

## Staphylococcus aureus, Strain NRS118

Catalog No. NR-45923

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### Contributor:

Network on Antimicrobial Resistance in *Staphylococcus aureus* (NARSA), NIAID, NIH

### Manufacturer:

BEI Resources

### Product Description:

Bacteria Classification: *Staphylococcaceae*, *Staphylococcus*

Species: *Staphylococcus aureus*

Strain: NRS118

NARSA Catalog Number: NRS118

Original Source: *Staphylococcus aureus* (*S. aureus*), strain NRS118 is a vancomycin-intermediate derivative of a vancomycin-sensitive strain. *S. aureus*, strain NRS118 was isolated in April 2002 from a 26-year-old female kidney transplant ICU inpatient in California, USA.<sup>1</sup>

Comments: *S. aureus*, strain NRS118 was deposited as a vancomycin-intermediate *S. aureus* (VISA) strain.<sup>1,2</sup> *S. aureus*, strain NRS118 was deposited as positive for SCCmec (subtype I); negative for *vanA*, *vanB*, *vanC1*, *vanC2*, *vanD* and *vanE*; MLST sequencing type (ST) 247; eGenomic *spa* type 4, eGenomic *spa* repeats YHFGFMBQBLO; Ridom *spa* type t051.<sup>1</sup>

*S. aureus* is a Gram-positive, cluster-forming coccus that normally inhabits human nasal passages, skin and mucus membranes. It is also a human pathogen and causes a variety of pus-forming infections as well as food-poisoning and toxic shock syndrome. In 1961, two years after the introduction of methicillin, a penicillinase-resistant penicillin, *S. aureus* developed methicillin-resistance due to acquisition of the *mecA* gene. Subsequently, MRSA infections have become widespread in both hospital and community settings.<sup>3</sup> Vancomycin has been the preferred antibiotic of choice for the treatment of MRSA infections.<sup>4</sup> However, there have now been MRSA strains isolated that also have reduced susceptibility or resistance to vancomycin.<sup>5,6</sup> It is believed that this decreased sensitivity primarily arises through mutations affecting the production of peptidoglycans, resulting in a thickened cell wall and a reduction of vancomycin at its site of action.<sup>7</sup> While much rarer, resistance can also occur through the acquisition of the vancomycin resistance gene, *vanA*, from *Enterococcus faecalis*.<sup>5,7,8</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-45923 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:

Brain Heart Infusion broth or Tryptic Soy broth or equivalent  
Brain Heart Infusion agar or Tryptic Soy agar or Tryptic Soy agar with 5% defibrinated sheep blood 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 provided by the Network on Antimicrobial Resistance in *Staphylococcus aureus* (NARSA) for distribution by BEI Resources, NIAID, NIH: *Staphylococcus aureus*, Strain NRS118, NR-45923."

### 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/bmbl5/index.htm](http://www.cdc.gov/biosafety/publications/bmbl5/index.htm).

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#### References:

1. NARSA, NRS118
2. Sakoulas, G., et al. "Accessory Gene Regulator (*agr*) Locus in Geographically Diverse *Staphylococcus aureus* Isolates with Reduced Susceptibility to Vancomycin." Antimicrob. Agents Chemother. 46 (2002): 1492-502. PubMed: 11959587.
3. Deurenberg, R. H. and E. E. Stobberingh. "The Evolution of *Staphylococcus aureus*." Infect. Genet. Evol. 8 (2008): 747-763. PubMed: 18718557.
4. Hiramatsu, K. "Vancomycin-Resistant *Staphylococcus aureus*: A New Model of Antibiotic Resistance." Lancet Infect. Dis. 1 (2001): 147-155. PubMed: 11871491.
5. Hiramatsu, K., et al. "Methicillin-Resistant *Staphylococcus aureus* Clinical Strain with Reduced Vancomycin Susceptibility." J. Antimicrob. Chemother. 40 (1997): 135-136. PubMed: 9249217.
6. Hanaki, H., et al. "Activated Cell-Wall Synthesis is Associated with Vancomycin Resistance in Methicillin-Resistant *Staphylococcus aureus* Clinical Strains Mu3 and Mu50." J. Antimicrob. Chemother. 42 (1998): 199-209. PubMed: 9738837.
7. Howden, B. P., et al. "Reduced Vancomycin Susceptibility in *Staphylococcus aureus*, Including Vancomycin-Intermediate and Heterogeneous Vancomycin-Intermediate Strains: Resistance Mechanisms, Laboratory Detection, and Clinical Implications." Clin. Microbiol. Rev. 23 (2010): 99-139. PubMed: 20065327.
8. Chang, S., et al. "Infection with Vancomycin-Resistant *Staphylococcus aureus* Containing the *vanA* Resistance Gene." N. Engl. J. Med. 3 (2003): 1342-1347. PubMed: 12672861.
9. Shojim M. et al. "*walK* and *clpP* Mutations Confer Reduced Vancomycin Susceptibility in *Staphylococcus aureus*." Antimicrob. Agents Chemother. 55 (2011): 3870-81. PubMed: 21628539.

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