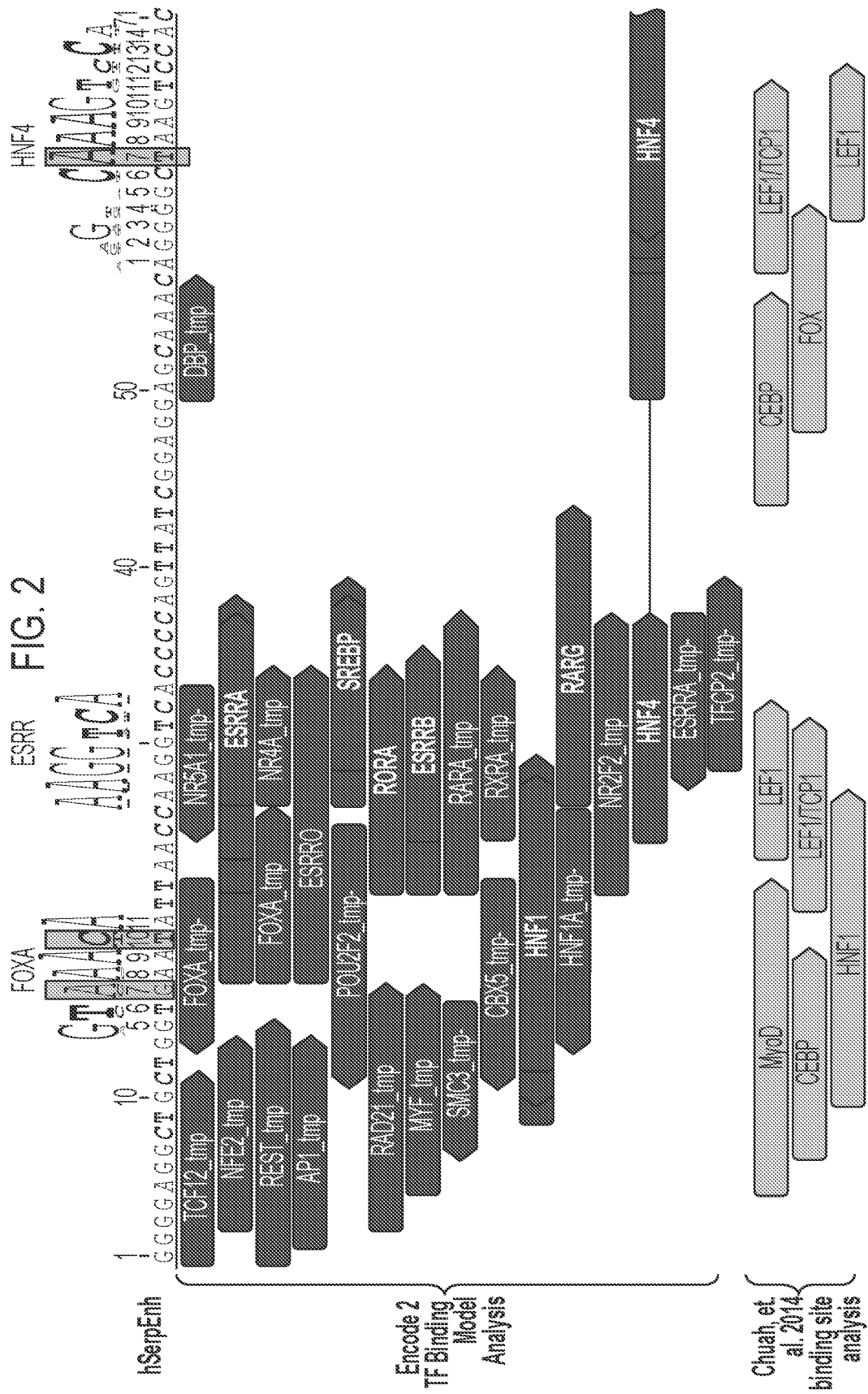


	1	10	20	30	39	
0 Human	GGGGG	GGTG	GGTG	TTT	GGTA	
1 Rhesus	GGGGAGGCTGCTGGTGAATATTAA	CCAAAGATCACC	CC	---	A-	
2 Squirrel monkey	GGGGGATGCTGCTGGTGAATATTAA	CCAAAGTCAGCC	---	---	A-	
3 Bactrian camel	GGGGAGGCTGCTGGTGAATATTAA	CCAAAGTCACTC	---	---	A-	
4 Ferret	GGGGAGGTTGCTGGTGAATATTAA	CTAAGTCACCC	---	---	A-	
5 Mouse lemur	GGGGAGGG	CCTGGTGAATATTAA	CCAAAGTCACCC	---	A-	
6 Chinese tree shrew	GGAGGCTGTTGGTGAATATTAA	CCAAAGTCACCC	---	---	A-	
7 Prairie vole	GGGGAGTCTGCT	GTGAATATTAA	CCAAAGTCACTC	---	A-	
8 Cat	GGGGAGGCTGCTGGTGAATATTAA	CTAAGTCACCC	---	---	A-	
9 Panda	GGGGAGGTTGCTGGTGAATATTAA	CTAAGTCACCC	---	---	A-	
10 David's nyctalis (bat)	GGGGAGGCTGCTGGTGAATATTAA	CTAAGTCACTC	---	---	A-	
11 Coquerel's Sifaka	GGGGAGGG	CTGGTGAATATTAA	CCAAAGTCACCC	---	A-	
12 Dog	GGGGTGGTTGCTGGTGAATATTAA	CCAA	GGTCACCC	---	G-	
13 Armadillo	GGGGAGGGTGG	GTGA	ATTAA	CCAAAGTCACCC	---	A-
14 Dolphin	GTGGGAGGGTGTGGTGAATATTAA	CCAAAGTCACCC	---	---	A-	
15 Bushbaby	GGGGGA	GGTCTGGTGAATATTAA	CCAAAGTCACCC	---	A-	
16 Lesser Egyptian jerboa	GGGGA	TGTGCT	GTGAATATTAA	CCAAAGTCCCC	---	A-
17 Rabbit	GGGG	AGCTG	GGTGAATATTAA	CCAAAGTCAGCC	---	A-
18 Tibetan	GGGGAGGCTGCTGGT	GGTGA	ATTAA	CCAAAGTCAGCC	---	A-
19 Big brown bat	GGGGAGGCTGCTGGTGAATATTAA	CCAGGGTCA	GTTC	---	A-	
20 Stanosed mole	TGGGGAGGCTGCTGGTGAATATTAA	CTAAGTCACTCC	---	---	A-	

0	Human	39	46	54	60	62	72
1	Rhesus	-A--GTTA	CGGAGGAG	-CAAACA	-G---G---	G--G--	CTAAGTCCAC
2	Squirrel monkey	-A--GTTA	CGGAGGAG	-CAAACA	-G---G---	G--G--	CTAAGTCCAC
3	Bactrian camel	-A--GTTAT	CGGAGGAG	-CAAACA	-----G---	G--G--	CTAAGTCCAT
4	Ferret	-A--GTTAT	CGGAGGAG	-CAAACA	-G---G---	G--G--	CTAAGTCCAG
5	Mouse lemur	-A--GTTAT	CGG--GGAG	-CAAACA	-G---G---	G--G--	CTAAGTCCAT
6	Chinese tree shrew	-A--GTTAT	CGGAGGAG	-CAAACA	-----G---	G--G--	CTAAGTCCAG
7	Prairie vole	-A--GTTAT	CGGAGGAG	-CAAACA	-G--GG--	G--G--	CTAAGTCCAT
8	Cat	-A--GTTAT	CGGAGGAG	-CAAATA	-G---G---	G--G--	CTAAGTCCAT
9	Panda	-A--GTTAT	CGGAGGAG	-CAAACA	-G---G---	G--G--	CTAAGTCCAG
10	David's myotis (bat)	-A--GTTAT	CGGAGGAG	-CAAACA	-G---G---	G--G--	CTAAGTCCAT
11	Coquerel's Sifaka	-A--GTTAT	CAG--GGAG	-CAAACA	-G---G---	G--G--	CTAAGTCCAT
12	Dog	-G--GTTAT	CGGAGGAG	-CAAACA	-G---G---	G--G--	CTAAGTCCAT
13	Armadillo	-A--GTTAT	CGGAGGAG	-CAAACA	-G---G---	G--G--	CTAAGTCCAC
14	Dolphin	-A--GTTAT	CGGAGGAG	-TAAACA	-G---G---	G--G--	CTAAGTCCAC
15	Bushbaby	-A--GTTAT	CG--GGAG	-CAAACA	-G---G---	G--G--	CTAAGTCCAT
16	Lesser Egyptian jerboa	-A--GTTAT	TGGAGGAG	-CAAACA	-G---G--GGG	-----G--	CTAAGTCCAC
17	Rabbit	-A--GTTAT	CGGAGGAG	-CAAACA	-G---G---	G--G--	CTAAGTCCAC
18	Tibetan	-A--GTTAT	CGAGGAG	-CAAACA	-----G---	G--G--	CTAAGTCCAT
19	Big brown bat	-A--GTTAT	CGGAGGAG	-CAAACA	-G---G---	G--G--	CTAAGTCCAT
20	Star-nosed mole	-A--GTTAT	CTGGGGAG	-CAAACA	-G---G---	G--G--	CTAAGTCCAT



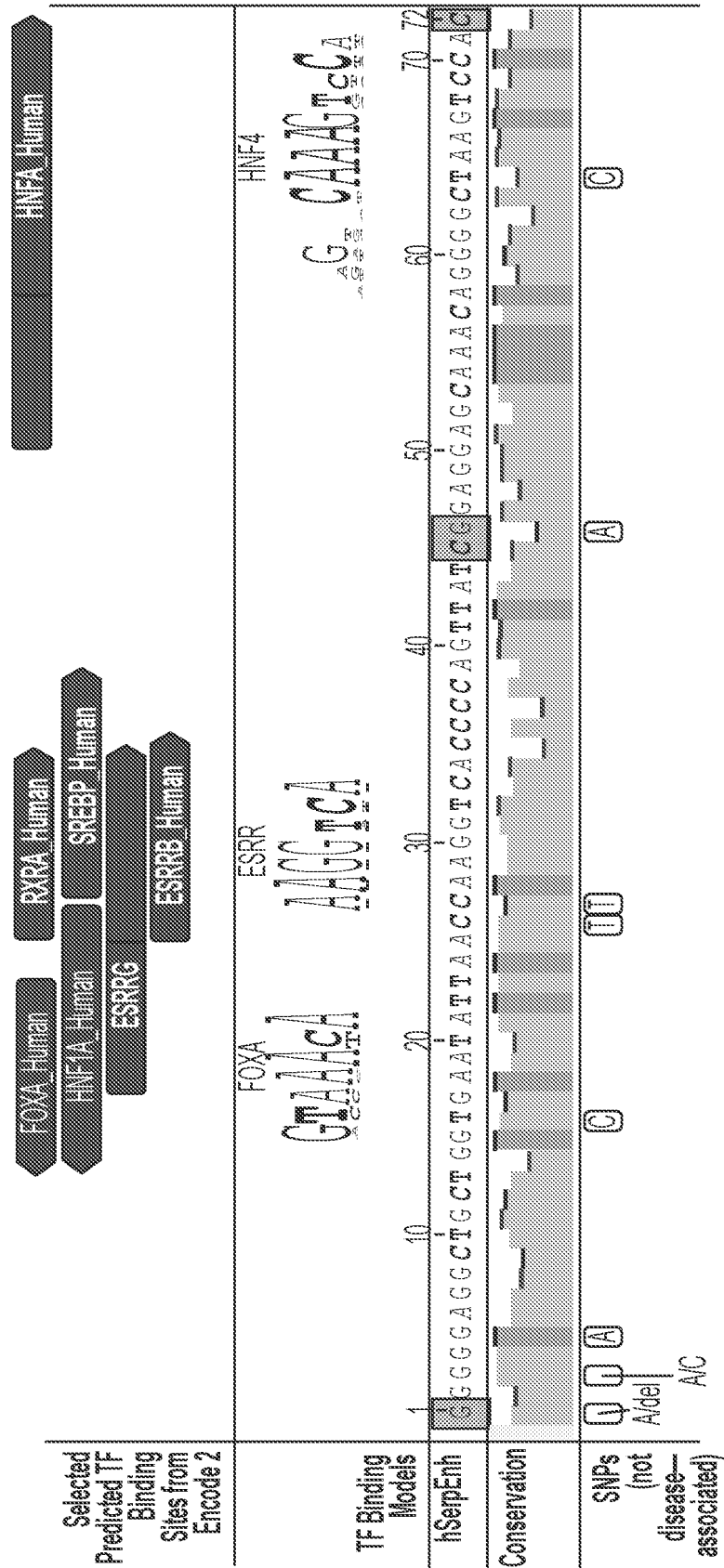


FIG. 3

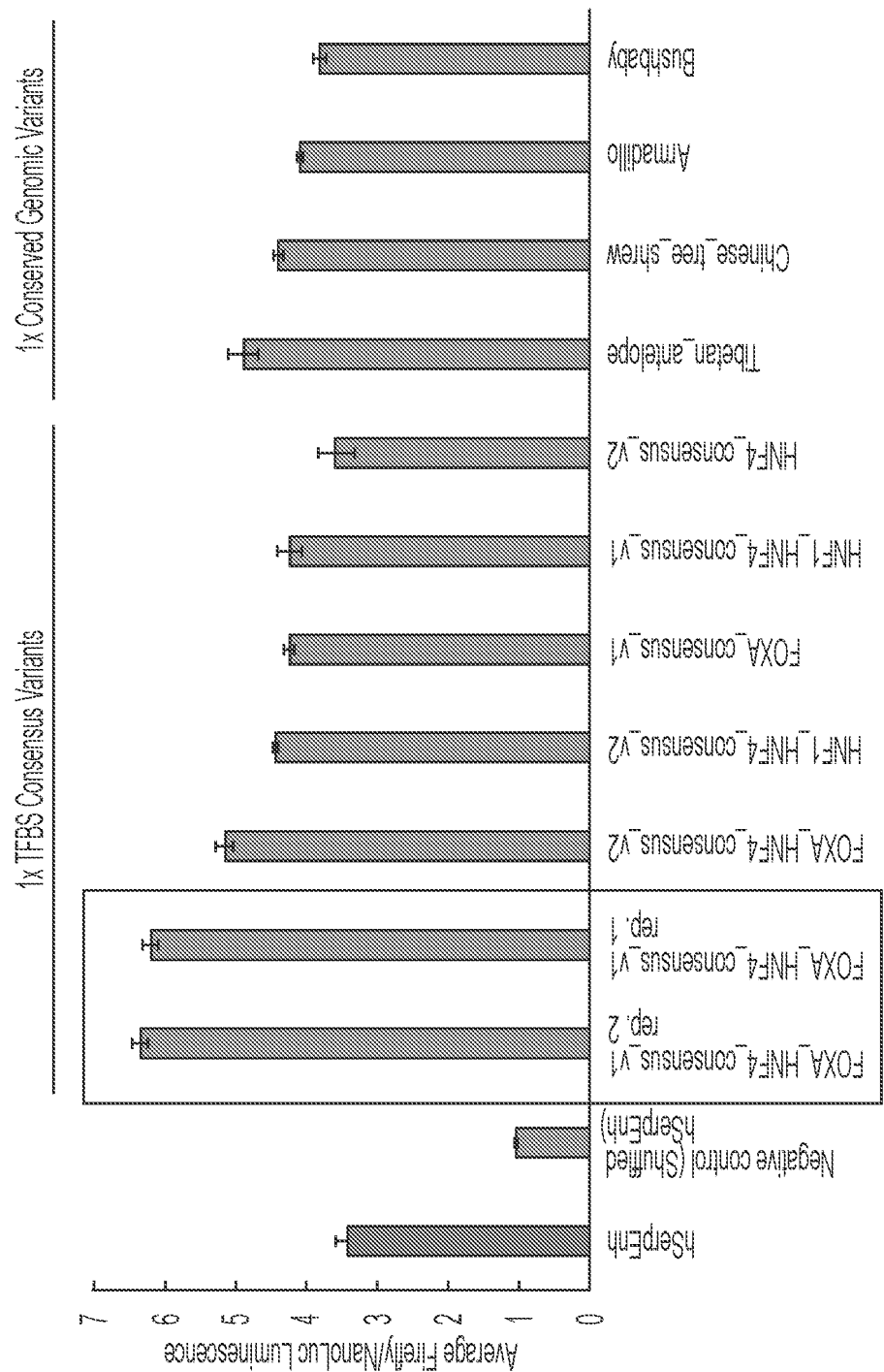


FIG. 4A

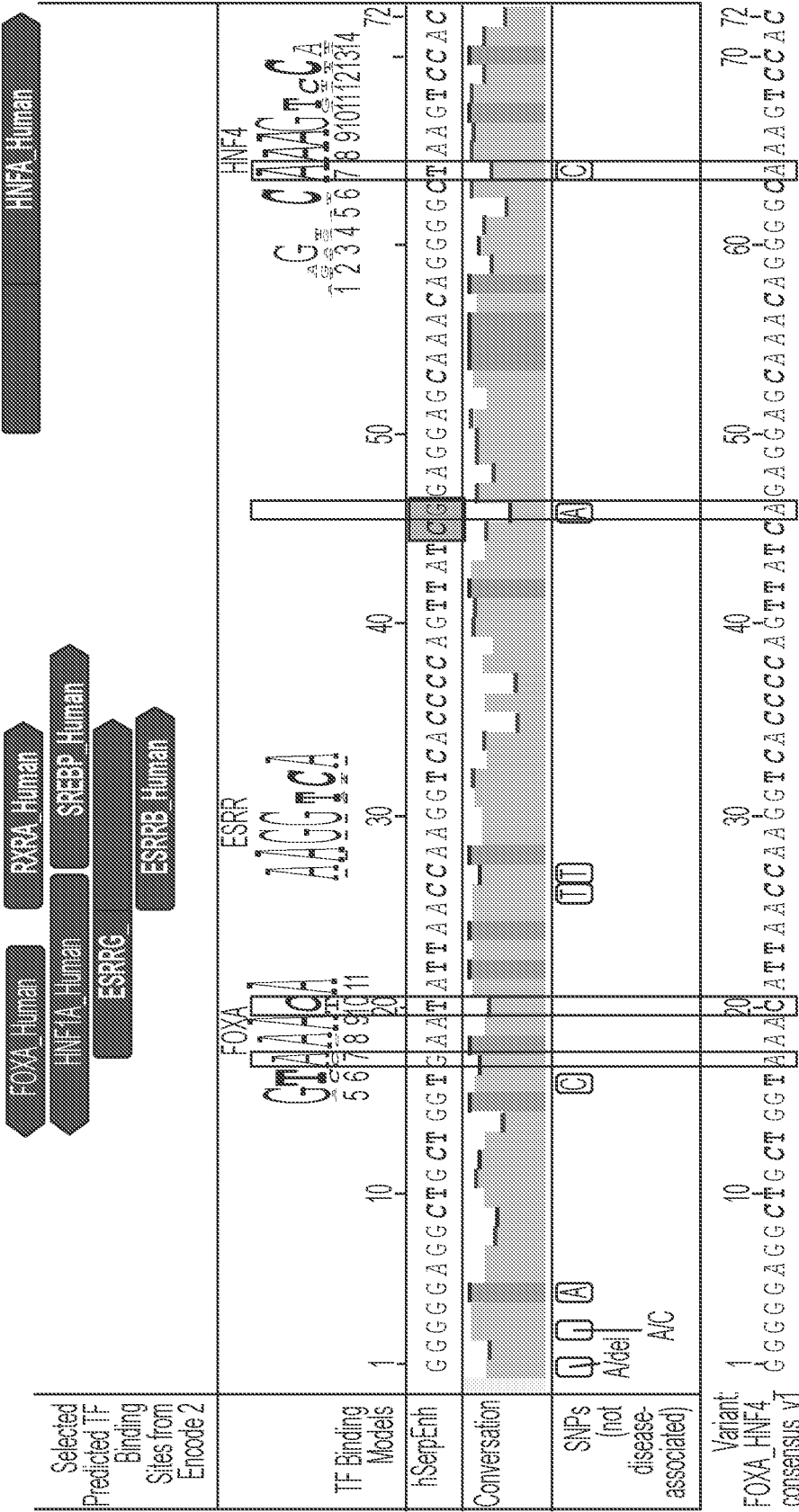


FIG. 4B

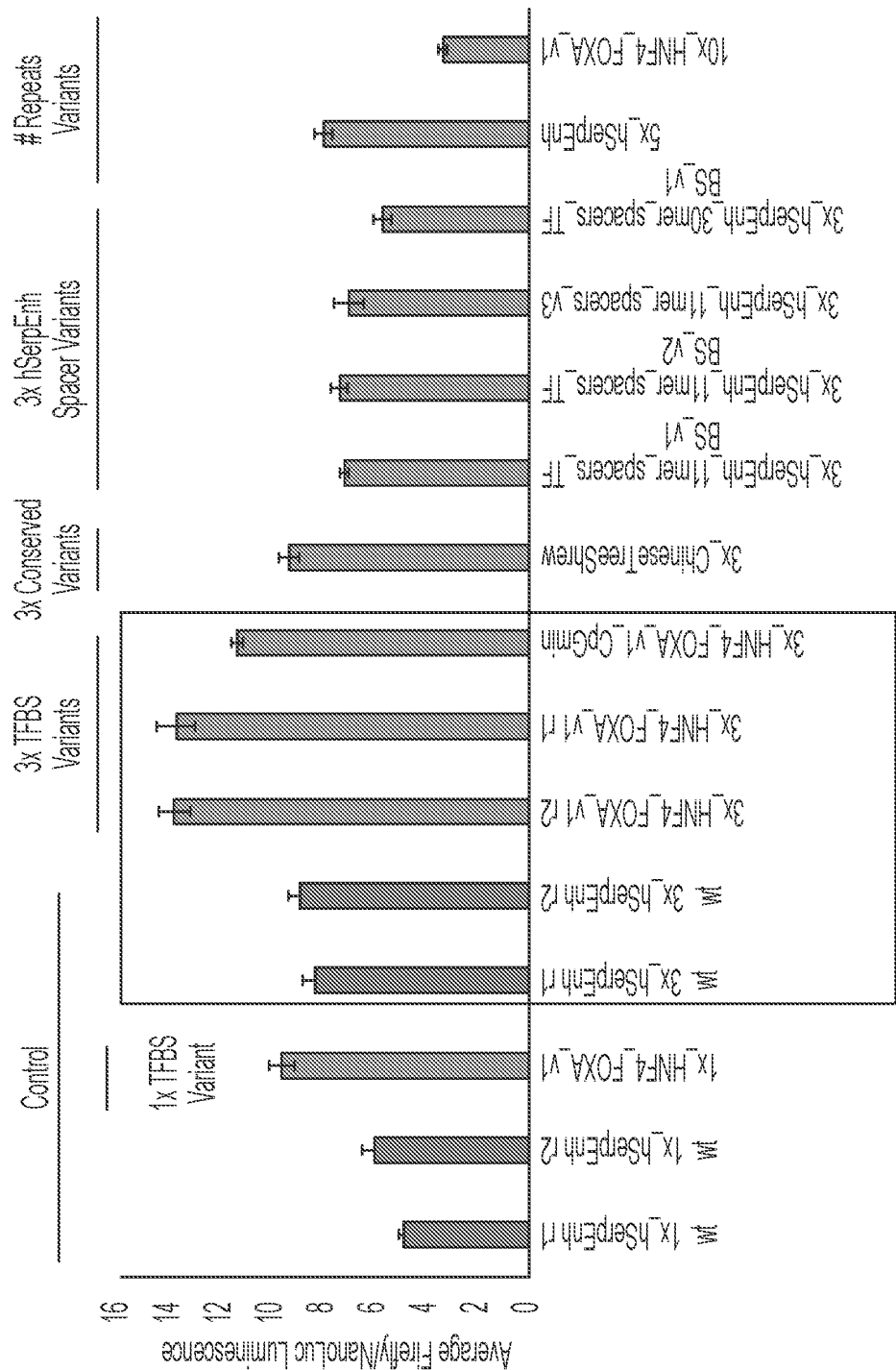
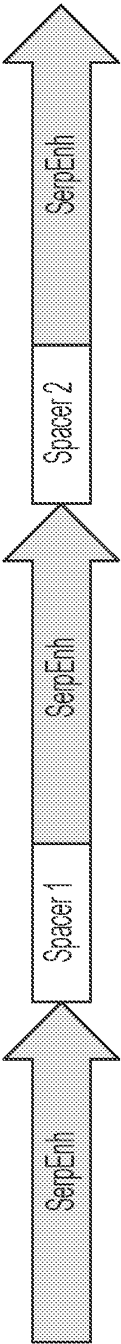


FIG. 5



- Length and composition of sequences between enhancer repeats may impact performance
- Spacers designed to not contain or create CpGs or ATGs

Spacer Length (nts)
2
3
5
11
30

FIG. 6A

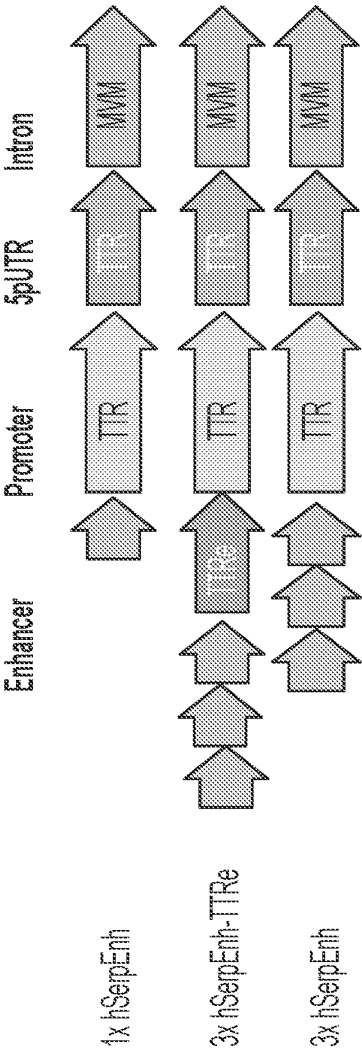


FIG. 6B

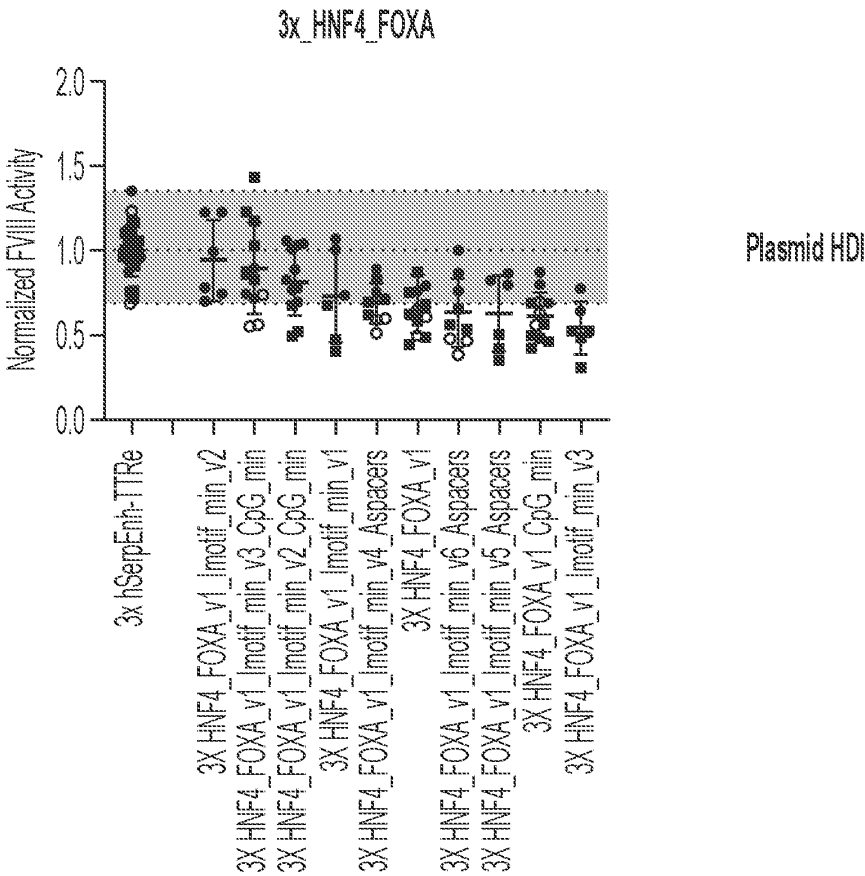


FIG. 7A

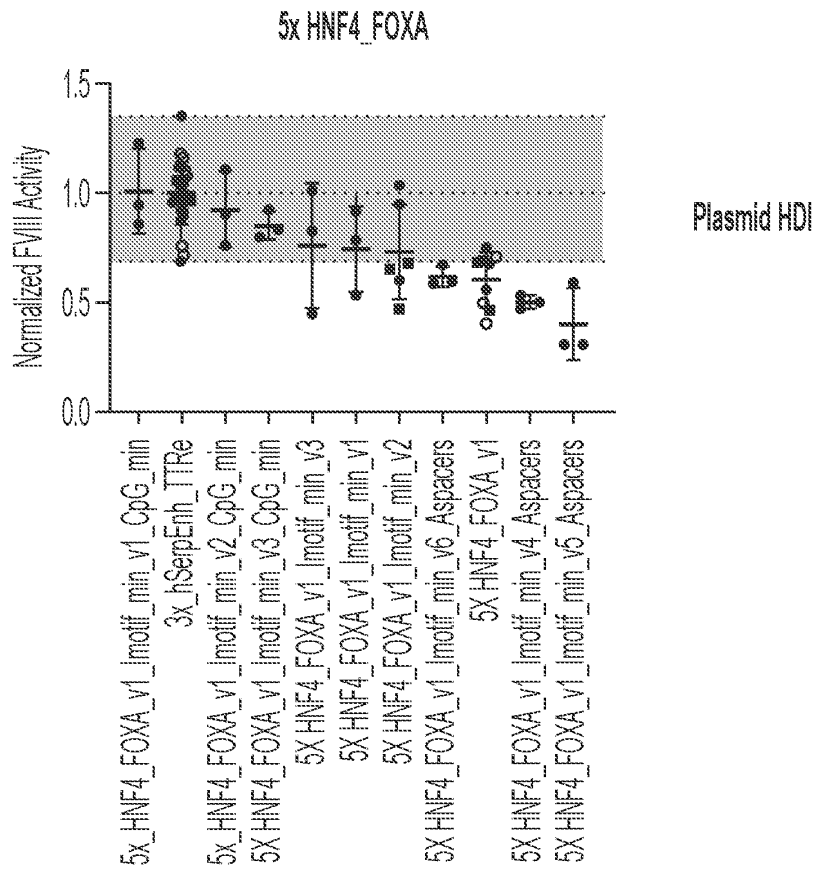


FIG. 7B

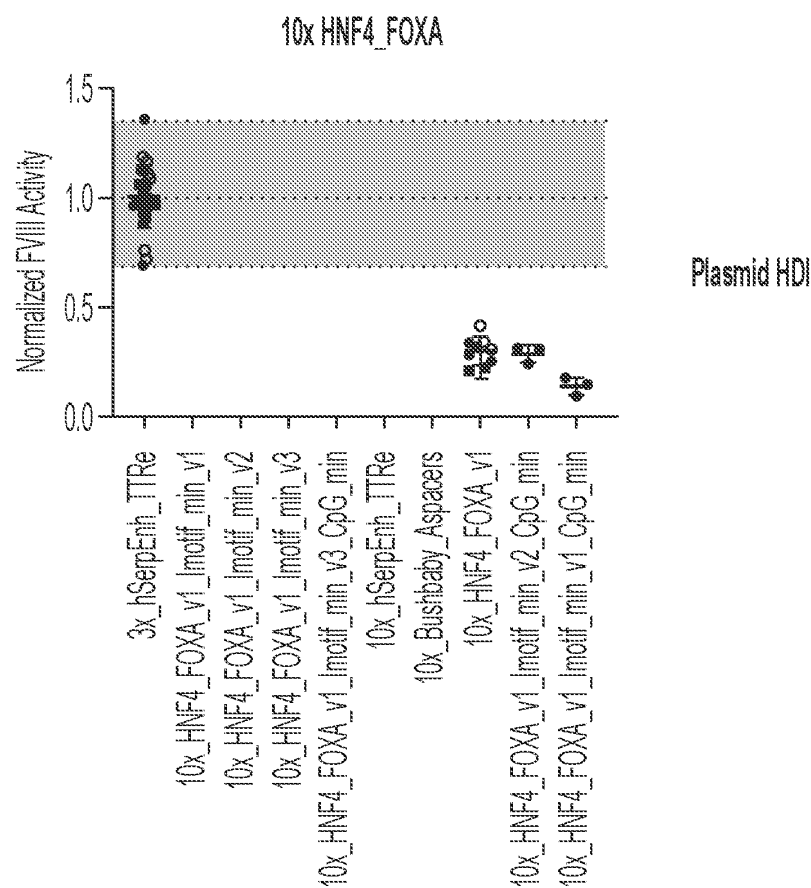


FIG. 7C

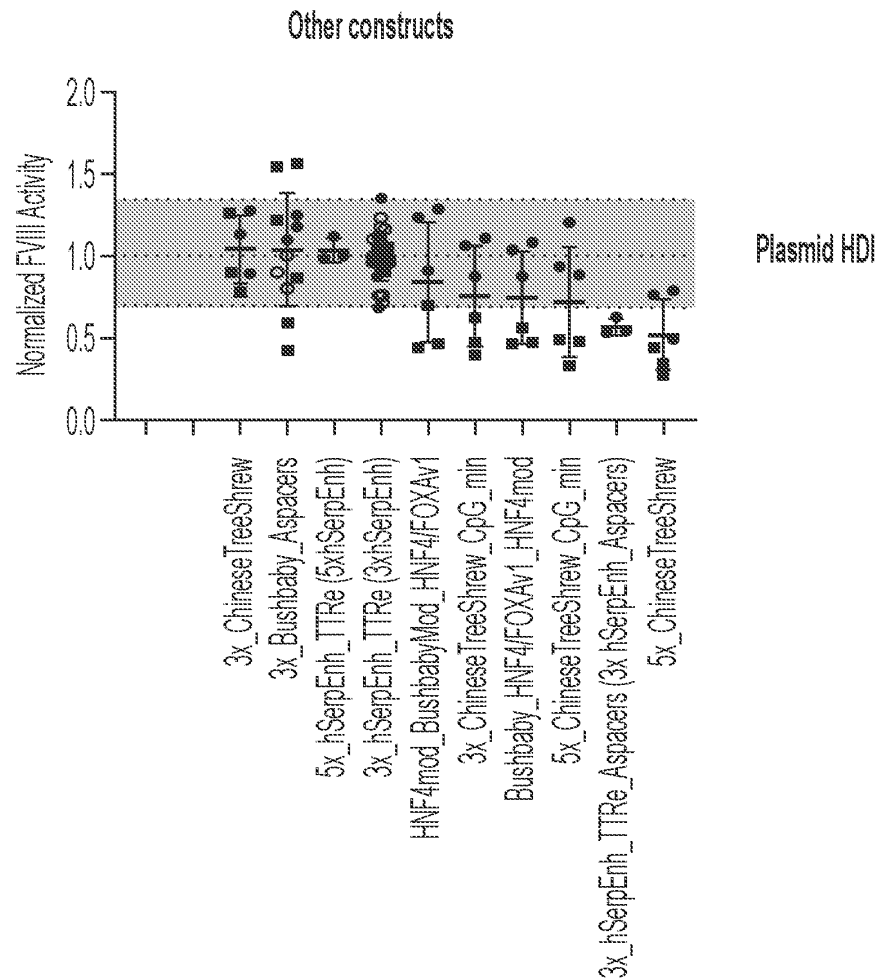


FIG. 7D

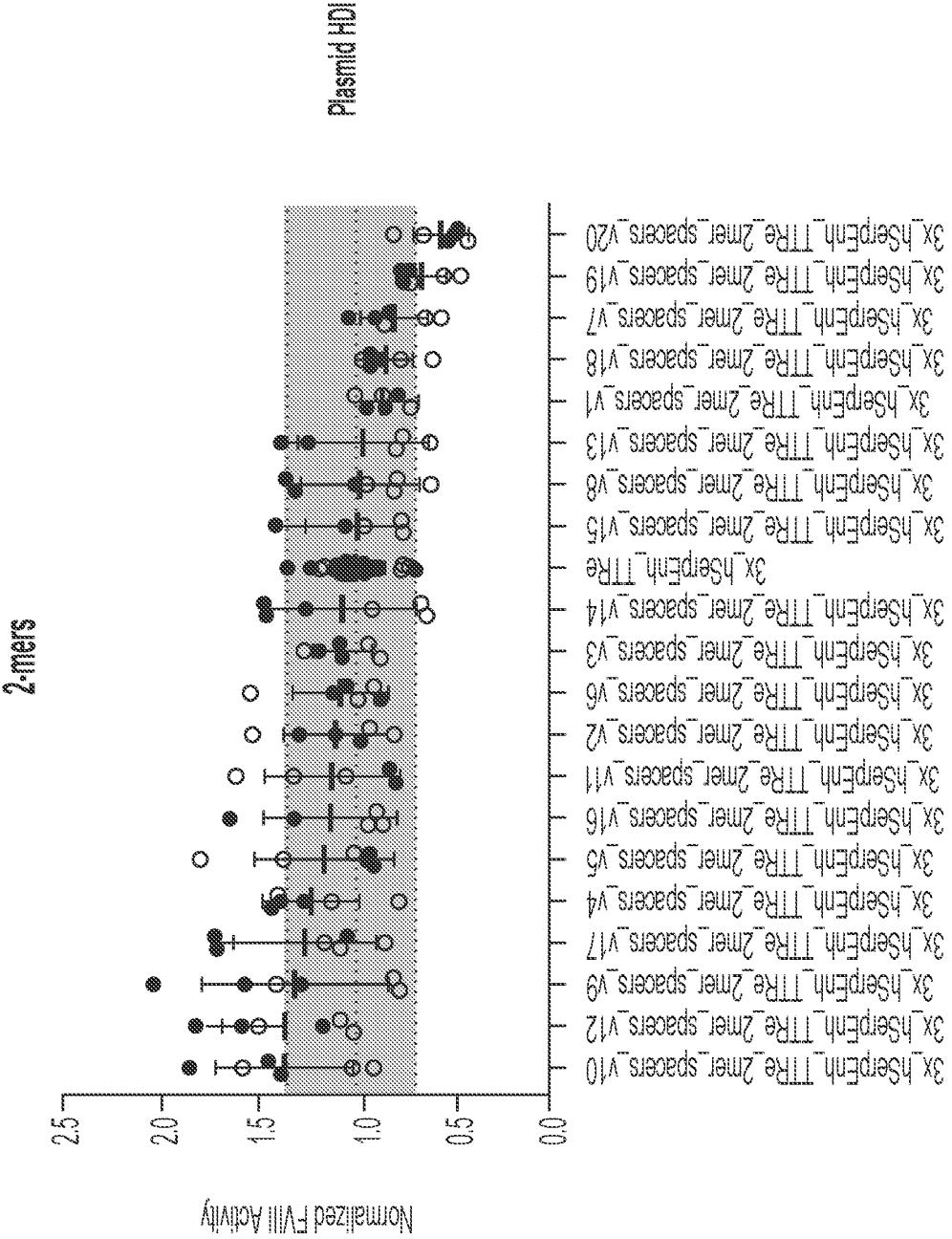


FIG. 8A

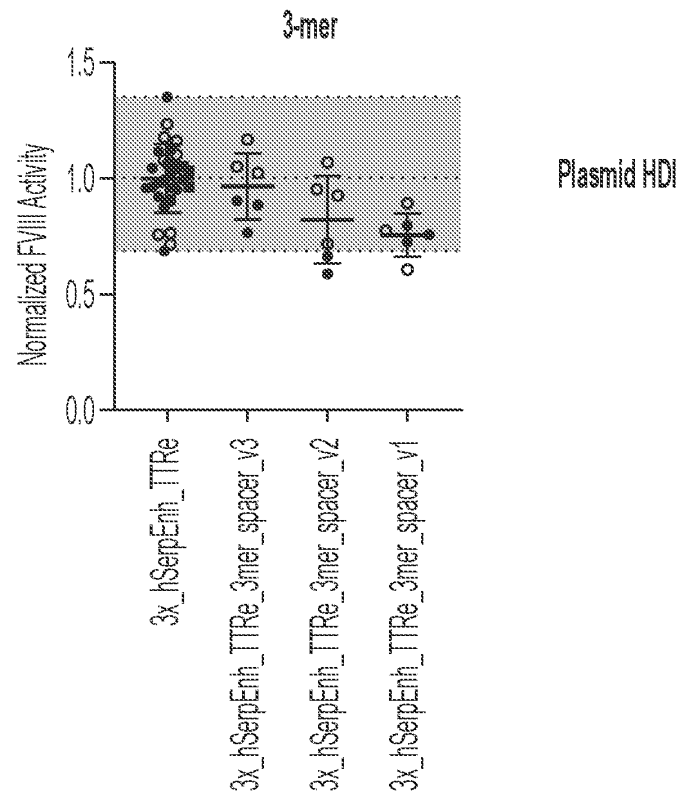


FIG. 8B

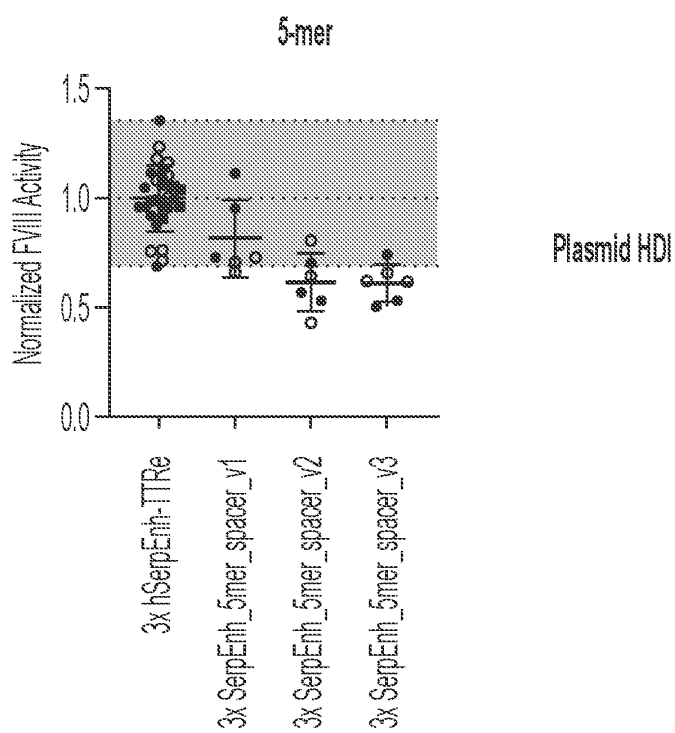


FIG. 8C

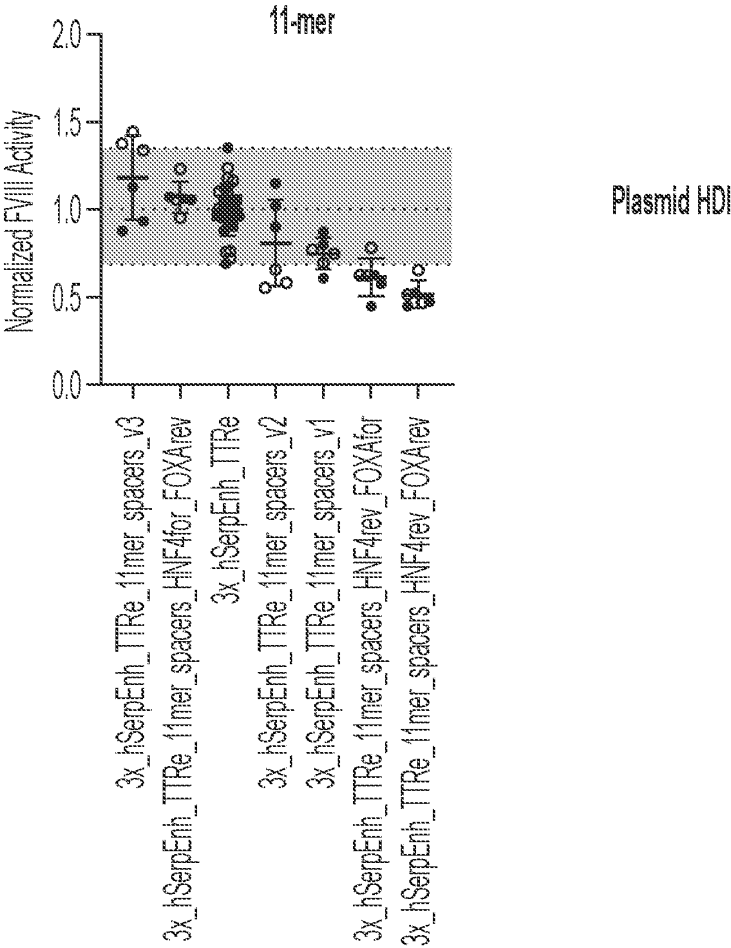


FIG. 8D

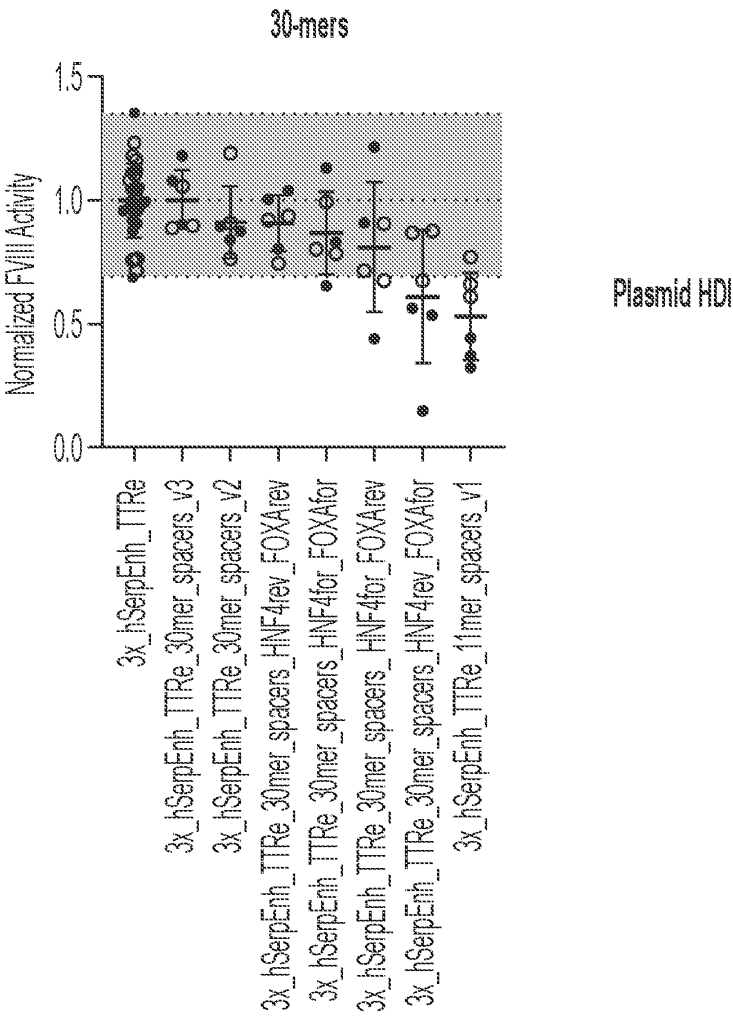


FIG. 8E

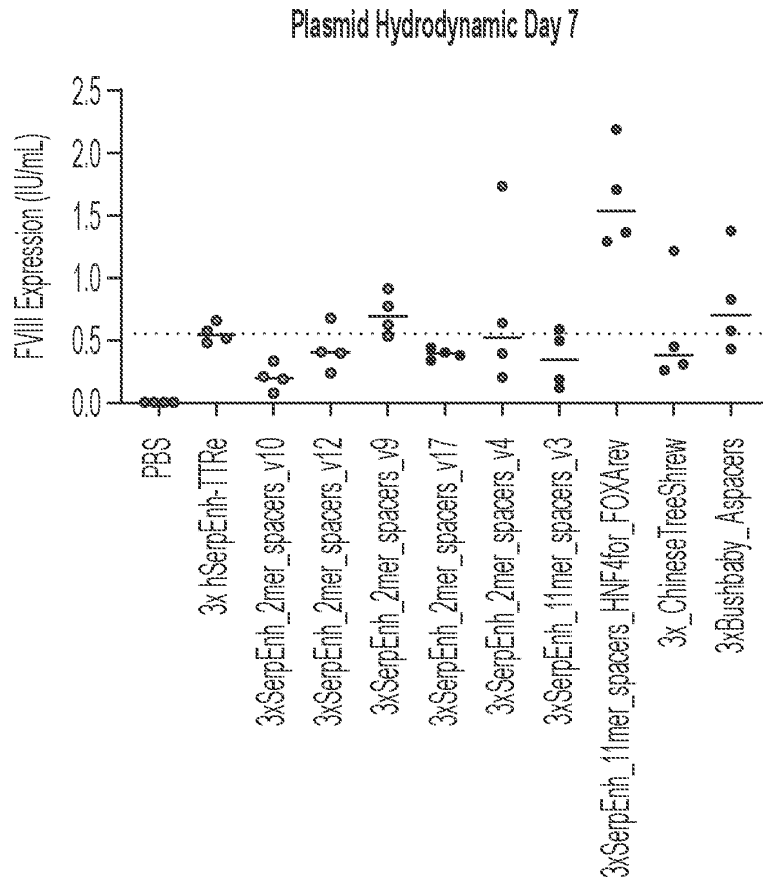


FIG. 9

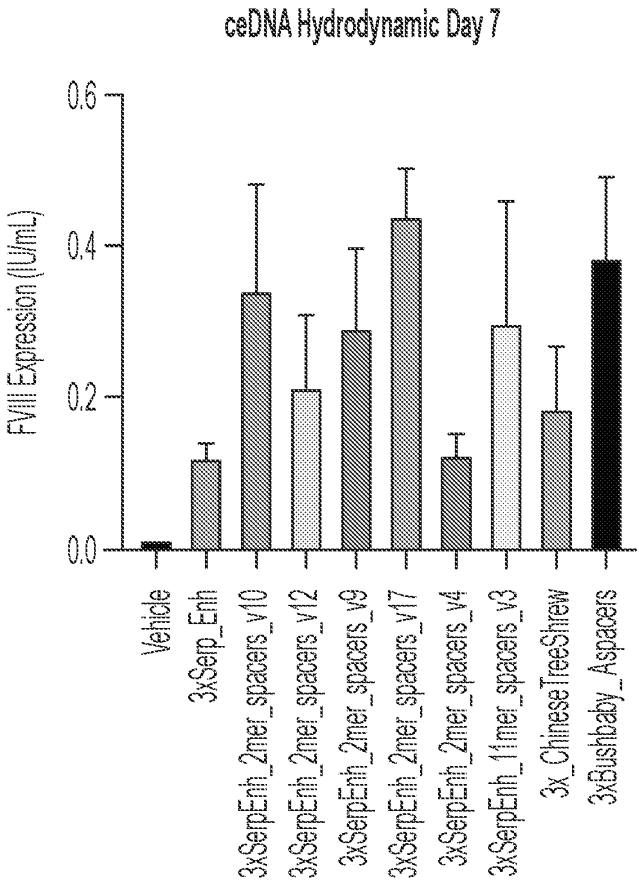


FIG. 10

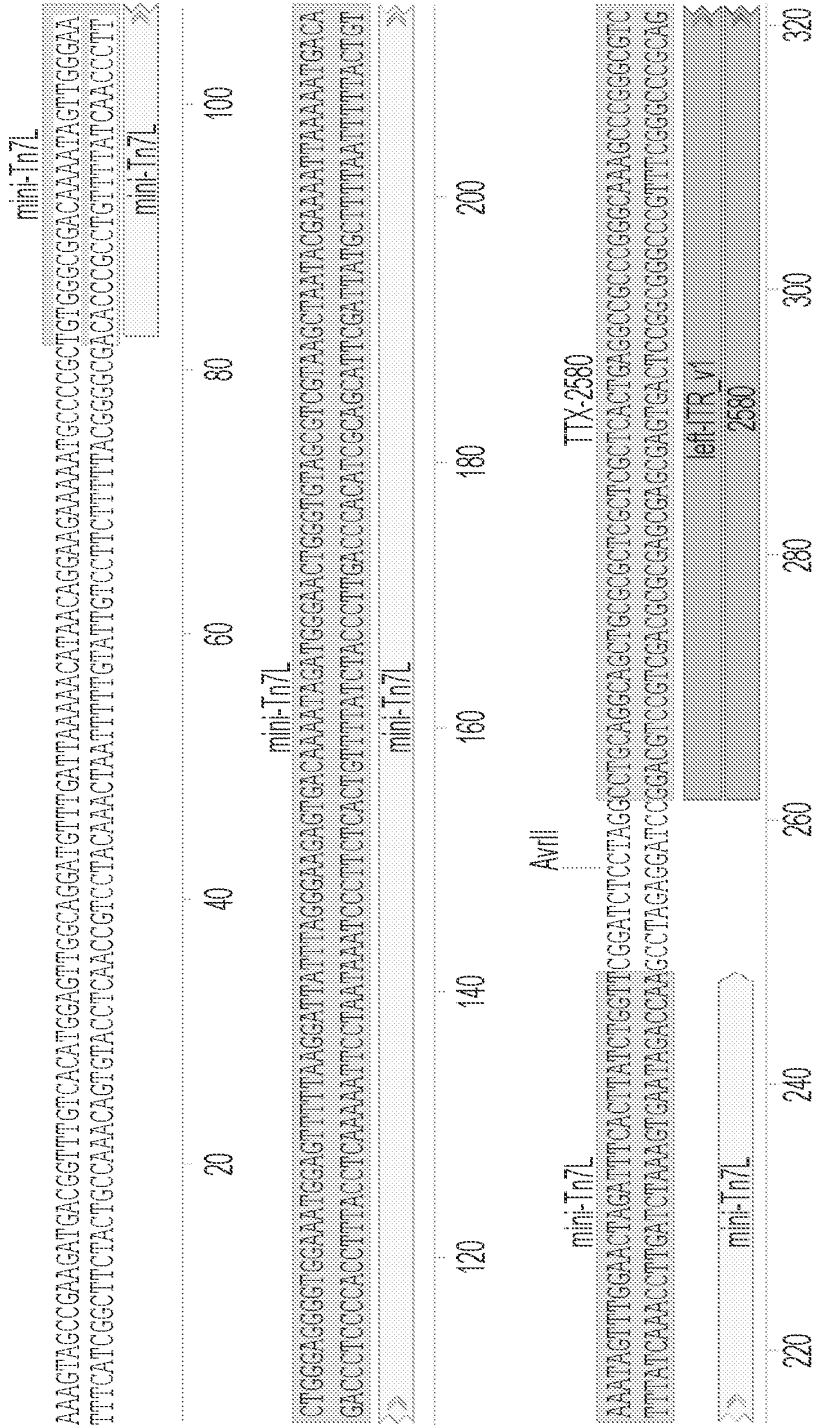


FIG. 11

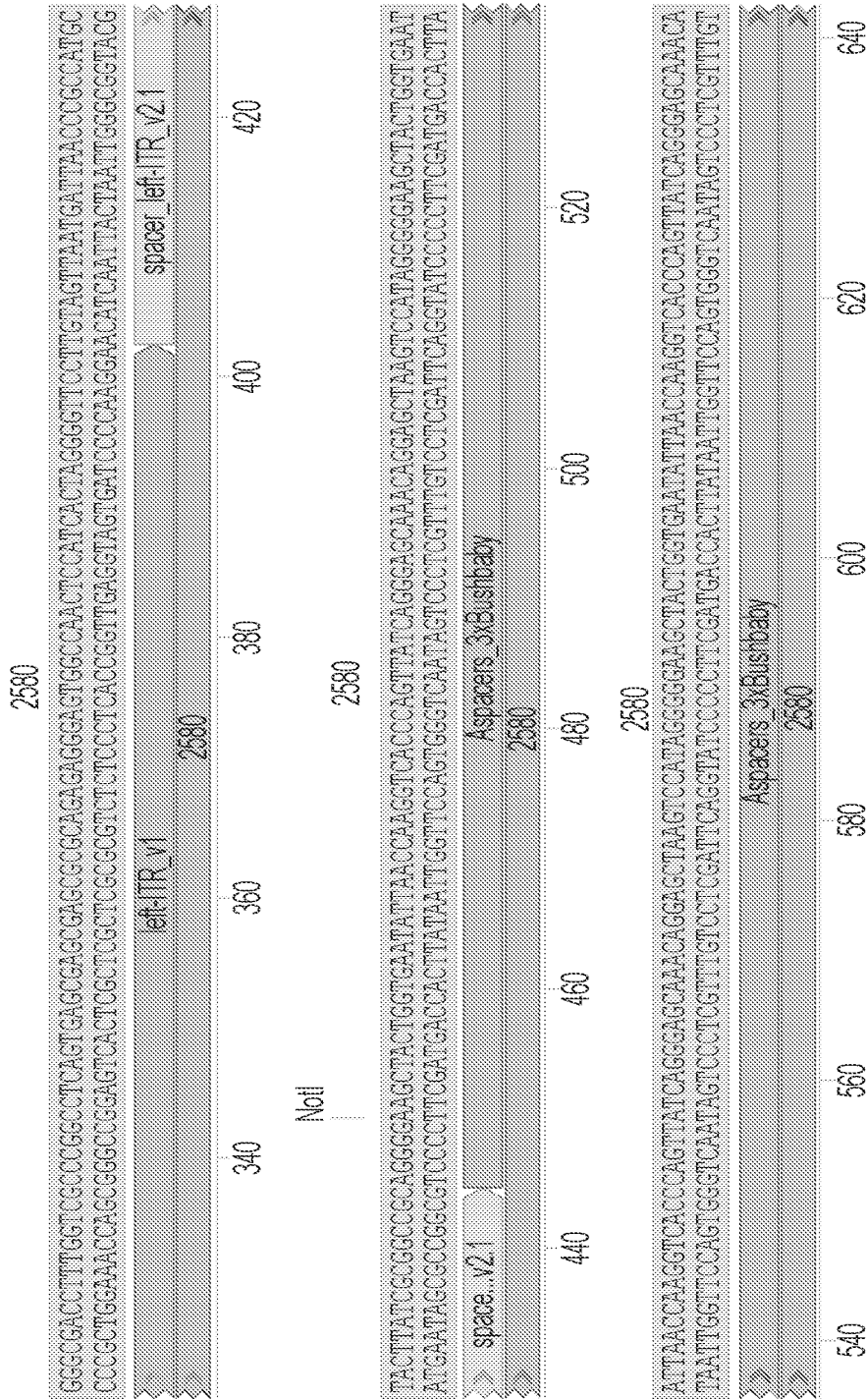
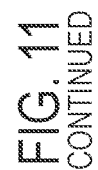


FIG. 11
CONTINUED



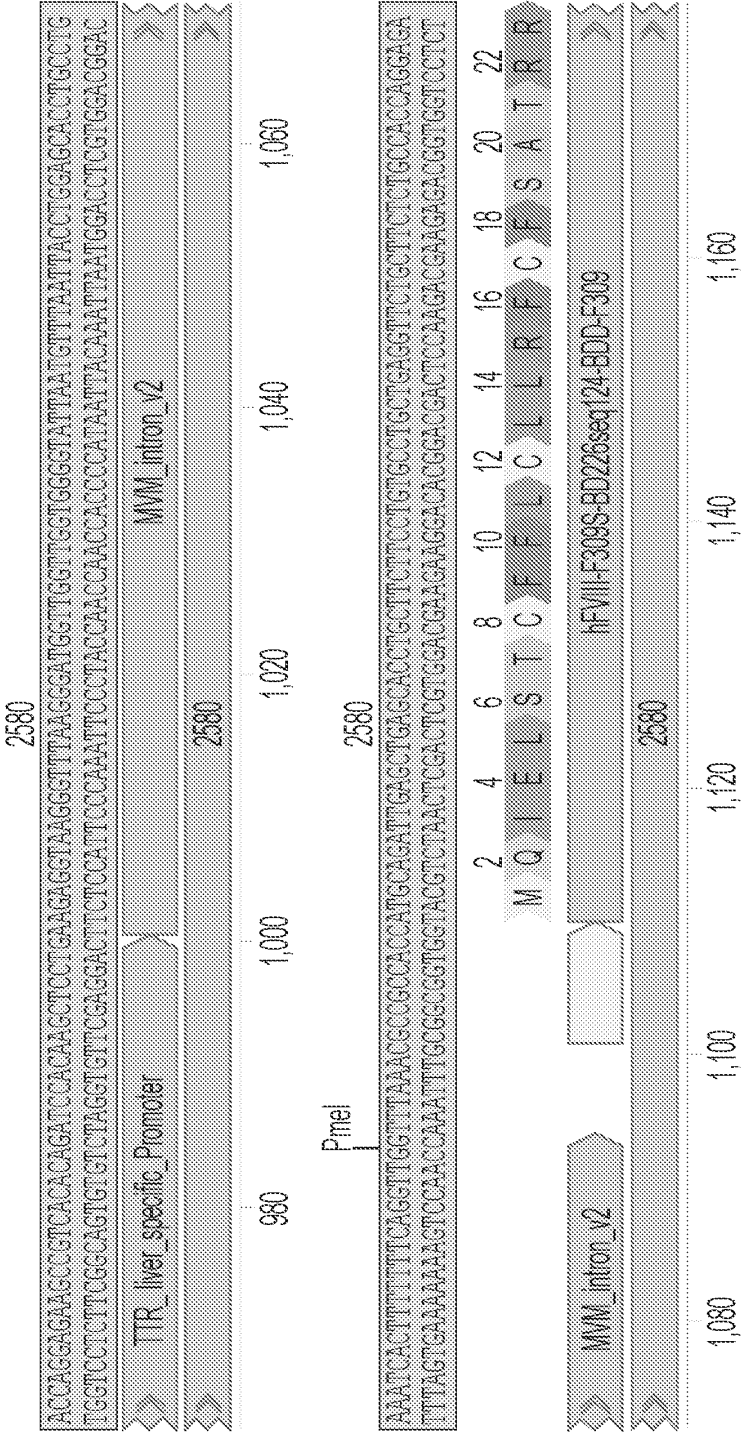
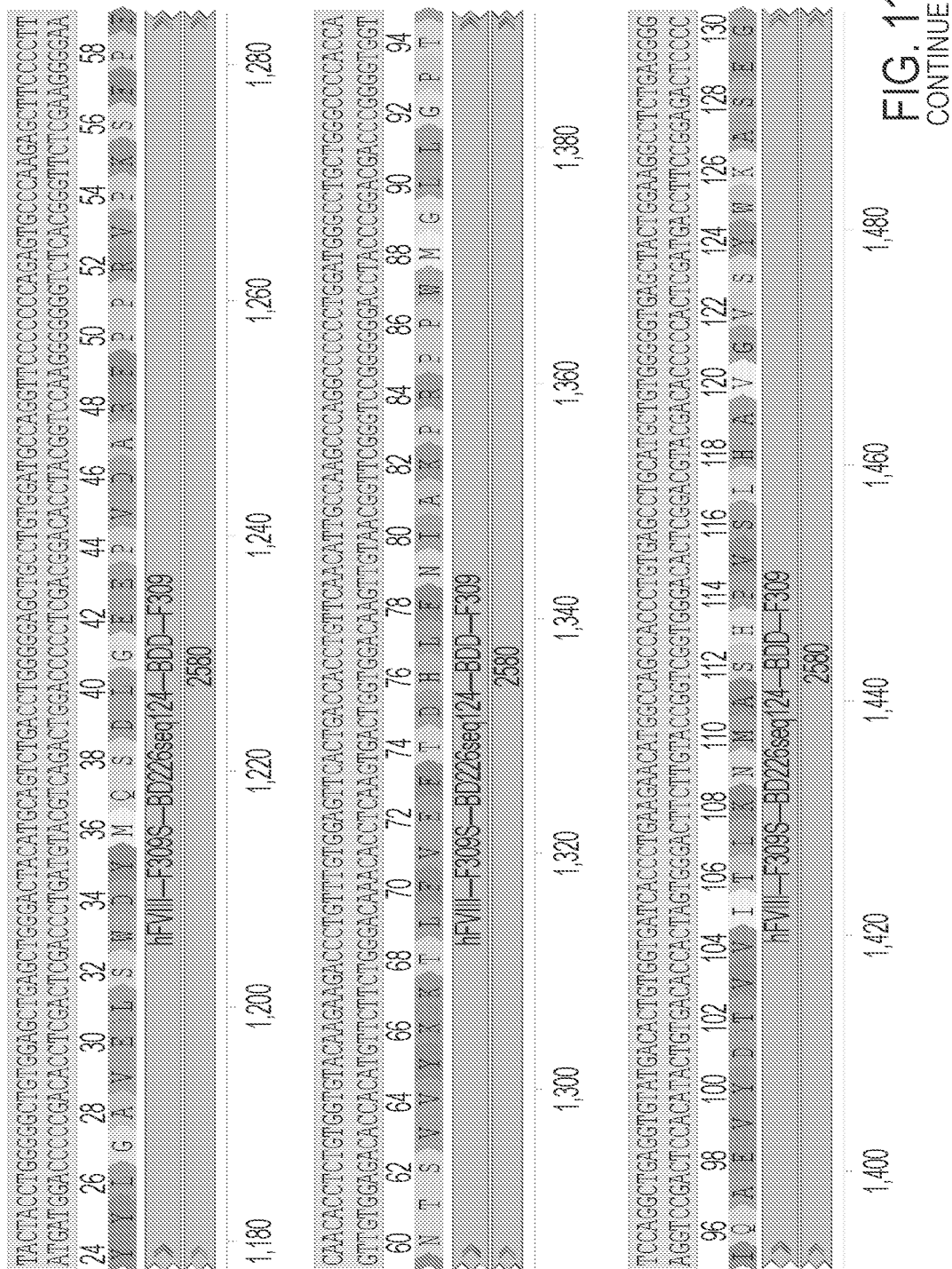


FIG. 11
CONTINUED



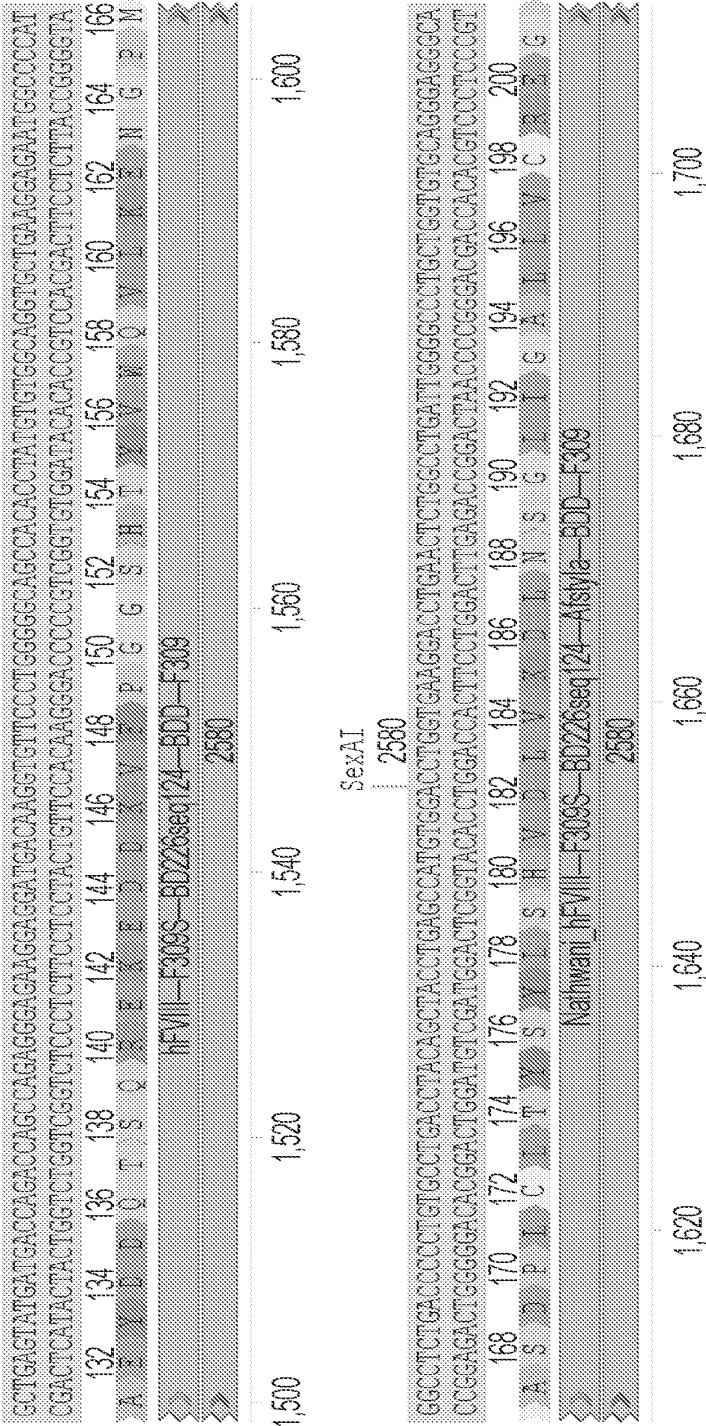


FIG. 11
CONTINUED

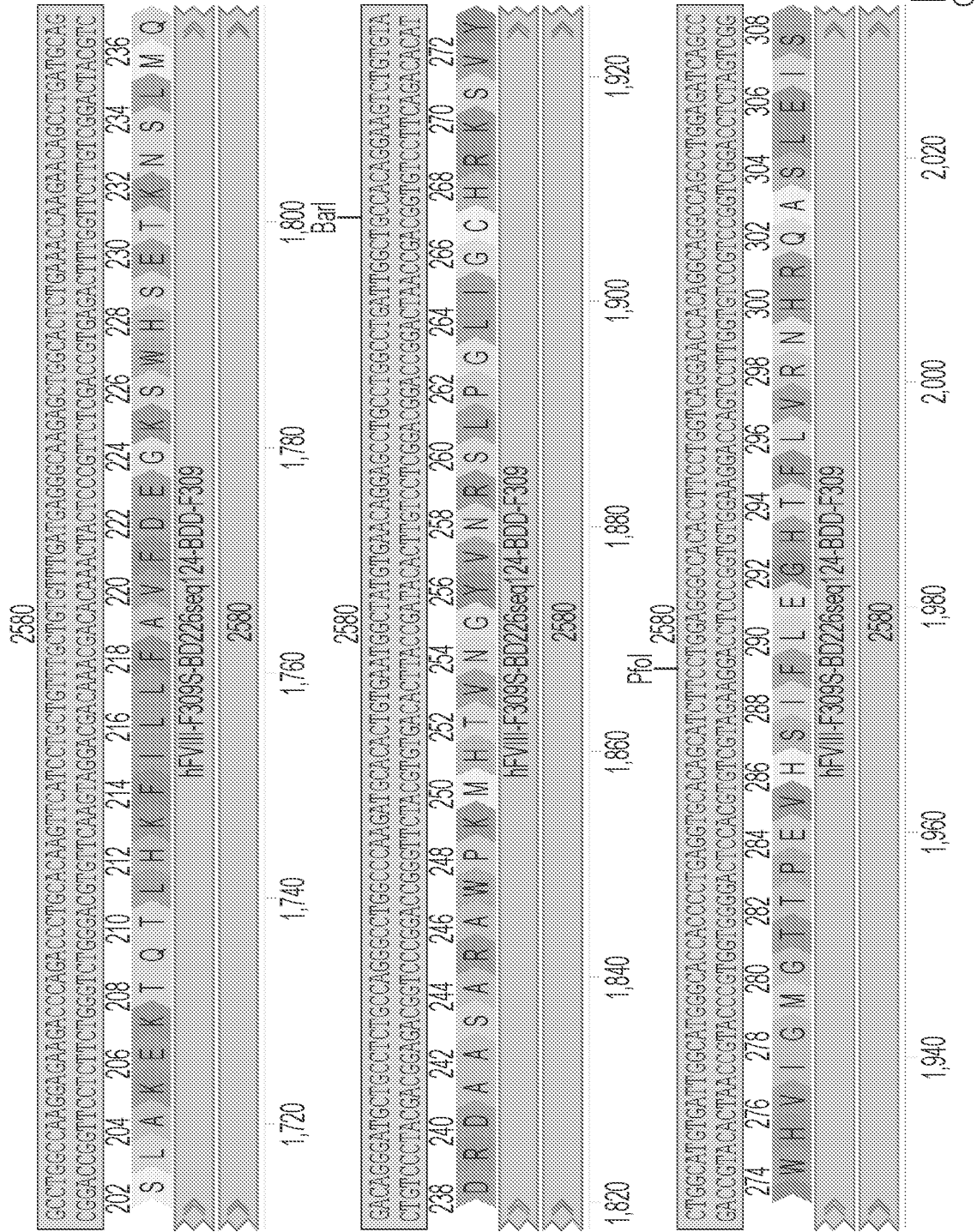
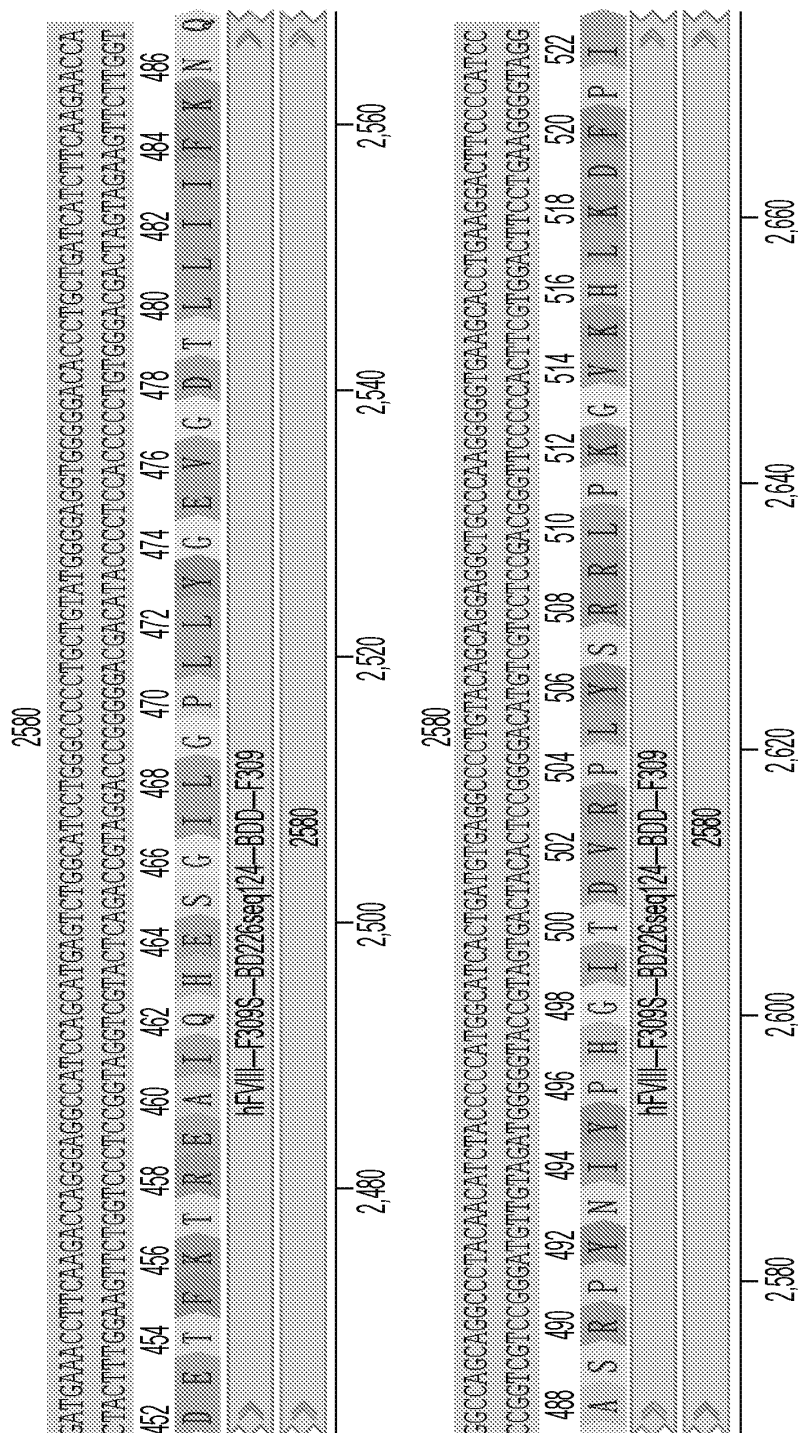


FIG. 11
CONTINUED

FIG. 11
CONTINUED



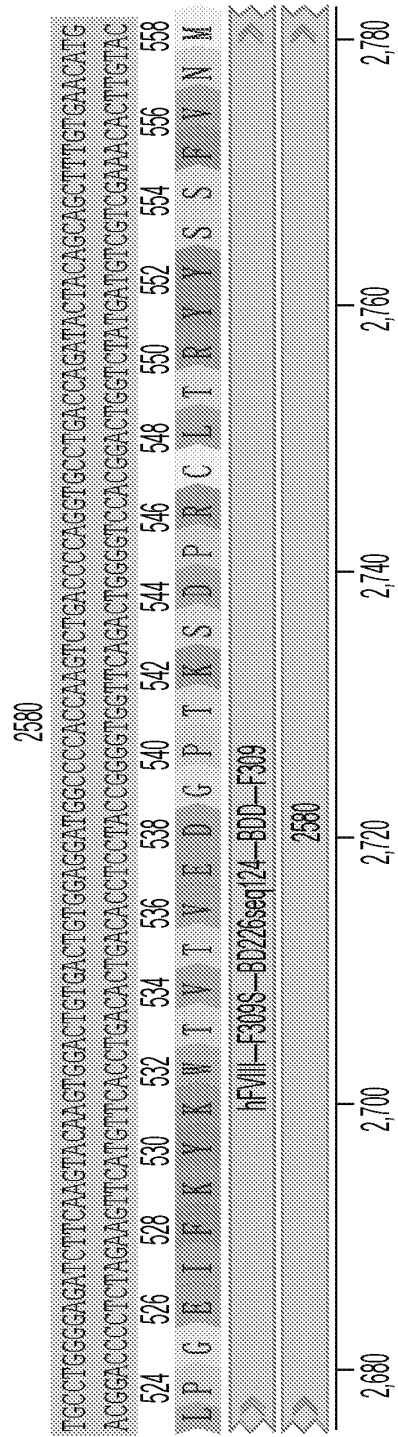
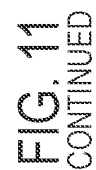


FIG. 11
CONTINUED



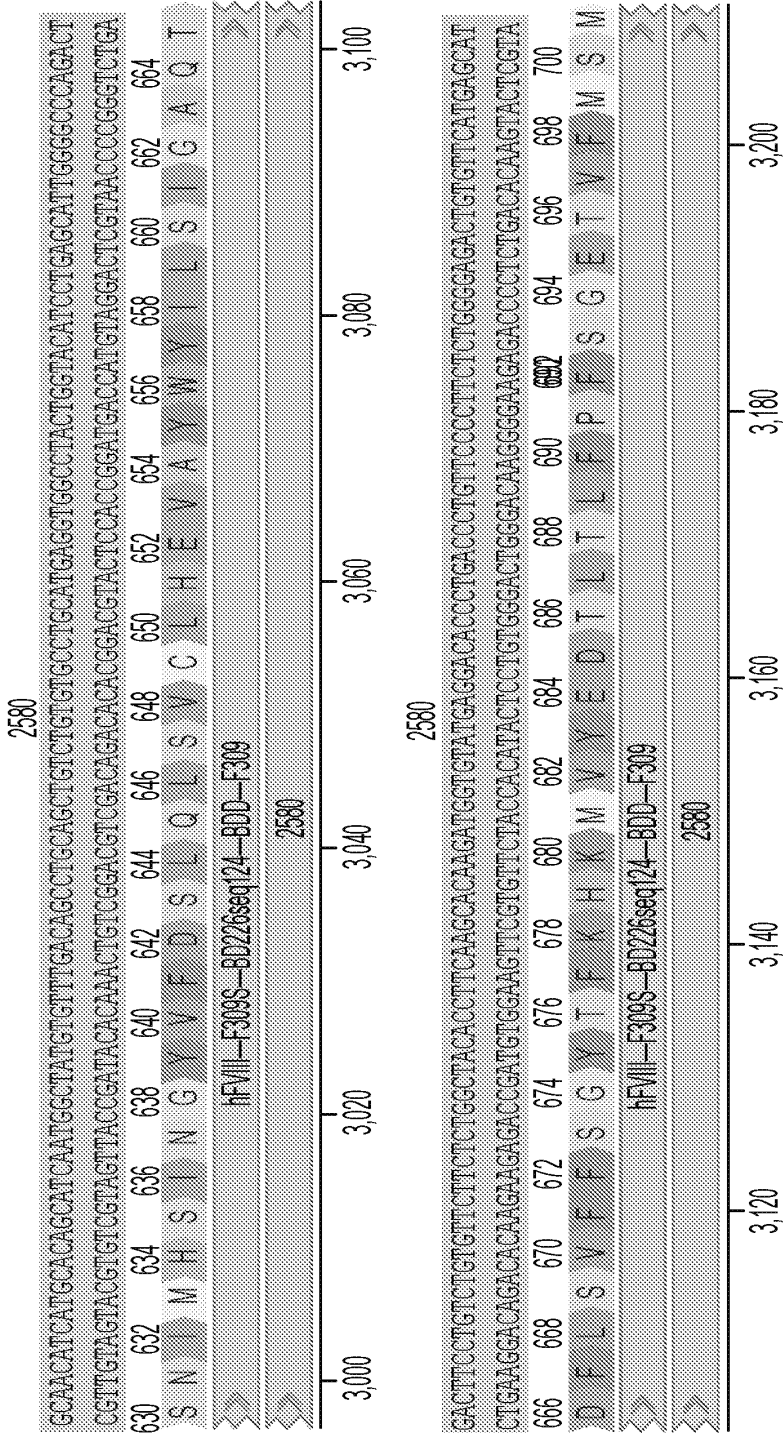


FIG. 11
CONTINUED

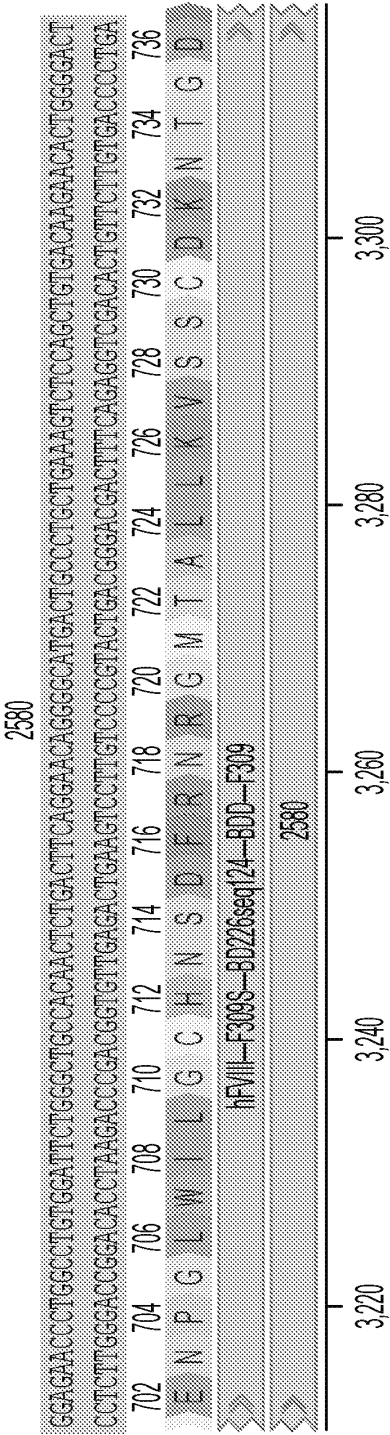


FIG. 11
CONTINUED



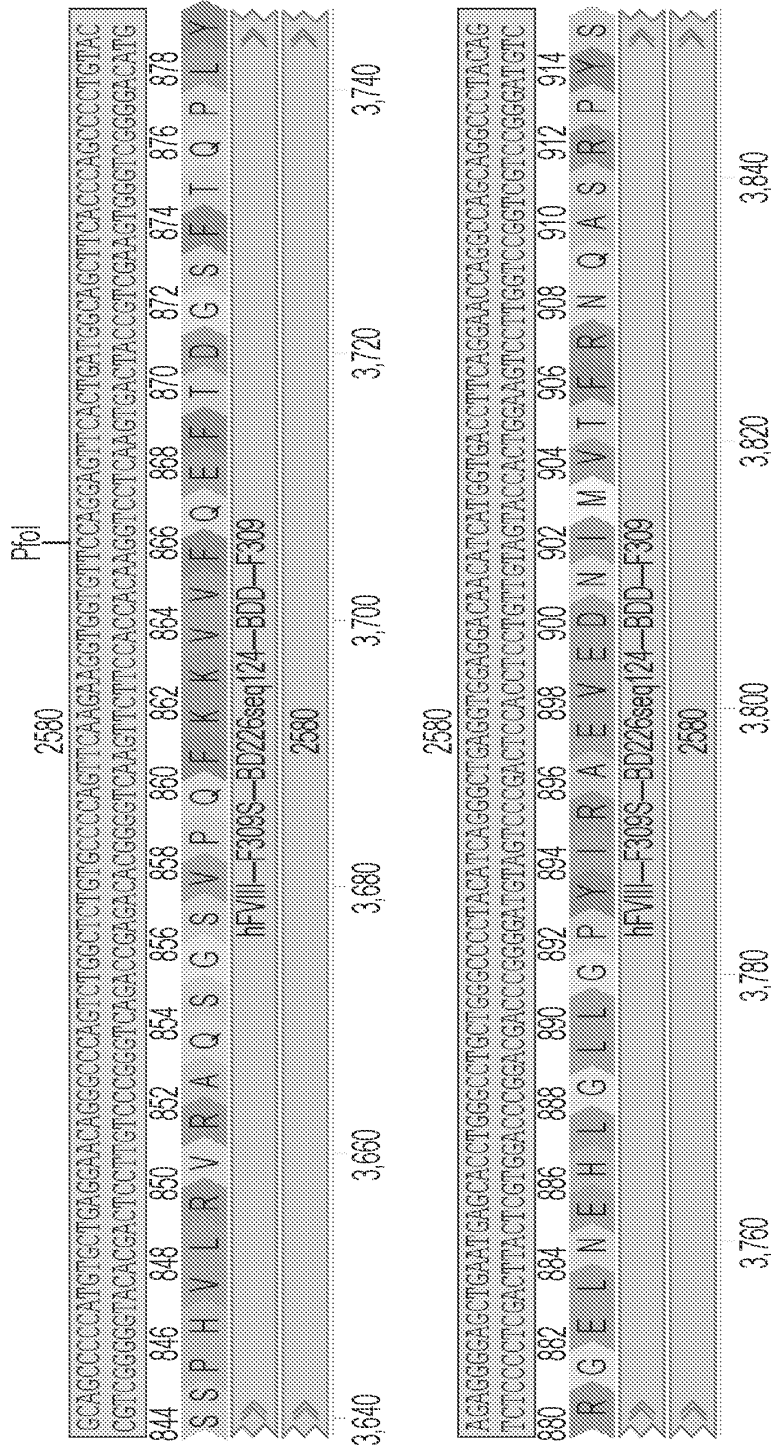


FIG. 11
CONTINUED

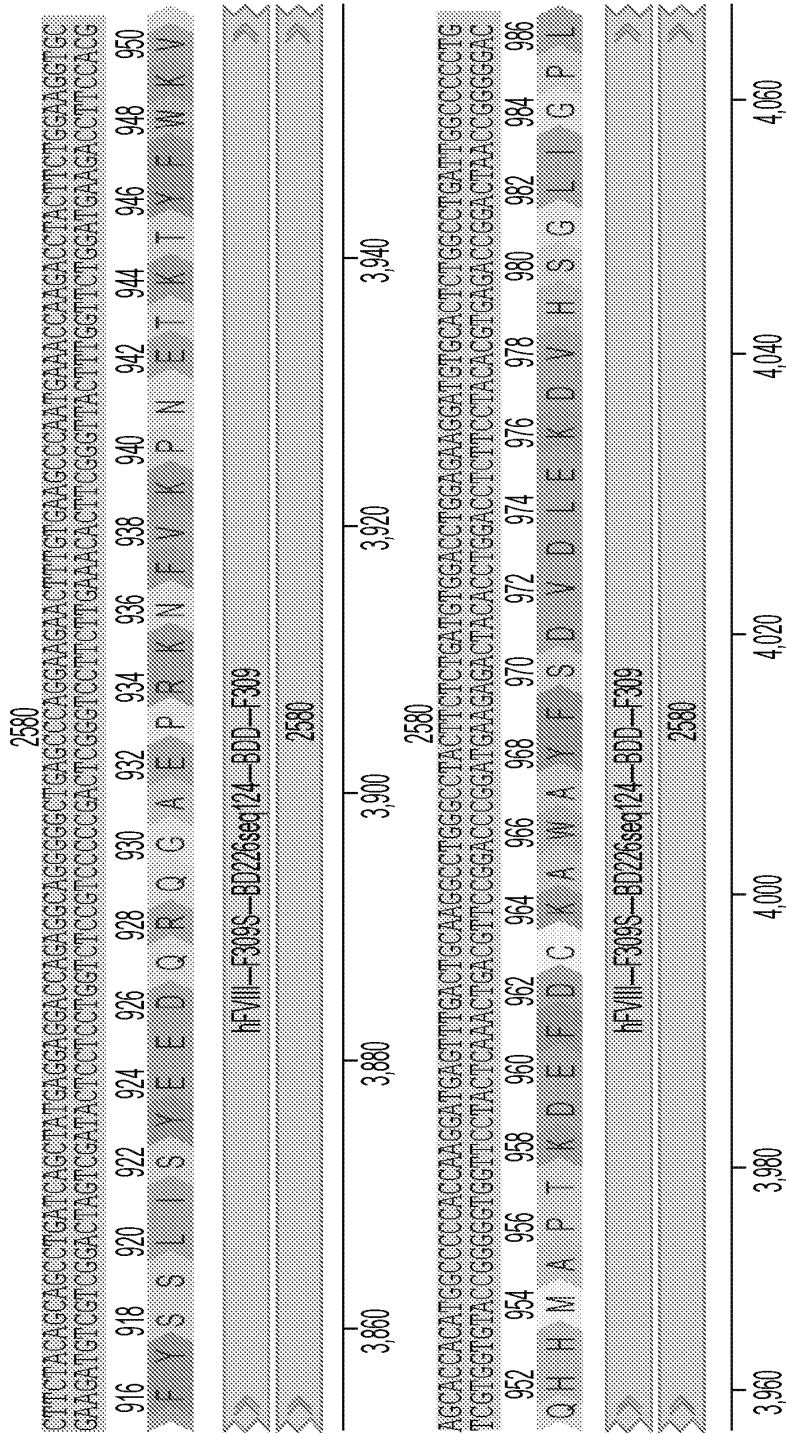


FIG. 11
CONTINUED



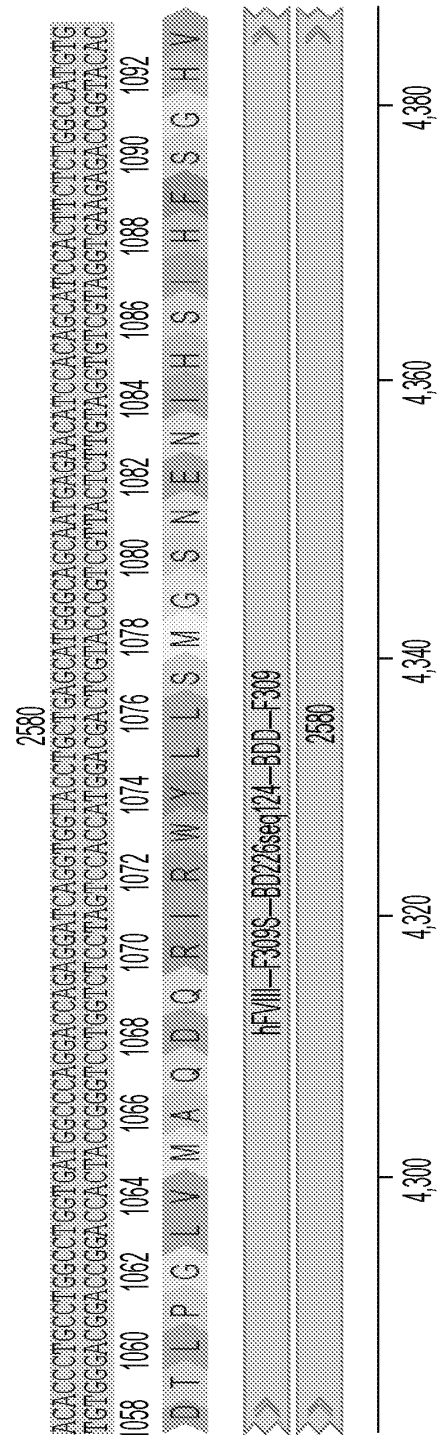


FIG. 11
CONTINUED



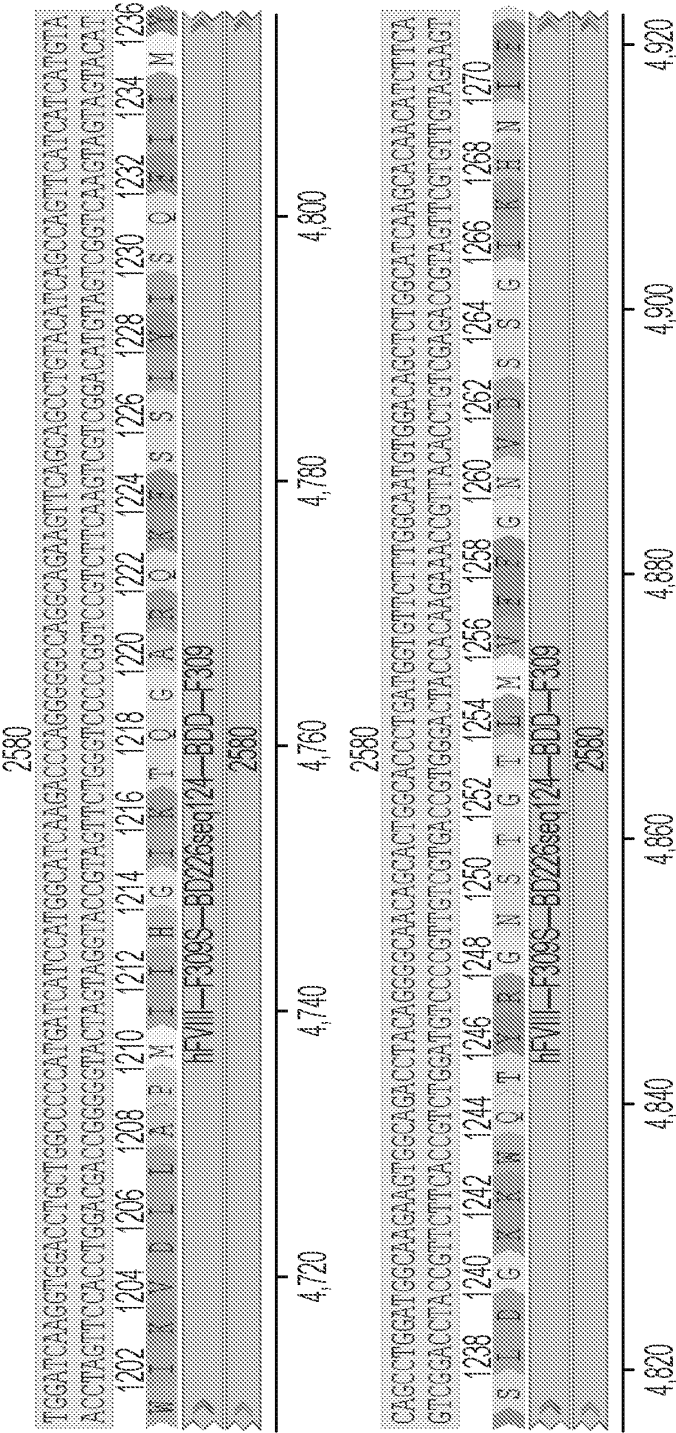


FIG. 11
CONTINUED

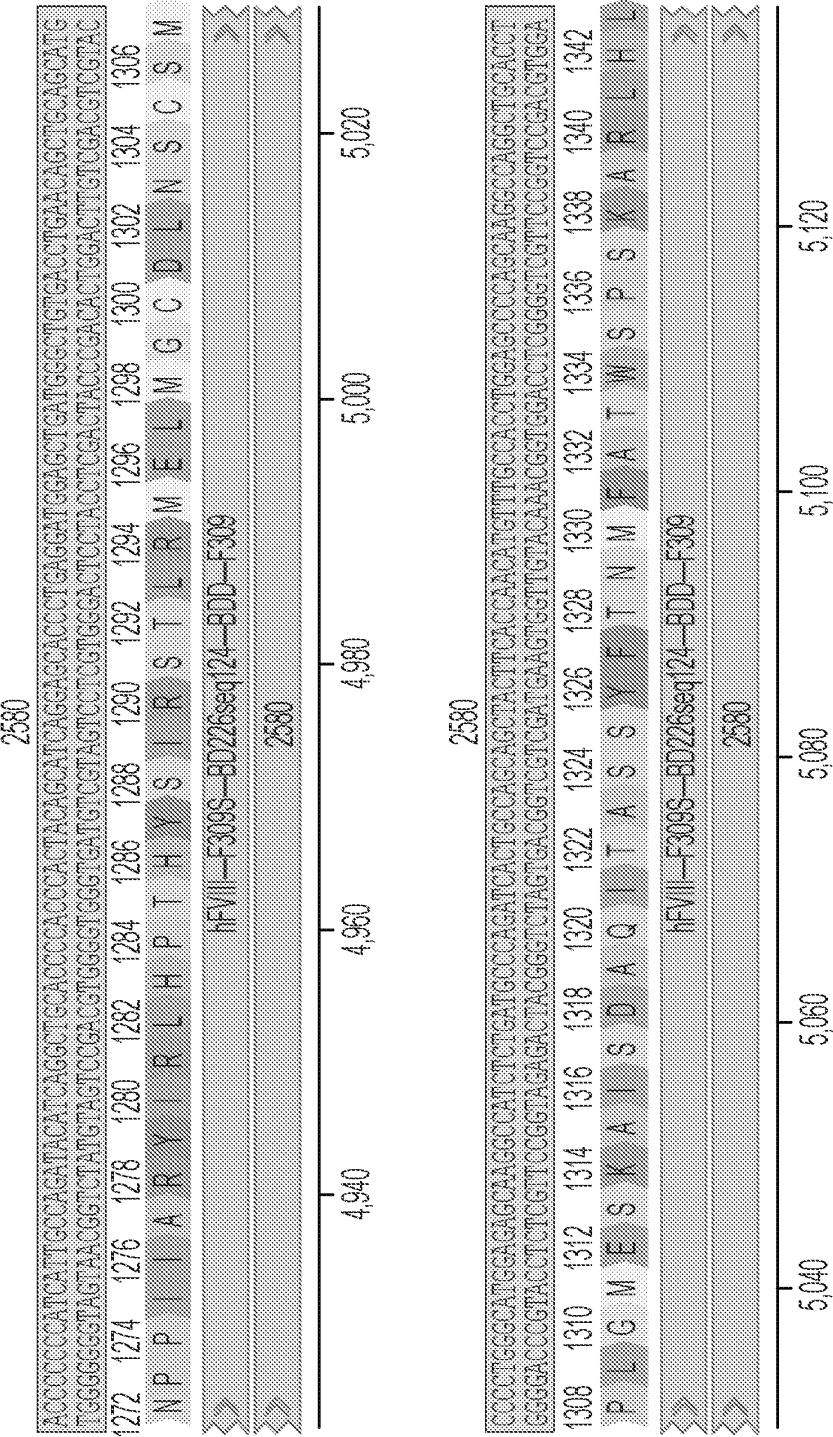


FIG. 11
CONTINUED

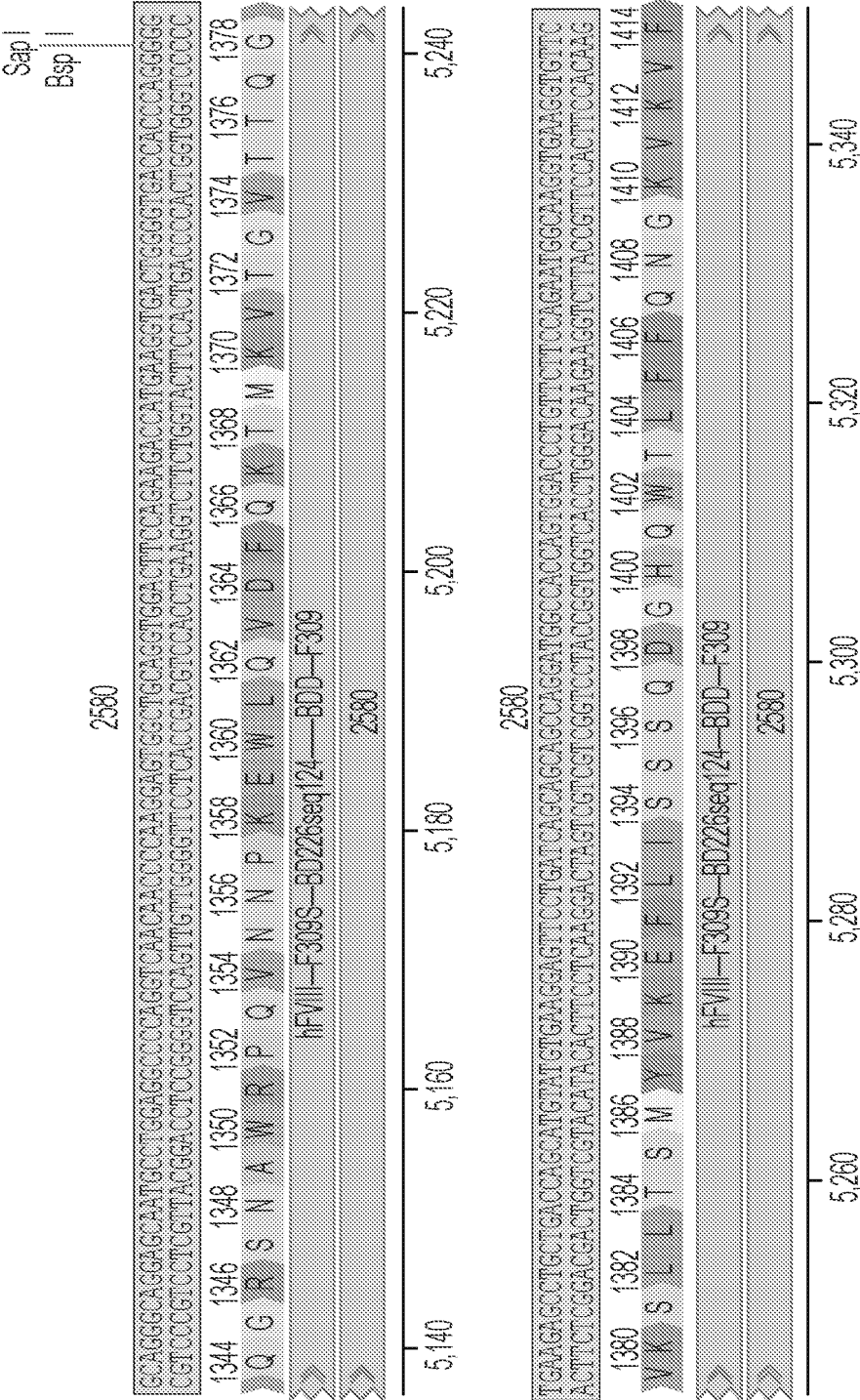
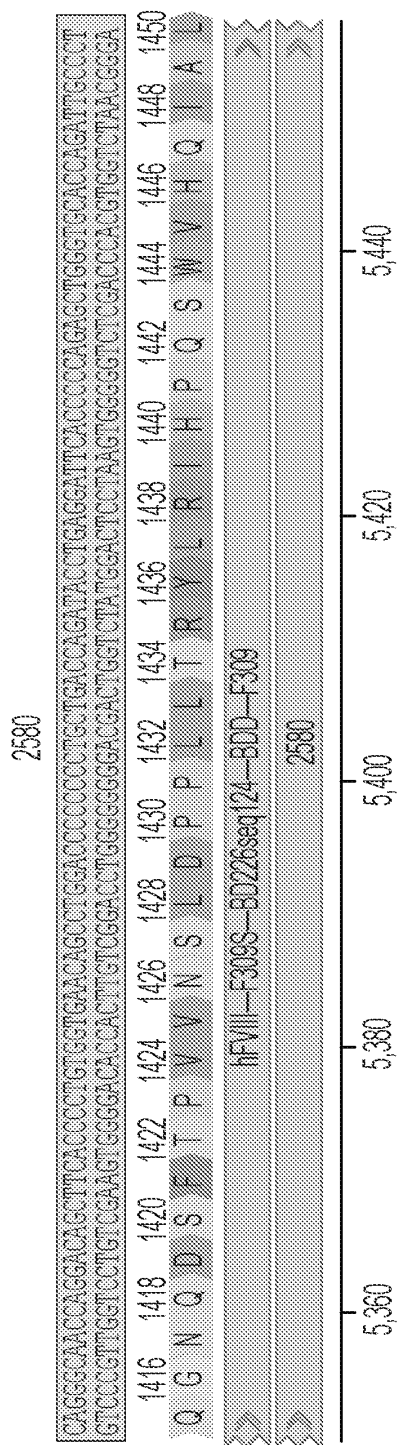
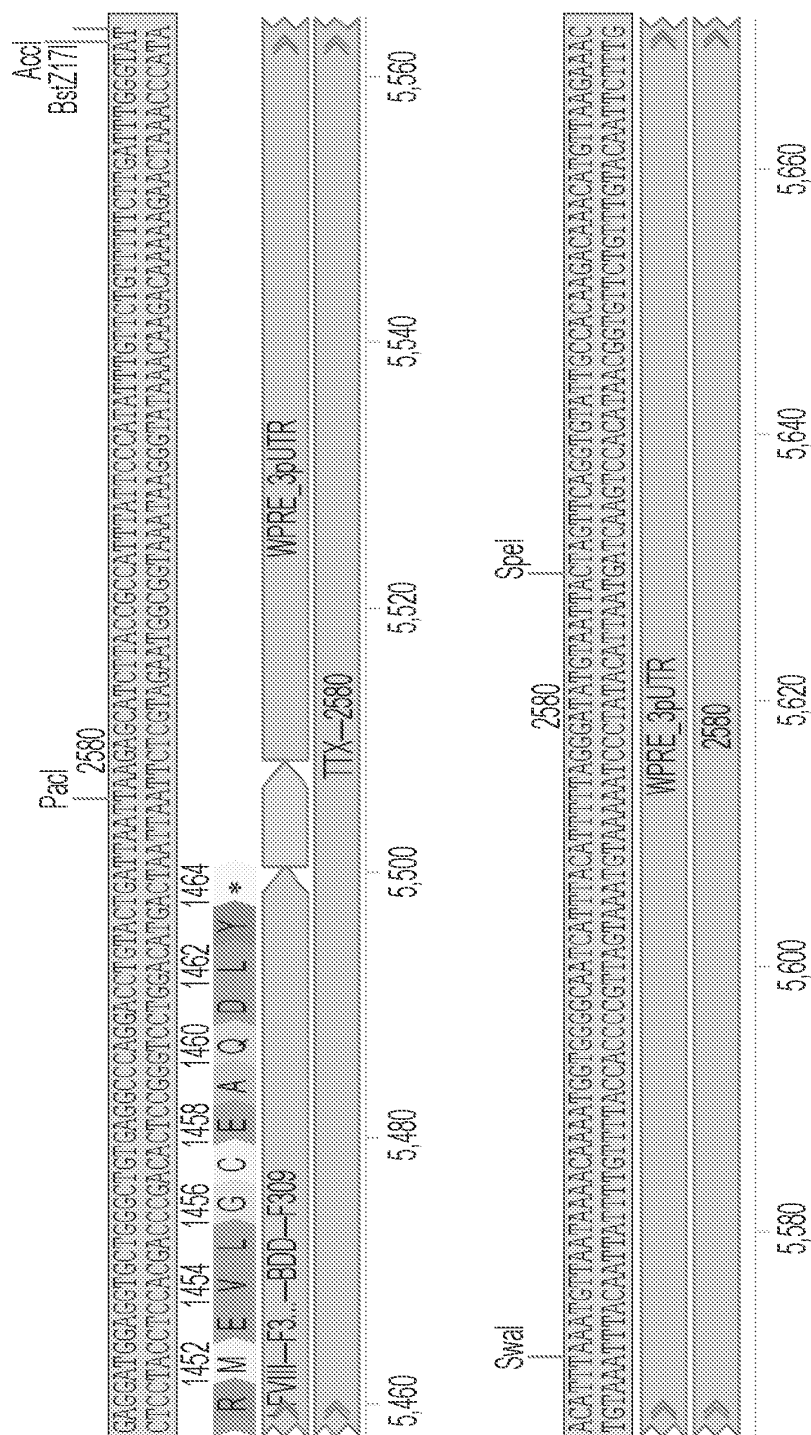


FIG. 11
CONTINUED



ME13751895v.1

FIG. 11
CONTINUED

FIG. 11
CONTINUED

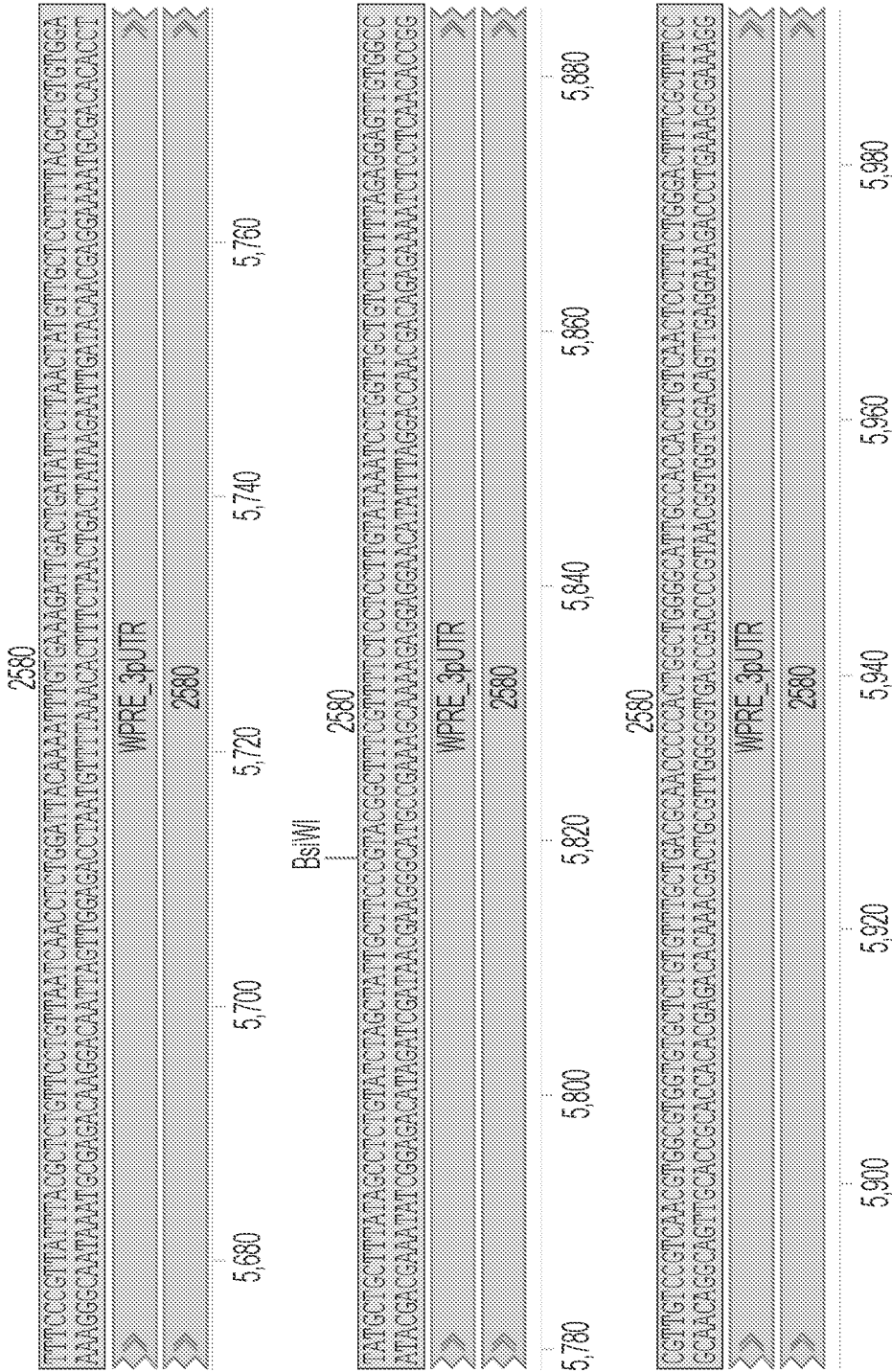
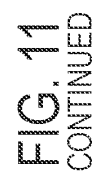


FIG. 11
CONTINUED

MEI 37511895v. 1



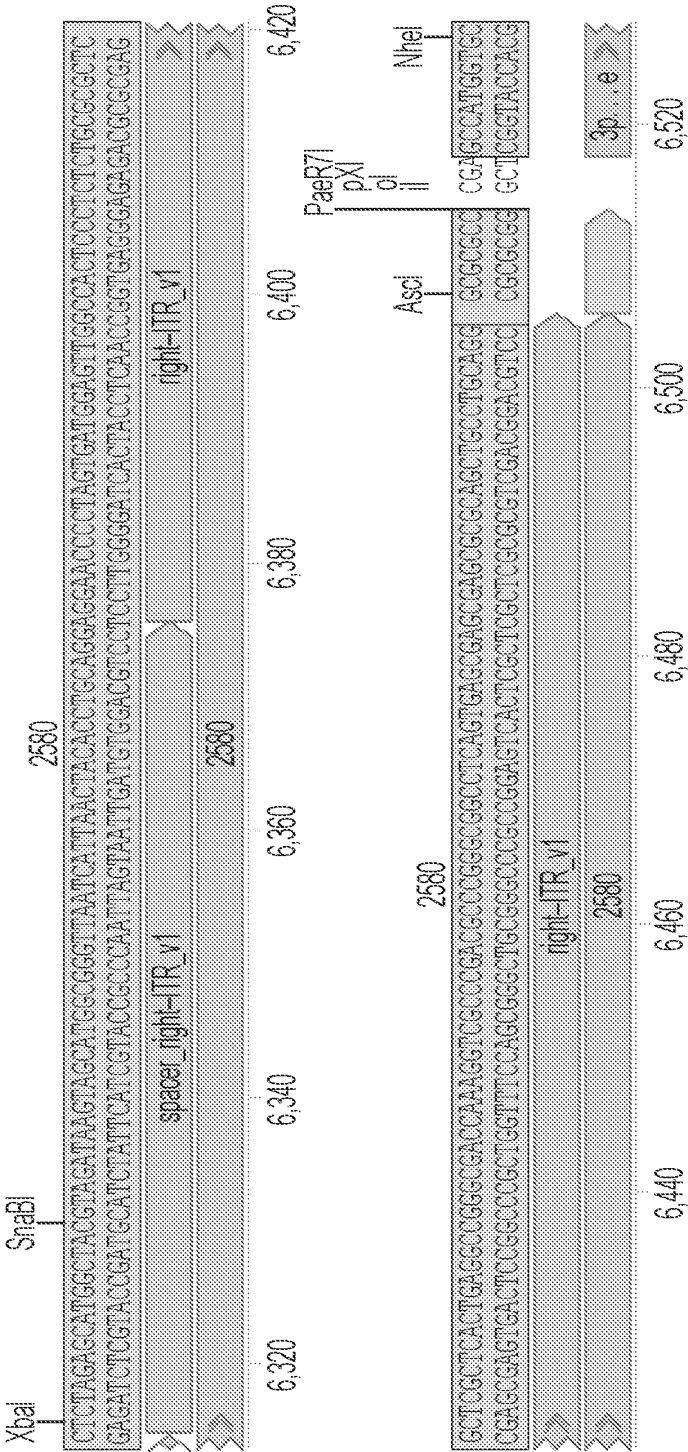


FIG. 11
CONTINUED

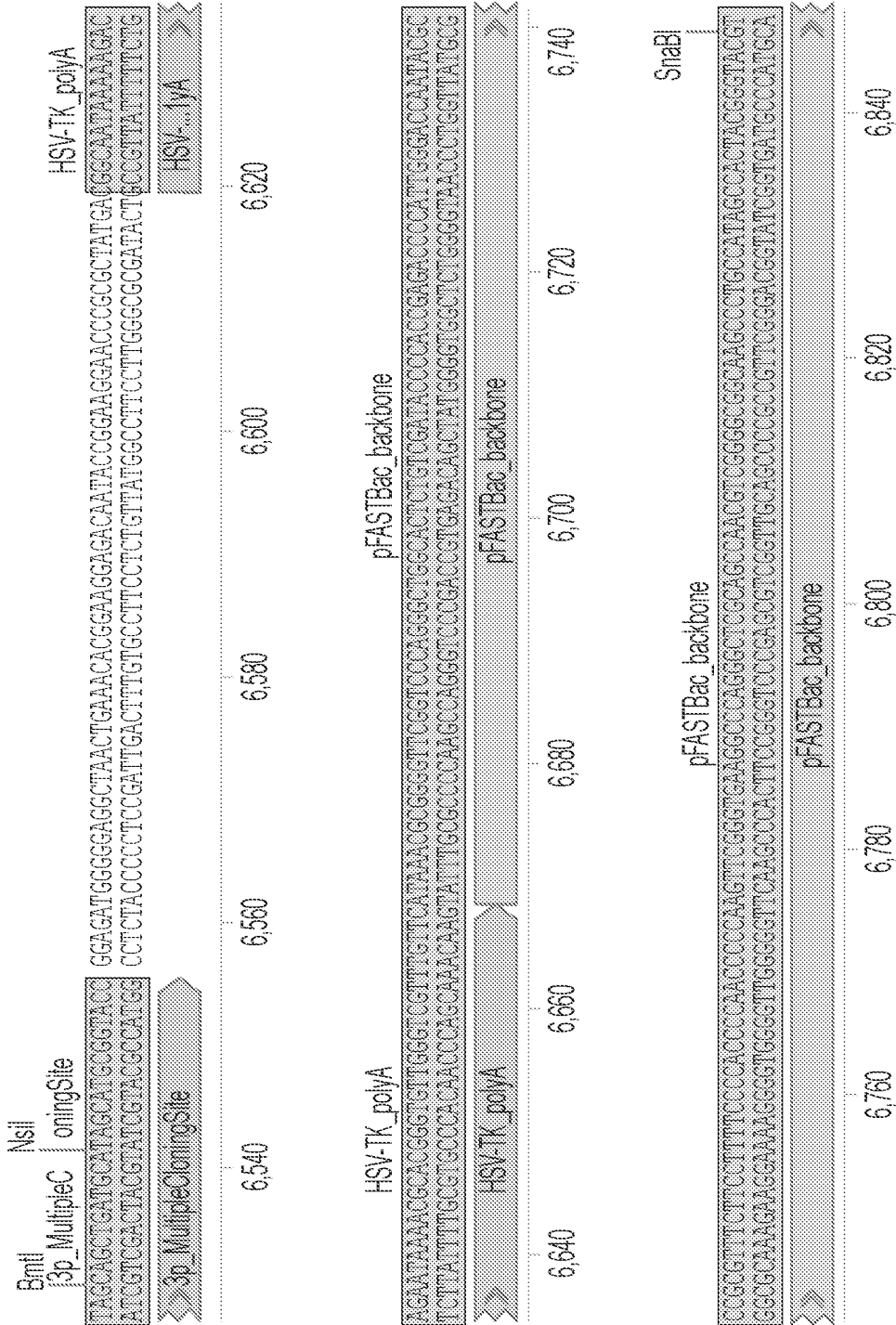
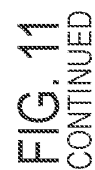
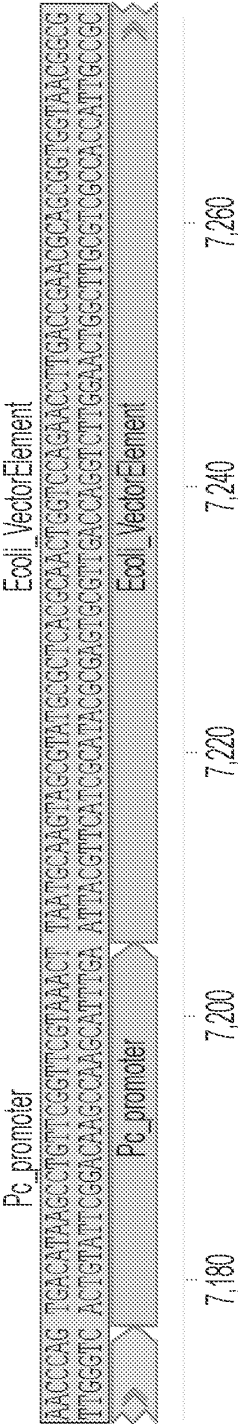


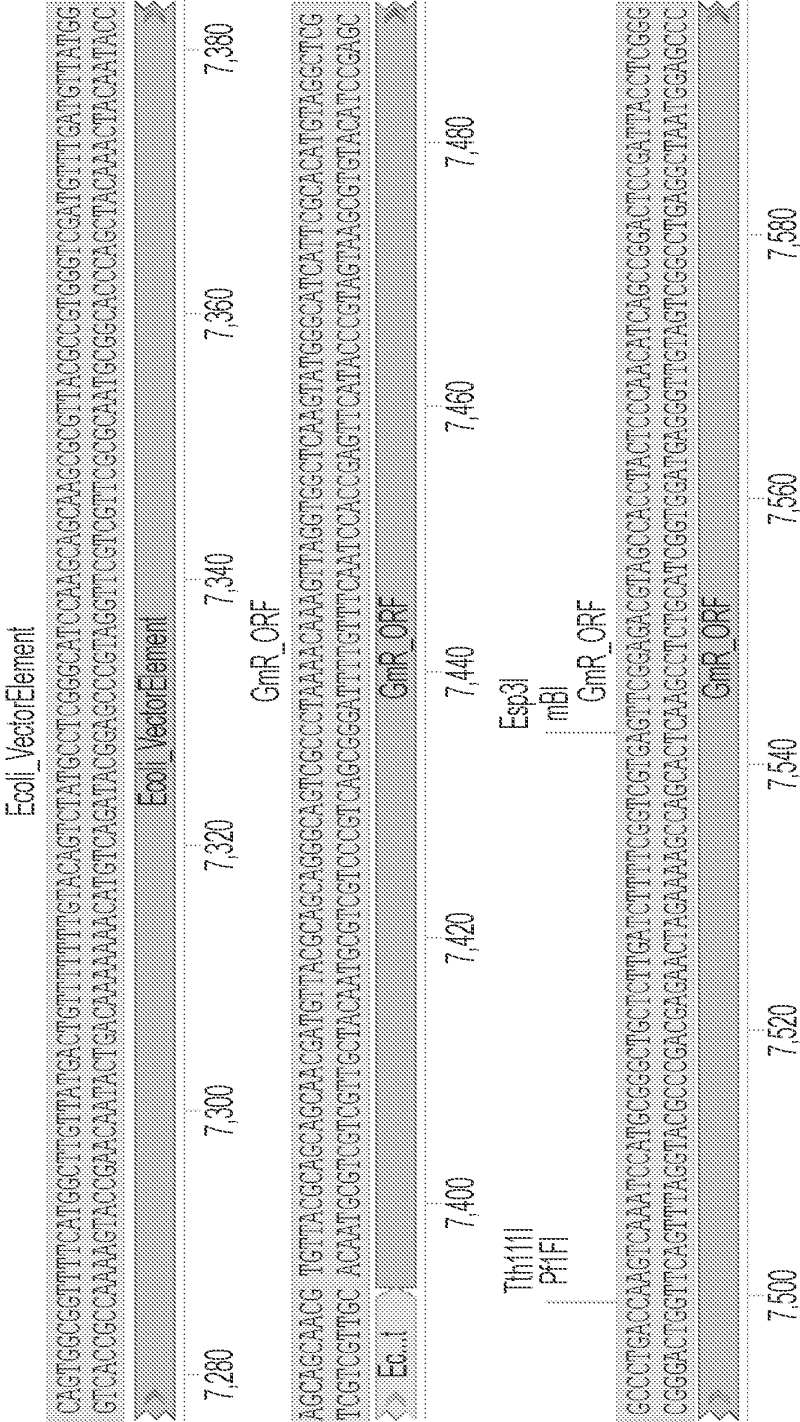
FIG. 11
CONTINUED

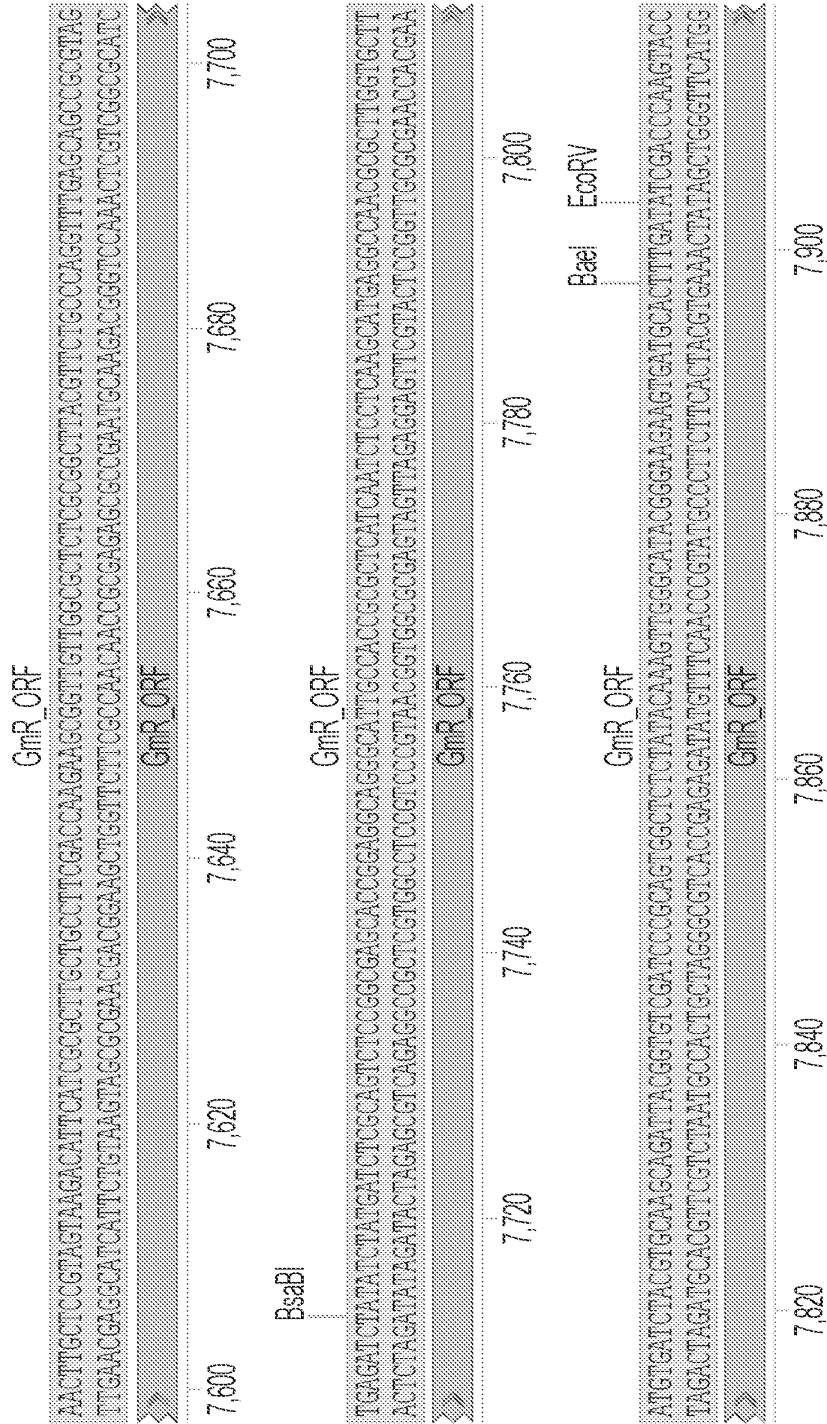




MEI 37511895v. 1

FIG. 11
CONTINUED





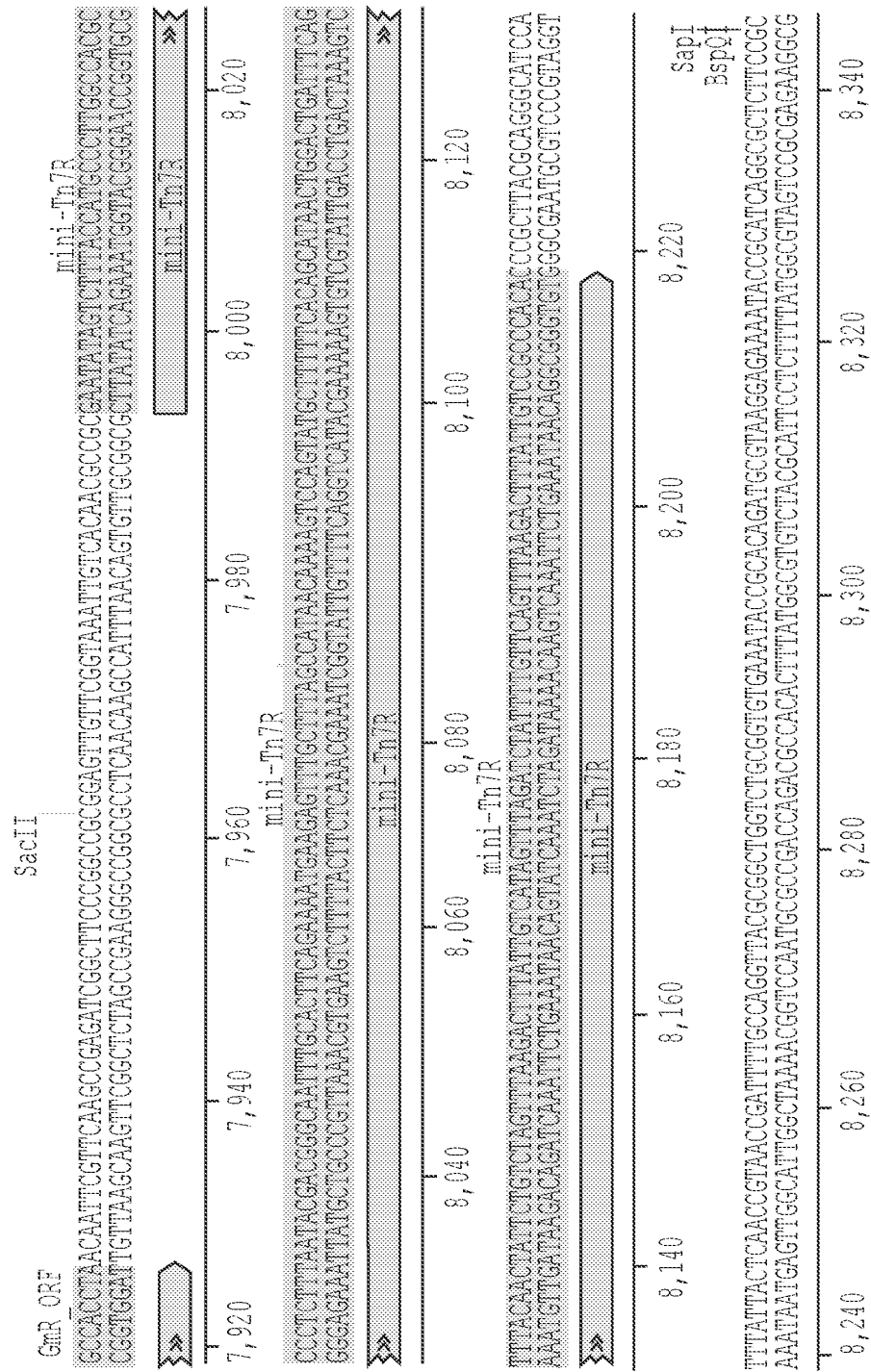
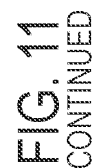


FIG. 11
CONTINUED



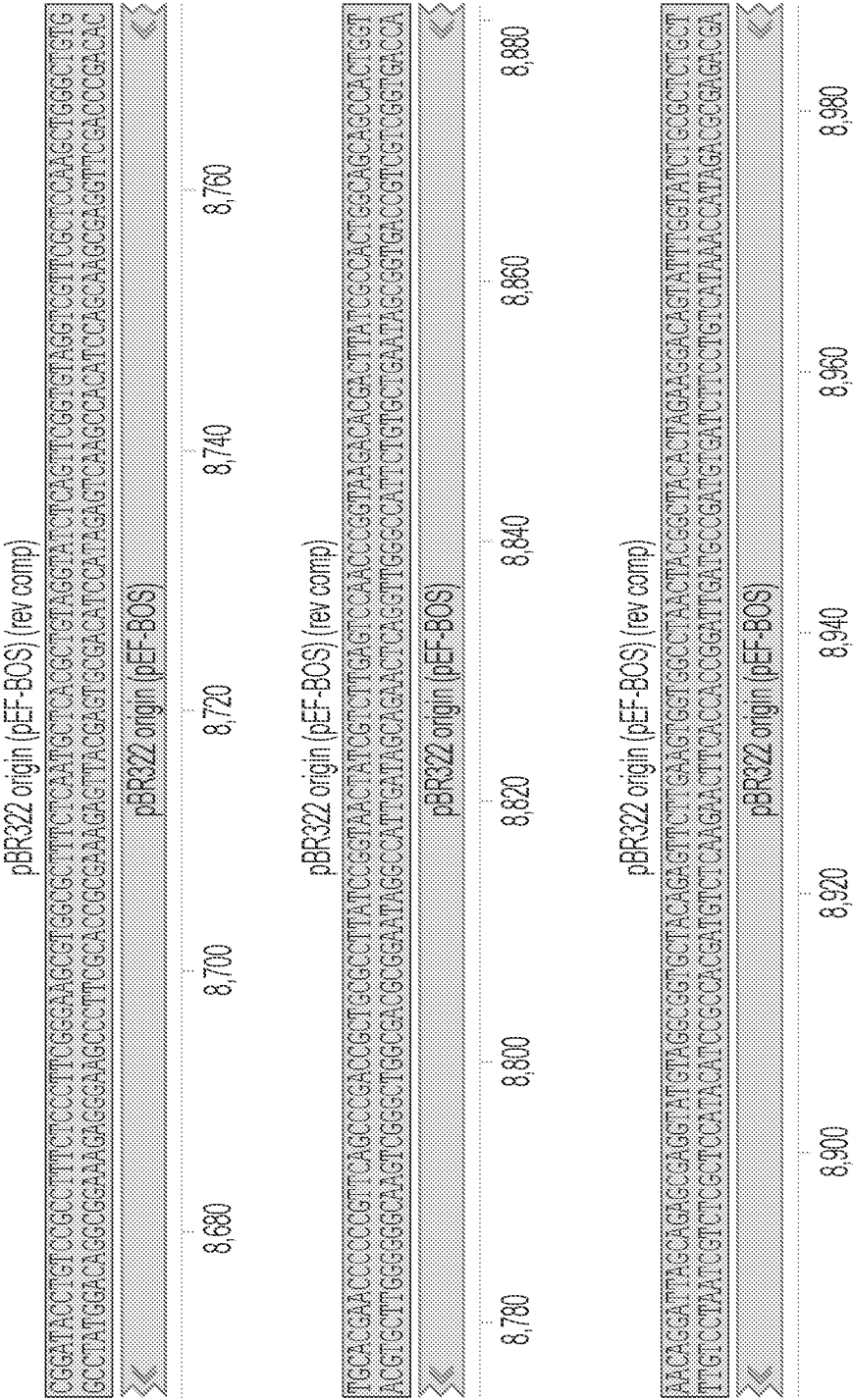
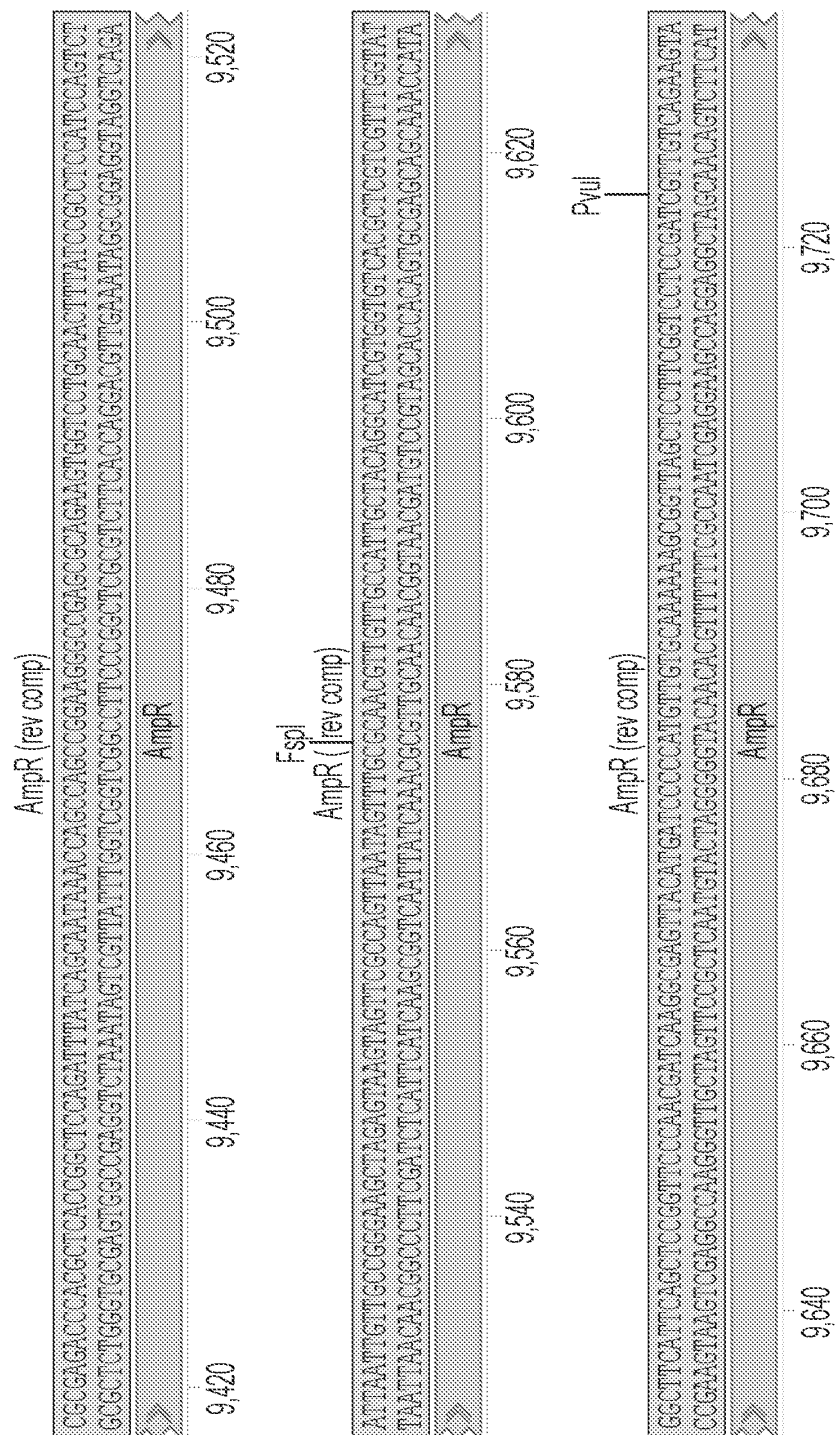
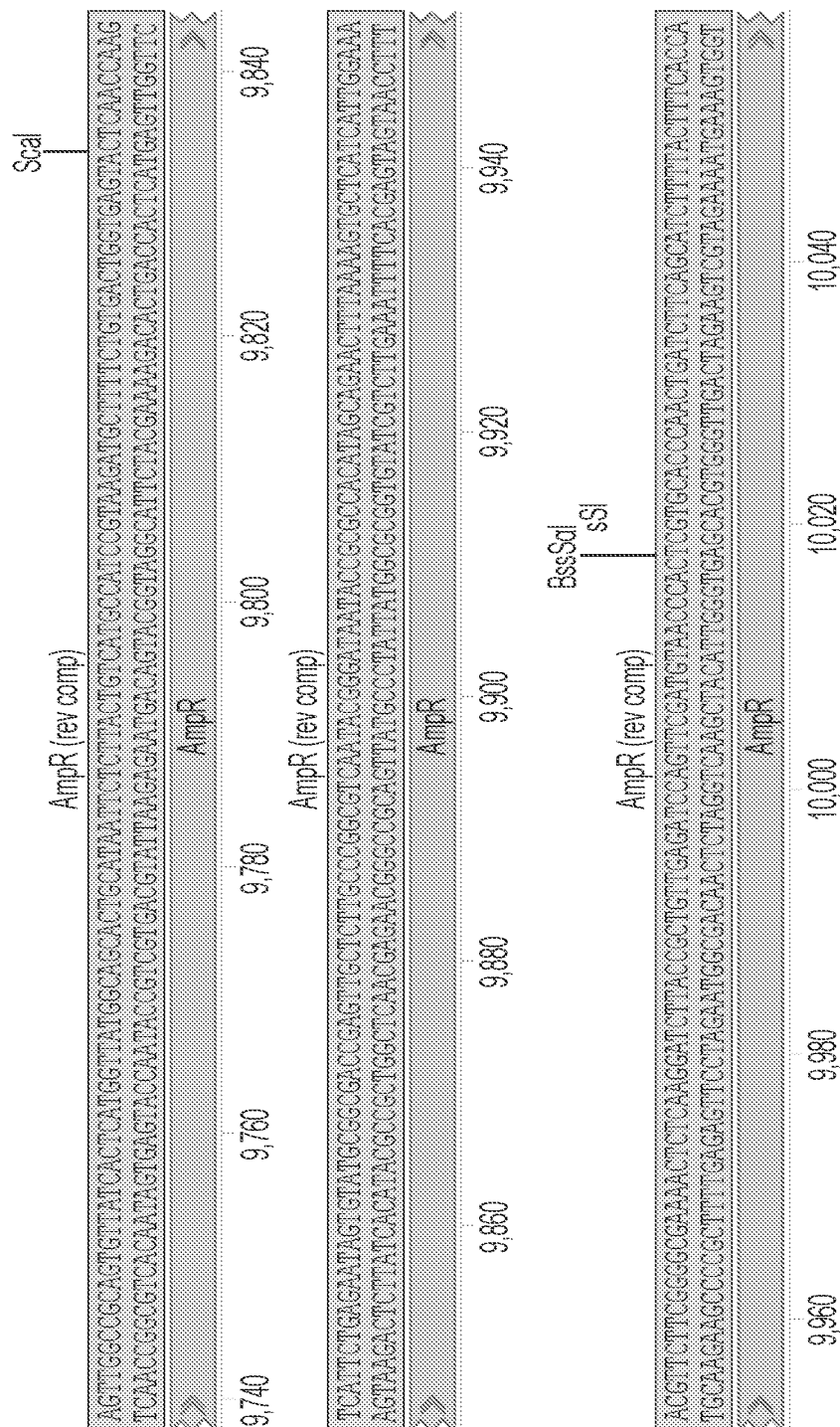
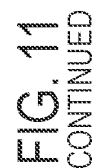


FIG. 11
CONTINUED



FIG. 11
CONTINUED

FIG. 11
CONTINUED



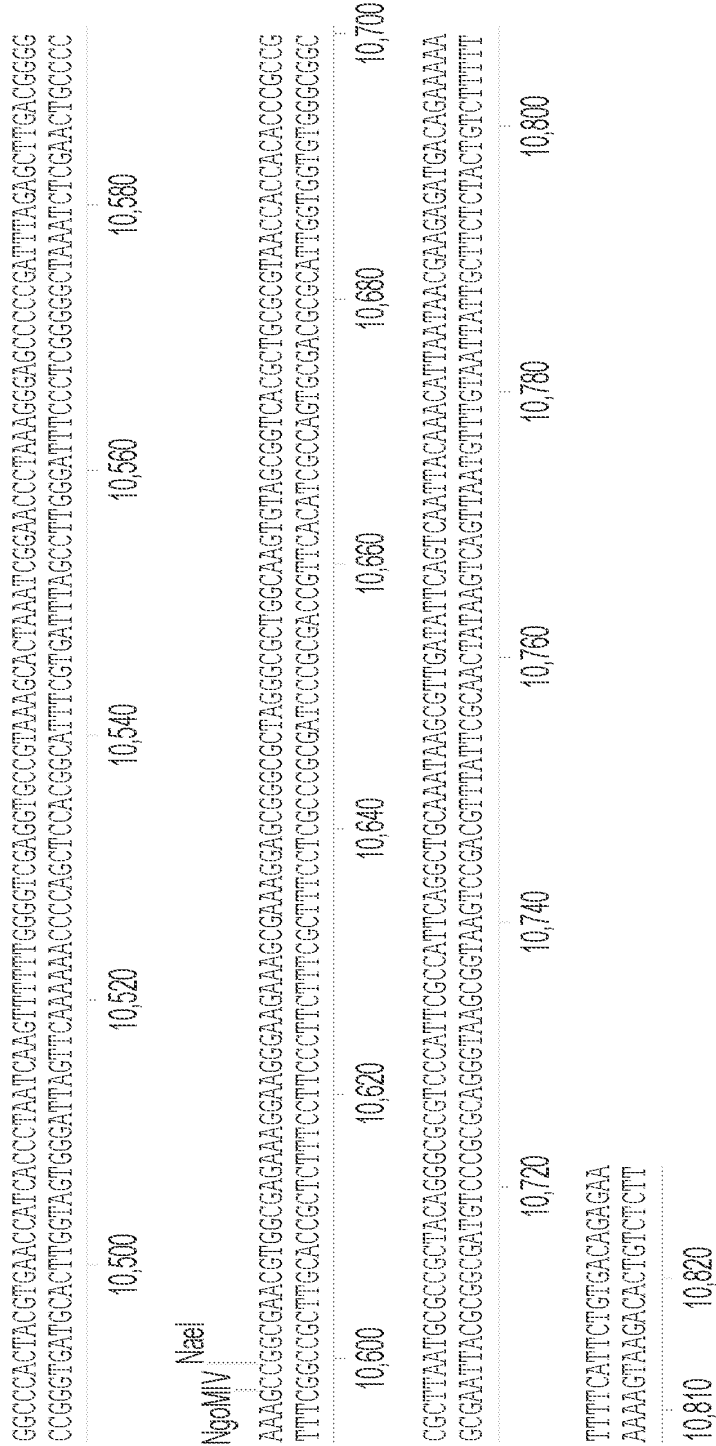


FIG. 11
CONTINUED

(SEQ ID NO: 502)



FIG. 12



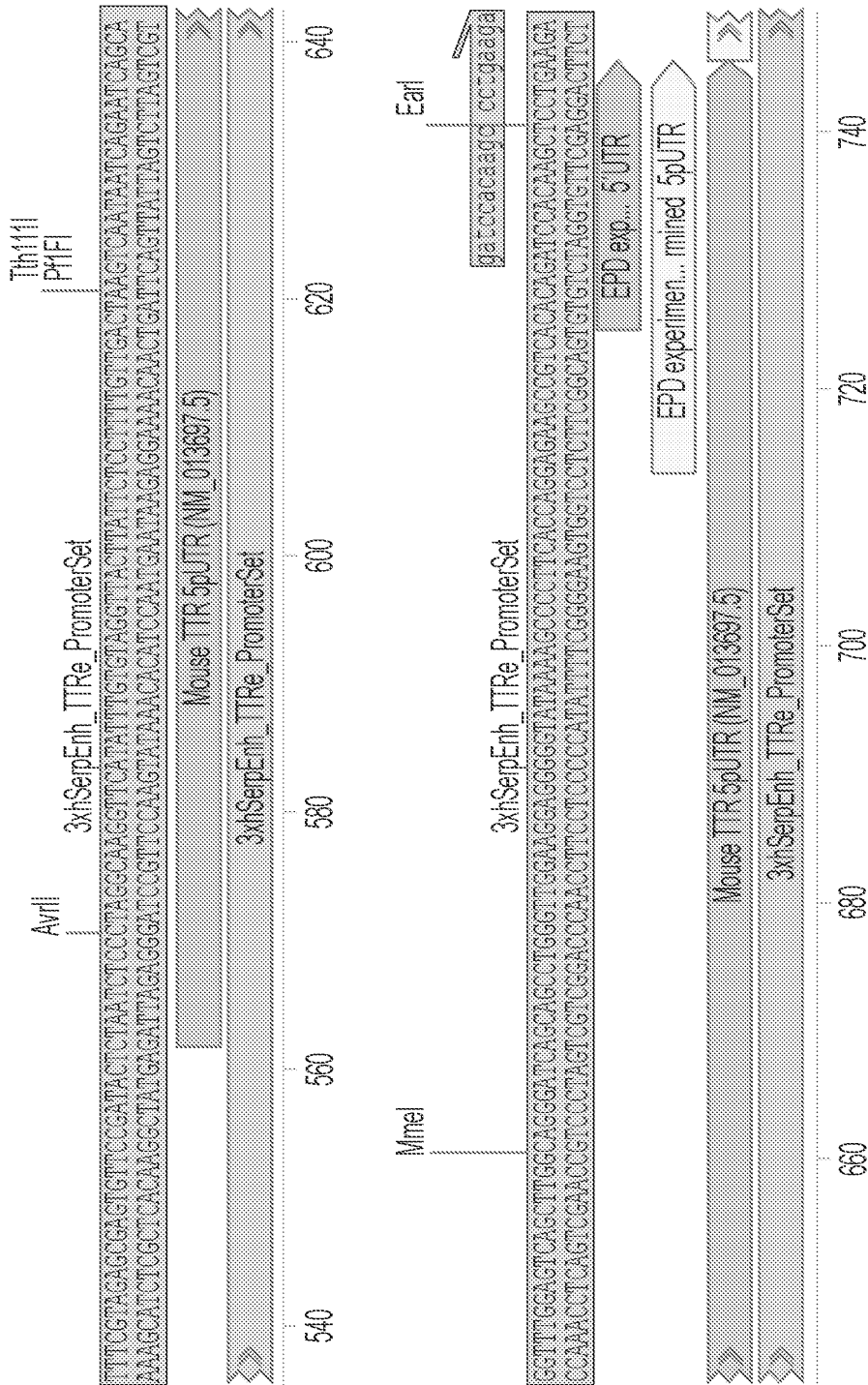


FIG. 12
CONTINUED

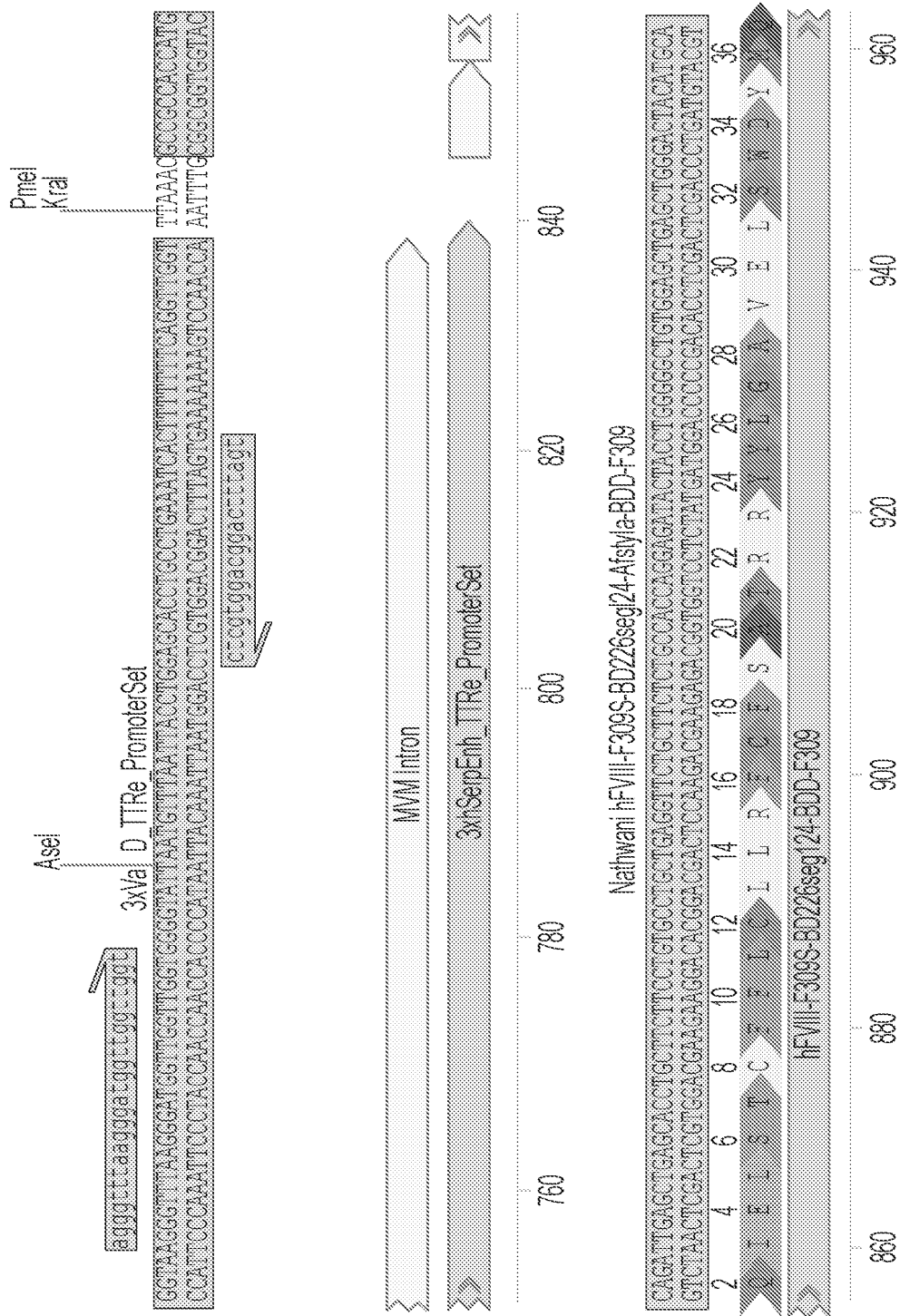
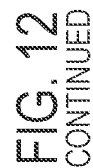
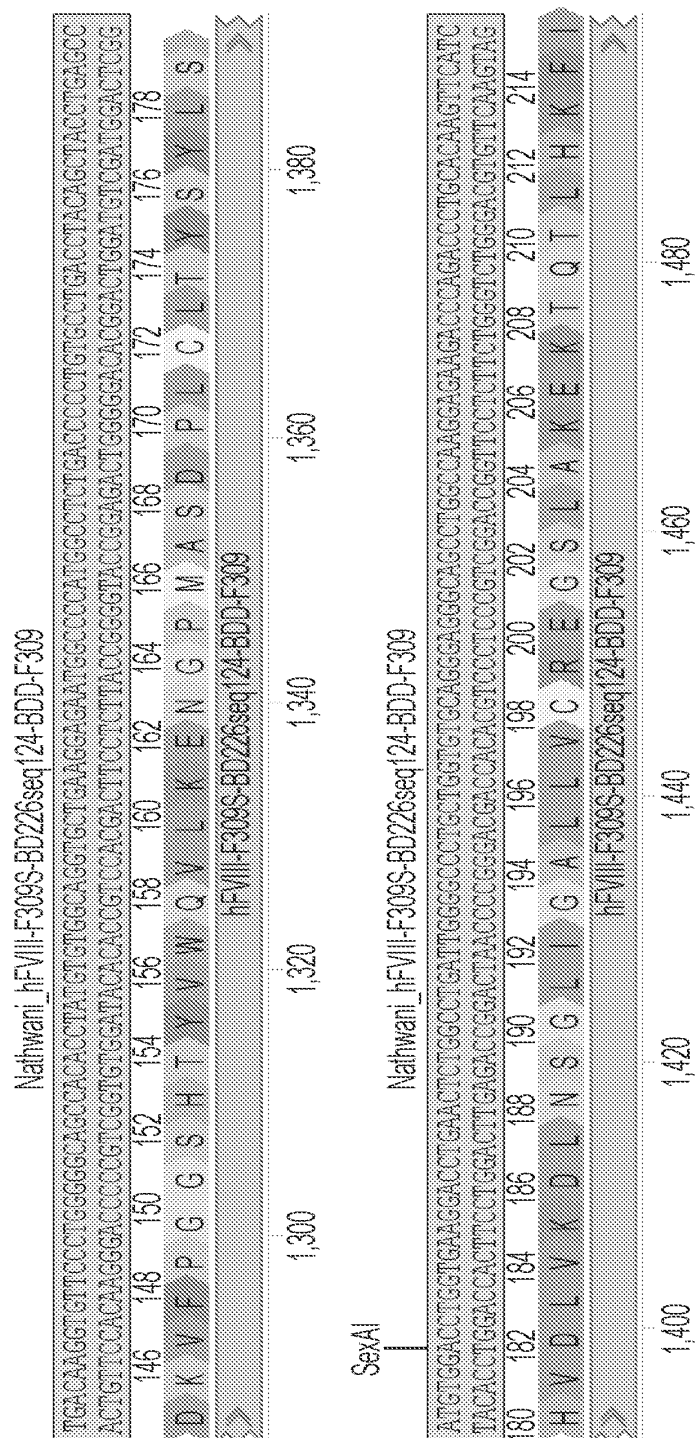


FIG. 12
CONTINUED





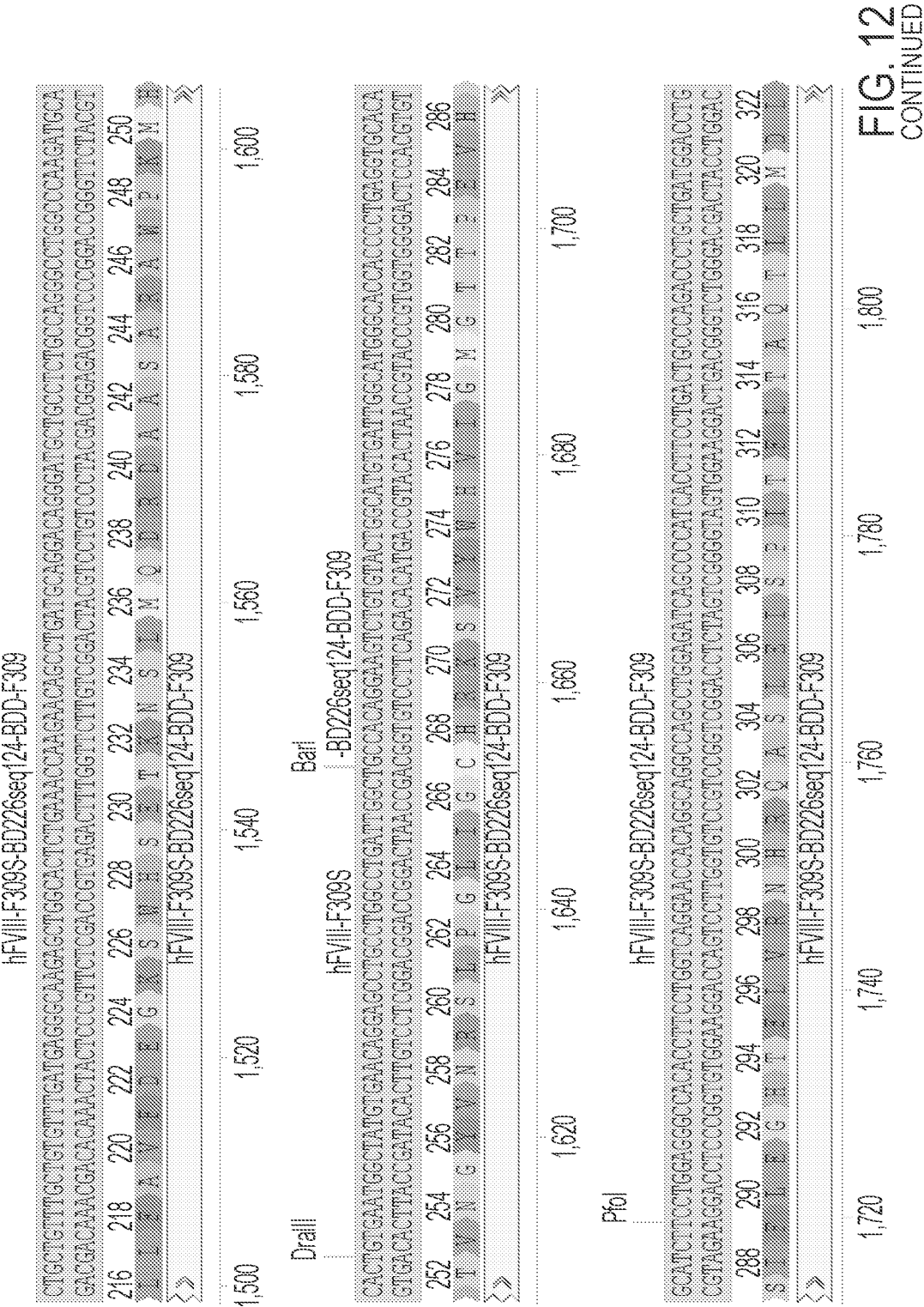


FIG. 12
CONTINUED

hFV_{III}-F309S-BD226seq124-BDD-F309

TACCCCAATGCATCACTG
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 ACCGTAGGACCGGGGGAGCACAATACCCCTCTGTGGACGACTAGTAGAAGTCTCTGGTCCGGGATGTTGTAGATGGGGGTACCGGTAGTGAC
 466 468 470 472 474 476 478 480 482 484 486 488 490 492 494 496 498 500
 G I L G P L L Y G E V G D T L L I I F K N Q A S R P Y N I Y P H G I T
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 2260 2280 2300 2320 2340

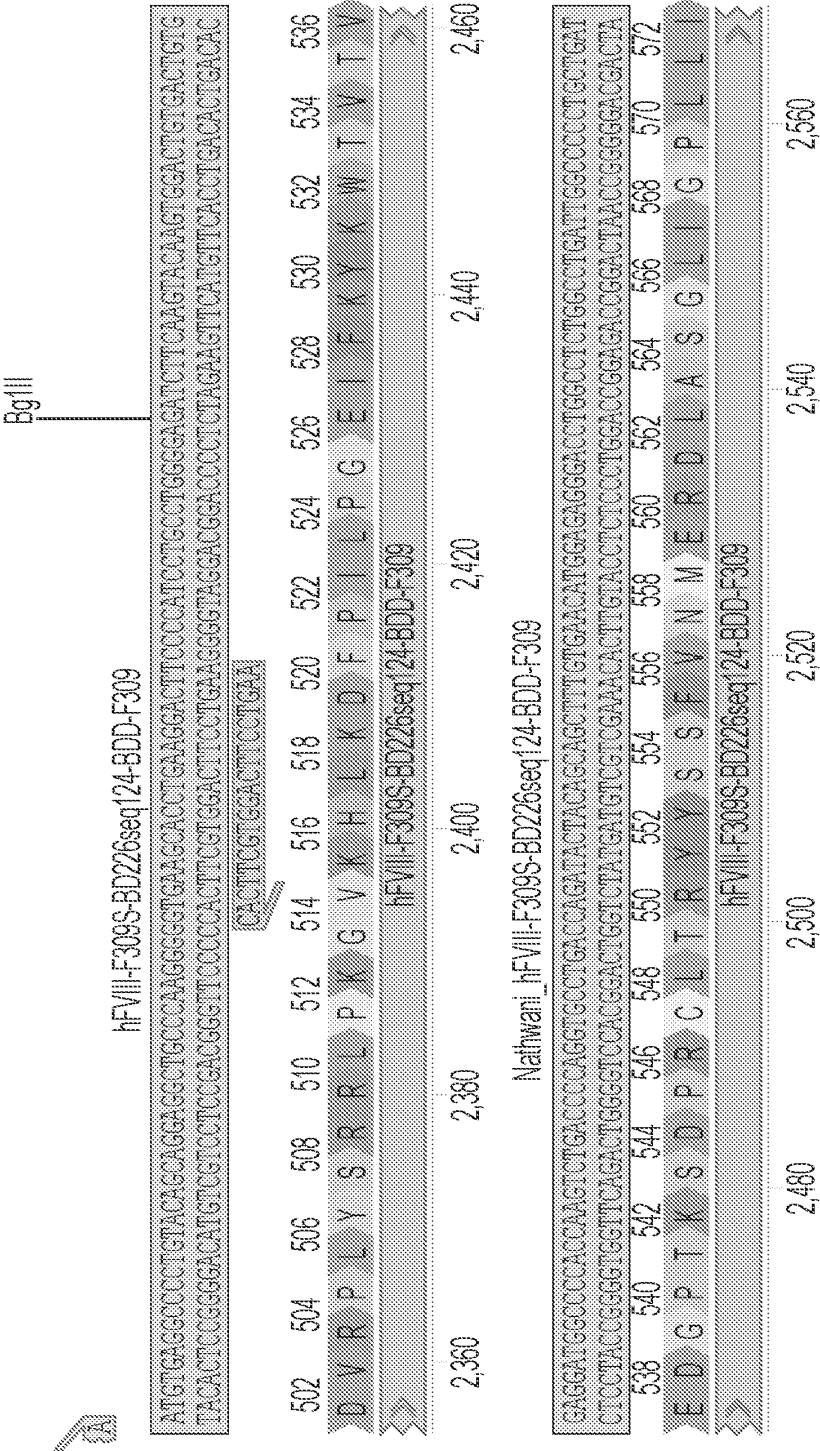


FIG. 12
CONTINUED

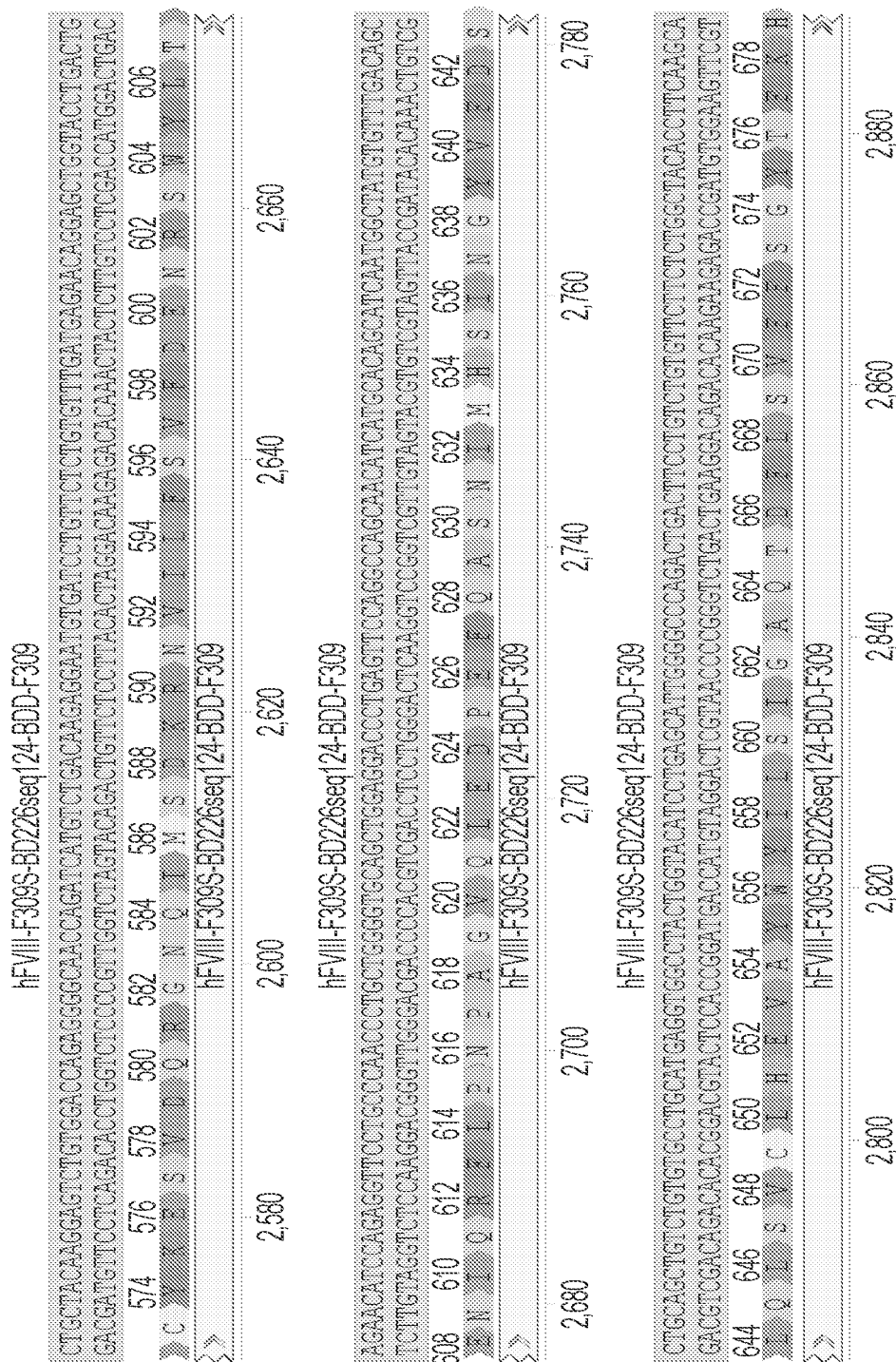


FIG. 12
CONTINUED

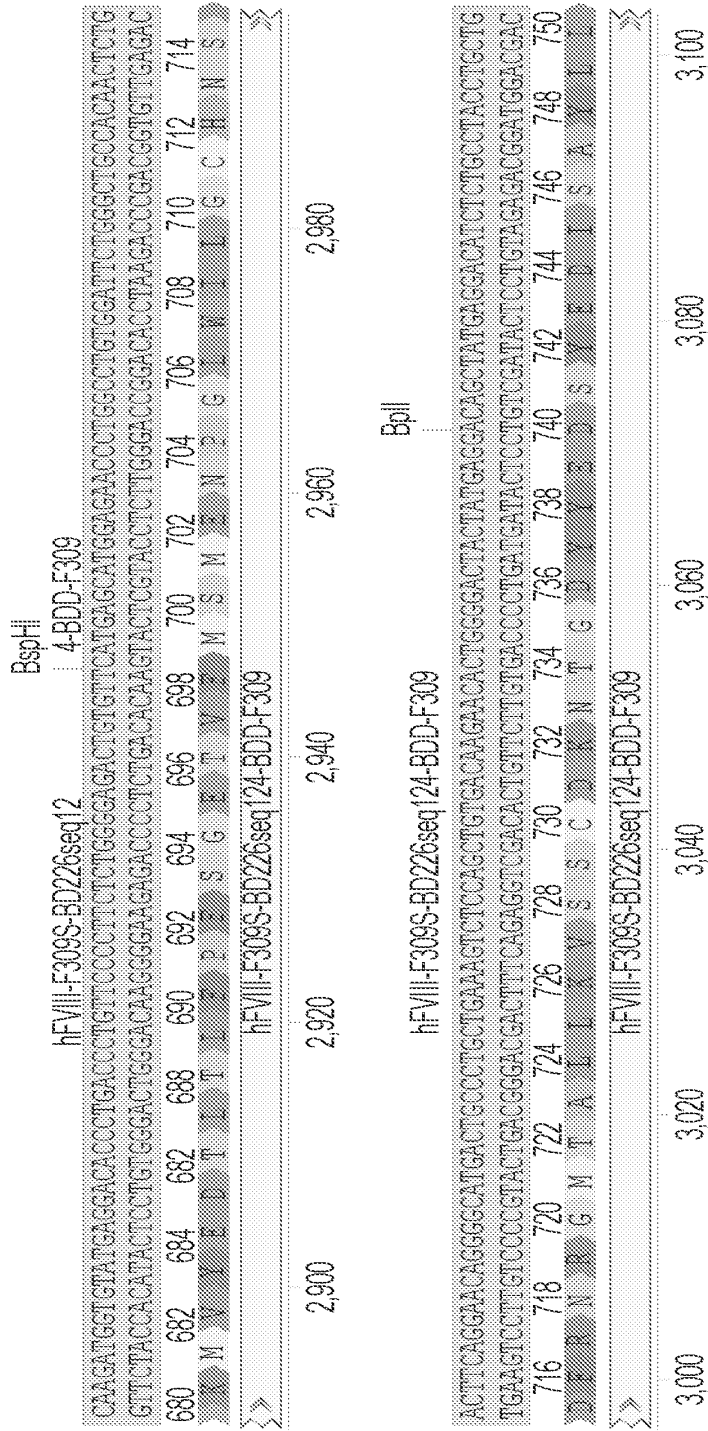
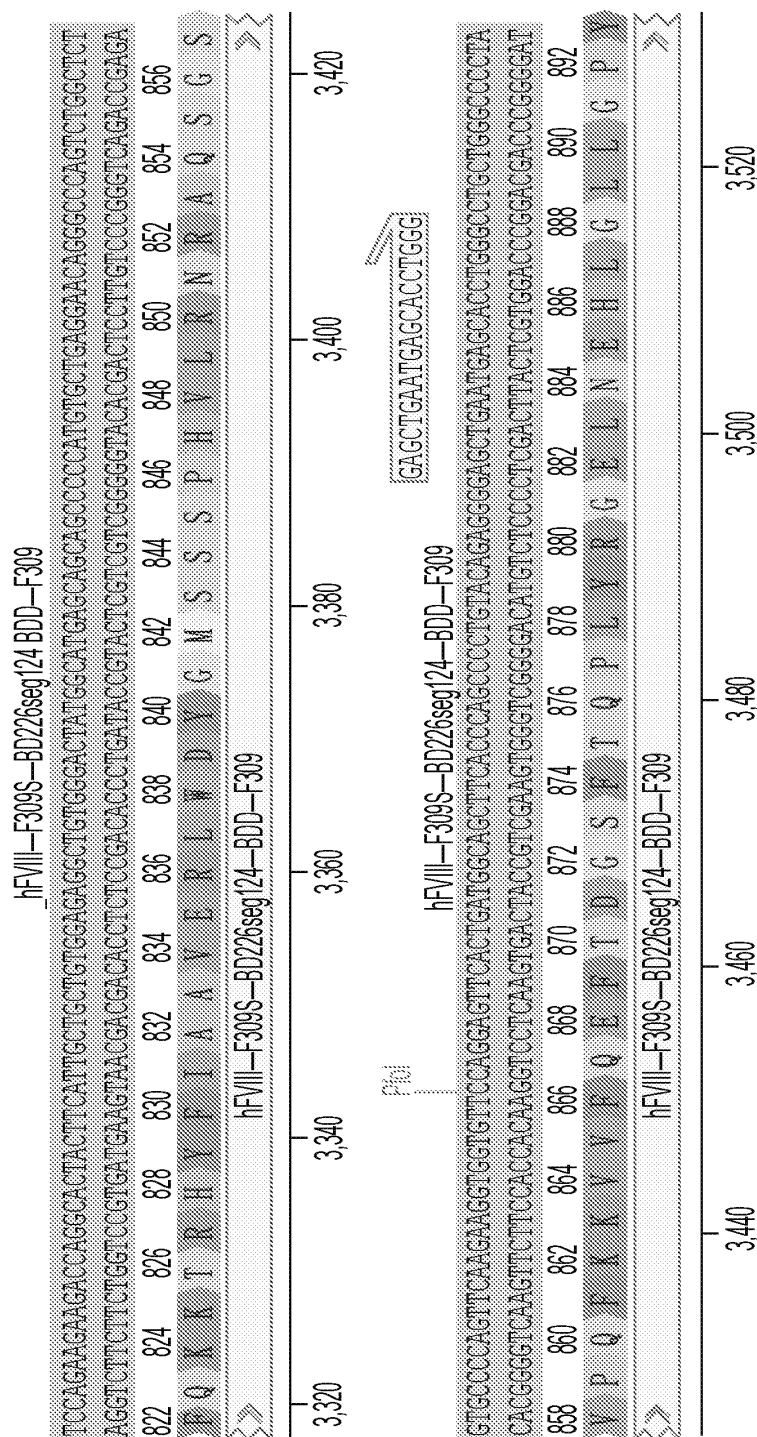


FIG. 12
CONTINUED

FIG. 12
CONTINUED



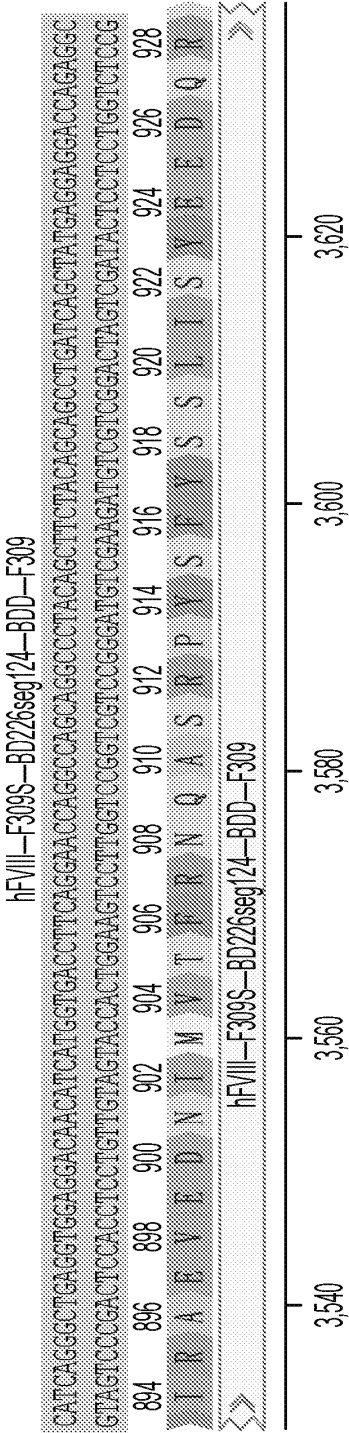


FIG. 12
CONTINUED

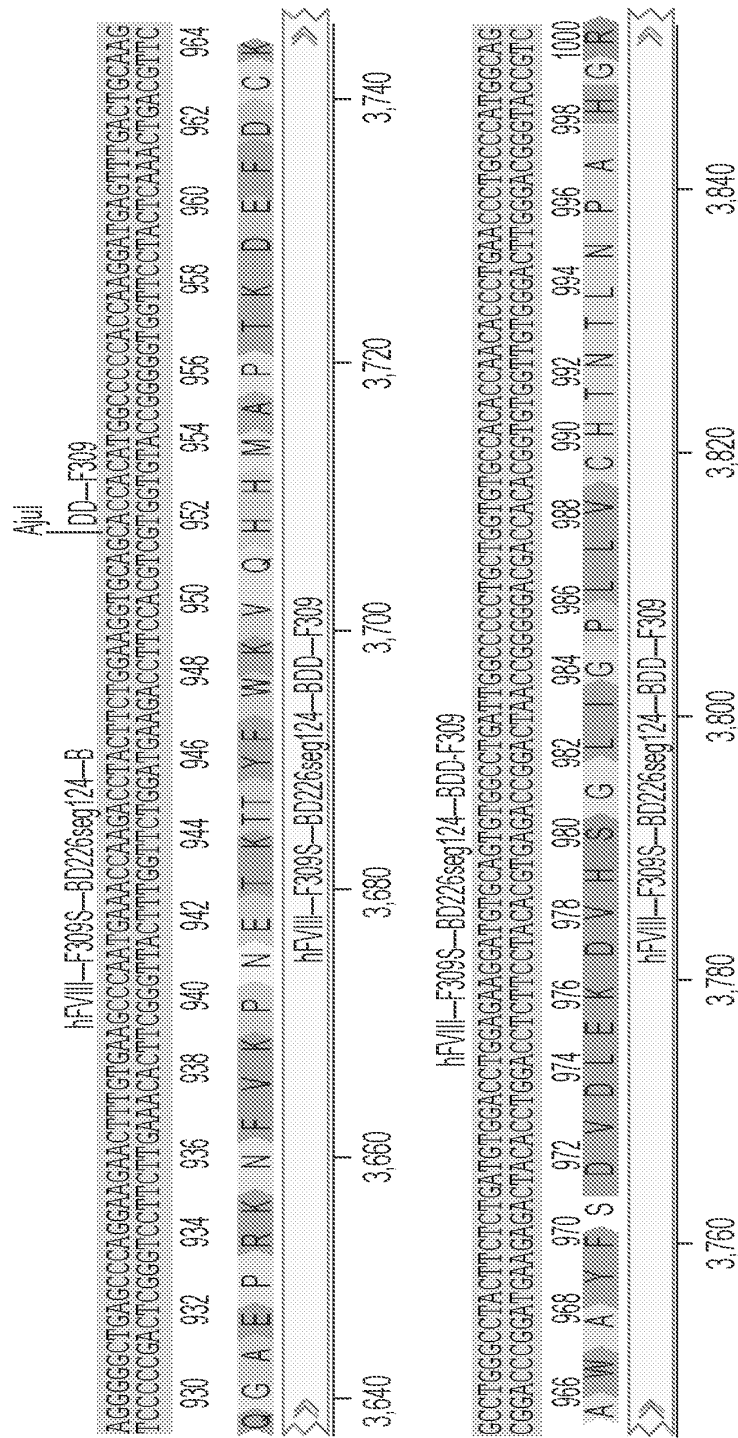


FIG. 12
CONTINUED

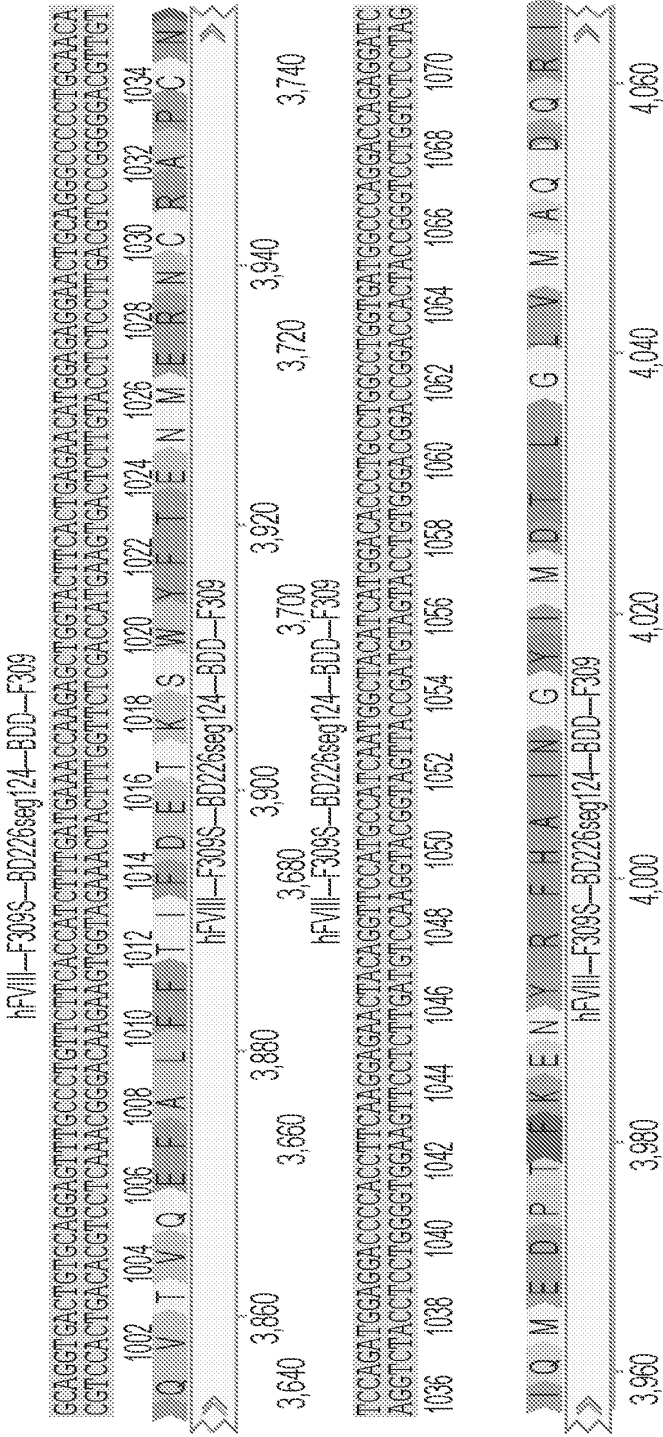
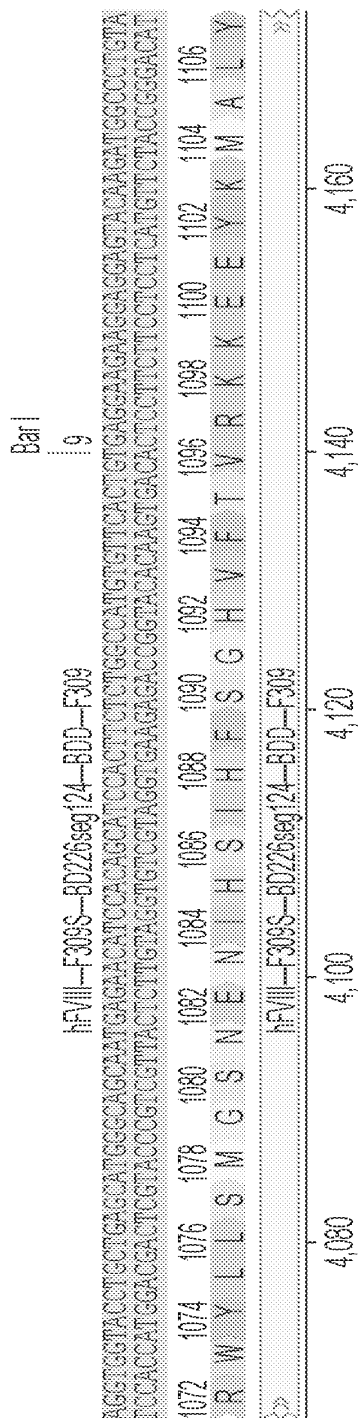


FIG. 12
CONTINUED



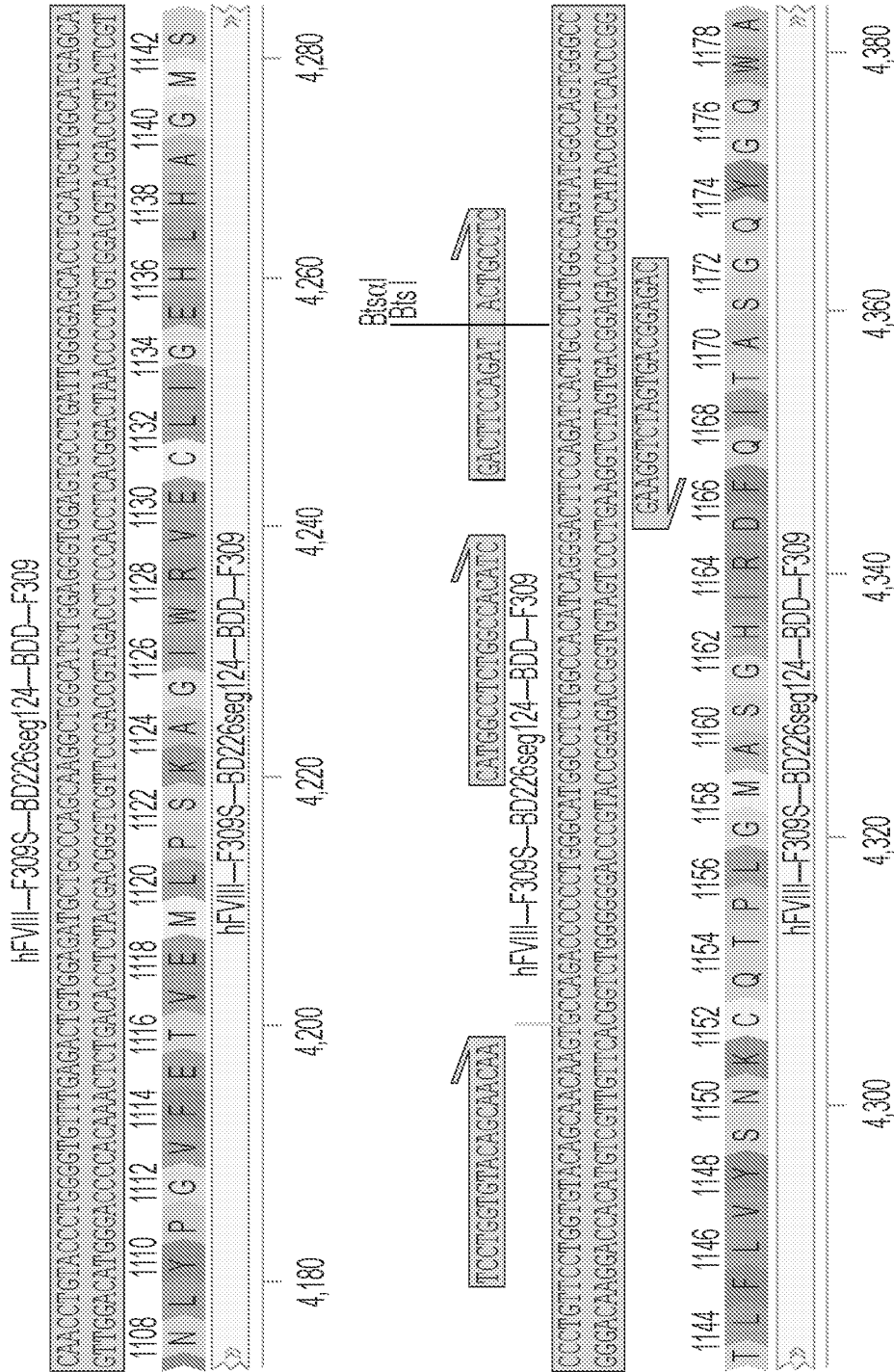


FIG. 12
CONTINUED

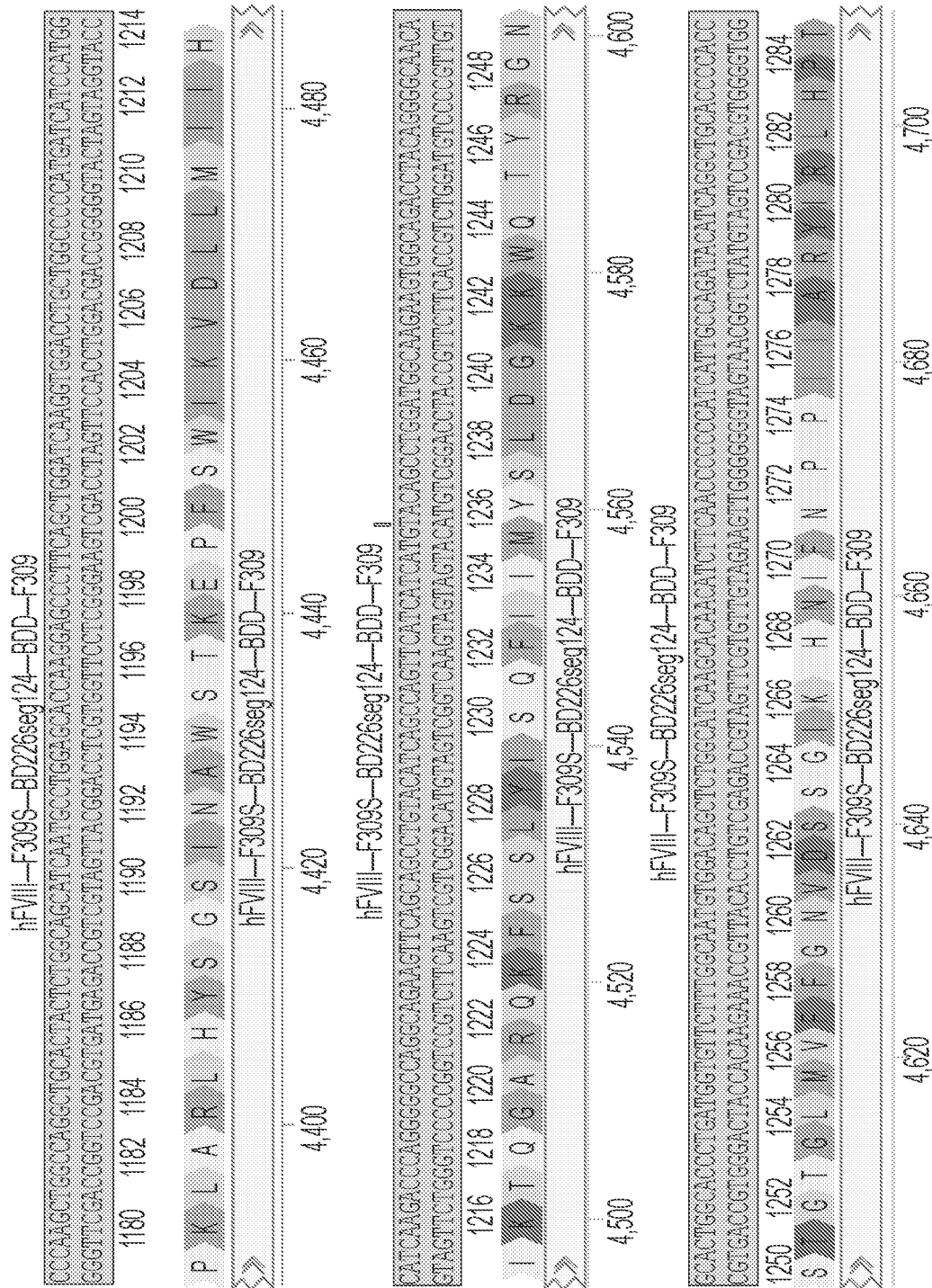
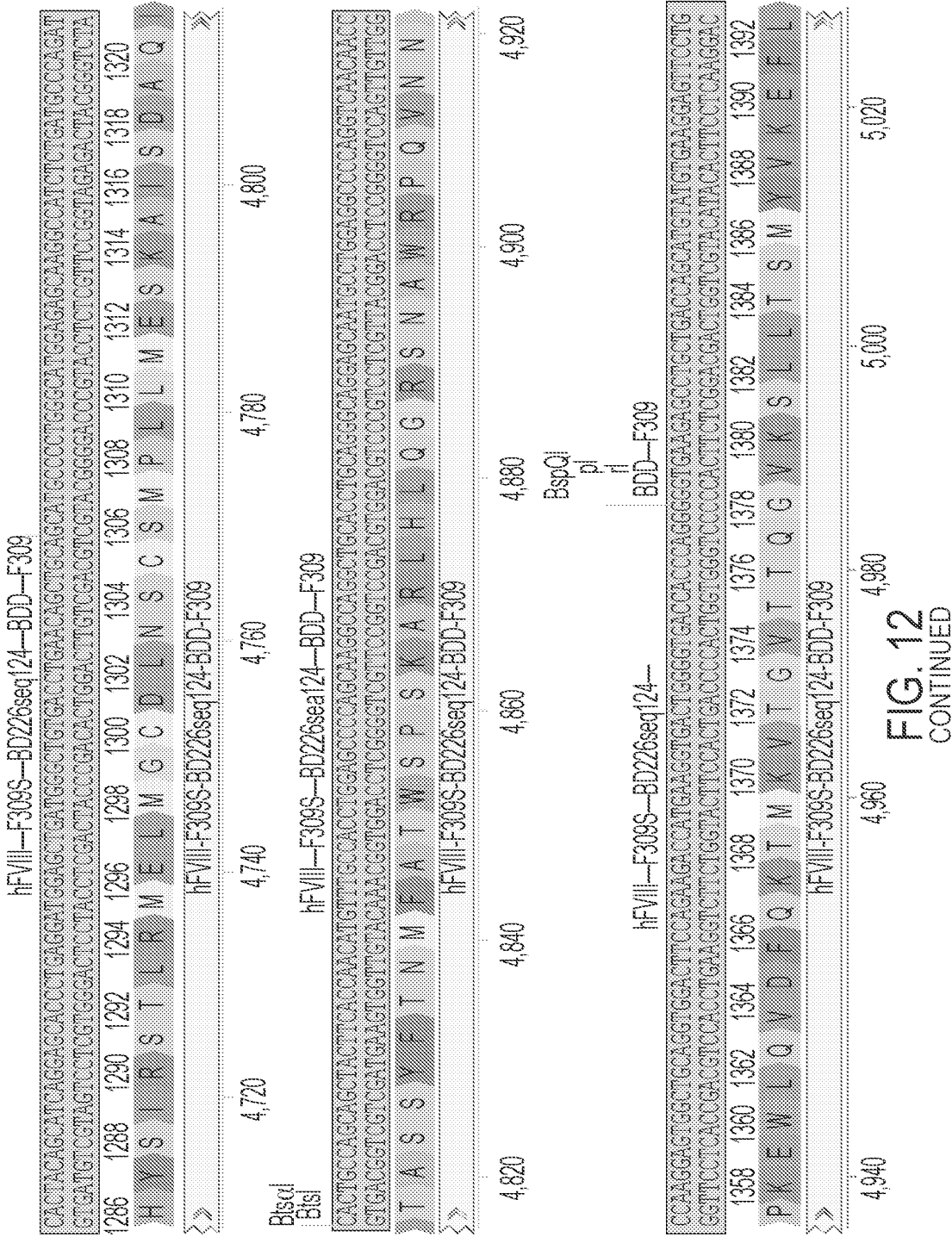


FIG. 12
CONTINUED



5,140	5,160	5,180	5,200	5,220	5,240
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FIG. 12
CONTINUED

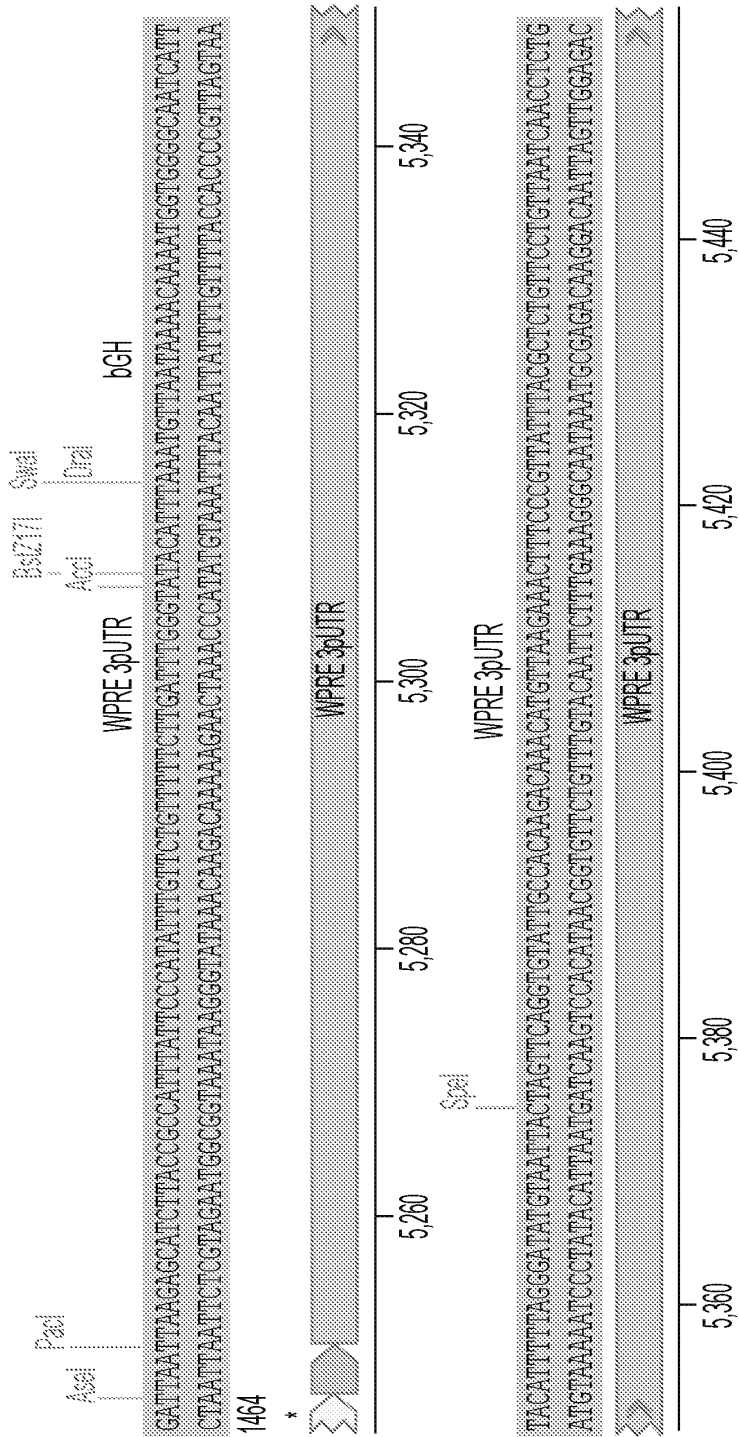


FIG. 12
CONTINUED

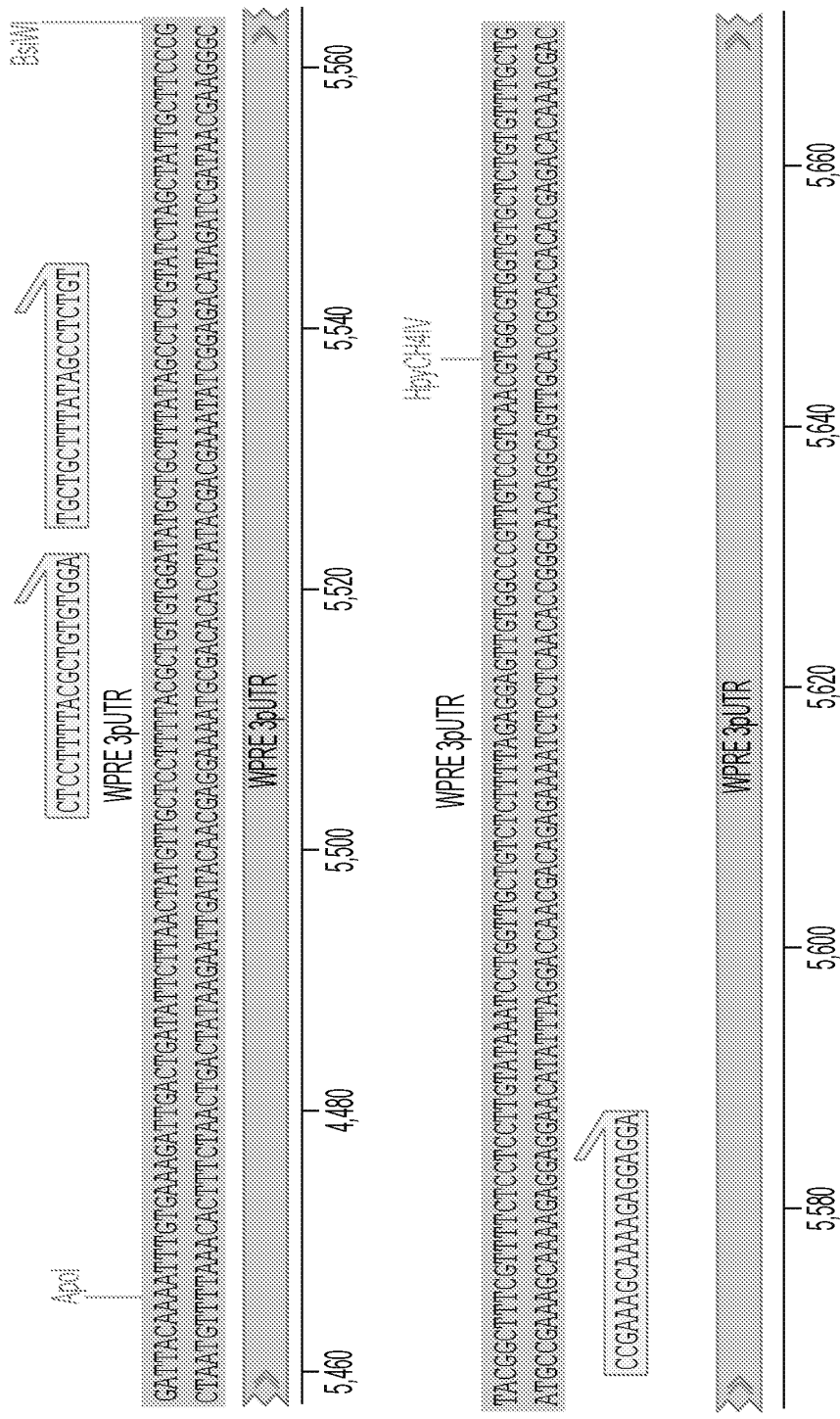


FIG.12
CONTINUED

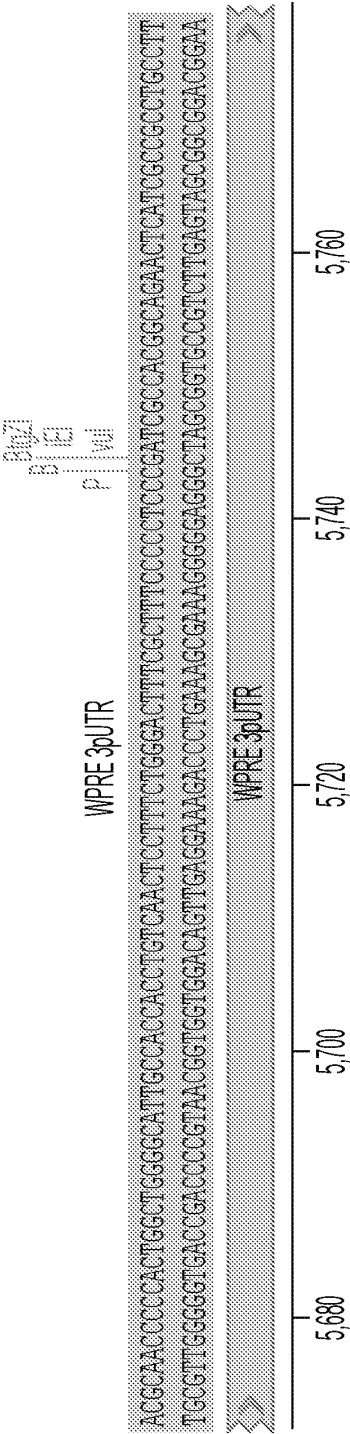
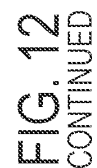


FIG. 12
CONTINUED



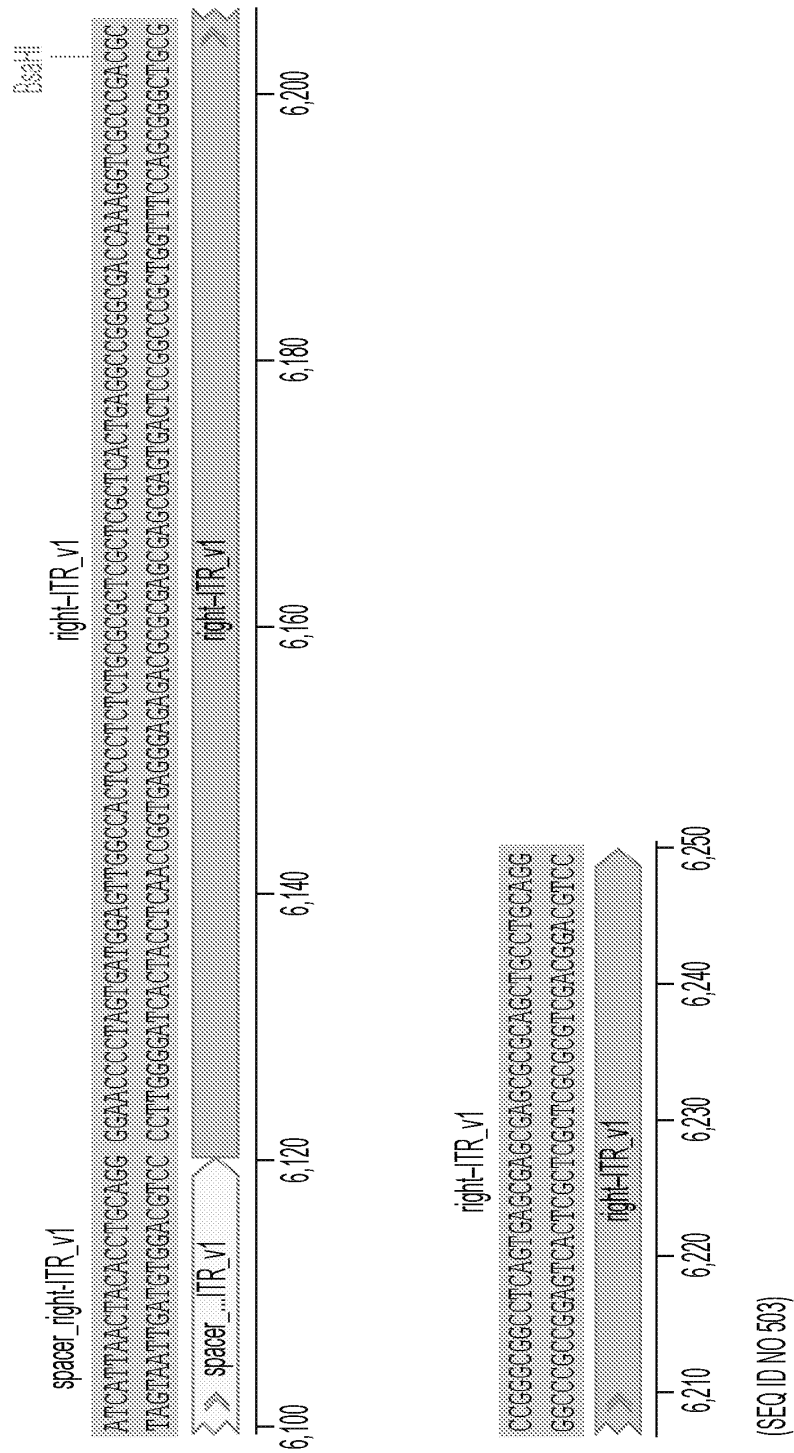


FIG. 12
CONTINUED

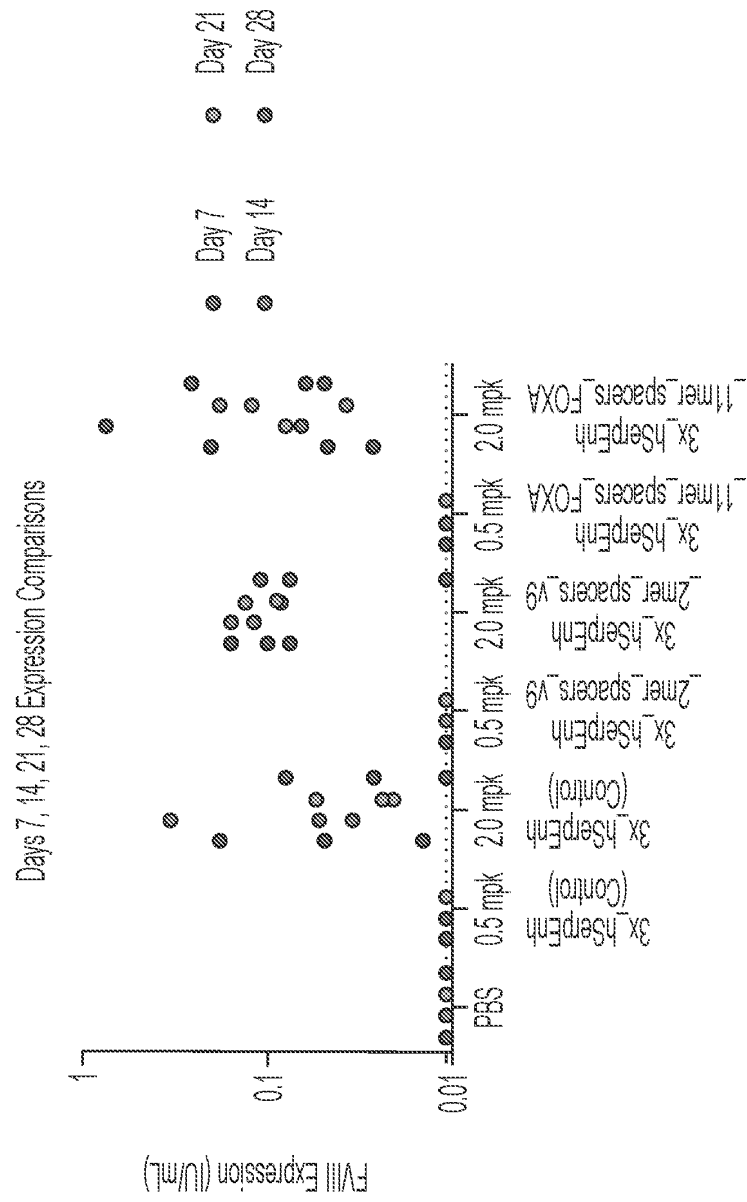


FIG. 13

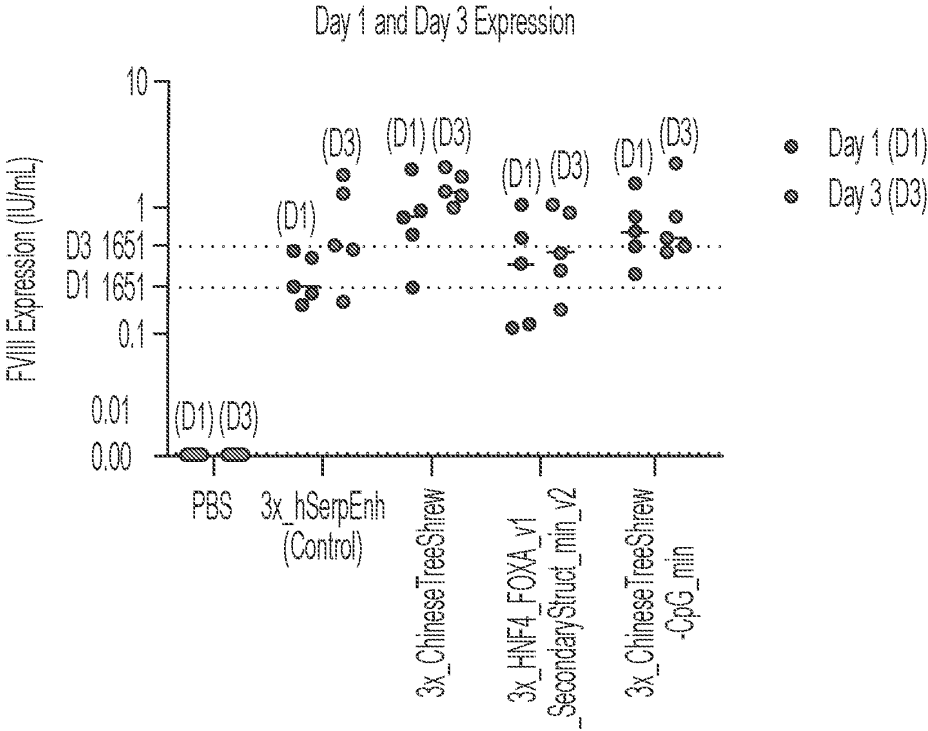


FIG. 14

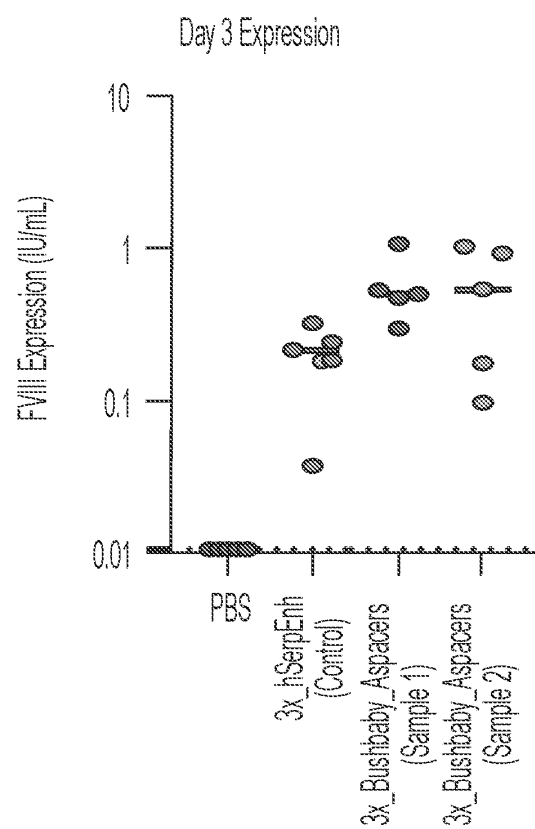
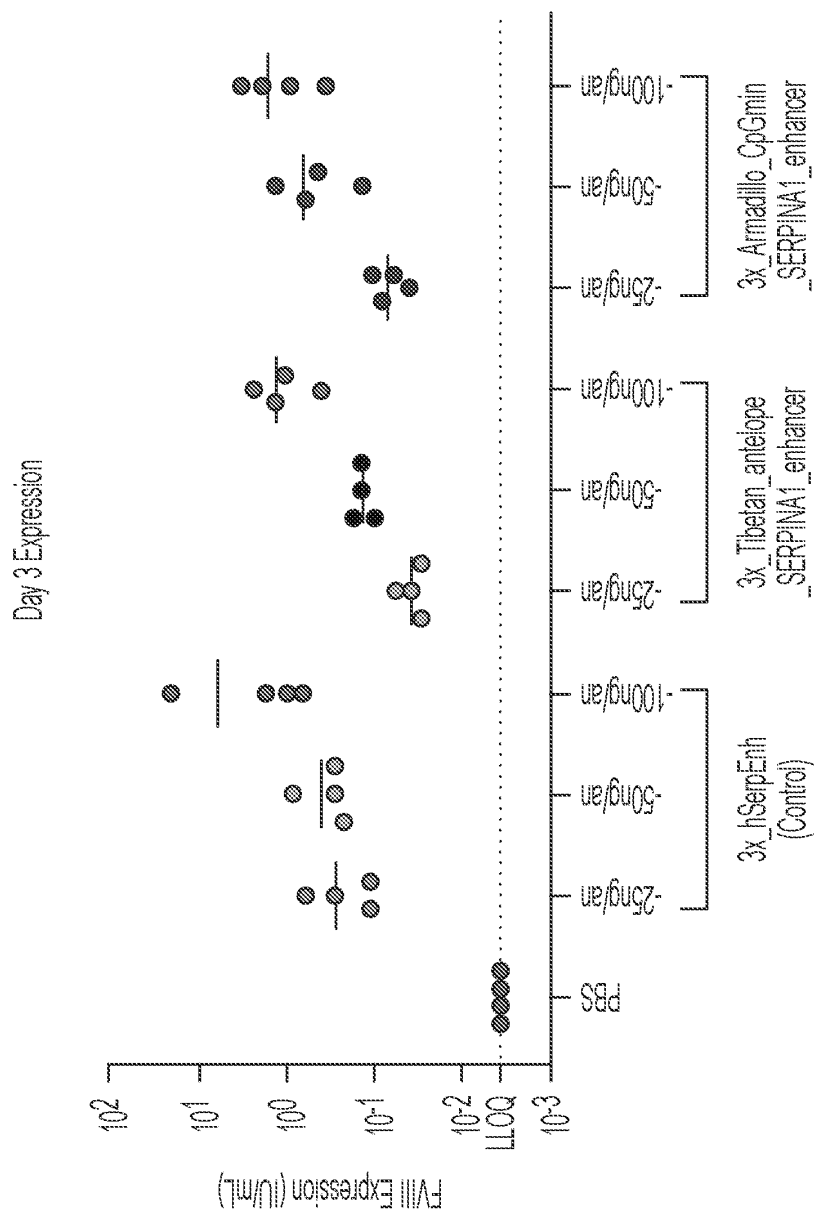
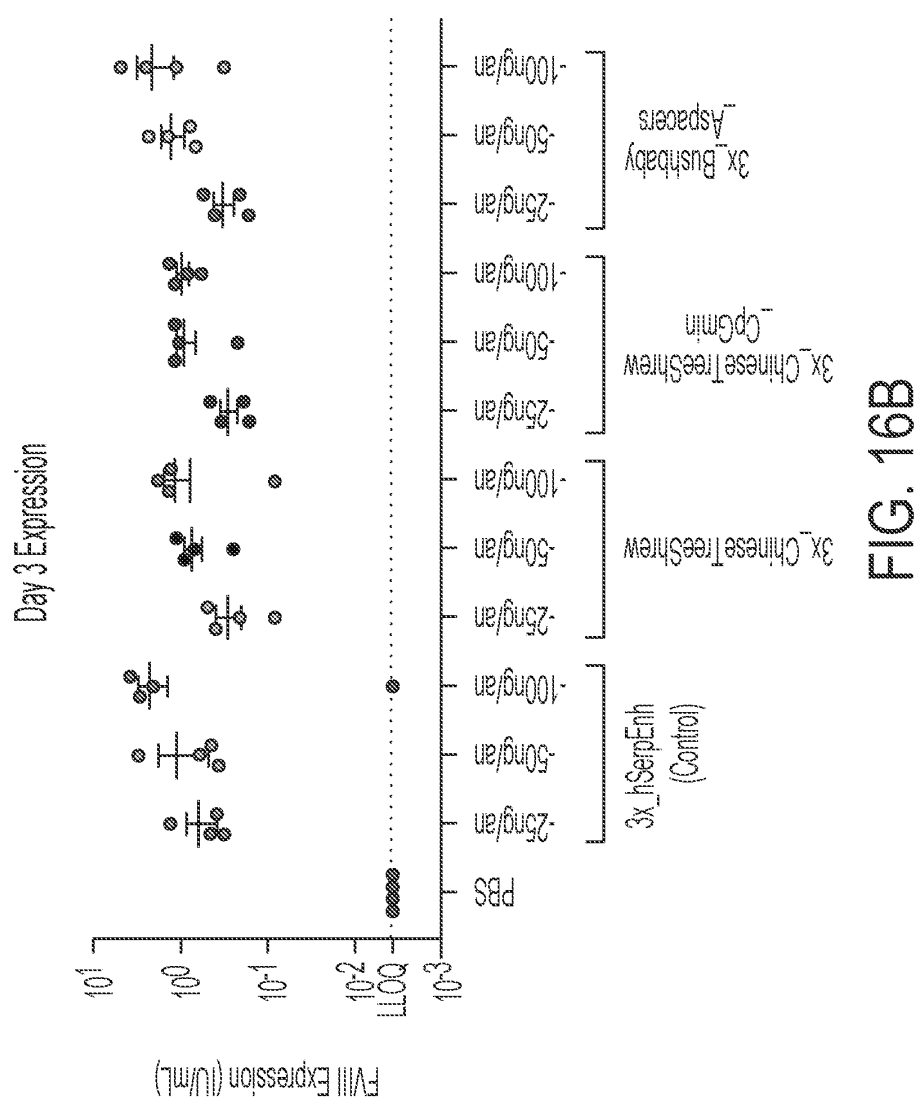


FIG. 15





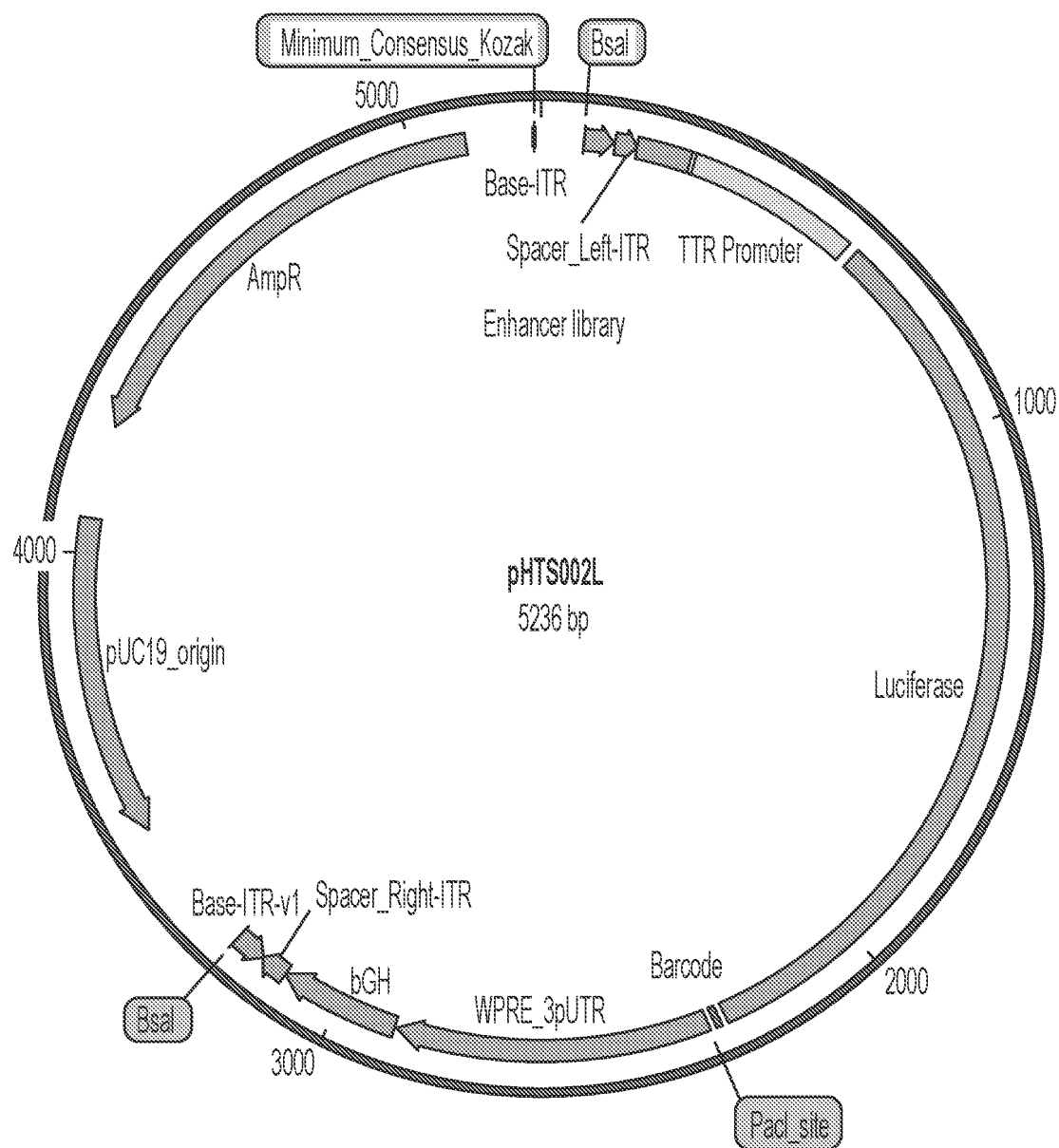


FIG. 17

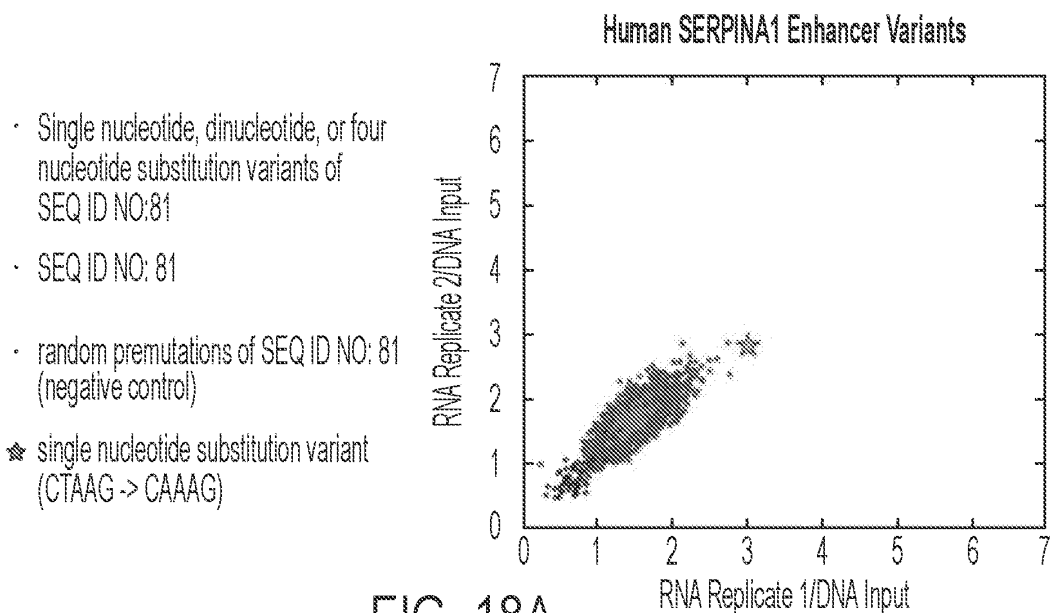


FIG. 18A

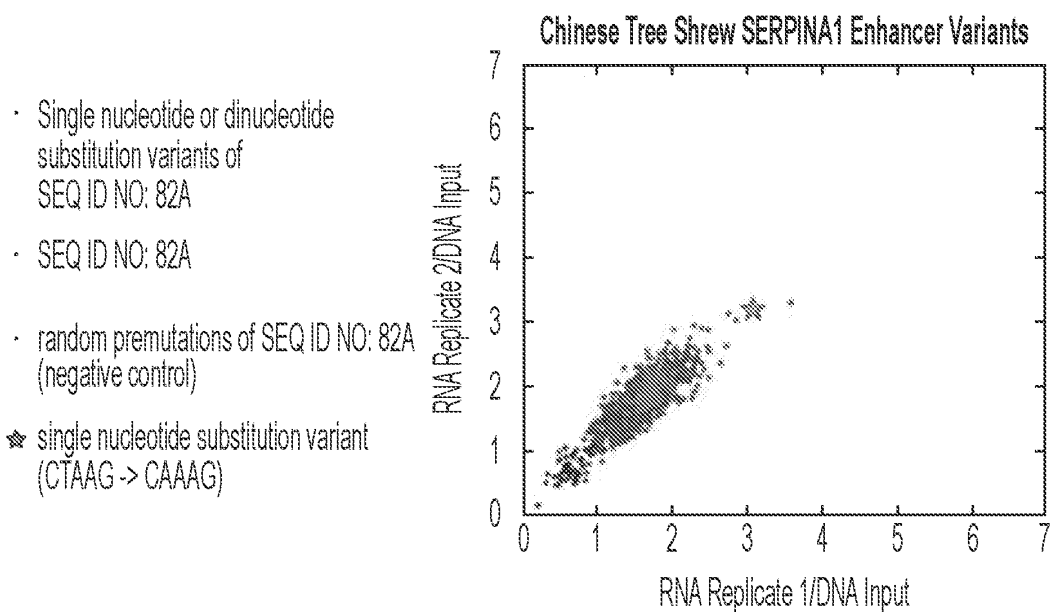


FIG. 18B

- Single nucleotide, dinucleotide, or four nucleotide substitution variants of SEQ ID NO: 83
- SEQ ID NO: 83
- random permutations of SEQ ID NO: 83 (negative control)
- ✦ single nucleotide substitution variant (CTAAG -> CAAAG)

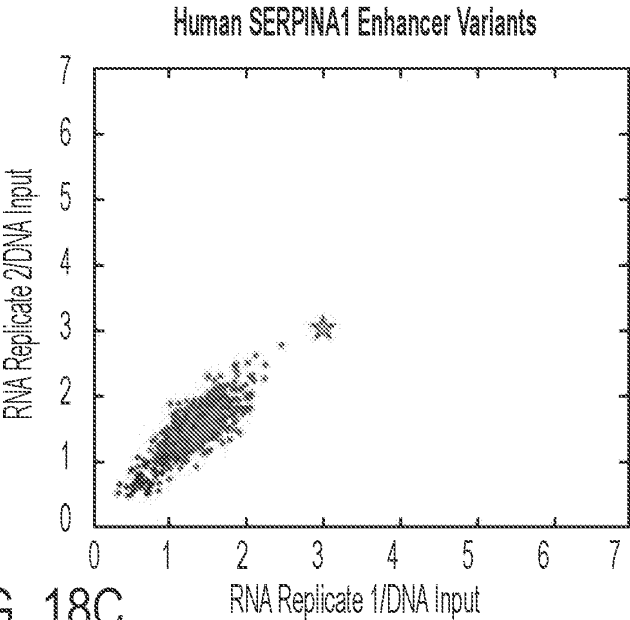


FIG. 18C

- Single nucleotide or dinucleotide substitution variants of SEQ ID NO: 85
- SEQ ID NO: 85
- random permutations of SEQ ID NO: 85 (negative control)
- ✦ single nucleotide substitution variant (CTAAG -> CAAAG)

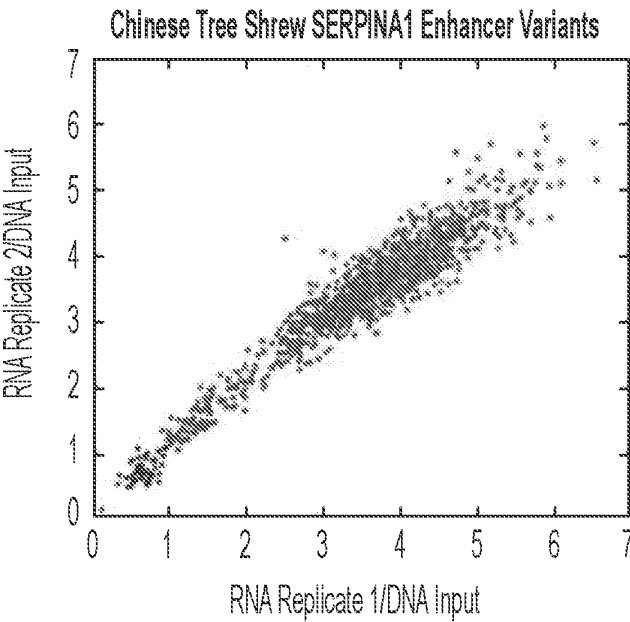
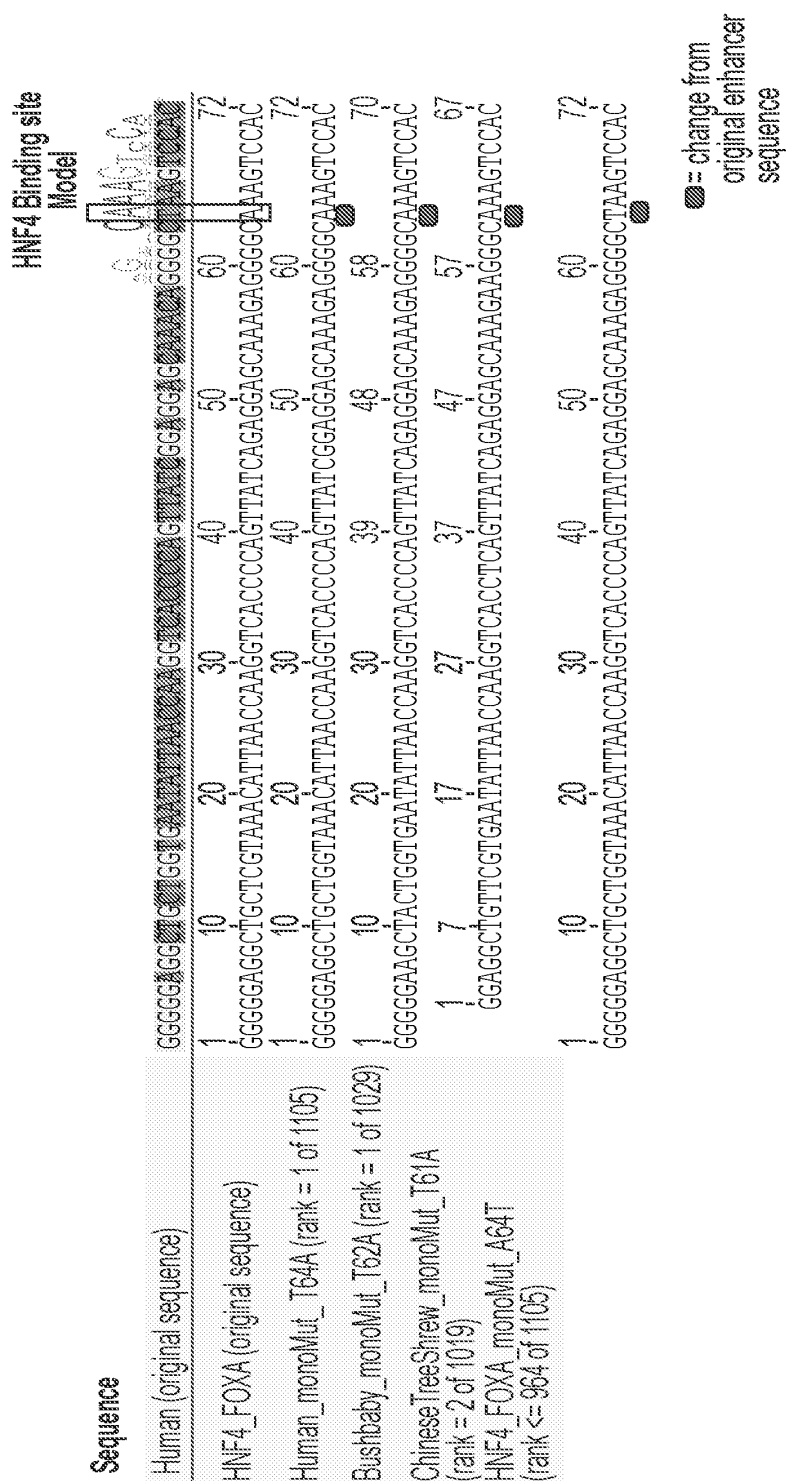


FIG. 18D



9
10