

**Antimicrobial Resistance Panel 12:
Pseudomonas aeruginosa RND Efflux
Pump Mutants**

Catalog No. NR-55651

For research use only. Not for use in humans.

Contributor:

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Manufacturer:

BEI Resources

Product Description:

NR-55651 consists of a 20-member panel of *Pseudomonas aeruginosa* (*P. aeruginosa*) resistance-nodulation-cell division (RND) family efflux pump mutant strains (Table 1).

Genetic inactivation of efflux pumps can render *Pseudomonas aeruginosa* susceptible to various antibacterial compounds that otherwise lack clinically useful potency. These mutant strains can be used in the screening of efflux pump inhibitors, in addition to their use in investigating the mechanisms of antimicrobial resistance in *P. aeruginosa*.

Detailed information for each mutant strain, including antibiotic susceptibility profile, is available on the individual Certificate of Analysis.

Material Provided:

Each panel contains one vial of each *P. aeruginosa* strain listed in Table 1 for a total of 20 vials. 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-55651 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: Antimicrobial Resistance Panel 12: *Pseudomonas aeruginosa* RND Efflux Pump Mutants, NR-55651."

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.

Disclaimers:

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References:

1. Caughlan, R. E., et al. "Fmt Bypass in *Pseudomonas aeruginosa* Causes Induction of MexXY Efflux Pump Expression." Antimicrob. Agents Chemother. 53 (2009): 5015-5021. PubMed: 19786597.
2. Jones, A. K., et al. "Determinants of Antibacterial Spectrum and Resistance Potential of the Elongation Factor G Inhibitor Argyrin B in Key Gram-negative Pathogens." Antimicrob. Agents Chemother. 61 (2017): PubMed: 28096160.
3. Srijan R., et al. "Target (MexB)- and Efflux-Based Mechanisms Decreasing the Effectiveness of the Efflux Pump Inhibitor D13-9001 in *Pseudomonas aeruginosa* PAO1: Uncovering a New Role for MexMN-OprM in Efflux of β -Lactams and a Novel Regulatory Circuit (MmnRS) Controlling MexMN Expression." Antimicrob. Agents Chemother. 63 (2019): e01718-18. PubMed: 30420483.
4. Reck, F., et al. "Optimization of Novel Monobactams with Activity Against Carbapenem-Resistant Enterobacteriaceae - Identification of LYS228." Bioorg. Med. Chem. Lett. 28 (2018): 748-755. PubMed: 29336873.
5. Sobel, M. L., et al. "Contribution of the MexXY Multidrug Transporter to Aminoglycoside Resistance in *Pseudomonas aeruginosa* Clinical Isolates." Antimicrob. Agents Chemother. 47 (2003): 3202-3207. PubMed: 14506031.
6. Fraud, S., et al. "MexCD-OprJ Multidrug Efflux System of *Pseudomonas aeruginosa*: Involvement in Chlorhexidine Resistance and Induction by Membrane-Damaging Agents Dependent upon the AlgU Stress Response Sigma Factor." Antimicrob. Agents Chemother. 52 (2008): 4478-4482. PubMed: 18838593.

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Table 1: List of Mutant Strains Included in Panel 12

Item No.	Strain	Description	Reference (PubMed)
NR-51901	NB52109-CDR0036 ¹	NB52109 derivative; <i>mexS</i> mutant, MexEF-OprN upregulated	28096160
NR-51912	NB52020-CDS0001	<i>P. aeruginosa</i> PAO1 Δ <i>mexAB-oprM</i> derivative with decreased susceptibility to LBM415, <i>nfxB</i> mutant	19786597
NR-51913	NB52019-CDK0005	<i>P. aeruginosa</i> PAO1 with engineered PA1438 encoding L172P substitution	30420483
NR-51914	NB52019-CDK0006	NB52019 - CDK0005 Δ <i>mexB</i>	30420483
NR-51915	NB52019-CDK0007	NB52019 - CDK0005 Δ <i>mexN</i>	30420483
NR-51916	NB52019-CDK0008	NB52019 - CDK0005 Δ <i>mexB</i> Δ <i>mexN</i>	30420483
NR-51917	NB52019-CDK0028	NB52019 - CDK0002 <i>mexB</i> mutant encoding a V177 deletion, selected via plating	30420483
NR-51918	NB52019-CDK0029	NB52019 - CDK0002 <i>mexB</i> F628L substitution mutant, selected via plating	30420483
NR-51919	NB52019-CDK0002	<i>P. aeruginosa</i> PAO1; <i>ampC</i> inactivated	30420483
NR-51920	NB52019-CDK0032	NB52019 - CDK0005 Δ <i>oprM</i>	30420483
NR-51921	NB52019-CDK0009	NB52019 - CDK0002 PA1438 L172P substitution mutant, selected via passaging	30420483
NR-51922	NB52019-CDK0026	NB52019 - CDK0002 <i>mexB</i> F628L substitution selected via passaging	30420483
NR-51924	NB52023-CDJ0014	<i>P. aeruginosa</i> PAO1 Δ <i>mexB</i> - Δ <i>mexBXY</i> derivative; <i>nfxB</i> mutant; overexpresses MexCD-OprJ	28096160
NR-51925	NB52245- CDJ0015	NB52245 <i>nalB</i> mutant; <i>mexR</i> mutation and <i>mexB</i> restored; overexpresses MexAB-OprM	28096160
NR-51926	NB52245-CDJ0021	NB52245 Δ <i>mexZ</i> , <i>mexXY</i> restored; overexpresses MexXY-OprM	28096160
NR-51928	NB52245-CDJ0054	NB52245 Δ <i>mexS</i> and active <i>mexT</i> from NB52109-CDR0036; overexpresses MexEF-OprN	28096160
NR-51952	NB52245-CDJ0018	NB52245 Δ <i>ampC</i>	29336873
NR-51953	NB52245-CDJ0019	NB52245 <i>nalB</i> mutant, Δ <i>ampC</i>	29336873
NR-51968	NB52109	<i>P. aeruginosa</i> clinical isolate; active <i>mexT</i> and overexpresses MexXY-OprM	28096160
NR-51970	NB52245	<i>P. aeruginosa</i> PAO1 derivative; Δ <i>mexB</i> Δ <i>mexXY</i> Δ <i>mexCD-oprJ</i>	28096160

¹The strain designation on the vial label is incorrect. The correct strain designation is NB2109-CDR0036.