

Antigenic Profile

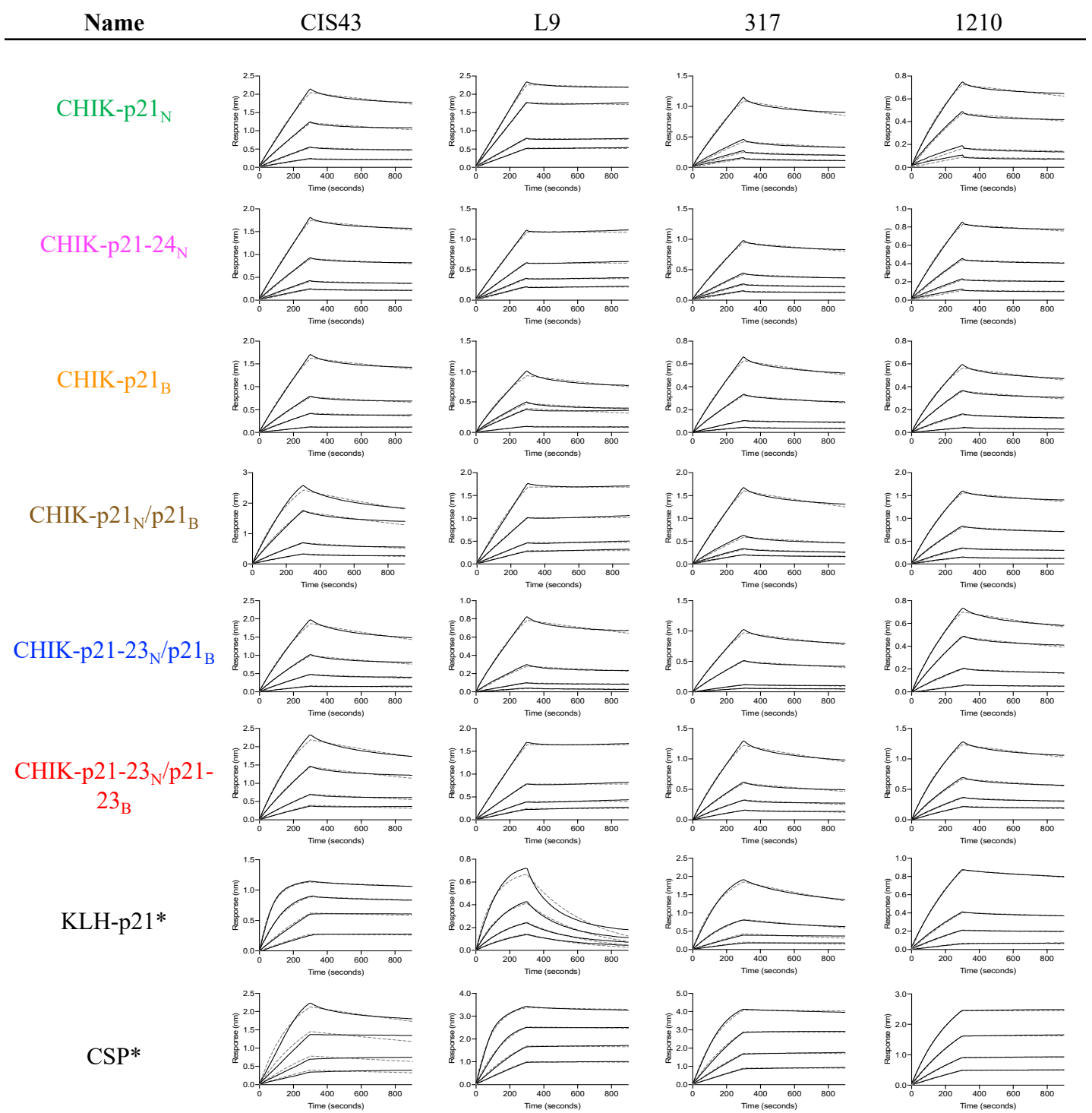


Figure S1: Binding curves and fit for KD measurements of CHIK-VLP immunogens towards antibodies CIS43, L9, 317, and 1210, respectively, using BLI. Biolayer interferometry (BLI) curves for CHIK-VLP immunogens towards antibodies CIS43, L9, 317, and 1210, respectively. Solid lines are the real processed data, and the dashed lines are the curve fits that were used to obtain the K_D values. Curves were modeled using 1:1 binding stoichiometry and the resulting kinetics were used to obtain K_D values. Dilution series started at 500 nM with 2-fold dilutions. *: KLH-p21 and CSP could not be fit to the 1:1 binding model used for the other immunogens. To circumvent this issue, KLH-p21 was captured onto amine-reactive biosensors, while CSP was immobilized via the 6xHis tag. Each immunogen was then dipped into a solution of the antibody.

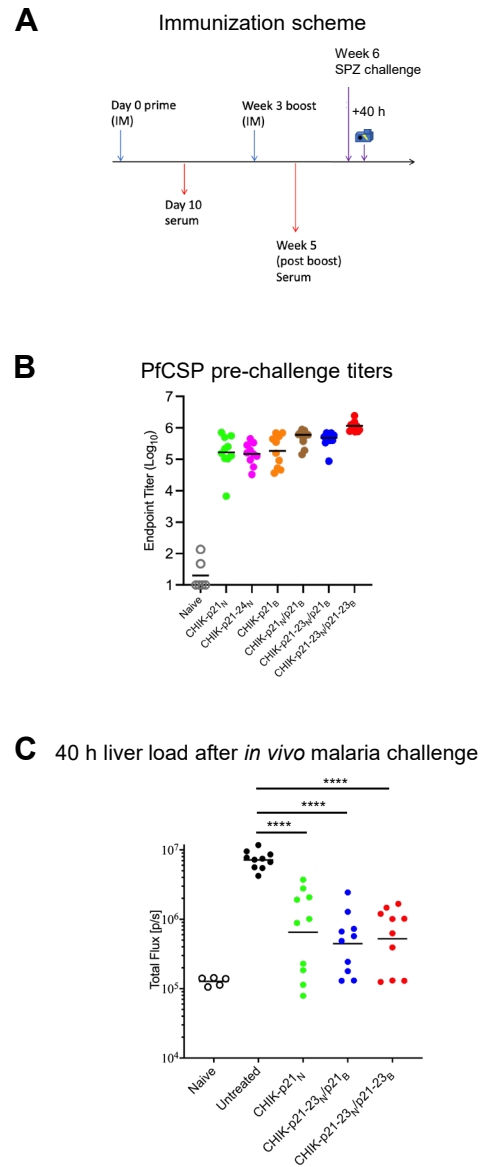


Figure S2. Malaria protection following two immunizations of CHIK-VLP immunogens displaying CIS43 and L9 epitopes. (A) Immunization and challenge schema. Blue arrows denote immunizations and red arrows denote blood draws. Liver burden was quantified 40 hours post challenge. **(B)** Pre-challenge PfCSP ELISA serum titers. **(C)** Liver burden following malaria challenge with Pb-PfCSP-GFP/Luc-SPZ. **** $P < 0.0001$ as calculated by two tailed Mann-Whitney test.

Peptide number	Peptide sequence
20	⁹⁷ PADG N P D P N AN P N V D ¹¹¹
21	¹⁰¹ N P D P N AN P N V D P N AN ¹¹⁵
22	¹⁰⁵ NAN P N V D P N AN P N V D ¹¹⁹
23	¹⁰⁹ N V D P N AN P N V D P N AN ¹²³
24	¹¹³ NAN P N V D P N AN P N V D ¹²⁷
25	¹¹⁷ N V D P N AN P N V D P N AN ¹³¹
26	¹²¹ NAN P N V D P N AN P NAN ¹³⁵
27	¹²⁵ N V D P N AN P NAN P NAN ¹³⁹
28	¹²⁹ NAN P NAN P NAN P NAN ¹⁴³
29-41	NAN P NAN P NAN P NAN
42	¹⁸⁵ NAN P NAN P NAN P N V D ¹⁹⁹
43	¹⁸⁹ NAN P NAN P N V D P N AN ²⁰³
44	¹⁹³ NAN P N V D P N AN P NAN ²⁰⁷
45	¹⁹⁷ N V D P N AN P NAN P NAN ²¹¹
46-60	NAN P NAN P NAN P NAN
61	²⁶¹ NAN P NAN P NAN P N K N ²⁷⁵

Table S1. Overlapping 15-mer peptides to the repeat region of PfCSP, strain 3D7. Superscripts indicate N-terminal amino acid numbering. Note that the following peptides are identical: 22 and 24; 23 and 25; 26 and 44; 27 and 45; 28-41, 46-60.

Data S1. Amino acid sequences of six junctional epitope-CHIK VLP immunogens.
Junctional epitope residues are highlighted in red.

CHIK-p21_N

MEFIPTQTFFYNRRYQPRPWAPRPTIQVIRPRPRPQRQAGQLAQLISAVNKLTMRAVPQQKPRRN
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GAEWSSLALPVLCLLANTTFPCSQPPCTPCCYEKEPESTLRMLEDNVMRPGYYQLLKASLTCSP
HRQRR**NPDPNANPNVDPNAN**STKDNFNVYKATRPYLAHCPDCGEGHSCHSPIALERIRNEATDG
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SYRNMGQEPNYHEEWVTHKKEVTTLTVPTEGLEVTWGNNEPYKYWPQMSTNGTAHGHPHEIILYY
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CHIK-p21-24_N

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CHIK-p21_B

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