

Genomic DNA from *Yersinia pestis*, Strain KIM Derivative 2 (D2)

Catalog No. NR-4706

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Contributor:

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Product Description:

Genomic DNA was isolated from a preparation of *Yersinia pestis* (*Y. pestis*), strain KIM Derivative 2 (D2).

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; ~ 110 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 monomer or ~ 19 kb dimer), which encodes a protease that facilitates the initial dissemination of the bacteria to the lymph nodes.¹ Virulence factors on the chromosome are located in an unstable locus, *pgm*.²

Y. pestis, strain KIM(D2) is an avirulent derivative of the highly virulent KIM strain, which was originally isolated from a Kurdistan Iran man (KIM). *Y. pestis*, strain KIM(D2) contains the pMT1 and pPCP1 plasmids, but lacks the pCD1 plasmid that is essential for virulence as well as the unstable chromosomal *pgm* locus.³ The complete sequence of the chromosome (4,600,755 bp; GenBank: AE009952),⁴ pMT1 (100,984 bp; GenBank: AF074611), pCD1 (70,504 bp; GenBank: AF074612), and pPCP1 (9,610 bp; GenBank: AF053945) from *Y. pestis*, strain KIM have been determined.⁵

The presence of the pMT1 and pPCP1 plasmids in NR-4706 has been confirmed by PCR amplification of a virulence marker on each plasmid. NR-4706 has been qualified for PCR applications by amplification of approximately 1500 bp of the 16S ribosomal RNA gene as well as virulence marker sequences of approximately 1200 and 400 bp.

Material Provided:

Each vial contains approximately 4 to 6 µg of bacterial genomic DNA in TE buffer (10 mM Tris-HCl, 1 mM EDTA, pH ~ 7.4). The concentration is shown on the Certificate of Analysis. The vial should be centrifuged prior to opening.

Packaging/Storage:

NR-4706 was packaged aseptically in screw-capped plastic cryovials. The product is provided frozen on dry ice and

should be stored at -20°C or colder immediately upon arrival. Freeze-thaw cycles should be minimized.

Citation:

Acknowledgment for publications should read "The following reagent was obtained through the NIH Biodefense and Emerging Infections Research Resources Repository, NIAID, NIH: Genomic DNA from *Yersinia pestis*, Strain KIM Derivative 2 (D2), NR-4706."

Biosafety Level: 1

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. Parkhill, J., et al. "Genome Sequence of *Yersinia pestis*, the Causative Agent of Plague." Nature 413 (2001): 523-527. PubMed: 11586360.
2. 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.
3. Robert R. Brubaker, personal communication.
4. Deng, W., et al. "Genome Sequence of *Yersinia pestis* KIM." J. Bacteriol. 184 (2002): 4601-4611. PubMed: 12142430. GenBank: AE009952.
5. Hu, P., et al. "Structural Organization of Virulence-Associated Plasmids of *Yersinia pestis*." J. Bacteriol. 180 (1998): 5192-5202. PubMed: 9748454.
6. Brubaker, R. R. "How the Structural Gene Products of *Yersinia pestis* Relate to Virulence." Future Microbiol. 2 (2007): 377-385. PubMed: 17683274.

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