

***Staphylococcus aureus*, Strain SA LinR #12**

Catalog No. NR-45924

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Contributor:

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Manufacturer:

BEI Resources

Product Description:

Bacteria Classification: *Staphylococcaceae*, *Staphylococcus*

Species: *Staphylococcus aureus*

Strain: SA LinR #12

NARSA Catalog Number: NRS119

Original Source: *Staphylococcus aureus* (*S. aureus*), strain SA LinR #12 was isolated in 2001 from an 85-year-old male with dialysis-associated peritonitis in Massachusetts, USA.^{1,2}

Comments: *S. aureus*, strain SA LinR #12 is a linezolid-resistant *S. aureus* (LRSA), methicillin-resistant *S. aureus* (MRSA) strain.¹⁻³ It was deposited as resistant to linezolid and tedizolid; positive for *mec* (subtype IV); MLST sequence type (ST) 507; eGenomic *spa* type 7, eGenomic *spa* repeats YHGCMQBLO; Ridom *spa* type t064.^{1,3} *S. aureus*, strain SA LinR #12 was co-isolated with SA LinR #13 (NRS120) and SA LinR #14 (NRS121) from the first clinically reported case of a MRSA infection that demonstrated resistance to linezolid. Based on pulsed-field gel electrophoresis, SA LinR #12 and SA LinR #13 are identical and SA LinR #14 is closely related to both. While each strain has a different antibiogram, all three are resistant to linezolid due to a G2576T mutation in domain V in one or more 23S rRNA genes (*Escherichia coli* numbering).^{1,2} Note: Methicillin is no longer clinically used, however, the term methicillin-resistant *S. aureus* (MRSA) continues to be used to describe *S. aureus* strains resistant to all 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.⁴ MRSA infections have been increasingly difficult to treat as this organism has developed resistance to a number of commonly used antibiotics, including the preferred antibiotic of choice for the treatment of MRSA infections, vancomycin.⁵ More

recently, strains have been isolated that are resistant to linezolid. These LRSA strains typically have the same G2576T point mutation in their 23S rRNA genes preventing linezolid from binding to its site of action.⁶⁻⁸ A second, rarer mechanism of resistance is due to the presence of *cfr*, which encodes for a ribosomal methyltransferase that modifies a specific rRNA nucleotide located in the site of the drug action. While the *cfr* gene was initially identified on plasmids isolated from animal sources, an increasing number of human cases have been reported.⁹⁻¹¹

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-45924 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 LinR #12, NR-45924."

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:

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