

# Product Information Sheet for NR-28784

## ***Salmonella enterica* subsp. *enterica*, Strain SARA23 (CDC B1722) (Serovar Saint Paul)**

**Catalog No. NR-28784**

**For research use only. Not for human use.**

### **Contributor:**

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### **Manufacturer:**

BEI Resources

### **Product Description:**

Bacteria Classification: *Enterobacteriaceae*, *Salmonella*

Species: *Salmonella enterica*

Subspecies: *Salmonella enterica* subsp. *enterica*

Serovar: Saint Paul or Saintpaul

Strain: SARA23 (also referred to as CDC B1722)<sup>1,2</sup>

Original Source: *Salmonella enterica* (*S. enterica*) subsp. *enterica*, strain SARA23 (CDC B1722) was isolated from human stool in Pennsylvania, USA.<sup>1,2</sup>

Comments: Strain SARA23 (CDC B1722) is reported to be an antibiotic-susceptible strain.<sup>1</sup> The complete genome for *S. enterica* subsp. *enterica*, strain SARA23 (CDC B1722) was sequenced at the [J. Craig Venter Institute](http://www.jcvi.org) (GenBank: [ABAM000000000](http://www.ncbi.nlm.nih.gov/GenBank/ABAM000000000)).<sup>1</sup>

*S. enterica* are Gram-negative, rod-shaped, flagellated bacteria. The species is divided into six subspecies (I, II, IIIa, IIIb, IV, VI) where only subspecies I, subsp. *enterica*, is considered of clinical relevance.<sup>3</sup> Salmonellosis (non-typhoidal), due to the greater than 1500 serovars of *S. enterica* subsp. *enterica*, is one of the most common food-borne diseases with approximately 1 million cases that occur in the United States every year.<sup>4</sup> Pathogenicity results from a variety of virulence factors found in plasmids, prophages, and five pathogenicity islands which allow these organisms to colonize and infect host organisms.<sup>5,6</sup>

*S. enterica* subsp. *enterica* serovar Saint Paul (formerly *Salmonella Saintpaul*) has been implicated in large foodborne outbreaks linked to fresh produce. Saint Paul is a common serovar infecting humans in the U.S. and has emerged in other countries.<sup>7-11</sup> Yet, little is known about the epidemiology, pathogenic potential, or genetic profile of this serovar.

### **Material Provided:**

Each vial contains approximately 0.5 mL of bacterial culture in 0.5X Nutrient broth supplemented with 10% glycerol.

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

### **Packaging/Storage:**

NR-28784 was packaged aseptically, in screw-capped plastic 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:

Tryptic Soy broth or Nutrient broth or equivalent

Tryptic Soy agar with 5% defibrinated sheep blood or Nutrient agar 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 24 hours.

### **Citation:**

Acknowledgment for publications should read "The following reagent was obtained through BEI Resources, NIAID, NIH: *Salmonella enterica* subsp. *enterica*, Strain SARA23 (CDC B1722) (Serovar Saint Paul), NR-28784."

### **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](http://www.cdc.gov/biosafety/publications/bmbl5/index.htm).

### **Disclaimers:**

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### References:

1. Fricke, W. F., et al. "Comparative Genomics of 28 *Salmonella enterica* Isolates: Evidence for CRISPR-Mediated Adaptive Sublineage Evolution." *J. Bacteriol.* 193 (2011): 3556-3568. PubMed: 21602358.
2. Dr. M. K. Mammel, personal communication
3. Grimont, P. A. D. and F.-X. Weill. *Antigenic Formulae of the Salmonella Serovars, 2007, 9th edition*. Paris: WHO Collaborating Centre for Reference and Research on *Salmonella*, Pasteur Institute.
4. Scallan, E., et al. "Foodborne Illness Acquired in the United States – Major Pathogens." *Emerg. Infect. Dis.* 17 (2011): 7-15. PubMed: 21192848.
5. Lavigne, J. P. and A. B. Blanc-Potard. "Molecular Evolution of *Salmonella enterica* Serovar Typhimurium and Pathogenic *Escherichia coli*: From Pathogenesis to Therapeutics." *Infect. Genet. Evol.* 8 (2008): 217-226. PubMed: 18226587.
6. Parsons, D. A. and F. Heffron. "*sciS*, an *icmF* Homolog in *Salmonella enterica* Serovar Typhimurium, Limits Intracellular Replication and Decreases Virulence." *Infect. Immun.* 73 (2005): 4338-4345. PubMed: 15972528.
7. Barton Behravesh, C., et al. "2008 Outbreak of *Salmonella* Saintpaul Infections Associated with Raw Produce." *N. Engl. J. Med.* 364 (2011): 918-927. PubMed: 21345092.
8. Mody, R. K., et al. "National Outbreak of *Salmonella* Serotype Saintpaul Infections: Importance of Texas Restaurant Investigations in Implicating Jalapeño Peppers." *PLoS One* 6 (2011): e16579. PubMed: 21373185.
9. Centers for Disease Control and Prevention (CDC). "Outbreak of *Salmonella* Serotype Saintpaul Infections Associated with Eating Alfalfa Sprouts-United States, 2009." *MMWR Morb Mortal Wkly Rep.* 58 (2009): 500-503. PubMed: 19444155.
10. Centers for Disease Control and Prevention (CDC). "Outbreak of *Salmonella* Serotype Saintpaul Infections Associated with Multiple Raw Produce Items-United States, 2008." *MMWR Morb. Mortal. Wkly. Rep.* 57 (2008): 929-934. PubMed: 18756191.
11. Beutlich, J., et al. "A Predominant Multidrug-Resistant *Salmonella enterica* Serovar Saintpaul Clonal Line in German Turkey and Related Food Products." *Appl. Environ. Microbiol.* 76 (2010): 3657-3667. PubMed: 20363784.
12. Fey, P. D., et al. "Assessment of Whole-Genome Mapping in a Well-Defined Outbreak of *Salmonella enterica* Serotype Saintpaul." *J. Clin. Microbiol.* 50 (2012): 3063-3065. PubMed: 22718933.
13. Jacobsen, A., et al. "The *Salmonella enterica* Pan-genome." *Microb. Ecol.* 62 (2011): 487-504. PubMed: 21643699.
14. Yue, M., et al. "Diversification of the *Salmonella* Fimbriae: A Model of Macro- and Microevolution." *PLoS One* 7 (2012): e38596. PubMed: 22701679.

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