# Genomic DNA from *Yersinia pestis*, Strain KIM Derivative 19 (D19)

## Catalog No. NR-4705

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

### Contributor:

Robert R. Brubaker, Ph.D., Professor, Department of Microbiology and Molecular Genetics, Michigan State University, East Lansing, Michigan

### Product Description:

Genomic DNA was isolated from a preparation of *Yersinia pestis* (*Y. pestis*), strain KIM derivative 19 (D19).

*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), 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(D19) is an avirulent derivative of the highly virulent KIM strain, which was originally isolated from a Kurdistan Iran man (KIM). *Y. pestis*, strain KIM(D19) contains all three virulence plasmids, but lacks the unstable *pgm* locus.[3] The complete sequence of the chromosome (4,600,755 bp; GenBank: AE009952),[4] and plasmids; 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, pCD1, and pPCP1 plasmids in NR-4705 has been confirmed by PCR amplification of a virulence marker on each plasmid. NR-4705 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, 1900, 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-4705 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 19 (D19), NR-4705."

### 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.

### Disclaimers:

You are authorized to use this product for research use only. It is not intended for human use.

Use of this product is subject to the terms and conditions of the BEI Resources Material Transfer Agreement (MTA). The MTA is available on our Web site at www.beiresources.org.

While BEI Resources uses reasonable efforts to include accurate and up-to-date information on this product sheet, neither ATCC® nor the U.S. Government make any warranties or representations as to its accuracy. Citations from scientific literature and patents are provided for informational purposes only. Neither ATCC® nor the U.S. Government warrants that such information has been confirmed to be accurate.

This product is sent with the condition that you are responsible for its safe storage, handling, use and disposal. ATCC® and the U.S. Government are not liable for any damages or injuries arising from receipt and/or use of this product. While reasonable effort is made to ensure authenticity and reliability of materials on deposit, the U.S. Government, ATCC®, their suppliers and contributors to BEI Resources are not liable for damages arising from the misidentification or misrepresentation of products.

### Use Restrictions:

**This material is distributed for internal research, non-commercial purposes only.** This material, its product or its derivatives may not be distributed to third parties. Except as performed under a U.S. Government contract, individuals contemplating commercial use of the material, its products or its derivatives must contact the contributor to determine if a license is required. U.S. Government contractors may need a license before first commercial sale.

**Biodefense and Emerging Infections Research Resources Repository**
P.O. Box 4137
Manassas, VA 20108-4137 USA
www.beiresources.org

800-359-7370
Fax: 703-365-2898
E-mail: contact@beiresources.org

**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.



Support Provided by NIAID

**Biodefense and Emerging Infections Research Resources Repository**
P.O. Box 4137
Manassas, VA 20108-4137 USA
www.beiresources.org

800-359-7370
Fax: 703-365-2898
E-mail: contact@beiresources.org