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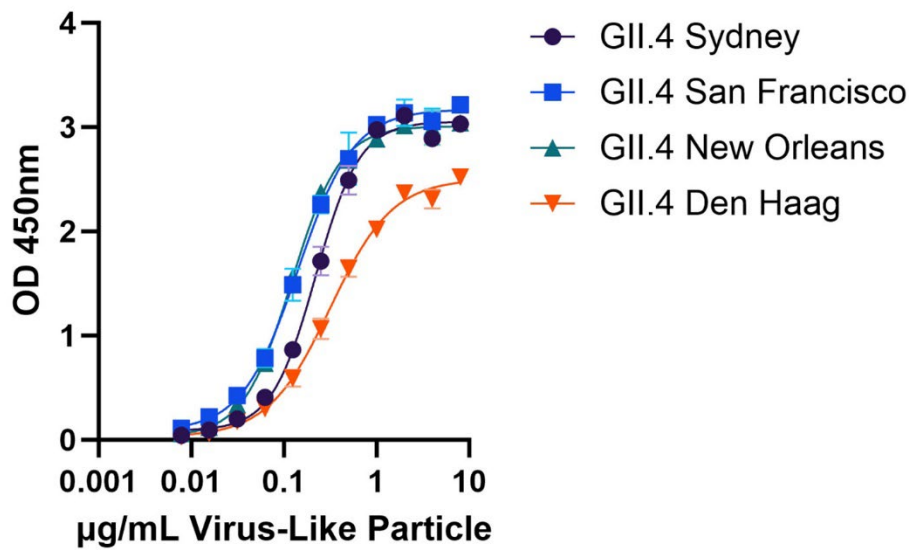
Emergence of Novel Norovirus GII.4 Variant

Appendix

GenBank # (strain/variant name)	P1	289	290	291	292	293	Insertion	294	295	296	297	298	299	308	372	373	383	382	389	339	350	351	375	376	377	378	391	392	393	394	395	396	397	507	411	412	413	414	327	401	352	353	356	357	359	362	309	310	402	403	504	506	310	316	484	493
OR262322 (SanFrancisco0128)	L	S	V	T	Q	L	A	T	G	S	H	N	Y	E	N	N	M	K	I	R	G	N	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
OR262323 (SanFrancisco0129)	L	S	V	T	Q	L	A	T	G	S	H	N	Y	E	N	N	M	K	I	R	G	N	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
OR262324 (SanFrancisco0130)	L	S	V	T	Q	L	A	T	G	S	H	N	Y	E	N	N	M	K	I	R	G	N	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
OR262325 (SanFrancisco0131)	L	S	V	T	Q	L	A	T	G	S	H	N	Y	E	N	N	M	K	I	R	G	N	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
OR262326 (1807_UK)	L	S	V	T	Q	L	A	T	G	S	H	N	Y	E	N	N	M	K	I	R	G	N	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
OR262327 (1808_UK)	L	S	V	T	Q	L	A	T	G	S	H	N	Y	E	N	N	M	K	I	R	G	N	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
OR262328 (1954_UK)	L	S	V	T	Q	L	A	T	G	S	H	N	Y	E	N	N	M	K	I	R	G	N	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
OR262329 (2177_UK)	L	S	V	T	Q	L	A	T	G	S	H	N	Y	E	N	N	M	K	I	R	G	N	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
MWS06847 (242_Gabon)	L	S	V	T	Q	L	A	T	G	S	H	N	Y	E	N	N	M	K	I	R	G	N	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
MWS06848 (548_Gabon)	L	S	V	T	Q	L	A	T	G	S	H	N	Y	E	N	N	M	K	I	R	G	N	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
MWS06849 (561_Gabon)	L	S	V	T	Q	L	A	T	G	S	H	N	Y	E	N	N	M	K	I	R	G	N	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
OR262341 (24832_SouthAfrica)	L	S	V	T	Q	L	A	T	G	S	H	N	Y	E	N	N	M	K	I	R	G	N	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
OR262342 (25610_SouthAfrica)	L	S	V	T	Q	L	A	T	G	S	H	N	Y	E	N	N	M	K	I	R	G	N	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
OR262343 (25993_SouthAfrica)	L	S	V	T	Q	L	A	T	G	S	H	N	Y	E	N	N	M	K	I	R	G	N	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
OR262344 (C027_SouthAfrica)	L	S	V	T	Q	L	A	T	G	S	H	N	Y	E	N	N	M	K	I	R	G	N	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
J043998 (Belgium)	A	M	D	V	T	H	I	P	G	S	R	N	Y	E	D	R	V	K	I	R	T	D	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
G1445325 (New Orleans)	A	M	D	V	T	H	I	P	G	S	R	N	Y	E	D	R	V	K	I	R	T	D	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
I3128965 (Den Haag)	A	M	D	V	T	H	I	P	G	S	R	N	Y	E	D	R	V	K	I	R	T	D	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
I5126963 (Yerevan)	V	M	D	V	T	H	I	P	G	S	R	N	Y	E	D	R	V	K	I	R	T	D	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
A8220922 (Sokai)	V	M	D	V	T	H	I	P	G	S	R	N	Y	E	D	R	V	K	I	R	T	D	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
A983096 (Hunter)	V	M	D	V	T	H	I	P	G	S	R	N	Y	E	D	R	V	K	I	R	T	D	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
A9520223 (Birmingham NBk)	V	M	D	V	T	H	I	P	G	S	R	N	Y	E	D	R	V	K	I	R	T	D	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
DQ278829 (US95-96)	V	M	D	V	T	H	I	P	G	S	R	N	Y	E	D	R	V	K	I	R	T	D	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
U46500 (Cambridge)	V	M	D	V	T	H	I	P	G	S	R	N	Y	E	D	R	V	K	I	R	T	D	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		
X85527 (Bristol)	V	M	D	V	T	H	I	P	G	S	R	N	Y	E	D	R	V	K	I	R	T	D	F	E	T	N	G	D	A	H	R	S	R	N	T	H	V	V	Y	S	N	D	A	R	N	S	Q	W	Q	D	S	E	R	K		

Amino Acid Type	Amino Acid Code/Color	Amino Acid Name
Positive charged	R, H, K	Arginine, Histidine, Lysine
Negative charged	D, E	Aspartic acid, Glutamic acid
Polar uncharged	S, T, N, Q	Serine, Threonine, Asparagine, Glutamine
Hydrophobic	A, V, I, L, M	Alanine, Valine, Isoleucine, Methionine
Aromatic hydrophobic	F, Y, W	Phenylalanine, Tyrosine, Tryptophan
Small molecule	G	Glycine
Forms kink in structure	P	Proline
Other special case	C, U	Cysteine, Selenocysteine

Appendix Figure 1. Amino acid differences of emergent novel norovirus GII.4 strains on 3 continents. Differences in the P1 and P2 antibody binding epitopes of the GII.4 San Francisco strains were compared with reference strains of other epidemic GII.4 variants.



Appendix Figure 2. Optical density of emergent novel norovirus GII.4 strains from 3 continents. GII.4 variants bind to ligands (porcine gastric mucin). The binding of each GII.4 variant was determined across a series of concentrations beginning at 8 µg/mL and the optical density measurements at 450 nm and fit using nonlinear regression analysis (log(agonist) versus response-variable slope) in GraphPad Prism 9.5.1 (GraphPad Software Inc., <https://www.graphpad.com>). Each virus-like protein was tested in duplicate in 2 independent experiments and mean +/- SEM of all data plotted.