

***Staphylococcus aureus*, Strain BR 5**

**Catalog No. NR-45890**

**For research use only. Not for human use.**

**Contributor:**

NARSA

**Manufacturer:**

BEI Resources

**Product Description:**

Bacteria Classification: *Staphylococcaceae*, *Staphylococcus*

Species: *Staphylococcus aureus*

Strain: BR 5

NARSA Catalog Number: NRS56

Original Source: *Staphylococcus aureus* (*S. aureus*), strain BR 5 was isolated in 1999 from a wound of an 11-year-old female burn patient in Brazil.<sup>1</sup>

Comments: *S. aureus*, strain BR 5 is a methicillin-resistant *S. aureus* (MRSA) strain and a vancomycin-intermediate *S. aureus* (VISA) strain. It is also reported to be resistant to a number of other antibiotics.<sup>1</sup> *S. aureus*, strain BR 5 was deposited as positive for *mec* (subtype III); negative for the vancomycin resistance genes; MLST sequencing type (ST) 239; eGenomic *spa* type 3, eGenomic *spa* repeats WGKAOMQ; Ridom *spa* type t037.<sup>1</sup> Based on MLST sequencing and the SCC*mec* type, *S. aureus*, strain BR 5 is most likely an isolate of the Brazilian Endemic Clone (BEC) which is reported to represent almost 80% of MRSA isolates in Brazil.<sup>2,3</sup> Note: Methicillin is no longer clinically used, however, the term methicillin-resistant *Staphylococcus aureus* (MRSA) continues to be used to describe *S. aureus* strains resistant to all penicillins.

*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>4</sup> Vancomycin has been the preferred antibiotic of choice for the treatment of MRSA infections.<sup>5</sup> However, there have now been MRSA strains isolated that also have reduced susceptibility or resistance to vancomycin.<sup>6,7</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>8</sup> While much rarer, resistance can also occur through the acquisition of the vancomycin resistance gene, *vanA*, from *Enterococcus faecalis*.<sup>6,8,9</sup>

**Material Provided:**

Each vial contains approximately 0.5 mL of bacterial culture in 0.5X 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-45890 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 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 18 to 24 hours.

**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 BR 5, NR-45890."

**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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[www.beiresources.org](http://www.beiresources.org)

E-mail: [contact@beiresources.org](mailto:contact@beiresources.org)

Tel: 800-359-7370

Fax: 703-365-2898

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**References:**

1. NARSA, NRS56.
2. Reinert, C., et al. "Type IV SCCmec Found in Decade Old Brazilian MRSA Isolates." Braz. J. Infect. Dis. 12 (2008): 213-216. PubMed: 18833406.
3. McDougal, L., et al. "Pulsed-Field Gel Electrophoresis Typing of Oxacillin-Resistant *Staphylococcus aureus* Isolates from the United States: Establishing a National Database." J. Clin. Microbiol. 41 (2003): 5113-5120. Pubmed: 14605147.
4. Deurenberg, R. H. and E. E. Stobberingh. "The Evolution of *Staphylococcus aureus*." Infect. Genet. Evol. 8 (2008): 747-763. PubMed: 18718557.
5. Hiramatsu K. "Vancomycin-Resistant *Staphylococcus aureus*: a New Model of Antibiotic Resistance." Lancet Infect. Dis. 1 (2001): 147-55. PubMed: 11871491.
6. Hiramatsu, K., et al. "Methicillin-Resistant *Staphylococcus aureus* Clinical Strain with Reduced Vancomycin Susceptibility." J. Antimicrob. Chemother. 40 (1997): 135-13. Pubmed: 9249217.
7. 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.
8. 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.

9. 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.

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