

S1 Table. Bacterial strains and plasmids used in this study

Strain or plasmid	Genotype or strain source	Source/reference
Strains		
<i>E. coli</i> Stellar cells	F ⁻ , <i>endA1</i> , <i>supE44</i> , <i>thi-1</i> , <i>recA1</i> , <i>relA1</i> , <i>gyrA96</i> , <i>phoA</i> , $\Phi 80\Delta$ <i>lacZ</i> Δ <i>M15</i> , Δ (<i>lacZYA</i> - <i>argF</i>) U169, Δ (<i>mrr</i> - <i>hsdRMS</i> - <i>mcrBC</i>), Δ <i>mcrA</i> , λ -	Clontech
<i>E. coli</i> PIR1 cells	F- Δ <i>lacI69</i> , <i>rpoS</i> (Am), <i>robA1</i> , <i>creC510</i> , <i>hsdR514</i> , <i>endA</i> , <i>recA1</i> , <i>uidA</i> (Δ <i>MluI</i>): <i>pir</i> -116	Invitrogen
<i>C. burnetii</i> Nine Mile RSA439 (NMII)	Passage variant of Nine Mile RSA493, phase II, clone 4	[1-3]
<i>C. burnetii</i> Nine Mile RSA493 (NMI)	Isolated in Montana (1935) from a tick, phase I, clone 7	[1-3]
<i>C. burnetii</i> Nine Mile RSA363	Passage variant of Nine Mile RSA493, phase I	[1]
<i>C. burnetii</i> Nine Mile Crazy RSA514 (NMC)	Isolated from a chronically infected guinea pig, phase I/II	[4, 5]
<i>C. burnetii</i> Australia (RSA425)	Passage variant of the Australia QD strain RSA425, isolated in Australia (1939) from human blood, phase II	[6]
<i>C. burnetii</i> Australia (RSA297)	Passage variant of the Australia QD strain RSA425, isolated in Australia (1939) from human blood, phase II	[6]
<i>C. burnetii</i> G (Q212)	Isolated in Nova Scotia (1981) from a human heart valve, phase I	[7]
<i>C. burnetii</i> S (Q217)	Isolated in Montana (1981) from a human liver biopsy, phase I	[8]
<i>C. burnetii</i> Dugway (7E65-68)	Isolated in Dugway, Utah (1958) from rodents, phase I	[9, 10]
<i>C. burnetii</i> California 16 (RSA350)	Isolated in California (1947) from cow's milk, phase II	[11, 12]
<i>C. burnetii</i> California 16 (RSA350) C2	Clone 2 of California 16 (RSA350), phase II	This study
<i>C. burnetii</i> M44 C1	Clone 1 of M44 (RSA459), phase II	[2, 13, 14]
<i>C. burnetii</i> <i>cbu0678tr</i>	Nine Mile RSA493, phase I containing a truncated <i>cbu0678</i> gene; Cm ^r	This study
<i>C. burnetii</i> Δ <i>cbu1655</i>	Nine Mile RSA439, phase II containing a <i>cbu1655</i> deletion; Cm ^r	This study
<i>C. burnetii</i> Δ <i>cbu0533</i>	Nine Mile RSA363, phase I containing a <i>cbu0533</i> deletion; lysine complemented	This study
<i>C. burnetii</i> Δ <i>cbu1657</i>	Nine Mile RSA439, phase II containing a <i>cbu1657</i> deletion; lysine complemented	This study
<i>C. burnetii</i> Δ <i>cbu0839</i>	Nine Mile RSA363, phase I containing a <i>cbu0839</i> deletion; lysine complemented	This study
Plasmids		
pJC-Kan	pJC84 containing <i>kan</i> driven by <i>1169^P</i> ; Kan ^r	This study
pJC-CAT	pJC84 containing <i>cat</i> driven by <i>1169^P</i> ; Cm ^r	[15]
pJC-CAT:: <i>1169^P-lysCA</i>	<i>1169^P-lysCA</i> cassette cloned into pJC-CAT; Cm ^r	This study
pCR TM -Blunt II-TOPO TM	Topoisomerase I cloning vector for blunt-ended PCR products, Kan ^r	Thermo Fisher Scientific
pCR-BluntII:: <i>1169^P-CAT</i>	<i>loxP-1169^P-CAT-term-loxP</i> gBlock fragment cloned into pCR-BluntII-topo	This study
pJC-Kan:: <i>cbu0678tr-5'3'</i>	5' and 3' flanking DNA containing a truncated <i>cbu0678</i> cloned into pJC-Kan; Kan ^r	This study
pJC-Kan:: <i>cbu0678tr-5'3'-CAT</i>	<i>1169^P-CAT</i> cassette cloned into pJC-Kan:: <i>cbu0678tr-5'3'</i> ; Cm ^r , Kan ^r	This study
pJC-Kan:: <i>cbu1655-5'3'</i>	5' and 3' flanking DNA from <i>cbu1655</i> cloned into pJC-Kan; Kan ^r	This study
pJC-Kan:: <i>cbu1655-5'3'-CAT</i>	<i>1169^P-CAT</i> cassette cloned into pJC-Kan:: <i>cbu1655-5'3'</i> ; Cm ^r , Kan ^r	This study
pJC-CAT:: <i>cbu0533-5'3'</i>	5' and 3' flanking DNA from <i>cbu0533</i> cloned into pJC-CAT; Cm ^r	This study

pJC-CAT:: <i>cbu0533-5'3'-lysCA</i>	<i>1169^P-lysCA</i> cassette cloned into pJC-CAT:: <i>cbu0533-5'3'</i> ; Cm ^r	This study
pJC-CAT:: <i>cbu1657-5'3'</i>	5' and 3' flanking DNA from <i>cbu1657</i> cloned into pJC-CAT; Cm ^r	This study
pJC-CAT:: <i>cbu1657-5'3'-lysCA</i>	<i>1169^P-lysCA</i> cassette cloned into pJC-CAT:: <i>cbu1657-5'3'</i> ; Cm ^r	This study
pJC-CAT:: <i>cbu0839-5'3'</i>	5' and 3' flanking DNA from <i>cbu0839</i> cloned into pJC-CAT; Cm ^r	This study
pJC-CAT:: <i>cbu0839-5'3'-lysCA</i>	<i>1169^P-lysCA</i> cassette cloned into pJC-CAT:: <i>cbu0839-5'3'</i> ; Cm ^r	This study
pJB-Kan-2xHA	pJB2581 containing <i>kan</i> driven by <i>1169^P</i> ; Kan ^r	[16]
pJB-CAT	pJB2581 containing <i>cat</i> driven by <i>1169^P</i> ; Cm ^r	[16]
pJB-Kan:: <i>cbu0678comp-I</i>	<i>Cbu0678</i> fragment cloned into pJB-Kan-2xHA; Kan ^r	This study
pJB-Kan:: <i>cbu0678comp-P74A</i>	<i>Cbu0678-P74A</i> fragment cloned into pJB-Kan-2xHA; Kan ^r	This study
pJB-Kan:: <i>cbu0678comp-G369R</i>	<i>Cbu0678-G368R</i> fragment cloned into pJB-Kan-2xHA; Kan ^r	This study
pJB-Kan:: <i>cbu0678comp-P74A/G369R</i>	<i>Cbu0678-P74A-G369R</i> fragment cloned into pJB-Kan-2xHA; Kan ^r	This study
pJB-CAT-2xHA	A 2x hemagglutinin tag cloned into pJB-CAT, Cm ^r	[17]
pJB-CAT:: <i>cbu1657comp-II</i>	<i>Cbu1657^P-cbu1657</i> fragment cloned into pJB-CAT-2xHA; Cm ^r	This study
pTnS2:: <i>1169^P-msABCD</i>	<i>cbu1169</i> promoter cloned into pTnS2; Amp ^r , R6K <i>ori</i>	[18]
pMiniTn7T-CAT	<i>1169^P-CAT</i> cloned into pUC18R6K-mini-Tn7T-Gm; Cm ^r , Amp ^r , R6K <i>ori</i>	[18]
pMiniTn7T-Kan	<i>1169^P-Kan</i> cloned into pUC18R6K-mini-Tn7T-CAT; Kan ^r , Amp ^r , R6K <i>ori</i>	This study
pMiniTn7T-Kan:: <i>cbu1655comp-II</i>	<i>Cbu1655^P-cbu1655</i> fragment cloned into pMiniTn7T-Kan; Kan ^r , Amp ^r	This study
pMiniTn7T-CAT:: <i>cbu0533comp-I</i>	<i>Cbu0533^P-cbu0533-I-comp</i> fragment cloned into pMiniTn7T-CAT; Cm ^r , Amp ^r	This study
pMiniTn7T-CAT:: <i>cbu0533comp-II</i>	<i>Cbu0533^P-cbu0533-II-comp</i> fragment cloned into pMiniTn7T-CAT; Cm ^r , Amp ^r	This study
pMiniTn7T-CAT:: <i>cbu0533comp-D156C</i>	<i>Cbu0533^P-cbu0533-D156C-comp</i> fragment cloned into pMiniTn7T-CAT; Cm ^r , Amp ^r	This study
pMiniTn7T-CAT:: <i>cbu0533comp-T138M</i>	<i>Cbu0533^P-cbu0533-T138M-comp</i> fragment cloned into pMiniTn7T-CAT; Cm ^r , Amp ^r	This study
pMiniTn7T-CAT:: <i>cbu0845comp-I</i>	<i>Cbu0845^P-cbu0845</i> fragment cloned into pMiniTn7T-CAT; Cm ^r , Amp ^r	This study
pMiniTn7T-CAT:: <i>cbu1657comp-II</i>	<i>Cbu1657^P-cbu1657comp</i> fragment cloned into pMiniTn7T-CAT; Cm ^r , Amp ^r	This study
pMiniTn7T-CAT:: <i>cbu0839comp-I</i>	<i>Cbu0839^P-cbu0839-cbu0840-cbu0841</i> fragment cloned into pMiniTn7T-CAT; Cm ^r , Amp ^r	This study

References

1. Davis GE, Cox HR. A filter-passing infectious agent isolated from ticks. I. Isolation from *Dermacentor andersonii*, reactions with animals, and filtration experiments. Public Health Rep. 1938;53:2259-76.
2. Ormsbee RA, Peacock MG. Rickettsial plaques assay and cloning procedures. Tissue Culture Assoc. 1976;2:475-8.
3. Amano K, Williams JC. Chemical and immunological characterization of lipopolysaccharides from phase I and phase II *Coxiella burnetii*. J Bacteriol. 1984;160(3):994-1002.
4. Peacock MG, Fiset P, Ormsbee RA, Wisseman CL, Jr. Antibody response in man following a small intradermal inoculation with *Coxiella burnetii* phase I vaccine. Acta Virol. 1979;23(1):73-81. PubMed PMID: 35962.

5. Hackstadt T, Peacock MG, Hitchcock PJ, Cole RL. Lipopolysaccharide variation in *Coxiella burnetii*: intrastrain heterogeneity in structure and antigenicity. *Infect Immun*. 1985;48(2):359-65. PubMed PMID: 3988339; PubMed Central PMCID: PMCPMC261314.
6. Burnet FM, Freeman M. Experimental studies on the virus of "Q" fever. *Med J Aust*. 1937;2:299-305.
7. Haldane EV, Marrie TJ, Faulkner RS, Lee SH, Cooper JH, MacPherson DD, et al. Endocarditis due to Q fever in Nova Scotia: experience with five patients in 1981-1982. *J Infect Dis*. 1983;148(6):978-85. PubMed PMID: 6655300.
8. Hendrix LR, Samuel JE, Mallavia LP. Differentiation of *Coxiella burnetii* isolates by analysis of restriction-endonuclease-digested DNA separated by SDS-PAGE. *J Gen Microbiol*. 1991;137(Pt 2):269-76.
9. Stoenner HG, Lackman DB. The biologic properties of *Coxiella burnetii* isolated from rodents collected in Utah. *Am J Hyg*. 1960;71:45-51. PubMed PMID: 13834767.
10. Beare PA, Jeffrey BM, Martens CA, Heinzen RA. Draft Genome Sequences of the Avirulent *Coxiella burnetii* Dugway 7D77-80 and Dugway 7E65-68 Strains Isolated from Rodents in Dugway, Utah. *Genome Announc*. 2017;5(39). doi: 10.1128/genomeA.00984-17. PubMed PMID: 28963209; PubMed Central PMCID: PMCPMC5624755.
11. Huebner RJ, Jellison WL, Beck MD, Parker RR, Shepard CC. Q fever studies in southern California. I. Recovery of *Rickettsia burnetii* from raw milk. *Public Health Rep*. 1948;63(7):214-22. PubMed PMID: 18899804.
12. Beare PA, Jeffrey BM, Martens CA, Pearson T, Heinzen RA. Draft genome sequences of historical strains of *Coxiella burnetii* isolated from cow's milk and a goat placenta. *Genome Announc*. 2017;5(39). doi: 10.1128/genomeA.00985-17. PubMed PMID: 28963210; PubMed Central PMCID: PMCPMC5624756.
13. Caminopetros JP. La Q fever en Grèce; le lait source de l'infection pour l'homme et les animaux. *Annales de parasitologie humaine et comparee*. 1948;23(1-2):107-18. Epub 1948/01/01. PubMed PMID: 18889741.
14. Genig VA. A live vaccine 1-M-44 against Q-fever for oral use. *J Hyg Epidemiol Microbiol Immunol*. 1968;12(3):265-73. PubMed PMID: 5753316.
15. Beare PA, Larson CL, Gilk SD, Heinzen RA. Two systems for targeted gene deletion in *Coxiella burnetii*. *Appl Environ Microbiol*. 2012;78(13):4580-9. Epub 2012/04/24. doi: 10.1128/AEM.00881-12. PubMed PMID: 22522687; PubMed Central PMCID: PMC3370473.
16. Omsland A, Beare PA, Hill J, Cockrell DC, Howe D, Hansen B, et al. Isolation from animal tissue and genetic transformation of *Coxiella burnetii* are facilitated by an improved axenic growth medium. *Appl Environ Microb*. 2011;77(11):3720-5. PubMed PMID: ISI:000290847800021.
17. Beare PA. Genetic manipulation of *Coxiella burnetii*. *Advances in experimental medicine and biology*. 2012;984:249-71. Epub 2012/06/20. doi: 10.1007/978-94-007-4315-1_13. PubMed PMID: 22711636.
18. Beare PA, Gilk SD, Larson CL, Hill J, Stead CM, Omsland A, et al. Dot/Icm type IVB secretion system requirements for *Coxiella burnetii* growth in human macrophages. *Mbio*. 2011;2(4):e00175-11. Epub 2011/08/25. doi: 10.1128/mBio.00175-11e00175-11 [pii] mBio.00175-11 [pii]. PubMed PMID: 21862628; PubMed Central PMCID: PMC3163939.

