**Appendix: Supplementary data**

**Supplementary Figure captions**

**Supplemental Figure 1. No difference of Lyme borreliae survival in human sera determined by motile spirochete measuring and Live/Dead staining.** A low passage, infectious, and serum resistant *B. burgdorferi* strain B31-5A4 (“B31-5A4”) or a high passage, a non-infectious, and serum sensitive *B. burgdorferi* strain B313 (“B313”) was incubated for 4h with the human sera at a final concentration of 40 % in the presence (“OmCI-serum”) or absence (“serum”) of 2 µM of OmCI. The heat-inactivated human sera were included as a control (“heat-treated”). The number of motile spirochetes was assessed microscopically (“Motile spirochete measuring”) or using Live/Dead staining. The percentage of survival for those *B. burgdorferi* strains was calculated using the number of live spirochetes at 4 h post incubation normalized to that prior to the incubation with serum. The work was performed on three independent experiments; within each experiment, samples were run in triplicate, and the survive percentage for each experiment was calculated by averaging the results from triplicate experiments. The result shown here is the average ± standard deviation of the survival percentage from three independent experiments. (\*), the significant difference (P < 0.05) of the percent survival of spirochetes between indicated groups was determined using the one-way ANOVA with post hoc Dunn’s test.

**Supplemental Figure 2. *B. duttonii* survives in human and chicken sera independent on heat or OmCI treatment.** *B. duttonii* strains V (“V”) or LA1 (“LA1”) was incubated for 4h with the serum from **(A)** human or **(B)** chicken at a final concentration of 40 % in the presence (“OmCI-serum”) or absence (“serum”) of 2 µM of OmCI. The heat-inactivated sera from the above-mentioned animals were included as a control (“heat-treated”). The number of motile spirochetes was assessed microscopically. The percentage of survival for those *B. burgdorferi* strains was calculated using the number of mobile spirochetes at 4 h post incubation normalized to that prior to the incubation with serum. The work was performed on three independent experiments; within each experiment, samples were run in triplicate, and the survive percentage for each experiment was calculated by averaging the results from triplicate experiments. The result shown here is the average ± standard deviation of the survival percentage from three independent experiments using the one-way ANOVA with post hoc Dunn’s test, no statistical difference (P > 0.05) were observed between groups.

**Supplementary Tables**

**Supplemental Table 1. Bacteria strains used in this study**

|  |  |  |
| --- | --- | --- |
| Strain or plasmid | Genotype or characteristic | References or Sources |
| *B. burgdorferi* strains |  |  |
| B31-5A4 | *B. burgdorferi* strain B31 clone 5A4 | ([Purser and Norris, 2000](#_ENREF_42))  |
| B313 | High-passage *B. burgdorferi* B31 missing lp5, lp17, lp21, lp25, lp28-1, lp28-2, lp28-3, lp28-4, lp36, lp38, lp54, lp56, cp9, cp32-4, cp32-6, cp32-8, cp32-9 | ([Sadziene et al., 1993](#_ENREF_47))  |
|  |  |  |
| *B. duttonii* strains |  |  |
| V | *B. duttonii* strain isolated from a patient with relapsing fever | This study  |
| LA1 | Passaged from a *B. duttonii* strain La, isolated from an Ethiopian patient with relapsing fever | ([Cutler et al., 1999](#_ENREF_11))  |
|  |  |  |
| *E. coli* strains |  |  |
| BL21(DE3) | F–, *ompT*, *hsdSB* (rB–, mB–), *dcm*, *gal*, λ(DE3) | Promega |
| BL21(DE3)/pET16-*omCI*  | BL21 producing histidine tagged residue OmCI  | ([Blom et al., 2014](#_ENREF_7))  |