

Yersinia pestis*, Strain A12 Derivative 5 (D5)*Catalog No. NR-4688****For research use only. Not for human use.****Contributor:**

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Product Description:

Bacteria Classification: *Enterobacteriaceae*, *Yersinia*

Species: *Yersinia pestis*

Biotype/Biovar: Orientalis

Strain: A12 derivative 5 (D5)

Source: Derivative 5 of the A12 strain¹, which in turn is a derivative of the avirulent A1122 strain², originally isolated in 1939 from a California ground squirrel (*Spermophilus beecheyi*)³

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.⁴

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.⁴ Virulence factors on the chromosome are located in an unstable locus, *pgm*.⁵

Y. pestis, strain A12(D5) contains the pMT1 plasmid and the unstable *pgm* locus, but lacks the pCD1 plasmid that is essential for virulence as well as the pPCP1 plasmid.⁶

The presence of the pMT1 plasmid in NR-4688 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-4688 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:⁷ 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 A12 Derivative 5 (D5), NR-4688."

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:

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5. 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.
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