

***Pseudomonas aeruginosa*, Strain MRSN 321**

**Catalog No. NR-51517**

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**Contributor:**

Multidrug-Resistant Organism Repository and Surveillance Network (MRSN), Bacterial Disease Branch, Walter Reed Army Institute of Research, Silver Spring, Maryland, USA

**Manufacturer:**

BEI Resources

**Product Description:**

Bacteria Classification: *Pseudomonadaceae*, *Pseudomonas*

Species: *Pseudomonas aeruginosa*

Strain: MRSN 321

Original Source: *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.<sup>1</sup>

Comments: *P. aeruginosa*, strain MRSN 321 was deposited as part of the MRSN *Pseudomonas aeruginosa* Diversity Panel available from BEI Resources as NR-51829. NR-51517 was deposited as multi-locus sequence type (MLST) ST 663, sensitive to amikacin, ciprofloxacin, gentamicin, levofloxacin and tobramycin, intermediately resistant to cefepime and resistant to aztreonam, ceftazidime, imipenem, meropenem and piperacillin/tazobactam. Strain MRSN 321 is reported to have a chromosomal aminoglycoside phosphotransferase gene [*aph*(3')-IIb; conferring resistance to kanamycin A and B, neomycin B and C, butirosin and seldomycin F5], two beta-lactamase genes (*bla*<sub>OXA-50</sub> and *bla*<sub>PAO</sub>; conferring resistance to beta-lactams), a chloramphenicol acetyltransferase enzyme gene (*cat* B7; conferring resistance to chloramphenicol) and a fosfomycin-inactivating gene (*fosA*; conferring resistance to fosfomycin).<sup>1</sup> The complete genome of *P. aeruginosa*, strain MRSN 321 is available (GenBank: [RXUG000000000](https://www.ncbi.nlm.nih.gov/nuclseq/RXUG000000000)).

Note: Environmental and clinical isolates of *P. aeruginosa* frequently contain viruses known as prophages.<sup>2</sup> During growth, some strains from the *Pseudomonas aeruginosa* Diversity Panel displayed plaques resulting from the activation of their inherent prophages. Please refer to the Certificate of Analysis to determine if phage plaques were observed for this strain.

*P. aeruginosa* is a Gram-negative, aerobic, rod-shaped bacterium with unipolar motility that thrives in many diverse environments including soil, water and certain eukaryotic hosts. It is a key emerging opportunistic pathogen in animals, including humans and plants. While it rarely infects healthy individuals, *P. aeruginosa* causes severe acute and chronic nosocomial infections in immunocompromised or catheterized patients, especially in patients with cystic fibrosis, burns,

cancer or HIV.<sup>3-5</sup> Infections of this type are often highly antibiotic resistant, difficult to eradicate and often lead to death. The ability of *P. aeruginosa* to survive on minimal nutritional requirements, tolerate a variety of physical conditions and rapidly develop resistance during the course of therapy has allowed it to persist in both community and hospital settings.<sup>5,6</sup>

**Material Provided:**

Each vial contains approximately 0.5 mL of bacterial culture in Tryptic Soy broth supplemented with 10% glycerol.

Note: If homogeneity is required for your intended use, please purify prior to initiating work.

**Packaging/Storage:**

NR-51517 was packaged aseptically in cryovials. The product is provided frozen and should be stored at -60°C or colder immediately upon arrival. For long-term storage, the vapor phase of a liquid nitrogen freezer is recommended. Freeze-thaw cycles should be avoided.

**Growth Conditions:**

Media:

Tryptic Soy broth or Brain Heart Infusion broth or Nutrient broth or equivalent

Tryptic Soy agar with 5% defibrinated sheep blood or Brain Heart Infusion agar or Nutrient agar or equivalent

Incubation:

Temperature: 37°C

Atmosphere: Aerobic

Propagation:

1. Keep vial frozen until ready for use, then thaw.
2. Transfer the entire thawed aliquot into a single tube of broth.
3. Use several drops of the suspension to inoculate an agar slant and/or plate.
4. Incubate the tube, slant and/or plate at 37°C for 1 day.

**Citation:**

Acknowledgment for publications should read "The following reagent was obtained through BEI Resources, NIAID, NIH: *Pseudomonas aeruginosa*, Strain MRSN 321, NR-51517. This strain is part of the *Pseudomonas aeruginosa* Diversity Panel provided by the Multidrug-Resistant Organism Repository and Surveillance Network (MRSN) at the Walter Reed Army Institute of Research (WRAIR), Silver Spring, MD, USA."

**Biosafety Level: 2**

Appropriate safety procedures should always be used with this material. Laboratory safety is discussed in the following publication: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health. Biosafety in Microbiological and Biomedical Laboratories. 5th ed. Washington, DC: U.S. Government Printing Office, 2009; see [www.cdc.gov/biosafety/publications/bmb15/index.htm](http://www.cdc.gov/biosafety/publications/bmb15/index.htm).

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**References:**

1. McGann, P., Personal Communication.
2. Tsao, Y.-F., et al. "Phage Morons Play an Important Role in *Pseudomonas aeruginosa* Phenotypes." J. Bacteriol. 200 (2018): e00189-18. PubMed: 30150232.
3. Silva Filho, L. V., et al. "*Pseudomonas aeruginosa* Infection in Patients with Cystic Fibrosis: Scientific Evidence Regarding Clinical Impact, Diagnosis, and Treatment." J. Bras. Pneumol. 39 (2013): 495-512. PubMed: 24068273.
4. Dettman, J. R., et al. "Evolutionary Genomics of Epidemic and Nonepidemic Strains of *Pseudomonas aeruginosa*." Proc. Natl. Acad. Sci. USA 110 (2013): 21065-21070. PubMed: 24324153.
5. Morita, Y., J. Tomida and Y. Kawamura. "Responses of *Pseudomonas aeruginosa* to Antimicrobials." Front. Microbiol. 4 (2014): 422. PubMed: 24409175.
6. Lister, P. D., D. J. Wolter and N. D. Hanson. "Antibacterial-Resistant *Pseudomonas aeruginosa*: Clinical Impact and Complex Regulation of Chromosomally Encoded Resistance Mechanisms." Clin. Microbiol. Rev. 22 (2009): 582-610. PubMed: 19822890.

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