

Table S1. Organisms and their protein sequence files in the current study.

Organism Number ²	Species	Protein Sequences File	Number of Proteins	Vector
5	<i>Anaplasma centrale</i> str. Israel	GCA_000024505.1_ASM2450v1_protein.faa	925	Tick
4	<i>Anaplasma marginale</i> str. Florida	GCA_000020305.1_ASM2030v1_protein.faa	942	Tick
0	<i>Anaplasma marginale</i> str. St. Maries	GCA_000011945.1_ASM1194v1_protein.faa	949	Tick
2	<i>Anaplasma phagocytophilum</i> str. HZ	GCA_000013125.1_ASM1312v1_protein.faa	1352	Tick
9	<i>Anaplasma phagocytophilum</i> str. HZ2	GCA_000439755.1_ASM43975v1_protein.faa	1247	Tick
10	<i>Anaplasma phagocytophilum</i> str. JM	GCA_000439775.1_ASM43977v1_protein.faa	1256	Tick
55	<i>Bartonella clarridgeiae</i> 73	NC_014932.faa	1323	Fleas
54	<i>Bartonella grahamii</i> as4aup	NC_012846.faa	1737	Fleas
25	<i>Bartonella henselae</i> str. Houston-1	NC_005956.faa	1488	Fleas
91	<i>Bartonella quintana</i> RM-11	NC_018533.faa	1203	Lice
24	<i>Bartonella quintana</i> str. Toulouse	NC_005955.faa	1142	Lice
44	<i>Bartonella tribocorum</i> CIP 105476	NC_010161.faa	2069	Fleas
93	<i>Borrelia afzelii</i> HLJ01	NC_018887.faa	892	Tick
32	<i>Borrelia afzelii</i> PKo (FLI) ¹	NC_008277.faa	848	Tick
84	<i>Borrelia afzelii</i> PKo (Maryland) ¹	NC_017238.faa	824	Tick
57	<i>Borrelia bissettii</i> DN127	NC_015921.faa	816	Tick
21	<i>Borrelia burgdorferi</i> B31	NC_001318.faa	797	Tick
98	<i>Borrelia burgdorferi</i> CA382	NC_022048.faa	819	Tick
85	<i>Borrelia burgdorferi</i> JD1	NC_017403.faa	823	Tick
86	<i>Borrelia burgdorferi</i> N40	NC_017418.faa	809	Tick
52	<i>Borrelia burgdorferi</i> ZS7	NC_011728.faa	808	Tick
90	<i>Borrelia crocidurae</i> str. Achema	NC_017808.faa	864	Tick
48	<i>Borrelia duttonii</i> Ly	NC_011229.faa	820	Tick
89	<i>Borrelia garinii</i> BgVir	NC_017717.faa	826	Tick
92	<i>Borrelia garinii</i> NMJW1	NC_018747.faa	813	Tick
46	<i>Borrelia hermsii</i> HS1	NC_010673.faa	819	Tick
99	<i>Borrelia miyamotoi</i> LB-2001	NC_022079.faa	808	Tick
49	<i>Borrelia recurrentis</i> A1	NC_011244.faa	800	Lice
35	<i>Borrelia turicatae</i> 91E135	NC_008710.faa	818	Tick
100	<i>Borrelia valaisiana</i> VS116	NZ_ABCY02000001.faa	832	Tick
50	<i>Coxiella burnetii</i> CbuG_Q212	NC_011527.faa	1864	Tick

51	<i>Coxiella burnetii</i> CbuK_Q154	NC_011528.faa	1898	Tick
37	<i>Coxiella burnetii</i> Dugway 5J108-111	NC_009727.faa	1993	Tick
43	<i>Coxiella burnetii</i> RSA 331	NC_010117.faa	1930	Tick
22	<i>Coxiella burnetii</i> RSA 493	NC_002971.faa	1823	Tick
1	<i>Ehrlichia canis</i> str. Jake	GCA_000012565.1_ASM1256v1_protein.faa	925	Tick
3	<i>Ehrlichia chaffeensis</i> str. Arkansas	GCA_000013145.1_ASM1314v1_protein.faa	1105	Tick
12	<i>Ehrlichia chaffeensis</i> str. Heartland	GCA_000632815.1_ASM63281v1_protein.faa	970	Tick
14	<i>Ehrlichia chaffeensis</i> str. Jax	GCA_000632865.1_ASM63286v1_protein.faa	989	Tick
15	<i>Ehrlichia chaffeensis</i> str. Liberty	GCA_000632885.1_ASM63288v1_protein.faa	989	Tick
16	<i>Ehrlichia chaffeensis</i> str. Osceola	GCA_000632905.1_ASM63290v1_protein.faa	988	Tick
17	<i>Ehrlichia chaffeensis</i> str. Saint Vincent	GCA_000632925.1_ASM63292v1_protein.faa	973	Tick
18	<i>Ehrlichia chaffeensis</i> str. Wakulla	GCA_000632945.1_ASM63294v1_protein.faa	980	Tick
19	<i>Ehrlichia chaffeensis</i> str. West Paces	GCA_000632965.1_ASM63296v1_protein.faa	962	Tick
11	<i>Ehrlichia muris</i> AS145	GCA_000508225.1_ASM50822v1_protein.faa	904	Tick
7	<i>Ehrlichia ruminantium</i> str. Gardel	GCA_000050405.1_ASM5040v1_protein.faa	950	Tick
6	<i>Ehrlichia ruminantium</i> str. Welgevonden	GCA_000026005.1_ASM2600v1_protein.faa	888	Tick
8	<i>Ehrlichia ruminantium</i> str. Welgevonden	GCA_000050425.1_ASM5042v1_protein.faa	958	Tick
13	<i>Ehrlichia</i> sp. HF	GCA_000632845.1_ASM63284v1_protein.faa	946	Tick
94	<i>Francisella tularensis</i> subsp. holarctica F92	NC_019537.faa	1842	Tick
95	<i>Francisella tularensis</i> subsp. holarctica FSC200	NC_019551.faa	1438	Tick
38	<i>Francisella tularensis</i> subsp. holarctica FTNF002-00	NC_009749.faa	1581	Tick
29	<i>Francisella tularensis</i> subsp. holarctica LVS	NC_007880.faa	1754	Tick
33	<i>Francisella tularensis</i> subsp. holarctica OSU18	NC_008369.faa	1555	Tick
47	<i>Francisella tularensis</i> subsp. mediasiatica FSC147	NC_010677.faa	1406	Tick
34	<i>Francisella tularensis</i> subsp. novicida U112	NC_008601.faa	1719	Tick
31	<i>Francisella tularensis</i> subsp. tularensis FSC198	NC_008245.faa	1605	Tick
87	<i>Francisella tularensis</i> subsp.	NC_017453.faa	1836	Tick

	tularensis NE061598			
27	<i>Francisella tularensis</i> subsp. tularensis SCHU S4	NC_006570.faa	1556	Tick
70	<i>Francisella tularensis</i> subsp. tularensis TIO902	NC_016937.faa	1544	Tick
69	<i>Francisella tularensis</i> subsp. tularensis TIGB03	NC_016933.faa	1624	Tick
36	<i>Francisella tularensis</i> subsp. tularensis WY96-3418	NC_009257.faa	1634	Tick
53	<i>Rickettsia africae</i> ESF-5	NC_012633.faa	1030	Tick
80	<i>Rickettsia australis</i> str. Cutlack	NC_017058.faa	1239	Tick
41	<i>Rickettsia bellii</i> OSU 85-389	NC_009883.faa	1475	Tick
30	<i>Rickettsia bellii</i> RML369-C	NC_007940.faa	1429	Tick
66	<i>Rickettsia canadensis</i> str. CA410	NC_016929.faa	1016	Tick
39	<i>Rickettsia canadensis</i> str. McKiel	NC_009879.faa	1089	Tick
23	<i>Rickettsia conorii</i> str. Malish 7	NC_003103.faa	1374	Tick
28	<i>Rickettsia felis</i> URRWXCal2	NC_007109.faa	1400	Fleas
56	<i>Rickettsia heilongjiangensis</i> 054	NC_015866.faa	1297	Tick
58	<i>Rickettsia japonica</i> YH	NC_016050.faa	971	Tick
42	<i>Rickettsia massiliae</i> MTU5	NC_009900.faa	968	Tick
68	<i>Rickettsia massiliae</i> str. AZT80	NC_016931.faa	1195	Tick
101	<i>Rickettsia monacensis</i>	NZ_LN794217.faa	1443	Tick
72	<i>Rickettsia montanensis</i> str. OSU 85-930	NC_017043.faa	1217	Tick
73	<i>Rickettsia parkeri</i> str. Portsmouth	NC_017044.faa	1318	Tick
67	<i>Rickettsia philipii</i> str. 364D	NC_016930.faa	1344	Tick
97	<i>Rickettsia prowazekii</i> str. Breinl	NC_020993.faa	920	Lice
78	<i>Rickettsia prowazekii</i> str. BuV67-CWPP	NC_017056.faa	843	Lice
75	<i>Rickettsia prowazekii</i> str. Chernikova	NC_017049.faa	845	Lice
77	<i>Rickettsia prowazekii</i> str. Dachau	NC_017051.faa	839	Lice
74	<i>Rickettsia prowazekii</i> str. GvV257	NC_017048.faa	829	Lice
76	<i>Rickettsia prowazekii</i> str. Katsinyian	NC_017050.faa	844	Lice
20	<i>Rickettsia prowazekii</i> str. Madrid E	NC_000963.faa	843	Lice

96	<i>Rickettsia prowazekii</i> str. NMRC Madrid E	NC_020992.faa	938	Lice
88	<i>Rickettsia prowazekii</i> str. Rp22	NC_017560.faa	950	Lice
79	<i>Rickettsia prowazekii</i> str. RpGvF24	NC_017057.faa	834	Lice
71	<i>Rickettsia rhipicephali</i> str. 3-7-female6-CWPP	NC_017042.faa	1252	Tick
61	<i>Rickettsia rickettsii</i> str. Arizona	NC_016909.faa	1343	Tick
63	<i>Rickettsia rickettsii</i> str. Brazil	NC_016913.faa	1332	Tick
60	<i>Rickettsia rickettsii</i> str. Colombia	NC_016908.faa	1350	Tick
62	<i>Rickettsia rickettsii</i> str. Hauke	NC_016911.faa	1340	Tick
64	<i>Rickettsia rickettsii</i> str. Hino	NC_016914.faa	1335	Tick
65	<i>Rickettsia rickettsii</i> str. Hlp#2	NC_016915.faa	1308	Tick
45	<i>Rickettsia rickettsii</i> str. Iowa	NC_010263.faa	1382	Tick
40	<i>Rickettsia rickettsii</i> str. 'Sheila Smith'	NC_009882.faa	1343	Tick
59	<i>Rickettsia slovaca</i> 13-B	NC_016639.faa	1112	Tick
82	<i>Rickettsia slovaca</i> str. D-CWPP	NC_017065.faa	1347	Tick
81	<i>Rickettsia typhi</i> str. B9991CWPP	NC_017062.faa	839	Fleas
83	<i>Rickettsia typhi</i> str. TH1527	NC_017066.faa	838	Fleas
26	<i>Rickettsia typhi</i> str. Wilmington	NC_006142.faa	837	Fleas
	Total: 102 organisms		120,046	

¹ *FLI* and *Maryland* are designations in the KEGG database for the two *Borrelia afzelii* spp.

² Network number corresponds to the organism number in the network in Figure 1.