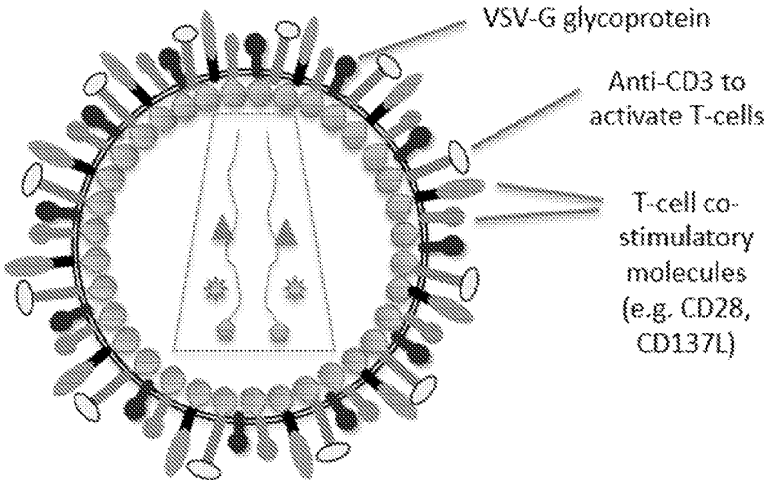

VSV-G glycoprotein
Anti-CD3 to activate T-cells
T-cell co-stimulatory molecules (e.g. CD28, CD137L)

FIG. 1A

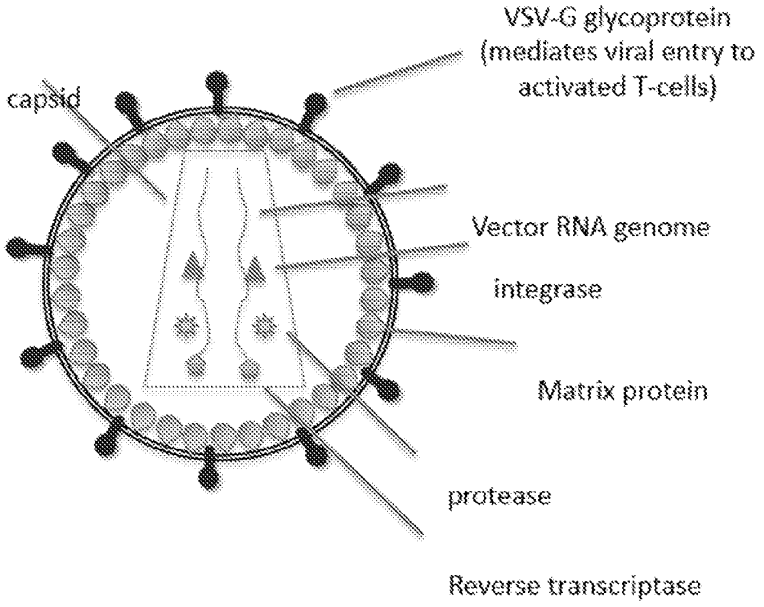

VSV-G glycoprotein (mediates viral entry to activated T-cells)
capsid
Vector RNA genome
integrase
Matrix protein
protease
Reverse transcriptase

FIG. 1B

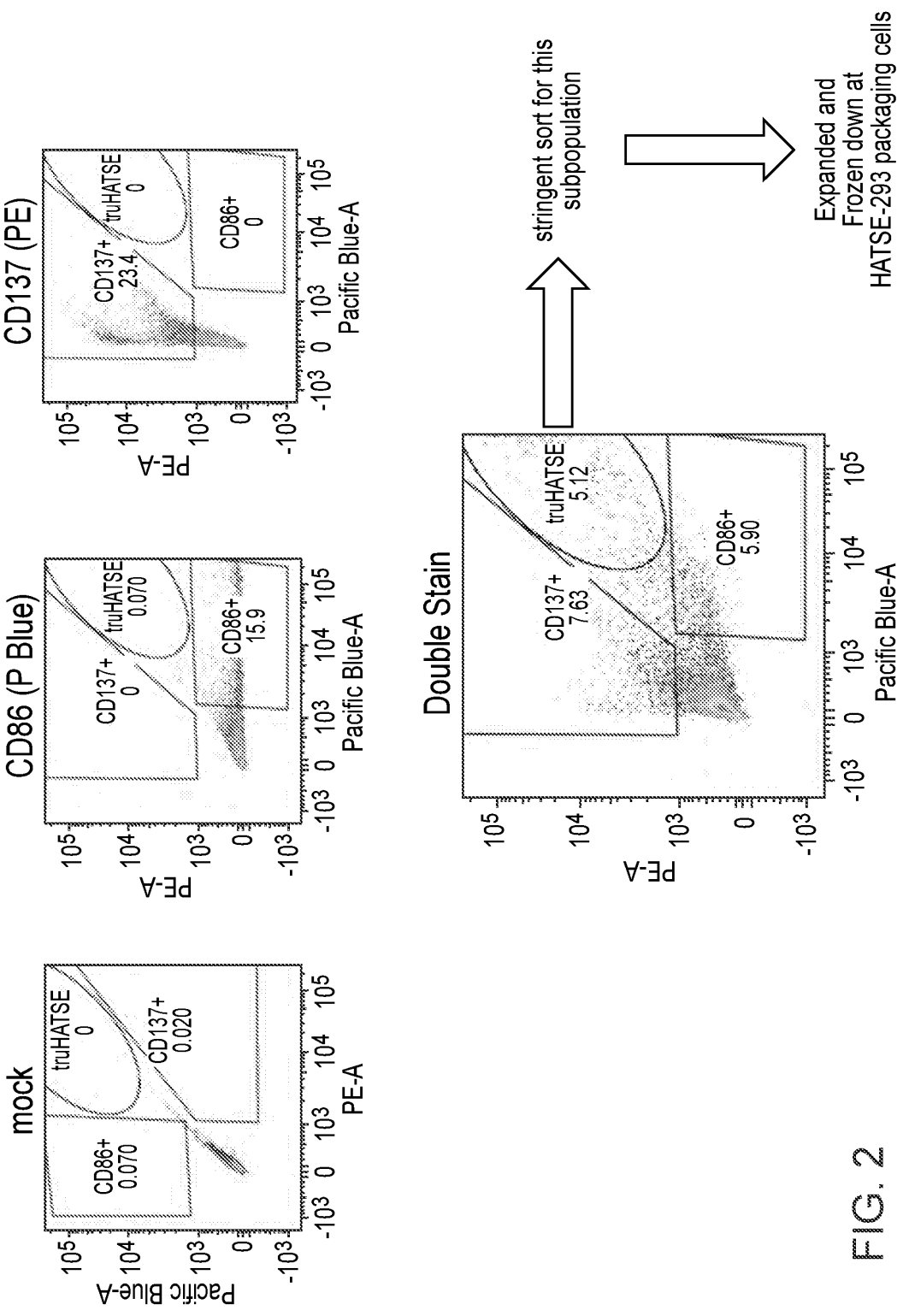

mock
truHATSE
0
CD137+
0.020
CD86+
0.070
Pacific Blue-A
PE-A
CD86 (P Blue)
truHATSE
0.070
CD137+
0
CD86+
15.9
PE-A
Pacific Blue-A
CD137 (PE)
truHATSE
0
CD137+
23.4
CD86+
0
PE-A
Pacific Blue-A
Double Stain
truHATSE
5.12
CD137+
7.63
CD86+
5.90
PE-A
Pacific Blue-A
stringent sort for this subpopulation
Expanded and Frozen down at HATSE-293 packaging cells

FIG. 2

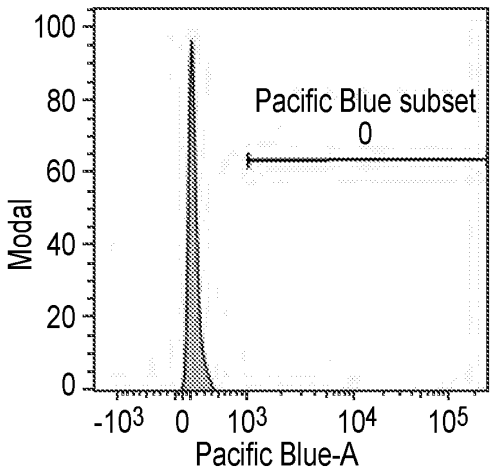


FIG. 3A

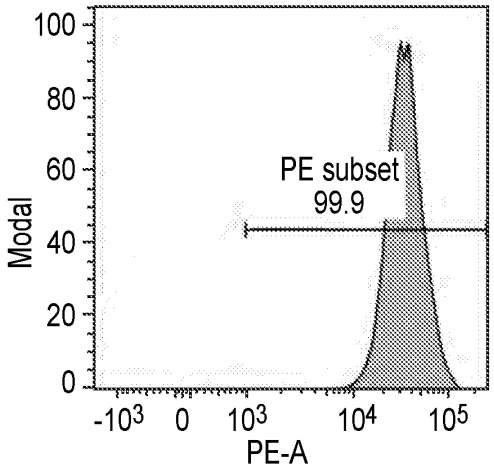


FIG. 3B

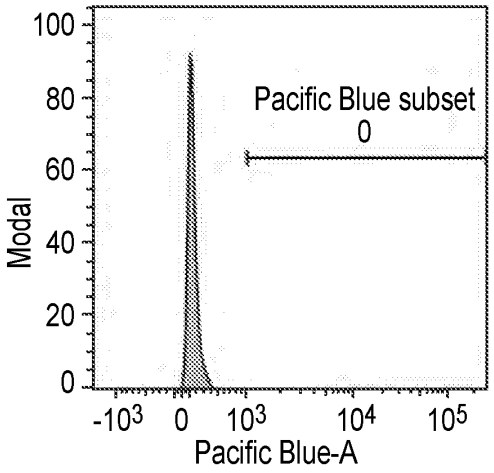


FIG. 3C

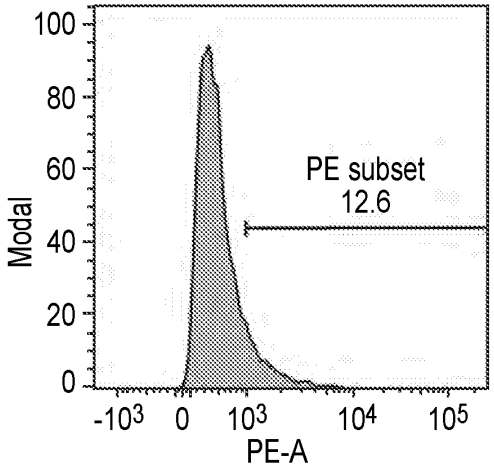


FIG. 3D

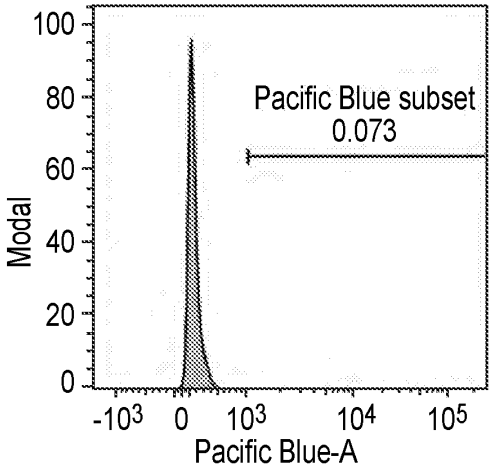


FIG. 3E

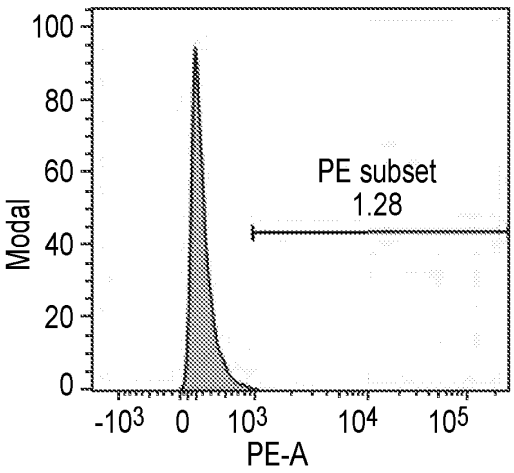


FIG. 3F

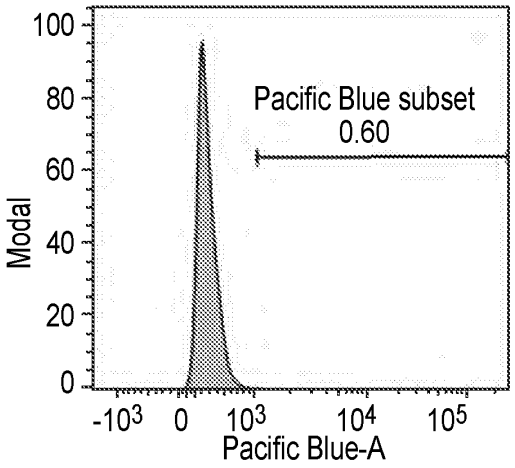


FIG. 3G

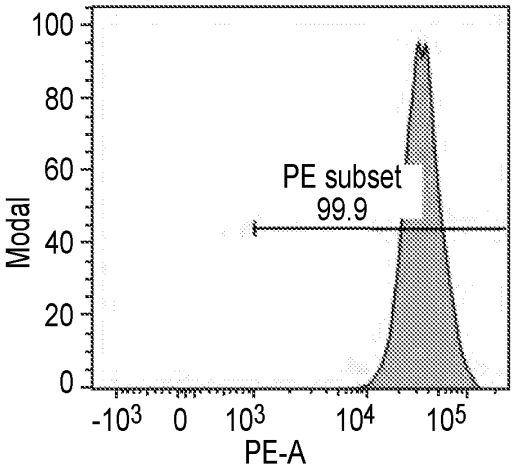


FIG. 3H

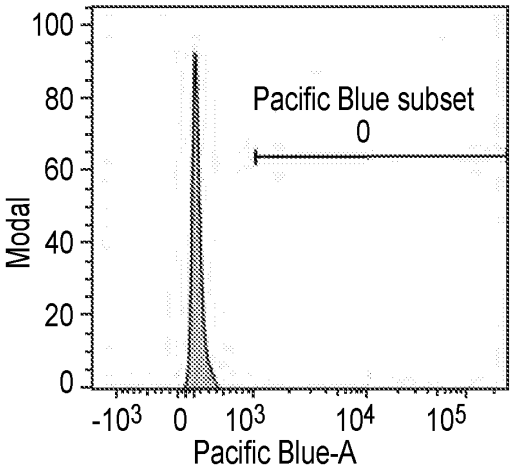


FIG. 3I

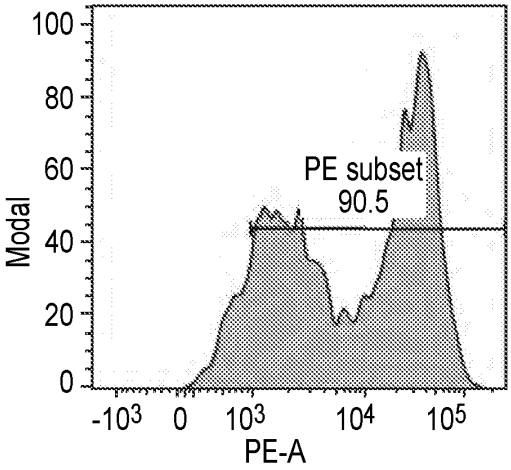


FIG. 3J

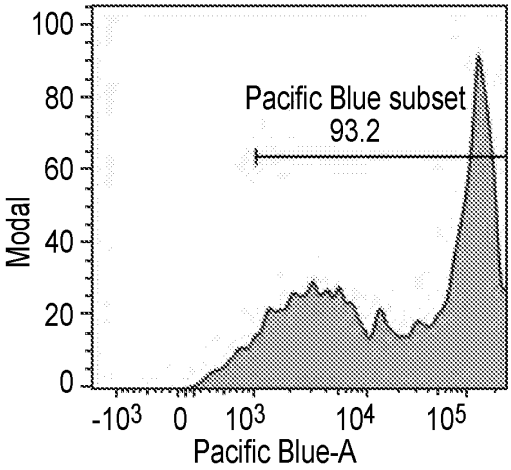


FIG. 3K

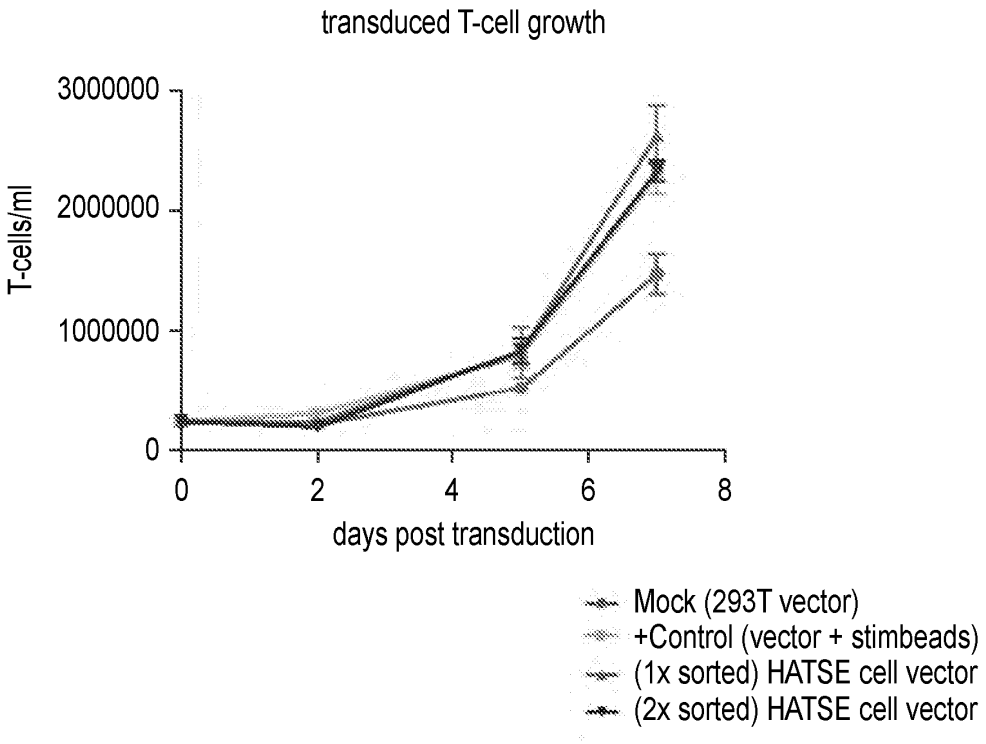

transduced T-cell growth
3000000
2000000
1000000
0
T-cells/ml
0
2
4
6
8
days post transduction
Mock (293T vector)
+Control (vector + stimbeads)
(1x sorted) HATSE cell vector
(2x sorted) HATSE cell vector

FIG. 4

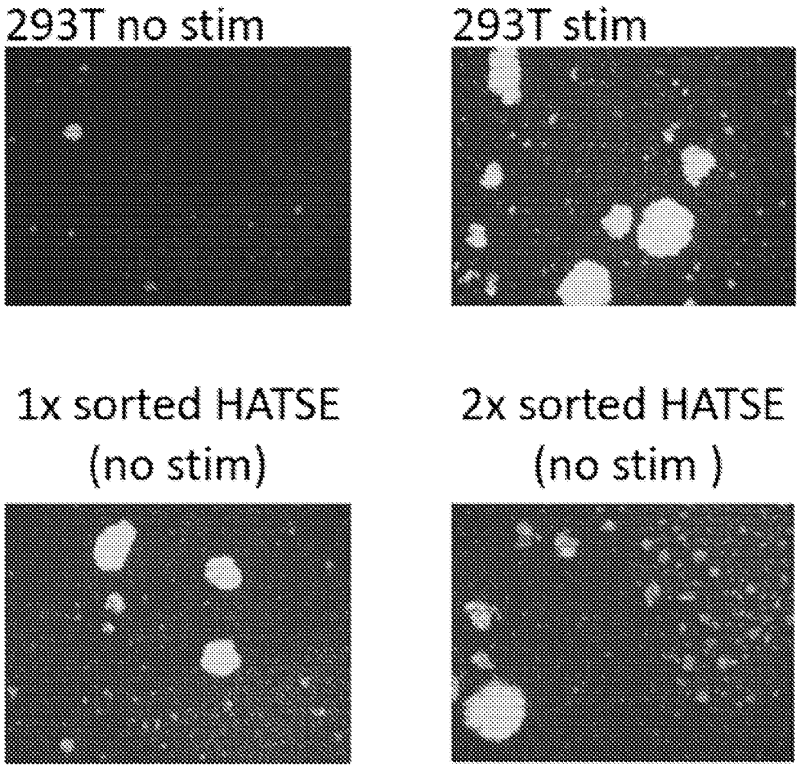

293T no stim
293T stim
1x sorted HATSE
(no stim)
2x sorted HATSE
(no stim)

FIG. 5

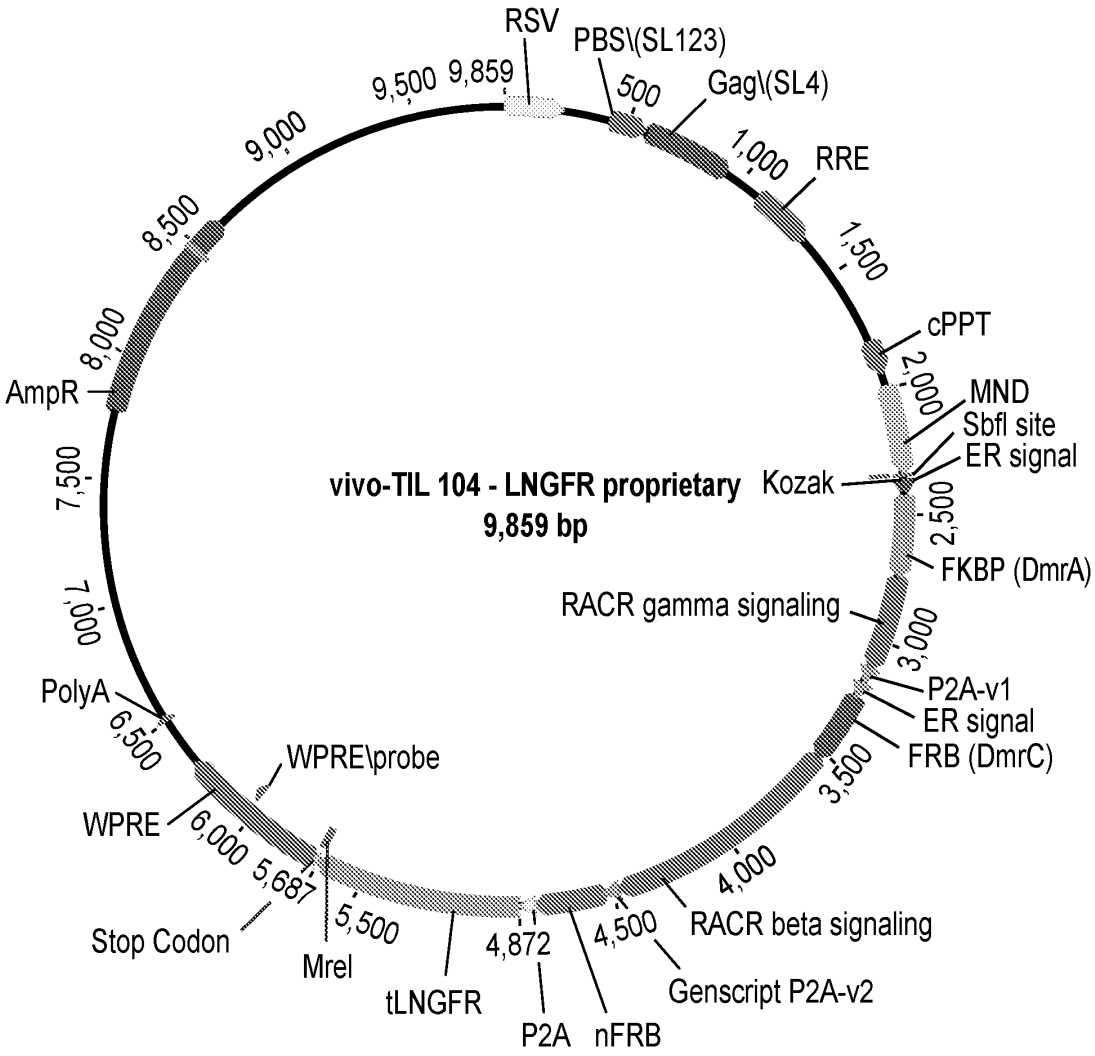

RSV
PBS\(SL123)
Gag\(SL4)
RRE
cPPT
MND
Sbfl site
ER signal
Kozak
FKBP (DmrA)
RACR gamma signaling
P2A-v1
ER signal
FRB (DmrC)
RACR beta signaling
Genscript P2A-v2
nFRB
P2A
tLNGFR
MreI
Stop Codon
WPRE
WPRE\probe
PolyA
AmpR
vivo-TIL 104 - LNGFR proprietary
9,859 bp
9,859
500
1,000
1,500
2,000
2,500
3,000
3,500
4,000
4,500
4,872
5,500
5,687
6,000
6,500
7,000
7,500
8,000
8,500
9,000
9,500

FIG. 6

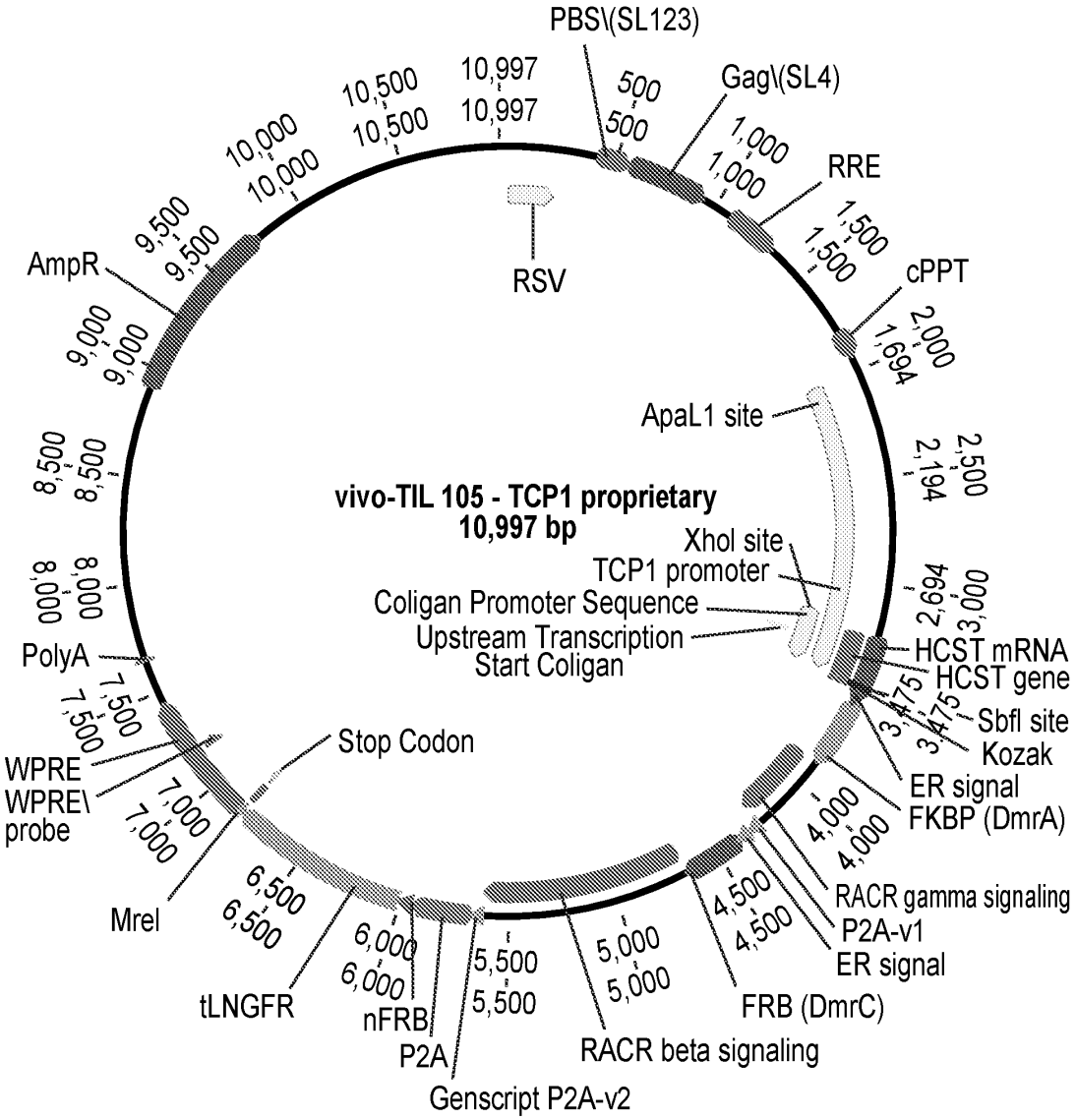

PBS\(SL123)
Gag\(SL4)
RRE
cPPT
ApaL1 site
vivo-TIL 105 - TCP1 proprietary
10,997 bp
XhoI site
TCP1 promoter
Coligan Promoter Sequence
Upstream Transcription
Start Coligan
HCST mRNA
HCST gene
SbfI site
Kozak
ER signal
FKBP (DmrA)
RACR gamma signaling
P2A-v1
ER signal
FRB (DmrC)
RACR beta signaling
Genscript P2A-v2
P2A
nFRB
tLNGFR
MreI
Stop Codon
WPRE
WPRE\
probe
PolyA
AmpR
RSV
10,997
500
1,000
1,500
2,000
2,500
3,000
4,000
4,500
5,000
5,500
6,000
6,500
7,000
7,500
8,000
8,500
9,000
9,500
10,000
10,500

FIG. 7

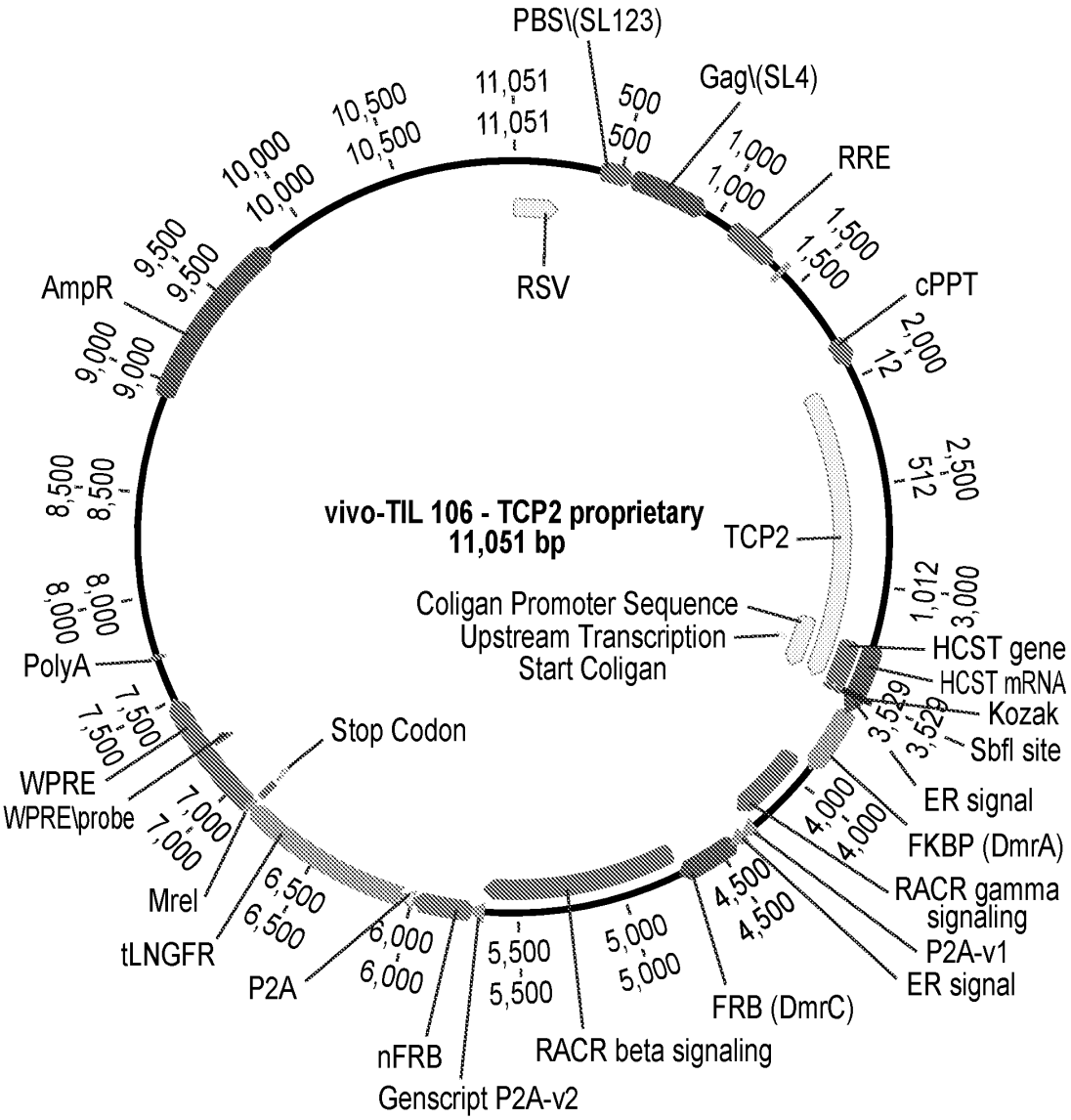

PBS\(SL123)
Gag\(SL4)
RRE
cPPT
TCP2
HCST gene
HCST mRNA
Kozak
Sbfl site
ER signal
FKBP (DmrA)
RACR gamma signaling
P2A-v1
ER signal
FRB (DmrC)
RACR beta signaling
nFRB
Genscript P2A-v2
P2A
tLNGFR
MreI
WPRE\probe
WPRE
PolyA
Stop Codon
Coligan Promoter Sequence
Upstream Transcription Start Coligan
AmpR
RSV
vivo-TIL 106 - TCP2 proprietary
11,051 bp

FIG. 8

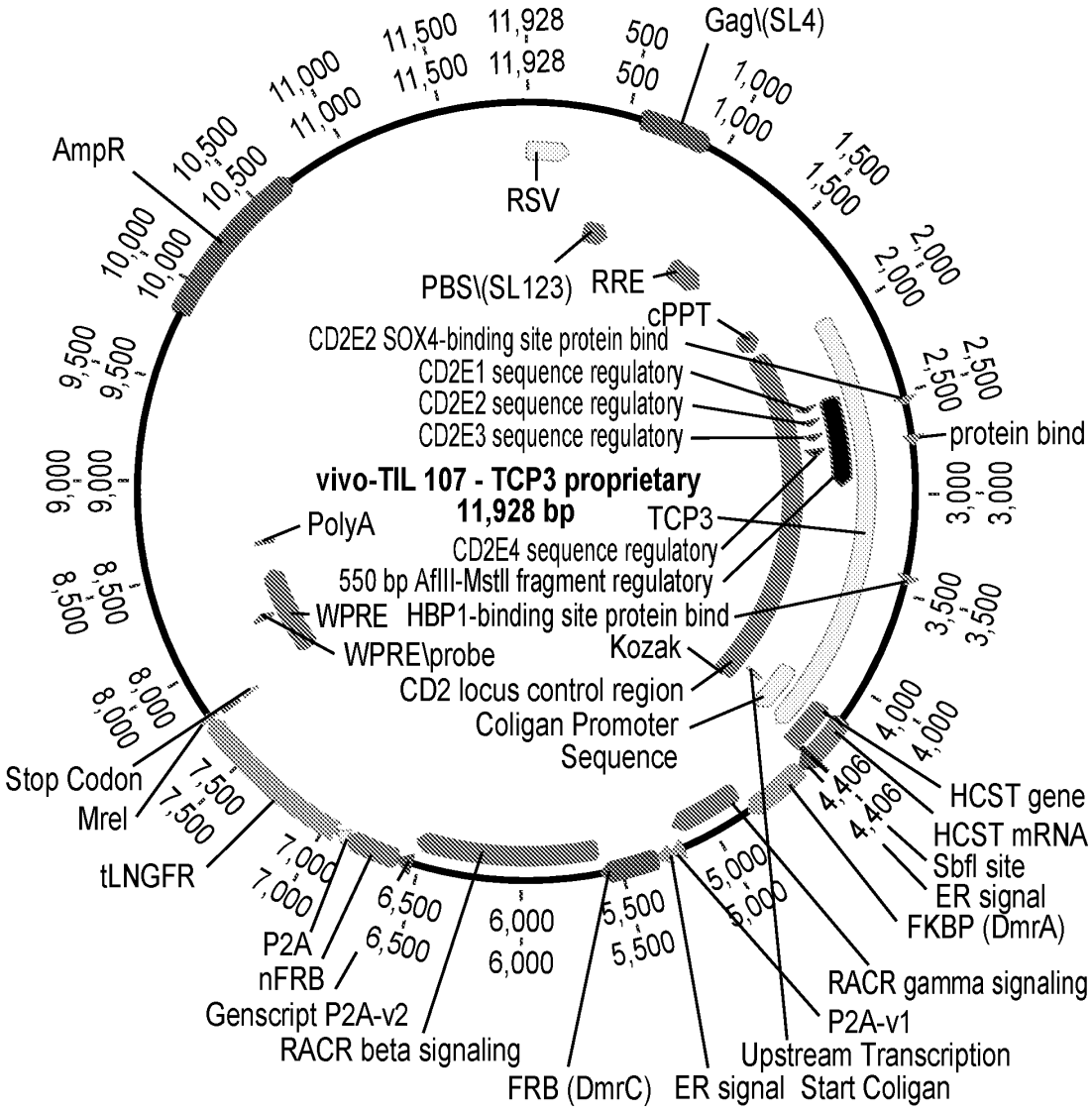

vivo-TIL 107 - TCP3 proprietary
11,928 bp
Gag\(SL4)
RSV
PBS\(SL123)
RRE
cPPT
CD2E2 SOX4-binding site protein bind
CD2E1 sequence regulatory
CD2E2 sequence regulatory
CD2E3 sequence regulatory
protein bind
TCP3
CD2E4 sequence regulatory
550 bp AflII-MstII fragment regulatory
HBP1-binding site protein bind
Kozak
CD2 locus control region
Coligan Promoter Sequence
HCST gene
HCST mRNA
SbfI site
ER signal
FKBP (DmrA)
RACR gamma signaling
P2A-v1
Upstream Transcription
ER signal
Start Coligan
FRB (DmrC)
RACR beta signaling
Genscript P2A-v2
nFRB
P2A
tLNGFR
MreI
Stop Codon
WPRE\probe
WPRE
PolyA
AmpR

FIG. 9

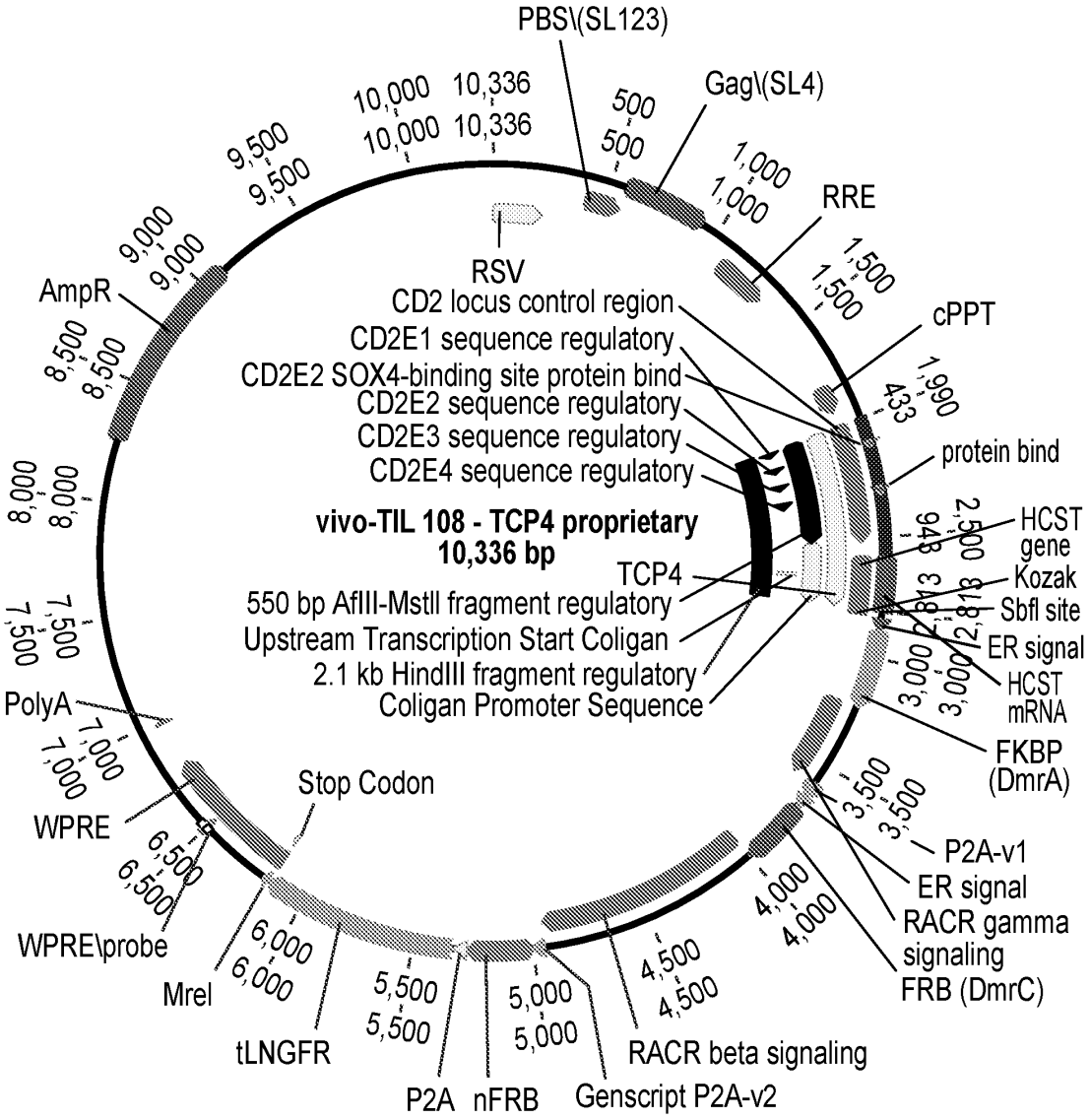

PBS\(SL123)
Gag\(SL4)
RRE
cPPT
protein bind
HCST gene
Kozak
SbfI site
ER signal
HCST mRNA
FKBP (DmrA)
P2A-v1
ER signal
RACR gamma signaling
FRB (DmrC)
RACR beta signaling
Genscript P2A-v2
nFRB
P2A
tLNGFR
MreI
WPRE\probe
WPRE
PolyA
Stop Codon
AmpR
RSV
CD2 locus control region
CD2E1 sequence regulatory
CD2E2 SOX4-binding site protein bind
CD2E2 sequence regulatory
CD2E3 sequence regulatory
CD2E4 sequence regulatory
vivo-TIL 108 - TCP4 proprietary
10,336 bp
TCP4
550 bp AflII-MstII fragment regulatory
Upstream Transcription Start Coligan
2.1 kb HindIII fragment regulatory
Coligan Promoter Sequence
10,000
10,336
500
1,000
1,500
1,990
433
2,500
948
813
2,813
3,000
3,500
4,000
4,500
5,000
5,500
6,000
6,500
7,000
7,500
8,000
8,500
9,000
9,500

FIG. 10

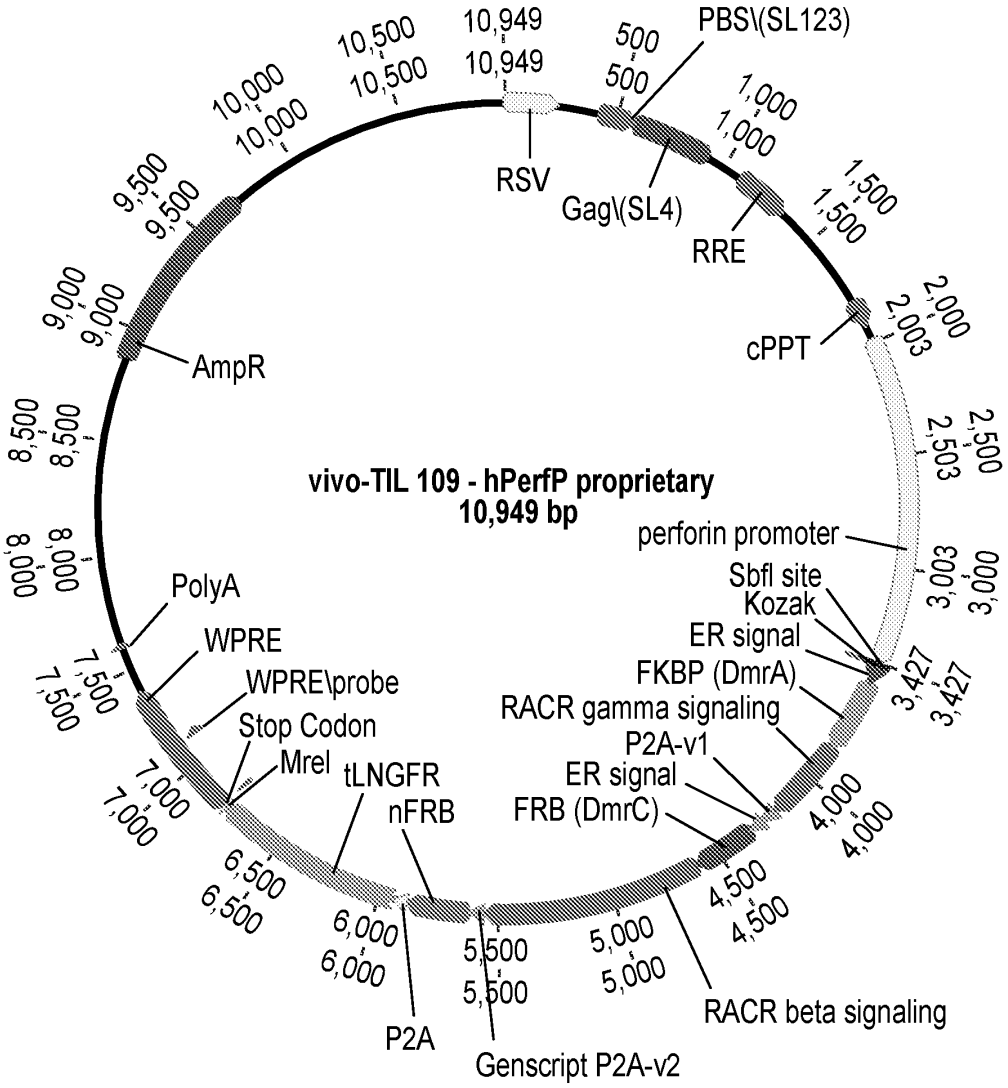

vivo-TIL 109 - hPerfP proprietary
10,949 bp
RSV
PBS\(SL123)
Gag\(SL4)
RRE
cPPT
perforin promoter
SbfI site
Kozak
ER signal
FKBP (DmrA)
RACR gamma signaling
P2A-v1
ER signal
FRB (DmrC)
RACR beta signaling
Genscript P2A-v2
P2A
nFRB
tLNGFR
MreI
Stop Codon
WPRE\probe
WPRE
PolyA
AmpR

FIG. 11

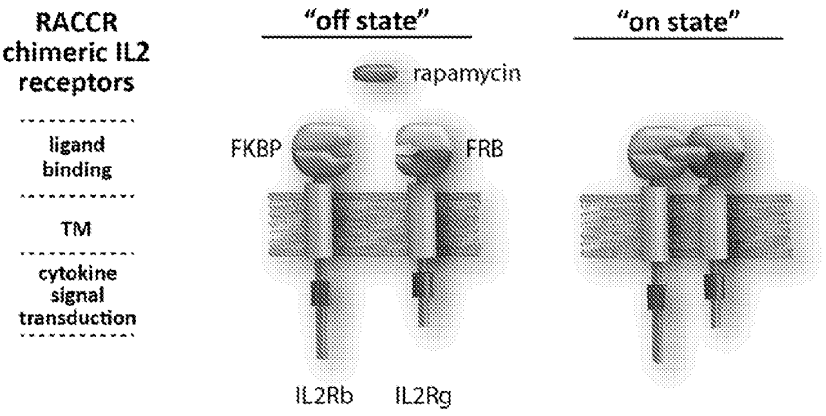

RACCR
chimeric IL2
receptors
ligand
binding
TM
cytokine
signal
transduction
"off state"
"on state"
rapamycin
FKBP
FRB
IL2Rb
IL2Rg

FIG. 12A

Payload: prom-GFP
Package: pMD2.G (std)

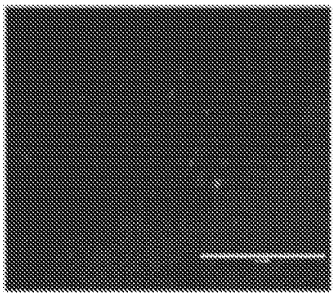


FIG. 12B

Payload: prom-Cherry
Package: pVT-SEC

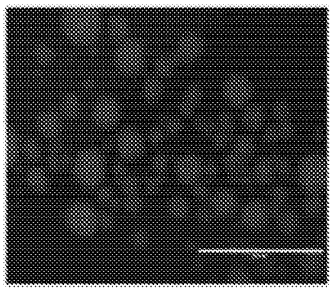


FIG. 12C

Payload: prom-RACCR
Package: pVT-SEC

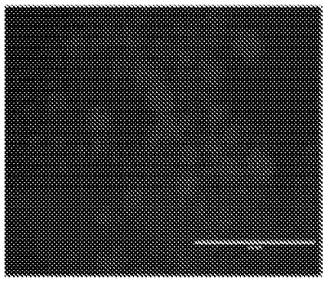


FIG. 12D

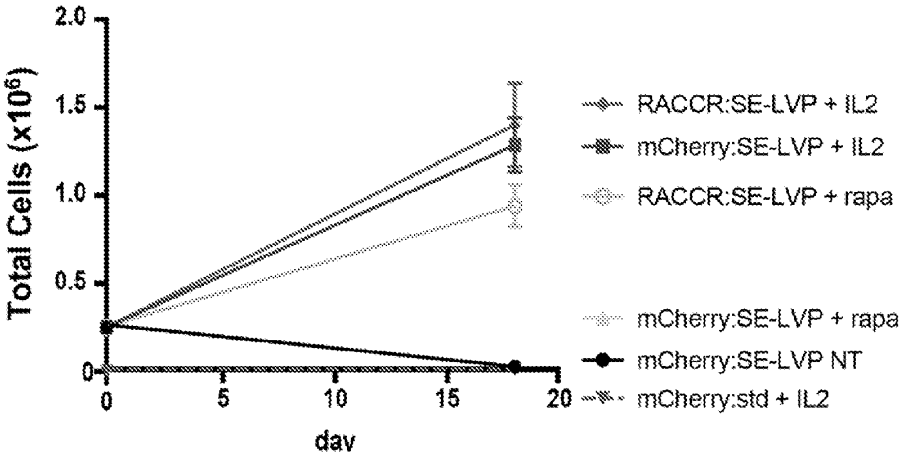


FIG. 12E

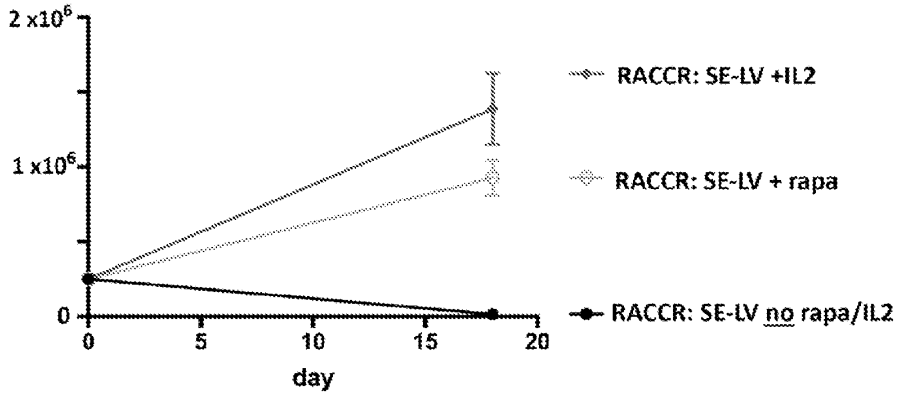


FIG. 12F