

Supplemental information

mRNA-1273 or mRNA-Omicron boost in vaccinated macaques elicits similar B cell expansion, neutralizing responses, and protection from Omicron

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Vaccine	Substitutions/Deletions outside RBD	Substitutions/Deletions in RBD
mRNA-1273.529 / mRNA-Omicron	A67V, ΔH69, ΔV70, T95I, G142D, ΔV143, ΔY144, ΔY145, N211I* , ΔL212* , ins214EPE, T547K, D614G, H655Y, N679K, P681H, N764K, D796Y, N856K, Q954H, N969K, L981F *Alternatively: ΔN211, L212I	G339D, S371L, S373P, S375F, K417N, N440K, G446S, S477N, T478K, E484A, Q493K, G496S, Q498R, N501Y, Y505H

Table S1. Amino acid replacements in mRNA-Omicron, related to Figure 1

All variant positions in reference to mRNA-1273.

Assay	Primary Regimen	Variant	W6		W41		Second Boost	Variant	W43		
			Reciprocal ID ₅₀	Fold change relative to D614G	Reciprocal ID ₅₀	Fold change relative to D614G			Reciprocal ID ₅₀	Fold change relative to D614G	
Live Virus Neutralization	mRNA-1273	D614G	5556	(1.0)	328	(1.0)	mRNA-1273	D614G	7196	(1.0)	
			Delta	3516	1.6	215		1.5	Delta	5119	1.4
			Beta	905	6.1	86		3.8	Beta	2650	2.7
			Omicron	110	50.6	33		10.0	Omicron	898	8.0
		mRNA-Omicron	D614G	4289	(1.0)	mRNA-Omicron	D614G	4289	(1.0)		
			Delta	3559	1.2		Delta	3559	1.2		
			Beta	1166	3.7		Beta	1166	3.7		
			Omicron	562	7.6		Omicron	562	7.6		
Pseudovirus Neutralization	mRNA-1273	D614G	4763	(1.0)	266	(1.0)	mRNA-1273	D614G	5356	(1.0)	
			Delta	1988	2.4	164		1.6	Delta	3198	1.7
			Beta	507	9.4	109		2.4	Beta	3093	1.7
			Omicron	319	14.9	110		2.4	Omicron	2981	1.8
		mRNA-Omicron	D614G	2667	(1.0)	mRNA-Omicron	D614G	2667	(1.0)		
			Delta	2083	1.3		Delta	2083	1.3		
			Beta	1381	1.9		Beta	1381	1.9		
			Omicron	1927	1.4		Omicron	1927	1.4		



Table S2. Reciprocal ID₅₀ geometric mean values and fold changes relative to D614G for live virus and pseudovirus neutralization values, related to Figure 1

NHP were immunized according to Fig. S1A. The values for reciprocal ID₅₀ and fold change relative to D614G at weeks 6 and 41 are the geometric mean of 8 animals, while the values at week 43 are the geometric mean of 4 animals. Conditional formatting applied to each individual assay.

Variant	Substitutions/Deletions outside RBD	Substitutions/Deletions in RBD
WA1	None	None
D614G	D614G	None
Delta	T19R, G142D, ΔE156, ΔF157, R158G, D614G, P681R, D950N	L452R, T478K
Beta	L18F, D80A, D215G, ΔL242-244, R246I, D614G, A701V	K417N, E484K, N501Y
Omicron	A67V, ΔH69, ΔV70, T95I, G142D, ΔV143, ΔY144, ΔY145, N211I, ΔL212, ins214EPE, T547K, D614G, H655Y, N679K, P681H, N764K, D796Y, N856K, Q954H, N969K, L981F	G339D, S371L, S373P, S375F, K417N, N440K, G446S, S477N, T478K, E484A, Q493R, G496S, Q498R, N501Y, Y505H

Table S3. List of amino acid replacements in variant-specific S-2P-ACE2 inhibition assays and B cell probes, related to Figure 2

All variant positions in reference to Wuhan-Hu-1 sequence (Genbank: NC_045512). All S-2P constructs contained furin substitution (GSAS at positions 682-685) and 2P stabilization (K986P and V987P).