**Yersinia pestis**, Strain KIM Derivative 2 (D2)

**Catalog No. NR-4682**

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: KIM derivative 2 (D2) Source: Derivative 2 of the highly virulent KIM strain, which was originally isolated from a Kurdistan Iran man (KIM) Comments: Yersinia pestis, strain KIM(D2) is an avirulent derivative of the KIM strain. The complete genome of Y. pestis, strain KIM has been sequenced (GenBank: AE009952).¹

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; ~ 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.³ Virulence factors on the chromosome are located in an unstable locus, pgm.⁴

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.⁵ The complete sequence of the chromosome (4,600,755 bp; GenBank: AE009952)¹ 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.⁶

The presence of the pMT1 and pPCP1 plasmids in NR-4682 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-4682 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: 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 KIM Derivative 2 (D2), NR-4682.”

**Biosafety Level: 2**

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References:
5. Robert R. Brubaker, personal communication.