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SUPPORTING INFECTIOUS DISEASE RESEARCH

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: 70054972 **Manufacturing Date: 2019**

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

/Sonia Bjorum Brower/
Sonia Bjorum Brower 09 NOV 2022

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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 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 315 was deposited as sensitive to piperacillin/tazobactam, cefepime, levofloxacin, ceftazidime, amikacin, gentamicin, tobramycin, aztreonam, meropenem and ciprofloxacin and resistant to imipenem.

Lot: 70024584[1] **Manufacturing Date: 12APR2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, slight peaked, entire, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (2-4 µg/mL)
Ceftriaxone	Report results	Inconclusive[4]
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	80-160 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 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 (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51515 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]Antibiotic susceptibility testing performed in duplicate determined that for *P. aeruginosa*, strain MRSN 315, the ceftriaxone MICs are 16 µg/mL and 32 µg/mL, which are interpreted as intermediate and resistant, respectively.
[5]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to

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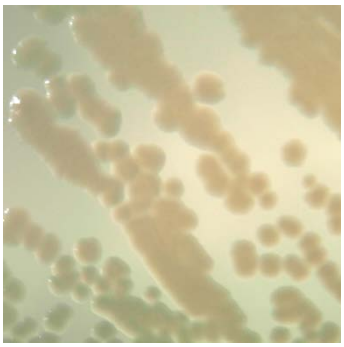
trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

[6]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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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 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 317 was deposited as sensitive to amikacin, gentamicin and tobramycin and resistant to aztreonam, cefepime, ceftazidime, ciprofloxacin, imipenem, levofloxacin, meropenem and piperacillin/tazobactam.

Lot: 70024586[1] **Manufacturing Date: 12APR2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, slight peaked, 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[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Meropenem	Resistant	Intermediate (4 µg/mL)[4]
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	80 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1440 base pairs)	≥ 99% sequence identity to *P. aeruginosa,* strain MRSN 317 (GenBank: RXUH01000043)	100% sequence identity to *P. aeruginosa,* strain MRSN 317 (GenBank: RXUH01000043)
Purity (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51516 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]Susceptibility results 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.
[6]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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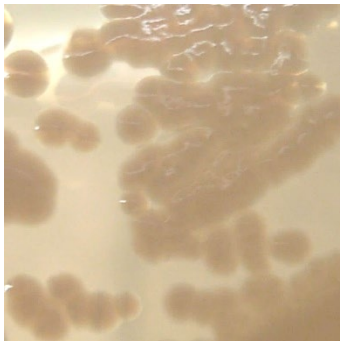
Figure 1: Colony Morphology



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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 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 321 was deposited as sensitive to amikacin, ciprofloxacin, gentamicin, levofloxacin and tobramycin, intermediately resistant to cefepime and resistant to aztreonam, ceftazidime, imipenem, meropenem and piperacillin/tazobactam.

Lot: 70024588[1] **Manufacturing Date: 12APR2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, entire, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Resistant (32 µg/mL)[4]
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 321 (GenBank: RXUG01000033.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 321 (GenBank: RXUG01000033.1)
Purity (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51517 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]Susceptibilty results 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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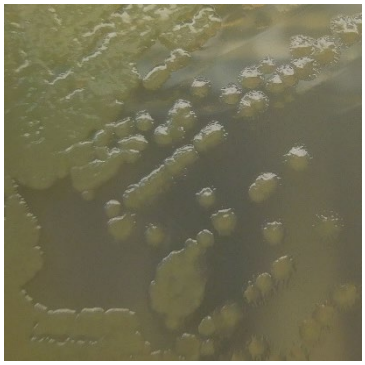
[6]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51518

Pseudomonas aeruginosa, Strain MRSN 552

Catalog No. NR-51518

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 552 was isolated in 2010 from human urine as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 552 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin and resistant to imipenem and meropenem.

Lot: 70024590[1] **Manufacturing Date: 12APR2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, entire, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Resistant	Inconclusive[4]
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.5 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 to 1 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/Sulfamethoxazole	Report results	≥ 80 µg/mL[5]
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 (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51518 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa*, strain MRSN 552 was deposited as resistant to meropenem. Repeated antibiotic susceptibility testing performed determined that for strain MRSN 552, the meropenem MICs are 4 µg/mL and 8 µg/mL, which are interpreted as intermediate and resistant, respectively.
[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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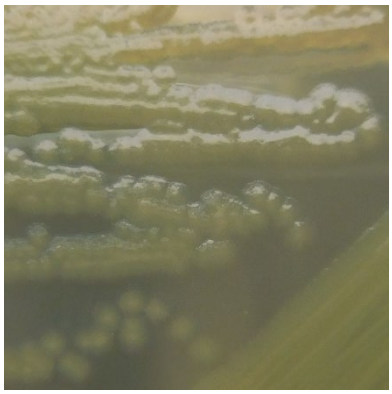
[6]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51519

Pseudomonas aeruginosa, Strain MRSN 994

Catalog No. NR-51519

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 994 is a human respiratory isolate collected in 2010 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 994 was deposited as sensitive to amikacin, gentamicin and tobramycin and resistant to aztreonam, ceftazidime, ciprofloxacin, cefepime, imipenem, levofloxacin, meropenem and piperacillin/tazobactam.

Lot: 70024592[1] **Manufacturing Date: 11APR2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, undulate, opaque and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Intermediate (16 µg/mL)[4]
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (1460 base pairs)	≥ 99% sequence identity to *P. aeruginosa,* strain MRSN 994 (GenBank: RXSX1000034.1)	99.9% sequence identity to *P. aeruginosa,* strain MRSN 994 (GenBank: RXSX1000034.1)
Purity (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51519 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa*, strain MRSN 994 was deposited as resistant to cefepime. Repeated antibiotic susceptibility testing determined that strain MRSN 994 is intermediately resistant to cefepime.
[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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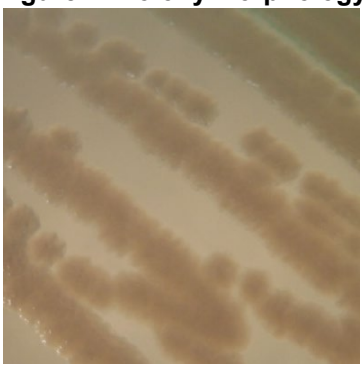
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51520

Pseudomonas aeruginosa, Strain MRSN 1344

Catalog No. NR-51520

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1344 was isolated in 2010 from a human groin as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 1344 was deposited as sensitive to amikacin, aztreonam, ceftazidime, gentamicin, imipenem, meropenem, piperacillin/tazobactam and tobramycin, intermediately resistant to cefepime and resistant to ciprofloxacin and levofloxacin.

Lot: 70024594[1] **Manufacturing Date: 11APR2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low 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[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ceftriaxone	Report results	Sensitive (8 µg/mL)
Cefepime	Intermediate	Sensitive (8 µg/mL)[4]
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Intermediate (2 µg/mL)[5]
Levofloxacin	Resistant	Intermediate (4 µg/mL)[6]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 160 µg/mL[7]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (1460 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)
Purity (post-freeze)[8]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51520 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]Susceptibilty results for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.
[5]*P. aeruginosa*, strain MRSN 1344 was deposited as resistant to ciprofloxacin. Repeated antibiotic susceptibility testing determined that strain MRSN 1344 is intermediately resistant to ciprofloxacin.

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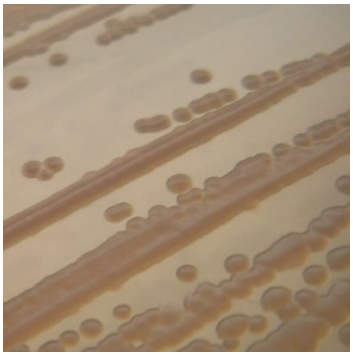
[6]*P. aeruginosa*, strain MRSN 1344 was deposited as resistant to levofloxacin. Repeated antibiotic susceptibility testing determined that strain MRSN 1344 is intermediately resistant to levofloxacin.
[7]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, 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.
[8]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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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 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 1356 was deposited as sensitive to amikacin, tobramycin, imipenem, ceftazidime, gentamicin, meropenem, piperacillin/tazobactam, cefepime, levofloxacin, aztreonam and ciprofloxacin.

Lot: 70024596[1] **Manufacturing Date: 09MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, flat, undulate, opaque and gray (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Sensitive	Sensitive (1 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (≤ 0.5 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 1356 (GenBank: RXWE01000167.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 1356 (GenBank: RXWE01000167.1)
Purity (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51521 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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Figure 1: Colony Morphology

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Certificate of Analysis for NR-51522

Pseudomonas aeruginosa, Strain MRSN 1380

Catalog No. NR-51522

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1380 was isolated in 2010 from a human groin as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 1380 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, piperacillin/tazobactam, ciprofloxacin, gentamicin, levofloxacin, tobramycin, meropenem and imipenem.

Lot: 70024598[1] **Manufacturing Date: 09MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, slight peaked, undulate, opaque and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (97%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (32 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Sensitive	Sensitive (1 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/Sulfamethoxazole	Report results	≥ 80 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 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)
Purity (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51522 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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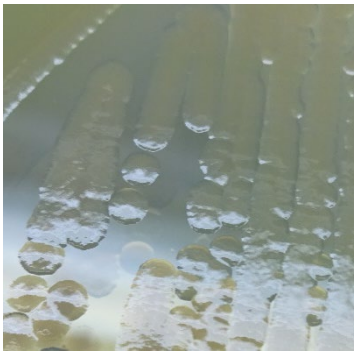
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51523

Pseudomonas aeruginosa, Strain MRSN 1388

Catalog No. NR-51523

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1388 was isolated in 2010 from a human groin as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 1388 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin and resistant to imipenem.

Lot: 70024600[1] **Manufacturing Date: 11APR2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (95%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (≤ 1 µg/mL)
Ceftriaxone	Report results	Intermediate (16 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 1 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/Sulfamethoxazole	Report results	≥ 320 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 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 (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51523 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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Figure 1: Colony Morphology

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Certificate of Analysis for NR-51524

Pseudomonas aeruginosa, Strain MRSN 1583

Catalog No. NR-51524

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1583 is a human respiratory isolate collected in 2010 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 1583 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, gentamicin, imipenem, meropenem, piperacillin/tazobactam, and tobramycin, intermediately resistant to levofloxacin and resistant to ciprofloxacin.

Lot: 70024602[1] **Manufacturing Date: 11APR2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, entire, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (97%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4-8 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 32 µg/mL)
Cefepime	Sensitive	Inconclusive[4]
Meropenem	Sensitive	Sensitive (0.5-1.0 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 4 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 2 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Intermediate (2 µg/mL)[5]
Levofloxacin	Intermediate	Intermediate (4 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 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 (post-freeze)[7]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51524 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa*, strain MRSN 1583 was deposited as sensitive to cefepime. Repeated antibiotic susceptibility testing determined that for strain MRSN 1583, the cefepime MICs are 32 µg/mL, 16 µg/mL and 8 µg/mL, which are interpreted as resistant, intermediate and sensitive, respectively.
[5]*P. aeruginosa*, strain MRSN 1583 was deposited as resistant to ciprofloxacin. Repeated antibiotic susceptibility testing determined that strain MRSN 1583 is intermediately resistant to ciprofloxacin.

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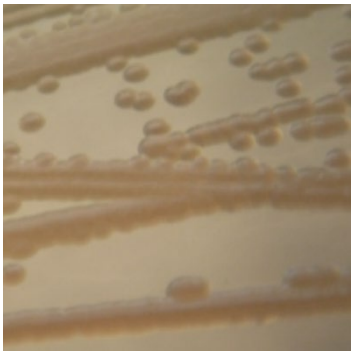
[6]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.
[7]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51525

Pseudomonas aeruginosa, Strain MRSN 1601

Catalog No. NR-51525

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1601 was isolated in 2010 from a human wound in the United States. *P. aeruginosa*, strain MRSN 1601 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin.

Lot: 70024604[1] **Manufacturing Date: 08MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Irregular, flat, undulate and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Sensitive	Intermediate (64 µg/mL)[4]
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (8 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Sensitive	Sensitive (1 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/Sulfamethoxazole	Report results	80 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 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 (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51525 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa* strain MRSN 1601 was deposited as sensitive to piperacillin/tazobactam. Repeated antibiotic susceptibility testing determined that strain MRSN 1601 is intermediately resistant to piperacillin/tazobactam.
[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.
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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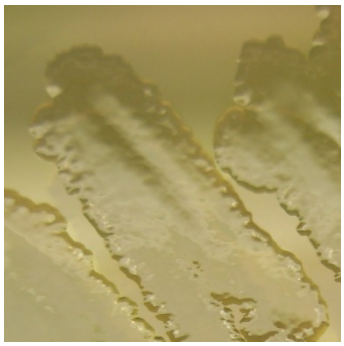
Figure 1: Colony Morphology



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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 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 1612 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin.

Lot: 70024606[1] **Manufacturing Date: 10MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Irregular, flat, undulate and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (97%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (≤ 1 µg/mL)
Ceftriaxone	Report results	Intermediate (16 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 1 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.25 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/Sulfamethoxazole	Report results	≥ 80 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (1460 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 (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51526 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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Figure 1: Colony Morphology

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Certificate of Analysis for NR-51527

Pseudomonas aeruginosa, Strain MRSN 1613

Catalog No. NR-51527

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1613 was isolated in 2010 from a human groin as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 1613 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin.

Lot: 70024608[1] **Manufacturing Date: 12APR2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Irregular, low convex, undulate, rough and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 32 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	160 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~1470 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 (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51527 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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Figure 1: Colony Morphology

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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 is a human respiratory isolate collected in 2010 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 1617 was deposited as sensitive to amikacin, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, meropenem and tobramycin, intermediately resistant to levofloxacin and piperacillin/tazobactam and resistant to aztreonam.

Lot: 70024610[1] **Manufacturing Date: 12APR2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (95%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Intermediate	Sensitive (16 µg/mL)[4]
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (8 µg/mL)
Meropenem	Sensitive	Sensitive (1 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Levofloxacin	Intermediate	Sensitive (2 µg/mL)[4]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~1490 base pairs)	≥ 99% sequence identity to *P. aeruginosa,* strain MRSN 1617 (GenBank: RXVT01000125.1)	99.9% sequence identity to *P. aeruginosa,* strain MRSN 1617 (GenBank: RXVT01000125.1)
Purity (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51528 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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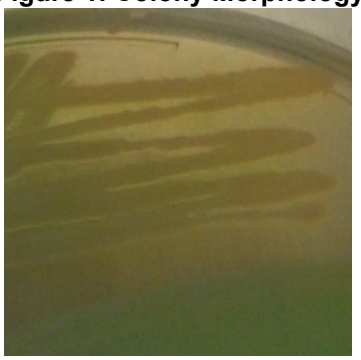
Figure 1: Colony Morphology



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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 human urine as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 1688 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin.

Lot: 70024612[1] **Manufacturing Date: 08MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Irregular, raised, undulate, rough and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Intermediate (16 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 1 µg/mL)
Meropenem	Sensitive	Sensitive (0.5 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	80 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~1440 base pairs)	≥ 99% sequence identity to *P. aeruginosa,* strain MRSN 1688 (GenBank: RXVM01000049.1)	99.9% sequence identity to *P. aeruginosa,* strain MRSN 1688 (GenBank: RXVM01000049.1)
Purity (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51529 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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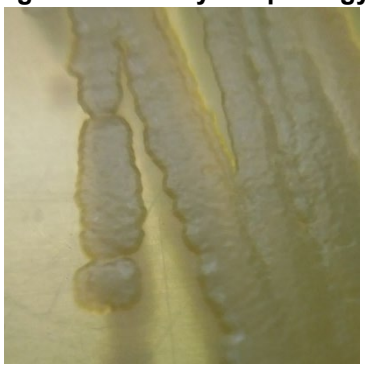
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51530

Pseudomonas aeruginosa, Strain MRSN 1739

Catalog No. NR-51530

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1739 was isolated in 2010 from human blood as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 1739 was deposited as sensitive to amikacin and resistant to aztreonam, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem and tobramycin with intermediate resistance to cefepime, ceftazidime and piperacillin/tazobactam.

Lot: 70024614[1] **Manufacturing Date: 09MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[2,3]	Report results	Colony type 1: Circular, convex, entire, smooth and cream (Figure 1) Colony type 2: Circular, slightly peaked, undulate, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[4,5]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Intermediate	Variable (16-32 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Intermediate	Variable (4-16 µg/mL)
Ceftriaxone	Report results	Resistant (64 µg/mL)
Cefepime	Intermediate	Variable (4-16 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 1739 (GenBank: RXVL01000104.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 1739 (GenBank: RXVL01000104.1)
Purity (post-freeze)[7]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51530 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar

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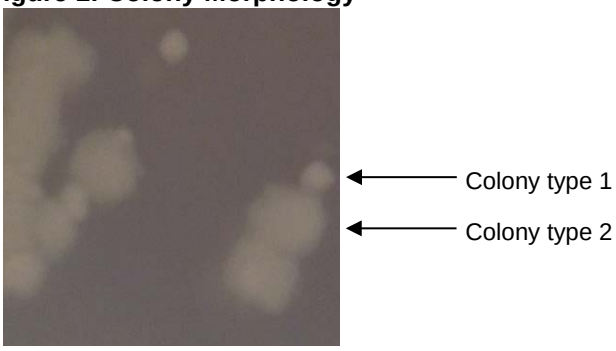
[3]Two colony types were observed. Plating of the individual colony types showed that they did not revert to the mixed colony type. VITEK® GN card analysis identified cells from both colony types as *P. aeruginosa*.
[4]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[5]Antibiotic susceptibility testing was performed for each colony type and interpretations are identical except where indicated.
[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.
[7]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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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 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 1899 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, piperacillin/tazobactam, gentamicin, tobramycin, meropenem and imipenem and resistant to ciprofloxacin and levofloxacin.

Lot: 70024616[1] **Manufacturing Date: 08MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, entire, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (≤ 1 µg/mL)
Ceftriaxone	Report results	Intermediate (8-16 µg/mL)
Cefepime	Sensitive	Sensitive (8 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Intermediate (2 µg/mL)[4]
Levofloxacin	Resistant	Intermediate (4 µg/mL)[5]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	80 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1420 base pairs)	≥ 99% sequence identity to *P. aeruginosa,* strain MRSN 1899 (GenBank: RXVD01000045.1)	100% sequence identity to *P. aeruginosa,* strain MRSN 1899 (GenBank: RXVD01000045.1)
Purity (post-freeze)[7]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51531 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa*, strain MRSN 1899 was deposited as resistant to ciprofloxacin. Antibiotic susceptibility testing performed in duplicate determined that susceptibility of strain MRSN 1899 to ciprofloxacin is intermediate.
[5]*P. aeruginosa*, strain MRSN 1899 was deposited as resistant to levofloxacin. Antibiotic susceptibility testing performed in duplicate determined that susceptibility of strain MRSN 1899 to levofloxacin is intermediate.

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[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.
[7]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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 from a human in 2010 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 1902 was deposited as sensitive to piperacillin/tazobactam, cefepime, levofloxacin, ceftazidime, amikacin, gentamicin, tobramycin, aztreonam, meropenem and ciprofloxacin and resistant to imipenem.

Lot: 70024618[1] **Manufacturing Date: 08MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, undulate, mucoid and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (32 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 2 µg/mL)
Meropenem	Sensitive	Sensitive (4 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (128 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	80 to 160 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 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 (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51532 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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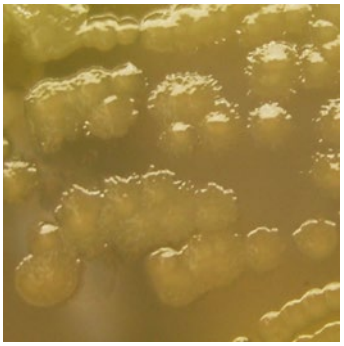
Figure 1: Colony Morphology



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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 from a human in 2010 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 1906 was deposited as sensitive to piperacillin/tazobactam, cefepime, ceftazidime, amikacin, aztreonam, imipenem and meropenem and resistant to levofloxacin, ciprofloxacin, gentamicin and tobramycin.

Lot: 70024620[1] **Manufacturing Date: 08MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, slight peaked, undulate, mucoid and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (16 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (≤ 1 µg/mL)
Ceftriaxone	Report results	Intermediate (32 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 1 µg/mL)
Meropenem	Sensitive	Sensitive (1 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Ciprofloxacin	Resistant	Sensitive (1 µg/mL)[4]
Levofloxacin	Resistant	Intermediate (4 µg/mL)[5]
Tetracycline	Report results	Resistant (≥ 8 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa,* strain MRSN 1906 (GenBank: RXVB01000063.1)	99.9% sequence identity to *P. aeruginosa,* strain MRSN 1906 (GenBank: RXVB01000063.1)
Purity (post-freeze)[7]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51533 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa*, strain MRSN 1906 was deposited as resistant to ciprofloxacin. Antibiotic susceptibility testing performed in duplicate determined that strain MRSN 1906 is sensitive to ciprofloxacin.
[5]*P. aeruginosa*, strain MRSN 1906 was deposited as resistant to levofloxacin. Antibiotic susceptibility testing performed in duplicate determined that strain MRSN 1906 is intermediately resistant to levofloxacin.

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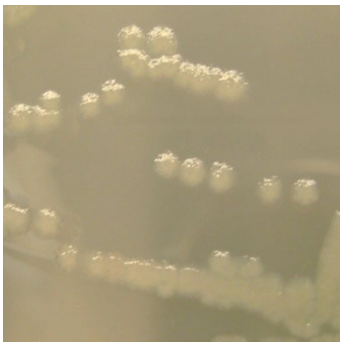
[6]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.
[7]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51534

Pseudomonas aeruginosa, Strain MRSN 1925

Catalog No. NR-51534

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1925 was isolated from the respiratory track of a human in 2010 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 1925 was deposited as sensitive to piperacillin/tazobactam, cefepime, ceftazidime, amikacin, aztreonam, imipenem, meropenem, levofloxacin, gentamicin, tobramycin and ciprofloxacin.

Lot: 70024622[1] **Manufacturing Date: 08MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology[2]	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Circular, low convex, entire, smooth and light green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 32 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 1 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (≤ 0.12 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 256 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≤ 20 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 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 (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51534 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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Figure 1: Colony Morphology

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Certificate of Analysis for NR-51535

Pseudomonas aeruginosa, Strain MRSN 1938

Catalog No. NR-51535

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1938 was isolated from human urine in 2010 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 1938 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime and piperacillin/tazobactam and resistant to ciprofloxacin, gentamicin, imipenem, levofloxacin and tobramycin with intermediate resistance to meropenem.

Lot: 70024624[1] **Manufacturing Date: 08MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, entire, smooth and brown (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ceftriaxone	Report results	Intermediate (16 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Intermediate	Intermediate (4 µg/mL)
Amikacin	Sensitive	Sensitive (4 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 1938 (GenBank: RXUZ01000154.1)	100% sequence identity to *P. aeruginosa,* strain MRSN 1938 (GenBank: RXUZ01000154.1)
Purity (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51535 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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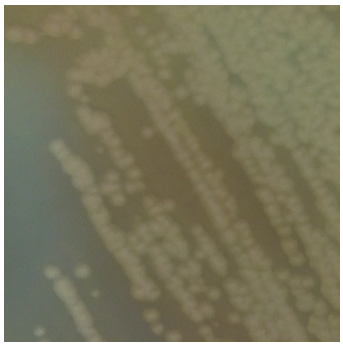
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51536

Pseudomonas aeruginosa, Strain MRSN 1948

Catalog No. NR-51536

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 1948 was isolated in 2010 from a human wound as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 1948 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin.

Lot: 70024944[1] **Manufacturing Date: 10MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, slight peaked, undulate, rough and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (32 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	80 to 160 µg/mL[4]
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 (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51536 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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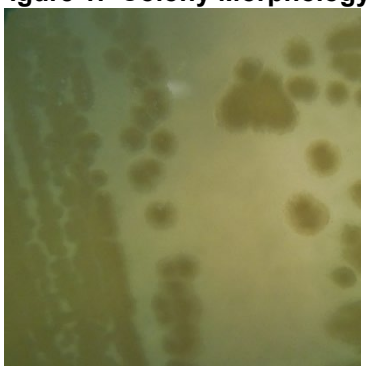
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51537

Pseudomonas aeruginosa, Strain MRSN 2101

Catalog No. NR-51537

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 2101 was isolated in 2011 from a human wound as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 2101 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin.

Lot: 70024946[1] **Manufacturing Date: 10MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, slight peaked, undulate and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (97%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 2101 (GenBank: RXUT01000129.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 2101 (GenBank: RXUT01000129.1)
Purity (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51537 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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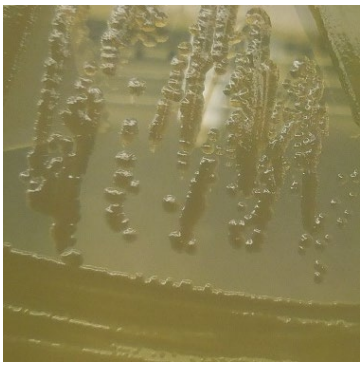
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51538

Pseudomonas aeruginosa, Strain MRSN 2108

Catalog No. NR-51538

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 2108 was isolated in 2011 from a human tissue sample as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 2108 was deposited as sensitive to amikacin, gentamicin and tobramycin and resistant to aztreonam, meropenem, imipenem, levofloxacin and ciprofloxacin with intermediate resistance to piperacillin/tazobactam, cefepime, and ceftazidime.

Lot: 70024948[1] **Manufacturing Date: 10MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[2,3]	Report results	Colony type 1: Circular, low convex, entire and smooth (Figure 1) Colony type 2: Irregular, flat, undulate, opaque and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (≥ 97%)
Antibiotic Susceptibility Profile[4,5]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Intermediate	Intermediate (64 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Intermediate	Variable (16-32 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Variable (2-4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 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 (post-freeze)[7,8]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51538 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Two colony types were observed. Plating of the individual colony types showed that they reverted to the mixed colony type. VITEK® GN card analysis identified cells from both colony types as *P. aeruginosa*.
[4]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)

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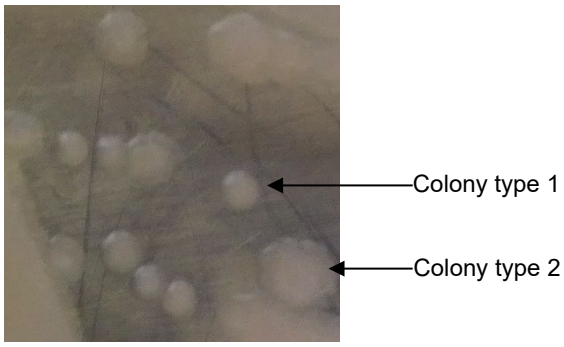
[5]Antibiotic susceptibility testing was performed for each colony type and interpretations are identical except where indicated.
[6]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. 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.
[7]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.
[8]Two colony types were observed after 1 day of growth in an aerobic atmosphere with 5% CO_2. Plating of the individual colony types showed that they did not revert to the mixed colony type. VITEK® GN card analysis identified cells from both colony types as *P. aeruginosa*.

Figure 1: Colony Morphologies



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Certificate of Analysis for NR-51539

Pseudomonas aeruginosa, Strain MRSN 2144

Catalog No. NR-51539

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 2144 was isolated in 2010 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 2144 was deposited as sensitive to piperacillin/tazobactam, cefepime, levofloxacin, ceftazidime, amikacin, gentamicin, tobramycin, aztreonam, meropenem, ciprofloxacin and imipenem.

Lot: 70024950[1] **Manufacturing Date: 10MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, convex, entire, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (97%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ceftriaxone	Report results	Intermediate (16 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 1 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (≤ 0.12 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 2144 (GenBank: RXUR01000085.1)	99.9% sequence identity to *P. aeruginosa,* strain MRSN 2144 (GenBank: RXUR01000085.1)
Purity (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51539 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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Figure 1: Colony Morphology

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NR-51539_70024950_ZZZZZ2019

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 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 2444 was deposited as sensitive to amikacin, cefepime, ceftazidime and piperacillin/tazobactam, intermediately resistant to aztreonam and resistant to ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem and tobramycin.

Lot: 70024952[1] **Manufacturing Date: 10MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, undulate, opaque and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Sensitive	Sensitive (16 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 to 4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Intermediate (32 µg/mL)[4]
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51540 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]Susceptibilty results 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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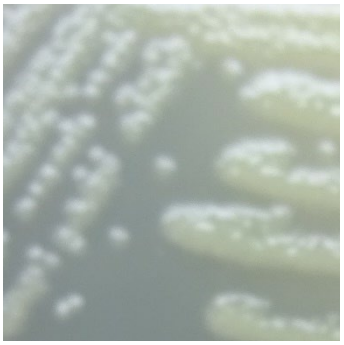
[6]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51541

Pseudomonas aeruginosa, Strain MRSN 3587

Catalog No. NR-51541

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 3587 was isolated in 2011 from human urine as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 3587 was deposited as sensitive to amikacin, ceftazidime, cefepime, gentamicin, piperacillin/tazobactam and tobramycin and resistant to aztreonam and meropenem with intermediate resistance to ciprofloxacin, imipenem and levofloxacin.

Lot: 70026687[1] **Manufacturing Date: 28JUN2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Irregular, raised, undulate, mucoid and cream (Figure 1) Plaques observed
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Intermediate	Sensitive (1 µg/mL)[4]
Levofloxacin	Intermediate	Intermediate (4 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 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)
Purity (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51541 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa,* strain MRSN 3587 was deposited as intermediate to ciprofloxacin, but showed a MIC of 1 µg/mL (interpreted as sensitive) for ciprofloxacin during QC testing. Testing was performed in duplicate.

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[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.
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology

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Certificate of Analysis for NR-51542

Pseudomonas aeruginosa, Strain MRSN 3705

Catalog No. NR-51542

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 3705 was isolated in 2011 from a human respiratory sample in Guam as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 3705 was deposited as sensitive to amikacin, gentamicin, imipenem, meropenem and tobramycin and resistant to aztreonam, ceftazidime, ciprofloxacin, levofloxacin and piperacillin/tazobactam, with intermediate resistance to cefepime.

Lot: 70024956[1] **Manufacturing Date: 09MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, convex, entire, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (95%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)
Meropenem	Sensitive	Sensitive (0.5 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Intermediate (2 µg/mL)[4]
Levofloxacin	Resistant	Intermediate (4 µg/mL)[5]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	160 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 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 (post-freeze)[7]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51542 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa* strain MRSN 3705 was deposited as resistant to ciprofloxacin. Repeated antibiotic susceptibility testing determined that strain MRSN 3705 is intermediately resistant to ciprofloxacin.
[5]*P. aeruginosa* strain MRSN 3705 was deposited as resistant to levofloxacin. Repeated antibiotic susceptibility testing determined that strain MRSN 3705 is intermediately resistant to levofloxacin.

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[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.
[7]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology

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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 human urine as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 4841 was deposited as sensitive to amikacin, imipenem and tobramycin, intermediately resistant to ceftazidime, gentamicin, meropenem and piperacillin/tazobactam and resistant to aztreonam, cefepime, ciprofloxacin and levofloxacin.

Lot: 70024958[1] **Manufacturing Date: 09MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	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* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Intermediate	Intermediate (32 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Intermediate	Resistant (32 µg/mL)[4]
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Meropenem	Intermediate	Sensitive (2 µg/mL)[4]
Amikacin	Sensitive	Intermediate (32 µg/mL)[5]
Gentamicin	Intermediate	Intermediate (8 µg/mL)
Tobramycin	Sensitive	Sensitive (4 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 base pairs)	≥ 99% sequence identity to *P. aeruginosa,* strain MRSN 4841 (GenBank: RXTT01000078.1)	99.9% sequence identity to *P. aeruginosa,* strain MRSN 4841 (GenBank: RXTT01000078.1)
Purity (post-freeze)[7]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51543 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]Susceptibilty results for this antibiotic are within one doubling dilution of specification, which is considered an equivalent result.
[5]*P. aeruginosa*, strain MRSN 4841 was deposited as sensitive to amikacin. Repeated antibiotic susceptibility testing determined that strain MRSN 4841 is intermediately resistant to amikacin.

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[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.
[7]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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 human tissue as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 5498 was deposited as sensitive to amikacin and ceftazidime and resistant to aztreonam, ciprofloxacin, cefepime, gentamicin, imipenem, levofloxacin, meropenem, tobramycin and piperacillin/tazobactam.

Lot: 70024960[1] **Manufacturing Date: 17MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, slightly peaked, undulate, opaque and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (32 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (16 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 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 (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51544 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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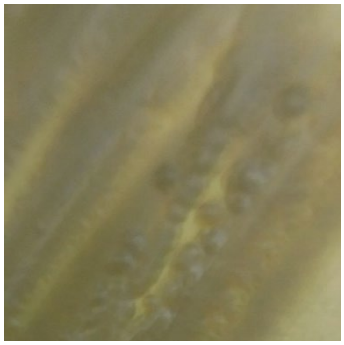
Figure 1: Colony Morphology



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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 human fluid as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 5508 was deposited as sensitive to amikacin, aztreonam, gentamicin and tobramycin and resistant to ceftazidime, imipenem, meropenem and piperacillin/tazobactam with intermediate resistance to cefepime, ciprofloxacin and levofloxacin.

Lot: 70024962[1] **Manufacturing Date: 17MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, slightly peaked, entire, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (≥ 95%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 4 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Intermediate	Sensitive (≤ 0.5 µg/mL)[4]
Levofloxacin	Intermediate	Sensitive (≤ 2 µg/mL)[5]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 256 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[6]
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 (post-freeze)[7]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51545 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa*, strain MRSN 5508 was deposited as intermediate to ciprofloxacin, but showed a MIC of ≤ 0.5 µg/mL (interpreted as sensitive) for ciprofloxacin during QC testing. Testing was performed in duplicate.
[5]*P. aeruginosa*, strain MRSN 5508 was deposited as intermediate to levofloxacin, but showed a MIC of ≤ 2 µg/mL (interpreted as sensitive) for levofloxacin during QC testing. Testing was performed in duplicate.

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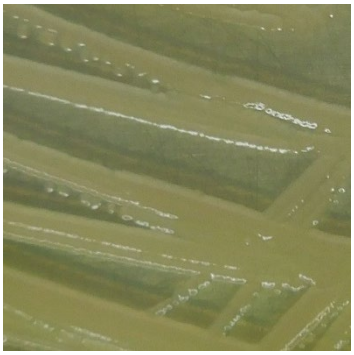
[6]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.
[7]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51546

Pseudomonas aeruginosa, Strain MRSN 5519

Catalog No. NR-51546

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 5519 was isolated in 2004 from a human wound as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 5519 was deposited as resistant to amikacin, aztreonam, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin, with intermediate resistance to cefepime.

Lot: 70024965[1] **Manufacturing Date: 10MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, slight peaked, undulate, opaque and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (32 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Resistant	Resistant (≥ 64 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 5519 (GenBank: RXTQ01000082.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 5519 (GenBank: RXTQ01000082.1)
Purity (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51546 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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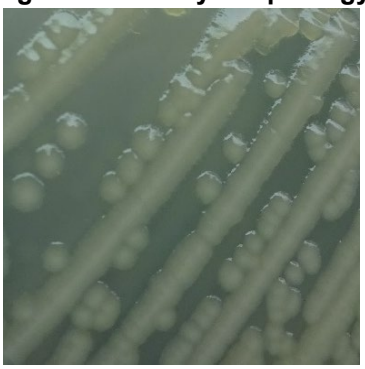
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51547

Pseudomonas aeruginosa, Strain MRSN 5524

Catalog No. NR-51547

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 5524 was isolated from human urine in 2004 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 5524 was deposited as sensitive to amikacin and resistant to aztreonam, ciprofloxacin, cefepime, gentamicin, imipenem, levofloxacin, meropenem, tobramycin and piperacillin/tazobactam with intermediate resistance to ceftazidime.

Lot: 70024967[1] **Manufacturing Date: 10MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, convex, entire, opaque, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Intermediate	Intermediate (8 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (16 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Ciprofloxacin	Resistant	Sensitive (0.5 µg/mL)[4]
Levofloxacin	Resistant	Sensitive (2 µg/mL)[5]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 5524 (GenBank: RXTO01000087.1)	100% sequence identity to *P. aeruginosa,* strain MRSN 5524 (GenBank: RXTO01000087.1)
Purity (post-freeze)[7]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51547 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa,* strain MRSN 5524 was deposited as resistant to ciprofloxacin, but showed a MIC of 0.5 µg/mL (interpreted as sensitive) for ciprofloxacin during QC testing. Testing was performed in duplicate.
[5]*P. aeruginosa,* strain MRSN 5524 was deposited as resistant to levofloxacin, but showed a MIC of 2 µg/mL (interpreted as sensitive) for levofloxacin during QC testing. Testing was performed in duplicate.

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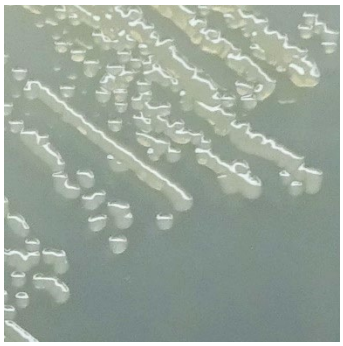
[6]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.
[7]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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 human tissue as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 5539 was deposited as sensitive to amikacin and tobramycin, intermediately resistant to cefepime and resistant to aztreonam, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem and piperacillin/tazobactam.

Lot: 70024969[1] **Manufacturing Date: 10MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, undulate, opaque, rough and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (4 to 16 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 5539 (GenBank: RXTN01000066.1)	> 99.9% sequence identity to *P. aeruginosa,* strain MRSN 5539 (GenBank: RXTN01000066.1)
Purity (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51548 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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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 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 6220 was deposited as resistant to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin.

Lot: 70024973[1] **Manufacturing Date: 16MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	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[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Resistant	Resistant (≥ 64 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 6220 (GenBank: RXTM01000189.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 6220 (GenBank: RXTM01000189.1)
Purity (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51549 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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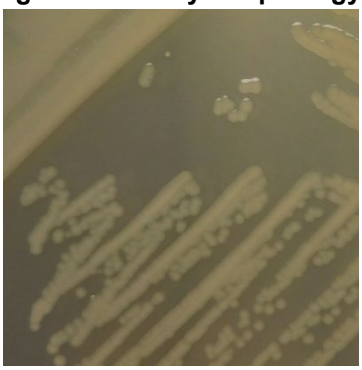
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51550

Pseudomonas aeruginosa, Strain MRSN 6241

Catalog No. NR-51550

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 6241 was isolated in 2011 from a human wound as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 6241 was deposited as sensitive to amikacin and resistant to piperacillin/tazobactam, imipenem, ceftazidime, cefepime, gentamicin, tobramycin, aztreonam and meropenem, with intermediate resistance to ciprofloxacin and levofloxacin.

Lot: 70024975[1] **Manufacturing Date: 15MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[2,3]	Report results	Colony type 1: Circular, flat, undulate, smooth and cream (Figure 1) Colony type 2: Circular, low convex, entire and smooth (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (97%)
Antibiotic Susceptibility Profile[4,5]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 32 µg/mL)
Meropenem	Resistant	Resistant (≥ 8 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 16 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Ciprofloxacin	Intermediate	Intermediate (≥ 1 µg/mL)
Levofloxacin	Intermediate	Intermediate (4 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 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 (post-freeze)[7]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology[8]
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51550 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Two colony types were observed. Plating of the individual colony types showed that they did not revert to the mixed colony type. VITEK® GN card analysis identified cells from both colony types as *P. aeruginosa*.
[4]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)

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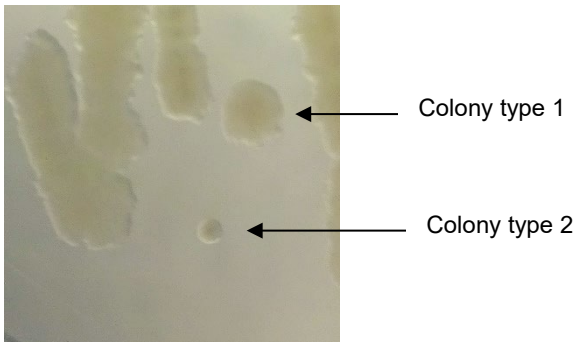
[5]Antibiotic susceptibility testing was performed for each colony type and interpretations are identical.
[6]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, 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.
[7]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.
[8]Two colony types were observed after 1 day of growth in an aerobic atmosphere with 5% CO_2. Plating of the individual colony types showed that colony type 1 did not revert and colony type 2 reverted to the mixed colony type.

Figure 1: Colony Morphologies



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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 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 6678 was deposited as sensitive to amikacin and resistant to tobramycin, imipenem, ceftazidime, gentamicin, meropenem, piperacillin/tazobactam, cefepime, levofloxacin, aztreonam, and ciprofloxacin.

Lot: 70024977[1] **Manufacturing Date: 15MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	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* (97%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Intermediate (16 µg/mL)[4]
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (16 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1420 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 6678 (GenBank: RXTK01000084.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 6678 (GenBank: RXTK01000084.1)
Purity (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51551 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa*, strain MRSN 6678 was deposited as resistant to cefepime. Antibiotic susceptibility testing performed in duplicate determined that susceptibility of strain MRSN 6678 to cefepime is intermediate.
[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.
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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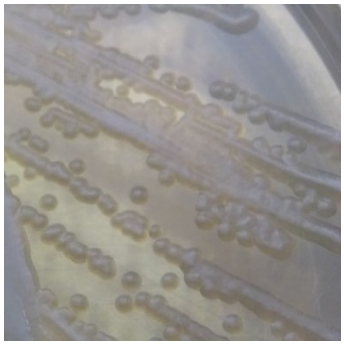
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51552

Pseudomonas aeruginosa, Strain MRSN 6695

Catalog No. NR-51552

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 6695 was isolated in 2012 from human urine as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 6695 was deposited as sensitive to amikacin, gentamicin and tobramycin and resistant to aztreonam, ceftazidime, ciprofloxacin, imipenem, levofloxacin, meropenem and piperacillin/tazobactam with intermediate resistance to cefepime.

Lot: 70024979[1] **Manufacturing Date: 09MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, entire, opaque and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Intermediate (16 µg/mL)[4]
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Sensitive (8 µg/mL)[5]
Meropenem	Resistant	Intermediate (4 µg/mL)[6]
Amikacin	Sensitive	Sensitive (8 µg/mL)
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Sensitive (1 µg/mL)[7]
Levofloxacin	Resistant	Intermediate (4 µg/mL)[8]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	80 µg/mL[9]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 6695 (GenBank: RXTJ01000040.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 6695 (GenBank: RXTJ01000040.1)
Purity (post-freeze)[10]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51552 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa* strain MRSN 6695 was deposited as resistant to ceftazidime. Repeated antibiotic susceptibility testing determined that strain MRSN 6695 is intermediately resistant to ceftazidime.
[5]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

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[6]*P. aeruginosa* strain MRSN 6695 was deposited as resistant to meropenem. Repeated antibiotic susceptibility testing determined that strain MRSN 6695 is intermediately resistant to meropenem.
[7]*P. aeruginosa* strain MRSN 6695 was deposited as resistant to ciprofloxacin. Repeated antibiotic susceptibility testing determined that strain MRSN 6695 is sensitive to ciprofloxacin.
[8]*P. aeruginosa* strain MRSN 6695 was deposited as resistant to levofloxacin. Repeated antibiotic susceptibility testing determined that strain MRSN 6695 is intermediately resistant to levofloxacin.
[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.
[10]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology

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Certificate of Analysis for NR-51553

Pseudomonas aeruginosa, Strain MRSN 6739

Catalog No. NR-51553

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 6739 was isolated in 2011 from human urine as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 6739 was deposited as sensitive to amikacin, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin, with intermediate resistance to aztreonam.

Lot: 70024981[1] **Manufacturing Date: 09MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, convex, entire, smooth and yellow (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Intermediate (16 µg/mL)
Cefepime	Sensitive	Sensitive (8 µg/mL)
Meropenem	Sensitive	Sensitive (2 µg/mL)
Amikacin	Sensitive	Sensitive (16 µg/mL)
Gentamicin	Sensitive	Sensitive (4 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/Sulfamethoxazole	Report results	160 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1440 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 6739 (GenBank: RXTI01000034.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 6739 (GenBank: RXTI01000034.1)
Purity (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51553 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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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 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 7014 was deposited as sensitive to amikacin and tobramycin and resistant to aztreonam, ceftazidime, cefepime, imipenem, levofloxacin, meropenem and piperacillin/tazobactam with intermediate resistance to ciprofloxacin and gentamicin.

Lot: 70024984[1] **Manufacturing Date: 30MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	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[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (32 µg/mL)
Meropenem	Resistant	Intermediate (4 µg/mL)[4]
Amikacin	Sensitive	Sensitive (16 µg/mL)
Gentamicin	Intermediate	Intermediate (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1µg/mL)
Ciprofloxacin	Intermediate	Sensitive (1 µg/mL)[4]
Levofloxacin	Resistant	Intermediate (4 µg/mL)[4]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	80 µg/mL[5]
Liofilchem® antibiotic test strips[6]		
Piperacillin/tazobactam	Resistant	Resistant (256 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1480 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 (post-freeze)[7]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51554 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

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[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.
[6]1 day at 37°C in an aerobic atmosphere on Mueller Hinton agar
[7]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology

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Certificate of Analysis for NR-51555

Pseudomonas aeruginosa, Strain MRSN 8130

Catalog No. NR-51555

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 8130 was isolated in 2012 from a human blood specimen as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 8130 was deposited as sensitive to amikacin, ceftazidime and gentamicin and resistant to aztreonam, cefepime, ciprofloxacin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin.

Lot: 70024986[1] **Manufacturing Date: 30MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low 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[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Intermediate (32 µg/mL)[4]
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 8130 (GenBank: RXTG01000156.1)	100% sequence identity to *P. aeruginosa,* strain MRSN 8130 (GenBank: RXTG01000156.1)
Purity (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51555 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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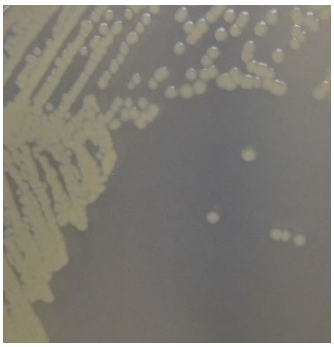
Figure 1: Colony Morphology



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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 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 8136 was deposited as sensitive to amikacin, gentamicin and tobramycin and resistant to imipenem, cefepime, levofloxacin, ceftazidime, aztreonam, meropenem and ciprofloxacin, with intermediate resistance to piperacillin/tazobactam.

Lot: 70024988[1] **Manufacturing Date: 21JUN2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	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* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Intermediate	Resistant (≥ 128 µg/mL)[4]
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (16 µg/mL)
Gentamicin	Sensitive	Sensitive (4 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (1420 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 (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51556 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa,* strain MRSN 8136 was deposited as intermediate to piperacillin/tazobactam but showed a MIC of ≥ 128 µg/mL (interpreted as resistant) for piperacillin/tazobactam during QC testing. Testing was performed in duplicate.

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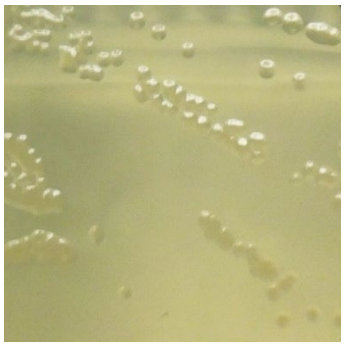
[5]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51557

Pseudomonas aeruginosa, Strain MRSN 8139

Catalog No. NR-51557

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 8139 was isolated in 2012 from a human wound as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 8139 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, gentamicin, piperacillin/tazobactam and tobramycin and resistant to imipenem, with intermediate resistance to ciprofloxacin, levofloxacin and meropenem.

Lot: 70024990[1] **Manufacturing Date: 21JUN2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Irregular, low convex, undulate, mucoid and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (32 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Intermediate	Intermediate (4 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Intermediate	Sensitive (1 µg/mL)[4]
Levofloxacin	Intermediate	Intermediate (4 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/Sulfamethoxazole	Report results	80 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 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 (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51557 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]Susceptibilty results 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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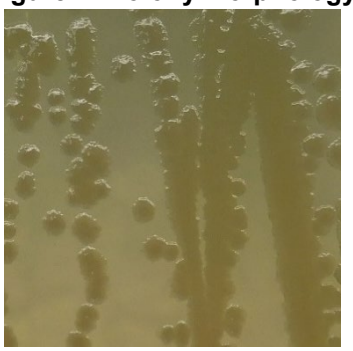
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51558

Pseudomonas aeruginosa, Strain MRSN 8141

Catalog No. NR-51558

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 8141 was isolated in 2012 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 8141 was deposited as sensitive to amikacin and resistant to ceftazidime, gentamicin, ciprofloxacin, tobramycin, aztreonam, cefepime, piperacillin/tazobactam, imipenem, levofloxacin and meropenem.

Lot: 70024992[1] **Manufacturing Date: 22MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, entire, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (97%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (16 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Ciprofloxacin	Resistant	Intermediate (2 µg/mL)[4]
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 8141 (GenBank: RXVC01000040.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 8141 (GenBank: RXVC01000040.1)
Purity (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51558 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa* strain MRSN 8141 was deposited as resistant to ciprofloxacin. Repeated antibiotic susceptibility testing determined that strain MRSN 8141 is intermediately resistance to ciprofloxacin.
[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.
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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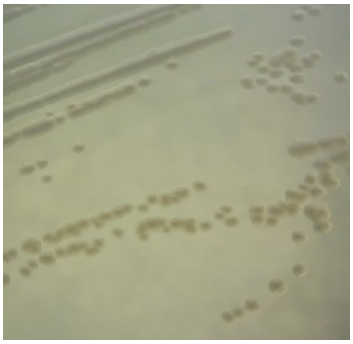
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51559

Pseudomonas aeruginosa, Strain MRSN 8912

Catalog No. NR-51559

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 8912 was isolated in 2007 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 8912 was deposited as sensitive to amikacin and ceftazidime and resistant to gentamicin, ciprofloxacin, tobramycin, aztreonam, cefepime, piperacillin/tazobactam, imipenem, levofloxacin and meropenem.

Lot: 70024994[1] **Manufacturing Date: 22MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	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[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Intermediate (16 µg/mL)[4]
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (4 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Ciprofloxacin	Resistant	Intermediate (2 µg/mL)[5]
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 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 (post-freeze)[7,8]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51559 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa*, strain MRSN 8912 was deposited as resistant to cefepime. Antibiotic susceptibility testing performed in duplicate determined that the susceptibility of strain MRSN 8912 to cefepime is intermediate.
[5]*P. aeruginosa*, strain MRSN 8912 was deposited as resistant to ciprofloxacin. Antibiotic susceptibility testing performed in duplicate determined that the susceptibility of strain MRSN 8912 to ciprofloxacin is intermediate.

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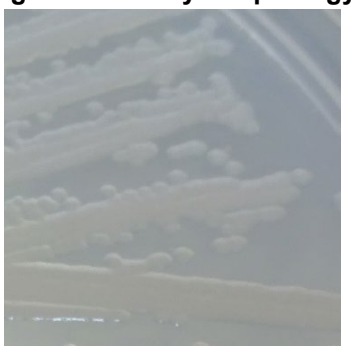
[6]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.
[7]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.
[8]Two colony types were observed after 1 day. Plating of the individual colony types showed that they reverted to a single colony type that is consistent expected colony morphology of *P. aeruginosa.*

Figure 1: Colony Morphology



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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 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 8914 was deposited as resistant to gentamicin, ciprofloxacin, tobramycin, aztreonam, cefepime, piperacillin/tazobactam, imipenem, levofloxacin and meropenem with intermediate resistance to amikacin and ceftazidime.

Lot: 70024996[1] **Manufacturing Date: 06JUN2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, slight peaked, 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[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Intermediate	Resistant (32 µg/mL)[4]
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Intermediate	Resistant (≥ 64 µg/mL)[4]
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51560 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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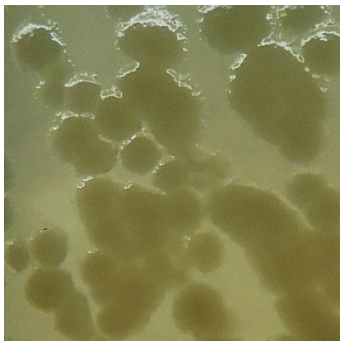
Figure 1: Colony Morphology



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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 human urine as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 8915 was deposited as sensitive to amikacin, aztreonam, cefepime and ceftazidime and resistant to gentamicin, tobramycin, imipenem, meropenem, ciprofloxacin, levofloxacin and piperacillin/tazobactam.

Lot: 70024999[1] **Manufacturing Date: 06JUN2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	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* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Intermediate (32 µg/mL)
Cefepime	Sensitive	Intermediate (16 µg/mL)[4]
Meropenem	Resistant	Resistant (8 µg/mL)
Amikacin	Sensitive	Intermediate (32 µg/mL)[5]
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1410 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 (post-freeze)[7]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51561 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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 8915 was deposited as sensitive to amikacin, but showed a MIC of ≥ 32 µg/mL (interpreted as resistant) for amikacin during QC testing. Testing was performed in duplicate.
[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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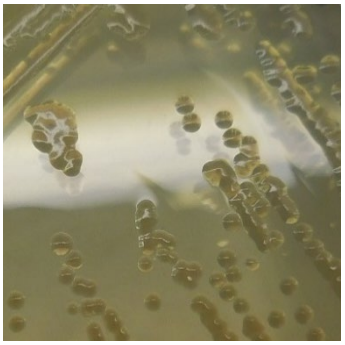
[7]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51562

Pseudomonas aeruginosa, Strain MRSN 9718

Catalog No. NR-51562

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 9718 was isolated in 2012 from human urine as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 9718 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem and tobramycin and resistant to levofloxacin and meropenem with intermediate resistance to piperacillin/tazobactam.

Lot: 70025001[1] **Manufacturing Date: 07JUN2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[2,3]	Report results	Colony type 1: Circular, low convex, entire, smooth and cream (Figure 1) Colony type 2: 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[4,5]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Variable (16-≥ 32 µg/mL)
Piperacillin/tazobactam	Intermediate	Sensitive (16 µg/mL)[6]
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Variable (16-≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 4 µg/mL)
Meropenem	Resistant	Variable (4-≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Resistant (≥ 4 µg/mL)[7]
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[8]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 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 (post-freeze)[9]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51562 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar

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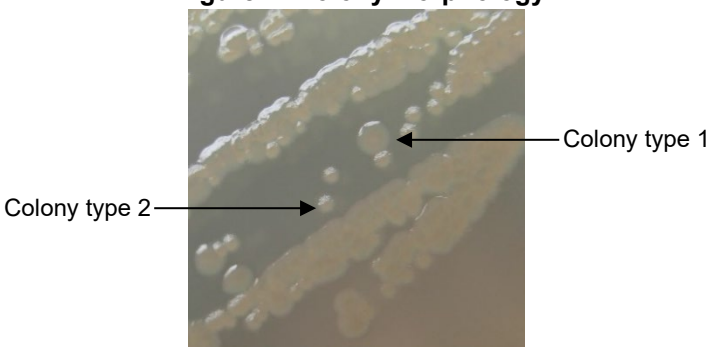
[3]Two colony types were observed. Plating of the individual colony types showed that they did not revert to the mixed colony type. VITEK® GN card analysis identified cells from both colony types as *P. aeruginosa*. The 16S ribosomal RNA gene of each colony type was sequenced and found to have 100% sequence identity to the other colony type and to *P. aeruginosa* strain MRSN 9718 (GenBank: RXSZ01000188.1).
[4]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[5]Antibiotic susceptibility testing was performed for each colony type and interpretations are identical except where indicated.
[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 9718 was deposited as sensitive to ciprofloxacin. Repeated antibiotic susceptibility testing determined that strain MRSN 9718 is resistant to ciprofloxacin.
[8]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.
[9]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51563

Pseudomonas aeruginosa, Strain MRSN 9873

Catalog No. NR-51563

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 9873 was isolated in 2012 from human urine as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 9873 was deposited as sensitive to amikacin, aztreonam, ciprofloxacin, levofloxacin and piperacillin/tazobactam and resistant to cefepime, ceftazidime, gentamicin, imipenem, meropenem and tobramycin.

Lot: 70025003[1] **Manufacturing Date: 07JUN2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, convex, entire, smooth, mucoid and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Intermediate (16 µg/mL)[4]
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (8 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (2 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 9873 (GenBank: RXSY01000129.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 9873 (GenBank: RXSY01000129.1)
Purity (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51563 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa*, strain MRSN 9873 was deposited as resistant to cefepime. Antibiotic susceptibility testing performed in duplicate identified strain MRSN 9873 as having an intermediate resistance to cefepime.
[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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[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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 is a human respiratory isolate collected in 2012 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 11278 was deposited as sensitive to ceftazidime and piperacillin/tazobactam, intermediately resistant to amikacin and levofloxacin, and resistant to aztreonam, cefepime, ciprofloxacin, gentamicin, imipenem, meropenem and tobramycin.

Lot: 70025005[1] **Manufacturing Date: 24MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, slightly peaked, 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[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (≤ 1 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Sensitive (8 µg/mL)[4]
Meropenem	Resistant	Sensitive (2 µg/mL)[5]
Amikacin	Intermediate	Sensitive (16 µg/mL)[6]
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Ciprofloxacin	Resistant	Sensitive (1 µg/mL)[7]
Levofloxacin	Intermediate	Inconclusive[8]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/Sulfamethoxazole	Report results	≥ 320 µg/mL[9]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (1460 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 (post-freeze)[10]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51564 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa* strain MRSN 11278 was deposited as resistant to cefepime. Repeated antibiotic susceptibility testing determined that strain MRSN 11278 is sensitive to cefepime.
[5]*P. aeruginosa* strain MRSN 11278 was deposited as resistant to meropenem. Repeated antibiotic susceptibility testing determined that strain MRSN 11278 is sensitive to meropenem.
[6]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

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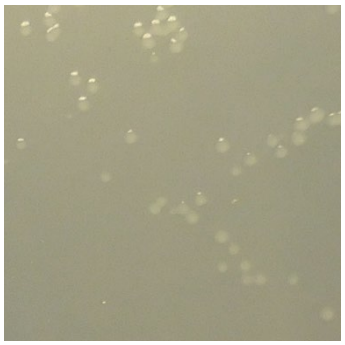
[7]*P. aeruginosa* strain MRSN 11278 was deposited as resistant to ciprofloxacin. Repeated antibiotic susceptibility testing determined that strain MRSN 11278 is sensitive to ciprofloxacin.
[8]*P. aeruginosa*, strain MRSN 11278 was deposited as being intermediately resistant to levofloxacin. Repeated antibiotic susceptibility testing determined that for strain MRSN 11278, the levofloxacin MICs are 2 µg/mL and 4 µg/mL, which are interpreted as sensitive and intermediate, respectively.
[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.
[10]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar. Plaques were observed after 1 day at 37°C only in an aerobic atmosphere with 5% CO_2.

Figure 1: Colony Morphology



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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 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 11281 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin and resistant to imipenem, with intermediate resistance to meropenem.

Lot: 70025007[1] **Manufacturing Date: 31MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, slight peaked, entire, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (97%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Meropenem	Intermediate	Intermediate (4 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	160 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 11281 (GenBank: RXWR01000027.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 11281 (GenBank: RXWR01000027.1)
Purity (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51565 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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Figure 1: Colony Morphology

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Certificate of Analysis for NR-51566

Pseudomonas aeruginosa, Strain MRSN 11285

Catalog No. NR-51566

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 11285 was isolated in 2012 from human urine as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 11285 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin.

Lot: 70025009[1] **Manufacturing Date: 03JUL2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	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* (93%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ceftriaxone	Report results	Intermediate (16 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 1 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.25 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 11285 (GenBank: RXWQ01000052.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 11285 (GenBank: RXWQ01000052.1)
Purity (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51566 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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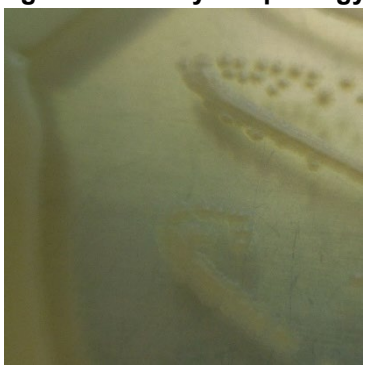
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51567

Pseudomonas aeruginosa, Strain MRSN 11286

Catalog No. NR-51567

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 11286 was isolated in 2012 from a human wound as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 11286 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin and resistant to imipenem with intermediate resistance to meropenem.

Lot: 70025011[1] **Manufacturing Date: 03JUL2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Irregular, low convex, undulate, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (95%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Intermediate (16 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Intermediate	Intermediate (4 µg/mL)
Amikacin	Sensitive	Sensitive (4 µg/mL)
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	80 to 160 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 11286 (GenBank: RXWP01000155.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 11286 (GenBank: RXWP01000155.1)
Purity (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51567 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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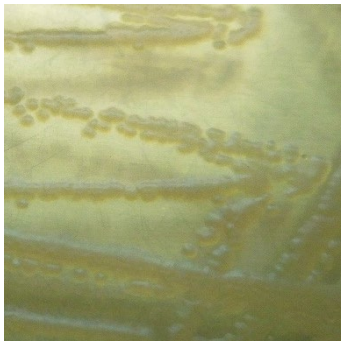
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51568

Pseudomonas aeruginosa, Strain MRSN 11536

Catalog No. NR-51568

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 11536 was isolated in 2012 from a human wound as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 11536 was deposited as sensitive to amikacin, cefepime, ceftazidime and piperacillin/tazobactam and resistant to aztreonam, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem and tobramycin.

Lot: 70025027[1] **Manufacturing Date: 05JUN2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	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* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Intermediate (16 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 11536 (GenBank: RXWO01000162.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 11536 (GenBank: RXWO01000162.1)
Purity (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51568 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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Figure 1: Colony Morphology

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Certificate of Analysis for NR-51569

Pseudomonas aeruginosa, Strain MRSN 11538

Catalog No. NR-51569

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 11538 was isolated in 2012 from a human wound as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 11538 was deposited as sensitive to amikacin, aztreonam, ciprofloxacin, cefepime, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin, intermediately resistant to ceftazidime and resistant to imipenem and meropenem.

Lot: 70025029[1] **Manufacturing Date: 05JUN2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, undulate, opaque and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Intermediate (64 µg/mL)[4]
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Intermediate	Intermediate (16 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Intermediate (16 µg/mL)[5]
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (1 µg/mL)
Levofloxacin	Sensitive	Intermediate (4 µg/mL)[6]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 11538 (GenBank: RXWN01000143.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 11538 (GenBank: RXWN01000143.1)
Purity (post-freeze)[8]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51569 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa*, strain MRSN 11538 was deposited as sensitive to piperacillin/tazobactam. Repeated antibiotic susceptibility testing determined that strain MRSN 11538 is intermediately resistant to piperacillin/tazobactam.
[5]*P. aeruginosa*, strain MRSN 11538 was deposited as sensitive to cefepime. Repeated antibiotic susceptibility testing determined that strain MRSN 11538 is intermediately resistant to cefepime.

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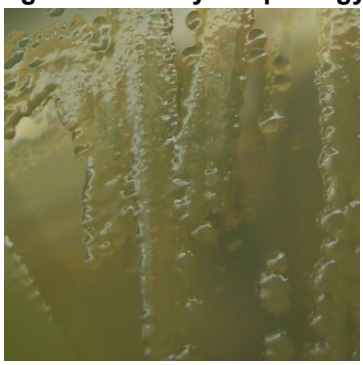
[6]*P. aeruginosa*, strain MRSN 11538 was deposited as sensitive to levofloxacin. Repeated antibiotic susceptibility testing determined that strain MRSN 11538 is intermediately resistant to levofloxacin.
[7]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, 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.
[8]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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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 is a human respiratory isolate collected in 2012 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 11976 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin.

Lot: 70025031[1] **Manufacturing Date: 07JUN2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Irregular, flat, undulate, opaque and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ceftriaxone	Report results	Resistant (32 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Amikacin	Sensitive	Sensitive (4 to 8 µg/mL)
Gentamicin	Sensitive	Sensitive (4 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 11976 (GenBank: RXWM01000164.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 11976 (GenBank: RXWM01000164.1)
Purity (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51570 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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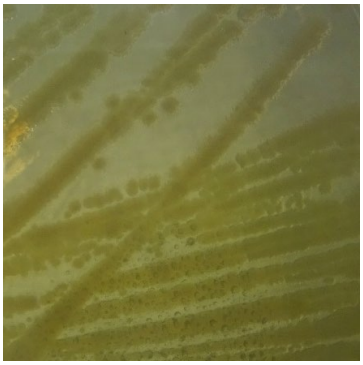
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51571

Pseudomonas aeruginosa, Strain MRSN 12282

Catalog No. NR-51571

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 12282 was isolated in 2012 from human respiratory sample as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 12282 was deposited as sensitive to amikacin and tobramycin, intermediate to gentamicin and resistant to imipenem, piperacillin/tazobactam, cefepime, levofloxacin, ceftazidime, aztreonam, meropenem and ciprofloxacin.

Lot: 70025034[1] **Manufacturing Date: 26JUN2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, convex, entire, smooth and cream (Figure 1) Plaques observed
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (97%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (32 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Intermediate (16 µg/mL)[4]
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (16 µg/mL)
Gentamicin	Intermediate	Intermediate (8 µg/mL)
Tobramycin	Sensitive	Sensitive (2 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 12282 (GenBank: RXWL01000175.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 12282 (GenBank: RXWL01000175.1)
Purity (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51571 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa,* strain MRSN 12282 was deposited as resistant to cefepime, but showed a MIC of 16 µg/mL (interpreted as intermediate) for cefepime during QC testing. Testing was performed in quadruplicate.
[5]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to

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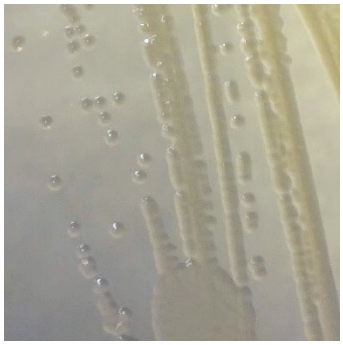
trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51572

Pseudomonas aeruginosa, Strain MRSN 12283

Catalog No. NR-51572

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 12283 was isolated in 2012 from human urine as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 12283 was deposited as sensitive to amikacin, aztreonam, cefepime, ciprofloxacin, ceftazidime, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin, intermediately resistant to meropenem and resistant to imipenem.

Lot: 70025041[1] **Manufacturing Date: 07JUN2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Irregular, flat, undulate, opaque and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (95%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (≤ 1 µg/mL)
Ceftriaxone	Report results	Intermediate (16 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Meropenem	Intermediate	Sensitive (2 µg/mL)[4]
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (4 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	80 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1420 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 (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51572 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]Susceptibilty results 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.
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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Figure 1: Colony Morphology

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Product Information Sheet 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 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 12365 was deposited as sensitive to amikacin, aztreonam, ceftazidime, cefepime, piperacillin/tazobactam and tobramycin and resistant to imipenem, levofloxacin and meropenem, with intermediate resistance to ciprofloxacin and gentamicin.

Lot: 70025043[1] **Manufacturing Date: 07JUN2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	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[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Resistant	Intermediate (4 µg/mL)[4]
Amikacin	Sensitive	Intermediate (32 µg/mL)[4]
Gentamicin	Intermediate	Intermediate (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Intermediate	Inconclusive[5]
Levofloxacin	Resistant	Intermediate (4 µg/mL)[4]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1410 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 12365 (GenBank: RXWJ01000169.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 12365 (GenBank: RXWJ01000169.1)
Purity (post-freeze)[7]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51573 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

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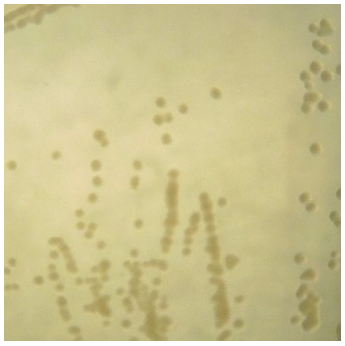
[5]*P. aeruginosa*, strain MRSN 12365 was deposited as being intermediately resistant to ciprofloxacin. Repeated antibiotic susceptibility testing determined that for strain MRSN 12365, the ciprofloxacin MICs are 1 µg/mL and 2 µg/mL, which are interpreted as sensitive and intermediate, respectively.

[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.

[7]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51574

Pseudomonas aeruginosa, Strain MRSN 12368

Catalog No. NR-51574

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 12368 was isolated in 2012 from a human blood sample as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 12368 was deposited as sensitive to piperacillin/tazobactam, amikacin, aztreonam, cefepime, ciprofloxacin, ceftazidime, levofloxacin and tobramycin and resistant to imipenem and meropenem with intermediate susceptibility to gentamicin.

Lot: 70025045[1] **Manufacturing Date: 21JUN2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, slight peaked, undulate, mucoid and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (95%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Sensitive	Sensitive (32 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (8 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Intermediate (16-32 µg/mL)[4]
Gentamicin	Intermediate	Intermediate (8 µg/mL)
Tobramycin	Sensitive	Sensitive (2 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	80 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 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 (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51574 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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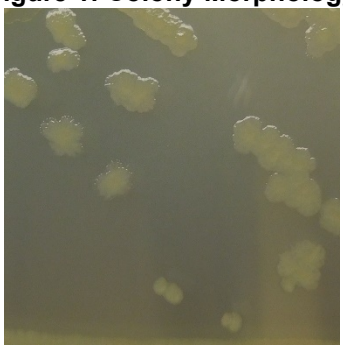
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51575

Pseudomonas aeruginosa, Strain MRSN 12914

Catalog No. NR-51575

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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 in the United States. *P. aeruginosa*, strain MRSN 12914 was deposited as sensitive to amikacin and resistant to aztreonam, cefepime, ceftazidime, ciprofloxacin, imipenem, gentamicin, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin.

Lot: 70025049[1] **Manufacturing Date: 21JUN2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, slight peak, entire and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Resistant (≥ 64 µg/mL)[4]
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 12914 (GenBank: RXWH01000139.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 12914 (GenBank: RXWH01000139.1)
Purity (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51575 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa* strain MRSN 12914 was deposited as sensitive to amikacin. Repeated antibiotic susceptibility testing determined that strain MRSN 12914 is resistant to amikacin.

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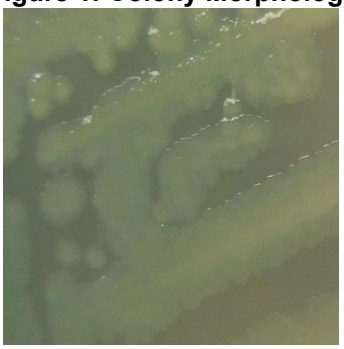
[5]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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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 human urine as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 13488 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin and resistant to meropenem, with intermediate resistance to imipenem.

Lot: 70025055[1] **Manufacturing Date: 19JUL2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, entire, translucent and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Sensitive (8 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 1 µg/mL)
Meropenem	Resistant	Sensitive (≤ 0.25 µg/mL)[4]
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.25 µg/mL)
Tetracycline	Report results	Resistant (4 to 8 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≤ 80 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1410 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 (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51576 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa,* strain MRSN 351791 was deposited as resistant to meropenem, but showed a MIC of ≤ 0.25 µg/mL (interpreted as sensitive) for meropenem during QC testing. Testing was performed in duplicate.
[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

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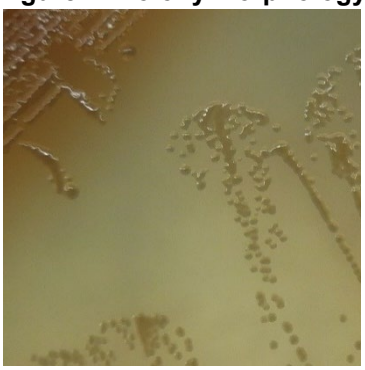
Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51577

Pseudomonas aeruginosa, Strain MRSN 14981

Catalog No. NR-51577

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 14981 was isolated in 2013 from a human respiratory sample as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 14981 was deposited as sensitive to amikacin, gentamicin and tobramycin and resistant to ceftazidime, ciprofloxacin, imipenem, levofloxacin and piperacillin/tazobactam, with intermediate resistance to aztreonam, cefepime and meropenem.

Lot: 70025060[1] **Manufacturing Date: 19JUL2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	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[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Sensitive (8 µg/mL)[4]
Meropenem	Intermediate	Intermediate (4 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Intermediate (2 µg/mL)[5]
Levofloxacin	Resistant	Intermediate (4 µg/mL)[6]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (128 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[7]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 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 (post-freeze)[8]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51577 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]Susceptibilty results for this antibiotic are within one doubling dilution of specification, which is considered an equivalent result.
[5]*P. aeruginosa,* strain MRSN 14981 was deposited as resistant to ciprofloxacin. Repeated antibiotic susceptibility testing determined that strain MRSN 14981 is intermediately resistant to ciprofloxacin.
[6]*P. aeruginosa,* strain MRSN 14981 was deposited as resistant to levofloxacin. Repeated antibiotic susceptibility testing determined that strain MRSN 14981 is intermediately resistant to levofloxacin.

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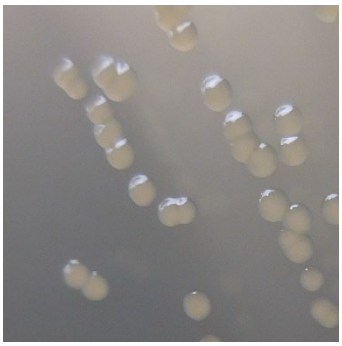
[7]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.
[8]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51578

Pseudomonas aeruginosa, Strain MRSN 15566

Catalog No. NR-51578

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 15566 was isolated in 2013 from human urine as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 15566 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, gentamicin, meropenem, piperacillin/tazobactam and tobramycin and resistant to ciprofloxacin, imipenem and levofloxacin.

Lot: 70025062[1] **Manufacturing Date: 26JUN2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphologies[2,3]	Report results	Colony type 1: Circular, low convex, undulate, rough and cream (Figure 1) Colony type 2: Irregular, low convex, undulate, mucoid and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (≥ 93%)
Antibiotic Susceptibility Profile[4,5]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (≤ 1 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 8 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 1 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 1 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Sensitive (≤ 1 µg/mL)[6]
Levofloxacin	Resistant	Sensitive (≤ 2 µg/mL)[7]
Tetracycline	Report results	Resistant (≥ 8 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 256 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[8]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1420 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 (post-freeze)[9]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51578 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Two colony types were observed. Plating of the individual colony types showed that colony type 1 did not revert to the mixed colony type and colony type 2 reverted to colony type 1. VITEK® MS (MALDI-TOF) analysis identified cells from both colony types as *P. aeruginosa*.
[4]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)

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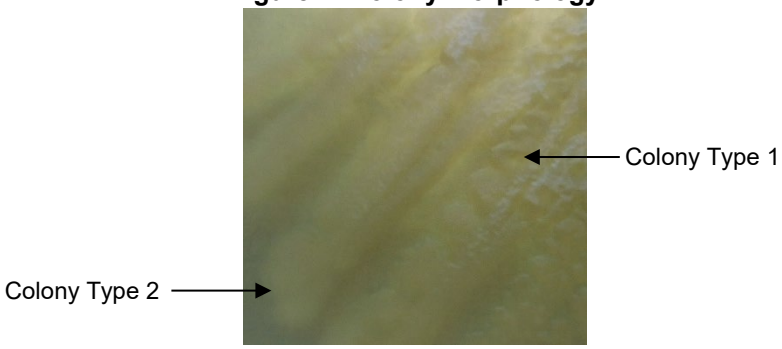
[5]Antibiotic susceptibility testing was performed using a mixed colony suspension.
[6]*P. aeruginosa*, strain MRSN 15566 was deposited as resistant to ciprofloxacin. Repeated antibiotic susceptibility testing determined that strain MRSN 15566 is sensitive to ciprofloxacin.
[7]*P. aeruginosa*, strain MRSN 15566 was deposited as resistant to levofloxacin. Repeated antibiotic susceptibility testing determined that strain MRSN 15566 is sensitive to levofloxacin.
[8]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.
[9]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51579

Pseudomonas aeruginosa, Strain MRSN 15678

Catalog No. NR-51579

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 15678 was isolated in 2013 from a human wound as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 15678 was deposited as sensitive to amikacin, gentamicin and tobramycin, intermediately resistant to aztreonam and cefepime and resistant to ceftazidime, ciprofloxacin, imipenem, levofloxacin, meropenem and piperacillin/tazobactam.

Lot: 70025064[1] **Manufacturing Date: 28JUN2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, convex, undulate, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (≥ 98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Intermediate (16 µg/mL)[4]
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)
Meropenem	Resistant	Intermediate (4 µg/mL)[5]
Amikacin	Sensitive	Sensitive (8 µg/mL)
Gentamicin	Sensitive	Sensitive (4 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1420 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 (post-freeze)[7]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51579 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa,* strain MRSN 15678 was deposited as resistant to ceftazidime. Repeated antibiotic susceptibility testing determined that strain MRSN 15678 is intermediately resistant to ceftazidime.
[5]Susceptibilty results for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

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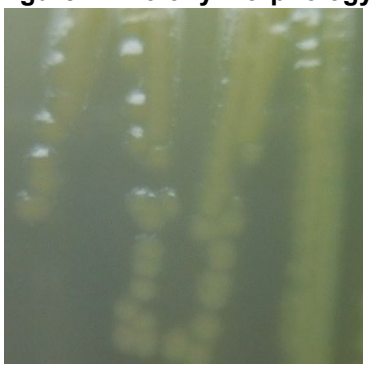
[6]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.
[7]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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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 is a human respiratory isolate collected in 2013 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 15753 was deposited as sensitive to amikacin, aztreonam, ceftazidime, gentamicin, piperacillin/tazobactam and tobramycin and resistant to cefepime, ciprofloxacin, imipenem and meropenem with intermediate resistance to levofloxacin.

Lot: 70025066[1] **Manufacturing Date: 03JUL2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	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[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Sensitive (8 µg/mL)[4]
Meropenem	Resistant	Resistant (8 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Sensitive (1 µg/mL)[5]
Levofloxacin	Intermediate	Sensitive (2 µg/mL)[6]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/Sulfamethoxazole	Report results	≥ 320 µg/mL[7]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (1410 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 (post-freeze)[8]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51580 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa,* strain MRSN 15753 was deposited as resistant to cefepime, but showed a MIC of 8 µg/mL (interpreted as sensitive) for cefepime during QC testing. Testing was performed in duplicate.
[5]*P. aeruginosa,* strain MRSN 15753 was deposited as resistant to ciprofloxacin, but showed a MIC of 1 µg/mL (interpreted as sensitive) for ciprofloxacin during QC testing. Testing was performed in duplicate.

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[6]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent 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.
[8]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology

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Certificate of Analysis for NR-51581

Pseudomonas aeruginosa, Strain MRSN 16344

Catalog No. NR-51581

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 16344 was isolated in 2013 from a human wound as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 16344 was deposited as sensitive to aztreonam, ceftazidime and piperacillin/tazobactam, intermediately resistant to amikacin, cefepime and meropenem and resistant to ciprofloxacin, gentamicin, imipenem, levofloxacin and tobramycin.

Lot: 70025068[1] **Manufacturing Date: 03JUL2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Punctiform (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (≥ 97%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 32 µg/mL)
Ceftazidime	Sensitive	Sensitive (≤ 1 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Sensitive (≤ 8 µg/mL)[4]
Meropenem	Intermediate	Sensitive (1 µg/mL)[5]
Amikacin	Intermediate	Sensitive (16 µg/mL)[4]
Gentamicin	Resistant	Intermediate (8 µg/mL)[4]
Tobramycin	Resistant	Sensitive (≤ 4 µg/mL)[6]
Ciprofloxacin	Resistant	Intermediate (2 µg/mL)[7]
Levofloxacin	Resistant	Intermediate (4 µg/mL)[8]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[9]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1420 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 (post-freeze)[10]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51581 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]Susceptibilty results for this antibiotic are within one doubling dilution of specification, which is considered an equivalent result.
[5]*P. aeruginosa*, strain MRSN 16344 was deposited as intermediately resistant to meropenem. Repeated antibiotic susceptibility testing determined that strain MRSN 16344 is sensitive to meropenem.

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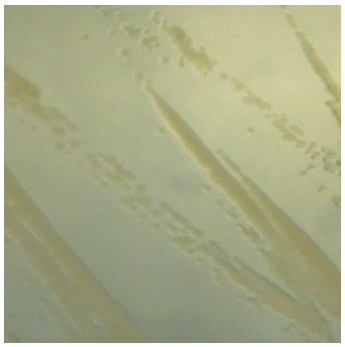
[6]*P. aeruginosa*, strain MRSN 16344 was deposited as resistant to tobramycin. Repeated antibiotic susceptibility testing determined that strain MRSN 16344 is sensitive to tobramycin.
[7]*P. aeruginosa*, strain MRSN 16344 was deposited as resistant to ciprofloxacin. Repeated antibiotic susceptibility testing determined that strain MRSN 16344 is intermediately resistant to ciprofloxacin.
[8]*P. aeruginosa*, strain MRSN 16344 was deposited as resistant to levofloxacin. Repeated antibiotic susceptibility testing determined that strain MRSN 16344 is intermediately resistant to levofloxacin.
[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.
[10]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51582

Pseudomonas aeruginosa, Strain MRSN 16345

Catalog No. NR-51582

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 16345 was isolated in 2013 from human urine as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 16345 was deposited as sensitive to amikacin, gentamicin, meropenem and tobramycin, intermediately resistant to cefepime and imipenem and resistant to aztreonam, ceftazidime, ciprofloxacin, levofloxacin and piperacillin/tazobactam.

Lot: 70025070[1] **Manufacturing Date: 27JUN2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	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* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Resistant (32 µg/mL)[4]
Meropenem	Sensitive	Sensitive (1 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (256 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 16345 (GenBank: RXVR01000117.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 16345 (GenBank: RXVR01000117.1)
Purity (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51582 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]Susceptibilty results for this antibiotic are 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.
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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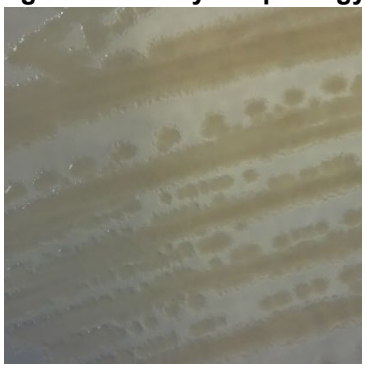
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51583

Pseudomonas aeruginosa, Strain MRSN 16383

Catalog No. NR-51583

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 16383 is a human respiratory isolate collected in 2013 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 16383 was deposited as sensitive to amikacin, aztreonam, ceftazidime, meropenem, piperacillin/tazobactam and tobramycin, intermediately resistant to cefepime, gentamicin and imipenem and resistant to ciprofloxacin and levofloxacin.

Lot: 70025072[1] **Manufacturing Date: 27JUN2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	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* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ceftriaxone	Report results	Sensitive (4-8 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.5 µg/mL)
Amikacin	Sensitive	Sensitive (16 µg/mL)
Gentamicin	Intermediate	Intermediate (8 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 256 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 40 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~1460 base pairs)	≥ 99% sequence identity to *P. aeruginosa,* strain MRSN 16383 (GenBank: RXVQ01000033.1)	99.9% sequence identity to *P. aeruginosa,* strain MRSN 16383 (GenBank: RXVQ01000033.1)
Purity (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51583 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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Figure 1: Colony Morphology

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Certificate of Analysis for NR-51584

Pseudomonas aeruginosa, Strain MRSN 16740

Catalog No. NR-51584

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 16740 is a human respiratory isolate collected in 2013 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 16740 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin and resistant to imipenem and meropenem.

Lot: 70025074[1] **Manufacturing Date: 17JUL2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, peaked, undulate and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Resistant	Intermediate (4 µg/mL)[4]
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.25 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1420 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 16740 (GenBank: RXVP01000139.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 16740 (GenBank: RXVP01000139.1)
Purity (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51584 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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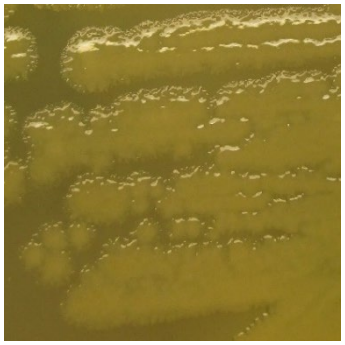
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51585

Pseudomonas aeruginosa, Strain MRSN 16744

Catalog No. NR-51585

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 16744 was isolated in 2013 from human tissue as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 16744 was deposited as sensitive to amikacin, cefepime, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin, intermediately resistance to aztreonam and resistant to imipenem and meropenem.

Lot: 70025076[1] **Manufacturing Date: 17JUL2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, slightly peaked, undulate, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (97%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (16 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Resistant	Resistant (8 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 160 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1470 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 (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51585 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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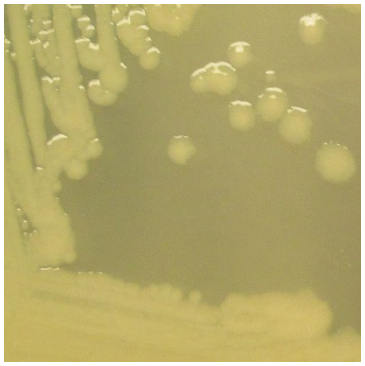
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51586

Pseudomonas aeruginosa, Strain MRSN 16847

Catalog No. NR-51586

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 16847 was isolated in 2013 from a human groin as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 16847 was deposited as sensitive to amikacin, aztreonam, cefepime, ciprofloxacin, ceftazidime, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin and resistant to imipenem and meropenem.

Lot: 70025079[1] **Manufacturing Date: 10JUL2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, entire, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (95%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Intermediate (16 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Resistant	Intermediate (4 µg/mL)[4]
Amikacin	Sensitive	Sensitive (≤ 4 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1420 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 (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51586 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]Susceptibilty results 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.
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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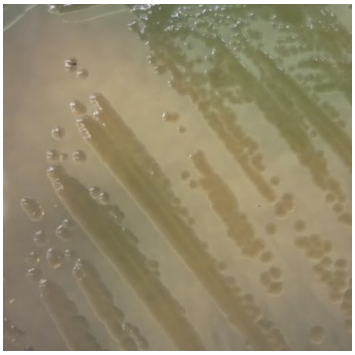
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51587

Pseudomonas aeruginosa, Strain MRSN 17849

Catalog No. NR-51587

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 17849 is a human respiratory isolate collected in 2013 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 17849 was deposited as sensitive to amikacin, cefepime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem and tobramycin, with intermediate resistance to aztreonam, ceftazidime and piperacillin/tazobactam.

Lot: 70025080[1] **Manufacturing Date: 10JUN2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, convex, entire, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (97%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Intermediate	Resistant (≥ 128 µg/mL)[4]
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Intermediate	Resistant (≥ 64 µg/mL)[5]
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Intermediate (16 µg/mL)[6]
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Amikacin	Sensitive	Sensitive (4 µg/mL)
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (≤ 0.12 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 160 µg/mL[7]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 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 (post-freeze)[8]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51587 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa*, strain MRSN 17849 was deposited as intermediate to piperacillin/tazobactam, but showed a MIC of ≥ 128 µg/mL (interpreted as resistant) for piperacillin/tazobactam during QC testing. Testing was performed in duplicate.
[5]*P. aeruginosa*, strain MRSN 17849 was deposited as intermediate to ceftazidime, but showed a MIC of ≥ 64 µg/mL (interpreted as resistant) for ceftazidime during QC testing. Testing was performed in duplicate.

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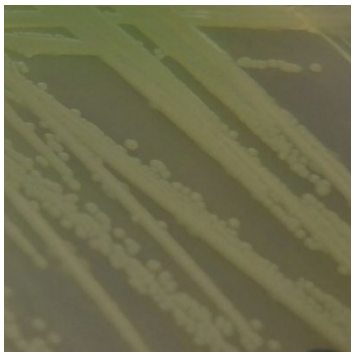
[6]Susceptibilty results for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.
[7]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. 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.
[8]Purity of this lot was assessed for 8 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51588

Pseudomonas aeruginosa, Strain MRSN 18560

Catalog No. NR-51588

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 18560 was isolated in 2013 from a human wound as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 18560 was deposited as sensitive to amikacin, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin, with intermediate resistance to aztreonam.

Lot: 70025082[1] **Manufacturing Date: 26JUL2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Irregular, flat, undulate, opaque and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Meropenem	Sensitive	Sensitive (1 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 4 µg/mL)
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	80 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1400 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 (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51588 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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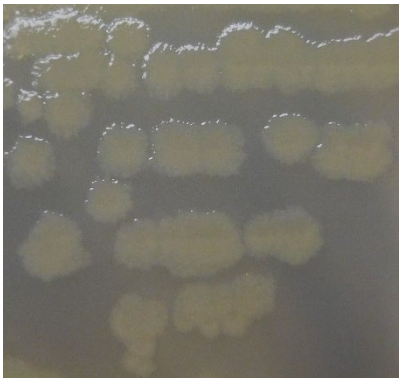
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51589

Pseudomonas aeruginosa, Strain MRSN 18562

Catalog No. NR-51589

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 18562 was isolated in 2013 from a human respiratory specimen as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 18562 was deposited as sensitive to amikacin, cefepime, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, piperacillin/tazobactam and tobramycin, intermediately resistant to aztreonam and resistant to imipenem and meropenem.

Lot: 70025084[1] **Manufacturing Date: 26JUL2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	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[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ceftriaxone	Report results	Resistant (16 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Meropenem	Resistant	Resistant (8 µg/mL)
Amikacin	Sensitive	Sensitive (8 µg/mL)
Gentamicin	Sensitive	Sensitive (4 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	80 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~1400 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 (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51589 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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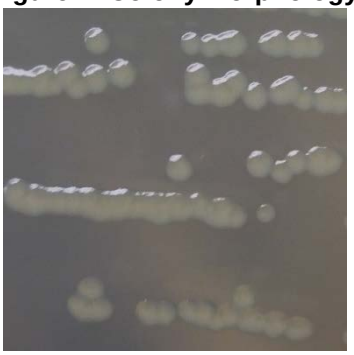
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51590

Pseudomonas aeruginosa, Strain MRSN 18754

Catalog No. NR-51590

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 18754 was isolated in 2013 from human tissue as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 18754 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin.

Lot: 70025086[1] **Manufacturing Date: 01AUG2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Irregular, low convex, 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[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Meropenem	Sensitive	Sensitive (1 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (≤ 1 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 256 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	160 µg/mL[4]
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 (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51590 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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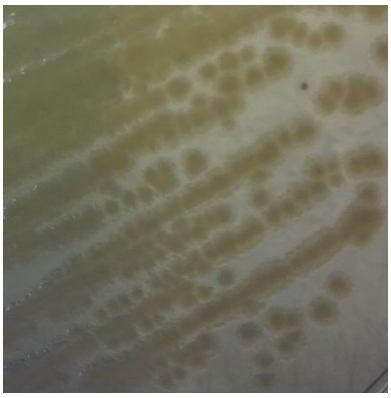
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51591

Pseudomonas aeruginosa, Strain MRSN 18803

Catalog No. NR-51591

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 18803 was isolated in 2013 from a human respiratory sample as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 18803 was deposited as sensitive to amikacin, cefepime, ceftazidime, gentamicin, imipenem, meropenem and tobramycin, resistant to ciprofloxacin and levofloxacin with intermediate resistance to aztreonam and piperacillin/tazobactam.

Lot: 70025088[1] **Manufacturing Date: 08MAY2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, flat, 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[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Intermediate	Sensitive (8 µg/mL)[4]
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Amikacin	Sensitive	Sensitive (4-8 µg/mL)
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Sensitive (≤ 0.25 µg/mL)[5]
Levofloxacin	Resistant	Sensitive (1 µg/mL)[6]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[7]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 530 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 18803 (GenBank: RXVG01000106.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 18803 (GenBank: RXVG01000106.1)
Purity (post-freeze)[8]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51591 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa,* strain MRSN 18803 was deposited as intermediate to piperacillin/tazobactam,but showed a MIC of 8 µg/mL (interpreted as sensitive) for piperacillin/tazobactam during QC testing. Testing was performed in duplicate
[5]*P. aeruginosa,* strain MRSN 18803 was deposited as resistant to ciprofloxacin, but showed a MIC of ≤ 0.25 µg/mL (interpreted as sensitive) for ciprofloxacin during QC testing. Testing was performed in duplicate

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[6]*P. aeruginosa,* strain MRSN 18803 was deposited as resistant to levofloxacin, but showed a MIC of ≤ 1 µg/mL (interpreted as sensitive) for levofloxacin during QC testing. Testing was performed in duplicate

[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.

[8]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology

/Heather Couch/
Heather Couch 11 FEB 2020
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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 human tissue as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 18855 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin.

Lot: 70025090[1] **Manufacturing Date: 01AUG2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	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[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (8 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 18855 (GenBank: RXVF01000133.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 18855 (GenBank: RXVF01000133.1)
Purity (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51592 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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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 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 18970 was deposited as sensitive to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin.

Lot: 70025092[1] **Manufacturing Date: 01AUG2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, undulate, translucent and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (16 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (≤ 2 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 160 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1410 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 (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51593 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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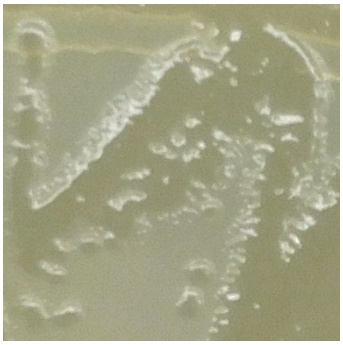
Figure 1: Colony Morphology



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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 as part of a surveillance program in the United States. NR-51594 was deposited as sensitive to amikacin, ciprofloxacin, gentamicin and tobramycin and resistant to aztreonam, imipenem and meropenem with intermediate resistance to cefepime, ceftazidime, levofloxacin and piperacillin/tazobactam.

Lot: 70025094[1] **Manufacturing Date: 01AUG2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, convex, undulate, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (97%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Intermediate	Resistant (≥ 128 µg/mL)[4]
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Intermediate	Intermediate (16 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)
Meropenem	Resistant	Resistant (≥16 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Levofloxacin	Intermediate	Sensitive (2 µg/mL)[5]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1420 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 (post-freeze)[7]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51594 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa* strain MRSN 19711 was deposited as intermediately resistant to piperacillin/tazobactam. Repeated antibiotic susceptibility testing determined that strain MRSN 19711 is resistant to piperacillin/tazobactam.
[5]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

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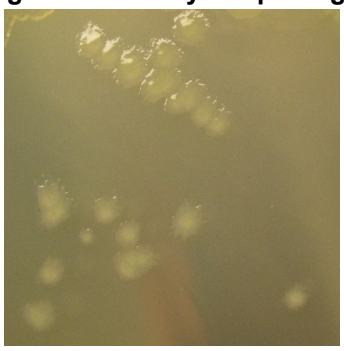
[6]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.
[7]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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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 groin in Afghanistan as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 20176 was deposited as sensitive to meropenem and resistant to aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, piperacillin/tazobactam and tobramycin with intermediate resistance to amikacin.

Lot: 70025096[1] **Manufacturing Date: 31JUL2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, slightly peaked, undulate, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (97%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Meropenem	Sensitive	Sensitive (1 µg/mL)
Amikacin	Intermediate	Resistant (≥ 64 µg/mL)[4]
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Resistant (≥ 16 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/Sulfamethoxazole	Report results	≥ 320 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1410 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 (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51595 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa,* strain MRSN 20176 was deposited as intermediate to amikacin, but showed a MIC of ≥ 64 µg/mL (interpreted as resistant) for tobramycin during QC testing. Testing was performed in duplicate.

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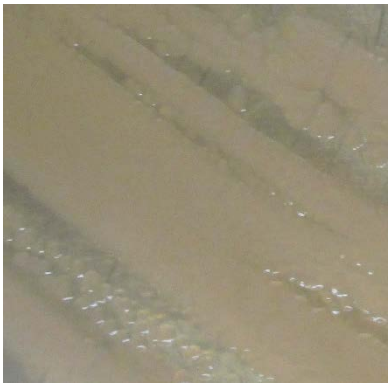
[5]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51596

Pseudomonas aeruginosa, Strain MRSN 20190

Catalog No. NR-51596

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 20190 was isolated in 2013 from human tissue as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 20190 was deposited as resistant to amikacin, aztreonam, cefepime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, piperacillin/tazobactam and tobramycin.

Lot: 70025098[1] **Manufacturing Date: 01AUG2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, entire, smooth and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (96%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Resistant	Resistant (≥ 64 µg/mL)
Gentamicin	Resistant	Resistant (≥ 16 µg/mL)
Tobramycin	Resistant	Intermediate (8 µg/mL)[4]
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	160 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 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 (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51596 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa* strain MRSN 20190 was deposited as resistant to tobramycin. Repeated antibiotic susceptibility testing determined that strain MRSN 20190 is intermediately resistant to tobramycin.
[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.
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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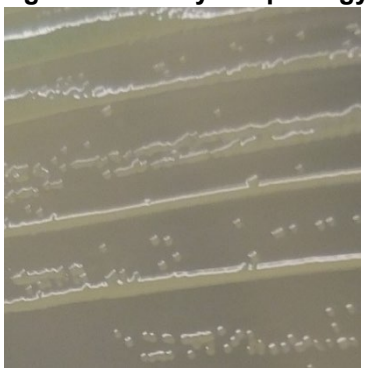
Figure 1: Colony Morphology



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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 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 23861 was deposited as sensitive to amikacin, ceftazidime, gentamicin and tobramycin and resistant to aztreonam, cefepime, ciprofloxacin, imipenem, levofloxacin and meropenem, with intermediate resistance to piperacillin/tazobactam.

Lot: 70025100[1] **Manufacturing Date: 17JUL2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	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* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Intermediate	Resistant (≥ 128 µg/mL)[4]
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Intermediate (16 µg/mL)[4]
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (4 µg/mL)
Tobramycin	Sensitive	Intermediate (8 µg/mL)[5]
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (1460 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 (post-freeze)[7]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51597 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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 23861 was deposited as sensitive to tobramycin. Repeated antibiotic susceptibility testing determined that strain MRSN 23861 is intermediately resistant to tobramycin.

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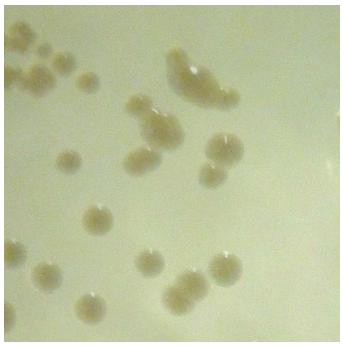
[6]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.
[7]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51598

Pseudomonas aeruginosa, Strain MRSN 25623

Catalog No. NR-51598

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 25623 was isolated in 2014 from a human respiratory sample as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 25623 was deposited as sensitive to piperacillin/tazobactam, cefepime, ceftazidime, amikacin, gentamicin and tobramycin and resistant to aztreonam, imipenem, meropenem, ciprofloxacin and levofloxacin.

Lot: 70025102[1] **Manufacturing Date: 01AUG2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Irregular, low convex, 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[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 25623 (GenBank: RXUO01000089.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 25623 (GenBank: RXUO01000089.1)
Purity (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51598 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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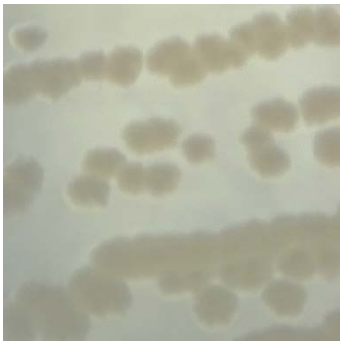
Figure 1: Colony Morphology



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Certificate of Analysis for NR-51599

Pseudomonas aeruginosa, Strain MRSN 25678

Catalog No. NR-51599

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 25678 was isolated from human urine in 2014 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 25678 was deposited as sensitive to amikacin, imipenem and tobramycin and resistant to aztreonam, ciprofloxacin, cefepime and levofloxacin, with intermediate resistance to ceftazidime, gentamicin, meropenem and piperacillin/tazobactam.

Lot: 70025104[1] **Manufacturing Date: 01AUG2020**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	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* (97%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Intermediate	Sensitive (16 µg/mL)[4]
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Intermediate	Intermediate (16 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Meropenem	Intermediate	Intermediate (2-4 µg/mL)
Amikacin	Sensitive	Intermediate (32 µg/mL)[5]
Gentamicin	Intermediate	Sensitive (4 µg/mL)[4]
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Intermediate (2 µg/mL)[6]
Levofloxacin	Resistant	Intermediate (4 µg/mL)[7]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[8]
Etest® antibiotic test strips[9]		
Gentamicin	Intermediate	Intermediate (12 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1400 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 (post-freeze)[10]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51599 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]The susceptibility result for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

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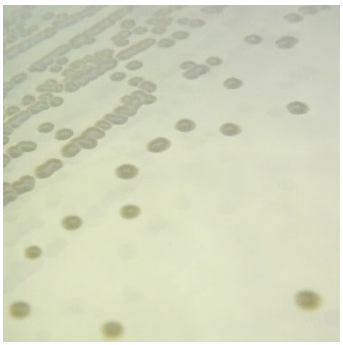
[5]*P. aeruginosa,* strain MRSN 25678 was deposited as sensitive to amikacin, but showed a MIC of 32 µg/mL (interpreted as intermediate) for amikacin during QC testing. Testing was performed in duplicate.
[6]*P. aeruginosa,* strain MRSN 25678 was deposited as resistant to ciprofloxacin, but showed a MIC of 2 µg/mL (interpreted as intermediate) for ciprofloxacin during QC testing. Testing was performed in duplicate.
[7]*P. aeruginosa,* strain MRSN 25678 was deposited as resistant to levofloxacin, but showed a MIC of 4 µg/mL (interpreted as intermediate) for levofloxacin during QC testing. Testing was performed in duplicate.
[8]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.
[9]1 day at 37°C in an aerobic atmosphere on Mueller Hinton agar
[10]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51600

Pseudomonas aeruginosa, Strain MRSN 25762

Catalog No. NR-51600

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 25762 is a human respiratory isolate collected in 2014 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 25762 was deposited as sensitive to amikacin, aztreonam, ceftazidime, ciprofloxacin, gentamicin, levofloxacin, tobramycin and piperacillin/tazobactam and resistant to imipenem and meropenem, with intermediate resistance to cefepime.

Lot: 70025106[1] **Manufacturing Date: 18JUL2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	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* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Intermediate	Intermediate (16 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Intermediate (32 µg/mL)[4]
Gentamicin	Sensitive	Intermediate (8 µg/mL)[5]
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 to 2 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 25762 (GenBank: RXUM01000052.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 25762 (GenBank: RXUM01000052.1)
Purity (post-freeze)[7]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51600 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa,* strain MRSN 25762 was deposited as sensitive to amikacin, but showed a MIC of 32 µg/mL (interpreted as intermediate) for amikacin during QC testing. Testing was performed in duplicate.
[5]Susceptibilty results for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.

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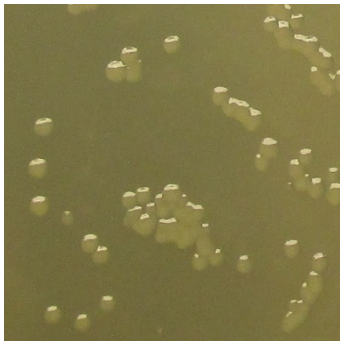
[6]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however, most clinical isolates are resistant to trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.
[7]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51601

Pseudomonas aeruginosa, Strain MRSN 26263

Catalog No. NR-51601

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 26263 was isolated in 2014 from a human respiratory sample as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 26263 was deposited as sensitive to piperacillin/tazobactam, cefepime, levofloxacin, amikacin, gentamicin, aztreonam, meropenem and imipenem and resistant to tobramycin and ciprofloxacin with intermediate resistance to ceftazidime.

Lot: 70025108[1] **Manufacturing Date: 18JUL2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, convex, entire, smooth and cream (Figure 1) Plaques observed
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (≥ 94%)
Antibiotic Susceptibility Profile[3]		
Sensititre™ System[4]		
Amikacin	Report results	Intermediate (32 µg/mL)
Aztreonam	Report results	Sensitive (4-8 µg/mL)
Cefepime	Report results	Sensitive (8 µg/mL)
Cefotaxime	Report results	Resistant (> 32 µg/mL)
Ceftazidime	Report results	Sensitive (≤ 2 µg/mL)
Ciprofloxacin	Report results	Resistant (> 2 µg/mL)
Colistin	Report results	Sensitive (≤ 0.25 µg/mL)
Doripenem	Report results	Non-susceptible (> 2 µg/mL)
Doxycycline	Report results	8 µg/mL[5]
Ertapenem	Report results	> 4 µg/mL[5]
Gentamicin	Report results	Resistant (> 8 µg/mL)
Imipenem	Report results	Resistant (8 µg/mL)
Levofloxacin	Report results	Intermediate (4 µg/mL)[6]
Meropenem	Report results	Resistant (8 µg/mL)[6]
Minocycline	Report results	8 µg/mL[5]
Piperacillin/tazobactam	Report results	Sensitive (8 µg/mL)[6]
Polymyxin B	Report results	Sensitive (≤ 0.25 µg/mL)
Ticarcillin/clavulanic acid	Report results	Intermediate (32-64 µg/mL)
Tigecycline	Report results	4 µg/mL[5]
Tobramycin	Report results	Sensitive (4 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	> 4 µg/mL[7]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1420 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 26263 (GenBank: RXUL01000092.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 26263 (GenBank: RXUL01000092.1)
Purity (post-freeze)[8]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

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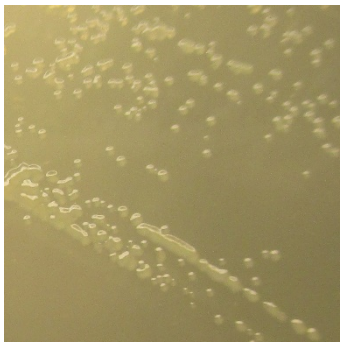
[1]NR-51601 was produced by inoculation of the depositor material into Tryptic Soy broth and grown for 1 day at 37°C in an aerobic atmosphere. Broth inoculum was added to Tryptic Soy agar kolles, which were grown for 1 day at 37°C in an aerobic atmosphere to produce this lot.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]Sensititre™ Gram Negative GNX2F with colistin, Thermo Scientific™, catalog number GNX2F
[5]No Clinical & Laboratory Standards Institute (CLSI) interpretation for this antibiotic is currently available.
[6]Results manually read
[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.
[8]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51602

Pseudomonas aeruginosa, Strain MRSN 29192

Catalog No. NR-51602

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 29192 was isolated from human urine in 2015 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 29192 was deposited as sensitive to amikacin, gentamicin and tobramycin and resistant to aztreonam, ceftazidime, ciprofloxacin, cefepime, levofloxacin, meropenem and piperacillin/tazobactam with intermediate resistance to imipenem.

Lot: 70025110[1] **Manufacturing Date: 02AUG2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, convex, entire, smooth and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (16 µg/mL)
Gentamicin	Sensitive	Intermediate (8 µg/mL)[4]
Tobramycin	Sensitive	Sensitive (2 µg/mL)
Ciprofloxacin	Resistant	Sensitive (1 µg/mL)[5]
Levofloxacin	Resistant	Intermediate (4 µg/mL)[6]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[7]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1460 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 (post-freeze)[8]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51602 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa,* strain MRSN 29192 was deposited as sensitive to gentamicin, but showed a MIC of 8 µg/mL (interpreted as intermediate) for gentamicin during QC testing. Testing was performed in quadruplicate.
[5]*P. aeruginosa,* strain MRSN 29192 was deposited as resistant to ciprofloxacin, but showed a MIC of 1 µg/mL (interpreted as sensitive) for ciprofloxacin during QC testing. Testing was performed in quadruplicate.

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[6]*P. aeruginosa,* strain MRSN 29192 was deposited as resistant to levofloxacin, but showed a MIC of 4 µg/mL (interpreted as intermediate) for levofloxacin during QC testing. Testing was performed in quadruplicate.
[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.
[8]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology

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Certificate of Analysis for NR-51603

Pseudomonas aeruginosa, Strain MRSN 30858

Catalog No. NR-51603

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 30858 is a human respiratory isolate collected in 2015 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 30858 was deposited as sensitive to amikacin, ceftazidime, ciprofloxacin, cefepime, gentamicin, levofloxacin, tobramycin and piperacillin/tazobactam and resistant to aztreonam, imipenem and meropenem.

Lot: 70025112[1] **Manufacturing Date: 02AUG2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	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* (97%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (16-32 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (8 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (8 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 4 µg/mL)
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (1-2 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[4]
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 (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51603 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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Figure 1: Colony Morphology

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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 is a human respiratory isolate collected in 2015 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 346179 was deposited as sensitive to amikacin, aztreonam, ceftazidime, ciprofloxacin, cefepime, gentamicin, imipenem, levofloxacin, meropenem, tobramycin and piperacillin/tazobactam.

Lot: 70025114[1] **Manufacturing Date: 02AUG2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Irregular, low convex, undulate and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (97%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/Clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/Tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Sensitive	Sensitive (0.5 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.5 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 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 346179 (GenBank: RXUF01000011.1)	100% sequence identity to *P. aeruginosa,* strain MRSN 346179 (GenBank: RXUF01000011.1)
Purity (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51604 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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Figure 1: Colony Morphology

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Certificate of Analysis for NR-51605

Pseudomonas aeruginosa, Strain MRSN 351791

Catalog No. NR-51605

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 351791 was isolated from human urine in 2015 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 351791 was deposited as sensitive to amikacin, ceftazidime, cefepime, gentamicin, imipenem, meropenem and piperacillin/tazobactam and resistant to aztreonam, ciprofloxacin and levofloxacin, with intermediate resistance to tobramycin.

Lot: 70025116[1] **Manufacturing Date: 02AUG2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology[2]	Gram-negative rods	Gram-negative rods
Colony morphology	Report results	Irregular, slight peaked, undulate, opaque and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Amikacin	Sensitive	Sensitive (4-8 µg/mL)
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Tobramycin	Intermediate	Sensitive (≤ 1 µg/mL)[4]
Ciprofloxacin	Resistant	Sensitive (≤ 0.25 µg/mL)[5]
Levofloxacin	Resistant	Sensitive (0.5 µg/mL)[6]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	80 µg/mL[7]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1400 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 (post-freeze)[8]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51605 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa*, strain MRSN 351791 was deposited as intermediate to tobramycin, but showed a MIC of ≤ 1 µg/mL (interpreted as sensitive) for tobramycin during QC testing. Testing was performed in duplicate.
[5]*P. aeruginosa*, strain MRSN 351791 was deposited as resistant to ciprofloxacin, but showed a MIC of ≤ 0.25 µg/mL (interpreted as sensitive) for ciprofloxacin during QC testing. Testing was performed in duplicate.

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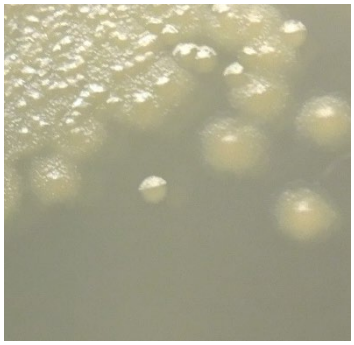
[6]*P. aeruginosa*, strain MRSN 351791 was deposited as resistant to levofloxacin, but showed a MIC of 0.5 µg/mL (interpreted as sensitive) for levofloxacin during QC testing. Testing was performed in duplicate.
[7]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, 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.
[8]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51606

Pseudomonas aeruginosa, Strain MRSN 358800

Catalog No. NR-51606

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 358800 was isolated in 2015 from a human respiratory sample as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 358800 was deposited as sensitive to tobramycin, resistant to cefepime, levofloxacin, ceftazidime, gentamicin, aztreonam, meropenem, imipenem and ciprofloxacin and intermediately resistant to piperacillin/tazobactam and amikacin.

Lot: 70025118[1] **Manufacturing Date: 01AUG2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, entire, smooth, translucent and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Sensitive (8 µg/mL)[4]
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 32 µg/mL)
Amikacin	Intermediate	Sensitive (8-16 µg/mL)[5]
Gentamicin	Resistant	Sensitive (8 µg/mL)[6]
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 160 µg/mL[7]
Etest® antibiotic test strips[8]		
Meropenem	Resistant	Resistant (> 32 µg/mL)
Piperacillin/tazobactam	Intermediate	Intermediate (64 µg/mL)
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1430 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 (post-freeze)[9,10]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51606 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa* strain MRSN 358800 was deposited as resistant to ceftazidime. Repeated antibiotic susceptibility testing determined that strain MRSN 358800 is sensitive to ceftazidime.

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[5]*P. aeruginosa* strain MRSN 358800 was deposited as intermediately resistant to amikacin. Repeated antibiotic susceptibility testing determined that strain MRSN 358800 is sensitive to amikacin.
[6]*P. aeruginosa* strain MRSN 358800 was deposited as resistant to gentamicin. Repeated antibiotic susceptibility testing determined that strain MRSN 358800 is sensitive to gentamicin.
[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.
[8]1 day at 37°C in an aerobic atmosphere on Mueller Hinton agar
[9]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.
[10]Two colony types were observed after 1 day under propagation conditions. 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 have 100% sequence identity to the other colony type and to *P. aeruginosa*, strain MRSN 358800 (GenBank: RXUD01000144.1).

Figure 1: Colony Morphology

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Certificate of Analysis for NR-51607

Pseudomonas aeruginosa, Strain MRSN 369569

Catalog No. NR-51607

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 369569 was isolated in 2015 from a human blood sample as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 369569 was deposited as sensitive to meropenem, amikacin, gentamicin, tobramycin and imipenem, intermediately resistant to piperacillin/tazobactam and resistant to levofloxacin, ceftazidime, cefepime, aztreonam and ciprofloxacin.

Lot: 70025120[1] **Manufacturing Date: 08AUG2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	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[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Intermediate	Intermediate (32 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Intermediate (16 µg/mL)[4]
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Sensitive (8 µg/mL)[5]
Meropenem	Sensitive	Sensitive (0.5 µg/mL)
Amikacin	Sensitive	Sensitive (16 µg/mL)
Gentamicin	Sensitive	Sensitive (2 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥320 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1420 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 (post-freeze)[7]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51607 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa* strain MRSN 369569 was deposited as resistant to ceftazidime. Repeated antibiotic susceptibility testing determined that strain MRSN 358800 is intermediately resistant to ceftazidime.
[5]*P. aeruginosa* strain MRSN 369569 was deposited as resistant to cefepime. Repeated antibiotic susceptibility testing determined that strain MRSN 358800 is sensitive to ceftazidime.

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[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.
[7]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology

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Heather Couch 16 DEC 2019
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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 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 373401 was deposited as sensitive to piperacillin/tazobactam, cefepime, levofloxacin, ceftazidime, amikacin, gentamicin, tobramycin, aztreonam and ciprofloxacin and resistant to imipenem with intermediate resistance to meropenem.

Lot: 70025122[1] **Manufacturing Date: 07AUG2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Irregular, slight peak, undulate, rough, opaque and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (32 µg/mL)
Cefepime	Sensitive	Sensitive (≤ 2 µg/mL)
Meropenem	Intermediate	Intermediate (4 µg/mL)
Amikacin	Sensitive	Sensitive (≤ 2 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (0.25 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	80 µg/mL[4]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1420 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 (post-freeze)[5]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51608 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[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.
[5]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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Figure 1: Colony Morphology

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Certificate of Analysis for NR-51609

Pseudomonas aeruginosa, Strain MRSN 390231

Catalog No. NR-51609

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 390231 was isolated in 2016 as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 390231 was deposited as sensitive to amikacin, imipenem, cefepime, levofloxacin, ceftazidime, meropenem, gentamicin and tobramycin and intermediate to aztreonam, ciprofloxacin and piperacillin/tazobactam.

Lot: 70025124[1] **Manufacturing Date: 07AUG2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, entire, smooth, mucoid and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (93%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Intermediate	Resistant (≥ 128 µg/mL)[4]
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (8 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Sensitive	Resistant (≥ 64 µg/mL)[5]
Meropenem	Sensitive	Sensitive (2 µg/mL)
Amikacin	Sensitive	Sensitive (16 µg/mL)
Gentamicin	Sensitive	Intermediate (8 µg/mL)[6]
Tobramycin	Sensitive	Sensitive (2 µg/mL)
Ciprofloxacin	Intermediate	Intermediate (2 µg/mL)
Levofloxacin	Sensitive	Resistant (≥ 8 µg/mL)[7]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	40 µg/mL[8]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1420 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 390231 (GenBank: RXTZ01000026.1)	100% sequence identity to *P. aeruginosa*, strain MRSN 390231 (GenBank: RXTZ01000026.1)
Purity (post-freeze)[9]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51609 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa,* strain MRSN 390231 was deposited as intermediate to piperacillin/tazobactam but showed a MIC of ≥ 128 µg/mL (interpreted as resistant) for piperacillin/tazobactam during QC testing. Testing was performed in duplicate.
[5]*P. aeruginosa,* strain MRSN 390231 was deposited as sensitive to cefepime, but showed a MIC of ≥ 64 µg/mL (interpreted as resistant) for cefepime during QC testing. Testing was performed in duplicate.
[6]Susceptibilty results for gentamicin is within one doubling dilution of specification, which is considered an equivalent result.

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[7]*P. aeruginosa,* strain MRSN 390231 was deposited as sensitive to levofloxacin, but showed a MIC of ≥ 8 µg/mL (interpreted as resistant) for levofloxacin during QC testing. Testing was performed in duplicate.
[8]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.
[9]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology

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Certificate of Analysis for NR-51610

Pseudomonas aeruginosa, Strain MRSN 401528

Catalog No. NR-51610

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 401528 was isolated in 2016 from a human urine sample as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 401528 was deposited as sensitive to amikacin, ceftazidime, imipenem, cefepime, piperacillin/tazobactam, meropenem, gentamicin and tobramycin, intermediate to levofloxacin, ciprofloxacin and resistant to aztreonam.

Lot: 70025126[1] **Manufacturing Date: 01AUG2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, raised, 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[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (8-16 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (4 µg/mL)
Ceftriaxone	Report results	Resistant (16 µg/mL)
Cefepime	Sensitive	Sensitive (8 µg/mL)
Meropenem	Sensitive	Sensitive (2 µg/mL)
Amikacin	Sensitive	Sensitive (4 µg/mL)
Gentamicin	Sensitive	Sensitive (4 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Intermediate	Sensitive (0.5 µg/mL)[4]
Levofloxacin	Intermediate	Intermediate (4 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 660 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 (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51610 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]Susceptibility results 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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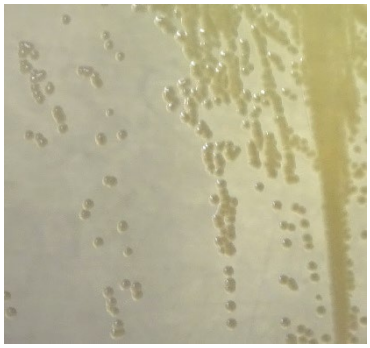
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51611

Pseudomonas aeruginosa, Strain MRSN 409937

Catalog No. NR-51611

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 409937 was isolated in 2016 from human fluid as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 409937 was deposited as sensitive to amikacin, gentamicin, imipenem and tobramycin and resistant to aztreonam, cefepime, ceftazidime, ciprofloxacin, levofloxacin, meropenem and piperacillin/tazobactam.

Lot: 70025128[1] **Manufacturing Date: 26JUL2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, flat, undulate, opaque and green (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Resistant	Resistant (≥ 128 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Resistant	Resistant (≥ 64 µg/mL)
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Meropenem	Resistant	Intermediate (4 µg/mL)[4]
Amikacin	Sensitive	Sensitive (4 µg/mL)
Gentamicin	Sensitive	Sensitive (≤ 1 µg/mL)
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Resistant (≥ 4 µg/mL)
Levofloxacin	Resistant	Resistant (≥ 8 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1420 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 409937 (GenBank: RXTX01000079.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 409937 (GenBank: RXTX01000079.1)
Purity (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51611 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa*, strain MRSN 409937 was deposited as resistant to meropenem. Antibiotic susceptibility testing performed in duplicate identified strain MRSN 409937 as having an intermediate resistance to meropenem.
[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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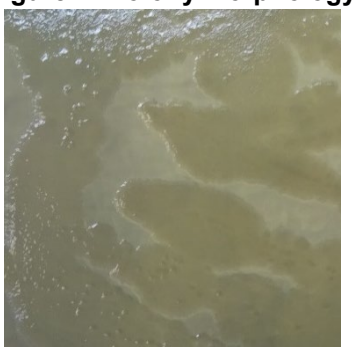
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51612

Pseudomonas aeruginosa, Strain MRSN 435288

Catalog No. NR-51612

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 435288 was isolated in 2016 from a human sputum sample as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 435288 was deposited as sensitive to amikacin, aztreonam, ceftazidime, cefepime, piperacillin/tazobactam, meropenem, and tobramycin, intermediately resistant to imipenem, gentamicin and resistant to levofloxacin and ciprofloxacin.

Lot: 70025130[1] **Manufacturing Date: 02AUG2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, convex, entire, glistening and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (98%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic Acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (≤ 1 µg/mL)
Ceftriaxone	Report results	Intermediate (8-16 µg/mL)
Cefepime	Sensitive	Sensitive (2 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Amikacin	Sensitive	Intermediate (32 µg/mL)[4]
Gentamicin	Intermediate	Sensitive (4 µg/mL)[4]
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Resistant	Inconclusive[5]
Levofloxacin	Resistant	Intermediate (4 µg/mL)[4]
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[6]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1420 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 (post-freeze)[7]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51612 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]Susceptibilty results for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.
[5]*P. aeruginosa*, strain MRSN 435288 was deposited as resistant to ciprofloxacin. Repeated antibiotic susceptibility testing determined that for strain MRSN 435288, the ciprofloxacin MICs are 1 µg/mL and 2 µg/mL, which are interpreted as sensitive and intermediate, respectively.
[6]Trimethoprim/sulfamethoxazole MIC interpretive standards are not available for *P. aeruginosa*, however most clinical isolates are resistant to

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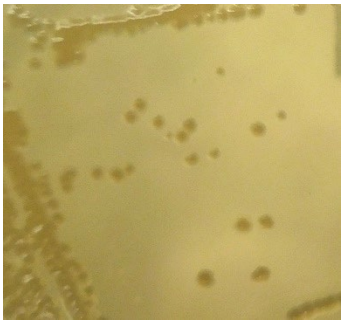
trimethoprim/sulfamethoxazole. For more information, please refer to Köhler, T., et al. "Multidrug Efflux in Intrinsic Resistance to Trimethoprim and Sulfamethoxazole in *Pseudomonas aeruginosa*." Antimicrob. Agents Chemother. 40 (1996): 2288-2290. PubMed: 9036831.

[7]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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Certificate of Analysis for NR-51613

Pseudomonas aeruginosa, Strain MRSN 436311

Catalog No. NR-51613

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Product Description:

Pseudomonas aeruginosa (P. aeruginosa), strain MRSN 436311 was isolated in 2016 from human urine as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 436311 was deposited as sensitive to amikacin, ceftazidime, gentamicin and tobramycin and resistant to imipenem, cefepime, meropenem and aztreonam, with intermediate resistance to levofloxacin, ciprofloxacin and piperacillin/tazobactam.

Lot: 70025132[1] **Manufacturing Date: 02AUG2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2,3]	Report results	Colony type 1: Circular, convex, entire, smooth and cream (Figure 1) Colony type 2: Irregular, low convex, undulate, opaque, rough and white (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (≥ 98%)
Antibiotic Susceptibility Profile[4,5]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Intermediate	Intermediate (32 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Intermediate (8 µg/mL)[6]
Ceftriaxone	Report results	Resistant (≥ 64 µg/mL)
Cefepime	Resistant	Resistant (≥ 64 µg/mL)
Meropenem	Resistant	Resistant (≥ 16 µg/mL)
Amikacin	Sensitive	Sensitive (16 µg/mL)
Gentamicin	Sensitive	Intermediate (8 µg/mL)[6]
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Intermediate	Sensitive (≤ 1 µg/mL)[7]
Levofloxacin	Intermediate	Intermediate (4 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≥ 320 µg/mL[8]
Etest® antibiotic test strips[9]		
Ciprofloxacin	Intermediate	Intermediate (1.5 µg/mL)
Levofloxacin	Intermediate	Resistant (8 µg/mL)[10]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1410 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 (post-freeze)[11]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51613 was produced by inoculation of the depositor material 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.

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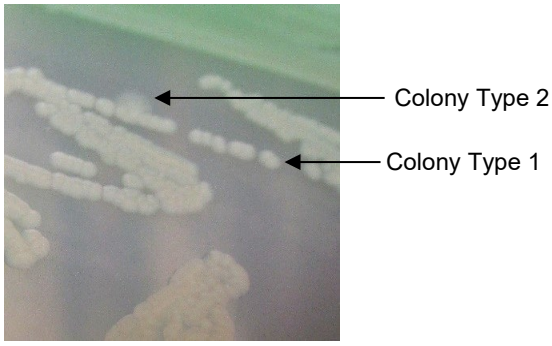
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Two colony types were observed. Plating of the individual colony types showed that they did not revert to the mixed colony type. VITEK® MS (MALDI-TOF) analysis identified the cells from both colony types as *P. aeruginosa*. The 16S ribosomal RNA gene of each colony type was sequenced and found to have 100% sequence identity to the other colony type and to *P. aeruginosa* strain MRSN 436311 (GenBank: RXTV01000033.1).
[4]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[5]Antibiotic susceptibility testing was performed using a mixed colony suspension.
[6]Susceptibilty results for this antibiotic is within one doubling dilution of specification, which is considered an equivalent result.
[7]*P. aeruginosa,* strain MRSN 436311 was deposited as intermediate to ciprofloxacin, but showed a MIC of ≤ 1 µg/mL (interpreted as sensitive) for ciprofloxacin during QC testing. Testing was performed 6 times.
[8]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.
[9]1 day at 37°C in an aerobic atmosphere on Mueller Hinton agar
[10]*P. aeruginosa,* strain MRSN 436311 was deposited as intermediate to levofloxacin, but showed a MIC of 8 µg/mL (interpreted as resistant) for levofloxacin during QC testing. Testing was performed in duplicate.
[11]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

Figure 1: Colony Morphology



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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 human sputum as part of a surveillance program in the United States. *P. aeruginosa*, strain MRSN 443463 was deposited as sensitive to amikacin, ceftazidime, imipenem, cefepime, piperacillin/tazobactam, meropenem, gentamicin, tobramycin, levofloxacin, ciprofloxacin and aztreonam.

Lot: 70025134[1] **Manufacturing Date: 07AUG2019**

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis		
Cellular morphology	Gram-negative rods	Gram-negative rods
Colony morphology[2]	Report results	Circular, low convex, entire, smooth, mucoid and cream (Figure 1)
Motility (wet mount)	Report results	Motile
VITEK® 2 (GN card)	*P. aeruginosa* (≥ 89%)	*P. aeruginosa* (99%)
Antibiotic Susceptibility Profile[3]		
VITEK® (AST-GN81 Card)		
Ampicillin	Report results	Resistant (≥ 32 µg/mL)
Amoxicillin/clavulanic acid	Report results	Resistant (≥ 32 µg/mL)
Piperacillin/tazobactam	Sensitive	Sensitive (≤ 4 µg/mL)
Cefazolin	Report results	Resistant (≥ 64 µg/mL)
Cefoxitin	Report results	Resistant (≥ 64 µg/mL)
Ceftazidime	Sensitive	Sensitive (2 µg/mL)
Ceftriaxone	Report results	Intermediate (32 µg/mL)
Cefepime	Sensitive	Sensitive (4 µg/mL)
Meropenem	Sensitive	Sensitive (≤ 0.25 µg/mL)
Amikacin	Sensitive	Sensitive (16 µg/mL)
Gentamicin	Sensitive	Intermediate (8 µg/mL)[4]
Tobramycin	Sensitive	Sensitive (≤ 1 µg/mL)
Ciprofloxacin	Sensitive	Sensitive (≤ 0.25 µg/mL)
Levofloxacin	Sensitive	Sensitive (1 µg/mL)
Tetracycline	Report results	Resistant (≥ 16 µg/mL)
Nitrofurantoin	Report results	Resistant (≥ 512 µg/mL)
Trimethoprim/sulfamethoxazole	Report results	≤ 20 µg/mL[5]
Genotypic Analysis		
Sequencing of 16S ribosomal RNA gene (~ 1420 base pairs)	≥ 99% sequence identity to *P. aeruginosa*, strain MRSN 443463 (GenBank: RXTU01000100.1)	99.9% sequence identity to *P. aeruginosa*, strain MRSN 443463 (GenBank: RXTU01000100.1)
Purity (post-freeze)[6]	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)[2]	Growth	Growth

[1]NR-51614 was produced by inoculation of the depositor material 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.
[2]1 day at 37°C in an aerobic atmosphere on Tryptic Soy agar
[3]Minimum Inhibitory Concentration (MIC); MIC Interpretation Guideline: CLSI M100-S28 (2018)
[4]*P. aeruginosa*, strain MRSN 443463 was deposited as sensitive to gentamicin. Antibiotic susceptibility testing performed in duplicate determined that strain MRSN 443463 is intermediately resistant to gentamicin.
[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.
[6]Purity of this lot was assessed for 7 days at 37°C in an aerobic atmosphere with and without 5% CO_2 on Tryptic Soy agar.

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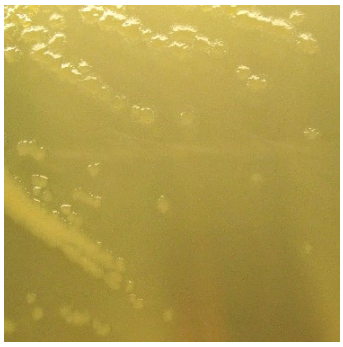
Figure 1: Colony Morphology



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