Product Information Sheet for NR-51672

Borrelia recurrentis, Strain PBek

Catalog No. NR-51672

For research use only. Not for use in humans.

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Manufacturer:
BEI Resources

Product Description:
Bacteria Classification: *Spirochaetaceae*, *Borrelia*
Species: *Borrelia recurrentis*
Strain: PBek
Original Source: *Borrelia recurrentis (B. recurrentis)*, strain PBek was isolated in Germany in 2004 from the blood of a human with louse-borne relapsing fever returning from Ethiopia.[1,2]
Comments: *B. recurrentis*, strain PBek is reported to be multi-locus sequence type (MLST) ST-669.[2] The complete genome of *B. recurrentis*, strain PBek has been sequenced (BioProject: PRJNA378726).[2]

B. recurrentis is a large, loosely coiled, motile spirochete transmitted by a single known vector, *Pediculus humanus* (body louse).[2,3,4] It is the causative agent of louse-borne relapsing fever (LBRF), an epidemic disease with a distinctive relapsing phenomenon endemic to the Horn of Africa that is re-emerging in Europe, primarily along refugee migration routes.[2,3] *B. recurrentis* has the most simple genome of all *Borrelia spp.,* composed of one linear chromosome, seven linear plasmids and 990 protein-coding genes.[2,3] Genomic analysis indicates that *B. recurrentis* and *B. duttoni*, which causes tick-borne relapsing fever, are nearly identical and cannot be differentiated by sequencing of the 16S ribosomal RNA gene.[2,3] Approximately 30 genes or gene families are missing or damaged in *B. recurrentis*, including the RecA and RadA proteins involved in DNA double-strand break repair, suggesting that *B. recurrentis* is a decaying strain of *B. duttonii*.[2,3,4]

Material Provided:
Each vial contains approximately 0.5 mL of bacterial culture in Revised Barbour-Stoenner-Kelly broth supplemented with 15% glycerol.

Note: If homogeneity is required for your intended use, please purify prior to initiating work.

Packaging/Storage:
NR-51672 was packaged aseptically in cryovials. The product is provided frozen and should be stored at -60°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:
Revised Barbour-Stoenner-Kelly broth or equivalent (Appendix I)
Note: Medium should be prepared fresh before each use.
Incubation:
Temperature: 32°C to 34°C
Atmosphere: Microaerophilic
Propagation:
Note: It is recommended that NR-51672 be cultured in 24-well plates until growth is established from the frozen vial.

1. Place the frozen vial in a 35°C to 37°C water bath and thaw for approximately 2 to 3 minutes. Immerse the vial just enough to cover the frozen material. Do not agitate the vial. Do not leave the vial in the water bath after it is thawed.
2. Immediately after thawing, aseptically transfer the contents of the vial to 2 wells of a 24-well plate containing 1.5 mL fresh Revised Barbour-Stoenner-Kelly medium per well.
3. Incubate the plate at 32°C to 34°C. Do not shake culture during growth. It may take up to 21 days for the culture to establish from the frozen state.

Note: NR-51672 should be subcultured during the log phase of growth, as viability of the culture may decrease quickly.
Maintenance:

1. Monitor growth of the culture by live/dead staining every 3 to 6 days. When the culture has reached the log phase, transfer approximately 2 mL into to a T-25 tissue culture flask containing 8 mL fresh Revised Barbour-Stoenner-Kelly medium.
2. Incubate the plate at 32°C to 34°C.
3. Transfer the culture every 3 to 21 days as described in Maintenance steps 1 and 2. The transfer interval will depend on the size of the inoculum and the quality of the medium. This should be determined by performing live/dead staining every 3 to 6 days. Do not allow the culture to overgrow. Viability of the culture may be affected soon after reaching peak density.

Citation:
Acknowledgment for publications should read "The following reagent was obtained through BEI Resources, NIAID, NIH: *Borrelia recurrentis*, Strain PBek, NR-51672."

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 (BMBL). Current Edition. Washington, DC: U.S. Government Printing Office.

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References:

1. Fingerle, V., Personal Communication.
2. Marosevic, D., et al. "First Insights in the Variability of *Borrelia recurrentis* Genomes." PLoS Negl. Trop. Dis. 11 (2017): e0005865. PubMed: 28902847.
3. Warrell, D. A. "Louse-Borne Relapsing Fever (*Borrelia recurrentis* Infection)." Epidemiol. Infect. 147 (2019): e106. PubMed: 30869050.
4. Lescot, M., et al. "The Genome of *Borrelia recurrentis*, the Agent of Louse-Borne Relapsing Fever, is a Degraded Subset of Tick-Borne *Borrelia duttonii*." PLoS Genet. 4 (2008): e1000185. PubMed: 18787695.

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APPENDIX I: REVISED BSK MEDIUM (ATCC® MEDIUM: 1914)

1. Prepare the Revised BSK medium directly before each use following the recipe below by dissolving each component one at a time in distilled water:

HEPES	5.64 g
Neopeptone	4.7 g
Sodium citrate	0.7 g
Glucose	5.64 g
$NaHCO_3$	2 g
TC-Yeastolate	2 g
Sodium pyruvate	0.75 g
N-acetylglucosamine	0.37 g
Bovine serum albumin, fraction V	47 g
Distilled water	840 mL

2. Adjust the pH of the base medium to 7.5 using 1 N HCl or 1 N NaOH and filter-sterilize using a 0.22 µm filter.
3. Aseptically add the next two components to the base medium:

CMRL 1066 Medium, 10× (w/o Glutamine and $NaHCO_3$)	100 mL
Heat-inactivated rabbit serum	60 mL

4. Mix well and aseptically dispense into appropriate vessels. The medium may be stored in aliquots of 50 mL in freezer-safe vessels and stored frozen at -20°C until use. Once thawed, each aliquot should be kept at 2°C to 8°C and used within one month.
5. Adjust the pH of the complete medium to 7.5 to 7.6, as needed, using sterile solutions of 1 N HCl or 1 N NaOH, before use.

Note: Medium should be prepared fresh directly before each use or immediately aliquoted and frozen at -20°C until needed. Once thawed, each aliquot should be kept at 2°C to 8°C and used within one month.

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