Supplemental Information

A PfSPZ Vaccine Immunization Regimen Equally Protective Against Homologous and Heterologous Controlled Human Malaria Infection

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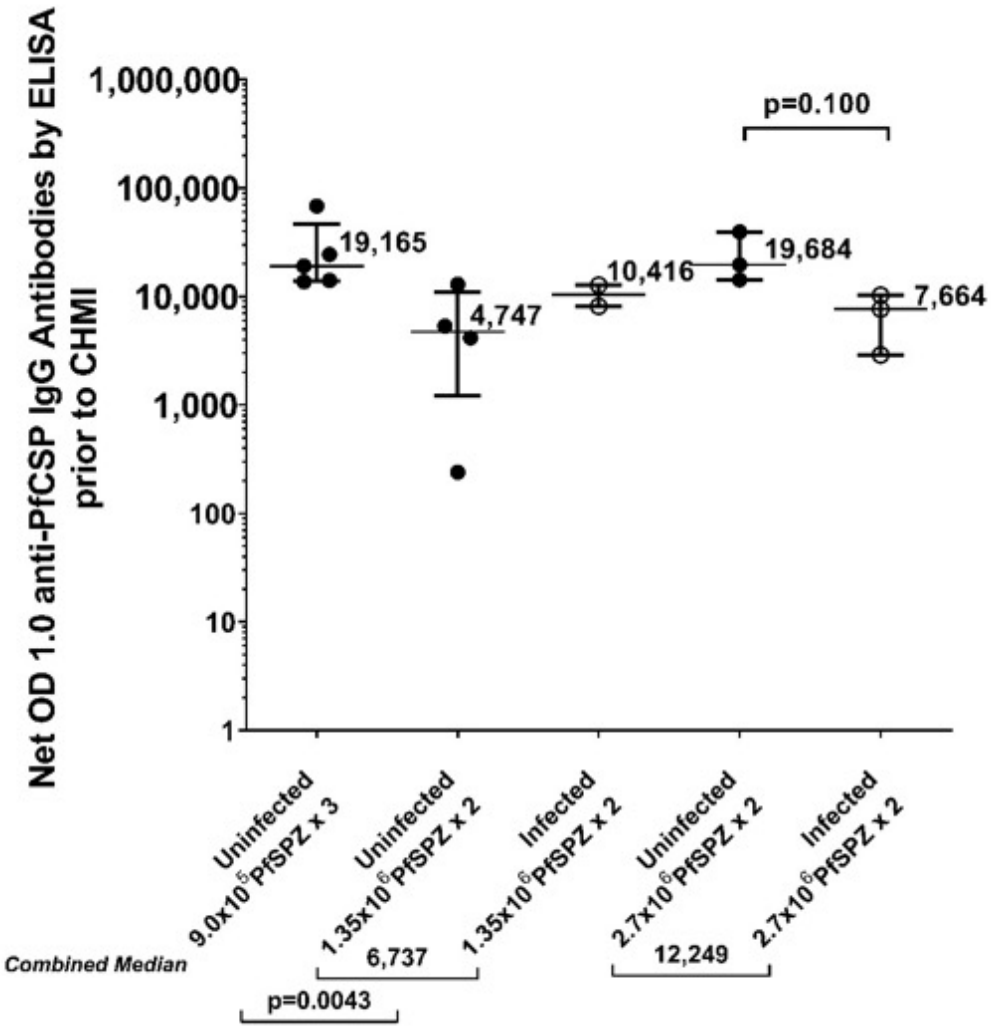
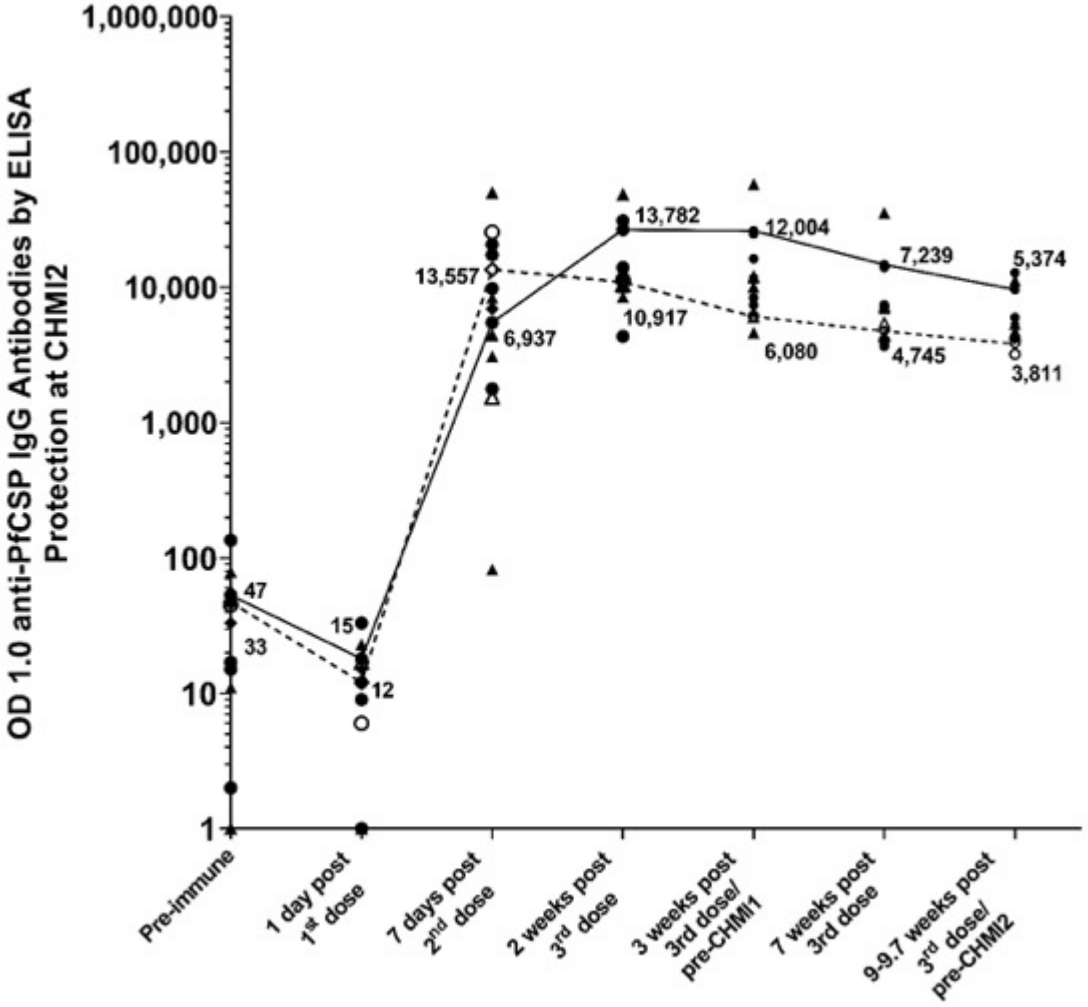


Supplementary Figure 1. ***Optimization phase*****:** Median and interquartile range of net OD 1.0 for IgG antibodies to PfCSP one day prior to CHMI of PfSPZ Vaccine in malaria-naïve adults who were uninfected (protected) and infected during CHMI administered 3 weeks after the last dose. P value calculated by Wilcoxon-Mann-Whitney test. For each panel, filled circles are uninfected subjects and open circles are infected subjects who received homologous CHMI with PfSPZ Challenge (NF54).



Supplementary Figure 2. ***Verification phase antibody kinetics***: OD 1.0 for IgG antibodies to PfCSP measured at different intervals post PfSPZ Vaccine. Filled triangles are uninfected subjects and open triangles are infected subjects who received heterologous CHMI with PfSPZ Challenge (7G8) and filled circles are uninfected subjects and open circles are infected subjects who received homologous CHMI with PfSPZ Challenge (NF54). Solid line is conncting the median OD 1.0 values for all protected subjects and dotted line is connecting median OD 1.0 values for uninfected subjects.

Supplementary Table 1. Number and Percentage of Participants Experiencing Solicited Adverse Events During the Optimization Phase. All solicited AE are treated as related.

All doses		Group A (n = 6)		Group B1 (n = 6)		Group C2 (n= 6)	
Solicited Adverse Event	**Severity**	**n**	**%**	**n**	**%**	**n**	**%**
Any Adverse Event	Mild	4	66.7	0	0	1	16.7
	Moderate	1	16.7	4	66.7	2	33.3
	Severe	1	16.7	0	0	1	16.7
Any Systemic Adverse Event	Mild	4	66.7	0	0	1	16.7
	Moderate	0	0	4	66.7	1	16.7
	Severe	1	16.7	0	0	1	16.7
Nausea	Mild	1	16.7	0	0	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Diarrhea	Mild	0	0	1	16.7	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Fatigue	Mild	4	66.7	3	50	2	33.3
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	1	16.7
Headache	Mild	0	0	0	0	1	16.7
	Moderate	4	66.7	3	50	1	16.7
	Severe	0	0	0	0	0	0
Myalgia	Mild	1	16.7	2	33.3	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	1	16.7
Fever (including Subjective Fever)	Mild	0	0	3	50	1	16.7
	Moderate	0	0	0	0	0	0
	Severe	1	16.7	0	0	0	0
Malaise	Mild	0	0	0	0	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Chills	Mild	2	33.3	1	16.7	0	0
	Moderate	0	0	0	0	1	16.7
	Severe	0	0	0	0	1	16.7
Sweats	Mild	0	0	2	33.3	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Arthralgia	Mild	1	16.7	1	16.7	0	0
	Moderate	1	16.7	0	0	0	0
	Severe	0	0	0	0	0	0
Vomiting	Mild	0	0	0	0	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	1	16.7
Dizziness	Mild	3	50	0	0	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Any Local Adverse Event	Mild	2	33.3	0	0	2	33.3
	Moderate	0	0	0	0	1	16.7
	Severe	0	0	0	0	0	0
Bruising	Mild	0	0	0	0	1	16.7
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Hematoma	Mild	0	0	0	0	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Pain	Mild	1	16.7	0	0	1	16.7

	Moderate	0	0	0	0	1	16.7
	Severe	0	0	0	0	0	0
Pruritus	Mild	1	16.7	0	0	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0

Supplementary Table 2. Number and Percentage of Participants Experiencing Unsolicited Adverse Events Considered Possibly, Probably, or Definitely Related by MedDRA® System Organ Class, Severity, and Treatment Group – through 21 Days After the 3rd Immunization (Labs and Vital Signs Excluded).

All doses		Group A (n = 6)		Group B1 (n = 6)		Group C2 (n= 6)	
MedDRA® System Organ Class	**Severity**	**n**	**%**	**n**	**%**	**n**	**%**
Any SOC	None	0	0	4	66.7	5	83.4
	Mild	5	83.4	2	33.3	1	16.6
	Moderate	1	16.6	0	0	0	0
	Severe	0	0	0	0	0	0
Gastrointestinal disorders	None	5	83.4	5	83.4	6	100
	Mild	0	0	1	16.6	0	0
	Moderate	1	16.6	0	0	0	0
	Severe	0	0	0	0	0	0
Blood and lymphatic system disorders	None	5	83.4	6	100	6	100
	Mild	1	16.6	0	0	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Musculoskeletal and connective tissue disorders	None	5	83.4	6	100	6	100
	Mild	1	16.6	0	0	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Nervous system disorders	None	4	66.7	6	100	6	100
	Mild	2	33.3	0	0	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
General disorders and administration site conditions	None	6	100	5	83.4	6	100
	Mild	0	0	1	16.6	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Infections and infestations	None	2	33.3	5	83.4	6	100
	Mild	4	66.7	1	16.6	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Respiratory, thoracic and mediastinal disorders	None	5	83.4	6	100	6	100
	Mild	1	16.6	0	0	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Psychiatric disorders	None	5	83.4	6	100	6	100
	Mild	1	16.6	0	0	0	0

All doses		Group A (n = 6)		Group B1 (n = 6)		Group C2 (n= 6)	
MedDRA® System Organ Class	**Severity**	**n**	**%**	**n**	**%**	**n**	**%**
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Cardiac disorders	None	4	66.7	5	83.4	6	100
	Mild	2	33.3	1	16.6	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Skin and subcutaneous tissue disorders	None	5	83.4	6	100	6	100
	Mild	1	16.6	0	0	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Immune system disorders	None	6	100	6	100	6	100
	Mild	0	0	0	0	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Injury, poisoning and procedural complications	None	6	100	6	100	5	83.4
	Mild	0	0	0	0	1	16.6
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0

Supplementary Table 3. Number and Percentage of Participants with Abnormal Hematology or Biochemistry Laboratory Results through 21 Days After the Third Immunization- *Optimization* and *Verification* Phases.

		Optimization (n = 18)		Verification			
				PfSPZ (n = 12)		Placebo (n = 6)	
Lab parameter	**Severity**	**n**	**%**	**n**	**%**	**n**	**%**
Hemoglobin, decreased	Mild	5	28	6	50	4	67
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Leucocytes, decreased	Mild	3	17	1	8.3	0	0
	Moderate	1	5.6	0	0	0	0
	Severe	0	0	0	0	0	0
Platelets, decreased	Mild	1	5.6	1	8.3	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Neutrophils, decreased	Mild	3	17	4	33	0	0
	Moderate	1	5.6	1	8.3	1	17
	Severe	0	0	0	0	0	0
Eosinophils, increased	Mild	0	0	0	0	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Lymphocytes, decreased[1]	Mild	5	28	3	25	0	0
	Moderate	3	17	7	58	0	0
	Severe	2	11	0	0	0	0
Total Bilirubin, increased	Mild	0	0	1	8	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Creatinine, increased	Mild	0	0	0	0	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
AST (SGOT), increased	Mild	1	5.6	2	16	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
ALT (SGPT), increased	Mild	1	5.6	3	25	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Glucose, increased	Mild	1	5.5	0	0	0	0
	Moderate	1	5.5	1	16	0	0
	Severe	0	0	0	0	0	0

		Optimization (n = 18)		Verification			
				PfSPZ (n = 12)		Placebo (n = 6)	
Lab parameter	**Severity**	**n**	**%**	**n**	**%**	**n**	**%**
Glucose, decreased	Mild	2	11	1	8.3	1	16
	Moderate	2	11	5	41	2	32
	Severe	1[2]	5.5	0	0	0	0
Sodium, increased	Mild	2	11	0	0	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Sodium, decreased	Mild	0	0	0	0	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Potassium, increased	Mild	1	5.5	0	0	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	0	0	0	0
Potassium, decreased	Mild	0	0	0	0	0	0
	Moderate	0	0	0	0	0	0
	Severe	0	0	1[3]	8.3	0	0

[1]Verification phase, PfSPZ Vaccine vs. NS, p=0.015 Fisher's exact test, 2 tailed. 19/20 abnormal lymphocyte counts occurred 1 day after a vaccine dose and had returned towards normal at the next measurement.
[2]Asymptomatic hypoglycemia with glucose 48 mg/dL, resolved.
[3]Hypokalemia (3.2 mmol/L) 20 days after the 3rd dose, resolved.

Supplementary Table 4. Related Moderate (Grade 2) and Severe (Grade 3) Adverse Events, Vital Sign and Laboratory Abnormalities Beginning on Day 6 Following Inoculation of PfSPZ Challenge for CHMI by Cohort and Absence of Parasitaemia (Negative) or Presence of Parasitaemia According to Pf (PfNF54 or Pf7G8) used for CHMI. For the vaccine and placebo groups the results from CHMI 1 and CHMI 2 are combined.

Preferred term	Severity grade	Optimization (17 underwent CHMI with NF54)		Verification: Vaccine (12 underwent CHMI twice, 24 CHMIs)			Verification: Placebo (6 underwent CHMI twice, 12 CHMIs)		
		Negative (N=12)	NF54 (N=5)	Negative (N=19)	7G8 (N=2)	NF54 (N=3)	Negative (N=1)	7G8 (N=6)	NF54 (N=5)
Chills	Moderate	0	0	0	0	0	0	0	1
	Severe	0	0	0	0	0	0	0	0
Headache	Moderate	0	0	2	0	1	1	2	2
	Severe	0	0	0	0	0	0	0	0
Myalgia	Moderate	0	0	0	0	0	0	1	1
	Severe	0	0	0	0	0	0	0	0
Nausea	Moderate	0	0	0	0	0	0	1	0
	Severe	0	0	0	0	0	0	0	0
Pyrexia**	Moderate	0	0	0	1	0	0	1	2
	Severe	0	0	0	0	0	0	0	0
Abdominal pain	Moderate	1	0	0	0	0	0	0	0
	Severe	0	0	0	0	0	0	0	0
Tachycardia	Moderate	1	0	0	0	0	0	0	0
	Severe	0	0	0	0	0	0	0	0
Leukopenia	Moderate	0	0	0	0	0	0	1	0
	Severe	0	1	0	0	0	0	0	0
Lymphopenia	Moderate	0	0	0	0	1	0	0	1
	Severe	0	1	0	0	0	0	2	1
Neutropenia	Moderate	0	0	0	0	1	0	0	0
	Severe	0	0	0	0	0	0	1	0

*There were two severe (Grade 3) (lymphopenia and leukopenia) AEs during *Optimization* that occurred in subjects who had parasitemia and one severe (Grade 3) AE (lymphopenia) during *Verification* that occurred in a subject who had parasitemia – all of which resolved.
**Includes subjective report of fever and/or a measured abnormal temperature.

Supplementary Table 5. Prepatent Periods and Parasite Density by qPCR in Participants Infected in the Verfication Phase, CHMI 1 and 2.

Subject	PfSPZ or NS	CHMI 1			CHMI 2		
		Strain	Prepatent Period - days	Parasite Density – Pf/mL	Strain	Prepatent Period - days	Parasite Density – Pf/mL
056	PfSPZ	7G8	10	181	NF54	Not infected	
059	PfSPZ	NF54	11	2503	7G8	10	371
060	PfSPZ	NF54	16	681	7G8	Not infected	
076	PfSPZ	7G8	Not infected		NF54	10	505
054	NS	NF54	9	216	7G8	9	781
058	NS	7G8	9	970	NF54	Not infected	
065	NS	NF54	9	274	7G8	9	342
067	NS	7G8	9	454	NF54	13	1524
073	NS	7G8	9	163	NF54	13	1235
075	NS	NF54	9	477	7G8	11	2669

Supplementary Table 6. Immunological data for all volunteers from the optimization phase of the MAVACHE clinical trial, as measured by PfCSP ELISA assay.

All out-of-range values, negatives and zeroes are reported as 1.

Group		PfSPZ/Dose	ID	CHMI	Infected	ELISA									
						PfCSP OD 1.0									
						Pre-Immune	2 weeks post 3rd dose	Net (Post-Pre)	Ratio (Post/Pre)	Pre-CHMI 1	Pre-CHMI 1 Net	Pre-CHMI 1 Ratio	Pre-CHMI 2	Pre-CHMI 2 Net	Pre-CHMI 2 Ratio
Optimization	A	Group A: 9.0 X 10^5 PfSPZ in 1.0 mL administered DVI at Day 0, 7, and 28.	M1.002	NF54	No	76	29,309	29,233	385	14,121	14,045	185	N/A		
			M1.003	NF54	No	26	31,640	31,614	1,216	19,191	19,165	737			
			M1.004	NF54	No	55	11,834	11,779	214	24,465	24,410	444			
			M1.006	NF54	No	50	17,964	17,914	358	13,734	13,684	274			
			M1.009	NF54	No	26	78,430	78,404	3,016	68,269	68,243	2,625			
	B1	Group B1: 1.35 X 10^6 PfSPZ in 1.0 mL administered DVI at Day 0, and 7.	M1.014	NF54	No	57	16,649	16,592	291	297	240	4			
			M1.018	NF54	Yes	125	9,982	9,857	79	12,820	12,695	102			
			M1.026	NF54	No	92	9,760	9,668	105	13,067	12,975	141			
			M1.027	NF54	No	31	9,453	9,422	304	5,368	5,337	172			
			M1.032	NF54	Yes	71	4,465	4,394	62	8,207	8,136	115			
			M1.033	NF54	No	33	19,518	19,485	590	4,189	4,156	126			
	C2	Group C2: 2.7 X 10^6 PfSPZ in 1.0 mL administered DVI at Day 0, and 7.	M1.039	NF54	No	1	27,561	27,560	27,560	19,685	19,684	19,684			
			M1.041	NF54	Yes	44	10,110	10,066	229	7,708	7,664	174			
			M1.044	NF54	Yes	49	4,930	4,881	100	10,320	10,271	210			
			M1.046	NF54	No	56	44,275	44,219	790	14,283	14,227	254			
			M1.047	NF54	No	1,101	49,338	48,237	44	40,667	39,566	36			
			M1.048	NF54	Yes	1	2,280	2,279	2,279	2,891	2,890	2,890			

Supplementary Table 7. Increased levels as compared to pre-immunization for IgG antibodies to PfCSP by ELISA, IgG antibodies to PfSPZ by aIFA and inhibition of PfSPZ invasion of hepatocytes by aISI in sera taken one day prior to the first CHMI 3 weeks after the last dose of vaccine and one day prior to the second CHMI 9-10 weeks after the last dose of vaccine. For ELISA, samples were considered to have increased (seroconverted) over pre-immunization, if the difference between the post-immunization OD 1.0 and the pre-immunization OD 1.0 (net OD 1.0) was ≥50 and the ratio of the post-immunization OD 1.0 to pre-immunization OD 1.0 (ratio) was ≥3.0. For automated immunofluorescence assays, participants with a net reciprocal serum dilution for $2.0x10^5$ arbitrary fluorescence units (AFU) of ≥150 and a ratio reciprocal serum dilution of ≥3.0 were considered positive. For the automated inhibition of sporozoite invasion assay, participants with a net reciprocal serum dilution for 80% inhibition of ≥10 in the inhibition of sporozoite invasion assay and a ratio reciprocal serum dilution for 80% inhibition of ≥3.0 in the inhibition of sporozoite invasion assay were considered positive.

	PfCSP ELISA		**PfSPZ aIFA**		**PfSPZ aISI**	
	CHMI 1	**CHMI 2**	**CHMI 1**	**CHMI 2**	**CHMI 1**	**CHMI 2**
Uninfected (no. with significant increase/no. vaccinated)	9/9 (100%)	9/9 (100%)	6/9 (66.7%)	8/9 (88.9%)	9/9 (100%)	9/9 (100%)
Infected (no. with significant increase/no. vaccinated)	3/3 (100%)	3/3 (100%)	3/3 (100%)	3/3 (100%)	3/3 (100%)	3/3 (100%)

Supplementary Table 8. Immunological data for all volunteers who received three doses of 9.0x10^5 PfSPZ Vaccine or saline in the verification phase of MAVACHE clinical trial, as measured by PfCSP ELISA, aIFA, and ISI assays.

All out-of-range values, negatives and zeroes are reported as 1. Three subjects (shown in italics below): [1]no sample available 2 weeks post 3rd dose (n=1) sample included in the analysis was drawn 1 day post 3rd dose for IgG and IgM ELISA, [2]no sample available 2 weeks post 3rd dose (n=2).

Group	PfSPZ/Dose	ID	CHMI	Infected	ELISA									
					PfCSP OD 1.0									
					Pre-Immune	2 weeks post 3rd dose	Net (Post-Pre)	Ratio (Post/Pre)	Pre-CHMI 1	Pre-CHMI 1 Net	Pre-CHMI 1 Ratio	Pre-CHMI 2	Pre-CHMI 2 Net	Pre-CHMI 2 Ratio
Verification	9.0 X 10^5 PfSPZ in 1.0 mL administered DVI at Day 0, 7, and 28.	M1.051	NF54/7G8	No/No	58	10,025	9,967	173	12,174	12,116	210	5,405	5,347	93
		M1.060	NF54/7G8	Yes/No	11	8,526	8,515	775	4,618	4,607	420	4,661	4,650	424
		M1.063	NF54/7G8	No/No	79	13,590	13,511	172	10,083	10,004	128	5,342	5,263	68
		M1.070	NF54/7G8	No/No	49	48,674	48,625	993	57,880	57,831	1,181.00	11,274	11,225	230
		M1.071	NF54/7G8	No/No	1	12,203	12,202	12,203.00	11,834	11,833	11,834.00	4,739	4,738	4,739.00
		M1.056	7G8/NF54	Yes/No	2	14,042	14,040	7,021.00	16,248	16,246	8,124.00	4,314	4,312	2,157.00
		M1.049	7G8/NF54	No/No	135	13,973	13,838	104	8,353	8,218	62	5,978	5,843	44
		M1.050	7G8/NF54	No/No	17	4,345	4,328	256	7,398	7,381	435	4,202	4,185	247
		M1.064	7G8/NF54	No/No	15	*341,171*	34,102	2,274.50	24,893	24,878	1,660.00	12,836	12,821	856
		M1.086	7G8/NF54	No/No	53	26,632	26,579	502	26,227	26,174	495	9,642	9,589	182
		M1.076	7G8/NF54	No/Yes	45	11,359	11,314	252	6,134	6,089	136	3,204	3,159	71
		M1.059	NF54/7G8	Yes/Yes	49	10,475	10,426	214	6,786	6,737	138.5	4,418	4,369	90
	Placebo	M1.054	NF54/7G8	Yes/Yes	60	97	37	2	64	4	1	168	108	3
		M1.065	NF54/7G8	Yes/No	8	*11*	1	1	1	1	1	1	1	1
		M1.075	NF54/7G8	Yes/Yes	18	13	1	1	1	1	1	64	46	4
		M1.058	7G8/NF54	Yes/Yes	44	43	1	1	31	1	1	65	21	1
		M1.067	7G8/NF54	Yes/Yes	19	1	1	1	23	4	1	80	61	4
		M1.073	7G8/NF54	Yes/Yes	98	*631*	1	1	72	1	1	180	82	2

Group	PfSPZ/Dose	ID	CHMI	Infected	ELISA									
					PfCSP IgM OD 1.0									
					Pre-Immune	2 weeks post 3rd dose	Net (Post-Pre)	Ratio (Post/Pre)	Pre-CHMI 1	Pre-CHMI 1 Net	Pre-CHMI 1 Ratio	Pre-CHMI 2	Pre-CHMI 2 Net	Pre-CHMI 2 Ratio
Verification	9.0 X 10^5 PfSPZ in 1.0 mL administered DVI at Day 0, 7, and 28.	M1.051	NF54/7G8	No/No	127	234,942	234,815	1,850.00	273,707	273,580	2,155.00	38,222	38,095	301
		M1.060	NF54/7G8	Yes/No	275	181,989	181,714	662	191,043	190,768	695	46,326	46,051	168
		M1.063	NF54/7G8	No/No	391	445,622	445,231	1,140.00	124,433	124,042	318	53,185	52,794	136
		M1.070	NF54/7G8	No/No	940	825,681	824,741	878	285,116	284,176	303	172,993	172,053	184
		M1.071	NF54/7G8	No/No	144	1,063,618	1,063,474	7,386.00	1,556,905	1,556,904	10,812.00	62,729	62,728	436
		M1.056	7G8/NF54	Yes/No	512	332,879	332,367	650	332,879	800,863	1,565.00	332,879	89,908	177
		M1.049	7G8/NF54	No/No	1,715	454,731	453,016	265	148,375	146,660	87	106,631	104,916	62
		M1.050	7G8/NF54	No/No	69	49,690	49,621	720	55,708	55,639	807	23,132	23,063	335
		M1.064	7G8/NF54	No/No	157	*2,661,961*	266,039	1,695.50	159,112	158,955	1,013.00	40,788	40,631	260
		M1.086	7G8/NF54	No/No	592	558,654	558,062	944	195,990	195,398	331	92,709	92,117	157
		M1.076	7G8/NF54	No/Yes	1	259,625	259,624	259,625.00	273,757	273,756	273,757.00	32,240	32,239	32,240.00
		M1.059	NF54/7G8	Yes/Yes	388	168,220	167,832	434	109,861	109,473	283	51,011	50,623	131
	Placebo	M1.054	NF54/7G8	Yes/Yes	159	134	1	1	140	1	1	373	214	2
		M1.065	NF54/7G8	Yes/No	149	*11*	1	1	162	1	1	158	19	1
		M1.075	NF54/7G8	Yes/Yes	18	13	1	1	1	1	1	64	46	4
		M1.058	7G8/NF54	Yes/Yes	208	215	7	1	202	1	1	570	362	3
		M1.067	7G8/NF54	Yes/Yes	123	229	1	2	201	78	2	1,259	1,136	10
		M1.073	7G8/NF54	Yes/Yes	477	*321*	1	1	960	483	2	7,858	7,381	16

Group	PfSPZ/Dose	ID	CHMI	Infected	aIFA									
					AFU 2x10^5									
					Pre-Immune	2 weeks post 3rd dose	Net (Post-Pre)	Ratio (Post/Pre)	Pre-CHMI 1	Pre-CHMI 1 Net	Pre-CHMI 1 Ratio	Pre-CHMI 2	Pre-CHMI 2 Net	Pre-CHMI 2 Ratio
Verification	9.0 X 10^5 PfSPZ in 1.0 mL administered DVI at Day 0, 7, and 28.	M1.051	NF54/7G8	No/No	1	12,194	12,193	12,194.00	18,730	18,729	18,730.00	13,009	13,008	13,009.00
		M1.060	NF54/7G8	Yes/No	1	8,410	8,409	8,410.00	7,704	7,703	7,704.00	6,213	6,212	6,213.00
		M1.063	NF54/7G8	No/No	205	405	200	2	147	-59	1	76,256	76,050	371
		M1.070	NF54/7G8	No/No	375	863	488	2	228	-147	1	1	1	1
		M1.071	NF54/7G8	No/No	170	28,284	28,114	167	26,261	26,091	155	10,513	10,343	62
		M1.056	7G8/NF54	Yes/No	43	23,869	23,826	560	18,000	17,957	422	8,359	8,317	196
		M1.049	7G8/NF54	No/No	33	31,107	31,074	929	12,847	12,814	384	7,123	7,089	213
		M1.050	7G8/NF54	No/No	50	6,369	6,319	127	8,705	8,655	174	2,637	2,586	53
		M1.064	7G8/NF54	No/No	80	*NS*[2]	*NS*[2]	*NS*[2]	19,132	19,052	239	13,875	13,795	174
		M1.086	7G8/NF54	No/No	67	34,072	34,005	509	1	-66	1	13,838	13,771	207
		M1.076	7G8/NF54	No/Yes	177	25,603	25,427	145	23,324	23,148	132	4,032	3,855	23
		M1.059	NF54/7G8	Yes/Yes	43	23,869	15,144	15,145.00	18,000	12,539	12,540.00	8,359	3,719	3,720.00
	Placebo	M1.054	NF54/7G8	Yes/Yes	462	41	1	1	1	1	1	32	1	1
		M1.065	NF54/7G8	Yes/No	42	*NS*[2]	*NS*[2]	*NS*[2]	186	145	4	85	44	2
		M1.075	NF54/7G8	Yes/Yes	35	1	1	1	1	1	1	187	152	5
		M1.058	7G8/NF54	Yes/Yes	53	62	12	1	67	1	1	359	13	1
		M1.067	7G8/NF54	Yes/Yes	61	74	9	1	60	14	1	75	307	7
		M1.073	7G8/NF54	Yes/Yes	54	*NS*[2]	*NS*[2]	*NS*[2]	29	1	1	331	277	6

Group	PfSPZ/Dose	ID	CHMI	Infected	ISI									
					Reciprocal serum dilution for 80% inhibition									
					Pre-Immune	2 weeks post 3rd dose	Net (Post-Pre)	Ratio (Post/Pre)	Pre-CHMI 1	Pre-CHMI 1 Net	Pre-CHMI 1 Ratio	Pre-CHMI 2	Pre-CHMI 2 Net	Pre-CHMI 2 Ratio
Verification	9.0 X 10^5 PfSPZ in 1.0 mL administered DVI at Day 0, 7, and 28.	M1.051	NF54/7G8	No/No	9.19	101.85	92.66	11.08	60.77	51.57	6.61	53.63	44.44	5.83
		M1.060	NF54/7G8	Yes/No	17.06	57.45	40.39	3.37	55.66	38.6	3.26	49.46	32.4	2.9
		M1.063	NF54/7G8	No/No	6.25	70.57	64.32	11.29	60.93	54.68	9.75	167.16	160.91	26.75
		M1.070	NF54/7G8	No/No	19.17	58.98	39.81	3.08	191.2	172.03	9.97	89.14	69.97	4.65
		M1.071	NF54/7G8	No/No	17.29	94.68	77.39	5.48	77.13	59.83	4.46	115.56	98.27	6.68
		M1.056	7G8/NF54	Yes/No	16.81	57.74	40.93	3.44	86.71	69.91	5.16	44.88	28.08	2.67
		M1.049	7G8/NF54	No/No	13.33	111.94	98.61	8.4	79.27	65.95	5.95	64.65	51.33	4.85
		M1.050	7G8/NF54	No/No	23.08	238.64	215.56	10.34	67.25	44.18	2.91	117.89	94.81	5.11
		M1.064	7G8/NF54	No/No	56.65	*NS*[2]	*NS*[2]	*NS*[2]	218.79	162.14	3.86	179.77	123.12	3.17
		M1.086	7G8/NF54	No/No	1	58	57	58	108.76	107.76	108.76	261.1	260.1	261.1
		M1.076	7G8/NF54	No/Yes	14.05	79.13	65.08	5.63	77.01	62.96	5.48	41.06	27.01	2.92
		M1.059	NF54/7G8	Yes/Yes	4.98	39.88	34.9	8.01	52.66	47.68	10.57	59.92	54.94	12.03
	Placebo	M1.054	NF54/7G8	Yes/Yes	9.02	1	1	0.11	1	1	0.11	1	1	0.11
		M1.065	NF54/7G8	Yes/No	10.29	*NS*[2]	*NS*[2]	*NS*[2]	12.33	2.04	1.2	21.94	11.65	2.13
		M1.075	NF54/7G8	Yes/Yes	9.52	11.53	2	1.21	7.32	1	0.77	16.13	6.61	1.69
		M1.058	7G8/NF54	Yes/Yes	9.67	1	1	0.1	9.47	1	0.98		1	1
		M1.067	7G8/NF54	Yes/Yes	1	1	1	1	1	1	1	1	1	1
		M1.073	7G8/NF54	Yes/Yes	51.17	*NS*[2]	*NS*[2]	*NS*[2]	17.54	1	0.34	57.41	6.24	1.12

Group	PfSPZ/Dose	ID	CHMI	Infected	ELISA						
					PfCSP IgG OD 1.0						
					Pre-Immune	1 day post 1st dose	7 days post 2nd dose	2 weeks post 3rd dose	3 weeks post 3rd dose/Pre-CHMI1	7 weeks post 3rd dose	9-10 weeks post 3rd dose/Pre-CHMI2
Verification	9.0 X 10^5 PfSPZ in 1.0 mL administered DVI at Day 0, 7, and 28.	M1.051	NF54/7G8	No/No	58	1	8,373	10,025	12,174	7,178	5,405
		M1.060	NF54/7G8	Yes/No	11	34	82	8,526	4,618	4,367	4,661
		M1.063	NF54/7G8	No/No	79	23	3,102	13,590	10,083	7,300	5,342
		M1.070	NF54/7G8	No/No	49	19	50,152	48,674	57,880	35,364	11,274
		M1.071	NF54/7G8	No/No	1	1	4,466	12,203	11,834	6,980	4,739
		M1.056	7G8/NF54	Yes/No	2	12	20,711	14,042	16,248	7,411	4,314
		M1.049	7G8/NF54	No/No	135	33	9,797	13,973	8,353	7,151	5,978
		M1.050	7G8/NF54	No/No	17	1	1,775	4,345	7,398	3,664	4,202
		M1.064	7G8/NF54	No/No	15	9	17,418	*31,040*	24,893	14,052	12,836
		M1.086	7G8/NF54	No/No	53	18	5,501	26,632	26,227	14,740	9,642
		M1.076	7G8/NF54	No/Yes	45	6	25,567	11,359	6,134	4,046	3,204
		M1.059	NF54/7G8	Yes/Yes	49	17	1,547	10,475	6,025	5,444	4,418