

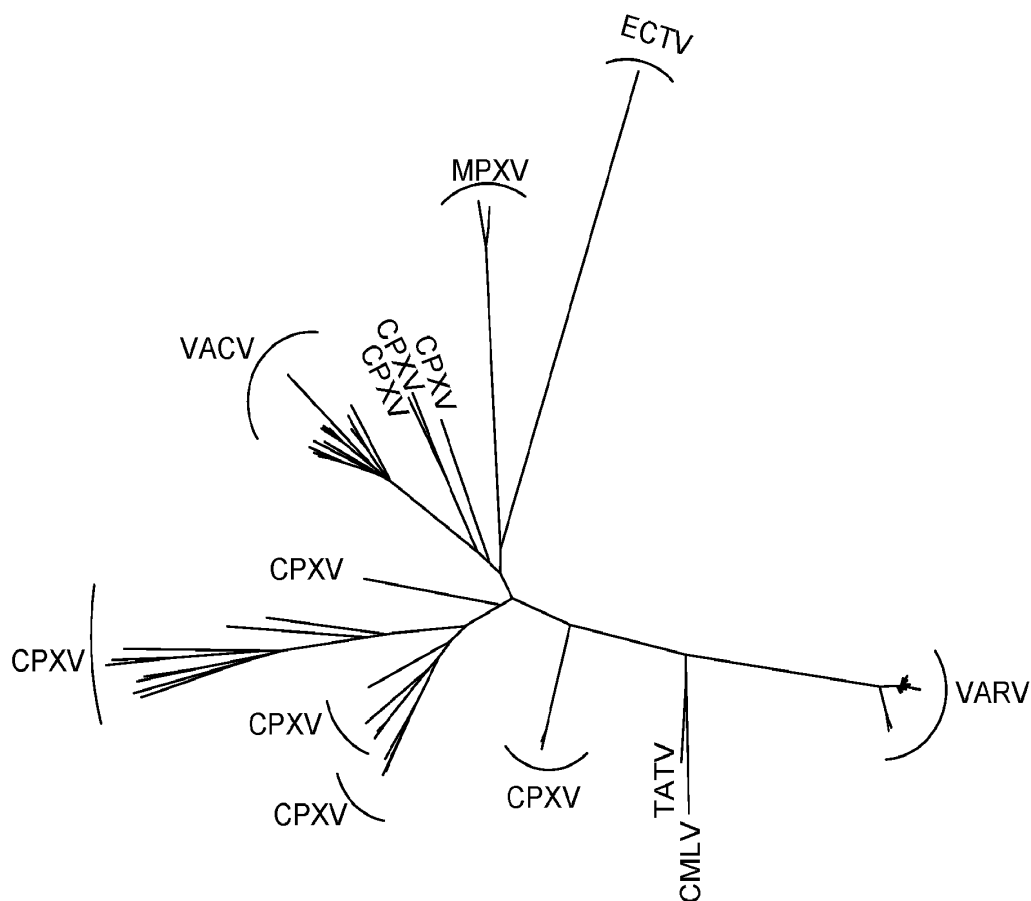


FIG. 1

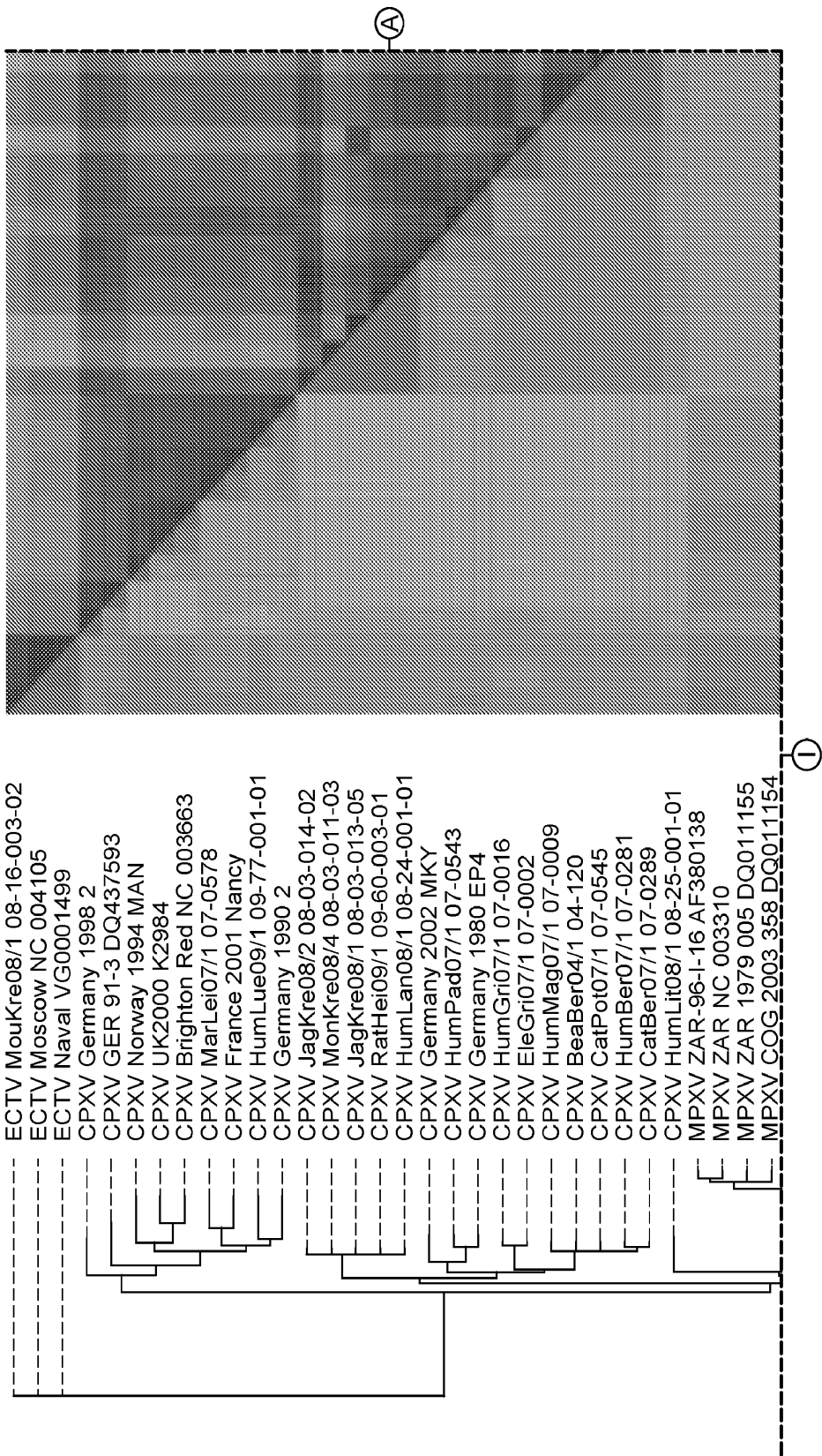




FIG. 2 (Continued)

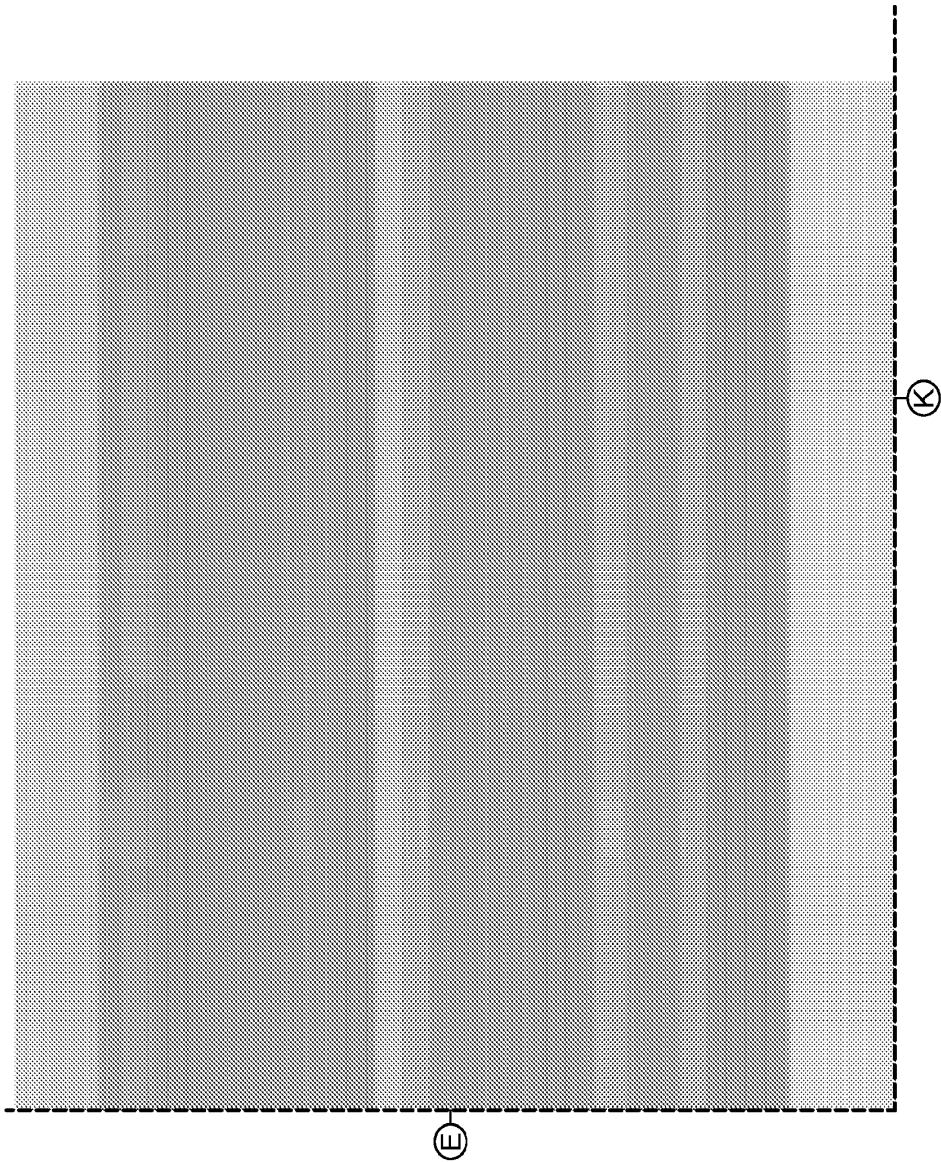


FIG. 2 (Continued)

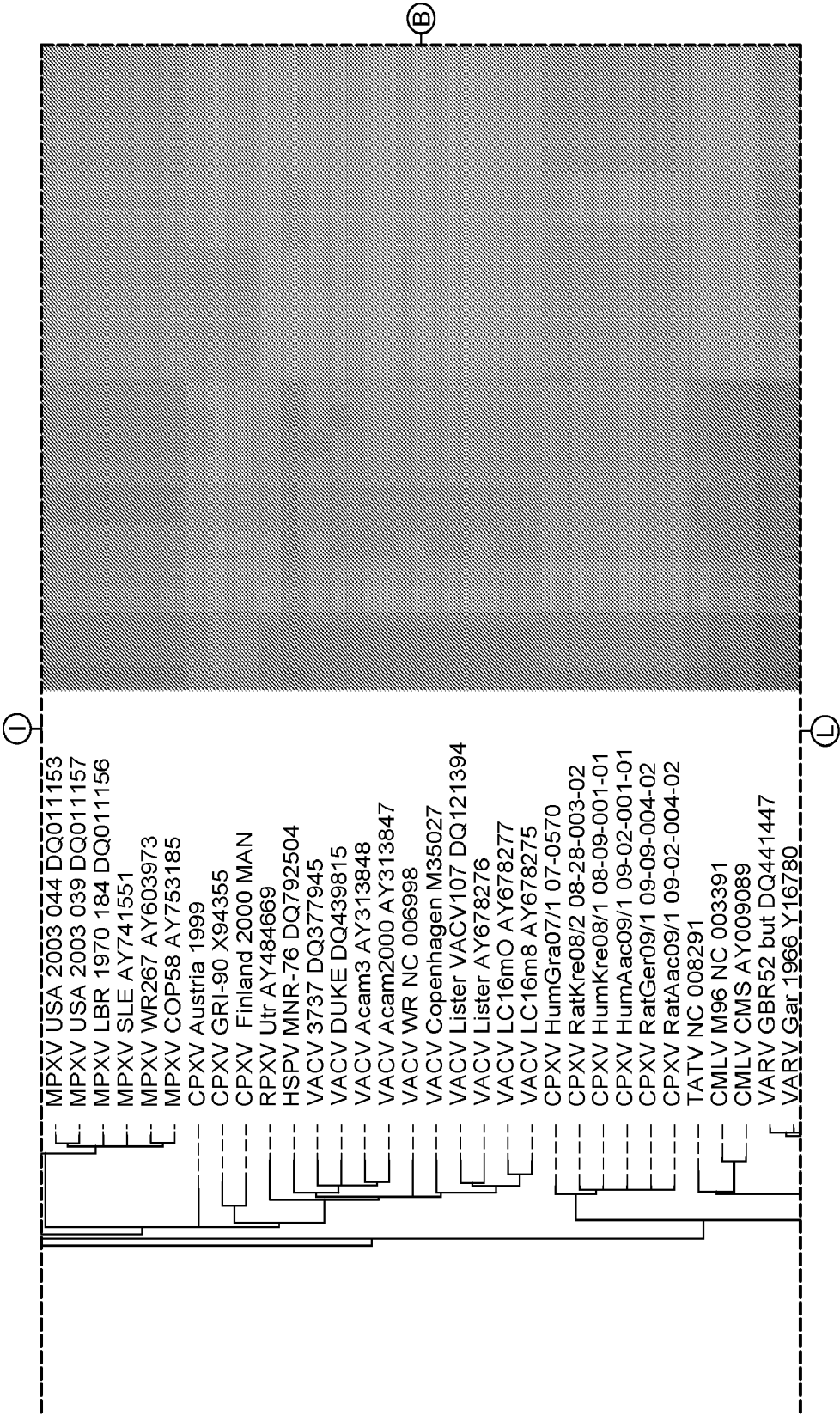


FIG. 2 (Continued)

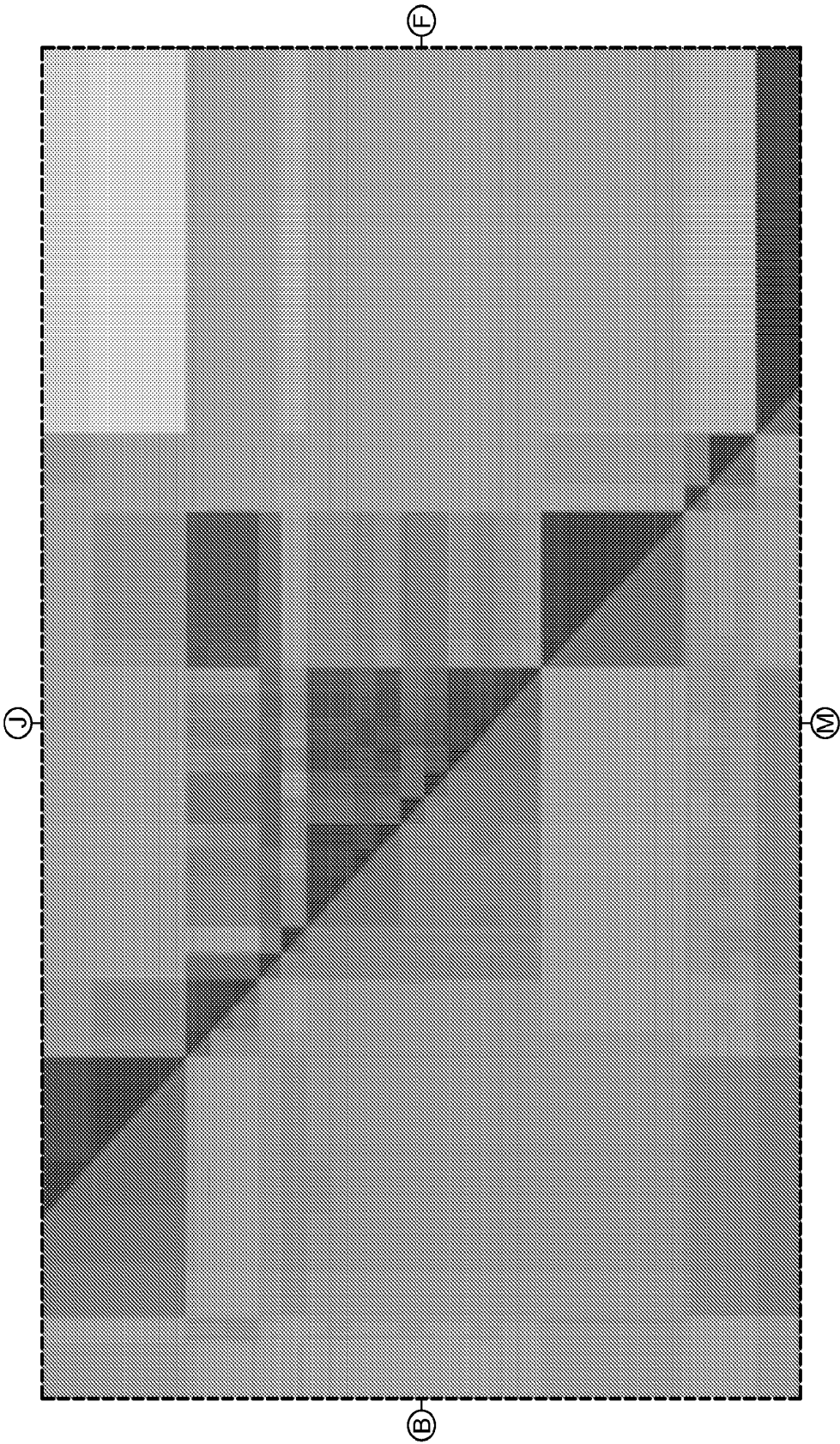
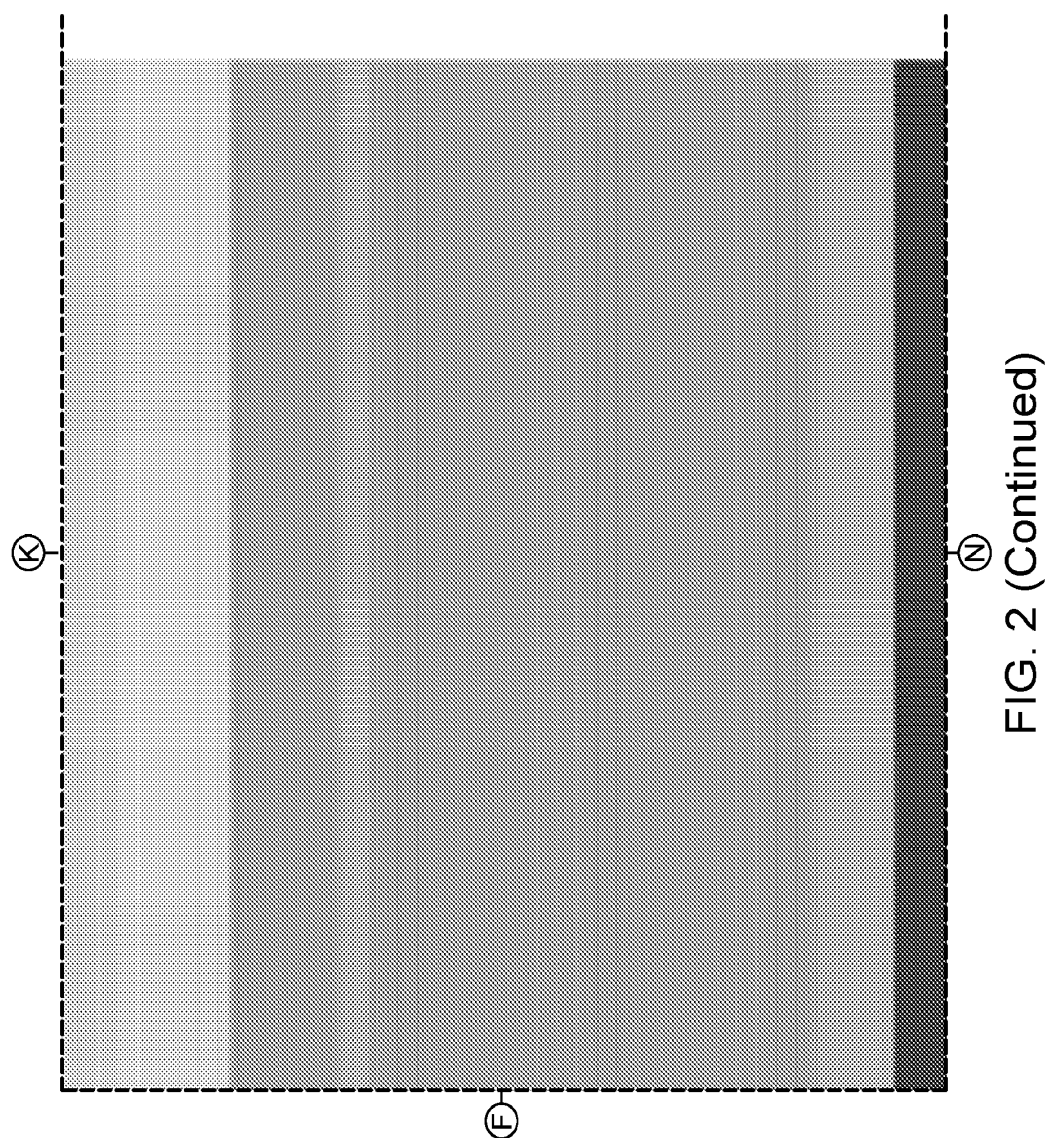


FIG. 2 (Continued)



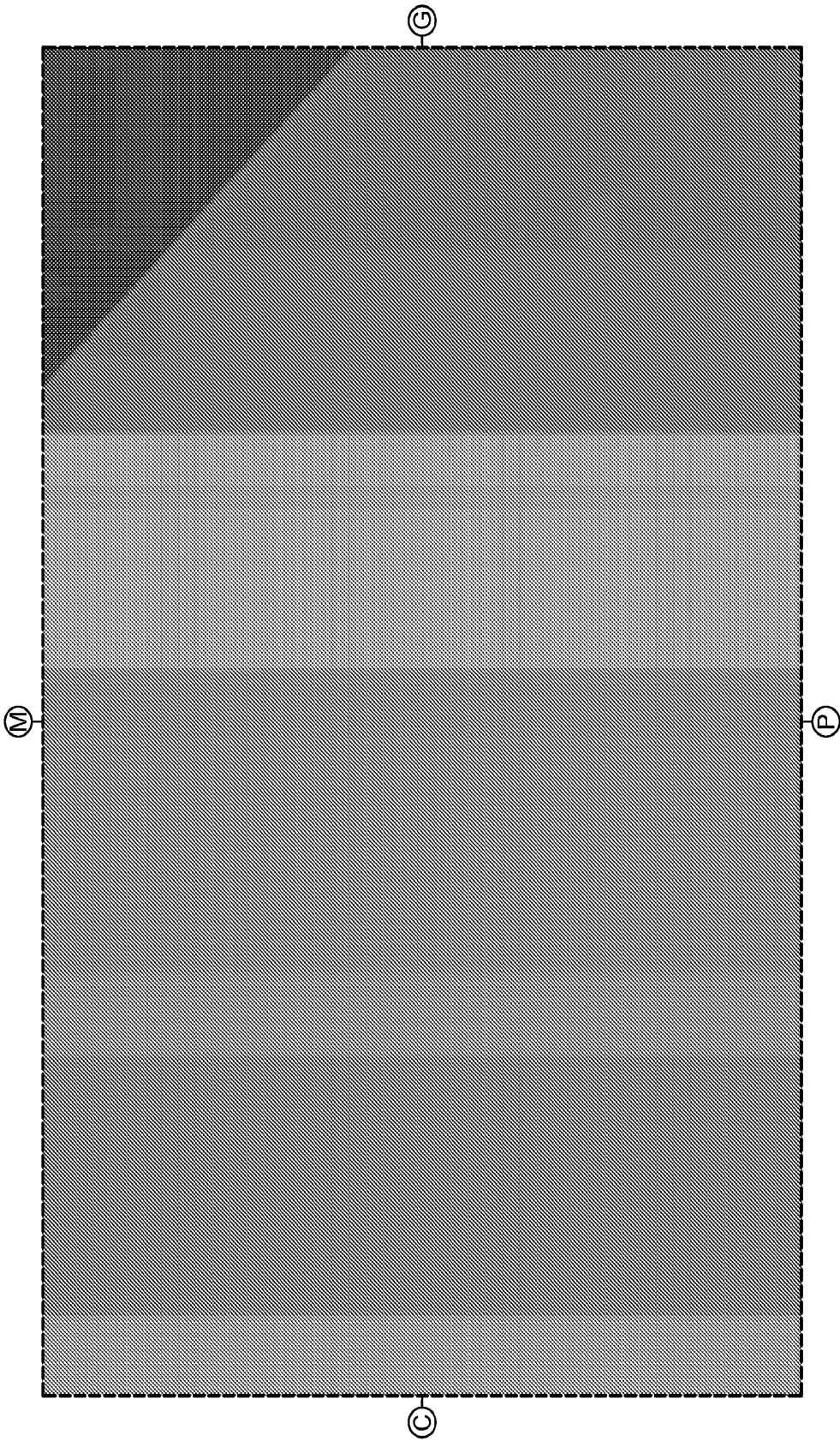


FIG. 2 (Continued)

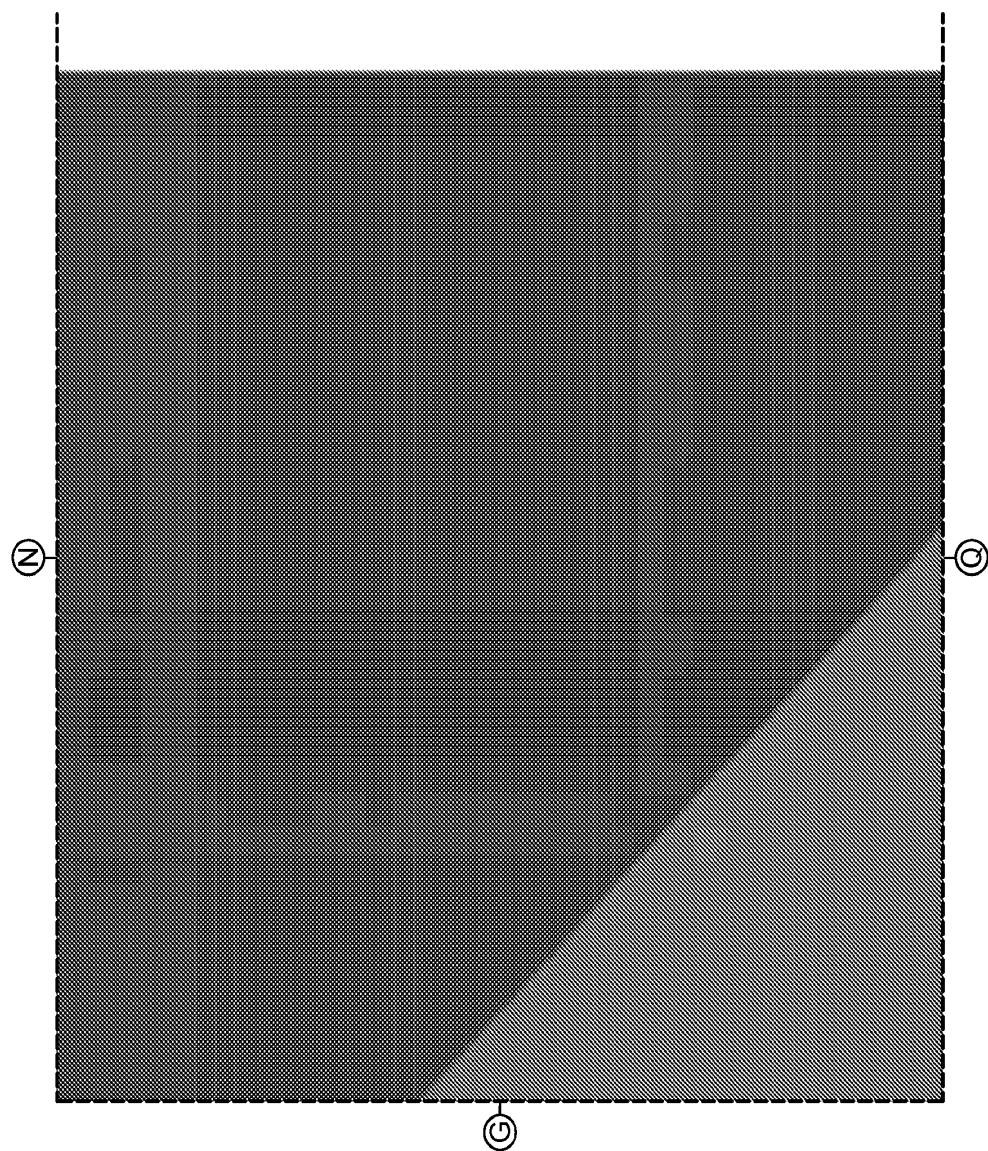


FIG. 2 (Continued)

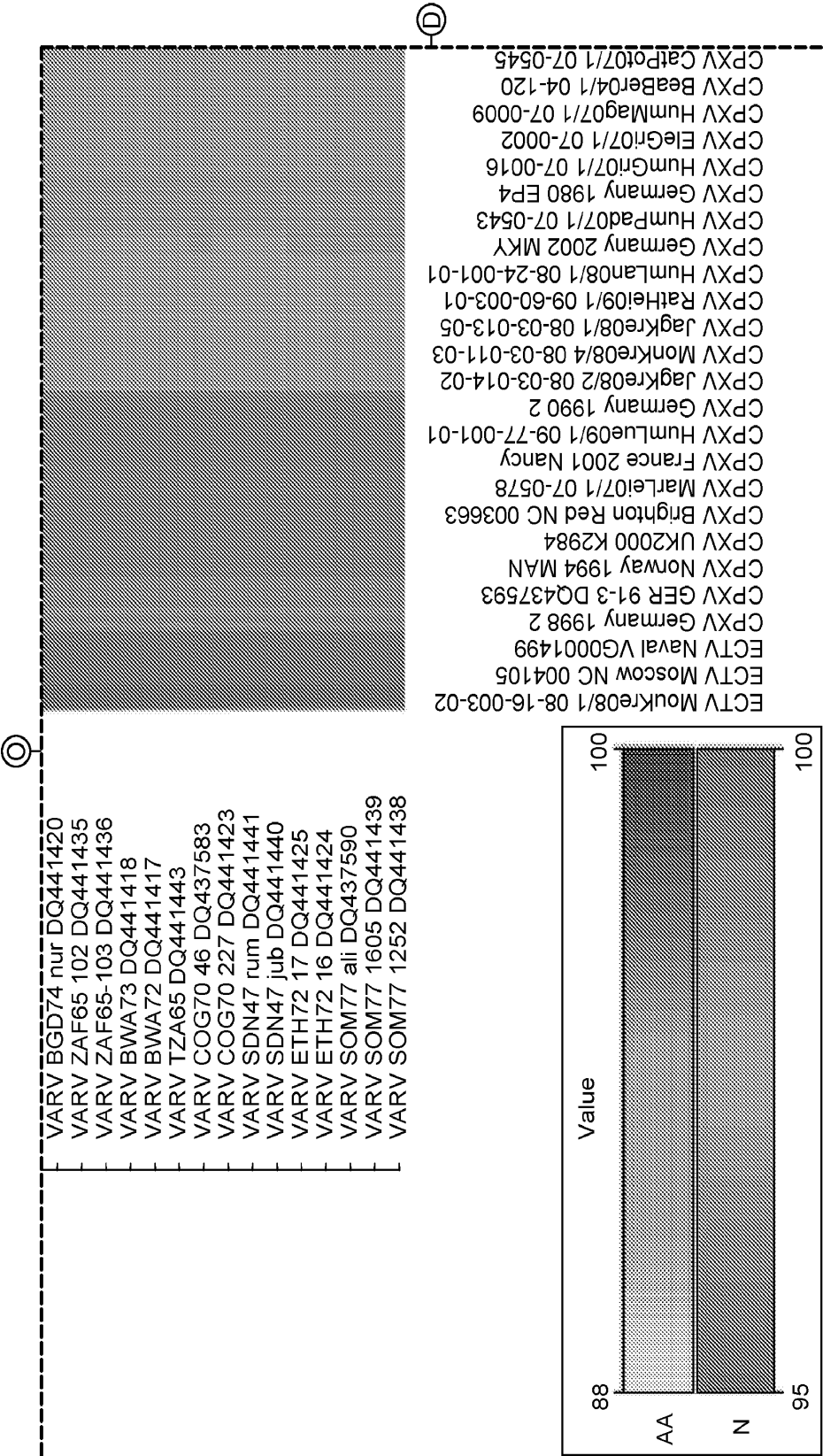
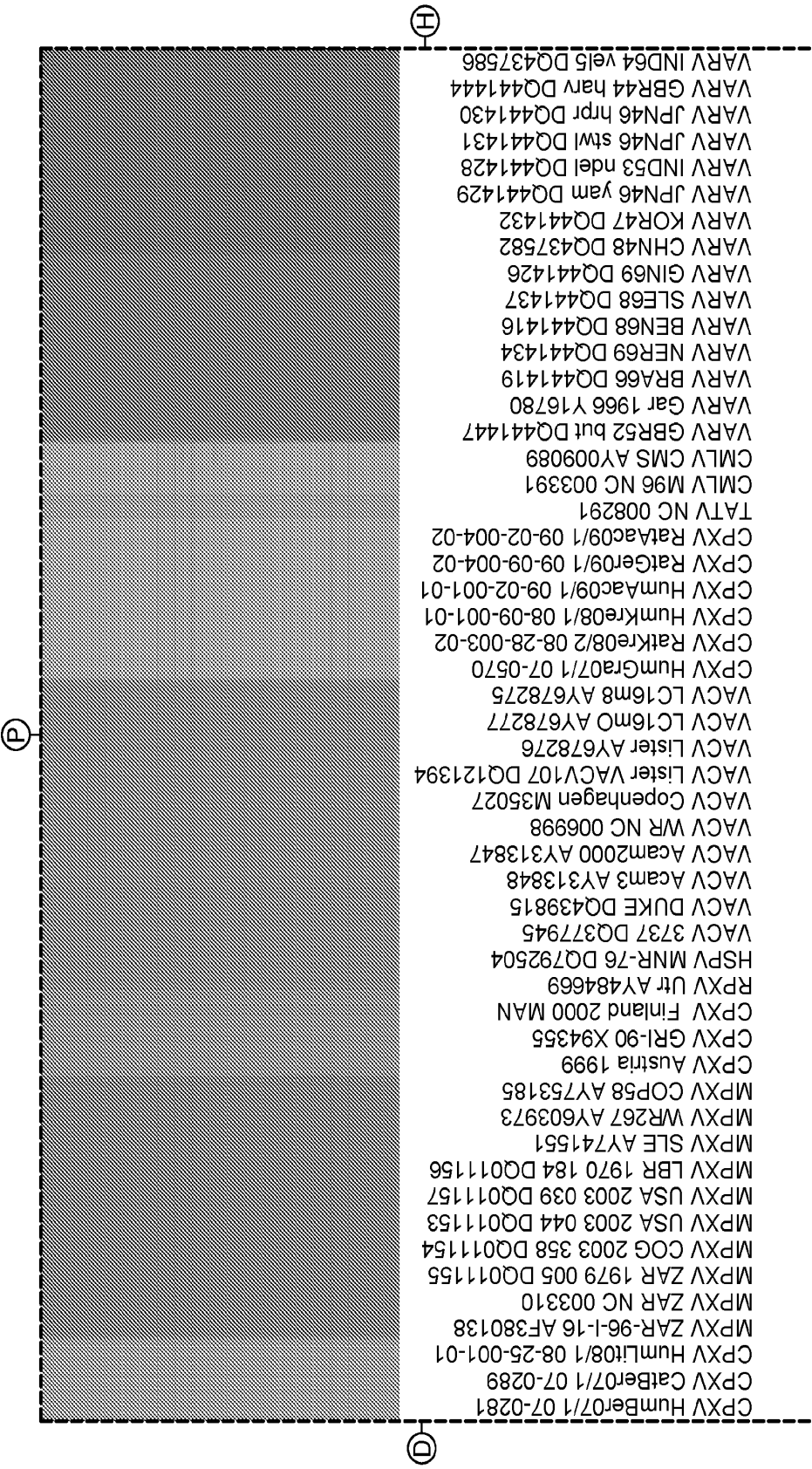


FIG. 2 (Continued)



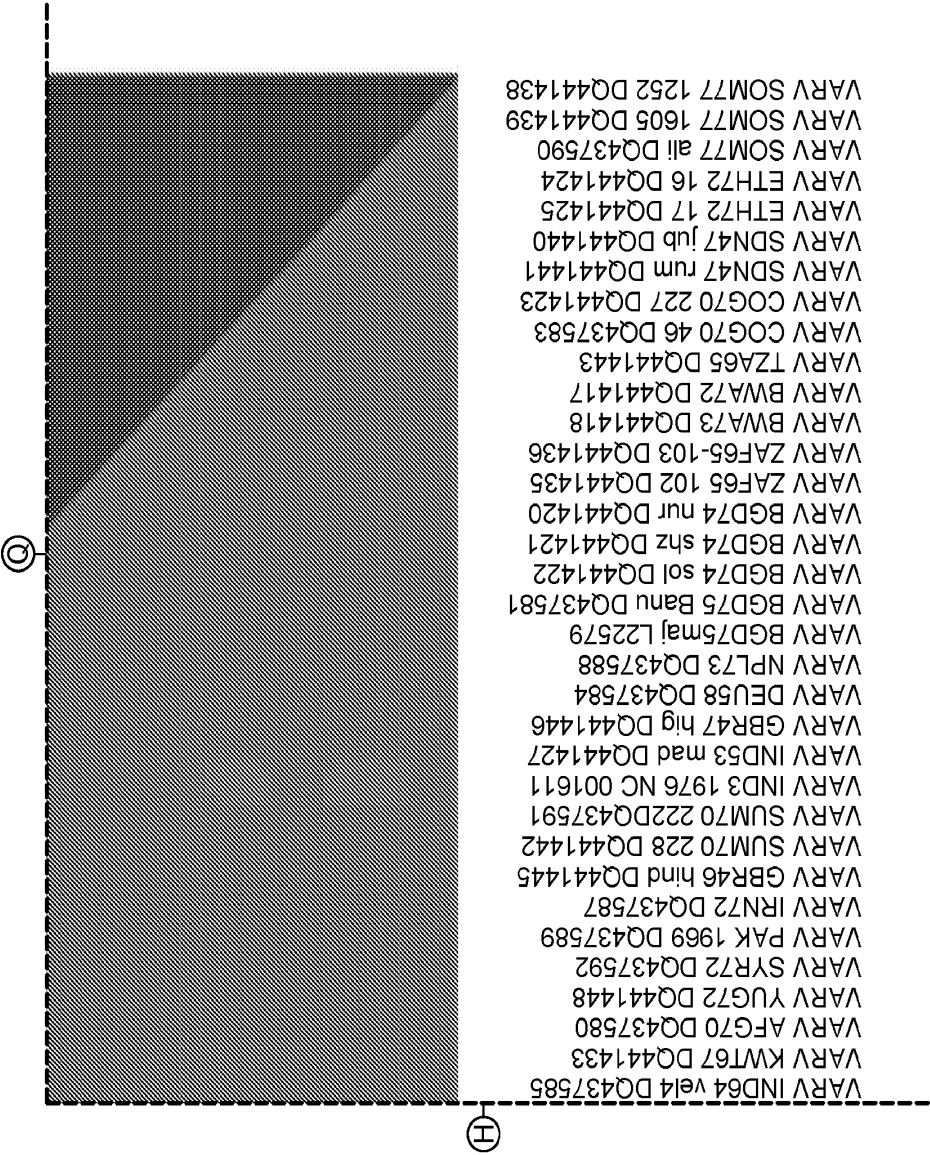


FIG. 2 (Continued)

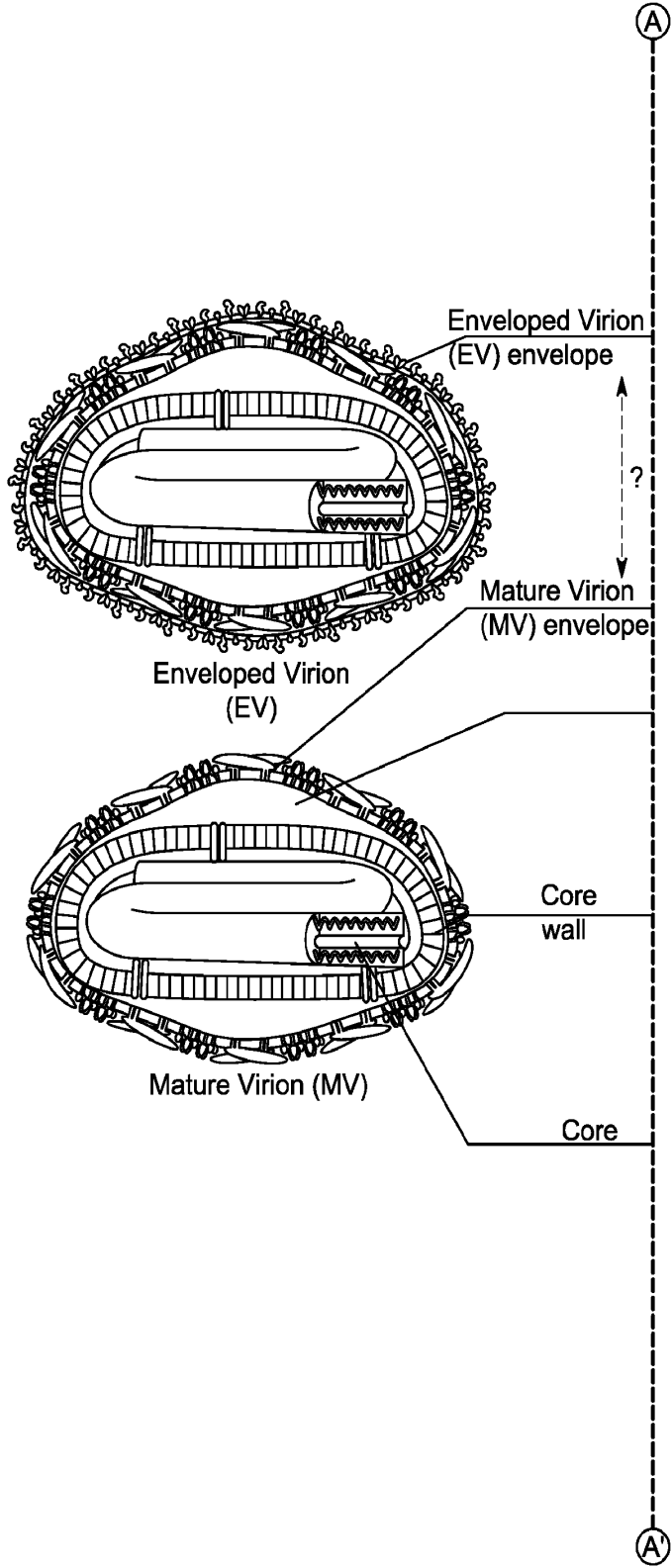


FIG. 3

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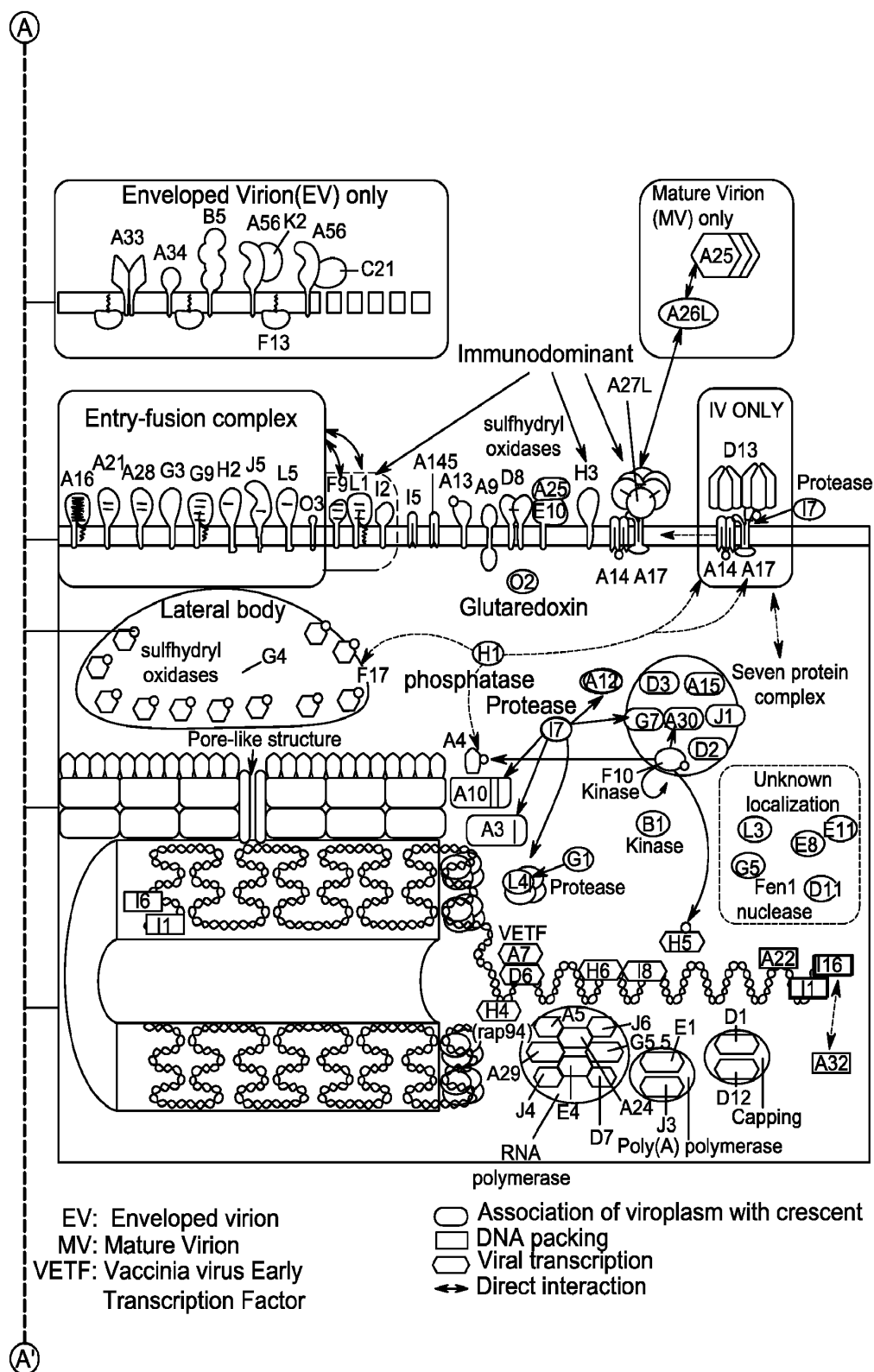


FIG. 3 (Continued)

SUBSTITUTE SHEET (RULE 26)

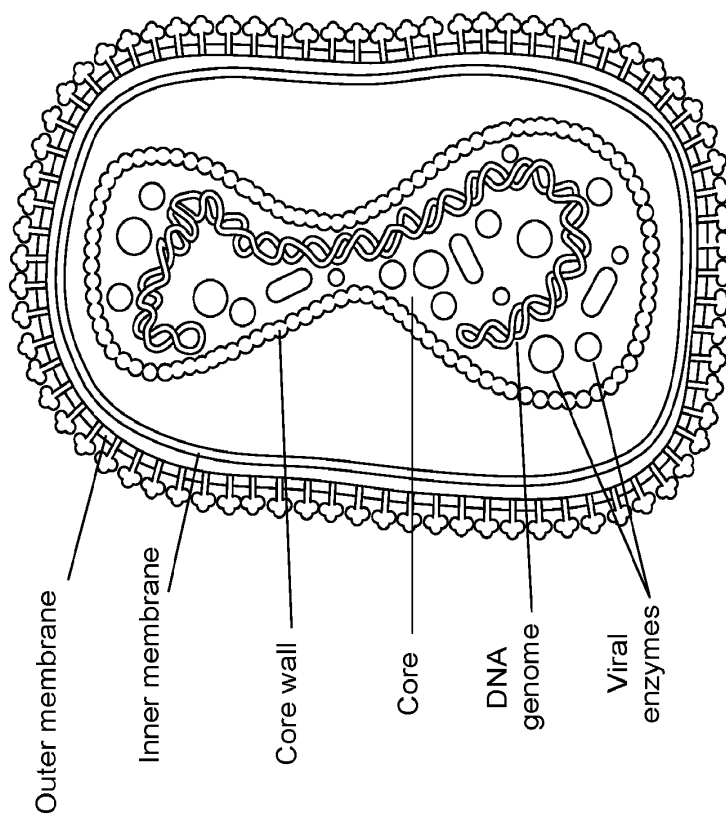
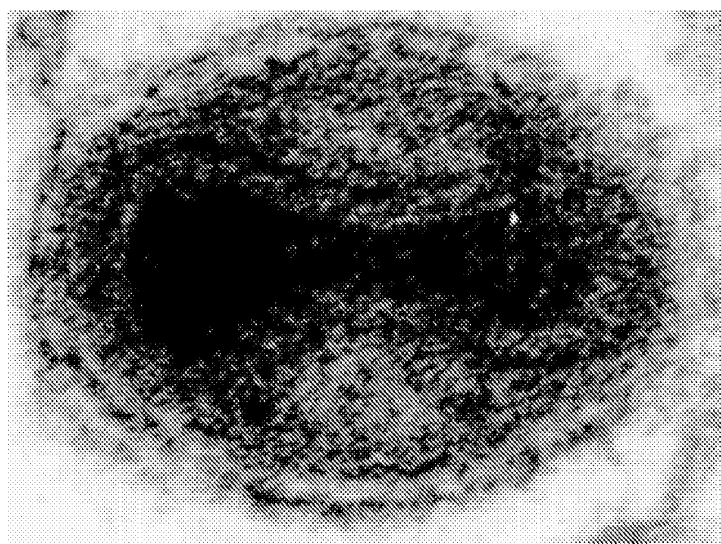


FIG. 4A



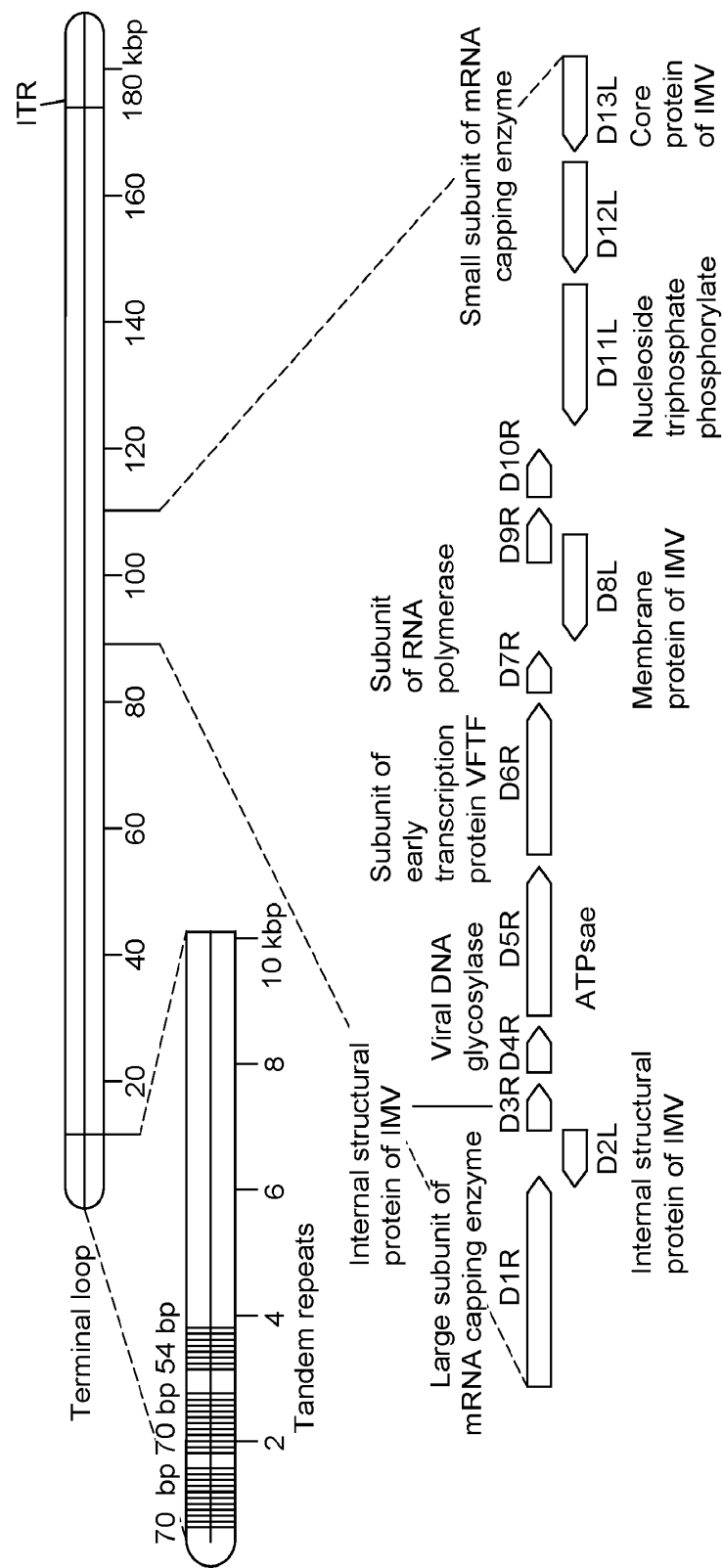


FIG. 4B

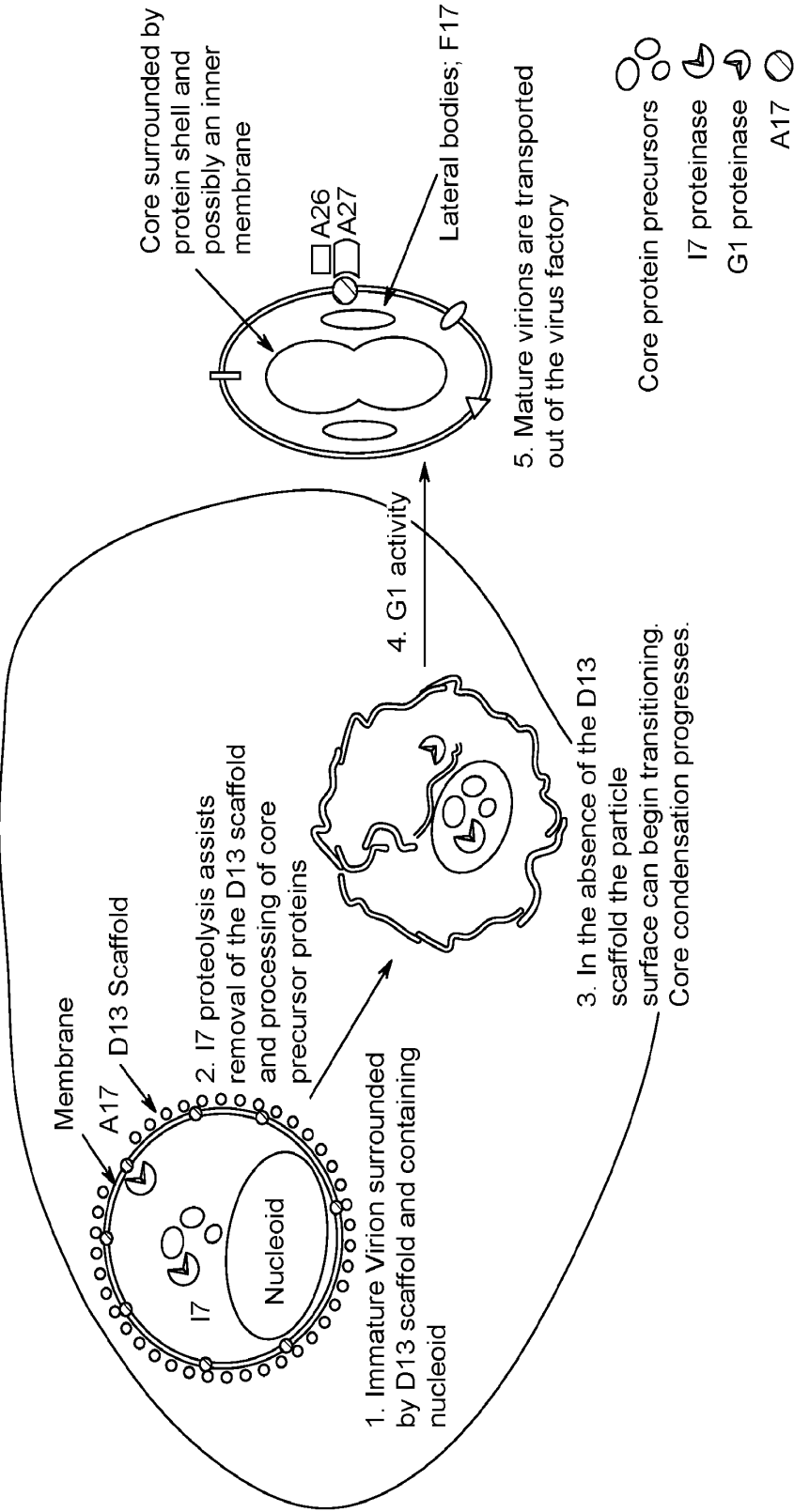


FIG. 5

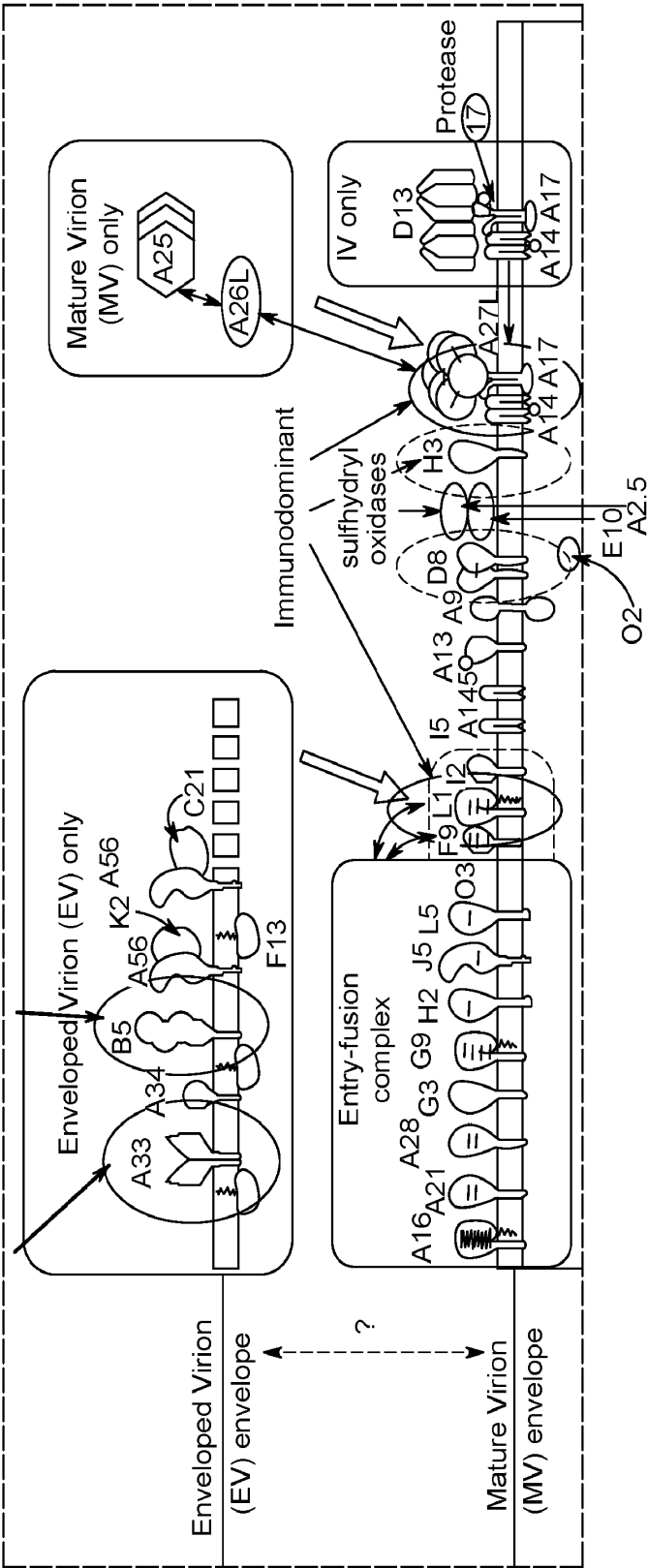


FIG. 6

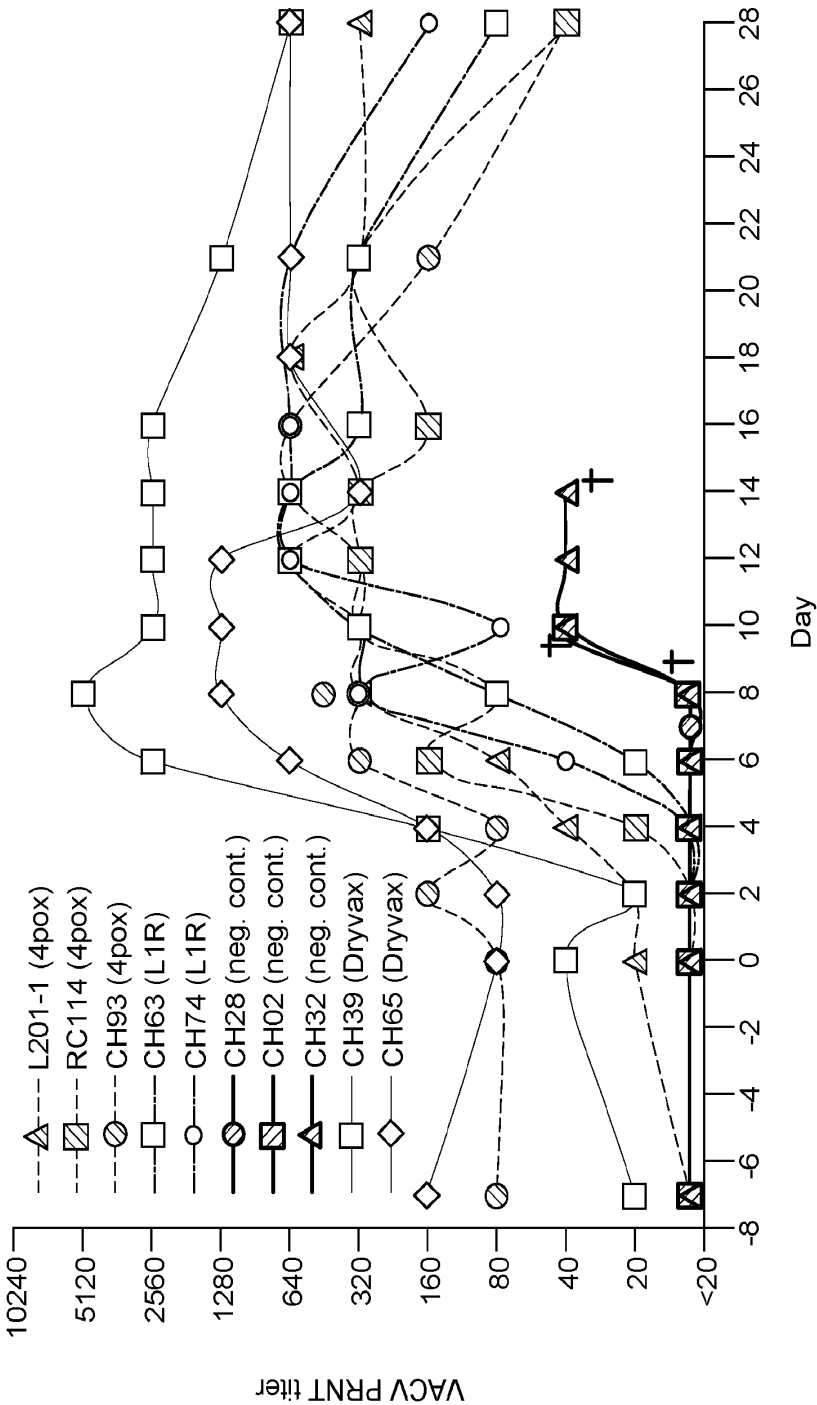


FIG. 7A

TABLE 1. Rhesus macaques used in MPOV i.v. challenge: vaccination history and challenge outcome (Table view)

Process	ID ^a	Sex/wt (kg) ^b	Vaccine ^c	Vaccination (wk)	Challenge (PFU)	Challenge outcome		No. of lesions ^e	Dis Sev
						Initial series	Boost ^d		
Dosing expt	CH42	F/5.8	Neg. cont.	0, 3, 6, 11	5 x 10 ⁸	0	Grave ^f	6	
	CH03	F/4.5	Neg. cont.	0, 3, 6, 11	5 x 10 ⁸	0	Grave ^f	6	
	CH85	F/4.8	Neg. cont.	0, 3, 6, 12	5 x 10 ⁶	198	Severe	Survived	
	CH64	F/5.5	Neg. cont.	0, 3, 6, 12	5 x 10 ⁶	125	Severe	Survived	
Vaccine evaluation 1	L20 1-	M/8.4	4pox DNA	0, 3, 6, 11	2 x 10 ⁷	13	Mild	Survived	
	RC114	F/4.0	4pox DNA	0, 3, 6, 12	2 x 10 ⁷	30	Moderate	Survived	
	CH93	F/4.1	4pox DNA	0, 3, 6, 12	2 x 10 ⁷	1	Mild	Survived	
	CH63	F/4.0	L1R DNA	0, 3, 6, 12	2 x 10 ⁷	100	Severe	Survived	
	CH74	F/4.5	L1R DNA	0, 3, 6, 12	2 x 10 ⁷	212	Severe	Survived	
	CH28	F/5.3	Neg. cont.	0, 3, 6, 11	2 x 10 ⁷	TNTC	Grave ^g	7	

(A)

FIG. 7B

(A')

(A')

(A)

CH02	F/4.7	Neg. cont.	0, 3, 6, 11	59	2 x 10 ⁷	TNTC	Grave	10
CH32	F/4.5	Neg. cont.	0, 3, 6, 11	ND	2 x 10 ⁷	TNTC	Grave	14
CH39	F/4.1	Dryvax	0	ND	2 x 10 ⁷	0	No disease	Survived
CH65	F/3.8	Dryvax	0	ND	2 x 10 ⁷	0	No disease	Survived



- a ID, monkey identification number
- b F, female; M, male.
- c Neg. cont., negative control DNA vaccine
- d ND, not done.
- e TNTC, too numerous to count.
- f Hemorrhagic monkeypox.
- g Hemorrhagic monkeypox Progressing to disseminated exanthem.

FIG. 7B (Continued)

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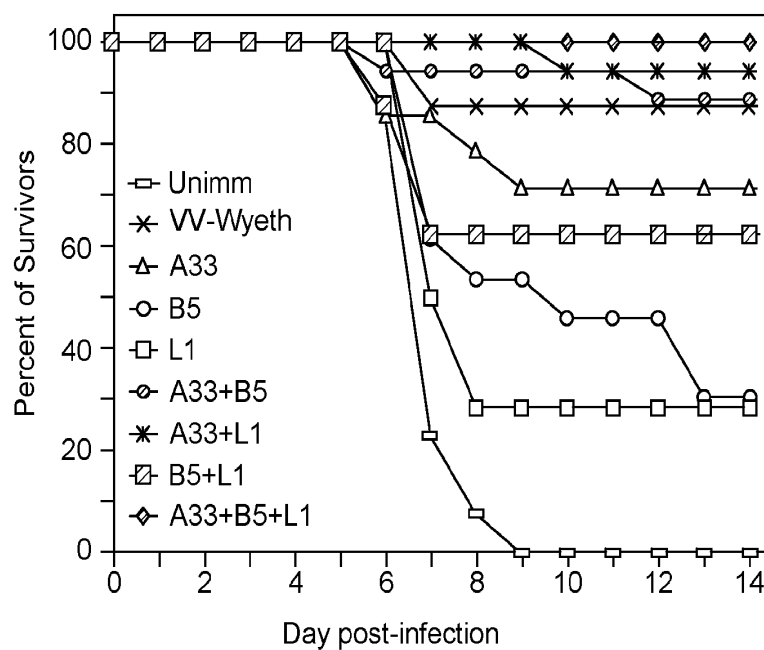


FIG. 8A

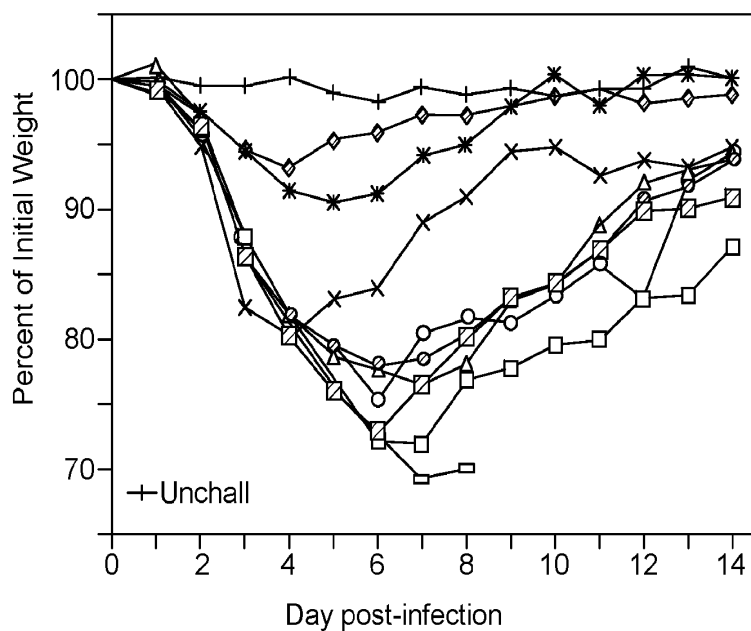


FIG. 8B

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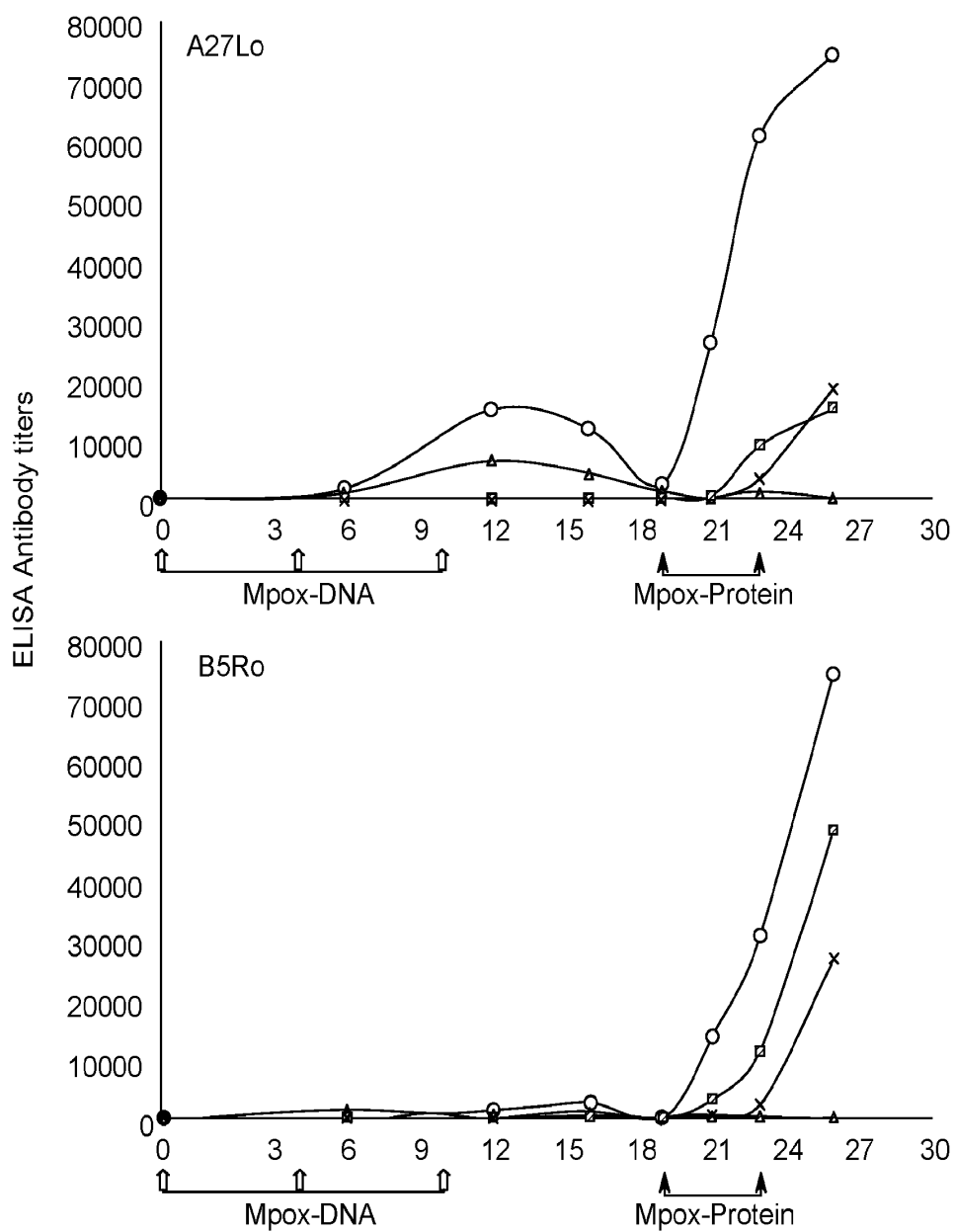


FIG. 9A

SUBSTITUTE SHEET (RULE 26)

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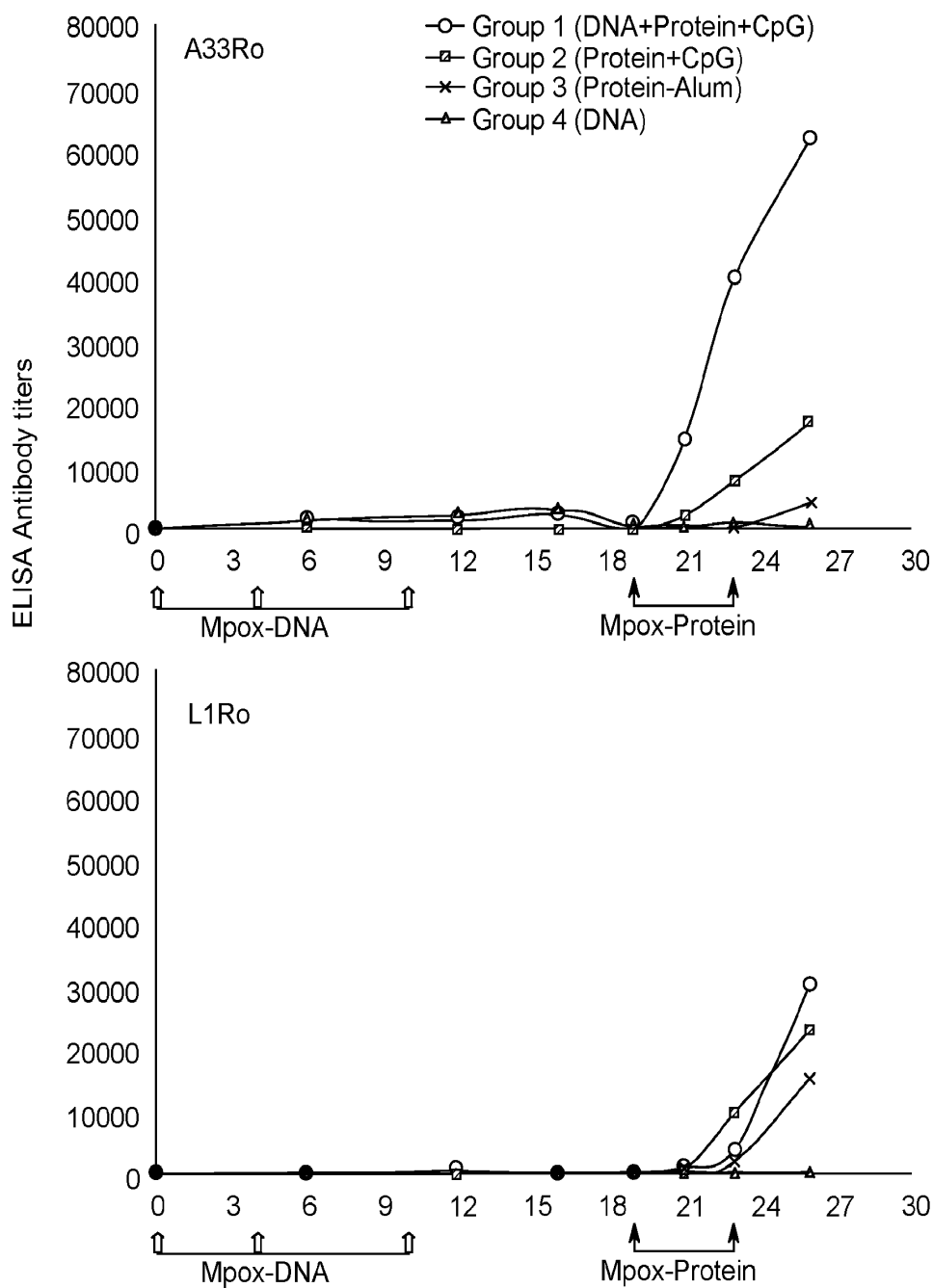


FIG. 9B

SUBSTITUTE SHEET (RULE 26)

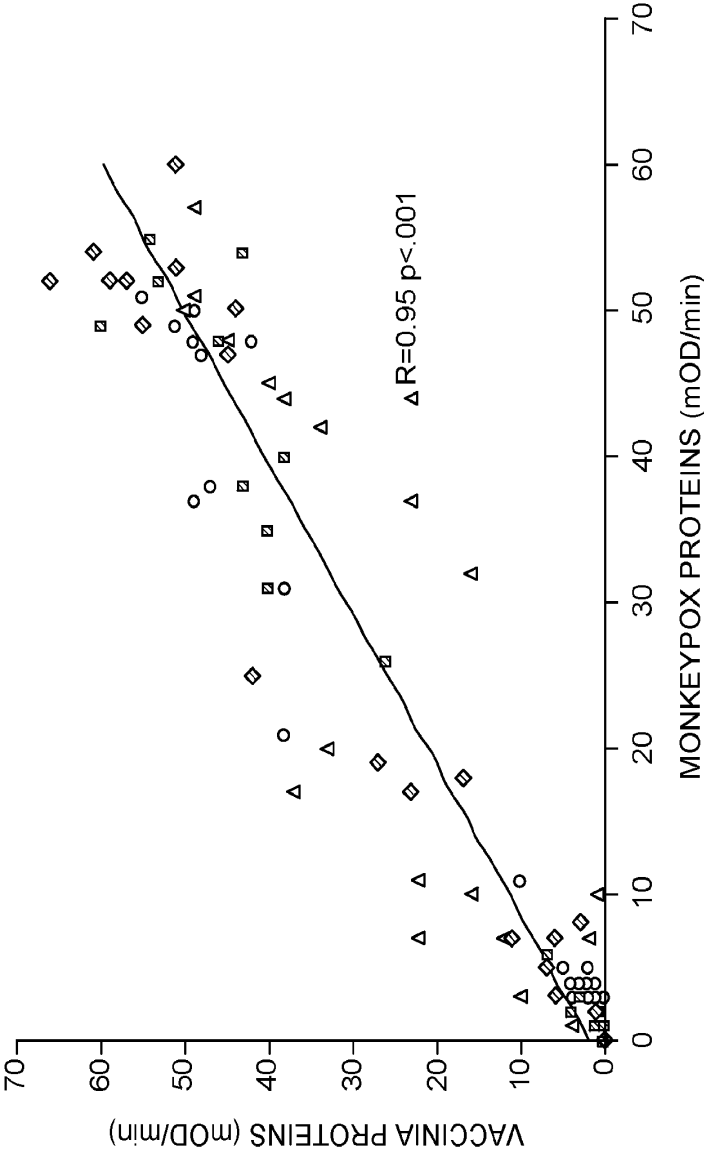


FIG. 9C

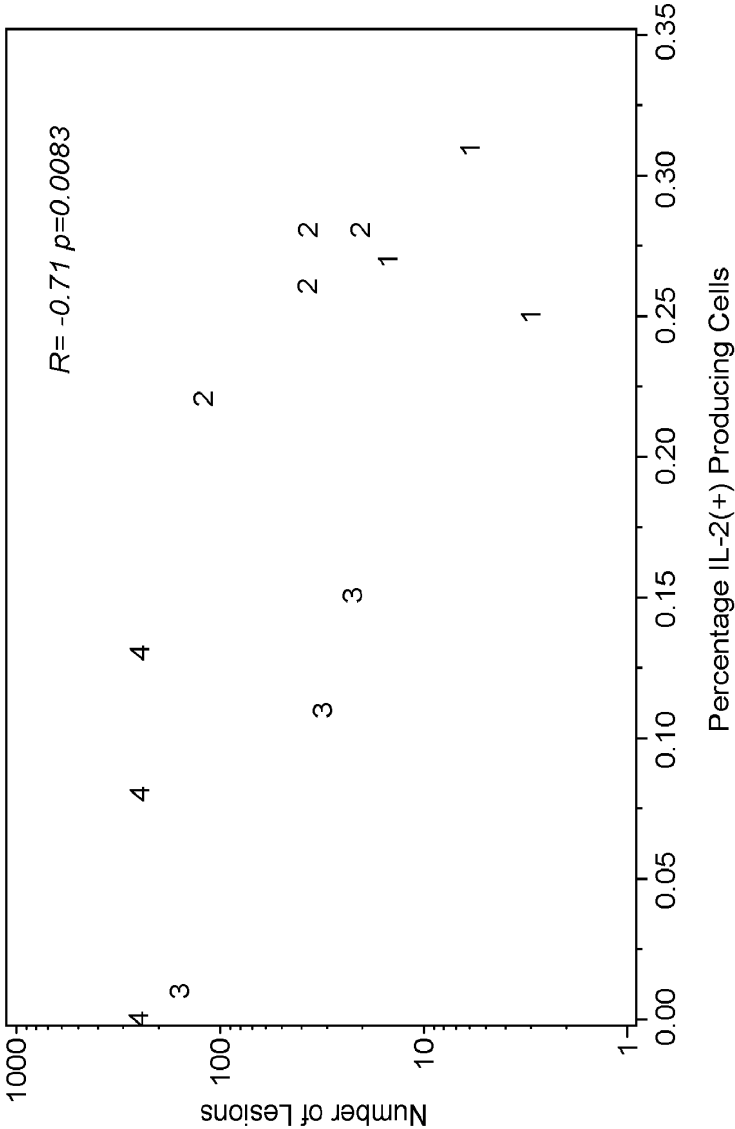


FIG. 10A

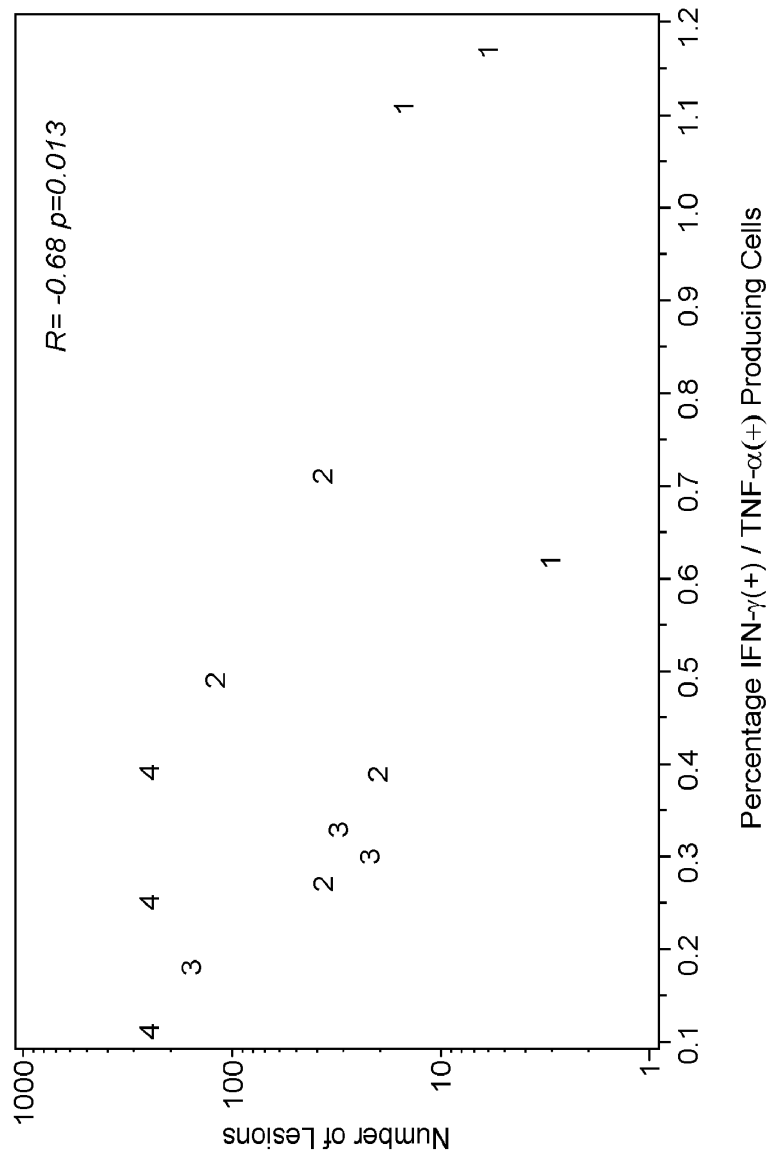


FIG. 10B

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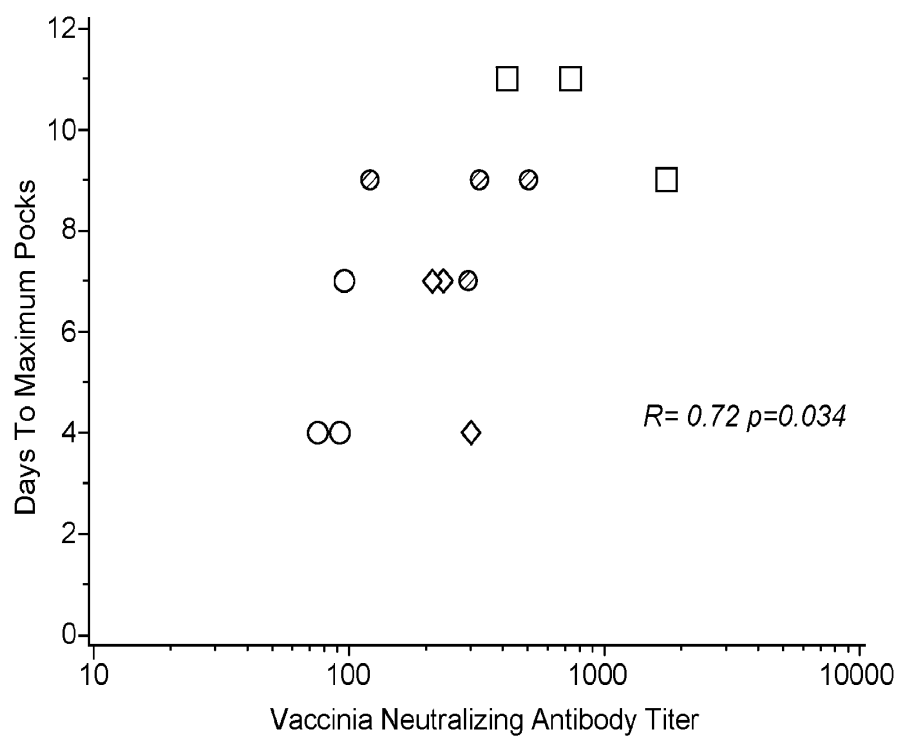


FIG. 10C

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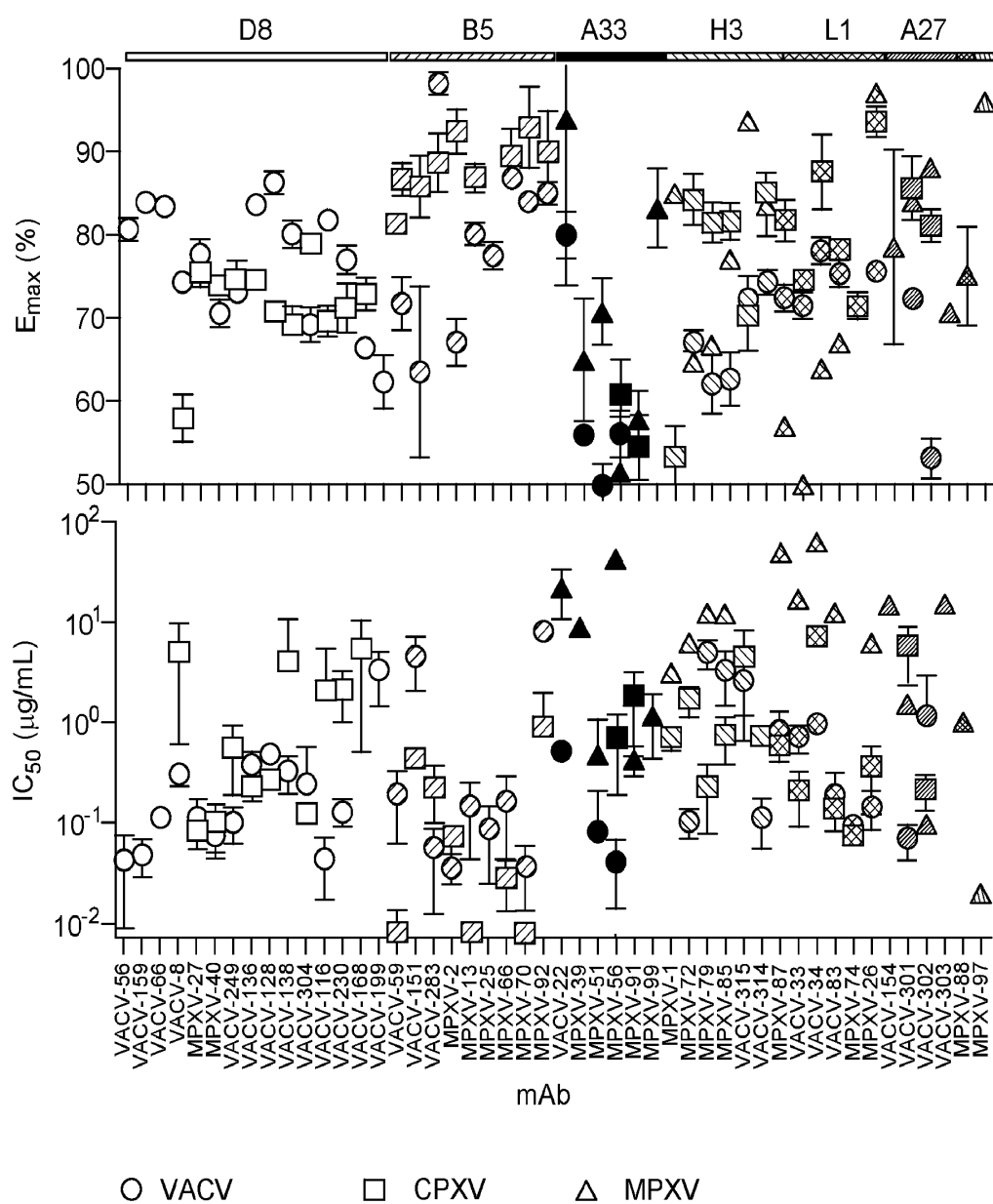


FIG. 11

SUBSTITUTE SHEET (RULE 26)

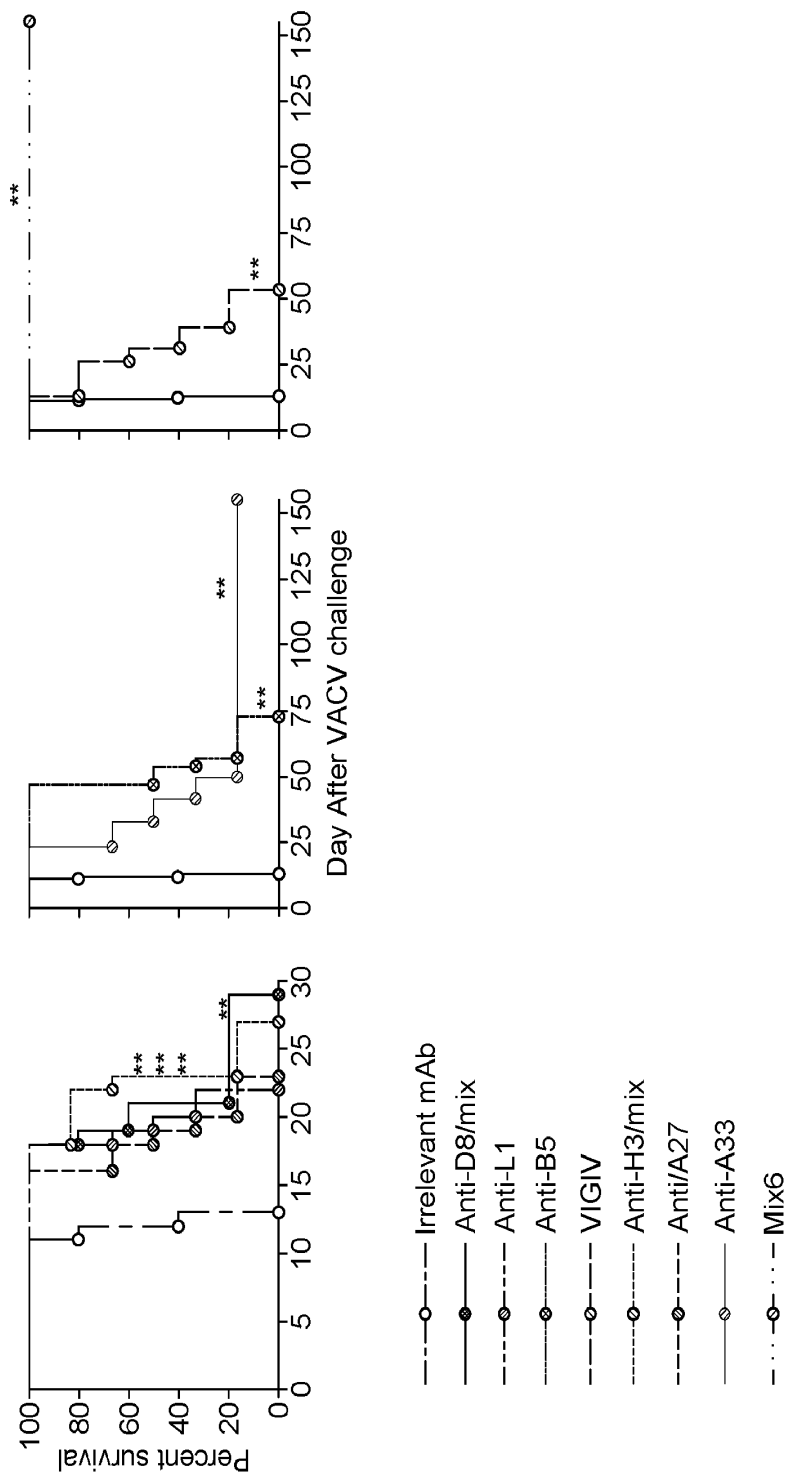


FIG. 12

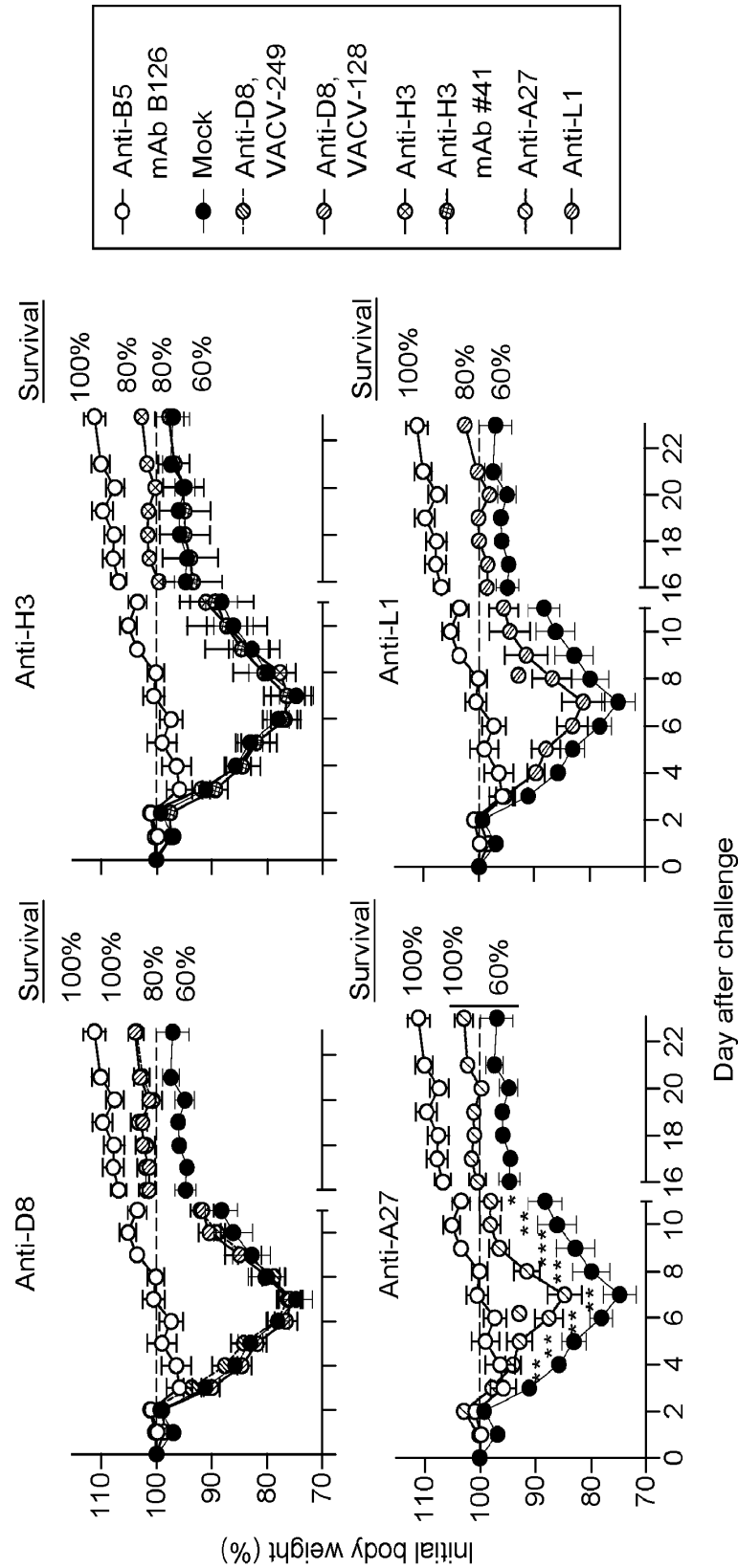


FIG. 13A

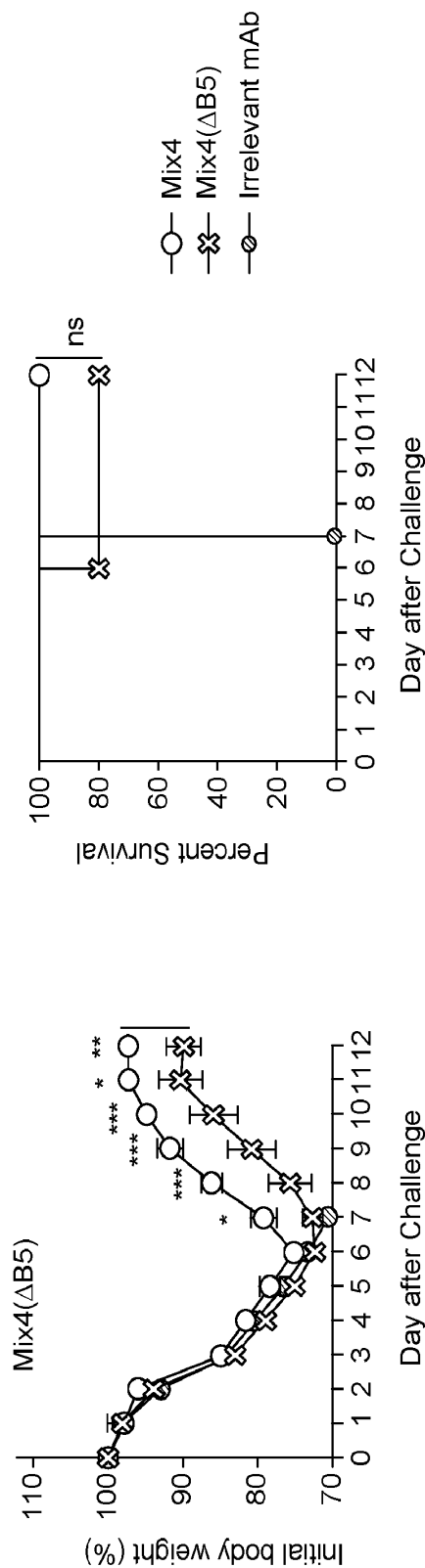


FIG. 13B

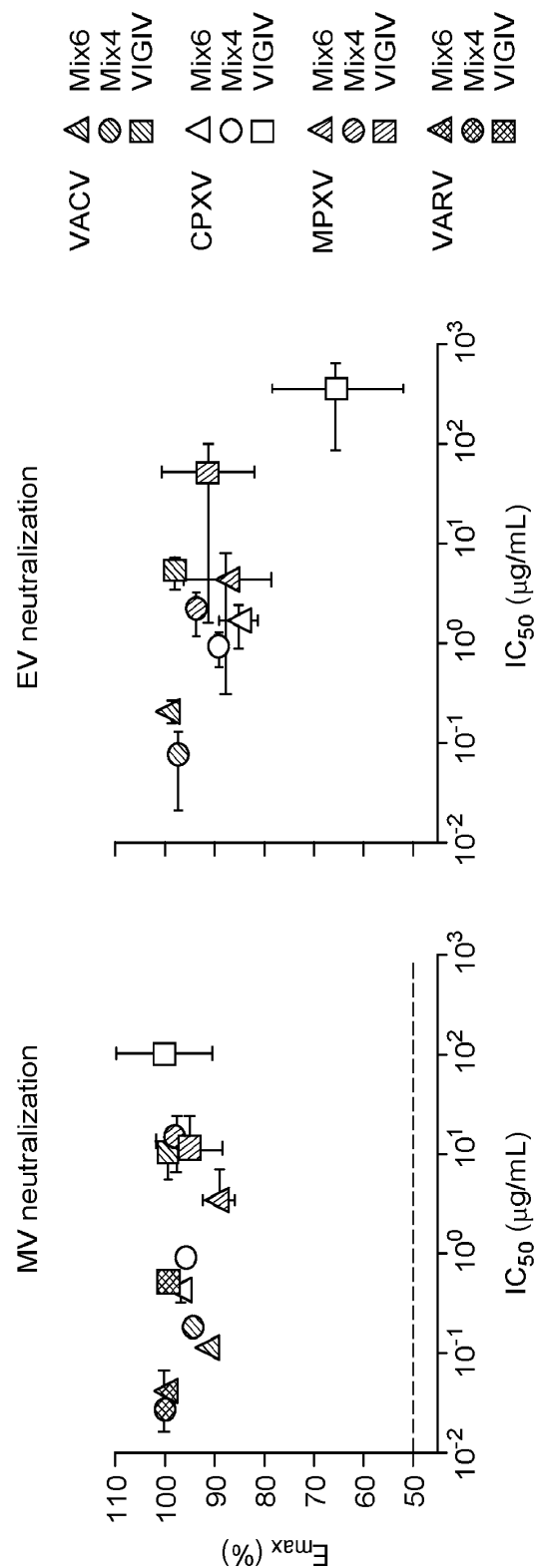


FIG. 14

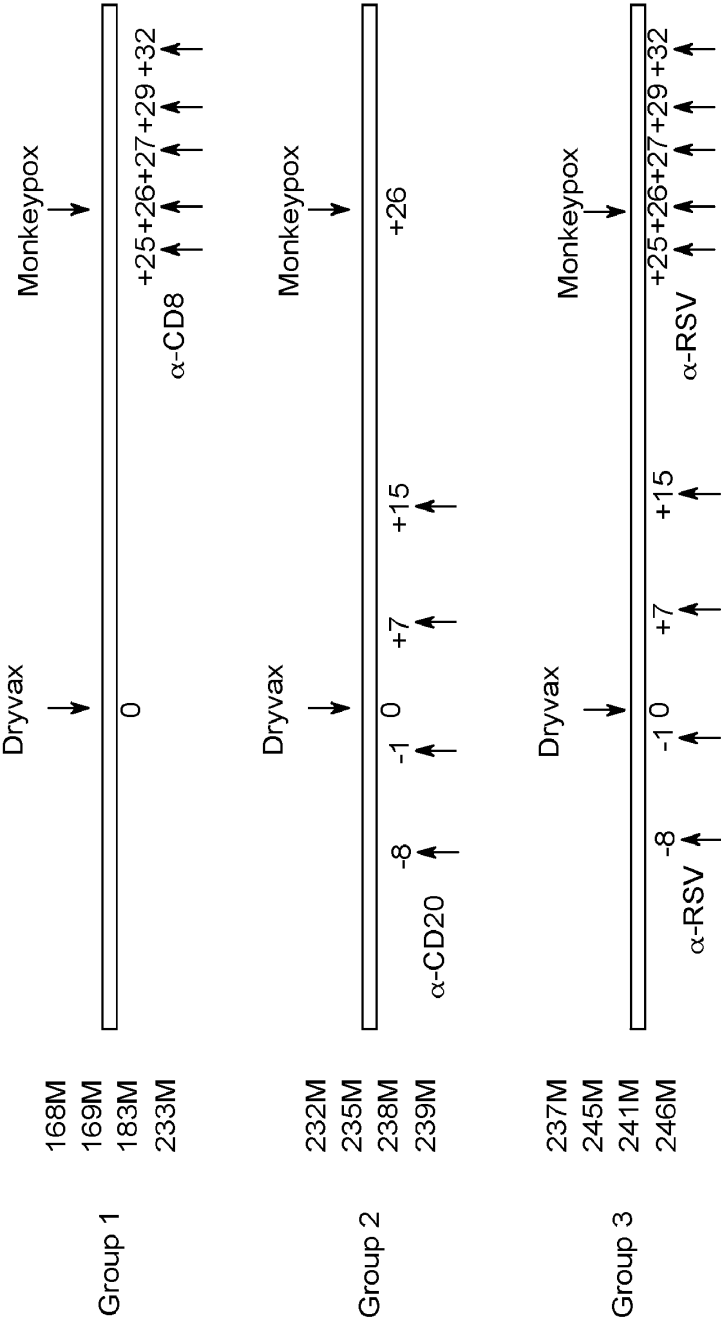


FIG. 15

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Macaque	Treatment	Antibodies to vaccinia titer		Monkeypox virus genomes/ml blood, log 10					Skin pocks
		Neutralizing	ELISA ^a	3 min after challenge	Day 2	Day 5	Day 8-10	Day 13	Day 17
Group 1	cM-T807(α -CD8)								
168M	Dryvax	1:891	≥12,800	6.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6
169M	Dryvax	1:376	3,200	6.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6
183M	Dryvax	1:735	≥12,800	5.9	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6
233M	Dryvax	1:3,548	6,400	6.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6
Group 2	Rituxan(α -CD20)								
232M	Dryvax	1:42	<	6.6	< 3.6	5.6	7.4	Dead	Innumerable
235M	Dryvax	1:35	<	6.8	< 3.6	5	7.9	Dead	Innumerable
238M	Dryvax	1:56	1,600	7	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6
239M	Dryvax	1:59	<	6.6	< 3.6	5	7.6	Dead	Innumerable
Group 3	Synagis(α -RSV) or saline								
237M	Dryvax	1:2,963	6,400	6.9	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6
245M	Dryvax	1:885	3,200	5.3	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6
241M	Dryvax	1:614	800	6.7	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6
246M	Dryvax	1:268	1,600	6.3	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6

FIG. 16

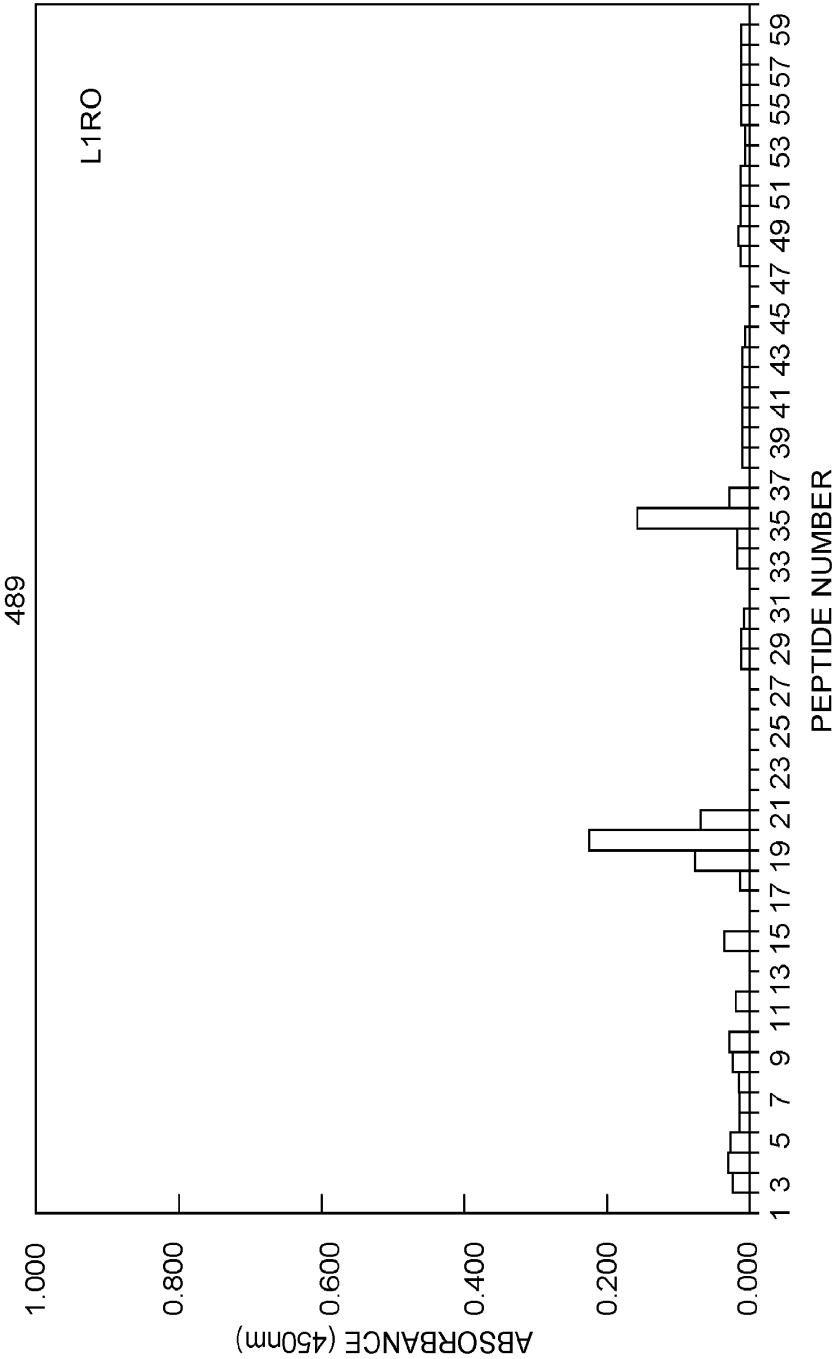


FIG. 17A

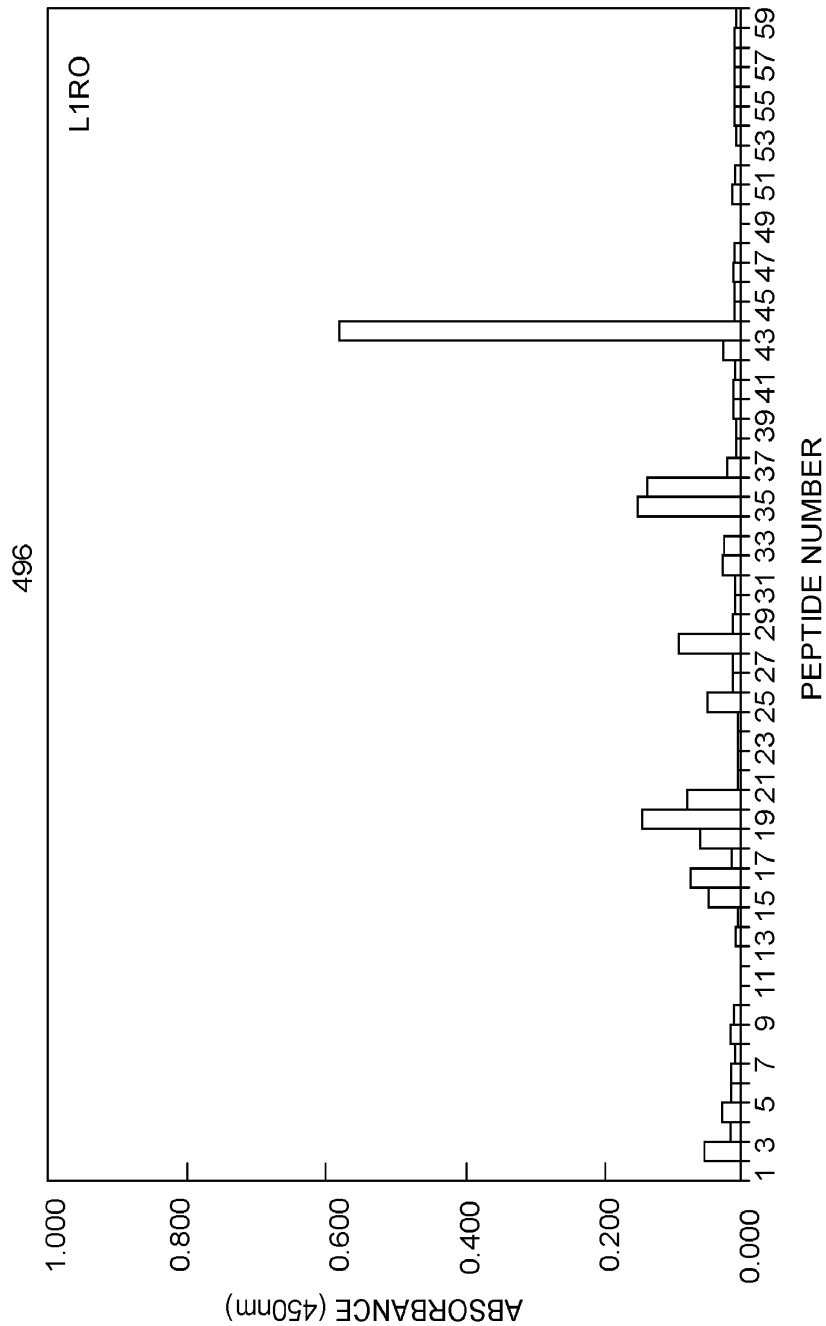


FIG. 17B

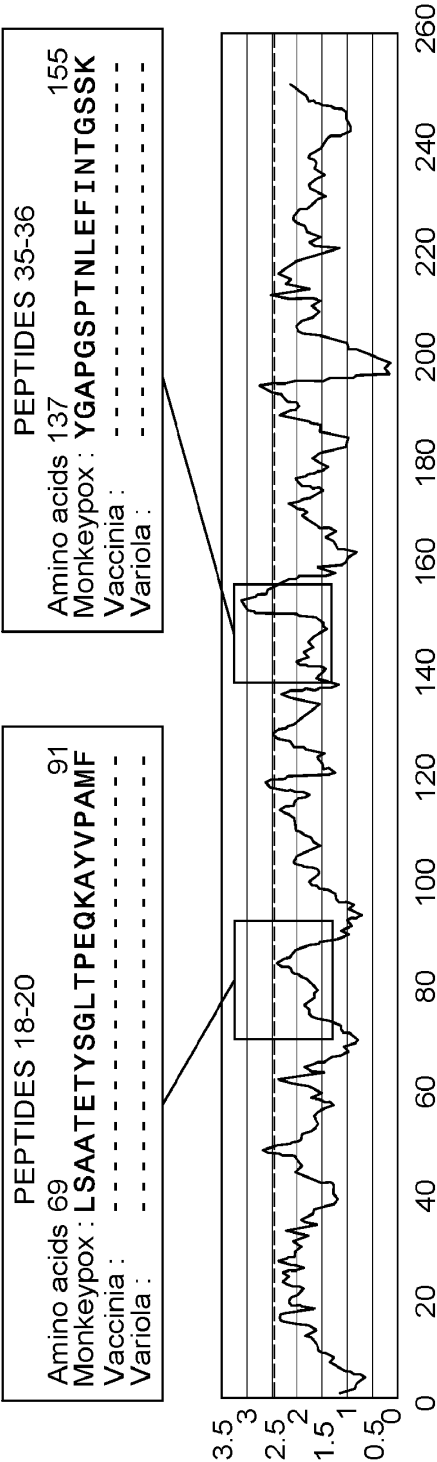


FIG. 17C

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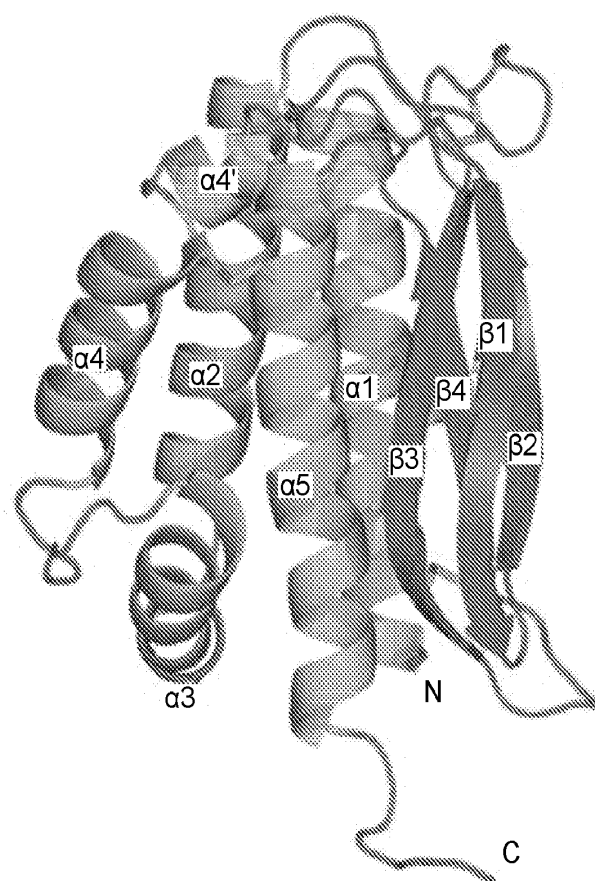


FIG. 18A

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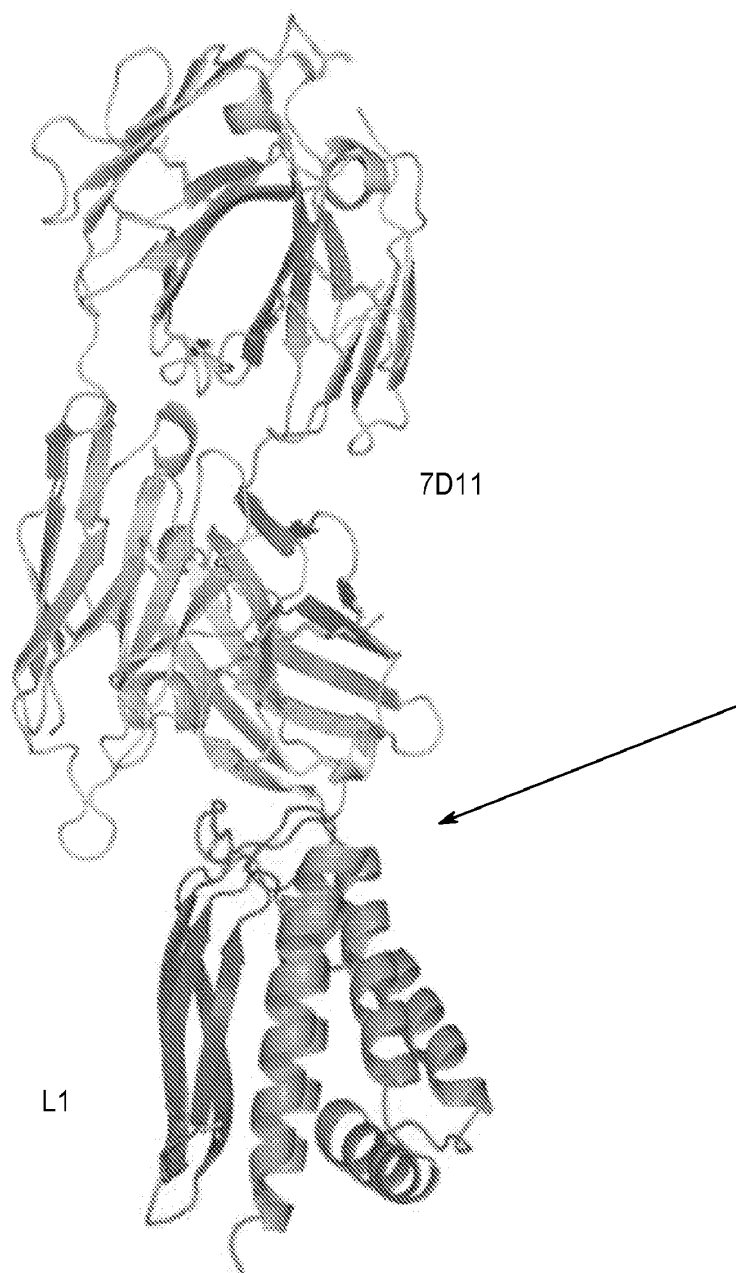


FIG. 18B

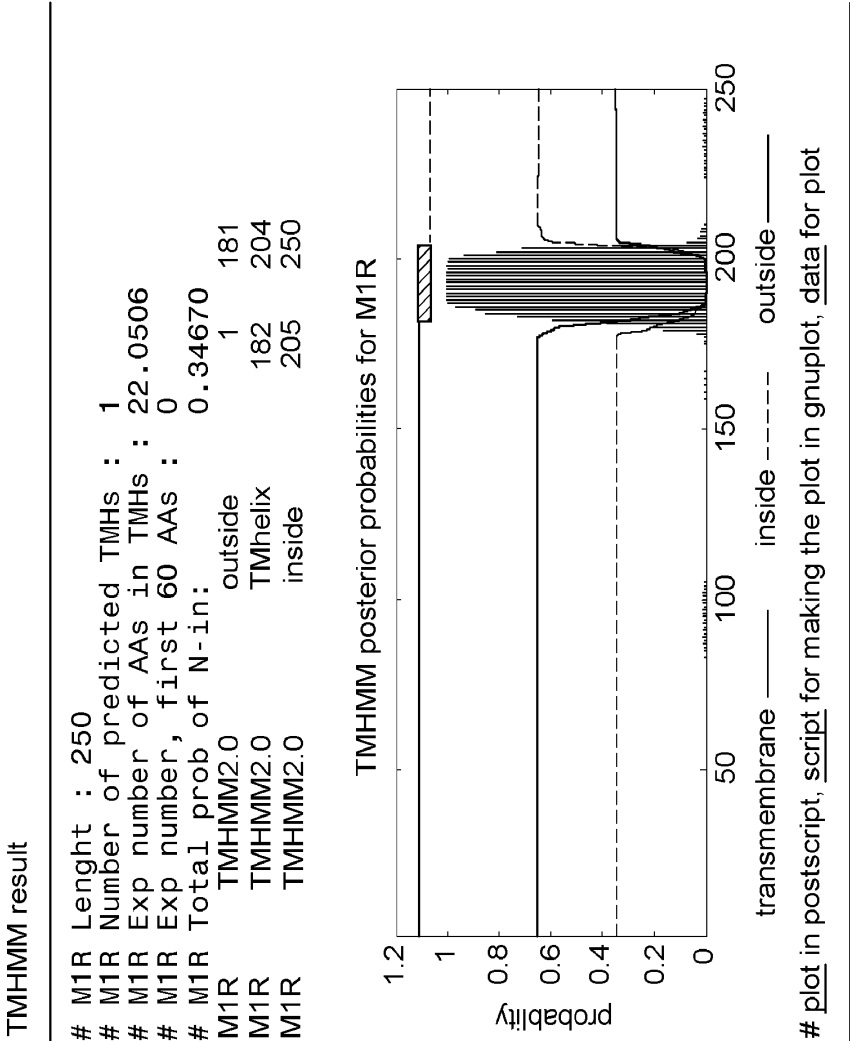


FIG. 19

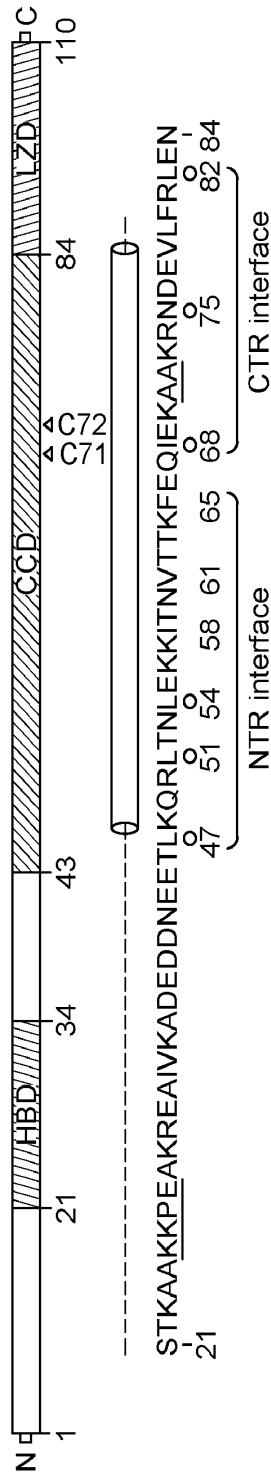


FIG. 20A

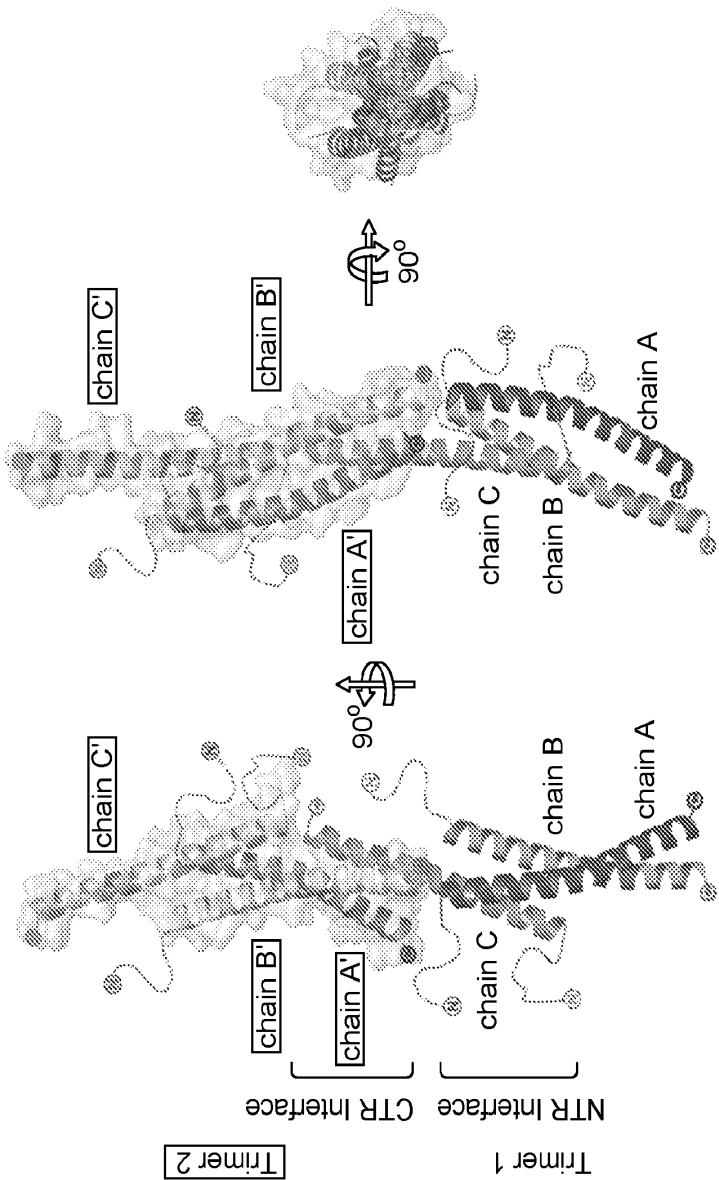


FIG. 20B

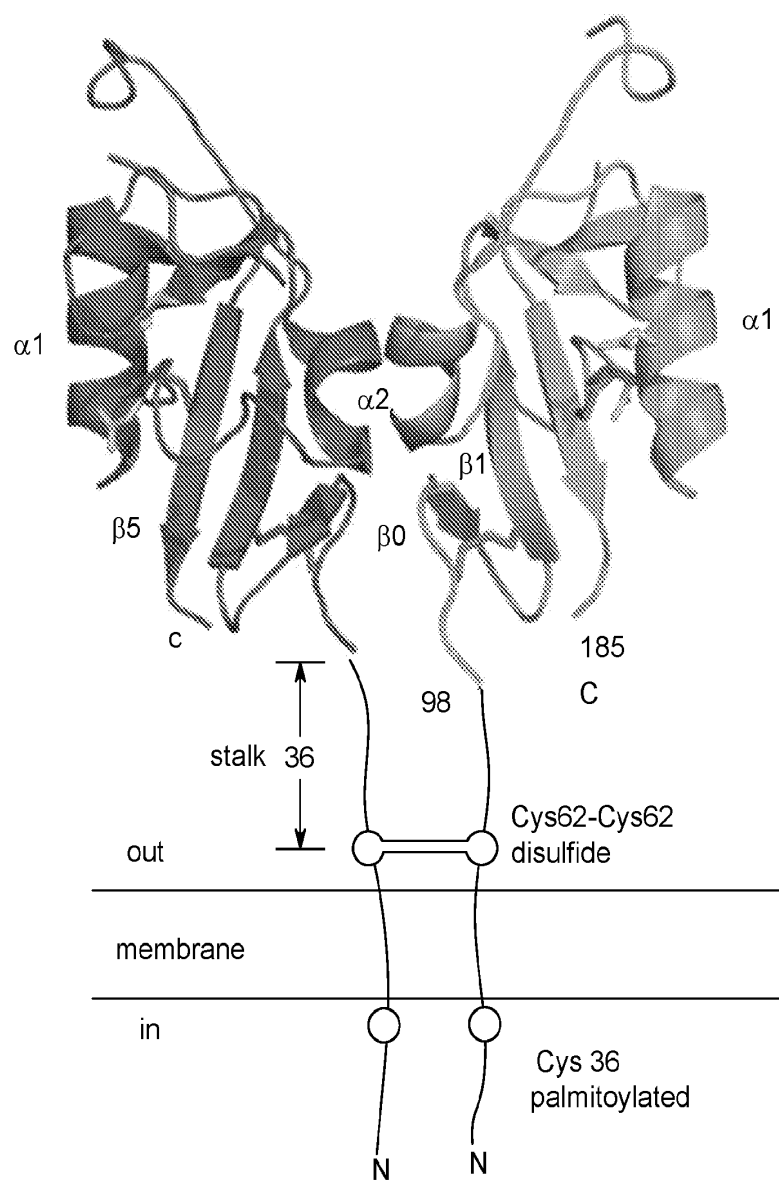


FIG. 21A

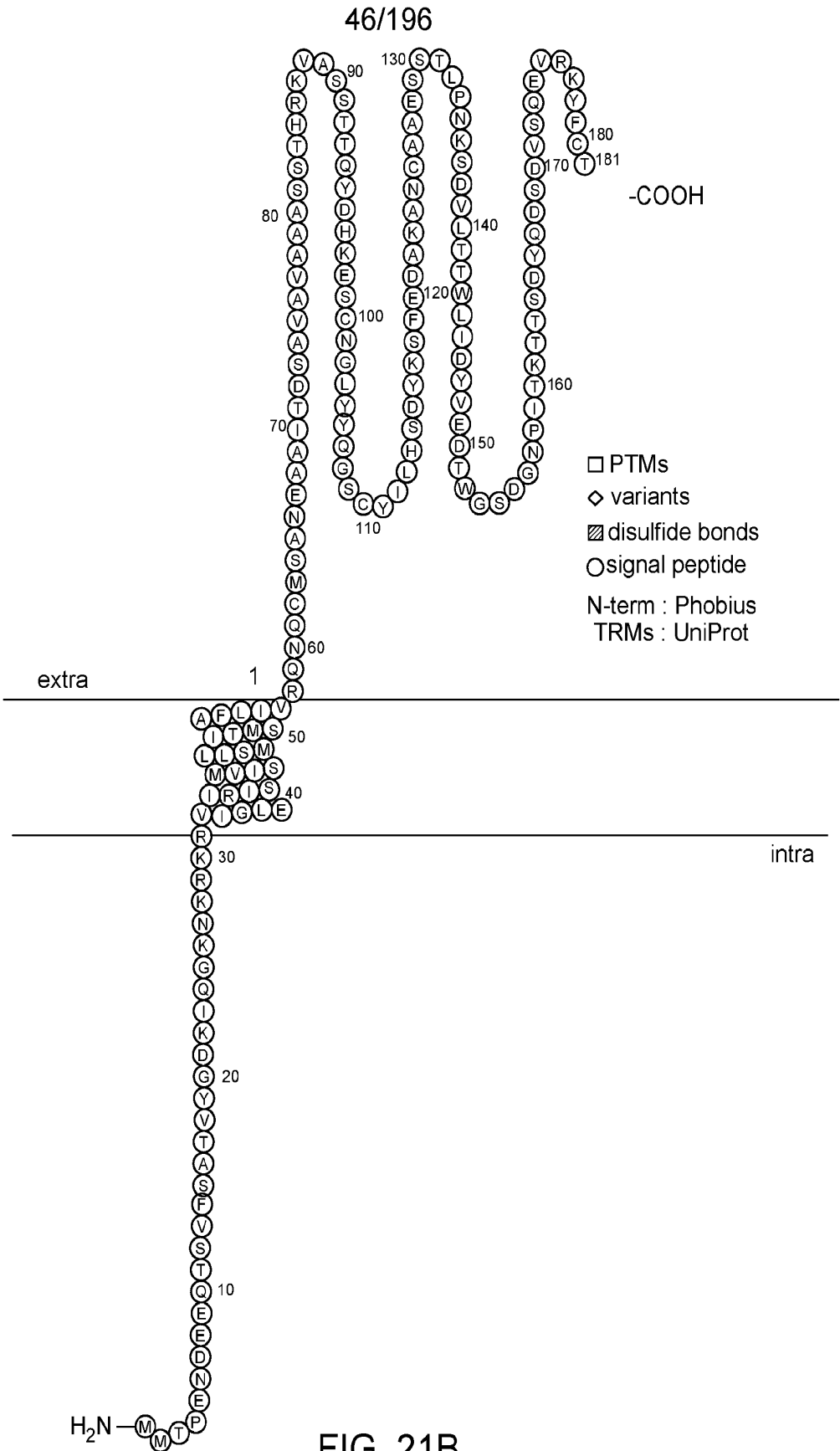


FIG. 21B
SUBSTITUTE SHEET (RULE 26)

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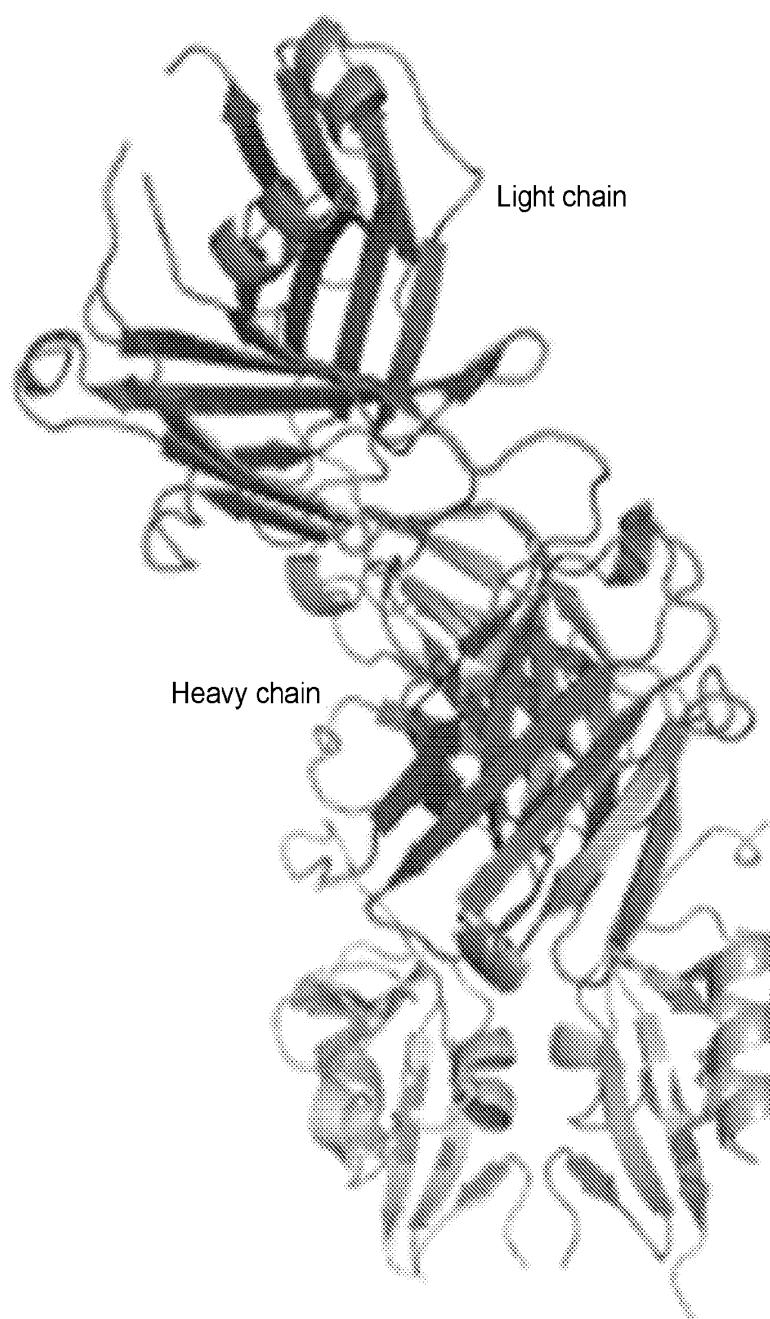


FIG. 21C

SUBSTITUTE SHEET (RULE 26)

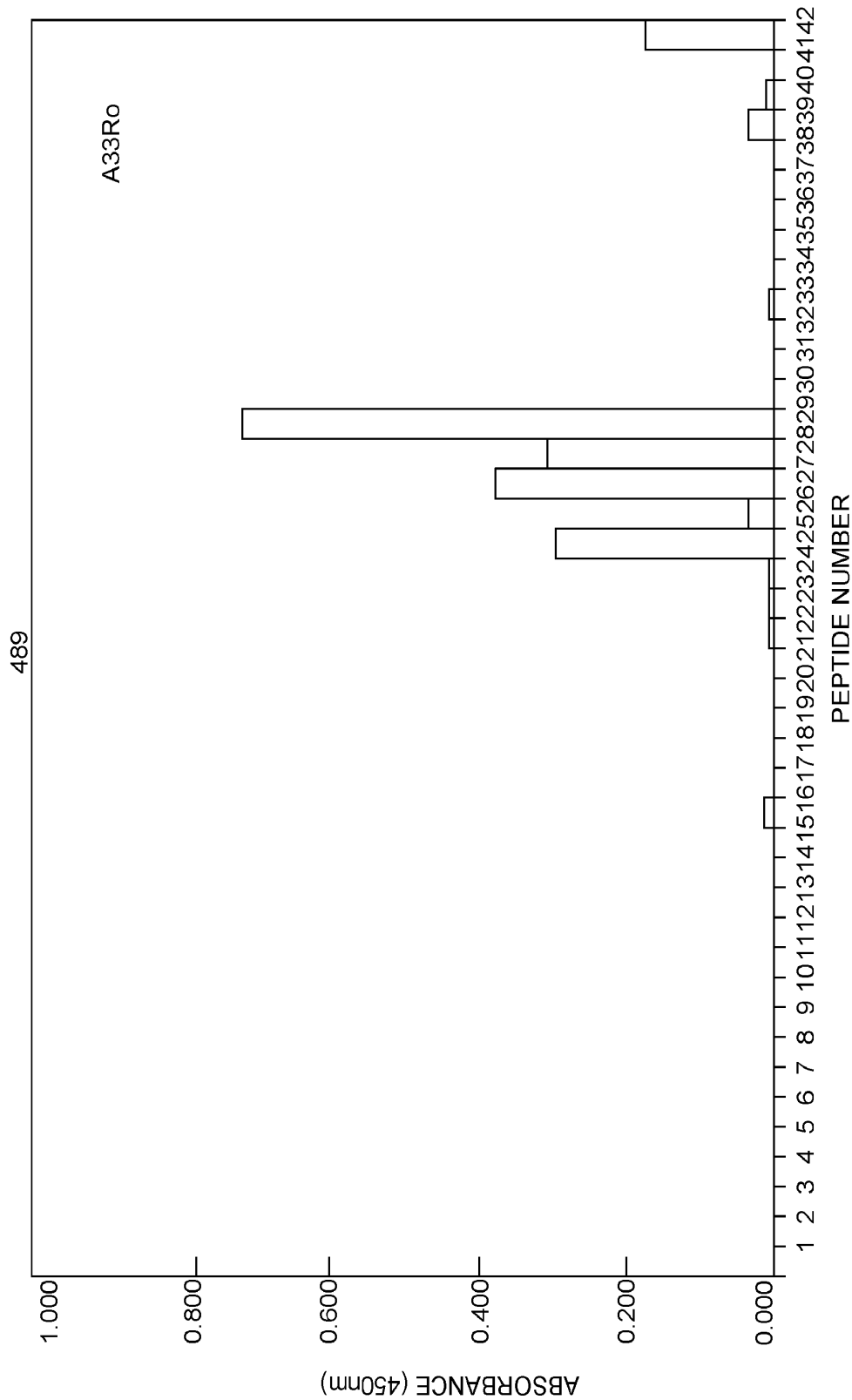


FIG. 22A

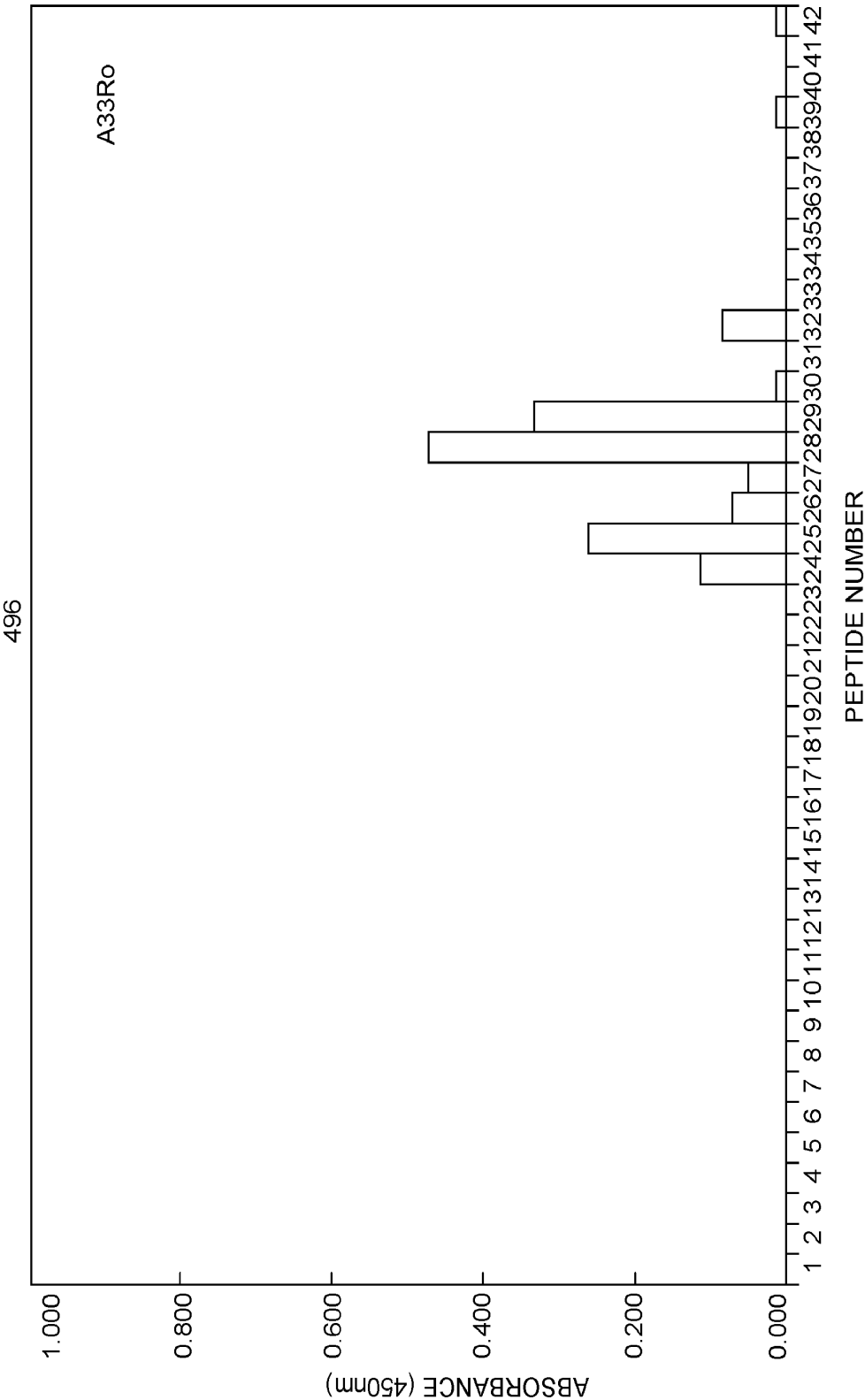


FIG. 22B

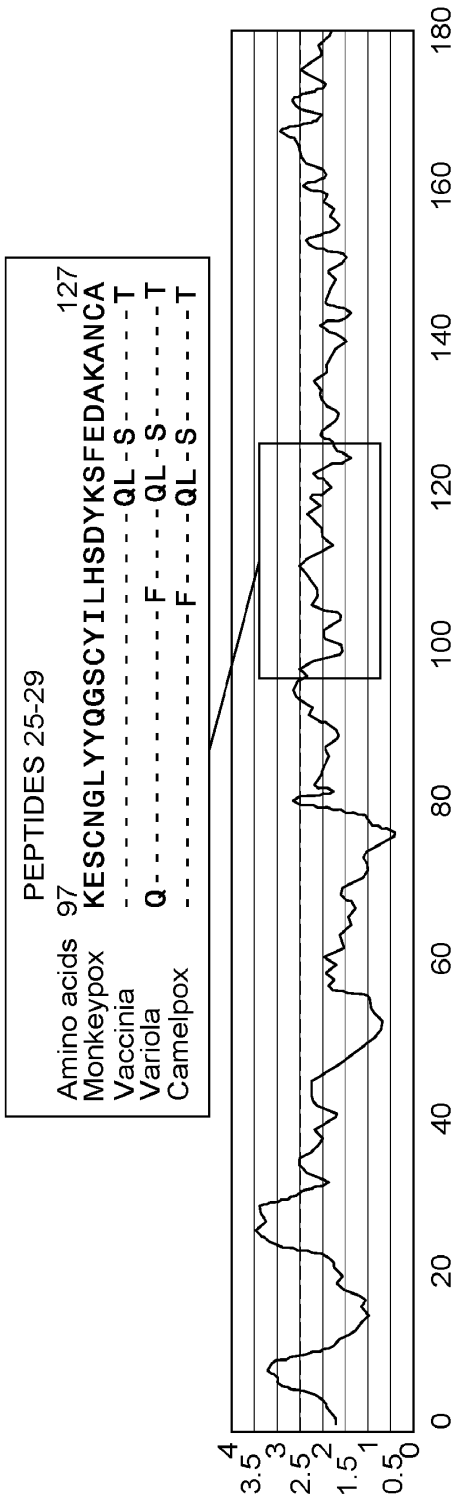


FIG. 22C

□ PTMs
 ◇ variants
 ▨ disulfide bonds
 ○ signal peptide
 N-term : Phobius
 TRMs : UniProt

SUBSTITUTE SHEET (RULE 26)

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FIG. 23B

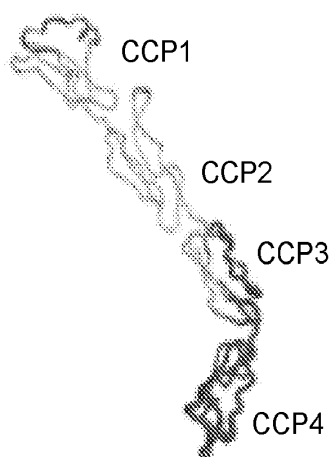


FIG. 23C

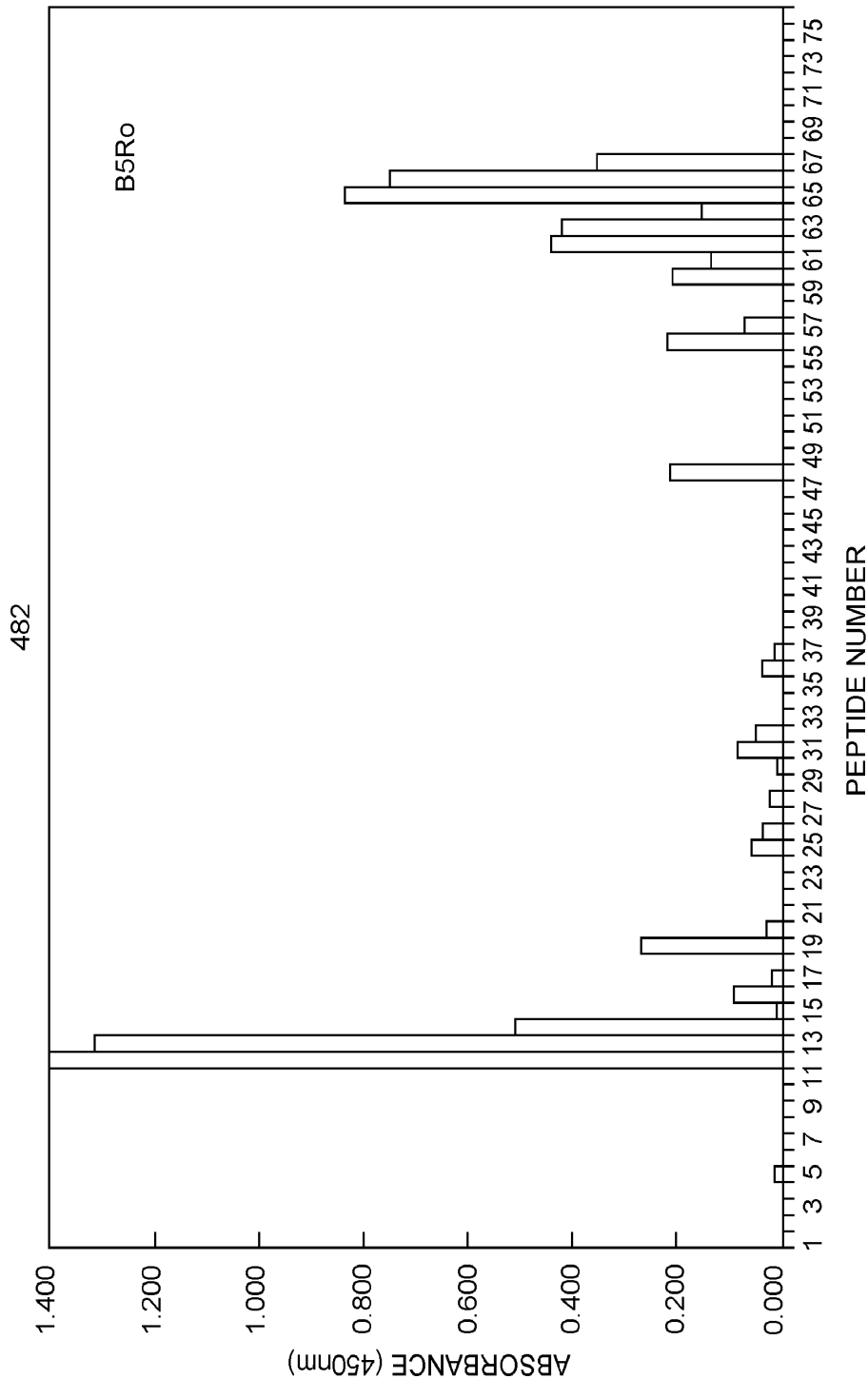


FIG. 24A

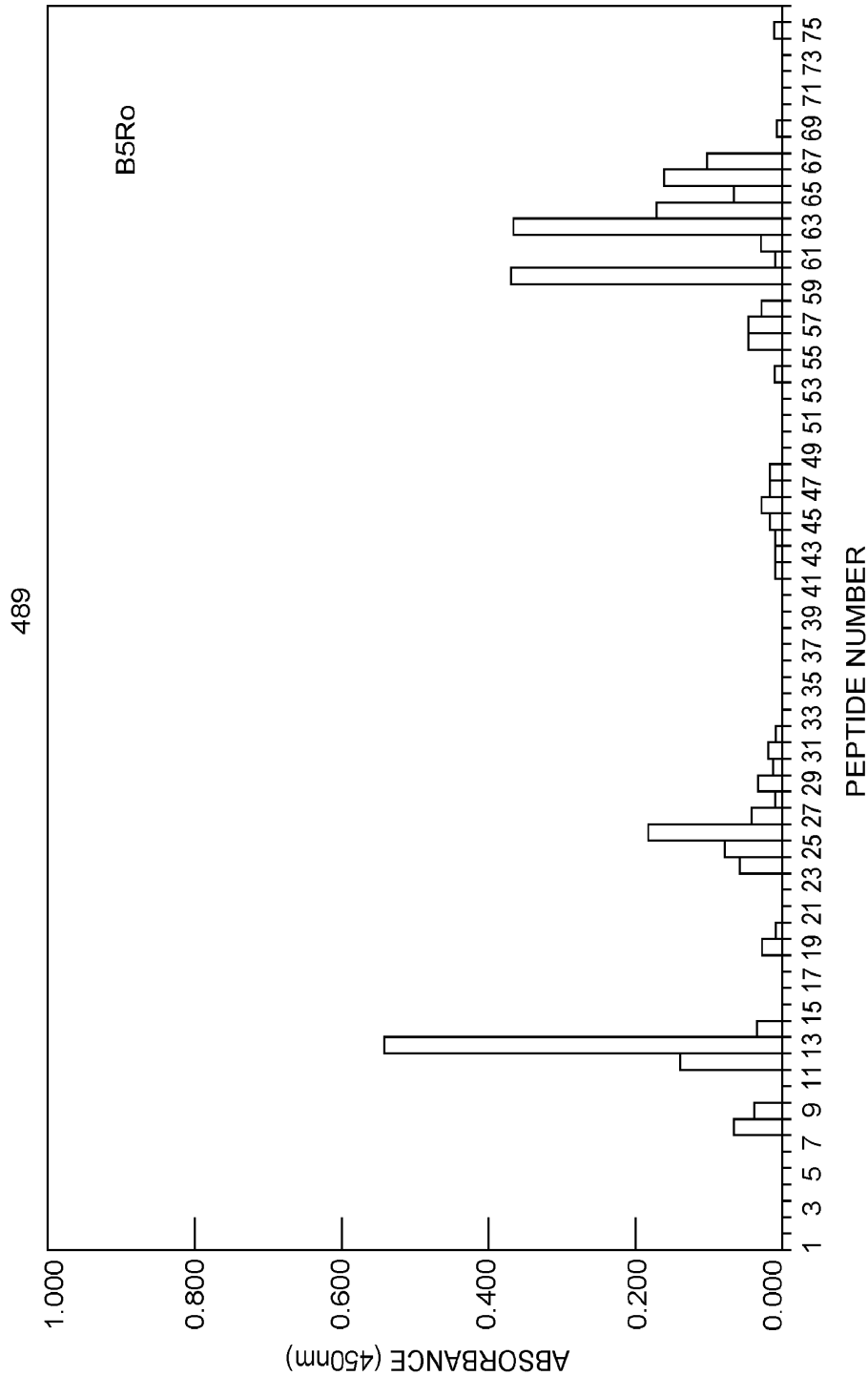


FIG. 24B

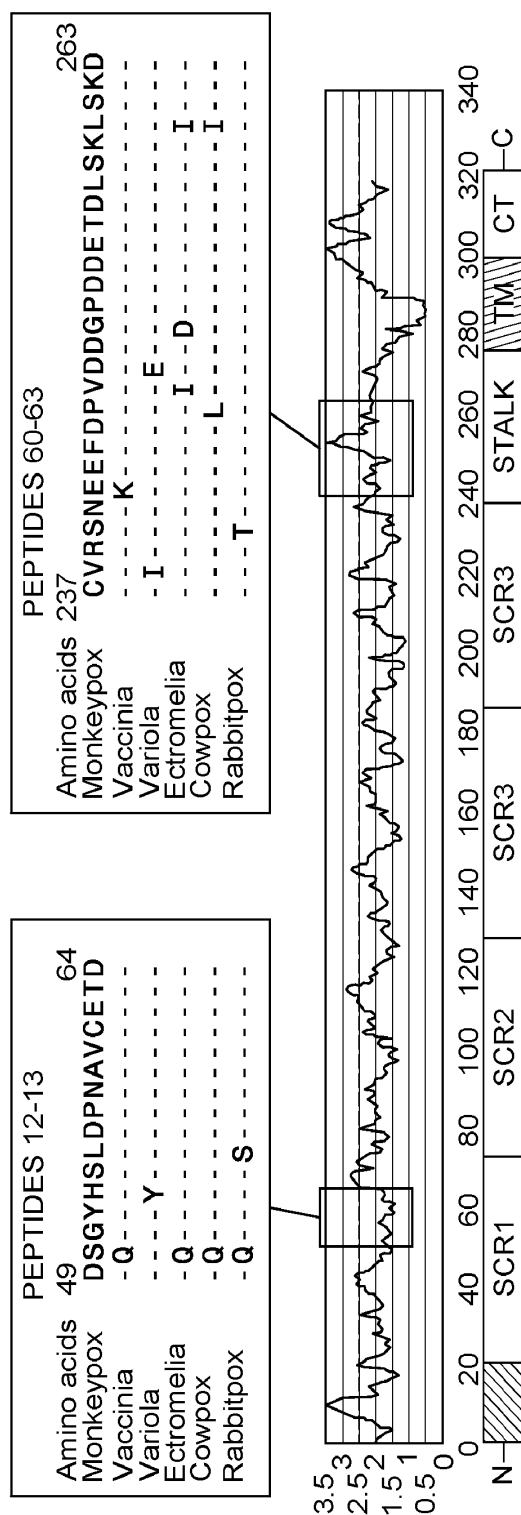
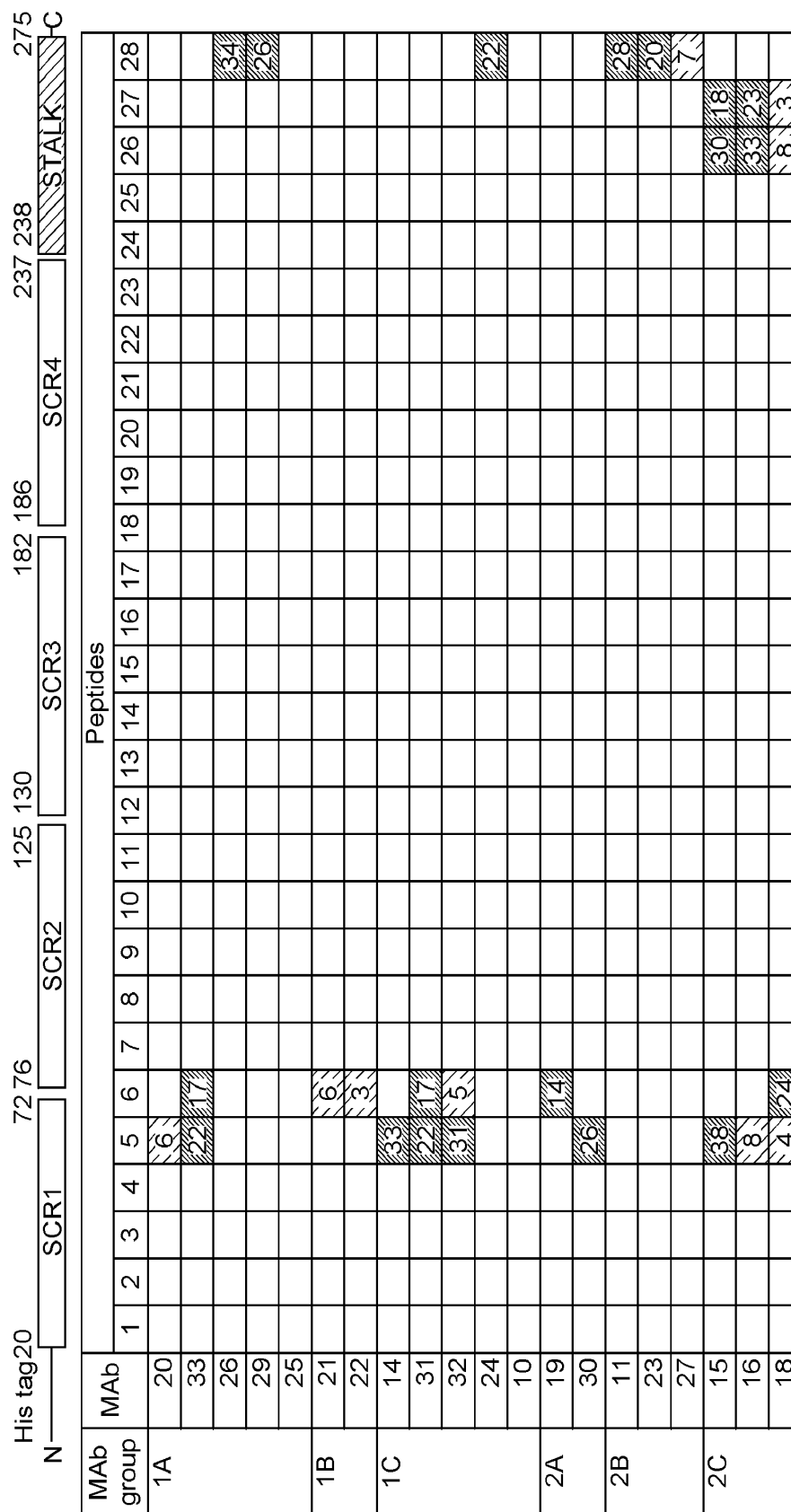


FIG. 24C

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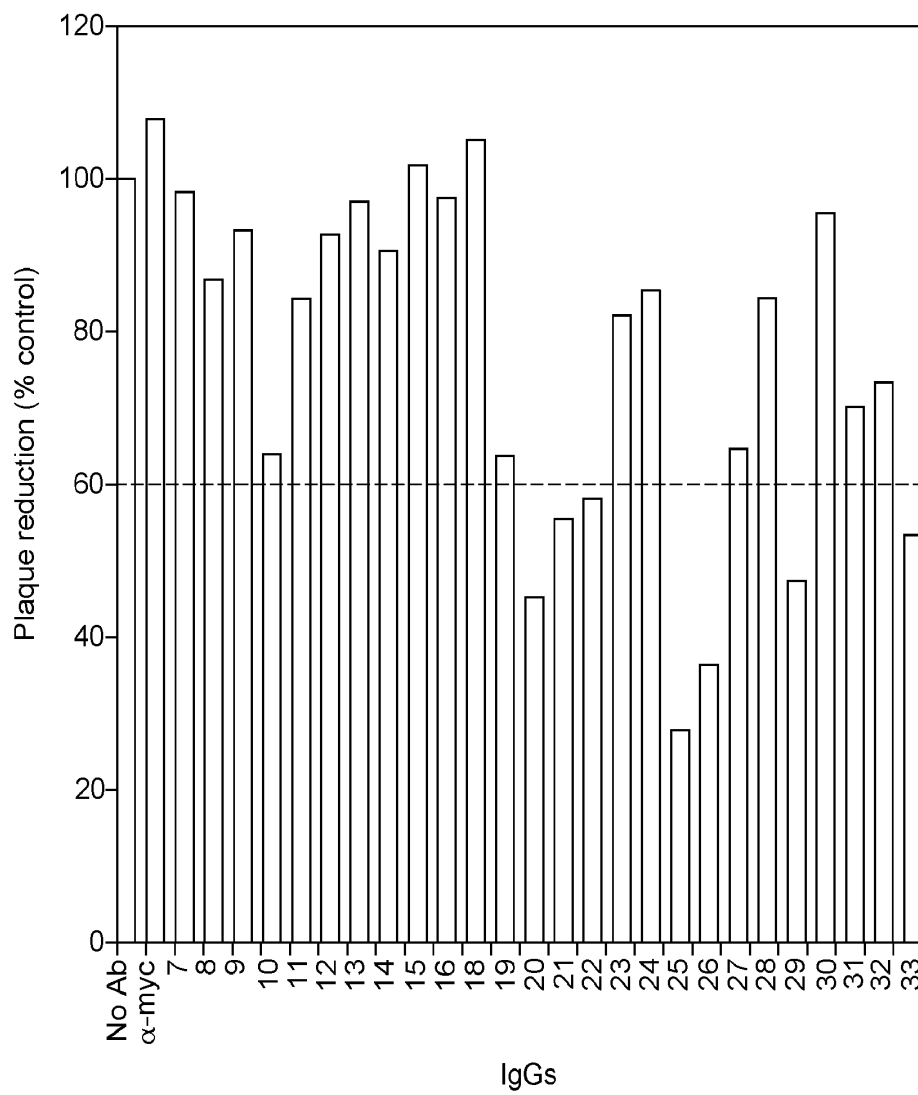


FIG. 26

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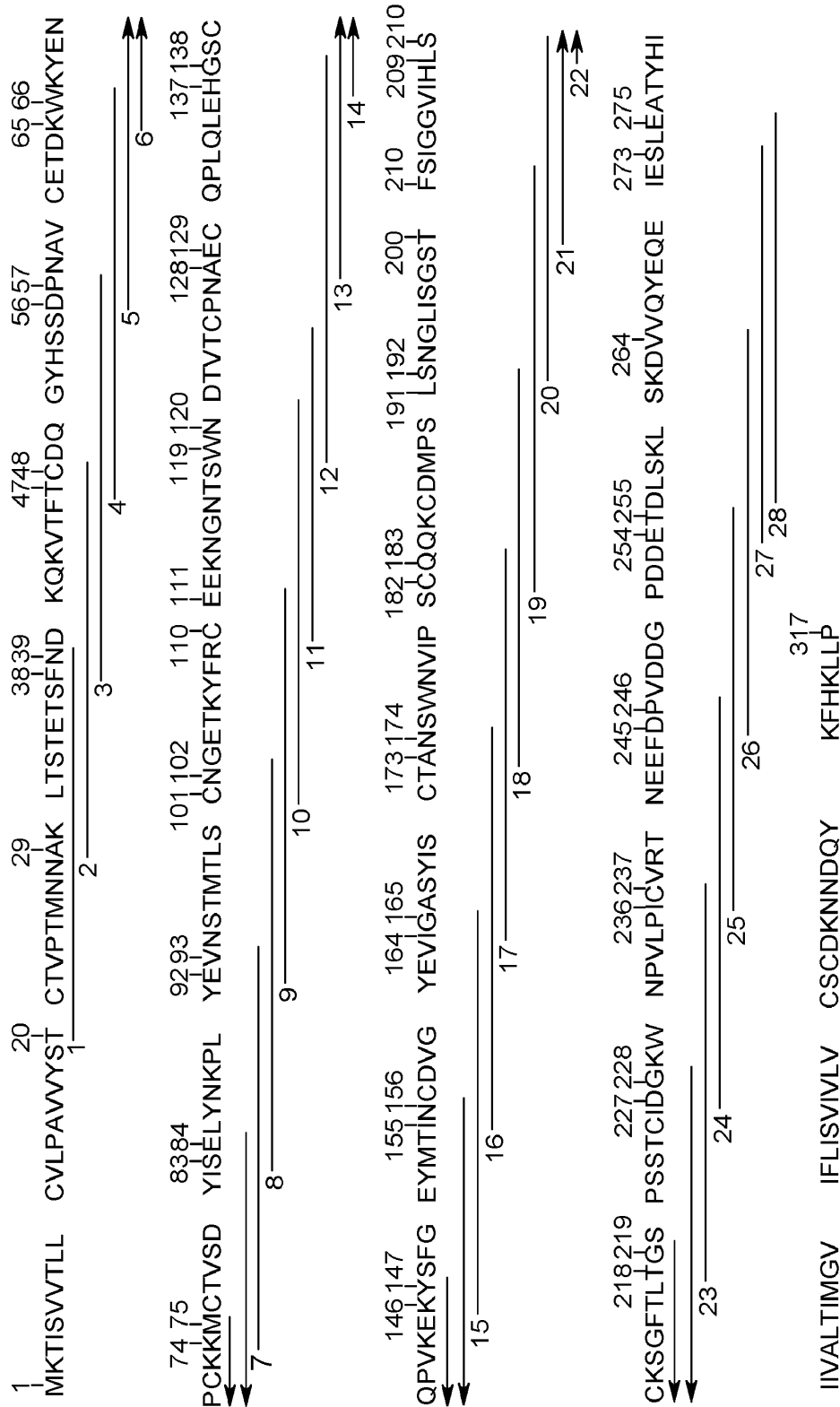


FIG. 27



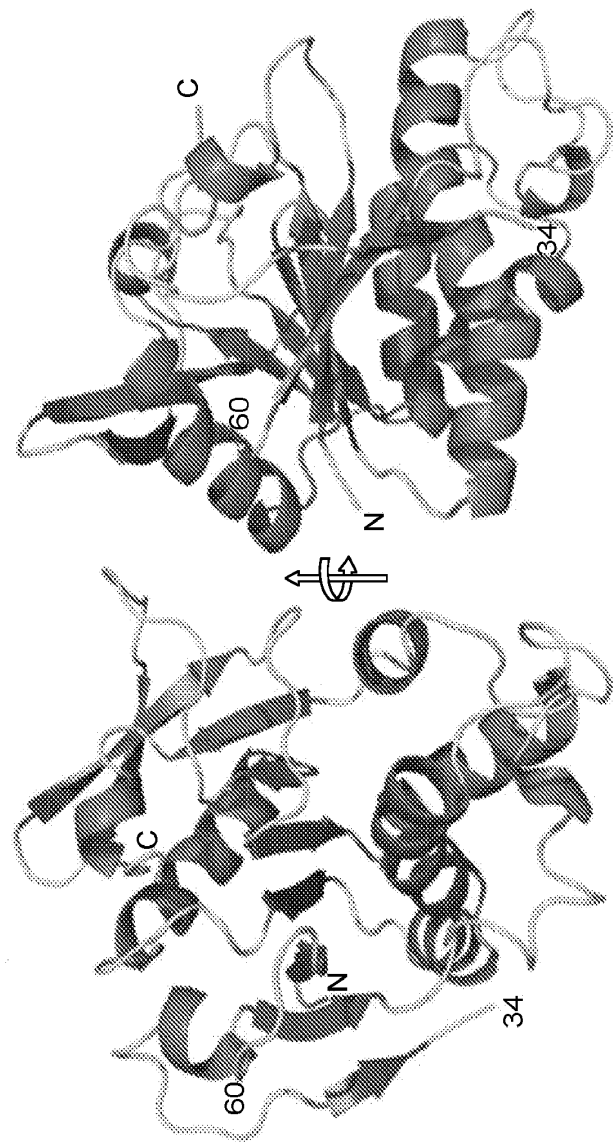


FIG. 28B

NCBI Multiple Sequence Alignment Viewer, Version 1.22.0		
Sequence ID	Start	Alignment
1		
Query_62132	(+)	1
AAU01359.1	(+)	57
AAA80899.1	(+)	1
ABF28542.1	(+)	1
NP_536582.1	(+)	57
ABF25129.1	(+)	1
ABF23122.1	(+)	1
ABF24322.1	(+)	1
ABF24523.1	(+)	1
ABG43729.1	(+)	1
NP_042199.1	(+)	1
ADK39184.1	(+)	57
ABD98640.1	(+)	57
YP_010085835.1	(+)	57
QQA05883.1	(+)	57
AGY97083.1	(+)	57
AAS49886.1	(+)	57
YP_233052.1	(+)	57
ABD52861.1	(+)	57
ADZ29716.1	(+)	57
AIX99290.1	(+)	57
AGY97514.1	(+)	57
ADX23002.1	(+)	57
ADZ29288.1	(+)	57
YP_717477.1	(+)	1

1

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A

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V

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FIG. 29

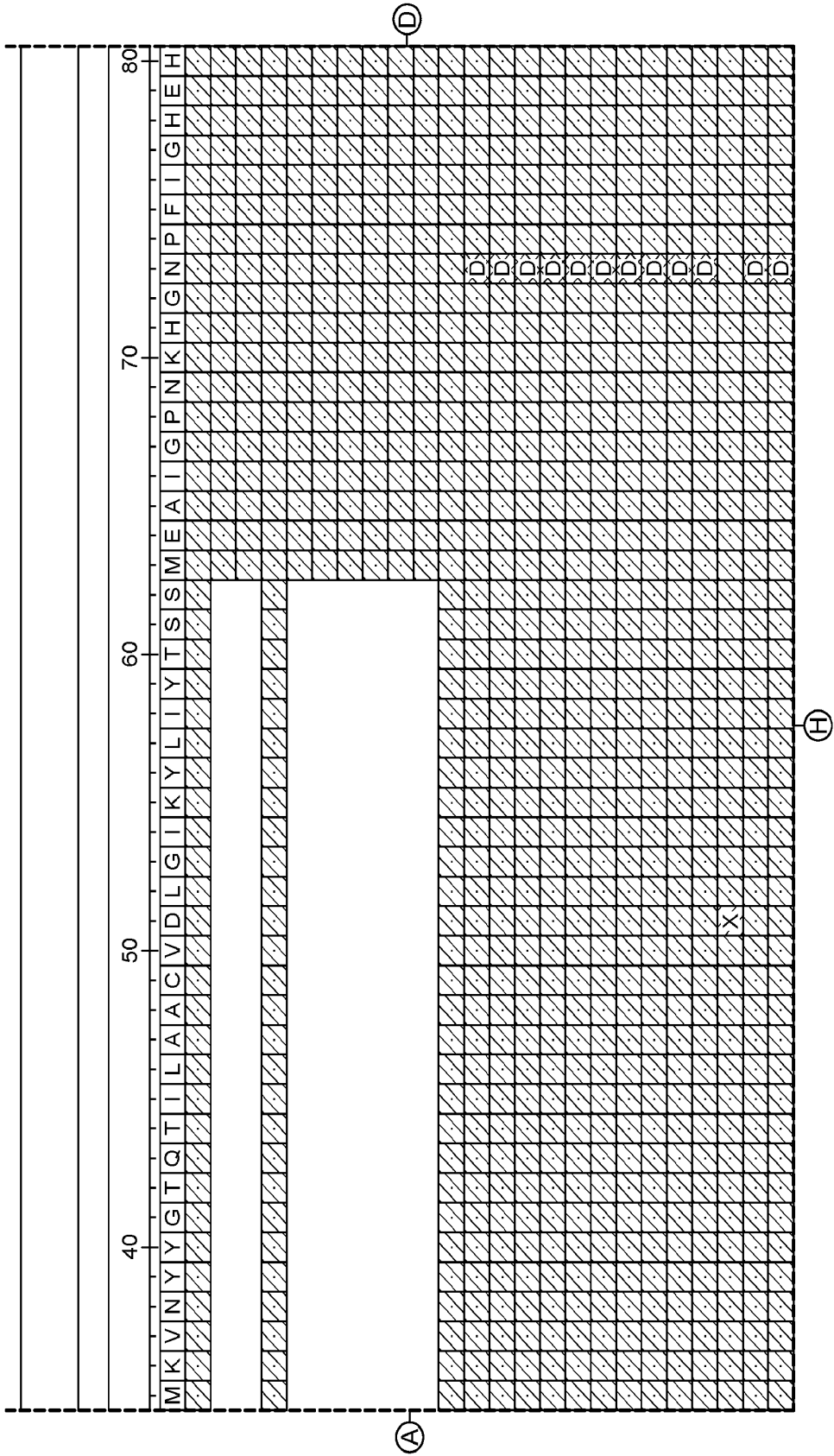


FIG. 29 (Continued)

															End	Organism	Identity	Coverage	Mismatches					
															90					93				
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	93		100.00	100.00	0					
L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	149	Monkeypox virus	100.00	100.00	0					
Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	31	Variola major virus	100.00	33.33	0					
V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	31	Variola virus	100.00	33.33	0					
H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	149	Monkeypox virus Zaire-9...	100.00	100.00	0					
G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	31	Variola virus	100.00	33.33	0					
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	31	Variola virus	100.00	33.33	0					
S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	31	Variola virus	100.00	33.33	0					
I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	31	Variola virus	100.00	33.33	0					
D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	31	Variola virus	100.00	33.33	0					
Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	31	Variola virus	100.00	33.33	0					
A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	31	Variola virus	100.00	33.33	0					
K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	31	Variola virus	100.00	33.33	0					
															90					93				
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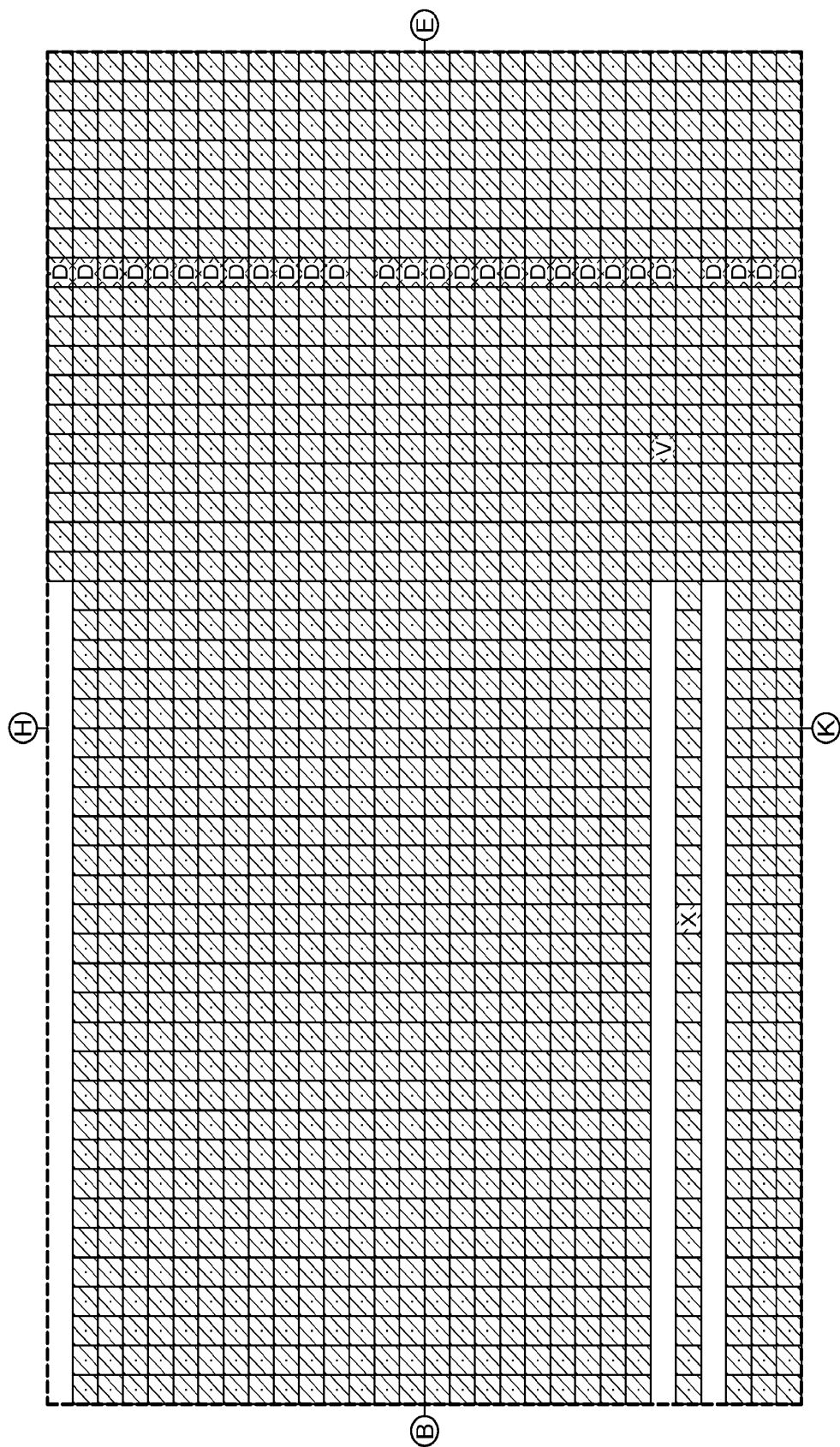
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ABF22919.1	(+)	1
P21097.1	(+)	57
AND74003.1	(+)	57
AIZ72919.1	(+)	57
CAG7621389.1	(+)	57
NP_671662.1	(+)	57
AAW23605.1	(+)	57
CAM58342.1	(+)	57
QCY54364.1	(+)	57
AEY74168.1	(+)	57
AEY73458.1	(+)	57
AGJ91367.1	(+)	57
AGR36807.1	(+)	57
AHB35807.1	(+)	57
AVO21171.1	(+)	57
AEY74877.1	(+)	57
AEY72981.1	(+)	57
O67245.1	(+)	57
AEY74637.1	(+)	57
AGB75887.1	(+)	57
AAF34055.1	(+)	57
ALF36327.1	(+)	57
AZY90851.1	(+)	57
CUI02445.1	(+)	57
APR82893.1	(+)	1
ADX22806.1	(+)	57
AUL80329.1	(+)	1
DAD53536.1	(+)	57
QEQA49722.1	(+)	57
AAQ93267.1	(+)	57

①

FIG. 29 (Continued)

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E											31	Variola virus	96.77	33.33	1
											149	Vaccinia virus Copenhagen...	98.92	100.00	1
											149	Vaccinia virus	98.92	100.00	1
											149	Vaccinia virus	98.92	100.00	1
											149	Ectromelia virus	98.92	100.00	1
											149	Ectromelia virus	98.92	100.00	1
											149	Vaccinia virus	98.92	100.00	1
											149	Vaccinia virus Ankara	98.92	100.00	1
											149	Buffalopox virus	98.92	100.00	1
											149	Vaccinia virus	98.92	100.00	1
											149	Vaccinia virus	98.92	100.00	1
											149	Vaccinia virus	98.92	100.00	1
											149	Monkeypox virus	98.92	100.00	1
											149	Vaccinia virus	98.92	100.00	1
											149	Buffalopox virus	98.92	100.00	1
											149	Vaccinia virus	98.92	100.00	1
											149	Vaccinia virus	98.92	100.00	1
											149	Vaccinia virus Ankara	98.92	100.00	1
											149	Vaccinia virus	98.92	100.00	1
											149	Vaccinia virus	98.92	100.00	1
											149	Vaccinia virus Tian Tan	98.92	100.00	1
											149	Vaccinia virus	98.92	100.00	1
											149	Cowpox virus	98.92	100.00	1
											149	Cowpox virus	98.92	100.00	1
											31	Variola virus	93.55	33.33	2
											149	Monkeypox virus	97.85	100.00	2
											31	Vaccinia virus	93.55	33.33	2
											149	Horsepox virus	97.85	100.00	2
											149	Akhmeta virus	97.85	100.00	2
											149	Vaccinia virus	97.85	100.00	2

FIG. 29 (Continued)

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©

②

[illegible]

FIG. 29 (Continued)

SUBSTITUTE SHEET (RULE 26)

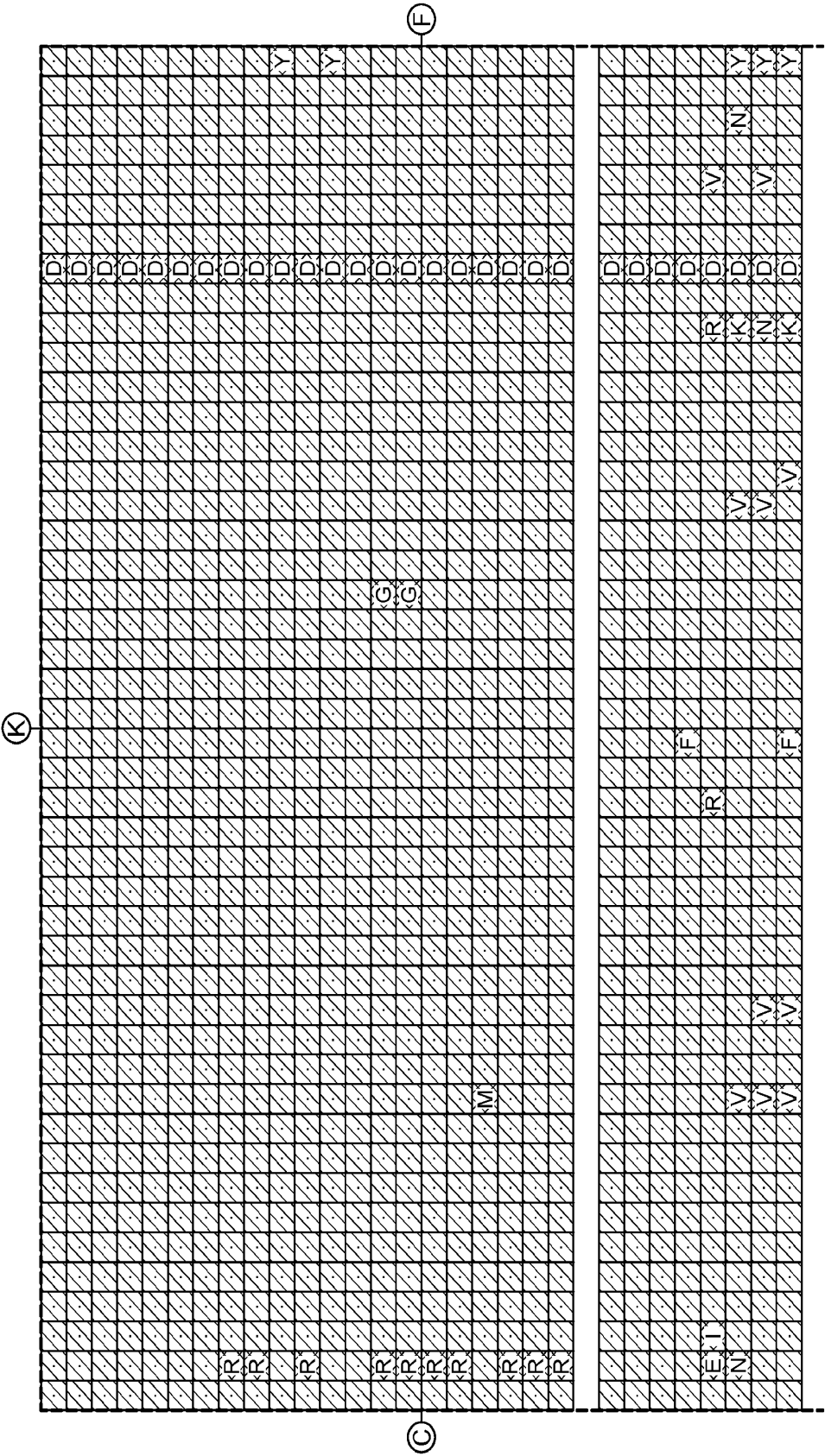
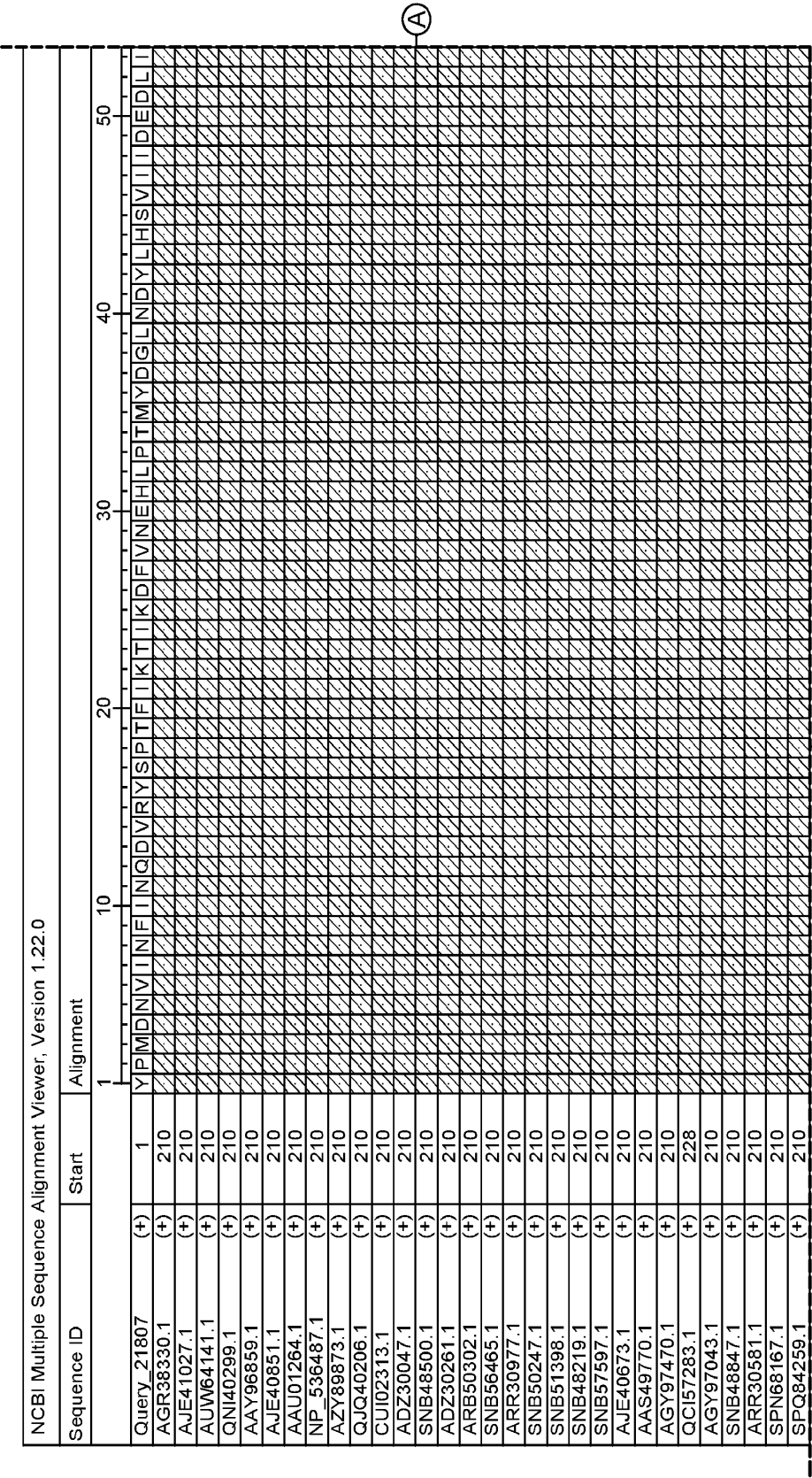


FIG. 29 (Continued)

F	L	149	Cowpox virus	97.85	100.00	2
		149	Cowpox virus	97.85	100.00	2
		149	Vaccinia virus	97.85	100.00	2
		149	Vaccinia virus	97.85	100.00	2
		149	Horsepox virus	97.85	100.00	2
		149	Cowpox virus	97.85	100.00	2
		149	Akhmeta virus	97.85	100.00	2
		149	Cowpox virus	97.85	100.00	2
		149	Cowpox virus	96.77	100.00	3
		149	Camelpox virus	96.77	100.00	3
		149	Cowpox virus	96.77	100.00	3
		149	Camelpox virus CMS	96.77	100.00	3
		149	Cowpox virus	96.77	100.00	3
		149	Cowpox virus	96.77	100.00	3
		149	Cowpox virus	96.77	100.00	3
		149	Cowpox virus	96.77	100.00	3
		149	Cowpox virus	96.77	100.00	3
		149	Akhmeta virus	96.77	100.00	3
		149	Cowpox virus	96.77	100.00	3
		149	Cowpox virus	96.77	100.00	3
P P Q	L	76	Taterapox virus	80.95	22.58	4
		149	Cowpox virus	95.70	100.00	4
		149	Cowpox virus	95.70	100.00	4
		149	Cowpox virus	95.70	100.00	4
		149	Vaccinia virus	92.47	100.00	7
		149	Alaskapox virus	90.32	100.00	9
		149	Skunkpox virus	87.10	100.00	12
		149	Raccoonpox virus	87.10	100.00	12
		149	Volepox virus	84.96	100.00	14
		149	Volepox virus	84.96	100.00	14

FIG. 29 (Continued)



Ⓒ FIG. 30

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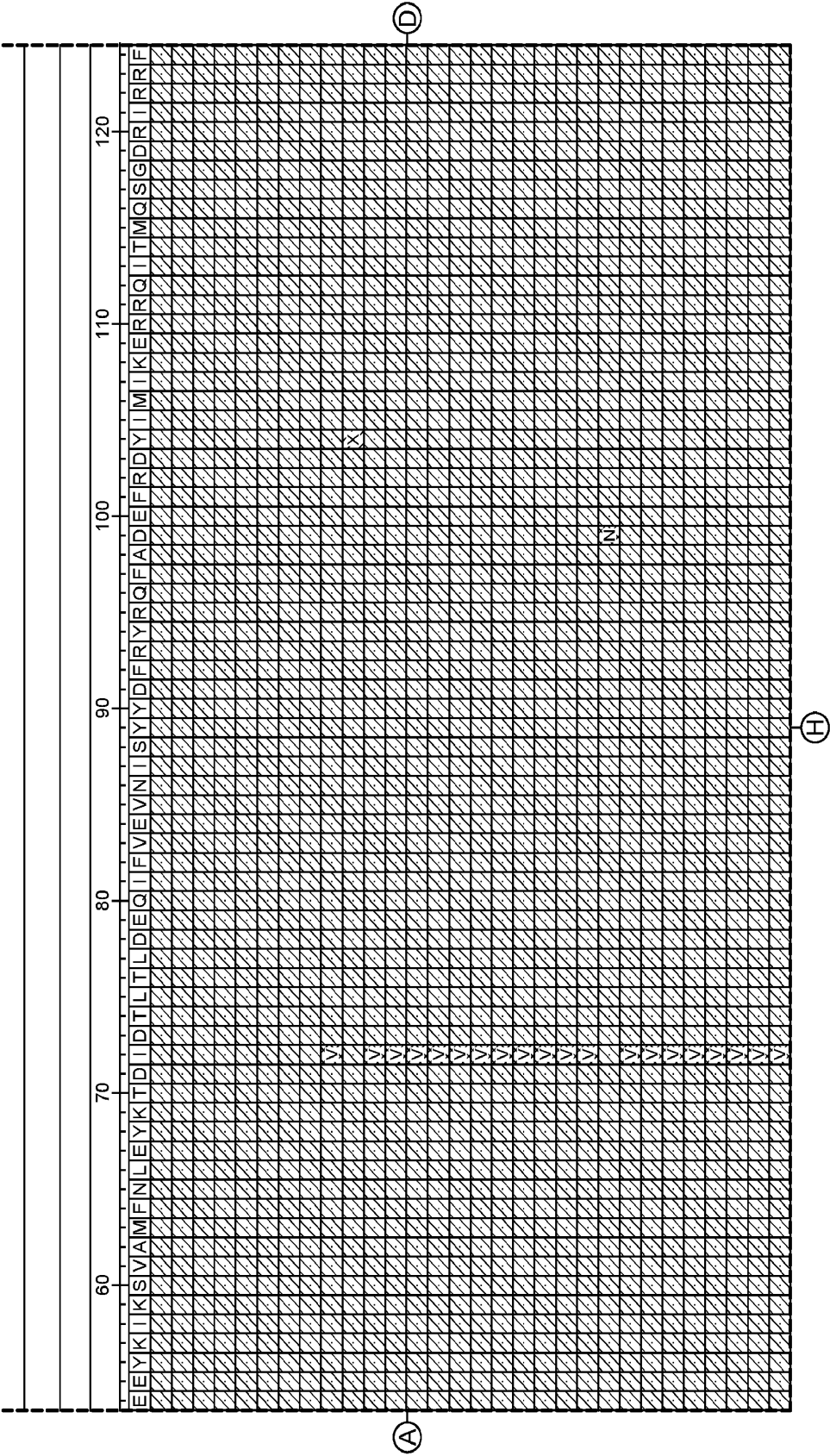


FIG. 30 (Continued)



FIG. 30 (Continued)

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[illegible]

FIG. 30 (Continued)

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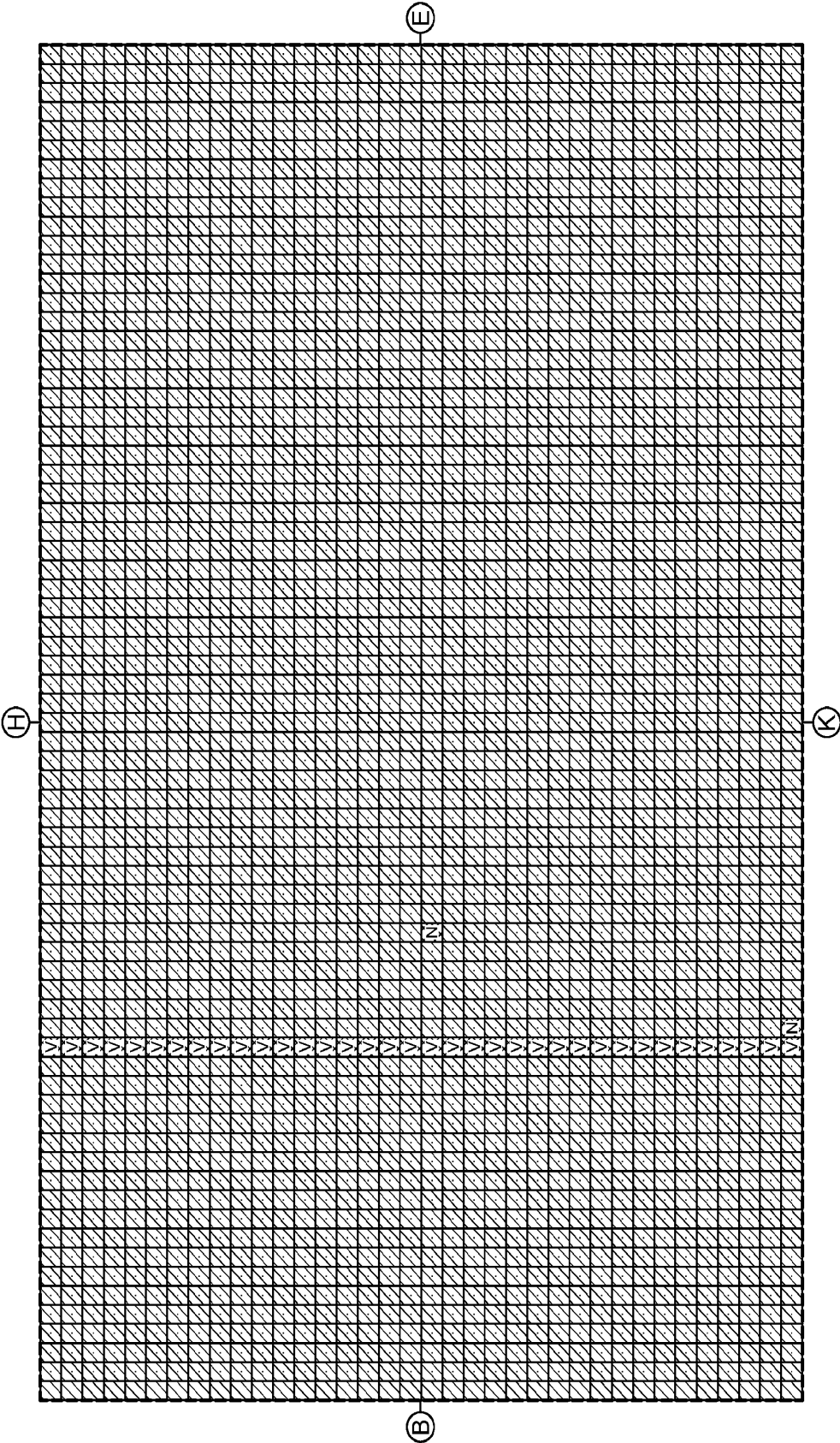


FIG. 30 (Continued)

[illegible]

FIG. 30 (Continued)

[illegible]

FIG. 30 (Continued)

F	L	344	Buffalopox virus	98.54	100.00	2
		346	Vaccinia virus Tian Tan	98.54	100.00	2
		346	Vaccinia virus	98.54	100.00	2
		346	Cowpox virus	98.54	100.00	2
		346	Vaccinia virus	98.54	100.00	2
		346	Cowpox virus	97.81	100.00	3
		346	Vaccinia virus WAUB6/8 ...	97.81	100.00	3
		346	Vaccinia virus	97.81	100.00	3
		346	Vaccinia virus	97.81	100.00	3
		346	Vaccinia virus	97.81	100.00	3
		346	Cowpox virus	97.81	100.00	3
		346	Orthopoxvirus Abatino	97.81	100.00	3
		346	Vaccinia virus	97.81	100.00	3
		346	Vaccinia virus	97.81	100.00	3
		346	Vaccinia virus	97.81	100.00	3
		346	Cowpox virus	97.81	100.00	3
		344	Cowpox virus	97.81	100.00	3
		346	Cowpox virus	97.81	100.00	3
		346	Vaccinia virus	97.81	100.00	3
		346	Cowpox virus	97.81	100.00	3
		346	Cowpox virus	97.08	100.00	4
		346	Cowpox virus	97.08	100.00	4
		346	Vaccinia virus	97.08	100.00	4
		346	Ectromelia virus	97.08	100.00	4
		346	Cowpox virus	96.35	100.00	5
		346	Cowpox virus	96.35	100.00	5
		346	Cowpox virus	95.62	100.00	6
		346	Cowpox virus	95.62	100.00	6
		346	Cowpox virus	95.62	100.00	6
		246	Camelpox virus CMS	94.74	97.08	7
		346	Vaccinia virus	94.16	100.00	8
		346	Vaccinia virus	94.16	100.00	8

FIG. 30 (Continued)

[illegible]

FIG. 31

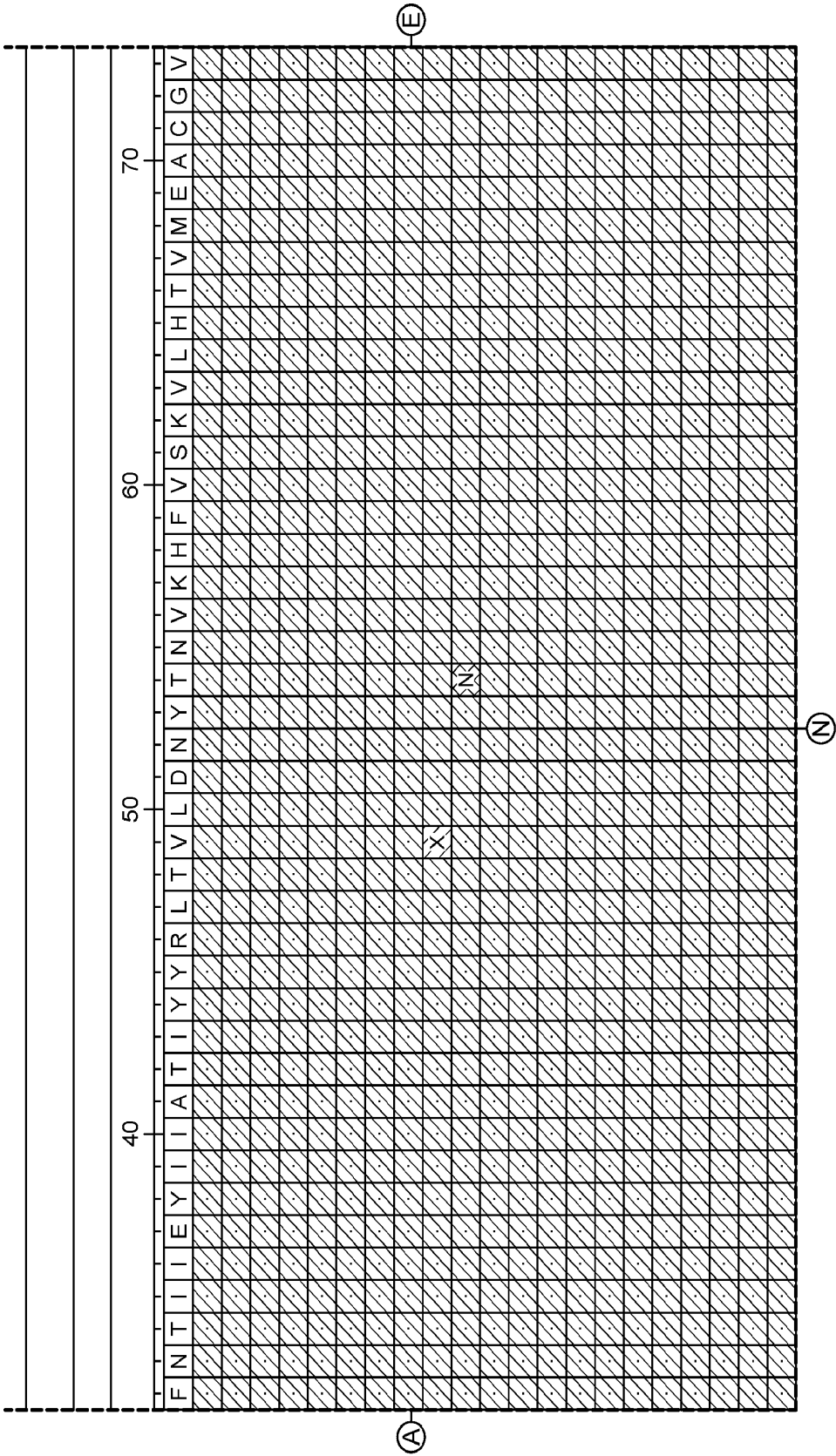


FIG. 31 (Continued)

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Organism	Identity	Coverage	Mismatches	
	100.00	100.00	0	0
Monkeypox virus	100.00	94.69	0	0
Monkeypox virus Zaire-9...	100.00	100.00	0	0
Monkeypox virus	100.00	100.00	0	0
Monkeypox virus	100.00	100.00	0	0
Monkeypox virus	100.00	100.00	0	0
Monkeypox virus	100.00	100.00	0	0
Monkeypox virus	100.00	100.00	0	0
Monkeypox virus	100.00	100.00	0	0
Monkeypox virus	99.12	100.00	1	1
Monkeypox virus	99.12	100.00	1	1
Cowpox virus	98.23	100.00	2	2
Cowpox virus	98.23	100.00	2	2
Cowpox virus	98.23	100.00	2	2
Vaccinia virus	97.35	100.00	3	3
Ectromelia virus	97.35	100.00	3	3
Vaccinia virus	97.35	100.00	3	3
Vaccinia virus	97.35	100.00	3	3
Vaccinia virus	97.35	100.00	3	3
Vaccinia virus WAUB6/8 ...	97.35	100.00	3	3

FIG. 31 (Continued)

(M)	SMZ64622.1	(+)	545	(B)
	YP_010085737.1	(+)	547	
	AAR17911.1	(+)	547	
	CAD90617.1	(+)	547	
	SNB50009.1	(+)	547	
	ADZ29403.1	(+)	547	
	AGY97687.1	(+)	547	
	SNB48500.1	(+)	547	
	SPN67873.1	(+)	33	
	ARR30581.1	(+)	547	
	SNB68486.1	(+)	547	
	ATB55340.1	(+)	547	
	AGY97256.1	(+)	547	
	QEM25169.1	(+)	547	
	ADZ29831.1	(+)	547	
	YP_232950.1	(+)	547	
	QEG58876.1	(+)	547	
	AND73902.1	(+)	547	
	AIZ72816.1	(+)	547	
	AUO38363.1	(+)	19	
	AHB35706.1	(+)	547	
(Q)	AGB75788.1	(+)	547	(S)
	ALF05063.1	(+)	544	
	AGJ92048.1	(+)	547	
	AAF33928.1	(+)	547	
	AGY97043.1	(+)	547	
	AQQ12936.1	(+)	547	

FIG. 31 (Continued)

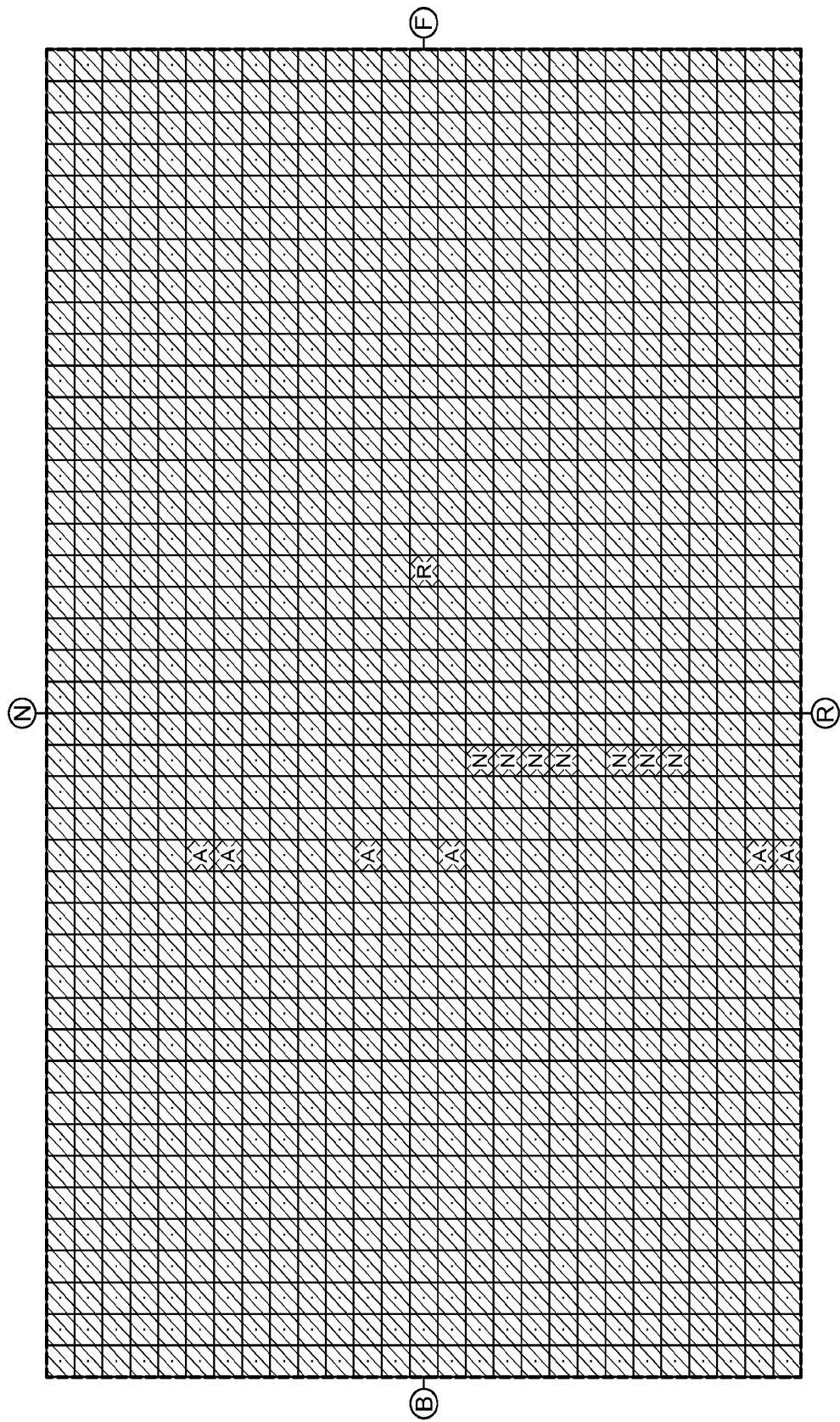


FIG. 31 (Continued)

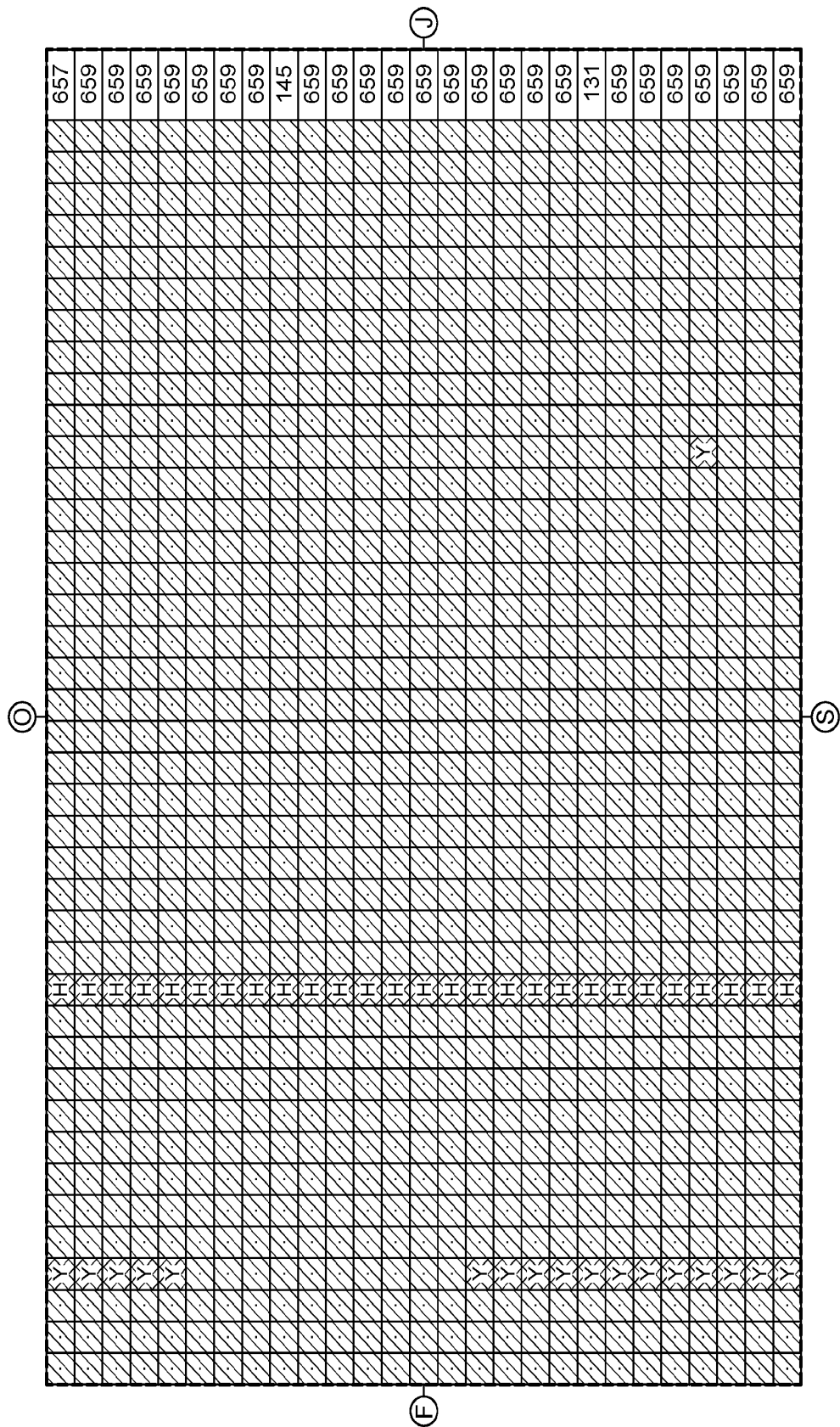


FIG. 31 (Continued)

Cowpox virus	97.35	100.00	3
Orthopoxvirus Abatino	97.35	100.00	3
Vaccinia virus	97.35	100.00	3
Cowpox virus	97.35	100.00	3
Cowpox virus	97.35	100.00	3
Cowpox virus	97.35	100.00	3
Cowpox virus	97.35	100.00	3
Cowpox virus	97.35	100.00	3
Cowpox virus	97.35	100.00	3
Cowpox virus	97.35	100.00	3
Cowpox virus	97.35	100.00	3
Cowpox virus	97.35	100.00	3
Cowpox virus	97.35	100.00	3
Cowpox virus	98.46	100.00	4
Vaccinia virus	98.46	100.00	4
Vaccinia virus	98.46	100.00	4
Vaccinia virus	98.46	100.00	4
Vaccinia virus	98.46	100.00	4
Vaccinia virus	98.46	100.00	4
Vaccinia virus	98.46	100.00	4
Vaccinia virus	98.46	100.00	4
Vaccinia virus Tian Tan	98.46	100.00	4
Cowpox virus	98.46	100.00	4
Cowpox virus	98.46	100.00	4

FIG. 31 (Continued)

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AGZ00464.1	(+)	547
ADZ29190.1	(+)	547
SNB48847.1	(+)	547
QCI57283.1	(+)	565
QCI57083.1	(+)	85
AAT10457.1	(+)	33
ARR30379.1	(+)	547
ARR29961.1	(+)	547
ARR29758.1	(+)	547
SNB53900.1	(+)	547
ADZ30047.1	(+)	547
ABD97420.1	(+)	547
ABD57598.1	(+)	547
ADZ30261.1	(+)	547
SNB52818.1	(+)	547
ARB50302.1	(+)	547
SNB57597.1	(+)	547
SPN68167.1	(+)	547
AAS49770.1	(+)	547
ABH08172.1	(+)	547
DAD53921.1	(+)	547
QKE61207.1	(+)	547
ALF05314.1	(+)	544
AEY75014.1	(+)	547
AGJ91231.1	(+)	547
CAB5514035.1	(+)	547
AEY74305.1	(+)	547

FIG. 31 (Continued)

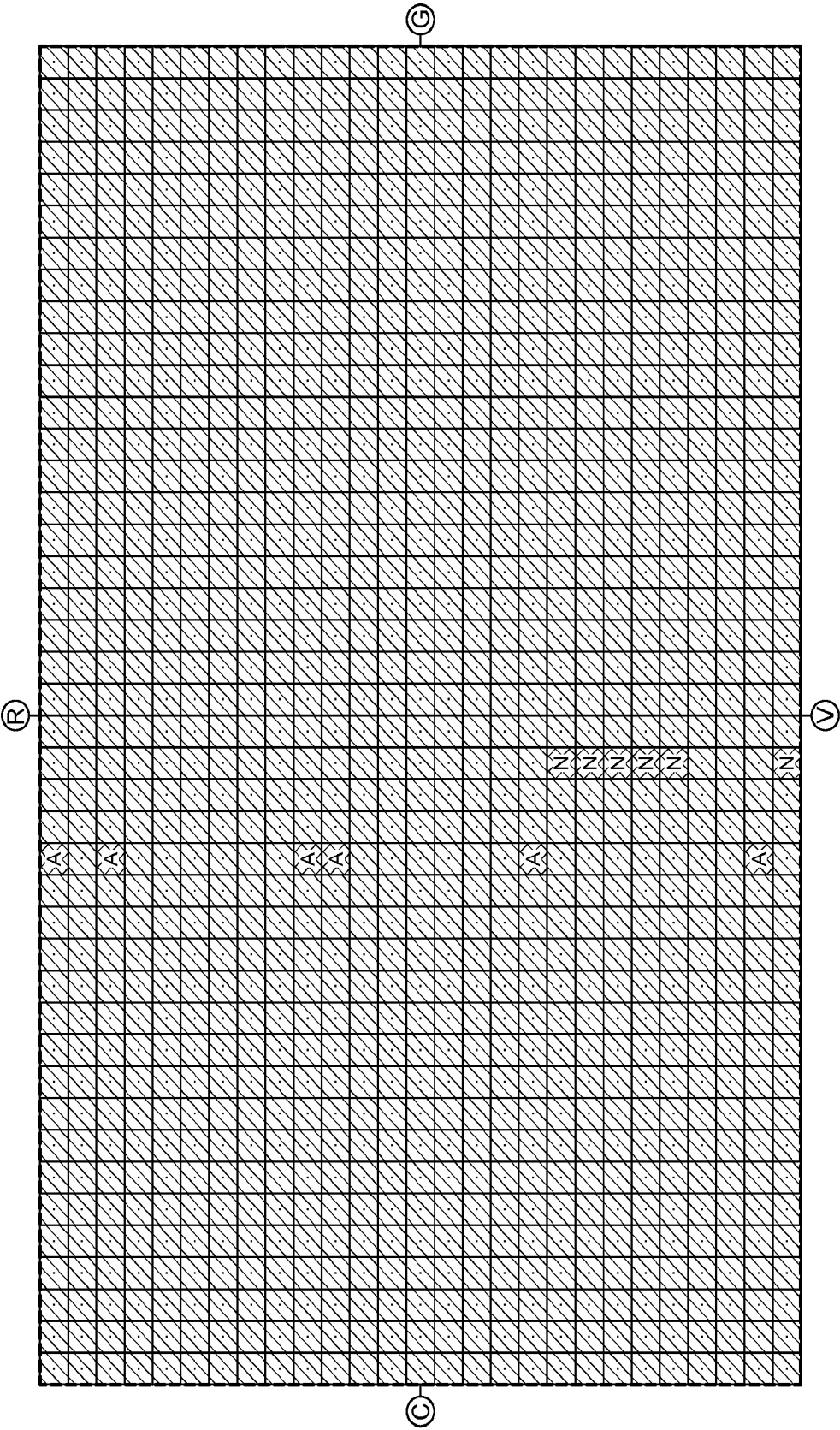


FIG. 31 (Continued)

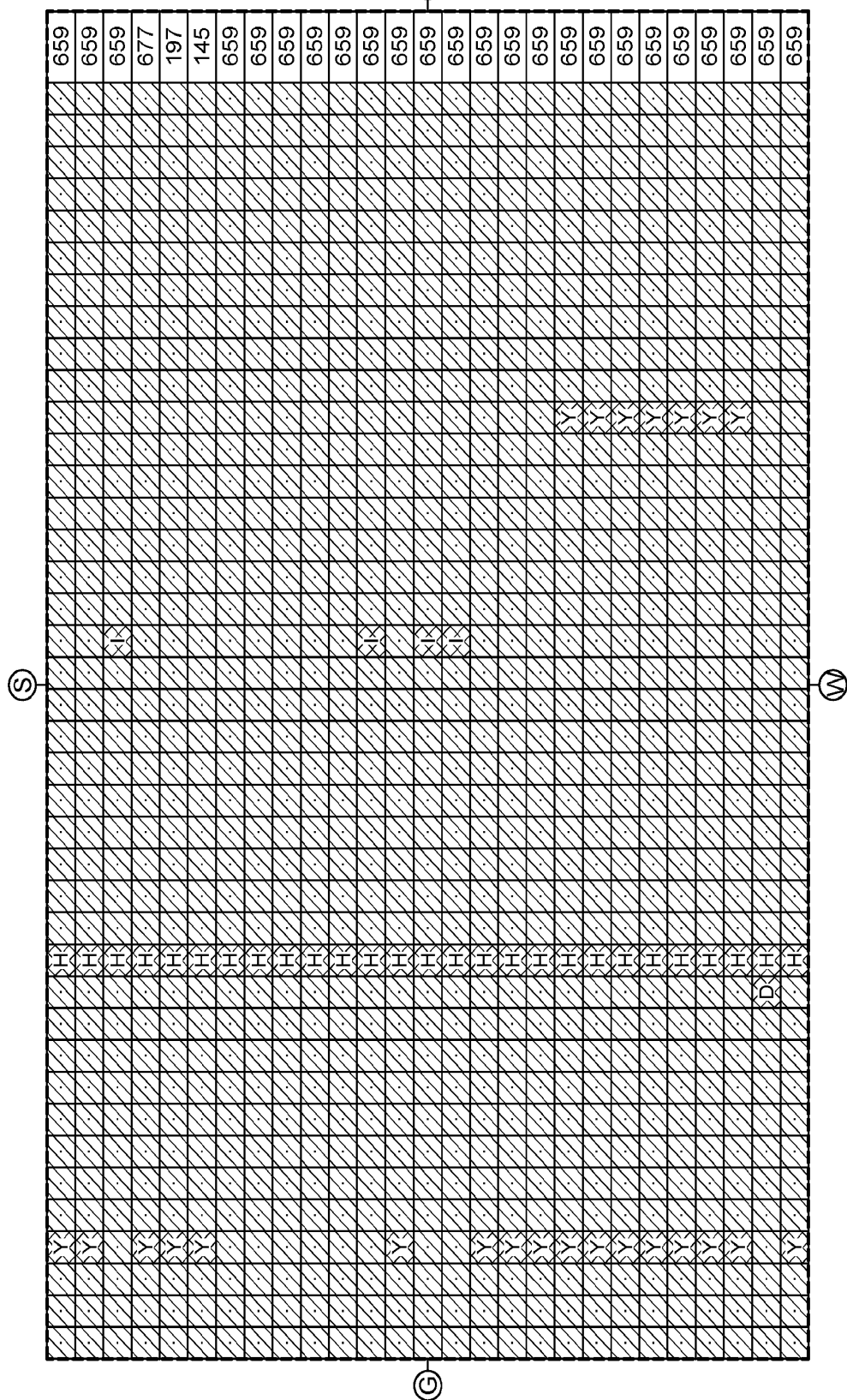


FIG. 31 (Continued)

T	Cowpox virus	98.46	100.00	4
	Cowpox virus	98.46	100.00	4
	Cowpox virus	98.46	100.00	4
	Vaccinia virus	98.46	100.00	4
	Vaccinia virus	98.46	100.00	4
	Vaccinia virus	98.46	100.00	4
	Cowpox virus	98.46	100.00	4
	Cowpox virus	98.46	100.00	4
	Cowpox virus	98.46	100.00	4
	Cowpox virus	98.46	100.00	4
	Cowpox virus	98.46	100.00	4
	Cowpox virus	98.46	100.00	4
	Vaccinia virus	98.46	100.00	4
	Cowpox virus	98.46	100.00	4
	Cowpox virus	98.46	100.00	4
	Cowpox virus	98.46	100.00	4
	Cowpox virus	98.46	100.00	4
	Cowpox virus	95.68	100.00	5
	Rabbitpox virus	95.68	100.00	5
	Horsepox virus	95.68	100.00	5
K	Vaccinia virus	95.68	100.00	5
	Vaccinia virus	95.68	100.00	5
	Vaccinia virus	95.68	100.00	5
	Vaccinia virus	95.68	100.00	5
	Vaccinia virus	95.68	100.00	5
	Cowpox virus	95.68	100.00	5
	Vaccinia virus	95.68	100.00	5
X				

FIG. 31 (Continued)

P21093.1	(+)	547
QCY53959.1	(+)	545
UJQ44580.1	(+)	547
AVO21085.1	(+)	545
AIX99186.1	(+)	547
SNB56485.1	(+)	547
ADZ30472.1	(+)	547
ARR30977.1	(+)	547
ADZ24077.1	(+)	547
AGJ92321.1	(+)	547
QEQ49410.1	(+)	547
AXN75298.1	(+)	547
YP_010085522.1	(+)	545
AGY98763.1	(+)	547
AZY89873.1	(+)	547
AZY91174.1	(+)	547
CUI02313.1	(+)	547
SPO84259.1	(+)	547
SNB49983.1	(+)	547
AGY97470.1	(+)	547
QED21112.1	(+)	547
ADZ29618.1	(+)	547
AGY99188.1	(+)	547
NP_570454.1	(+)	158
YP_717376.1	(+)	187

FIG. 31 (Continued)

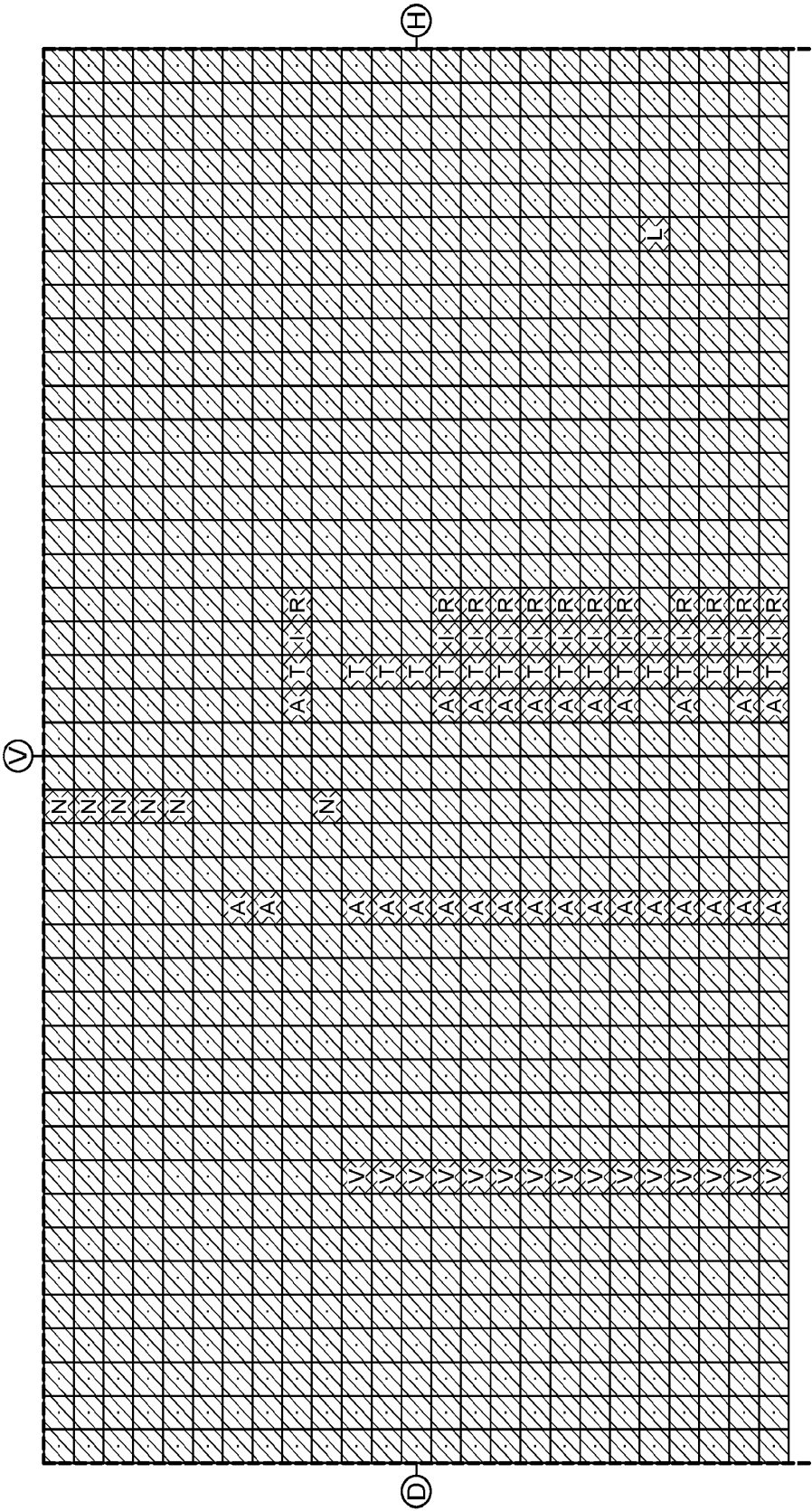


FIG. 31 (Continued)

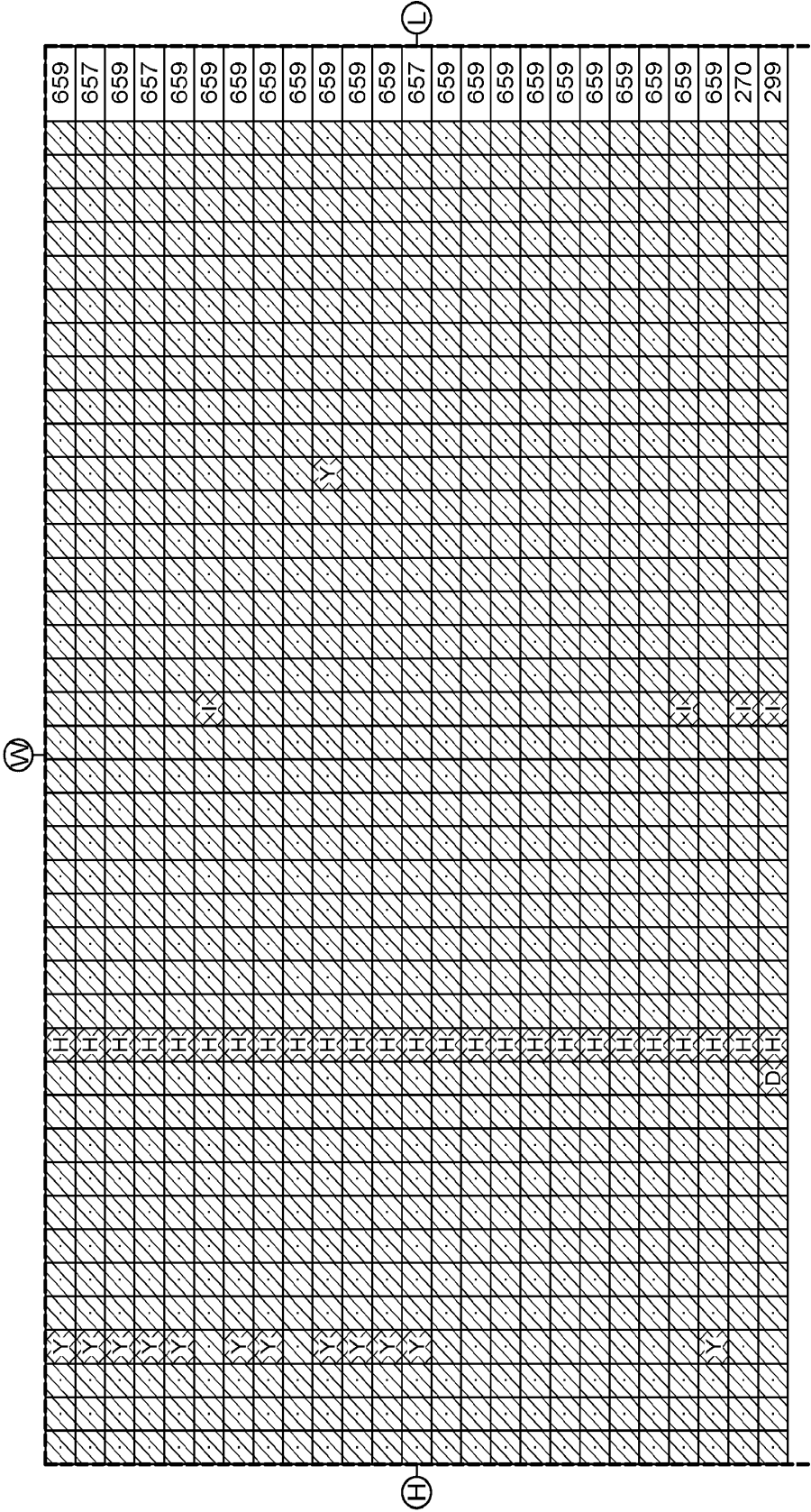


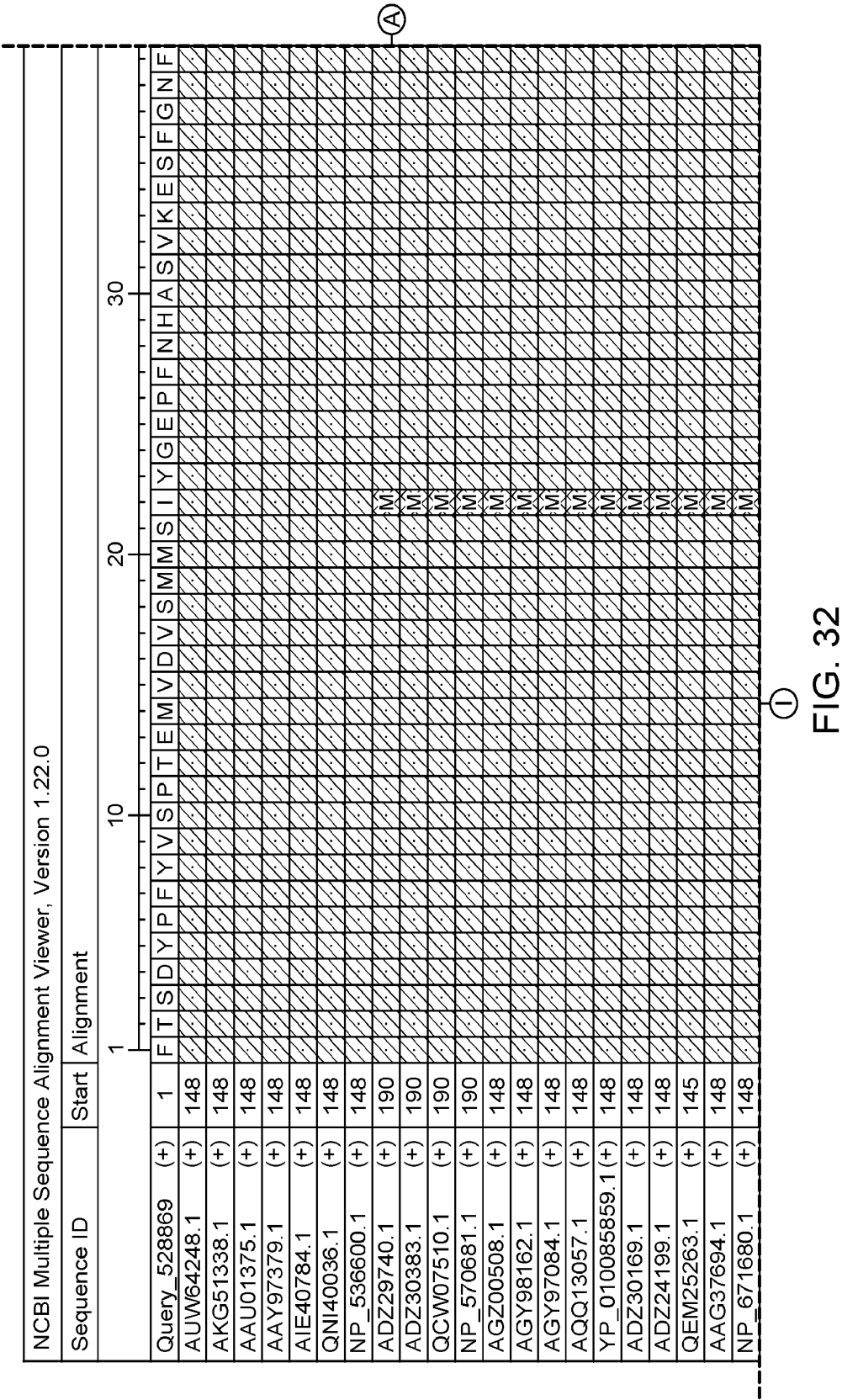
FIG. 31 (Continued)

(X)

Vaccinia virus Copenhag...	95.68	100.00	5
Buffalopox virus	95.68	100.00	5
Buffalopox virus	95.68	100.00	5
Buffalopox virus	95.68	100.00	5
Vaccinia virus	95.68	100.00	5
Cowpox virus	95.68	100.00	5
Cowpox virus	95.68	100.00	5
Cowpox virus	95.68	100.00	5
Cowpox virus	95.68	100.00	5
Cowpox virus	94.69	100.00	6
Vaccinia virus	94.69	100.00	6
Akhmeta virus	92.92	100.00	8
Akhmeta virus	92.92	100.00	8
Akhmeta virus	92.92	100.00	8
Cowpox virus	92.92	100.00	8
Cowpox virus	92.92	100.00	8
Cowpox virus	92.92	100.00	8
Cowpox virus	92.04	100.00	9
Cowpox virus	92.04	100.00	9
Cowpox virus	92.04	100.00	9
Cowpox virus	92.04	100.00	9
Alaskapox virus	92.04	100.00	9
Cowpox virus	92.04	100.00	9
Cowpox virus	92.04	100.00	9
Camelpox virus	91.15	100.00	10
Taterapox virus	90.27	100.00	11

(L)

FIG. 31 (Continued)



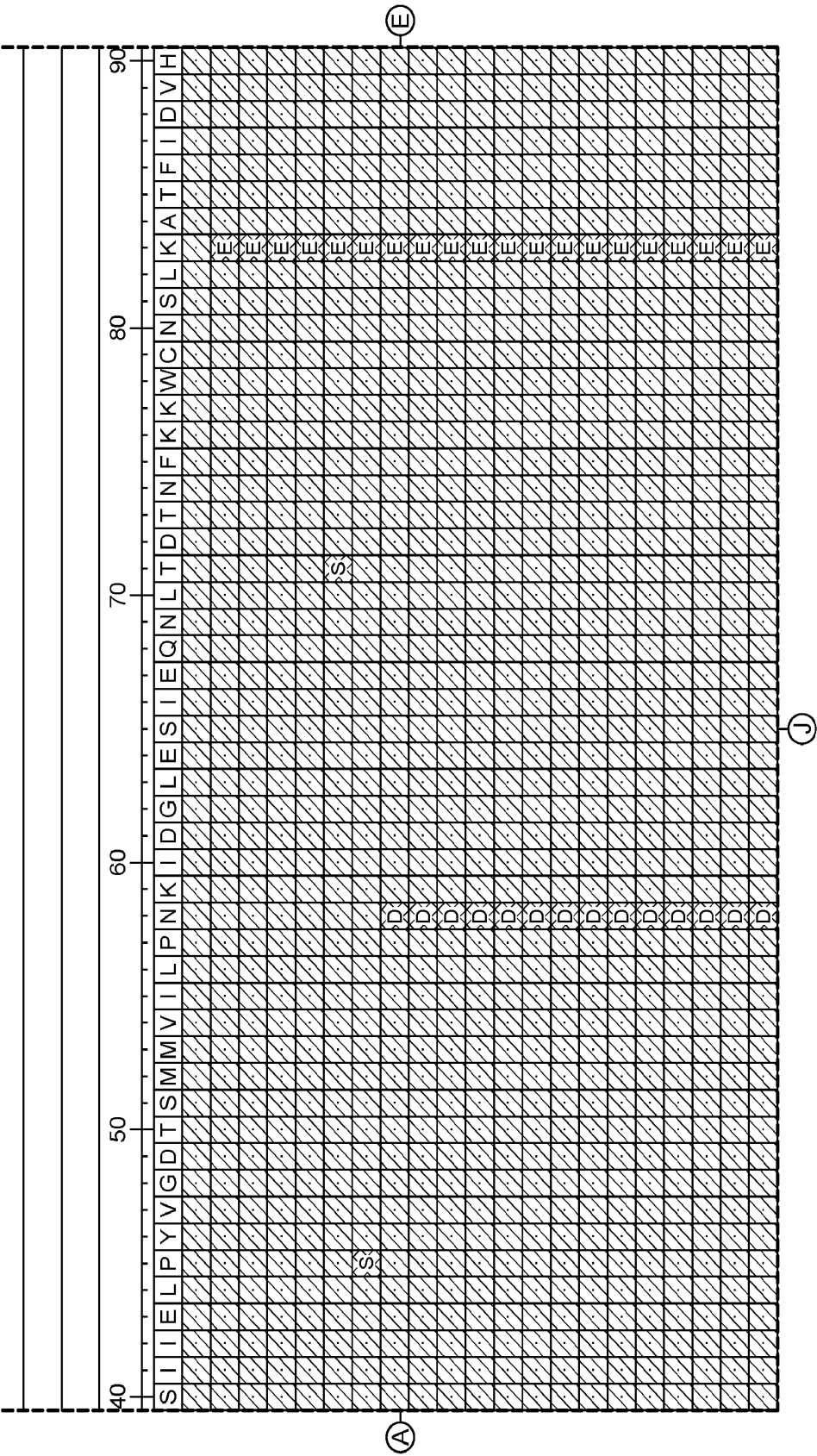
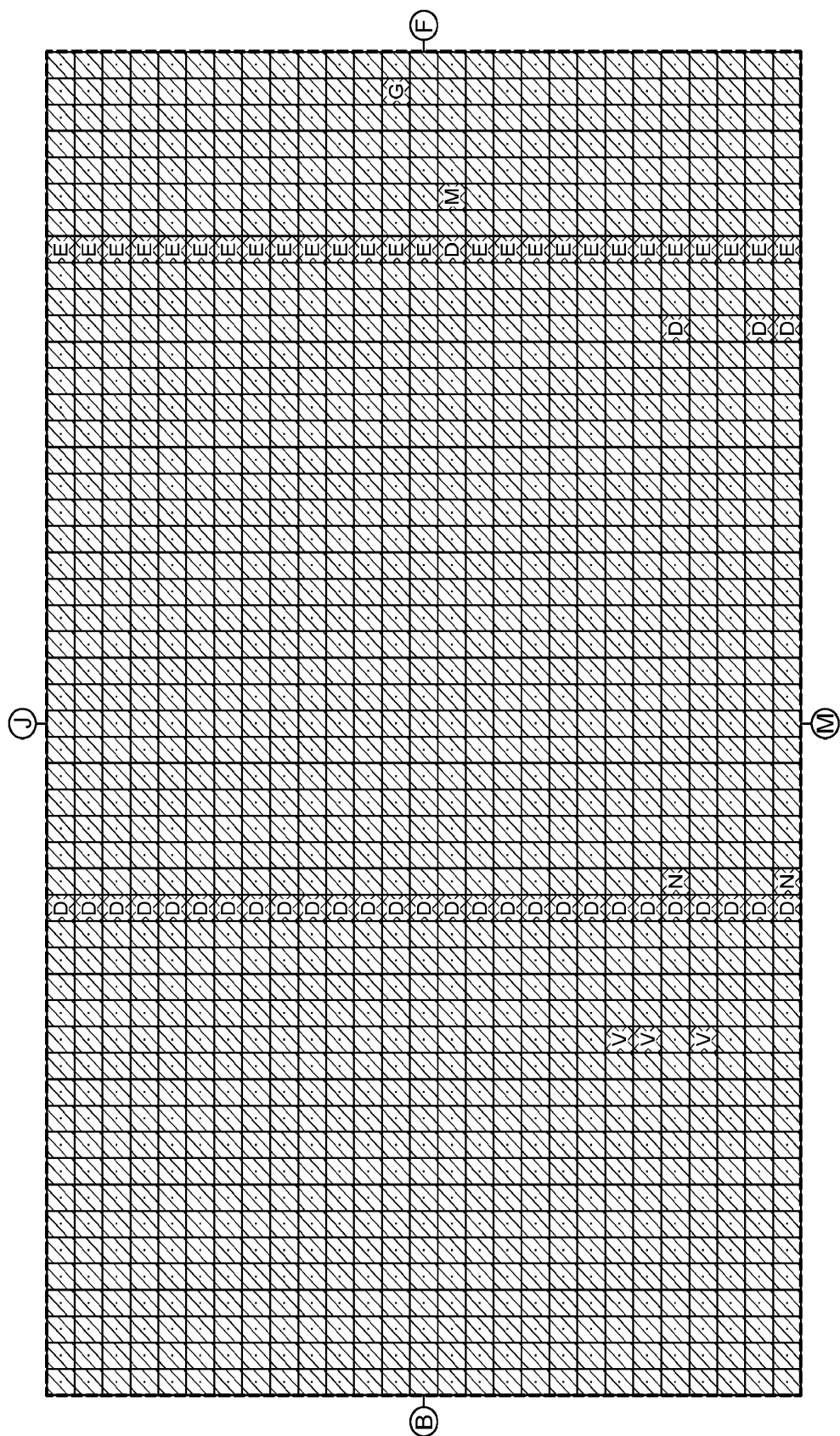


FIG. 32 (Continued)

						End	Organism	Identity	Coverage	Mismatches	
97											
I	P	K	F	K	V	I	97		100.00	100.00	0
							244	Monkeypox virus	100.00	100.00	0
							244	Monkeypox virus	98.97	100.00	1
							244	Monkeypox virus	98.97	100.00	1
							244	Monkeypox virus	98.97	100.00	1
							244	Monkeypox virus	98.97	100.00	1
							244	Monkeypox virus	98.97	100.00	1
							244	Monkeypox virus	97.94	100.00	2
							244	Monkeypox virus Zaire-9...	97.94	100.00	2
							285	Cowpox virus	96.88	98.97	3
							285	Cowpox virus	96.88	98.97	3
							285	Camelpox virus	96.88	98.97	3
							285	Camelpox virus	96.88	98.97	3
							243	Cowpox virus	96.88	98.97	3
							243	Cowpox virus	96.88	98.97	3
							243	Cowpox virus	96.88	98.97	3
							243	Cowpox virus	96.88	98.97	3
							243	Orthopoxvirus Abatino	96.88	98.97	3
							243	Cowpox virus	96.88	98.97	3
							243	Cowpox virus	96.88	98.97	3
							240	Cowpox virus	96.88	98.97	3
							243	Camelpox virus CMS	96.88	98.97	3
							243	Ectromelia virus	96.88	98.97	3

FIG. 32 (Continued)

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F	K	243	Ectromelia virus	96.88	98.97	3
		83	Vaccinia virus	95.18	85.57	4
		285	Cowpox virus	95.83	98.97	4
		243	Cowpox virus	95.83	98.97	4
		243	Cowpox virus	95.83	98.97	4
		243	Taterapox virus	95.83	98.97	4
		244	Cowpox virus	95.88	100.00	4
		77	Vaccinia virus Ankara	94.81	79.38	4
		129	Vaccinia virus	95.83	98.97	4
		120	Vaccinia virus	95.83	98.97	4
		120	Vaccinia virus	95.83	98.97	4
		120	Vaccinia virus	95.83	98.97	4
		243	Ectromelia virus	95.83	98.97	4
		120	Vaccinia virus	94.79	98.97	5
		120	Vaccinia virus Copenhagen..	94.79	98.97	5
		120	Vaccinia virus	94.79	98.97	5
		243	Rabbitpox virus Uracht	94.79	98.97	5
		243	Vaccinia virus	94.79	98.97	5
		233	Vaccinia virus	94.79	98.97	5
		243	Vaccinia virus	94.79	98.97	5
		243	Cowpox virus	94.79	98.97	5
		243	Cowpox virus	94.79	98.97	5
		243	Cowpox virus	94.79	98.97	5
		285	Cowpox virus	94.79	98.97	5
		120	Vaccinia virus	94.79	98.97	5
		120	Vaccinia virus	93.75	98.97	6
		243	Cowpox virus	93.75	98.97	6
				N		

FIG. 32 (Continued)

ADZ29953.1	(+)	148
AEY74437.1	(+)	25
ATB66249.1	(+)	148
ABF22948.1	(+)	148
NP_042225.1	(+)	148
AAA69393.1	(+)	148
ABF24549.1	(+)	148
ABF24348.1	(+)	148
APR62919.1	(+)	148
DAD63318.1	(+)	148
AXN56261.1	(+)	25
AGJ91402.1	(+)	138
ABF25759.1	(+)	148
AGJ92218.1	(+)	138
ARR30824.1	(+)	145
YP_010085650.1	(+)	148
AXN75426.1	(+)	148
ABG43754.1	(+)	148
AAQ93293.1	(+)	25
AAW23642.1	(+)	25
AVO21194.1	(+)	25
AIZ72946.1	(+)	25
ABH08303.1	(+)	148
AUL80661.1	(+)	138
ABF25960.1	(+)	148
ADZ30808.1	(+)	145
NP_619988.1	(+)	145

FIG. 32 (Continued)

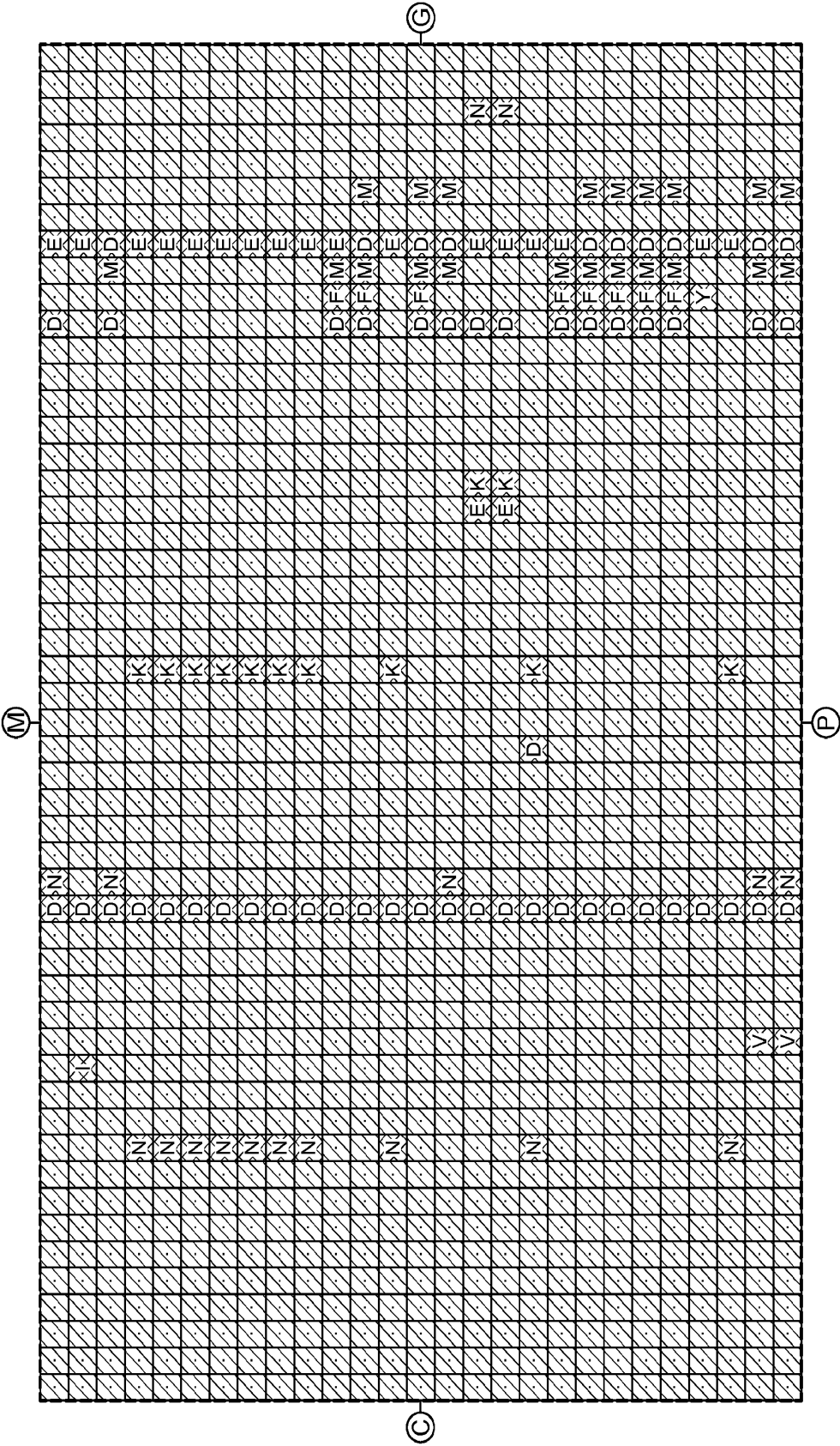
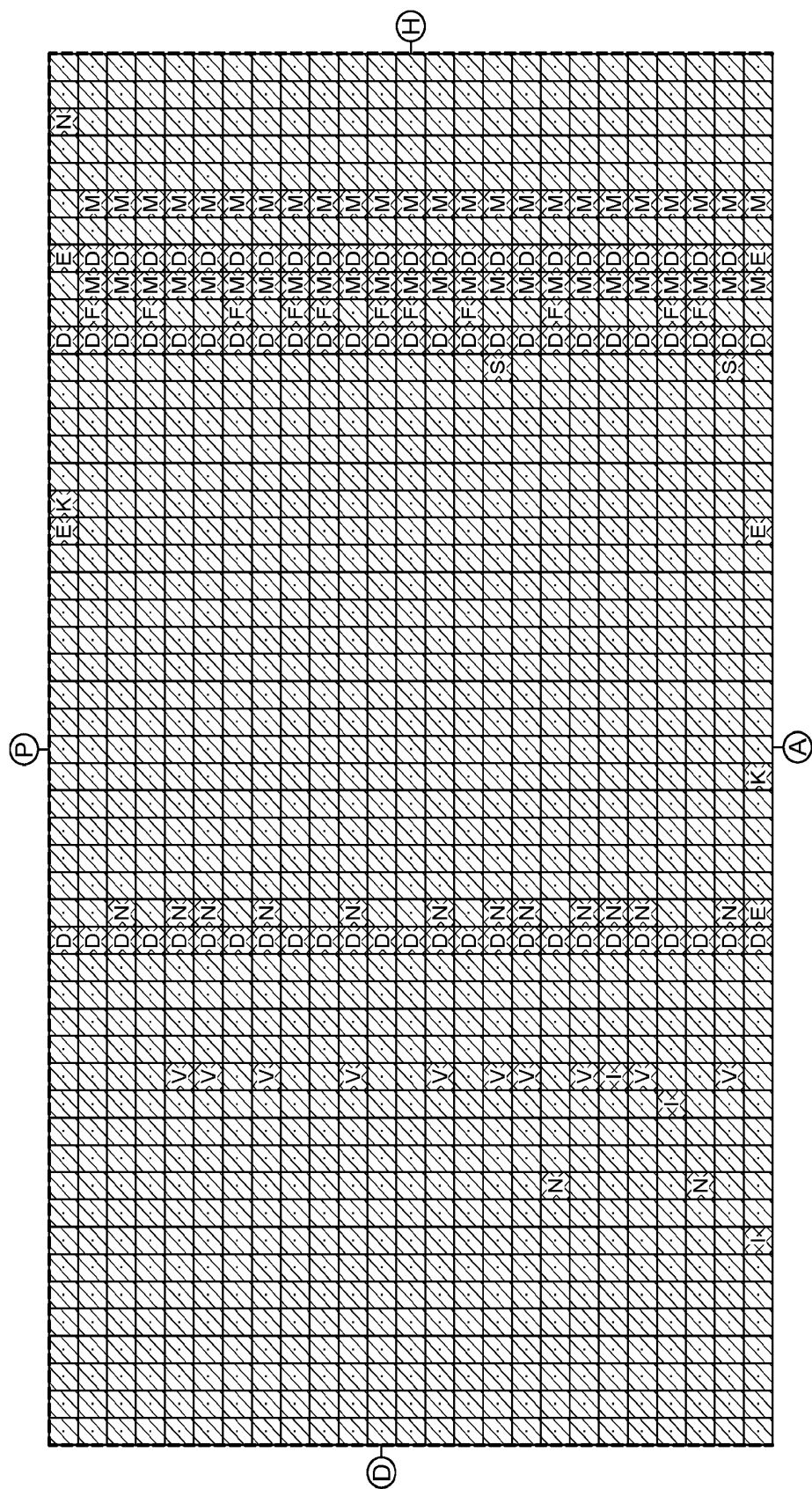


FIG. 32 (Continued)

G	N	243	Cowpox virus	93.75	98.97	6
		120	Vaccinia virus	93.75	98.97	6
		243	Cowpox virus	93.75	98.97	6
		243	Variola virus	92.71	98.97	7
		243	Variola virus	92.71	98.97	7
		243	Variola virus	92.71	98.97	7
		243	Variola virus	92.71	98.97	7
		243	Variola virus	92.71	98.97	7
		243	Variola virus	92.71	98.97	7
		243	Vaccinia virus	92.71	98.97	7
		120	Vaccinia virus	91.67	98.97	8
		233	Vaccinia virus	91.67	98.97	8
		243	Variola virus	91.67	98.97	8
		233	Vaccinia virus	91.67	98.97	8
		240	Cowpox virus	91.67	98.97	8
		243	Akhmeta virus	91.67	98.97	8
		243	Akhmeta virus	91.67	98.97	8
		243	Variola virus	91.67	98.97	8
		120	Vaccinia virus	91.67	98.97	8
		120	Vaccinia virus	91.67	98.97	8
		120	Baffalopox virus	91.67	98.97	8
		120	Vaccinia virus	91.67	98.97	8
		243	Horsepox virus	90.62	98.97	9
		233	Vaccinia virus	90.62	98.97	9
		243	Variola virus	90.62	98.97	9
		240	Cowpox virus	90.62	98.97	9
		240	Cowpox virus	90.62	98.97	9

FIG. 32 (Continued)

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H	243	Akhmeta virus	90.62	98.97	9
	243	Vaccinia virus	90.62	98.97	9
	243	Cowpox virus	90.62	98.97	9
	120	Vaccinia virus Tian Tan	90.62	98.97	9
	243	Cowpox virus	90.62	98.97	9
	243	Cowpox virus	90.62	98.97	9
	120	Vaccinia virus	90.62	98.97	9
	245	Cowpox virus	90.62	98.97	9
	120	Vaccinia virus	90.62	98.97	9
	120	Baffalopox virus	90.62	98.97	9
	240	Cowpox virus	90.62	98.97	9
	120	Vaccinia virus	90.62	98.97	9
	120	Vaccinia virus	90.62	98.97	9
	243	Cowpox virus	90.62	98.97	9
	120	Vaccinia virus	90.62	98.97	9
	240	Cowpox virus	89.58	98.97	10
	243	Cowpox virus	89.58	98.97	10
	233	Vaccinia virus	89.58	98.97	10
	245	Cowpox virus	89.58	98.97	10
	243	Cowpox virus	89.58	98.97	10
	245	Cowpox virus	89.58	98.97	10
	120	Vaccinia virus	89.58	98.97	10
	120	Vaccinia virus	89.58	98.97	10
	185	Cowpox virus	89.58	98.97	10
	243	Alaskapox virus	85.42	98.97	14

FIG. 32 (Continued)

NCBI Multiple Sequence Alignment Viewer, Version 1.22.0																												
Sequence ID		Start	Alignment																									
			1					10					20															
			K	S	S	S	S	I	L	A	R	R	P	T	P	K	K	M	N	I	V	T	D	S	E	N	R	L
Query_68960	(+)	1																										
NP_536470.1	(+)	18																										
AAU01247.1	(+)	18																										
AIE41363.1	(+)	18																										
AIE40479.1	(+)	18																										
AUL80152.1	(+)	1																										
AEY72858.1	(+)	18																										
ATB55099.1	(+)	18																										
AGY97295.1	(+)	18																										
ALF05044.1	(+)	18																										
ARB50284.1	(+)	18																										
NP_619846.1	(+)	18																										
SOU90060.1	(+)	18																										
ARR30621.1	(+)	18																										
ABH08154.1	(+)	18																										
NP_570436.1	(+)	18																										
AGR37839.1	(+)	18																										
SMZ64603.1	(+)	18																										
AZY90647.1	(+)	18																										
CUI02290.1	(+)	18																										
ADZ30666.1	(+)	18																										
AHB35688.1	(+)	18																										
DAD53414.1	(+)	18																										
AAT10439.1	(+)	18																										

Ⓐ

Ⓒ

FIG. 33

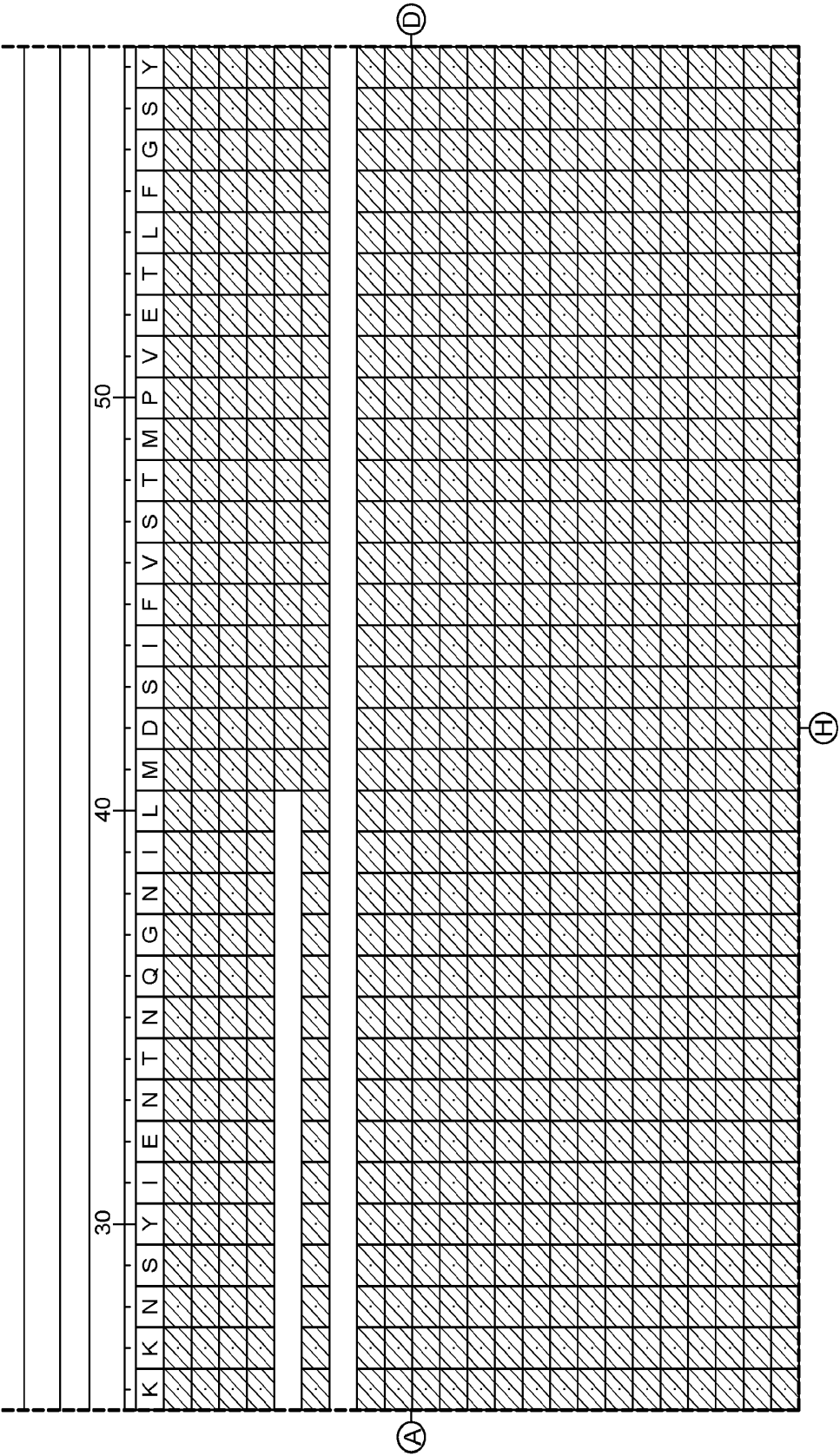


FIG. 33 (Continued)

End	Organism	Identity	Coverage	Mismatches
59				
I				
59		100.00	100.00	0
76	Monkeypox virus Zaire-9...	100.00	100.00	0
76	Monkeypox virus	100.00	100.00	0
76	Monkeypox virus	100.00	100.00	0
76	Monkeypox virus	100.00	100.00	0
19	Vaccinia virus	100.00	32.20	0
76	Vaccinia virus	98.31	100.00	1
31	Cowpox virus	92.86	23.73	1
76	Cowpox virus	98.31	100.00	1
76	Vaccinia virus	98.31	100.00	1
76	Cowpox virus	98.31	100.00	1
76	Cowpox virus	98.31	100.00	1
76	Vaccinia virus WR	98.31	100.00	1
76	Cowpox virus	98.31	100.00	1
76	Horsepox virus	98.31	100.00	1
76	Camelpox virus	98.31	100.00	1
76	Monkeypox virus	98.31	100.00	1
76	Cowpox virus	98.31	100.00	1
76	Cowpox virus	98.31	100.00	1
76	Cowpox virus	98.31	100.00	1
76	Cowpox virus	98.31	100.00	1
76	Vaccinia virus	98.31	100.00	1
76	Horsepox virus	98.31	100.00	1
76	Vaccinia virus	98.31	100.00	1

FIG. 33 (Continued)

Ⓒ	Ⓓ	ADZ29600.1	(+)	18	Ⓔ
		UJQ44561.1	(+)	18	
		UJQ44888.1	(+)	18	
		P29888.1	(+)	18	
		AGZ01354.1	(+)	18	
		AEY74285.1	(+)	18	
		ABD57579.1	(+)	18	
		AIX99167.1	(+)	18	
		AAQ93146.1	(+)	18	
		AAS49752.1	(+)	18	
		SNB49925.1	(+)	18	
		YP_232932.1	(+)	18	
		CRL86809.1	(+)	18	
		AHB23490.1	(+)	18	
		P21052.1	(+)	18	
		AEY74514.1	(+)	18	
		AAW23450.1	(+)	18	
		AQQ12918.1	(+)	18	
		ADZ24059.1	(+)	18	
		AGY99230.1	(+)	18	
		SPQ64235.1	(+)	18	
		AAF33903.1	(+)	18	
		QCW07358.1	(+)	18	
		YP_717358.1	(+)	18	
		ADZ29813.1	(+)	18	
		SNB50136.1	(+)	18	
		SNB48477.1	(+)	18	
		AGY97948.1	(+)	18	

FIG. 33 (Continued)

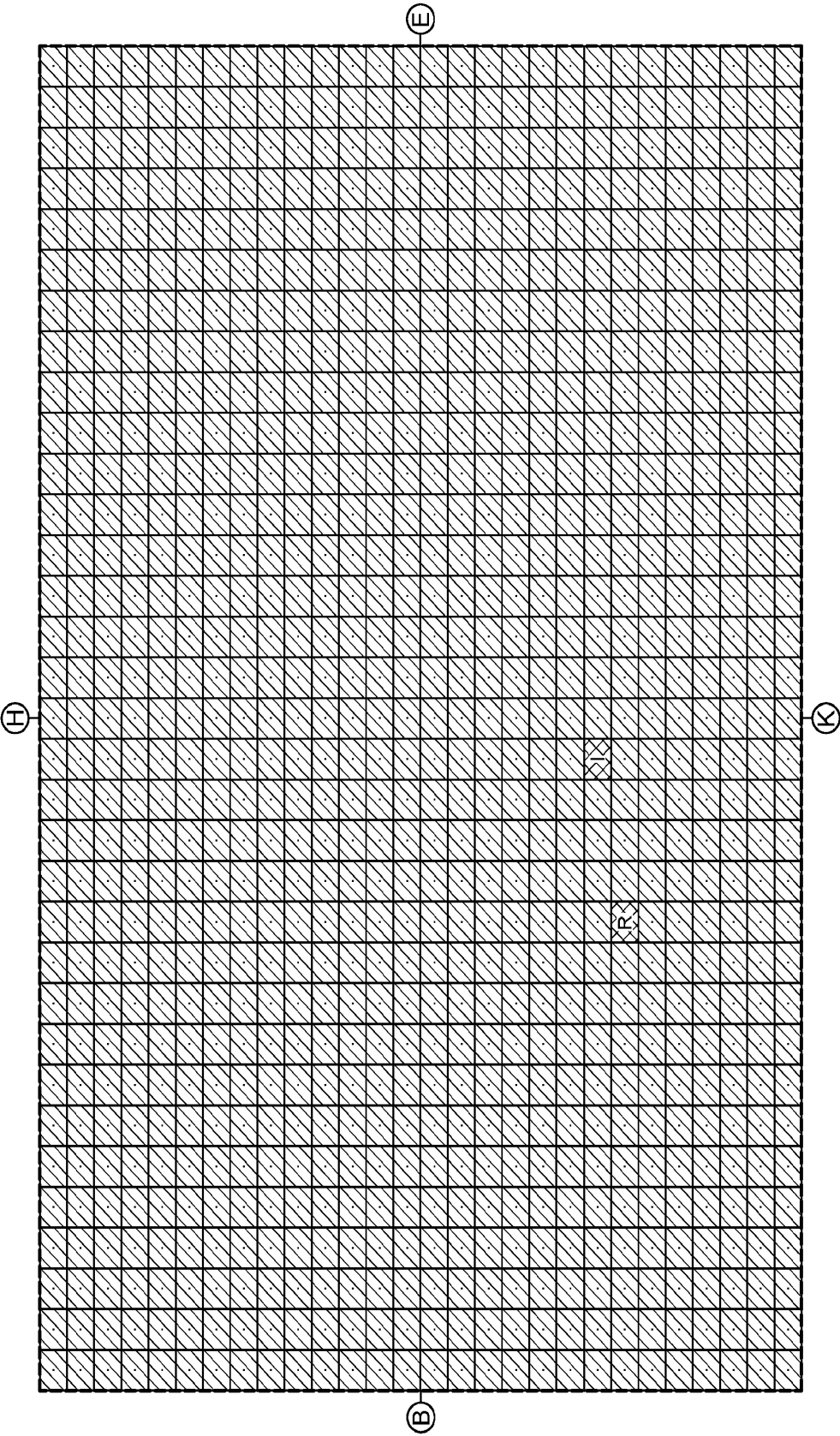


FIG. 33 (Continued)

①

76	Cowpox virus	98.31	100.00	1
76	Buffalopox virus	98.31	100.00	1
76	Buffalopox virus	98.31	100.00	1
76	Vaccinia virus L-IPV	98.31	100.00	1
76	Cowpox virus	98.31	100.00	1
76	Vaccinia virus	98.31	100.00	1
76	Vaccinia virus	98.31	100.00	1
76	Vaccinia virus	98.31	100.00	1
76	Rabbitpox virus	98.31	100.00	1
76	Cowpox virus	98.31	100.00	1
76	Vaccinia virus	98.31	100.00	1
76	Cowpox virus	98.31	100.00	1
76	Vaccinia virus WAU86/8...	98.31	100.00	1
76	Vaccinia virus Copenhag...	98.31	100.00	1
76	Vaccinia virus	98.31	100.00	1
76	Vaccinia virus	98.31	100.00	1
76	Cowpox virus	98.31	100.00	1
76	Cowpox virus	98.31	100.00	1
76	Cowpox virus	98.31	100.00	1
76	Cowpox virus	96.61	100.00	2
76	Cowpox virus	96.61	100.00	2
76	Vaccinia virus Tian Tan	96.61	100.00	2
76	Camelpox virus	96.61	100.00	2
76	Taterapox virus	96.61	100.00	2
76	Cowpox virus	96.61	100.00	2
76	Cowpox virus	96.61	100.00	2
76	Cowpox virus	96.61	100.00	2
76	Cowpox virus	96.61	100.00	2

②

FIG. 33 (Continued)

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②

[illegible]

FIG. 33 (Continued)

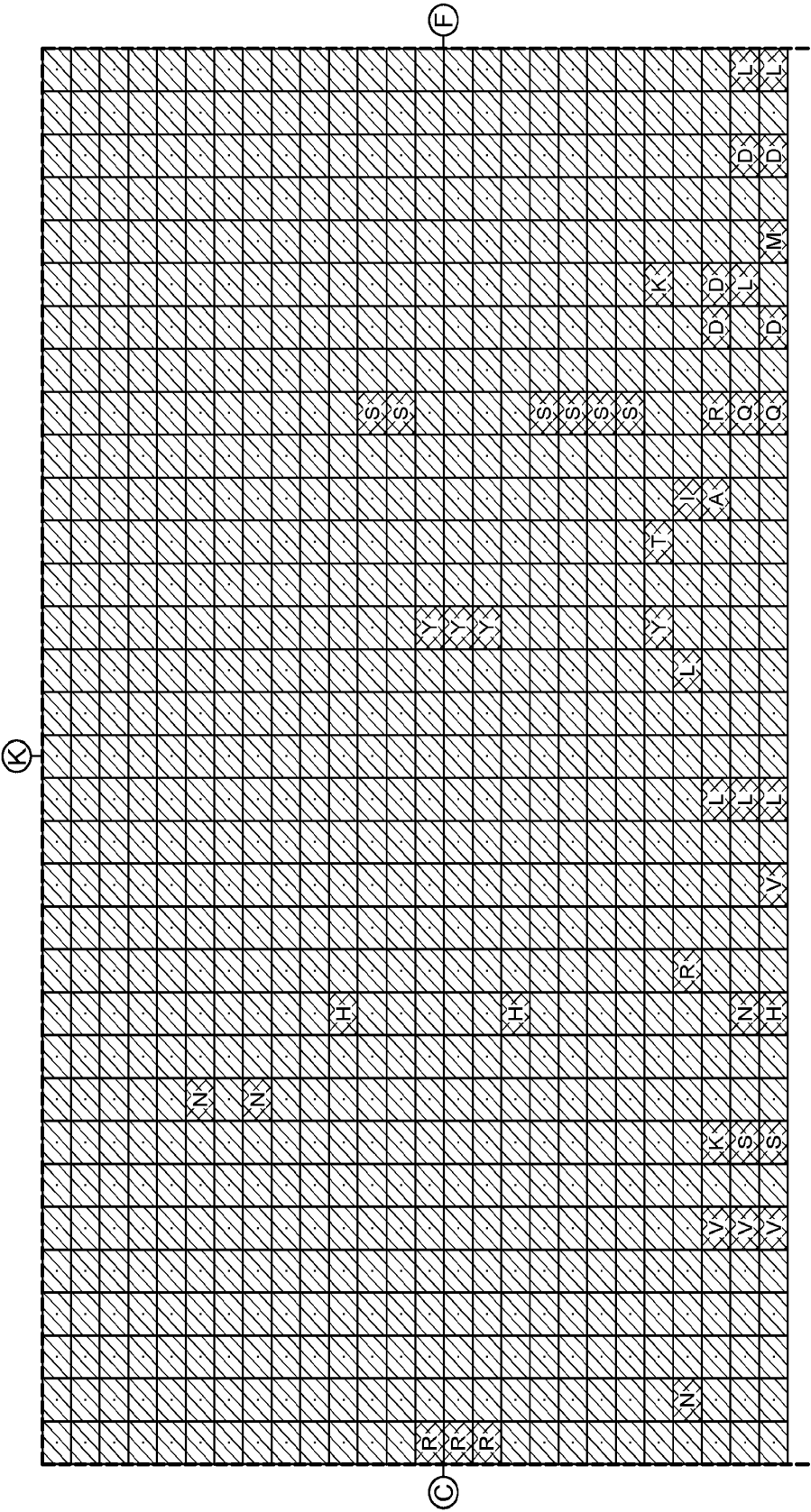


FIG. 33 (Continued)

(L)

76	Cowpox virus	96.61	100.00	2
76	Cowpox virus	96.61	100.00	2
76	Cowpox virus	96.61	100.00	2
76	Cowpox virus	96.61	100.00	2
76	Cowpox virus	96.61	100.00	2
76	Cowpox virus	96.61	100.00	2
76	Orthopoxvirus Abaino	94.92	100.00	3
76	Cowpox virus	94.92	100.00	3
76	Cowpox virus	94.92	100.00	3
76	Cowpox virus	94.92	100.00	3
76	Cowpox virus	93.22	100.00	4
76	Ectromelia virus	93.22	100.00	4
76	Ectromelia virus ERPV	93.22	100.00	4
76	Akhmeta virus	93.22	100.00	4
76	Akhmeta virus	93.22	100.00	4
76	Akhmeta virus	93.22	100.00	4
76	Cowpox virus	93.22	100.00	4
76	Variola virus	91.53	100.00	5
76	Variola virus	91.53	100.00	5
76	Variola virus	91.53	100.00	5
76	Variola virus	89.83	100.00	6
89	Alaskapox virus	86.44	100.00	8
76	Vaccinia virus	84.75	100.00	9
74	Raccoonpox virus	75.00	81.36	12
76	Skunkpox virus	74.00	84.75	13
75	Volepox virus	66.00	83.05	16

(F)

FIG. 33 (Continued)

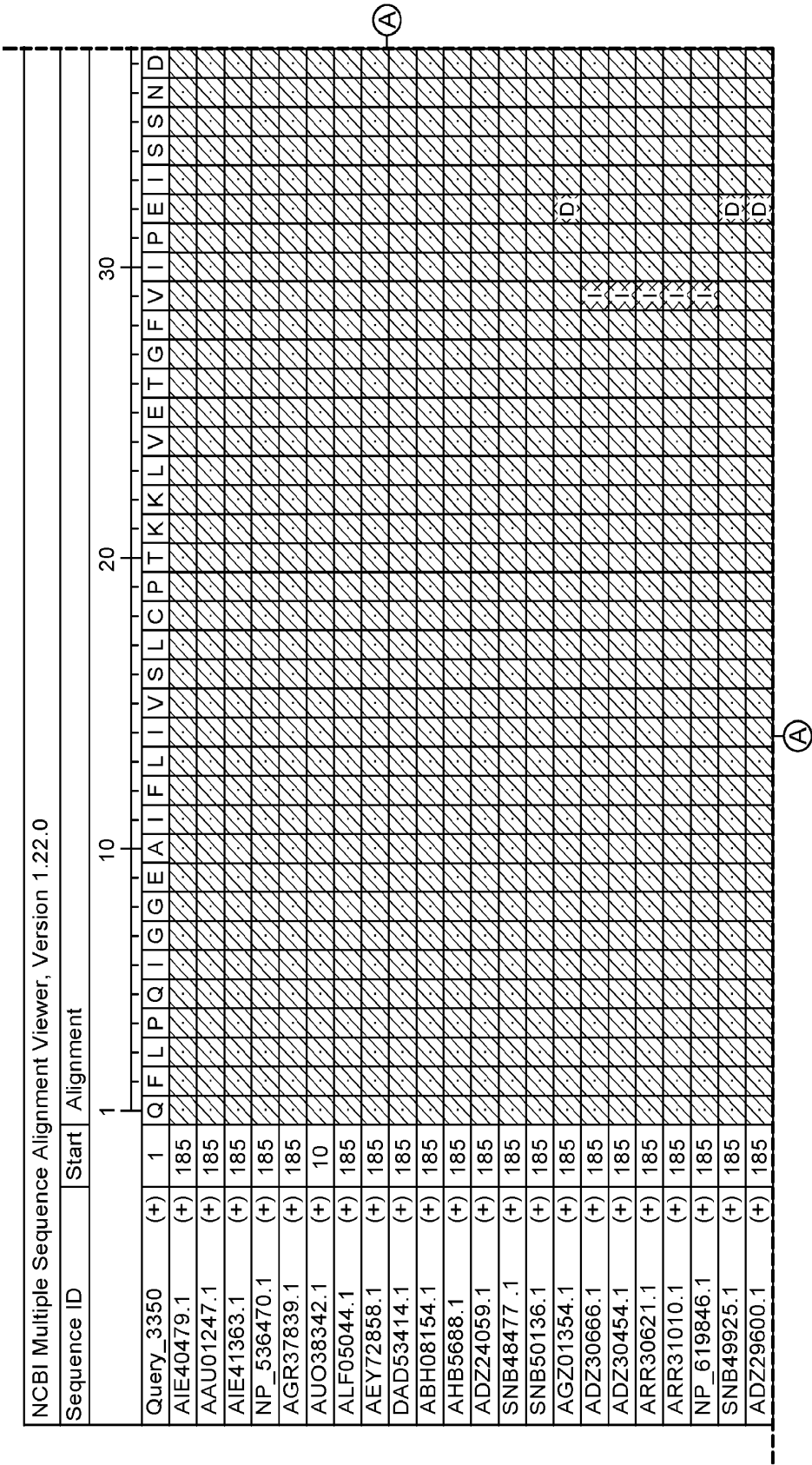


FIG. 34

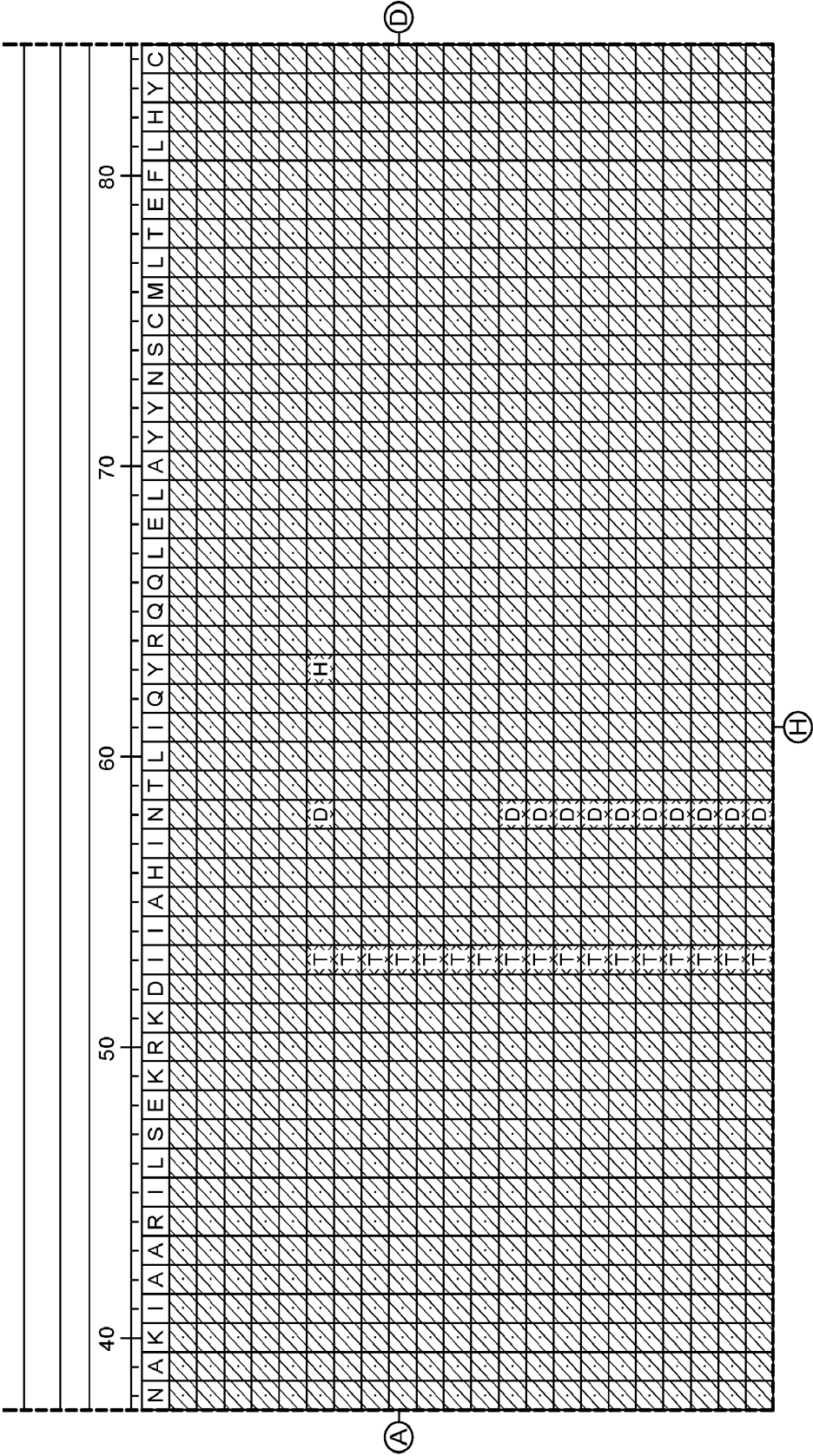


FIG. 34 (Continued)

														End	Organism	Identity	Coverage	Mismatches
														97				
														90				
N	S	Y	A	D	T	I	K	E	S	L	L	K		97				
														281	Monkeypox virus	100.00	100.00	0
														281	Monkeypox virus	100.00	100.00	0
														281	Monkeypox virus	100.00	100.00	0
														281	Monkeypox virus Zaire-9...	100.00	100.00	0
														281	Monkeypox virus	100.00	100.00	0
														106	Vaccinia virus	95.88	100.00	4
														281	Vaccinia virus	98.97	100.00	1
														281	Vaccinia virus	98.97	100.00	1
														281	Horsepox virus	98.97	100.00	1
														281	Horsepox virus	98.97	100.00	1
														281	Vaccinia virus	98.97	100.00	1
														281	Cowpox virus	98.97	100.00	1
														281	Cowpox virus	97.94	100.00	2
														281	Cowpox virus	97.94	100.00	2
														281	Cowpox virus	96.91	100.00	3
														281	Cowpox virus	96.91	100.00	3
														281	Cowpox virus	96.91	100.00	3
														281	Cowpox virus	96.91	100.00	3
														281	Cowpox virus	96.91	100.00	3
														281	Cowpox virus	96.91	100.00	3
														281	Cowpox virus	96.91	100.00	3
														281	Cowpox virus	96.91	100.00	3
														281	Cowpox virus	96.91	100.00	3

FIG. 34 (Continued)

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⑨

FIG. 34 (Continued)

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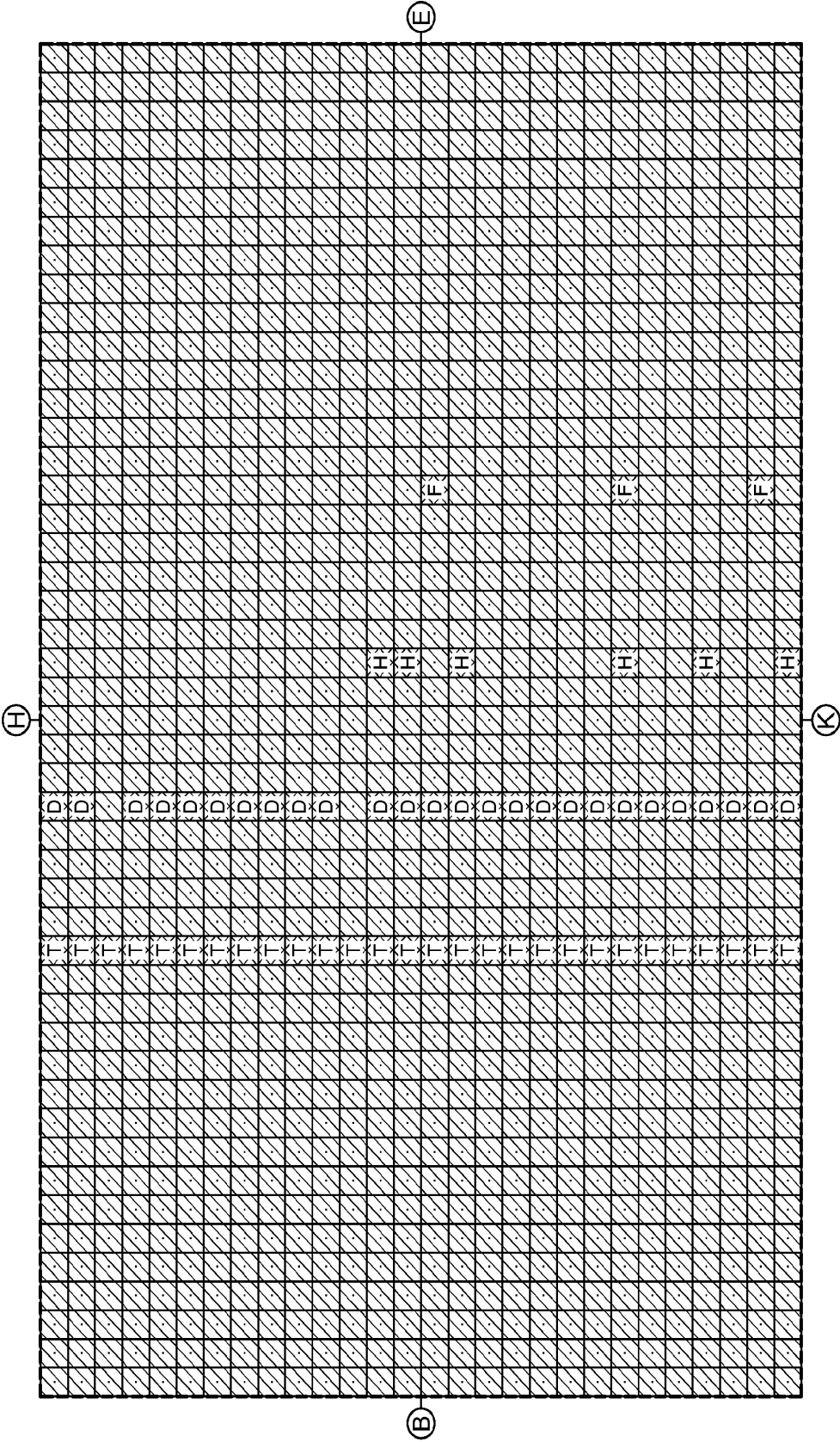
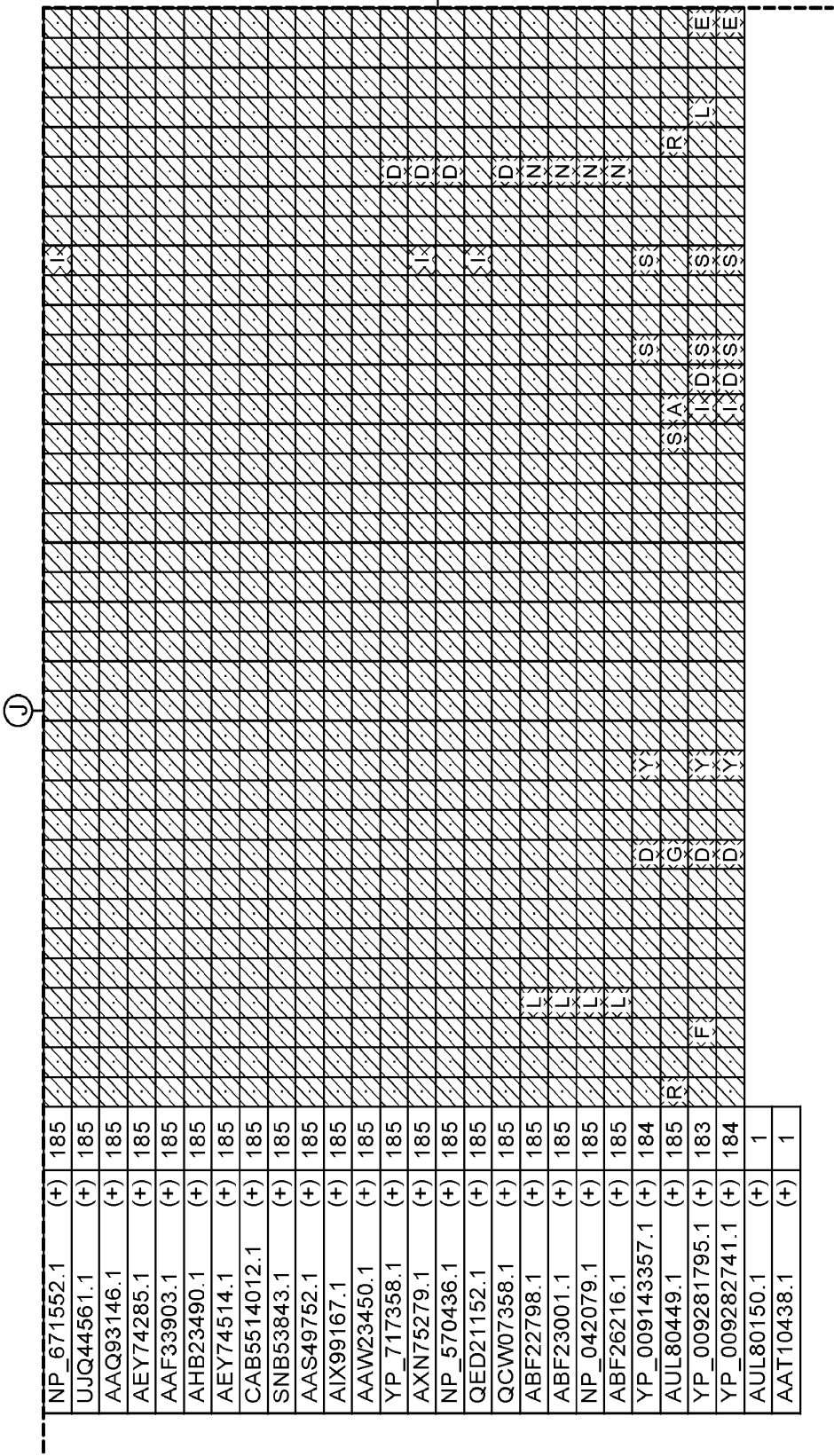


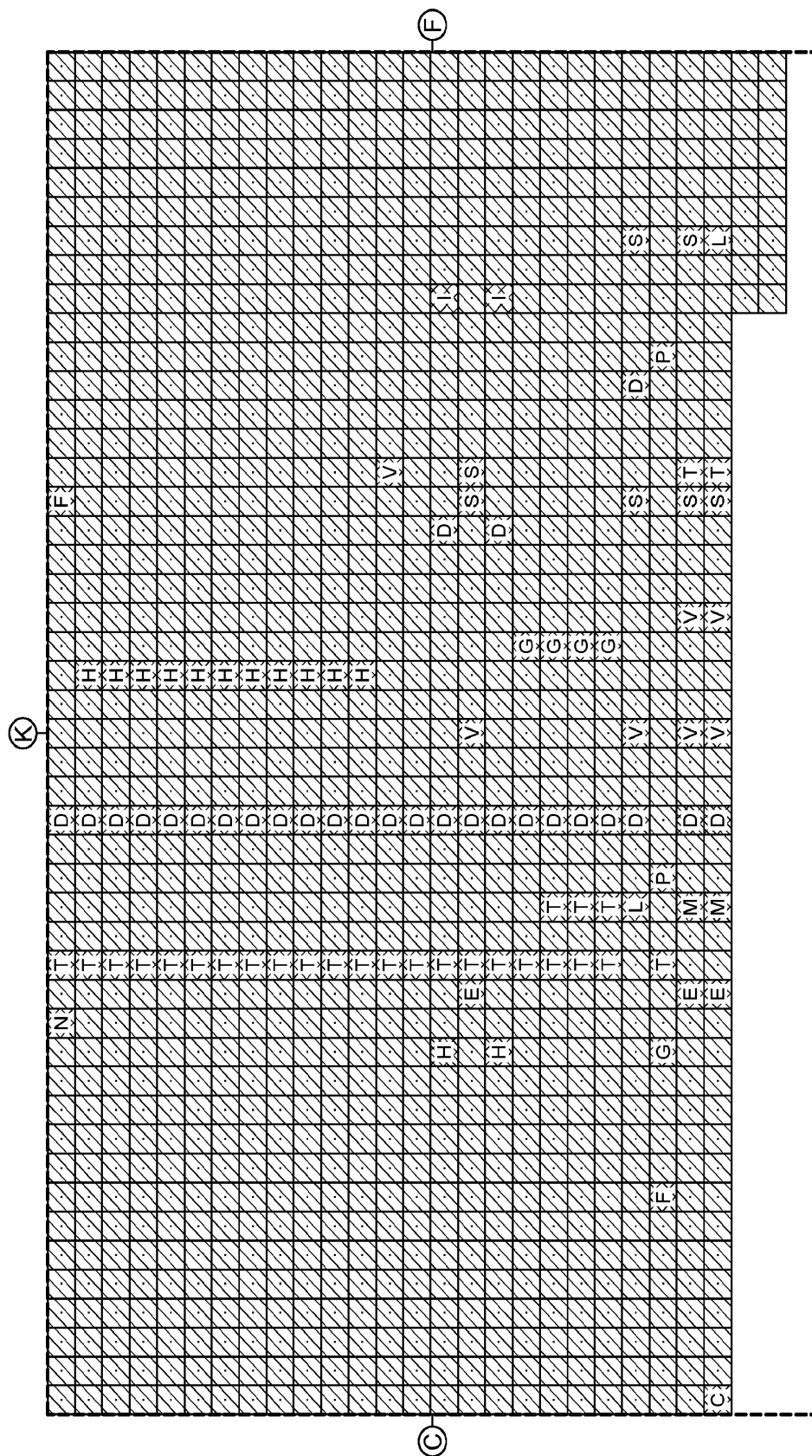
FIG. 34 (Continued)

E	①	281	Cowpox virus	96.91	100.00	3
		281	Cowpox virus	96.91	100.00	3
		281	Vaccinia virus	97.94	100.00	2
		281	Cowpox virus	96.91	100.00	3
		281	Cowpox virus	96.91	100.00	3
		281	Cowpox virus	96.91	100.00	3
		281	Cowpox virus	96.91	100.00	3
		281	Cowpox virus	96.91	100.00	3
		281	Cowpox virus	96.91	100.00	3
		281	Cowpox virus	96.91	100.00	3
		281	Cowpox virus	96.91	100.00	3
		281	Cowpox virus	96.91	100.00	3
		281	Vaccinia virus WR	97.94	100.00	2
		281	Vaccinia virus	96.91	100.00	3
		281	Vaccinia virus Copenhag...	96.91	100.00	3
		281	Ectromelia virus ERPV	95.88	100.00	4
		281	Cowpox virus	96.91	100.00	3
		281	Cowpox virus	96.91	100.00	3
		281	Cowpox virus	95.88	100.00	4
		281	Cowpox virus	95.88	100.00	4
		281	Cowpox virus	95.88	100.00	4
		281	Cowpox virus	95.88	100.00	4
		281	Cowpox virus	95.88	100.00	4
		281	Akhmeta virus	94.85	100.00	5
		281	Cowpox virus	95.88	100.00	4
		281	Buffalopox virus	95.88	100.00	4
		281	Akhmeta virus	94.85	100.00	5
		281	Orthopoxvirus Abatino	94.85	100.00	5
		277	Vaccinia virus L-IPV	95.88	100.00	4

FIG. 34 (Continued)



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E	L	281	Ectromelia virus	94.85	100.00	5
		281	Buffalopox virus	95.88	100.00	4
		281	Vaccinia virus	95.88	100.00	4
		281	Vaccinia virus	95.88	100.00	4
		281	Vaccinia virus Tian Tan	95.88	100.00	4
		281	Vaccinia virus WAU86/8...	95.88	100.00	4
		281	Vaccinia virus	95.88	100.00	4
		281	Cowpox virus	95.88	100.00	4
		281	Cowpox virus	95.88	100.00	4
		281	Rabbitpox virus	95.88	100.00	4
		281	Vaccinia virus	95.88	100.00	4
		281	Vaccinia virus	95.88	100.00	4
		281	Taterapox virus	94.85	100.00	5
		281	Akhmeta virus	93.81	100.00	6
		281	Camelpox virus	91.75	100.00	8
		294	Alaskapox virus	90.72	100.00	9
		281	Camelpox virus	91.75	100.00	8
		281	Variola virus	92.78	100.00	7
		281	Variola virus	91.75	100.00	8
		281	Variola virus	91.75	100.00	8
		281	Variola virus	91.75	100.00	8
		280	Raccoonpox virus	85.57	100.00	14
		281	Vaccinia virus	87.63	100.00	12
F	L	279	Volepox virus	78.35	100.00	21
		280	Skunkpox virus	79.38	100.00	20
		22	Vaccinia virus	95.45	22.68	1
		22	Vaccinia virus	95.45	22.68	1

FIG. 34 (Continued)

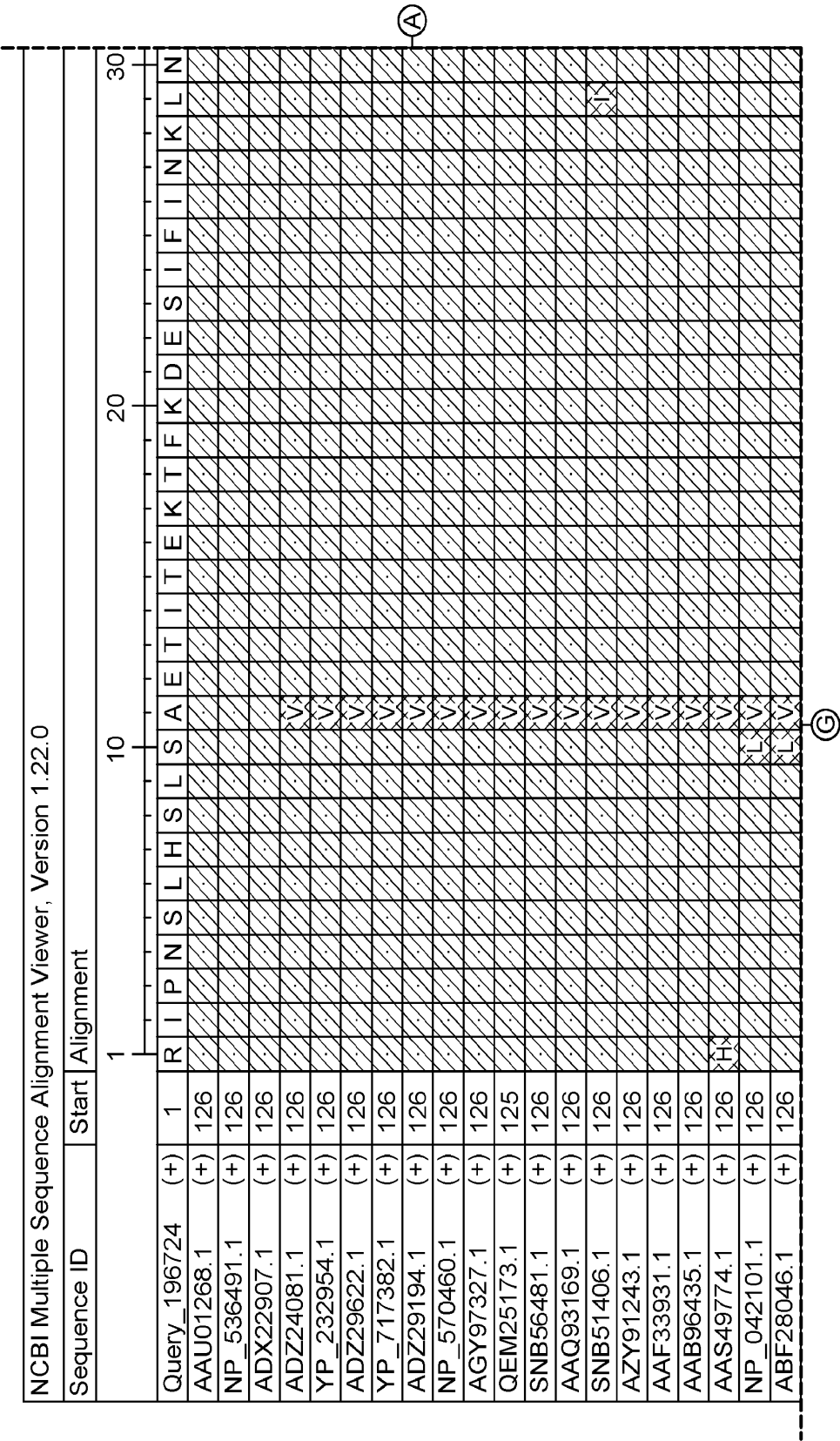


FIG. 35

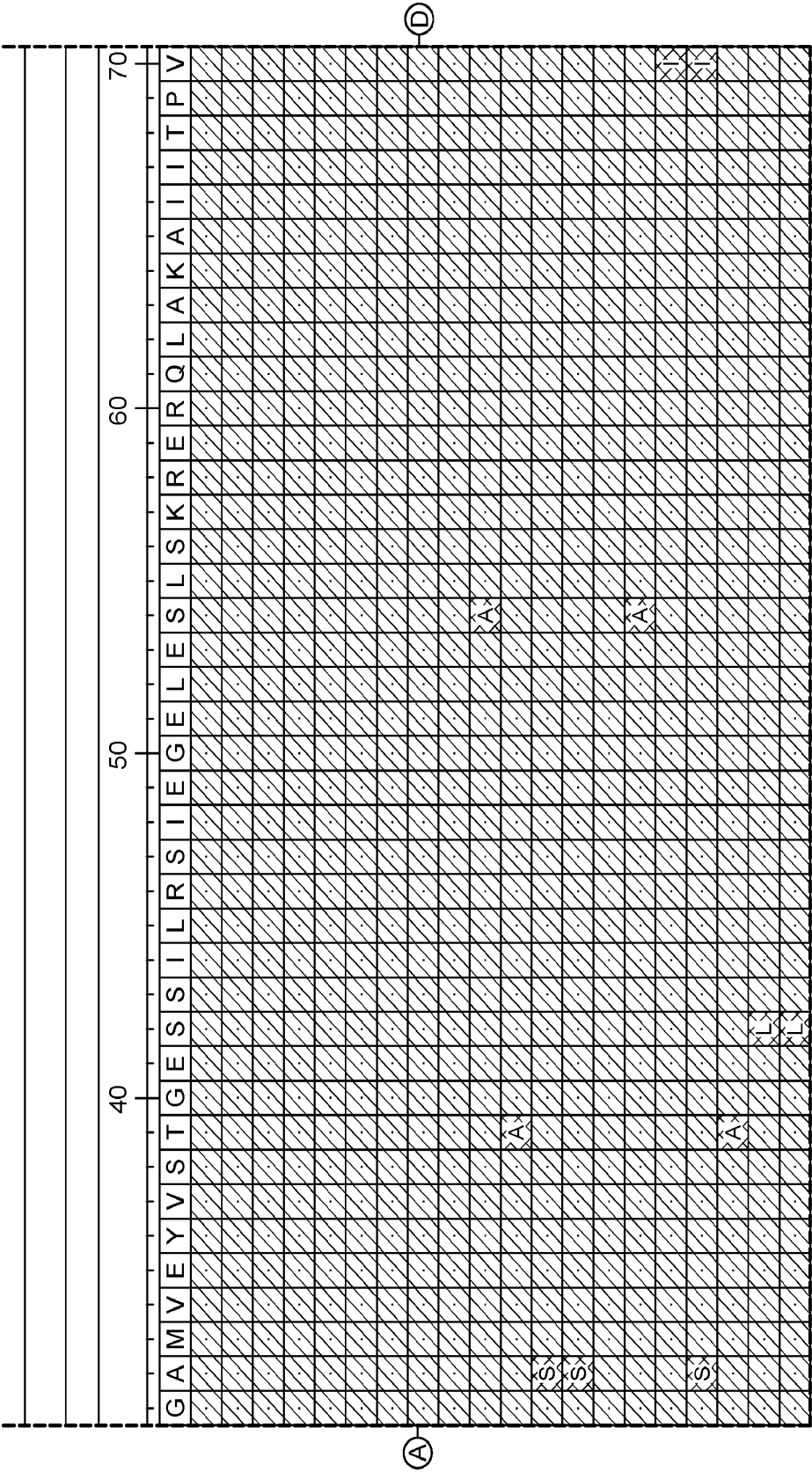


FIG. 35 (Continued)

										End	Organism	Identity	Coverage	Mismatches
<div>74</div>														
										V	F	Y	R	74
D										199	Monkeypox virus	100.00	100.00	0
										199	Monkeypox virus Zaire-9...	100.00	100.00	0
										199	Monkeypox virus	100.00	100.00	0
										199	Cowpox virus	98.65	100.00	1
										199	Vaccinia virus	98.65	100.00	1
										199	Cowpox virus	98.65	100.00	1
										199	Taterapox virus	98.65	100.00	1
										199	Cowpox virus	98.65	100.00	1
										199	Camelpox virus	98.65	100.00	1
										199	Cowpox virus	97.30	100.00	2
										198	Cowpox virus	97.30	100.00	2
										199	Cowpox virus	97.30	100.00	2
										199	Vaccinia virus	97.30	100.00	2
										199	Cowpox virus	97.30	100.00	2
										199	Cowpox virus	97.30	100.00	2
										199	Vaccinia virus Tian Tan	97.30	100.00	2
										199	Vaccinia virus	95.95	100.00	3
										199	Rabbitpox virus	95.95	100.00	3
										199	Variola virus	95.95	100.00	3
										199	Variola virus	95.95	100.00	3

FIG. 35 (Continued)

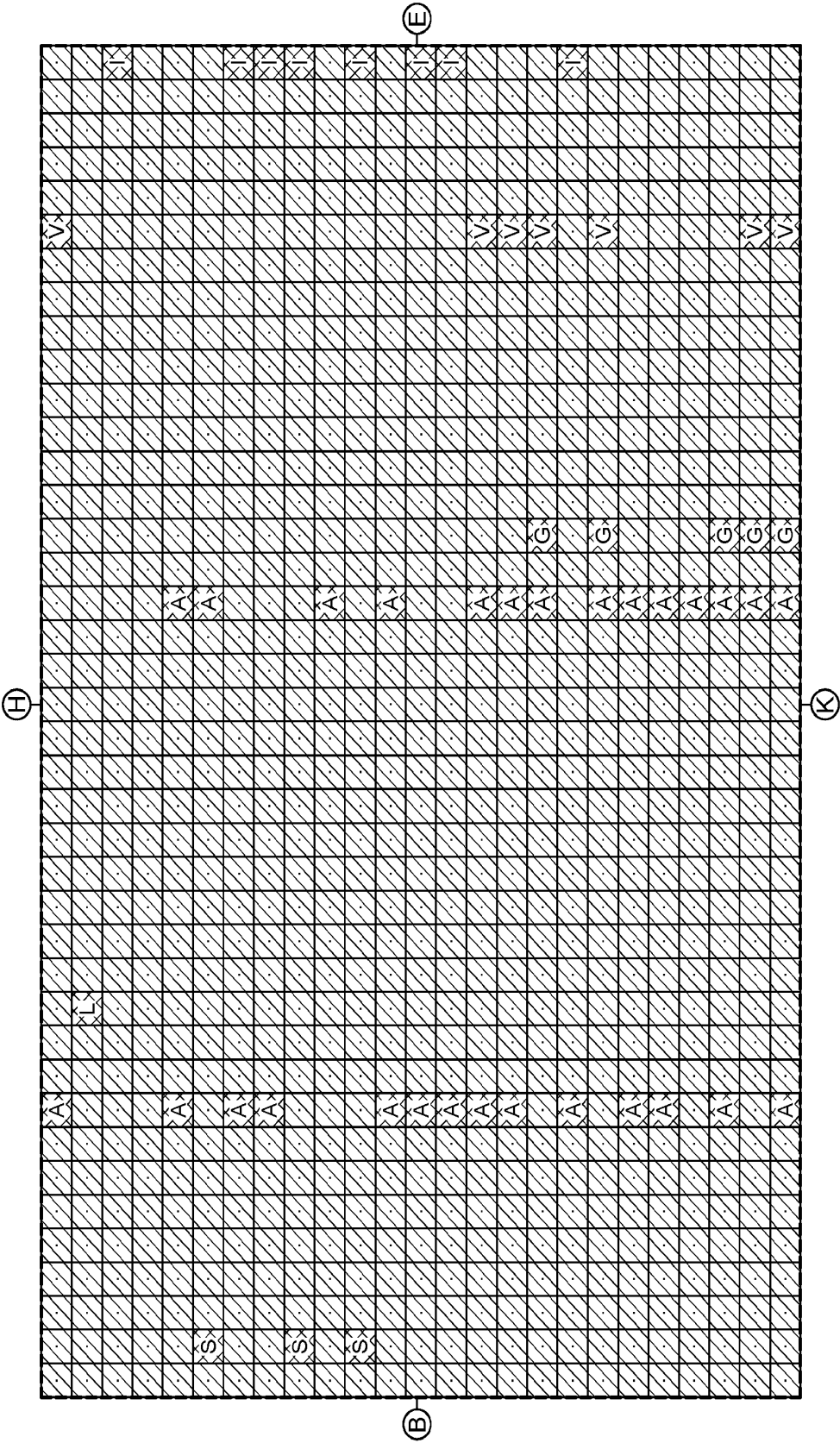


FIG. 35 (Continued)

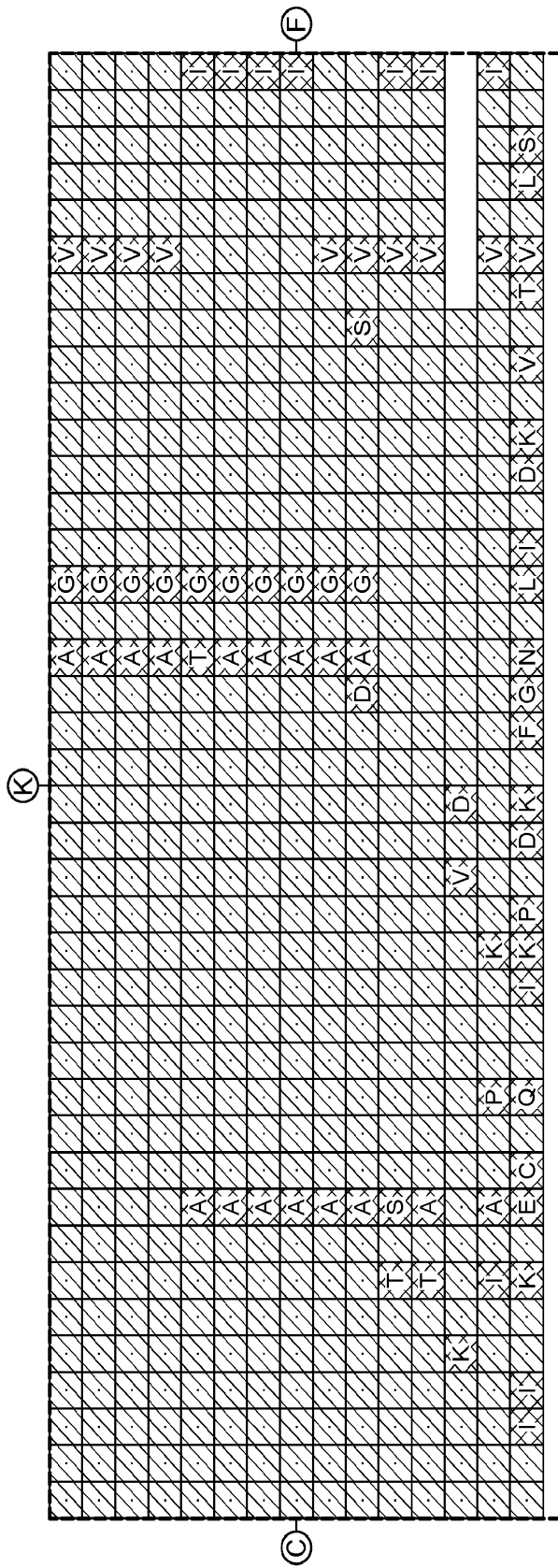
E	199	Cowpox virus	95.95	100.00	3
	199	Variola virus	95.95	100.00	3
	199	Vaccinia virus	95.95	100.00	3
	199	Cowpox virus	95.95	100.00	3
	198	Cowpox virus	95.95	100.00	3
	199	Cowpox virus	95.95	100.00	3
	199	Vaccinia virus	95.95	100.00	3
	199	Vaccinia virus Copenhagen...	95.95	100.00	3
	199	Vaccinia virus	95.95	100.00	3
	199	Cowpox virus	95.95	100.00	3
	199	Vaccinia virus	95.95	100.00	3
	199	Cowpox virus	94.59	100.00	4
	199	Vaccinia virus	94.59	100.00	4
	199	Horsepox virus	94.59	100.00	4
	198	Cowpox virus	94.59	100.00	4
	199	Cowpox virus	94.59	100.00	4
	199	Cowpox virus	94.59	100.00	4
	199	Vaccinia virus	94.59	100.00	4
	199	Cowpox virus	94.59	100.00	4
	199	Cowpox virus	94.59	100.00	4
	198	Cowpox virus	94.59	100.00	4
	199	Cowpox virus	94.59	100.00	4
	199	Cowpox virus	94.59	100.00	4
	199	Cowpox virus	94.59	100.00	4
	199	Cowpox virus	93.24	100.00	5
	199	Cowpox virus	93.24	100.00	5

FIG. 35 (Continued)

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[illegible]

FIG. 35 (Continued)



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FIG. 35 (Continued)

F	L	199	Cowpox virus	93.24	100.00	5
		199	Cowpox virus	93.24	100.00	5
		199	Cowpox virus	93.24	100.00	5
		199	Cowpox virus	93.24	100.00	5
		199	Alaskapox virus	93.24	100.00	5
		199	Orthopoxvirus Abatino	93.24	100.00	5
		199	Ectromelia virus	93.24	100.00	5
		199	Ectromelia virus	93.24	100.00	5
		199	Cowpox virus	91.89	100.00	6
		199	Akhmeta virus	90.54	100.00	7
		198	Skunkpox virus	89.19	100.00	8
		199	Raccoonpox virus	89.19	100.00	8
		80	Vaccinia virus	87.30	85.14	8
		199	Volepox virus	85.14	100.00	11
		207	Cetacean poxvirus 1	50.00	100.00	37

FIG. 35 (Continued)

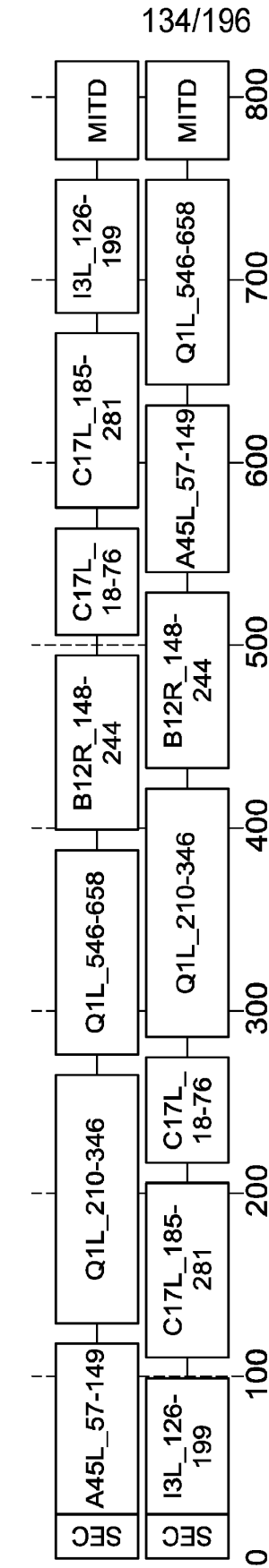


FIG. 36

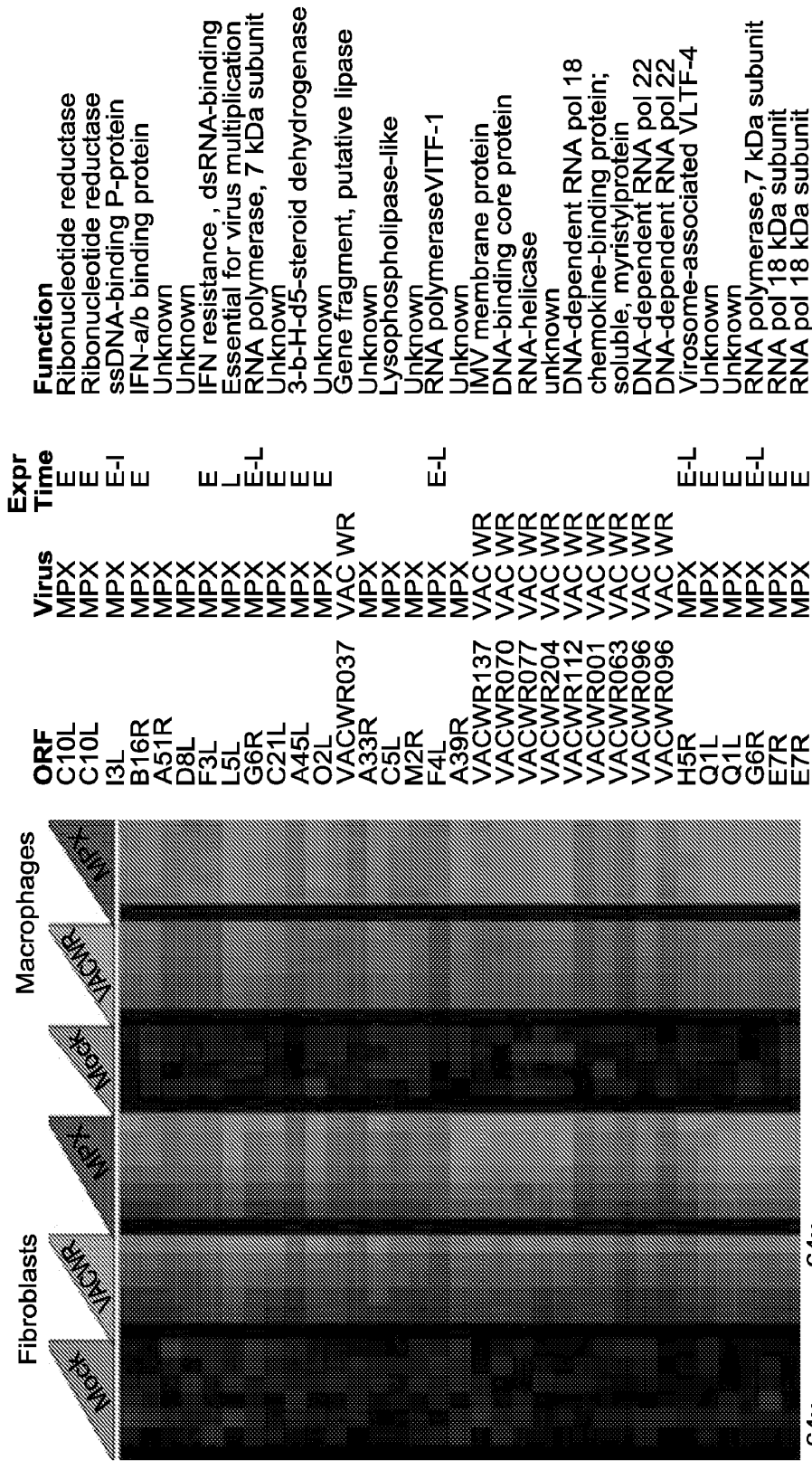


FIG. 37

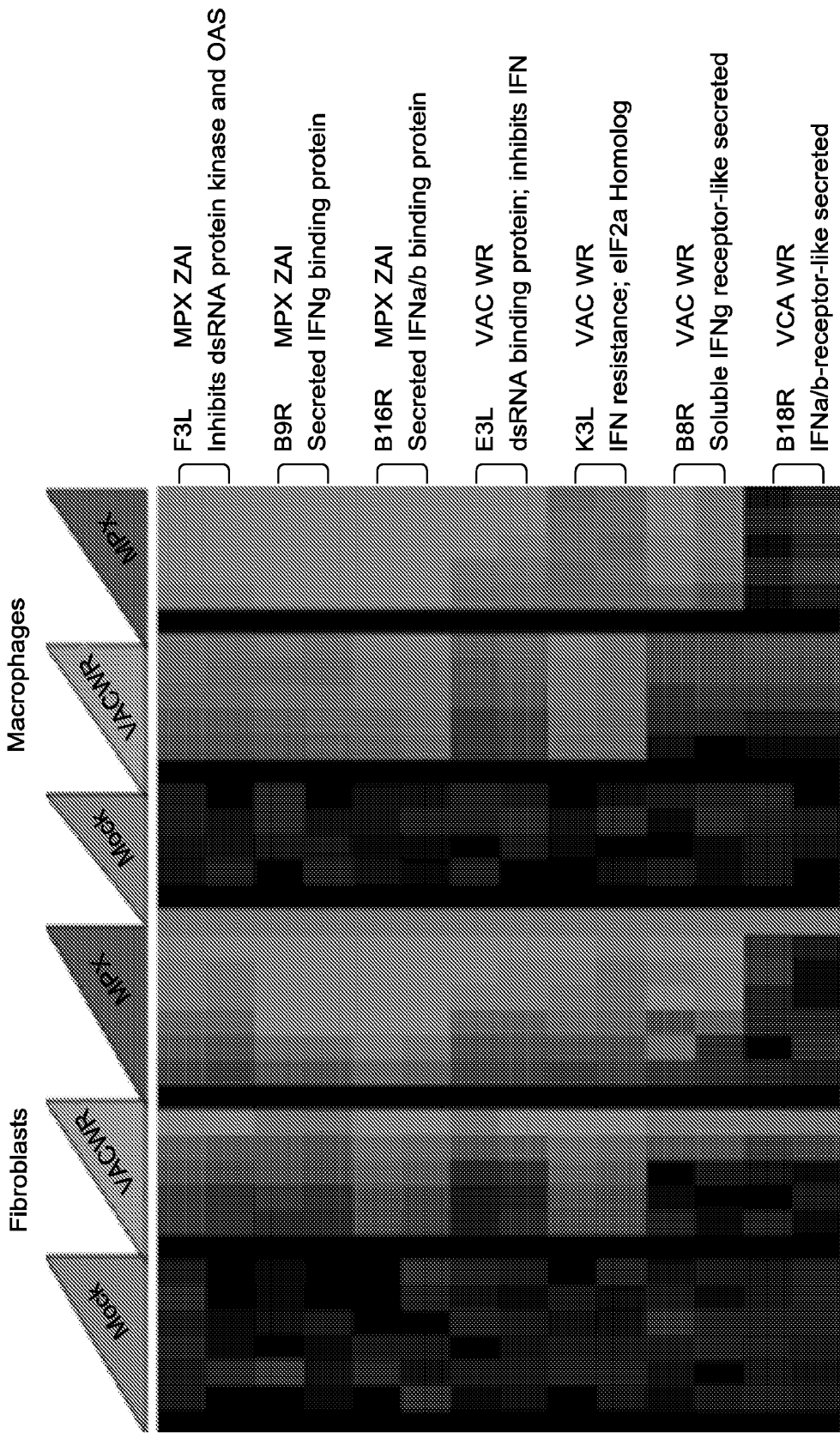


FIG. 38

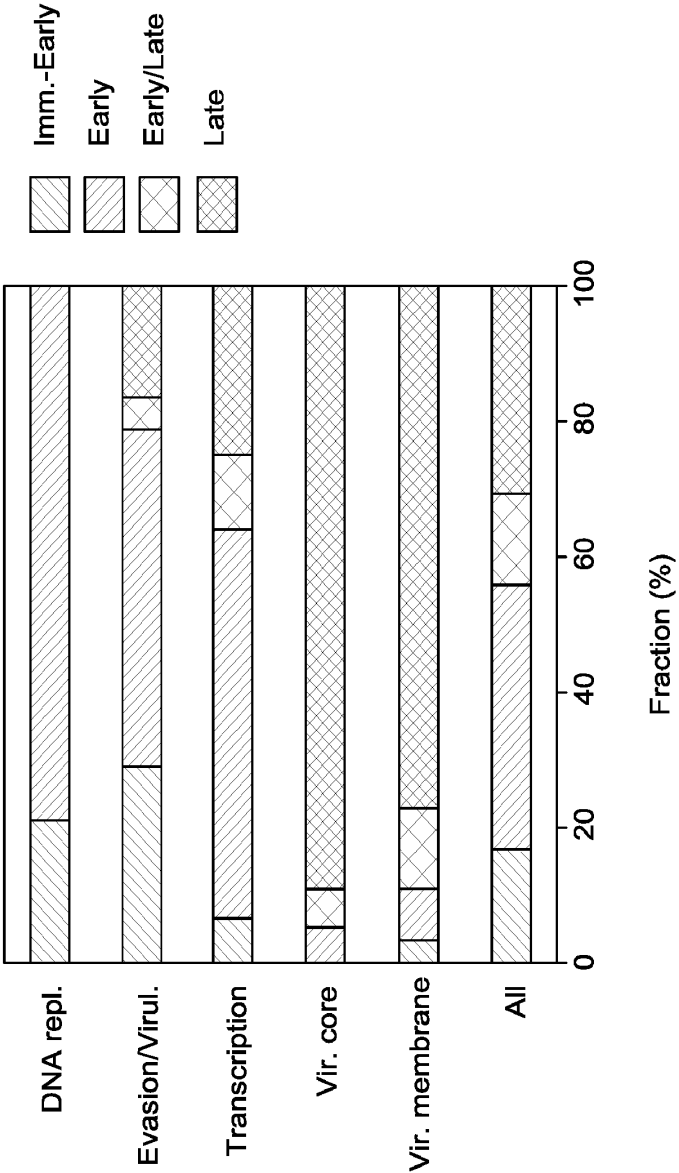


FIG. 39A

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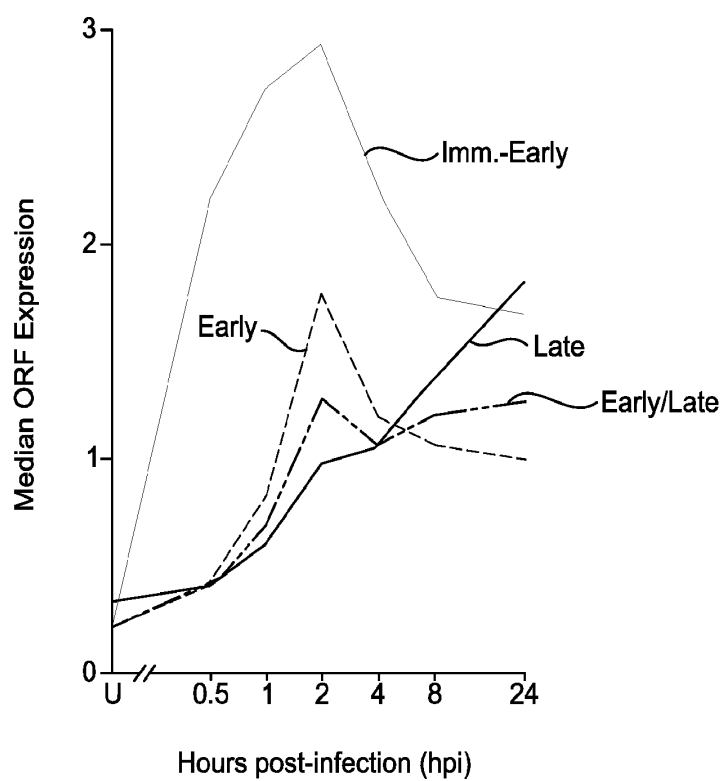


FIG. 39B

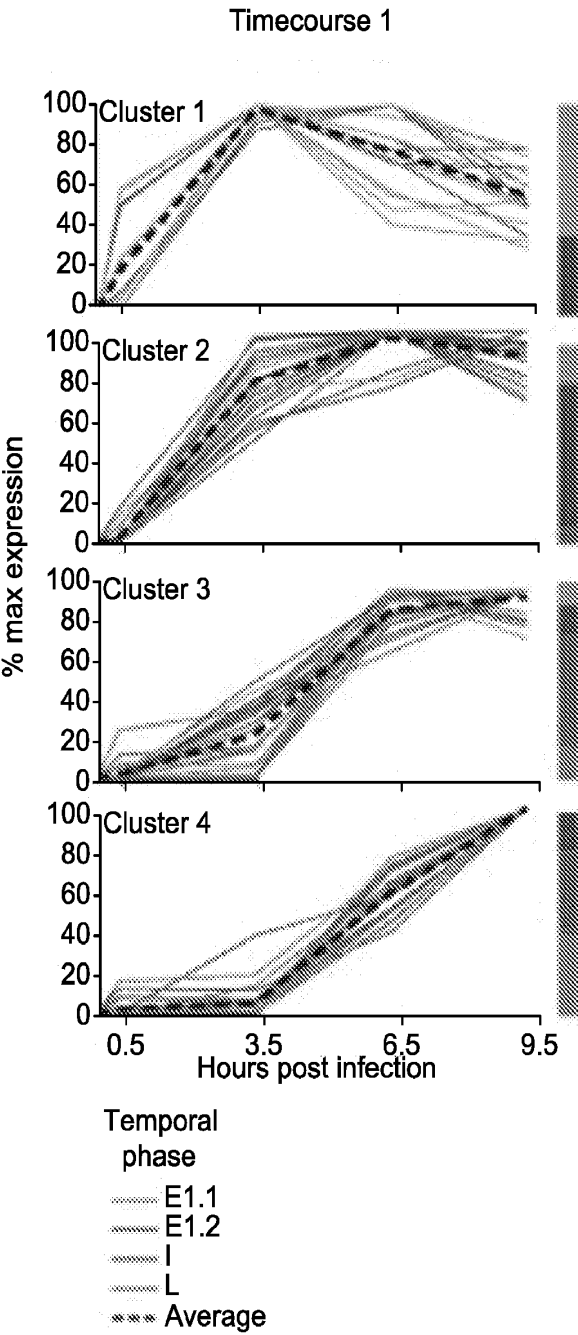


FIG. 40A

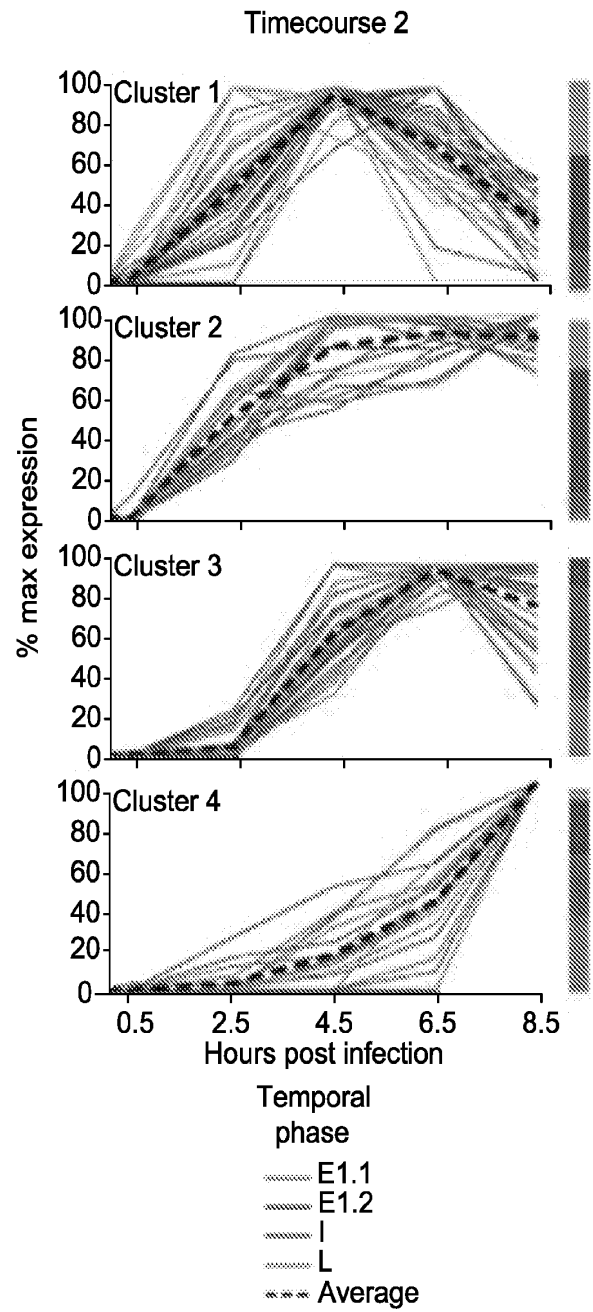


FIG. 40B

Antigen (MPXV)	Occurrence in the 3 studies	Protein length (A4)	Reported epitope #	Epitope density
A45L	3	346	72	0.208092
Q1L	3	665	118	0.177444
A35R**	2	181	98	0.541436
B12R	2	344	125	0.363372
B4R*	2	503	52	0.10338
P2L	2	177	23	0.129944
C10L	2	319	73	0.22884
C17L	2	354	150	0.423729
C1L	2	284	57	0.200704
F3L	2	153	45	0.294118
F4L	2	259	96	0.370656
H5R	2	210	26	0.12381
I3L	2	269	178	0.66171
O2L	2	220	37	0.168182
B16R	2	356	36	0.101124
B9R	2	267	54	0.202247

Confirmed by
both MS and
transcription

Confirmed by 2
transcription
studies

T cell Epitopes

A45L
Q1L
B12R
C17L
I3L

FIG. 41

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M1R full length ₍₁₋₂₅₀₎

MGAAASIQTTVNTLSERISSKLEQEANASAQTKCDIEI
 GNFYIRQNHGCNITVKNMCSADADAQLDAVLSAATE
 TYSGLTPEQKAYVPAMFTAALNIQTSVNTVVRDFENY
 VKQTCNSSAVVDNKLKIQNVIIDECYGAPGSPTNLEFI
 NTGSSKGNCAIKALMQLTTKATTQIAPRQVAGTGVQF
 YMIVIGVILAALFMYAKRMLFTSTNDKIKLILANKE
 NVHWTTYMDTFFRTSPMIATTDIQN*
 (SEQ ID NO.: 158)

FIG. 42A

HSV/ gD _{sec}	M1R full length ₍₁₋₂₅₀₎
------------------------	------------------------------------

MGAAARLGAVILFVVIVGLHGVRGMGAAASIQTTVN
TLSERISSKLEQEANASAQTKCDIEIGNFYIRQNHGCNIT
 VKNMCSADADAQLDAVLSAATETYSGLTPEQKAYVP
 AMFTAALNIQTSVNTVVRDFENYVKQTCNSSAVVDNK
 LKIQNVIIDECYGAPGSPTNLEFINTGSSKGNCAIKALM
 QLTTKATTQIAPRQVAGTGVQFYMIVIGVILAALFMY
 YAKRMLFTSTNDKIKLILANKENVHWTTYMDTFFRTSP
 MIATTDIQN* (SEQ ID NO.: 162)

FIG. 42B

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A29L full length ₍₁₋₁₁₀₎

MDGTLFPGDDDLAIPATEFFSTKAAKNPETKREAIVK
 AYGDDNEETLKQRLTNLEKKITNITTKFEQIEKCKCRN
 DEVLFRLENHAETLRAAMISLAKKIDVQTGRHPYE*
 (SEQ ID NO.: 164)

FIG. 43A

HSV/ gD _{sec}	A29L full length ₍₁₋₁₁₀₎
------------------------	-------------------------------------

MGGAAARLGAVILFVVIVGLHGVRGMDGTLFPGDDDL
 AIPATEFFSTKAAKNPETKREAIVKAYGDDNEETLKQR
 LTNLEKKITNITTKFEQIEKCKCRNDEVLFRLNHAETL
 RAAMISLAKKIDVQTGRHPYE* (SEQ ID NO.: 166)

FIG. 43B

HSV/ gD _{sec}	<div style="text-align: center;">C71A/C72A ▼</div> A29L full length ₍₁₋₁₁₀₎
------------------------	--

MGGAAARLGAVILFVVIVGLHGVRGMDGTLFPGDDDL
 AIPATEFFSTKAAKNPETKREAIVKAYGDDNEETLKQR
 LTNLEKKITNITTKFEQIEKAAKRNDEVLFRLNHAETL
 RAAMISLAKKIDVQTGRHPYE* (SEQ ID NO.: 170)

FIG. 43C

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A35R full length₍₁₋₁₈₁₎

MMTPENDEEQTSVFSATVYGDQKIQGKNKRKRVLGLCI
RISMVISLLSMITMSAFLIVRLNQCMSANKAAITDSAV
AVAAASSTHRKVVSSTTQYDHKESCNGLYYQGSCYIL
HSDYKSFEDAKANCAAESSTLPNKSDVLTTLWIDYVE
DTWGS DGNPITKTTSDYQSDVSQEV RKYFCT*
(SEQ ID NO.: 172)

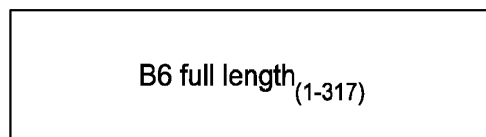
FIG. 44A

HSV/ gD _{sec}	A35R ECD ₍₈₉₋₁₈₁₎	Linker	A35R ECD ₍₈₉₋₁₈₁₎
------------------------	------------------------------	--------	------------------------------

MGGAAARLGAVILFVVIVGLHGVRGSSTTQYDHKESC
NGLYYQGSCYILHSDYKSFEDAKANCAAESSTLPNKSD
VLTTLWIDYVEDTWGS DGNPITKTTSDYQSDVSQEV
RKYFCTGGSGGGSGGSSTTQYDHKESCNGLYYQGSC
YILHSDYKSFEDAKANCAAESSTLPNKSDVLTTLWIDY
VEDTWGS DGNPITKTTSDYQSDVSQEV RKYFCT*
(SEQ ID NO.: 178)

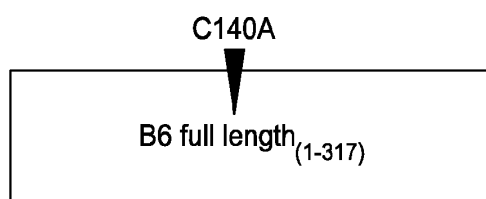
FIG. 44B

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MKTISVVTLTLCVLPVVYSTCTVPTMNNAKLTSTETS
 FNDKQKVTFTCDSGYHSLDPNAV CETDKWKYENPCK
 KMCTVSDYVSELYDKPLYEVNSTMTLSCNGETKYFR
 CEEKNGNTSWNDTVTCPNAECQPLQLEHGSCQPVE
 KYSGEYMTINCDVGYEIVGVSYISCTANSWNVIPSC
 QQKCDIPSLNGLISGSTFSIGGVIHL SCKSGFTLTGSPS
 STCIDGKWNIP LPTCVRSNEEFDPVDDGPDDDETDL SK
 LSKD VVQYEQEIESLEATYHIIIMALTIMGVIFLISIIVLV
 CSCDKNNDQYKFHKLLP* (SEQ ID NO: 180)

FIG. 45A



MKTISVVTLTLCVLPVVYSTCTVPTMNNAKLTSTETS
 FNDKQKVTFTCDSGYHSLDPNAV CETDKWKYENPCK
 KMCTVSDYVSELYDKPLYEVNSTMTLSCNGETKYFR
 CEEKNGNTSWNDTVTCPNAECQPLQLEHGS AQPVE
 KYSGEYMTINCDVGYEIVGVSYISCTANSWNVIPSC
 QQKCDIPSLNGLISGSTFSIGGVIHL SCKSGFTLTGSPS
 STCIDGKWNIP LPTCVRSNEEFDPVDDGPDDDETDL SK
 LSKD VVQYEQEIESLEATYHIIIMALTIMGVIFLISIIVLV
 CSCDKNNDQYKFHKLLP* (SEQ ID NO.: 182)

FIG. 45B

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H3L full length ₍₁₋₃₂₄₎

MAAVKTPVIVVPVIDRPPSETFPNVHEHINDQKFDDV
 KDNEVMQEKRDVVIVNDDPDHYKDYVFIQWTGGNI
 RDDDKYTHFFSGFCNTMCTEETKRNIARHLALWDSK
 FFTELENKNVEYVVIIENDNVIEDITFLRPVLKAIHDK
 KIDILQMREITGNKVKTTELVIDKDHAIFTYTGGYDVS
 LSAYIIRVTTALNIVDEIISKSGGLSSGFYFEIARIENEMK
 INRQIMDNSAKYVEHDPRLVAEHRFETMKPNFWSRIG
 TVAAKRYPGVMYFTFTPLISFFGLFDINVIGLIVILFIMF
 MLIFNVKSKLLWFLTGTFTVTAFI* (SEQ ID NO.: 184)

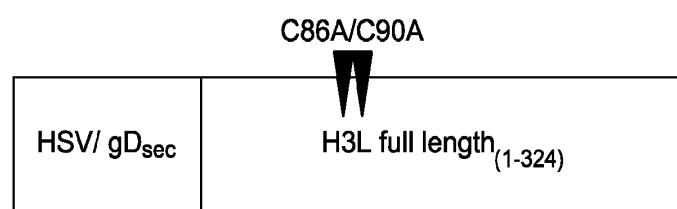
FIG. 46A

HSV/ gD _{sec}	H3L full length ₍₁₋₃₂₄₎
------------------------	------------------------------------

MGGAAARLGAVILFVVIVGLHGVRGMAAVKTPVIVVP
VIDRPPSETFPNVHEHINDQKFDDVKDNEVMQEKR
VIVNDDPDHYKDYVFIQWTGGNIRDDDKYTHFFSGFC
 NTMCTEETKRNIARHLALWDSKFFTELENKNVEYVVII
 ENDNVIEDITFLRPVLKAIHDKKIDILQMREITGNKVKT
 ELVIDKDHAIFTYTGGYDVSL SAYIIRVTTALNIVDEIISK
 SGGLSSGFYFEIARIENEMKINRQIMDNSAKYVEHDPRL
 VAEHRFETMKPNFWSRIGTVAAKRYPGVMYFTFTPLIS
 FFGLFDINVIGLIVILFIMFMLIFNVKSKLLWFLTGTFTV
 TAFI* (SEQ ID NO.: 186)

FIG. 46B

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MGGAAARLGAVILFVVIVGLHGVRGMAAVKTPVIVVP
VIDRPPSETFPNVHEHINDQKFDDVKDNEVMQEKRDV
VIVNDDPDHYKDYVFIQWTGGNIRDDDKYTHFFSGFA
NTMATEETKRNIARHLALWDSKFFTELENKNVEYVVII
ENDNVIEDITFLRPVLKAIHDKKIDILQMREITGNKVKT
ELVIDKDHAIPTYTGGYDVSL SAYIIRVTTALNIVDEIHK
SGGLSSGFYFEIARIENEMKINRQIMDNSAKYVEHDPRL
VAEHRFETMKPNFWSRIGTVAAKRYPGVMYTFITPLIS
FFGLFDINVIGLIVILFIMFMLIFNVKSKLLWFLTGTFTVT
AFI* (SEQ ID NO.: 190)

FIG. 46C

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E8L full length₍₁₋₃₀₄₎

MPQQLSPINIETKKAISDARLKTLDIHYNESKPTTIQNT
GKLVRINFKGGYISGGFLPNEYVLSTIHIYWGKEDDY
GSNHLIDVYKYSGEINLVHWNKKKYSSYEEAKKHDD
GIIIIAIFLQVSDHKNVYFQKIVNQLDSIRSANMSAPFD
SVFYLDNLLPSTLDYFTYLGTTINHSADAAWIIFTPIN
IHSDQLSKFRTLSSSNHEGKPHYITENYRNPNYKLND
TQVYYSGEIIRAATTSPVRENYFMKWLSDLREACFSY
YQKYIEGNKTFIIAIVFVILTFLMSQRYRSREKQN
* (SEQ ID NO.: 192)

FIG. 47A

HSV/ gD _{sec}	E8L full length ₍₁₋₃₀₄₎
------------------------	------------------------------------

MGGAAARLGAVILFVVIVGLHGVRGMPQQLSPINIETK
KAISDARLKTLDIHYNESKPTTIQNTGKLVRINFKGGYI
SGGFLPNEYVLSTIHIYWGKEDDYGSNHLIDVYKYSGEI
NLVHWNKKKYSSYEEAKKHDDGIIIIAIFLQVSDHKNV
YFQKIVNQLDSIRSANMSAPFDSVFYLDNLLPSTLDYFT
YLGTTINHSADAAWIIFTPINIHSDQLSKFRTLSSSNH
EGKPHYITENYRNPNYKLNDDTQVYYSGEIIRAATTSPV
RENYFMKWLSDLREACFSYYQKYIEGNKTFIIAIVFVF
ILTFLMSQRYRSREKQN* (SEQ ID NO.: 194)

FIG. 47B

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A28L full length₍₁₋₅₀₉₎

MANIINLWNGIVPMVQDVNVASITAFKSMIDETWDK
KIEANTCISRKHRNIIHEVIRDFMKAYPKMDENRKSPL
GAPMQWLTQYYILKNEYHKTMLAYDDGSLNTKFKT
LNIYMITNVGQYILYIVFCIISGKNHDGTPYIYDSEITS
NDKNLINDRIKYACKQILHGQLTMALRIRNKFMFIGSP
MYLWFNVNGSHVYHEIYDRNVGFHNKEIGRLLYAFM
YYLSISGRFLNDLALLKFTYLGESWTFSLSVPEYILYG
LGYSVFDTIEKFSNDAILVYIRTNNRNGYDYAEFNKK
GIVKVTEDEKPDNDKRIHAIRLINYSSDVQHIHFGFRNT
LIIDNECTNIQSSAENATDIGHYQDSKINIEDDDIIDD
DDDDDDDDDDYNPKPTPIPDPHRPPFPRHDYHKRP
KLLPVEEPDPVKKDADRIRLDNHILNTLDHNLNSIGH
YCCDTVAVDRLEHHIETLGQYTVILARKINMQTLLFP
WPLPTVHQHAIDGSIPPHGRSTIL* (SEQ ID NO.: 196)

FIG. 48A

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HSV/ gD _{sec}	A28L full length ₍₁₋₅₀₉₎
------------------------	-------------------------------------

MGGAAARLGAVILFVVIVGLHGVRGMANIINLWNGIV
PMVQDVNVASITAFKSMIDETWDKKIEANTCISRKHRN
IIHEVIRDFMKA YPKMDENRKSPLGAPMQWLTQYYILK
NEYHKTMLAYDDGSLNTKFKTLNIYMITNVGQYILYIV
FCIISGKNHDGTPYIYDSEITSNDKNLINDRIKYACKQIL
HGQLTMALRIRNKF MFIGSPMYLWFNVNGSHVYHEIY
DRNVGFHNKEIGRLLYAFMYYLSISGRFLNDLALLKFT
YLGESWTFSLSVPEYILYGLGYSVFDTIEKFSNDAILVYI
RTNNRNGYDYAEFNKKGIVKVTEDKPDNDKRIHAIRLI
NYSSDVQHIFGFRNTLIIDNECTNIQSSAENATDIGHY
QDSKINIEDDDIIDDDDDDDDDDDDDDDYNPKPTPIPDPH
PRPPFPRHDYHKRPKLLPVEEPDPVKKDADRIRLDNHIL
NTLDHNLNSIGHYCCDTVAVDRLEHHIETLGQYTVILA
RKINMQTLLFPWPLPTVHQHAIDGSIPPHGRSTIL*
(SEQ ID NO.: 198)

FIG. 48B



FIG. 49

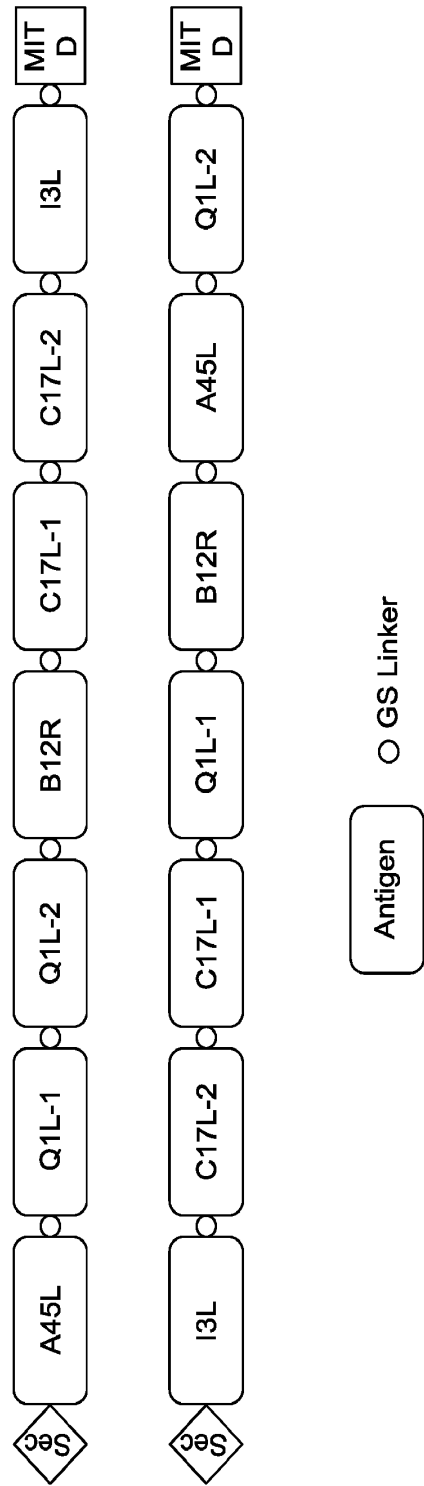


FIG. 50

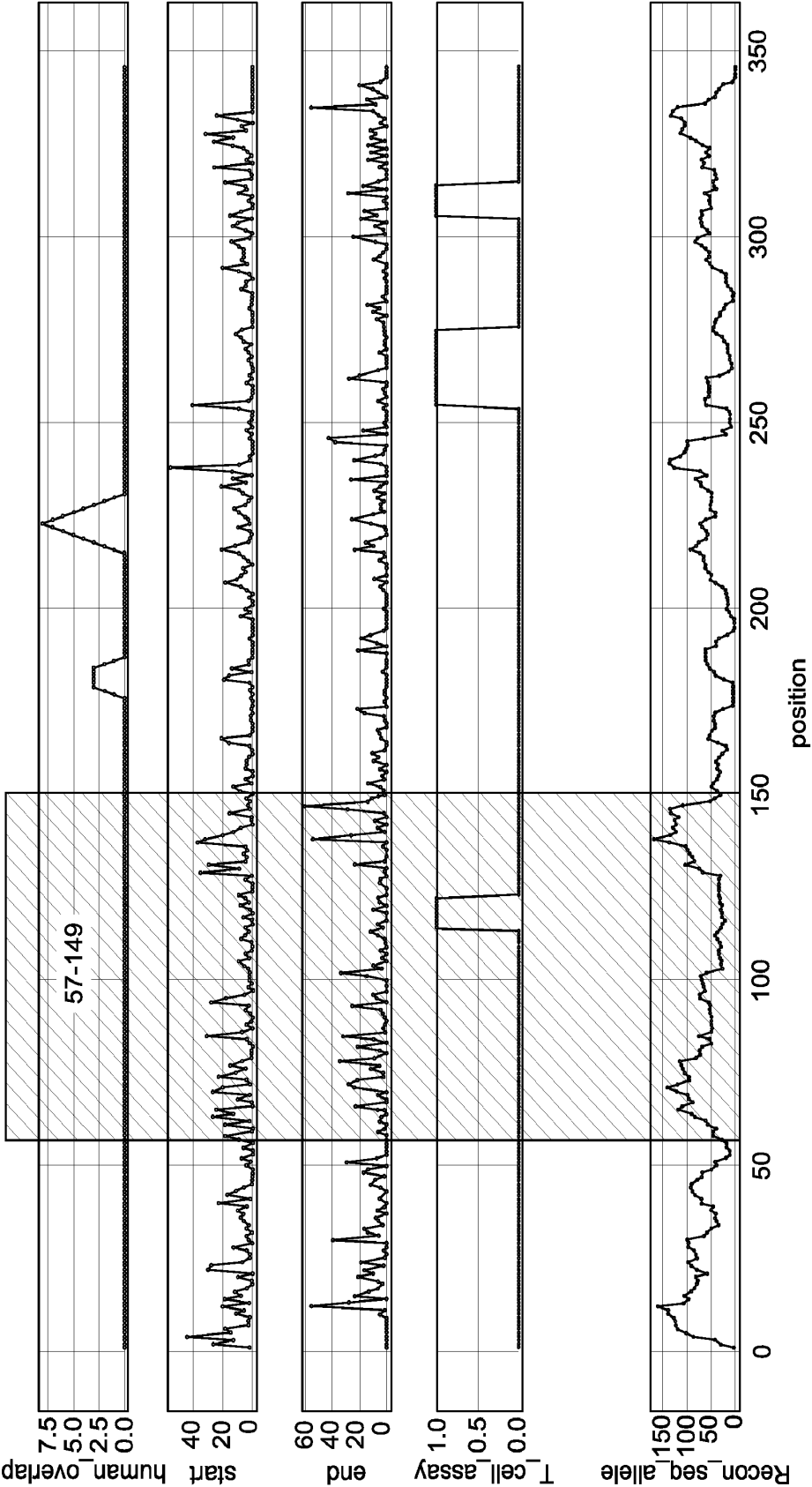


FIG. 51

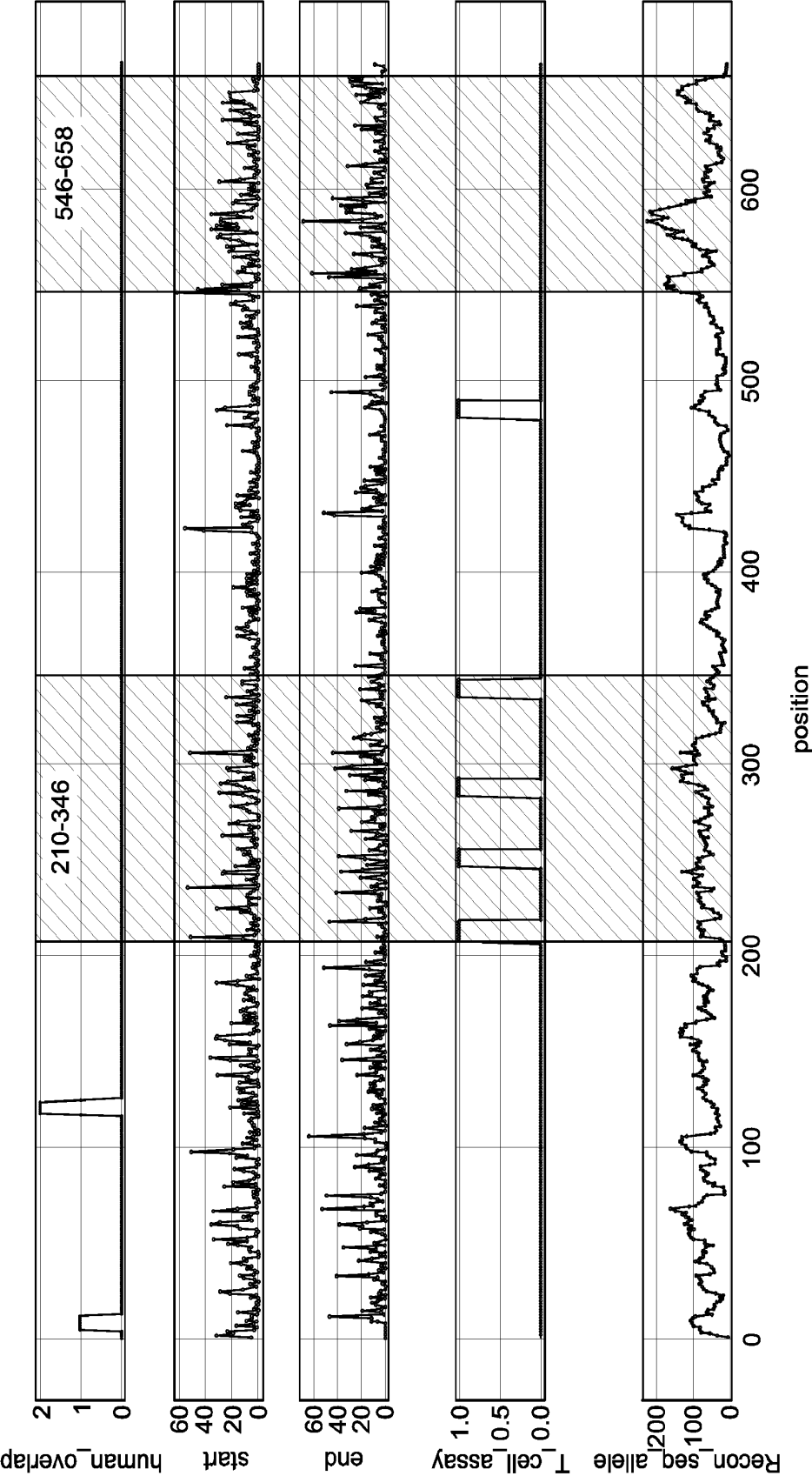


FIG. 52

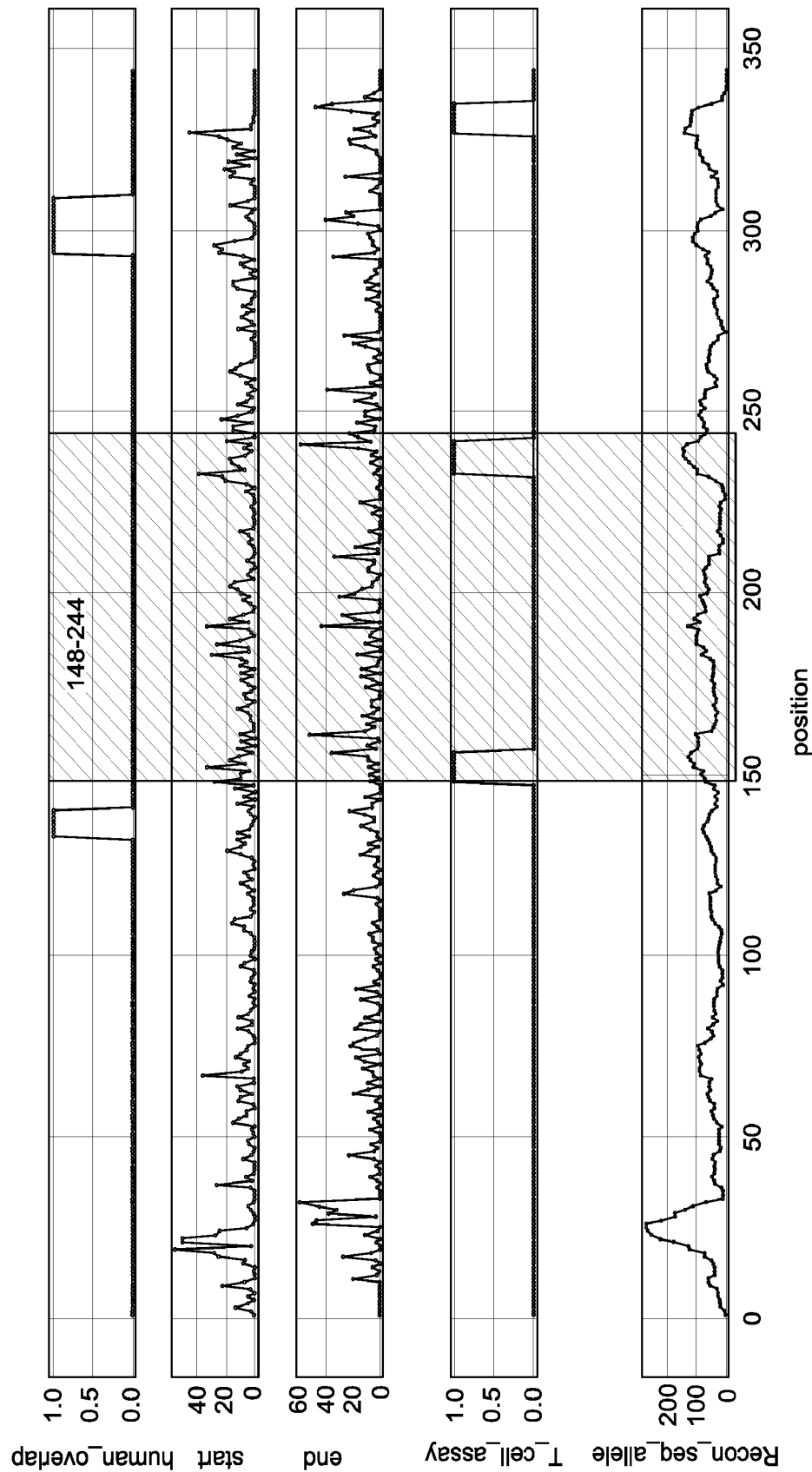


FIG. 53

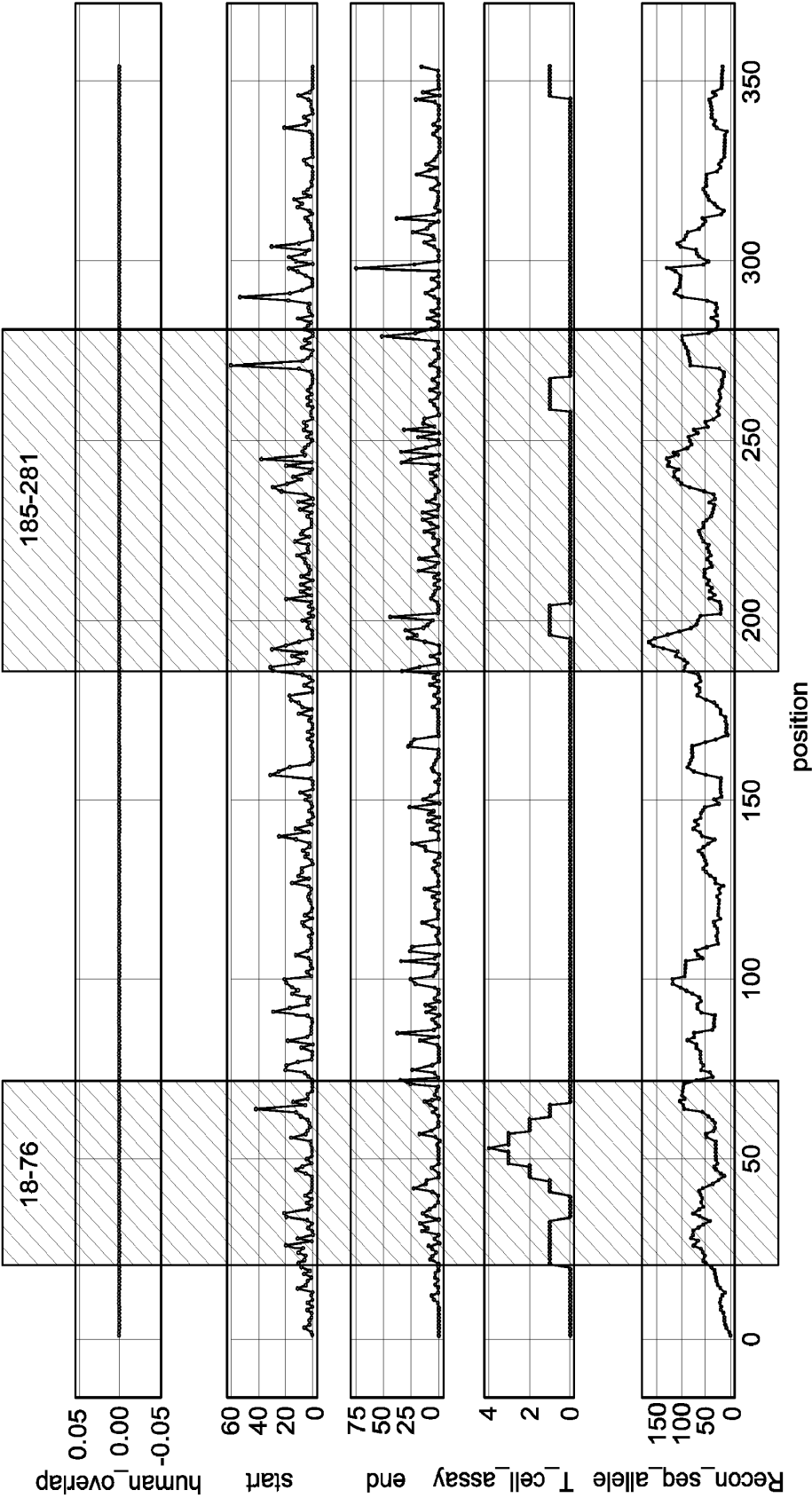


FIG. 54

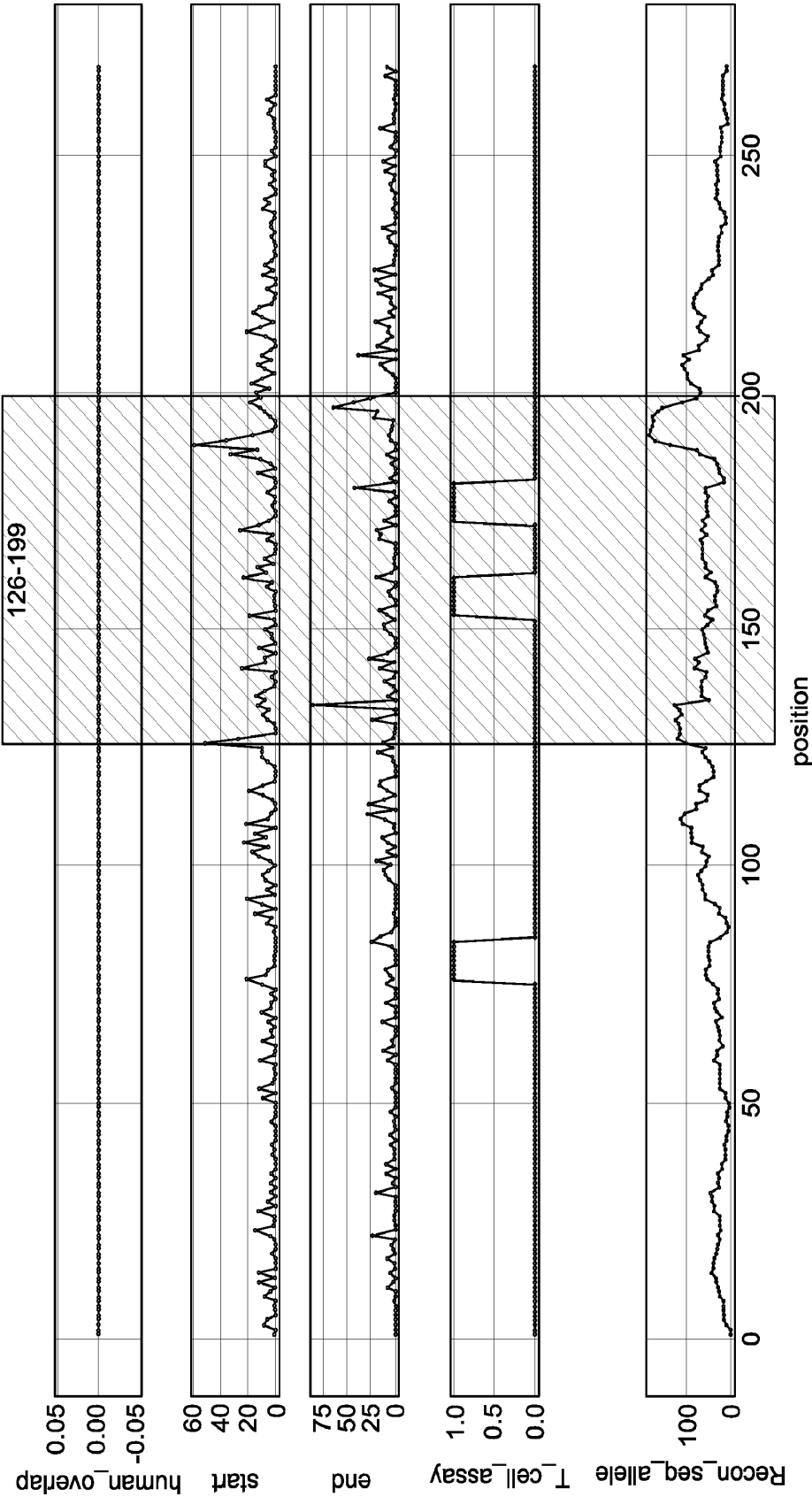


FIG. 55

VACV name	MPXV name	# of designs	Virion form	Native Signal sequence	Oligomer	Lipid PTM	Membrane anchor	Trouble w/ cysteines	Host homologs
L1R	M1R	5	MV	No	Monomer	Myristoylated @ glycine 2	N term <u>out</u> , 1 TM pass		TBD
A27L	A29L	6	MV	No	Dimer of trimers		None, binds cofactor	C71 C72 compromise stability	TBD
A33R	A35R	4	EV	No	Dimer		N term <u>in</u> , 1 TM pass		NK cell receptors
B5R	B6R	6	EV	<u>Yes</u>	Predicted monomer		N term <u>out</u> , 1 TM pass	C140 is unpaired	Complement receptor & others
H3L	H3L	9	MV	No	Monomer		N term <u>out</u> , 1 TM pass	C86 & C90 unclear pairing	TBD
D8L	E8L	7	MV	No	Hexamer		N term <u>out</u> , 1 TM pass		CAH

FIG. 56

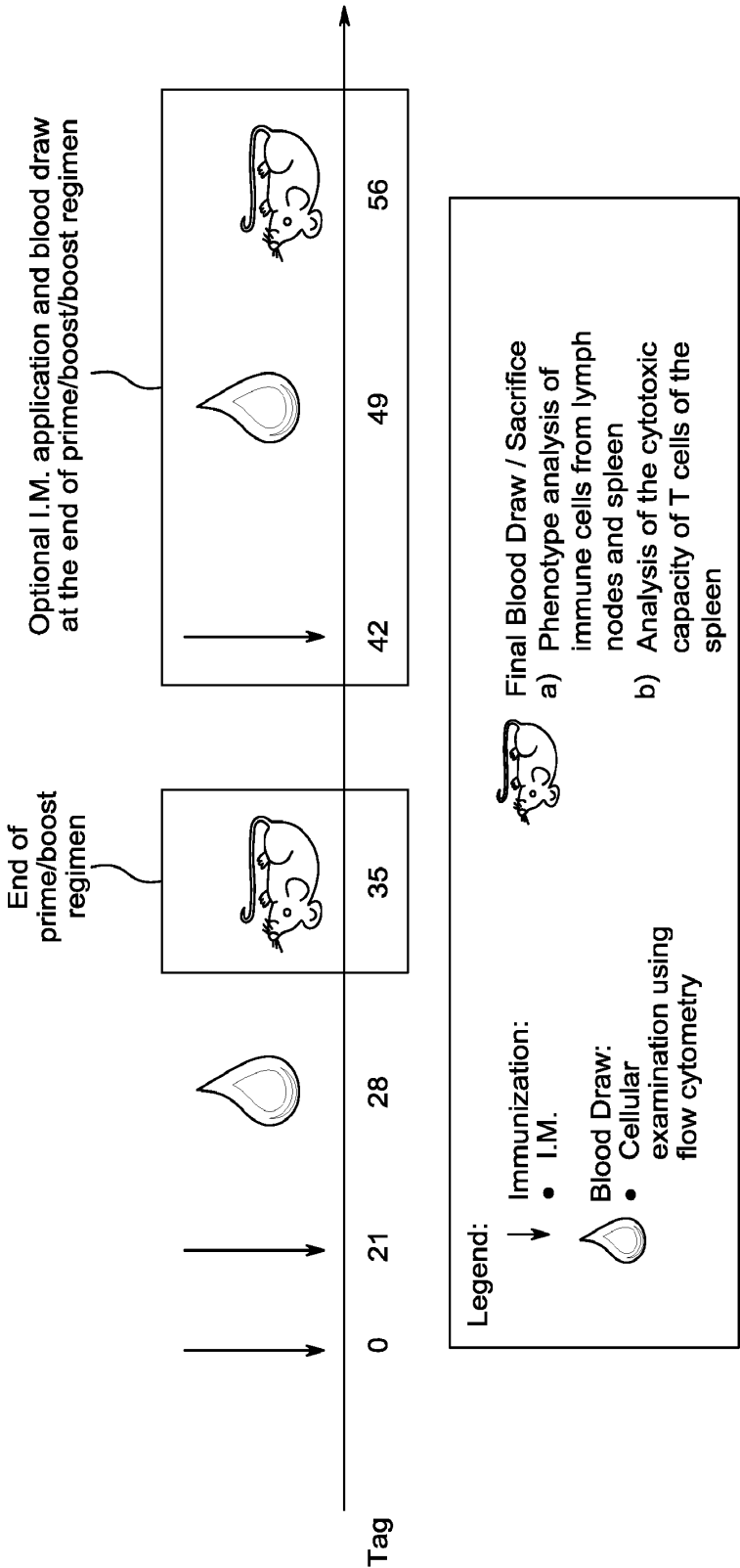


FIG. 57

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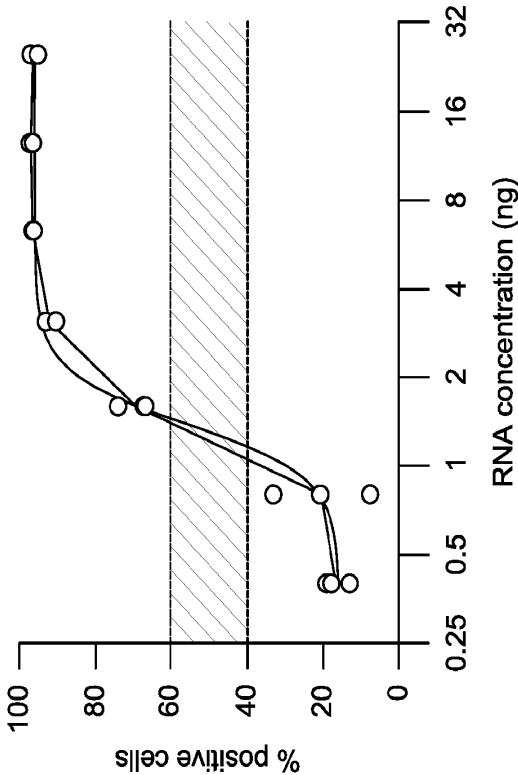


FIG. 58B

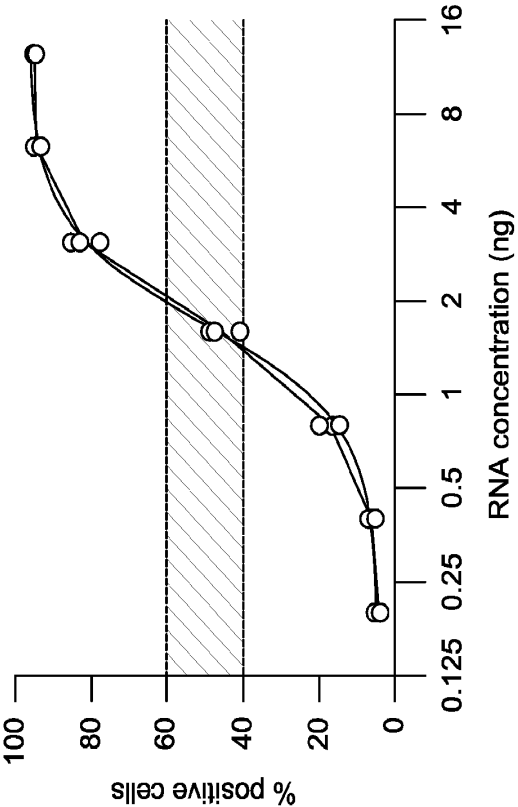


FIG. 58A

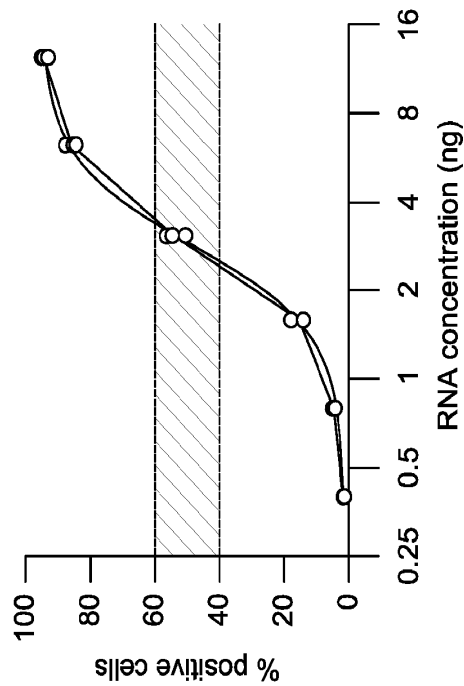


FIG. 58D

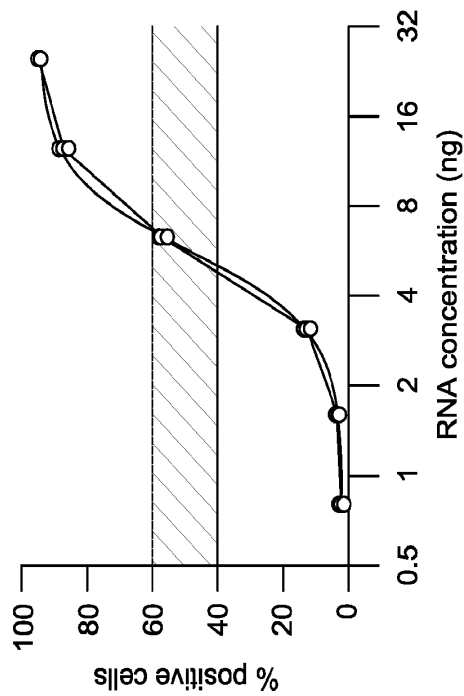


FIG. 58C

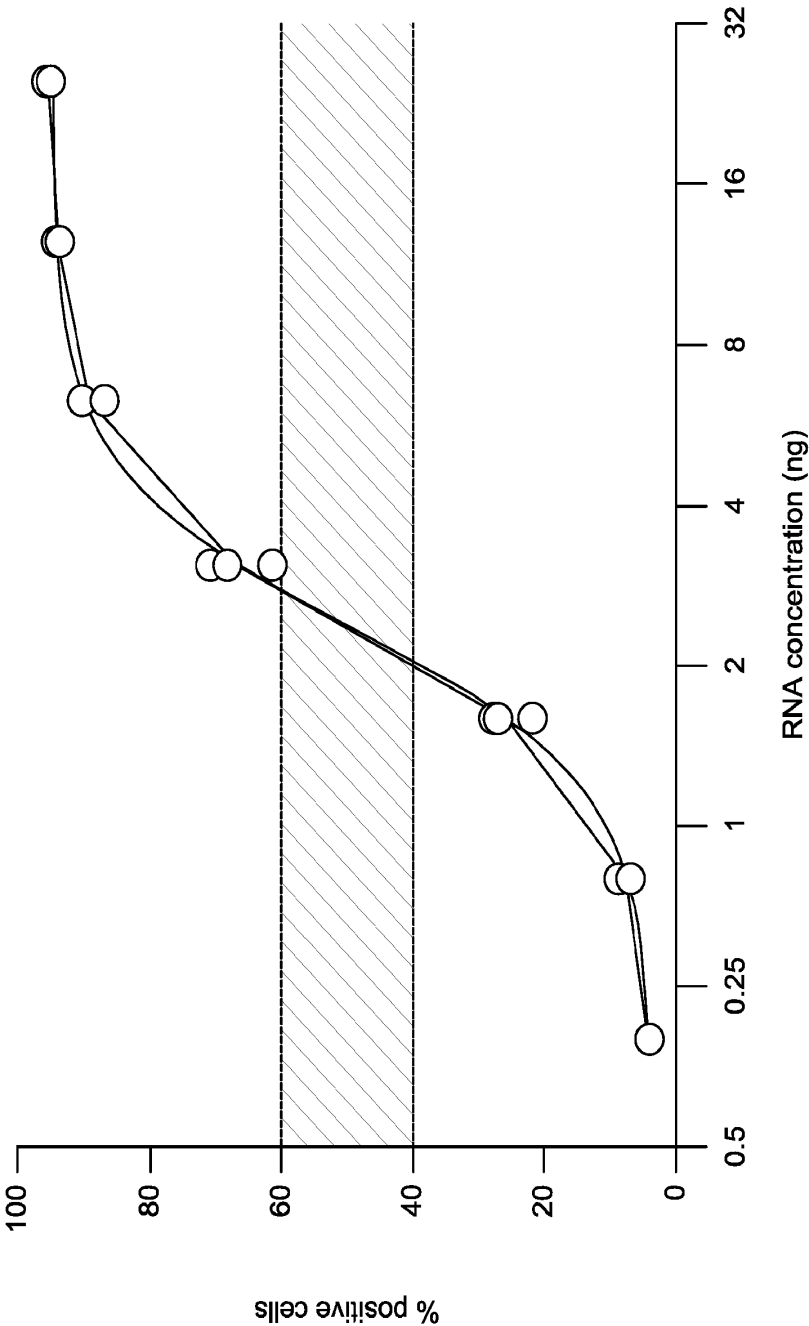


FIG. 58E

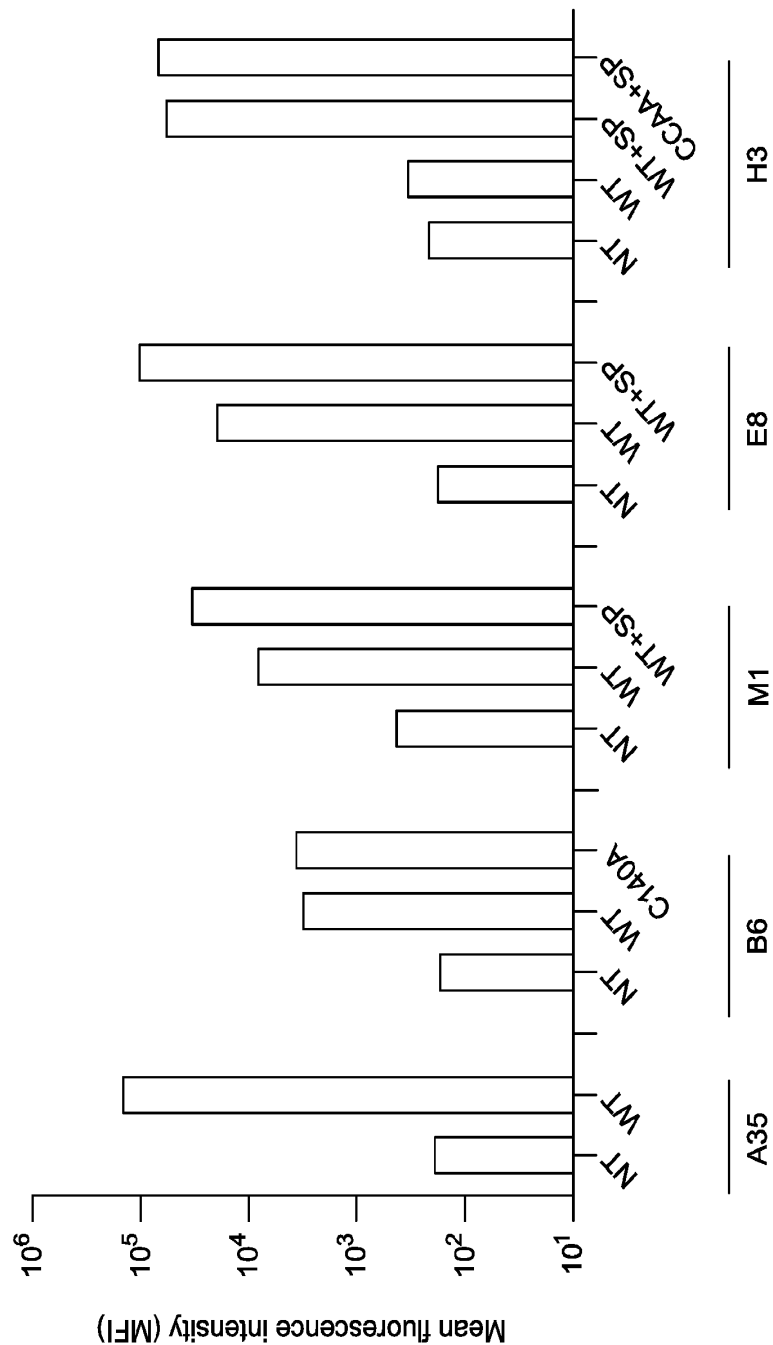


FIG. 59

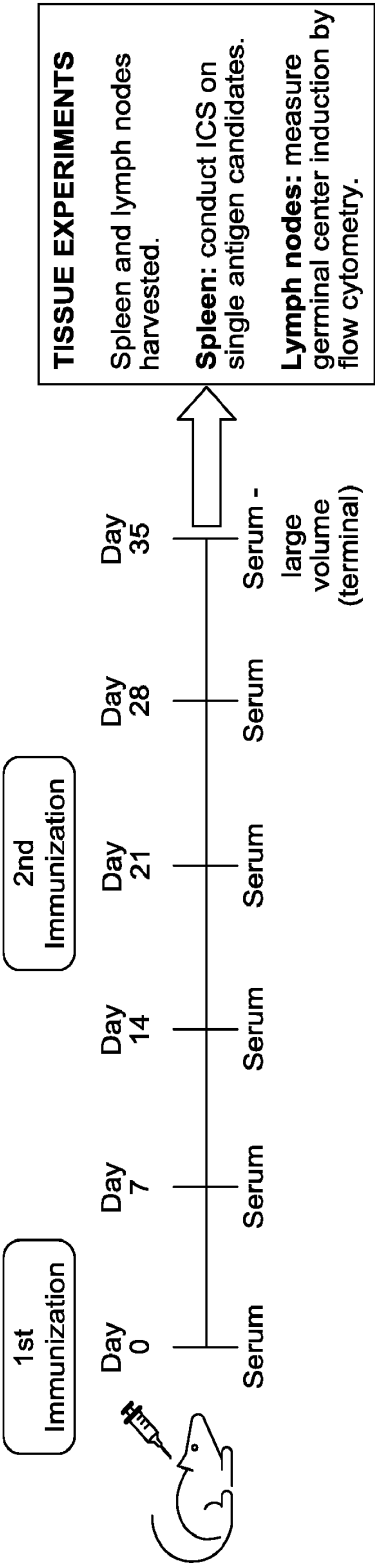


FIG. 60

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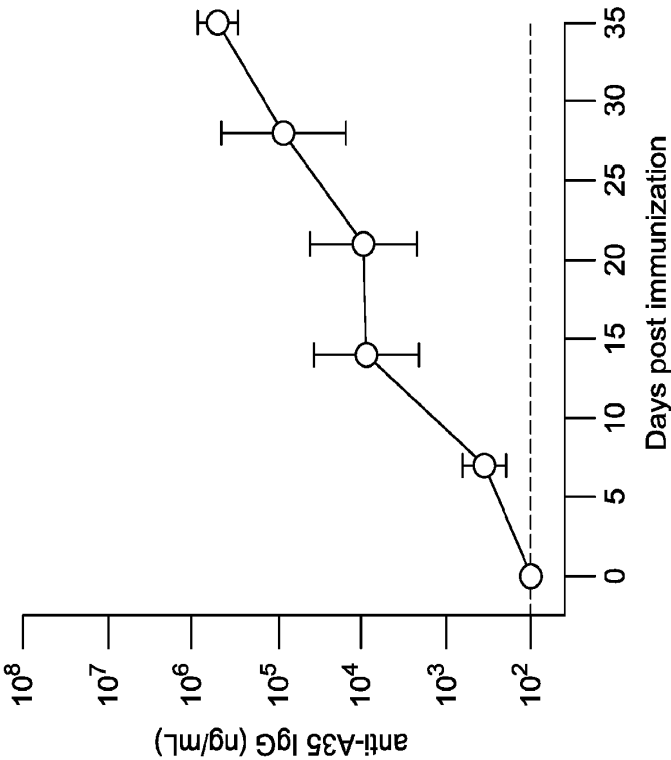


FIG. 61B

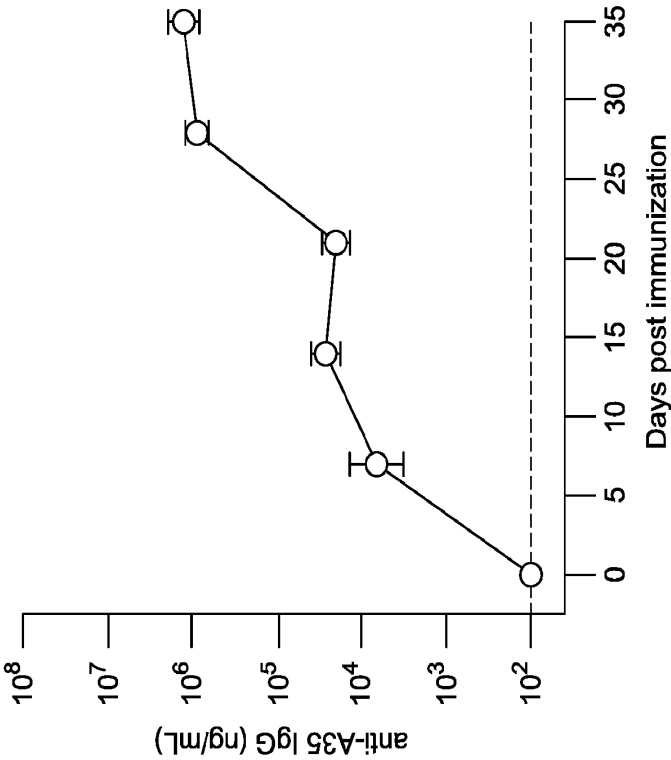


FIG. 61A

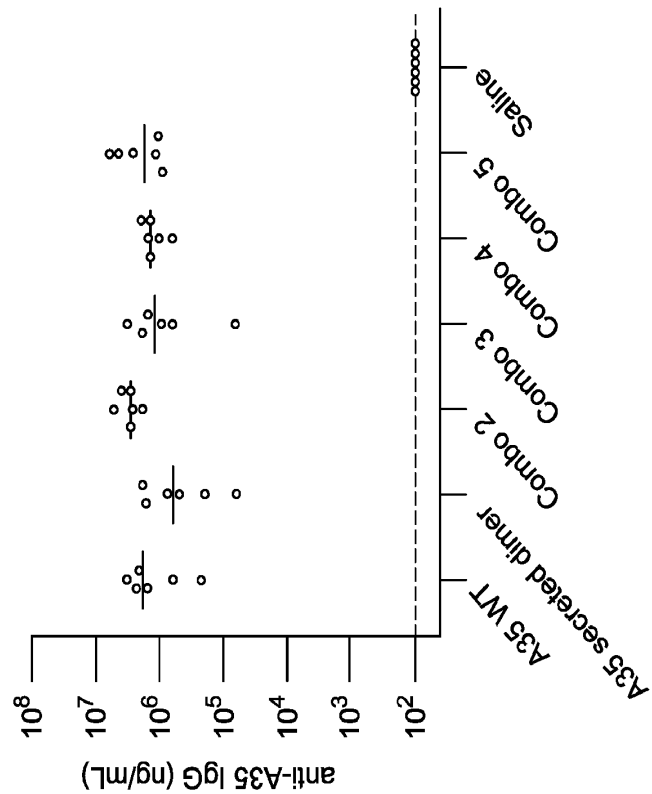


FIG. 62B

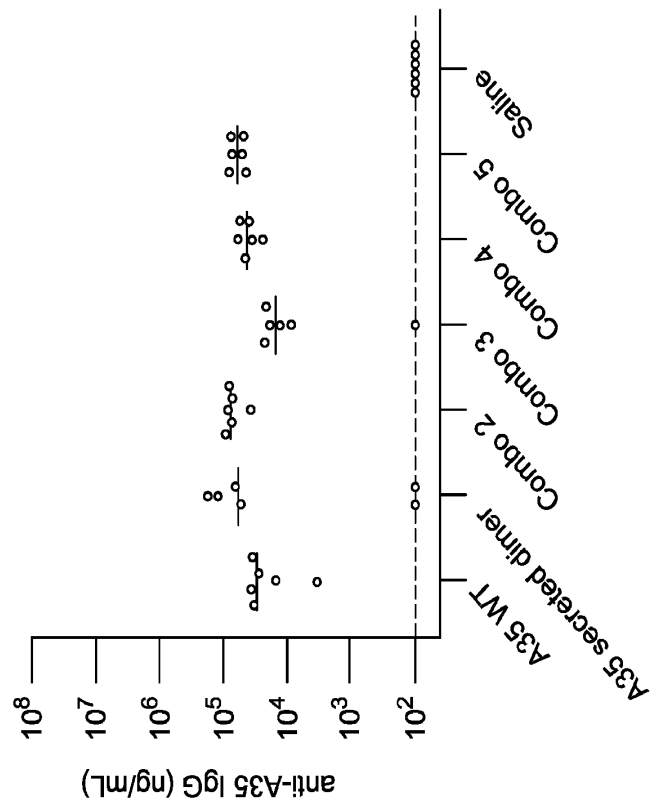


FIG. 62A

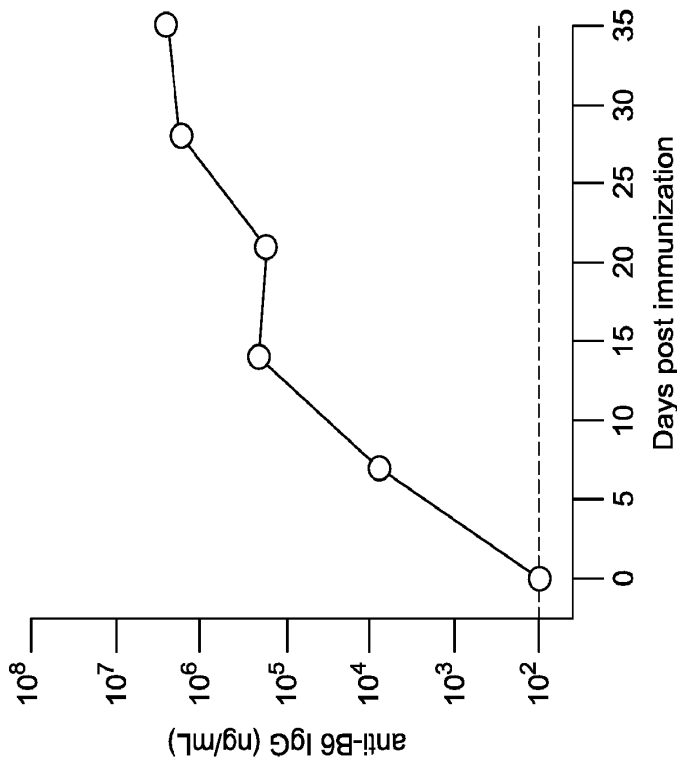


FIG. 63B

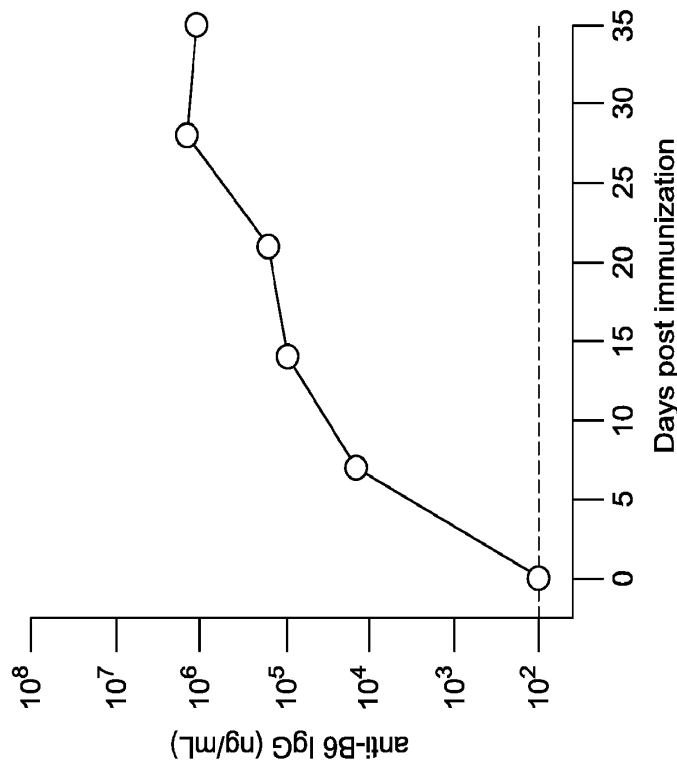


FIG. 63A

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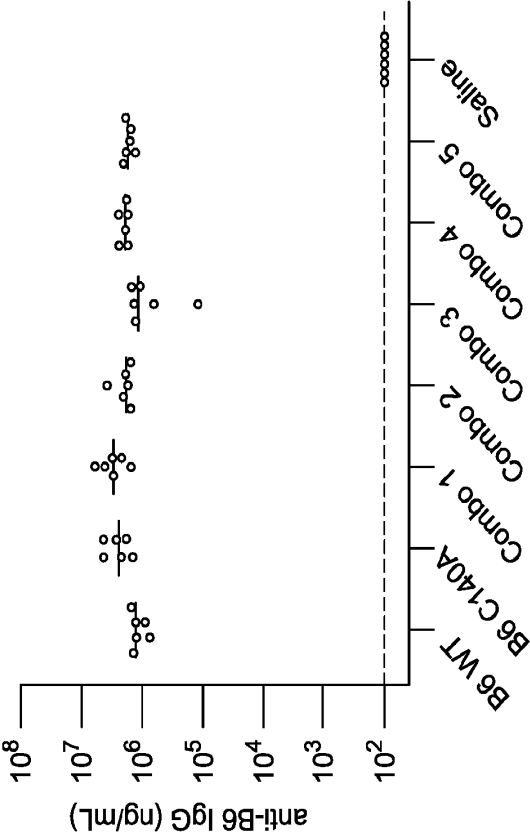


FIG. 64B

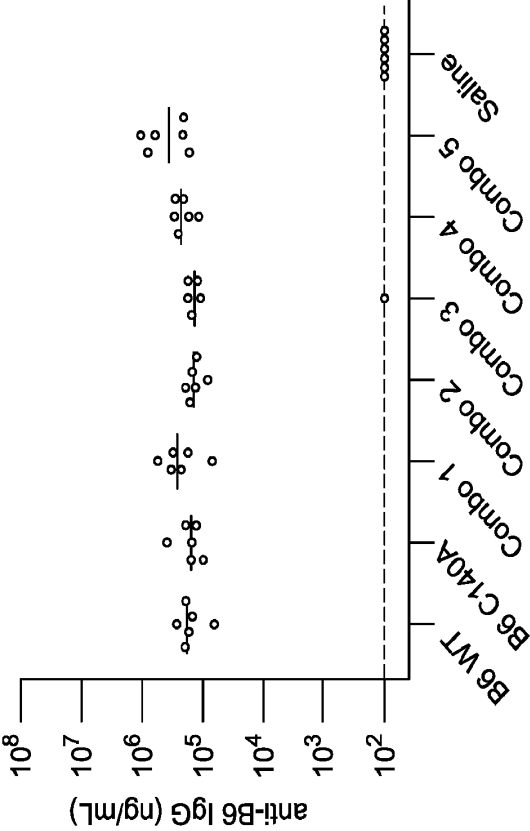


FIG. 64A

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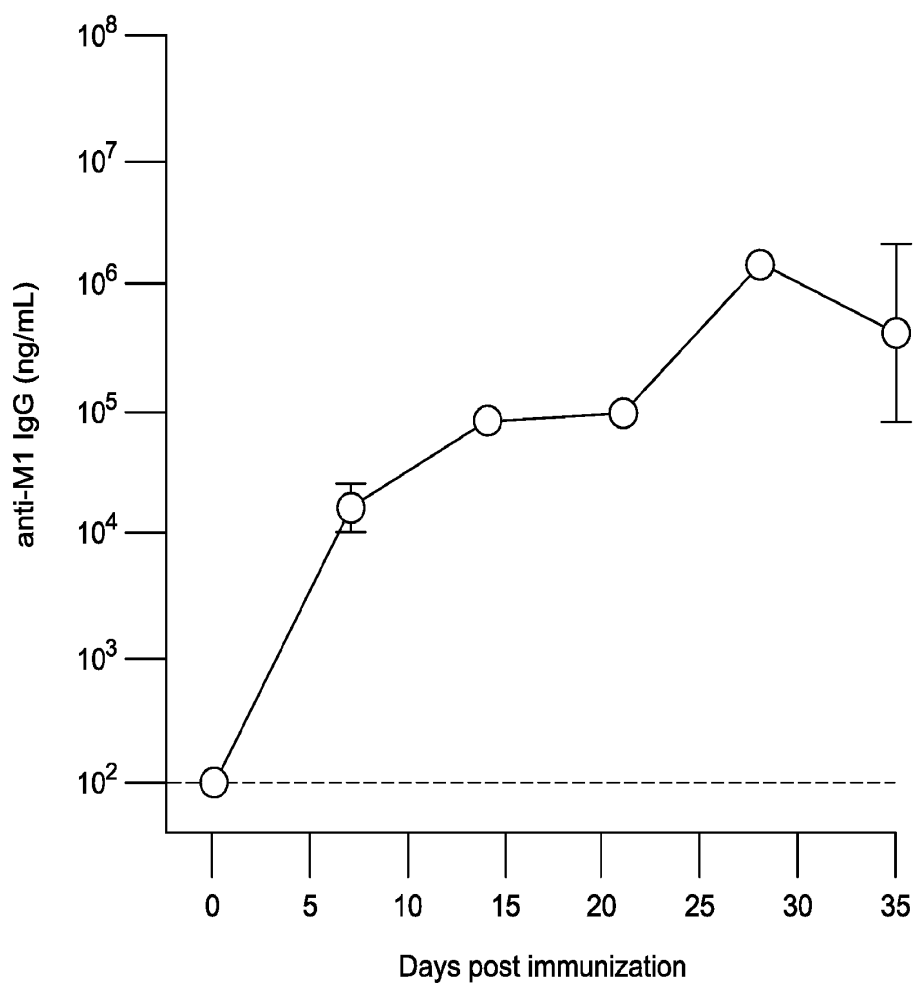


FIG. 65

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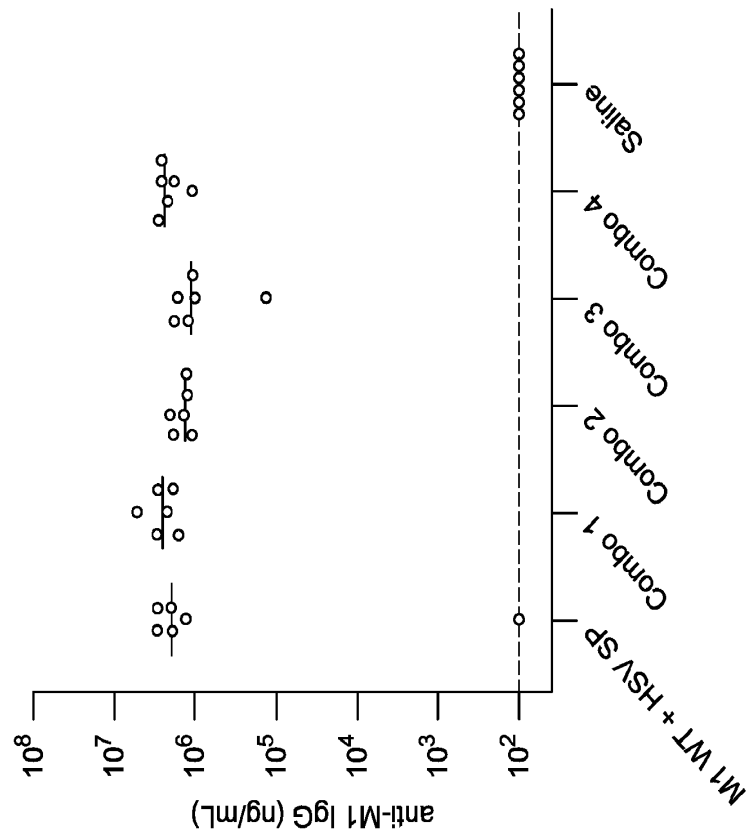


FIG. 66B

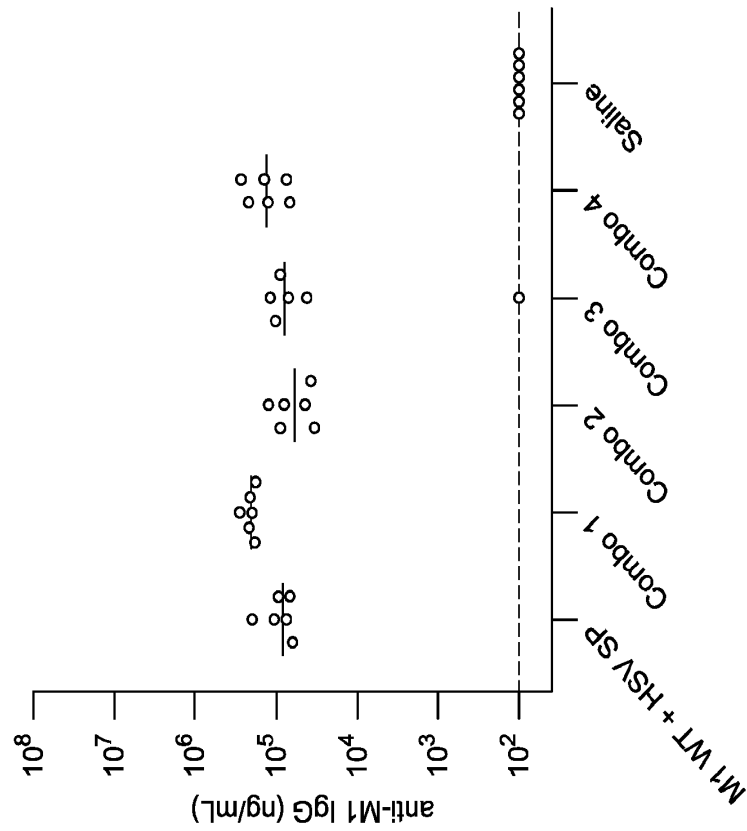


FIG. 66A

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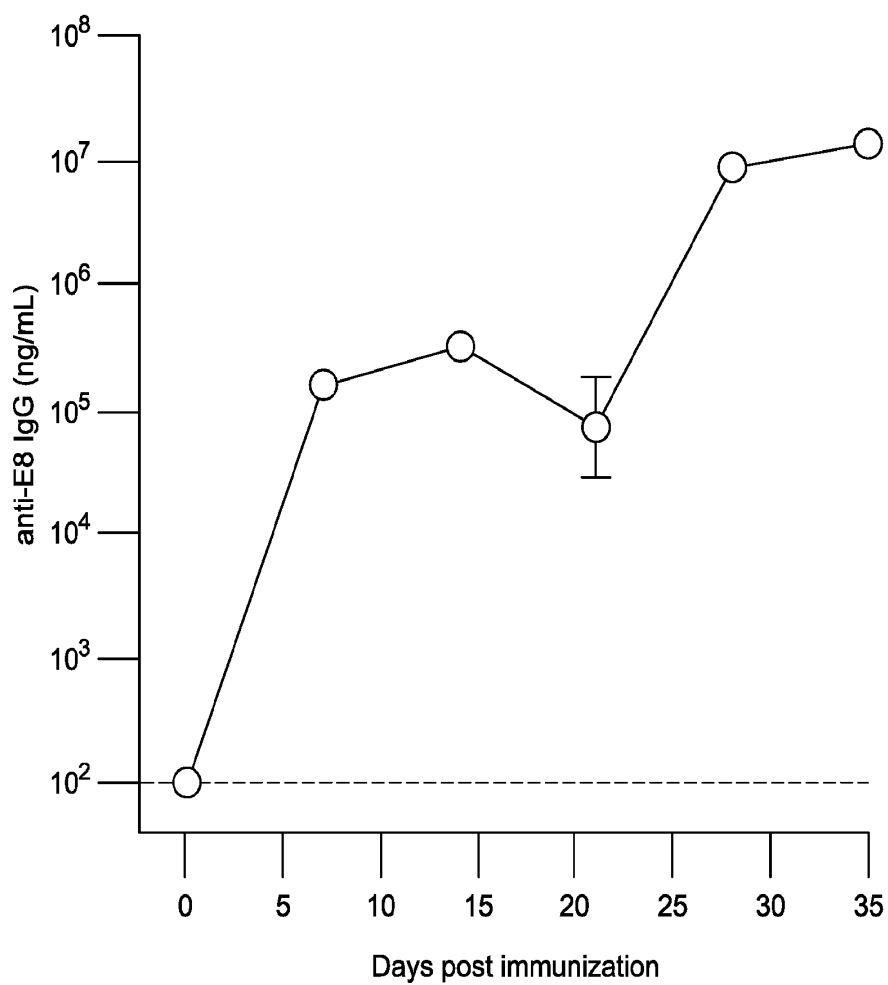


FIG. 67

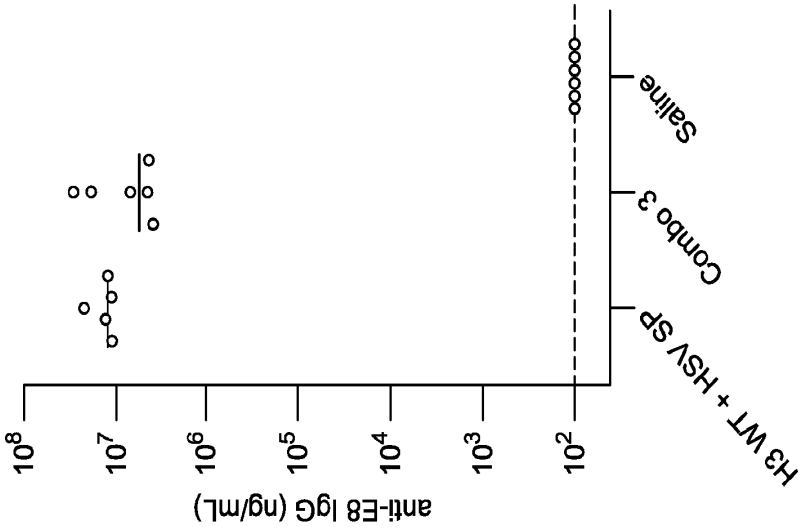


FIG. 68B

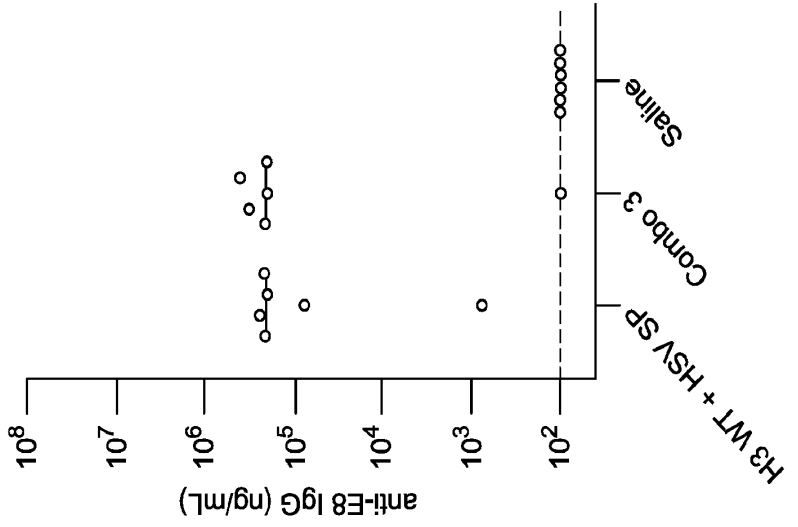


FIG. 68A

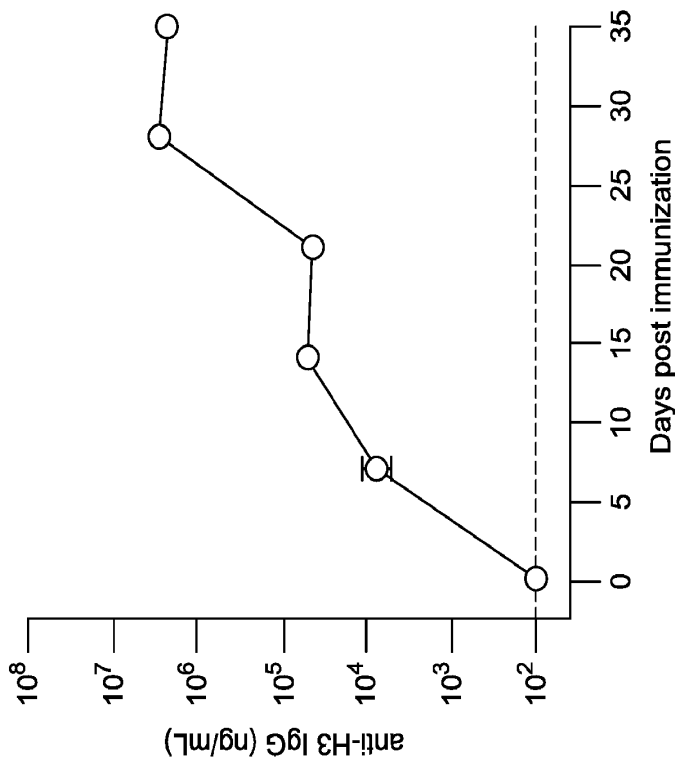


FIG. 69B

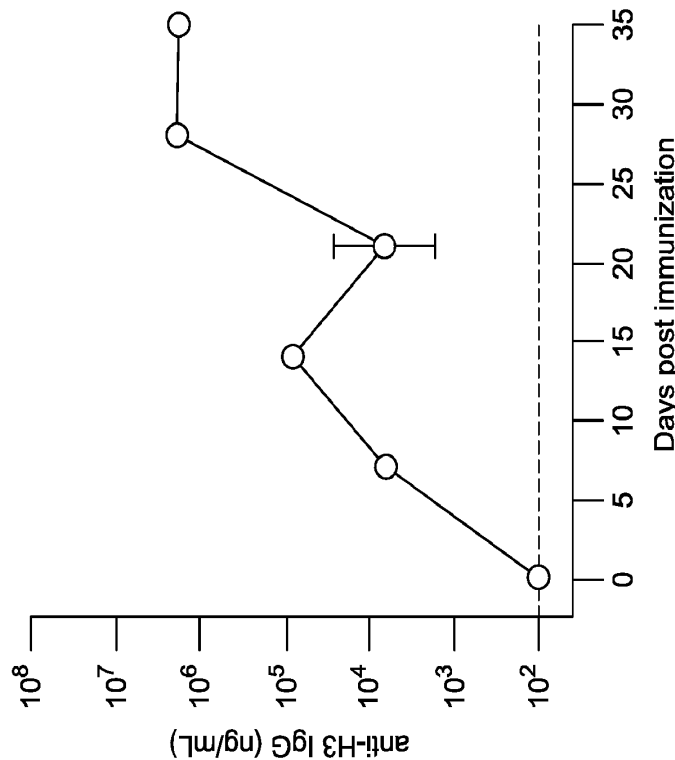


FIG. 69A

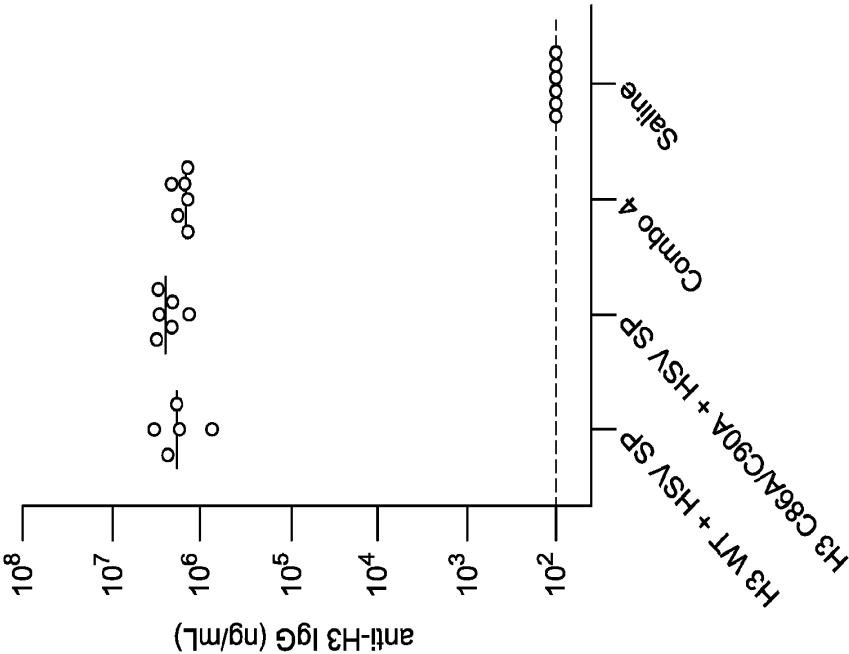


FIG. 70B

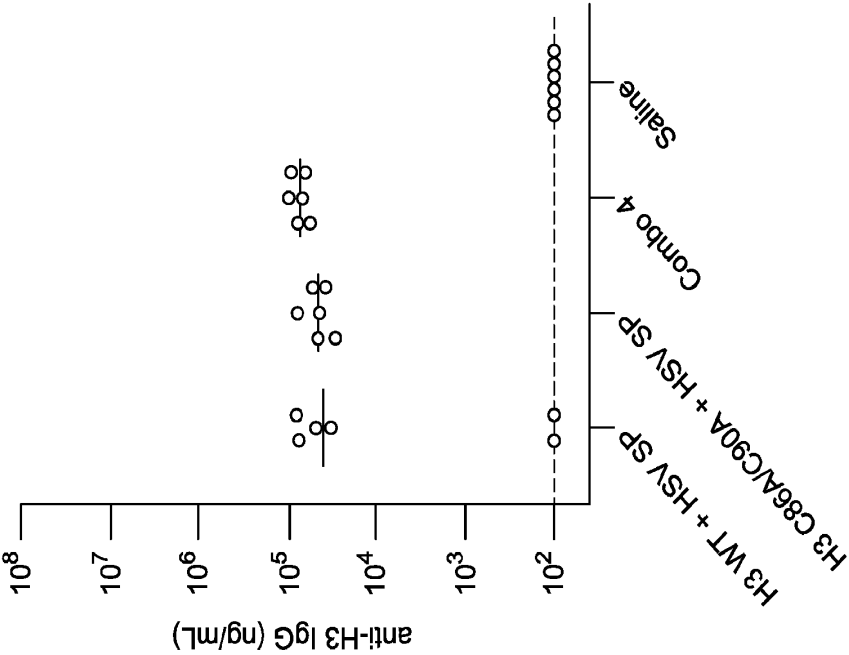


FIG. 70A

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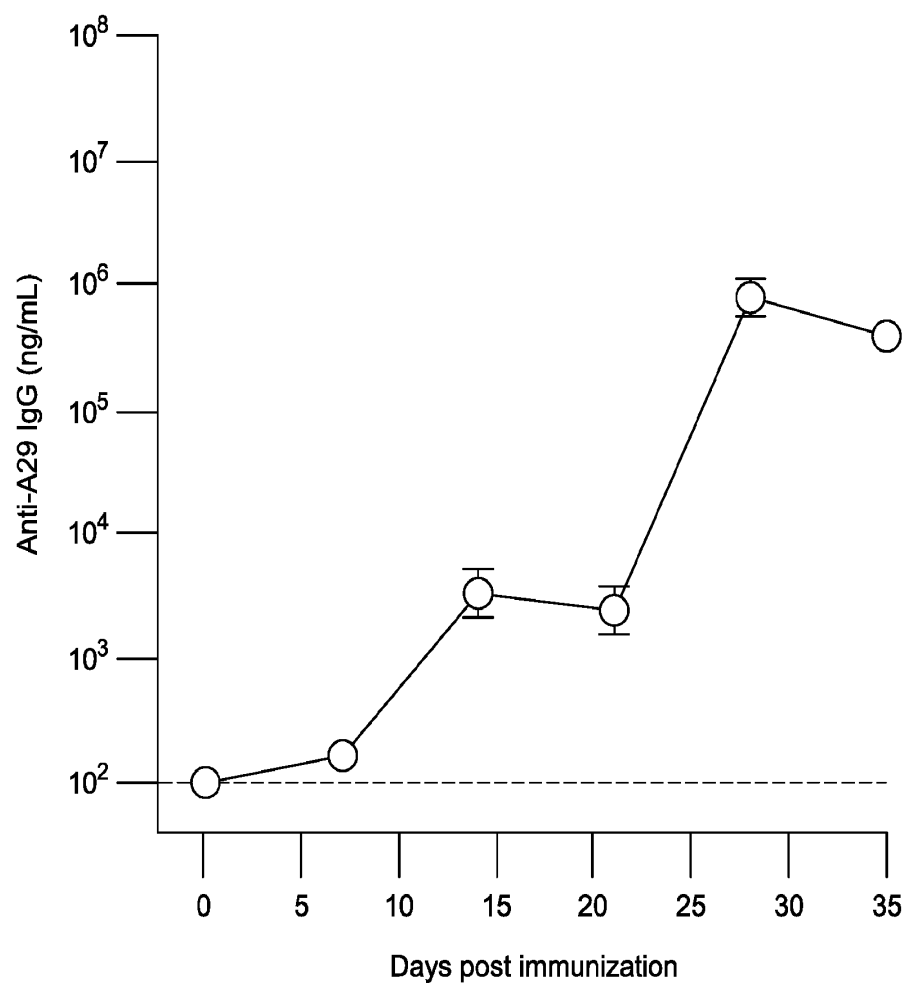


FIG. 71

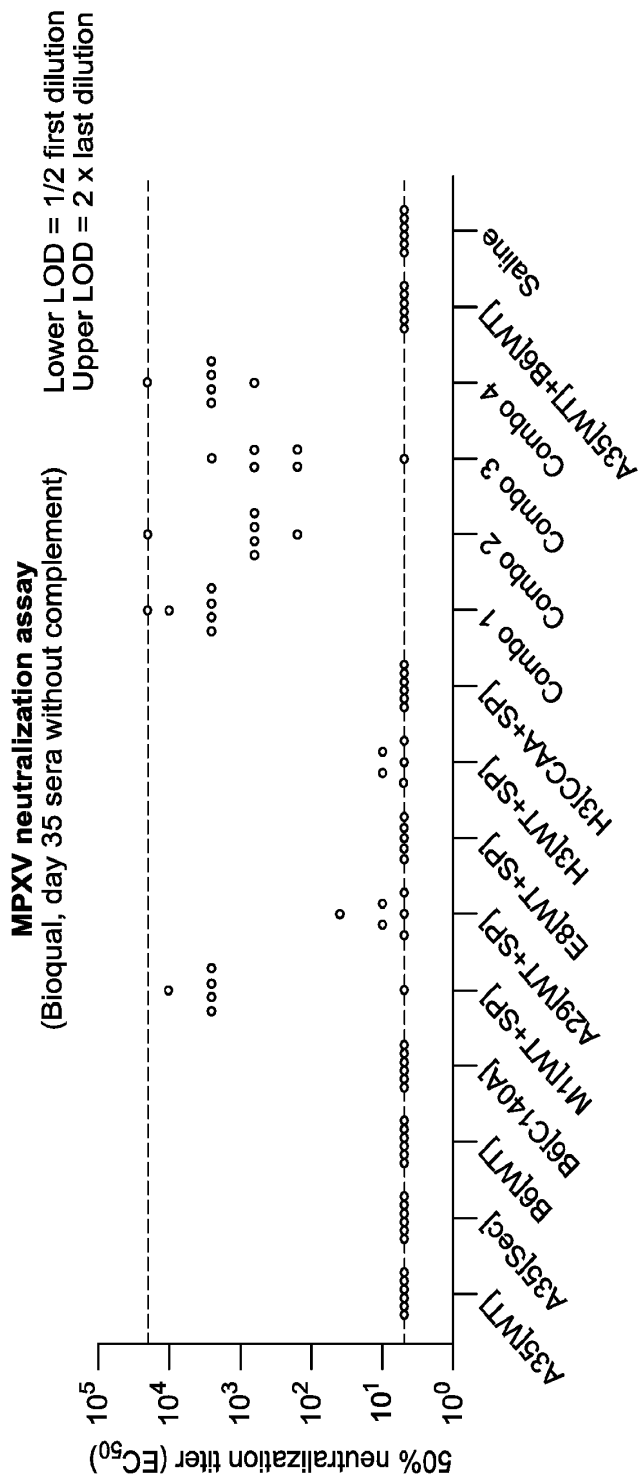


FIG. 72

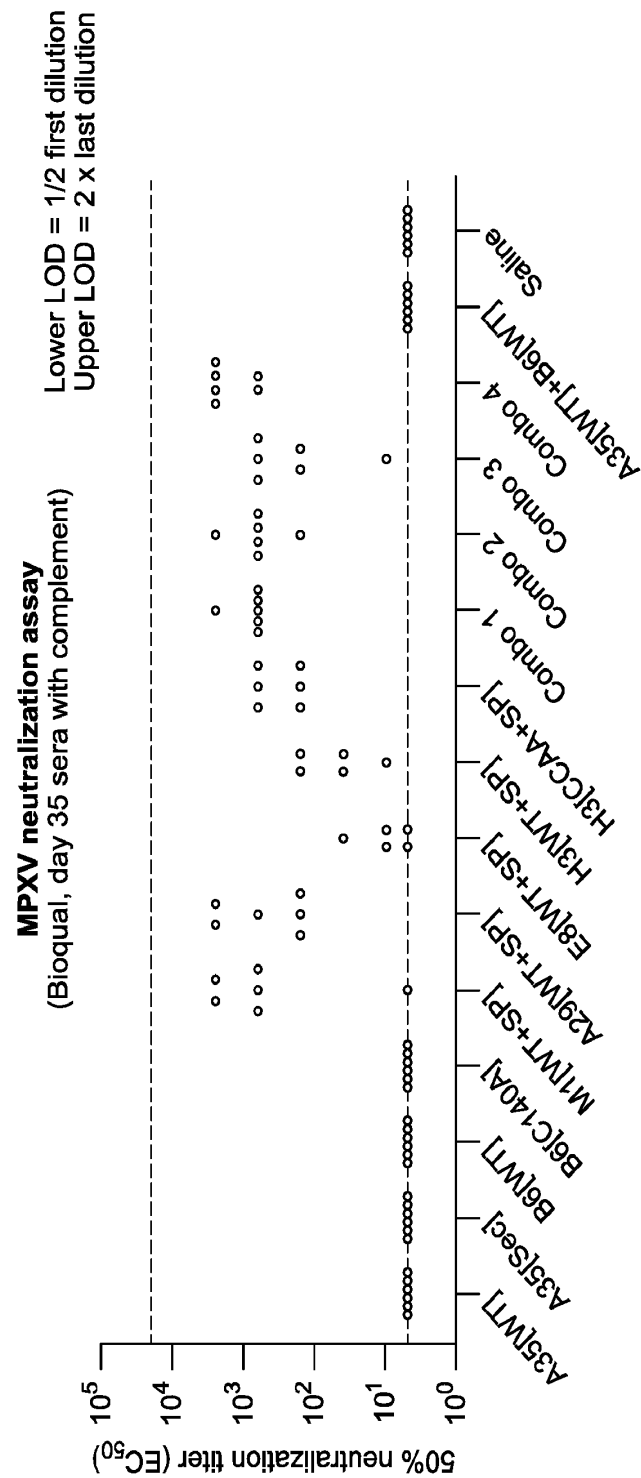


FIG. 73

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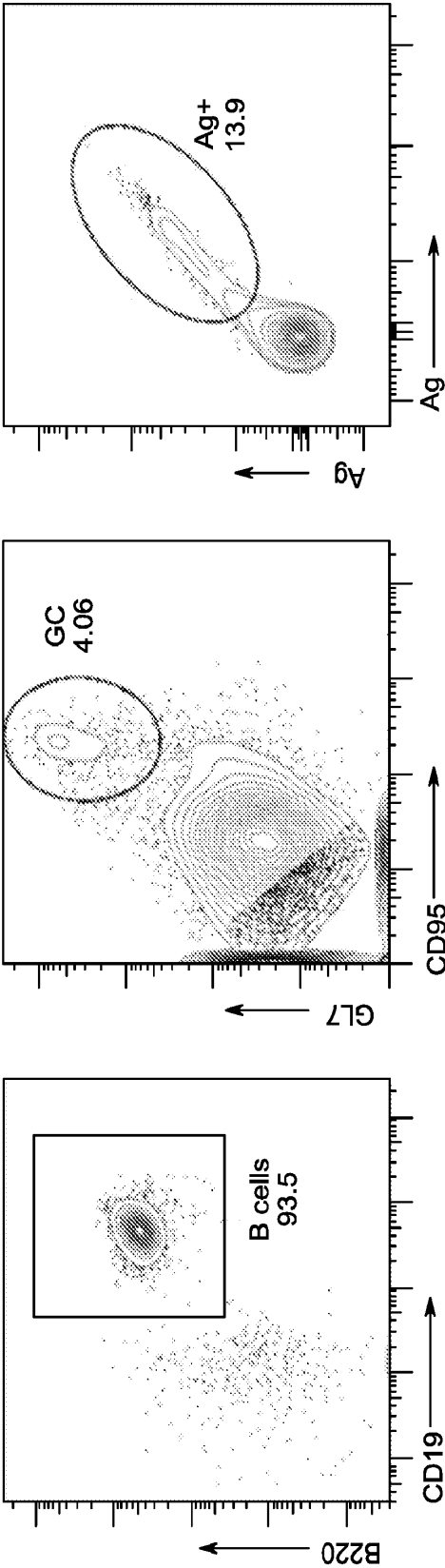


FIG. 74A

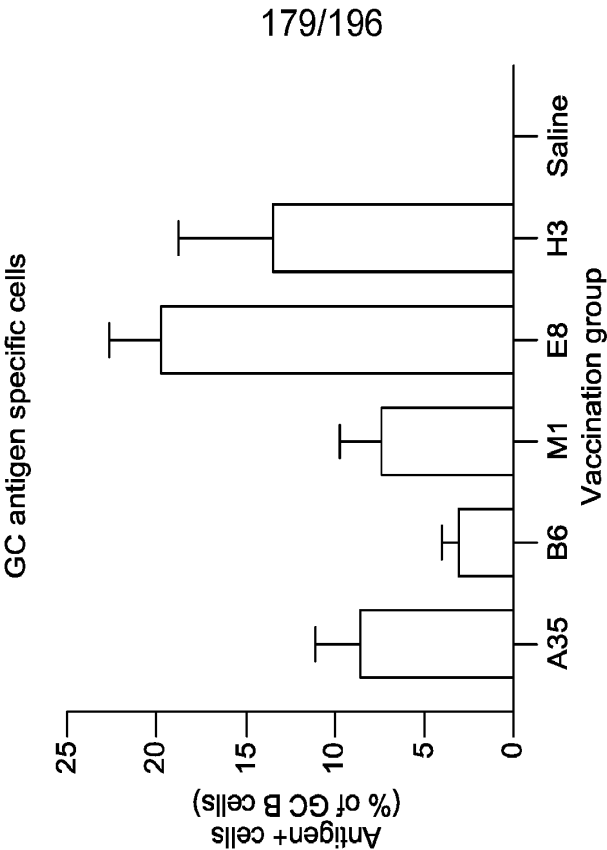


FIG. 74C

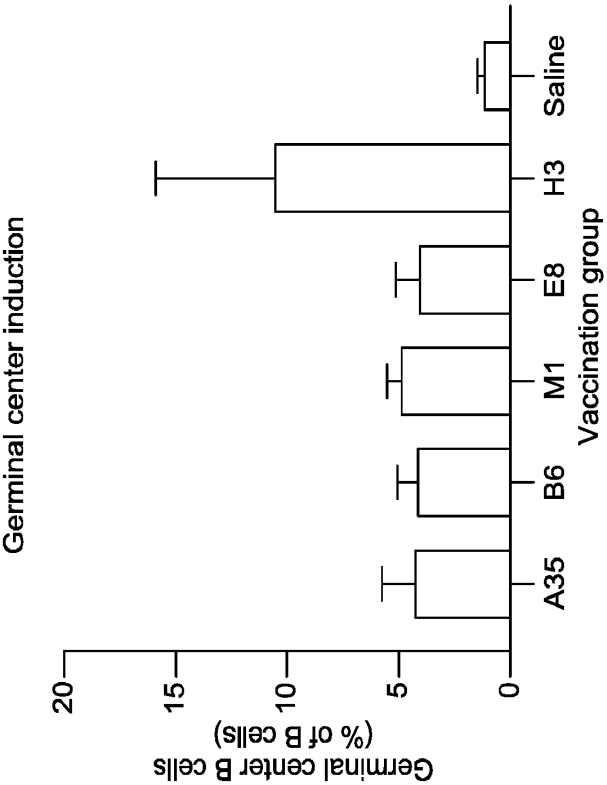


FIG. 74B

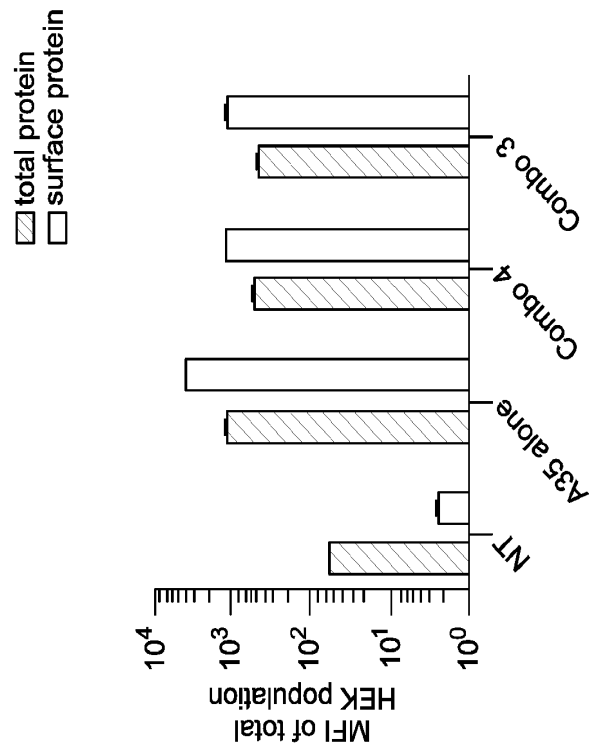


FIG. 75B

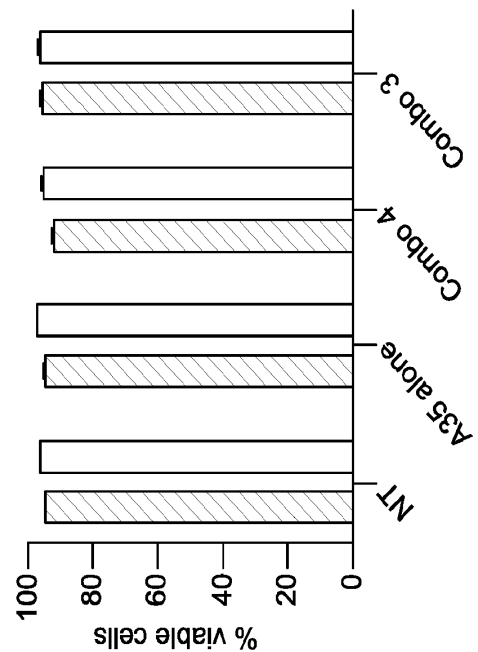


FIG. 75A

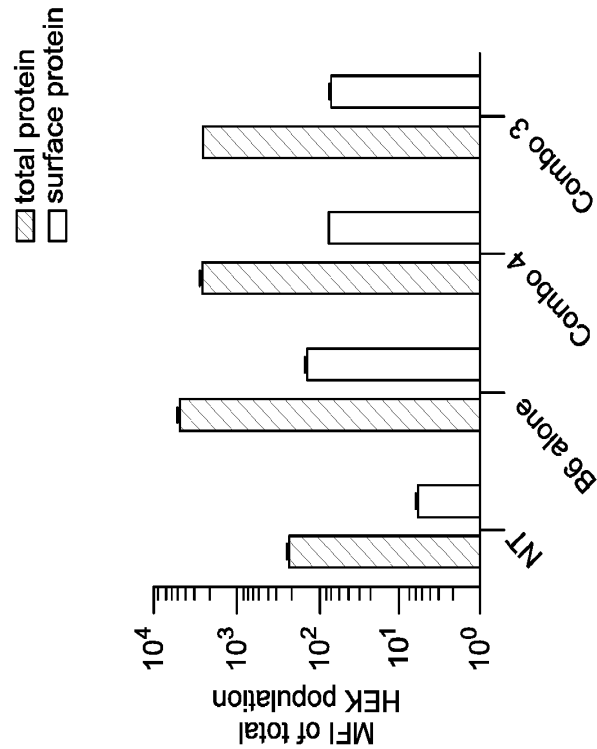


FIG. 75D

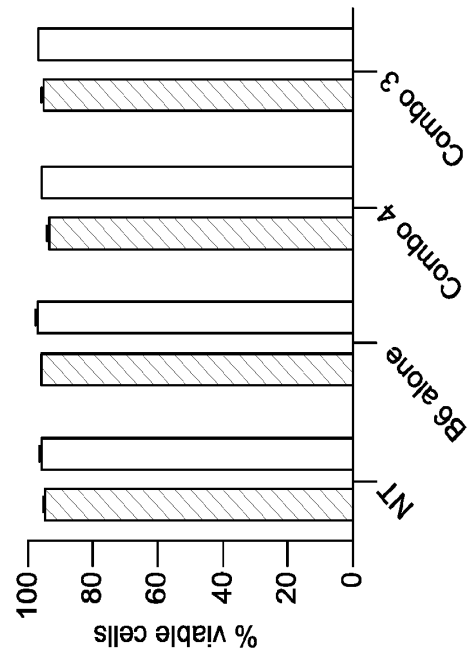


FIG. 75C

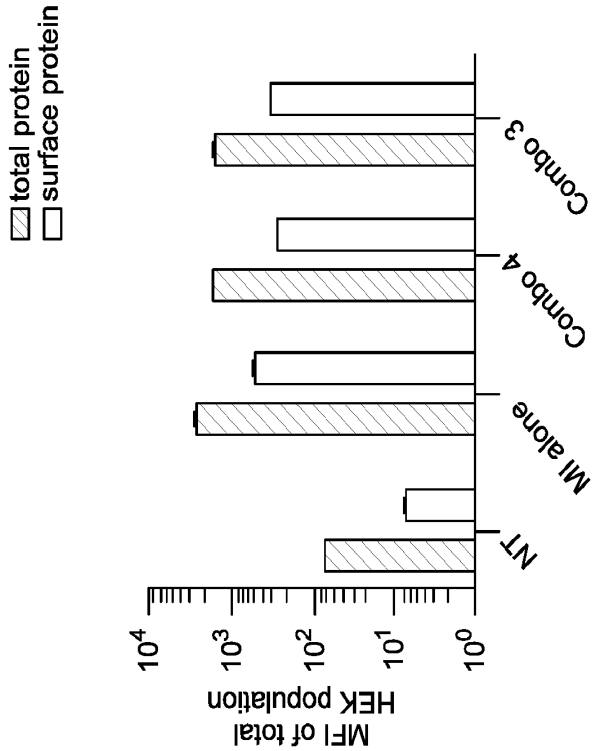


FIG. 75F

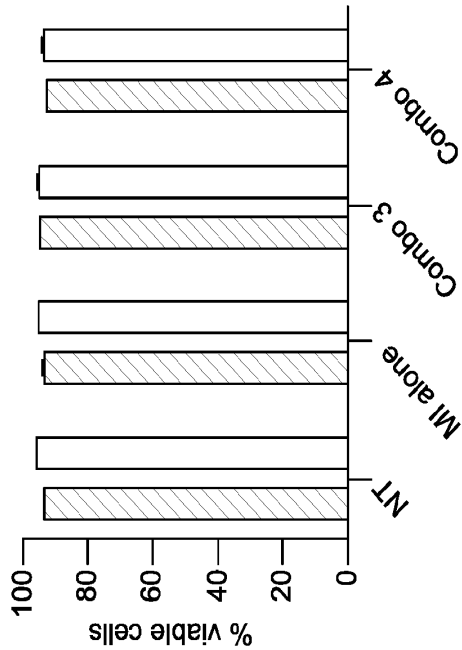


FIG. 75E

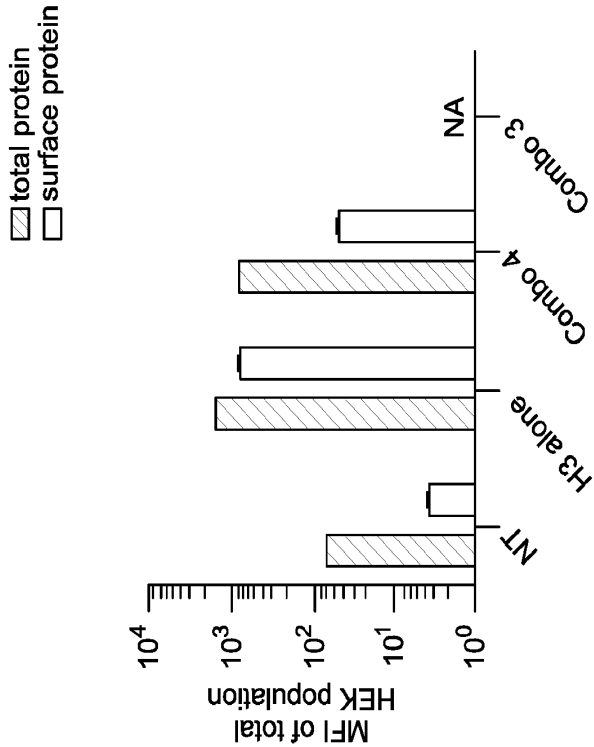


FIG. 75H

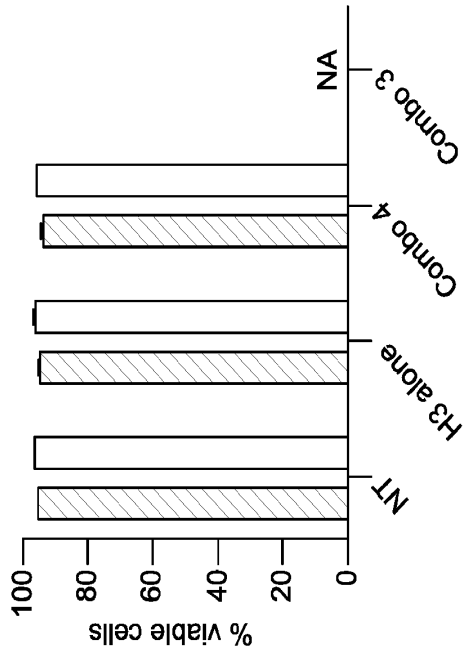


FIG. 75G

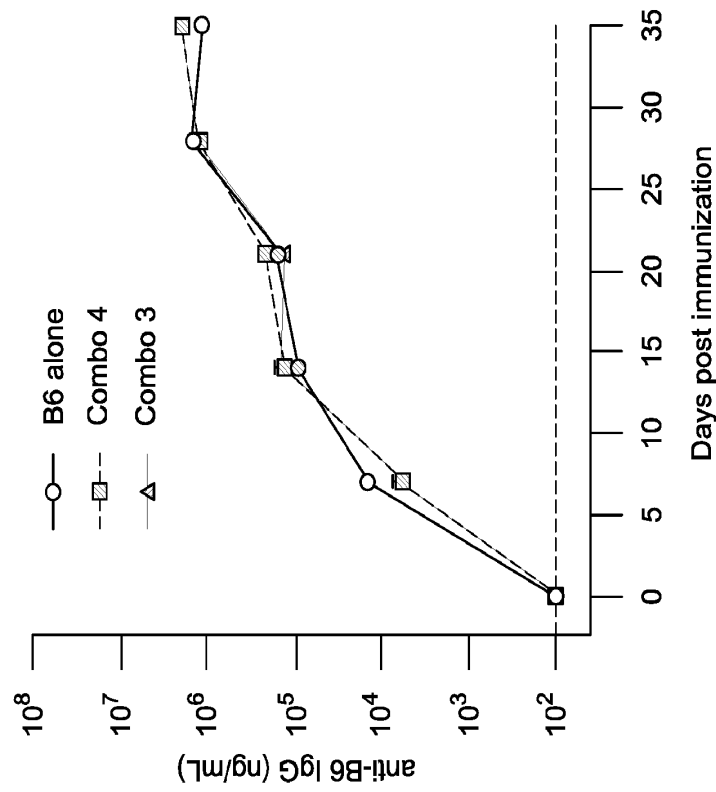


FIG. 76B

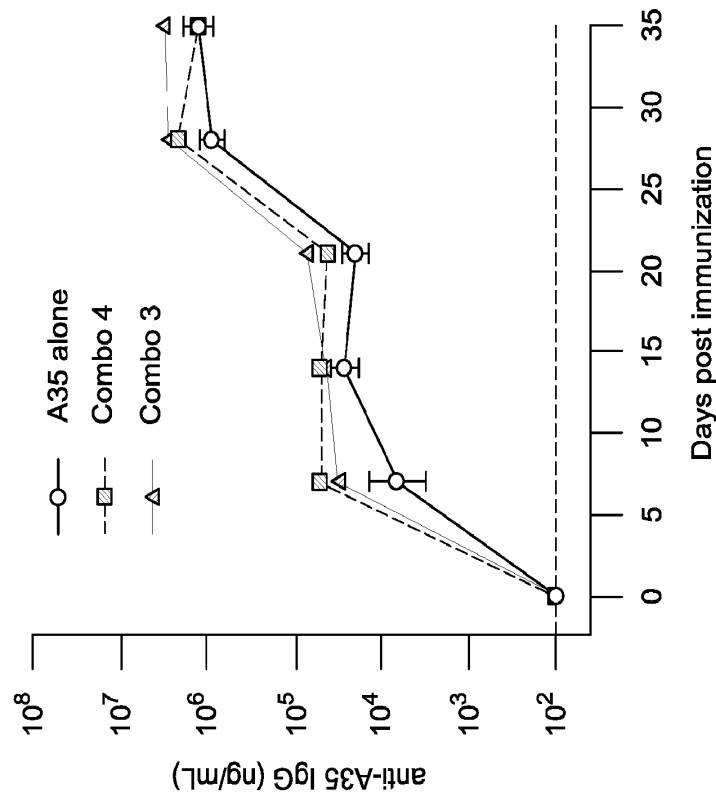


FIG. 76A

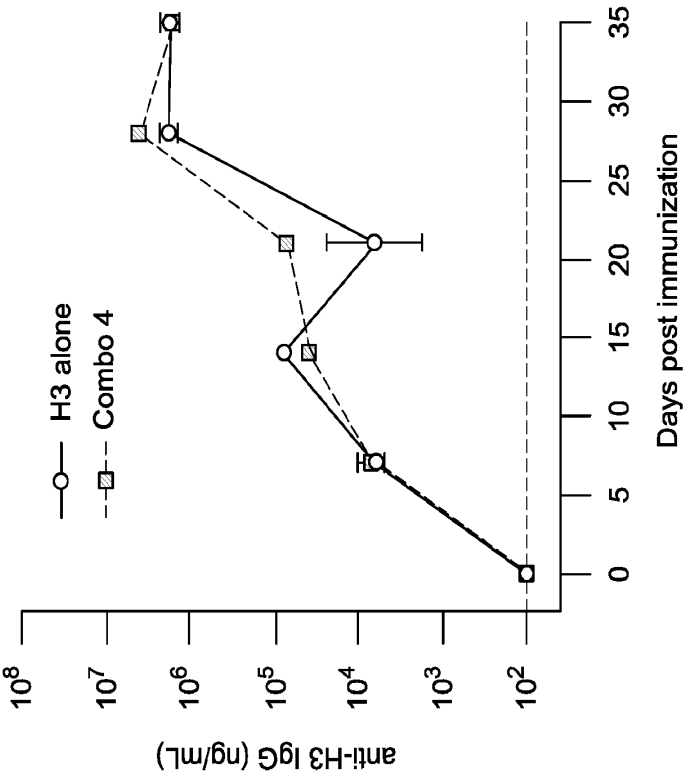


FIG. 76D

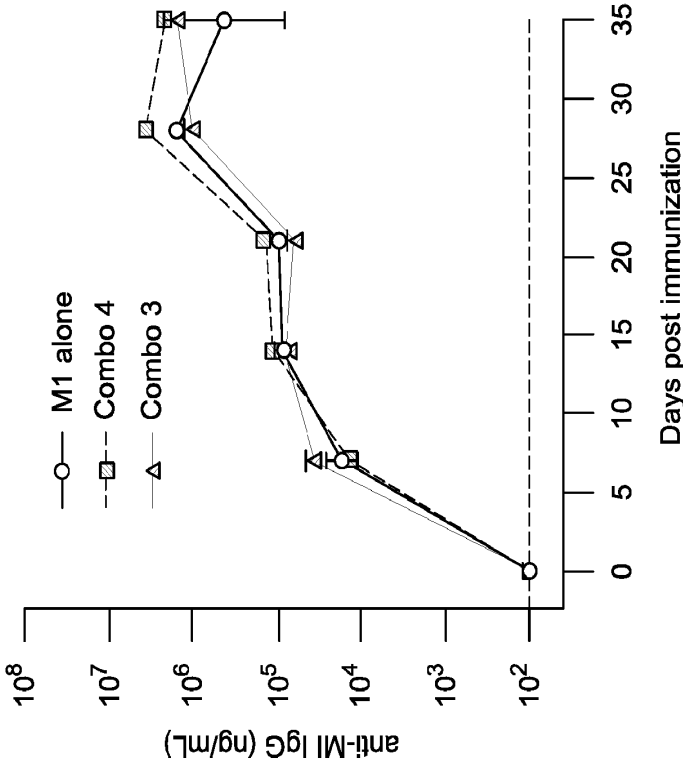


FIG. 76C

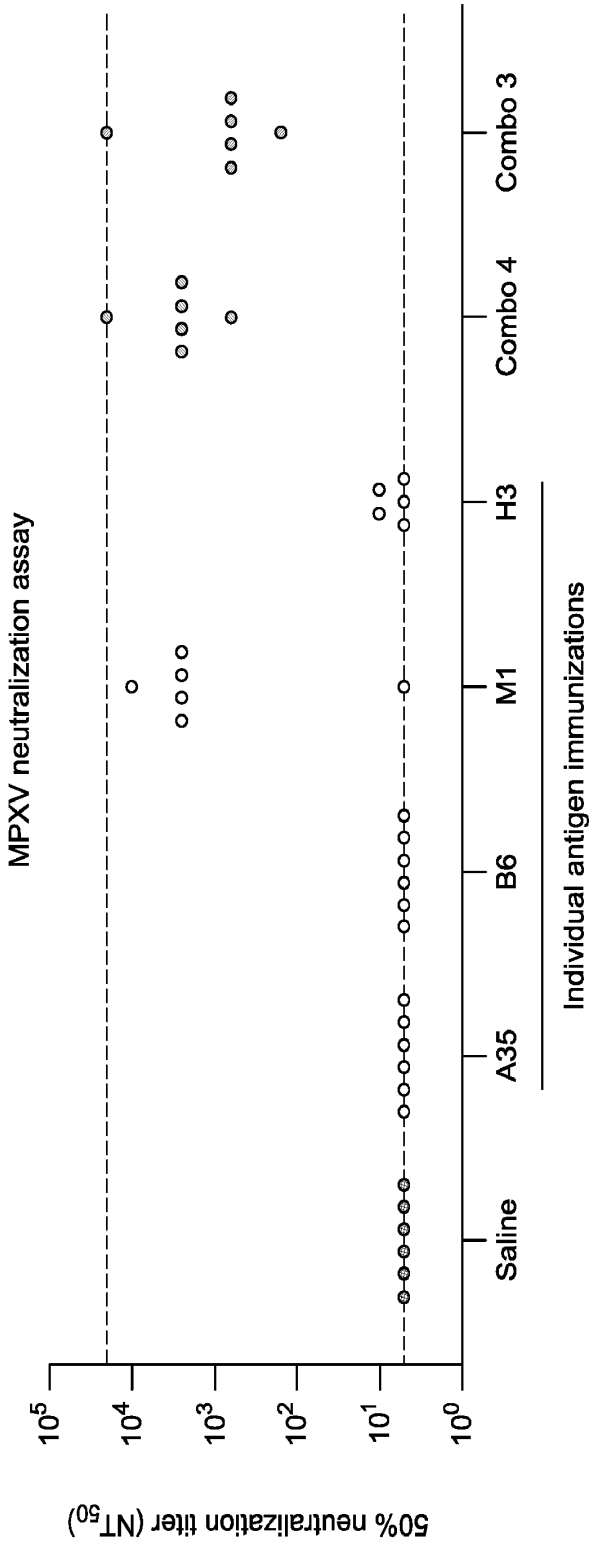


FIG. 77A

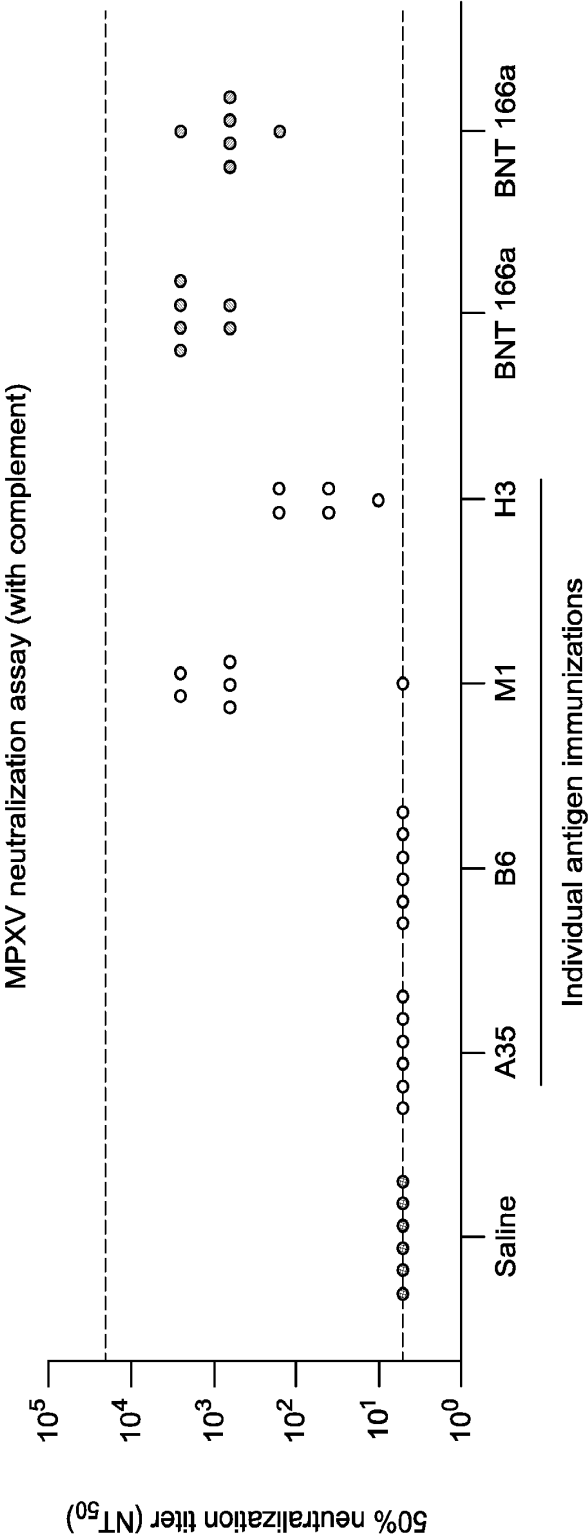


FIG. 77B

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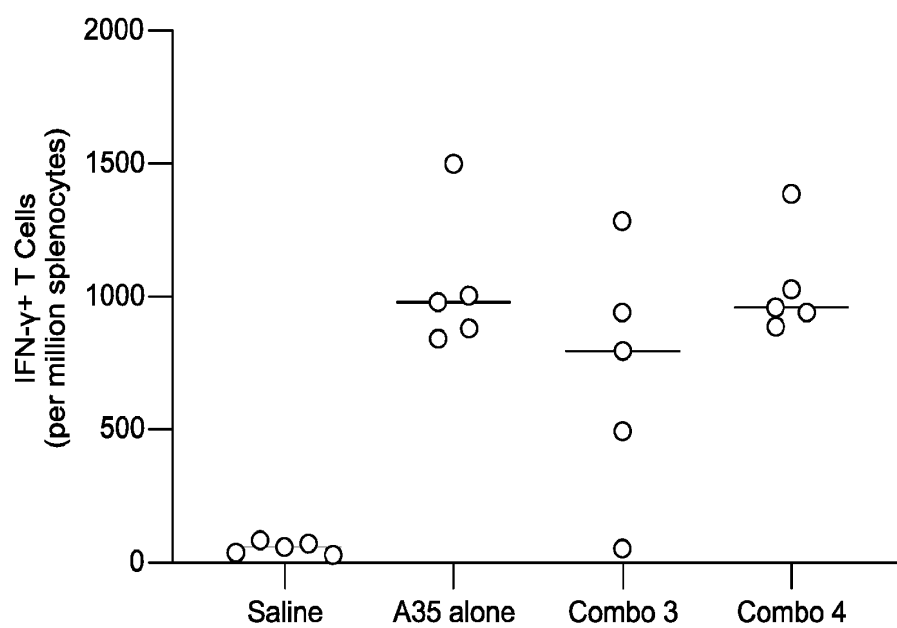


FIG. 78A

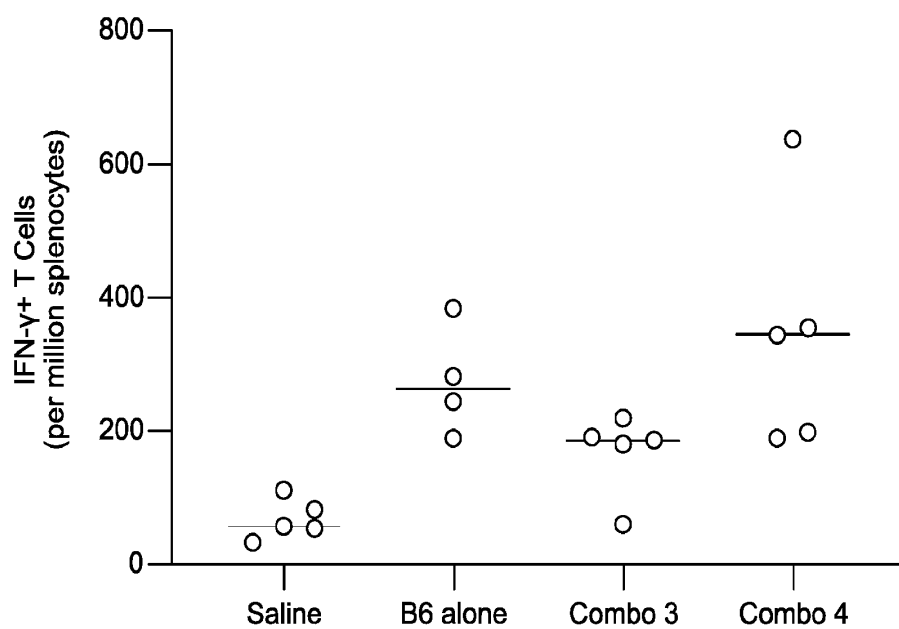


FIG. 78B

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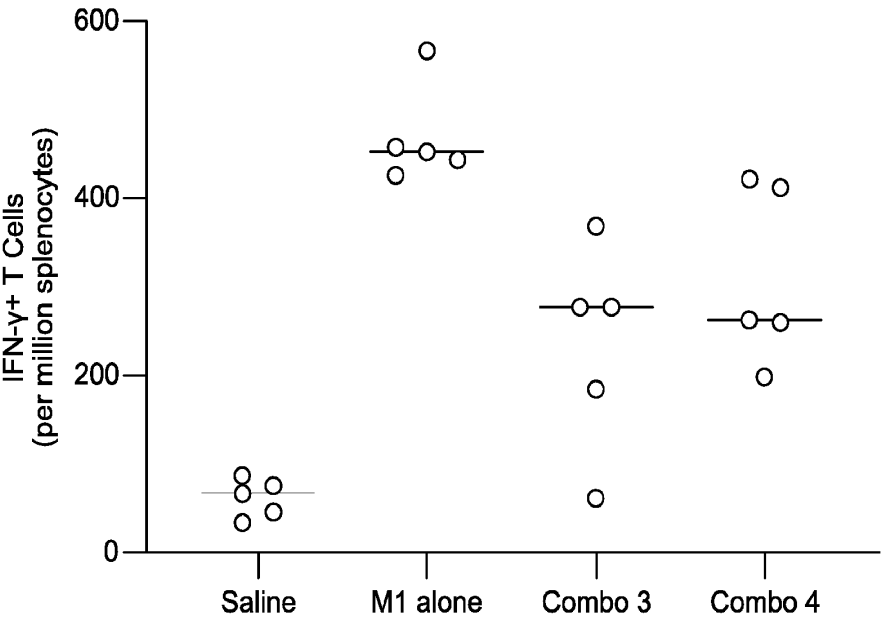


FIG. 78C

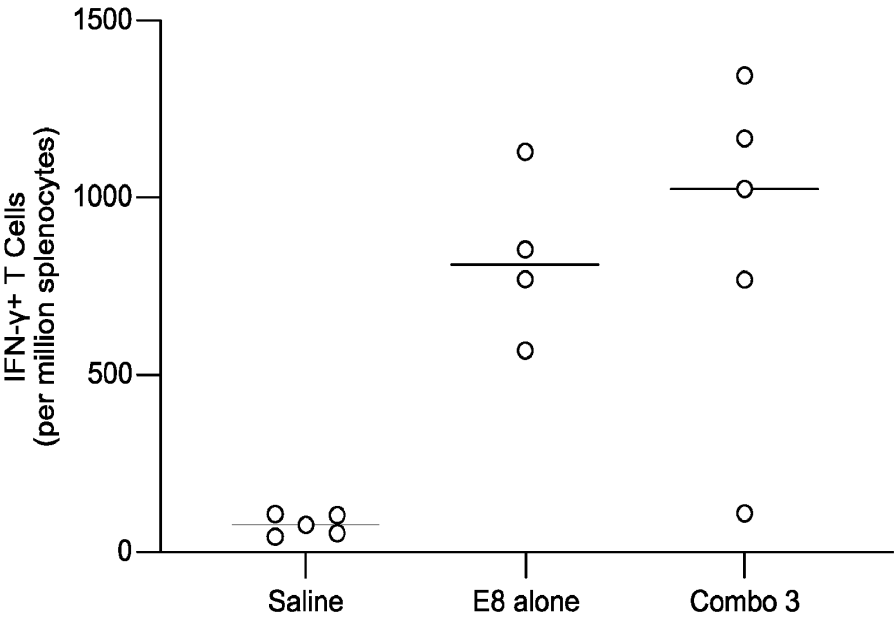


FIG. 78D

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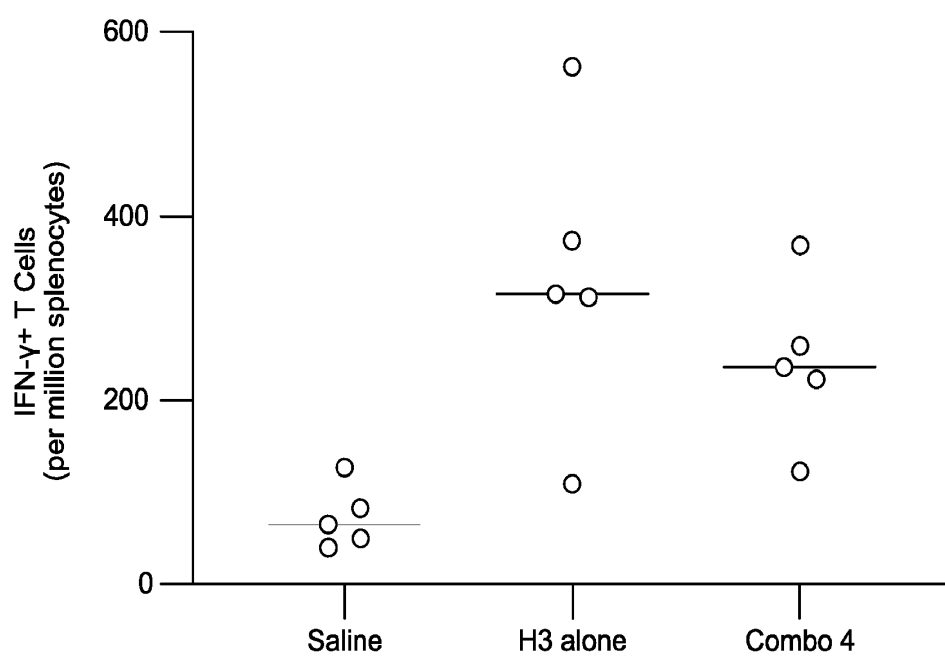


FIG. 78E

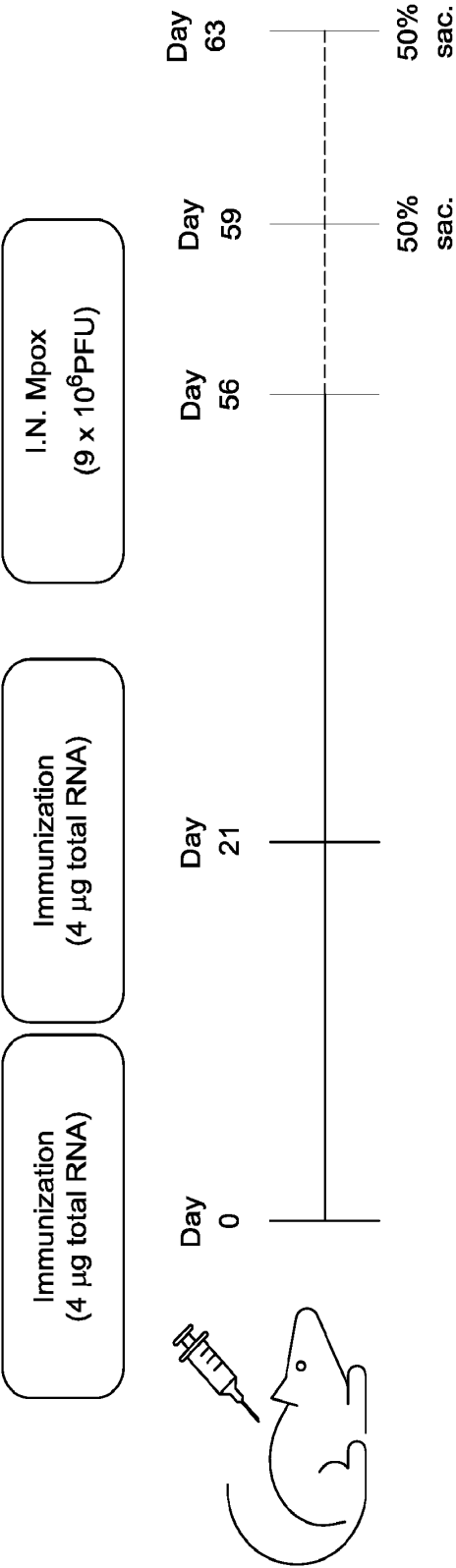


FIG. 79A

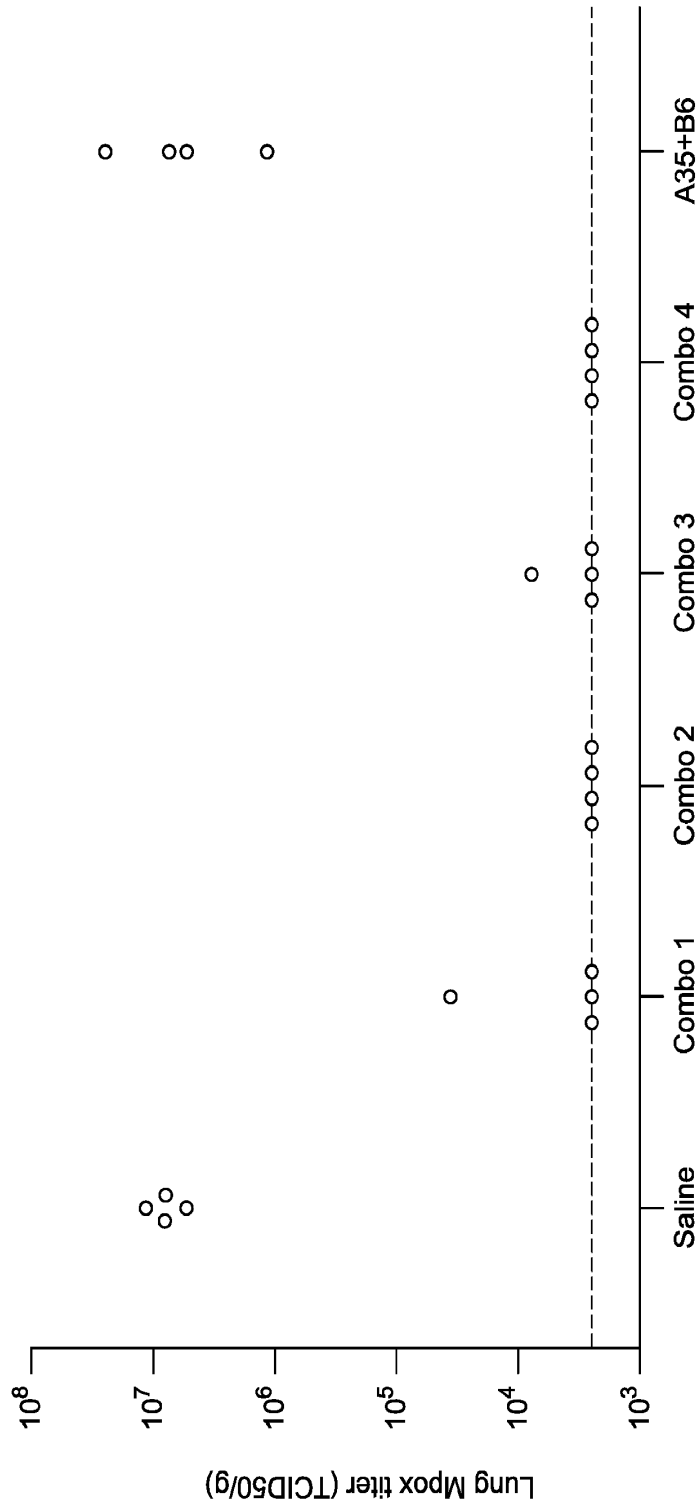


FIG. 79B

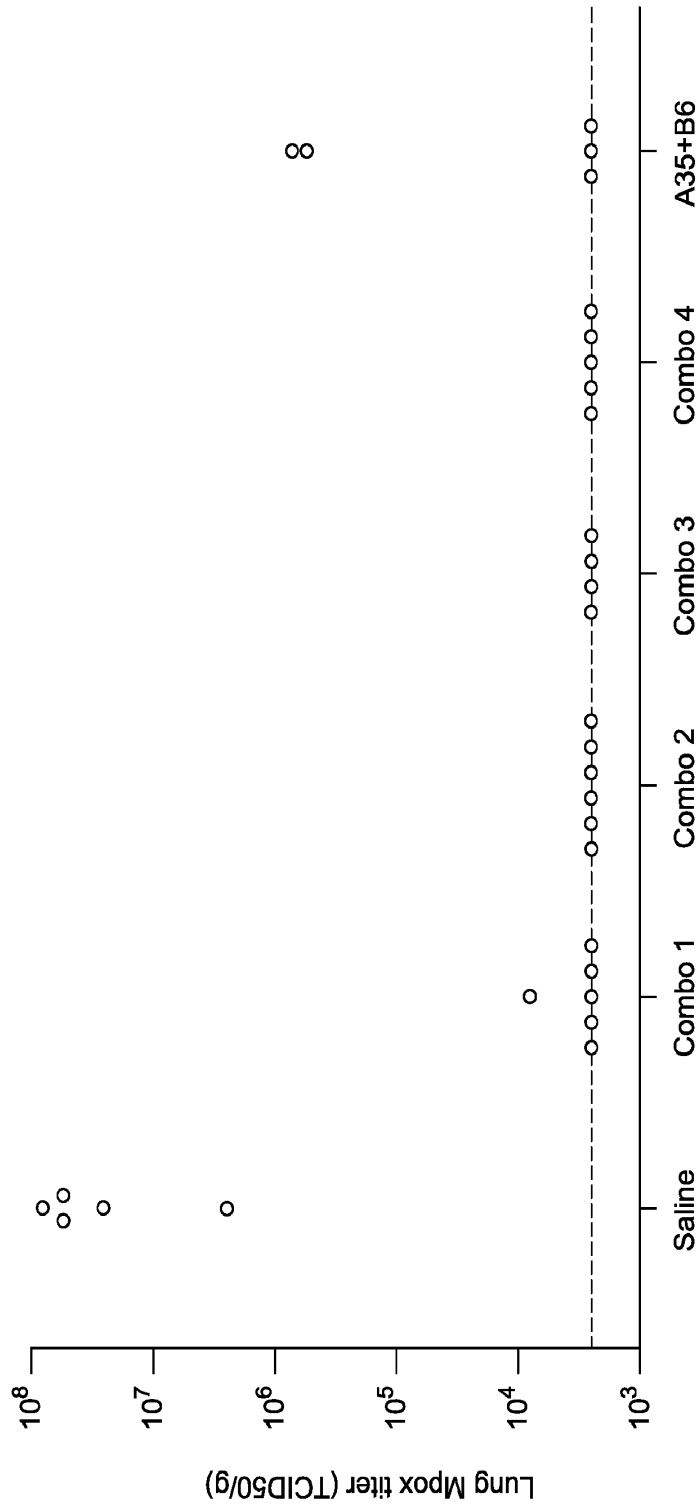


FIG. 79C

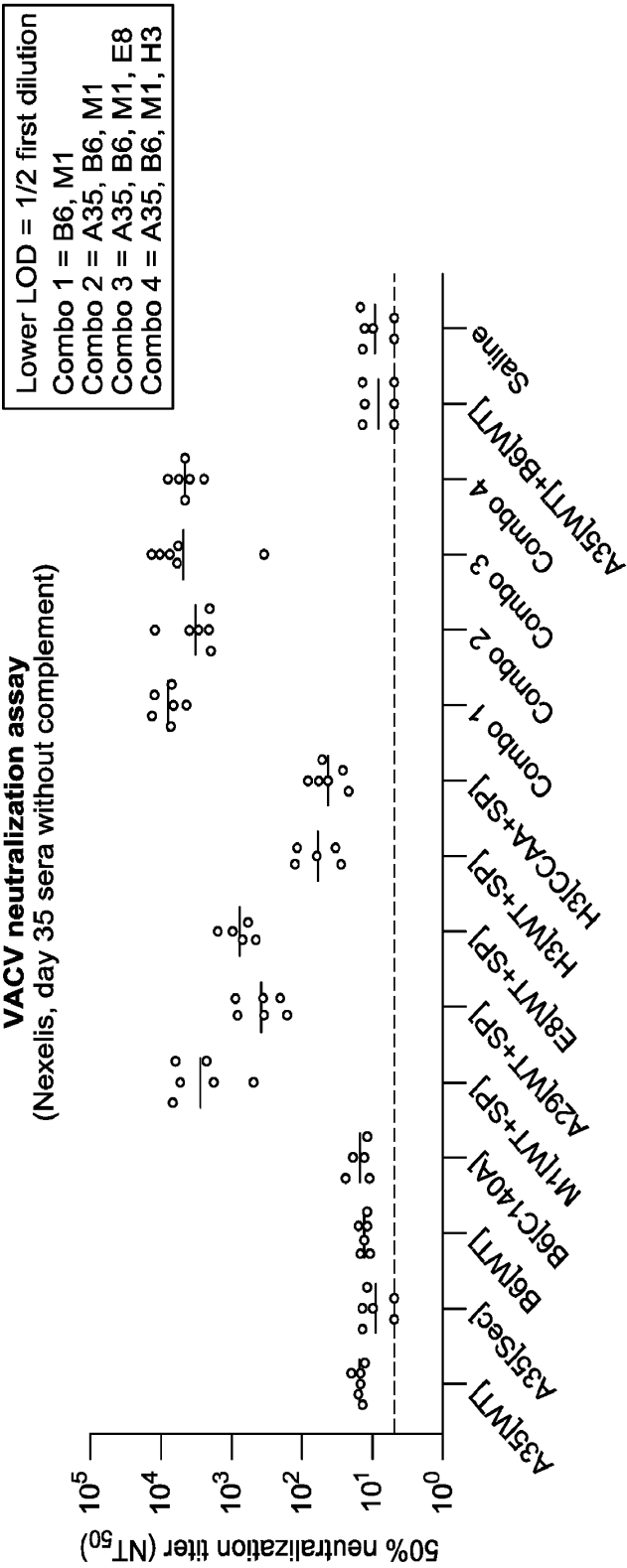


FIG. 80

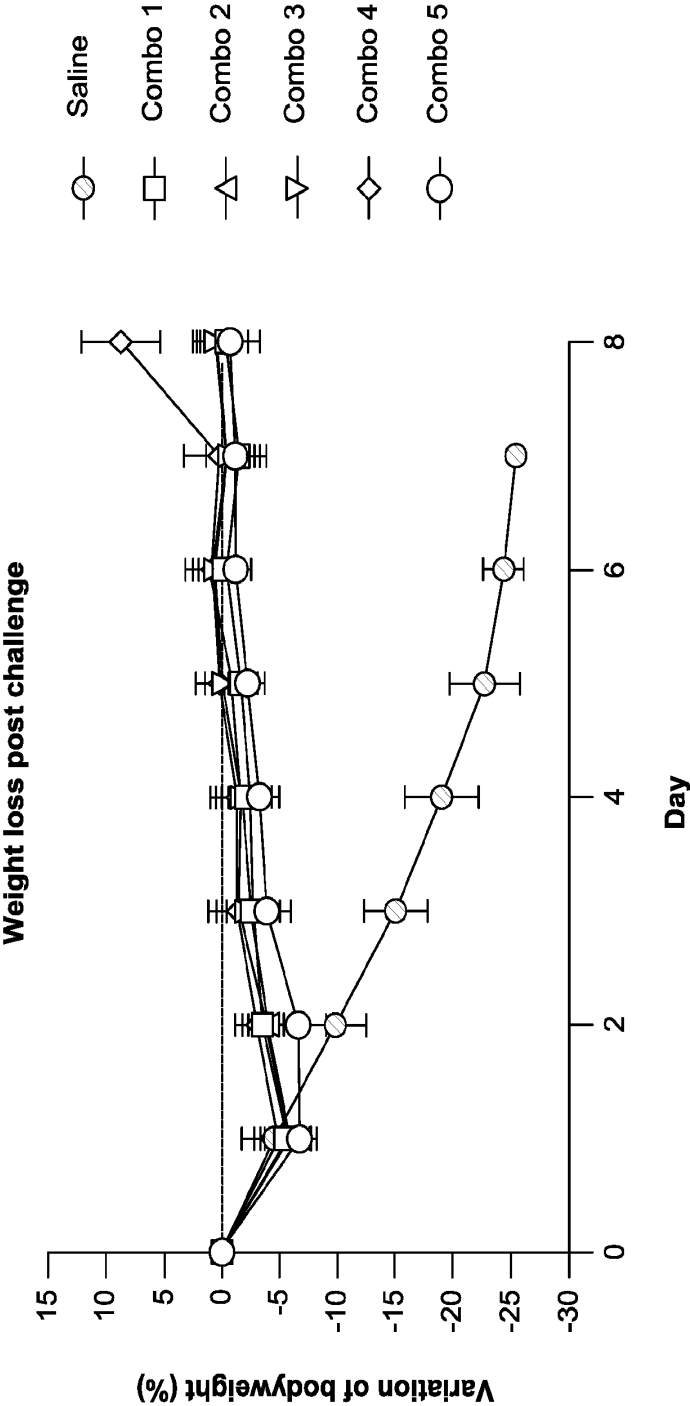


FIG. 81A

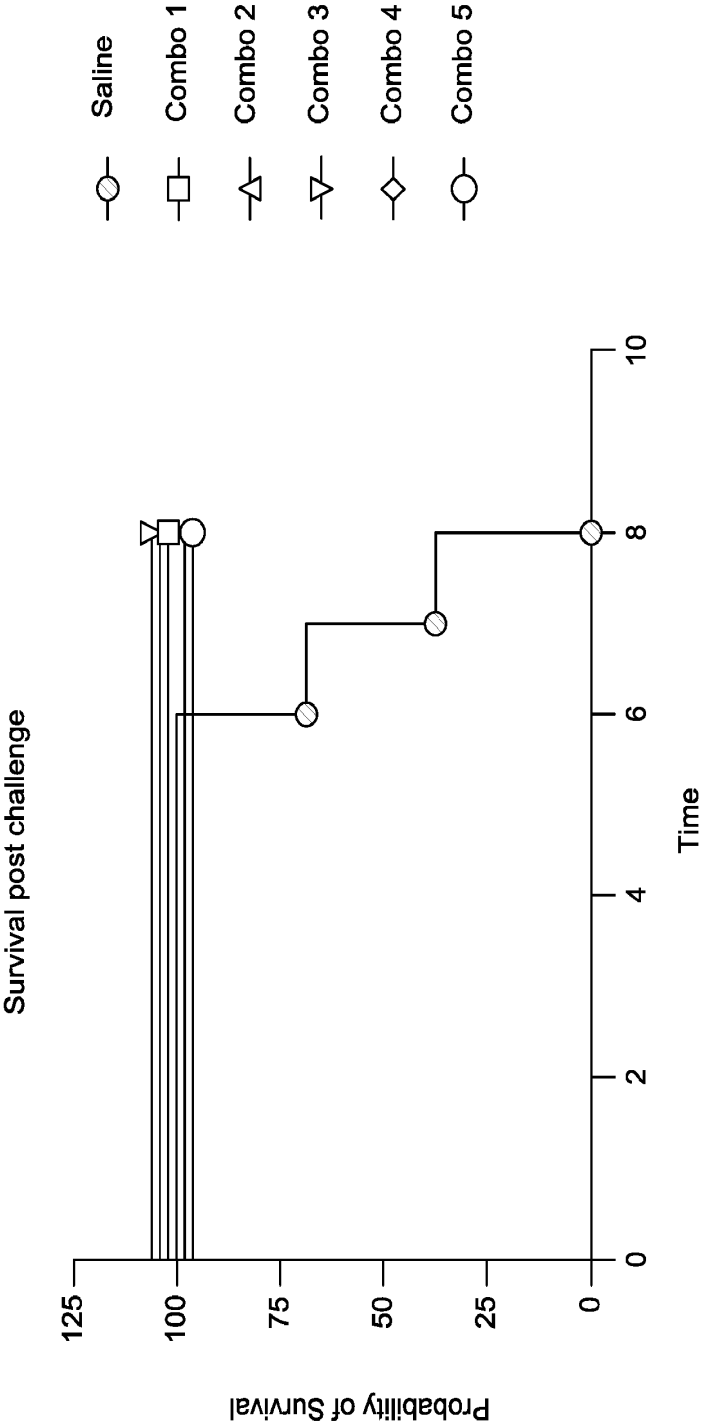


FIG. 81B