

***Yersinia pestis*, Strain K25 Derivative 80 (D80)**

Catalog No. NR-4703

For research use only. Not for human use.

Contributor:

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Product Description:

Bacteria Classification: *Enterobacteriaceae*, *Yersinia*

Species: *Yersinia pestis*

Biotype/Biovar: Medievalis

Strain: K25 derivative 80 (D80)

Source:¹ Derivative 80 of the K25 strain, a purine-auxotroph mutant of strain KIM-10

Yersinia pestis (*Y. pestis*) is the etiologic agent of bubonic, septicemic and pneumonic plague. Three biovars have been associated with the three historically recognized pandemics of *Y. pestis*: Antiqua, Medievalis, and Orientalis. Rodents are the main reservoir and the organism is transmitted to humans through the bite of an infected flea. Humans and other animals can also serve as hosts.²

Y. pestis is an aerobic, non-spore-forming, Gram-negative, rod-shaped bacterium. Virulence-associated genes are located on the chromosome and on three plasmids found in typical *Y. pestis* strains: 1) pMT1 (pFra; ~ 100 kb), which encodes a murine toxin and capsular protein with anti-phagocytic activities, 2) pCD1 (pYV; ~ 70 kb), which encodes a type III secretion system and is essential for virulence and 3) pPCP1 (pPla; ~ 9.5 kb), which encodes a protease that facilitates the initial dissemination of the bacteria to the lymph nodes.³ Virulence factors on the chromosome are located in an unstable locus, *pgm*.⁴

Y. pestis, strain K25(D80) contains the pMT1 and pPCP1 plasmids, but lacks the pCD1 plasmid that is essential for virulence as well as the unstable chromosomal *pgm* locus.⁵

The presence of the pMT1 and pPCP1 plasmids in NR-4703 has been confirmed by PCR amplification of plasmid-specific sequences from extracted DNA.

Material Provided:

Each vial contains approximately 0.5 mL of bacterial culture in 0.5X 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-4703 was packaged aseptically in screw-capped plastic cryovials. The product is provided frozen and should be stored at -80°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 Brain Heart Infusion Broth

Tryptic Soy Agar or Sheep Blood Agar

Incubation:

Temperature:⁶ 28°C or 37°C

Atmosphere: Aerobic

Propagation:

1. Keep vial frozen until ready for use; thaw slowly.
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 tubes and plate at 28°C or 37°C for 24 to 48 hours.

Citation:

Acknowledgment for publications should read "The following reagent was obtained through the NIH Biodefense and Emerging Infections Research Resources Repository, NIAID, NIH: *Yersinia pestis*, Strain K25 Derivative 80 (D80), NR-4703."

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, 2007; see www.cdc.gov/od/ohs/biosfty/bmbl5/bmbl5toc.htm.

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References:

1. Brubaker, R. R. "Interconversion of Purine Mononucleotides in *Pasteurella pestis*." Infect. Immun. 1 (1970): 446-454. PubMed: 16557756.
2. Huang, X. Z., M. P. Nikolich and L. E. Lindler. "Current Trends in Plague Research: From Genomics to Virulence." Clin. Med. Res. 4 (2006): 189-199. PubMed: 16988099.
3. Parkhill, J., et al. "Genome Sequence of *Yersinia pestis*, the Causative Agent of Plague." Nature 413 (2001): 523-527. PubMed: 11586360.
4. Hare, J. M. and K. A. McDonough. "High-Frequency RecA-Dependent and -Independent Mechanisms of Congo Red Binding Mutations in *Yersinia pestis*." J. Bacteriol. 181 (1999): 4896-4904. PubMed: 10438760.
5. Robert R. Brubaker, personal communication.
6. Chu, M. C. Laboratory Manual of Plague Diagnostic Tests. Centers for Disease Control and Prevention, Atlanta, 2000.
7. Brubaker, R. R. "How the Structural Gene Products of *Yersinia pestis* Relate to Virulence." Future Microbiol. 2 (2007): 377-385. PubMed: 17683274.
8. Brubaker, R. R. "Factors Promoting Acute and Chronic Diseases Caused by *Yersiniae*." Clin. Microbiol. Rev. 4 (1991): 309-324. PubMed: 1889045.

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