**Staphylococcus aureus, Strain AIS 080003**

**Catalog No. NR-46419**

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**Manufacturer:**
BEI Resources

**Product Description:**

**Bacteria Classification:** Staphylococcaceae, Staphylococcus
**Species:** Staphylococcus aureus
**Strain:** AIS 080003 (also referred to as VRSA-9)
**NARSA Catalog Number:** VRS9

**Original Source:** Staphylococcus aureus (S. aureus), strain AIS 080003 was isolated in 2007 in Michigan, USA from a left plantar foot wound of a 54-year-old female who recently received a 4-week course of vancomycin and levofloxacin to treat osteomyelitis of the left metatarsals.

**Comments:** S. aureus, strain AIS 080003 is a vancomycin-resistant S. aureus (VRSA) strain. S. aureus, strain AIS 080003 was deposited as positive for mec and vanA; negative for vanB, vanC1, vanC2, vanD, vanE, PVL and arginine catabolic mobile element (ACME); pulsed-field type USA100; spa repeats TJMBMDMGMK; Ridom spa type t002. S. aureus, strain AIS 080003 is a USA100 isolate. USA100 isolates have the same MLST profile (ST 5), SCCmec (subtype II) and spa motif (MDMGKM) 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 pulse-field type and is endemic in many U.S. hospitals.

S. aureus, strain AIS080003 is partially dependent on vancomycin for growth due to a mutation in D-alanyl-D-alanine ligase (Ddl), an enzyme involved in biosynthesis of peptidoglycans. The presence of the vanA operon compensates for the Ddl mutation by providing alternative peptidoglycans for cell wall synthesis; however, some have found that this change in the type of peptidoglycans produced renders it susceptible to oxacillin. The complete genome sequence of S. aureus, strain AIS 080003 is available (GenBank: AHBS00000000).

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

**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-46419 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 AIS 080003, NR-46419.”
Biosafety Level: 2

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References:
2. NARSA, VRS9

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