

***Salmonella enterica* subsp. *enterica*, Strain 14028s Δ STM14:3647 (Serovar Typhimurium)**

Catalog No. NR-40669

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*^{1,2}

Serogroup: B

Serovar: Typhimurium

Strain: 14028s Δ STM14:3647³ (STM:3020)

Original Source: *Salmonella enterica* (*S. enterica*) subsp. *enterica*, strain 14028s Δ STM14:3647 (serovar Typhimurium) was derived from strain 14028s (strain 14028s was originally known as strain 14028, however, a variant of the original strain with a rough colony morphology was designated 14028r and the original smooth strain was renamed 14028s). Strain 14028 is a descendent of strain CDC 6516-60 which was isolated from pools of hearts and livers of 4-week-old chickens.⁴

Comments: The Δ STM14:3647 mutant of strain 14028s was produced by creating a PCR product with STM14:3647 homologous sequences at the 5' and 3' ends of a linear fragment containing a kanamycin resistance cassette. *S. enterica* subsp. *enterica*, strain 14028s was transformed, and insertion of the *kan* cassette in place of STM14:3647 was confirmed by PCR. The final non-polar deletions were constructed by elimination of the *kan* cassette.⁵ The complete genome (GenBank: [CP001363.1](#)) and plasmid (GenBank: [CP001362.1](#)) sequences are available for strain 14028s.

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. 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 an estimated two million cases that occur in the United States every year.⁶ 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.⁷

S. enterica subsp. *enterica* serovar Typhimurium (formerly

Salmonella typhimurium) is a major cause of gastroenteritis. These bacteria are host generalists that occur in humans and many other mammals. Septic shock resulting in part from lipopolysaccharide (LPS) is a primary complication associated with serovar Typhimurium infection.⁸ Due to its similarity to the clinical and pathological effects in humans, calves are currently used as an animal model for human enterocolitis caused by this serotype.⁹ Additionally, this serovar causes typhoid-like disease in mice and is used as a mouse model of human typhoid fever.⁴

Material Provided:

Each vial contains approximately 0.5 mL of bacterial culture in 0.5X LB broth (supplemented with 1% Bacto-tryptone, 0.5% yeast extract and 1% sodium chloride) with 10% glycerol.

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

Packaging/Storage:

NR-40669 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 14028s Δ STM14:3647 (Serovar Typhimurium), NR-40669."

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:

- Judicial Commission of the International Committee on Systematics of Prokaryotes. "The Type Species of the Genus *Salmonella* Lignierres 1900 Is *Salmonella enterica* (ex Kauffmann and Edwards 1952) Le Minor and Popoff 1987, with the Type Strain LT2^T, and Conservation of the Epithet *enterica* in *Salmonella enterica* over All Earlier Epithets that May Be Applied to This Species. Opinion 80." *Int. J. Syst. Evol. Microbiol.* 55 (2005): 519-520. PubMed: 15653929.
- Tindall, B. J., et al. "Nomenclature and Taxonomy of the Genus *Salmonella*." *Int. J. Syst. Evol. Microbiol.* 55 (2005): 521-524. PubMed: 15653930.
- F. Heffron, Personal Communication.
- Jarvik, T., et al. "Short-Term Signatures of Evolutionary Change in the *Salmonella enterica* Serovar Typhimurium 14028 Genome." *J. Bacteriol.* 192 (2010): 560-567. PubMed: 19897643.
- Datsenko, K. A. and B. L. Wanner. "One-step Inactivation of Chromosomal Genes in *Escherichia coli* K-13 Using PCR Products." *Proc. Natl. Acad. Sci. USA* 97 (2000): 6640-6645. PubMed: 10829079.
- Altekruse, S. F., M. L. Cohen and D. L. Swerdlow. "Emerging Foodborne Diseases." *Emerg. Infect. Dis.* 3 (1997): 285-293. PubMed: 9284372.
- 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.
- Sha, J., et al. "The Two Murein Lipoproteins of *Salmonella enterica* Serovar Typhimurium Contribute to the Virulence of the Organism." *Infect. Immun.* 72 (2004): 3987-4003. PubMed: 15213144.
- Zhang, S., et al. "The *Salmonella enterica* Serotype Typhimurium Effector Proteins SipA, SopA, SopB, SopD, and SopE2 Act in Concert to Induce Diarrhea in Calves." *Infect. Immun.* 70 (2002): 3843-3855. PubMed: 12065528.

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