

**Staphylococcus aureus, Strain RN4220**

**Catalog No. NR-45946**

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

**Contributor:**

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**Manufacturer:**

BEI Resources

**Product Description:**

Bacteria Classification: *Staphylococcaceae, Staphylococcus*

Species: *Staphylococcus aureus*

Strain: RN4220

NARSA Catalog Number: NRS144

Original Source: *Staphylococcus aureus* (*S. aureus*), strain RN4220 was generated through UV and chemical mutagenesis of *S. aureus*, strain NCTC 8325-4.<sup>1</sup>

Comments: *S. aureus*, strain RN4220 was selected for transformability with DNA from *Escherichia coli*.<sup>2</sup> It has a mutation in *sau1 hsdR* which makes it restriction deficient and a good intermediate cloning host.<sup>1</sup> *S. aureus*, strain RN4220 was deposited as negative for *mec*, *rsbU* and *agr*; MLST sequence type (ST) 8; eGenomic *spa* type 59, eGenomic *spa* repeats YHGGFMBQBLO; Ridom *spa* type t211.<sup>2</sup> The complete genome sequence of *S. aureus*, strain RN4220 is available (GenBank: [AFGU00000000.1](http://www.ncbi.nlm.nih.gov/GenBank/AFGU00000000.1)). Note: Methicillin is no longer clinically used, however, the terms methicillin-resistant *Staphylococcus aureus* (MRSA) and methicillin-sensitive *Staphylococcus aureus* (MSSA) continue to be used to describe the susceptibility of *S. aureus* strains to the 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>3</sup> As compared to MSSA infections, MRSA infections tend to have more complications such as a higher recurrence rate and higher mortality.<sup>4-6</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-45946 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 RN4220, NR-45946."

**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. Nair, D., et al. "Whole-Genome Sequencing of *Staphylococcus aureus*, Strain RN4220, a Key Laboratory Strain Used in Virulence Research, Identifies Mutations that Affect not Only Virulence Factors but also the Fitness of the Strain." J. Bacteriol. 193 (2011): 2332-2335. PubMed: 21378186.
2. NARSA, NRS144.
3. Deurenberg, R. H. and E. E. Stobberingh. "The Evolution of *Staphylococcus aureus*." Infect. Genet. Evol. 8 (2008): 747-763. PubMed: 18718557.
4. Park, D. A., et al. "Impact of Methicillin-Resistance on Mortality in Children and Neonates with *Staphylococcus aureus* Bacteremia: A Meta-Analysis." Infect. Chemother. 45 (2013): 202-210. PubMed: 24265968.
5. Porto, J. P., et al. "Active Surveillance to Determine the Impact of Methicillin-Resistance on Mortality in Patients with Bacteremia and Influences of the Use of Antibiotics on the Development of MRSA Infections." Rev. Soc. Bras. Med. Trop. 46 (2013): 713-718. PubMed: 24474012.
6. Inoue, S., et al. "Comparison of Clinical Features and Outcomes of *Staphylococcus aureus* Vertebral Osteomyelitis Caused by Methicillin-Resistant and Methicillin-Sensitive Strains." SpringerPlus 2 (2013): 283. PubMed: 23853753.

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