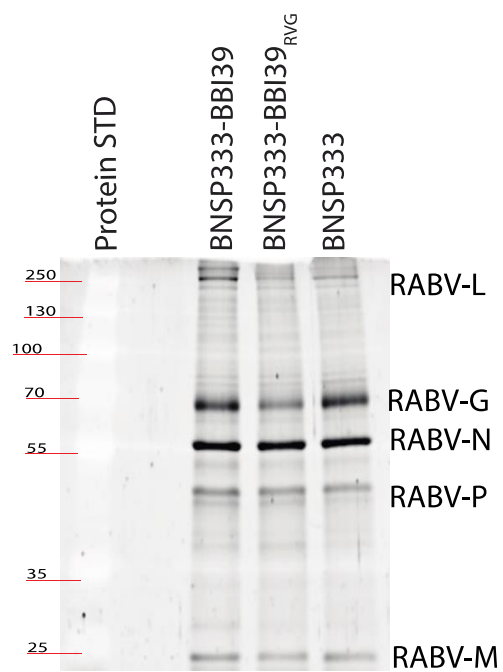


a.



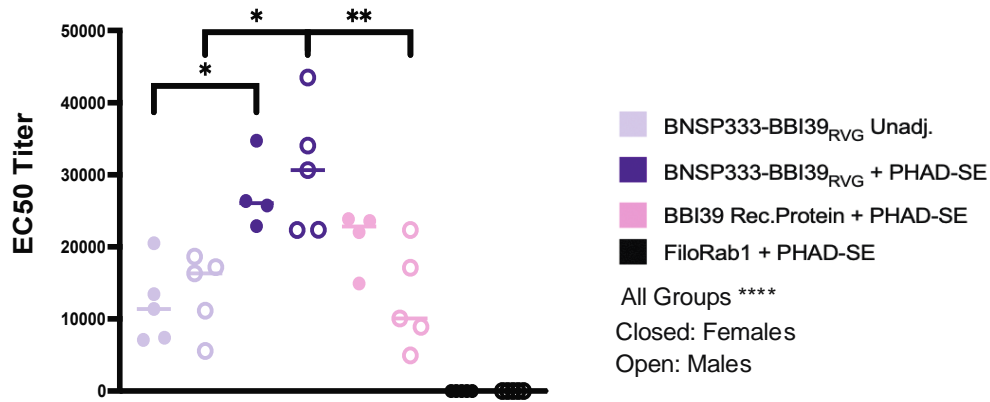
**Supplementary Figure S1:**

**SDS-PAGE protein gel of RABV-based constructs.**

(a) Protein gel of sucrose purified virions showing all RABV proteins.

a.

### Day 56 BBI39 EC50 Females and Males

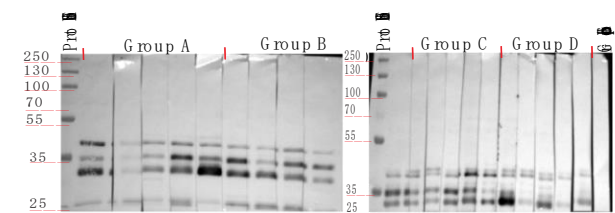


### Supplementary Figure S2

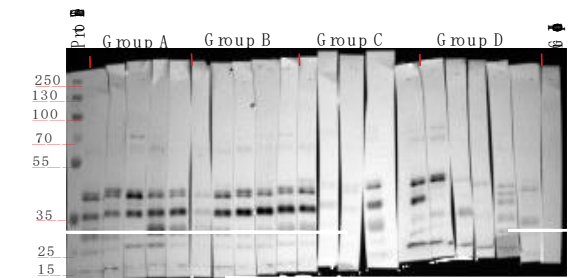
#### Sex differences in antibody titers from vaccinated female and male mice

(a) anti-BBI39 total IgG EC50 titers for comparing male and female vaccinated mice. Statistics were calculated by one-way ANOVA with post hoc Tukey's test of log-transformed data.  $p > (ns)$ ,  $p < 0.0332$  (\*),  $p < 0.0021$  (\*\*),  $p < 0.0002$  (\*\*\*),  $p < 0.0001$  (\*\*\*\*).

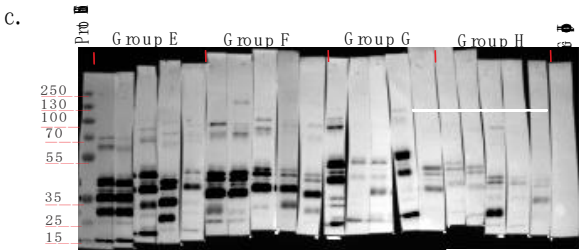
a.



b.



c.



d.






	Groups	Number of Infected Mice		
		Heart	Joint	Skin
Group A/E	BNSP333-BBI39 <sub>RVG</sub> Unadjuvanted	7/15	7/15	11/15
Group B/F	BNSP333-BBI39 <sub>RVG</sub> + PHAD-SE	4/15	8/15	11/15
Group C/G	BBI39 Protein + PHAD-SE	9/15	10/15	12/15
Group D/H	FiloRab1 + PHAD-SE	15/15	15/15	15/15
Group E/I/J	Unvaccinated/Unchallenged	0/15	0/15	0/15

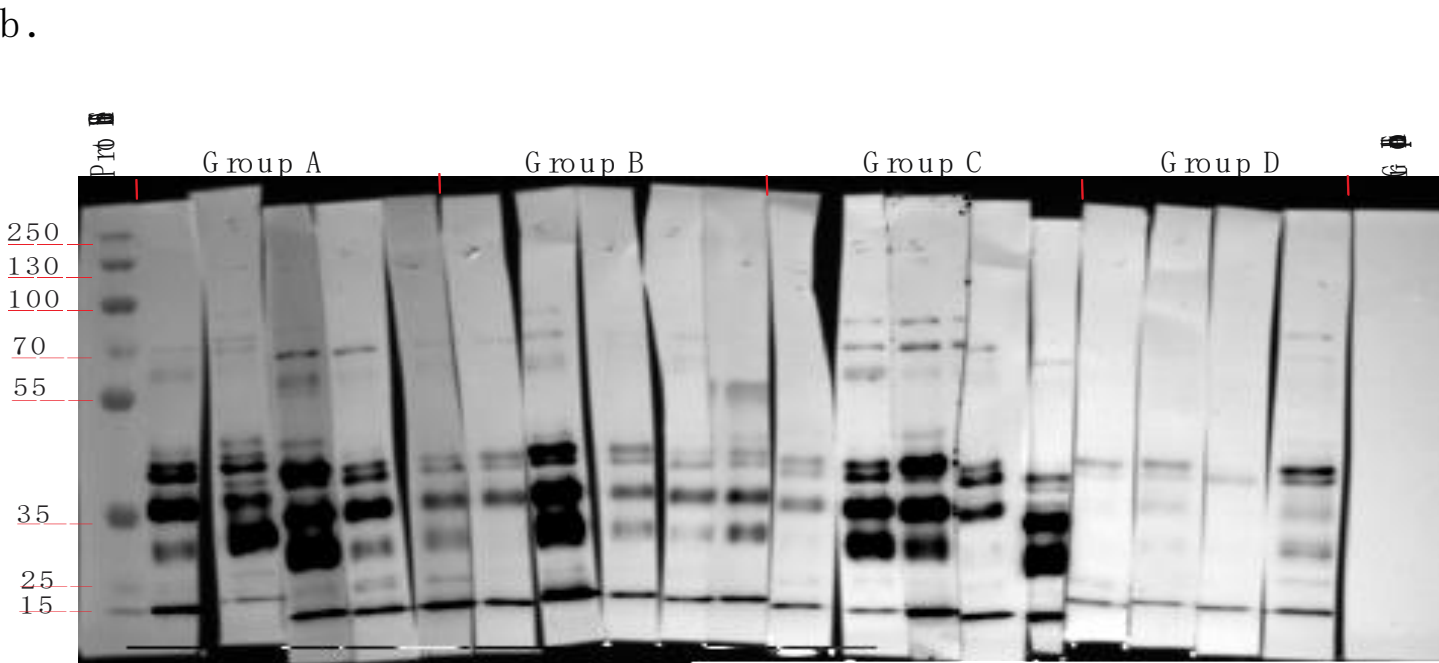
Supplementary Figure S3

*Borrelia burgdorferi* depletion in infected organs by culture in BSK and confirmation of infection by western blot.

(a-c) Western blot analysis of infected mice by serum. Whole borrelial lysates ran on gel and transferred to nitrocellulose membrane. Probed with individual infected mouse serum from 2 separate experiments of female (a-b) and male (c) mice. (d) Number of infected mouse organs by culture in BSK-H medium numerated under dark field microscopy for presence of *Borrelia*.

a.

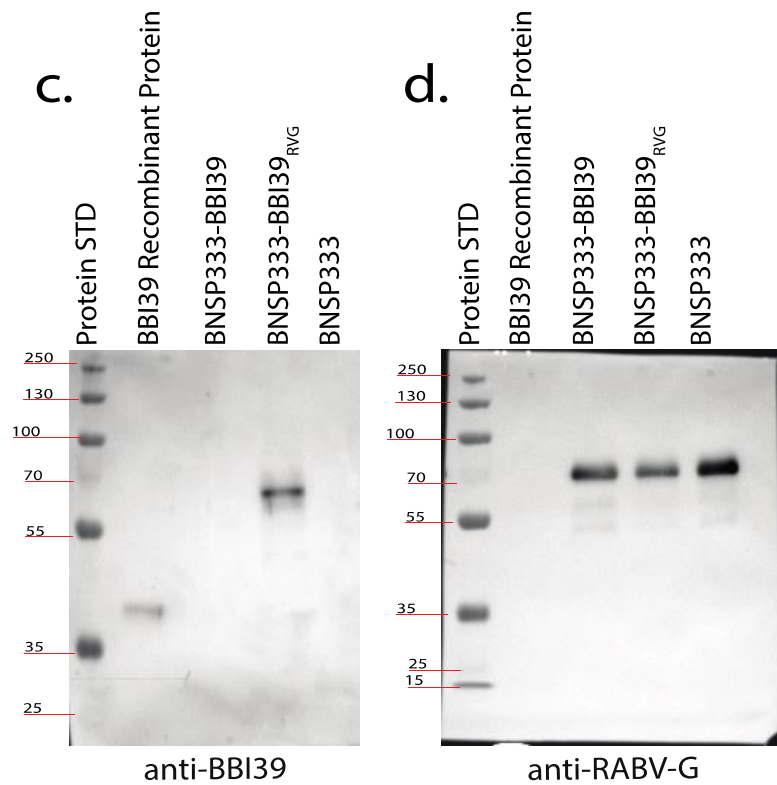
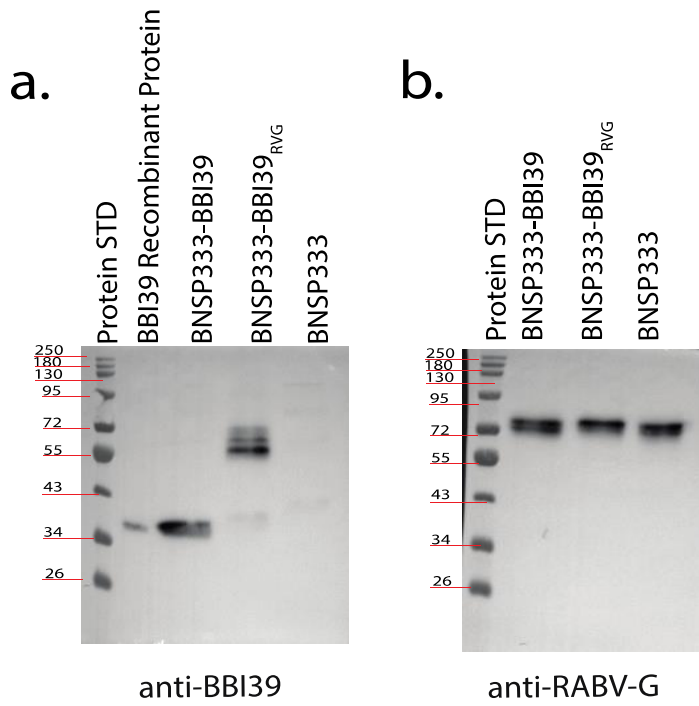
		Number of Infected Mice			
		Groups	Heart	Joint	Skin
G r o u p A		BNSP333-BBI39 <sub>RVG</sub> Unadjuvanted	3/5	3/5	4/5
G r o u p B		BNSP333-BBI39 <sub>RVG</sub> + PHAD-SE	5/5	2/5	2/5
G r o u p C		BBI39 Protein + PHAD-SE	4/5	1/5	4/5
G r o u p D		FiloRab1 + PHAD-SE	5/5	5/5	5/5
G r o u p E		Unvaccinated/Unchallenged	0/5	0/5	0/5



Supplementary Figure S4

Long-term vaccination and challenge organ culture and western blot analysis.

(a-b) ELISA curves for anti-BBI39 and anti-RABV-G from individual mouse serum 8 months (224 days) post-initial immunization. Determination of EC50 titers in Figure 7.



**Supplementary Figure S5:**

**Raw data of western blots from Figure 2.**

Western blot from Figure 2b (a-b) and Figure 2d (c-d).