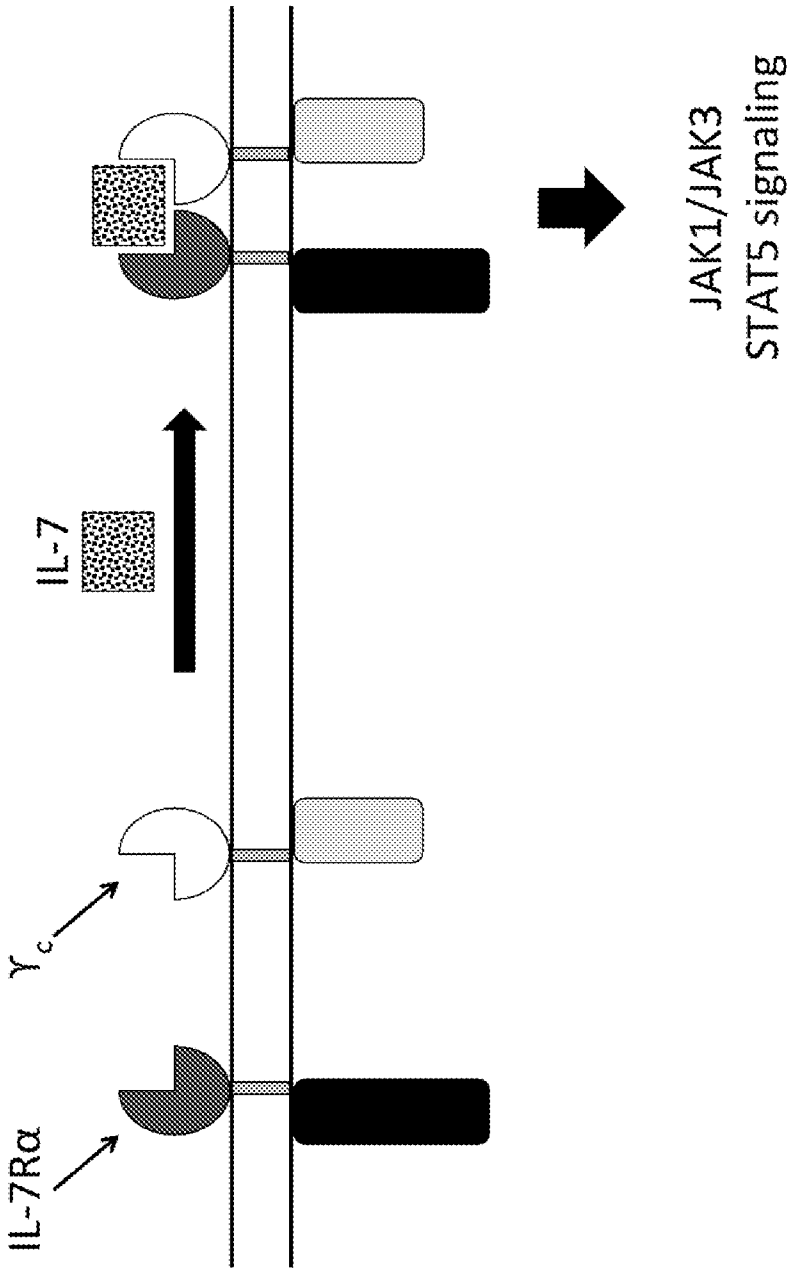


FIG. 1

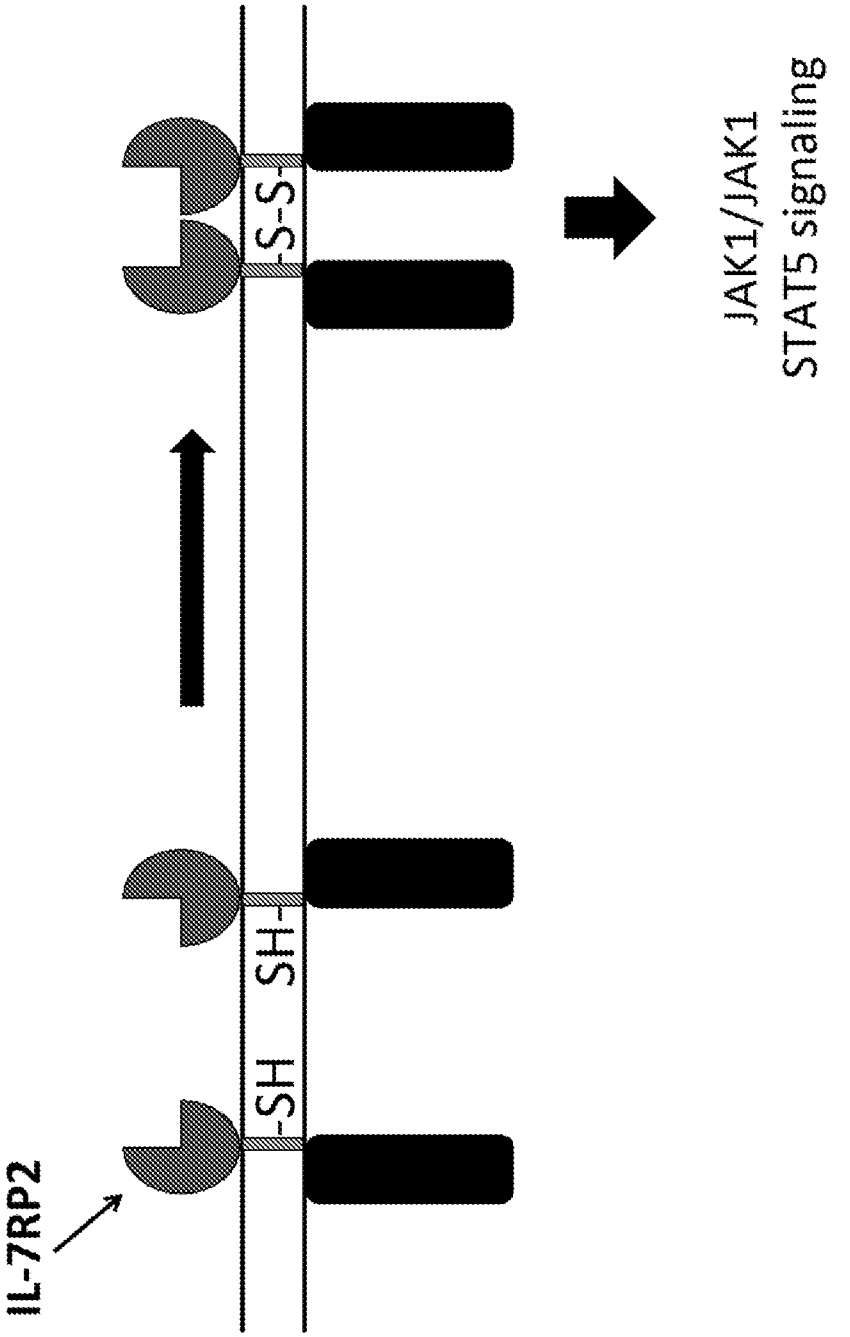


FIG. 2

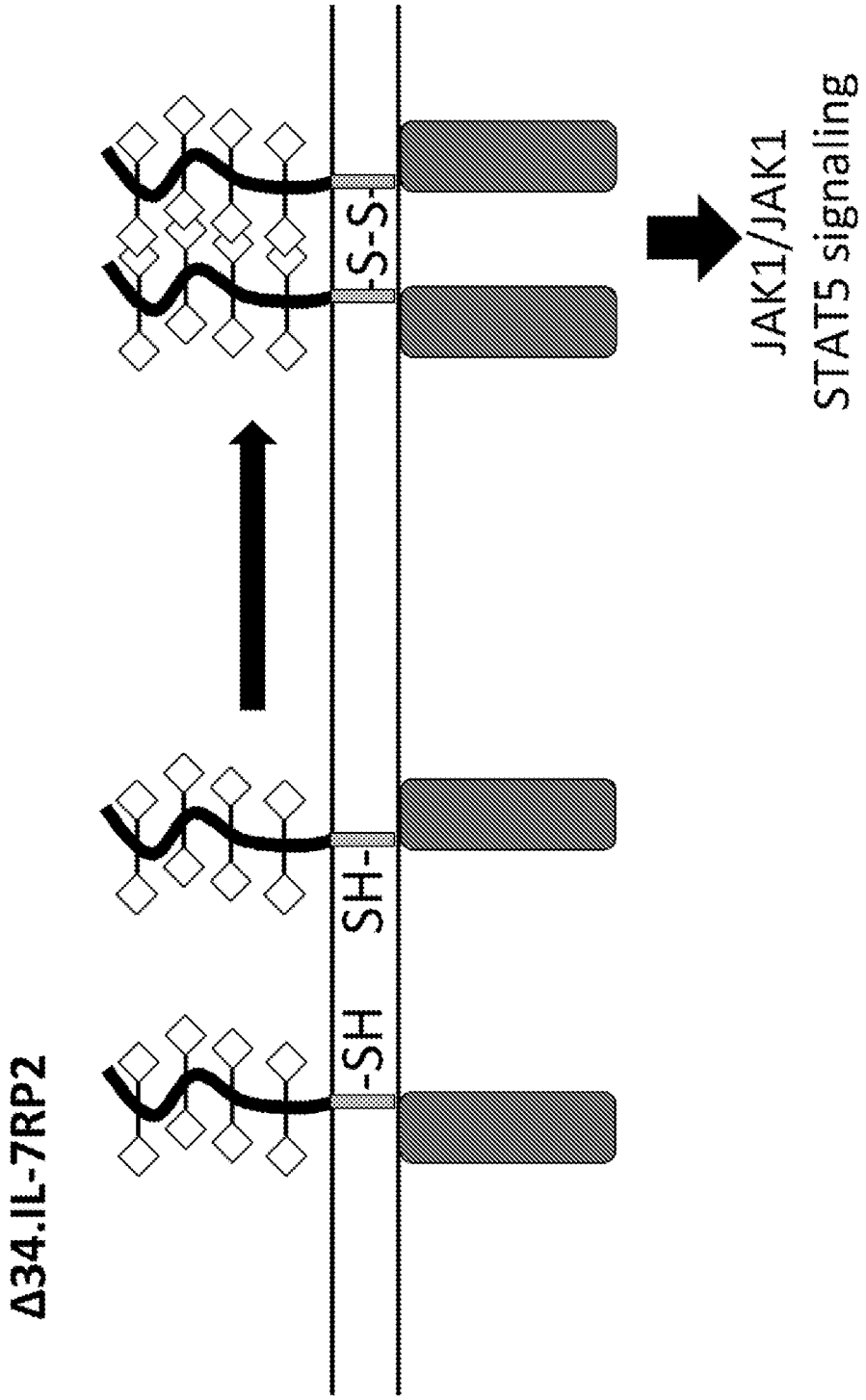


FIG. 3

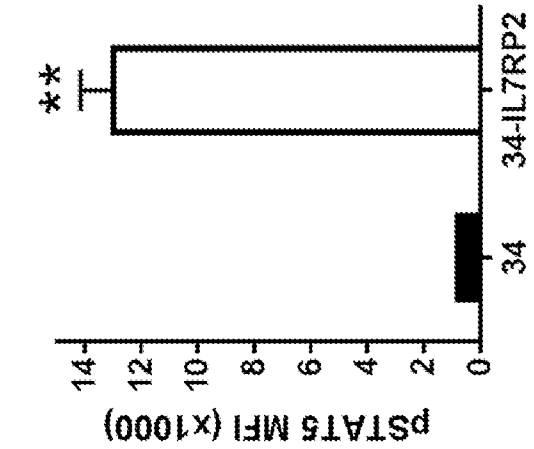

**
pSTAT5 MFI (x1000)
0
2
4
6
8
10
12
14
34
34-IL7RP2

FIG. 4B

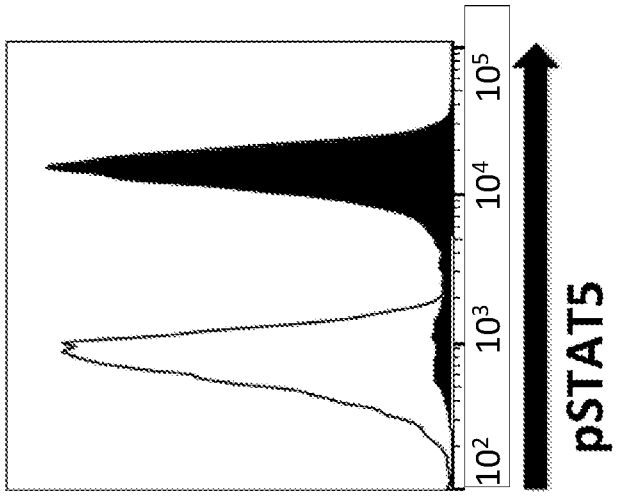

10^2
10^3
10^4
10^5
pSTAT5

FIG. 4A

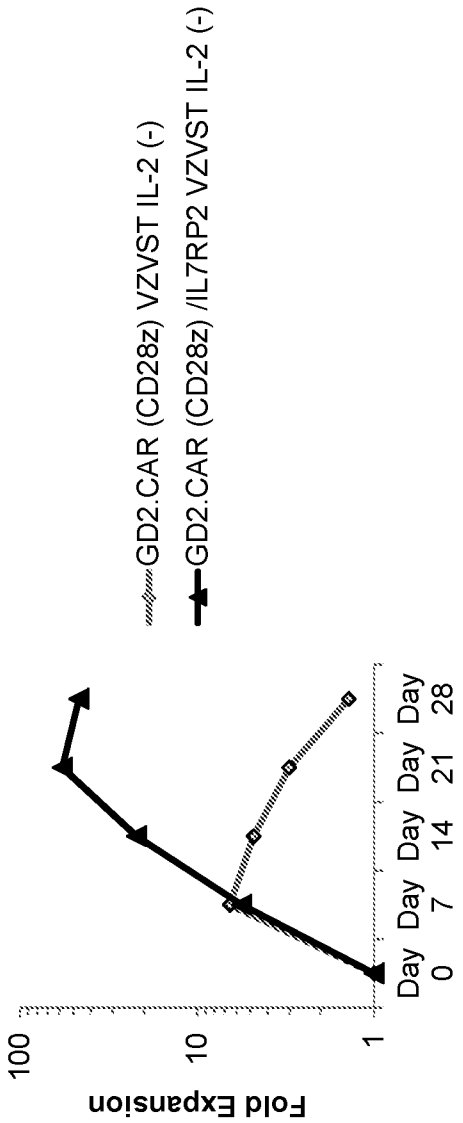

GD2.CAR (CD28z) VZVST IL-2 (-)
GD2.CAR (CD28z) /IL7RP2 VZVST IL-2 (-)
Fold Expansion
100
10
1
Day 0
Day 7
Day 14
Day 21
Day 28

FIG. 5

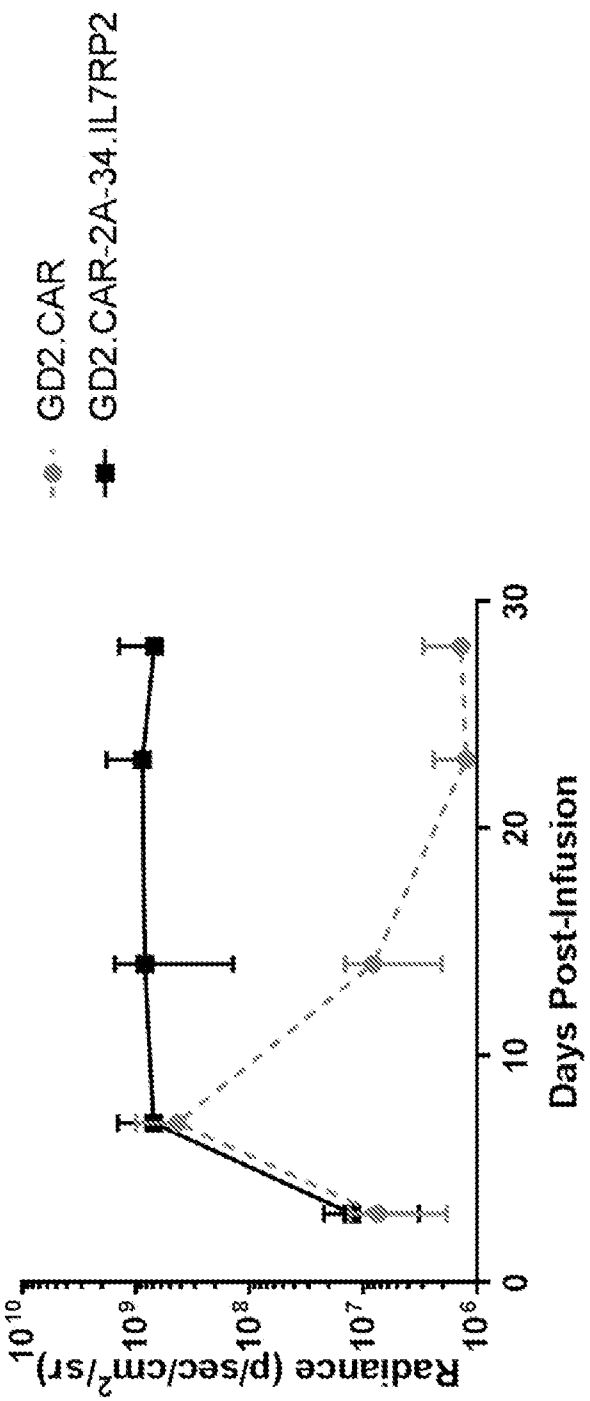

GD2.CAR
GD2.CAR-2A-34.IL7RP2
Radiance (p/sec/cm²/sr)
10¹⁰
10⁹
10⁸
10⁷
10⁶
0
10
20
30
Days Post-Infusion

FIG. 6A

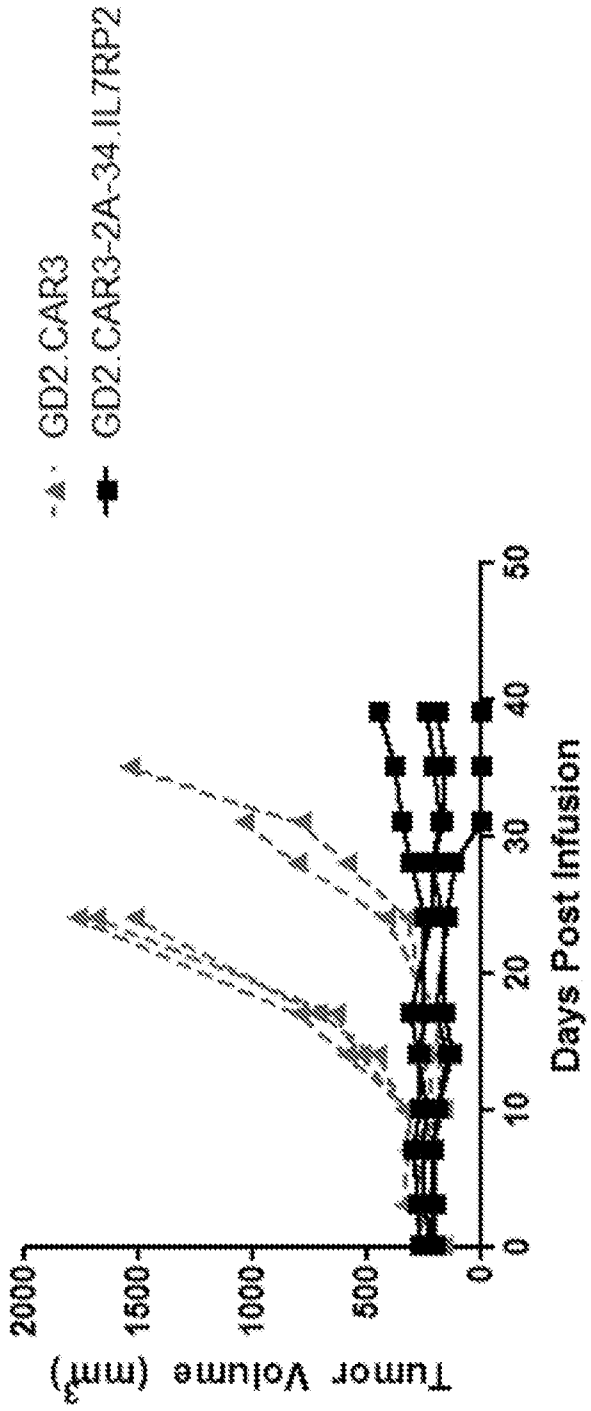

GD2.CAR3
GD2.CAR3-2A-34.IL7RP2
Tumor Volume (mm³)
2000
1500
1000
500
0
0
10
20
30
40
50
Days Post Infusion

FIG. 6B

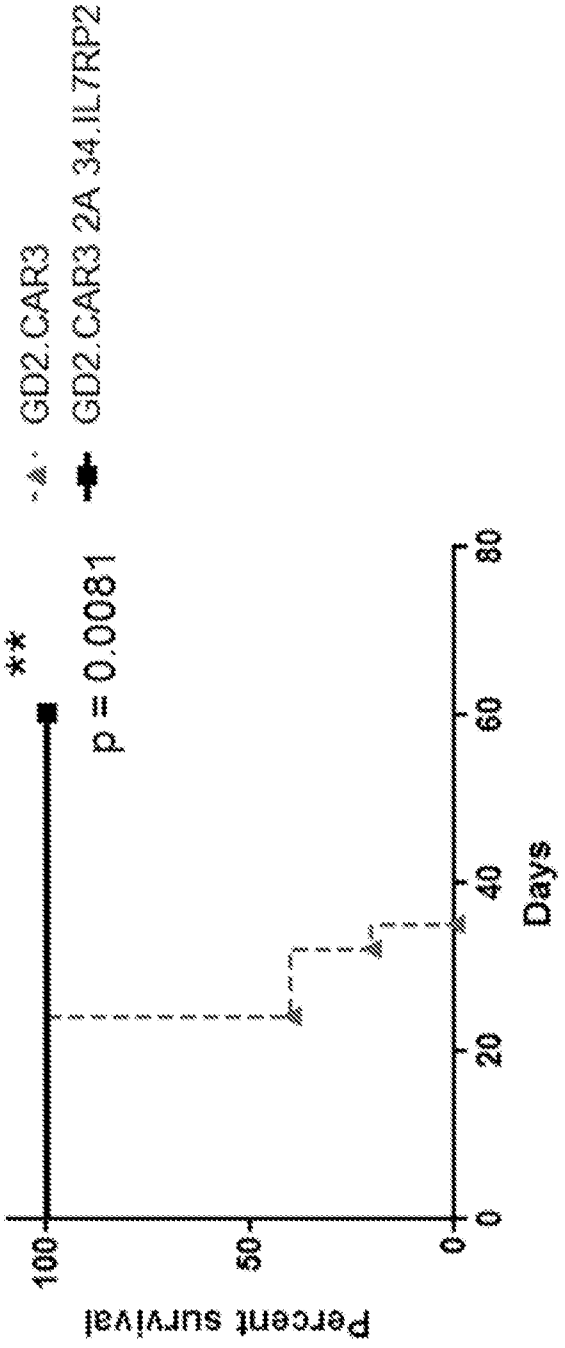

GD2.CAR3
GD2.CAR3 2A 34.IL7RP2
**
p = 0.0081
Percent survival
100
50
0
0
20
40
60
80
Days

FIG. 6C

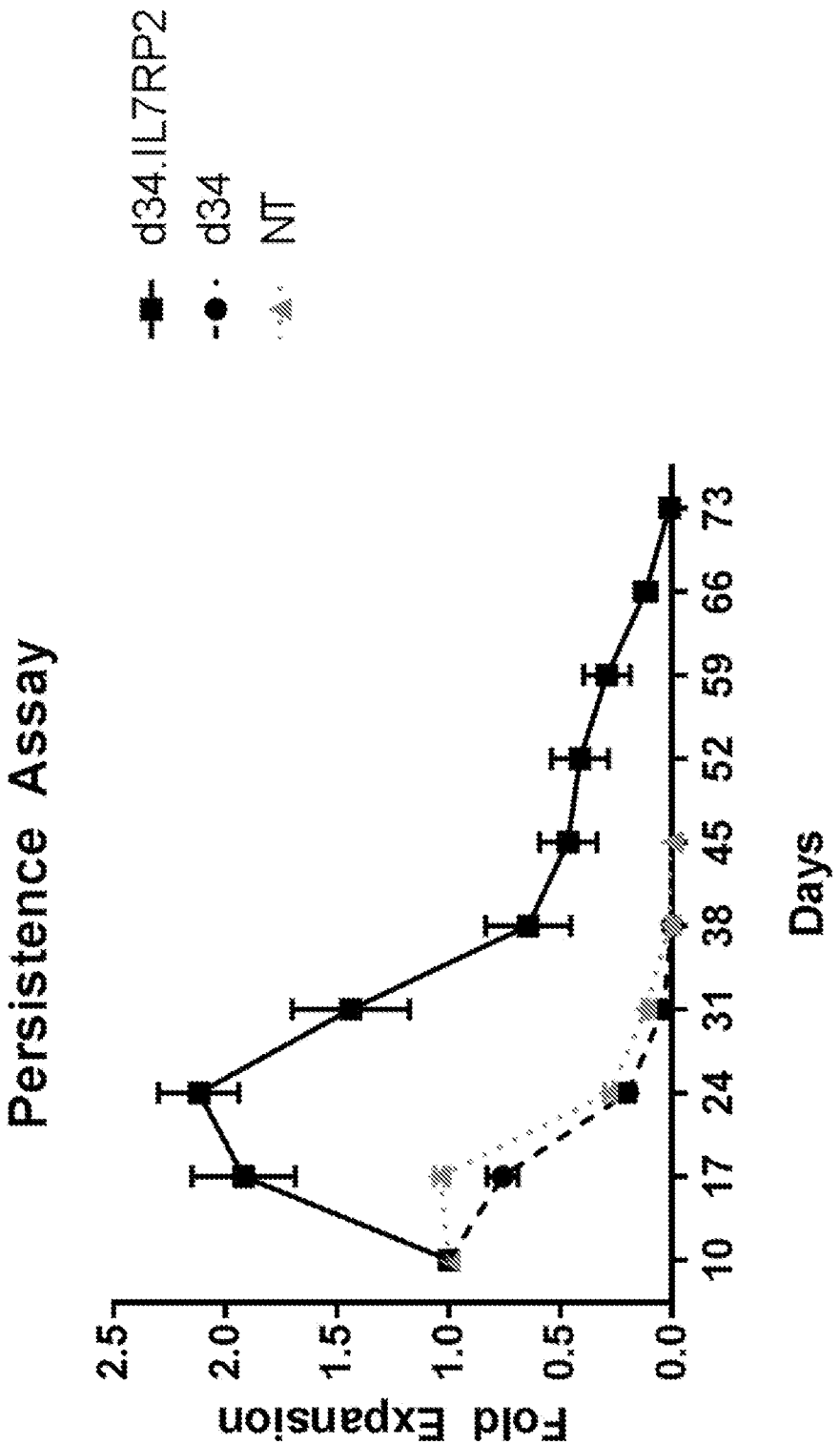

d34.IL7RP2
d34
NT
Persistence Assay
Fold Expansion
2.5
2.0
1.5
1.0
0.5
0.0
10
17
24
31
38
45
52
59
66
73
Days

FIG. 7

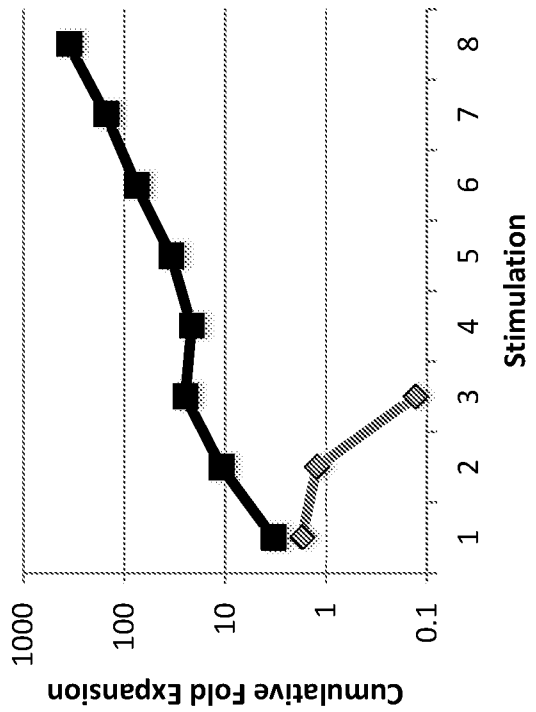

Cumulative Fold Expansion
1000
100
10
1
0.1
1
2
3
4
5
6
7
8
Stimulation

FIG. 8

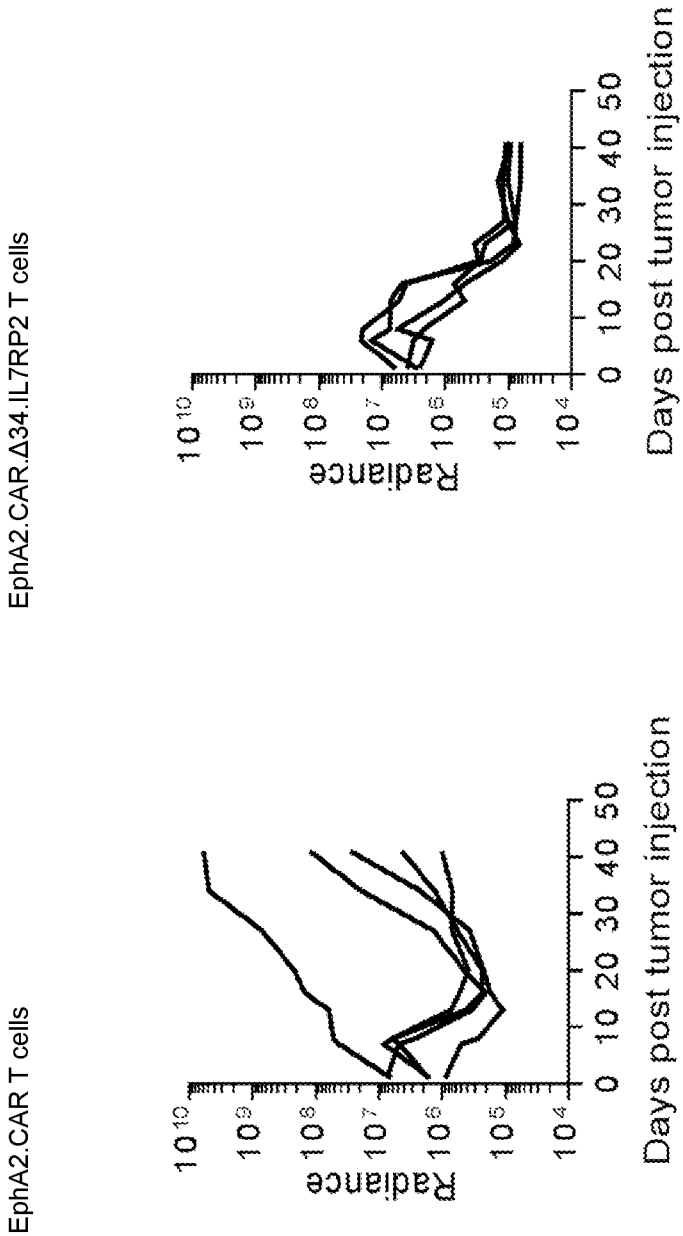

EphA2.CAR T cells
EphA2.CAR.Δ34.IL7RP2 T cells
Radiance
Days post tumor injection
0 10 20 30 40 50
10^10
10^9
10^8
10^7
10^6
10^5
10^4

FIG. 9

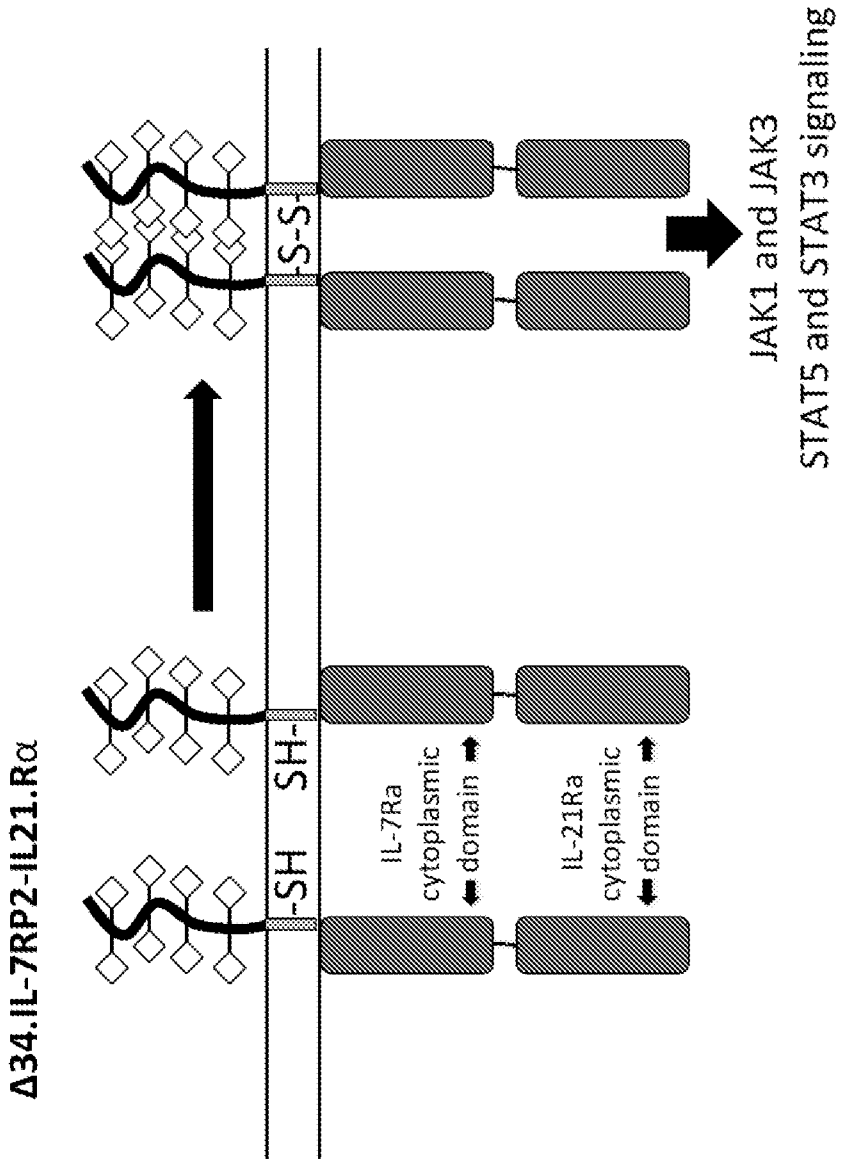

Δ34.IL-7RP2-IL21.Rα
-SH
SH-
-S-S-
IL-7Ra cytoplasmic domain
IL-21Ra cytoplasmic domain
JAK1 and JAK3
STAT5 and STAT3 signaling

FIG. 10A

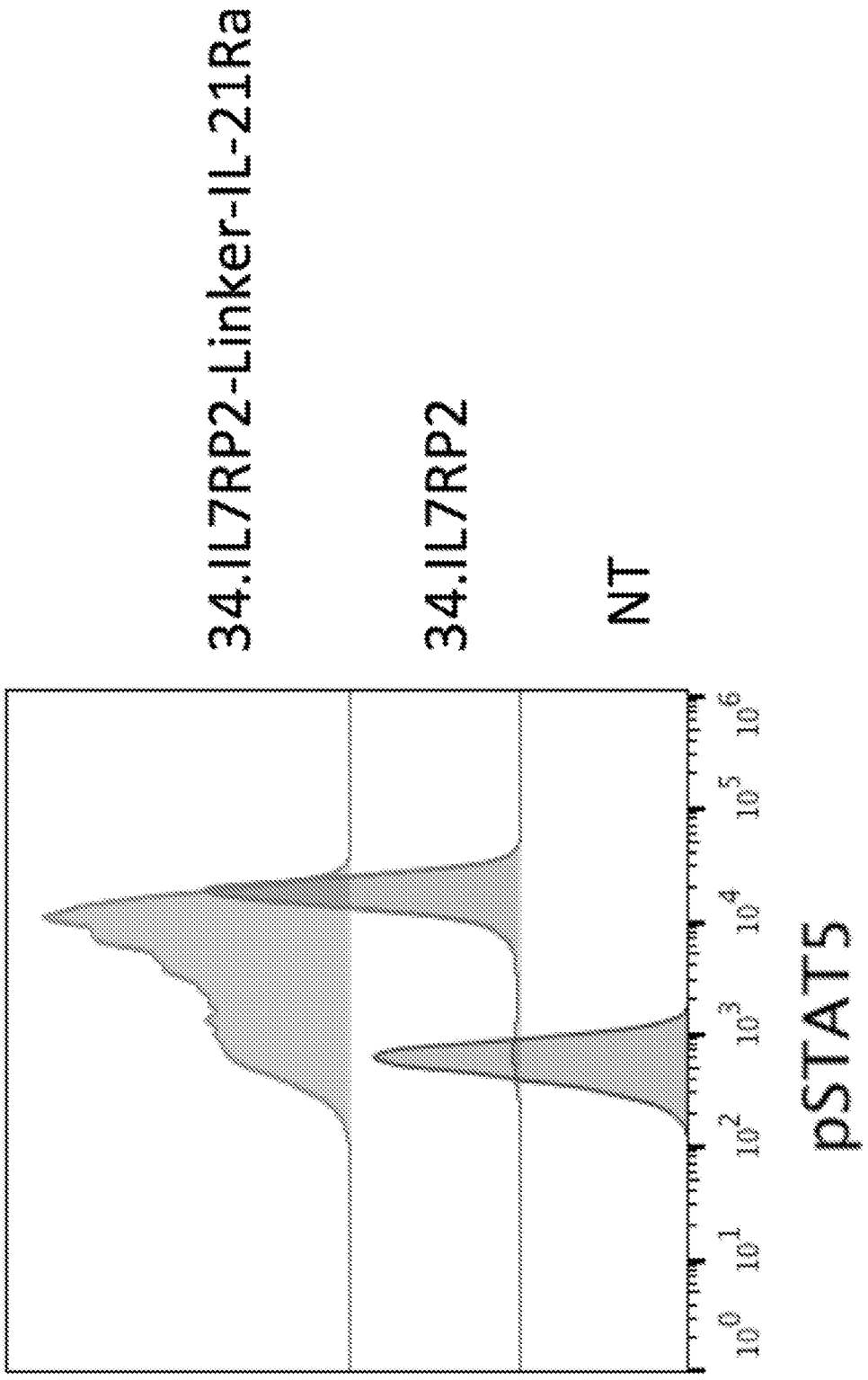

34.IL7RP2-Linker-IL-21Ra
34.IL7RP2
NT
pSTAT5
10^0 10^1 10^2 10^3 10^4 10^5 10^6

FIG. 10B

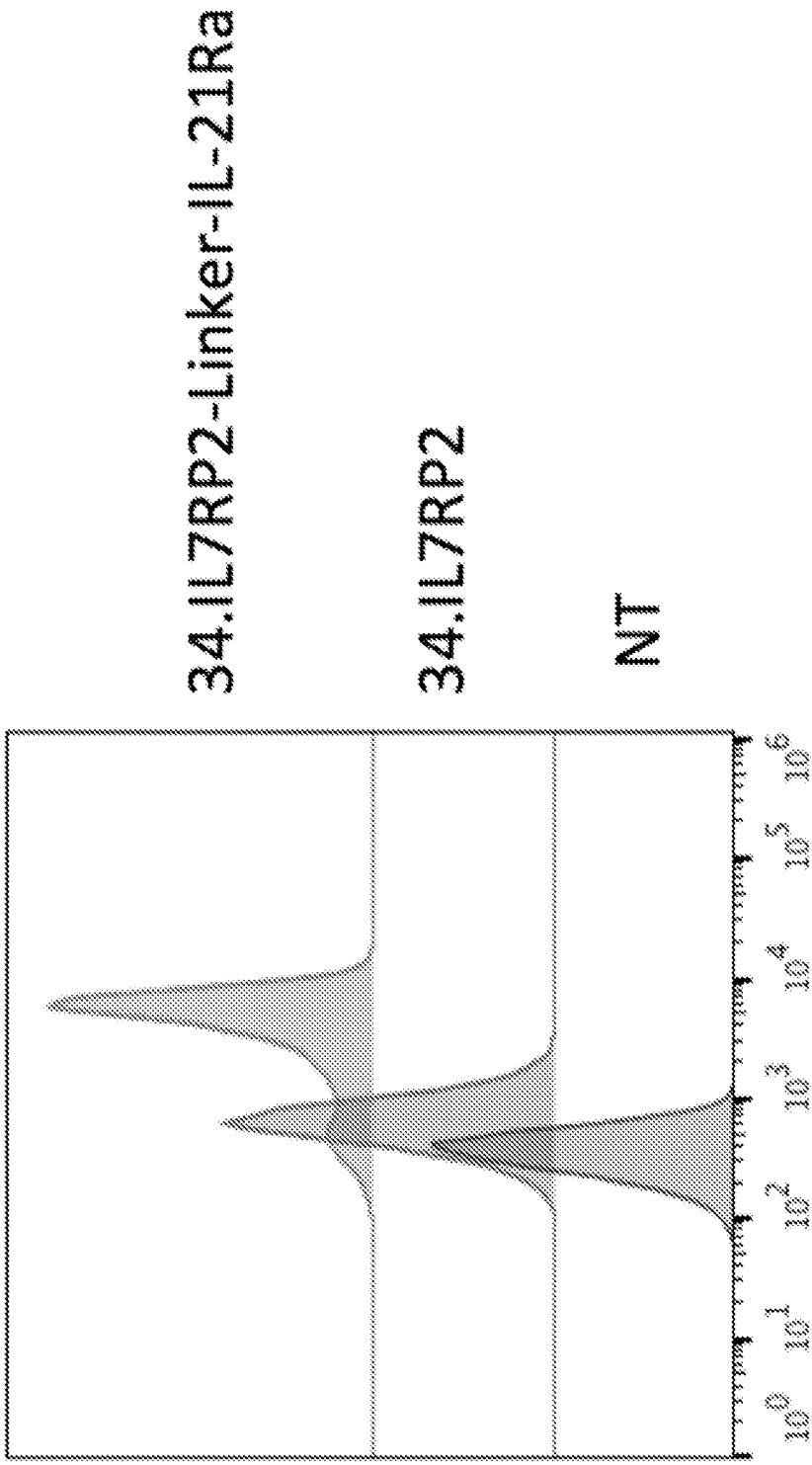

34.IL7RP2-Linker-IL-21Ra
34.IL7RP2
NT
pSTAT3
10^0 10^1 10^2 10^3 10^4 10^5 10^6

FIG. 10C

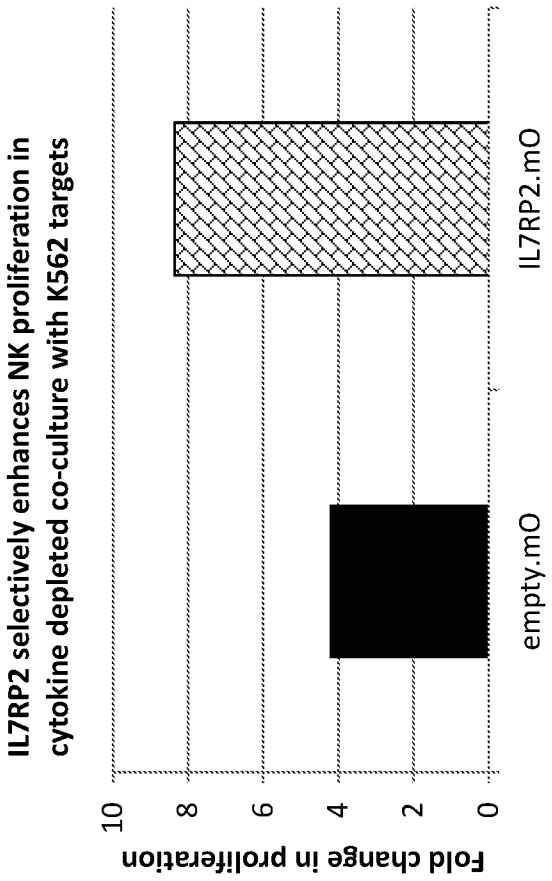

IL7RP2 selectively enhances NK proliferation in cytokine depleted co-culture with K562 targets
Fold change in proliferation
0
2
4
6
8
10
empty.mO
IL7RP2.mO

FIG. 11

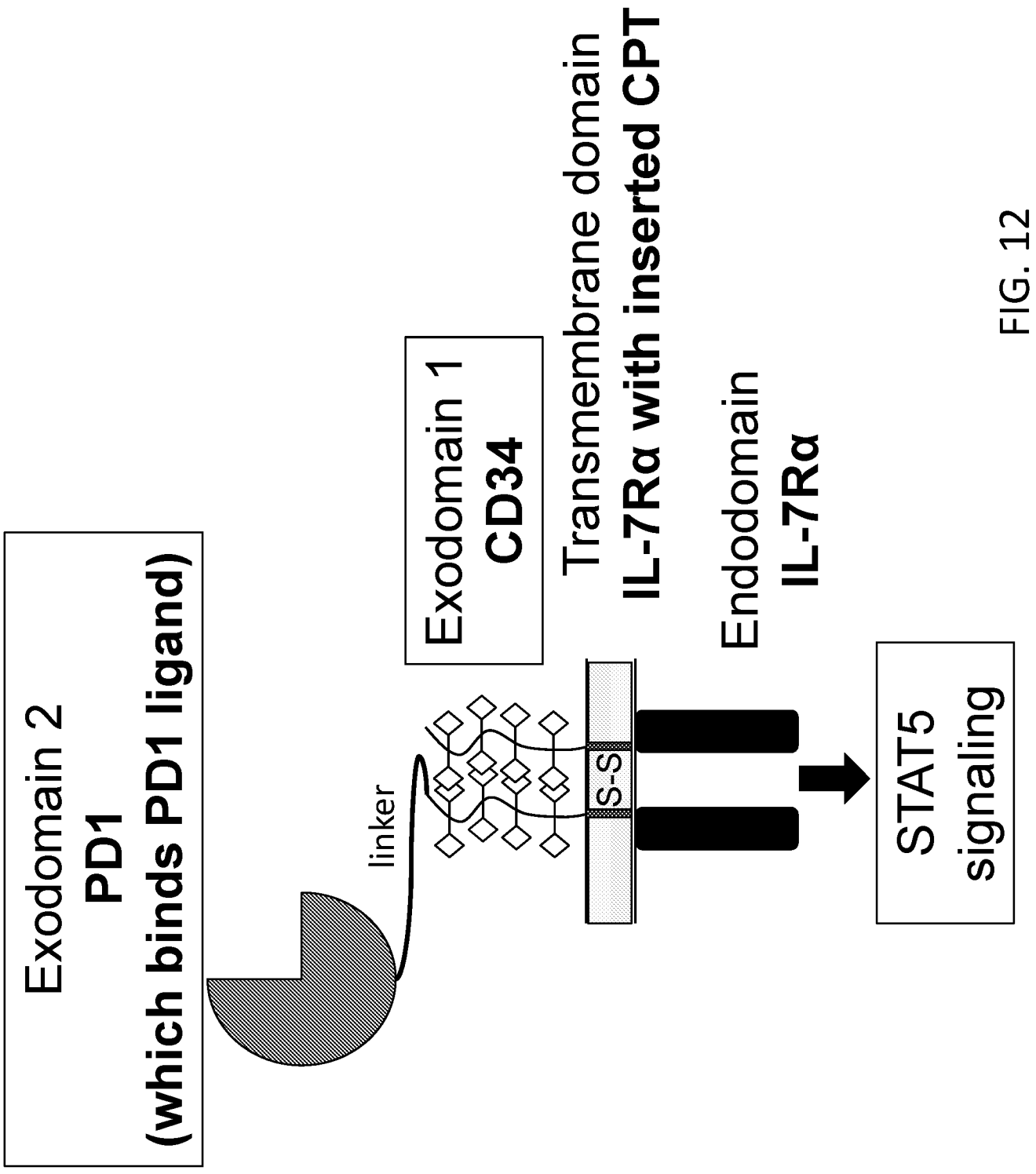

Exodomain 2
PD1
(which binds PD1 ligand)
linker
Exodomain 1
CD34
Transmembrane domain
IL-7Rα with inserted CPT
S-S
Endodomain
IL-7Rα
STAT5
signaling

FIG. 12

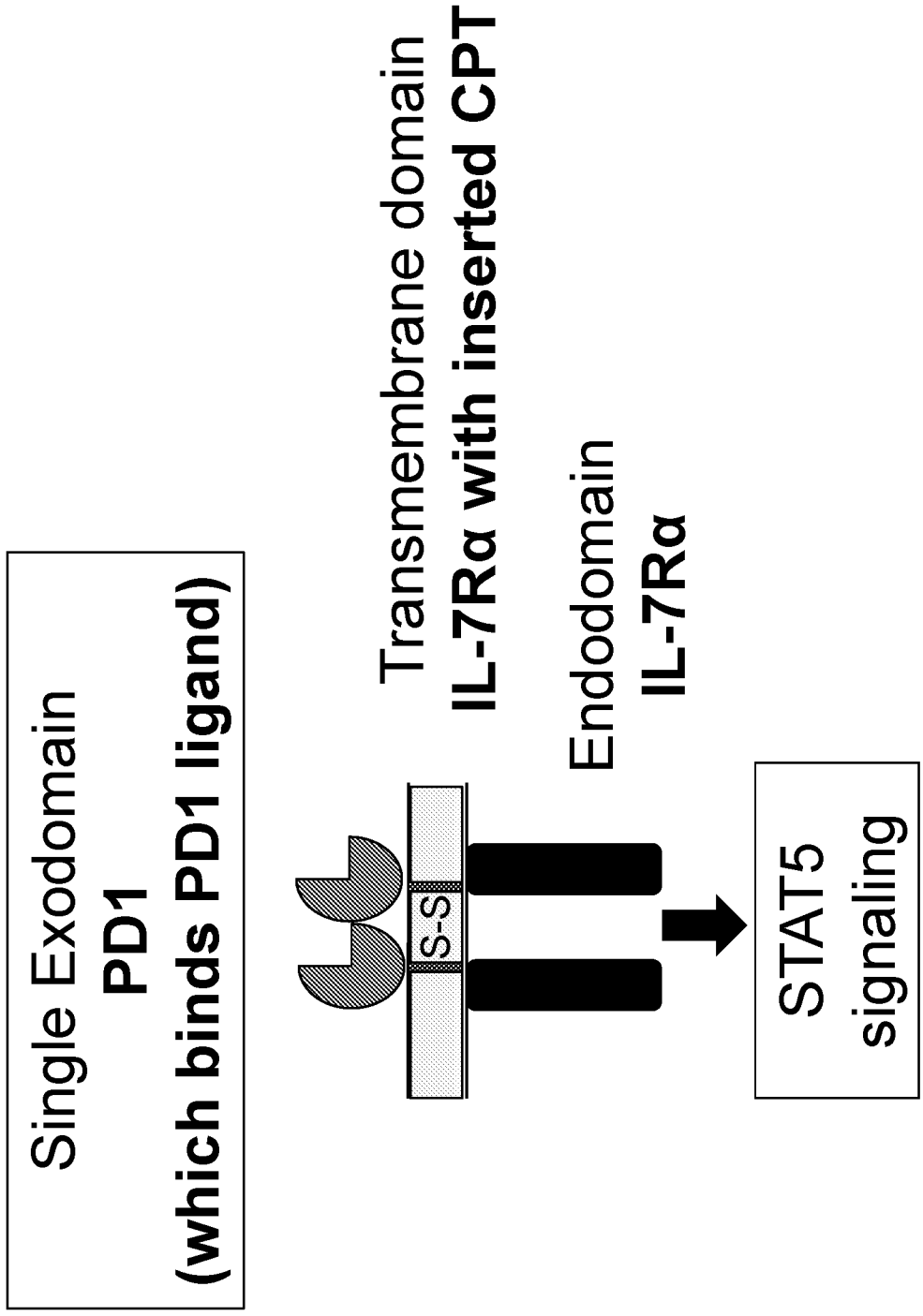
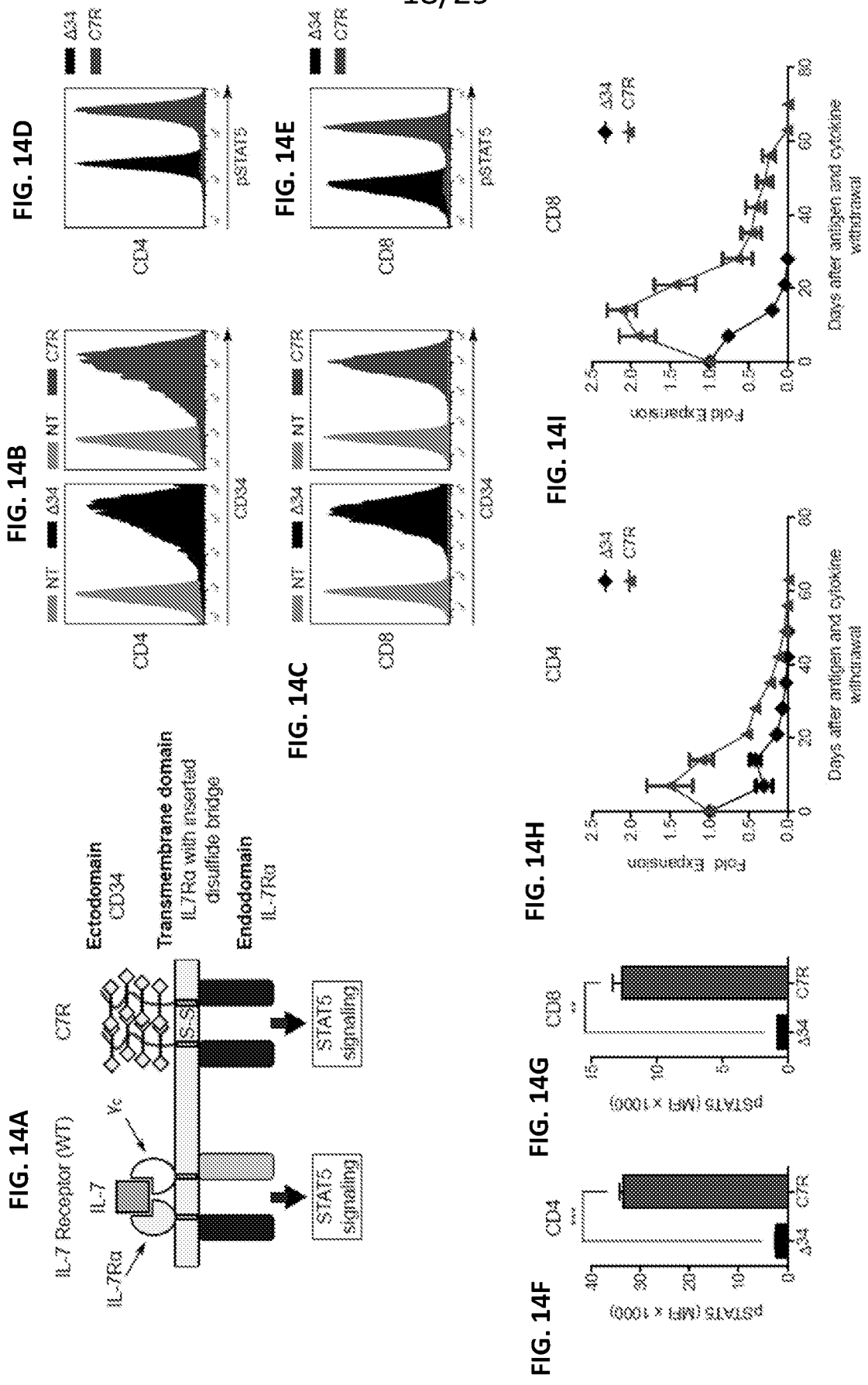

Single Exodomain
PD1
(which binds PD1 ligand)
Transmembrane domain
IL-7Rα with inserted CPT
Endodomain
IL-7Rα
S-S
STAT5
signaling

FIG. 13


FIG. 14A
IL-7 Receptor (WT)
C7R
IL-7
γc
IL-7Rα
S-S
Ectodomain
CD34
Transmembrane domain
IL7Rα with inserted
disulfide bridge
Endodomain
IL-7Rα
STAT5
signaling
STAT5
signaling
FIG. 14B
NT
Δ34
NT
C7R
CD4
CD34
FIG. 14C
NT
Δ34
NT
C7R
CD8
CD34
FIG. 14D
Δ34
C7R
CD4
pSTAT5
FIG. 14E
Δ34
C7R
CD8
pSTAT5
FIG. 14F
CD4
***
pSTAT5 (MFI x 100)
Δ34
C7R
FIG. 14G
CD8
**
pSTAT5 (MFI x 100)
Δ34
C7R
FIG. 14H
CD4
Δ34
C7R
Fold Expansion
Days after antigen and cytokine
withdrawal
FIG. 14I
CD8
Δ34
C7R
Fold Expansion
Days after antigen and cytokine
withdrawal

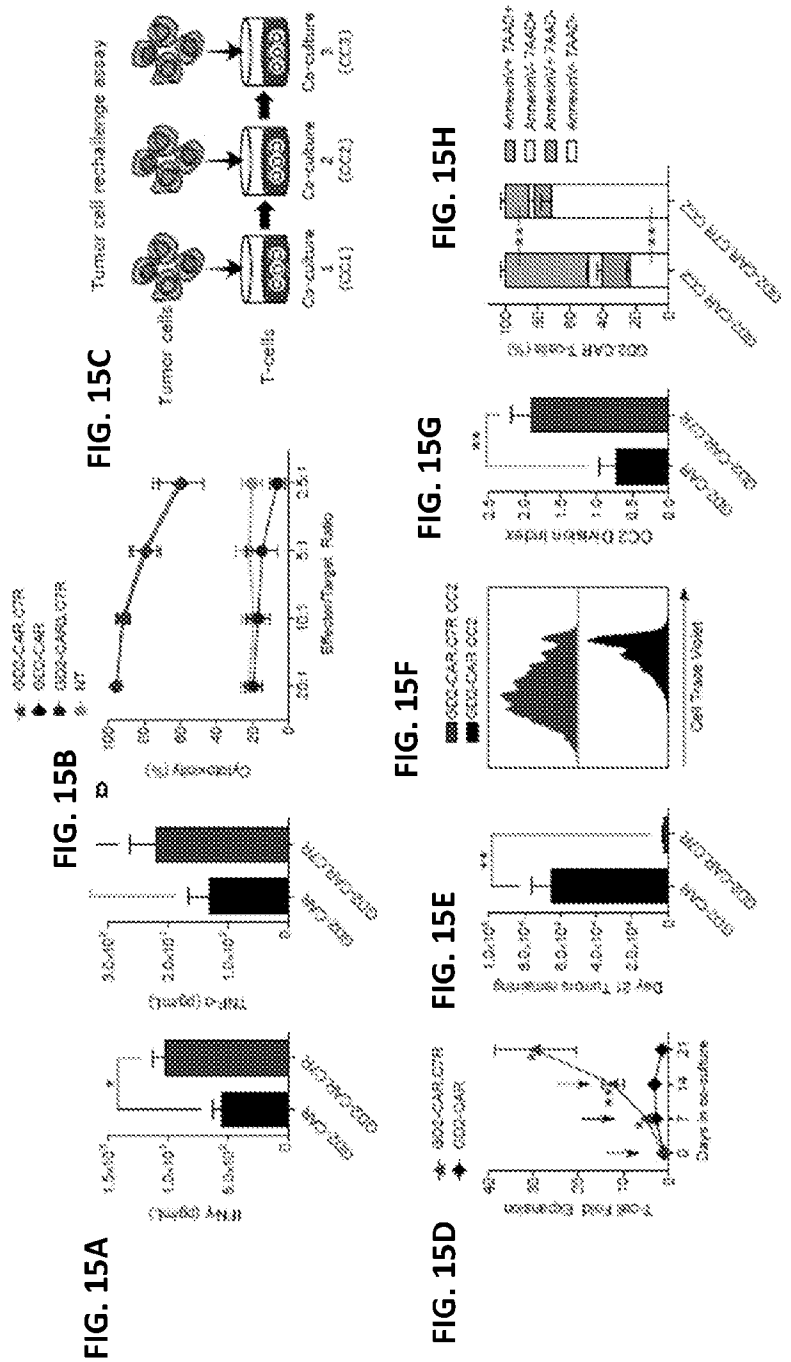

FIG. 15A
FIG. 15B
FIG. 15C
FIG. 15D
FIG. 15E
FIG. 15F
FIG. 15G
FIG. 15H
FIG. 15I
Tumor cell rechallenge assay
Tumor cells
T-cells
Co-culture 1 (CC1)
Co-culture 2 (CC2)
Co-culture 3 (CC3)
Effector:Target Ratio
Cell Trace Violet
Days in co-culture
Differentially Expressed Genes (GD2-CAR.CTR/GD2-CAR)
BCL2
GZMA
CASP8
FAS
Color Key
Value

FIG. 16A

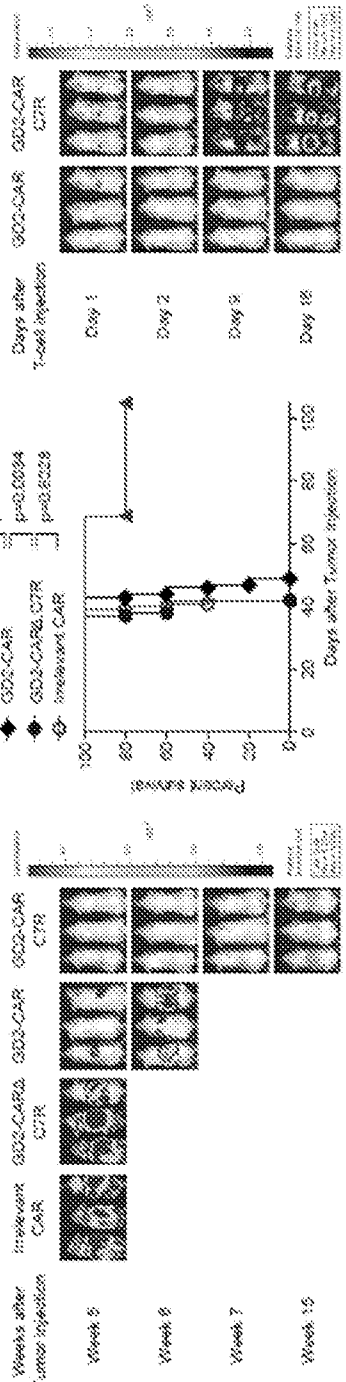


FIG. 16B

FIG. 16C

FIG. 16D

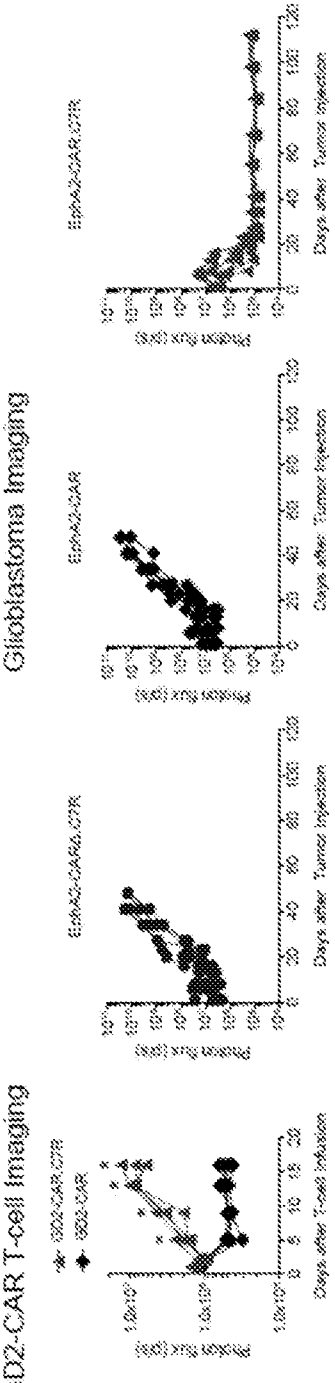


FIG. 16E

FIG. 16F

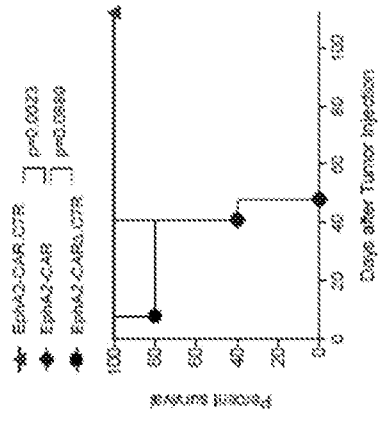


FIG. 17A

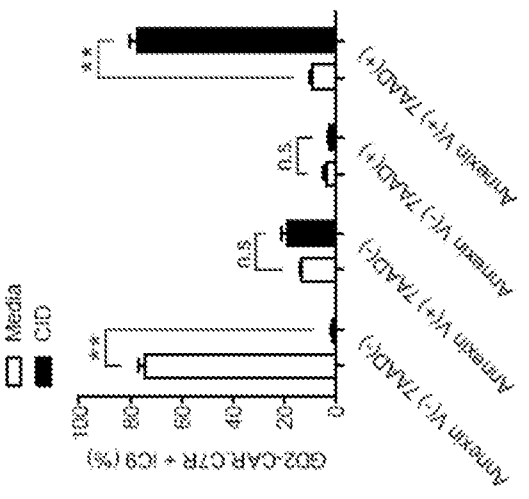


FIG. 17B

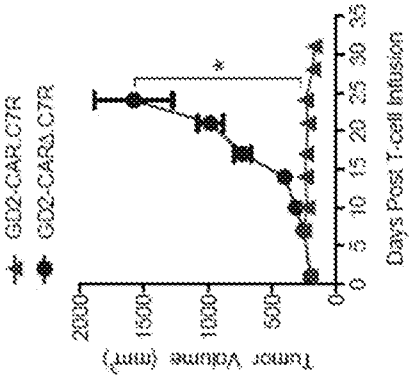


FIG. 17C

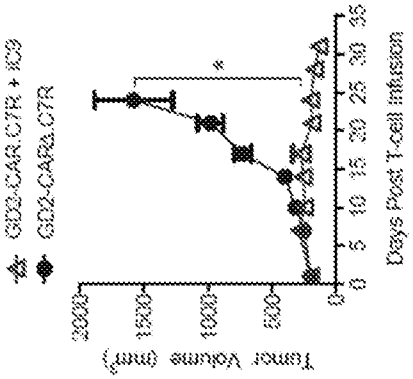
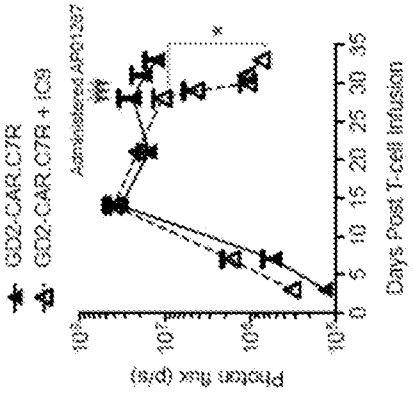


FIG. 17D



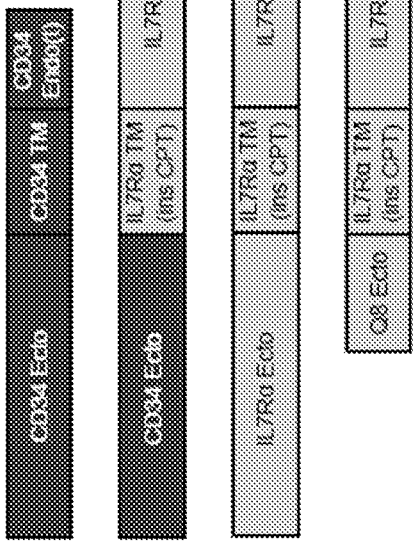


FIG. 18A

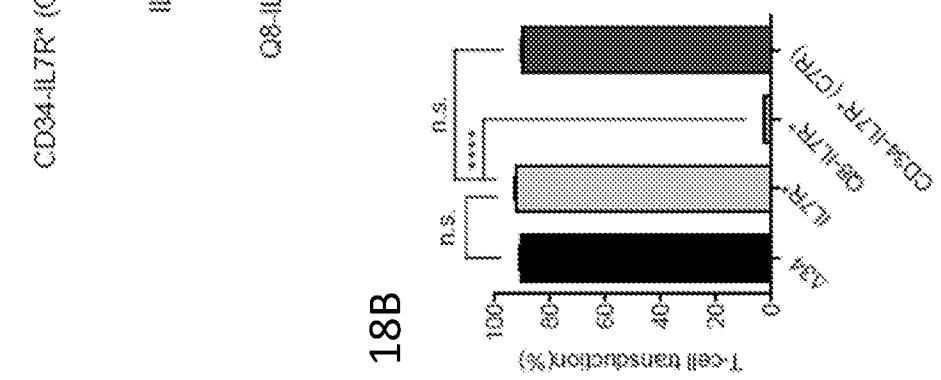


FIG. 18B

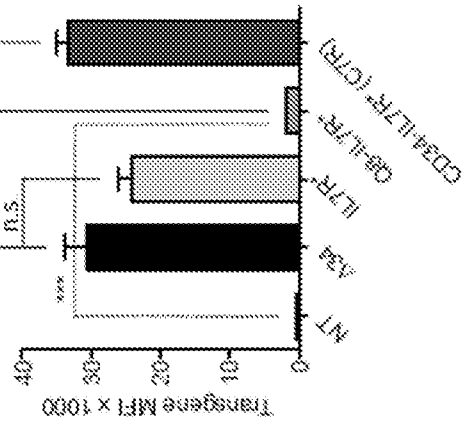


FIG. 18C

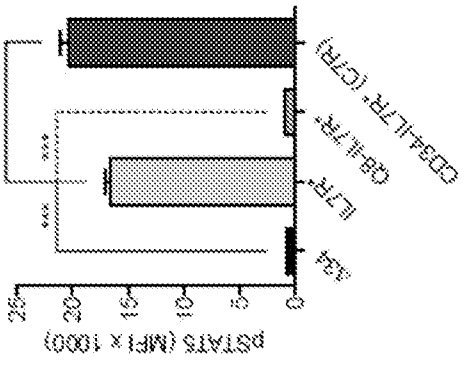


FIG. 18D

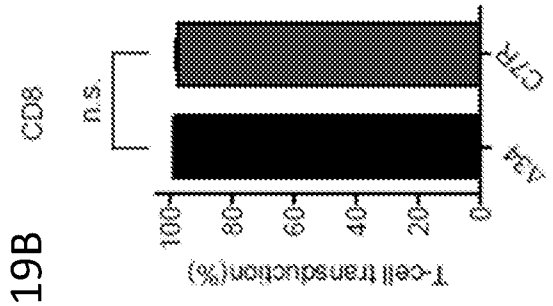


FIG. 19B

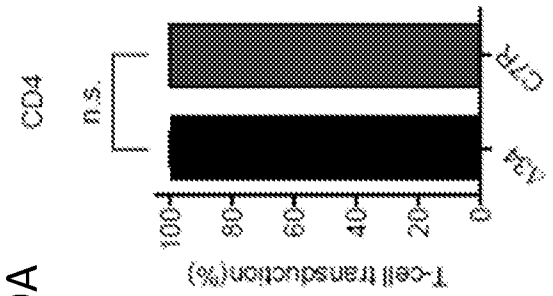


FIG. 19A

FIG. 20A

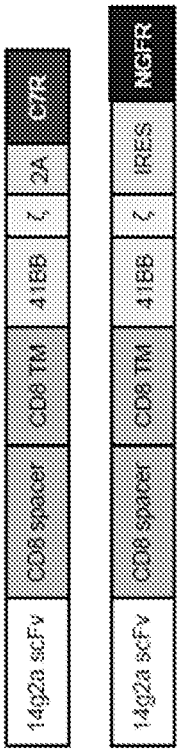


FIG. 20B

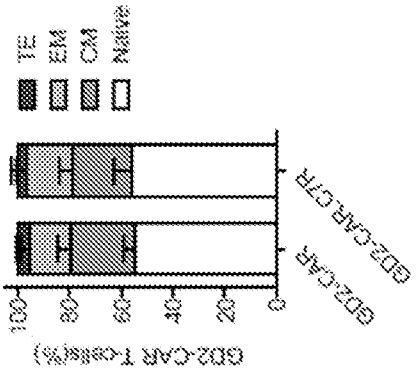


FIG. 20C

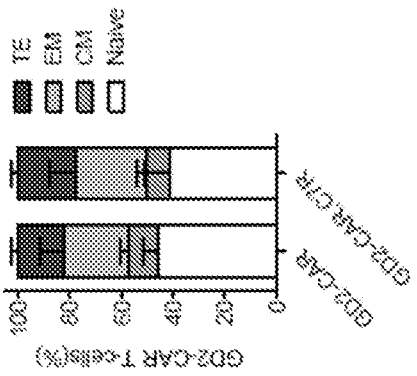
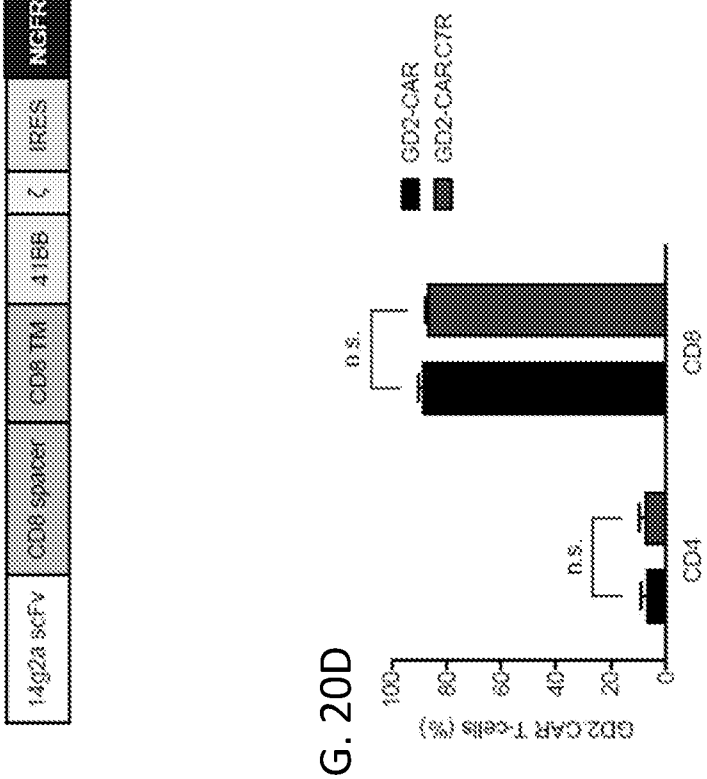


FIG. 20D



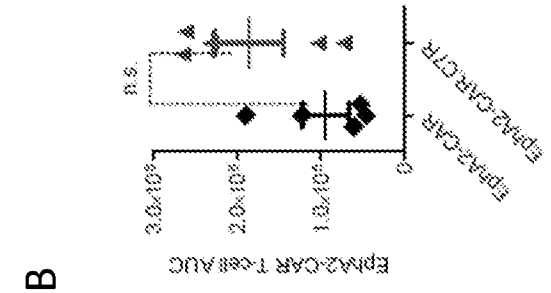


FIG. 21B

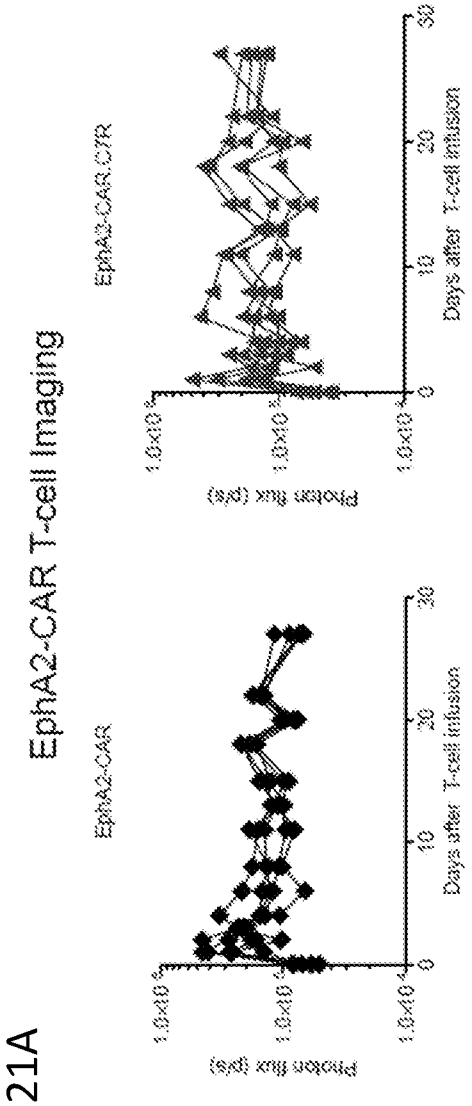


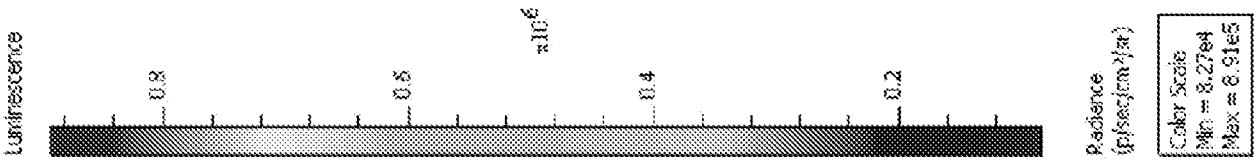
FIG. 21A

Gene Name	P Value	Fold Change	Gene Name	P Value	Fold Change
SOCS1	0.00577	2.50472	IL6ST	0.00577	0.39407
HAVCR2	0.00577	2.34276	ABCB1	0.00577	0.18342
BCL2	0.00577	2.73604	CD28	0.00577	0.12690
NCAM1	0.00577	6.65741	CXCL13	0.00577	0.00690
BATF3	0.00587	2.73369	CTSG	0.00577	0.06024
FCGR2A	0.00697	5.25978	S1PR1	0.00577	0.25211
IL2RA	0.01113	3.26967	ITGA6	0.00577	0.06362
ITGAX	0.01191	2.07030	IL15	0.00577	0.25342
FCER1G	0.01209	3.68320	ITGB1	0.00585	0.48091
DPP4	0.00851	2.63478	CCL24	0.00587	0.09091
CCL3	0.00851	3.86553	CASP8	0.00697	0.48072
IL13	0.00851	10.96200	NLRP3	0.00697	0.12974
TNFSF10	0.01342	3.23159	IL6R	0.00697	0.04533
XCL1	0.01350	3.63855	SELL	0.00784	0.27297
GAPDH	0.01384	1.67977	SYK	0.00788	0.05734
NCF4	0.01384	1.71959	TRAF1	0.00828	0.54448
CISH	0.01384	6.75305	IL21R	0.00828	0.40174
KLRF2	0.01454	4.84632	CIITA	0.00924	0.30701
LAG3	0.01460	2.64611	HLA-DPB1	0.01209	0.58034
PTGS2	0.01471	5.34714	TNFRSF14	0.01209	0.49924
CCL18	0.01497	2.98956	HLA-DMB	0.01209	0.63451
LIF	0.01533	5.74462	CD6	0.01209	0.44243
PDGFRB	0.01712	3.53609	RARRES3	0.01209	0.54712
CCND3	0.01743	1.83435	CXCL11	0.01314	0.10345
GZMA	0.01821	2.11802	CD44	0.01342	0.41938
CCR8	0.01821	1.53114	TLR1	0.01350	0.55877
CCL2	0.01821	5.90181	TLR9	0.01386	0.30631
IFIH1	0.01821	2.20198	TNFRSF17	0.01397	0.03631
PLAUR	0.01821	1.69454	EBI3	0.01433	0.29787
CCBP2	0.01821	5.56993	CD82	0.01460	0.62381
IFITM1	0.01905	2.49478	STAT6	0.01460	0.57347
TUBB	0.01958	2.01669	IL7R	0.01471	0.15475
CCR1	0.01958	7.75882	EOMES	0.01471	0.32396
TNF	0.01958	1.76365	CFH	0.01602	0.51495
CDKN1A	0.01958	2.93698	TGFB1	0.01628	0.67611

FIG. 22

Gene Name	P Value	Fold Change
SLAMF6	0.01628	0.51056
TOLLIP	0.01655	0.66615
LY96	0.01655	0.64675
HLA-DMA	0.01712	0.64402
ICOSLG	0.01743	0.40284
ATG7	0.01743	0.68213
MBP	0.01743	0.62974
PTK2	0.01743	0.02695
TNFAIP3	0.01743	0.44911
TYK2	0.01743	0.70494
FAS	0.01743	0.62709
PLAU	0.01743	0.13369
STAT5A	0.01743	0.65752
CTNNB1	0.01743	0.70534
MS4A1	0.01743	0.04961
SMAD5	0.01754	0.67904
MAF	0.01821	0.44447
MAP4K4	0.01821	0.69104
IL16	0.01821	0.56076
IKBKB	0.01821	0.67992
NFATC2	0.01861	0.57920
KIR3DL2	0.01867	0.40404
CD81	0.01886	0.69911
TLR3	0.01915	0.32951
CXCL10	0.01958	0.14631
ATG16L1	0.01958	0.63774
ITGAE	0.01958	0.71460
TGFBR2	0.01958	0.53011

FIG. 22 (cont.)


Luminescence
0.8
0.6
x10^6
0.4
0.2
Radiance (p/sec/cm^2/sr)
Color Scale
Min = 8.27e4
Max = 6.91e5

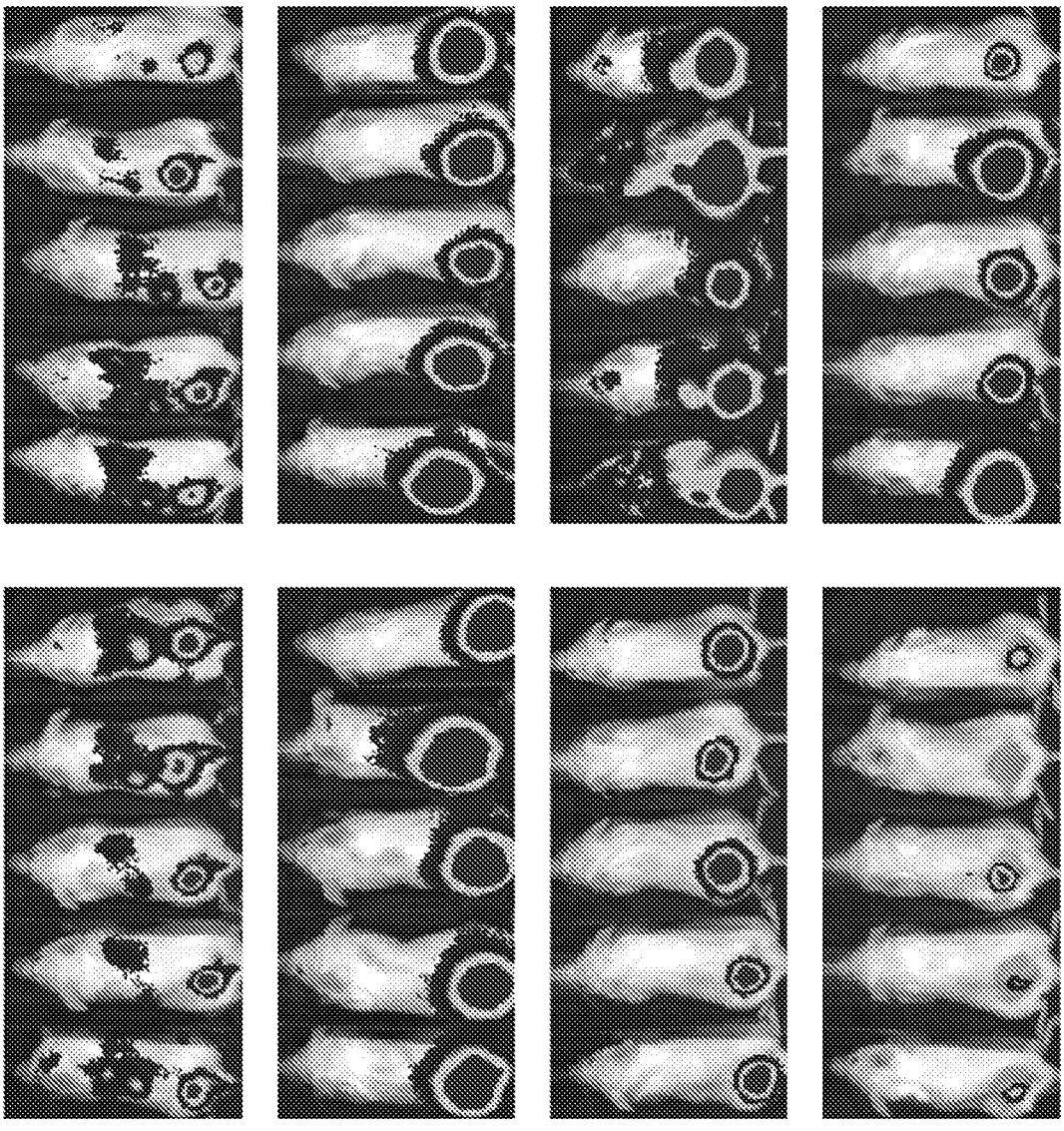

EBVST
34.IL7RP2-EBVST
Day 1
Day 7
Day 15
Day 39

FIG. 23A

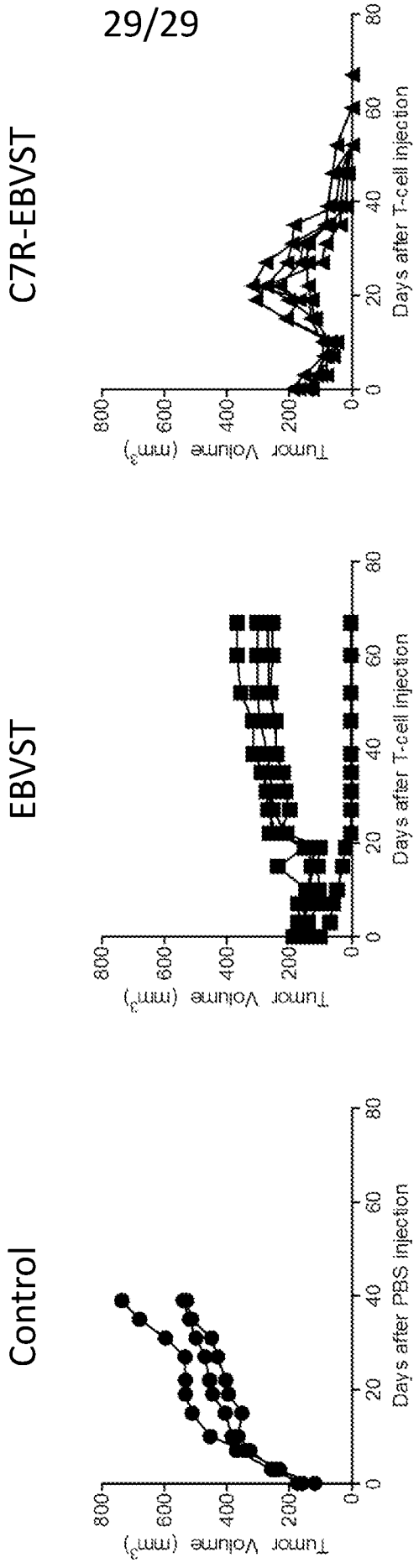

Control
EBVST
C7R-EBVST
Tumor Volume (mm3)
0
200
400
600
800
0
20
40
60
80
Days after PBS injection
Days after T-cell injection

FIG. 23B