

Supplemental Tables

Supplemental Table 1

Group comparison using Tukey's multiple comparisons test	P value
Figure 1B	
229E spike (α -CoV) vacc. vs. NL63 spike (α -CoV) vacc.	<0.0001
229E spike (α -CoV) vacc. vs. OC43 spike (β -CoV) vacc.	<0.0001
229E spike (α -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	<0.0001
229E spike (α -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
229E spike (α -CoV) vacc. vs. neg. contr. (HA) vacc.	<0.0001
NL63 spike (α -CoV) vacc. vs. OC43 spike (β -CoV) vacc.	<0.0001
NL63 spike (α -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	<0.0001
NL63 spike (α -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
NL63 spike (α -CoV) vacc. vs. neg. contr. (HA) vacc.	<0.0001
OC43 spike (β -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	0.2214
OC43 spike (β -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	0.0268
OC43 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	0.9984
HKU1 spike (β -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
HKU1 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	0.0772
SARS-CoV-2 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	0.0747
Figure 1C	
229E spike (α -CoV) vacc. vs. NL63 spike (α -CoV) vacc.	<0.0001
229E spike (α -CoV) vacc. vs. OC43 spike (β -CoV) vacc.	<0.0001
229E spike (α -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	<0.0001
229E spike (α -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
229E spike (α -CoV) vacc. vs. neg. contr. (HA) vacc.	<0.0001
NL63 spike (α -CoV) vacc. vs. OC43 spike (β -CoV) vacc.	<0.0001
NL63 spike (α -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	<0.0001
NL63 spike (α -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
NL63 spike (α -CoV) vacc. vs. neg. contr. (HA) vacc.	<0.0001
OC43 spike (β -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	0.9820
OC43 spike (β -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	0.9179
OC43 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	0.1729
HKU1 spike (β -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	0.9995
HKU1 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	0.4668
SARS-CoV-2 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	0.6841
Figure 1D	
229E spike (α -CoV) vacc. vs. NL63 spike (α -CoV) vacc.	0.9981
229E spike (α -CoV) vacc. vs. OC43 spike (β -CoV) vacc.	<0.0001
229E spike (α -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	<0.0001
229E spike (α -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
229E spike (α -CoV) vacc. vs. neg. contr. (HA) vacc.	0.9180
NL63 spike (α -CoV) vacc. vs. OC43 spike (β -CoV) vacc.	<0.0001
NL63 spike (α -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	<0.0001
NL63 spike (α -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
NL63 spike (α -CoV) vacc. vs. neg. contr. (HA) vacc.	0.9908
OC43 spike (β -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	0.0002
OC43 spike (β -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
OC43 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	<0.0001
HKU1 spike (β -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	0.0090
HKU1 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	<0.0001
SARS-CoV-2 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	

	<0.0001
Figure 1E	
229E spike (α -CoV) vacc. vs. NL63 spike (α -CoV) vacc.	0.9809
229E spike (α -CoV) vacc. vs. OC43 spike (β -CoV) vacc.	<0.0001
229E spike (α -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	<0.0001
229E spike (α -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
229E spike (α -CoV) vacc. vs. neg. contr. (HA) vacc.	0.1351
NL63 spike (α -CoV) vacc. vs. OC43 spike (β -CoV) vacc.	<0.0001
NL63 spike (α -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	<0.0001
NL63 spike (α -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
NL63 spike (α -CoV) vacc. vs. neg. contr. (HA) vacc.	0.0187
OC43 spike (β -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	<0.0001
OC43 spike (β -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	0.2235
OC43 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	<0.0001
HKU1 spike (β -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
HKU1 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	<0.0001
SARS-CoV-2 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	<0.0001
Figure 1F	
229E spike (α -CoV) vacc. vs. NL63 spike (α -CoV) vacc.	0.1735
229E spike (α -CoV) vacc. vs. OC43 spike (β -CoV) vacc.	<0.0001
229E spike (α -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	<0.0001
229E spike (α -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
229E spike (α -CoV) vacc. vs. neg. contr. (HA) vacc.	0.9998
NL63 spike (α -CoV) vacc. vs. OC43 spike (β -CoV) vacc.	<0.0001
NL63 spike (α -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	<0.0001
NL63 spike (α -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
NL63 spike (α -CoV) vacc. vs. neg. contr. (HA) vacc.	0.1018
OC43 spike (β -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	0.9861
OC43 spike (β -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
OC43 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	<0.0001
HKU1 spike (β -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
HKU1 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	<0.0001
SARS-CoV-2 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	<0.0001
Figure 1G	
229E spike (α -CoV) vacc. vs. NL63 spike (α -CoV) vacc.	>0.9999
229E spike (α -CoV) vacc. vs. OC43 spike (β -CoV) vacc.	>0.9999
229E spike (α -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	0.6268
229E spike (α -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
229E spike (α -CoV) vacc. vs. neg. contr. (HA) vacc.	>0.9999
NL63 spike (α -CoV) vacc. vs. OC43 spike (β -CoV) vacc.	>0.9999
NL63 spike (α -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	0.6268
NL63 spike (α -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
NL63 spike (α -CoV) vacc. vs. neg. contr. (HA) vacc.	>0.9999
OC43 spike (β -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	0.6268
OC43 spike (β -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
OC43 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	>0.9999
HKU1 spike (β -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	0.0063
HKU1 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	0.6268
SARS-CoV-2 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	<0.0001

Supplemental Table 2

Group comparison using Tukey's multiple comparisons test	P value
Figure 2A	
229E spike (α -CoV) vacc. vs. NL63 spike (α -CoV) vacc.	0.9994
229E spike (α -CoV) vacc. vs. OC43 spike (β -CoV) vacc.	0.7767
229E spike (α -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	0.8858
229E spike (α -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
229E spike (α -CoV) vacc. vs. neg. contr. (HA) vacc.	0.9606
NL63 spike (α -CoV) vacc. vs. OC43 spike (β -CoV) vacc.	0.9194
NL63 spike (α -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	0.9733
NL63 spike (α -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
NL63 spike (α -CoV) vacc. vs. neg. contr. (HA) vacc.	0.8557
OC43 spike (β -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	0.9999
OC43 spike (β -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
OC43 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	0.2971
HKU1 spike (β -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
HKU1 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	0.4196
SARS-CoV-2 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	<0.0001
Figure 2C	
229E spike (α -CoV) vacc. vs. NL63 spike (α -CoV) vacc.	0.9171
229E spike (α -CoV) vacc. vs. OC43 spike (β -CoV) vacc.	0.9569
229E spike (α -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	0.9806
229E spike (α -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
229E spike (α -CoV) vacc. vs. neg. contr. (HA) vacc.	0.2900
NL63 spike (α -CoV) vacc. vs. OC43 spike (β -CoV) vacc.	>0.9999
NL63 spike (α -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	0.9997
NL63 spike (α -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
NL63 spike (α -CoV) vacc. vs. neg. contr. (HA) vacc.	0.8522
OC43 spike (β -CoV) vacc. vs. HKU1 spike (β -CoV) vacc.	>0.9999
OC43 spike (β -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
OC43 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	0.7784
HKU1 spike (β -CoV) vacc. vs. SARS-CoV-2 spike (β -CoV) vacc.	<0.0001
HKU1 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	0.6963
SARS-CoV-2 spike (β -CoV) vacc. vs. neg. contr. (HA) vacc.	<0.0001

Supplemental Table 3

Pre/post challenge comparison, t-test	P value
Figure 2C	
229E spike (α -CoV)	<0.0001
NL63 spike (α -CoV)	<0.0001
OC43 spike (β -CoV)	<0.0001
HKU1 spike (β -CoV)	0.0003
SARS-CoV-2 spike (β -CoV)	0.2010
neg. contr. (HA)	<0.0001
Figure 2D	
229E spike (α -CoV)	0.0046
NL63 spike (α -CoV)	0.6519
OC43 spike (β -CoV)	0.0507
HKU1 spike (β -CoV)	0.0014
SARS-CoV-2 spike (β -CoV)	0.0917

neg. contr. (HA)	0.1586
Figure 2E	
229E spike (α -CoV)	0.7836
NL63 spike (α -CoV)	0.6472
OC43 spike (β -CoV)	0.7076
HKU1 spike (β -CoV)	0.1493
SARS-CoV-2 spike (β -CoV)	0.7036
neg. contr. (HA)	0.6119
Figure 2F	
229E spike (α -CoV)	0.3442
NL63 spike (α -CoV)	0.8733
OC43 spike (β -CoV)	0.1553
HKU1 spike (β -CoV)	0.5709
SARS-CoV-2 spike (β -CoV)	0.0212
neg. contr. (HA)	0.0004
Figure 2G	
229E spike (α -CoV)	<0.0001
NL63 spike (α -CoV)	<0.0001
OC43 spike (β -CoV)	0.2383
HKU1 spike (β -CoV)	0.1213
SARS-CoV-2 spike (β -CoV)	0.8895
neg. contr. (HA)	0.0002

Supplemental Table 4

Group comparison using Tukey's multiple comparisons test	P value
Figure 3B	
229E spike vs. NL63 spike	0.8097
229E spike vs. OC43 spike	0.9994
229E spike vs. HKU1 spike	0.6685
229E spike vs. SARS-CoV-2 spike	<0.0001
229E spike vs. neg. contr. (HA)	>0.9999
229E spike vs. naive contr.	<0.0001
NL63 spike vs. OC43 spike	0.9556
NL63 spike vs. HKU1 spike	0.0862
NL63 spike vs. SARS-CoV-2 spike	<0.0001
NL63 spike vs. neg. contr. (HA)	0.8878
NL63 spike vs. naive contr.	<0.0001
OC43 spike vs. HKU1 spike	0.3860
OC43 spike vs. SARS-CoV-2 spike	<0.0001
OC43 spike vs. neg. contr. (HA)	0.9998
OC43 spike vs. naive contr.	<0.0001
HKU1 spike vs. SARS-CoV-2 spike	<0.0001
HKU1 spike vs. neg. contr. (HA)	0.7986
HKU1 spike vs. naive contr.	<0.0001
SARS-CoV-2 spike vs. neg. contr. (HA)	<0.0001
SARS-CoV-2 spike vs. naive contr.	<0.0001
neg. contr. (HA) vs. naive contr.	<0.0001
Figure 3C	
229E spike vs. NL63 spike	0.8676
229E spike vs. OC43 spike	0.9961
229E spike vs. HKU1 spike	>0.9999

229E spike vs. SARS-CoV-2 spike	<0.0001
229E spike vs. neg. contr. (HA)	>0.9999
NL63 spike vs. OC43 spike	0.9811
NL63 spike vs. HKU1 spike	0.9088
NL63 spike vs. SARS-CoV-2 spike	<0.0001
NL63 spike vs. neg. contr. (HA)	0.8680
OC43 spike vs. HKU1 spike	0.9990
OC43 spike vs. SARS-CoV-2 spike	<0.0001
OC43 spike vs. neg. contr. (HA)	0.9896
HKU1 spike vs. SARS-CoV-2 spike	<0.0001
HKU1 spike vs. neg. contr. (HA)	0.9995
SARS-CoV-2 spike vs. neg. contr. (HA)	0.0002

Figure 3D

229E spike vs. NL63 spike	>0.9999
229E spike vs. OC43 spike	>0.9999
229E spike vs. HKU1 spike	>0.9999
229E spike vs. SARS-CoV-2 spike	>0.9999
229E spike vs. neg. contr. (HA)	>0.9999
229E spike vs. naive contr.	<0.0001
NL63 spike vs. OC43 spike	>0.9999
NL63 spike vs. HKU1 spike	>0.9999
NL63 spike vs. SARS-CoV-2 spike	>0.9999
NL63 spike vs. neg. contr. (HA)	>0.9999
NL63 spike vs. naive contr.	<0.0001
OC43 spike vs. HKU1 spike	>0.9999
OC43 spike vs. SARS-CoV-2 spike	>0.9999
OC43 spike vs. neg. contr. (HA)	>0.9999
OC43 spike vs. naive contr.	<0.0001
HKU1 spike vs. SARS-CoV-2 spike	>0.9999
HKU1 spike vs. neg. contr. (HA)	>0.9999
HKU1 spike vs. naive contr.	<0.0001
SARS-CoV-2 spike vs. neg. contr. (HA)	>0.9999
SARS-CoV-2 spike vs. naive contr.	<0.0001
neg. contr. (HA) vs. naive contr.	<0.0001

Figure 3E

229E spike vs. NL63 spike	>0.9999
229E spike vs. OC43 spike	>0.9999
229E spike vs. HKU1 spike	>0.9999
229E spike vs. SARS-CoV-2 spike	>0.9999
229E spike vs. neg. contr. (HA)	>0.9999
229E spike vs. naive contr.	<0.0001
NL63 spike vs. OC43 spike	>0.9999
NL63 spike vs. HKU1 spike	>0.9999
NL63 spike vs. SARS-CoV-2 spike	>0.9999
NL63 spike vs. neg. contr. (HA)	>0.9999
NL63 spike vs. naive contr.	<0.0001
OC43 spike vs. HKU1 spike	>0.9999
OC43 spike vs. SARS-CoV-2 spike	>0.9999
OC43 spike vs. neg. contr. (HA)	>0.9999
OC43 spike vs. naive contr.	<0.0001
HKU1 spike vs. SARS-CoV-2 spike	>0.9999
HKU1 spike vs. neg. contr. (HA)	>0.9999

HKU1 spike vs. naive contr.	<0.0001
SARS-CoV-2 spike vs. neg. contr. (HA)	>0.9999
SARS-CoV-2 spike vs. naive contr.	<0.0001
neg. contr. (HA) vs. naive contr.	<0.0001