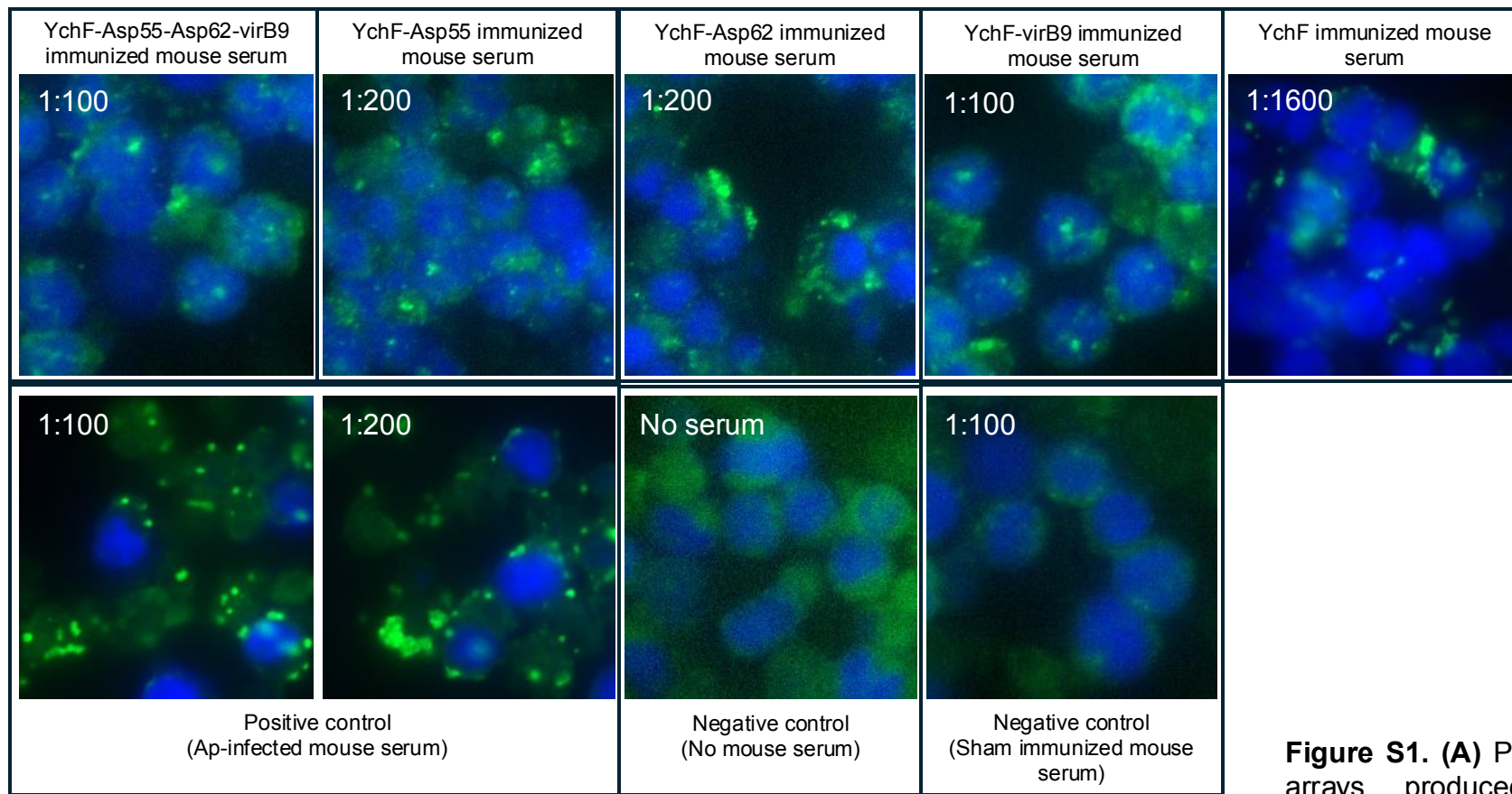
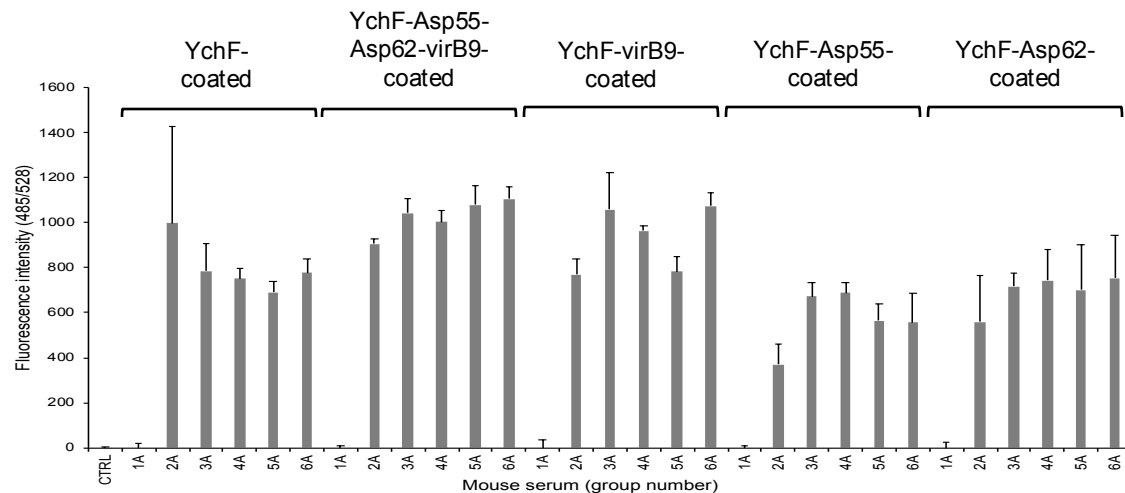
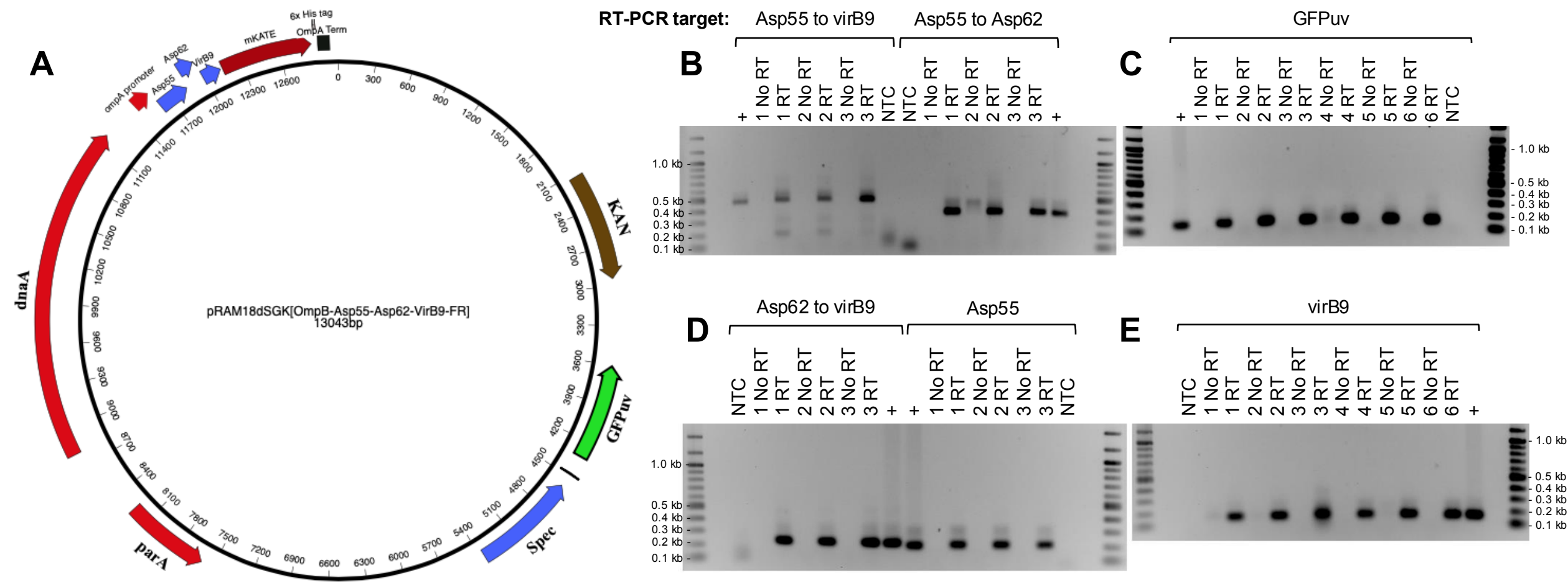


**A****B**

**Figure S1. (A)** Pooled sera from mice injected with purified epitope arrays produced in *E. coli* BL21(DE3) were used in immunofluorescence assays against HL-60 cells infected with *Anaplasma phagocytophilum*. The secondary antibody was goat anti-mouse IgG AlexaFluor488 conjugate used at 1:1000.

**(B)** Peptide ELISA using sera from mice immunized with recombinant protein expressed in *E. coli*. 1 = control (elution buffer only); 2 = YchF-Asp55-Asp62-virB9; 3 = YchF-virB9; 4 = YchF-Asp55; 5 = YchF-Asp62; 6 = YchF. Plate was coated with 500ng/well of each recombinant protein epitope. Plates were blocked 3h with PBST + 5% BSA, then incubated 2h with sera from mice at 1:100 dilution. Secondary antibody (goat anti-mouse IgG, AlexFluor488) was added at 1:2000 for 1h. Fluorescence was measured at 485/528 on plate reader, readings were adjusted to negative control (secondary ab only). Wells were washed 3x in PBST between each step.



**Figure S2:** (A) Map of pRAM18dSGK plasmid expressing all epitopes (without YchF). (B-E) Gels of RT-PCR analysis that demonstrate transcription of epitope arrays from a shuttle plasmid transformed into *R. parkeri*, indicating *R. parkeri* is able to express them. The promoter and epitopes are indicated by the sample numbers above the wells and detailed in the table (F). No RT = control lacking reverse transcriptase; NTC = no template control using water instead of RNA; RT = test condition using RNA and reverse transcriptase; + = reactions used DNA as a positive control.

<b>F</b>	
+	DNA from <i>Rp</i> pRAM18dSGK [OmpA-YchF-Asp55-Asp62-virB9]
NTC	No template control (water)
1	<i>Rp</i> pRAM18dSGK [OmpA-Asp55-Asp62-virB9-mKate]
2	<i>Rp</i> pRAM18dSGK [OmpA-Asp55-Asp62-virB9]
3	<i>Rp</i> pRAM18dSGK [OmpB-Asp55-Asp62-virB9]
4	<i>Rp</i> pRAM18dSGK [OmpA-virB9]
5	<i>Rp</i> pRAM18dSGK [OmpA-virB9-mKate]
6	<i>Rp</i> pRAM18dSGK [OmpB-virB9]

**Figure S3: Persistence of vaccine strain *R. parkeri* (G8::lox[*virB9*-mKate]) in mice.** Mouse tissues from vaccinated and boosted mice on day 3 (3 days after primary vaccination), day 35 (7 days after booster), and day 49 (21 days after booster; *Ap*-challenged group shown) were tested by qPCR against rickettsial *gltA*.

