

# Coxiella burnetii as a bioterrorism agent

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The obligate intracellular, Gram-negative bacterial pathogen *Coxiella burnetii* infects a wide range of vertebrate hosts. Acute infection of humans, termed Q fever, results in nonspecific, flu-like symptoms such as high-grade fever and severe preorbital headache. *C. burnetii* can also establish a persistent infection that may later reactivate and result in chronic endocarditis or hepatitis. Human infection usually occurs via the aerosol route and is most commonly associated with exposure to infected livestock or their products.

*C. burnetii* fulfils all requirements for a biological weapon: it consistently causes disability; it can be manufactured on a large scale; it remains stable under production, storage, and transportation conditions; it can be efficiently disseminated; and it remains viable for years after dissemination.

*C. burnetii* has a phase I and a phase II which undergo a “phase variation” event: a chromosomal mutation affecting lipopolysaccharide (LPS) biosynthesis. Avirulent or “phase II” bacteria produce an LPS that lacks the unique branched terminal sugar-containing O-polysaccharide chain that is characteristic of the LPS of virulent or “phase I” organisms. Phase I *C. burnetii* causes disease and persists in a guinea pig model of infection, whereas phase II *C. burnetii* does not. Jeffrey and his college propose a model that the lipopolysaccharide of virulent *C. burnetii* as a shielding molecule is a determinant of the virulence of the organism.

## Reference

Shannon, J.G., Howe, D., Heinzen, R.A. (2005) *Proc Natl Acad Sci U S A.* 14; 102(24):8722-7.