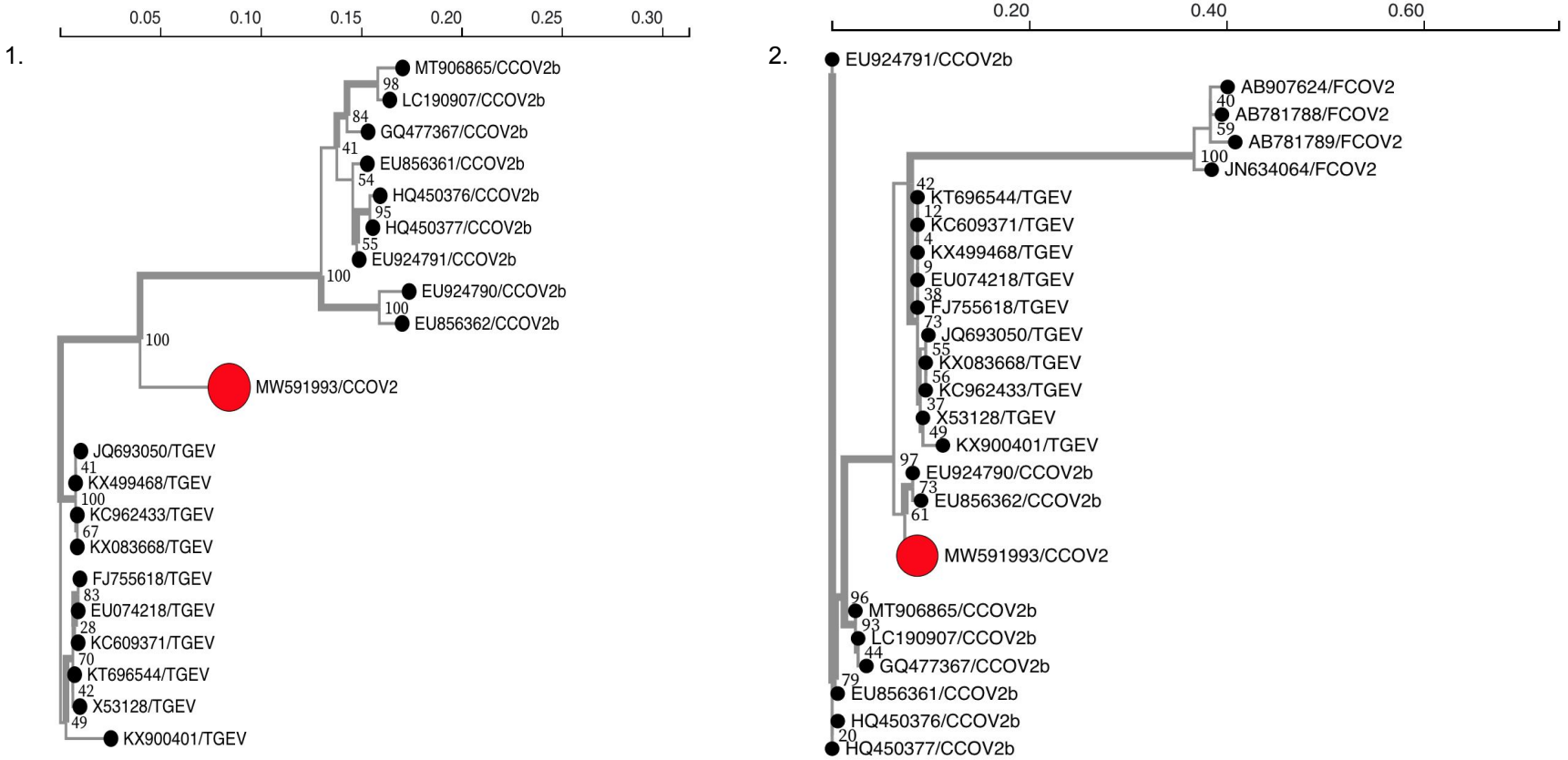
Table S1: Isolate details and sequence accessions for the included CoVs.

Alignment set	Accession number	Alpha-1 Type	Strain Name	Collection date	Location
1 & 2	MW591993.1	CCoV-HuPN-2018	CCoV-HuPN-2018	2017	Malaysia
1 & 2	EU856361.1	CCoV2b	341/05	Dec 2005	Italy
1 & 2	EU924791.1	CCoV2b	119-08	Mar 2008	Italy
1 & 2	HQ450377.1	CCoV2b	68-09	2009	Greece
1 & 2	HQ450376.1	CCoV2b	66-09	2009	Greece
1 & 2	EU924790.1	CCoV2b	430-07	Oct 2007	Italy
1 & 2	EU856362.1	CCoV2b	174-06	Mar 2006	Italy
1 & 2	MT906865.1	CCoV2b	2020-7	2020	United Kingdom
1 & 2	GQ477367.1	CCoV2b	CCOV-NTU336-2008	Nov 2008	Taiwan
1 & 2	LC190907.1	CCoV2b	CCOV-Dog-HCM47-2015	June 2015	Vietnam
1 & 2	KX900401.1	TGEV	TGEV/USA/Tennessee144/2008	15 Apr 2008	USA - Tennessee
1 & 2	KC609371.1	TGEV	NA	21 May 2013	China
1 & 2	FJ755618.2	TGEV	H16	1973	China
1 & 2	KT696544.1	TGEV	JS2012	2012	China
1 & 2	EU074218.2	TGEV	Attenuated H	NA	China
1 & 2	X53128.1	TGEV	TGEV FD772-70	NA	China
1 & 2	KX499468.1	TGEV	TGEV AHHF	22 Dec 2015	China
1 & 2	KC962433.1	TGEV	TGEV HX	5 May 2012	China
1 & 2	JQ693050.1	TGEV	NA	NA	South Korea
1 & 2	KX083668.1	TGEV	NA	2015	China
2	AB781789.1	FCOV2	KUK-H-L	NA	Japan
2	AB781788.1	FCOV2	M91-267	NA	Japan
2	AB907624.1	FCOV2	Tokyo/cat/130627	NA	Tokyo, Japan
2	JN634064.1	FCOV2	WSU-79-1683	1979	USA - Washington

Figure S1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0.30
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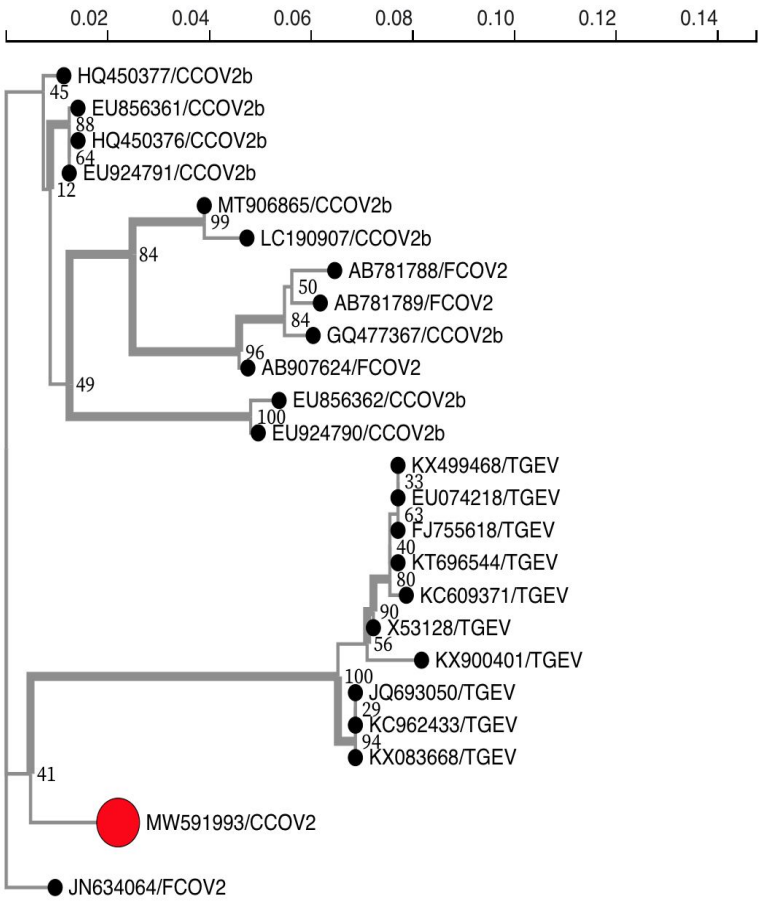
LC190907/CCOV2b
GQ477367/CCOV2b
EU856361/CCOV2b
HQ450376/CCOV2b
HQ450377/CCOV2b
EU924791/CCOV2b
EU924790/CCOV2b
EU856362/CCOV2b
MW591993/CCOV2
JQ693050/TGEV
KX499468/TGEV
KC962433/TGEV
KX083668/TGEV
FJ755618/TGEV
EU074218/TGEV
KC609371/TGEV
KT696544/TGEV
X53128/TGEV
KX900401/TGEV
2.
0.20
0.40
0.60
EU924791/CCOV2b
AB907624/FCOV2
AB781788/FCOV2
AB781789/FCOV2
JN634064/FCOV2
KT696544/TGEV
KC609371/TGEV
KX499468/TGEV
EU074218/TGEV
FJ755618/TGEV
JQ693050/TGEV
KX083668/TGEV
KC962433/TGEV
X53128/TGEV
KX900401/TGEV
EU924790/CCOV2b
EU856362/CCOV2b
MW591993/CCOV2
MT906865/CCOV2b
LC190907/CCOV2b
GQ477367/CCOV2b
EU856361/CCOV2b
HQ450376/CCOV2b
HQ450377/CCOV2b

3.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0.10
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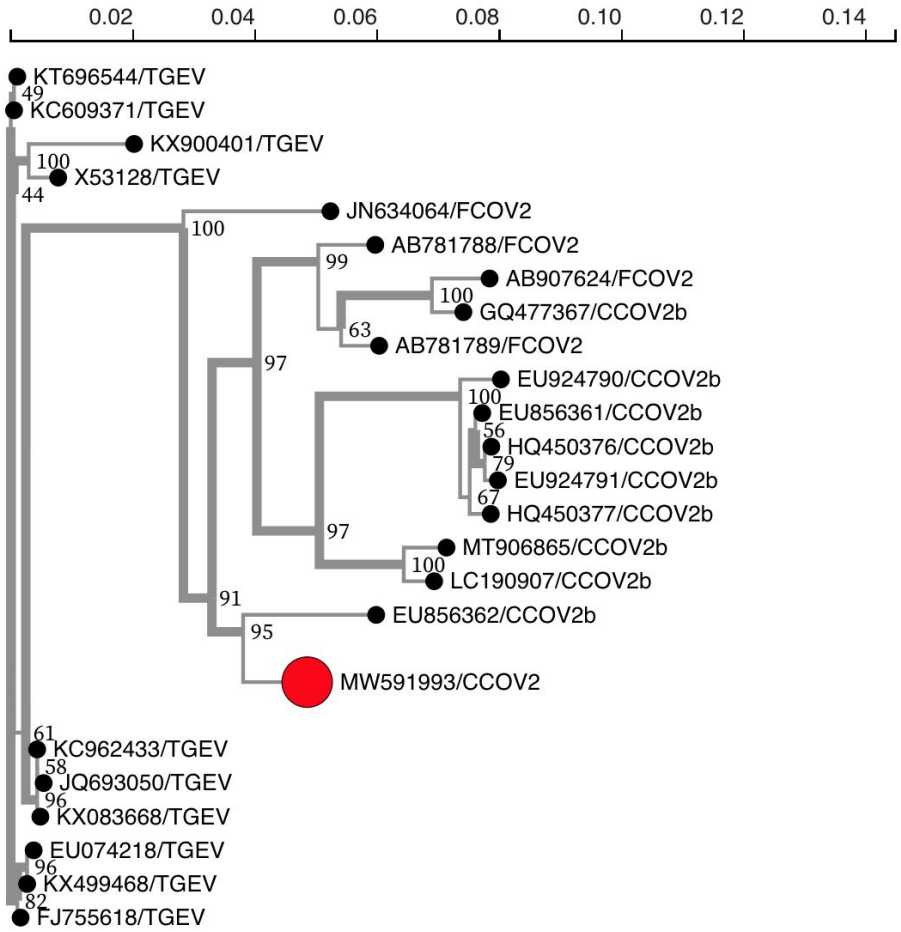
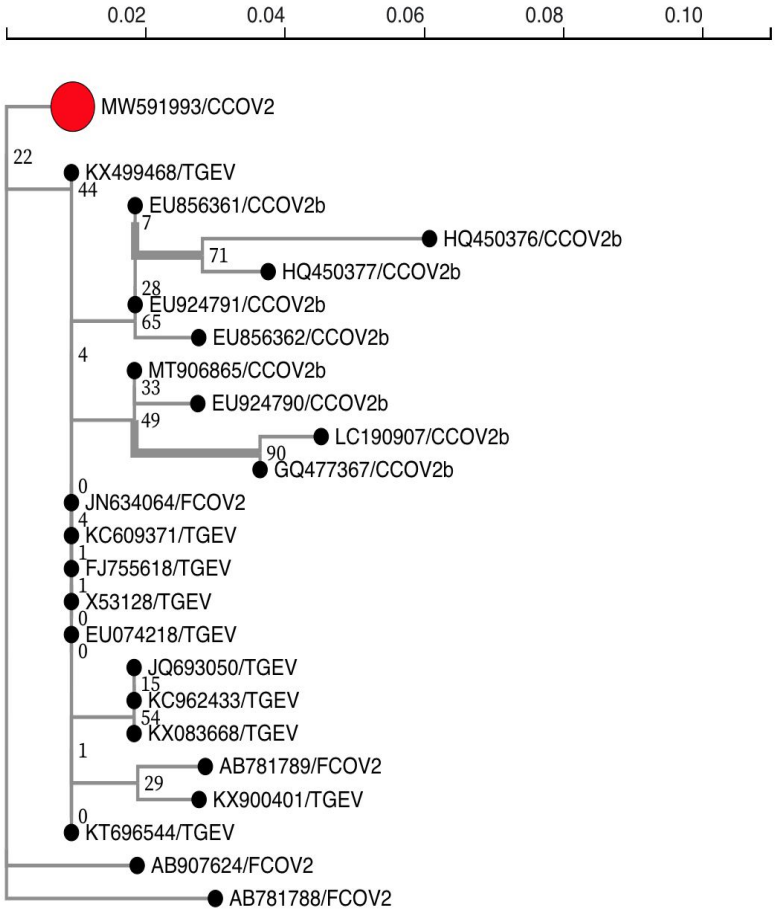
EU924791/CCOV2b
MT906865/CCOV2b
LC190907/CCOV2b
AB781788/FCOV2
AB781789/FCOV2
GQ477367/CCOV2b
AB907624/FCOV2
EU856362/CCOV2b
EU924790/CCOV2b
KX499468/TGEV
EU074218/TGEV
FJ755618/TGEV
KT696544/TGEV
KC609371/TGEV
X53128/TGEV
KX900401/TGEV
JQ693050/TGEV
KC962433/TGEV
KX083668/TGEV
MW591993/CCOV2
JN634064/FCOV2

4.


0.02
0.04
0.06
0.08
0.10
0.12
0.14
KT696544/TGEV
KC609371/TGEV
KX900401/TGEV
X53128/TGEV
JN634064/FCOV2
AB781788/FCOV2
AB907624/FCOV2
GQ477367/CCOV2b
AB781789/FCOV2
EU924790/CCOV2b
EU856361/CCOV2b
HQ450376/CCOV2b
EU924791/CCOV2b
HQ450377/CCOV2b
MT906865/CCOV2b
LC190907/CCOV2b
EU856362/CCOV2b
MW591993/CCOV2
KC962433/TGEV
JQ693050/TGEV
KX083668/TGEV
EU074218/TGEV
KX499468/TGEV
FJ755618/TGEV

5.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0.08
0.10
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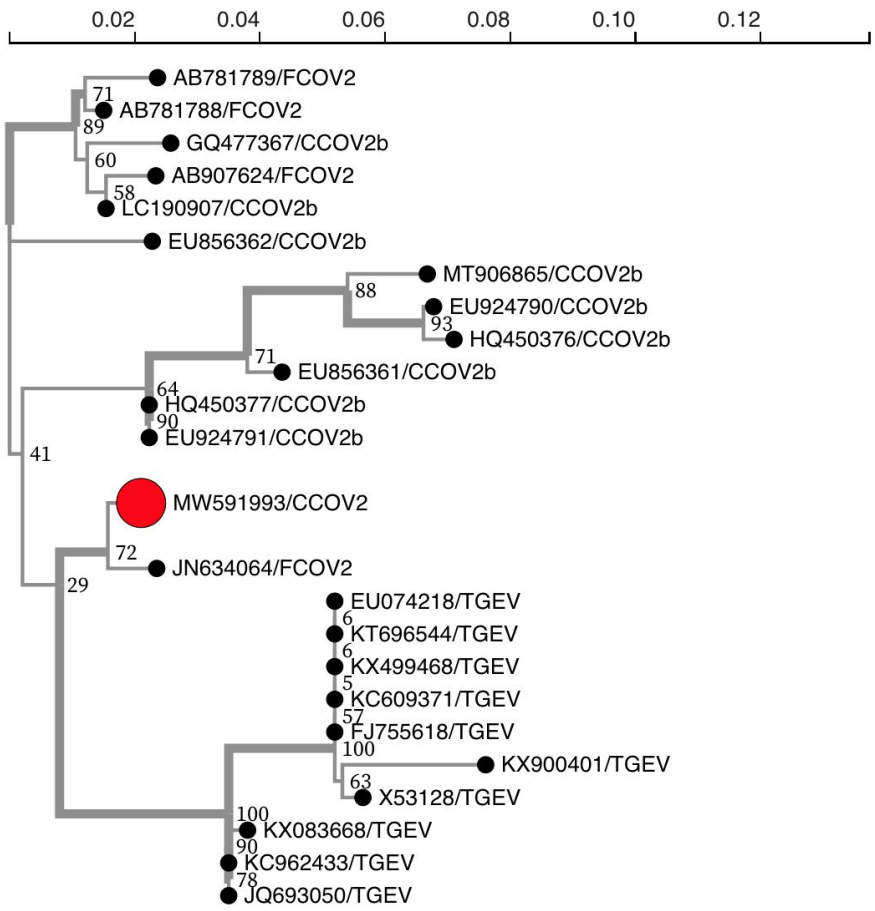
7
HQ450376/CCOV2b
71
HQ450377/CCOV2b
28
EU924791/CCOV2b
65
EU856362/CCOV2b
4
MT906865/CCOV2b
33
EU924790/CCOV2b
49
LC190907/CCOV2b
90
GQ477367/CCOV2b
0
JN634064/FCOV2
4
KC609371/TGEV
1
FJ755618/TGEV
1
X53128/TGEV
0
EU074218/TGEV
0
JQ693050/TGEV
15
KC962433/TGEV
54
KX083668/TGEV
1
AB781789/FCOV2
29
KX900401/TGEV
0
KT696544/TGEV
AB907624/FCOV2
AB781788/FCOV2

6.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0.06
0.08
0.10
0.12
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89
GQ477367/CCOV2b
60
AB907624/FCOV2
58
LC190907/CCOV2b
EU856362/CCOV2b
MT906865/CCOV2b
88
EU924790/CCOV2b
93
HQ450376/CCOV2b
71
EU856361/CCOV2b
64
HQ450377/CCOV2b
90
EU924791/CCOV2b
41
MW591993/CCOV2
72
JN634064/FCOV2
29
EU074218/TGEV
6
KT696544/TGEV
6
KX499468/TGEV
5
KC609371/TGEV
57
FJ755618/TGEV
100
KX900401/TGEV
63
X53128/TGEV
100
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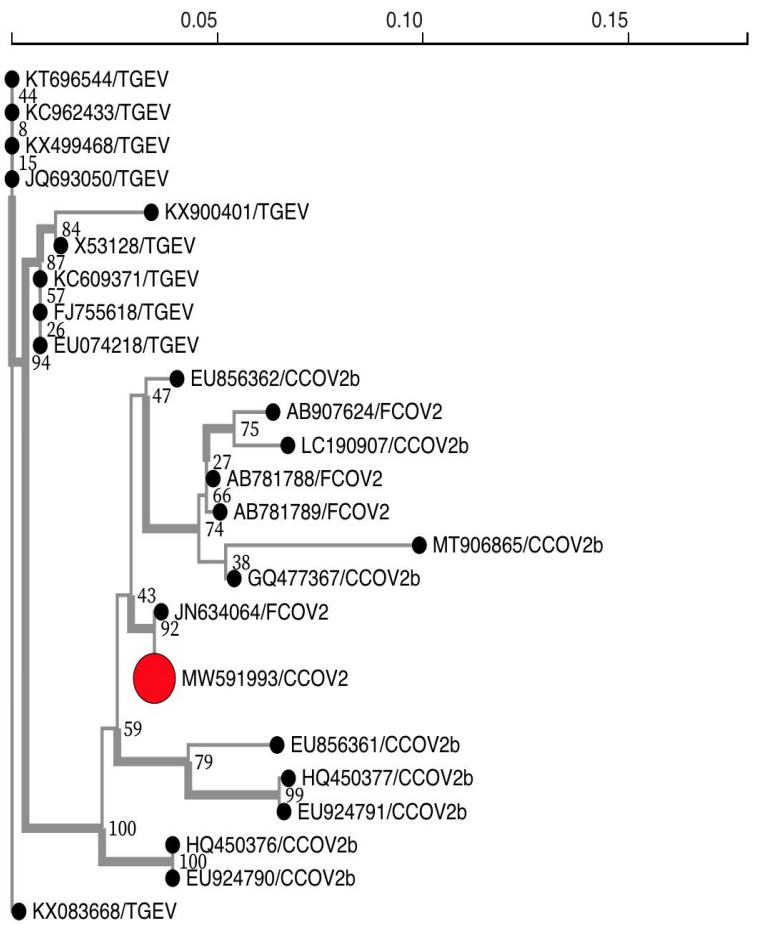
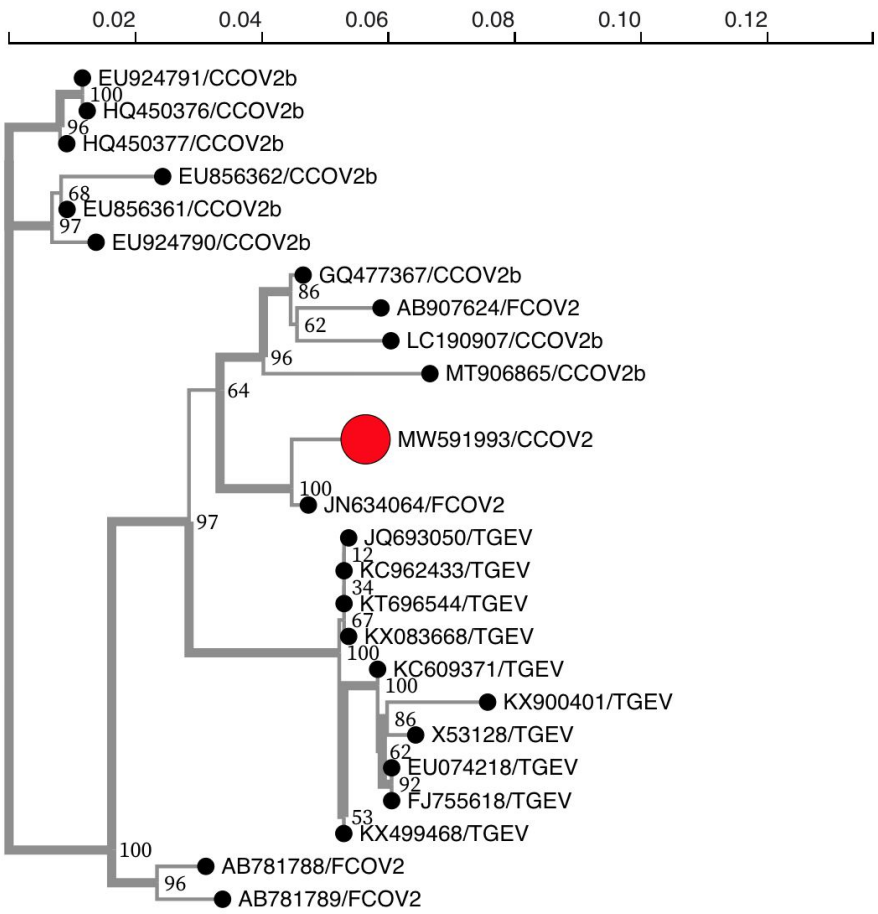
90
KC962433/TGEV
78
JQ693050/TGEV

7.


0.05
0.10
0.15
KT696544/TGEV
KC962433/TGEV
KX499468/TGEV
JQ693050/TGEV
KX900401/TGEV
X53128/TGEV
KC609371/TGEV
FJ755618/TGEV
EU074218/TGEV
EU856362/CCOV2b
AB907624/FCOV2
LC190907/CCOV2b
AB781788/FCOV2
AB781789/FCOV2
MT906865/CCOV2b
GQ477367/CCOV2b
JN634064/FCOV2
MW591993/CCOV2
EU856361/CCOV2b
HQ450377/CCOV2b
EU924791/CCOV2b
HQ450376/CCOV2b
EU924790/CCOV2b
KX083668/TGEV

8.


0.02
0.04
0.06
0.08
0.10
0.12
EU924791/CCOV2b
HQ450376/CCOV2b
HQ450377/CCOV2b
EU856362/CCOV2b
EU856361/CCOV2b
EU924790/CCOV2b
GQ477367/CCOV2b
AB907624/FCOV2
LC190907/CCOV2b
MT906865/CCOV2b
MW591993/CCOV2
JN634064/FCOV2
JQ693050/TGEV
KC962433/TGEV
KT696544/TGEV
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KC609371/TGEV
KX900401/TGEV
X53128/TGEV
EU074218/TGEV
FJ755618/TGEV
KX499468/TGEV
AB781788/FCOV2
AB781789/FCOV2

9.

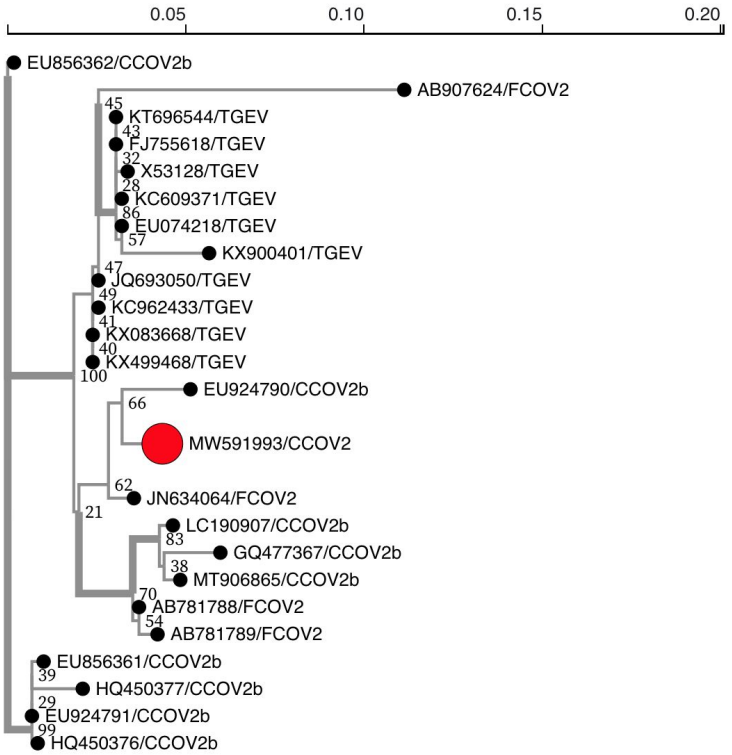

Figure S1. Phylogenetic trees for each GARD fragment inferred using RaxML. 1. Is the first non-recombinant fragment from alignment set I and the further trees correspond to non-recombinant fragments from alignment set II. Tree 2 corresponds to non-recombinant fragment 2 as depicted in the Fig. 1 gene map; tree 3 corresponds to non-recombinant fragment 3, and so on. These trees represent the phylogenetic incongruencies between the different non-recombinant fragments.

Table S2: Positive selection statistics from MEME and FEL

HuPN-2018 sites	FIPV mapped sites	MEME Non-synonymous substitution rate	MEME Synonymous substitution rate	FEL Non-synonymous substitution rate	FEL Synonymous substitution rate	MEME p-value	FEL p-value
13	13	3.58	0	NA	NA	0.04	NA
110	130	30.94	0	29.432	0	0.02	0.02
124	144	3.87	0	NA	NA	0.02	NA
246	262	2.9	0	2.784	0	0.02	0.04
367	384	4.8	0	4.817	0	0.04	0.05
575	603	11.17	0	NA	NA	0.02	NA
529	549	9.23	0	9.46	0	NA	0.05
698	715	11.26	0	NA	NA	0.05	NA
619	637	12.48	0	12.47	0	0.03	0.02
589	619	10.84	0	NA	NA	0.04	NA
1227	1246	27.49	0	NA	NA	0.04	NA
1296	1311	38.37	0	37.386	0	0.01	0.01
1233	1252	3.3	0	3.281	0	0.04	0.04

Figure S2

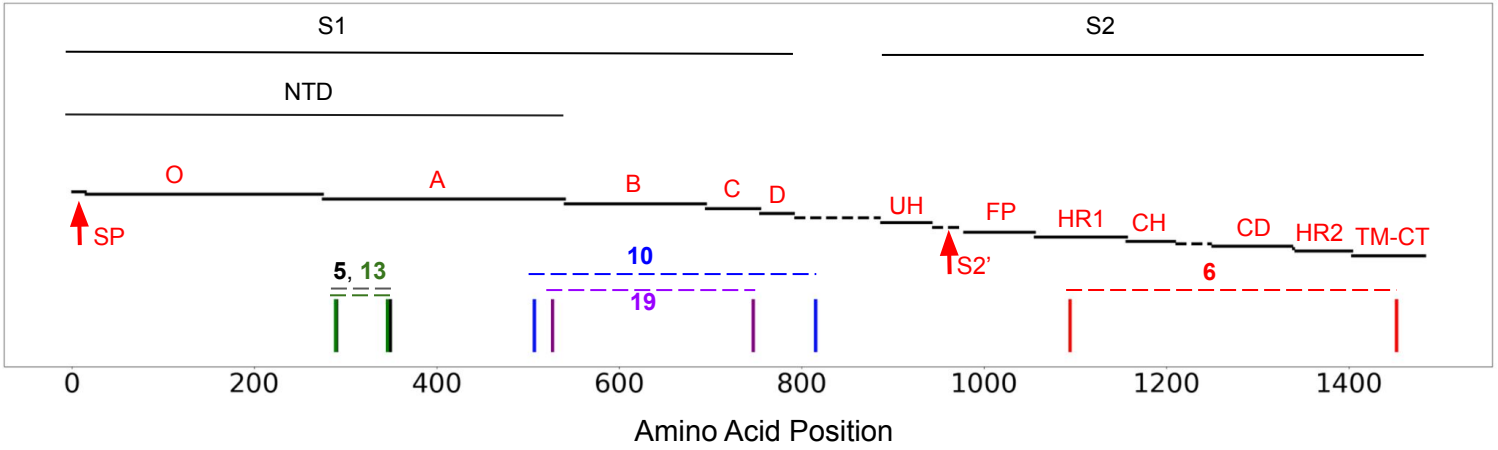

Figure S2. RDP5 results with supported recombination events (event boundaries outlined) that implicate CCoV-HuPn-2018, positioned along a spike gene map. A complete, enumerated list of the RDP5 recombination events, involving all sequences, can be found in Table S3. Event 5 (black) involves a proposed FCoV2 recombinant, with genetic donors: CCoV-HuPn-2018 and a different FCoV2. Event 13 (green) extensively overlaps with 5, as well as with GARD fragment 2 (Fig. 1), where CCoV-HuPn-2018 is a proposed recombinant, with genetic donors: FCoV2 from event 13, as well as a TGEV. Event 10 (cyan) proposes the same FCoV2 sequence from 5 and 13 as the recombinant, with genetic donors: CCoV-HuPn-2018 and a TGEV. Event 19 (purple) falls within 10, with CCoV-HuPn-2018 as the proposed recombinant and the genetic donors: a CCoV2b and a TGEV. Event 6 (red) proposes a CCoV2b as the recombinant, with genetic donors: CCoV-HuPn-2018 and another CCoV2b.

Table S3: RDP5 Recombination Results

Table key:
~ = It is possible that this apparent recombination signal could have been caused by an evolutionary process other than recombination.
* = The actual breakpoint position is undetermined (it was most likely either overprinted by a subsequent recombination event or off the edges of the analysed sequence fragments).
^ = The recombinant sequence may have been misidentified (one of the identified parents might be the recombinant)
Minor Parent = Parent contributing the smaller fraction of sequence.
Major Parent = Parent contributing the larger fraction of sequence.
Unknown = Only one parent and a recombinant need be in the alignment for a recombination event to be detectable.
The sequence listed as unknown was used to infer the existance of a missing parental sequence.
NS = No significant P-value was recorded for this recombination event using the particular method in question.

			Breakpoint Positions					
		In Alignment		In Recombinant Sequence		Relative to AB781789_1_FCOV2_stKUK_H_L_iNA_hFELIS_CATUS_cJAPAN		
Recombination Event Number	Number In .RDP File	Begin	End	Begin	End	Begin	End	Recombinant Sequence(s)
1	1	1781	2398	1781	2398	1781	2398	HQ450376_1_CCOV2b_st66_09_iNA_hDOG_cGREECE_cod2009
2	2	3	222	3	222	3	222	^GQ477367_1_CCOV2b_stCCOV_NTU336_F_2008_iNA_hDOG_cT
2								
2								
2								
3	3	1474	3158	1474	3158	1474	3158	LC190907_1_CCOV2b_stCCOV_DOG_HCM47_2015_iNA_hCANIS
4	4	552	1550	552	1550	552	1550	^EU924790_1_CCOV2b_st430_07_iNA_hDOG_cITALY_codOCT_
4								
4								
4								
5	5	3536	208	3533	208	3536	208	^JN634064_1_FCOV2_stWSU_79_1683_iNA_hNA_cNA_codNA_c
6	6	2426	3507	2426	3507	2426	3507	EU856362_1_CCOV2b_st174_06_iNA_hDOG_cITALY_codMAR_
7	7	1930*	3194	1930*	3194	1930*	3194	^EU924790_1_CCOV2b_st430_07_iNA_hDOG_cITALY_codOCT_
8	8	3538	466	3538	466	3538	466	^MT906865_1_CCOV2b_st2020_7_iNA_hDOMESTIC_DOG_cUNIT
8								LC190907_1_CCOV2b_stCCOV_DOG_HCM47_2015_iNA_hCANIS
9	9~	3380	3532*	3380	3532*	3380	3532*	AB907624_1_FCOV2_stTOKYO_CAT_130627_iNA_hFELIS_CAT
9								
10	10	668	1546	665	1543	668	1546	^JN634064_1_FCOV2_stWSU_79_1683_iNA_hNA_cNA_codNA_c
10								
10								
10								
10								
10								
10								
10								
10								
10								
11	11~	31	240	31	240	31	240	EU856362_1_CCOV2b_st174_06_iNA_hDOG_cITALY_codMAR_
11								EU924790_1_CCOV2b_st430_07_iNA_hDOG_cITALY_codOCT_
11								
11								
11								
11								
11								
12	12	21	1797	21	1797	21	1797	^EU856361_1_CCOV2b_st341_05_iNA_hDOG_cITALY_codDEC_
13	13	8	194	8	194	8	194	^MW591993_1_CCOV2_stNA_iCCoV_HuPn_2018_hHOMO_cMALAY
14	14	1810*	2048	1810*	2048	1810*	2048	^MT906865_1_CCOV2b_st2020_7_iNA_hDOMESTIC_DOG_cUNIT
15	15	2074	3542	2071	3539	2074	3542	^KX499468_1_TGEV_stTGEV_AHHF_iNA_hPORCINE_cCHINA_co
15								KT696544_1_TGEV_stJS2012_iNA_hPIG_cCHINA_cod2012_c[T]
16	16	2488	2976*	2485	2973*	2488	2976*	^AB781788_1_FCOV2_stM91_267_iNA_hFELIS_CATUS_cJAPAN
16								AB781789_1_FCOV2_stKUK_H_L_iNA_hFELIS_CATUS_cJAPAN
17	17~	1*	212	1*	212	1*	212	^HQ450376_1_CCOV2b_st66_09_iNA_hDOG_cGREECE_cod2009
17								EU924791_1_CCOV2b_st119_08_iNA_hDOG_cITALY_codMAR_
17								HQ450377_1_CCOV2b_st68_09_iNA_hDOG_cGREECE_cod2009
17								
17								
17								
18	18	208	466*	208	466*	208	466*	^LC190907_1_CCOV2b_stCCOV_DOG_HCM47_2015_iNA_hCANIS
18								MT906865_1_CCOV2b_st2020_7_iNA_hDOMESTIC_DOG_cUNIT
18								
19	19	729	1393	729	1393	729	1393	MW591993_1_CCOV2_stNA_iCCoV_HuPn_2018_hHOMO_cMALAY
19								
19								

~ = It is possible that this apparent recombination signal could have been caused by an evolutionary process other than recombination.
* = The actual breakpoint position is undetermined (it was most likely either overprinted by a subsequent recombination event or off the edges of the analysed sequence fragments).
^ = The recombinant sequence may have been misidentified (one of the identified parents might be the recombinant)
Minor Parent = Parent contributing the smaller fraction of sequence.
Major Parent = Parent contributing the larger fraction of sequence.
Unknown = Only one parent and a recombinant need be in the alignment for a recombination event to be detectable.
The sequence listed as unknown was used to infer the existance of a missing parental sequence.
NS = No significant P-value was recorded for this recombination event using the particular method in question.

kpoint Analysis Results

					Detection Methods					
Minor Parental Sequence(s)	Major Parental Sequence(s)	RDP	GENECONV	Bootscan	Maxchi	Chimaera	SiSscan	PhylPro	LARD	3Seq
EU924790_1_CCOV2b_st430_07_iNA_hDOG_cITALY_codOCT_	EU924791_1_CCOV2b_st119_08_iNA_hDOG_cITALY_codMAR_	2.54929441781989E-21	2.69904252016586E-19	1.58842061271349E-21	1.60241325509649E-12	1.11712519923247E-12	3.85798631003641E-13	NS	NS	3.09149434769133E-27
HQ450377_1_CCOV2b_st68_09_iNA_hDOG_cGREECE_cod2009	AB781788_1_FCOV2_stM91_267_iNA_hFELIS_CATUS_cJAPAN	1.5968974254152E-18	1.4763E-15	NS	NS	3.42976996758612E-08	6.57784854284356E-12	NS	NS	1.47659662275146E-13
EU856361_1_CCOV2b_st341_05_iNA_hDOG_cITALY_codDEC_										
EU924791_1_CCOV2b_st119_08_iNA_hDOG_cITALY_codMAR_										
HQ450376_1_CCOV2b_st66_09_iNA_hDOG_cGREECE_cod2009										
AB907624_1_FCOV2_stTOKYO_CAT_130627_iNA_hFELIS_CAT	MT906865_1_CCOV2b_st2020_7_iNA_hDOMESTIC_DOG_cUNIT	5.71429583963982E-13	1.91705875741076E-06	1.30171681145963E-11	2.17851813857237E-15	3.01222470951235E-03	3.04126195422575E-08	NS	NS	1.22223432622612E-20
HQ450377_1_CCOV2b_st68_09_iNA_hDOG_cGREECE_cod2009	EU856362_1_CCOV2b_st174_06_iNA_hDOG_cITALY_codMAR_	1.06565559083198E-10	1.61019545136601E-10	2.04958616039796E-10	3.81617339524108E-14	2.67182105696006E-08	8.49132498380889E-15	NS	NS	1.47659662275146E-13
EU856361_1_CCOV2b_st341_05_iNA_hDOG_cITALY_codDEC_										
EU924791_1_CCOV2b_st119_08_iNA_hDOG_cITALY_codMAR_										
HQ450376_1_CCOV2b_st66_09_iNA_hDOG_cGREECE_cod2009										
AB907624_1_FCOV2_stTOKYO_CAT_130627_iNA_hFELIS_CAT	MW591993_1_CCOV2_stNA_iCCoV_HuPn_2018_hHOMO_cMALAY	NS	0.0000000088179	1.29024890729025E-07	NS	1.61547737751844E-06	7.49308129377183E-12	NS	NS	2.58640664441145E-09
EU856361_1_CCOV2b_st341_05_iNA_hDOG_cITALY_codDEC_	MW591993_1_CCOV2_stNA_iCCoV_HuPn_2018_hHOMO_cMALAY	NS	2.59815477303155E-08	8.52400599331166E-13	1.34314511108633E-10	1.77795291254701E-11	2.50494885152511E-15	NS	NS	1.47659662275146E-12
EU856361_1_CCOV2b_st341_05_iNA_hDOG_cITALY_codDEC_	Unknown (EU924791_1_CCOV2b_st119_08_iNA_hDOG_cITALY_codMAR_)	6.96405652714313E-05	NS	1.13700574314452E-04	1.82373326519041E-08	2.72418943094248E-02	NS	NS	NS	2.40326399873259E-04
HQ450377_1_CCOV2b_st68_09_iNA_hDOG_cGREECE_cod2009	AB781789_1_FCOV2_stKUK_H_L_iNA_hFELIS_CATUS_cJAPAN	9.06380073189918E-05	9.80678186227046E-10	2.50077762261688E-12	6.53884904347062E-09	2.82361660755354E-08	1.88070874106544E-18	NS	NS	4.36800248615477E-06
Unknown (MT906865_1_CCOV2b_st2020_7_iNA_hDOMESTIC_DOG_cUNIT)	AB781789_1_FCOV2_stKUK_H_L_iNA_hFELIS_CATUS_cJAPAN	NS	0.000000017955	2.93054559450642E-10	2.36128641144729E-02	5.76594627581528E-03	2.37152292533844E-07	NS	NS	1.35269529157434E-04
Unknown(LC190907_1_CCOV2b_stCCOV_DOG_HCM47_2015_iNA_hCANIS)	AB781788_1_FCOV2_stM91_267_iNA_hFELIS_CATUS_cJAPAN									
KT696544_1_TGEV_stJS2012_iNA_hPIG_cCHINA_cod2012_c	MW591993_1_CCOV2_stNA_iCCoV_HuPn_2018_hHOMO_cMALAY	3.94299401437865E-02	NS	NS	1.74085030001778E-05	6.39077111921958E-04	NS	NS	NS	3.19260417075828E-03
KX900401_1_TGEV_stTGEV_USA_TENNESSEE144_2008_iNA_h										
KC609371_1_TGEV_stNA_iZH_hPIG_cCHINA_codNA_crd21_M										
FJ755618_2_TGEV_stH16_iNA_hPIG_cCHINA_cod1973_crd1										
EU074218_2_TGEV_stATTENUATED_H_iNA_hNA_cCHINA_codN										
X53128_1_TGEV_stTGEV_FS772_70_VIRULENT_BRITISH_ISO										
KX499468_1_TGEV_stTGEV_AHHF_iNA_hPORCINE_cCHINA_co										
KC962433_1_TGEV_stNA_iTGEV_HX_hSUS_SCROFA_cCHINA_c										
JQ693050_1_TGEV_stNA_iDAE_hSWINE_cSOUTH_KOREA_codN										
KX083668_1_TGEV_stNA_iHE_1_hSWINE_cCHINA_cod2015_c										
KX083668_1_TGEV_stNA_iHE_1_hSWINE_cCHINA_cod2015_c	Unknown (AB907624_1_FCOV2_stTOKYO_CAT_130627_iNA_hFELIS_CAT)	NS	0.00000015694	NS	8.83742902309859E-03	3.76911218069598E-04	NS	NS	NS	NS
KX900401_1_TGEV_stTGEV_USA_TENNESSEE144_2008_iNA_h	Unknown(AB781789_1_FCOV2_stKUK_H_L_iNA_hFELIS_CATUS_cJAPAN)									
KC609371_1_TGEV_stNA_iZH_hPIG_cCHINA_codNA_crd21_M	Unknown(AB781788_1_FCOV2_stM91_267_iNA_hFELIS_CATUS_cJAPAN)									
KT696544_1_TGEV_stJS2012_iNA_hPIG_cCHINA_cod2012_c										
EU074218_2_TGEV_stATTENUATED_H_iNA_hNA_cCHINA_codN										
X53128_1_TGEV_stTGEV_FS772_70_VIRULENT_BRITISH_ISO										
KX499468_1_TGEV_stTGEV_AHHF_iNA_hPORCINE_cCHINA_co										
HQ450377_1_CCOV2b_st68_09_iNA_hDOG_cGREECE_cod2009	Unknown (EU924791_1_CCOV2b_st119_08_iNA_hDOG_cITALY_codMAR_)	NS	NS	NS	5.519095479311E-08	1.01555418986308E-05	NS	NS	NS	1.11866912377856E-06
KX900401_1_TGEV_stTGEV_USA_TENNESSEE144_2008_iNA_h	Unknown (AB781788_1_FCOV2_stM91_267_iNA_hFELIS_CATUS_cJAPAN)	3.12809262916968E-04	NS	5.2554920803031E-06	NS	NS	2.26944812454335E-10	NS	NS	1.66035638800721E-03
EU856361_1_CCOV2b_st341_05_iNA_hDOG_cITALY_codDEC_	AB781789_1_FCOV2_stKUK_H_L_iNA_hFELIS_CATUS_cJAPAN	6.877666015684E-04	NS	1.18916131310652E-03	5.2541093519971E-03	1.63968470554917E-03	NS	NS	NS	1.08625952189634E-04
KX083668_1_TGEV_stNA_iHE_1_hSWINE_cCHINA_cod2015_c	EU074218_2_TGEV_stATTENUATED_H_iNA_hNA_cCHINA_codN	NS	NS	NS	8.23395529029022E-05	6.57226784482268E-04	3.57411410115915E-04	NS	NS	1.86295488697752E-05
	FJ755618_2_TGEV_stH16_iNA_hPIG_cCHINA_cod1973_crd1									
EU924791_1_CCOV2b_st119_08_iNA_hDOG_cITALY_codMAR_	LC190907_1_CCOV2b_stCCOV_DOG_HCM47_2015_iNA_hCANIS	NS	NS	NS	3.14472616262718E-04	3.26398151918505E-03	8.30480787757935E-03	NS	NS	5.35893306119373E-03
HQ450377_1_CCOV2b_st68_09_iNA_hDOG_cGREECE_cod2009	AB907624_1_FCOV2_stTOKYO_CAT_130627_iNA_hFELIS_CAT									
KT696544_1_TGEV_stJS2012_iNA_hPIG_cCHINA_cod2012_c	AB907624_1_FCOV2_stTOKYO_CAT_130627_iNA_hFELIS_CAT	NS	NS	NS	3.48572332854324E-03	1.42536925312427E-03	NS	NS	NS	NS
KX900401_1_TGEV_stTGEV_USA_TENNESSEE144_2008_iNA_h	AB781789_1_FCOV2_stKUK_H_L_iNA_hFELIS_CATUS_cJAPAN									
KC609371_1_TGEV_stNA_iZH_hPIG_cCHINA_codNA_crd21_M										
EU074218_2_TGEV_stATTENUATED_H_iNA_hNA_cCHINA_codN										
X53128_1_TGEV_stTGEV_FS772_70_VIRULENT_BRITISH_ISO										
KX499468_1_TGEV_stTGEV_AHHF_iNA_hPORCINE_cCHINA_co										
AB907624_1_FCOV2_stTOKYO_CAT_130627_iNA_hFELIS_CAT	Unknown (EU074218_2_TGEV_stATTENUATED_H_iNA_hNA_cCHINA_codN)	NS	NS	4.83472613678042E-02	8.68564366541979E-06	1.16862405208412E-06	NS	NS	NS	2.95064125133138E-07
AB781789_1_FCOV2_stKUK_H_L_iNA_hFELIS_CATUS_cJAPAN	Unknown(FJ755618_2_TGEV_stH16_iNA_hPIG_cCHINA_cod1973_crd1)									
AB781788_1_FCOV2_stM91_267_iNA_hFELIS_CATUS_cJAPAN										
KT696544_1_TGEV_stJS2012_iNA_hPIG_cCHINA_cod2012_c	EU856361_1_CCOV2b_st341_05_iNA_hDOG_cITALY_codDEC_	NS	NS	NS	4.76176649908222E-03	4.10098289581509E-02	6.80442619453942E-19	NS	NS	NS
HQ450377_1_CCOV2b_st68_09_iNA_hDOG_cGREECE_cod2009	KC609371_1_TGEV_stNA_iZH_hPIG_cCHINA_codNA_crd21_M									
HQ450376_1_CCOV2b_st66_09_iNA_hDOG_cGREECE_cod2009	KT696544_1_TGEV_stJS2012_iNA_hPIG_cCHINA_cod2012_c									

Figure S3

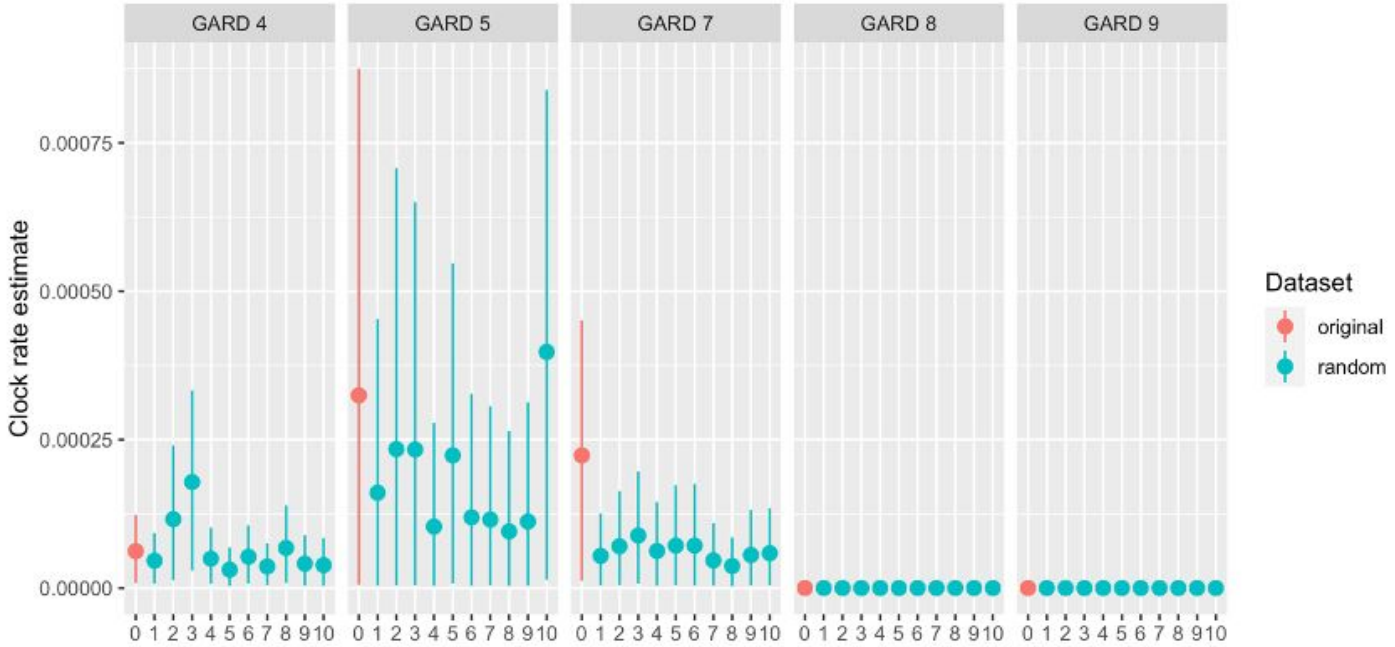

Figure S3. Mean and 95% HPD clock rate estimates for the original dataset and ten datasets with random dates are shown for the five GARD fragments with evidence of temporal signal on the root-tip regression analysis. Only GARD 7 had a mean clock rate estimate above the 95% HPD of the randomized datasets, indicating the presence of a temporal signal.

Table S4: Root-tip-regression results for each GARD Partition

GARD partition	Correlation coefficient	R^2
1	0.083	0.0070
2	-0.046	0.0021
3	-0.11	0.013
4	0.20	0.040
5	0.20	0.039
6	0.088	0.0077
7	0.36	0.13
8	0.30	0.089
9	0.21	0.046

Figure S4

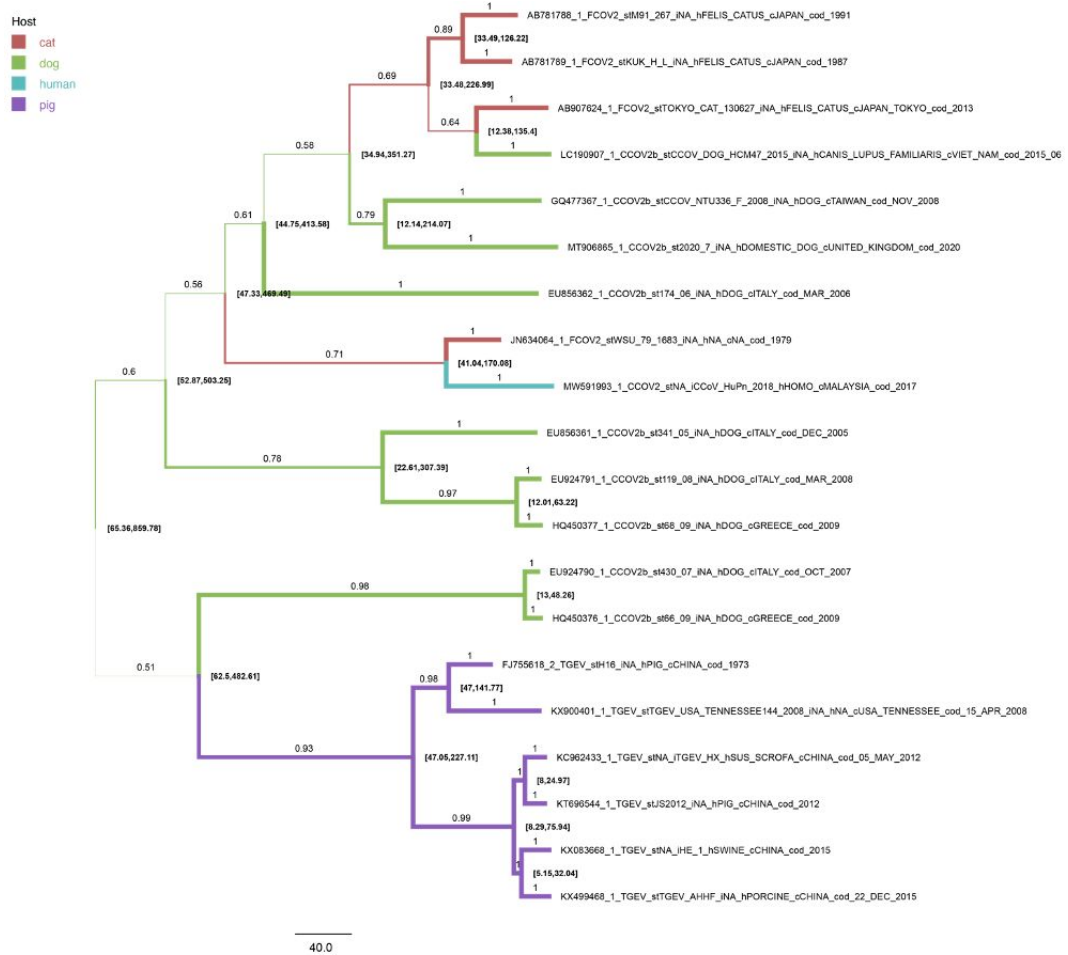
Host
cat
dog
human
pig
AB781788_1_FCOV2_stM91_267_iNA_hFELIS_CATUS_cJAPAN_cod_1991
AB781789_1_FCOV2_stKUK_H_L_iNA_hFELIS_CATUS_cJAPAN_cod_1987
AB907624_1_FCOV2_stTOKYO_CAT_130627_iNA_hFELIS_CATUS_cJAPAN_TOKYO_cod_2013
LC190907_1_CCOV2b_stCCOV_DOG_HCM47_2015_iNA_hCANIS_LUPUS_FAMILIARIS_cVIET_NAM_cod_2015_06
GQ477367_1_CCOV2b_stCCOV_NTU336_F_2008_iNA_hDOG_cTAIWAN_cod_NOV_2008
MT906865_1_CCOV2b_st2020_7_iNA_hDOMESTIC_DOG_cUNITED_KINGDOM_cod_2020
EU856362_1_CCOV2b_st174_06_iNA_hDOG_cITALY_cod_MAR_2006
JN634064_1_FCOV2_stWSU_79_1683_iNA_hNA_cNA_cod_1979
MW591993_1_CCOV2_stNA_iCCoV_HuPn_2018_hHOMO_cMALAYSIA_cod_2017
EU856361_1_CCOV2b_st341_05_iNA_hDOG_cITALY_cod_DEC_2005
EU924791_1_CCOV2b_st119_08_iNA_hDOG_cITALY_cod_MAR_2008
HQ450377_1_CCOV2b_st68_09_iNA_hDOG_cGREECE_cod_2009
EU924790_1_CCOV2b_st430_07_iNA_hDOG_cITALY_cod_OCT_2007
HQ450376_1_CCOV2b_st66_09_iNA_hDOG_cGREECE_cod_2009
FJ755618_2_TGEV_stH16_iNA_hPIG_cCHINA_cod_1973
KX900401_1_TGEV_stTGEV_USA_TENNESSEE144_2008_iNA_hNA_cUSA_TENNESSEE_cod_15_APR_2008
KC962433_1_TGEV_stNA_iTGEV_HX_hSUS_SCROFA_cCHINA_cod_05_MAY_2012
KT696544_1_TGEV_stJS2012_iNA_hPIG_cCHINA_cod_2012
KX083668_1_TGEV_stNA_iHE_1_hSWINE_cCHINA_cod_2015
KX499468_1_TGEV_stTGEV_AHHF_iNA_hPORCINE_cCHINA_cod_22_DEC_2015
40.0

Figure S4. Ancestral host reconstruction and divergence time estimates**.** Branches are colored by inferred host species. The branch width is proportional to the posterior probability of host assignment (also labeled on branches). Internal nodes are labeled with the divergence time 95% HPD in years from the most recent sample date, 2017. CCoV-HuPn-2018 diverged from FCoV2 JN634064 between 40 and 170 years ago, with a median date estimate of 1957.

Figure S5

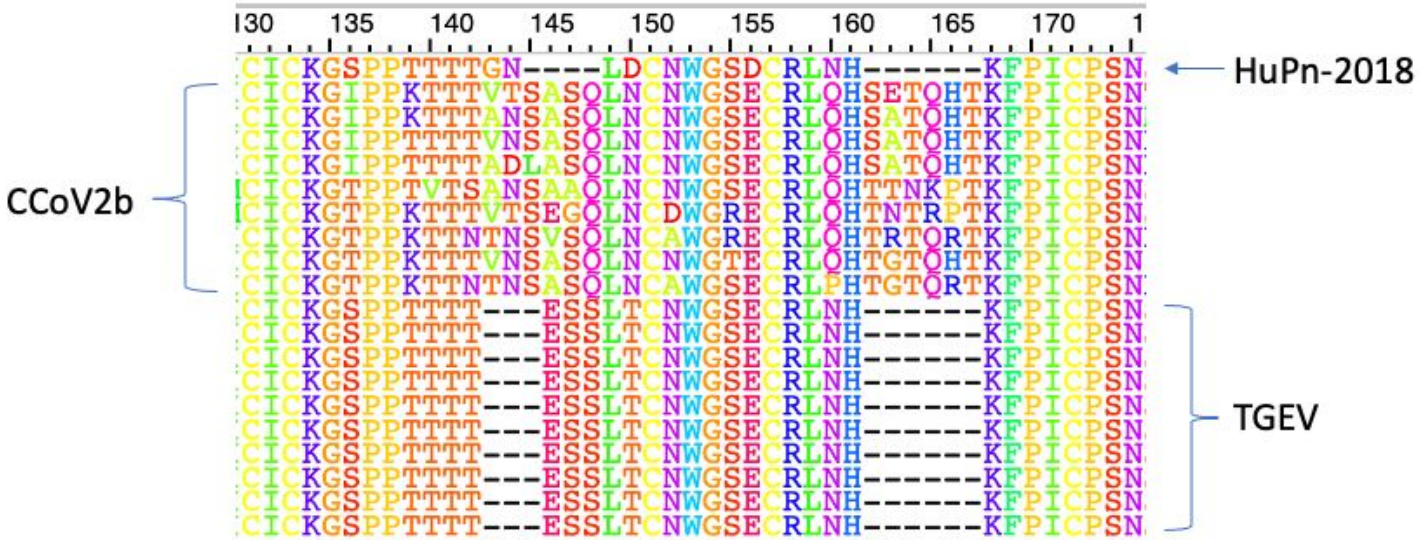

Figure S5. Set I sequence alignment highlighting the region involved in the proposed sialic acid binding, identified in the Krempl et al. (1997) mutation experiments.