

## ***Pseudomonas aeruginosa*, Strain MRSN 994**

### **Catalog No. NR-51519**

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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 994

Original Source: *Pseudomonas aeruginosa* (*P. aeruginosa*), strain MRSN 994 was isolated in 2010 from a human respiratory sample in the United States as part of a global surveillance program.<sup>1</sup>

Comments: *P. aeruginosa*, strain MRSN 994 was deposited as part of the MRSN *Pseudomonas aeruginosa* Diversity Panel available from BEI Resources as NR-51829. NR-51519 was deposited as multi-locus sequence type (MLST) ST 27, sensitive to amikacin, gentamicin and tobramycin and resistant to aztreonam, ceftazidime, ciprofloxacin, cefepime, imipenem, levofloxacin, meropenem and piperacillin/tazobactam. Strain MRSN 994 is reported to have one aminoglycoside aminotransferase gene (*aadA6*; conferring resistance to spectinomycin and streptomycin), one 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), one chloramphenicol acetyltransferase gene (*catB7*; conferring resistance to chloramphenicol), one fosfomycin-inactivating gene (*fosA*; conferring resistance to fosfomycin) and one dihydropteroate synthase gene (*sul1*; conferring resistance to sulfonamides).<sup>1</sup> The complete genome of *P. aeruginosa*, strain MRSN 994 has been sequenced (GenBank: [RXSX00000000](#)).

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>3,4,5</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-51519 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 994, NR-51519. 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)."

#### **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 \(BMBL\)](#), 6th ed. Washington, DC: U.S. Government Printing Office, 2020.

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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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