

Staphylococcus aureus*, Strain HIP11714*Catalog No. NR-46410****For research use only. Not for human use.****Contributor:**

Centers for Disease Control and Prevention, Atlanta, Georgia, USA

Manufacturer:

BEI Resources

Product Description:Bacteria Classification: *Staphylococcaceae*, *Staphylococcus*Species: *Staphylococcus aureus*Strain: HIP11714 (also referred to as VRSA-1¹, VRSA-MI²)

NARSA Catalog Number: VRS1

Original Source: *Staphylococcus aureus* (*S. aureus*), strain HIP11714 was isolated in 2002 in Michigan, USA from an infected catheter exit site of a 40-year-old adult who had a co-infection with vancomycin-resistant *Enterococcus faecalis* (*E. faecalis*) and had been treated with numerous antibiotics, including a six-week course of vancomycin therapy.³⁻⁸

Comments: *S. aureus*, strain HIP11714 is a vancomycin-resistant *S. aureus* (VRSA) strain and is reported to be resistant to a number of other antimicrobial agents.³⁻⁵ *S. aureus*, strain HIP11714 was deposited as positive for *mec* (subtype II) and *vanA*; negative for *vanB*, *vanC1*, *vanC2*, *vanD*, *vanE*, PVL and arginine catabolic mobile element (ACME); pulsed-field type USA100; MLST (ST) 5; spa repeats TJMGMK; Ridom spa type t062.³⁻⁷ *S. aureus*, strain HIP11714 is a USA100 isolate. USA100 isolates have the same MLST profile (ST 5), SCCmec (subtype II) and are usually resistant to erythromycin and spectinomycin as well as being multiresistant to other commonly used therapeutic agents. USA100 is the most prevalent U.S. health care-associated pulsed-field type and is endemic in many U.S. hospitals.⁵ The *vanA* sequences of HIP11714 and the co-infecting *E. faecalis* are identical and it has been postulated that HIP11714 may have acquired the *vanA* gene from this *E. faecalis* isolate.⁴ This strain is the first documented VRSA strain isolated in the United States.⁸ The complete genome sequence of *S. aureus*, strain HIP11714 is available (GenBank: [AHBK00000000](#)).

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 septicemia and endocarditis. *S. aureus* infections are difficult to treat due to resistance to numerous antibiotics. The development and dissemination of methicillin-resistant *S. aureus* (MRSA) strains has proven to be particularly difficult to contain and treat.⁹ Vancomycin has been the preferred antibiotic of choice for the treatment of MRSA infections, however, there

have now been MRSA strains isolated that are also resistant to vancomycin.^{9,10} It is believed that this resistance results from either mutations that ultimately lead to a reduction of vancomycin at its site of action or from the acquisition of the vancomycin resistance gene, *vanA*, from *Enterococcus faecalis*.^{9,10} The *vanA* gene is carried by the Tn1546 transposon that resides on a plasmid in all VRSA strains.² For VRSA strains carrying both *mecA* and *vanA*, β-lactams and glycopeptides seem to have a synergistic effect against these strains, both *in vitro* and in an animal model.^{10,11} Combination therapy, therefore, may be a more effective treatment option for VRSA infections than monotherapy with either antibiotic.^{10,11}

Material Provided:

Each vial contains approximately 0.5 mL of bacterial culture in Brain Heart Infusion broth supplemented with 6 µg/mL vancomycin and 10% glycerol.

Note: If homogeneity is required for your intended use, please purify prior to initiating work.

Packaging/Storage:

NR-46410 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:

Note: For stability purposes, it is recommended that the strain is subcultured in the presence of vancomycin.

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 HIP11714, NR-46410."

Biosafety Level: 2

Appropriate safety procedures should always be used with this material. Laboratory safety is discussed in the following

Product Information Sheet for NR-46410

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.

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