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APPENDIX

Appendix 1. HLA alleles with ≥5% allele frequency among the Indonesian population

HLA I					
Summary	Allele	Population	% of individuals that have the allele	Allele Frequency (in_decimals)	Sample Size
A*02:01	A*02:01	Indonesia Java Western	12.7	0.066	236
	A*02:01:01:01	Indonesia Sundanese and Javanese		0.075	201
A*02:03:01	A*02:03:01	Indonesia Java pop 2		0.069	36
A*11:01	A*11:01	Indonesia Java Western	30.1	0.164	236
	A*11:01:01	Indonesia Sundanese and Javanese		0.164	201
	A*11:01:01	Indonesia Java pop 2		0.139	36
A*24:02	A*24:02	Indonesia Java Western	25.8	0.139	236
	A*24:02:01:01	Indonesia Sundanese and Javanese		0.144	201
	A*24:02:01:01	Indonesia Java pop 2		0.139	36
A*24:07	A*24:07	Indonesia Java pop 2		0.264	36
	A*24:07	Indonesia Java Western	39.4	0.222	236
	A*24:07	Indonesia Sundanese and Javanese		0.207	201
A*33:03	A*33:03	Indonesia Java Western	29.7	0.162	236
	A*33:03:01	Indonesia Sundanese and Javanese		0.169	201
	A*33:03:01	Indonesia Java pop 2		0.083	36
A*34:01	A*34:01	Indonesia Java pop 2		0.083	36
	A*34:01	Indonesia Java Western	14	0.073	236
	A*34:01	Indonesia Sundanese and Javanese		0.067	201
B*15:02	B*15:02	Indonesia Java pop 2		0.167	36
	B*15:02	Indonesia Java Western	22.9	0.122	236
	B*15:02	Indonesia Sundanese and Javanese		0.107	201
B*15:13	B*15:13	Indonesia Java pop 2		0.125	36

	B*15:13	Indonesia Java Western	21.6	0.115	236
	B*15:13	Indonesia Sundanese and Javanese		0.11	201
B*15:21	B*15:21	Indonesia Java pop 2		0.111	36
	B*15:21	Indonesia Java Western	14	0.073	236
	B*15:21	Indonesia Sundanese and Javanese		0.062	201
B*18:01	B*18:01	Indonesia Java Western	12.3	0.064	236
	B*18:01:01	Indonesia Sundanese and Javanese		0.07	201
B*35:05	B*35:05	Indonesia Sundanese and Javanese		0.09	201
	B*35:05	Indonesia Java Western	16.5	0.086	236
	B*35:05	Indonesia Java pop 2		0.056	36
B*38:02	B*38:02	Indonesia Java Western	10.6	0.054	236
	B*38:02:01	Indonesia Sundanese and Javanese		0.06	201
B*44:03	B*44:03	Indonesia Java Western	17.8	0.093	236
	B*44:03:02	Indonesia Sundanese and Javanese		0.07	201
B*58:01	B*58:01	Indonesia Sundanese and Javanese		0.06	201
	B*58:01	Indonesia Java Western	11.4	0.059	236

HLA II

Summary	Allele	Population	% of individuals that have the allele	Allele Frequency (in_decimals)	Sample Size
DRB1*07:01	DRB1*07	Indonesia Java Yogyakarta Region		0.11	62
	DRB1*07:01	Indonesia Java Western	25.4	0.136	236
	DRB1*07:01	Indonesia Singaporean		0.09	50
	DRB1*07:01	Indonesia Java		0.086	58
	DRB1*07:01	Indonesia Moluccan Islands		0.075	24
	DRB1*07:01:01	Indonesia Sundanese and Javanese		0.137	201

	DRB1*07:01:01	Indonesia Java pop 2		0.097	36
DRB1*11:01	DRB1*11:01	Indonesia Nusa Tenggara Islands		0.089	49
	DRB1*11:01	Indonesia Moluccan Islands		0.075	24
DRB1*12:02	DRB1*12:02	Indonesia Java		0.534	58
	DRB1*12:02	Indonesia Java Yogyakarta Region		0.507	62
	DRB1*12:02	Indonesia Java pop 2		0.431	36
	DRB1*12:02	Indonesia Sundanese and Javanese		0.368	201
	DRB1*12:02	Indonesia Java Western	59.7	0.365	236
	DRB1*12:02	Indonesia Singaporean		0.26	50
	DRB1*12:02	Indonesia Nusa Tenggara Islands		0.154	49
	DRB1*12:02	Indonesia Moluccan Islands		0.125	24
DRB1*15:01	DRB1*15:01	Indonesia Singaporean		0.12	50
	DRB1*15:01	Indonesia Moluccan Islands		0.063	24
DRB1*15:02	DRB1*15:02	Indonesia Nusa Tenggara Islands		0.479	49
	DRB1*15:02	Indonesia Moluccan Islands		0.463	24
	DRB1*15:02	Indonesia Java Western	41.1	0.233	236
	DRB1*15:02	Indonesia Java Yogyakarta Region		0.208	62
	DRB1*15:02	Indonesia Singaporean		0.17	50
	DRB1*15:02	Indonesia Java		0.146	58
	DRB1*15:02:01	Indonesia Sundanese and Javanese		0.241	201
	DRB1*15:02:01	Indonesia Java pop 2		0.167	36
DRB1*16:02	DRB1*16:02	Indonesia Moluccan Islands		0.05	24

Appendix 2. List of variant of concern sequences

Name	Accession ID	Collection Date	Pango Lineage
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ALPHA1	EPI_ISL_1169046	2021-02-12	(B.1.1.7)
ALPHA2	EPI_ISL_2500465	2021-05-30	(B.1.1.7)
ALPHA3	EPI_ISL_2500467	2021-05-30	(B.1.1.7)
ALPHA4	EPI_ISL_2617520	2021-05-15	(B.1.1.7)
ALPHA5	EPI_ISL_2617521	2021-05-15	(B.1.1.7)
ALPHA6	EPI_ISL_2617528	2021-05-10	(B.1.1.7)
ALPHA7	EPI_ISL_2617529	2021-05-10	(B.1.1.7)
ALPHA8	EPI_ISL_2617530	2021-05-10	(B.1.1.7)
ALPHA9	EPI_ISL_2617531	2021-05-10	(B.1.1.7)
ALPHA10	EPI_ISL_2631491	2021-05-30	(B.1.1.7)
BETA1	EPI_ISL_2226648	2021-05-05	(B.1.351)
BETA2	EPI_ISL_2262295	2021-04-17	B.1.351.2
BETA3	EPI_ISL_2382404	2021-03-11	(B.1.351)
BETA4	EPI_ISL_2382409	2021-03-29	B.1.351.3
BETA5	EPI_ISL_2854710	2021-05-04	(B.1.351)
BETA6	EPI_ISL_2854722	2021-01-25	(B.1.351)
BETA7	EPI_ISL_3138796	2021-05-08	B.1.351.3
BETA8	EPI_ISL_3138799	2021-05-08	(B.1.351)
BETA9	EPI_ISL_3138807	2021-05-05	(B.1.351)
BETA10	EPI_ISL_3138809	2021-05-06	(B.1.351)
DELTA1	EPI_ISL_10124456	2021-11-10	AY.23 Delta (B.1.617.2-like)
DELTA2	EPI_ISL_10124457	2021-01-03	AY.79 Delta (B.1.617.2-like)
DELTA3	EPI_ISL_10124533	2021-11-09	AY.23 Delta (B.1.617.2-like)
DELTA4	EPI_ISL_9846719	2022-01-04	AY.23 Delta (B.1.617.2-like)
DELTA5	EPI_ISL_9846720	2022-01-14	AY.23 Delta (B.1.617.2-like)
DELTA6	EPI_ISL_9846721	2022-01-14	AY.23 Delta (B.1.617.2-like)
DELTA7	EPI_ISL_9846722	2022-01-02	AY.23 Delta (B.1.617.2-like)
DELTA8	EPI_ISL_9846723	2022-01-14	AY.23 Delta (B.1.617.2-like)
DELTA9	EPI_ISL_9846724	2022-01-04	AY.23 Delta (B.1.617.2-like)
DELTA10	EPI_ISL_9907655	2022-02-01	AY.23 Delta (B.1.617.2-like)
OMICRON1	EPI_ISL_10101119	2022-01-29	BA.2
OMICRON2	EPI_ISL_10101121	2022-02-02	BA.2
OMICRON3	EPI_ISL_10101148	2022-02-02	BA.1
OMICRON4	EPI_ISL_10101399	2022-02-02	BA.2.3
OMICRON5	EPI_ISL_10101417	2022-02-03	BA.2.3
OMICRON6	EPI_ISL_9571285	2022-01-07	BA.2.3
OMICRON7	EPI_ISL_9571294	2022-01-07	BA.2

OMICRON8	EPI_ISL_9571303	2022-01-08	BA.2
OMICRON9	EPI_ISL_9571339	2022-01-11	BA.2
OMICRON10	EPI_ISL_9571842	2022-01-06	BA.2.3

Appendix 3. Wuhan-Hu-1 reference sequence 9-mer epitopes details

Wuhan-Hu-1				
Epitope #	Start residue	Epitope sequence	HLA Class I alleles	Immunogenicity
1	78	RFDNPVLPF	HLA-A*24:07, HLA-A*24:02, HLA-B*15:21, HLA-B*15:02, HLA-B*15:13	0.01291
2	89	GVYFASTEK	HLA-A*11:01, HLA-A*34:01	0.09023
3	133	FQFCNDPFL	HLA-A*02:01, HLA-B*38:02, HLA-A*02:01, HLA-A*02:03	0.05737
4	137	NDPFLGVYY	HLA-B*18:01	0.16798
5	138	DPFLGVYYH	HLA-B*35:05, HLA-B*18:01	0.09342
6	149	NKSWMESEF	HLA-B*38:02, HLA-B*15:21	0.01132
7	151	SWMESEFRV	HLA-A*24:07, HLA-A*24:02	0.10594
8	152	WMESEFRVY	HLA-B*15:02, HLA-B*15:21, HLA-B*15:13	0.14153
9	240	TLLALHRSY	HLA-B*15:02, HLA-B*15:21, HLA-B*15:13, HLA-B*35:05	0.00244
10	258	WTAGAAAYY	HLA-A*34:01, HLA-B*15:02, HLA-B*15:21, HLA-B*15:13, HLA-B*35:05	0.15259
11	321	QPTESIVRF	HLA-B*35:05, HLA-B*15:13, HLA-B*15:21, HLA-B*15:02, HLA-B*18:01, HLA-B*38:02	0.14261
12	334	NLCPFGEVF	HLA-B*15:21, HLA-B*15:02, HLA-B*15:13	0.22586
13	334	FVIRGDEVVR	HLA-B*15:21, HLA-B*15:02, HLA-B*15:13	0.22586
14	339	GEVFNATRF	HLA-B*44:03, HLA-B*18:01	0.22473
15	343	NATRFASVY	HLA-B*15:21, HLA-B*35:05, HLA-B*15:02, HLA-B*15:13	0.10001
16	413	GQTGKIADY	HLA-B*15:21, HLA-B*15:02	0.00796
17	448	NYNYLYRLF	HLA-A*24:02, HLA-A*24:07	0.0171
18	481	NGVEGFNCY	HLA-B*15:21, HLA-B*35:05, HLA-B*15:02	0.22039
19	497	FQPTNGVGY	HLA-B*15:21, HLA-B*15:02, HLA-B*15:13, HLA-B*18:01	0.1157
20	504	GYQPYRVVV	HLA-A*24:07, HLA-A*24:02	0.05532
21	505	YQPYRVVVL	HLA-B*15:21, HLA-A*02:03, HLA-B*38:02, HLA-A*02:01, HLA-A*24:07, HLA-A*24:02	0.1409
22	612	YQDVNCTEV	HLA-A*02:01, HLA-B*38:02	0.08295
23	710	NSIAIPTNF	HLA-B*15:13, HLA-B*15:21, HLA-B*58:01, HLA-B*35:05, HLA-B*15:02, HLA-A*34:01,	0.23071

			HLA-A*24:07, HLA-A*24:02	
24	857	GLTVLPPLL	HLA-A*02:01, HLA-A*02:03	0.01706
25	975	SVLNDILSR	HLA-A*11:01, HLA-A*34:01, HLA-A*33:03	0.03075
26	976	VLNDILSRL	HLA-A*02:03, HLA-A*02:01, HLA-B*15:13, HLA-A*34:01	0.03
27	1113	QIITDNTF	HLA-B*15:02, HLA-B*15:13, HLA-B*15:21, HLA-B*35:05	0.15816
28	1173	NASVVNIQK	HLA-A*34:01, HLA-A*11:01	0.06659

Appendix 4. Alpha Variant 9-mer epitopes details

Alpha			
Epitope #	Epitope sequence	HLA Class I Alleles	Immunogenicity
1	CONSERVED		
2	CONSERVED		
3	FQFCNHPFL (6-8)	HLA-A*02:01, HLA-A*02:03, HLA-B*38:02	0.06694
4	NDPFLGYHK (1-5; 9-10), NHPFLGYHK (6-8)	N/A	0.15108 (both)
5	DPFLGYHKN (1-5; 9-10), HPFLGYHKN (6-8)	N/A	-0.04234 (both)
6	CONSERVED		
7	CONSERVED		
8	CONSERVED		
9	ILLALHRSY (10)	HLA-B*15:02, HLA-B*15:21, HLA-B*15:13, HLA-B*35:05	0.00244
10	CONSERVED		
11	CONSERVED		
12	CONSERVED		
13	CONSERVED		
14	CONSERVED		
15	CONSERVED		
16	CONSERVED		
17	CONSERVED		
18	CONSERVED		
19	FQPTYGVGY (1-10)	HLA-B*15:21, HLA-B*15:02, HLA-B*15:13, HLA-B*18:01	0.1184
20	CONSERVED		
21	CONSERVED		
22	YQGVNCTEV (1-10)	N/A	0.08675

23	NSIAIPINF (1-10)	HLA-B*15:13, HLA-B*58:01, HLA-B*15:21, HLA-B*35:05, HLA-A*34:01, HLA-B*15:02, HLA-A*24:07, HLA-A*24:02	0.31027
24	CONSERVED		
25	SVLNDILAR (1-10)	HLA-A*11:01, HLA-A*34:01, HLA-A*33:03	0.15027
26	VLNDILARL (1-10)	HLA-A*02:03, HLA-A*02:01, HLA-B*15:13	0.20264
27	QIITTHNTF (1-10)	HLA-B*15:02, HLA-B*15:13, HLA-B*15:21, HLA-B*35:05, HLA-A*34:01, HLA-A*24:07, HLA-A*24:02, HLA-B*58:01	0.16773
28	CONSERVED		

Appendix 5. Beta Variant 9-mer epitopes details

Beta			
Epitope #	Epitope sequence	HLA Class I alleles	Immunogenicity
1	RFANPVLPF (1-9)	HLA-A*24:02, HLA-A*24:07, HLA-B*15:21, HLA-B*15:02, HLA-B*15:13	0.01841
2	CONSERVED		
3	CONSERVED		
4	CONSERVED		
5	CONSERVED		
6	CONSERVED		
7	CONSERVED		
8	CONSERVED		
9	TRFQLHRYSY (1;5-9); FQTLHRSY (2-4)	HLA-B*38:02, HLA-B*15:21, HLA-B*18:01	-0.11189; -0.03189
10	WTFGAGAAL (6)	HLA-A*34:01, HLA-B*15:21, HLA-B*35:05, HLA-B*15:02	0.19798
11	CONSERVED		
12	CONSERVED		
13	CONSERVED		
14	CONSERVED		
15	CONSERVED		
16	GQTGNIADY (1-9)	HLA-B*15:21	0.21166
17	CONSERVED		
18	NGVKGFNCY (1-9);	HLA-B*15:21, HLA-B*35:05, HLA-B*15:02	-0.09736
19	FQPTYGVGY (1-9)	N/A	0.1184
20	CONSERVED		
21	CONSERVED		
22	YQGVNCTEV (1-9)	N/A	0.08675

23	CONSERVED		
24	CONSERVED		
25	CONSERVED		
26	CONSERVED		
27	CONSERVED		
28	NAAVVNIQK (9)	HLA-A*34:01, HLA-A*11:01	0.13299

Appendix 6. Delta Variant 9-mer epitopes details

Delta			
Epitope #	Epitope sequence	HLA Class I alleles	Immunogenicity
1	CONSERVED		
2	CONSERVED		
3	FQFCKDPFL (10)	HLA-A*02:01, HLA-B*38:02, HLA-A*02:01, HLA-A*02:03	-0.14633
4	NDPFLDVYY (1-9), KDPFLDVYY (10)	HLA-B*18:01	0.15696
5	DPFLDVYYH (1-10)	HLA-B*35:05	0.08202
6	NKSWMESVY (1-10)	HLA-B*15:21, HLA-B*18:01	-0.02306
7	SWMESVYSS (1-10)	N/A	-0.17827
8	WMESVYSSA (1-10)	N/A	0.33353
9	CONSERVED		
10	CONSERVED		
11	CONSERVED		
12	CONSERVED		
13	CONSERVED		
14	GEVFNATSF (10)	HLA-B*44:03, HLA-B*18:01	0.09783
15	NATSFASVY (10)	HLA-B*15:21, HLA-B*35:05, HLA-B*15:02, HLA-B*15:13	-0.11854
16	CONSERVED		
17	NYNYRFLR (1); NYNYRYRLF (2-10)	HLA-A*24:02, HLA-A*24:07	0.09834; 0.0783
18	CONSERVED		
19	CONSERVED		
20	CONSERVED		
21	CONSERVED		
22	YQGVNCTEV (1-10)	N/A	0.08675
23	CONSERVED		

24	GLNVLPELL (10)	HLA-A*02:01, HLA-A*02:03	0.00236
25	CONSERVED		
26	CONSERVED		
27	CONSERVED		
28	CONSERVED		

Appendix 7. Omicron Variant 9-mer epitopes details

Omicron			
Epitope #	Epitope sequence	HLA Class I alleles	Immunogenicity
1	CONSERVED		
2	GVYFASIEK (3)	HLA-A*34:01, HLA-A*11:01	0.16979
3	CONSERVED		
4	NDPFLDVYY (1-2; 4-10)	HLA-B*18:01	0.15696
5	DPFLDVYYH (1-2; 4-10)	HLA-B*35:05	0.08202
6	CONSERVED		
7	CONSERVED		
8	CONSERVED		
9	CONSERVED		
10	CONSERVED		
11	QPTESIRFP (6)	HLA-B*35:05, HLA-B*15:13, HLA-B*15:21, HLA-B*15:02, HLA-B*18:01, HLA-B*38:02	0.18961
12	NLCPFDEVF (1-10)	HLA-B*15:21, HLA-B*15:02, HLA-B*15:13	0.21484
13	FVIRGNEVS (1-10)	N/A	0.23081
14	DEVFNATRF (1-10)	HLA-B*18:01, HLA-B*44:03	0.22473
15	CONSERVED		
16	GQTGNIADY (1-10)	HLA-B*15:21	0.21166
17	CONSERVED		
18	NGVAGFNCY (1-10)	HLA-B*35:05, HLA-B*15:21, HLA-B*15:02	0.15901
19	FRPTYGVGH (1-10)	N/A	0.1184
20	GHQPVRVVV (1-10)	HLA-B*38:02	0.05532
21	HQPVRVVVL (1-10)	HLA-B*15:21, HLA-B*38:02	0.1409
22	YQGVNCTEV (1-10)	N/A	0.08675
23	CONSERVED		
24	CONSERVED		

25	SVLNDIFSR (3)	HLA-A*11:01, HLA-A*34:01, HLA-A*33:03	0.13891
26	VLNDIFSRL (3)	HLA-A*02:03, HLA-A*02:01, HLA-B*15:13, HLA-A*34:01	0.15064
27	CONSERVED		
28	CONSERVED		

Appendix 8. Wuhan-Hu-1 reference sequence 15-mer epitopes details

Wuhan-Hu-1				
Epitope #	Start residue	Epitope sequence	HLA Class II alleles	IFNY Score
1	24	LPPAYTNSFTRGVVYY	HLA-DRB1*07:01, HLA-DRB1*16:02	0.71760044
2	25	PPAYTNSFTRGVVYYP	HLA-DRB1*07:01, HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*11:01	0.38425103
3	56	LPFFSNVTWFHAIHV	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*07:01, HLA-DRB1*16:02	0.47808514
4	57	PFFSNVTWFHAIHVS	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*12:02	0.38458522
5	58	FFSNVTWFHAIHVSG	HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*12:02	0.17100646
6	59	FSNVTWFHAIHVSGT	HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*12:02, HLA-DRB1*11:01	0.094599621
7	85	PFNDGVYFASTEKSN	HLA-DRB1*07:01, HLA-DRB1*15:02, HLA-DRB1*16:02	0.16919446
8	86	FNDGVYFASTEKSNI	HLA-DRB1*07:01, HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*11:01	0.047728045
9	87	NDGVYFASTEKSNII	HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*11:01, HLA-DRB1*07:01	0.27621612
10	88	DGVYFASTEKSNIIR	HLA-DRB1*07:01, HLA-DRB1*16:02, HLA-DRB1*11:01	0.57963949
11	89	GVYFASTEKSNIIRG	HLA-DRB1*11:01, HLA-DRB1*07:01	0.72695783
12	90	VYFASTEKSNIIRGW	HLA-DRB1*11:01, HLA-DRB1*07:01	0.81094476
13	137	NDPFLGVVYHKNKNS	HLA-DRB1*11:01, HLA-DRB1*07:01, HLA-DRB1*15:01, HLA-DRB1*15:02	0.25498216
14	138	DPFLGVVYHKNKNSW	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02	0.68565336
15	139	PFLGVVYHKNKNSWM	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02	0.36453817

16	140	FLGVYYHKNNKSWME	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02 HLA-DRB1*11:01	0.53199532
17	141	LGVYYHKNNKSWMES	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*11:01	0.40530432
18	142	GVYYHKNNKSWMESE	HLA-DRB1*15:01, HLA-DRB1*11:01	0.36198865
19	235	ITRFQTLALHRSYL	HLA-DRB1*12:02, HLA-DRB1*16:02, HLA-DRB1*11:01	0.12898427
20	238	FQTLALHRSYLTPG	HLA-DRB1*12:02, HLA-DRB1*11:01, HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*07:01	0.26071055
21	313	YQTSNFRVQPTESIV	HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*15:02, HLA-DRB1*11:01, HLA-DRB1*12:02, HLA-DRB1*15:01	0.21778209
22	314	QTSNFRVQPTESIVR	HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*07:01, HLA-DRB1*11:01, HLA-DRB1*12:02, HLA-DRB1*15:01	0.2289089
23	336	CPFGEVFNATRFASV	HLA-DRB1*11:01, HLA-DRB1*07:01	0.17455681
24	337	PFGEVFNATRFASVY	HLA-DRB1*11:01, HLA-DRB1*07:01	0.34111808
25	338	FGEVFNATRFASVYA	HLA-DRB1*11:01, HLA-DRB1*07:01	0.053644143
26	339	GEVFNATRFASVYAW	HLA-DRB1*11:01, HLA-DRB1*07:01	0.058893989
27	340	EVFNATRFASVYAWN	HLA-DRB1*07:01, HLA-DRB1*15:01	0.1439997
28	341	VFNATRFASVYAWNR	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*07:01, HLA-DRB1*16:02	0.05905041
29	342	FNATRFASVYAWNRK	HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*12:02, HLA-DRB1*11:01	0.1396436
30	343	NATRFASVYAWNRKR	HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*15:02, HLA-DRB1*12:02, HLA-DRB1*15:01, HLA-DRB1*11:01	0.47646374
31	344	ATRFASVYAWNRKRI	HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*15:02, HLA-DRB1*12:02, HLA-DRB1*15:01, HLA-DRB1*11:01	0.5575169
32	345	TRFASVYAWNRKRIS	HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*12:02, HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*11:01	0.73155567
33	346	RFASVYAWNRKRISN	HLA-DRB1*15:01, HLA-DRB1*11:01	0.53166283
34	361	CVADYSVLYNSASF	HLA-DRB1*16:02, HLA-DRB1*11:01, HLA-DRB1*15:02	0.21216882
35	362	VADYSVLYNSASFST	HLA-DRB1*16:02, HLA-DRB1*11:01, HLA-DRB1*15:02, HLA-DRB1*15:01	0.12924694
36	369	YNSASFSTFKCYGVS	HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*15:01	0.10980941
37	392	FTNVYADSFVIRGDE	HLA-DRB1*07:01, HLA-DRB1*11:01	0.1914622

38	393	TNVYADSFVIRGDEV	HLA-DRB1*07:01, HLA-DRB1*11:01	0.35983107
39	406	EVRQIAPGQTGKIAD	HLA-DRB1*07:01, HLA-DRB1*15:01	0.18851244
40	407	VRQIAPGQTGKIADY	HLA-DRB1*07:01, HLA-DRB1*15:01, HLA-DRB1*15:02	0.4128031
41	431	GCVIAWNSNNLDSKV	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*07:01	0.022799683
42	445	VGGNYNYLYRFRKS	HLA-DRB1*11:01, HLA-DRB1*12:02	0.18580082
43	446	GGNYNYLYRFRKSN	HLA-DRB1*11:01, HLA-DRB1*12:02, HLA-DRB1*16:02	0.37362504
44	467	DISTEIYQAGSTPCN	HLA-DRB1*15:02, HLA-DRB1*07:01, HLA-DRB1*16:02, HLA-DRB1*15:01	0.58015565
45	468	ISTEIYQAGSTPCNG	HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*15:01, HLA-DRB1*07:01	0.27074522
46	469	STEIYQAGSTPCNGV	HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*15:01, HLA-DRB1*07:01	0.38347612
47	470	TEIYQAGSTPCNGVE	HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*15:01, HLA-DRB1*07:01	0.024497472
48	491	PLQSYGFQPTNGVGY	HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*07:01	0.1550583
49	493	QSYGFQPTNGVGYQP	HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*07:01, HLA-DRB1*12:02, HLA-DRB1*11:01	0.076122433
50	494	SYGFQPTNGVGYQPY	HLA-DRB1*07:01, HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*12:02	0.18189287
51	497	FQPTNGVGYQPYRVV	HLA-DRB1*15:01, HLA-DRB1*15:02	0.062471564
52	498	QPTNGVGYQPYRVVV	HLA-DRB1*15:01, HLA-DRB1*15:02	0.018948551
53	502	GVGYPYRVVLSFE	HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*15:01	0.28627417
54	503	VGYPYRVVLSFEL	HLA-DRB1*15:02, HLA-DRB1*07:01, HLA-DRB1*16:02, HLA-DRB1*15:01	0.39490052
55	556	NKKFLPFQQFGRDIA	HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*12:02, HLA-DRB1*15:01, HLA-DRB1*11:01	0.15230751
56	671	CASYQTQTNPRRAR	HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*11:01	0.40113939
57	672	ASYQTQTNPRRARS	HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*11:01	0.13971691
58	687	VASQSIIAYTMSLGA	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*07:01	0.44143805
59	688	ASQSIIAYTMSLGAE	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*07:01, HLA-DRB1*16:02	0.34138886

60	689	SQSIIAYTMSLGAEN	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*07:01, HLA-DRB1*16:02, HLA-DRB1*11:01, HLA-DRB1*12:02	0.015671901
61	690	QSIIAYTMSLGAENS	HLA-DRB1*07:01, HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*11:01, HLA-DRB1*12:02	0.01474098
62	715	PTNFTISVTTEILPV	HLA-DRB1*07:01, HLA-DRB1*16:02, HLA-DRB1*15:02	0.0062863218
63	750	SNLLQYGSFCTQLN	HLA-DRB1*15:01, HLA-DRB1*15:02	0.27039446
64	751	NLLQYGSFCTQLNR	HLA-DRB1*15:01, HLA-DRB1*15:02	0.00035762101
65	918	ENQKLIANQFNSAIG	HLA-DRB1*15:02, HLA-DRB1*15:01	0.18783239
66	919	NQKLIANQFNSAIGK	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*12:02	0.19241501
67	920	QKLIANQFNSAIGKI	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02	0.066297285
68	922	LIANQFNSAIGKIQD	HLA-DRB1*07:01, HLA-DRB1*11:01, HLA-DRB1*16:02	0.19568708
69	936	DSLSTASALGKLQD	HLA-DRB1*07:01	0.07365154
70	944	ALGKLQDVVNQNAQA	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02	0.34140543
71	945	LGKLQDVVNQNAQAL	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02	0.20884651
72	946	GKLQDVVNQNAQALN	HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*16:02, HLA-DRB1*12:02	0.23876955
73	947	KLQDVVNQNAQALNT	HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*16:02, HLA-DRB1*12:02, HLA-DRB1*07:01	0.0169139
74	948	LQDVVNQNAQALNTL	HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*16:02, HLA-DRB1*12:02	0.046026994
75	949	QDVVNQNAQALNTLV	HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*16:02, HLA-DRB1*12:02	0.10585795
76	967	SSNFGAISSVLNDIL	HLA-DRB1*07:01, HLA-DRB1*16:02	0.026841048

Appendix 9. Alpha reference sequence 15-mer epitopes details

Alpha			
Epitope #	Epitope	HLA Class II alleles	IFN γ Score
1	CONSERVED	CONSERVED	CONSERVED
2	CONSERVED	CONSERVED	CONSERVED
3	LPFFSNVTWFHASGT (1-10)	N/A	0.15049572
4	PFFSNVTWFHASGTN (1-10)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02	0.25947104

5	FFSNVTWFHASGTNG (1-10)	HLA-DRB1*07:01, HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02	-0.25517265
6	FSNVTWFHASGTNGT (1-10)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*07:01	-0.37728334
7	CONSERVED	CONSERVED	CONSERVED
8	CONSERVED	CONSERVED	CONSERVED
9	CONSERVED	CONSERVED	CONSERVED
10	CONSERVED	CONSERVED	CONSERVED
11	CONSERVED	CONSERVED	CONSERVED
12	CONSERVED	CONSERVED	CONSERVED
13	FCNDPFLGYHKNNKS (1-5), FCNHPFLGYHKNNKS (6-8)	HLA-DRB1*15:01, HLA-DRB1*11:01	0.031239667; 0.36128506
14	CNDPFLGYHKNNKSW (1-5; 9-10), CNHPFLGYHKNNKSW (6-8)	HLA-DRB1*16:02, HLA-DRB1*15:01, HLA-DRB1*11:01, HLA-DRB1*15:02	-0.056001657; -0.25963052
15	NDPFLGYHKNNKSWM (1-5; 9-10), NHPFLGYHKNNKSWM (6-8)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*11:01, HLA-DRB1*16:02	-0.21047696; -0.10578721
16	DPFLGYHKNNKSWME (1-5; 9-10), HPFLGYHKNNKSWME (6-8)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*11:01, HLA-DRB1*16:02	0.28442871; 0.45110667
17	PFLGYHKNNKSWMES (1-10)	HLA-DRB1*15:01, HLA-DRB1*11:01, HLA-DRB1*15:02	0.095142921
18	FLGYHKNNKSWMESE (1-10)	HLA-DRB1*11:01	-0.10812526
19	ITRFQILLALHRSYL (10)	HLA-DRB1*11:01	0.079790035
20	FQILLALHRSYLTPG (10)	HLA-DRB1*12:02, HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*11:01, HLA-DRB1*16:02, HLA-DRB1*07:01	0.16729173
21	CONSERVED	CONSERVED	CONSERVED
22	CONSERVED	CONSERVED	CONSERVED
23	CONSERVED	CONSERVED	CONSERVED
24	CONSERVED	CONSERVED	CONSERVED
25	CONSERVED	CONSERVED	CONSERVED
26	CONSERVED	CONSERVED	CONSERVED
27	CONSERVED	CONSERVED	CONSERVED
28	CONSERVED	CONSERVED	CONSERVED

29	CONSERVED	CONSERVED	CONSERVED
30	CONSERVED	CONSERVED	CONSERVED
31	CONSERVED	CONSERVED	CONSERVED
32	CONSERVED	CONSERVED	CONSERVED
33	CONSERVED	CONSERVED	CONSERVED
34	CONSERVED	CONSERVED	CONSERVED
35	CONSERVED	CONSERVED	CONSERVED
36	CONSERVED	CONSERVED	CONSERVED
37	CONSERVED	CONSERVED	CONSERVED
38	CONSERVED	CONSERVED	CONSERVED
39	CONSERVED	CONSERVED	CONSERVED
40	CONSERVED	CONSERVED	CONSERVED
41	CONSERVED	CONSERVED	CONSERVED
42	CONSERVED	CONSERVED	CONSERVED
43	CONSERVED	CONSERVED	CONSERVED
44	CONSERVED	CONSERVED	CONSERVED
45	CONSERVED	CONSERVED	CONSERVED
46	CONSERVED	CONSERVED	CONSERVED
47	CONSERVED	CONSERVED	CONSERVED
48	PLQSYGFQPTYGVGY (1-10)	HLA-DRB1*15:01, HLA-DRB1*07:01, HLA-DRB1*16:02, HLA-DRB1*15:02	0.52522885
49	QSYGFQPTYGVGYQP (1-10)	HLA-DRB1*07:01, HLA-DRB1*12:02, HLA-DRB1*15:02, HLA-DRB1*16:02	0.3315254
50	SYGFQPTYGVGYQPY (1-10)	HLA-DRB1*07:01, HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*12:02	0.50060734
51	FQPTYGVGYQPYRVV (1-10)	HLA-DRB1*15:01	0.34220975
52	QPTYGVGYQPYRVVV (1-10)	HLA-DRB1*15:02, HLA-DRB1*15:01	0.073894327
53	CONSERVED	CONSERVED	CONSERVED
54	CONSERVED	CONSERVED	CONSERVED
55	NKKFLPFQQFGRDID (1-10)	HLA-DRB1*11:01, HLA-DRB1*16:02, HLA-DRB1*12:02, HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*07:01	0.074778449
56	CASYQTQTNSHRRAR (1-10)	HLA-DRB1*16:02, HLA-DRB1*11:01, HLA-DRB1*15:02	0.47210175
57	ASYQTQTNSHRRARS (1-10)	HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*11:01	0.48532178
58	CONSERVED	CONSERVED	CONSERVED

59	CONSERVED	CONSERVED	CONSERVED
60	CONSERVED	CONSERVED	CONSERVED
61	CONSERVED	CONSERVED	CONSERVED
62	PINFTISVTTEILPV (1-10)	HLA-DRB1*07:01, HLA-DRB1*16:02, HLA-DRB1*15:02	-0.27788575
63	CONSERVED	CONSERVED	CONSERVED
64	CONSERVED	CONSERVED	CONSERVED
65	CONSERVED	CONSERVED	CONSERVED
66	CONSERVED	CONSERVED	CONSERVED
67	CONSERVED	CONSERVED	CONSERVED
68	CONSERVED	CONSERVED	CONSERVED
69	CONSERVED	CONSERVED	CONSERVED
70	CONSERVED	CONSERVED	CONSERVED
71	CONSERVED	CONSERVED	CONSERVED
72	CONSERVED	CONSERVED	CONSERVED
73	CONSERVED	CONSERVED	CONSERVED
74	CONSERVED	CONSERVED	CONSERVED
75	CONSERVED	CONSERVED	CONSERVED
76	CONSERVED	CONSERVED	CONSERVED

Appendix 10. Beta reference sequence 15-mer epitopes details

Beta			
Epitope #	Epitope sequence	HLA Class II alleles	IFN γ Score
1	LPPSYTNSFTRGVYY (9)	HLA-DRB1*07:01, HLA-DRB1*16:02	0.84700247
2	PPSYTNSFTRGVYYP (9)	HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*11:01	0.35714773
3	CONSERVED	CONSERVED	CONSERVED
4	CONSERVED	CONSERVED	CONSERVED
5	CONSERVED	CONSERVED	CONSERVED
6	CONSERVED	CONSERVED	CONSERVED
7	CONSERVED	CONSERVED	CONSERVED
8	CONSERVED	CONSERVED	CONSERVED
9	CONSERVED	CONSERVED	CONSERVED
10	CONSERVED	CONSERVED	CONSERVED
11	CONSERVED	CONSERVED	CONSERVED
12	CONSERVED	CONSERVED	CONSERVED
13	CONSERVED	CONSERVED	CONSERVED
14	CONSERVED	CONSERVED	CONSERVED

15	CONSERVED	CONSERVED	CONSERVED
16	CONSERVED	CONSERVED	CONSERVED
17	CONSERVED	CONSERVED	CONSERVED
18	CONSERVED	CONSERVED	CONSERVED
19	IGINITRFQLHRSYL (1; 5-9), ITRFQTLHRSYLTP (2-4)	HLA-DRB1*15:01, HLA-DRB1*12:02	-0.21976797; -0.19878122
20	NITRFQLHRSYLTPG (1; 5-9), TRFQTLHRSYLTPG (2-4)	HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*07:01,HLA-DRB1*15:01	-0.1784664; -0.02010695
21	CONSERVED	CONSERVED	CONSERVED
22	CONSERVED	CONSERVED	CONSERVED
23	CONSERVED	CONSERVED	CONSERVED
24	CONSERVED	CONSERVED	CONSERVED
25	CONSERVED	CONSERVED	CONSERVED
26	CONSERVED	CONSERVED	CONSERVED
27	CONSERVED	CONSERVED	CONSERVED
28	CONSERVED	CONSERVED	CONSERVED
29	CONSERVED	CONSERVED	CONSERVED
30	CONSERVED	CONSERVED	CONSERVED
31	CONSERVED	CONSERVED	CONSERVED
32	CONSERVED	CONSERVED	CONSERVED
33	CONSERVED	CONSERVED	CONSERVED
34	CONSERVED	CONSERVED	CONSERVED
35	CONSERVED	CONSERVED	CONSERVED
36	CONSERVED	CONSERVED	CONSERVED
37	CONSERVED	CONSERVED	CONSERVED
38	CONSERVED	CONSERVED	CONSERVED
39	EVRQIAPGQTGNIAD (1-9)	HLA-DRB1*07:01	0.02159065
40	VRQIAPGQTGNIADY (1-9)	HLA-DRB1*07:01	0.2916958
41	CONSERVED	CONSERVED	CONSERVED
42	CONSERVED	CONSERVED	CONSERVED
43	CONSERVED	CONSERVED	CONSERVED
44	CONSERVED	CONSERVED	CONSERVED
45	CONSERVED	CONSERVED	CONSERVED
46	CONSERVED	CONSERVED	CONSERVED
47	TEIQAGSTPCNGVK (1-9),	HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*15:01, HLA-DRB1*07:01	0.33653611
48	PLQSYGFQPTYGVGY (1-9),	HLA-DRB1*07:01, HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*15:01	0.52522885

49	QSYGFQPTYGVGYQP (1-9)	HLA-DRB1*07:01, HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*12:02	0.3315254
50	SYGFQPTYGVGYQPY (1-9)	HLA-DRB1*07:01, HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*12:02	0.50060734
51	FQPTYGVGYQPYRVV (1-9),	HLA-DRB1*15:01	0.34220975
52	QPTYGVGYQPYRVVV (1-9),	HLA-DRB1*15:01, HLA-DRB1*15:02	0.073894327
53	CONSERVED	CONSERVED	CONSERVED
54	CONSERVED	CONSERVED	CONSERVED
55	CONSERVED	CONSERVED	CONSERVED
56	CONSERVED	CONSERVED	CONSERVED
57	CONSERVED	CONSERVED	CONSERVED
58	VASQSIIAYTMSLGV (1-9)	HLA-DRB1*07:01, HLA-DRB1*15:01, HLA-DRB1*15:02	0.34258071
59	ASQSIIAYTMSLGVE (1-9)	HLA-DRB1*07:01, HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02	0.32782195
60	SQSIIAYTMSLGVEN (1-9)	HLA-DRB1*12:02HLA-DRB1*07:01, HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02	0.19626167
61	QSIIAYTMSLGVENS (1-9)	HLA-DRB1*07:01, HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*16:02, HLA-DRB1*12:02	-0.17157923
62	CONSERVED	CONSERVED	CONSERVED
63	CONSERVED	CONSERVED	CONSERVED
64	CONSERVED	CONSERVED	CONSERVED
65	ENQKLIANQFNSVIG (5)	HLA-DRB1*15:02, HLA-DRB1*15:01	0.045185863
66	NQKLIANQFNSVIGK (5)	HLA-DRB1*12:02, HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02	0.031120248
67	QKLIANQFNSVIGKI (5)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02	-0.15350076
68	LIANQFNSVIGKIQD (5)	HLA-DRB1*11:01	0.03764326
69	DSLSSTASALGKLQY (4)	HLA-DRB1*07:01, HLA-DRB1*15:02, HLA-DRB1*16:02	0.16899035
70	ALGKLQYVVNQNAQA (4)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02	0.2274231
71	LGKLQYVVNQNAQAL (4)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02	0.24067777
72	GKLQYVVNQNAQALN (4)	HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*16:02, HLA-DRB1*12:02	0.20661442
73	KLQYVVNQNAQALNT (4)	HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*16:02, HLA-DRB1*12:02, HLA-DRB1*07:01	-0.0449118

74	LQYVVNQNAQALNTL (4)	HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*16:02, HLA-DRB1*12:02	-0.057888104
75	QYVVNQNAQALNTLV (4)	HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*16:02, HLA-DRB1*12:02	-0.068881898
76	CONSERVED	CONSERVED	CONSERVED

Appendix 11. Delta reference sequence 15-mer epitopes details

Delta			
Epitope #	Epitope sequence	HLA Class II alleles	IFN γ Score
1	CONSERVED	CONSERVED	CONSERVED
2	CONSERVED	CONSERVED	CONSERVED
3	CONSERVED	CONSERVED	CONSERVED
4	CONSERVED	CONSERVED	CONSERVED
5	CONSERVED	CONSERVED	CONSERVED
6	CONSERVED	CONSERVED	CONSERVED
7	CONSERVED	CONSERVED	CONSERVED
8	CONSERVED	CONSERVED	CONSERVED
9	CONSERVED	CONSERVED	CONSERVED
10	CONSERVED	CONSERVED	CONSERVED
11	CONSERVED	CONSERVED	CONSERVED
12	CONSERVED	CONSERVED	CONSERVED
13	NDPFLDVYYHKNNKS (1-9), KDPFLDVYYHKNNKS (10)	HLA-DRB1*15:01, HLA-DRB1*15:02	-0.060315599; -0.10624319
14	DPFLDVYYHKNNKSW (1-10)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02	0.30048143
15	PFLDVYYHKNNKSWM (1-10)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02	-0.018138428
16	FLDVYYHKNNKSWME (1-10)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*11:01, HLA-DRB1*07:01	0.12301597
17	LDVYYHKNNKSWMES (1-10)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*11:01, HLA-DRB1*16:02	-0.032558297
18	DVYYHKNNKSWMESV (1-10)	HLA-DRB1*11:01, HLA-DRB1*15:01	-0.080447919
19	CONSERVED	CONSERVED	CONSERVED
20	CONSERVED	CONSERVED	CONSERVED
21	CONSERVED	CONSERVED	CONSERVED
22	CONSERVED	CONSERVED	CONSERVED
23	CPFGEVFNATSFASV (10)	HLA-DRB1*11:01, HLA-DRB1*07:01	0.12464266
24	PFGEVFNATSFASVY (10)	HLA-DRB1*11:01, HLA-DRB1*07:01	0.30365363

25	FGEVFNATSFASVYA (10)	HLA-DRB1*11:01, HLA-DRB1*07:01	0.06805839
26	GEVFNATSFASVYAW (10)	HLA-DRB1*11:01, HLA-DRB1*07:01	0.18173478
27	EVFNATSFASVYAWN (10)	HLA-DRB1*07:01, HLA-DRB1*15:01	0.096631108
28	VFNATSFASVYAWNR (10)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*07:01, HLA-DRB1*16:02	0.34061671
29	FNATSFASVYAWNRK (10)	HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*12:02, HLA-DRB1*11:01	0.057222907
30	NATSFASVYAWNRKR (10)	HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*15:02, HLA-DRB1*12:02, HLA-DRB1*15:01, HLA-DRB1*11:01	0.39502752
31	ATSFASVYAWNRKRI (10)	HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*15:02, HLA-DRB1*12:02, HLA-DRB1*15:01, HLA-DRB1*11:01	0.46335771
32	TSFASVYAWNRKRIS (10)	HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*12:02, HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*11:01	0.67492206
33	SFASVYAWNRKRISN (10)	HLA-DRB1*15:01, HLA-DRB1*11:01	0.69288227
34	CONSERVED	CONSERVED	CONSERVED
35	CONSERVED	CONSERVED	CONSERVED
36	CONSERVED	CONSERVED	CONSERVED
37	CONSERVED	CONSERVED	CONSERVED
38	CONSERVED	CONSERVED	CONSERVED
39	CONSERVED	CONSERVED	CONSERVED
40	CONSERVED	CONSERVED	CONSERVED
41	CONSERVED	CONSERVED	CONSERVED
42	KVGGNYNYRFLFRKS (1), VGGNYNYRFLFRKS (2; 4-10), VVGNYNYRFLFRKS (3)	HLA-DRB1*11:01	0.30899225; 0.52425972; 0.59719789
43	VGGNYNYRFLFRKSN (1), GGNYNYRFLFRKSN (2; 4-10), VGNLYNYRFLFRKSN (3)	HLA-DRB1*11:01	0.61377583; 0.77009684; 0.49487378
44	DISTEIQAGSKPCN (1-10)	HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*07:01, HLA-DRB1*16:02	0.15976054
45	ISTEIQAGSKPCNG (1-10)	HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*07:01, HLA-DRB1*16:02, HLA-DRB1*11:01	-0.044311711
46	STEIQAGSKPCNGV (1-10)	HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*11:01	0.13292218
47	TEIQAGSKPCNGVE (1-10)	HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*16:02, HLA-DRB1*07:01,	-0.015907734

		HLA-DRB1*11:01	
48	CONSERVED	CONSERVED	CONSERVED
49	CONSERVED	CONSERVED	CONSERVED
50	CONSERVED	CONSERVED	CONSERVED
51	CONSERVED	CONSERVED	CONSERVED
52	CONSERVED	CONSERVED	CONSERVED
53	CONSERVED	CONSERVED	CONSERVED
54	CONSERVED	CONSERVED	CONSERVED
55	CONSERVED	CONSERVED	CONSERVED
56	CASYQTQNSRRRAR (1-10)	HLA-DRB1*15:02, HLA-DRB1*11:01, HLA-DRB1*16:02	0.449646
57	ASYQTQNSRRRARS (1-10)	HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*11:01	0.25119197
58	CONSERVED	CONSERVED	CONSERVED
59	CONSERVED	CONSERVED	CONSERVED
60	CONSERVED	CONSERVED	CONSERVED
61	CONSERVED	CONSERVED	CONSERVED
62	CONSERVED	CONSERVED	CONSERVED
63	CONSERVED	CONSERVED	CONSERVED
64	CONSERVED	CONSERVED	CONSERVED
65	CONSERVED	CONSERVED	CONSERVED
66	CONSERVED	CONSERVED	CONSERVED
67	CONSERVED	CONSERVED	CONSERVED
68	CONSERVED	CONSERVED	CONSERVED
69	CONSERVED	CONSERVED	CONSERVED
70	ALGKLQNVVNQNAQA (1-10)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*12:02, HLA-DRB1*11:01	0.46388318
71	LGKLQNVVNQNAQAL (1-10)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*12:02	0.42311065
72	GKLQNVVNQNAQALN (1-10)	HLA-DRB1*07:01, HLA-DRB1*12:02, HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*15:01	0.4191144
73	KLQNVVNQNAQALNT (1-10)	HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*16:02, HLA-DRB1*12:02, HLA-DRB1*07:01	0.17932682
74	LQNVVNQNAQALNTL (1-10)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*12:02	0.14889464
75	QNVVNQNAQALNTLV (1-10)	HLA-DRB1*15:01, HLA-DRB1*15:02,	0.23630428

		HLA-DRB1*16:02, HLA-DRB1*12:02	
76	CONSERVED	CONSERVED	CONSERVED

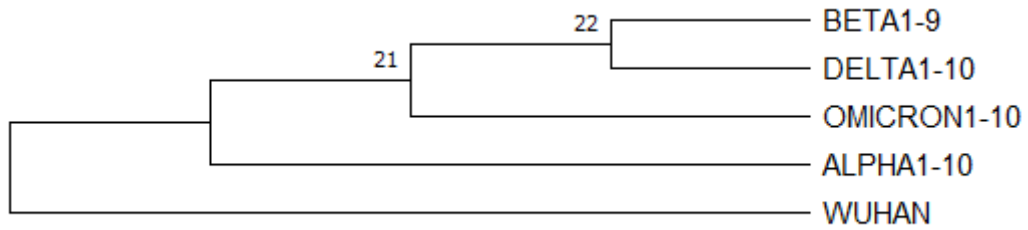
Appendix 12. Omicron reference sequence 15-mer epitopes details

Omicron			
Epitope #	Epitope sequence	HLA Class II alleles	IFNγ Score
1	TRTQYTNSFTRGVYY (1-2; 4-10)	HLA-DRB1*07:01, HLA-DRB1*16:02	0.94180916
2	RTQYTNSFTRGVYYP (1-2; 4-10)	HLA-DRB1*07:01, HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*11:01	0.20278886
3	CONSERVED	CONSERVED	CONSERVED
4	CONSERVED	CONSERVED	CONSERVED
5	CONSERVED	CONSERVED	CONSERVED
6	CONSERVED	CONSERVED	CONSERVED
7	PFNDGVYFASIEKSN (3)	HLA-DRB1*07:01, HLA-DRB1*15:02, HLA-DRB1*16:02	0.17843793
8	FNDGVYFASIEKSNI (3)	HLA-DRB1*07:01, HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*11:01	-0.050910083
9	NDGVYFASIEKSNII (3)	HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*11:01, HLA-DRB1*07:01	0.17066249
10	DGVYFASIEKSNIIR (3)	HLA-DRB1*07:01, HLA-DRB1*16:02, HLA-DRB1*11:01	0.47672937
11	GVYFASIEKSNIIRG (3)	HLA-DRB1*11:01, HLA-DRB1*07:01	0.69313744
12	VYFASIEKSNIIRGW (3)	HLA-DRB1*11:01, HLA-DRB1*07:01	0.78586464
13	NDPFLDVYYHKNNKS (1-2; 4-10)	HLA-DRB1*15:01, HLA-DRB1*15:02	-0.060315599
14	DPFLDVYYHKNNKSW (1-2; 4-10)	HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*15:01	0.30048143
15	PFLDVYYHKNNKSWM (1-2; 4-10)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02	-0.018138428
16	FLDVYYHKNNKSWME (1-2; 4-10)	HLA-DRB1*07:01, HLA-DRB1*11:01, HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*15:01	0.12301597
17	LDVYYHKNNKSWMES (1-2; 4-10)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*11:01, HLA-DRB1*16:02	-0.032558297
18	DVYYHKNNKSWMESE (1-2; 4-10)	HLA-DRB1*11:01, HLA-DRB1*15:01	-0.081555654
19	CONSERVED	CONSERVED	CONSERVED
20	CONSERVED	CONSERVED	CONSERVED

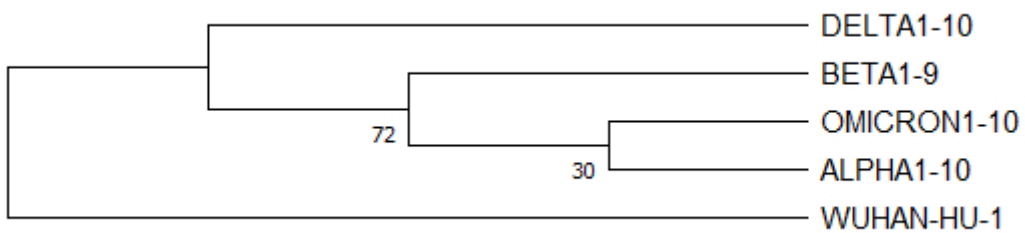
21	YQTSNFRVQPTESIR (6)	HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*15:02, HLA-DRB1*11:01, HLA-DRB1*12:02, HLA-DRB1*15:01	0.42836476
22	QTSNFRVQPTESIRF (6)	HLA-DRB1*16:02, HLA-DRB1*15:02, HLA-DRB1*07:01, HLA-DRB1*11:01, HLA-DRB1*12:02, HLA-DRB1*15:01	-8.7429571
23	CPFDEVFNATRFASV (1-10)	HLA-DRB1*11:01, HLA-DRB1*07:01	-0.007076754
24	PFEVFNATRDFASVY (1-10)	N/A	0.31818919
25	FDEVFNATRFASVYA (1-10)	HLA-DRB1*15:02, HLA-DRB1*11:01 HLA-DRB1*07:01	-0.13223121
26	DEVFNATRFASVYAW (1-10)	HLA-DRB1*07:01, HLA-DRB1*11:01	-0.11137248
27	CONSERVED	CONSERVED	CONSERVED
28	CONSERVED	CONSERVED	CONSERVED
29	CONSERVED	CONSERVED	CONSERVED
30	CONSERVED	CONSERVED	CONSERVED
31	CONSERVED	CONSERVED	CONSERVED
32	CONSERVED	CONSERVED	CONSERVED
33	CONSERVED	CONSERVED	CONSERVED
34	CVADYSVLYNFAPFF (1-10)	HLA-DRB1*16:02	-0.090584713
35	VADYSVLYNFAPFFA (1-10)	HLA-DRB1*16:02, HLA-DRB1*15:02	0.34968669
36	YNFAPFFAFKCYGVS (1-10)	HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*15:01, HLA-DRB1*07:01	0.5740766
37	FTNVYADSFVIRGNE (1-10)	HLA-DRB1*11:01, HLA-DRB1*07:01	0.50872494
38	TNVYADSFVIRGNEV (1-10)	HLA-DRB1*07:01, HLA-DRB1*11:01	0.73774177
39	EVSQIAPGQTGNIAD (1-10)	N/A	0.043779657
40	VSQIAPGQTGNIADY (1-10)	HLA-DRB1*07:01	0.25264764
41	GCVIAWNSNKLDSKV (1-3; 6-10)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*12:02	-0.39684265
42	CONSERVED	CONSERVED	CONSERVED
43	CONSERVED	CONSERVED	CONSERVED
44	DISTEIQAGNKPCN (1-10)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02	0.42711561
45	ISTEIQAGNKPCNG (1-10)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*07:01, HLA-DRB1*11:01	0.32494646
46	STEIQAGNKPCNGV (1-10)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*11:01, HLA-DRB1*07:01	0.45932889
47	TEIQAGNKPCNGVA (1-10)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*11:01, HLA-DRB1*16:02	0.071840834

48	PLRSYGFRPTYGVGH (1-10)	HLA-DRB1*07:01, HLA-DRB1*15:02, HLA-DRB1*16:02	0.40870266
49	RSYGFRPTYGVGHQP (1-10)	HLA-DRB1*07:01, HLA-DRB1*16:02, HLA-DRB1*11:01, HLA-DRB1*15:02	0.13313623
50	SYGFRPTYGVGHQPY (1-10)	HLA-DRB1*07:01, HLA-DRB1*16:02 HLA-DRB1*11:01	0.29409308
51	FRPTYGVGHQPYRVV (1-10)	N/A	0.16987488
52	RPTYGVGHQPYRVVV (1-10)	N/A	0.14307667
53	GVGHQPYRVVLSFE (1-10)	HLA-DRB1*15:01	-0.10159243
54	VGHQPYRVVLSFEL (1-10)	N/A	0.031717836
55	CONSERVED	CONSERVED	CONSERVED
56	CASYQTQTKSHRRAR (1-10)	HLA-DRB1*11:01	0.31454383
57	ASYQTQTKSHRRARS (1-10)	HLA-DRB1*11:01	0.28681444
58	CONSERVED	CONSERVED	CONSERVED
59	CONSERVED	CONSERVED	CONSERVED
60	CONSERVED	CONSERVED	CONSERVED
61	CONSERVED	CONSERVED	CONSERVED
62	CONSERVED	CONSERVED	CONSERVED
63	SNLLLQYGSFCTQLK (1-10)	HLA-DRB1*15:01, HLA-DRB1*15:02	0.27120816
64	NLLLQYGSFCTQLKR (1-10)	HLA-DRB1*15:01, HLA-DRB1*15:02	0.48653465
65	CONSERVED	CONSERVED	CONSERVED
66	CONSERVED	CONSERVED	CONSERVED
67	CONSERVED	CONSERVED	CONSERVED
68	CONSERVED	CONSERVED	CONSERVED
69	DSLSTASALGKLQN (1-10)	N/A	0.18446087
70	ALGKLQDVVNHNAQA (1-10)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*07:01	0.19784238
71	LGKLQDVVNHNAQAL (1-10)	HLA-DRB1*15:01, HLA-DRB1*15:02, HLA-DRB1*16:02, HLA-DRB1*07:01	0.2496127
72	GKLQDVVNHNAQALN (1-10)	HLA-DRB1*12:02, HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*07:01, HLA-DRB1*16:02	0.093327736
73	KLQDVVNHNAQALNT (1-10)	HLA-DRB1*12:02, HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*07:01, HLA-DRB1*16:02	-0.16502005
74	LQDVVNHNAQALNTL (1-10)	HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*07:01, HLA-DRB1*16:02	-0.065643886
75	QDVVNHNAQALNTLV (1-10)	HLA-DRB1*15:02, HLA-DRB1*15:01, HLA-DRB1*07:01, HLA-DRB1*16:02	0.25226995

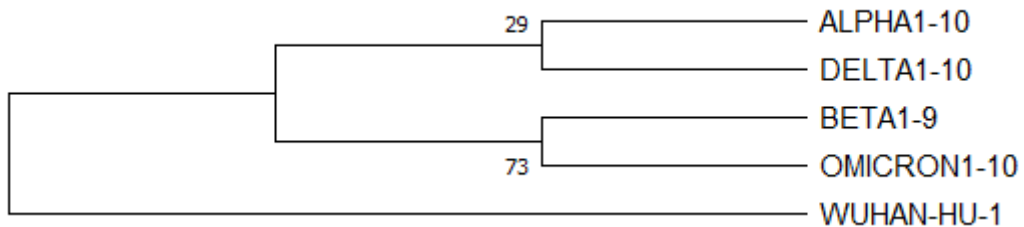
76	SSKFGAISSVLNDIL (1-2; 4-10), SSKFGAISSVLNDIF (3)	HLA-DRB1*07:01, HLA-DRB1*16:02, HLA-DRB1*11:01, HLA-DRB1*15:02	-0.31673522; -0.45216105
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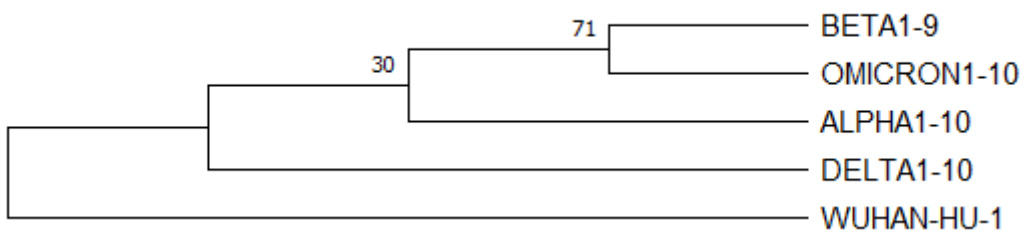
Appendix 13. MHC Class I phylogenetic tree of epitope YQDVNCTEV from Wuhan-Hu-1



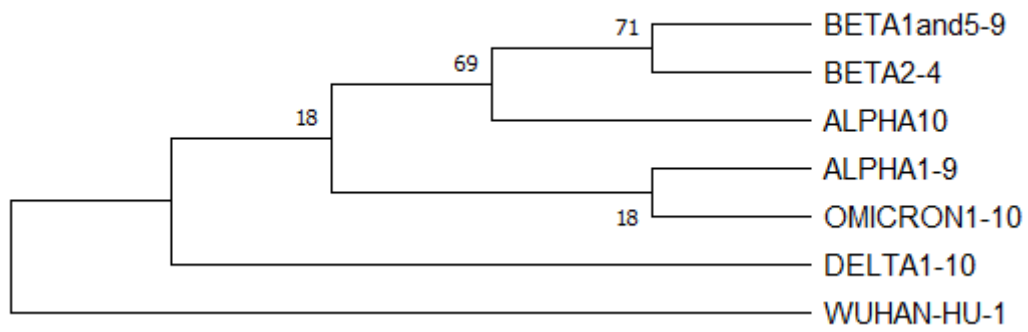
Appendix 14. MHC Class I phylogenetic tree of epitope FQPTNGVGY from Wuhan-Hu-1



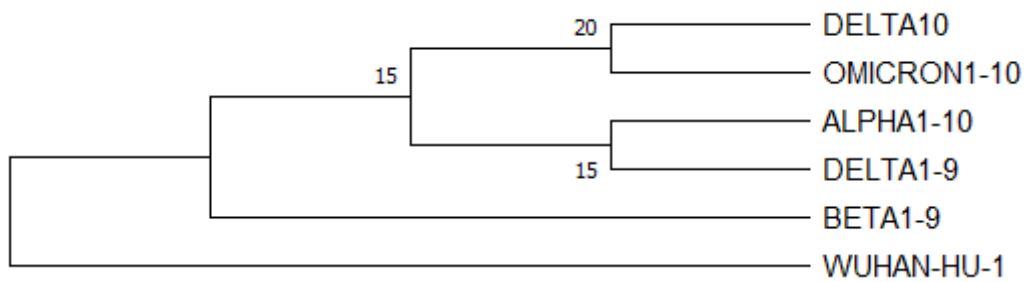
Appendix 15. MHC Class I phylogenetic tree of epitope GQTGKIADY from Wuhan-Hu-1



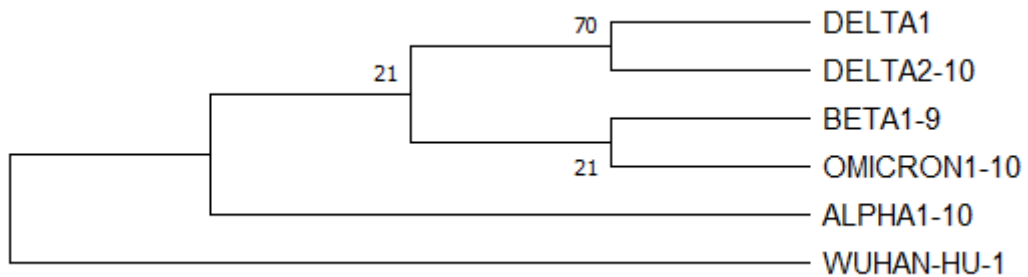
Appendix 16. MHC Class I phylogenetic tree of epitope NGVEGFNCY from Wuhan-Hu-1



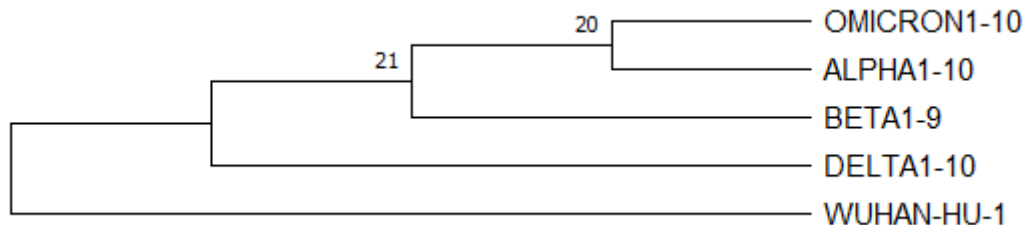
Appendix 17. MHC Class I phylogenetic tree of epitope TLLALHRSY from Wuhan-Hu-1



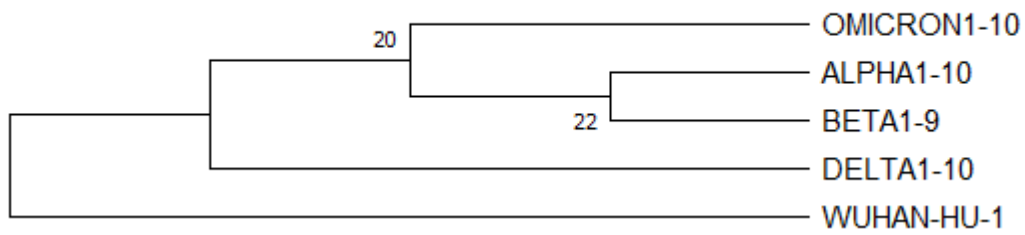
Appendix 18. MHC Class I phylogenetic tree of epitope GEVFNATRF from Wuhan-Hu-1



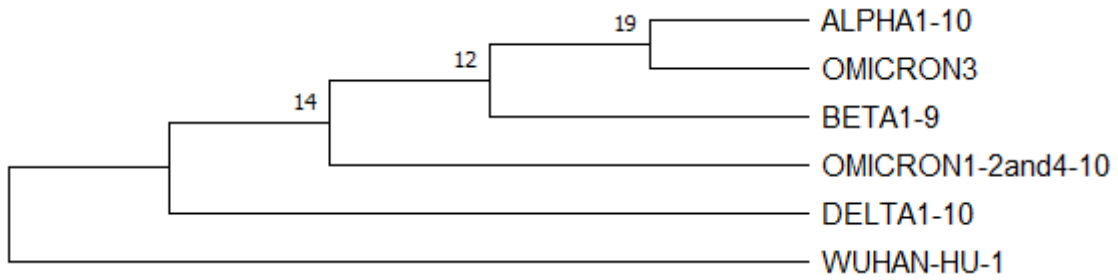
Appendix 19. MHC Class I phylogenetic tree of epitope NYNYLYRLF from Wuhan-Hu-1



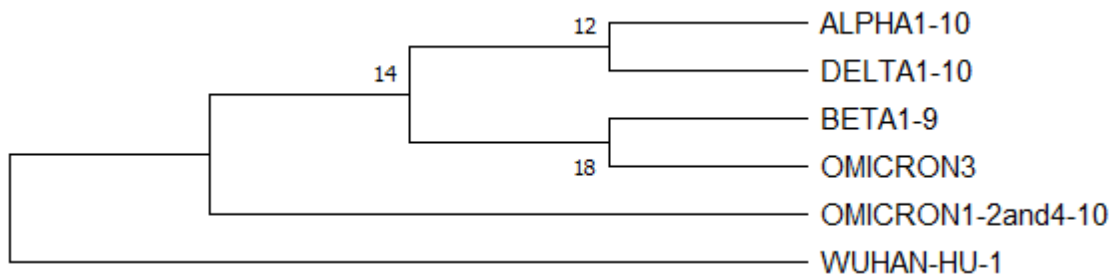
Appendix 20. MHC Class I phylogenetic tree of epitope GYQPYRVVV from Wuhan-Hu-1



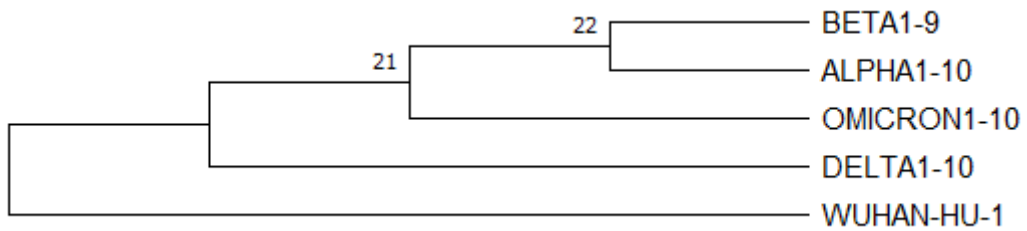
Appendix 21. MHC Class I phylogenetic tree of epitope YQPYRVVVL from Wuhan-Hu-1



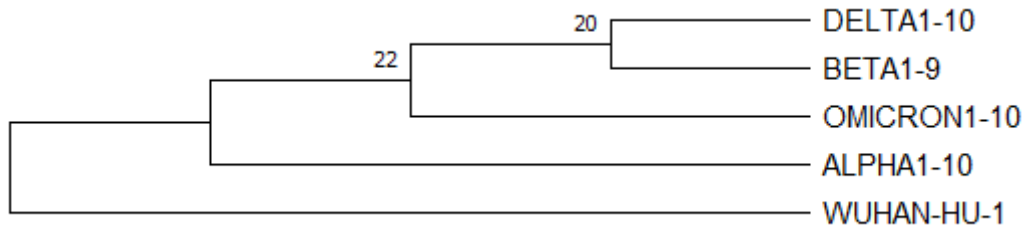
Appendix 22. MHC Class I phylogenetic tree of epitope SVLNDILSR from Wuhan-Hu-1



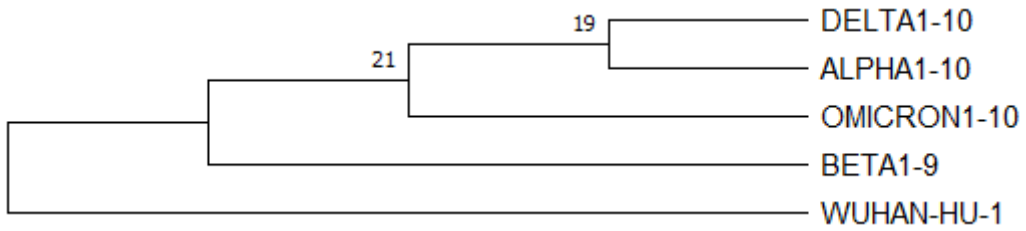
Appendix 23. MHC Class I phylogenetic tree of epitope VLNDILSRL from Wuhan-Hu-1



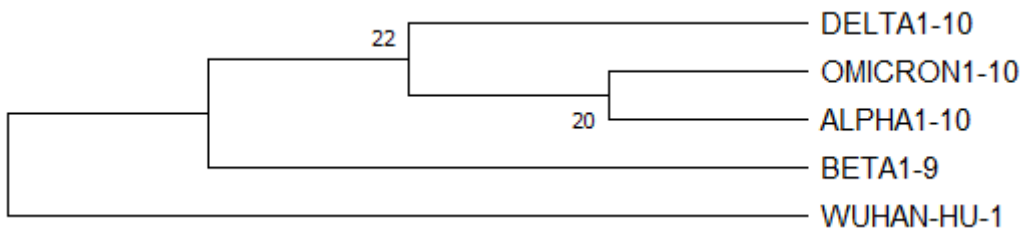
Appendix 24. MHC Class I phylogenetic tree of epitope RFDNPVLPF from Wuhan-Hu-1



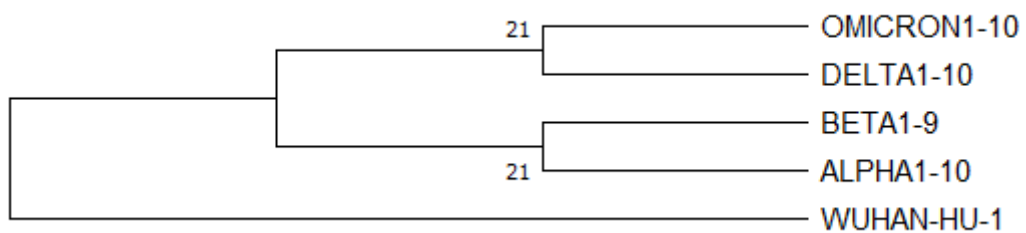
Appendix 25. MHC Class I phylogenetic tree of epitope NKSWMESEF from Wuhan-Hu-1



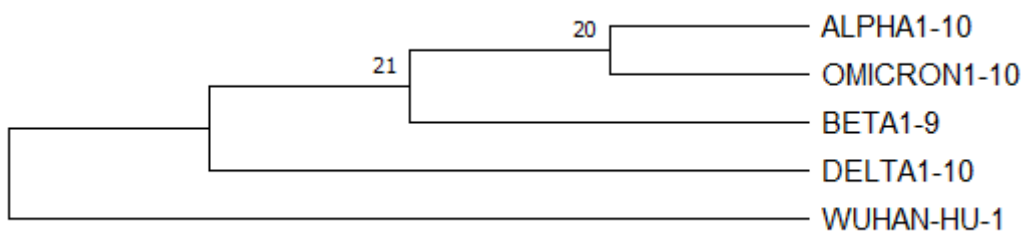
Appendix 26. MHC Class I phylogenetic tree of epitope SWMESEFRV from Wuhan-Hu-1



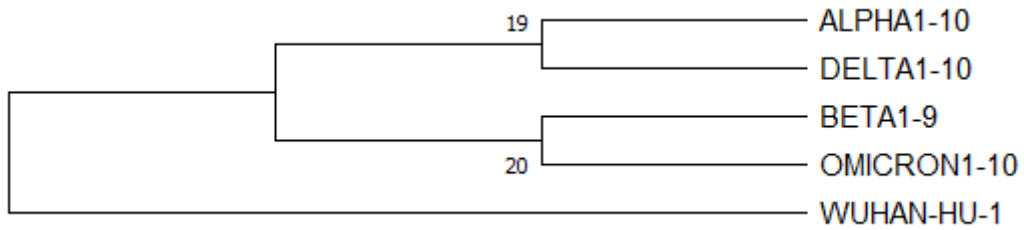
Appendix 27. MHC Class I phylogenetic tree of epitope WMESEFRVY from Wuhan-Hu-1



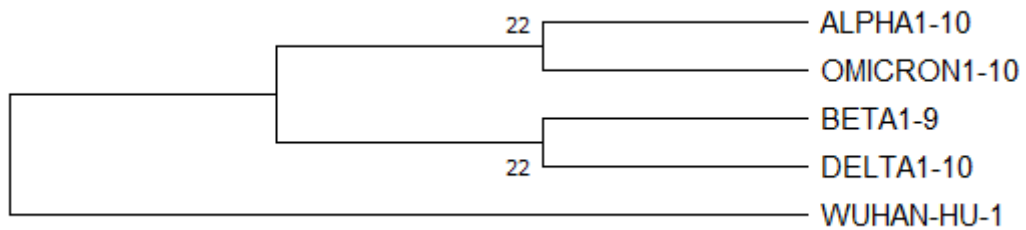
Appendix 28. MHC Class I phylogenetic tree of epitope NLCPFGEVF from Wuhan-Hu-1



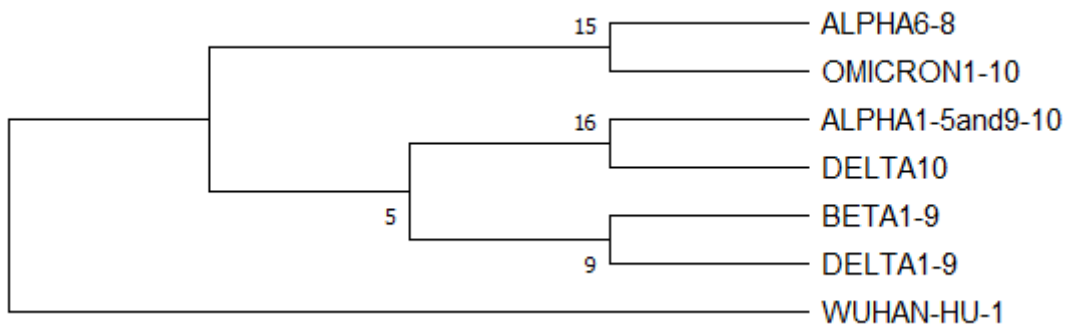
Appendix 29. MHC Class I phylogenetic tree of epitope FVIRGDEVK from Wuhan-Hu-1



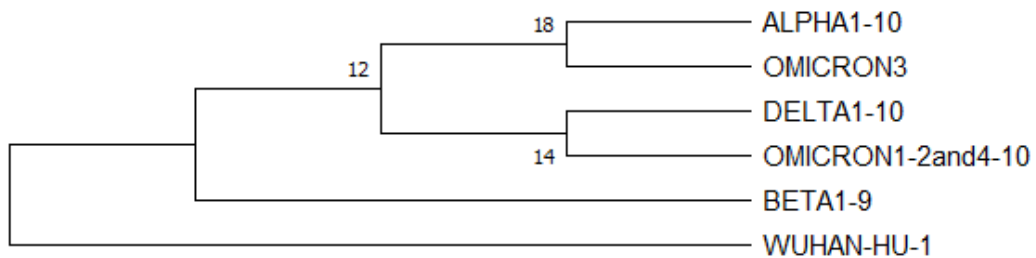
Appendix 30. MHC Class I phylogenetic tree of epitope NSIAIPTNF from Wuhan-Hu-1



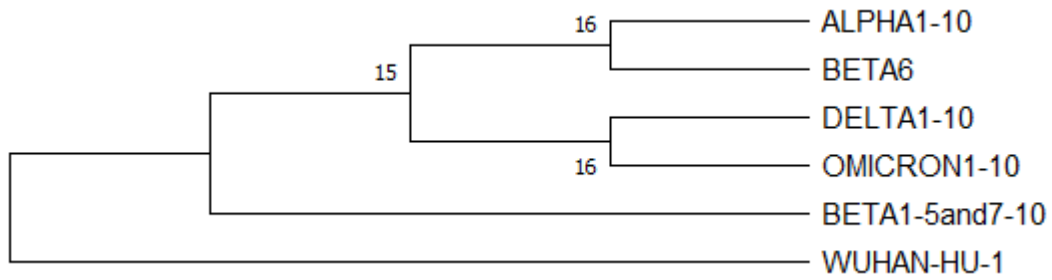
Appendix 31. MHC Class I phylogenetic tree of epitope QIITDNTF from Wuhan-Hu-1



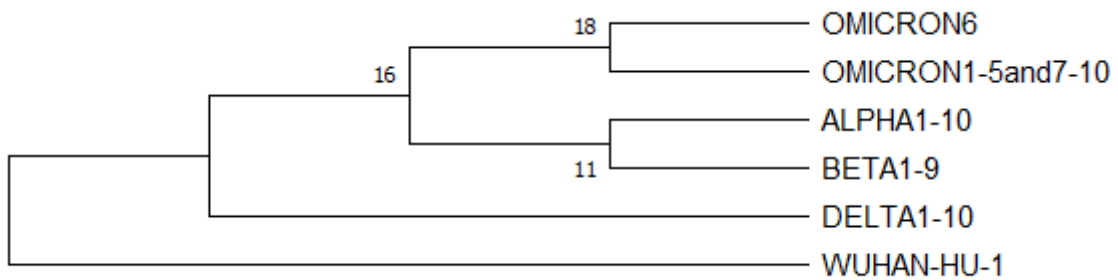
Appendix 32. MHC Class I phylogenetic tree of epitope FQFCNDPFL from Wuhan-Hu-1



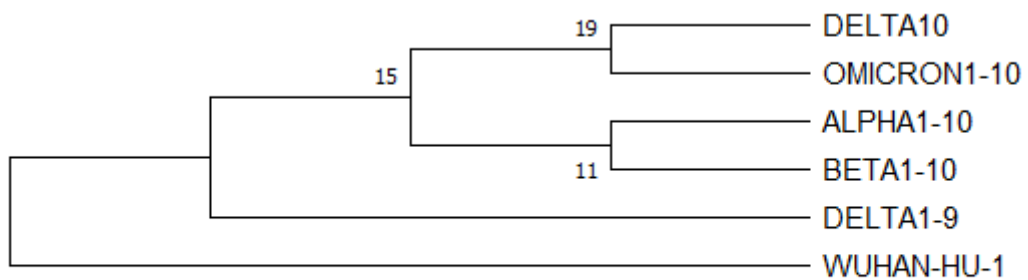
Appendix 33. MHC Class I phylogenetic tree of epitope GVVFASTK from Wuhan-Hu-1



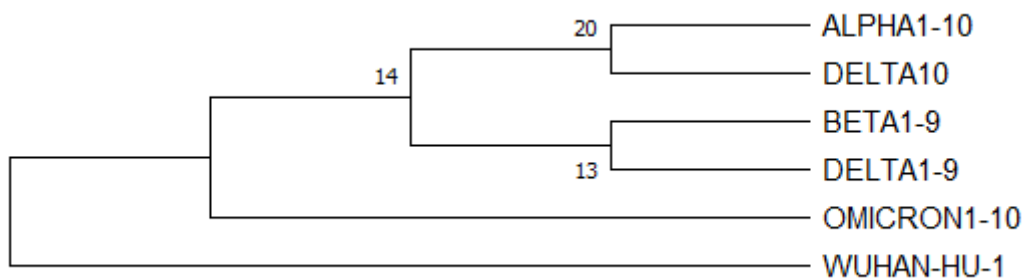
Appendix 34. MHC Class I phylogenetic tree of epitope WTAGAAAYY from Wuhan-Hu-1



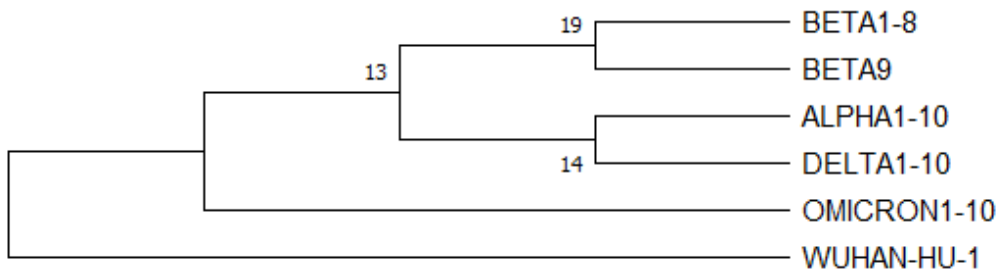
Appendix 35. MHC Class I phylogenetic tree of epitope QPTESIVRF from Wuhan-Hu-1



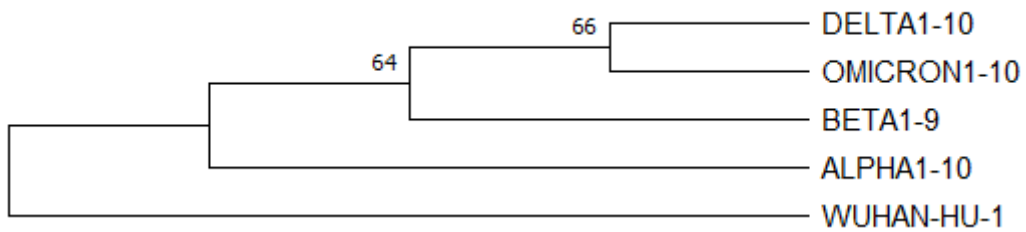
Appendix 36. MHC Class I phylogenetic tree of epitope NATRFASVY from Wuhan-Hu-1



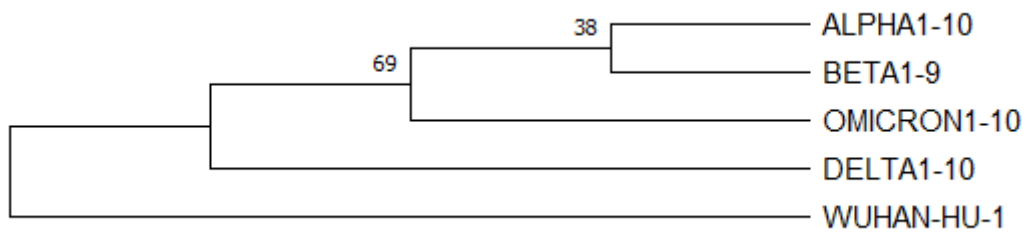
Appendix 37. MHC Class I phylogenetic tree of epitope GLTVLPPLL from Wuhan-Hu-1



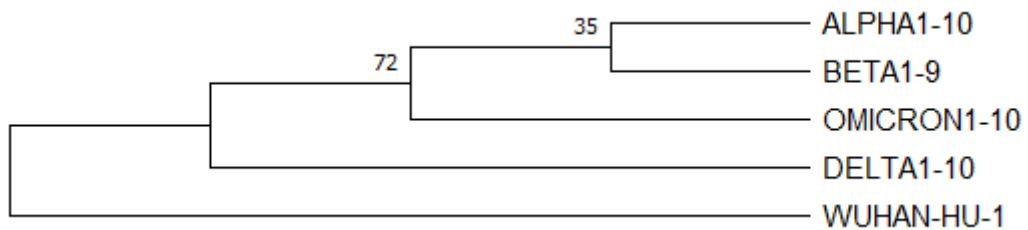
Appendix 38. MHC Class I phylogenetic tree of epitope NASVVNIQK from Wuhan-Hu-1



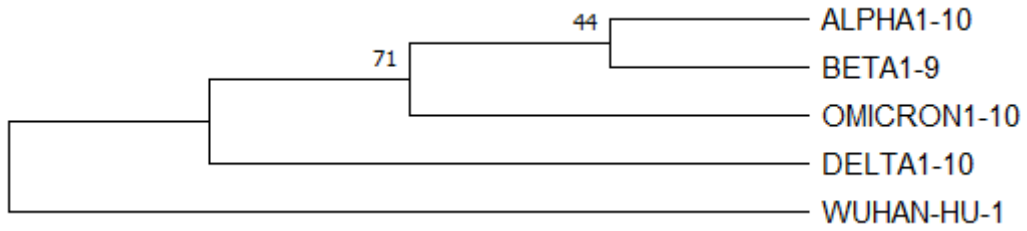
Appendix 39. MHC Class II phylogenetic tree of epitope TEIYQAGSTPCNGVE from Wuhan-Hu-1



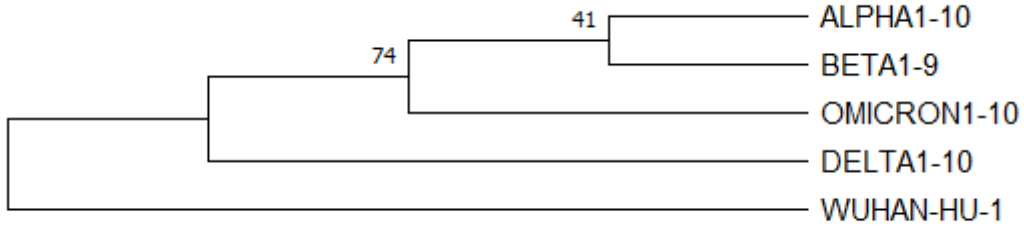
Appendix 40. MHC Class II phylogenetic tree of epitope PLQSYGFQPTNGVGY from Wuhan-Hu-1



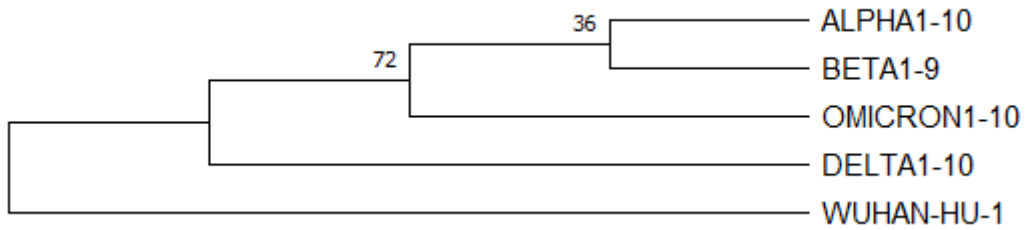
Appendix 41. MHC Class II phylogenetic tree of epitope QSYGFQPTNGVGYQP from Wuhan-Hu-1



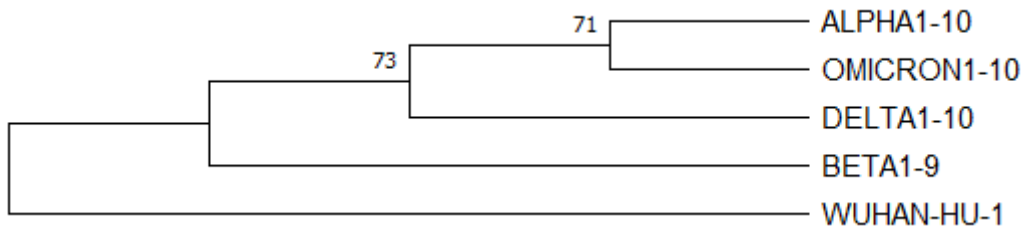
Appendix 42. MHC Class II phylogenetic tree of epitope SYGFQPTNGVGYQPY from Wuhan-Hu-1



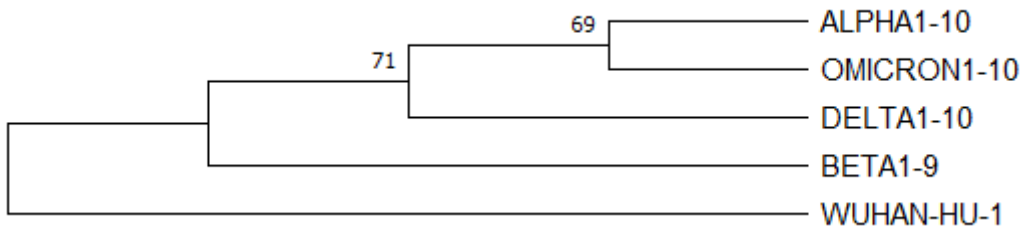
Appendix 43. MHC Class II phylogenetic tree of epitope FQPTNGVGYQPVRVV from Wuhan-Hu-1



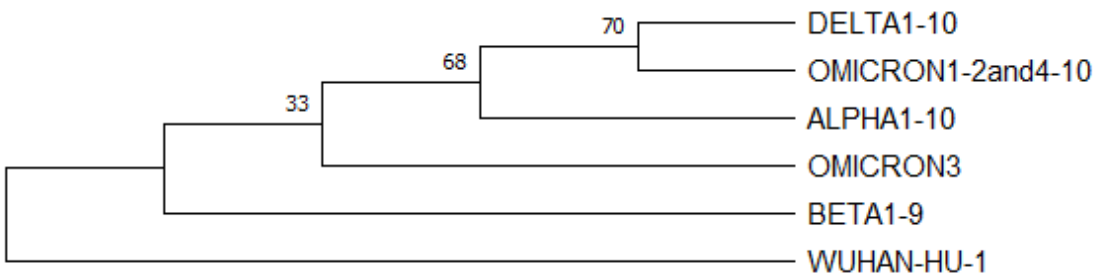
Appendix 44. MHC Class II phylogenetic tree of epitope QPTNGVGYQPVRVVV from Wuhan-Hu-1



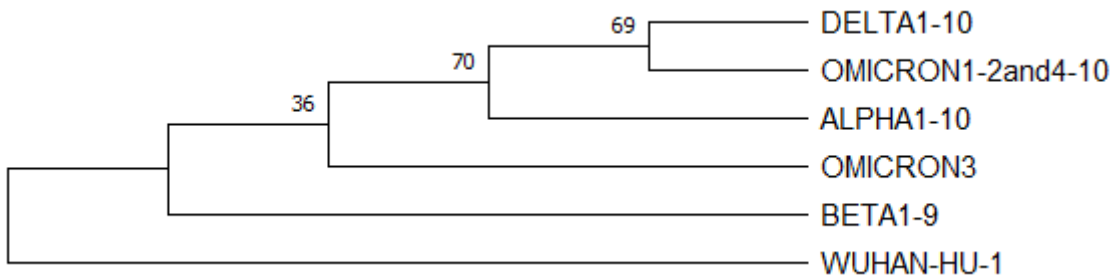
Appendix 45. MHC Class II phylogenetic tree of epitope CASYQTQTNSPRRAR from Wuhan-Hu-1



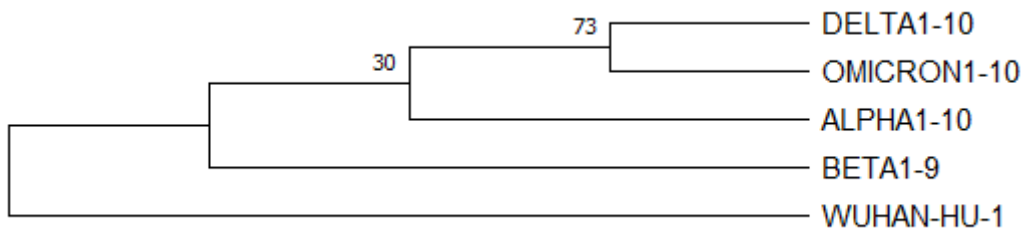
Appendix 46. MHC Class II phylogenetic tree of epitope ASYQTQTNSPRRARS from Wuhan-Hu-1



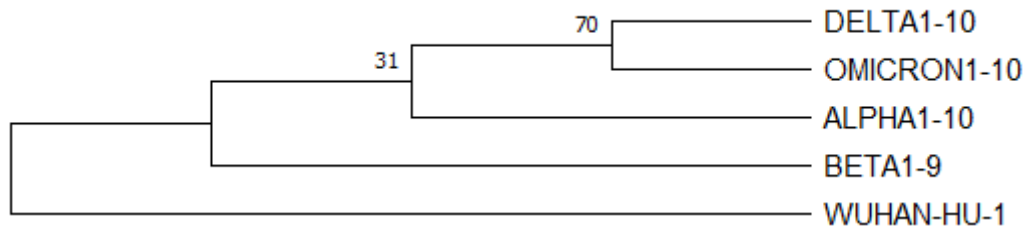
Appendix 47. MHC Class II phylogenetic tree of epitope LGVYYHKNNKSWMES from Wuhan-Hu-1



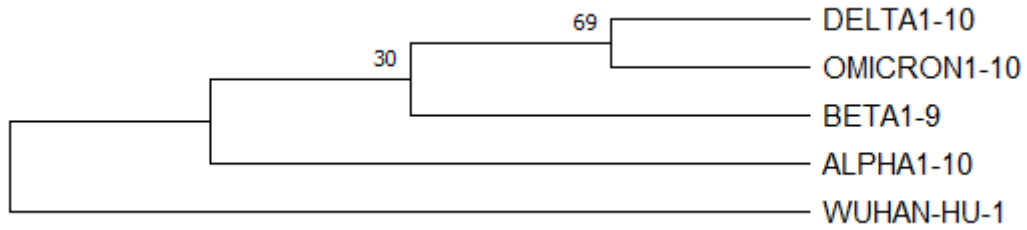
Appendix 48. MHC Class II phylogenetic tree of epitope GVYYHKNNKSWMESE from Wuhan-Hu-1



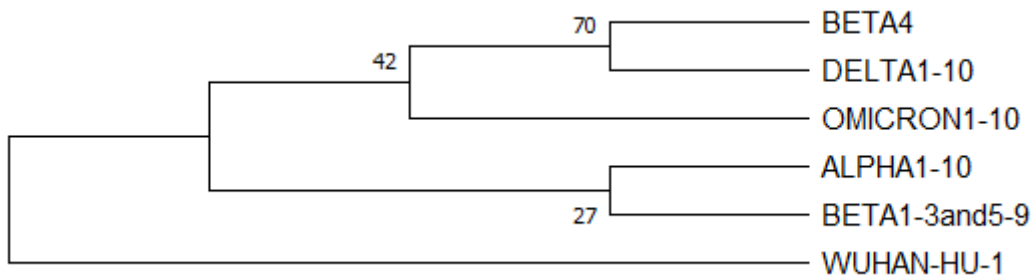
Appendix 49. MHC Class II phylogenetic tree of epitope DISTEIQAGSTPCN from Wuhan-Hu-1



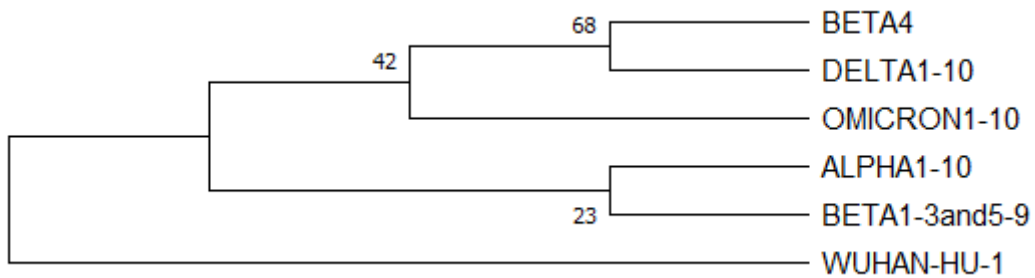
Appendix 50. MHC Class II phylogenetic tree of epitope ISTEIQAGSTPCNG from Wuhan-Hu-1



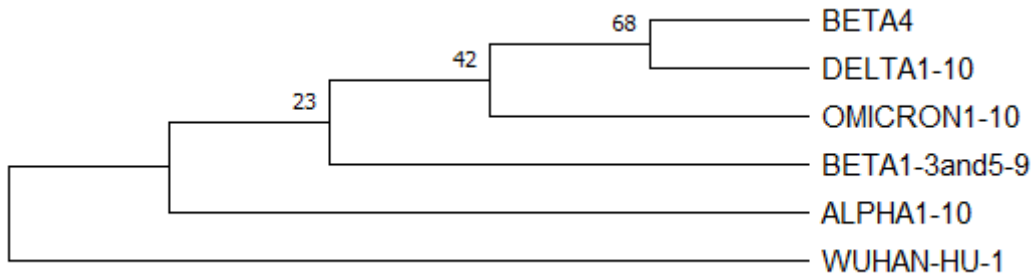
Appendix 51. MHC Class II phylogenetic tree of epitope STEIQAGSTPCNGV from Wuhan-Hu-1



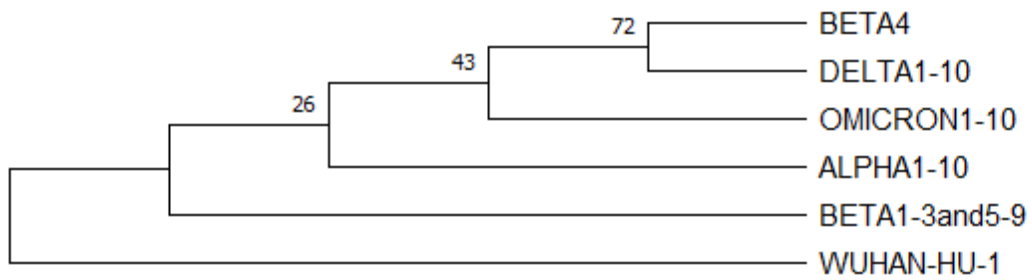
Appendix 52. MHC Class II phylogenetic tree of epitope ALGKLQDVVNQNAQA from Wuhan-Hu-1



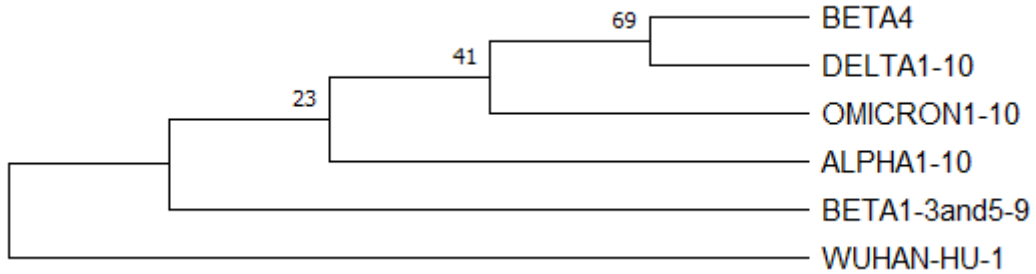
Appendix 53. MHC Class II phylogenetic tree of epitope LGKLQDVVNQNAQAL from Wuhan-Hu-1



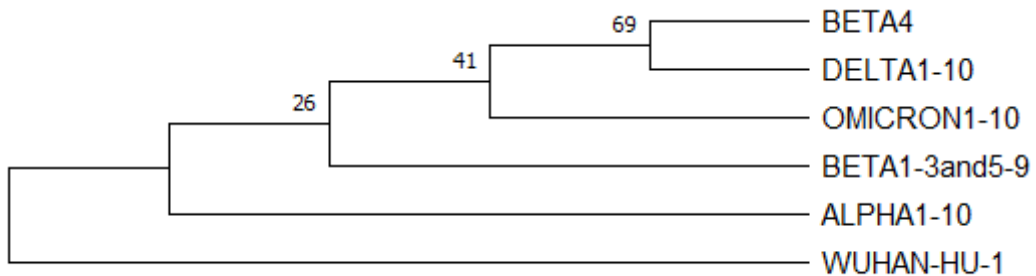
Appendix 54. MHC Class II phylogenetic tree of epitope GKLQDVVNQNAQALN from Wuhan-Hu-1



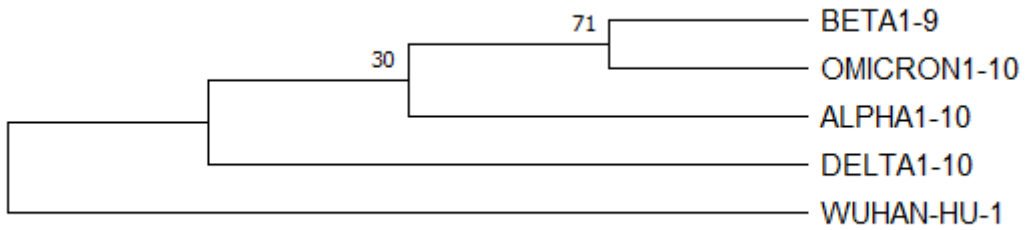
Appendix 55. MHC Class II phylogenetic tree of epitope KLQDVVNQNAQALNT from Wuhan-Hu-1



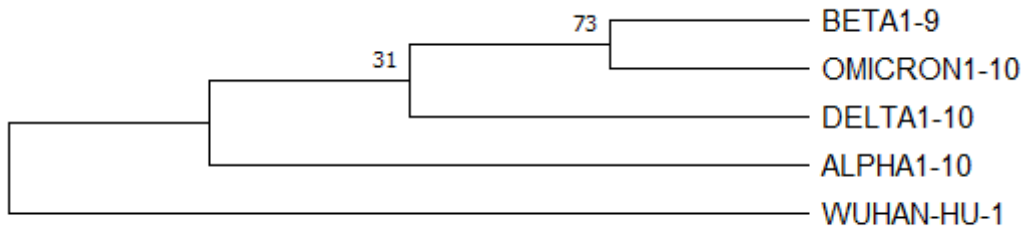
Appendix 56. MHC Class II phylogenetic tree of epitope LQDVVNQNAQALNTL from Wuhan-Hu-1



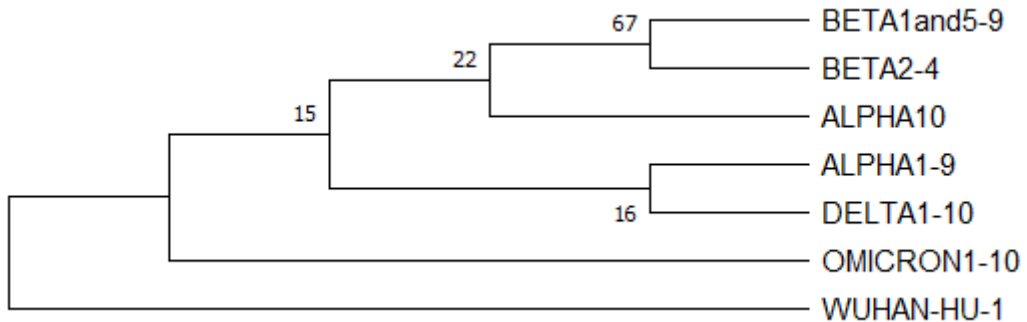
Appendix 57. MHC Class II phylogenetic tree of epitope QDVVNQNAQALNTLV from Wuhan-Hu-1



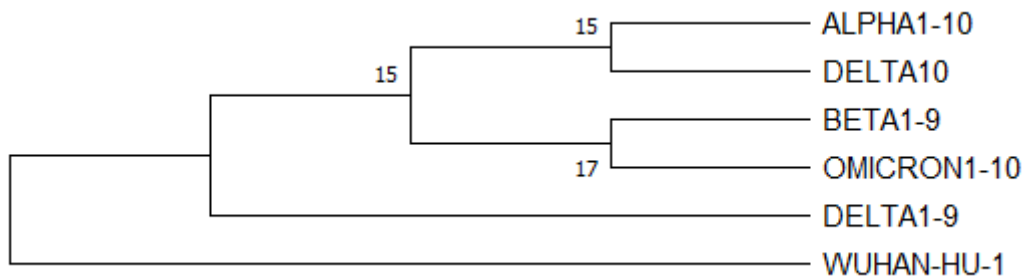
Appendix 58. MHC Class II phylogenetic tree of epitope EVRQIAPGQTGKIAD from Wuhan-Hu-1



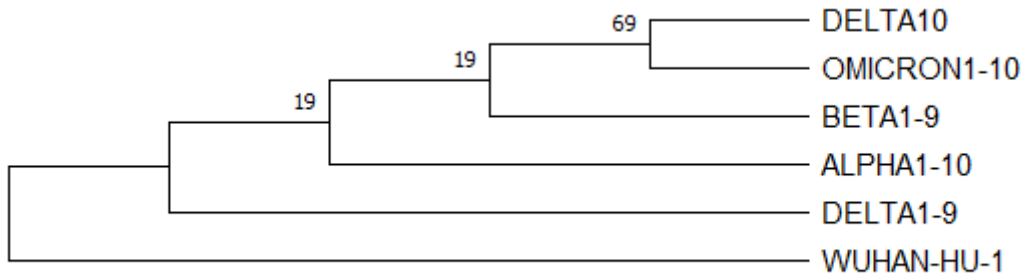
Appendix 59. MHC Class II phylogenetic tree of epitope VRQIAPGQTGKIADY from Wuhan-Hu-1



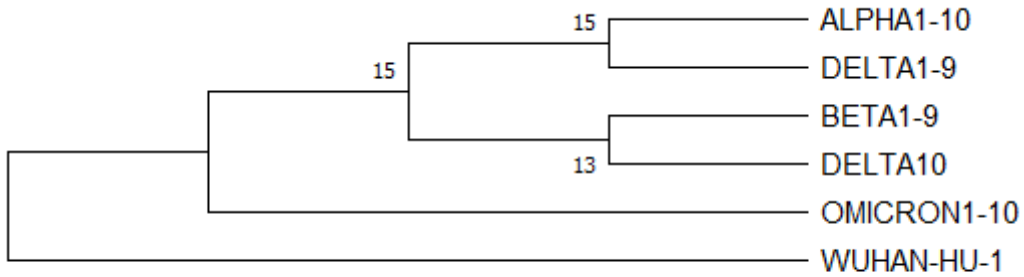
Appendix 60. MHC Class II phylogenetic tree of epitope ITRFQTLALHRSYL from Wuhan-Hu-1



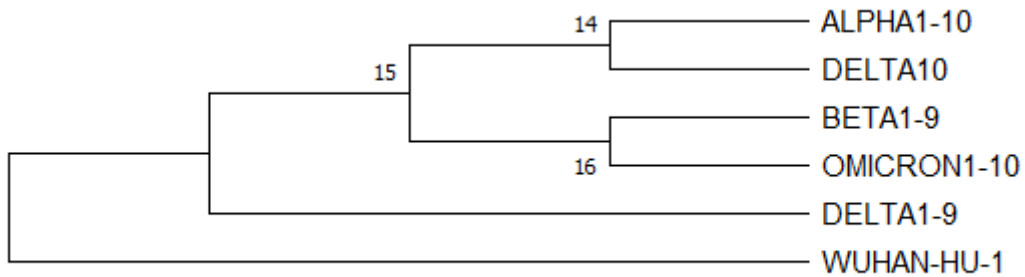
Appendix 61. MHC Class II phylogenetic tree of epitope CPFGEVFNATRFASV from Wuhan-Hu-1



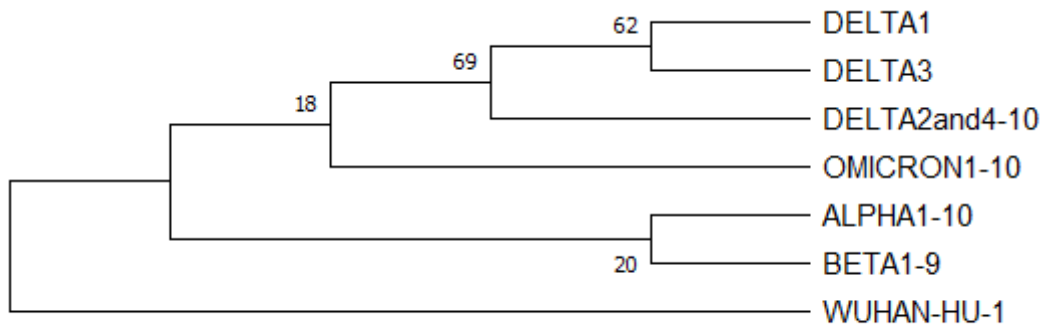
Appendix 62. MHC Class II phylogenetic tree of epitope PFGEVFNATRFASVY from Wuhan-Hu-1



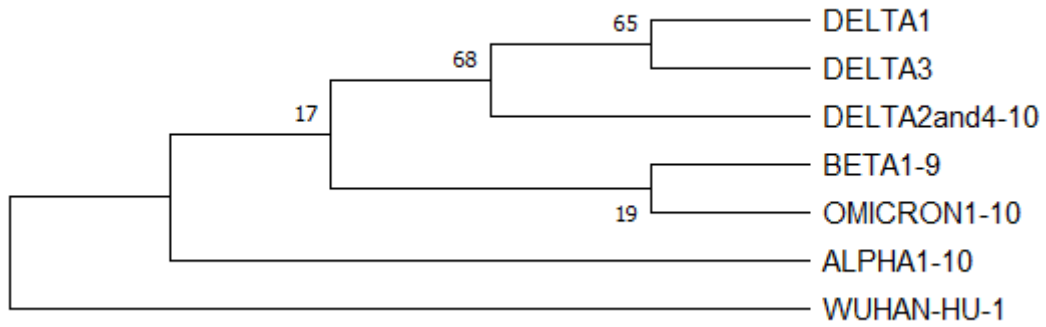
Appendix 63. MHC Class II phylogenetic tree of epitope FGEVFNATRFASVYA from Wuhan-Hu-1



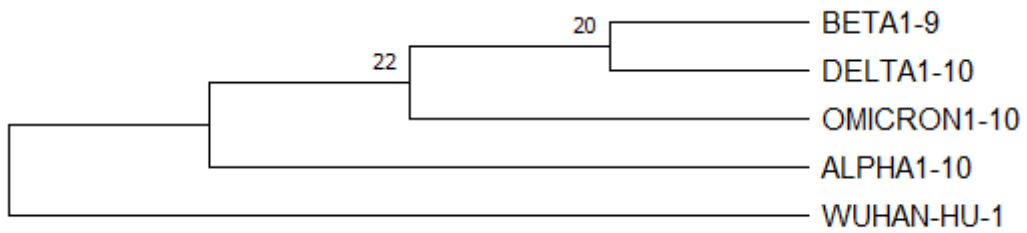
Appendix 64. MHC Class II phylogenetic tree of epitope GEVFNATRFASVYAW from Wuhan-Hu-1



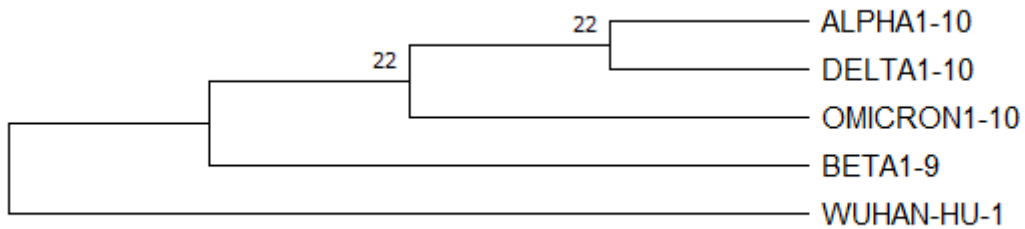
Appendix 64. MHC Class II phylogenetic tree of epitope VGGNYNYLRLFRKS from Wuhan-Hu-1



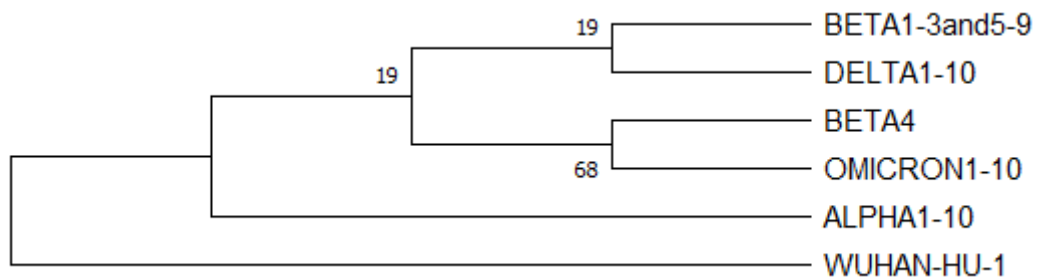
Appendix 65. MHC Class II phylogenetic tree of epitope GGNYNLYRLFRKSN from Wuhan-Hu-1



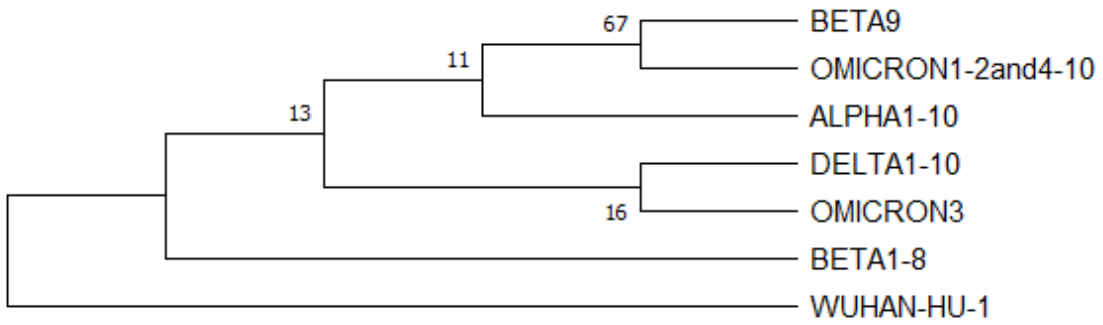
Appendix 66. MHC Class II phylogenetic tree of epitope GVGYPYRVVLSFE from Wuhan-Hu-1



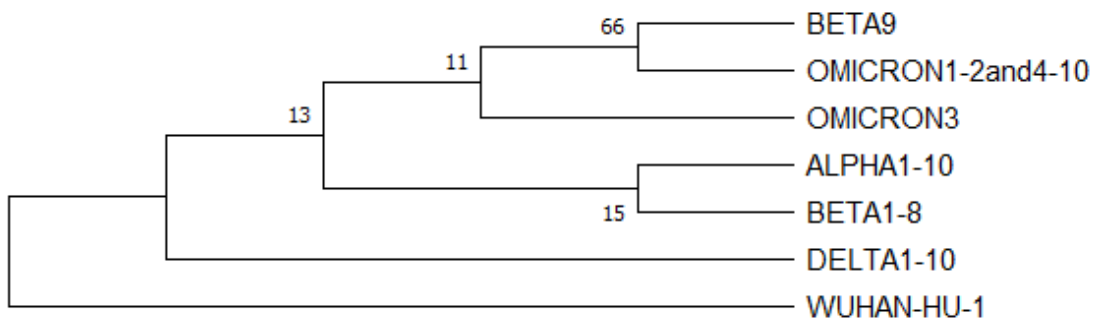
Appendix 67. MHC Class II phylogenetic tree of epitope VGYQPYRVVLSFEL from Wuhan-Hu-1



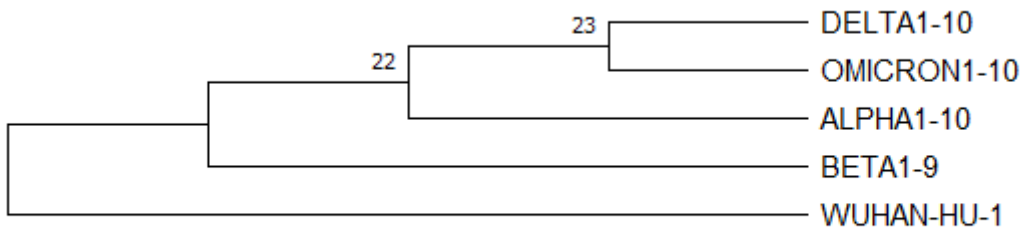
Appendix 68. MHC Class II phylogenetic tree of epitope DSLSSTASALGKLQD from Wuhan-Hu-1



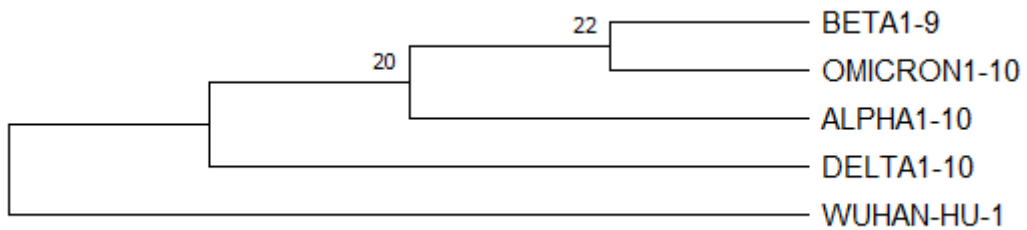
Appendix 69. MHC Class II phylogenetic tree of epitope LPPAYTNSFTRGVVY from Wuhan-Hu-1



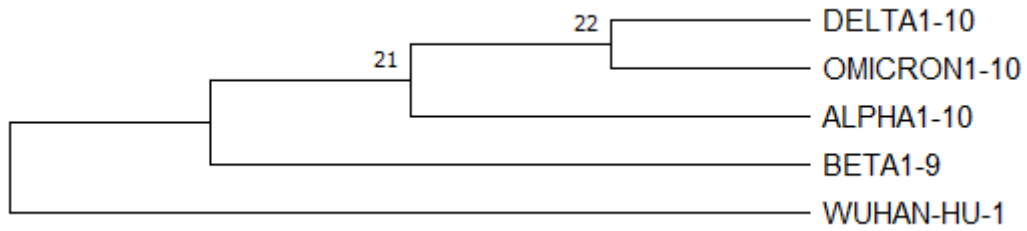
Appendix 70. MHC Class II phylogenetic tree of epitope PPAYTNSFTRGVYYP from Wuhan-Hu-1



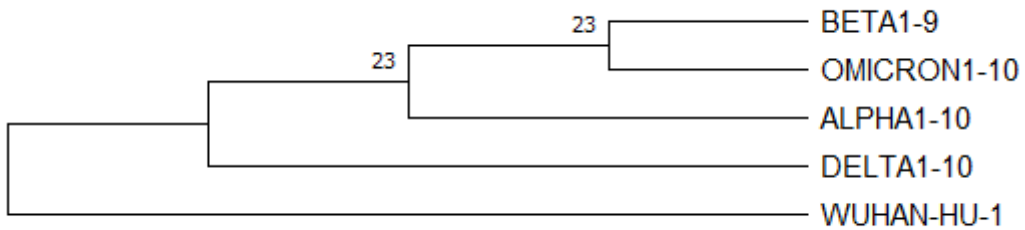
Appendix 71. MHC Class II phylogenetic tree of epitope FSNVTWFHAIHVSGT from Wuhan-Hu-1



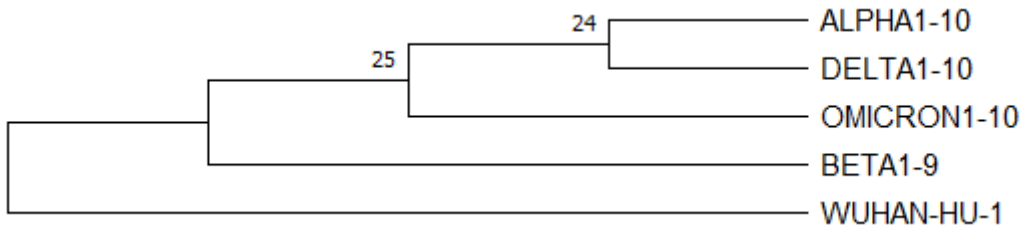
Appendix 72. MHC Class II phylogenetic tree of epitope LPFFSNVTWFHAIHV from Wuhan-Hu-1



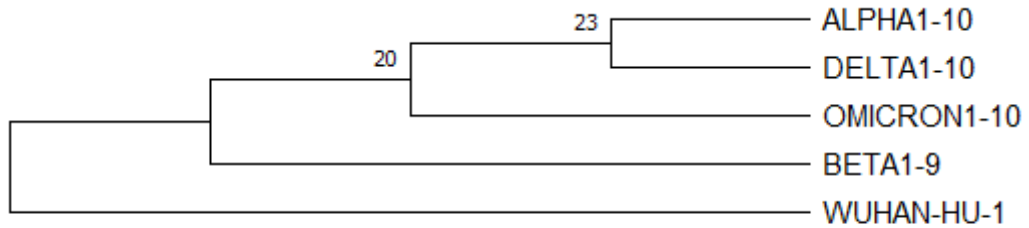
Appendix 73. MHC Class II phylogenetic tree of epitope PFFSNVTWFHAIHVS from Wuhan-Hu-1



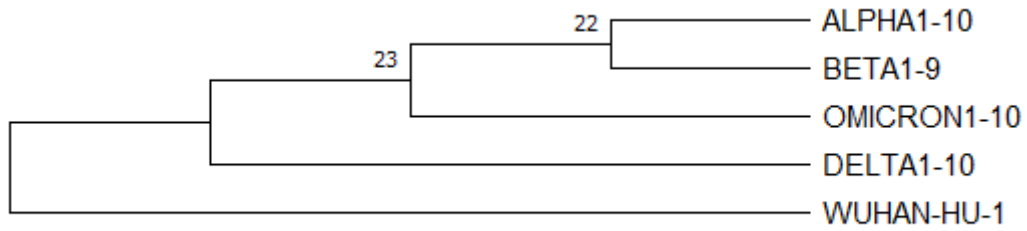
Appendix 74. MHC Class II phylogenetic tree of epitope FFSNVTWFHAIHVSG from Wuhan-Hu-1



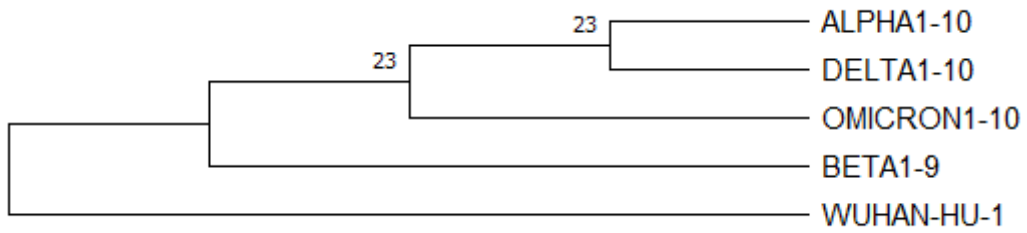
Appendix 75. MHC Class II phylogenetic tree of epitope CVADYSVLYNSASFS from Wuhan-Hu-1



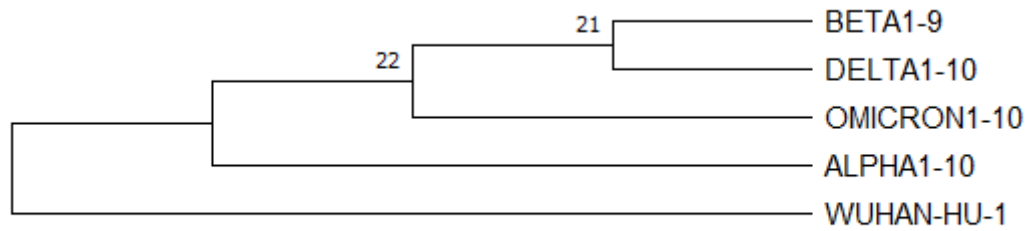
Appendix 76. MHC Class II phylogenetic tree of epitope VADYSVLYNSASFST from Wuhan-Hu-1



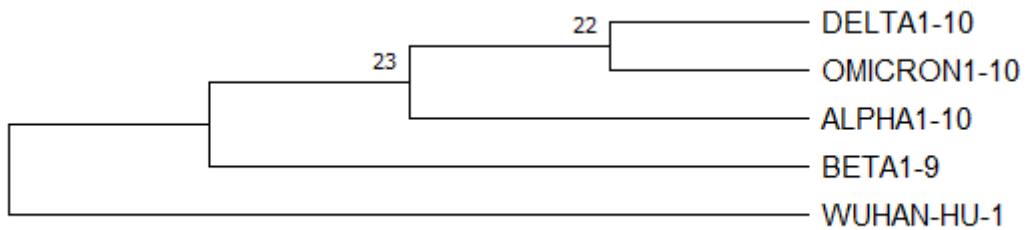
Appendix 77. MHC Class II phylogenetic tree of epitope YNSASFSTFKCYGVS from Wuhan-Hu-1



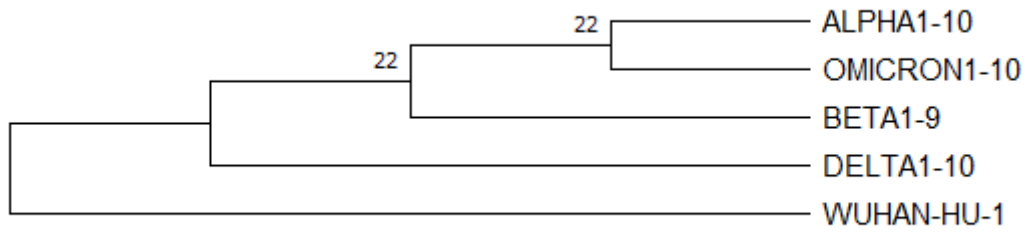
Appendix 78. MHC Class II phylogenetic tree of epitope FTNVYADSFVIRGDE from Wuhan-Hu-1



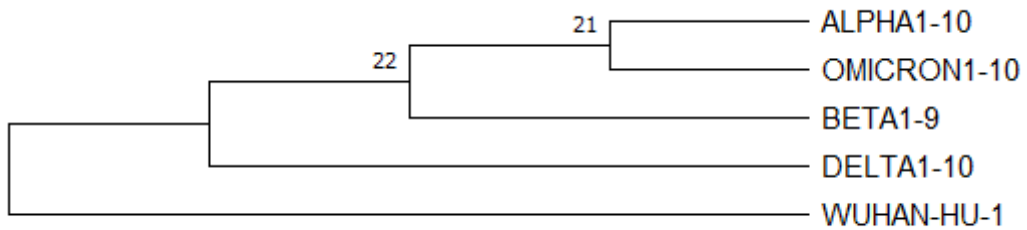
Appendix 79. MHC Class II phylogenetic tree of epitope TNVYADSFVIRGDEV from Wuhan-Hu-1



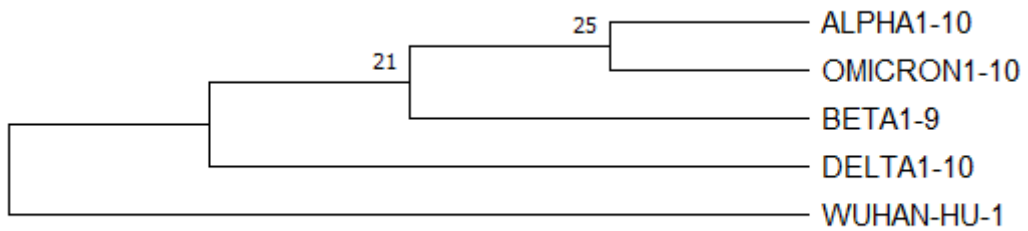
Appendix 80. MHC Class II phylogenetic tree of epitope NKKFLPFQQFGRDIA from Wuhan-Hu-1



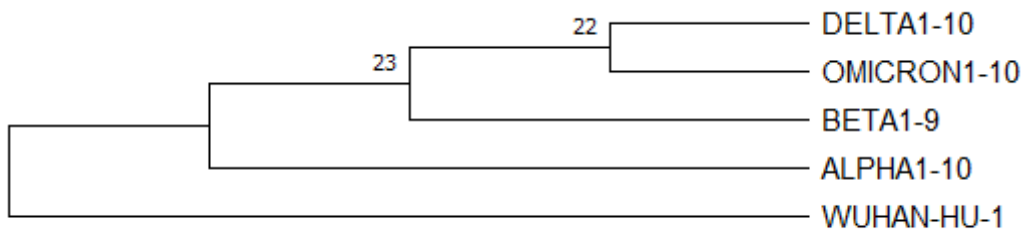
Appendix 81. MHC Class II phylogenetic tree of epitope VASQSIAYTMSLGA from Wuhan-Hu-1



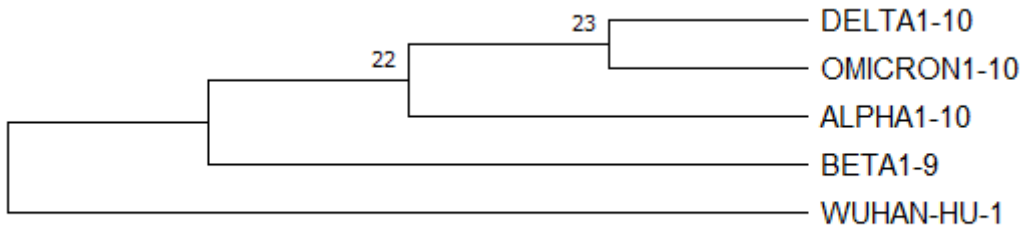
Appendix 82. MHC Class II phylogenetic tree of epitope ASQSIAYTMSLGAE from Wuhan-Hu-1



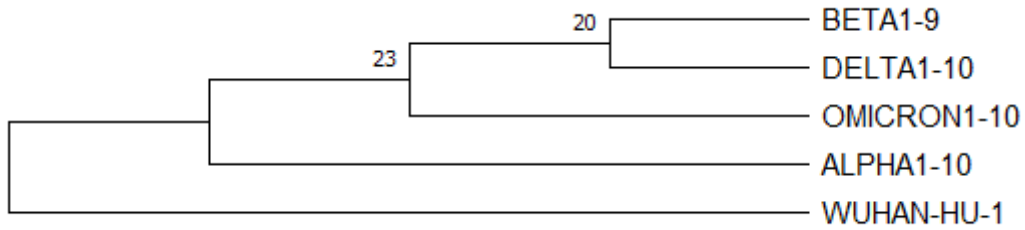
Appendix 83. MHC Class II phylogenetic tree of epitope SQSIAYTMSLGAEN from Wuhan-Hu-1



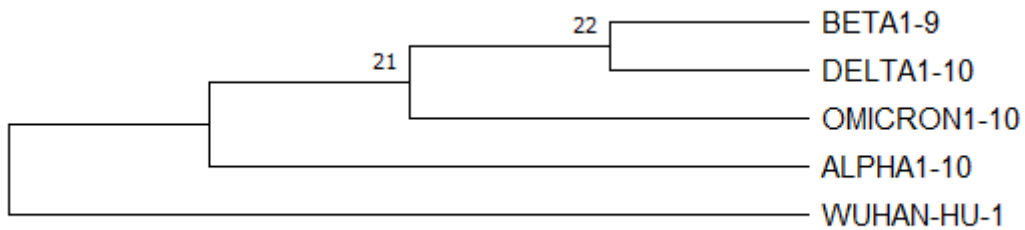
Appendix 84. MHC Class II phylogenetic tree of epitope QSIAYTMSLGAENS from Wuhan-Hu-1



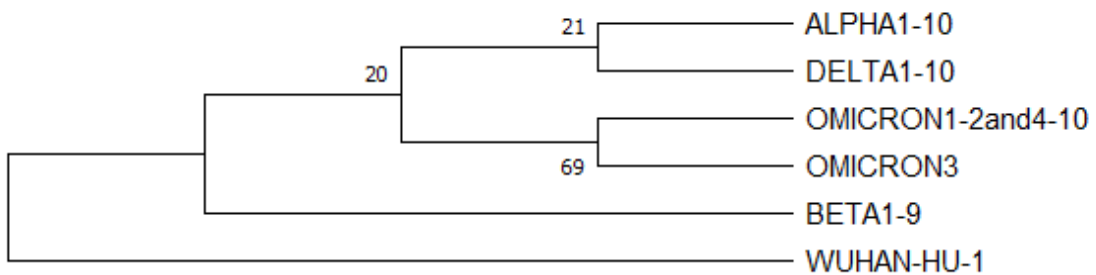
Appendix 85. MHC Class II phylogenetic tree of epitope PTNFTISVTTEILPV from Wuhan-Hu-1



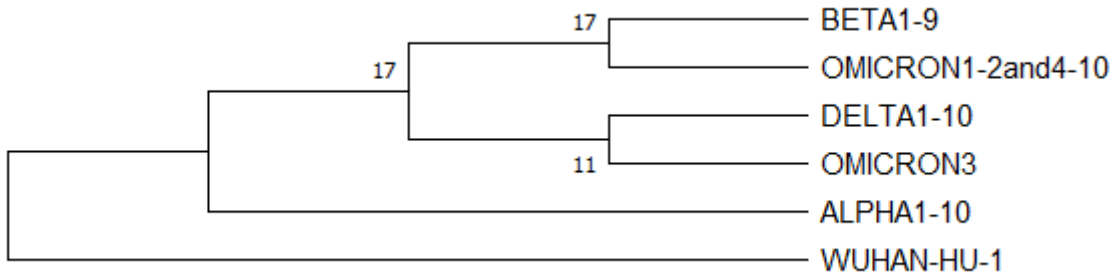
Appendix 86. MHC Class II phylogenetic tree of epitope SNLLQYGSFCTQLN from Wuhan-Hu-1



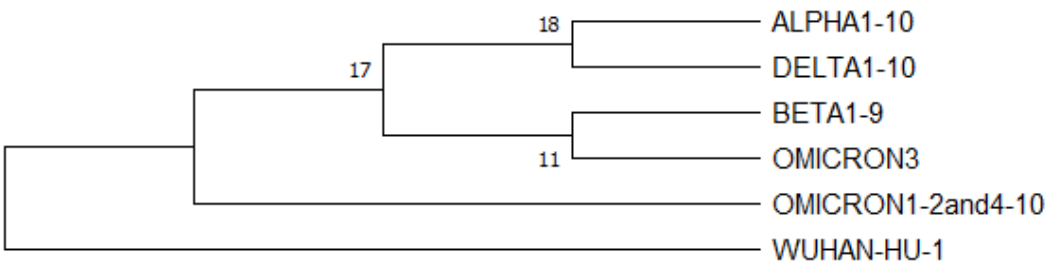
Appendix 87. MHC Class II phylogenetic tree of epitope NLLQYGSFCTQLNR from Wuhan-Hu-1



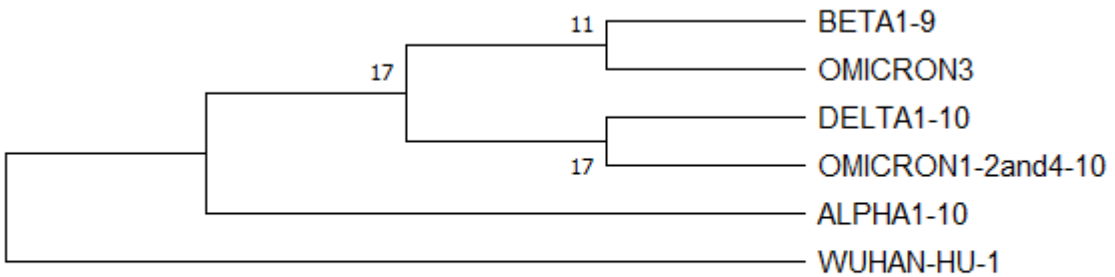
Appendix 88. MHC Class II phylogenetic tree of epitope SSNFGAISSVLNDIL from Wuhan-Hu-1



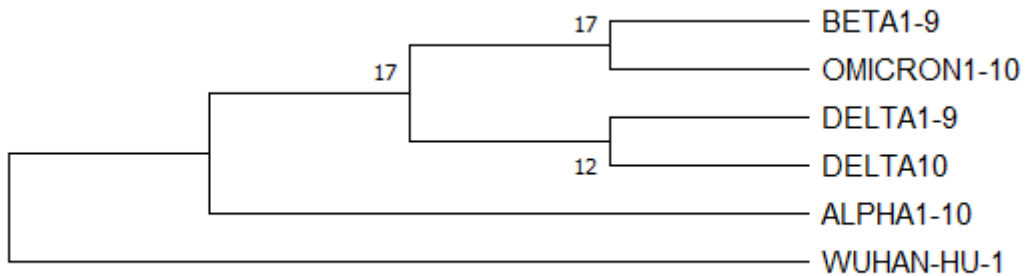
Appendix 93. MHC Class II phylogenetic tree of epitope DGVYFASTKSNIR from Wuhan-Hu-1



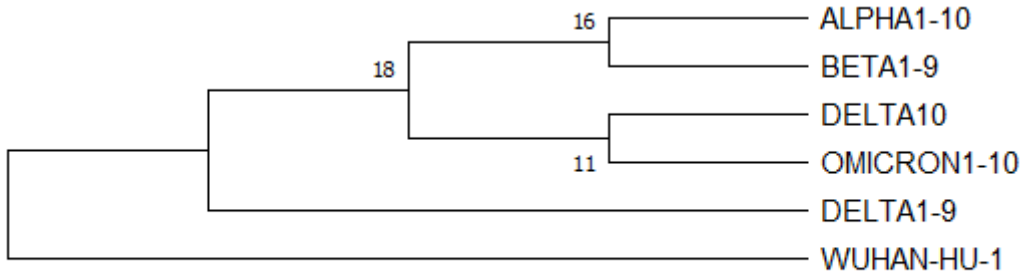
Appendix 94. MHC Class II phylogenetic tree of epitope GVVYFASTKSNIRG from Wuhan-Hu-1



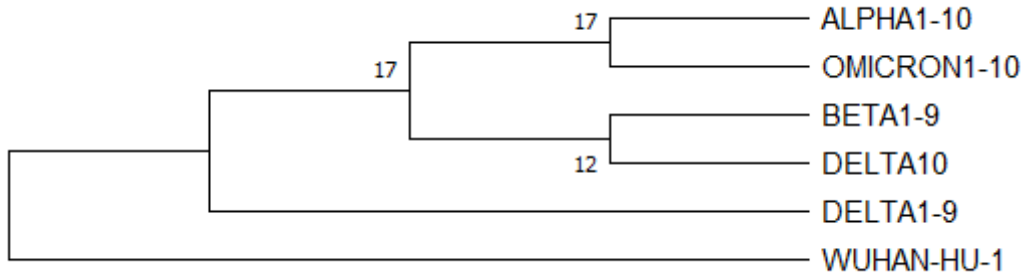
Appendix 95. MHC Class II phylogenetic tree of epitope VYFASTKSNIRGW from Wuhan-Hu-1



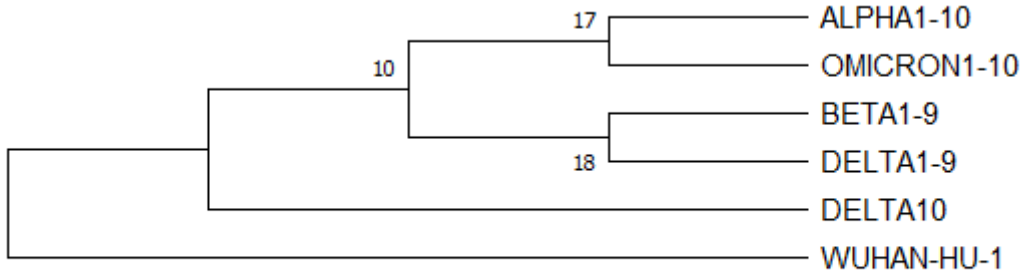
Appendix 96. MHC Class II phylogenetic tree of epitope EVFNATRFASVYAWN from Wuhan-Hu-1



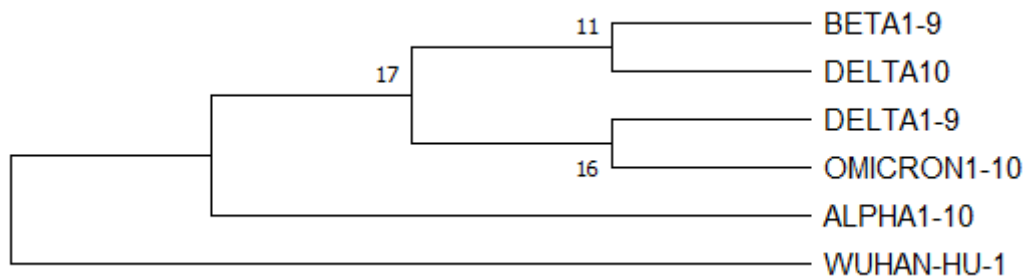
Appendix 97. MHC Class II phylogenetic tree of epitope VFNATRFASVYAWN R from Wuhan-Hu-1



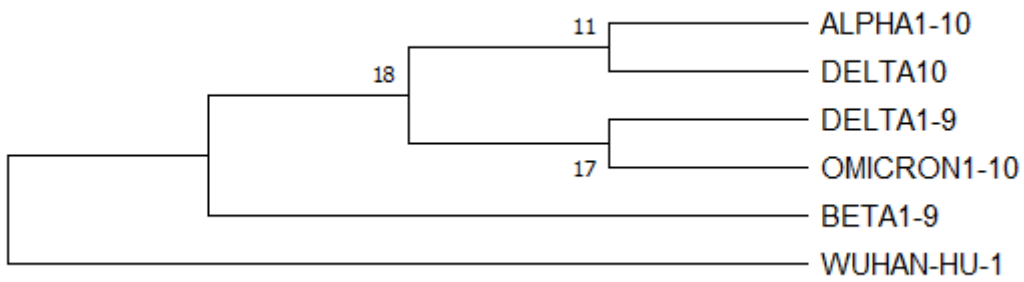
Appendix 98. MHC Class II phylogenetic tree of epitope FNATRFASVYAWN RK from Wuhan-Hu-1



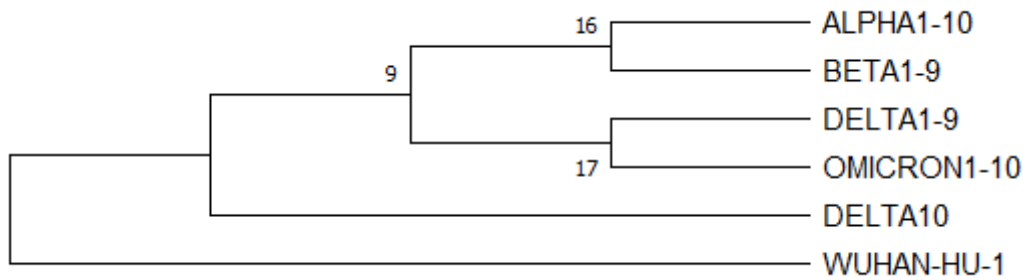
Appendix 99. MHC Class II phylogenetic tree of epitope NATRFASVYAWN RKR from Wuhan-Hu-1



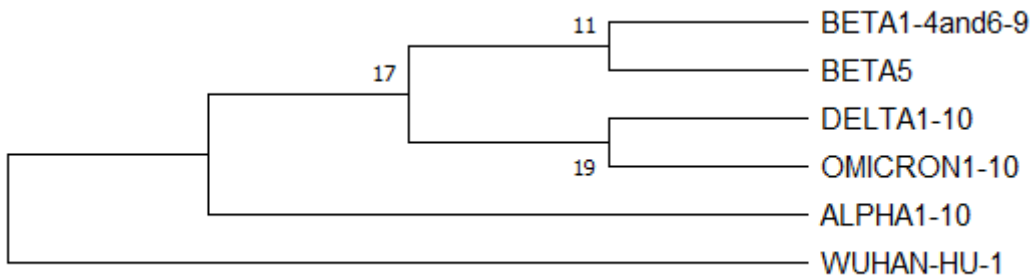
Appendix 100. MHC Class II phylogenetic tree of epitope ATRFASVYAWN RKRI from Wuhan-Hu-1



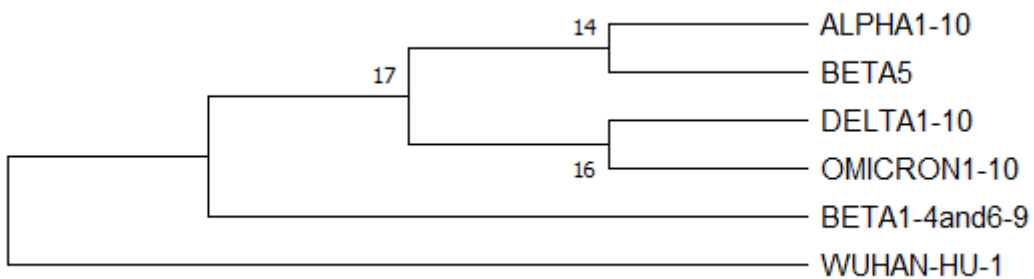
Appendix 101. MHC Class II phylogenetic tree of epitope TRFASVYAWNRRKRIS from Wuhan-Hu-1



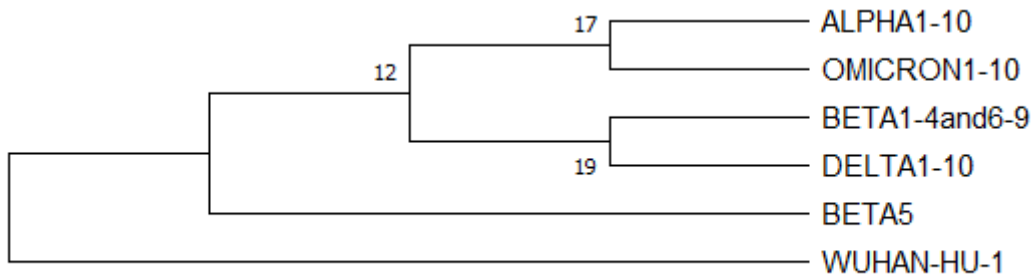
Appendix 102. MHC Class II phylogenetic tree of epitope RFASVYAWNRRKRISN from Wuhan-Hu-1



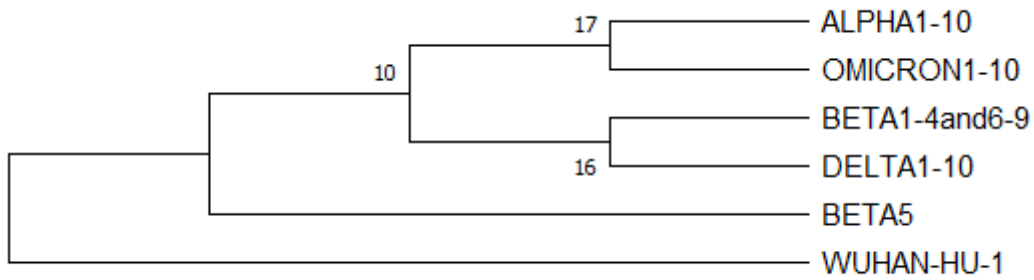
Appendix 103. MHC Class II phylogenetic tree of epitope ENQKLIANQFNSAIG from Wuhan-Hu-1



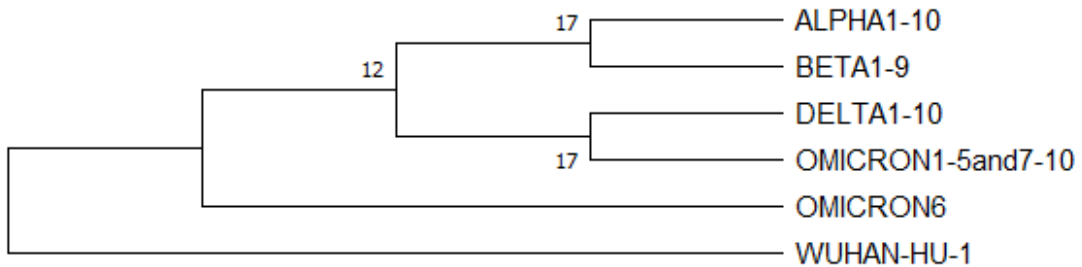
Appendix 104. MHC Class II phylogenetic tree of epitope NQKLIANQFNSAIGK from Wuhan-Hu-1



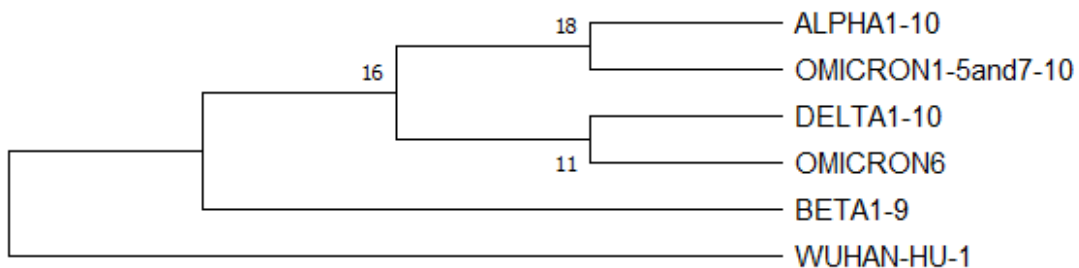
Appendix 105. MHC Class II phylogenetic tree of epitope QKLIANQFNSAIGKI from Wuhan-Hu-1



Appendix 106. MHC Class II phylogenetic tree of epitope LIANQFNSAIGKIQD from Wuhan-Hu-1



Appendix 107. MHC Class II phylogenetic tree of epitope YQTSNFRVQPTESIV from Wuhan-Hu-1



Appendix 108. MHC Class II phylogenetic tree of epitope QTSNFRVQPTESIVR from Wuhan-Hu-1