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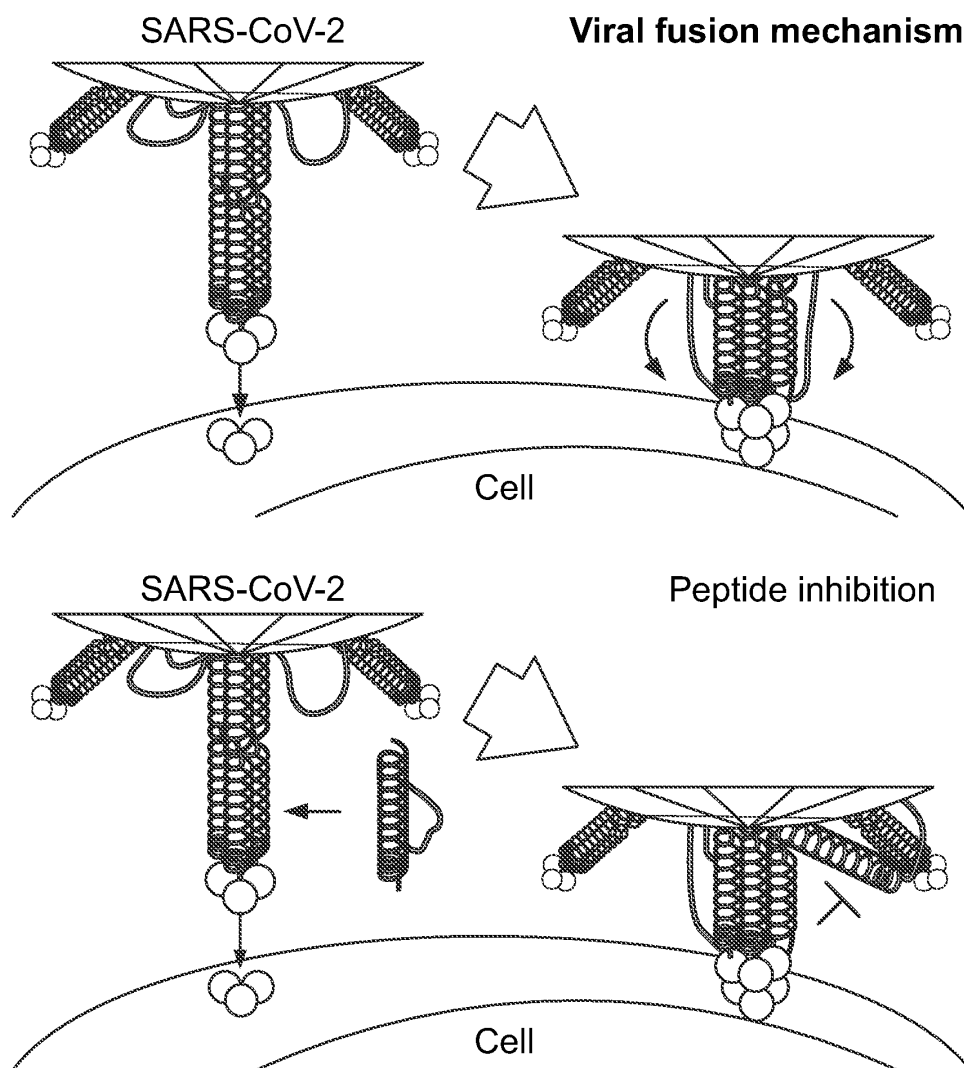


FIG. 1

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>QHD43416 (L=1273)

MFVFLVLLPLVSSQCVNLTTRTQLPPAYTNSFTRGVYYPDKVFRSSVLHS
TQDLFLPFFSNVTWFHAIHVSGTNGTKRFDNPVLPFNDGVYFASTEKSNI
IRGWIFGTTLDSKTQSLLIVNNATNVVIKVECFQFCNDPFLGVYYHKNNK
SWMESEFRVYSSANNCTFEYVSQPFLMDLEGKQGNFKNLREFVFKNIDGY
FKIYSKHTPINLVRDLPOGFSALEPLVDLPIGINITRFQTLLALHRSYLT
PGDSSSGWTAGAAAYYVGYLQPRTFLLKYNENGTITDAVDCALDPLSETK
CTLKSFTVEKGIYQTSNFRVQPTESIVRFPNITNLCPFGEVFNATRFASV
YAWNRKRISNCVADYSVLVNSASFSTFKCYGVSPTKLNLCFTNVYADSF
VIRGDEVQRQIAPGQTGKIADYNYKL PDDFTGCVIAWNSNNLDSKVGGNYN
YLYRLFRKSNLKPFERDISTEIIYQAGSTPCNGVEGFNCYFPLQSYGFQPT
NGVGYQPYRVVLSFELLHAPATVCGPKKSTNLVKNKCVNFNFNGLTGTG
VLTESNKKFLPFQQFGRDIADTTDAVRDPQTEILDITPCSFGGVSVITP
GTNTSNQVAVLYQDVNCTEVPVAIHADQLTPTWRVYSTGSNVFQTRAGCL
IGAHEVNNSYECDIPIGAGICASYQTQTN SPRRARSVASQSI IAYTMSLG
AENSVAYSNN SIAIPTNFTISVTTEILPVSMTKTSVDCTMYICGDSTEC S
NLLLQYGSFCTQLNRALTGIAVEQDKNTQEVFAQVKQIYKTPPIKDFGGF
NFSQILPDPSKPSKRSFIEDLLFNKVT LADAGFIKQYGDCLGDIAARDLI
CAQKFNGLTVLPPLLTDemiaQYTSALLAGTITSGWTFGAGAALQIPFAM
QMAYRFNGIGVTQNVLYENQKL IANQFNSAIGKIQDSL SSTASALGKLQD
VVNQNAQALNTLVKQLSSNFGAISSVLNDILSR LDKVEAEVQIDRLITGR
LQSLQTYVTQQLIRAAEIRASANLAATKMSECVLGQSKRVDFCGKGYHLM
SFPQSAPHGVVFLHVTYVPAQEKNFTTAPAICH DGKAHFPREGVFVSNGT
HWFVTQRNFYEPQIITTDNTFVSGNCDV VIGIVNNTVYDPLQPELDSFKE
ELDKYFKNHTSPDVLGDISGINASVVNIQKEIDRLNEVAKNLNESLIDL
QELGKYEQYIKWPWYIWLGF IAGLIAIVMTIMLCCMTSCCSCLKGCCSC
GSCCKFDEDDSEPV LKGVKLHYT

(SEQ ID NO: 1)

FIG. 2

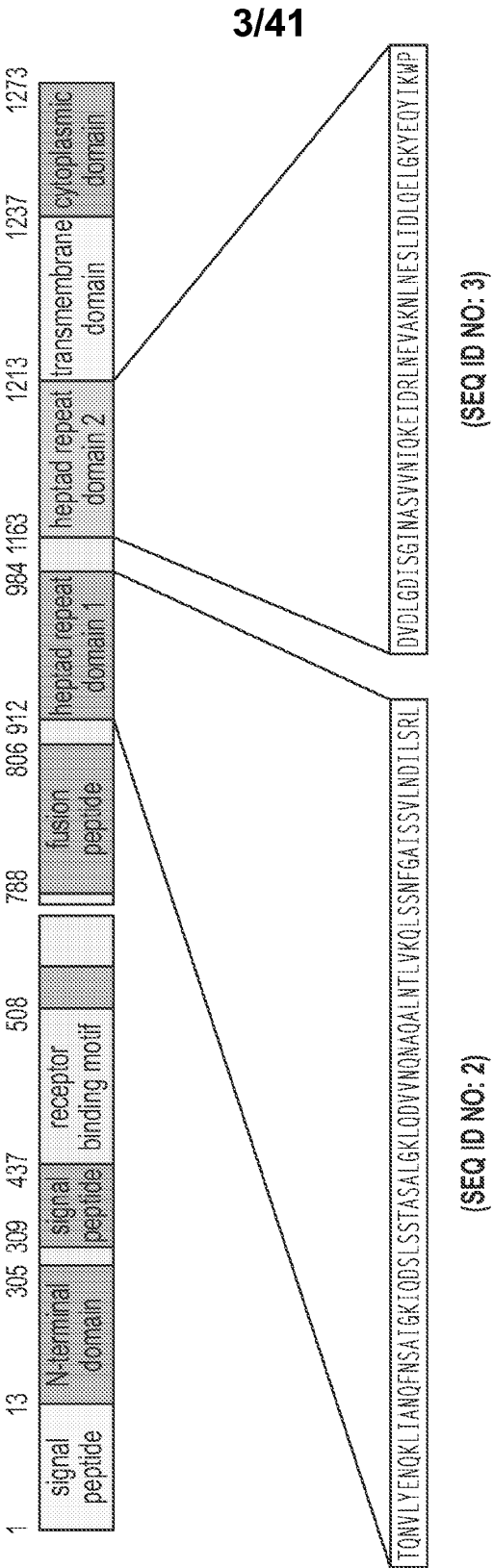


FIG. 3

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HR1

SEQ ID NO:2

912-TQNVLYENQKLIANQFNSAIGKIQDSLSSTASALGKLQDVVNQNAQALNTLVKQLSSNFGATSSVLNDILSRL-984	(SARS-CoV-2)
TQNVLYENQK IANQFN AI IQ+SL T ALGKLQDVVNQNAQALNTLVKQLSSNFGATSSVLNDILSRL	Homology
894-TQNVLYENQKLIANQFNKAISQIQESLTTTSTALGKLQDVVNQNAQALNTLVKQLSSNFGATSSVLNDILSRL-966	(SARS, c.2004)

SEQ ID NO:72

HR2

SEQ ID NO:3

1163-DVDLGDISGINASVVNIQKEIDRLNEVAKNLNESLIDLQELGKYEYIKWP-1213	(SARS-CoV-2)
DVDLGDISGINASVVNIQKEIDRLNEVAKNLNESLIDLQELGKYEYIKWP	Homology
1145-DVDLGDISGINASVVNIQKEIDRLNEVAKNLNESLIDLQELGKYEYIKWP-1195	(SARS, c.2004)

SEQ ID NO:73

FIG. 4

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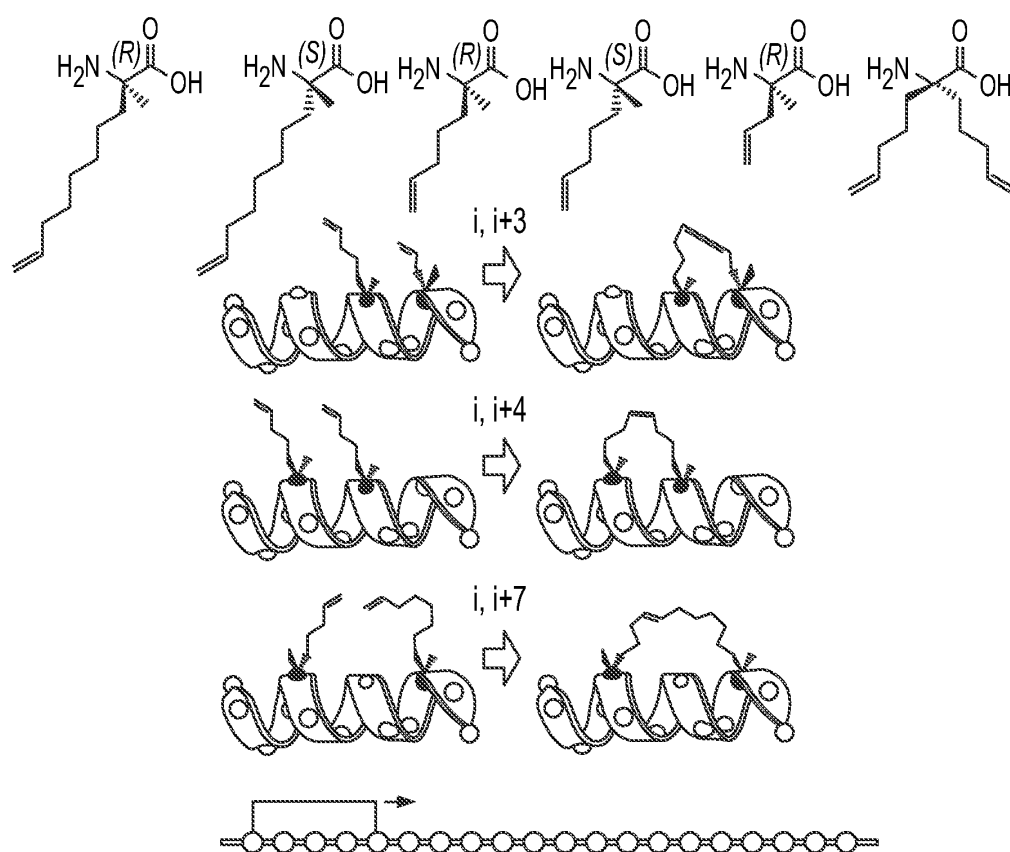
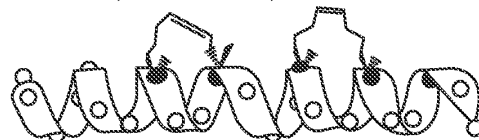
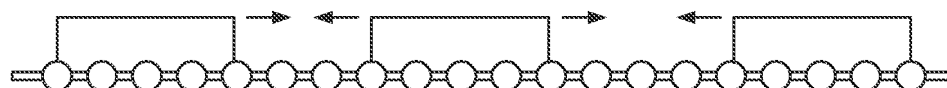
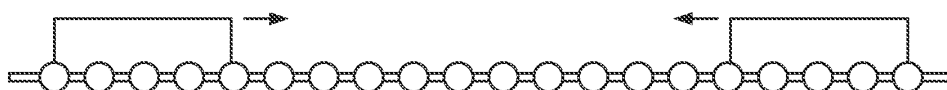


FIG. 5

6/41 $i, i+3$ and $i, i+3$  $i, i+4$ and $i, i+4$  $i, i+7$ and $i, i+7$  $i, i+3$ and $i, i+4$  $i, i+4$ and $i, i+7$  $i, i+4$ $i, i+4$ and $i, i+4$ **FIG. 6**

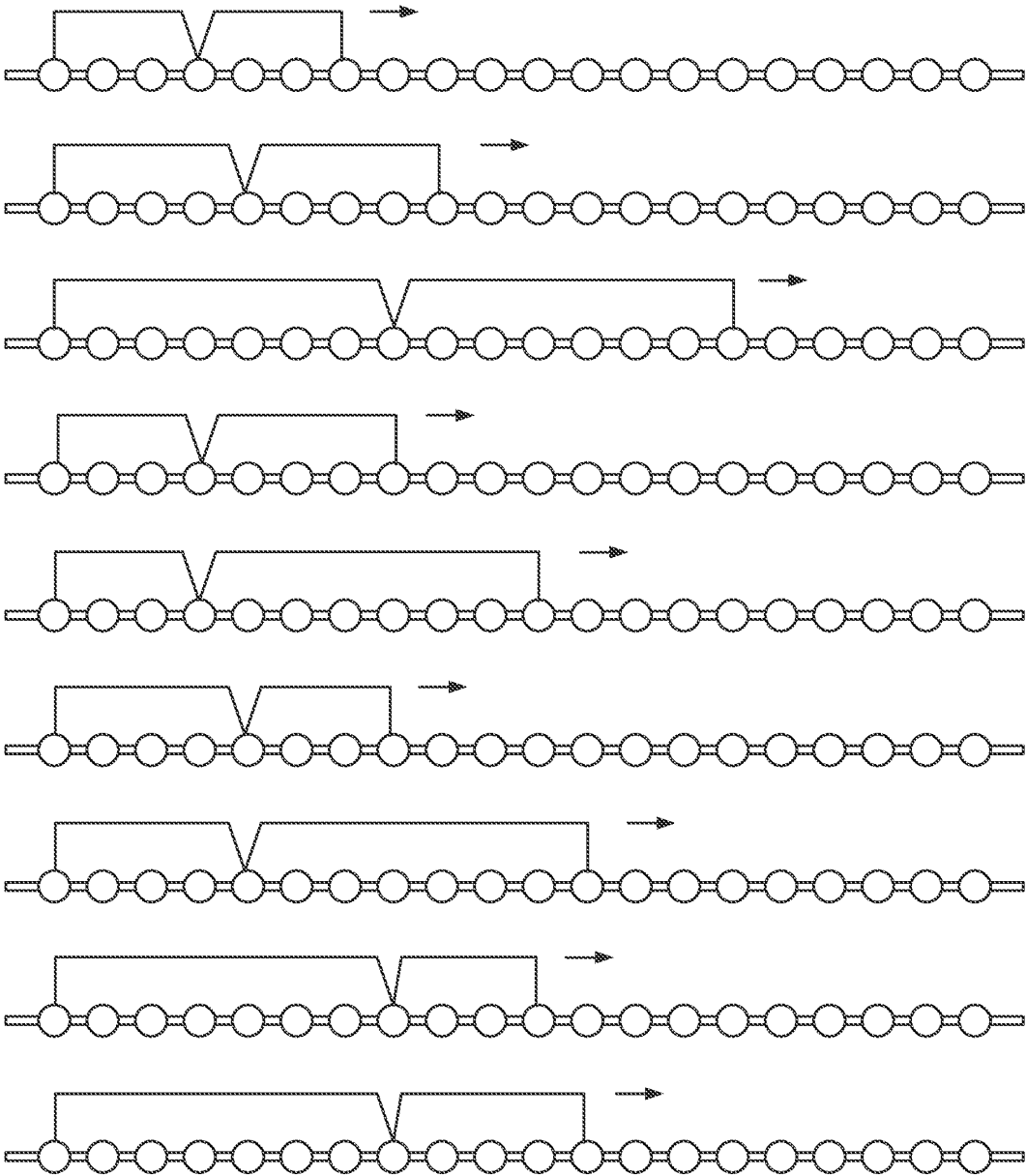


FIG. 7

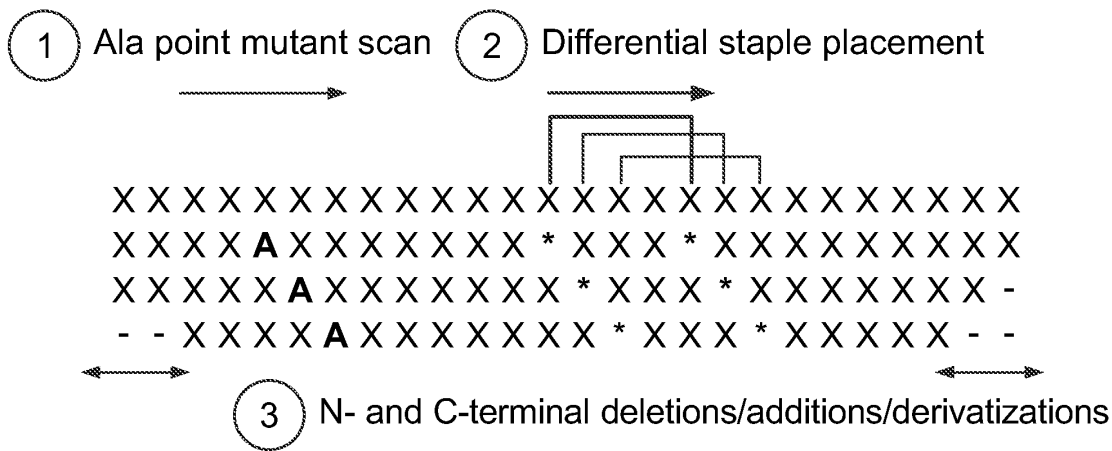


FIG. 8

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1179-IQKEIDRLNEVAKNLNESL-1197 (SEQ ID NO: 4)

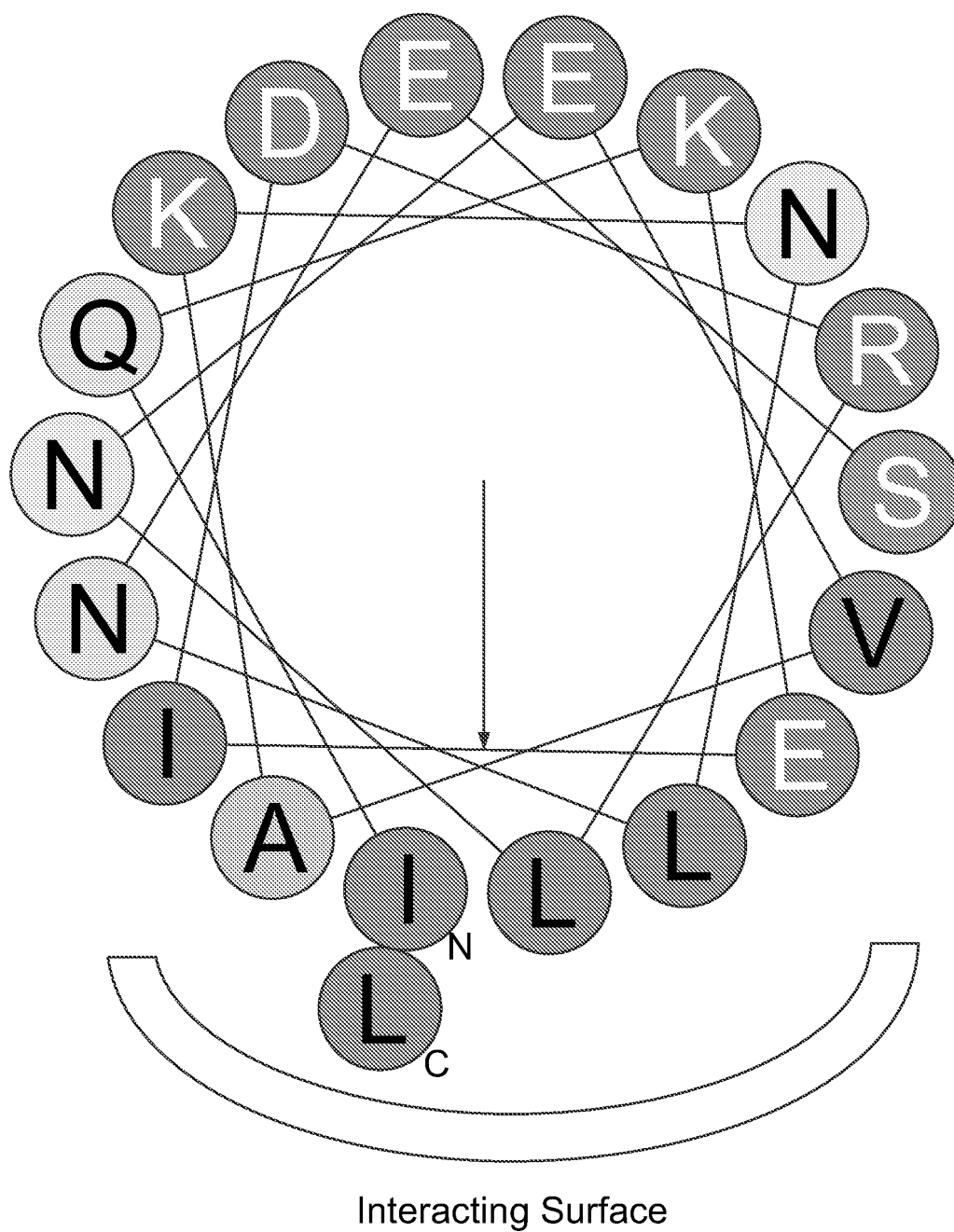


FIG. 9

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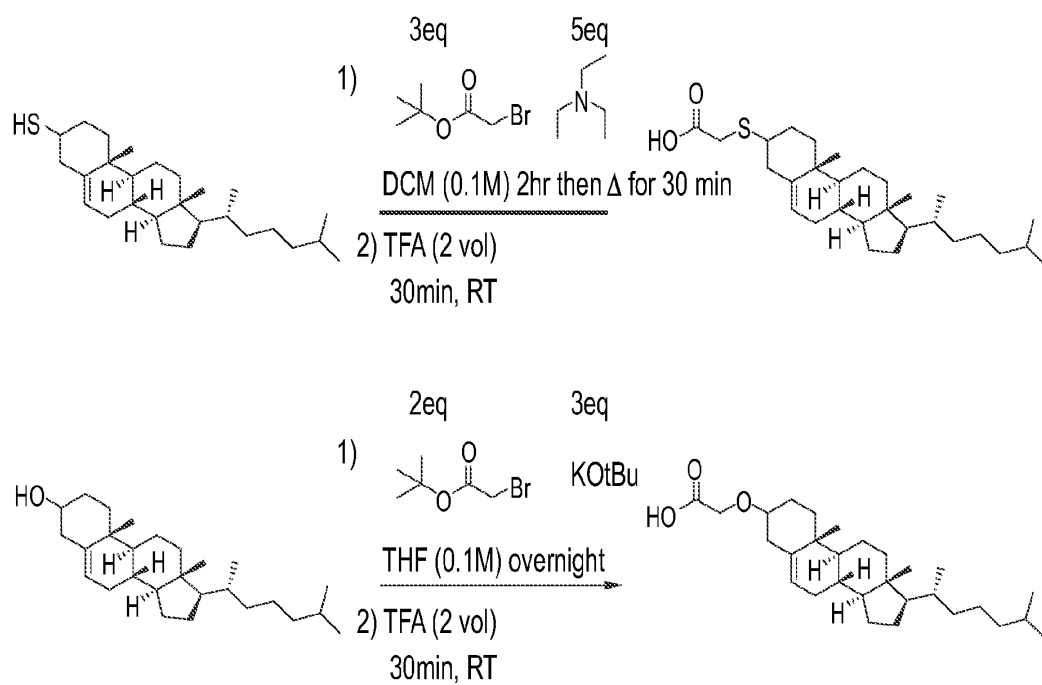


FIG. 10

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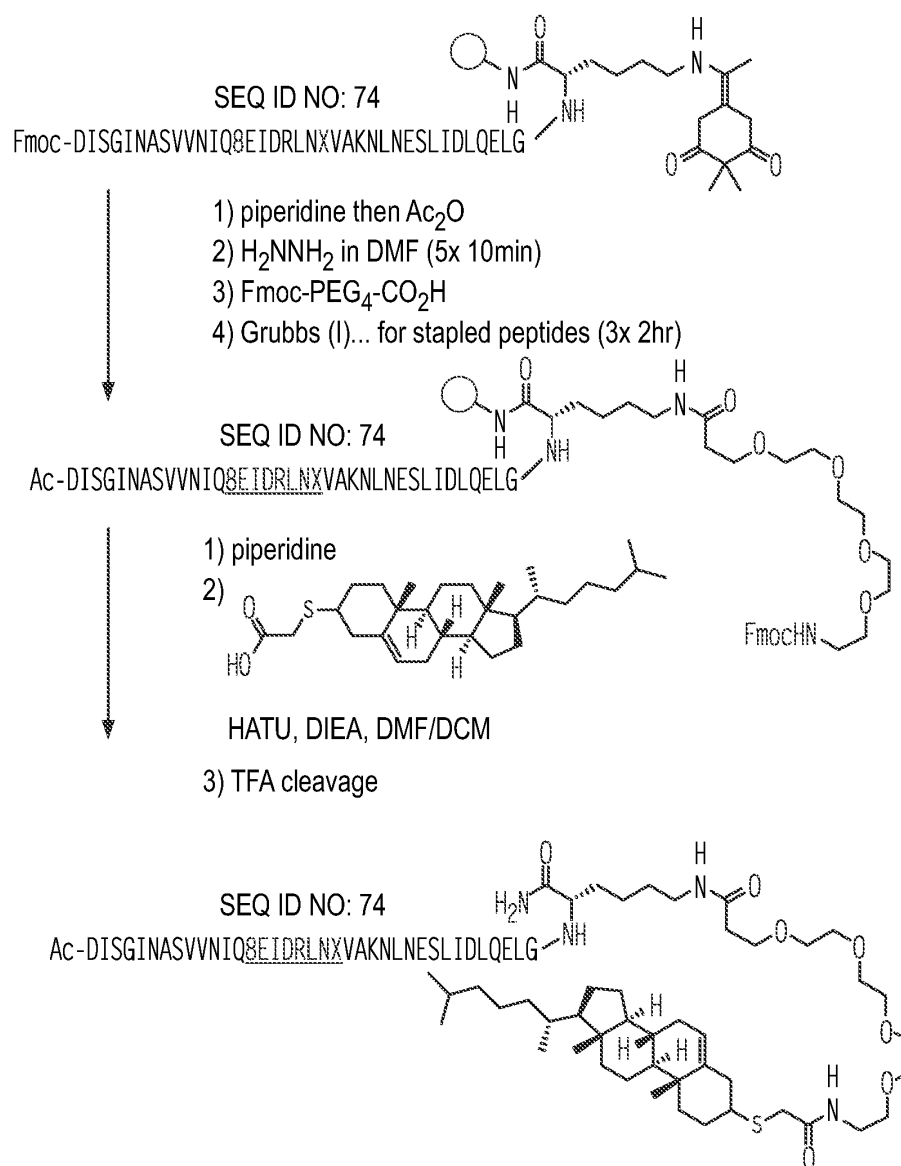


FIG. 11A

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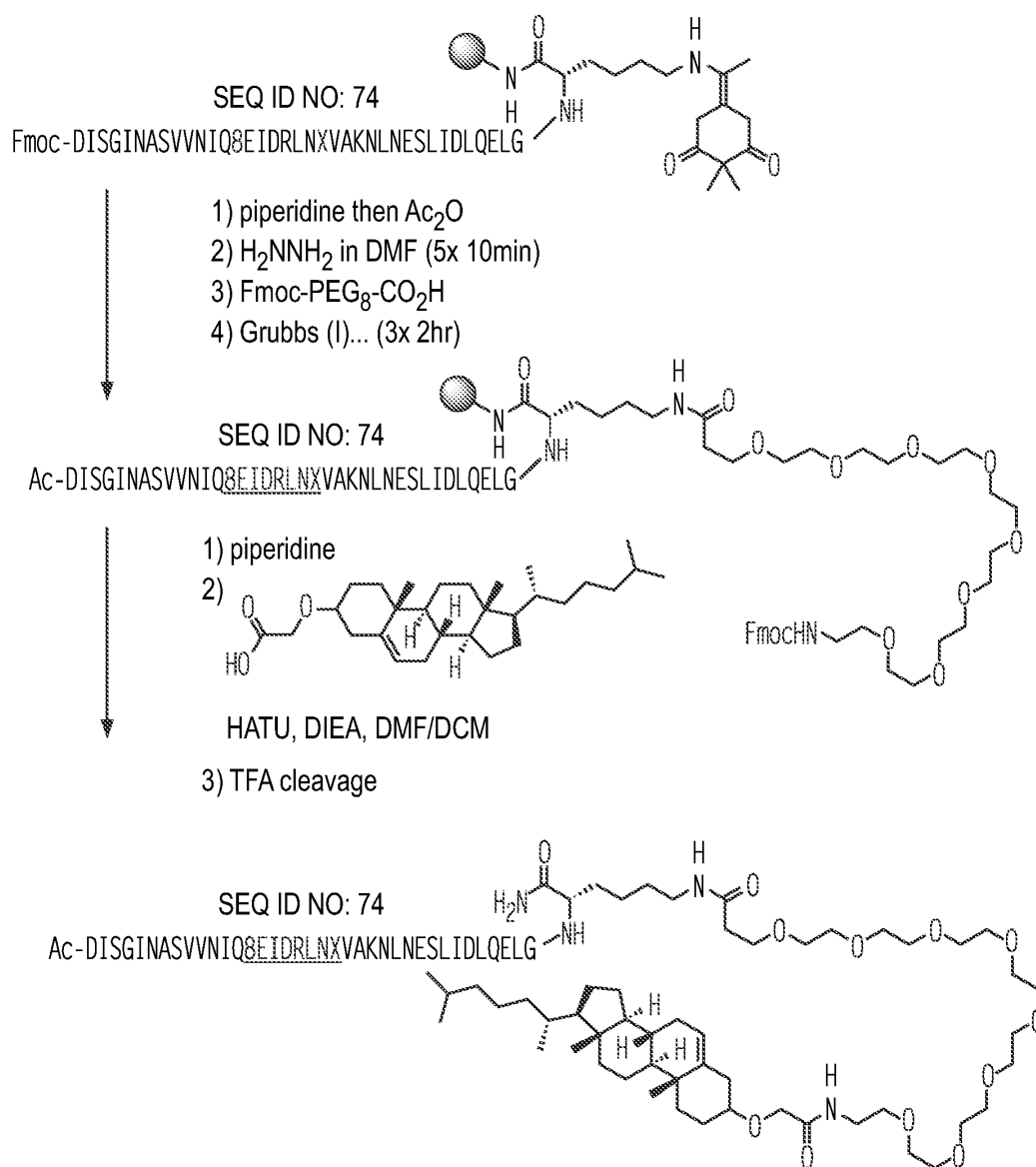


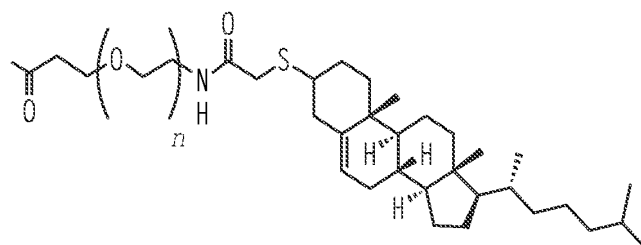
FIG. 11B

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i, i+7 Stapled Core Template Sequence plus N- and C-Terminal Extensions (aa 1168-1205)
and C-terminal derivatization with PEG-thiocholesterol or PEG-cholesterol moiety:

DISGINASVVNIQKEIDRLNEVAKNLNESLIDLQEL	(SEQ ID NO: 5)	Unstapled
DISGINASVVNIQKEIDRLNEVAKNLNESLIDLQEL GK*	(SEQ ID NO: 6)	Unstapled
DISGINASVVNIQKEIDRLNEVAKNLNESLIDLQEL GK*	(SEQ ID NO: 7)	Staple A
DISGINASVVNIQKEIDRLNEVAKNLNESLIDLQEL GK*	(SEQ ID NO: 8)	Staple B
DISGINASVVNIQKEIDRLNEVAKNLNESLIDLQEL GK*	(SEQ ID NO: 9)	Staple C
DISGINASVVNIQKEIDRLNEVAKNLNESLIDLQEL GK*	(SEQ ID NO: 10)	Staple D
DISGINASVVNIQKEIDRLNEVAKNLNESLIDLQEL GK*	(SEQ ID NO: 11)	Staple E
DISGINASVVNIQKEIDRLNEVAKNLNESLIDLQEL GK*	(SEQ ID NO: 12)	Staple F
DISGINASVVNIQKEIDRLNEVAKNLNESLIDLQEL GK*	(SEQ ID NO: 13)	Staple G
DISGINASVVNIQKEIDRLNEVAKNLNESLIDLQEL GK*	(SEQ ID NO: 14)	Staple H
DISGINASVVNIQKEIDRLNEVAKNLNESLIDLQEL GK*	(SEQ ID NO: 15)	Staple I
DISGINASVVNIQKEIDRLNEVAKNLNESLIDLQEL GK*	(SEQ ID NO: 16)	Staple J
DISGINASVVNIQKEIDRLNEVAKNLNESLIDLQEL GK*	(SEQ ID NO: 17)	Staple K
DISGINASVVNIQKEIDRLNEVAKNLNESLIDLQEL GK*	(SEQ ID NO: 18)	Staple L
DISGINASVVNIQKEIDRLNEVAKNLNESLIDLQEL GK*	(SEQ ID NO: 19)	Staple M
DISGINASVVNIQKEIDRLNEVAKNLNESLIDLQEL GK*	(SEQ ID NO: 20)	Staple N
DISGINASVVNIQKEIDRLNEVAKNLNESLIDLQEL GK*	(SEQ ID NO: 21)	Staple O

* =



OR

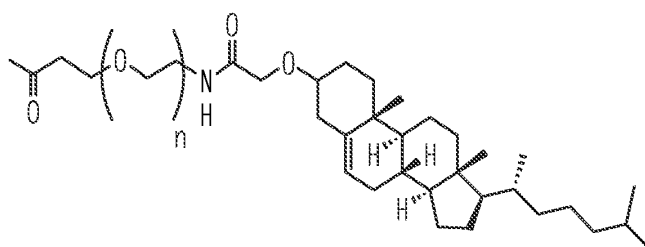
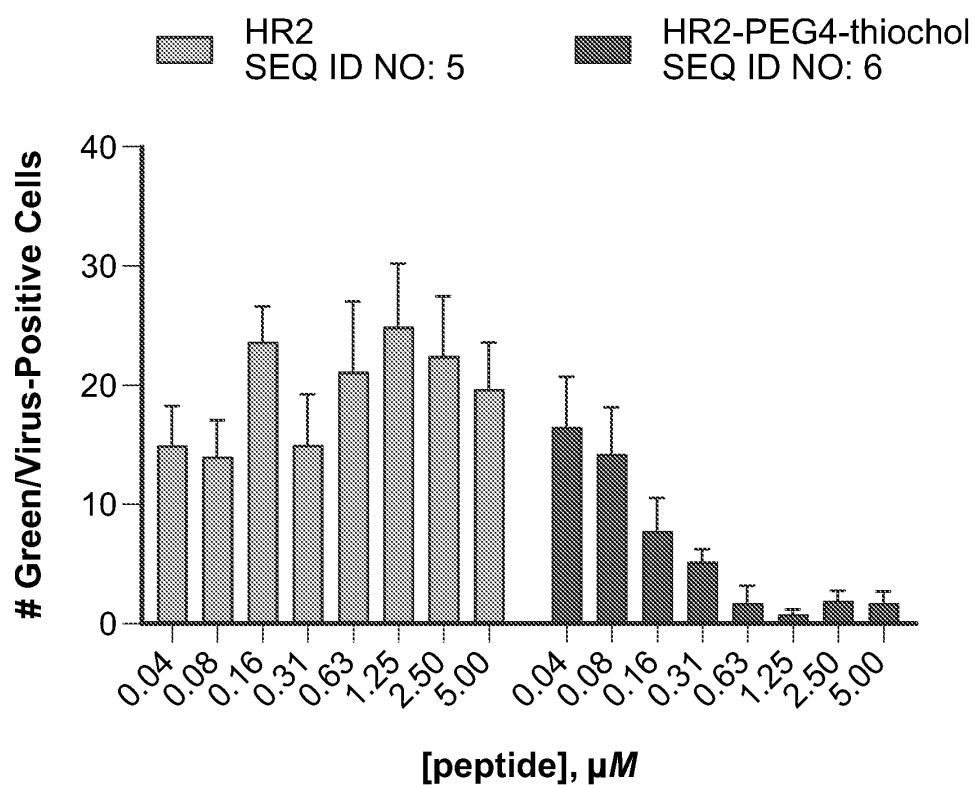
 $n = 1-36$

FIG. 12

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Pseudovirus: Wuhan-Hu-1
Cells: 293T-ACE2
Time: 72 h

FIG. 13

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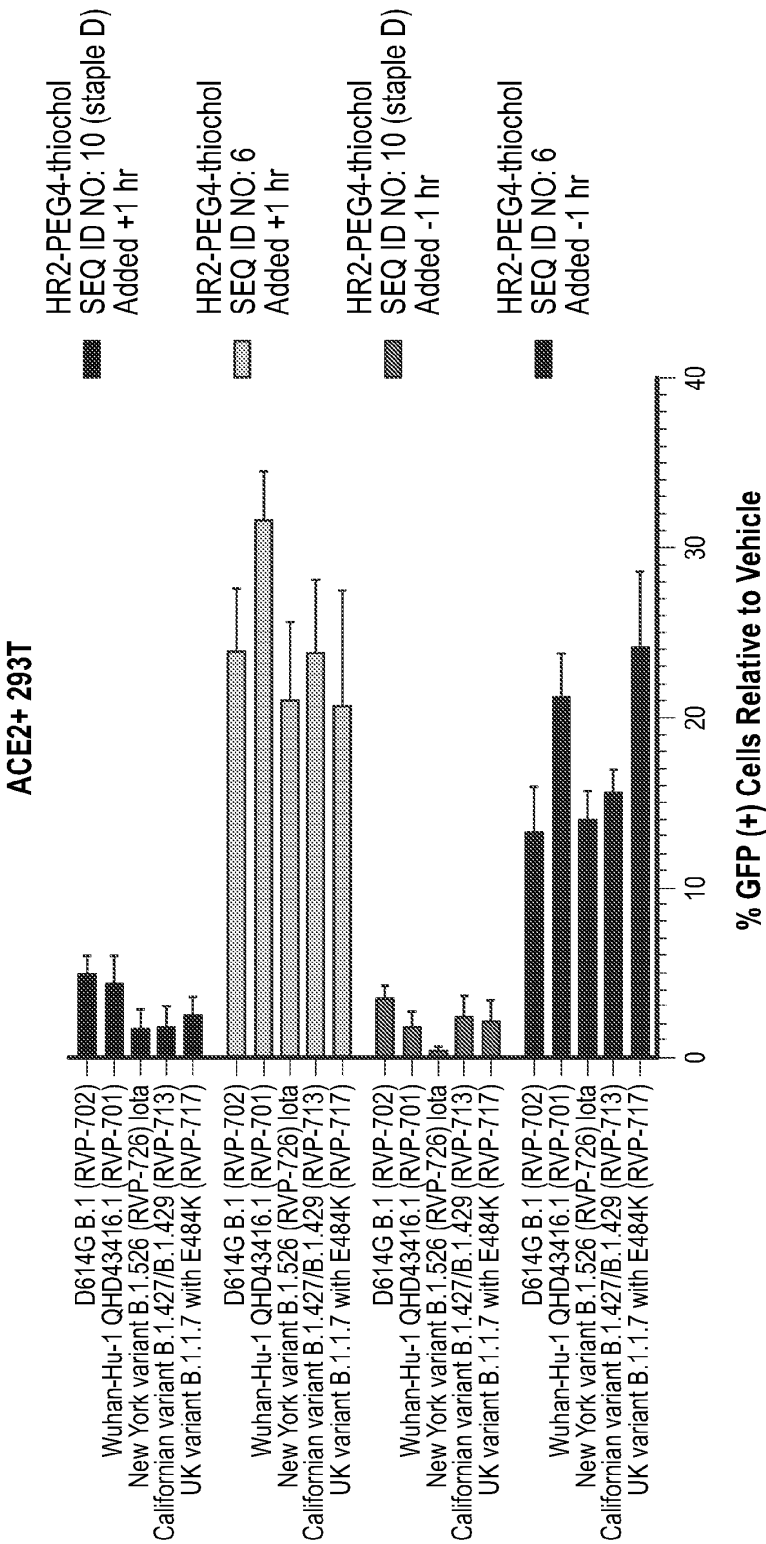


FIG. 14

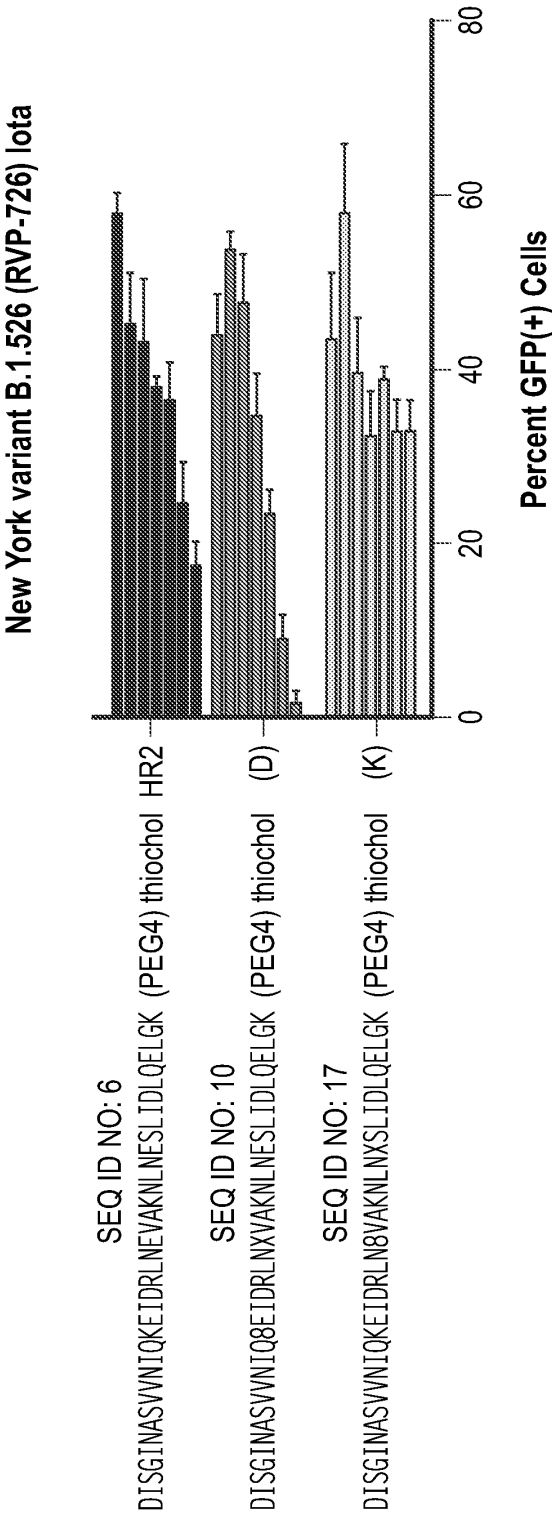


FIG.15

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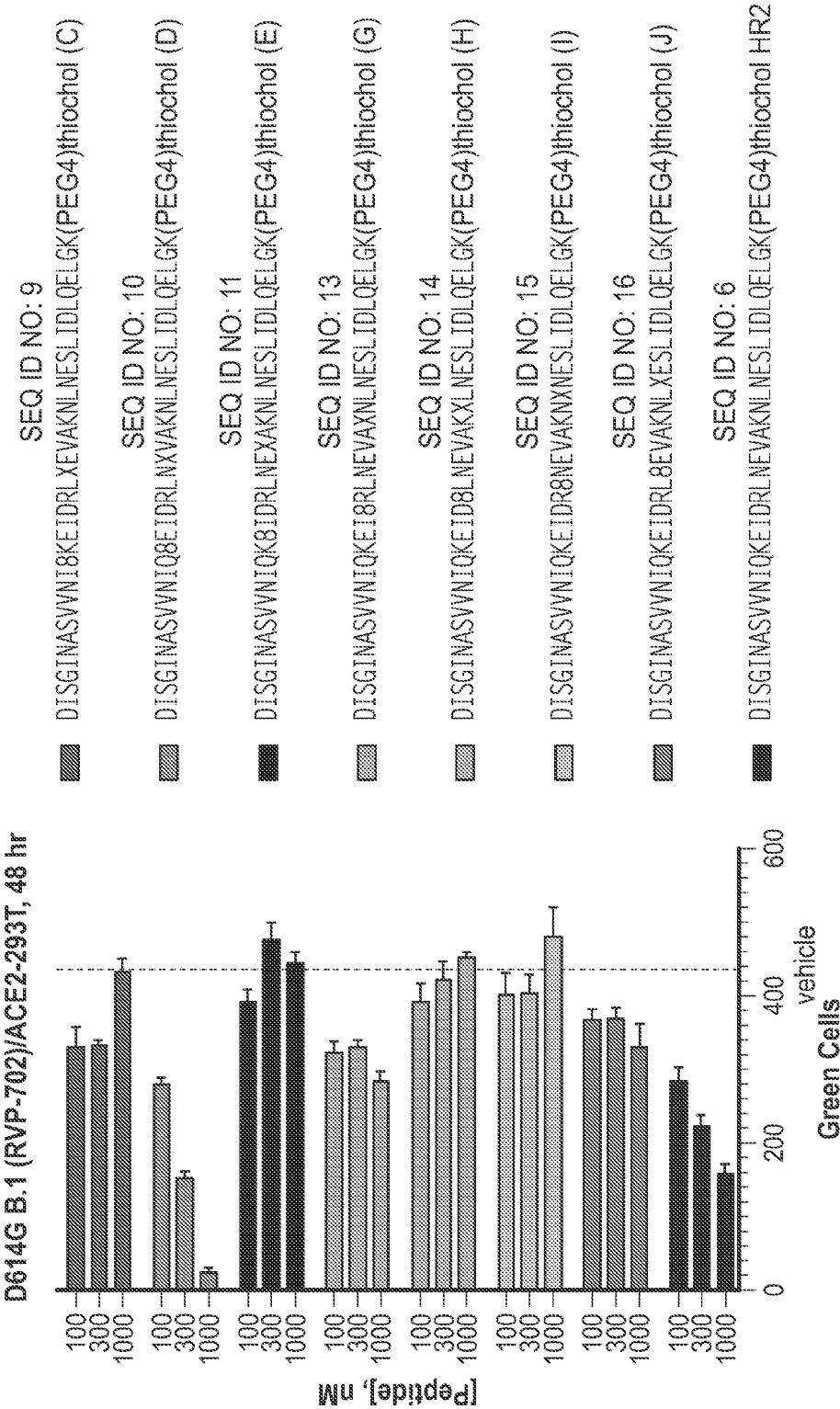


FIG. 16

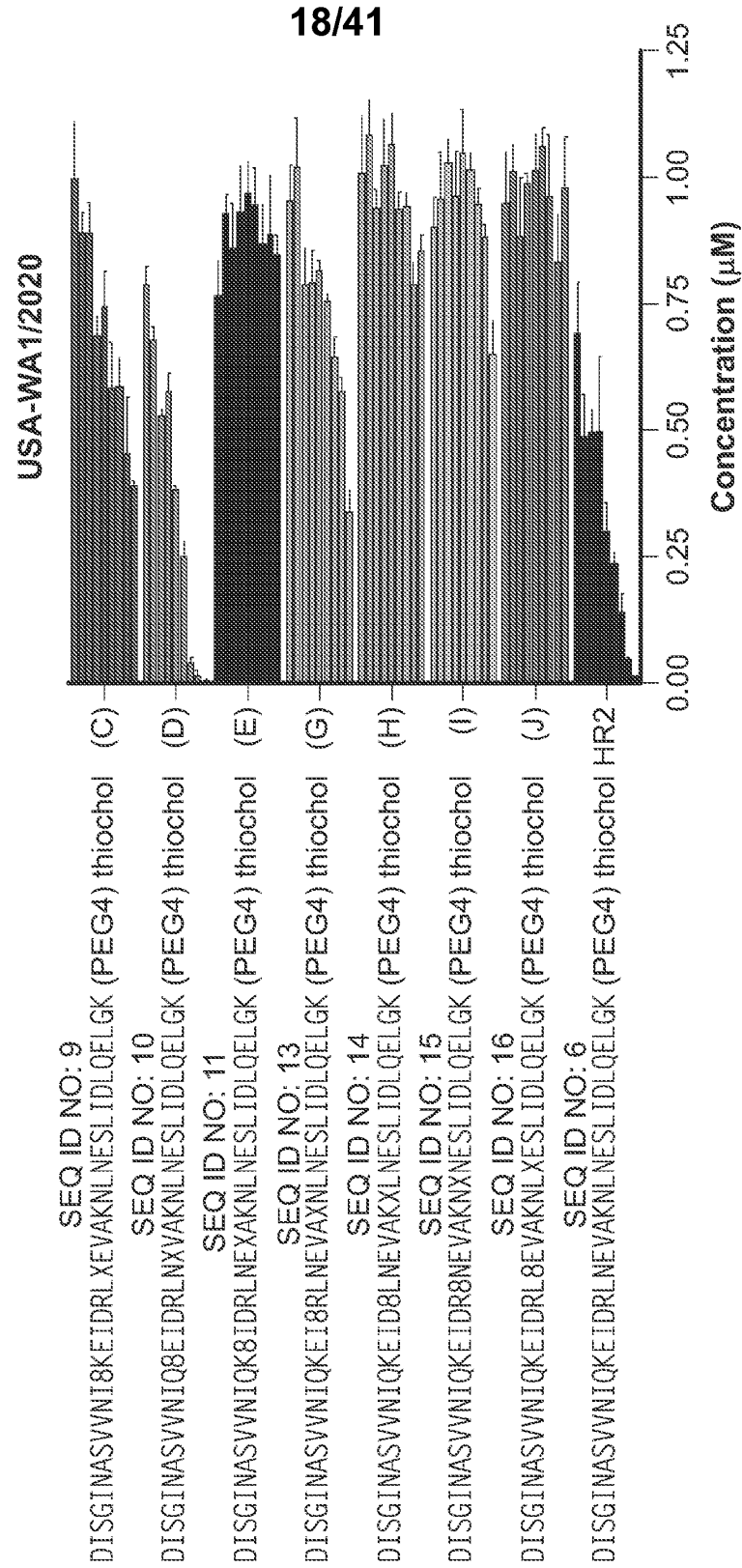
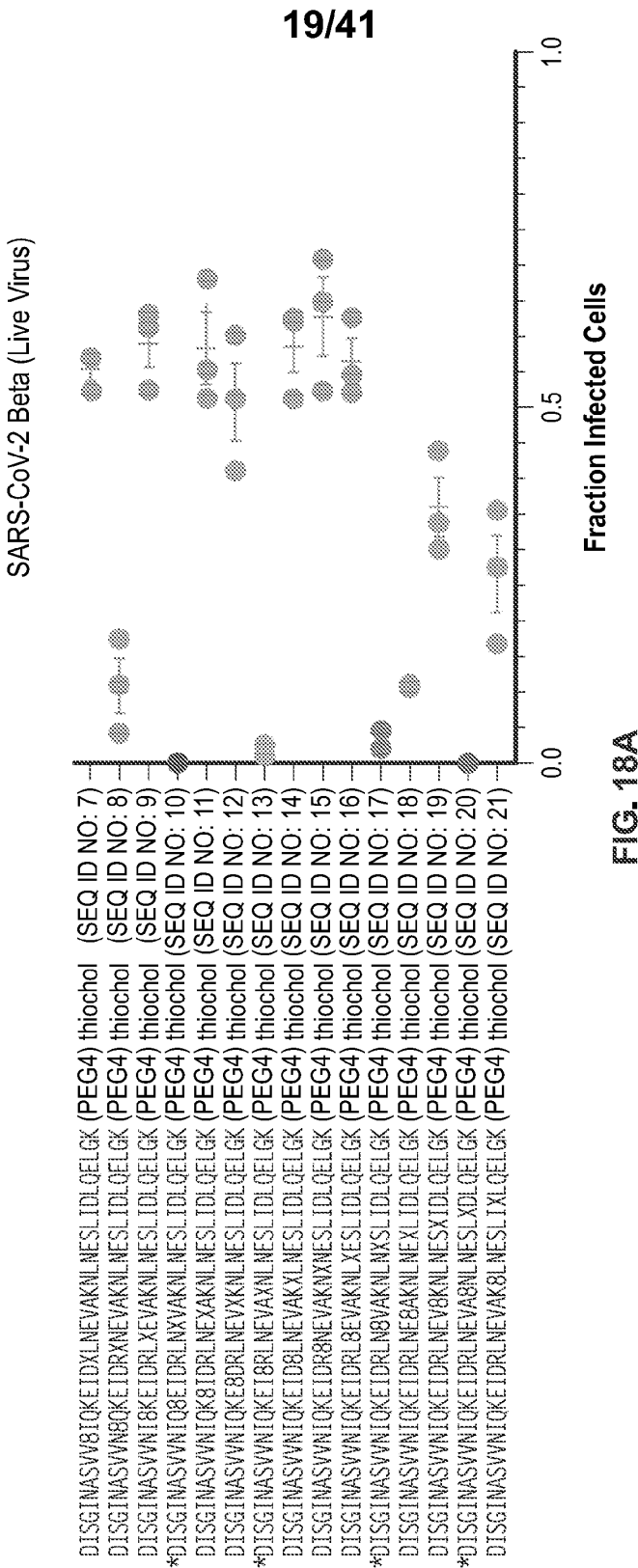
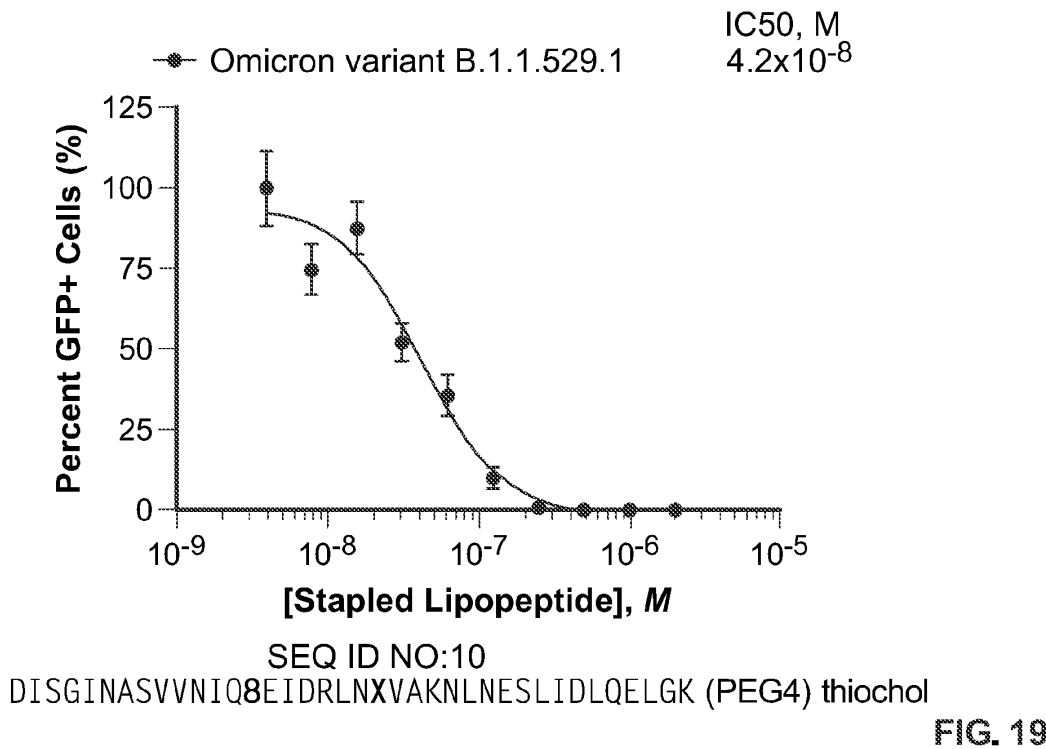
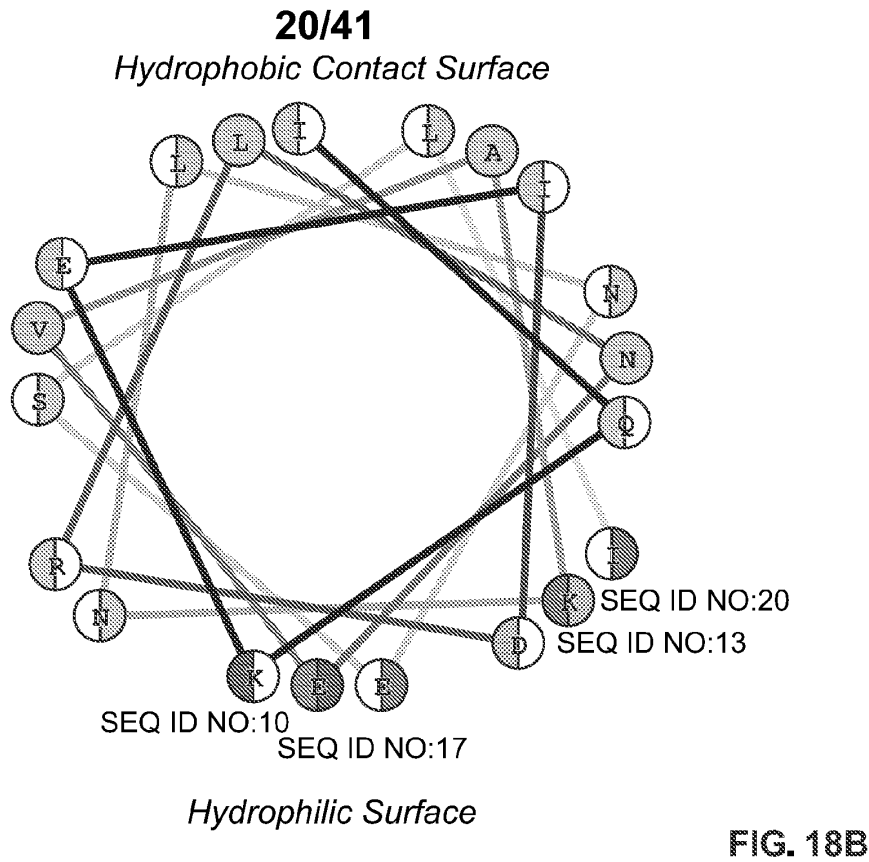
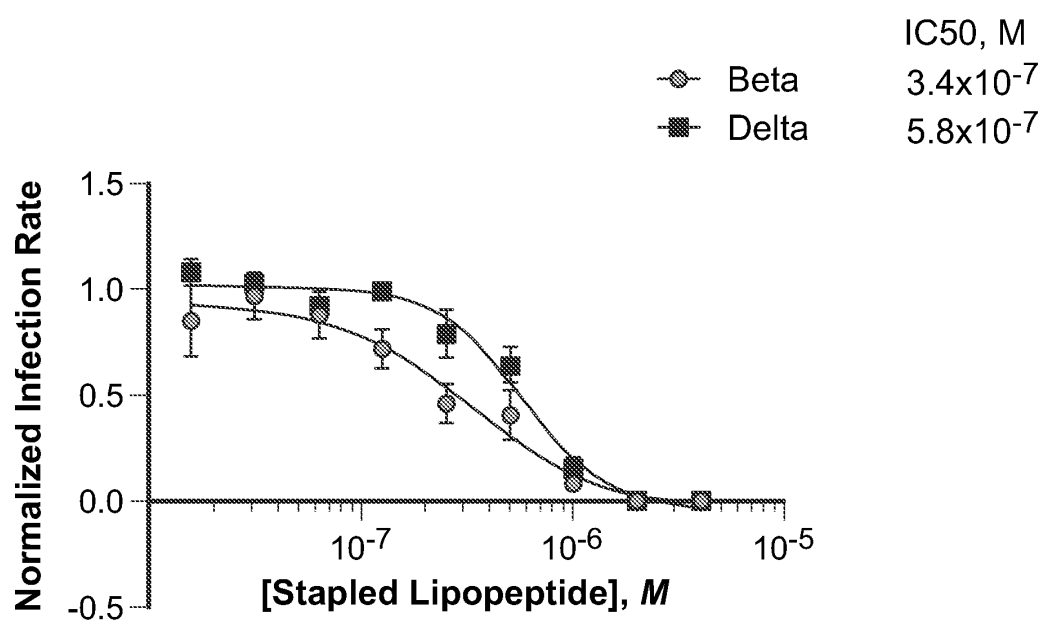


FIG. 17





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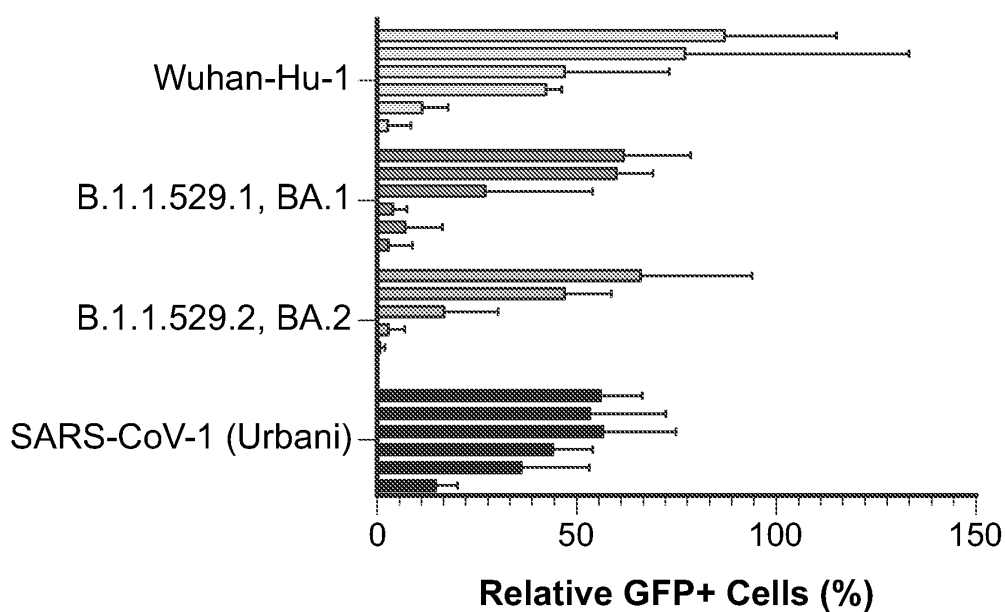


SEQ ID NO:10

DISGINASVVNIQ8EIDRLNXVAKNLNESLIDLQELGK (PEG4) Thiochol

FIG. 20

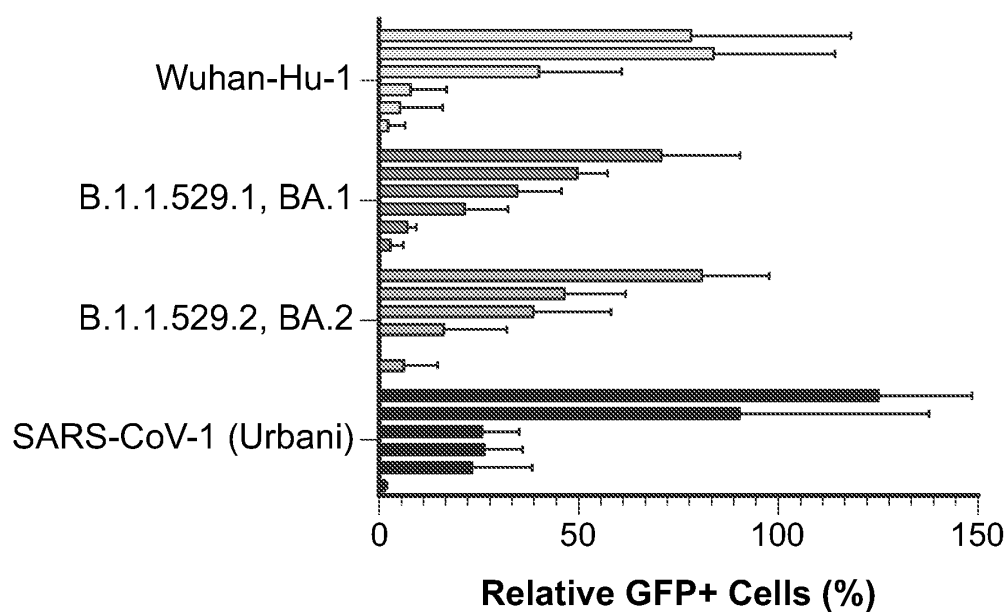
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SEQ ID NO:13

DISGINASVVNIQKEI8RLNEVAXNLNESLIDLQELGK (PEG4) thiochol

FIG. 21

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SEQ ID NO: 20

DISGINASVVNIQKEIDRLNEVA8NLNESLXDLQELGK (PEG4) thiochol

FIG. 22

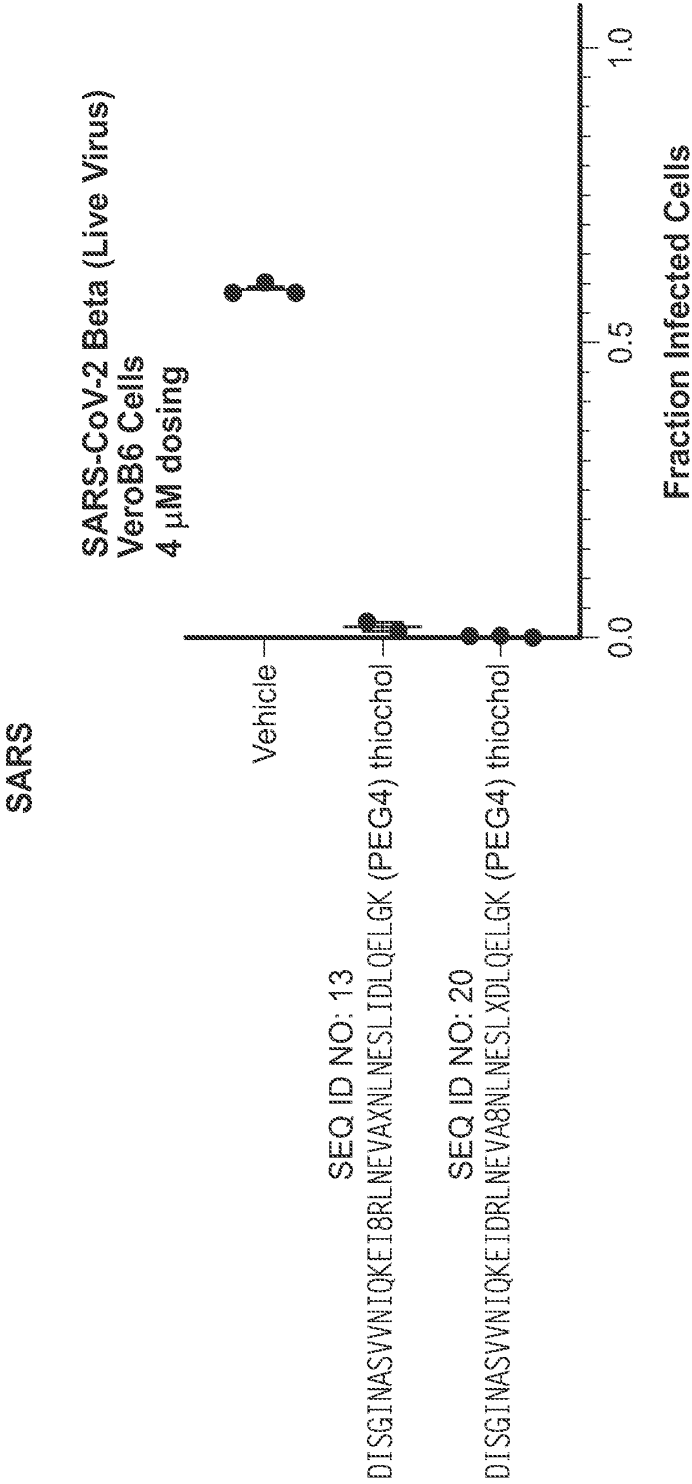


FIG. 23

1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209
T	S	P	D	V	D	L	G	D	I	S	G	I	N	A	S	V	N	I	Q	K	E	I	D	R	L	N	E	V	A	K	N	L	N	E	S	L	I	D	L	Q	E	L	G	K	Y	E	Q	Y	
U/B	HR1	U/B	U/B	HR1	U/B	HR1	U/B	HR1	U/B	HR1	U/B	HR1	U/B	HR1	U/B	HR1	U/B	HR1	U/B	HR1	U/B	HR1	U/B	HR1	U/B	HR1	U/B	HR1	U/B	HR1	U/B	HR1	U/B	HR1	U/B	HR1	U/B	HR1	U/B	HR1	U/B	HR1	U/B	HR1	U/B	HR1	U/B	HR1	U/B

U/B = unbound (solvent exposed)
HR1 = contacts HR1 core

FIG. 24A

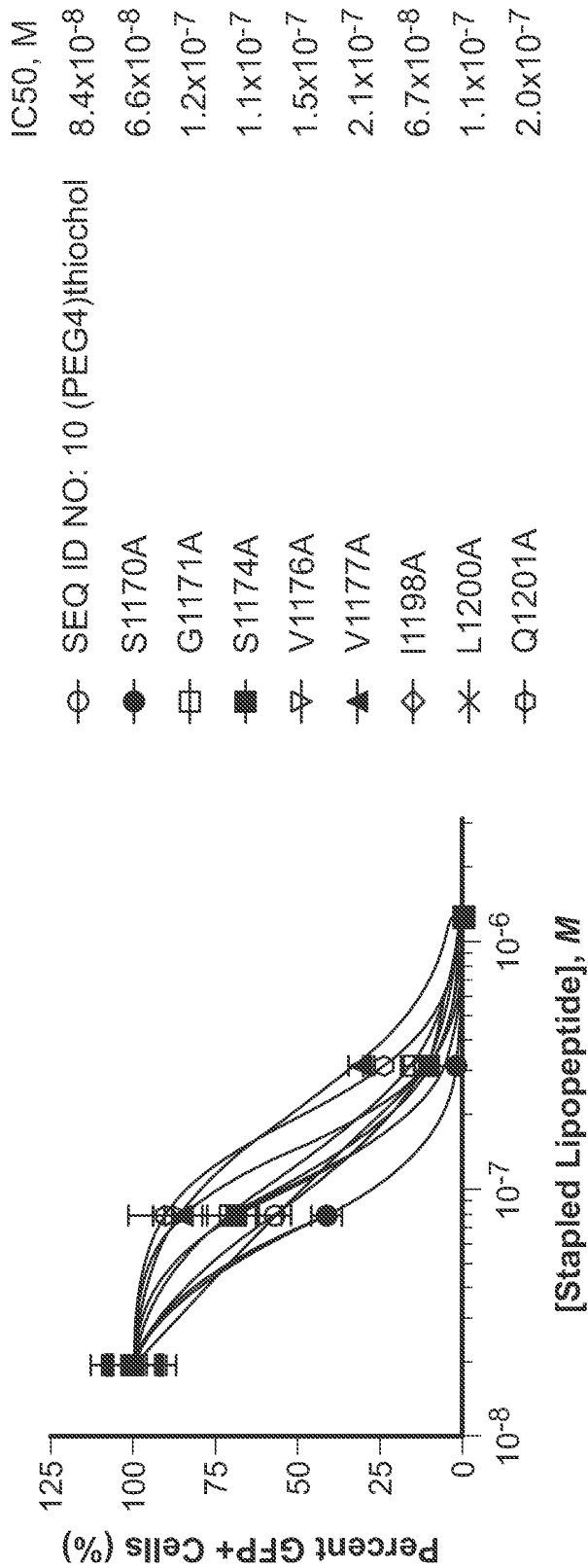
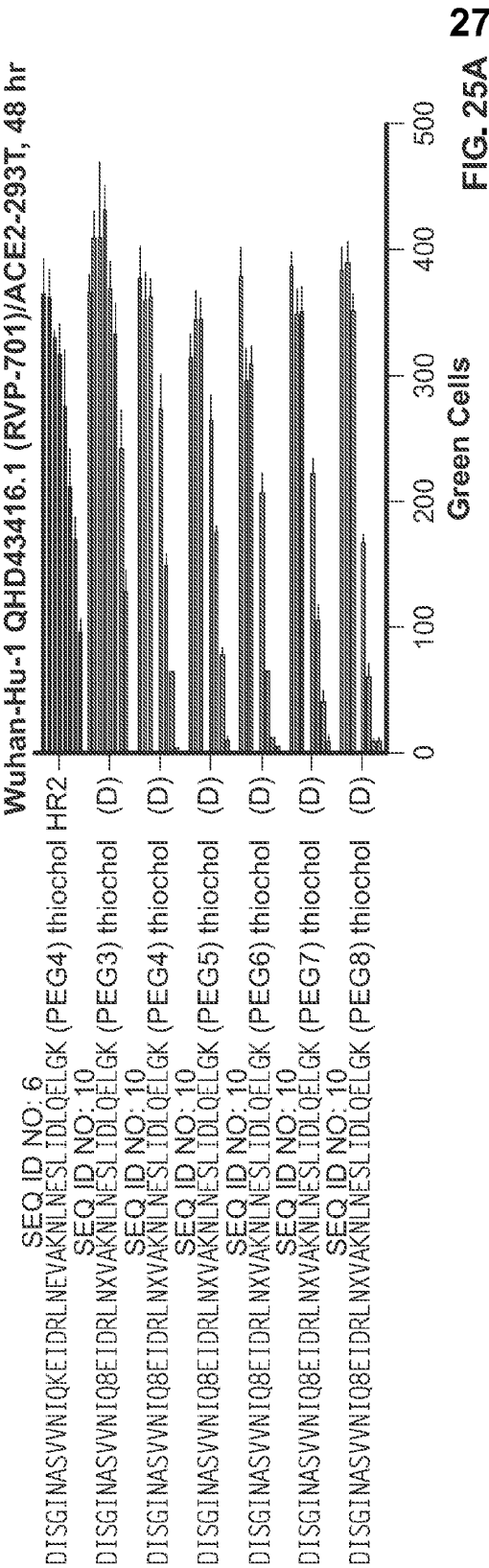
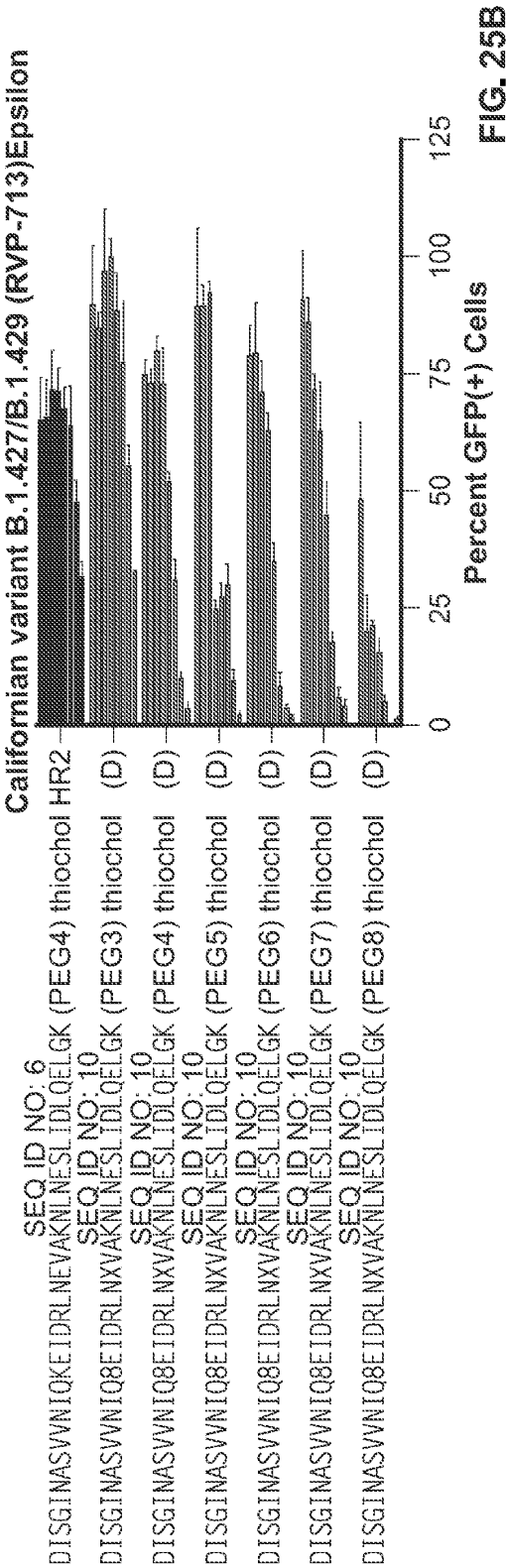


FIG. 24B



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Indian Variant B.1.617.2 [Delta] (RVP-763)/ACE2-293T, 48 hr

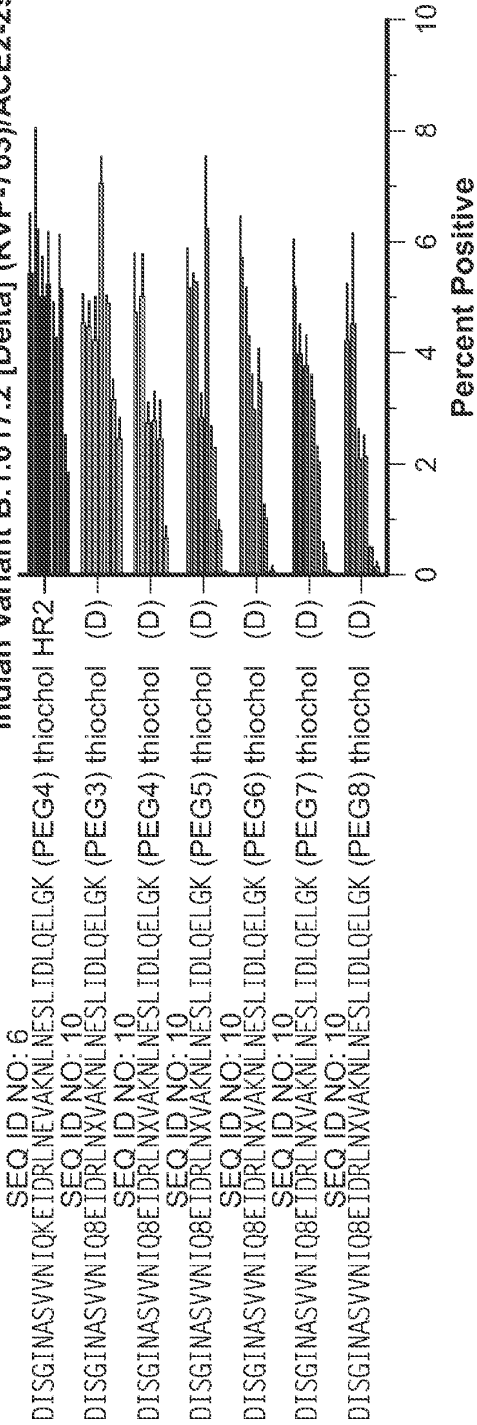


FIG. 25C

D614G B.1 (RVP-702)/ACE2-293T, 48 hr

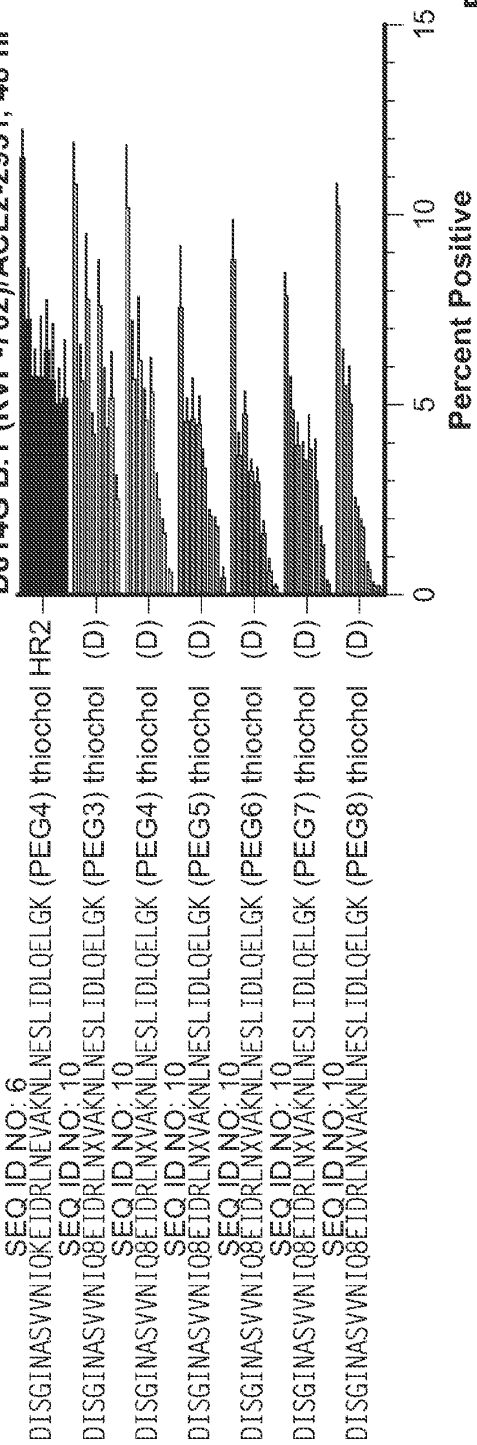
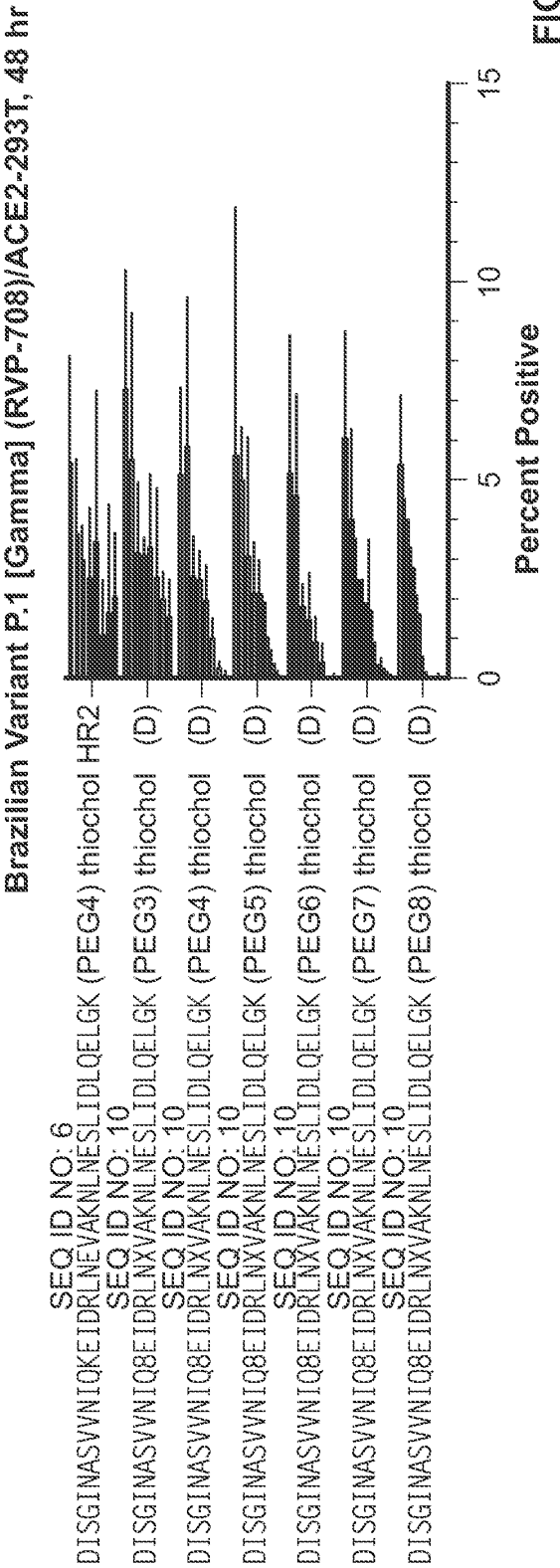


FIG. 25D



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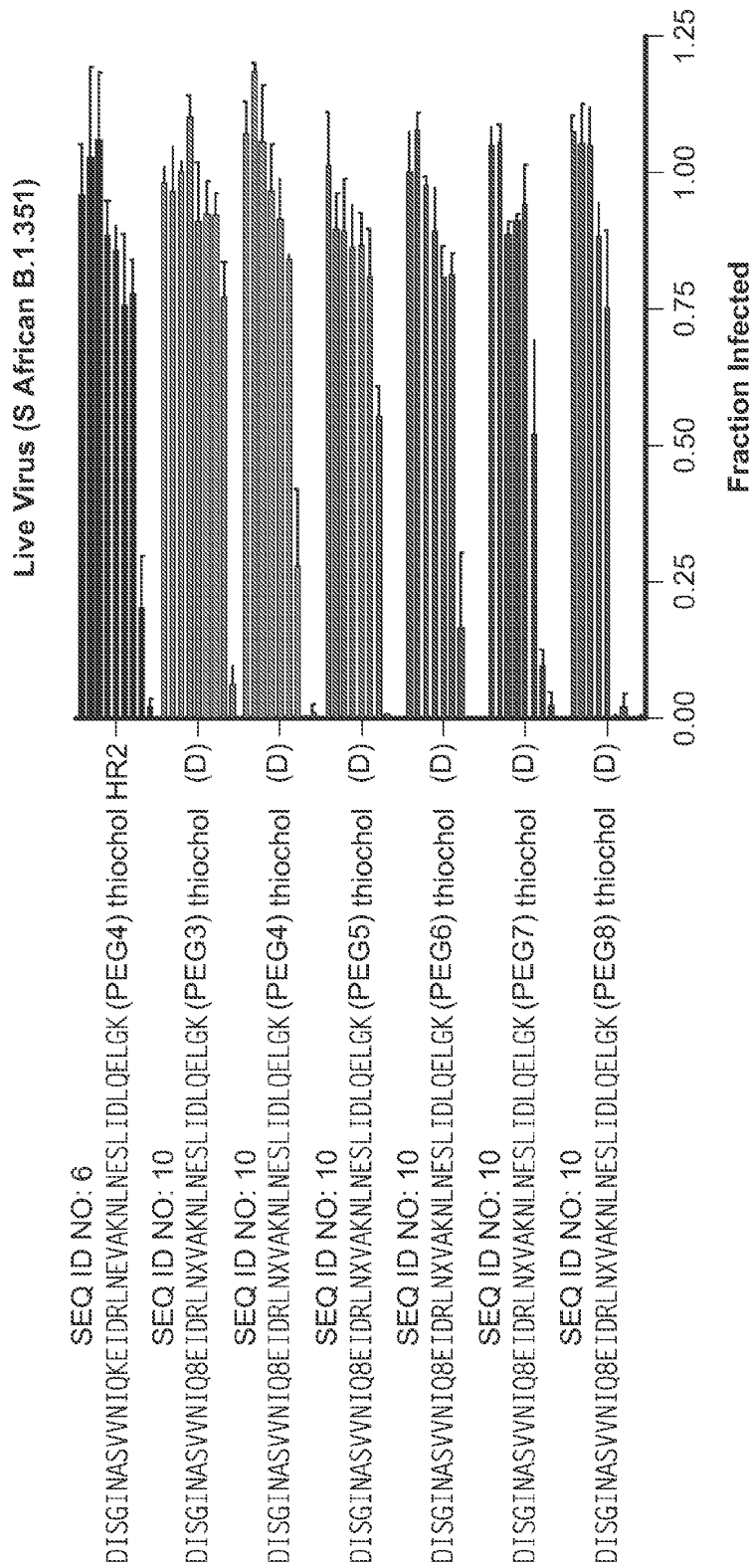


FIG. 26

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SEQ ID NO: 10
DISGINASVVNIQ8EIDRLNXVAKNLNESLIDLQELGK (PEG_n) thiochol

Omicron B.1.1.529.1

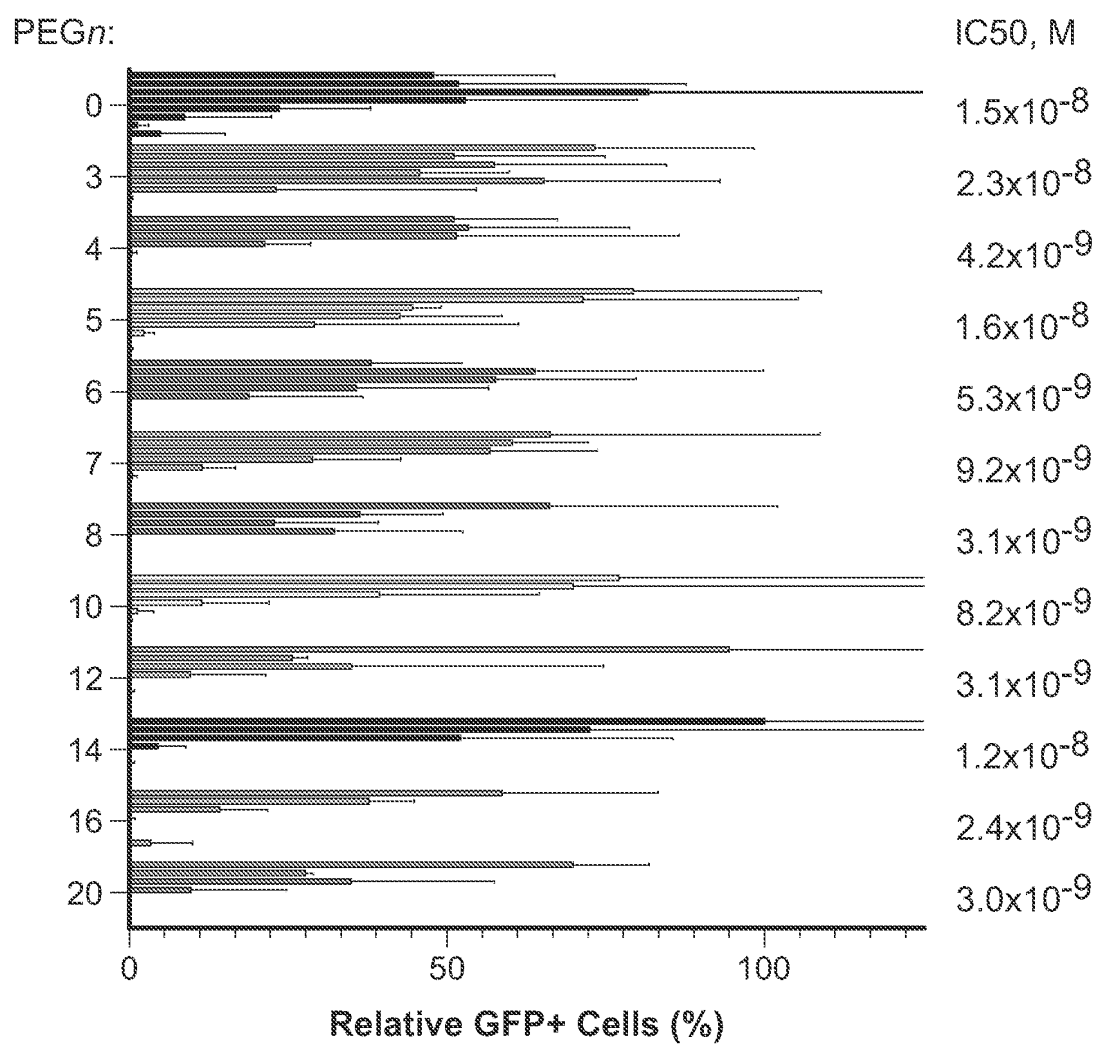


FIG. 27

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SEQ ID NO: 10
DISGINASVVNIQ8EIDRLNXVAKNLNESLIDLQELGK (PEG_n) thiochol

SARS-CoV-1 (Urbani)

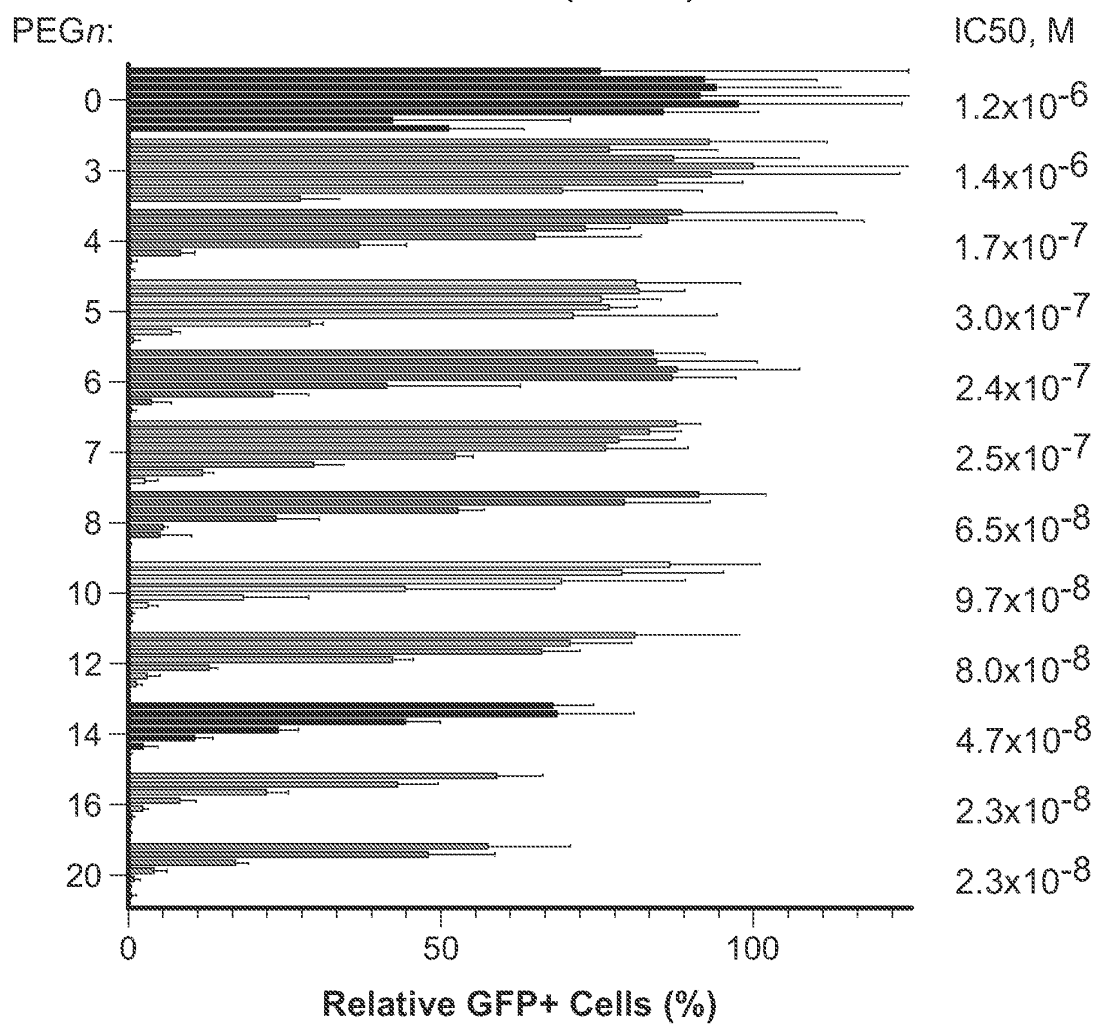


FIG. 28

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SEQ ID NO: 10
DISGINASVVNIQ8EIDRLNXVAKNLNESLIDLQELGK (PEG_n) thiochol

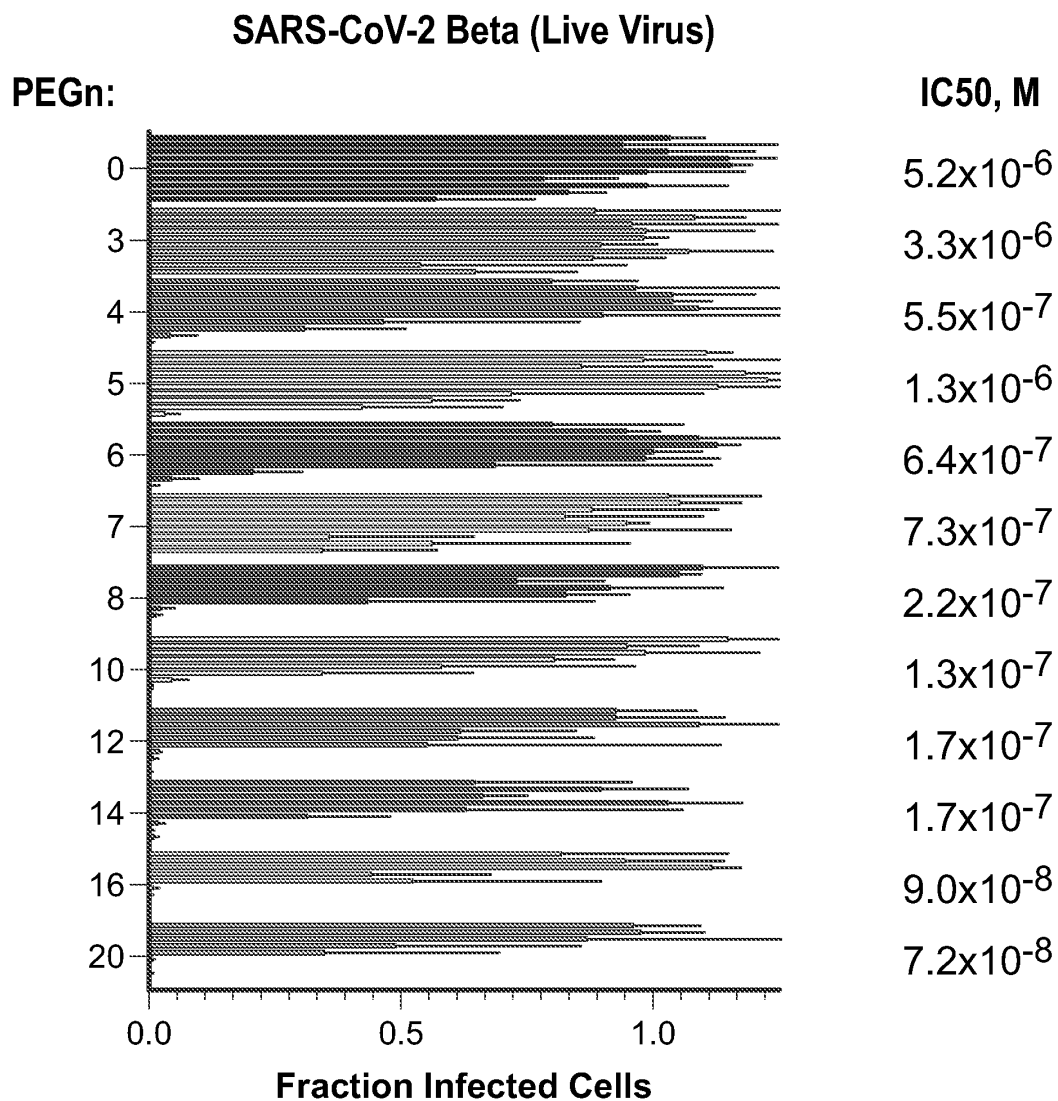
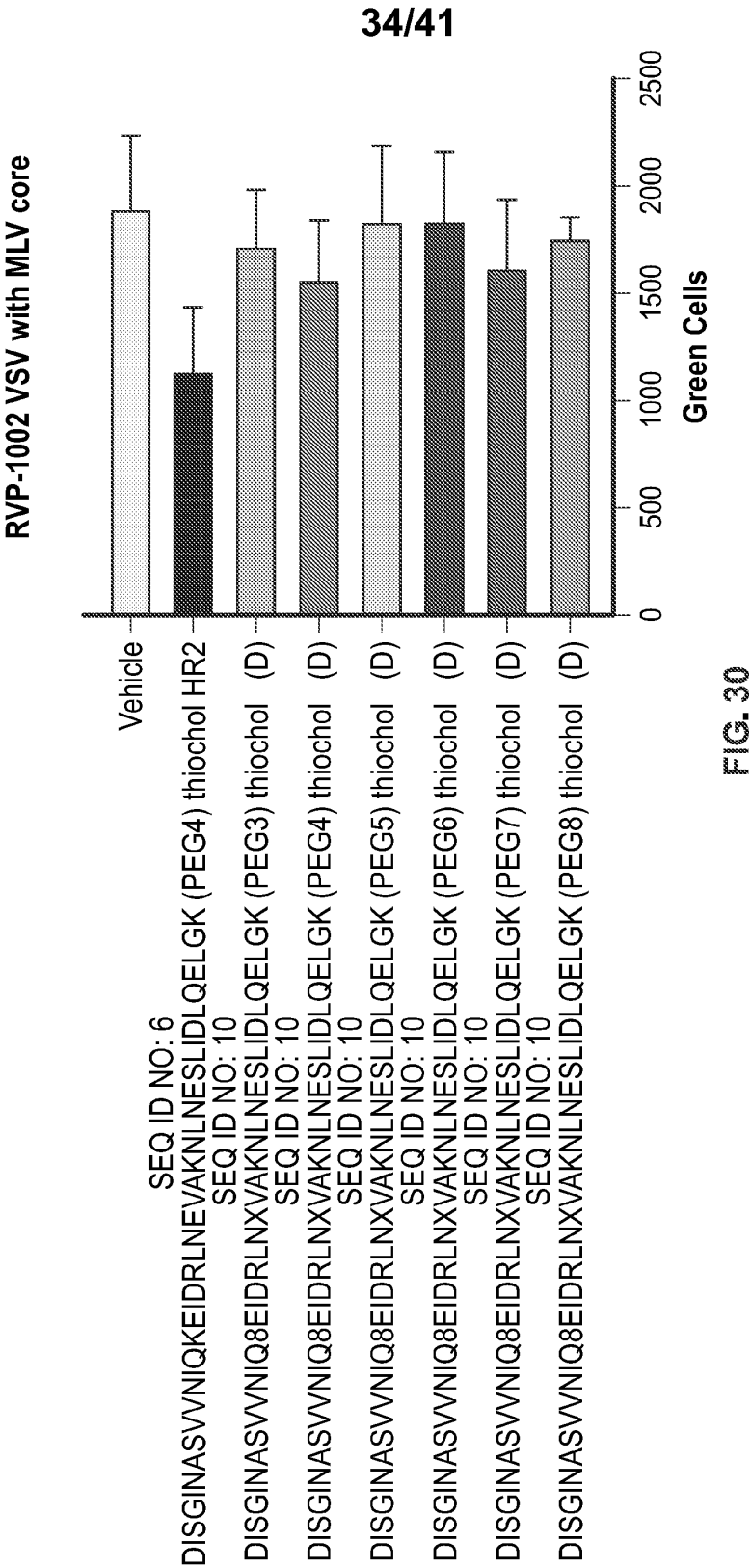
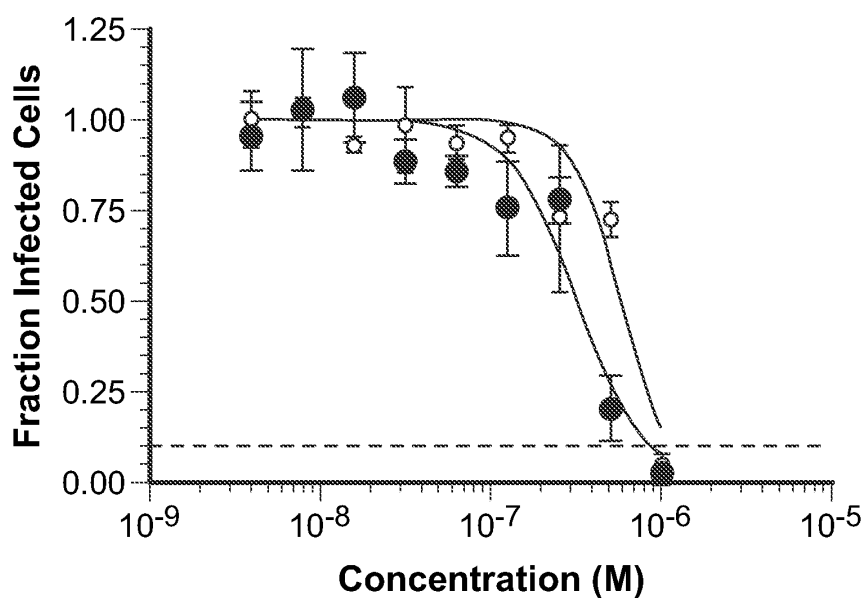


FIG. 29



35/41**Live Virus (S African B.1.351)**

SEQ ID NO: 10

● DISGINASVVNIQKEIDRLNEVAKNLNESLIDLQELGK(PEG4)thiochol HR2

SEQ ID NO: 71

○ DISGINASVVNIQKEIDRLNEVAKNLNESLIDLQELGSGSG
(PEG4)chol HR2**FIG. 31**

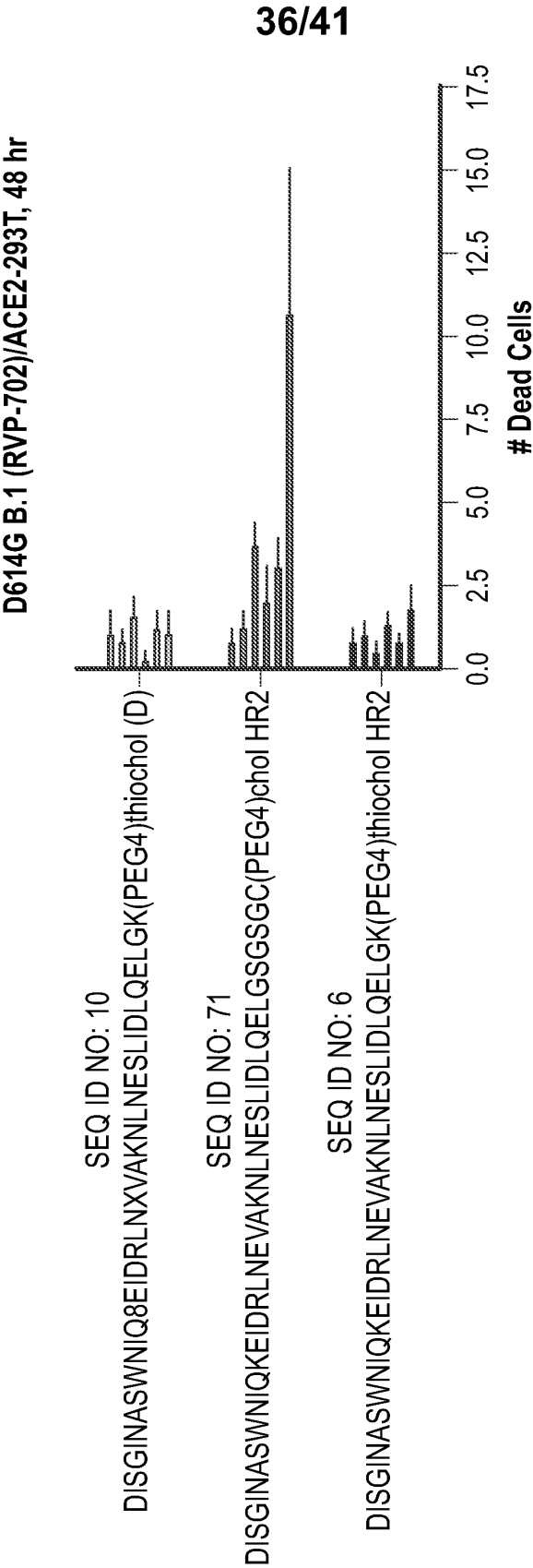
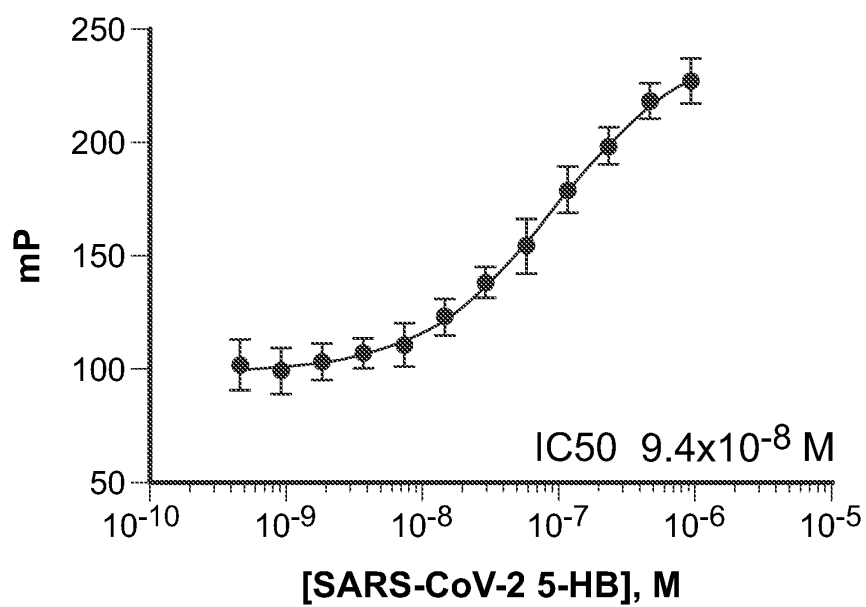


FIG. 32

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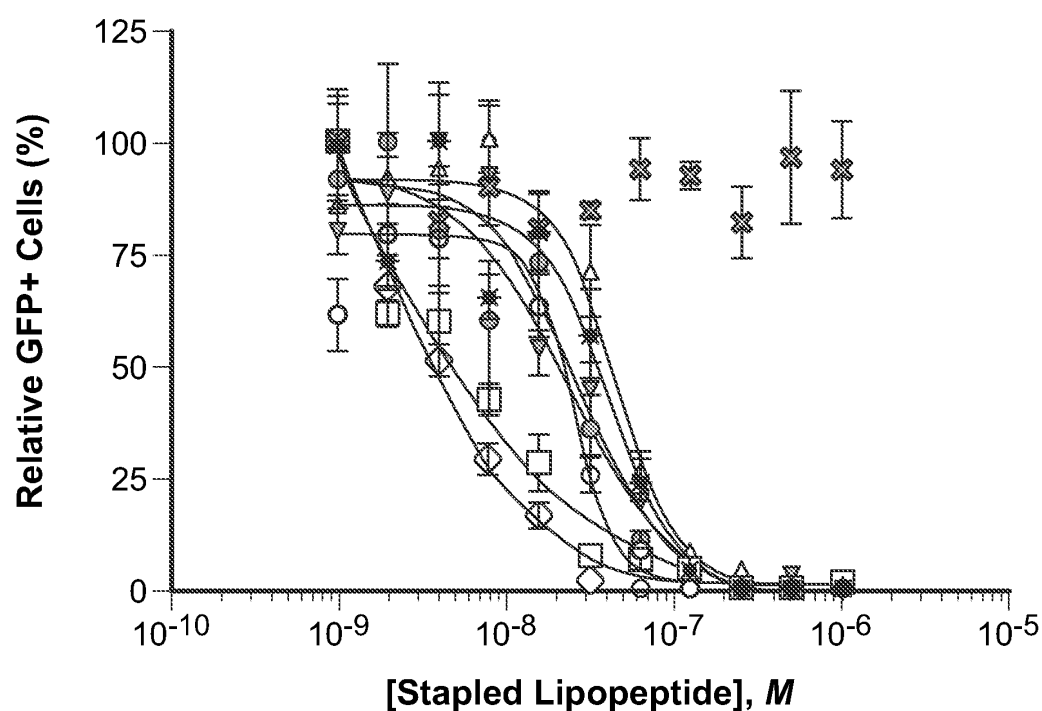


SEQ ID NO: 10
DISGINASVVNIQ8EIDRLNXVAKNLNESLIDLQELGK (PEG8) Chol

FIG. 33

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	IC ₅₀ , M
○ Wuhan-Hu-1	2.5×10^{-8}
* B.1 (D614G)	4.2×10^{-8}
▼ B.1.1.7 (Alpha)	2.6×10^{-8}
● B.1.351 (Beta)	2.4×10^{-8}
□ B.1.617.2 (Delta)	4.4×10^{-9}
◇ B.1.1.529.1 (Omicron)	3.5×10^{-9}
△ SARS-CoV-1 (Urbani)	4.5×10^{-8}
✕ VSV with MLV core	N/A

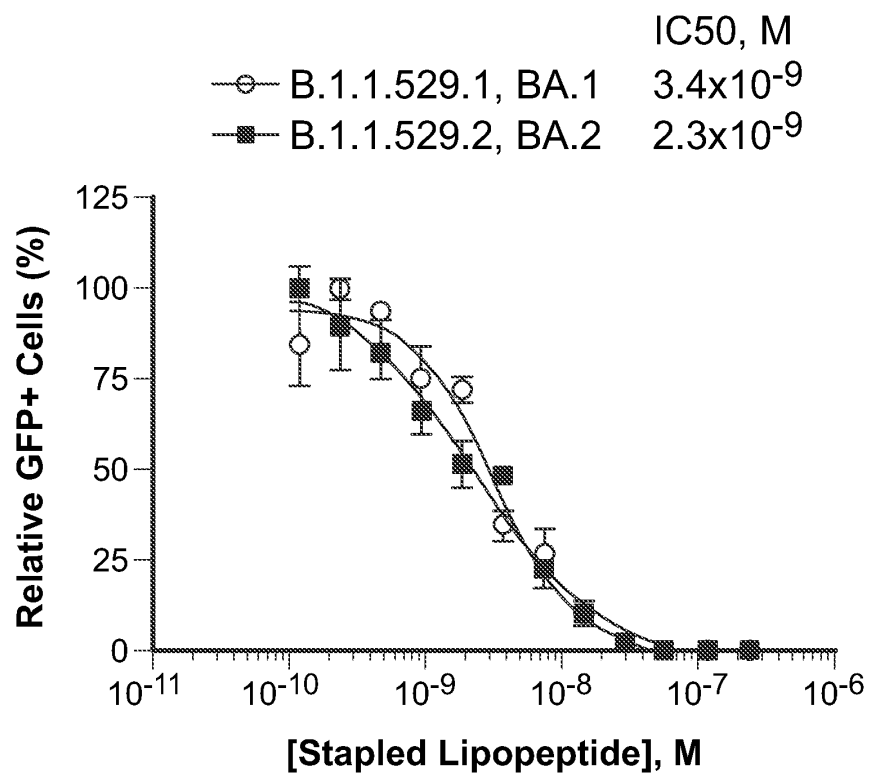


SEQ ID NO: 10

DISGINASVVNIQ8EIDRLNXVAKNLNESLIDLQELGK (PEG8) Chol

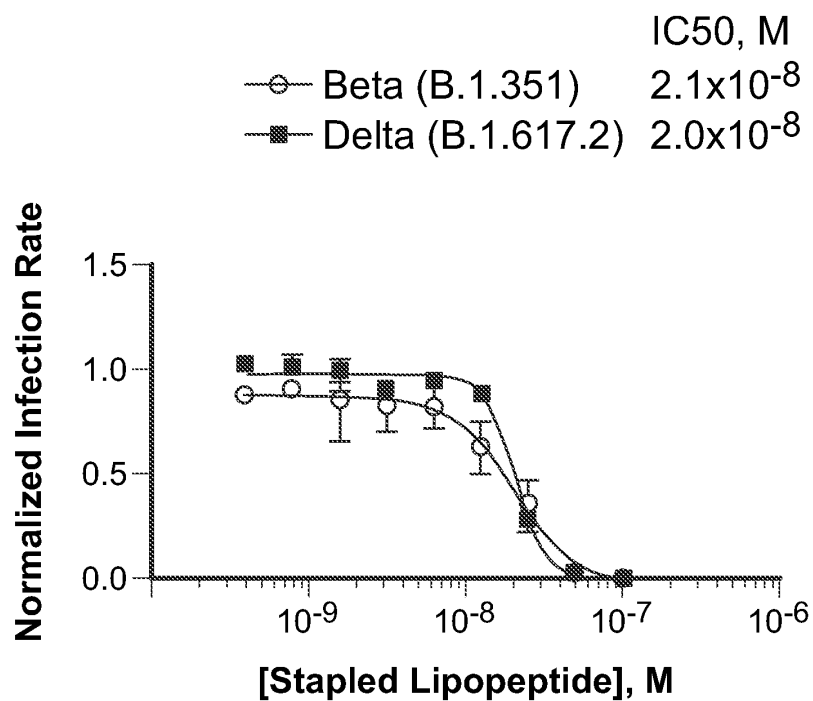
FIG. 34

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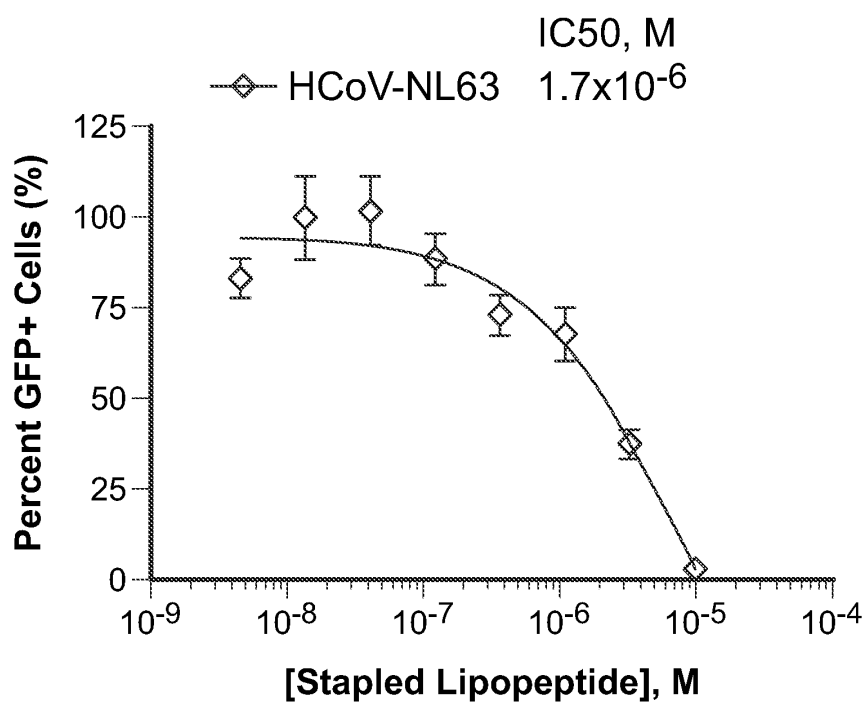
SEQ ID NO: 10
 DISGINASVVNIQ8EIDRLNXVAKNLNESLIDLQELGK (PEG8) Chol

FIG. 35

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SEQ ID NO: 10
 DISGINASVVNIQ8EIDRLNXVAKNLNESLIDLQELGK (PEG8) Chol

FIG. 36

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SEQ ID NO: 10
DISGINASVVNIQ**8**EIDRLN**X**VAKNLNESLIDLQELGK (PEG8) Chol

FIG. 37