

Staphylococcus aureus, Strain LGA251

Catalog No. NR-49455

For research use only. Not for human use.

Contributor:

Meghan F. Davis, Assistant Professor, Department of Environmental Health and Engineering, John Hopkins School of Public Health, Baltimore, Maryland, USA, and Mark A. Holmes, Vet.M.B., Ph.D., Department of Veterinary Medicine, University of Cambridge, Cambridge, United Kingdom

Manufacturer:

BEI Resources

Product Description:

Bacteria Classification: *Staphylococcaceae*, *Staphylococcus*

Species: *Staphylococcus aureus*

Strain: LGA251

Original Source: *Staphylococcus aureus* (*S. aureus*), strain LGA251 was isolated in 2007 from a bulk milk sample taken from a cow dairy farm in Somerset, England, United Kingdom.^{1,2}

Comments: *S. aureus*, strain LGA251 was deposited as negative for *mecA*; resistant to penicillin, oxacillin and cefoxitin; susceptible to gentamicin, neomycin, ciprofloxacin, tetracycline, erythromycin, clindamycin, fusidic acid, chloramphenicol, teicoplanin, rifampicin, trimethoprim, linezolid and mupirocin; MLST profile (ST) 425; *spa* type t6300.^{1,2} Strain LGA251 has a divergent *mecA* homologue, *mecA*_{LGA251} (now referred to as *mecC*)³, which is located in a unique SCC*mec* element with the designation of type XI. While *mecA*_{LGA251} was initially identified in a bovine sample, it is also present in clinical samples.^{2,4} The complete genome of *S. aureus*, strain LGA251 has been sequenced² (GenBank: [FR821779.1](https://www.ncbi.nlm.nih.gov/nuccore/FR821779.1)). Note: Methicillin is no longer clinically used; however, the term methicillin-resistant *Staphylococcus 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. For the last forty-five years hospital-acquired (HA) MRSA strains have disseminated worldwide. More recently, MRSA strains have been isolated that are not hospital acquired and are referred to as community-associated (CA) MRSA. These CA-MRSA strains differ phenotypically and genotypically from HA-MRSA strains and they are more frequently recovered from skin and soft tissue sources rather than post-operative wounds.^{5,6}

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-49455 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 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 1 day

Citation:

Acknowledgment for publications should read "The following reagent was obtained through BEI Resources, NIAID, NIH: *Staphylococcus aureus*, Strain LGA251, NR-49455."

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.

Disclaimers:

You are authorized to use this product for research use only. It is not intended for human use.

Use of this product is subject to the terms and conditions of the BEI Resources Material Transfer Agreement (MTA). The MTA is available on our Web site at www.beiresources.org.

While BEI Resources uses reasonable efforts to include accurate and up-to-date information on this product sheet, neither ATCC® nor the U.S. Government makes any warranties or representations as to its accuracy. Citations from scientific literature and patents are provided for informational purposes only. Neither ATCC® nor the U.S.

Government warrants that such information has been confirmed to be accurate.

This product is sent with the condition that you are responsible for its safe storage, handling, use and disposal. ATCC® and the U.S. Government are not liable for any damages or injuries arising from receipt and/or use of this product. While reasonable effort is made to ensure authenticity and reliability of materials on deposit, the U.S. Government, ATCC®, their suppliers and contributors to BEI Resources are not liable for damages arising from the misidentification or misrepresentation of products.

Use Restrictions:

This material is distributed for internal research, non-commercial purposes only. This material, its product or its derivatives may not be distributed to third parties. Except as performed under a U.S. Government contract, individuals contemplating commercial use of the material, its products or its derivatives must contact the contributor to determine if a license is required. U.S. Government contractors may need a license before first commercial sale.

References:

1. Davis, M. F., Personal Communication.
2. García-Álvarez, L., et al. "Methicillin-Resistant *Staphylococcus aureus* with a Novel *mecA* Homologue in Human and Bovine Populations in the UK and Denmark: A Descriptive Study." *Lancet Infect. Dis.* 11 (2011): 595-603. PubMed: 21641281.
3. Ballhausen, B., et al. "The *mecA* homolog *mecC* Confers Resistance Against β -Lactams in *Staphylococcus aureus* Irrespective of the Genetic Strain Background." *Antimicrob. Agents Chemother.* 58 (2014): 3791-3798. PubMed: 24752255.
4. Shore, A. C., et al. "Detection of Staphylococcal Cassette Chromosome *mec* Type XI Carrying Highly Divergent *mecA*, *mecI*, *mecR1*, *blaZ*, and *ccr* Genes in Human Clinical Isolates of Clonal Complex 130 Methicillin-Resistant *Staphylococcus aureus*." *Antimicrob. Agents Chemother.* 55 (2011): 3765-3773. PubMed: 21636525.
5. Deurenberg, R. H. and E. E. Stobberingh. "The Evolution of *Staphylococcus aureus*." *Infect. Genet. Evol.* 8 (2008): 747-763. PubMed: 18718557.
6. Davis, S. L., et al. "Epidemiology and Outcomes of Community-Associated Methicillin-Resistant *Staphylococcus aureus* Infection." *J. Clin. Microbiol.* 45 (2007): 1705-1711. PubMed: 17392441.
7. Kim, C., et al. "Properties of a Novel PBP2A Protein Homolog from *Staphylococcus aureus* Strain LGA251 and Its Contribution to the β -Lactam-Resistant Phenotype." *J. Biol. Chem.* 287 (2012): 36854-36863. PubMed: 22977239.

ATCC® is a trademark of the American Type Culture Collection.

