Staphylococcus aureus, Strain SA MER-S12

Catalog No. NR-45866

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Contributor:
Network on Antimicrobial Resistance in *Staphylococcus aureus* (NARSA), NIAID, NIH

Manufacturer:
BEI Resources

Product Description:
Bacteria Classification: *Staphylococcaceae, Staphylococcus*
Species: *Staphylococcus aureus*
Strain: SA MER-S12
NARSA Catalog Number: NRS13
Original Source: *Staphylococcus aureus* (*S. aureus*), strain SA MER-S12 is a derivative strain of strain SA MER (NRS11). Strain SA MER was isolated in December 1998 in France from the eye of a 35-year-old female with spontaneous conjunctivitis who had no history of treatment with antimicrobial agents, including glycopeptides, in the preceding three months.[1,2]
Comments: *S. aureus*, strain SA MER-S12 is a heterogeneous vancomycin-intermediate *S. aureus* (hVISA) strain, but unlike most hVISA strains, it is susceptible to methicillin.[2] *S. aureus,* strain SA MER-S12 was deposited as resistant to benzylpenicillin; negative for *mec*, *vanA*, *vanB*, *vanC1*, *vanC2*, *vanD* and *vanE;* MLST sequencing type (ST) 5; eGenomic *spa* type 2, eGenomic *spa* repeats TJMBMDMGMK; Ridom *spa* type t002.[1] Strain SA MER-S12 was produced by exposing strain SA MER to increasing levels of vancomycin resulting in SA MER-S6 (NRS12), SA MER-S12 and SA MER-S20 (NRS14), which can grow in the presence of 6 µg/mL, 12 µg/mL and 20 µg/mL vancomycin, respectively.[2]

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

Material Provided:
Each vial contains approximately 0.5 mL of bacterial culture in 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-45866 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 SA MER-S12, NR-45866."

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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References:

1. NARSA, NRS13
2. Bobin-Dubreux, S., et al. “Clinical Isolate of Vancomycin-Hetero Intermediate *Staphylococcus aureus* Susceptible to Methicillin and *in vitro* Selection of a Vancomycin-Resistant Derivative.” Antimicrob. Agents Chemother. 45 (2001): 349-352. PubMed: 11120996.
3. Deurenberg, R. H. and E. E. Stobberingh. "The Evolution of *Staphylococcus aureus*." Infect. Genet. Evol. 8 (2008): 747-763. PubMed: 18718557.
4. Hiramatsu K. "Vancomycin-Resistant *Staphylococcus aureus*: a New Model of Antibiotic Resistance." Lancet Infect. Dis. 1 (2001): 147-155. PubMed: 11871491.
5. Hiramatsu, K., et al. "Methicillin-Resistant *Staphylococcus aureus* Clinical Strain with Reduced Vancomycin Susceptibility." J. Antimicrob. Chemother. 40 (1997): 135-136. Pubmed: 9249217.
6. 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.
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