

Staphylococcus aureus, Strain HIP13170

Catalog No. NR-46412

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Contributor:

Linda Weigel, Ph.D., Centers for Disease Control and Prevention, Atlanta, Georgia, USA

Manufacturer:

BEI Resources

Product Description:

Bacteria Classification: *Staphylococcaceae, Staphylococcus*

Species: *Staphylococcus aureus*

Strain: HIP13170 (also referred to as VRSA-3a)

NARSA Catalog Number: VRS3a

Original Source: *Staphylococcus aureus* (*S. aureus*), strain HIP13170 was isolated in 2004 in New York, USA, from urine of a 63-year-old female with a polymicrobial infected nephrostomy tube exit site who had no recent history of vancomycin therapy. It was co-isolated with *S. aureus*, strain HIP13419 (VRS3b) which are similar in most aspects except the vancomycin resistant phenotype for HIP13170 is less stable than that of HIP13419.^{1,2}

Comments: *S. aureus*, strain HIP13170 is a vancomycin-resistant *S. aureus* (VRSA) strain. *S. aureus*, strain HIP13170 was deposited as positive for *mec* (subtype IV), *vanA* and resistance genes against tetracycline, macrolides, lincosamides and aminoglycosides; negative for *vanB*, *vanC1*, *vanC2*, *vanD* and *vanE*; pulsed-field type USA800; MLST (ST) 5; *spa* repeats TJMBMDMGMK; Ridom *spa* type t002.¹⁻⁶ This strain was isolated from the third documented case of VRSA infection in the United States.² Unlike the other VRSA strains, it is believed that this strain obtained *vanA* from *Enterococcus faecium* rather than *Enterococcus faecalis*.³ *S. aureus*, strain HIP13170 is a USA800/Pediatric isolate. USA800 isolates have the same MLST profile (ST 5), *agr* group (II), SCC*mec* subtype (IV), *spa* motif (MDMGMK) and Ridom *spa* types (t002 and related) and are positive for *sem* and *seo* toxin genes. USA800 isolates are resistant to β -lactams with some isolates being resistant to additional antibiotics.⁶⁻⁸ While first isolated in pediatric patients, USA800 strains recently have been isolated in adults.⁹ The complete genome sequence of *S. aureus*, strain HIP13170 is available (GenBank: [AHBM000000000](http://www.ncbi.nlm.nih.gov/GenBank/ABM000000000)).

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.¹⁰ 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.^{10,11} 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*.¹⁰⁻¹² The *vanA* gene is carried by the Tn1546 transposon that resides on a plasmid in all VRSA strains.¹¹ 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.^{12,13} Combination therapy, therefore, may be a more effective treatment option for VRSA infections than monotherapy with either antibiotic.^{12,13}

Material Provided:

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

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

Packaging/Storage:

NR-46412 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 VRS3a be subcultured in the presence of vancomycin.³

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 HIP13170, NR-46412."

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.

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