem and tobramycin, intermediately resistant to piperacillin/tazobactam and resistant to levofloxacin and meropenem. NR-51562 was produced by inoculation of BEI Resources seed lot 70025002 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70074998 **Manufacturing Date: 26MAR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, undulate, smooth and cream to green
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (8 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)[4]
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Report results	Resistant (≥ 16 µg/mL)[5]
Piperacillin/tazobactam	Sensitive	Sensitive (16 µg/mL)[6]
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 9718 (GenBank: RXSZ01000188.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 9718 (GenBank: RXSZ01000188.1)
Purity		
7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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[4]*P. aeruginosa* strain MRSN 9718 was deposited as sensitive to ciprofloxacin, but showed a MIC of ≥ 4 µg/mL (interpreted as resistant) for lot 70025001 during QC testing.
[5]*P. aeruginosa* strain MRSN 9718 was deposited as resistant to meropenem, but showed MICs of 4 µg/mL (interpreted as sensitive) and ≥ 16 µg/mL (interpreted as resistant) during QC testing for lot 700025001, resulting in an inconclusive result.
[6]*P. aeruginosa* strain MRSN 9718 was deposited as intermediately resistant to piperacillin/tazobactam, but showed a MIC of 16 µg/mL (interpreted as sensitive) for lot 70025001 during QC testing.

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Certificate of Analysis for NR-51563

Pseudomonas aeruginosa, Strain MRSN 9873

Catalog No. NR-51563

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 9873 was isolated in 2012 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 9873, was deposited as multi-locus sequence type (MLST) ST 3045, sensitive to amikacin, aztreonam, ciprofloxacin, levofloxacin and piperacillin/tazobactam and resistant to cefepime, ceftazidime, gentamicin, imipenem, meropenem and tobramycin. NR-51563 was produced by inoculation of BEI Resources seed lot 70025004 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70064245 **Manufacturing Date: 01NOV2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Sensitive	Sensitive (4 µg/mL)
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)[3]
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Levofloxacin	Sensitive	Sensitive (2 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 9873 (GenBank: RXSY01000129.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 9873 (GenBank: RXSY01000129.1)
Purity		
7 days at 37°C in an aerobic atmosphere with 5% CO_2 on Tryptic Soy agar with 5% defibrinated sheep blood	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology

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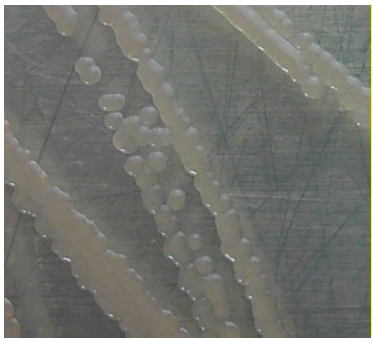
Certificate of Analysis for NR-51563

TEST	SPECIFICATIONS	RESULTS
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[3]*P. aeruginosa*, strain MRSN 9873 was deposited as resistant to cefepime, but showed a MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70025003 during QC testing.
[4]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*; however, most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51564

Pseudomonas aeruginosa, Strain MRSN 11278

Catalog No. NR-51564

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 11278 was isolated in 2012 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 11278 was deposited as multi-locus sequence type (MLST) ST 829, sensitive to ceftazidime and piperacillin/tazobactam, intermediately resistant to amikacin and levofloxacin and resistant to aztreonam, cefepime, ciprofloxacin, gentamicin, imipenem, meropenem and tobramycin. NR-51564 was produced by inoculation of BEI Resources seed lot 70025006 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70063500 **Manufacturing Date: 20SEP2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Sensitive	Sensitive (16 µg/mL)[3]
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (8 µg/mL)[4]
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (≤ 1 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (1 µg/mL)[5]
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Levofloxacin	Report results	Intermediate (4 µg/mL)[6]
Meropenem	Sensitive	Intermediate (4 µg/mL)[7,8]
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[9]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 11278 (GenBank: RXWS01000149.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 11278 (GenBank: RXWS01000149.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

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[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[3]*P. aeruginosa*, strain MRSN 11278 was deposited as intermediately resistant to amikacin, but showed a MIC of 16 µg/mL (interpreted as sensitive) for lot 70025005 during QC testing.
[4]*P. aeruginosa*, strain MRSN 11278 was deposited as resistant to cefepime, but showed a MIC of 8 µg/mL (interpreted as sensitive) for lot 70025005 during QC testing.
[5]*P. aeruginosa*, strain MRSN 11278 was deposited as resistant to ciprofloxacin, but showed a MIC of 1 µg/mL (interpreted as sensitive) for lot 70025005 during QC testing.
[6]*P. aeruginosa*, strain MRSN 11278 was deposited as intermediately resistant to levofloxacin but showed MICs of 2 µg/mL (interpreted as sensitive) and 4 µg/mL (interpreted as intermediately resistant) for lot 70025005 during QC testing, resulting in an inconclusive result.
[7]*P. aeruginosa*, strain MRSN 11278 was deposited as resistant to meropenem, but showed a MIC of 2 µg/mL (interpreted as sensitive) for lot 70025005 during QC testing.
[8]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.
[9]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

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Certificate of Analysis for NR-51565

Pseudomonas aeruginosa, Strain MRSN 11281

Catalog No. NR-51565

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 11281 was isolated in 2012 from a human wound sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 11281 was deposited as multi-locus sequence type (MLST) ST 875, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin and intermediately resistant to meropenem and resistant to imipenem. NR-51565 was produced by inoculation of BEI Resources seed lot 70025008 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70072941 **Manufacturing Date: 06DEC2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, entire, opaque, smooth, and green
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Meropenem	Intermediate	Intermediate (4 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1420 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 11281 (GenBank: RXWR01000028.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 11281 (GenBank: RXWR01000028.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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Certificate of Analysis for NR-51566

Pseudomonas aeruginosa, Strain MRSN 11285

Catalog No. NR-51566

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 11285 was isolated in 2012 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 11285 was deposited as multi-locus sequence type (MLST) ST 3030, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51566 was produced by inoculation of BEI Resources seed lot 70025010 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70072942 Manufacturing Date: 06DEC2024

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Irregular, flat, undulate, smooth and green
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 1 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.25 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1480 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 11285 (GenBank: RXWQ01000052.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 11285 (GenBank: RXWQ01000052.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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Certificate of Analysis for NR-51567

Pseudomonas aeruginosa, Strain MRSN 11286

Catalog No. NR-51567

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 11286 was isolated in 2012 from a human wound sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 11286 was deposited as multi-locus sequence type (MLST) ST 2387, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin, intermediately resistant to meropenem and resistant to imipenem. NR-51567 was produced by inoculation of BEI Resources seed lot 70025012 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70072943 **Manufacturing Date: 13DEC2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony Type 1: Irregular, low convex, undulate, cream and smooth (Figure 1) Colony Type 2: Circular, low convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3,4]		
Amikacin	Sensitive	Sensitive (4 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Meropenem	Intermediate	Intermediate (4µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 11286 (GenBank: RXWP01000155.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 11286 (GenBank: RXWP01000155.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Two colony types were observed. VITEK® MS (MALDI-TOF) analysis identified cells from all three colony types as *P. aeruginosa*.
[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

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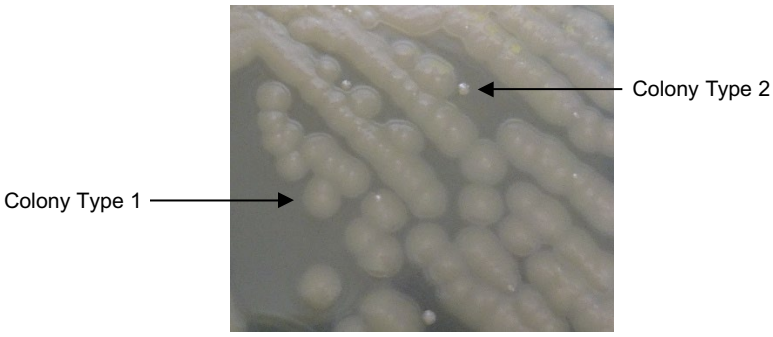
[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.
[4]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

Figure 1: Colony Morphology



/Sonia Bjorum Brower/
Sonia Bjorum Brower 17 JUN 2025
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Certificate of Analysis for NR-51568

Pseudomonas aeruginosa, Strain MRSN 11536

Catalog No. NR-51568

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 11536 was isolated in 2012 from a human wound sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 11536 was deposited as multi-locus sequence type (MLST) ST 621, sensitive to amikacin, cefepime, ceftazidime and piperacillin/tazobactam and resistant to aztreonam, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem and tobramycin. NR-51568 was produced by inoculation of BEI Resources seed lot 70025028 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70072944 Manufacturing Date: 13DEC2024

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tobramycin	Resistant	Resistant (12 to 16 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 11536 (GenBank: RXWO01000162.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 11536 (GenBank: RXWO01000162.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using a combination of bioMérieux VITEK® 2 GN81 and ETEST®.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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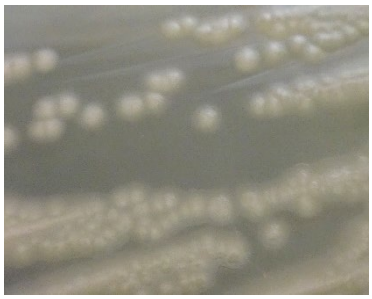
Figure 1: Colony Morphology



/Sonia Bjorum Brower/
Sonia Bjorum Brower 24 FEB 2025
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SUPPORTING INFECTIOUS DISEASE RESEARCH

Certificate of Analysis for NR-51569

Pseudomonas aeruginosa, Strain MRSN 11538

Catalog No. NR-51569

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 11538 was isolated in 2012 from a human wound sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 11538 was deposited as multi-locus sequence type (MLST) ST 1229, sensitive to amikacin, aztreonam, ciprofloxacin, cefepime, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin, intermediately resistant to ceftazidime and resistant to imipenem and meropenem. NR-51569 was produced by inoculation of BEI Resources seed lot 700250230 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70072495 **Manufacturing Date: 11DEC2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, entire, smooth and cream to green
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)[4]
Ceftazidime	Intermediate	Intermediate (16 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (1 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Intermediate	Intermediate (4 µg/mL)[5]
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Piperacillin/tazobactam	Intermediate	Sensitive (16 µg/mL)[6]
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1480 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 11538 (GenBank: RXWN01000143.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 11538 (GenBank: RXWN01000143.1)
Purity		
7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using a combination of bioMérieux VITEK® 2 GN81 and ETEST®.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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[4]*P. aeruginosa*, strain MRSN 11538 was deposited as sensitive to cefepime, but showed a MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70025029 during QC testing.
[5]*P. aeruginosa*, strain MRSN 11538 was deposited as sensitive to levofloxacin, but showed a MIC of 4 µg/mL (interpreted as intermediately resistant) for lot 70025029 during QC testing.
[6]*P. aeruginosa*, strain MRSN 11538 was deposited as sensitive to piperacillin/tazobactam, but showed a MIC of 64 µg/mL (interpreted as intermediately resistant) for lot 70025029 during QC testing.

/Sonia Bjorum Brower/
Sonia Bjorum Brower 12 SEP 2025
Technical Manager or designee, ATCC Federal Solutions

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Certificate of Analysis for NR-51570

Pseudomonas aeruginosa, Strain MRSN 11976

Catalog No. NR-51570

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 11976 was isolated in 2012 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 11976 was deposited as multi-locus sequence type (MLST) ST 111, sensitive to sensitive to amikacin, aztreonam, ceftazidime, ciprofloxacin, cefepime, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51570 was produced by inoculation of BEI Resources seed lot 70025033 into Tryptic Soy broth. Broth inoculum was added to a Tryptic Soy agar slant, which was grown for 1 day at 37°C in an aerobic atmosphere. After 5 days at room temperature, a loopful of colonies from the Tryptic Soy agar slant was used to inoculate Tryptic Soy broth, which was grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70072946 **Manufacturing Date: 16JAN2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	CT1: Irregular, flat, undulate, smooth and cream to green (Figure 1) CT2: Circular, convex, undulate, smooth and light green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3,4]		
Amikacin	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (4 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (16 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1450 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 11076 (GenBank: RXWM01000164.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 11976 (GenBank: RXWM01000164.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Two colony types were observed. Plating of the individual colony types showed that they reverted to the mixed colony type. VITEK® MS (MALDI-TOF) analysis identified cells from both colony types as *P. aeruginosa*.

[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural

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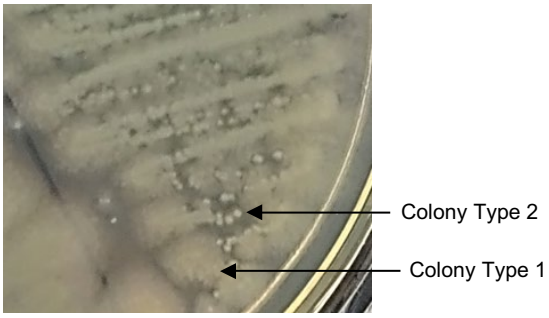
Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[3]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[4]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

Figure 1: Colony Morphology



/Sonia Bjorum Brower/
Sonia Bjorum Brower 13 AUG 2025
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SUPPORTING INFECTIOUS DISEASE RESEARCH

Certificate of Analysis for NR-51571

Pseudomonas aeruginosa, Strain MRSN 12282

Catalog No. NR-51571

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 12282 was isolated in 2012 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 12282 was deposited as multi-locus sequence type (MLST) ST 348, sensitive to amikacin and tobramycin, intermediately resistant to gentamicin and resistant to aztreonam, ceftazidime, ciprofloxacin, cefepime, imipenem, levofloxacin, meropenem and piperacillin/tazobactam. NR-51571 was produced by inoculation of BEI Resources seed lot 70025036 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70072947 **Manufacturing Date: 06DEC2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Intermediate (32 µg/mL)[4]
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)[5]
Ceftazidime	Resistant	Resistant (32 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Intermediate	Intermediate (8 µg/mL)
Levofloxacin	Resistant	Resistant (8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tobramycin	Sensitive	Sensitive (4 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 12282 (GenBank: RXWL01000175.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 12282 (GenBank: RXWL01000175.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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[4]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.
[5]*P. aeruginosa*, strain MRSN 12282 was deposited as resistant to cefepime, but showed a MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70025034 during QC testing.

/Sonia Bjorum Brower/
Sonia Bjorum Brower 19 MAY 2025
Technical Manager or designee, ATCC Federal Solutions

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Certificate of Analysis for NR-51572

Pseudomonas aeruginosa, Strain MRSN 12283

Catalog No. NR-51572

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 12283 was isolated in 2012 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 12283 was deposited as multi-locus sequence type (MLST) ST 646, sensitive to amikacin, aztreonam, ceftazidime, ciprofloxacin, cefepime, gentamicin, levofloxacin, tobramycin and piperacillin/tazobactam, intermediately resistant to meropenem and resistant to imipenem. NR-51572 was produced by inoculation of BEI Resources seed lot 70025042 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70072948 **Manufacturing Date: 06DEC2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony type 1: Irregular, flat, undulate, smooth, opaque and cream (Figure 1) Colony type 2: Circular, low convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3,4]		
Amikacin	Sensitive	Sensitive (4 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (4 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Meropenem	Sensitive	Intermediate (4 µg/mL)[5,6]
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 12283 (GenBank: RXWK01000038.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 12283 (GenBank: RXWK01000038.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Two colony types were observed. Plating of the individual colony types showed that they did not revert to the mixed colony type. VITEK® MS (MALDI-TOF) analysis identified cells from both colony types as *P. aeruginosa*.

[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

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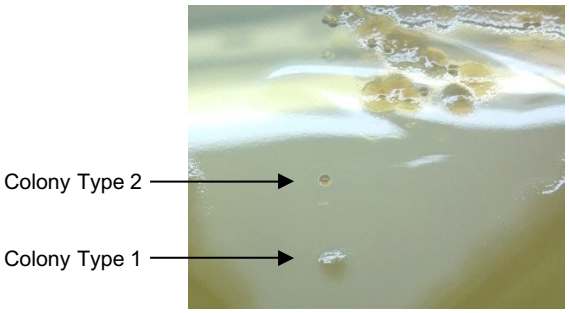
[3]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[4]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.
[5]*P. aeruginosa* strain MRSN 12283 was deposited as intermediately resistant to meropenem, and was found to be sensitive for lot 70025041, but showed a MIC of 4µg/mL (interpreted as intermediately resistant) for lot 70072948 during QC testing.
[6]Susceptibilty results for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

Figure 1: Colony Morphology



/Sonia Bjorum Brower/
Sonia Bjorum Brower 19 MAY 2025
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Certificate of Analysis for NR-51573

Pseudomonas aeruginosa, Strain MRSN 12365

Catalog No. NR-51573

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 12365 was isolated in 2012 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 12365 was deposited as multi-locus sequence type (MLST) ST 253, sensitive to aztreonam, amikacin, ceftazidime, cefepime, piperacillin/tazobactam, tobramycin, intermediately resistant to ciprofloxacin and gentamicin and resistant to imipenem, levofloxacin and meropenem. NR-51573 was produced by inoculation of BEI Resources seed lot 70025044 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70072949 **Manufacturing Date: 06DEC2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, entire, smooth and cream
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Intermediate	Sensitive (4 µg/mL)[4]
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Report results	Sensitive (0.25 µg/mL)[5]
Gentamicin	Intermediate	Sensitive (3 µg/mL)[6]
Levofloxacin	Intermediate	Sensitive (1 µg/mL)[7]
Meropenem	Intermediate	Sensitive (4 µg/mL)[8]
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1480 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 315 (GenBank: RXWJ01000169.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 315 (GenBank: RXWJ01000169.1)
Purity 7 days at 37°C in an aerobic atmosphere with 5% CO_2 on Tryptic Soy agar with 5% defibrinated sheep blood	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81 and ETEST®.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics

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were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

[4]*P. aeruginosa*, strain MRSN 12365 was deposited as sensitive to amikacin and was found to be intermediately resistant for lot 70025043, but showed a MIC of 4 µg/mL (interpreted as sensitive) for lot 70072949 during QC testing. Testing was performed in duplicate.

[5]*P. aeruginosa*, strain MRSN 12365 was deposited as intermediately resistant to ciprofloxacin but showed MICs of 1 µg/mL (interpreted as sensitive) and 2 µg/mL (interpreted as intermediately resistant) for lot 70025043 during QC testing, resulting in an inconclusive result. QC testing of lot 70072949 showed a MIC of 0.25 µg/mL (interpreted as sensitive). Testing was performed in duplicate.

[6]*P. aeruginosa*, strain MRSN 12365 was deposited as intermediately resistant to gentamicin, but showed a MIC of 3 µg/mL (interpreted as sensitive) for lot 70072949 during QC testing. Testing was performed in duplicate.

[7]*P. aeruginosa*, strain MRSN 12365 was deposited as resistant to meropenem and was found to be intermediately resistant for lot 70025043 during QC testing, but showed a MIC of 4 µg/mL (interpreted as sensitive) for lot 70072949 during QC testing. Testing was performed in duplicate.

/Sonia Bjorum Brower/
Sonia Bjorum Brower 19 MAY 2025
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SUPPORTING INFECTIOUS DISEASE RESEARCH

Certificate of Analysis for NR-51574

Pseudomonas aeruginosa, Strain MRSN 12368

Catalog No. NR-51574

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 12368 was isolated in 2012 from a human blood sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 12368 was deposited as multi-locus sequence type (MLST) ST 1685, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, levofloxacin, piperacillin/tazobactam and tobramycin, intermediately susceptible to gentamicin and resistant to imipenem and meropenem. NR-51574 was produced by inoculation of BEI Resources seed lot 70025048 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70072950 **Manufacturing Date: 06DEC2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, undulate, smooth and cream
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Intermediate	Intermediate (32 µg/mL)[4]
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (8 µg/mL)
Ceftazidime	Sensitive	Sensitive (8 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Gentamicin	Intermediate	Intermediate (8 µg/mL)
Levofloxacin	Sensitive	Sensitive (2 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Piperacillin/tazobactam	Intermediate	Intermediate (64 µg/mL)[5]
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 12368 (GenBank: RXWI01000126.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 12368 (GenBank: RXWI01000126.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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[4]*P. aeruginosa*, strain MRSN 12368 was deposited as sensitive to amikacin, but showed a MIC of 16 µg/mL to 32 µg/mL (interpreted as intermediately resistant) for lot 70025045 during QC testing.
[5]*P. aeruginosa*, strain MRSN 12368 was deposited as sensitive to piperacillin/tazobactam, but showed a MIC of 32 µg/mL (interpreted as intermediately resistant) for lot 70025045 during QC testing.

/Sonia Bjorum Brower/
Sonia Bjorum Brower 17 MAR 2025
Technical Manager or designee, ATCC Federal Solutions

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Certificate of Analysis for NR-51575

Pseudomonas aeruginosa, Strain MRSN 12914

Catalog No. NR-51575

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 12914 was isolated in 2012 from a human urine sample in Afghanistan as part of a surveillance program. *P. aeruginosa*, strain MRSN 12914 was deposited as multi-locus sequence type (MLST) ST 357, sensitive to amikacin and resistant to aztreonam, cefepime, ceftazidime, ciprofloxacin, imipenem, gentamicin, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51575 was produced by inoculation of BEI Resources seed lot 70025051 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70064246 **Manufacturing Date: 25OCT2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Resistant	Resistant (≥ 64 µg/mL)[3]
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 12914 (GenBank: RXWH01000139.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 12914 (GenBank: RXWH01000139.1)
Purity		
7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology

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Certificate of Analysis for NR-51575

TEST	SPECIFICATIONS	RESULTS
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa*, strain MRSN 12914 was deposited as sensitive to amikacin, but showed a MIC of ≥ 64 µg/mL (interpreted as resistant) for lot 70025049 during QC testing.

[4]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

Figure 1: Colony Morphology

/Sonia Bjorum Brower/
Sonia Bjorum Brower 25 JAN 2024
Technical Manager or designee, ATCC Federal Solutions

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Certificate of Analysis for NR-51576

Pseudomonas aeruginosa, Strain MRSN 13488

Catalog No. NR-51576

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 13488 was isolated in 2012 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 13488 was deposited as multi-locus sequence type (MLST) ST 1414, sensitive to amikacin, aztreonam, ceftazidime, cefepime, ciprofloxacin, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin, intermediately resistant to imipenem and resistant to meropenem. NR-51576 was produced by inoculation of BEI Resources seed lot 70025059 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70073394 **Manufacturing Date: 06FEB2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, entire, translucent and cream
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (96%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (0.38 to 0.75 µg/mL)
Ceftazidime	Sensitive	Sensitive (1 to 1.5 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.25 µg/mL)
Meropenem	Sensitive	Intermediate (4 µg/mL)[4]
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1450 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 13488 (GenBank: RXWF01000020.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 13488 (GenBank: RXWF01000020.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using a combination of bioMérieux VITEK® 2 GN81 and ETEST®.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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[4]*P. aeruginosa*, strain MRSN 13488 was deposited as resistant to meropenem, but showed a MIC of ≤ 0.25 µg/mL (interpreted as sensitive) for lot 70025055 during QC testing. The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

/Sonia Bjorum Brower/
Sonia Bjorum Brower 13 AUG 2025
Technical Manager or designee, ATCC Federal Solutions

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Certificate of Analysis for NR-51577

Pseudomonas aeruginosa, Strain MRSN 14981

Catalog No. NR-51577

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 14981 was isolated in 2013 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 14981 was deposited as multi-locus sequence type (MLST) ST 3004, sensitive to amikacin, gentamicin and tobramycin, intermediately resistant to aztreonam and meropenem and resistant to ceftazidime, ciprofloxacin, cefepime, imipenem, levofloxacin and piperacillin/tazobactam. NR-51577 was produced by inoculation of BEI Resources seed lot 70025061 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70073395 **Manufacturing Date: 29JAN2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, entire, smooth and cream
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Intermediate (16 µg/mL)[4,5]
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Intermediate	Intermediate (2 µg/mL)[6]
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Intermediate	Resistant (≥ 8 µg/mL)[5,7]
Meropenem	Intermediate	Intermediate (4 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 14981 (GenBank: RXWB01000131.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 14981 (GenBank: RXWB01000131.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[2]Antibiotic susceptibility was tested using a combination of bioMérieux VITEK® 2 GN81 and ETEST®.
[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics

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were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

[4]*P. aeruginosa*, strain MRSN 14981 was deposited as resistant to cefepime, but showed a MIC of 8 µg/mL (interpreted as sensitive) for lot 70025060 during QC testing.

[5]Susceptibilty results for this antibiotic are within one doubling dilution of specification, which is considered an equivalent result.

[6]*P. aeruginosa*, strain MRSN 14981 was deposited as resistant to ciprofloxacin, but showed a MIC of 2 µg/mL (interpreted as intermediately resistant) for lot 70025060 during QC testing.

[7]*P. aeruginosa*, strain MRSN 14981 was deposited as resistant to levofloxacin, but showed a MIC of 4 µg/mL (interpreted as intermediately resistant) for lot 70025060 during QC testing.

/Sonia Bjorum Brower/
Sonia Bjorum Brower 14 AUG 2025
Technical Manager or designee, ATCC Federal Solutions

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Certificate of Analysis for NR-51578

Pseudomonas aeruginosa, Strain MRSN 15566

Catalog No. NR-51578

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 15566 was isolated in 2013 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 15566 was deposited as multi-locus sequence type (MLST) ST 2855, sensitive to amikacin, aztreonam, ceftazidime, cefepime, gentamicin, meropenem, piperacillin/tazobactam and tobramycin and resistant to ciprofloxacin, imipenem and levofloxacin. NR-51578 was produced by inoculation of BEI Resources seed lot 70025062 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70073396 **Manufacturing Date: 16JAN2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony type 1: Irregular, flat, undulate, rough and cream (Figure 1) Colony type 2: Circular, convex, undulate, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3,4]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 1 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (1 µg/mL)[5]
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Intermediate (6 µg/mL)[6]
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 15566 (GenBank: RXWA01000170.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 15566 (GenBank: RXWA01000170.1)
Purity	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar		
Viability	Growth	Growth

[1]Two colony types were observed. VITEK® MS (MALDI-TOF) analysis identified cells from both colony types as *P. aeruginosa.*

[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

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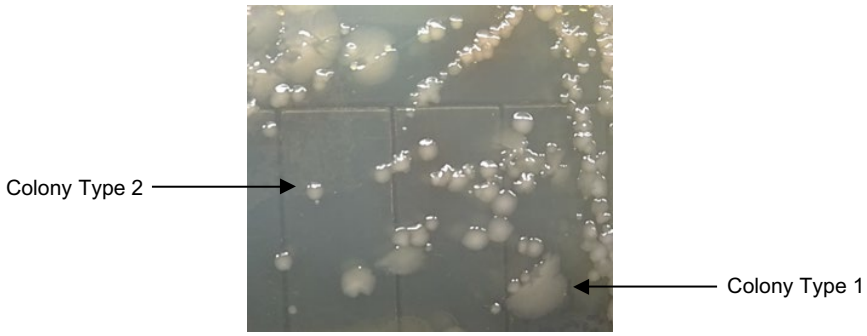
[3]Antibiotic susceptibility was tested using a combination of bioMérieux VITEK® 2 GN81 and ETEST®.
[4]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.
[5]*P. aeruginosa*, strain MRSN 15566 was deposited as resistant to ciprofloxacin, but showed a MIC of ≤ 1 µg/mL (interpreted as sensitive) for lot 70025062 during QC testing
[6]*P. aeruginosa*, strain MRSN 15566 was deposited as resistant to levofloxacin and was found to be sensitive for lot 70025062, but showed a MIC of 6 µg/mL (interpreted as intermediately resistant) for lot 70073396 during QC testing

Figure 1: Colony Morphology



/Sonia Bjorum Brower/
Sonia Bjorum Brower 19 MAY 2025
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Certificate of Analysis for NR-51579

Pseudomonas aeruginosa, Strain MRSN 15678

Catalog No. NR-51579

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 15678 was isolated in 2013 from a human wound sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 15678 was deposited as multi-locus sequence type (MLST) ST 235, sensitive to amikacin, gentamicin and tobramycin, intermediately resistant to aztreonam and resistant to ceftazidime, ciprofloxacin, cefepime, imipenem, levofloxacin, meropenem and piperacillin/tazobactam. NR-51579 was produced by inoculation of BEI Resources seed lot 70025065 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70074999 **Manufacturing Date: 26MAR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, undulate, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (16 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Resistant (32 µg/mL)[4,5]
Ceftazidime	Intermediate	Resistant (32 µg/mL)[4,6]
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Sensitive	Intermediate (8 µg/mL)[4]
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Intermediate	Resistant (8 µg/mL)[4,7]
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1440 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 15678 (GenBank: RXVZ01000134.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 15678 (GenBank: RXVZ01000134.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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[4]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.
[5]*P. aeruginosa*, strain MRSN 15678 was deposited as resistant to cefepime, but showed a MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70025064 during QC testing.
[6]*P. aeruginosa*, strain MRSN 15678 was deposited as resistant to ceftazidime, but showed a MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70025064 during QC testing.
[7]*P. aeruginosa*, strain MRSN 15678 was deposited as resistant to meropenem, but showed a MIC of 4 µg/mL (interpreted as intermediate) for lot 70025064 during QC testing

Figure 1: Colony Morphology

/Sonia Bjorum Brower/
Sonia Bjorum Brower 14 JUL 2025
Technical Manager or designee, ATCC Federal Solutions

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Certificate of Analysis for NR-51580

Pseudomonas aeruginosa, Strain MRSN 15753

Catalog No. NR-51580

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 15753 was isolated in 2013 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 15753 was deposited as multi-locus sequence type (MLST) ST 274, sensitive to amikacin, aztreonam, ceftazidime, gentamicin, piperacillin/tazobactam and tobramycin, intermediately resistant to levofloxacin and resistant to cefepime, ciprofloxacin, imipenem and meropenem. NR-51580 was produced by inoculation of BEI Resources seed lot 70025067 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70074083 Manufacturing Date: 20FEB2025

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, entire, smooth and cream to green
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (8 µg/mL)[4]
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (1 µg/mL)[5]
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Intermediate (4 µg/mL)[6]
Meropenem	Resistant	Resistant (8 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1440 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 15753 (GenBank: RXVY01000154.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 15753 (GenBank: RXVY01000154.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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[4]*P. aeruginosa*, strain MRSN 15753 was deposited as resistant to cefepime, but showed a MIC of 8 µg/mL (interpreted as sensitive) for lot 70025066 during QC testing.
[5]*P. aeruginosa*, strain MRSN 15753 was deposited as resistant to ciprofloxacin, but showed a MIC of 1 µg/mL (interpreted as sensitive) for lot 70025066 during QC testing.
[6]*P. aeruginosa*, strain MRSN 15753 was deposited as intermediately resistant to levofloxacin, but showed a MIC of 2 µg/mL (interpreted as sensitive) for lot 70025066 during QC testing. The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

/Sonia Bjorum Brower/
Sonia Bjorum Brower 12 SEP 2025
Technical Manager or designee, ATCC Federal Solutions

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Certificate of Analysis for NR-51581

Pseudomonas aeruginosa, Strain MRSN 16344

Catalog No. NR-51581

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 16344 was isolated in 2013 from a human wound sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 16344 was deposited as multi-locus sequence type (MLST) ST 3033, sensitive to amikacin, ceftazidime and piperacillin/tazobactam, intermediately resistant to meropenem and resistant to aztreonam, cefepime, ciprofloxacin, gentamicin, imipenem, levofloxacin, and tobramycin. NR-51581 was produced by inoculation of BEI Resources seed lot 70025069 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70074084 **Manufacturing Date: 28FEB2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (16 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)[4]
Ceftazidime	Sensitive	Sensitive (1 µg/mL)
Ciprofloxacin	Intermediate	Intermediate (2 µg/mL)[5]
Gentamicin	Intermediate	Intermediate (8 µg/mL)[6]
Levofloxacin	Intermediate	Intermediate (4 µg/mL)[7]
Meropenem	Sensitive	Sensitive (1 µg/mL)[8]
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Tobramycin	Sensitive	Sensitive (2 µg/mL)[9]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1450 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 16344 (GenBank: RXVS01000152.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 16344 (GenBank: RXVS01000152.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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[4]*P. aeruginosa*, strain MRSN 16344 was deposited as resistant to cefepime, but showed a MIC of ≤ 8 µg/mL (interpreted as sensitive) for lot 70025068 during QC testing.
[5]*P. aeruginosa*, strain MRSN 16344 was deposited as resistant to ciprofloxacin, but MIC showed 2 µg/mL (interpreted as intermediately resistant) for lot 70025068 during QC testing.
[6]*P. aeruginosa*, strain MRSN 16344 was deposited as resistant to gentamicin, but MIC showed 8 µg/mL (interpreted as intermediately resistant) for lot 70025068 during QC testing.
[7]*P. aeruginosa*, strain MRSN 16344 was deposited as resistant to levofloxacin, but MIC showed 4 µg/mL (interpreted as intermediately resistant) for lot 70025068 QC testing.
[8]*P. aeruginosa*, strain MRSN 16344 was deposited as intermediately resistant to meropenem, but MIC showed 1 µg/mL(interpreted as sensitive) for lot 70025068 QC testing.
[9]*P. aeruginosa*, strain MRSN 16344 was deposited as resistant to tobramycin, but MIC showed ≤ 4 µg/mL(interpreted as sensitive) for lot 70025068 QC testing

Figure 1: Colony Morphology

/Sonia Bjorum Brower/
Sonia Bjorum Brower 15 AUG 2025
Technical Manager or designe, ATCC Federal Solutions

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Certificate of Analysis for NR-51582

Pseudomonas aeruginosa, Strain MRSN 16345

Catalog No. NR-51582

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain 2013 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 16345 was deposited as multi-locus sequence type (MLST) ST 211, sensitive to amikacin, gentamicin, meropenem and tobramycin, intermediately resistant to imipenem and resistant to aztreonam, cefepime, ceftazidime, ciprofloxacin, levofloxacin and piperacillin/tazobactam. NR-51582 was produced by inoculation of BEI Resources seed lot 70025071 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70074085 Manufacturing Date: 20FEB2025

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Irregular, flat, undulate, smooth and cream to green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Sensitive	Sensitive (2 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (1430 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 16345 (GenBank: RXVR01000117.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 16345 (GenBank: RXVR01000117.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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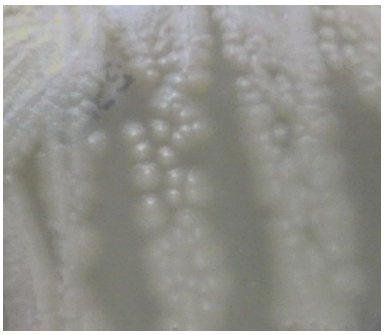
Certificate of Analysis for NR-51582

Figure 1: Colony Morphology



/Sonia Bjorum Brower/
Sonia Bjorum Brower 21 MAY 2025
Technical Manager or designee, ATCC Federal Solutions

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Certificate of Analysis for NR-51583

Pseudomonas aeruginosa, Strain MRSN 16383

Catalog No. NR-51583

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 16383 was isolated in 2013 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 16383 was deposited as multi-locus sequence type (MLST) ST 3006, sensitive to amikacin, aztreonam, ceftazidime, meropenem, piperacillin/tazobactam and tobramycin, intermediately resistant to gentamicin and imipenem and resistant to cefepime, ciprofloxacin and levofloxacin. NR-51583 was produced by inoculation of BEI Resources seed lot 70025073 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70074704 **Manufacturing Date: 26MAR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony Type 1: Circular, convex, entire, smooth and cream (Figure 1) Colony Type 2: Circular, low convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3,4]		
Amikacin	Sensitive	Sensitive (16 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Sensitive (8 µg/mL)[5]
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Intermediate	Intermediate (8 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1420 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 16383 (GenBank: RXVQ01000033.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 16383 (GenBank: RXVQ01000033.1)
Purity		
7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Two colony types were observed. VITEK® MS (MALDI-TOF) analysis identified cells from both colony types as *P. aeruginosa*.
[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.
[3]Antibiotic susceptibility was tested using using a combination of bioMérieux VITEK® 2 GN81 and ETEST®.

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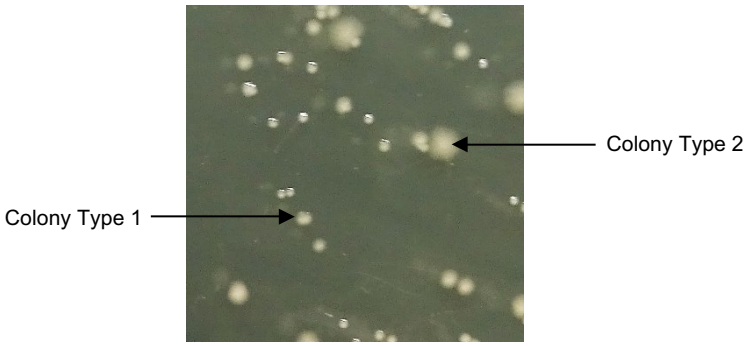
[4]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

[5]*P. aeruginosa,* strain MRSN 16383 was deposited as resistant to cefepime, but showed an MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70025072 during QC testing. Testing was performed in duplicate. The susceptibility result of the current lot for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51584

Pseudomonas aeruginosa, Strain MRSN 16740

Catalog No. NR-51584

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 16740 was isolated in 2013 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 16740 was deposited as multi-locus sequence type (MLST) ST 633, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin and resistant to imipenem and meropenem. NR-51584 was produced by inoculation of BEI Resources seed lot 70025075 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70074705 **Manufacturing Date: 19MAR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, undulate, smooth and cream
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa*	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Meropenem	Intermediate	Resistant (8 µg/mL)[4]
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1440 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 16740 (GenBank: RXVP01000139.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 16740 (GenBank: RXVP01000139.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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[4]*P. aeruginosa,* strain MRSN 16740 was deposited as resistant to meropenem, but showed an MIC of 4 µg/mL (interpreted as intermediately resistant) for lot 70025074 during QC testing. The susceptibility result of the current lot for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

/Sonia Bjorum Brower/
Sonia Bjorum Brower 14 AUG 2025
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Certificate of Analysis for NR-51585

Pseudomonas aeruginosa, Strain MRSN 16744

Catalog No. NR-51585

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 16744 was isolated in 2013 from a human tissue sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 16744 was deposited as multi-locus sequence type (MLST) ST 309, sensitive to amikacin, cefepime, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin, intermediately resistant to aztreonam and resistant to imipenem and meropenem. NR-51585 was produced by inoculation of BEI Resources seed lot 70025078 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075025 **Manufacturing Date: 03APR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony Type 1: Circular, slight peaked, undulate, smooth and cream Colony Type 2: Circular, convex, entire, smooth and light cream
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3,4]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Meropenem	Resistant	Resistant (8 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (1390 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 16744 (GenBank: RXVO01000053.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 16744 (GenBank: RXVO01000053.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Two colony types were observed. Plating of the individual colony types showed that they did not revert to the mixed colony type. VITEK® MS (MALDI-TOF) analysis identified cells from both colony types as *P. aeruginosa*.

[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

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[3]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.
[4]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

/Sonia Bjorum Brower/
Sonia Bjorum Brower 20 JUN 2025
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Certificate of Analysis for NR-51586

Pseudomonas aeruginosa, Strain MRSN 16847

Catalog No. NR-51586

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 16847 was isolated in 2013 from a human sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 16847 was deposited as multi-locus sequence type (MLST) ST 253, sensitive to amikacin, aztreonam, cefepime, ciprofloxacin, ceftazidime, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin and resistant to imipenem and meropenem. NR-51586 was produced by inoculation of BEI Resources seed lot 70025077 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70074707 **Manufacturing Date: 12MAR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Irregular, convex, undulate, smooth and green
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Meropenem	Intermediate	Resistant (8 µg/mL)[4]
Piperacillin/tazobactam	Sensitive	Sensitive (16 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 16847 (GenBank: RXVN01000043.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 16847 (GenBank: RXVN01000043.1)
Purity		
7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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[4]*P. aeruginosa*, strain MRSN 16847 was deposited as resistant to meropenem, but showed a MIC of 4 µg/mL (interpreted as intermediately resistant) for lot 70025079 during QC testing.

/Sonia Bjorum Brower/
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Certificate of Analysis for NR-51587

Pseudomonas aeruginosa, Strain MRSN 17849

Catalog No. NR-51587

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 17849 was isolated in 2013 from a human respiratory isolate sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 17849 was deposited as multi-locus sequence type (MLST) ST 2065, sensitive to amikacin, cefepime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem and tobramycin and intermediately resistant to aztreonam, ceftazidime and piperacillin/tazobactam. NR-51587 was produced by inoculation of BEI Resources seed lot 70025081 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70074708 **Manufacturing Date: 12MAR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony Type 1: Circular, convex, entire, smooth and cream to green Colony Type 2: Circular, flat, undulate, smooth and cream to green
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3,4]		
Amikacin	Sensitive	Sensitive (4 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Sensitive (6 to 8 µg/mL)[5,6]
Ceftazidime	Resistant	Intermediate (12 to 16 µg/mL)[6,7]
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.25 µg/mL)
Meropenem	Sensitive	Sensitive (1 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)[8]
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1410 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 17849 (GenBank: RXVK01000120.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 17849 (GenBank: RXVK01000120.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Two colony types were observed. Plating of the individual colony types showed that they did not revert to the mixed colony type. The 16S ribosomal RNA gene of each colony type was sequenced and found to be consistent with the other colony type and *P. aeruginosa.*

[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[3]Antibiotic susceptibility was tested using a combination of VITEK®2 GN81 and E-test strips.

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[4]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to ampicillin, amoxicillin, amoxicillin/clavulanic acid, ceftriaxone, cefuroxime, cefoxitin, chloramphenicol, ertapenem, nitrofurantoin, tetracycline, tigecycline, and trimethoprim/sulfamethoxazole. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested.
[5]*P. aeruginosa*, strain MRSN 17849 was deposited as sensitive to cefepime, but showed a MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70025080 during QC testing.
[6]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.
[7]*P. aeruginosa*, strain MRSN 17849 was deposited as intermediately resistant to ceftazidime, but showed a MIC of ≥ 64 µg/mL (interpreted as resistant) for lot 70025080 during QC testing.
[8]*P. aeruginosa*, strain MRSN 17849 was deposited as intermediately resistant to piperacillin/tazobactam, but showed a MIC of ≥ 128 µg/mL (interpreted as resistant) for lot 70025080 during QC testing.

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Sonia Bjorum Brower 15 AUG 2025
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Certificate of Analysis for NR-51588

Pseudomonas aeruginosa, Strain MRSN 18560

Catalog No. NR-51588

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 18560 was isolated in 2013 from a human wound sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 18560 was deposited as multi-locus sequence type (MLST) ST 3007, sensitive to amikacin, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin and intermediately resistant to aztreonam. NR-51588 was produced by inoculation of BEI Resources seed lot 70025083 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70074709 **Manufacturing Date: 12MAR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Irregular, flat, undulate, smooth and cream
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Meropenem	Sensitive	Sensitive (1 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1410 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 18560 (GenBank: RXVJ01000026.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 18560 (GenBank: RXVJ01000026.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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Certificate of Analysis for NR-51588

/Sonia Bjorum Brower/
Sonia Bjorum Brower 08 JUL 2025
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SUPPORTING INFECTIOUS DISEASE RESEARCH

Certificate of Analysis for NR-51589

Pseudomonas aeruginosa, Strain MRSN 18562

Catalog No. NR-51589

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 18562 was isolated in 2013 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 18562 was deposited as multi-locus sequence type (MLST) ST 3034, sensitive to amikacin, cefepime, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin, intermediately resistant to aztreonam and resistant to imipenem and meropenem. NR-51589 was produced by inoculation of BEI Resources seed lot 70025085 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70074710 **Manufacturing Date: 12MAR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, entire, smooth and cream to green
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (16 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Intermediate (8 µg/mL)[4]
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Meropenem	Resistant	Resistant (8 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 18562 (GenBank: RXVI01000051.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 18562 (GenBank: RXVI01000051.1)
Purity 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

[4]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

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Certificate of Analysis for NR-51589

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SUPPORTING INFECTIOUS DISEASE RESEARCH

Certificate of Analysis for NR-51590

Pseudomonas aeruginosa, Strain MRSN 18754

Catalog No. NR-51590

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 18754 was isolated in 2013 from a human tissue sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 18754 was deposited as multi-locus sequence type (MLST) ST 166, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51590 was produced by inoculation of BEI Resources seed lot 70025087 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075000 **Manufacturing Date: 27MAR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, undulate, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Ceftazidime	Sensitive	Sensitive (8 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Meropenem	Sensitive	Sensitive (1 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (16 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1410 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 18754 (GenBank: RXVH01000074.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 18754 (GenBank: RXVH01000074.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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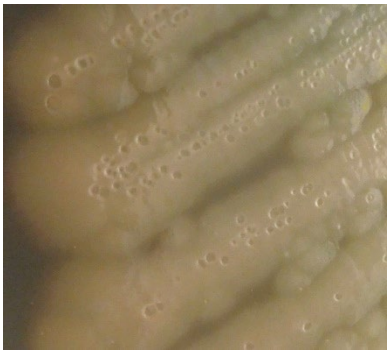
Certificate of Analysis for NR-51590

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51591

Pseudomonas aeruginosa, Strain MRSN 18803

Catalog No. NR-51591

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 18803 was isolated in 2013 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 18803 was deposited as multi-locus sequence type (MLST) ST 2132, sensitive to amikacin, cefepime, ceftazidime, gentamicin, imipenem, meropenem and tobramycin, intermediately resistant to aztreonam and piperacillin/tazobactam and resistant to ciprofloxacin and levofloxacin. NR-51591 was produced by inoculation of BEI Resources seed lot 70025089 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075001 **Manufacturing Date: 27MAR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony Type 1: Irregular, low convex, undulate, smooth and cream Colony Type 2: Circular, low convex, entire, smooth and cream
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3]		
Amikacin	Sensitive	Sensitive (4 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)[4]
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)[5]
Meropenem	Sensitive	Sensitive (0.5 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)[6]
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 18803 (GenBank: RXVG01000106.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 18803 (GenBank: RXVG01000106.1)
Purity		
7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Two colony types were observed. VITEK® MS (MALDI-TOF) analysis identified cells from both colony types as *P. aeruginosa*.

[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics

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were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

[4]*P. aeruginosa*, strain MRSN 18803 was deposited as resistant to ciprofloxacin, but showed a MIC of ≤ 0.25 µg/mL (interpreted as sensitive) for lot 70025088 during QC testing.

[5]*P. aeruginosa*, strain MRSN 18803 was deposited as resistant to levofloxacin, but showed a MIC of 1 µg/mL (interpreted as sensitive) for lot 70025088 during QC testing.

[6]*P. aeruginosa*, strain MRSN 18803 was deposited as intermediately resistant to piperacillin/tazobactam, but showed a MIC of 8 µg/mL (interpreted as sensitive) for lot 70025088 during QC testing.

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SUPPORTING INFECTIOUS DISEASE RESEARCH

Certificate of Analysis for NR-51592

Pseudomonas aeruginosa, Strain MRSN 18855

Catalog No. NR-51592

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 18855 was isolated in 2013 from a human tissue sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 18855 was deposited as multi-locus sequence type (MLST) ST 3035, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51592 was produced by inoculation of BEI Resources seed lot 70025091 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075002 **Manufacturing Date: 26MAR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony Type 1: Circular, low convex, entire, smooth and cream (Figure 1) Colony Type 2: Irregular, concave, undulate, opaque and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3,4]		
Amikacin	Sensitive	Sensitive (4 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (1460 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 18855 (GenBank: RXVF01000133.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 18855 (GenBank: RXVF01000133.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Two colony types were observed. VITEK® MS (MALDI-TOF) analysis identified cells from both colony types as *P. aeruginosa*.

[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[3]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

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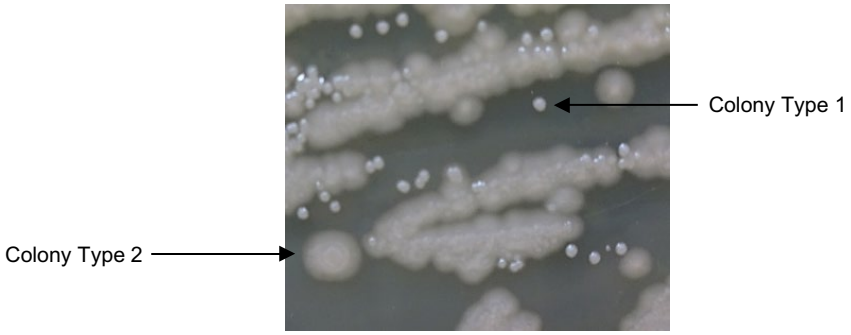
[4]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51593

Pseudomonas aeruginosa, Strain MRSN 18970

Catalog No. NR-51593

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 18970 was isolated in 2013 from a human wound sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 18970 was deposited as multi-locus sequence type (MLST) ST 192, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51593 was produced by inoculation of BEI Resources seed lot 70025093 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075003 **Manufacturing Date: 26MAR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Irregular, flat, undulate, smooth and cream to green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (2 µg/mL)
Meropenem	Sensitive	Sensitive (0.5 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (16 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 18970 (GenBank: RXVE01000076.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 18970 (GenBank: RXVE01000076.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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Figure 1: Colony Morphology

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Certificate of Analysis for NR-51594

Pseudomonas aeruginosa, Strain MRSN 19711

Catalog No. NR-51594

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 19711 was isolated in 2013 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 19711 was deposited as multi-locus sequence type (MLST) ST 2865, sensitive to amikacin, ciprofloxacin, gentamicin and tobramycin, intermediately resistant to ceftazidime, levofloxacin and piperacillin/tazobactam and resistant to aztreonam cefepime, imipenem and meropenem. NR-51594 was produced by inoculation of BEI Resources seed lot 70025095 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075004 **Manufacturing Date: 26MAR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, undulate, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)[4]
Ceftazidime	Intermediate	Intermediate (16 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (5 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (2 µg/mL)[5]
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)[6]
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1450 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 19711 (GenBank: RXUX01000114.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 19711 (GenBank: RXUX01000114.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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[4]*P. aeruginosa*, strain MRSN 19711 was deposited as resistant to cefepime, but showed a MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70025094 during QC testing.
[5]*P.*aeruginosa, strain MRSN 19711 was deposited as intermediately resistant to levofloxacin, but showed a MIC of 2 µg/mL (interpreted as sensitive) for lot 70025094 during QC testing.
[6]*P.aeruginosa,* strain MRSN 19711 was deposited as intermediately resistant to piperacillin/tazobactam, but showed a MIC of ≥ 128 µg/mL (interpreted as resistant) for lot 70025094 during QC testing. The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

Figure 1: Colony Morphology

/Sonia Bjorum Brower/
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Certificate of Analysis for NR-51595

Pseudomonas aeruginosa, Strain MRSN 20176

Catalog No. NR-51595

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 20176 was isolated in 2013 from a human in Afghanistan as part of a global surveillance program. *P. aeruginosa*, strain MRSN 20176 was deposited as multi-locus sequence type (MLST) ST 316, sensitive to meropenem, intermediately resistant to amikacin and resistant to aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, piperacillin/tazobactam and tobramycin. NR-51595 was produced by inoculation of BEI Resources seed lot 70025097 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70059160 **Manufacturing Date: 02MAR2023**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, slight peaked, undulate, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Resistant	Resistant (≥ 64 µg/mL)[3]
Amoxicillin/clavulanic acid	Resistant	Resistant (≥ 32 µg/mL)
Ampicillin	Resistant	Resistant (≥ 32 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Cefoxitin	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Sensitive	Sensitive (1 µg/mL)
Nitrofurantoin	Resistant	Resistant (≥ 512 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tetracycline	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 20176 (GenBank: RXUW01000149.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 20176 (GenBank: RXUW01000149.1)
Purity		
7 days at 37°C in an aerobic atmosphere with 5% CO_2 on Tryptic Soy agar with 5% defibrinated sheep blood	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology

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TEST	SPECIFICATIONS	RESULTS
Viability	Growth	Growth

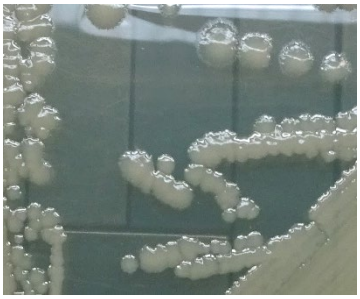
[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa*, strain MRSN 20176 was deposited as intermediately resistant to amikacin, but showed a MIC of ≥ 64 µg/mL (interpreted as resistant) for lot 70025096 during QC testing.

[4]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

Figure 1: Colony Morphology



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Sonia Bjorum Brower 25 JAN 2024
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Certificate of Analysis for NR-51596

Pseudomonas aeruginosa, Strain MRSN 20190

Catalog No. NR-51596

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 20190 was isolated in 2013 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 20190 was deposited as multi-locus sequence type (MLST) ST 3036, resistant to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51596 was produced by inoculation of BEI Resources seed lot 70025099 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075005 **Manufacturing Date: 26MAR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, entire, smooth and cream to green
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Resistant	Resistant (≥ 64 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tobramycin	Intermediate	Intermediate (8 µg/mL)[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 20190 (GenBank: RXUV01000077.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 20190 (GenBank: RXUV01000077.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to ampicillin, amoxicillin, amoxicillin/clavulanic acid, ceftriaxone, cefuroxime, cefoxitin, chloramphenicol, ertapenem, nitrofurantoin, tetracycline, tigecycline, and trimethoprim/sulfamethoxazole. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested.

[4]*P. aeruginosa*, strain MRSN 19711 was deposited as resistant to tobramycin, but showed a MIC of 8 µg/mL (interpreted as intermediately resistant) for lot 70025098 during QC testing.

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Certificate of Analysis for NR-51596

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SUPPORTING INFECTIOUS DISEASE RESEARCH

Certificate of Analysis for NR-51597

Pseudomonas aeruginosa, Strain MRSN 23861

Catalog No. NR-51597

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 23861 was isolated in 2014 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 23861 was deposited as multi-locus sequence type (MLST) ST 282, sensitive to amikacin, ceftazidime, gentamicin and tobramycin, intermediately resistant to piperacillin/tazobactam and resistant to aztreonam, cefepime, ciprofloxacin, imipenem, levofloxacin and meropenem. NR-51597 was produced by inoculation of BEI Resources seed lot 70025101 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70070584 **Manufacturing Date: 14AUG2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, undulate, smooth and cream
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Intermediate	Intermediate (16 µg/mL)[4]
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Sensitive	Sensitive (4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)[5]
Tobramycin	Intermediate	Intermediate (8 µg/mL)[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (1480 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 23861 (GenBank: RXUQ01000171.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 23861 (GenBank: RXUQ01000171.1)
Purity	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
7 days at 37°C in an aerobic atmosphere with 5% CO_2 on Tryptic Soy agar with 5% defibrinated sheep blood		
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 07.01 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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[4]*P. aeruginosa*, strain MRSN 23861 was deposited as sensitive to ceftazidime, but showed a MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70025100 during QC testing.
[5]*P. aeruginosa*, strain MRSN 23861 was deposited as intermediately resistant to piperacillin/tazobactam, but showed a MIC of ≥ 128 µg/mL (interpreted as resistant) for lot 70025100 during QC testing.
[6]*P. aeruginosa*, strain MRSN 23861 was deposited as sensitive to tobramycin, but showed a MIC of 8 µg/mL (interpreted as intermediately resistant) for lot 70025100 during QC testing.

/Sonia Bjorum Brower/
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SUPPORTING INFECTIOUS DISEASE RESEARCH

Certificate of Analysis for NR-51598

Pseudomonas aeruginosa, Strain MRSN 25623

Catalog No. NR-51598

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 25623 was isolated in 2014 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 25623 was deposited as multi-locus sequence type (MLST) ST 3038, sensitive to amikacin, cefepime, ceftazidime, gentamicin, piperacillin/tazobactam and tobramycin, and resistant to aztreonam, ciprofloxacin, imipenem, levofloxacin and meropenem. NR-51598 was produced by inoculation of BEI Resources seed lot 70025103 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075022 **Manufacturing Date: 09APR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Irregular, low convex, undulate, smooth and cream to green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (16 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1440 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 25623 (GenBank: RXUO01000089.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 25623 (GenBank: RXUO01000089.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to ampicillin, amoxicillin, amoxicillin/clavulanic acid, ceftriaxone, cefuroxime, cefoxitin, chloramphenicol, ertapenem, nitrofurantoin, tetracycline, tigecycline, and trimethoprim/sulfamethoxazole. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested.

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Figure 1: Colony Morphology

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Certificate of Analysis for NR-51599

Pseudomonas aeruginosa, Strain MRSN 25678

Catalog No. NR-51599

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 25678 was isolated in 2014 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 25678 was deposited as multi-locus sequence type (MLST) ST 3039, sensitive to amikacin, imipenem and tobramycin, intermediately resistant to ceftazidime, gentamicin, meropenem and piperacillin/tazobactam and resistant to aztreonam, ciprofloxacin, cefepime and levofloxacin. NR-51599 was produced by inoculation of BEI Resources seed lot 70025105 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075023 **Manufacturing Date: 03APR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Intermediate	Sensitive (16 µg/mL)[4]
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Intermediate	Intermediate (16 µg/mL)
Ciprofloxacin	Intermediate	Intermediate (2 µg/mL)[5]
Gentamicin	Sensitive	Sensitive (4 µg/mL)[6]
Levofloxacin	Intermediate	Intermediate (4 µg/mL)[7]
Meropenem	Intermediate	Intermediate (4 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (16 µg/mL)[8]
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1450 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 25678 (GenBank: RXUN01000193.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 25678 (GenBank: RXUN01000193.1)
Purity		
7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): **2379**-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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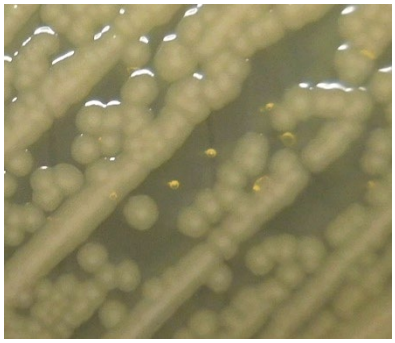
[4]*P. aeruginosa*, strain MRSN 25678 was deposited as sensitive to amikacin, but showed a MIC of 32 µg/mL (interpreted as intermediately resistant) for lot 70025104 during QC testing. The susceptibility result of the current lot for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.
[5]*P. aeruginosa*, strain MRSN 25678 was deposited as resistant to ciprofloxacin, but showed a MIC of 2 µg/mL (interpreted as intermediately resistant) for lot 70025104 during QC testing.
[6]*P. aeruginosa*, strain MRSN 25678 was deposited as intermediately resistant to gentamicin, but showed a MIC of 4 µg/mL (interpreted as sensitive) for lot 70025104 during QC testing.
[7]*P. aeruginosa*, strain MRSN 25678 was deposited as resistant to levofloxacin, but showed a MIC of 4 µg/mL (interpreted as intermediately resistant) for lot 70025104 during QC testing.
[8]*P. aeruginosa*, strain MRSN 25678 was deposited as intermediately resistant to piperacillin/tazobactam, but showed a MIC of 16 µg/mL (interpreted as sensitive) for lot 70025104 during QC testing.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51600

Pseudomonas aeruginosa, Strain MRSN 25762

Catalog No. NR-51600

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 25762 was isolated in 2014 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 25762 was deposited as multi-locus sequence type (MLST) ST 17, sensitive to amikacin, aztreonam, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin, and resistant to cefepime, imipenem and meropenem. NR-51600 was produced by inoculation of BEI Resources seed lot 70025107 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075024 **Manufacturing Date: 09APR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, entire, translucent and cream
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Intermediate	Sensitive (≤ 16 µg/mL)[3]
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)[4]
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Gentamicin	Intermediate	Intermediate (8 µg/mL)[5]
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (1430 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 25762 (GenBank: RXUM01000052.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 25762 (GenBank: RXUM01000052.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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[3]*P. aeruginosa*, strain MRSN 25762 was deposited as sensitive to amikacin, but showed a MIC of 32 µg/mL (interpreted as intermediately resistant) for lot 70025106 during QC testing. Susceptibilty results for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.
[4]*P. aeruginosa*, strain MRSN 25762 was deposited as resistant to cefepime, but showed a MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70025106 during QC testing.
[5]*P. aeruginosa*, strain MRSN 25762 was deposited as sensitive to gentamicin, but showed a MIC of 8 µg/mL (interpreted as intermediately resistant) for lot 70025106 during QC testing.

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Certificate of Analysis for NR-51601

Pseudomonas aeruginosa, Strain MRSN 26263

Catalog No. NR-51601

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 26263 was isolated in 2014 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 26263 was deposited as multi-locus sequence type (MLST) ST 3009, sensitive to amikacin, aztreonam, cefepime, gentamicin, imipenem, levofloxacin, meropenem and piperacillin/tazobactam, intermediately resistant to ceftazidime and resistant to ciprofloxacin and tobramycin. NR-51601 was produced by inoculation of BEI Resources seed lot 70025109 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70070743 **Manufacturing Date: 28AUG2024**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1]		
Sensititre™ System[2]		
Amikacin	Intermediate	Resistant (48 µg/mL)[3]
Aztreonam	Sensitive	Resistant (24 µg/mL)[4]
Cefepime	Sensitive	Intermediate (16 µg/mL)[5]
Ceftazidime	Sensitive	Sensitive (1.5 to 8 µg/mL)
Ciprofloxacin	Resistant	Resistant (> 2 µg/mL)
Colistin	Sensitive	Sensitive (0.5 µg/mL)
Doripenem	Non-susceptible	Non-susceptible (> 2 µg/mL)
Gentamicin	Resistant	Resistant (> 8 µg/mL)
Imipenem	Resistant	Resistant (> 8 µg/mL)
Levofloxacin	Intermediate	Resistant (> 8 µg/mL)[6]
Meropenem	Resistant	Resistant (> 8 µg/mL)
Piperacillin/tazobactam	Sensitive	Resistant (> 256 µg/mL)[7]
Polymyxin B	Sensitive	Sensitive (1 µg/mL)
Ticarcillin/clavulanic acid	Intermediate	Resistant (> 128 µg/mL)[8]
Tobramycin	Sensitive	Intermediate (8 µg/mL)[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 26263 (GenBank: RXUL01000092.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 26263 (GenBank: RXUL01000092.1)
Purity		
7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

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[1]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[2]Sensititre™ System Gram Negative GNX2F AST Plate, Thermo Scientific™ GNX2F
[3]*P. aeruginosa*, strain MRSN 26263 was deposited as sensitive to amikacin and was found to be intermediately resistant for lot 70025108, but showed a MIC of > 32 µg/mL (interpreted as resistant) for lot 70070743 during QC testing.
[4]*P. aeruginosa*, strain MRSN 26263 was deposited as sensitive to aztreonam and was found to be sensitive for lot 70025108, but showed a MIC of 24 µg/mL (interpreted as resistant) for lot 70070743 during QC testing.
[5]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.
[6]*P. aeruginosa*, strain MRSN 26263 was deposited as sensitive to levofloxacin and was found to be intermediately resistant for lot 70025108, but showed a MIC of > 8 µg/mL (interpreted as resistant) for lot 70070743 during QC testing.
[7]*P. aeruginosa*, strain MRSN 26263 was deposited as sensitive to piperacillin/tazobactam and was found to be sensitive for lot 70025108, but showed a MIC of > 256 µg/mL (interpreted as resistant) for lot 70070743 during QC testing.
[8]*P. aeruginosa*, strain MRSN 26263 was found to be sensitive for ticarcillin/clavulanic acid for lot 70025108, but showed a MIC of > 128 µg/mL (interpreted as resistant) for lot 70070743 during QC testing.

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SUPPORTING INFECTIOUS DISEASE RESEARCH

Certificate of Analysis for NR-51602

Pseudomonas aeruginosa, Strain MRSN 29192

Catalog No. NR-51602

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 29192 was isolated in 2015 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 29192 was deposited as multi-locus sequence type (MLST) ST 3010, sensitive to amikacin, gentamicin and tobramycin, intermediately resistant to imipenem and resistant to aztreonam, ceftazidime, ciprofloxacin, cefepime, levofloxacin, meropenem and piperacillin/tazobactam. NR-51602 was produced by inoculation of BEI Resources seed lot 70025111 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075474 **Manufacturing Date: 16APR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (16 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Sensitive	Intermediate (2 µg/mL)[4]
Gentamicin	Intermediate	Intermediate (8 µg/mL)[5]
Levofloxacin	Intermediate	Resistant (≥ 8 µg/mL)[6]
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1440 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 29192 (GenBank: RXUK01000033.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 29192 (GenBank: RXUK01000033.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): **2379**-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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[4]*P. aeruginosa*, strain MRSN 29192 was deposited as resistant to ciprofloxacin, but showed a MIC of 1 µg/mL (interpreted as sensitive) for lot 70025110 during QC testing. The susceptibility result of the current lot for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.
[5]*P. aeruginosa*, strain MRSN 29192 was deposited as sensitive to gentamicin, but showed a MIC of 8 µg/mL (interpreted as intermediate) for lot 70025110 during QC testing.
[6]*P. aeruginosa*, strain MRSN 29192 was deposited as resistant to levofloxacin, but showed a MIC of 4 µg/mL (interpreted as intermediately resistant) for lot 70025110 during QC testing. The susceptibility result of the current lot for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

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SUPPORTING INFECTIOUS DISEASE RESEARCH

Certificate of Analysis for NR-51603

Pseudomonas aeruginosa, Strain MRSN 30858

Catalog No. NR-51603

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 30858 was isolated in 2015 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 30858 was deposited as multi-locus sequence type (MLST) ST 2142, sensitive to amikacin, ceftazidime, ciprofloxacin, cefepime, gentamicin, levofloxacin, tobramycin and piperacillin/tazobactam and resistant to aztreonam, imipenem and meropenem. NR-51603 was produced by inoculation of BEI Resources seed lot 70025113 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075475 **Manufacturing Date: 16APR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Irregular, flat, undulate, translucent and cream
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (8 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Piperacillin/tazobactam	Sensitive	Intermediate (32 µg/mL)[4]
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1440 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 30858 (GenBank: RXUJ01000131.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 30858 (GenBank: RXUJ01000131.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

[4]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

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Certificate of Analysis for NR-51604

Pseudomonas aeruginosa, Strain MRSN 346179

Catalog No. NR-51604

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 346179 was isolated in 2015 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 346179 was deposited as multi-locus sequence type (MLST) ST 3011, sensitive to amikacin, aztreonam, ceftazidime, ciprofloxacin, cefepime, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51604 was produced by inoculation of BEI Resources seed lot 70025115 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075476 Manufacturing Date: 16APR2025

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Irregular, flat, undulate, smooth and green
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 1 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Meropenem	Sensitive	Sensitive (0.5 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1440 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 346179 (GenBank: RXUF01000011.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 346179 (GenBank: RXUF01000011.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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Certificate of Analysis for NR-51604

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SUPPORTING INFECTIOUS DISEASE RESEARCH

Certificate of Analysis for NR-51605

Pseudomonas aeruginosa, Strain MRSN 351791

Catalog No. NR-51605

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 351791 isolated in 2015 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 351791 was deposited as multi-locus sequence type (MLST) ST 252, sensitive to amikacin, ceftazidime, cefepime, gentamicin, imipenem, meropenem and piperacillin/tazobactam, intermediately resistant to tobramycin and resistant to aztreonam, ciprofloxacin and levofloxacin. NR-51605 was produced by inoculation of BEI Resources seed lot 70025117 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075477 Manufacturing Date: 23APR2025

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Irregular, slightly peaked, undulate, ground-glass and cream to green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (4 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)[4]
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)[5]
Meropenem	Sensitive	Sensitive (1 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1420 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 351791 (GenBank: RXUE01000124.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 351791 (GenBank: RXUE01000124.1)
Purity 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to ampicillin, amoxicillin, amoxicillin/clavulanic acid, ceftriaxone, cefuroxime, cefoxitin, chloramphenicol, ertapenem, nitrofurantoin, tetracycline, tigecycline, and trimethoprim/sulfamethoxazole. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested.

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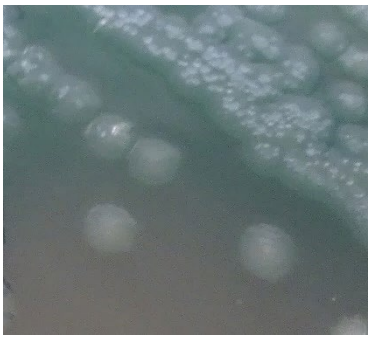
[4]*P. aeruginosa*, strain MRSN 351791 was deposited as resistant to ciprofloxacin, but showed a MIC of ≤ 0.25 µg/mL (interpreted as sensitive) for lot 70025116 during QC testing.
[5]*P. aeruginosa*, strain MRSN 351791 was deposited as resistant to levofloxacin, but showed a MIC of 0.5 µg/mL (interpreted as sensitive) for lot 70025116 during QC testing.
[6]*P. aeruginosa*, strain MRSN 351791 was deposited as intermediate to tobramycin, but showed a MIC of ≤ 1 µg/mL (interpreted as sensitive) for lot 70025116 during QC testing.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51606

Pseudomonas aeruginosa, Strain MRSN 358800

Catalog No. NR-51606

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 358800 was isolated in 2015 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 358800 was deposited as multi-locus sequence type (MLST) ST 3040, sensitive to tobramycin, intermediately resistant to amikacin and piperacillin/tazobactam and resistant to aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin and meropenem. NR-51606 was produced by inoculation of BEI Resources seed lot 70025119 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075478 Manufacturing Date: 23APR2025

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, entire, smooth and cream to green
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Inconclusive[4]
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (6 to 12 µg/mL)[5]
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Intermediate	Intermediate (12 µg/mL)[6]
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Piperacillin/tazobactam	Intermediate	Intermediate (32 to 48 µg/mL)
Tobramycin	Sensitive	Sensitive (2 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1440 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 358800 (GenBank: RXUD01000144.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 358800 (GenBank: RXUD01000144.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81 and ETEST®.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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[4]*P. aeruginosa*, strain MRSN 358800 was deposited as intermediately resistant to amikacin, but showed a MIC of 8 µg/mL to 16 µg/mL (interpreted as sensitive) for lot 70025118 during QC testing. It showed MICs of 64 µg/mL (interpreted as resistant) and 32 µg/mL (interpreted as intermediate) for the current lot during QC testing, resulting in an inconclusive result.
[5]*P. aeruginosa*, strain MRSN 358800 was deposited as resistant to ceftazidime, but showed a MIC of 8 µg/mL (interpreted as sensitive) for lot 70025118 during QC testing.
[6]*P. aeruginosa*, strain MRSN 358800 was deposited as resistant to gentamicin, but showed a MIC of 8 µg/mL (interpreted as intermediately resistant) for lot 70025118 during QC testing.

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Certificate of Analysis for NR-51607

Pseudomonas aeruginosa, Strain MRSN 369569

Catalog No. NR-51607

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 369569 was isolated in 2015 from a human blood sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 369569 was deposited as multi-locus sequence type (MLST) ST 3041, sensitive to amikacin, gentamicin, imipenem, and tobramycin, intermediately resistant to piperacillin/tazobactam and resistant to aztreonam, ceftazidime, ciprofloxacin, levofloxacin and meropenem. NR-51607 was produced by inoculation of BEI Resources seed lot 70025121 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075479 **Manufacturing Date: 30APR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony type 1: Circular, convex, entire, opaque and cream (Figure 1) Colony type 2: Circular, low convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3,4]		
Amikacin	Sensitive	Sensitive (16 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Intermediate (16 µg/mL)[5,6]
Ceftazidime	Intermediate	Resistant (32 µg/mL)[6,7]
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Sensitive	Sensitive (4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Sensitive	Sensitive (1 µg/mL)[8]
Piperacillin/tazobactam	Intermediate	Intermediate (32 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1480 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 369569 (GenBank: RXUC01000132.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 369569 (GenBank: RXUC01000132.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Two colony types were observed. The cellular morphology of each colony type was consistent with the other colony type and *Pseudomonas*. VITEK® MS (MALDI-TOF) analysis identified cells from both colony types as *K. pneumoniae*.

[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[3]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

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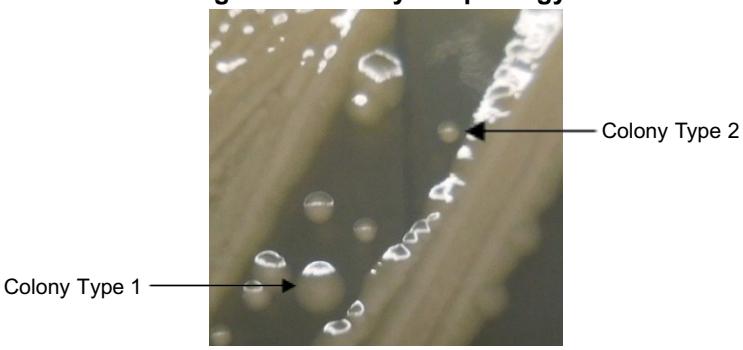
[4]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.
[5]*P. aeruginosa*, strain MRSN 369569 was deposited as resistant to cefepime, but showed a MIC of 8 µg/mL (interpreted as sensitive) for lot 70025120 during QC testing.
[6]The susceptibility result for this lot is within one doubling dilution of specification, which is considered an equivalent result.
[7]*P. aeruginosa*, strain MRSN 369569 was deposited as resistant to ceftazidime, but showed a MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70025120 during QC testing.
[8]*P. aeruginosa*, strain MRSN 369569 was deposited as resistant to meropenem, but showed a MIC of 0.5 µg/mL (interpreted as sensitive) for lot 70025120 during QC testing.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51608

Pseudomonas aeruginosa, Strain MRSN 373401

Catalog No. NR-51608

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 373401 was isolated in 2016 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 373401 was deposited as multi-locus sequence type (MLST) ST 347, sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin, intermediately resistant to meropenem and resistant to imipenem. NR-51608 was produced by inoculation of BEI Resources seed lot 70025123 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075480 Manufacturing Date: 16APR2025

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Irregular, slight peaked, undulate, smooth and green
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Meropenem	Intermediate	Resistant (8 µg/mL)[3]
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 373401 (GenBank: RXUA01000044.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 373401 (GenBank: RXUA01000044.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

[3]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

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Certificate of Analysis for NR-51608

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Certificate of Analysis for NR-51609

Pseudomonas aeruginosa, Strain MRSN 390231

Catalog No. NR-51609

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 390231 was isolated in 2016 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 390231 was deposited as multi-locus sequence type (MLST) ST 2572, sensitive to amikacin, cefepime, ceftazidime, gentamicin, imipenem, levofloxacin, meropenem and tobramycin and intermediately resistant to aztreonam, ciprofloxacin and piperacillin/tazobactam. NR-51609 was produced by inoculation of BEI Resources seed lot 70025125 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075481 **Manufacturing Date: 16APR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, entire, smooth, mucoid and cream
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Intermediate (24 to 32 µg/mL)[4]
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)[5]
Ceftazidime	Sensitive	Intermediate (16 µg/mL)[4]
Ciprofloxacin	Intermediate	Intermediate (2 µg/mL)
Gentamicin	Intermediate	Intermediate (12 to 16 µg/mL)[6]
Levofloxacin	Resistant	Resistant (16 µg/mL)[7]
Meropenem	Sensitive	Intermediate (4 µg/mL)[4]
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)[8]
Tobramycin	Sensitive	Sensitive (4 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 390231 (GenBank: RXTZ01000026.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 390231 (GenBank: RXTZ01000026.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using a combination of bioMérieux VITEK® 2 GN81 and ETEST®.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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[4]Susceptibilty results for gentamicin is within one doubling dilution of specification, which is considered an equivalent result.
[5]*P. aeruginosa*, strain MRSN 390231 was deposited as sensitive to cefepime, but showed a MIC of ≥ 64 µg/mL (interpreted as resistant) for lot 70025124 during QC testing.
[6]*P. aeruginosa*, strain MRSN 390231 was deposited as sensitive to gentamicin, but showed a MIC of 8 (interpreted as intermediately resistant) for lot 70025124 during QC testing.
[7]*P. aeruginosa*, strain MRSN 390231 was deposited as sensitive to levofloxacin, but showed a MIC of ≥ 8 (interpreted as resistant) for lot 70025124 during QC testing.
[8]*P. aeruginosa*, strain MRSN 390231 was deposited as intermediate to piperacillin/tazobactam, but showed a MIC of ≥ 128 µg/mL (interpreted as resistant) for lot 70025124 during QC testing.

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Certificate of Analysis for NR-51610

Pseudomonas aeruginosa, Strain MRSN 401528

Catalog No. NR-51610

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 401528 was isolated in 2016 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 401528 was deposited as multi-locus sequence type (MLST) 3042, sensitive to amikacin, cefepime, ceftazidime, gentamicin, imipenem, meropenem, piperacillin/tazobactam and tobramycin, intermediately resistant to ciprofloxacin and levofloxacin and resistant to aztreonam. NR-51610 was produced by inoculation of BEI Resources seed lot 70025127 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075482 **Manufacturing Date: 16APR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2]		
Amikacin	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (8 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (0.5 µg/mL)[3]
Gentamicin	Sensitive	Intermediate (8 µg/mL)[4]
Levofloxacin	Intermediate	Resistant (≥ 8 µg/mL)[4]
Meropenem	Sensitive	Sensitive (4 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (16 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1440 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 401528 (GenBank: RXTY01000039.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 401528 (GenBank: RXTY01000039.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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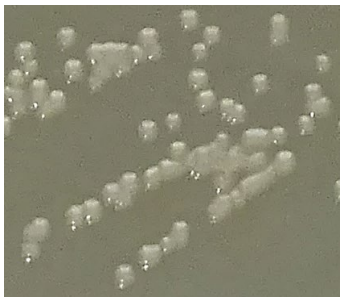
[3]*P. aeruginosa*, strain MRSN 401528 was deposited as intermediately resistant to ciprofloxacin, but showed a MIC of 0.5 µg/mL (interpreted as sensitive) for lot 70025126 during QC testing.
[4]Susceptibilty results for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51611

Pseudomonas aeruginosa, Strain MRSN 409937

Catalog No. NR-51611

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 409937 was isolated in 2016 from a human fluid sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 409937 was deposited as multi-locus sequence type (MLST) ST 1337, sensitive to amikacin, gentamicin, imipenem and tobramycin and resistant to aztreonam, cefepime, ceftazidime, ciprofloxacin, levofloxacin, meropenem and piperacillin/tazobactam NR-51611 was produced by inoculation of BEI Resources seed lot 70025129 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075483 Manufacturing Date: 23APR2025

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, undulate, opaque and cream to green
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (4 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Meropenem	Intermediate	Sensitive (4 µg/mL)[4]
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 409937 (GenBank: RXTX01000079.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 409937 (GenBank: RXTX01000079.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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[4]*P. aeruginosa*, strain MRSN 409937 was deposited as resistant to meropenem, but showed an MIC of 4 µg/mL (interpreted as intermediately resistant) for lot 70025128 during QC testing. The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

/Sonia Bjorum Brower/
Sonia Bjorum Brower 15 AUG 2025
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Certificate of Analysis for NR-51612

Pseudomonas aeruginosa, Strain MRSN 435288

Catalog No. NR-51612

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 435288 was isolated in 2016 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 435288 was deposited as multi-locus sequence type (MLST) ST 3012, sensitive to amikacin, aztreonam, ceftazidime, cefepime, piperacillin/tazobactam, meropenem and tobramycin, intermediately resistant to gentamicin and imipenem and resistant to ciprofloxacin and levofloxacin. NR-51612 was produced by inoculation of BEI Resources seed lot 70025131 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075484 Manufacturing Date: 23APR2025

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, convex, entire, smooth and cream to green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Intermediate	Sensitive (16 µg/mL)[4]
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Ceftazidime	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Report results	Sensitive (1 µg/mL)[5]
Gentamicin	Sensitive	Sensitive (4 µg/mL)[6]
Levofloxacin	Intermediate	Intermediate (4 µg/mL)[7]
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1440 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 435288 (GenBank: RXTW01000106.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 435288 (GenBank: RXTW01000106.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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[4]*P. aeruginosa*, strain MRSN 435288 was deposited as sensitive to amikacin, but showed a MIC of 32 µg/mL (interpreted as intermediately resistant) for lot 70025130 during QC testing.
[5]*P. aeruginosa*, strain MRSN 435288 was deposited as resistant to ciprofloxacin, but showed a MICs of 1 µg/mL (interpreted as sensitive) and 2 µg/mL (interpreted as intermediately resistant) for lot 70025130 during QC testing, resulting in an inconclusive result.
[6]*P. aeruginosa*, strain MRSN 435288 was deposited as intermediately resistant to gentamicin, but showed a MIC of 4 µg/mL (interpreted as sensitive) for lot 70025130 during QC testing.
[7]*P. aeruginosa*, strain MRSN 435288 was deposited as resistant to levofloxacin, but showed MIC of 4 µg/mL (interpreted as intermediately resistant) for lot 70025130 during QC testing.

Figure 1: Colony Morphology

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Certificate of Analysis for NR-51613

Pseudomonas aeruginosa, Strain MRSN 436311

Catalog No. NR-51613

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 436311 was isolated in 2016 from a human urine sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 436311 was deposited as multi-locus sequence type (MLST) ST 3012, sensitive to amikacin, ceftazidime, gentamicin and tobramycin, intermediately resistant to ciprofloxacin, levofloxacin and piperacillin/tazobactam and resistant to aztreonam, cefepime, imipenem and meropenem. NR-51613 was produced by inoculation of BEI Resources seed lot 70025133 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075485 **Manufacturing Date: 18APR2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[1]	Report results	Colony Type 1: Circular, low convex, undulate, smooth and cream to green (Figure 1) Colony Type 2: Circular, convex, entire, smooth and cream to green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[2,3,4]		
Amikacin	Sensitive	Sensitive (16 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Ceftazidime	Intermediate	Intermediate (16 µg/mL)[5]
Ciprofloxacin	Sensitive	Sensitive (0.5 µg/mL to 0.75 µg/mL)[6]
Gentamicin	Intermediate	Intermediate (8 µg/mL)[7]
Levofloxacin	Intermediate	Intermediate (4 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Piperacillin/tazobactam	Intermediate	Intermediate (32 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 436311 (GenBank: RXTV01000033.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 436311 (GenBank: RXTV01000033.1)
Purity	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar		
Viability	Growth	Growth

[1]Two colony types were observed. VITEK® MS (MALDI-TOF) analysis identified cells from both colony types as *P. aeruginosa*.

[2]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

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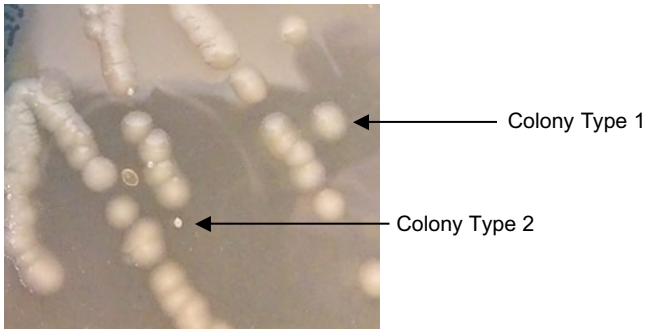
[3]Antibiotic susceptibility was tested using a combination of bioMérieux VITEK® 2 GN81 and ETEST®.
[4]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.
[5]*P. aeruginosa*, strain MRSN 463611 was deposited as sensitive to ceftazidime, but showed a MIC of 16 µg/mL (interpreted as intermediately resistant) for lot 70025132 during QC testing.
[6]*P. aeruginosa*, strain MRSN 463611 was deposited as intermediately resistant to ciprofloxacin, but showed a MIC of ≤ 1 µg/mL (interpreted as sensitive) for lot 70025132 during QC testing.
[7]*P. aeruginosa*, strain MRSN 463611 was deposited as sensitive to gentamicin, but showed a MIC of 8 µg/mL (interpreted as intermediately resistant) for lot 70025132 during QC testing.

Figure 1: Colony Morphology



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SUPPORTING INFECTIOUS DISEASE RESEARCH

Certificate of Analysis for NR-51614

Pseudomonas aeruginosa, Strain MRSN 443463

Catalog No. NR-51614

This reagent is the tangible property of the U.S. Government.

Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 443463 was isolated in 2017 from a human respiratory sample in the United States as part of a global surveillance program. *P. aeruginosa*, strain MRSN 443463 was deposited as multi-locus sequence type (MLST) ST 2851, sensitive to aztreonam, amikacin, ceftazidime, ciprofloxacin, cefepime, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin. NR-51614 was produced by inoculation of BEI Resources seed lot 70025136 into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70075486 **Manufacturing Date: 23AUG2025**

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TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Irregular, low convex, undulate, smooth and cream
Motility (wet mount)	Report results	Motile
VITEK® MS (MALDI-TOF)	*P. aeruginosa*	*P. aeruginosa* (99.9%)
Antibiotic Susceptibility Profile[1,2,3]		
Amikacin	Sensitive	Sensitive (16 µg/mL)
Cefazolin	Resistant	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Gentamicin	Intermediate	Intermediate (8 µg/mL)[4]
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 443463 (GenBank: RXTU01000100.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 443463 (GenBank: RXTU01000100.1)
Purity 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability	Growth	Growth

[1]Minimum Inhibitory Concentration (MIC); MIC interpretation was determined using VITEK® 2 software version 09.02 combined with the bioMérieux Advanced Expert System™ (AES) software using the interpretation standard CLSI M100-S28 (2018) and the interpretation guideline "Natural Resistance." For more information, please refer to Sanders, C. C., et al. "Potential Impact of the VITEK® 2 System and the Advanced Expert System on the Clinical Laboratory of a University-Based Hospital." J. Clin. Microbiol. 39 (2001): 2379-2385. PubMed: 11427542.

[2]Antibiotic susceptibility was tested using bioMérieux VITEK® 2 GN81.

[3]*P. aeruginosa* and other nonfermentative gram-negative bacteria are intrinsically resistant to penicillin, cephalosporins I, cephalosporin II, cephamycins, clindamycin, daptomycin, fusidic acid, glycopeptides, linezolid, macrolides, quinupristin-dalfopristin, and rifampin. These antibiotics were removed from the VITEK® 2 GN81 card and are no longer tested: ampicillin, amoxicillin, amoxicillin/clavulanic acid, cefoxitin, ceftriaxone, cefuroxime, ertapenem, tetracycline, tigecycline, trimethoprim/sulfamethoxazole, chloramphenicol and nitrofurantoin.

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[4]*P.aeruginosa*, strain MRSN 443463 was deposited as sensitive to gentamicin, but showed an MIC of 8 µg/mL (interpreted as intermediately resistant) for lot 70025134 during QC testing.

/Sonia Bjorum Brower/
Sonia Bjorum Brower 15 AUG 2025
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