

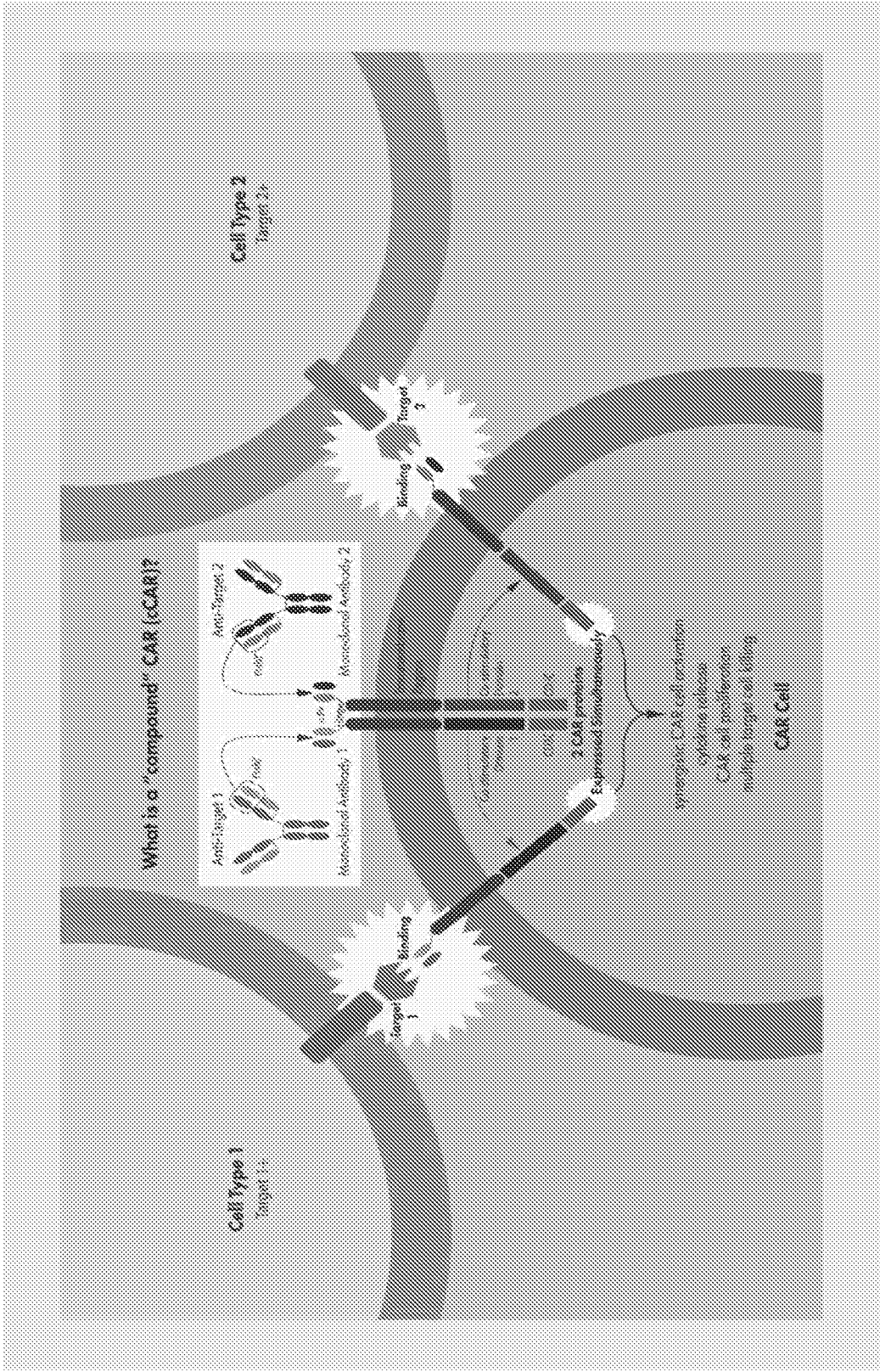


FIGURE 1

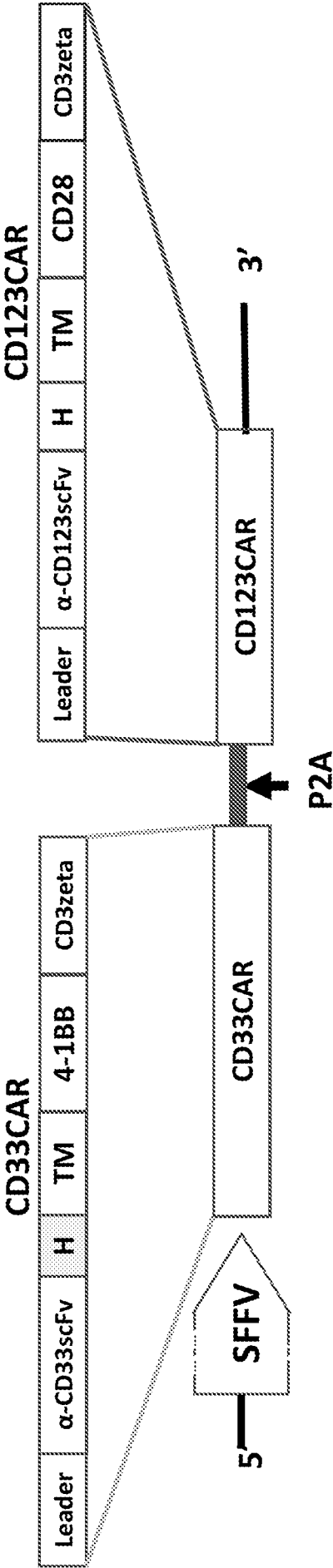


FIGURE 2A

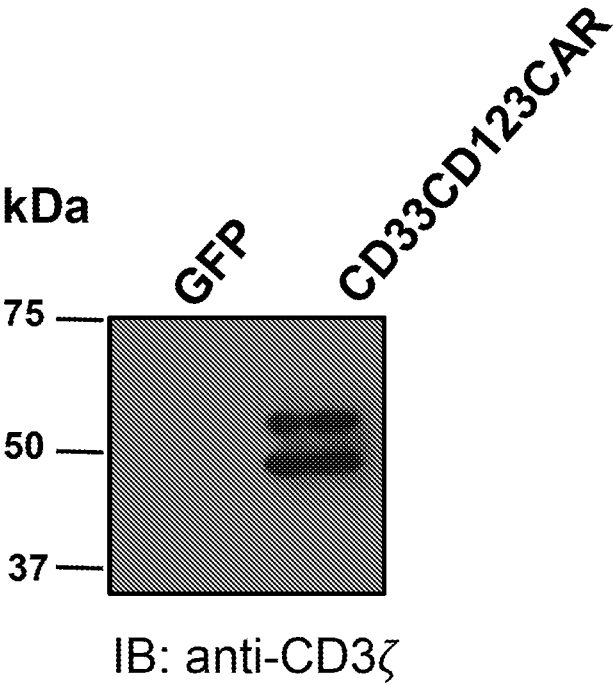
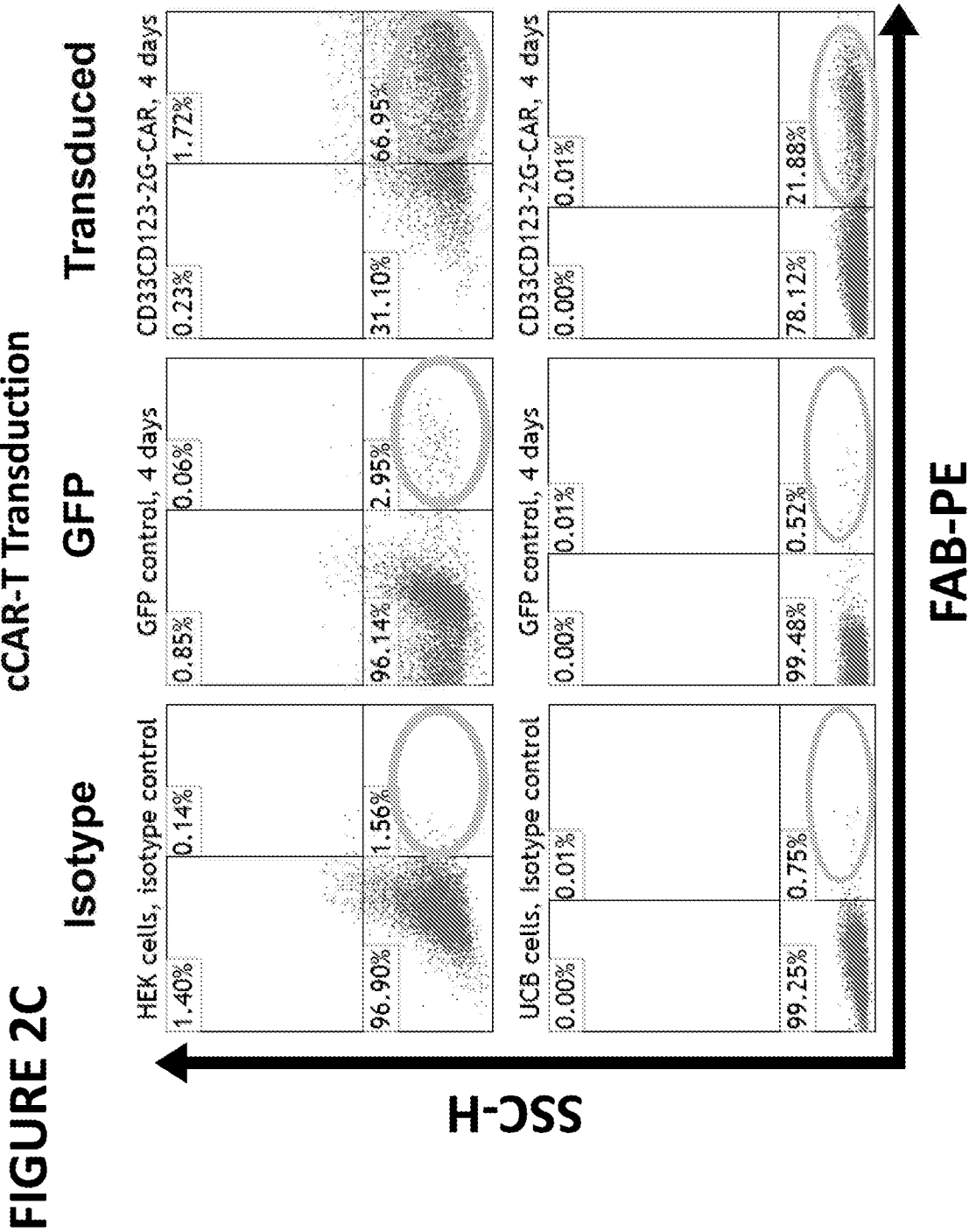
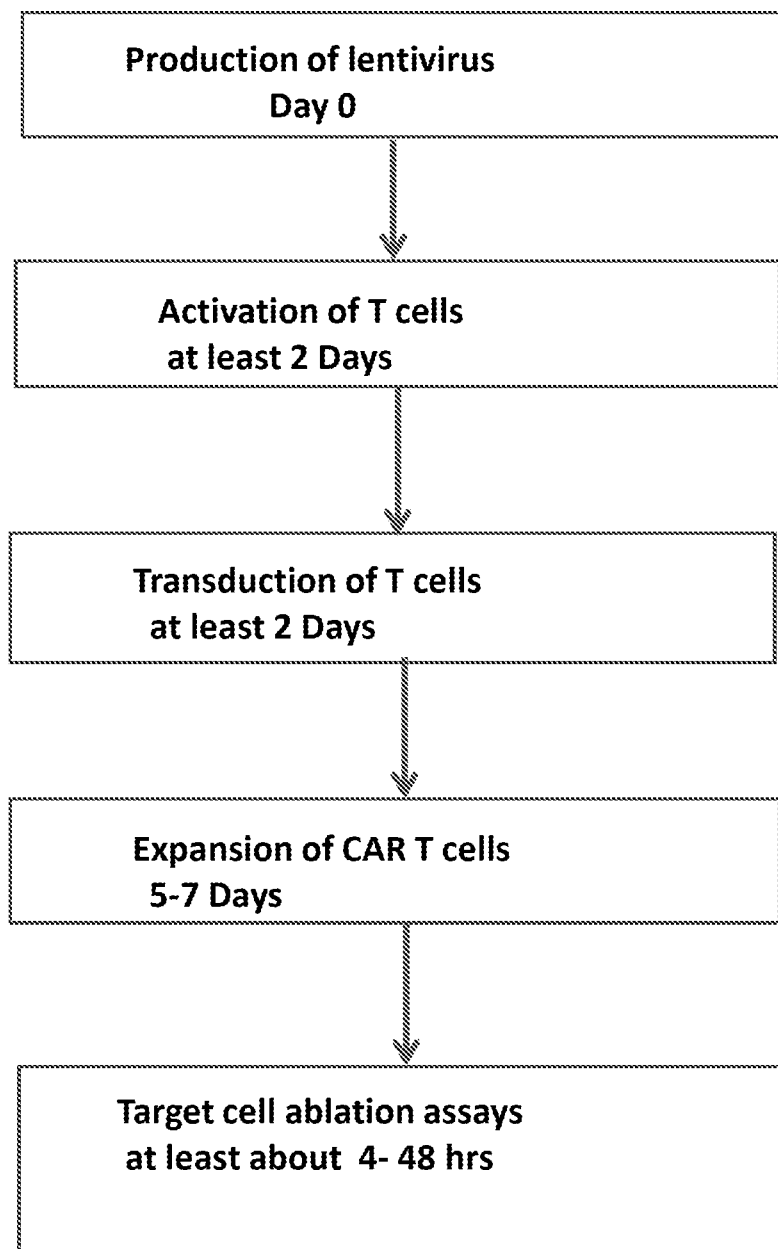
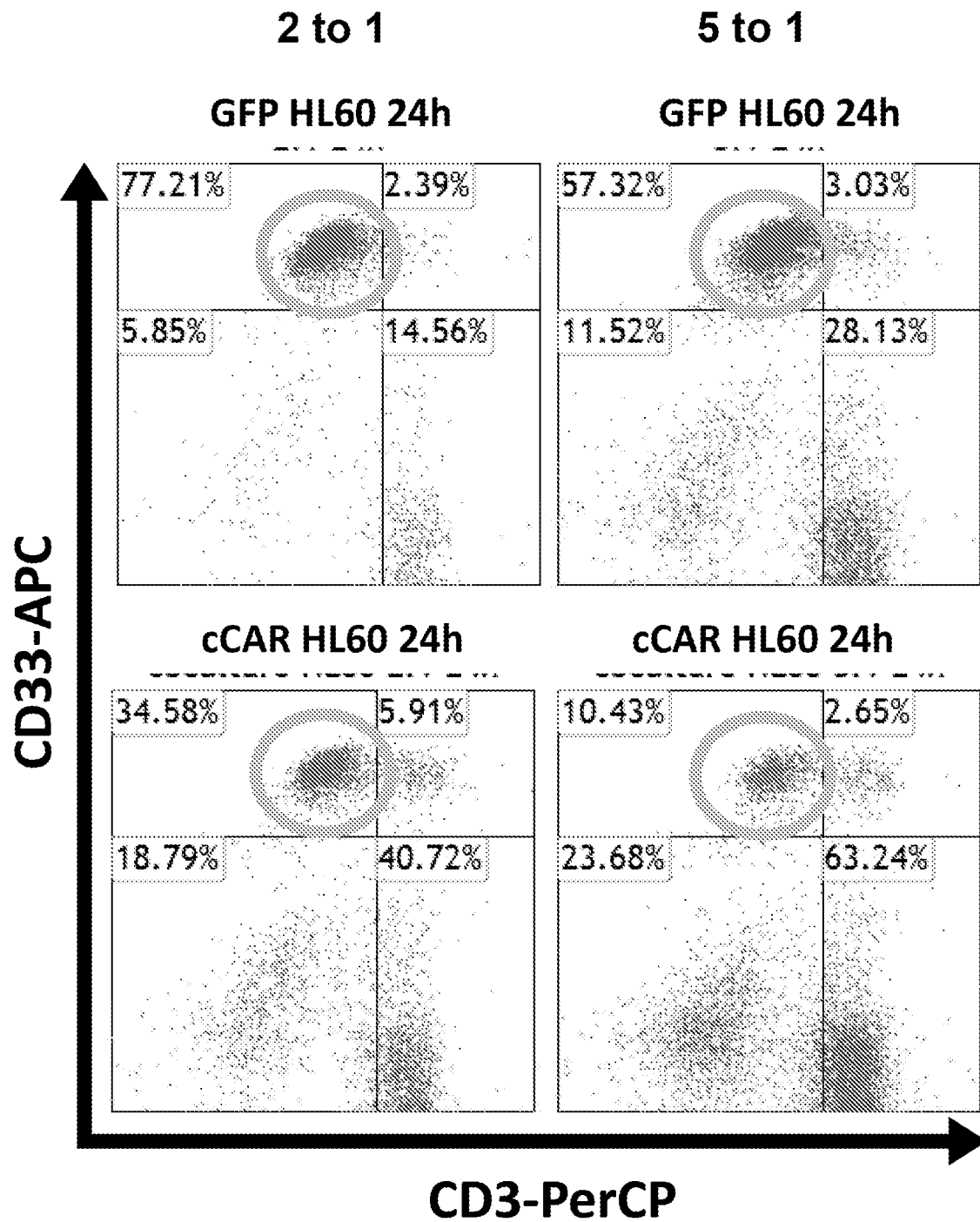


FIGURE 2B



**FIGURE 3**

**FIGURE 4**

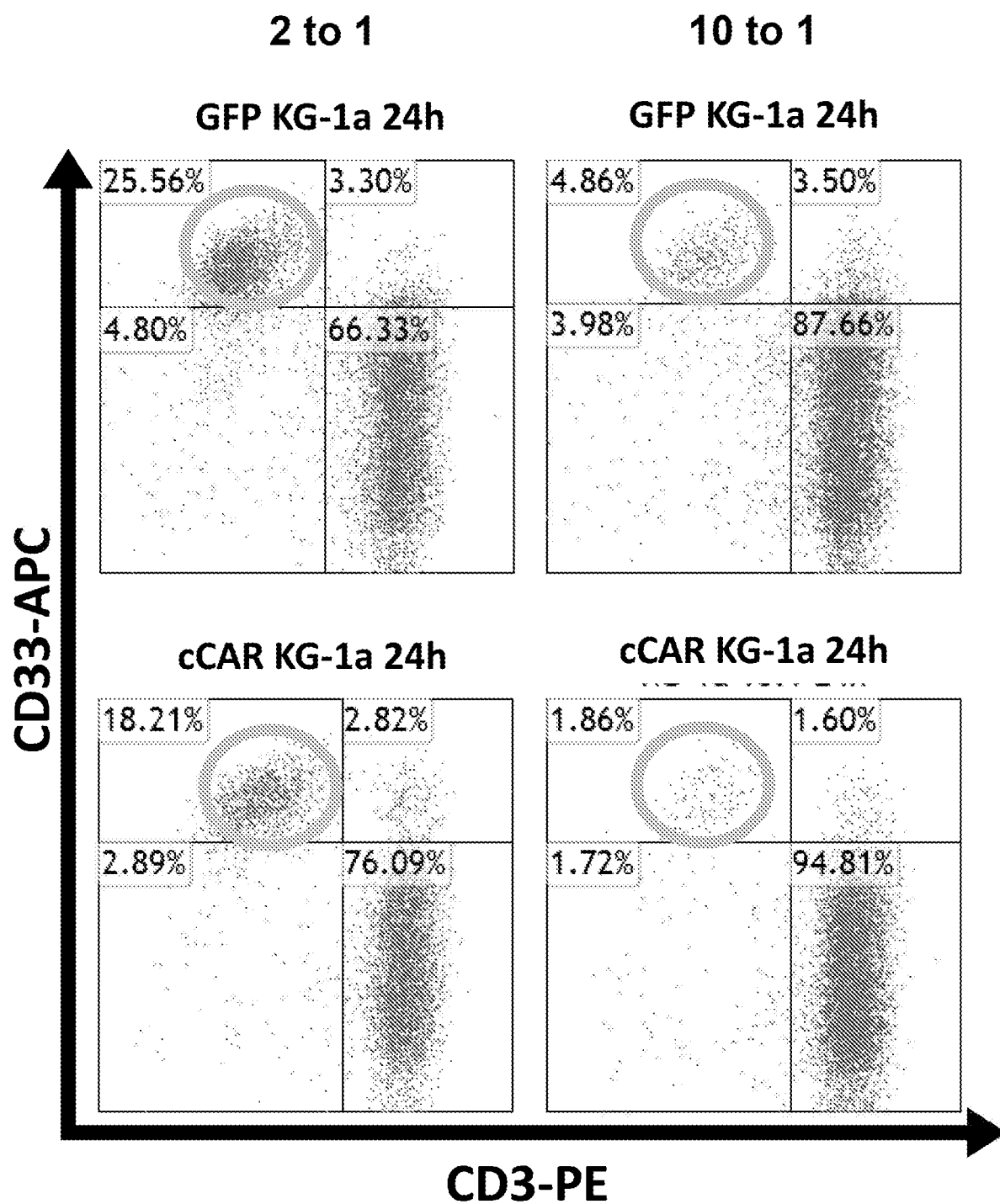


FIGURE 5

FIGURE 6

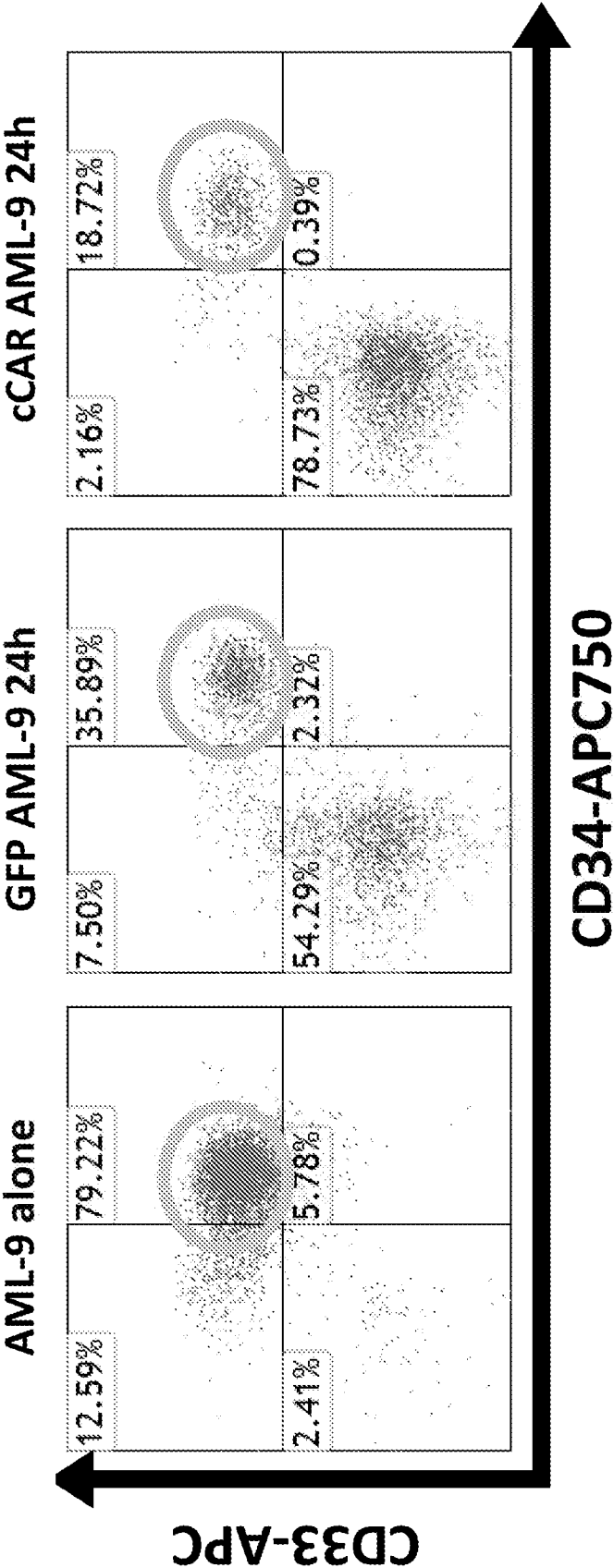


FIGURE 7

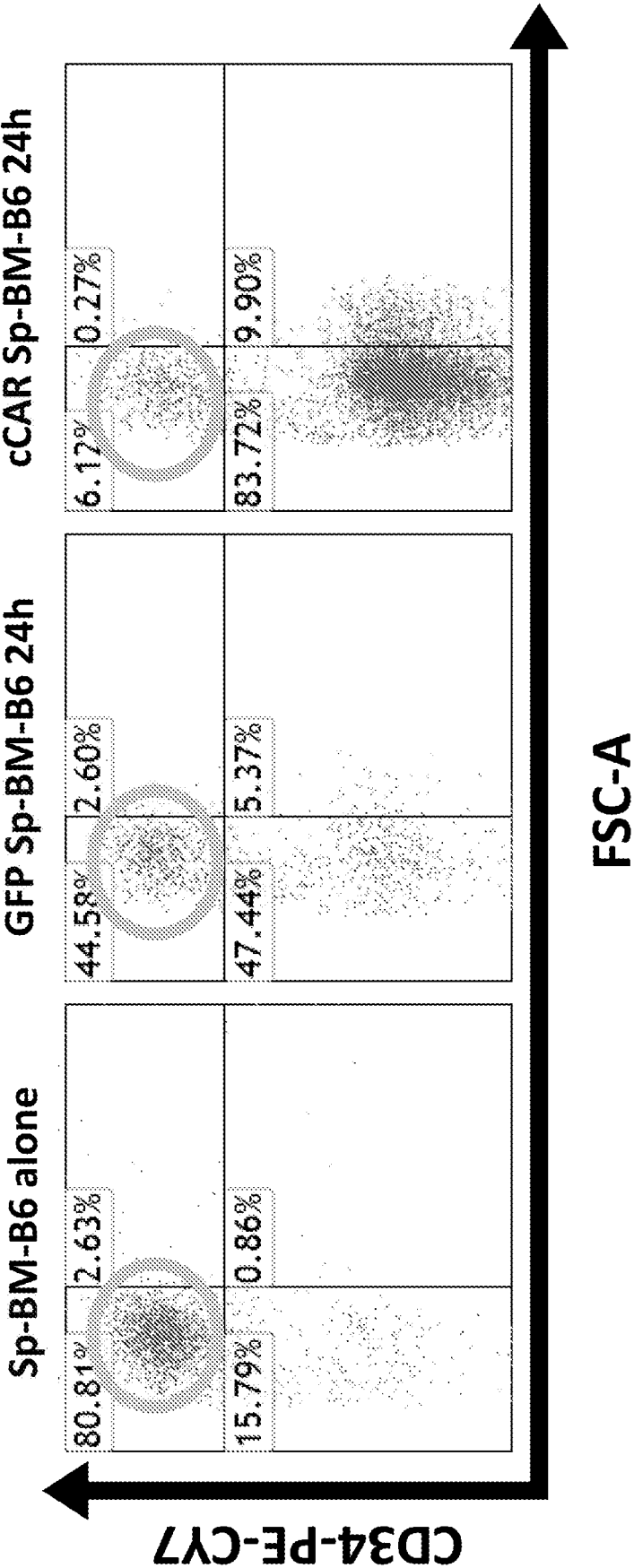
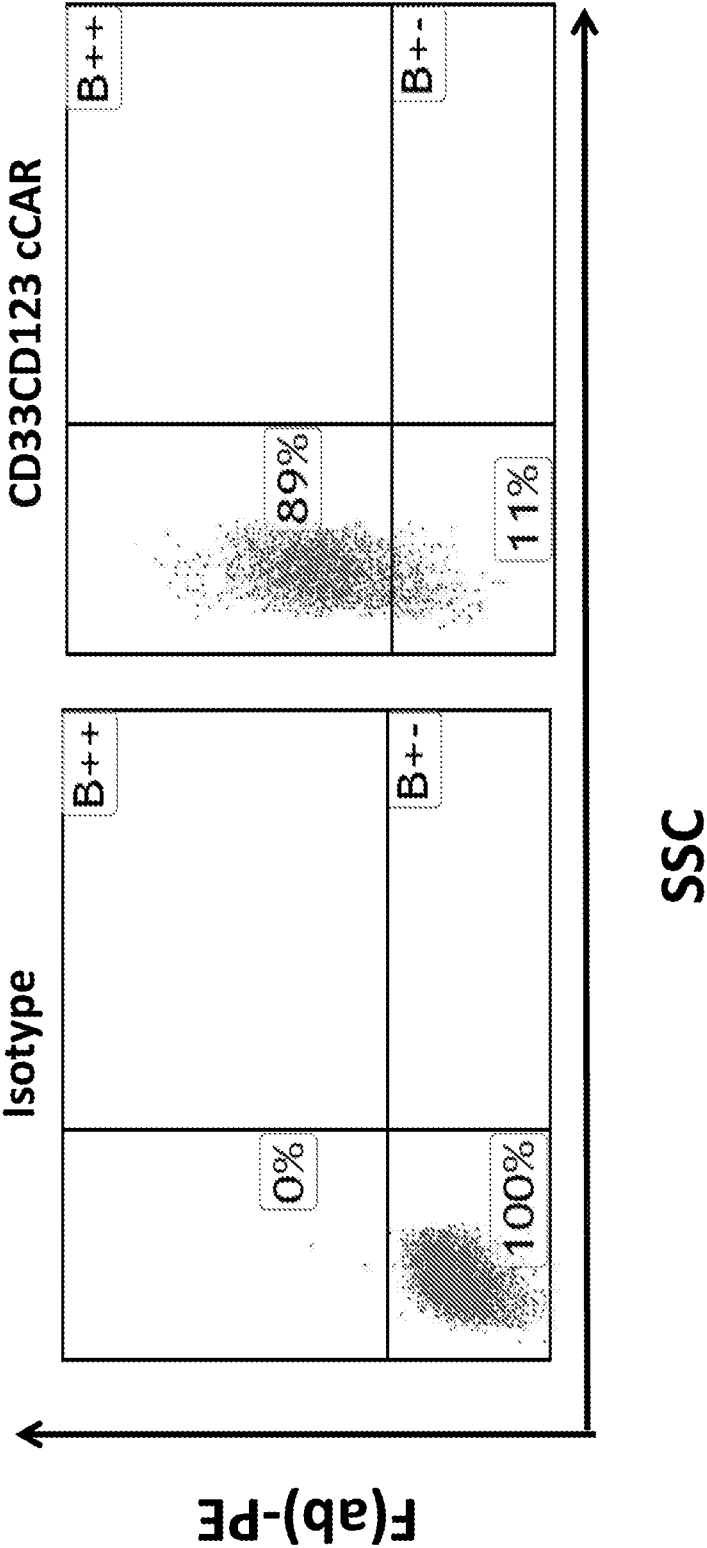
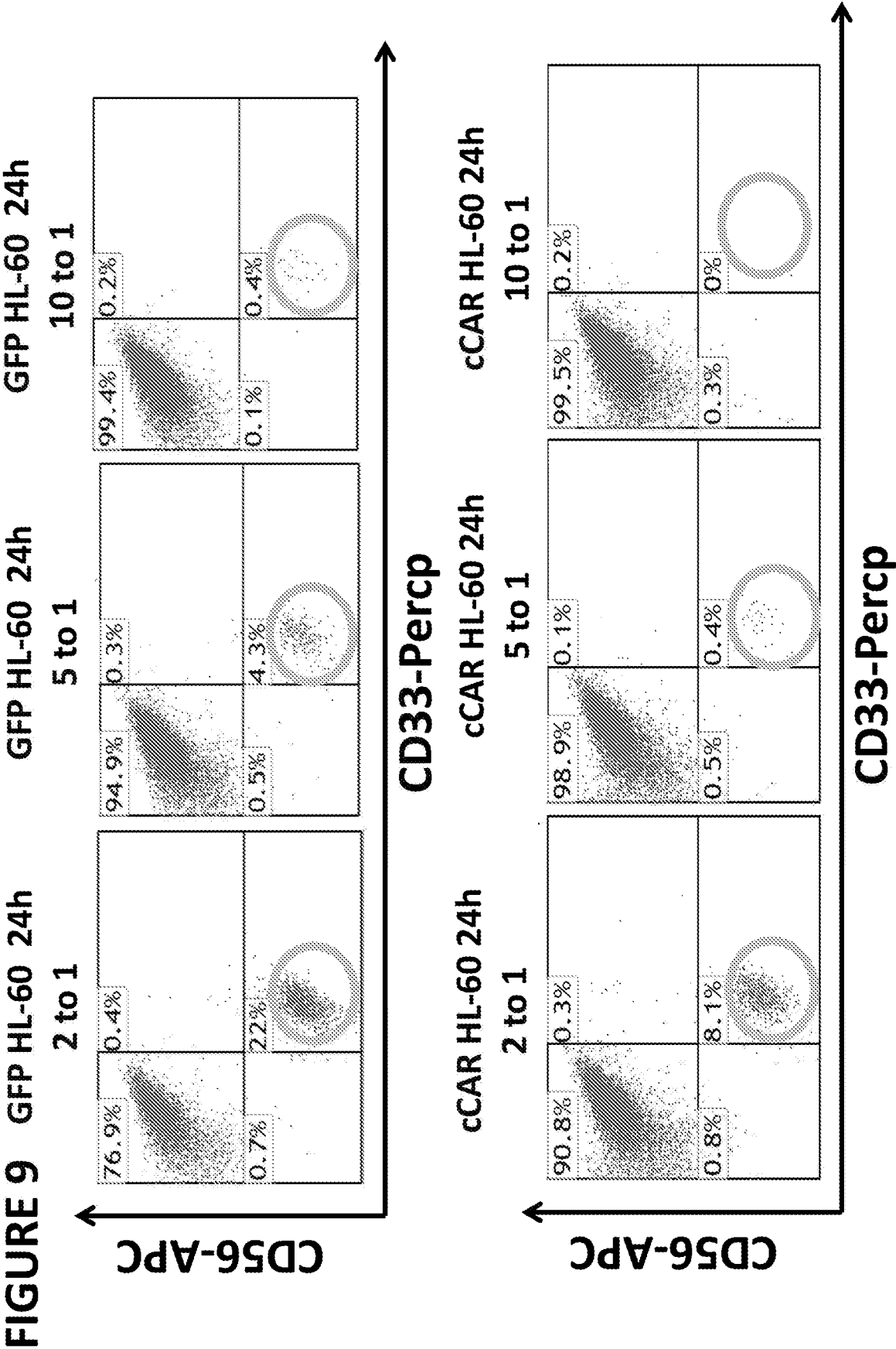


FIGURE 8





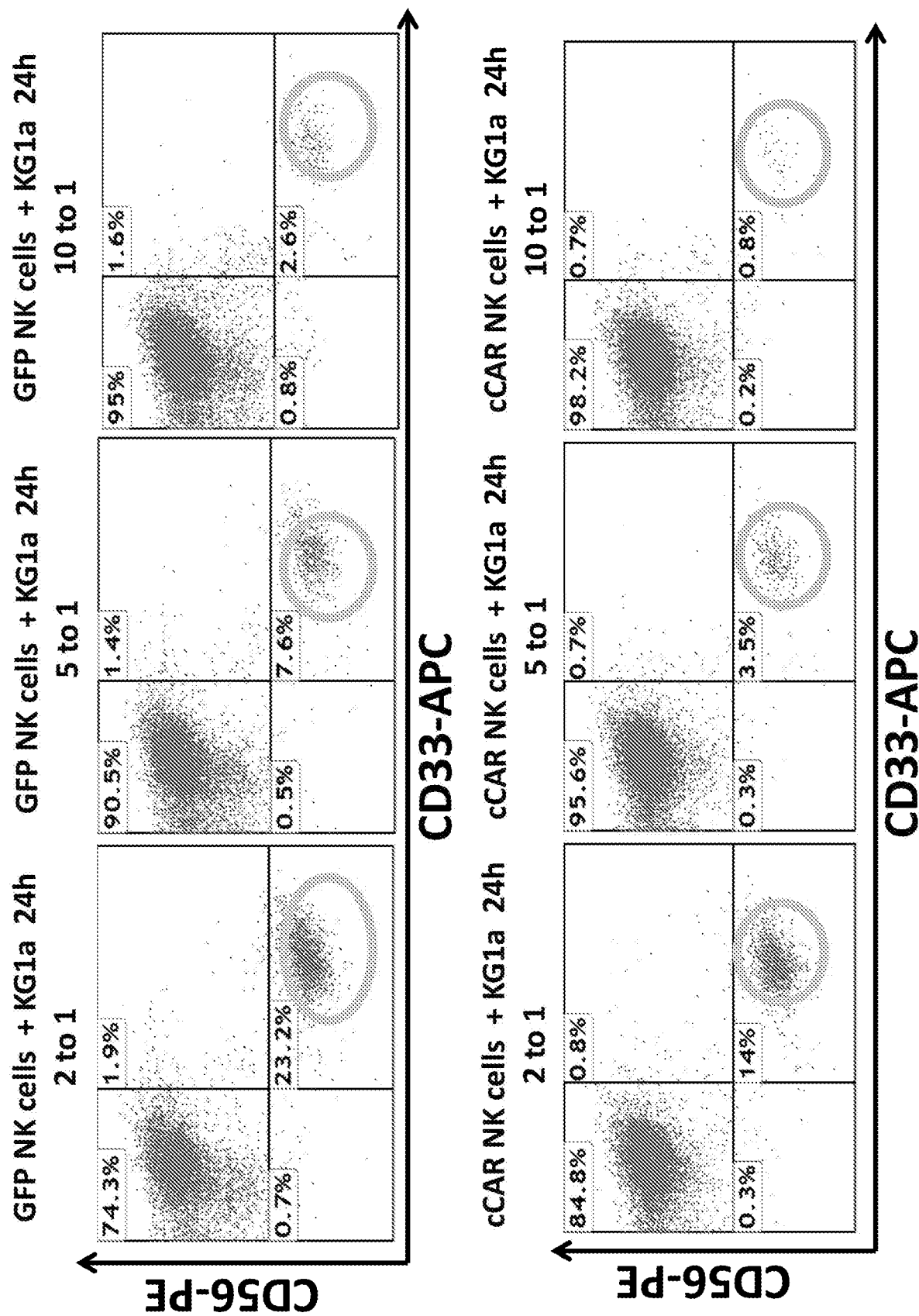


FIGURE 10

FIGURE 11

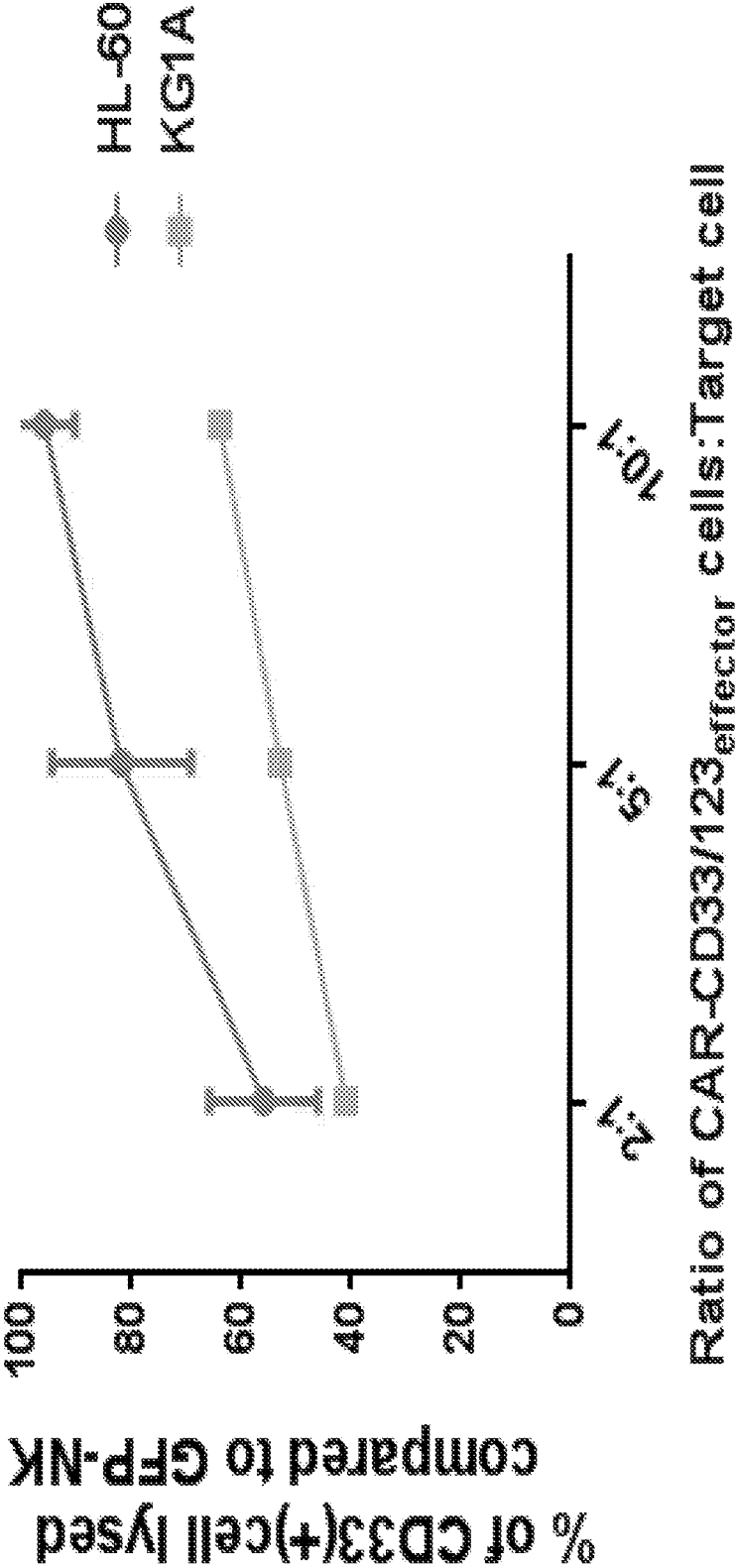
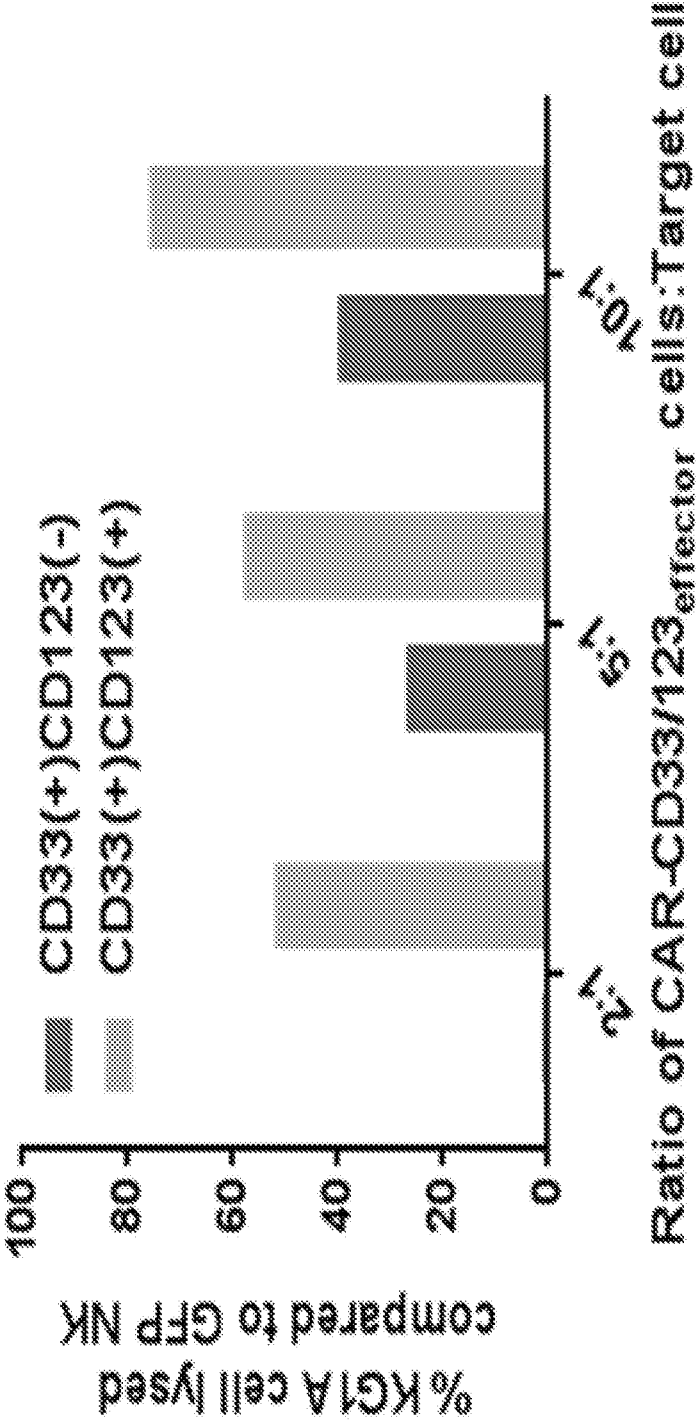
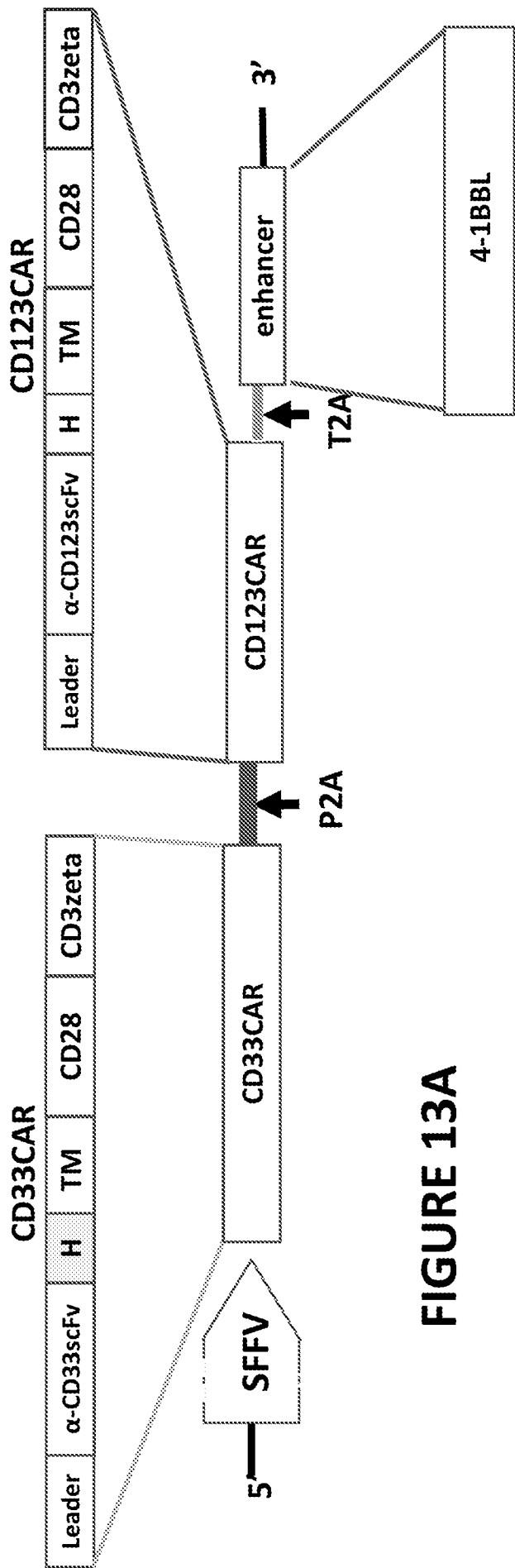


FIGURE 12





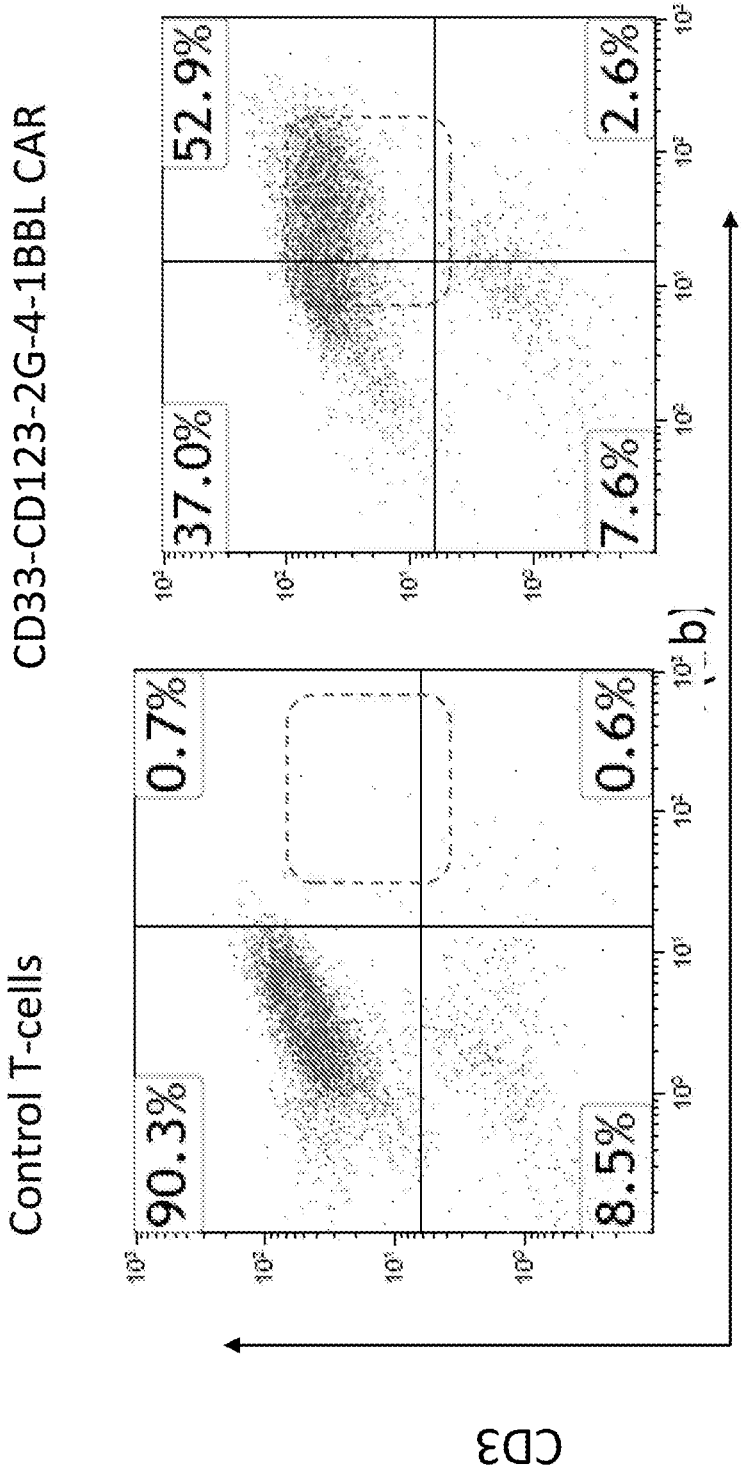


FIGURE 13B

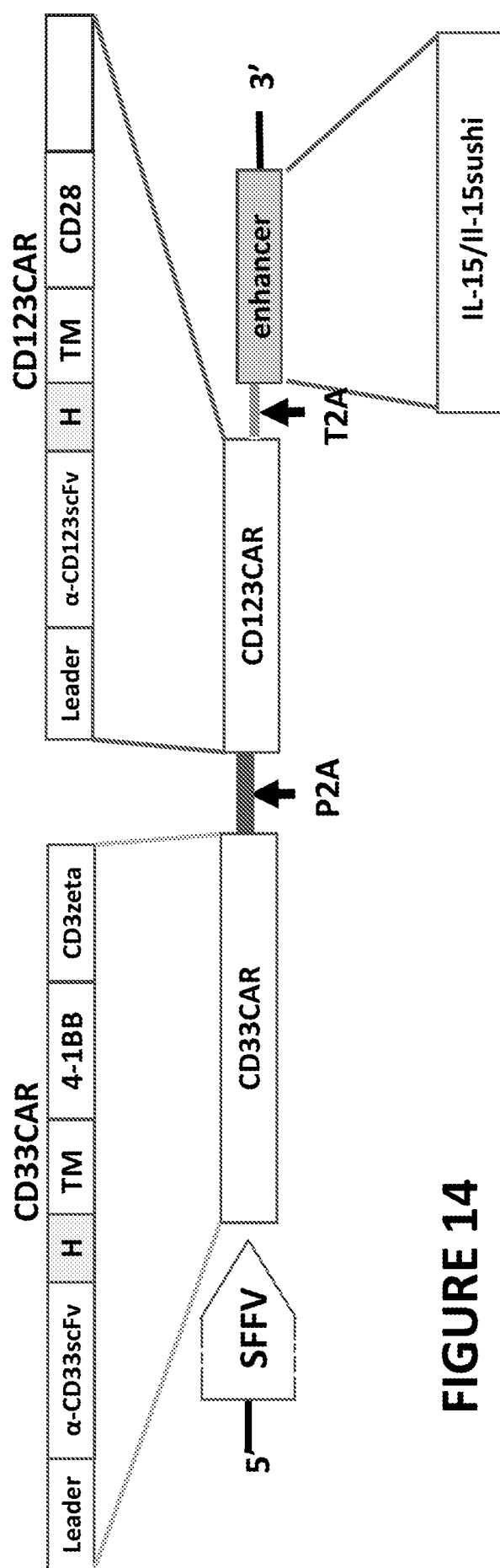


FIGURE 14

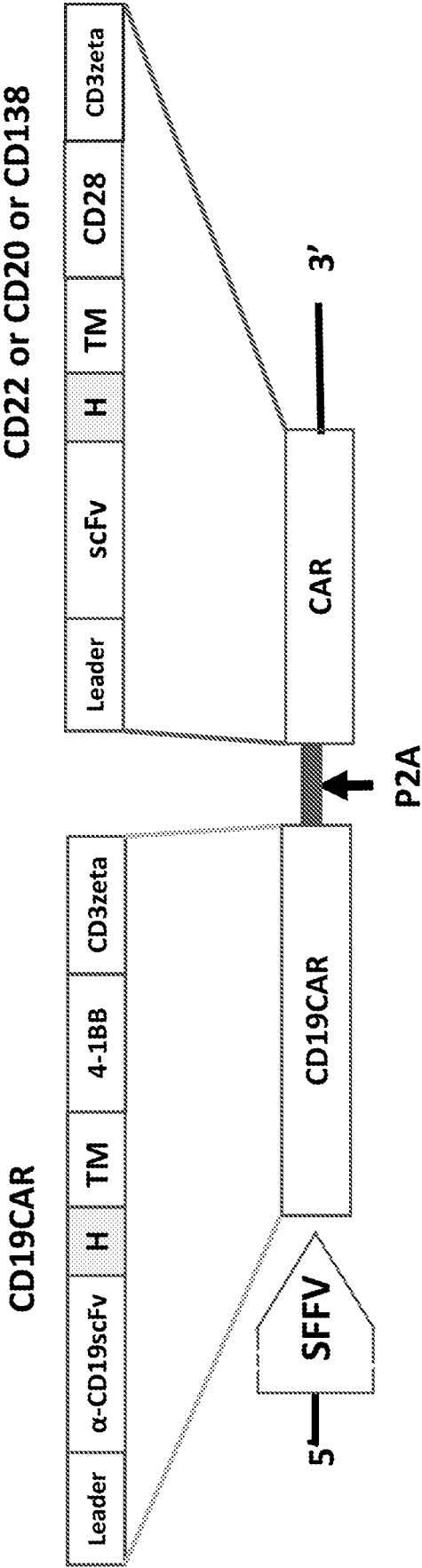


FIGURE 15

FIGURE 16A

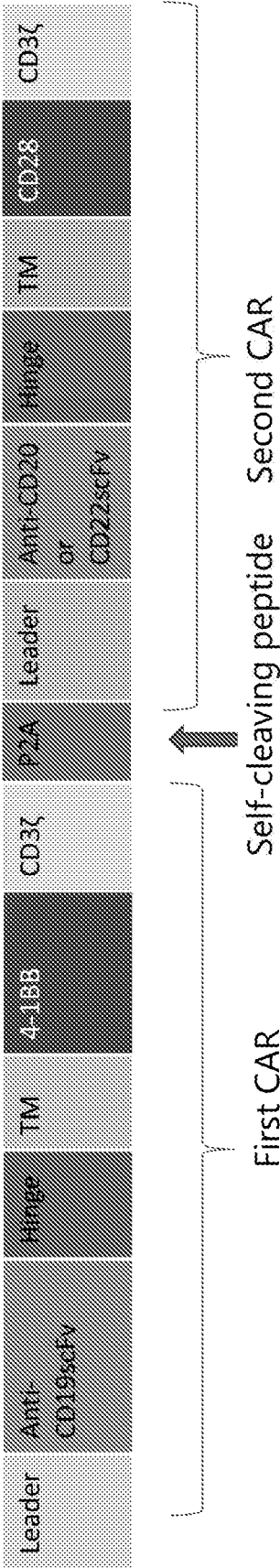
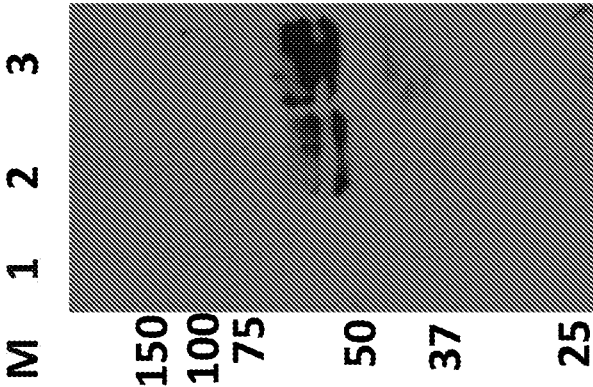
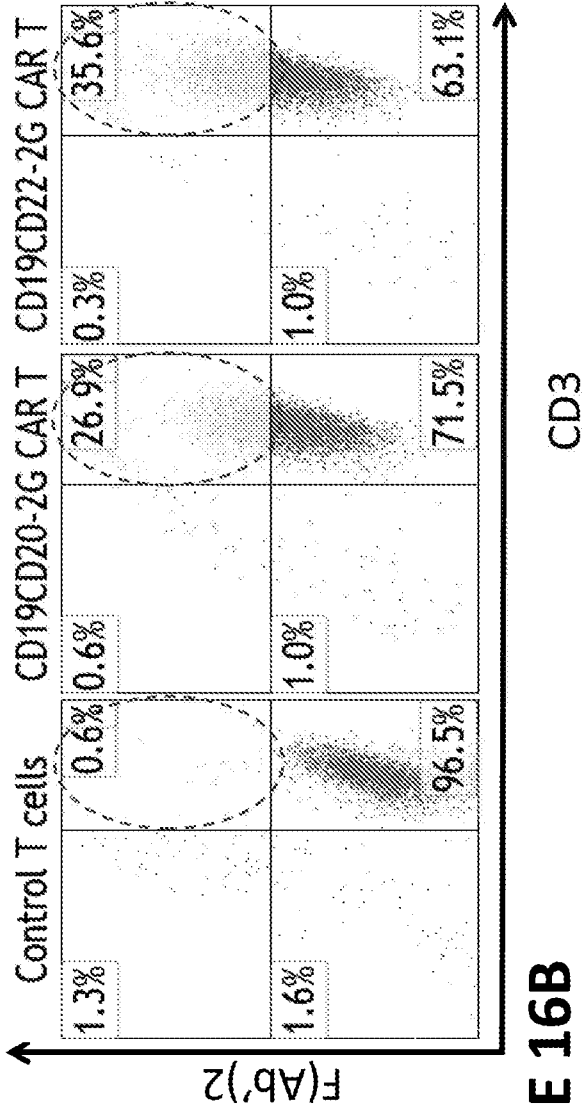
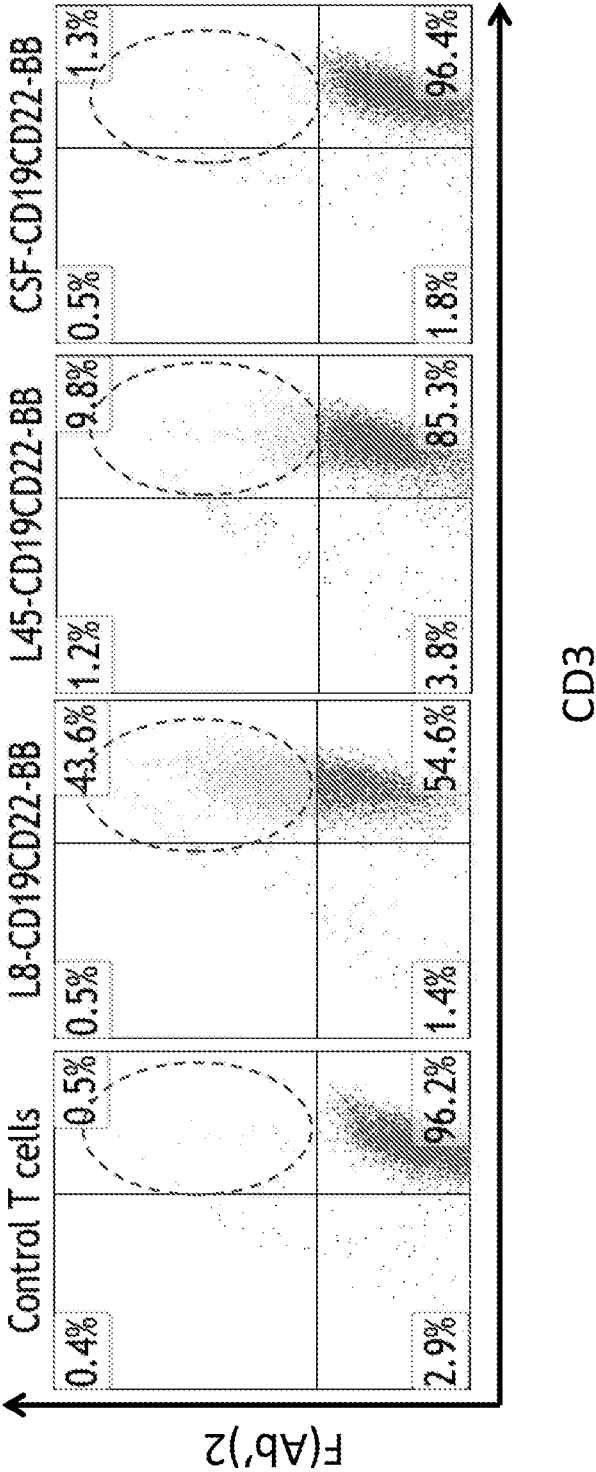


FIGURE 16B

FIGURE 17



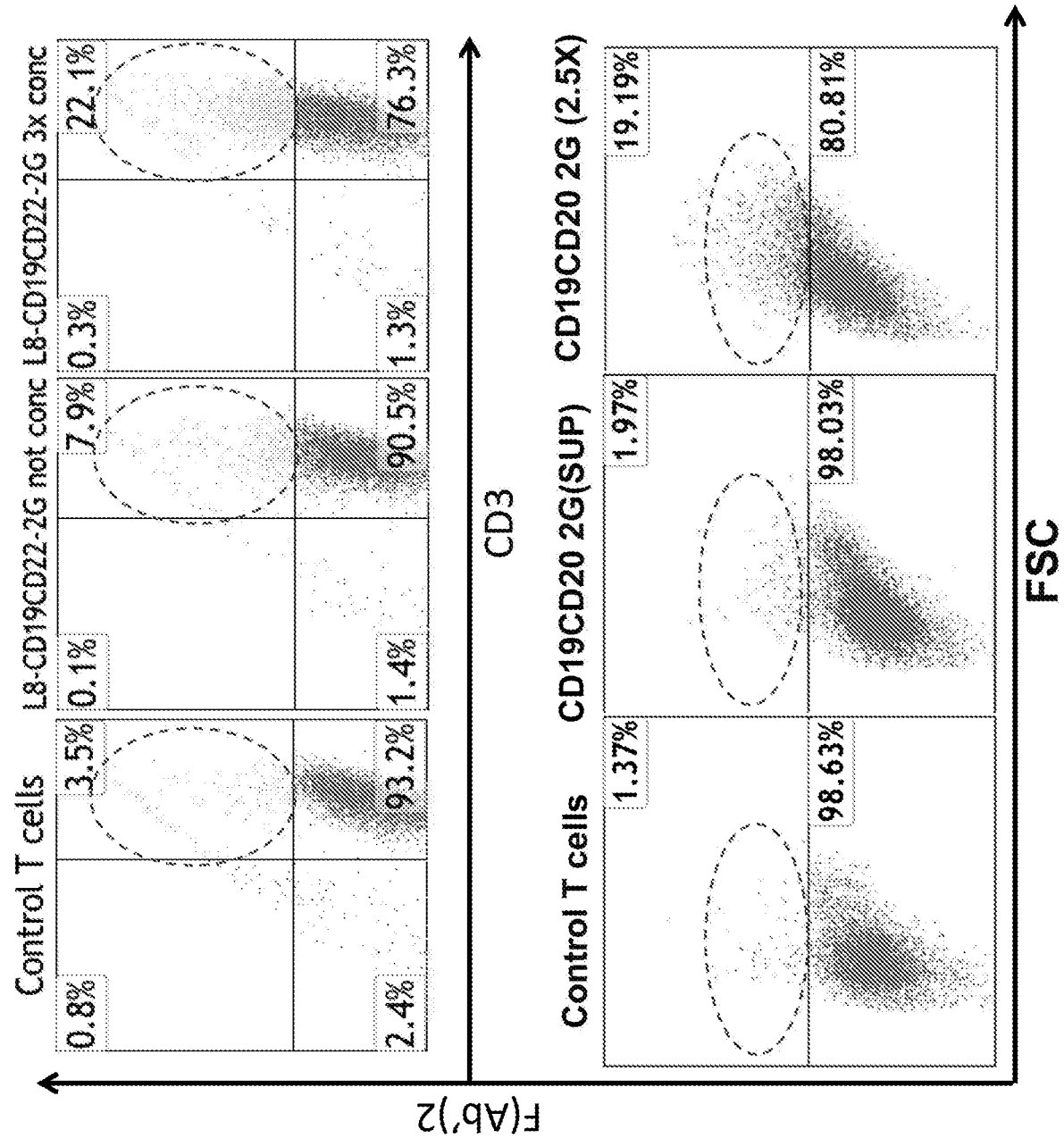
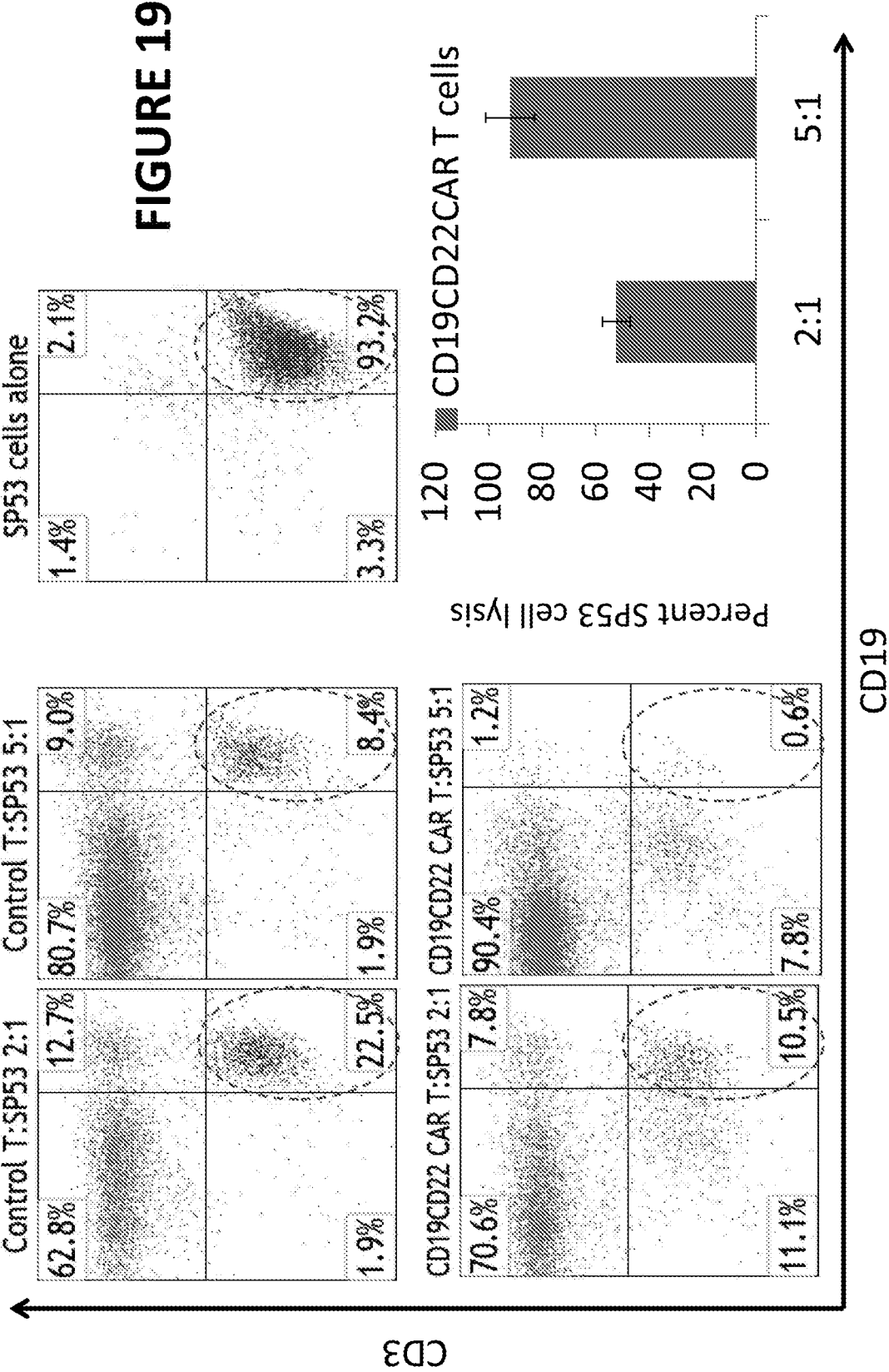
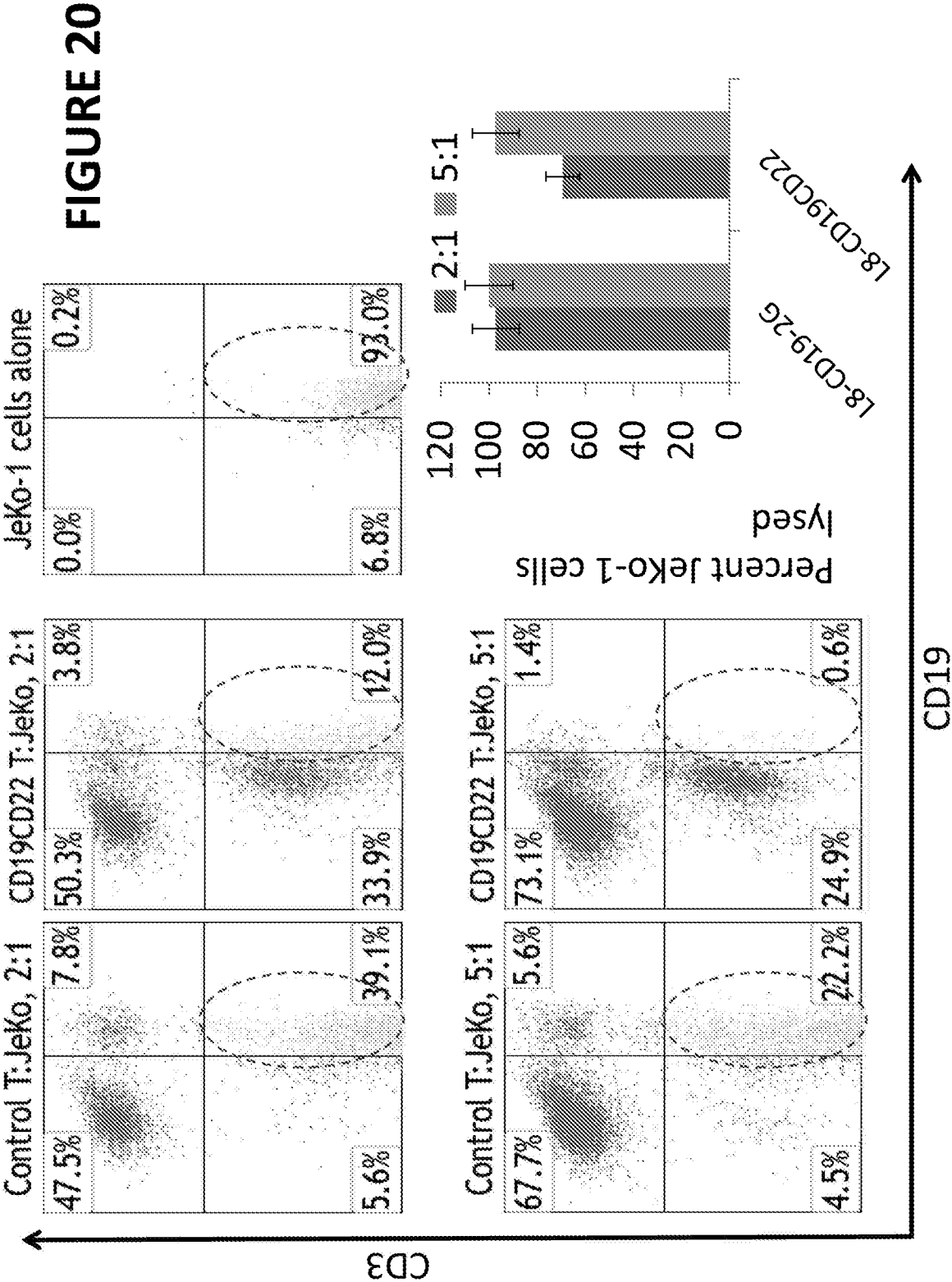


FIGURE 18





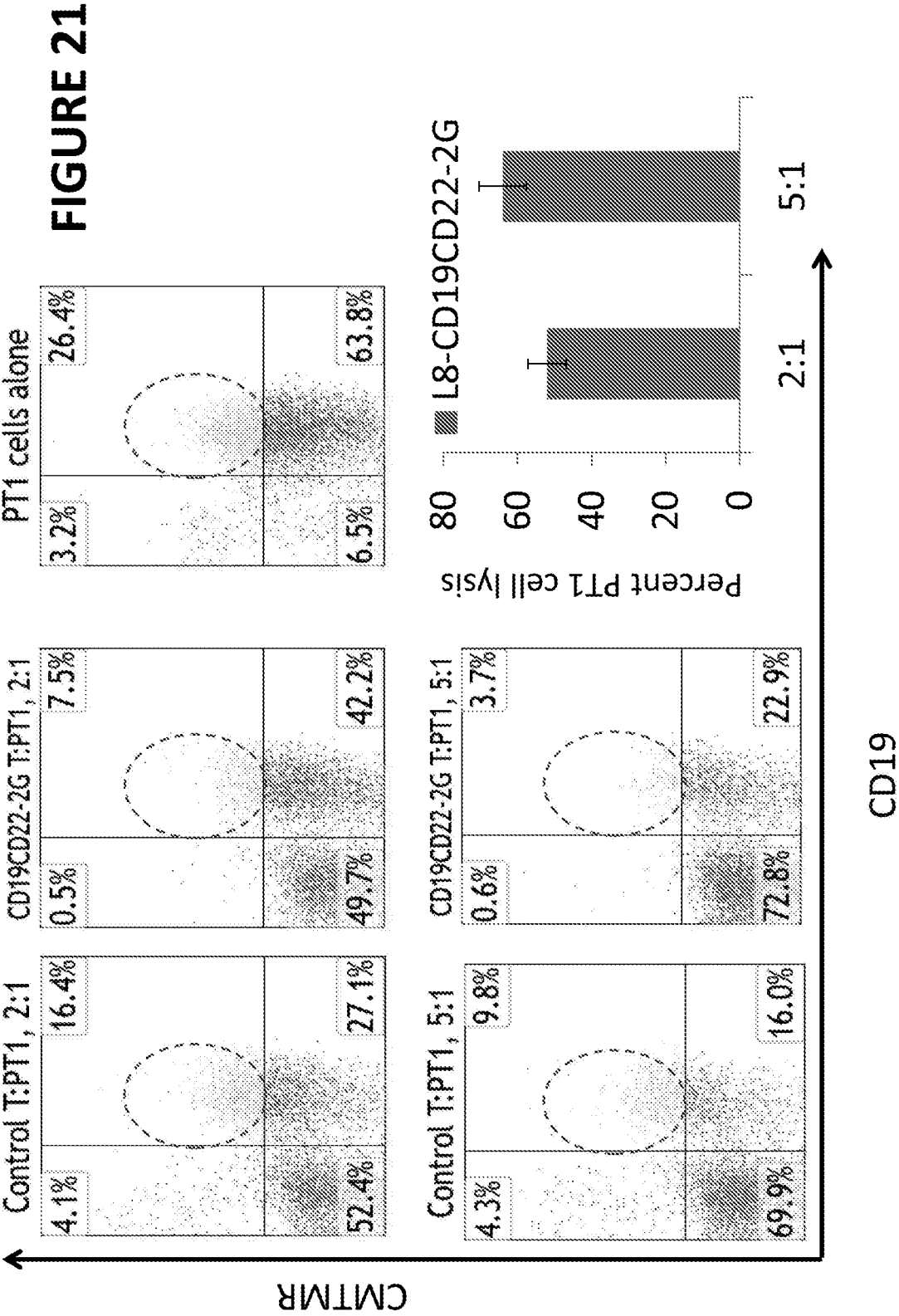
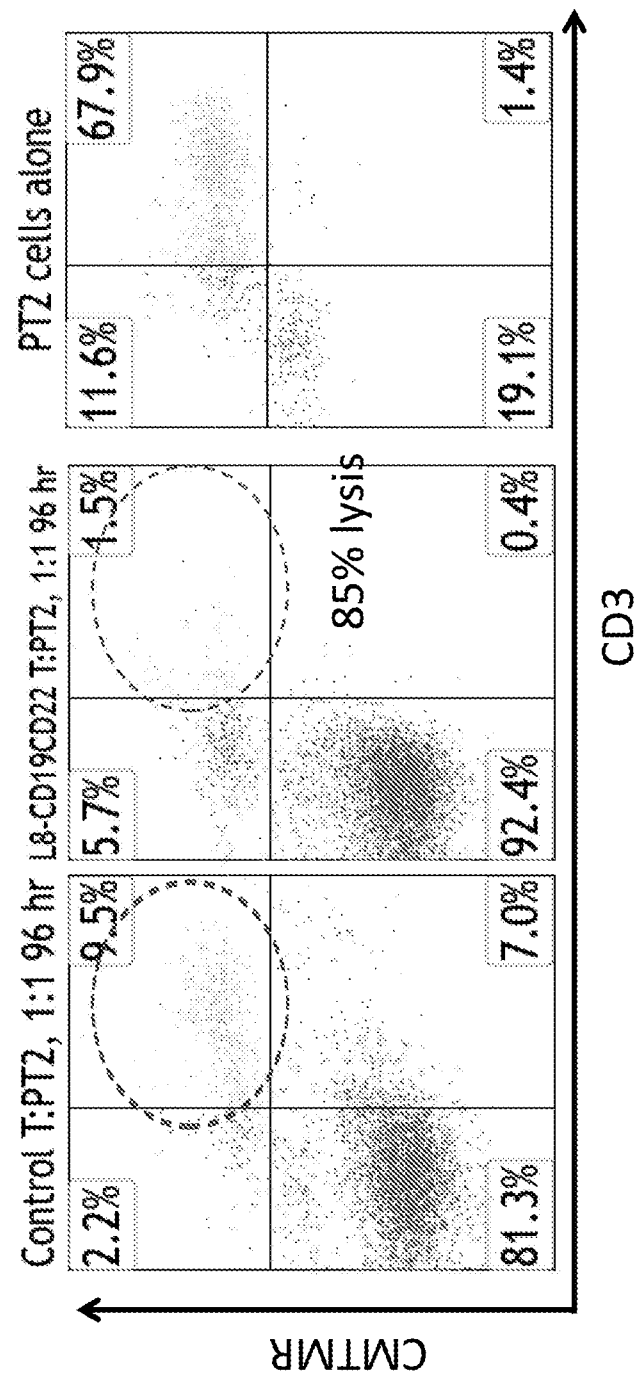


FIGURE 22A



In vitro summary

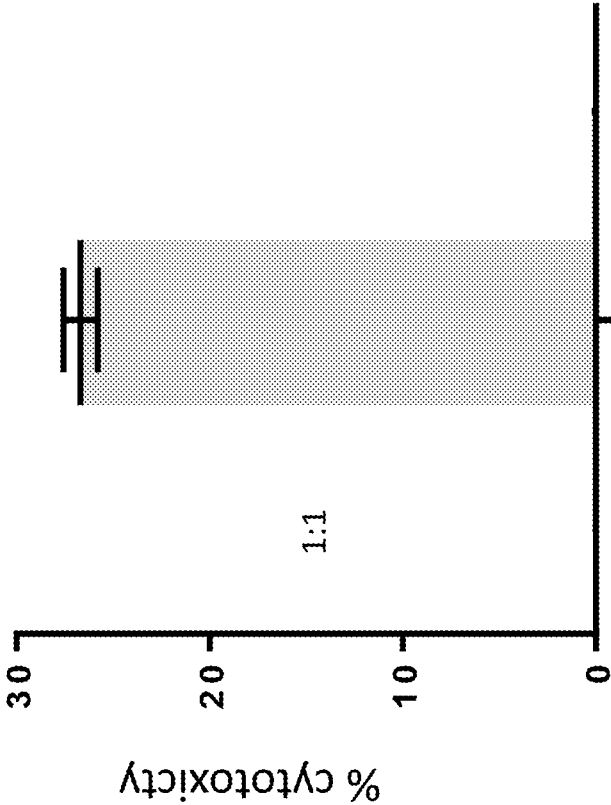


FIGURE 22B

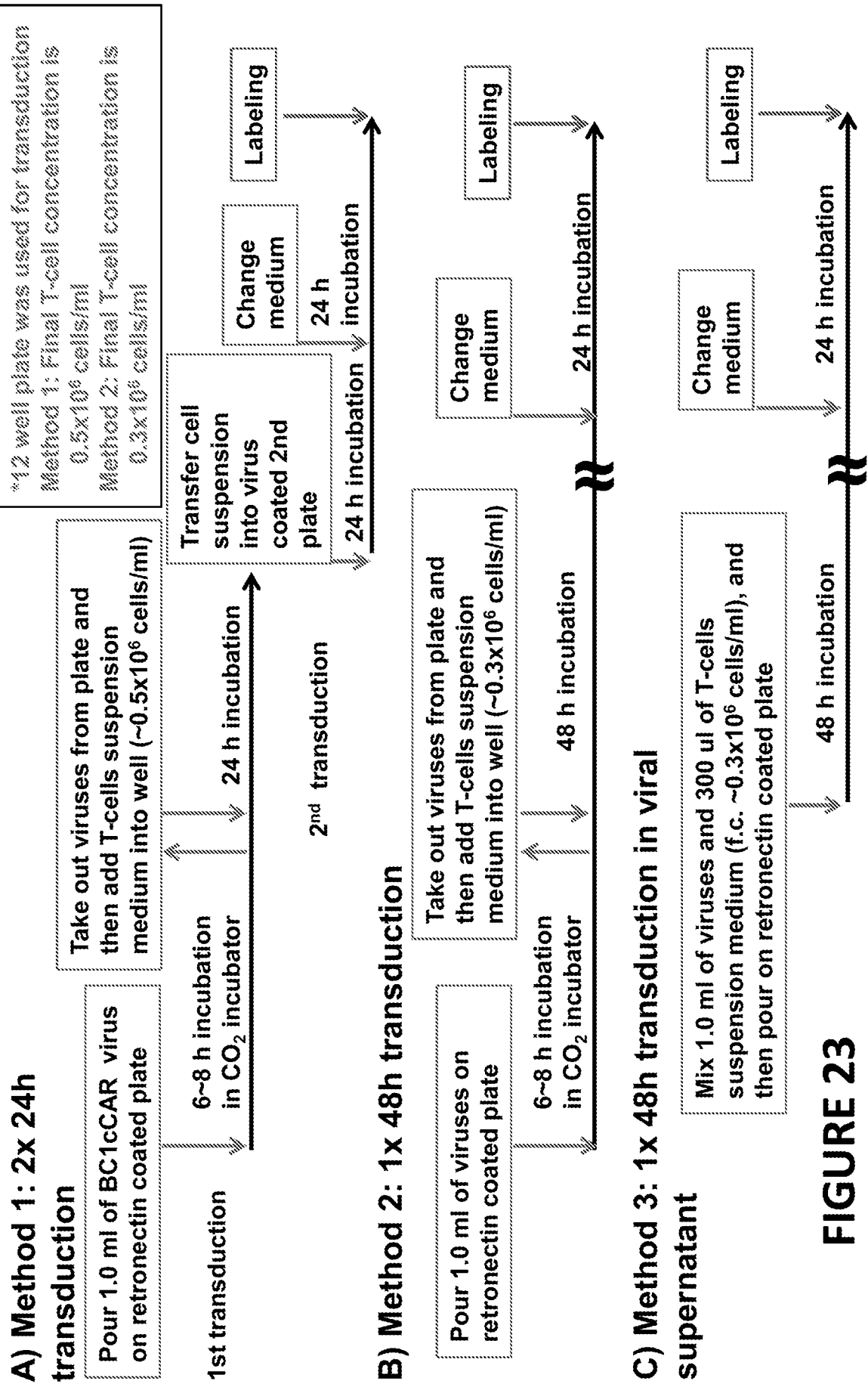


FIGURE 23

FIGURE 24A

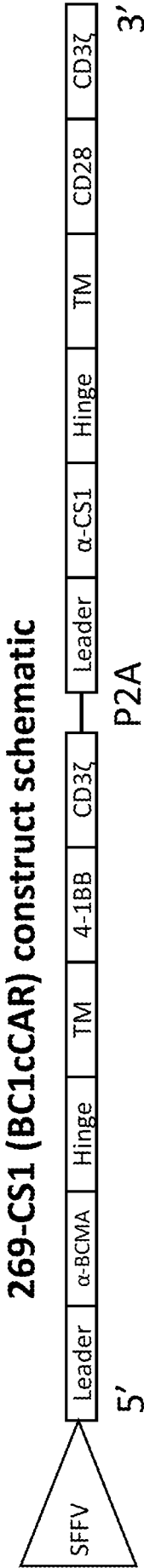
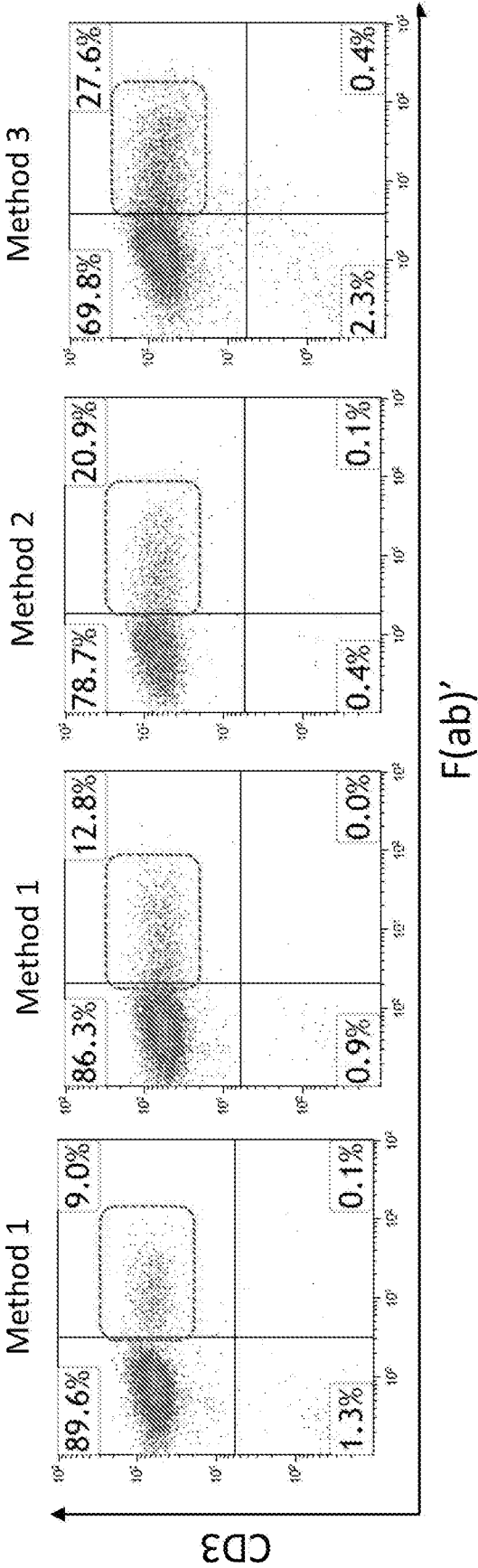


FIGURE 24B

BC1cCAR surface expression as a measure of the transduction methodology



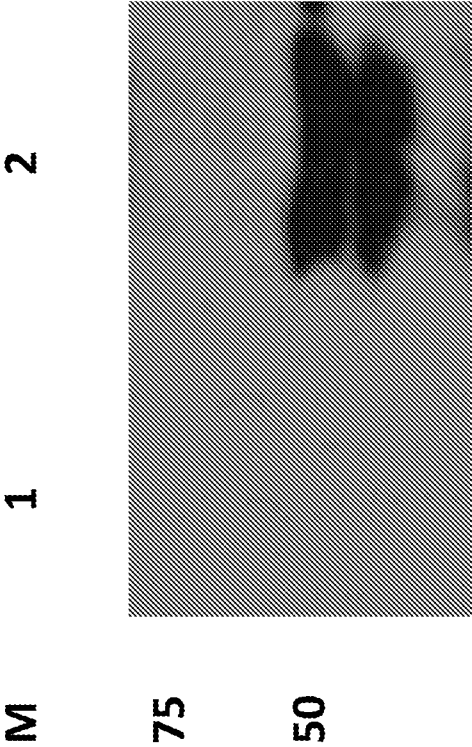


FIGURE 24D

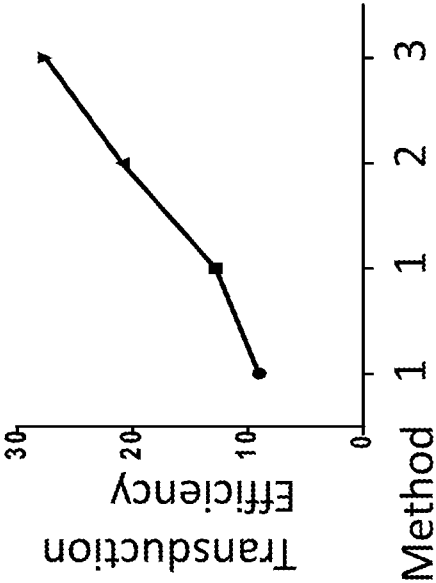


FIGURE 24C

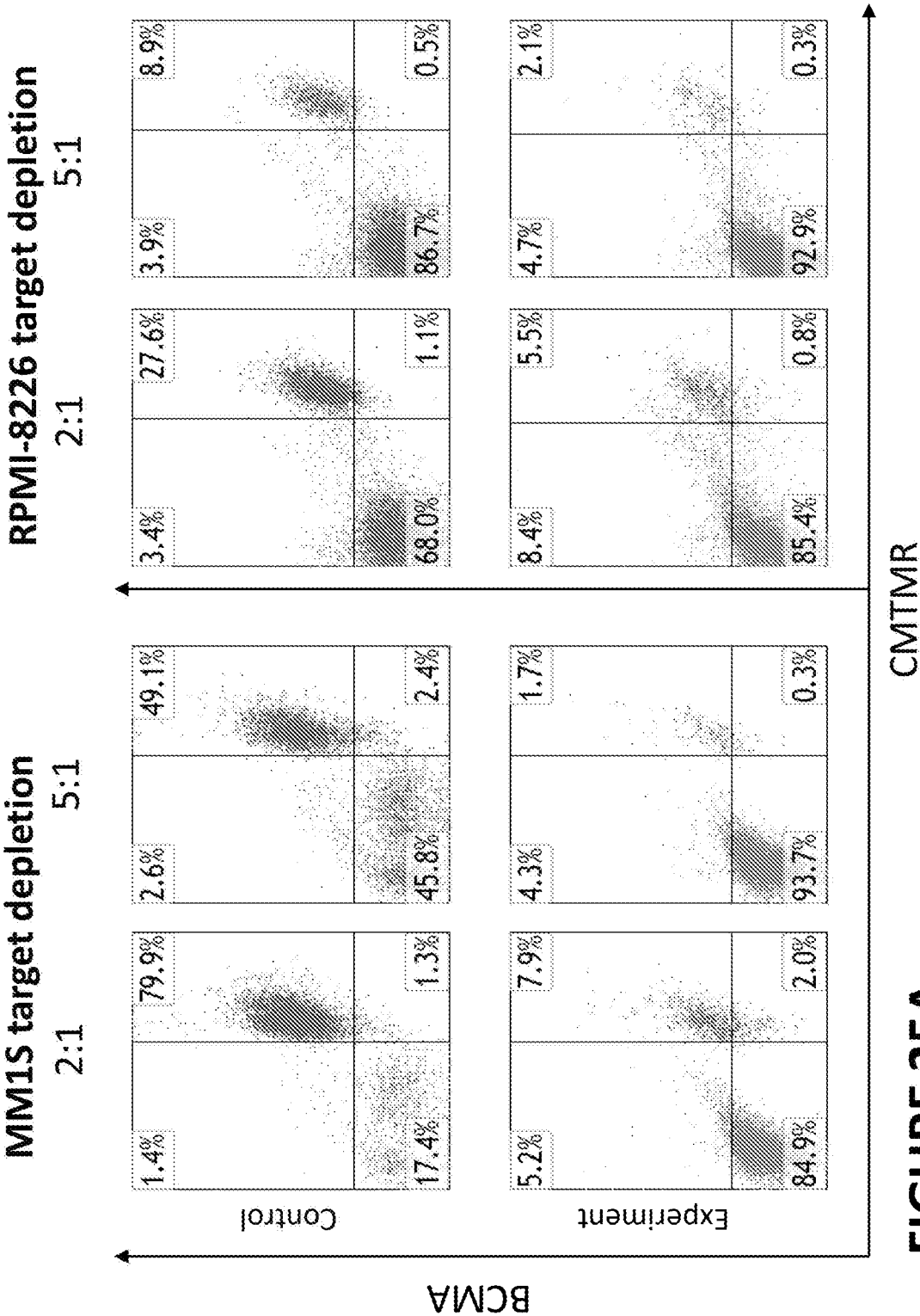
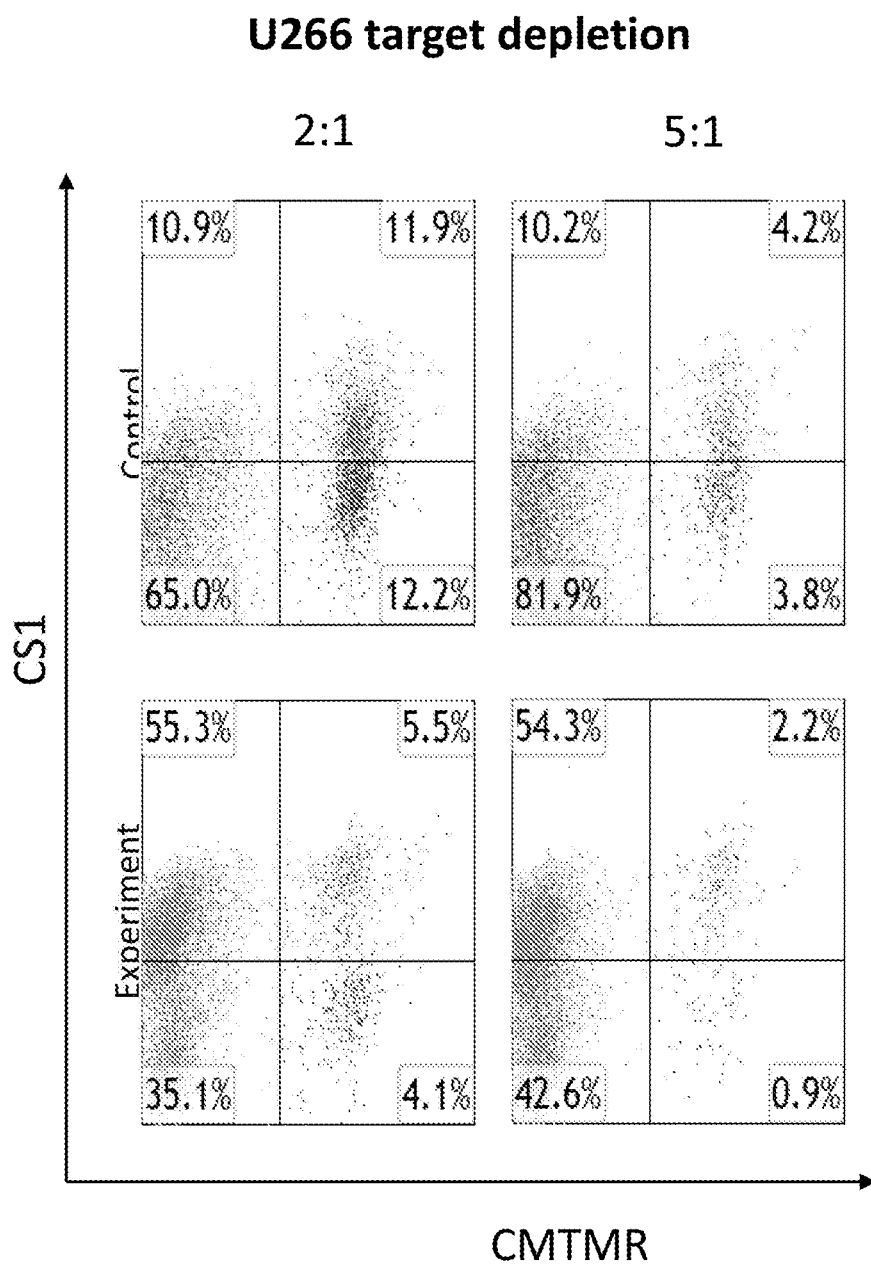


FIGURE 25A

**FIGURE 25B**

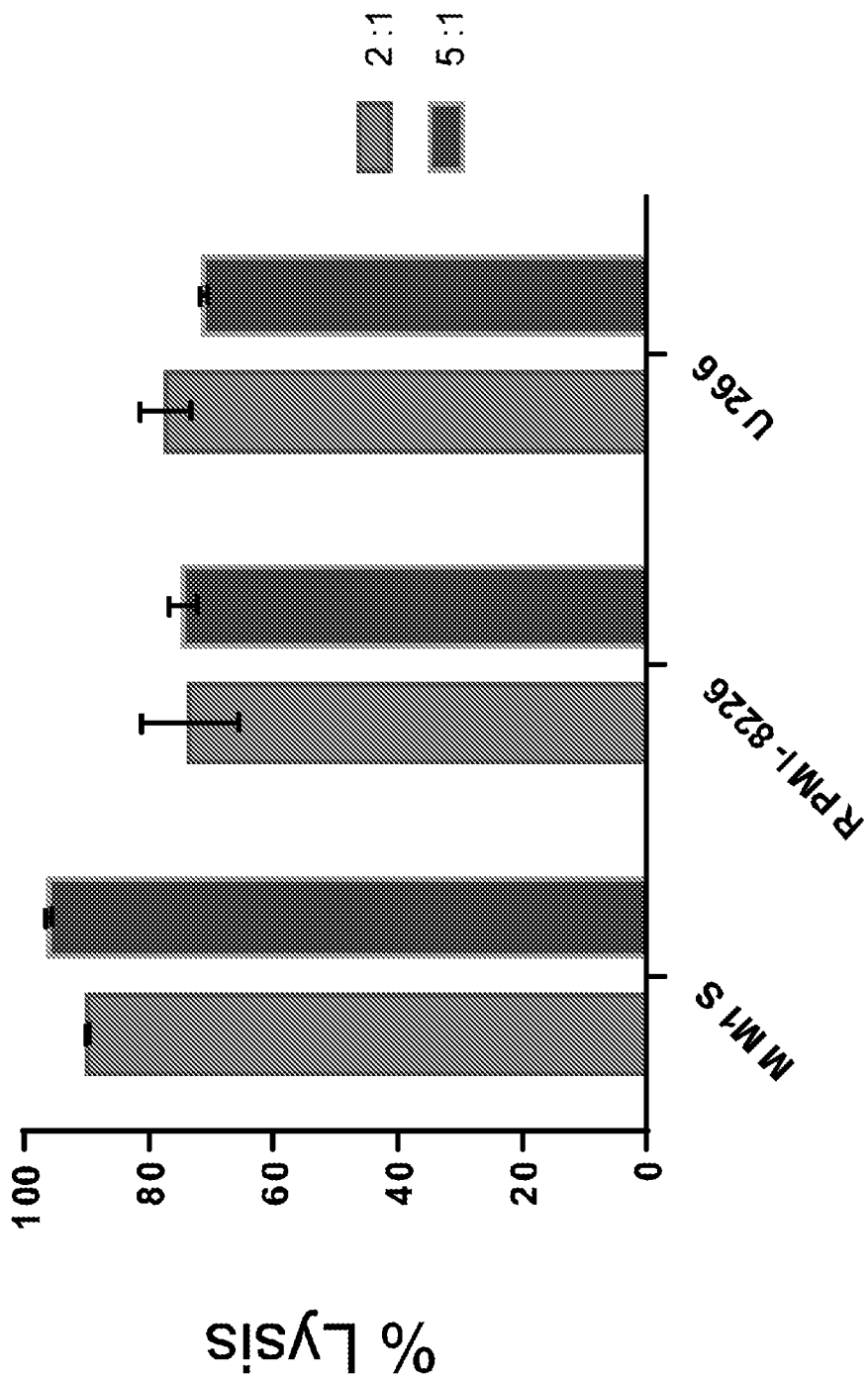


FIGURE 25C

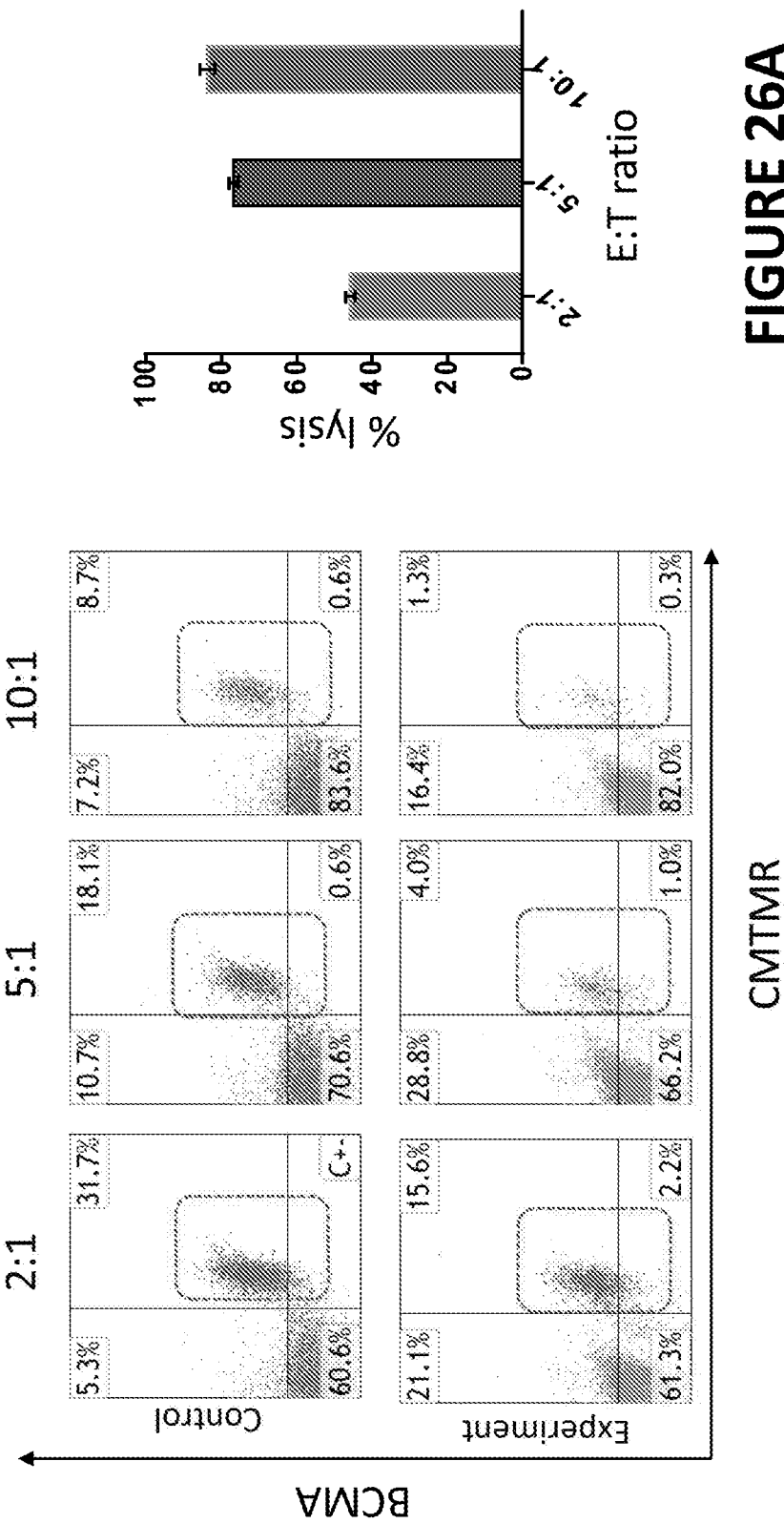
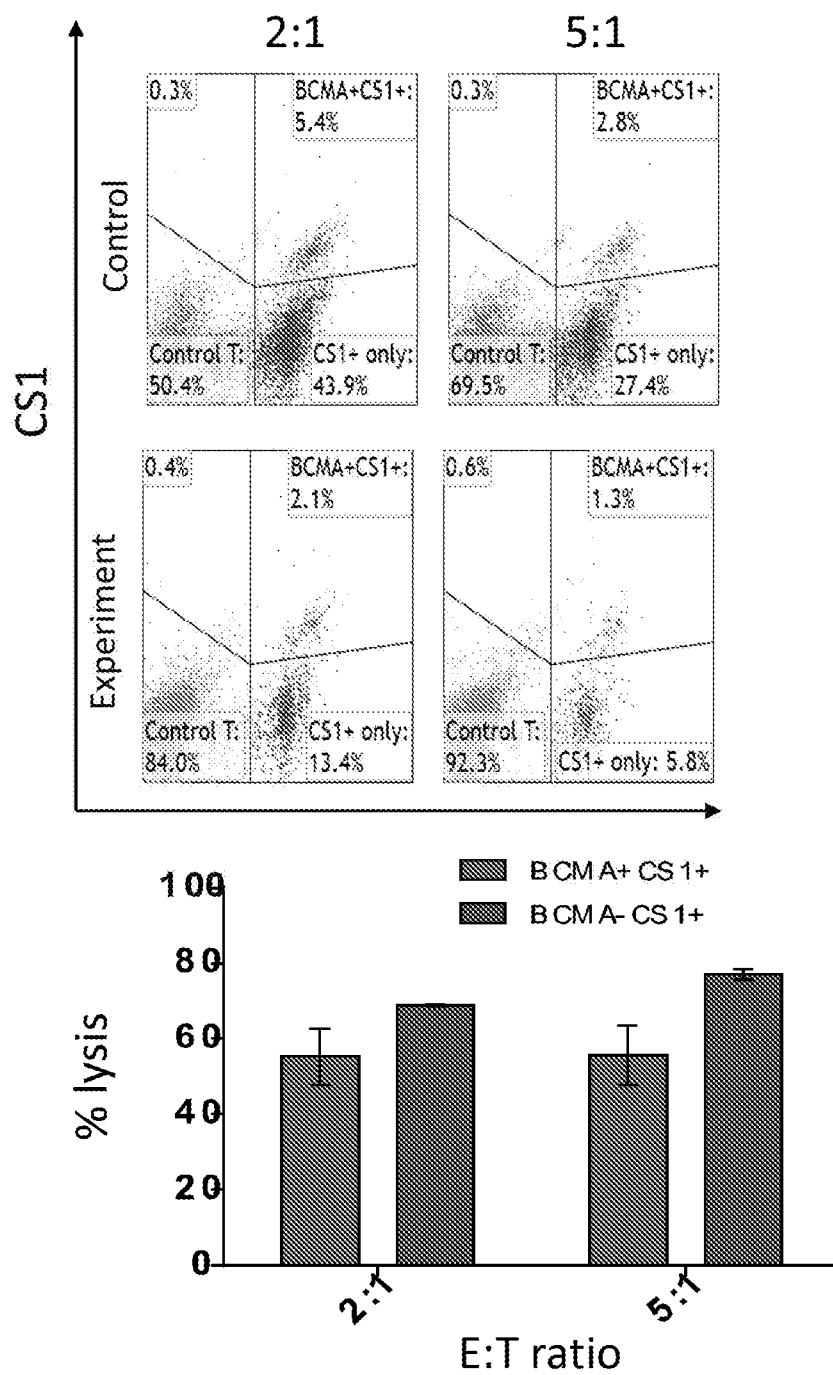


FIGURE 26A

**FIGURE 26B**

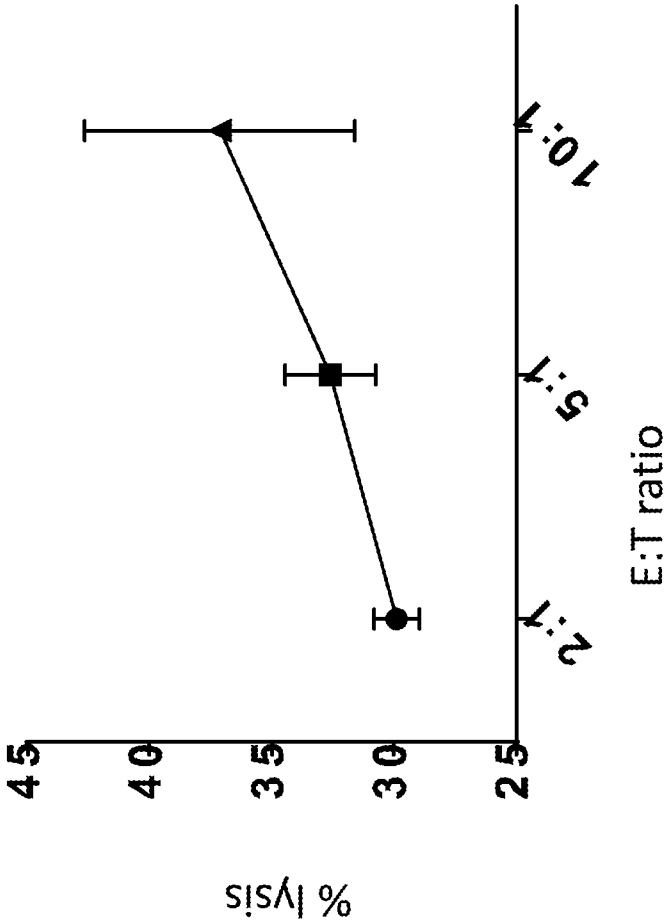


FIGURE 26C

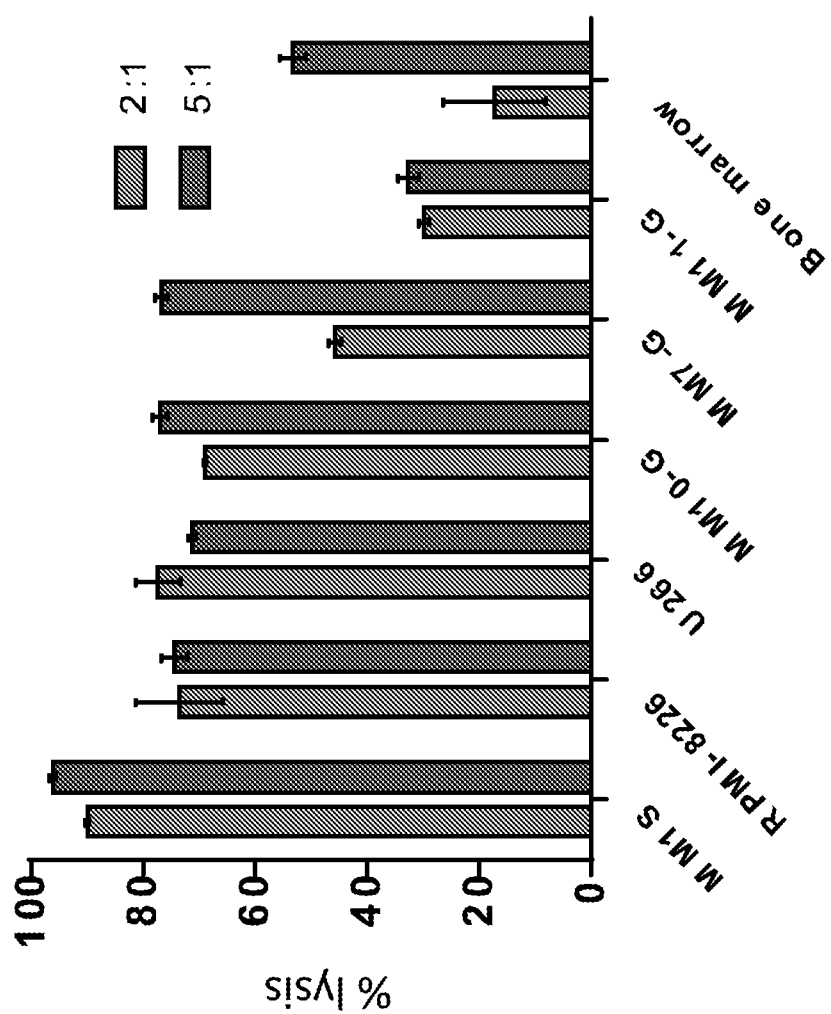
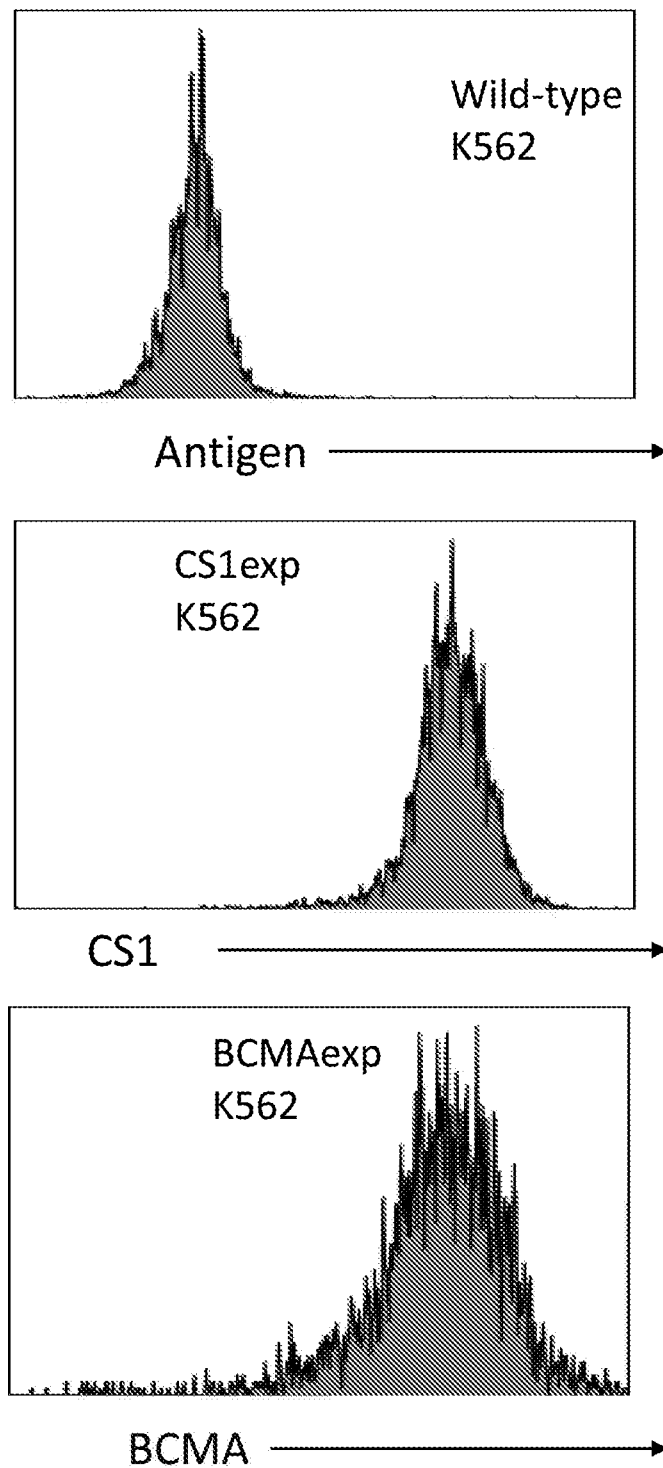


FIGURE 26D

**FIGURE 27A**

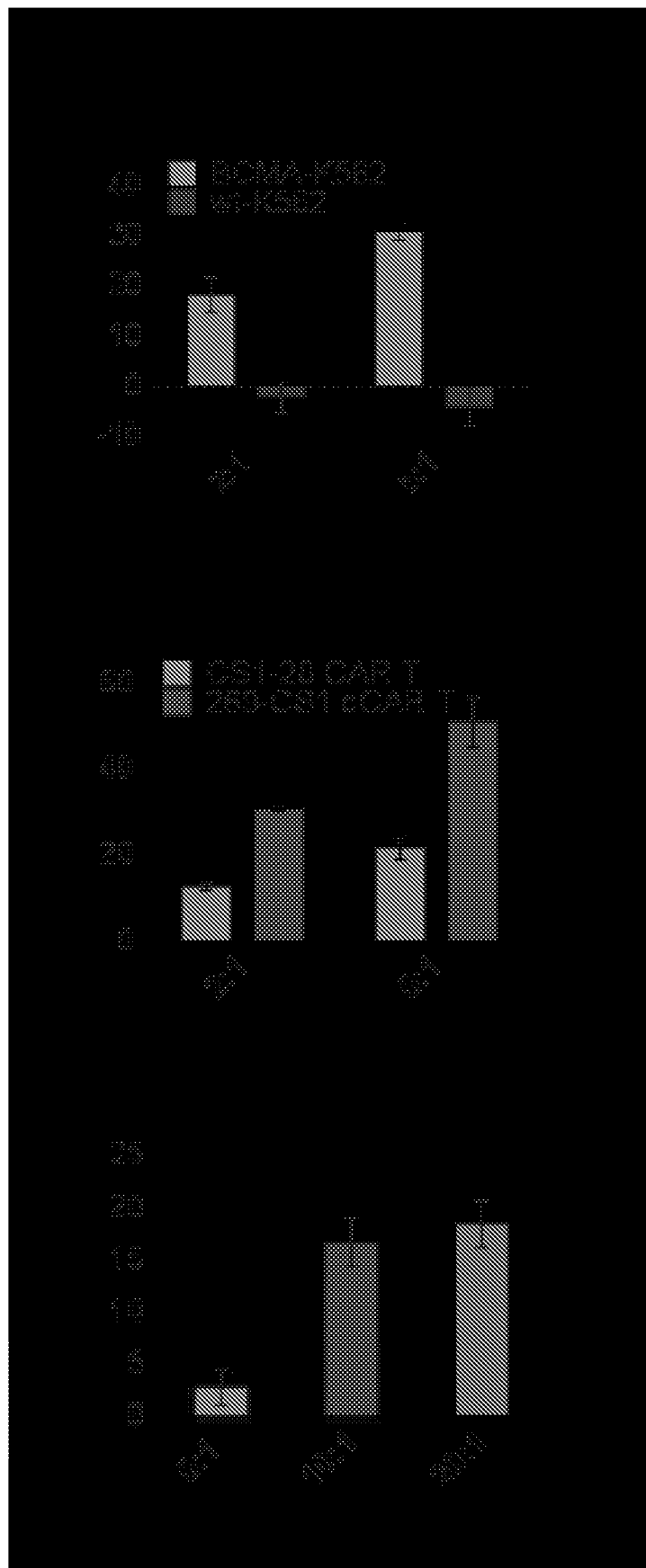
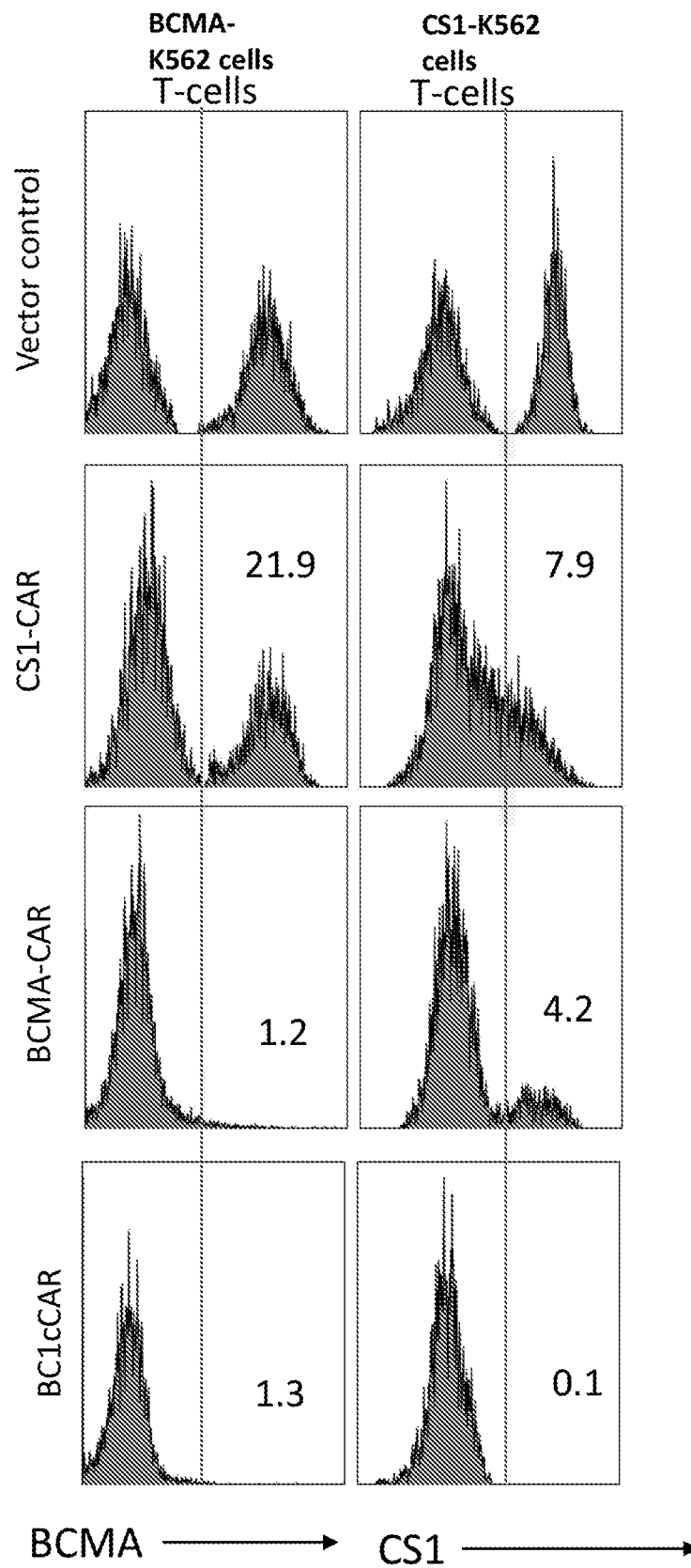
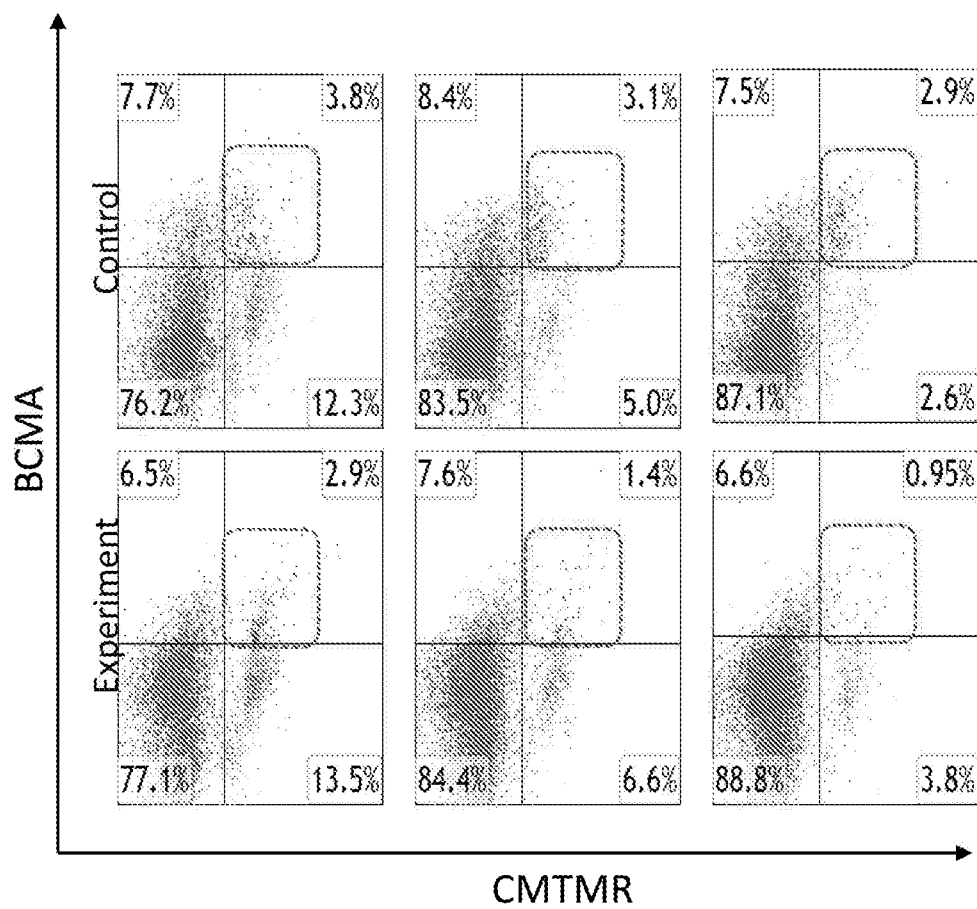
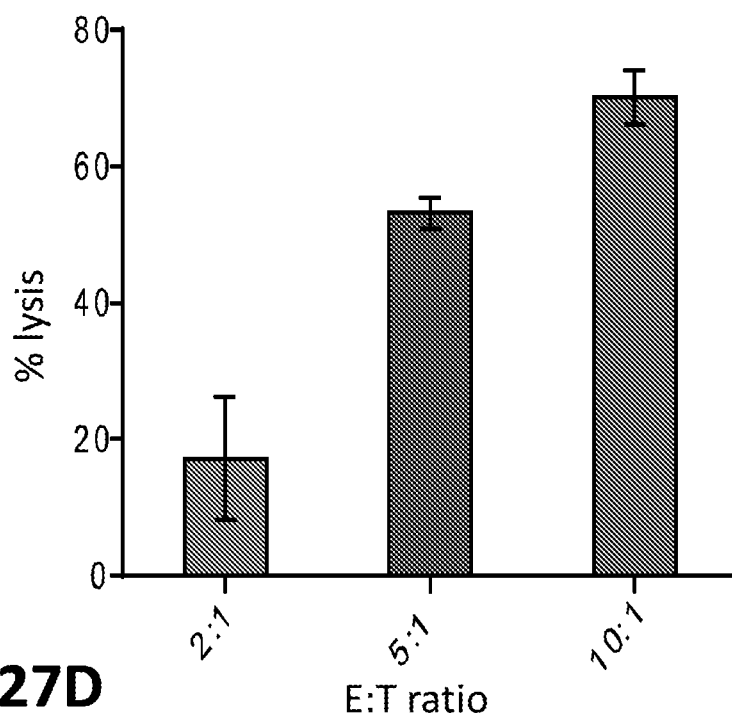


FIGURE 27B

**FIGURE 27C**

**FIGURE 27D**

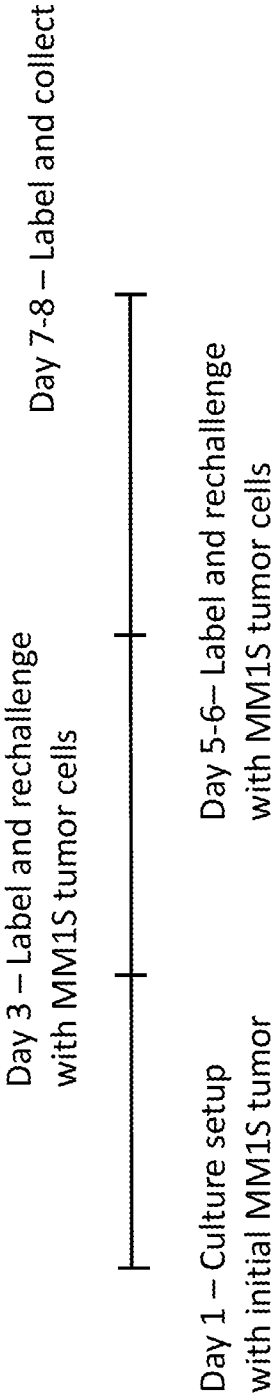


FIGURE 28A

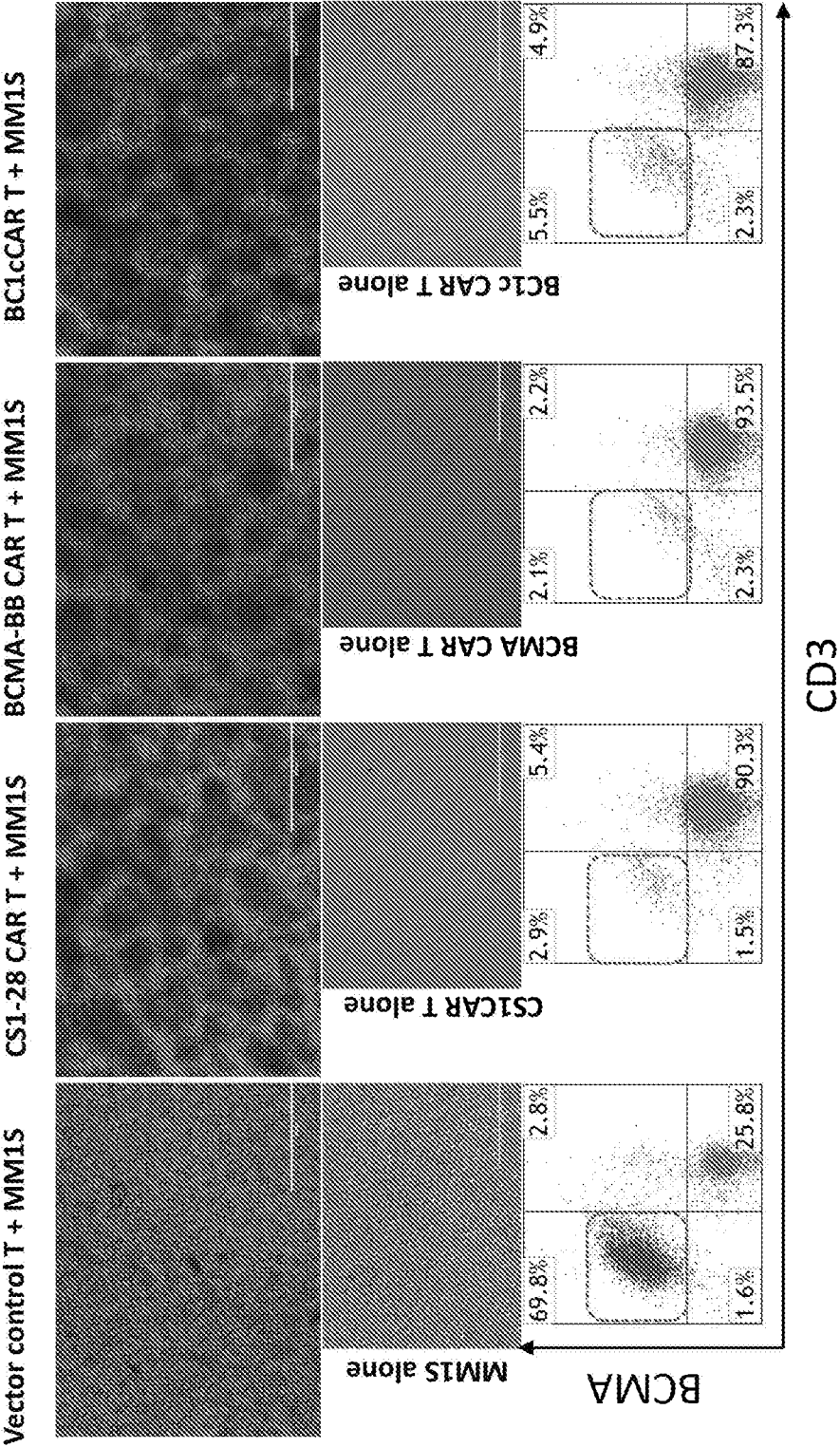


FIGURE 28B

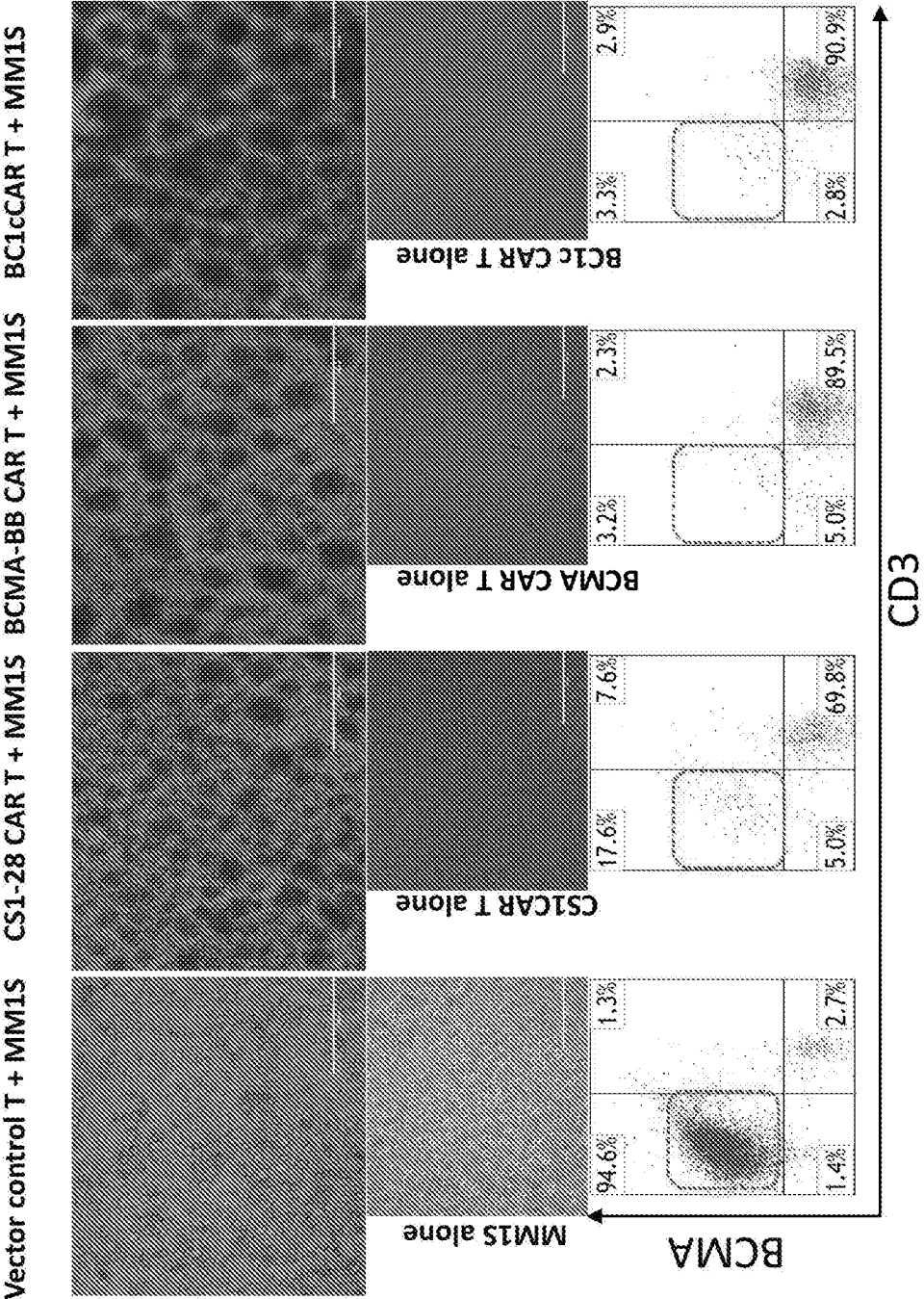


FIGURE 28C

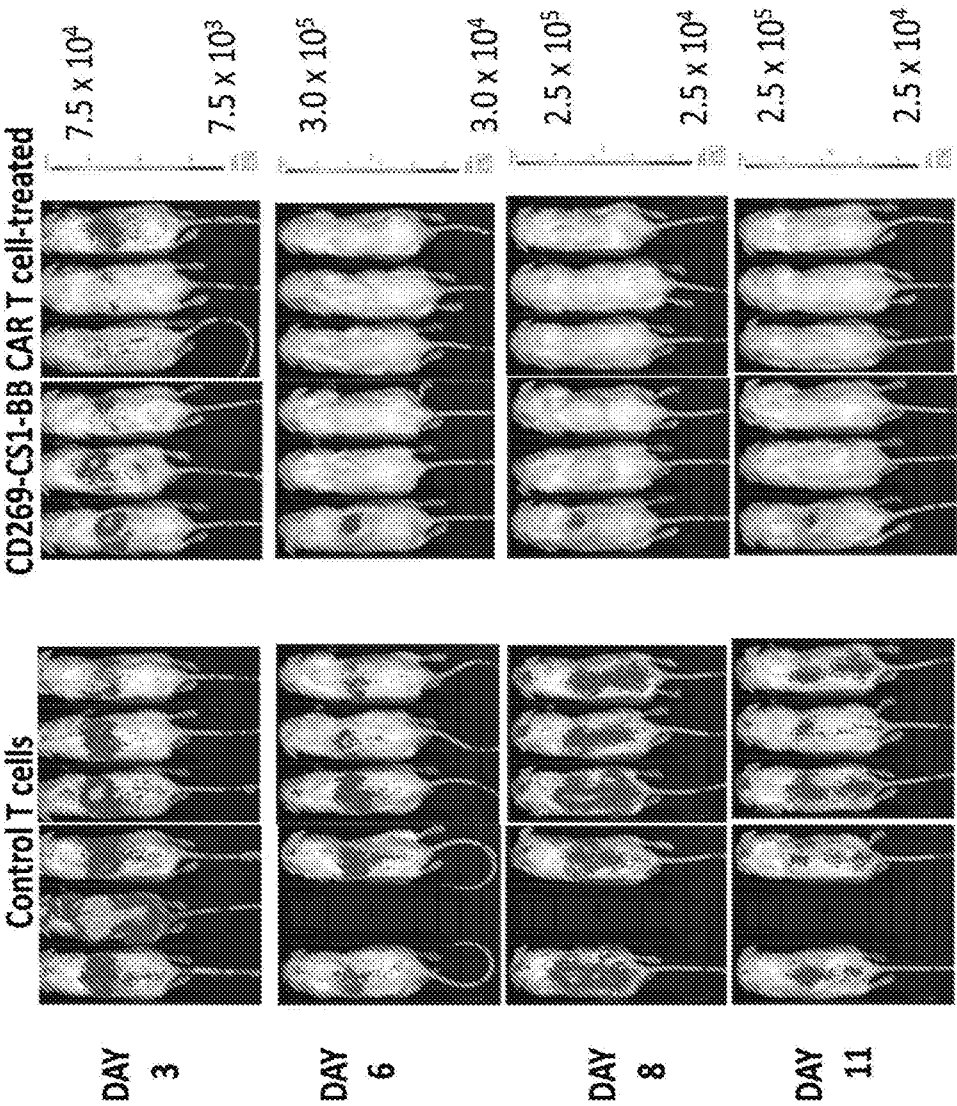


FIGURE 29A

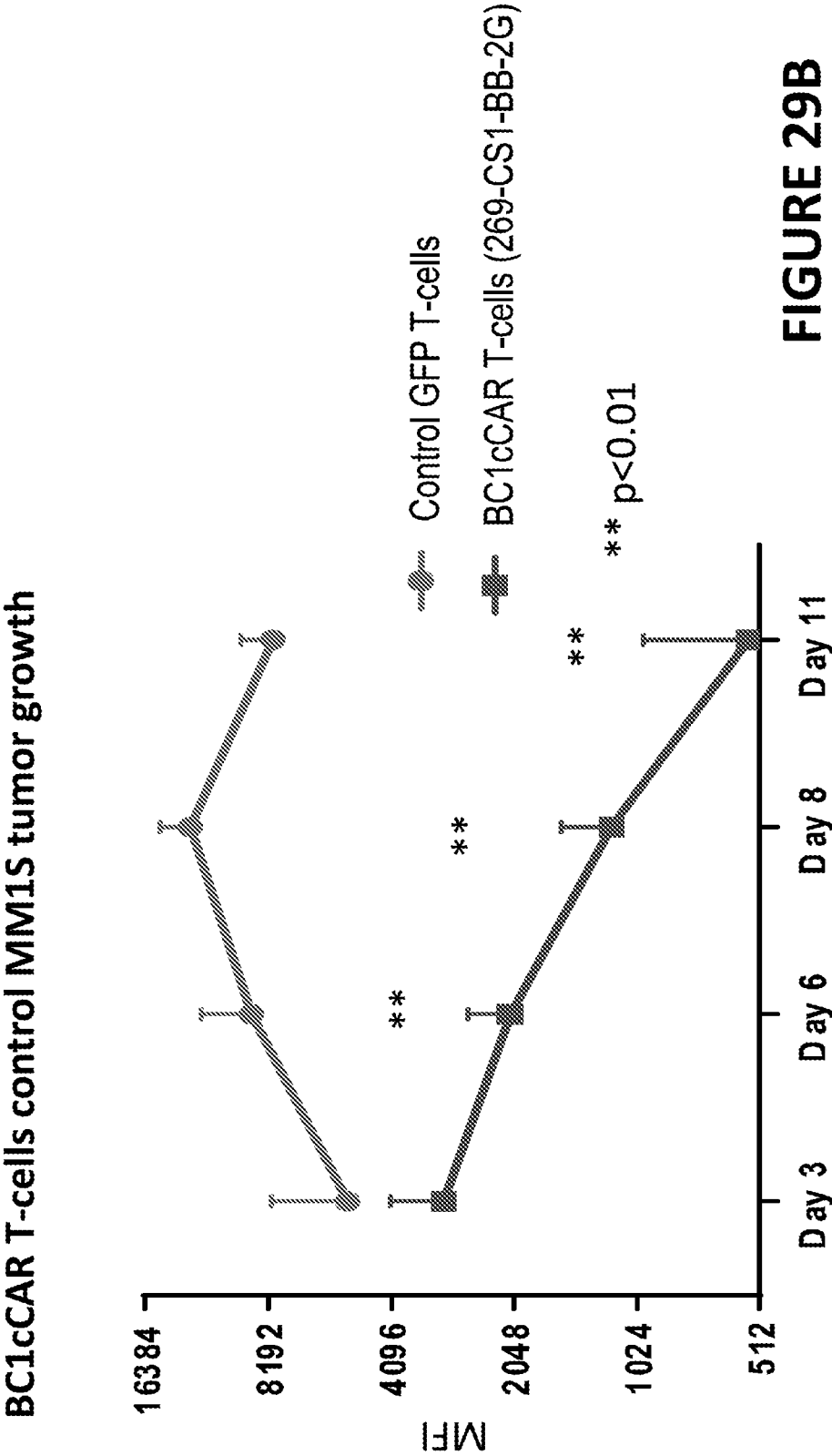


FIGURE 29B

BC1cCAR T-cells improve murine survival outlook

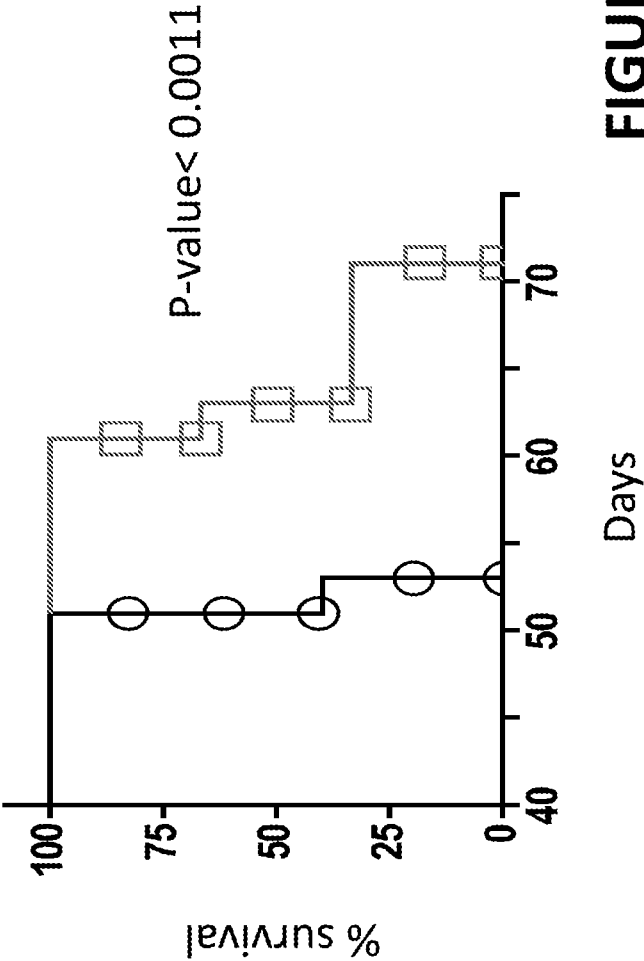


FIGURE 29C

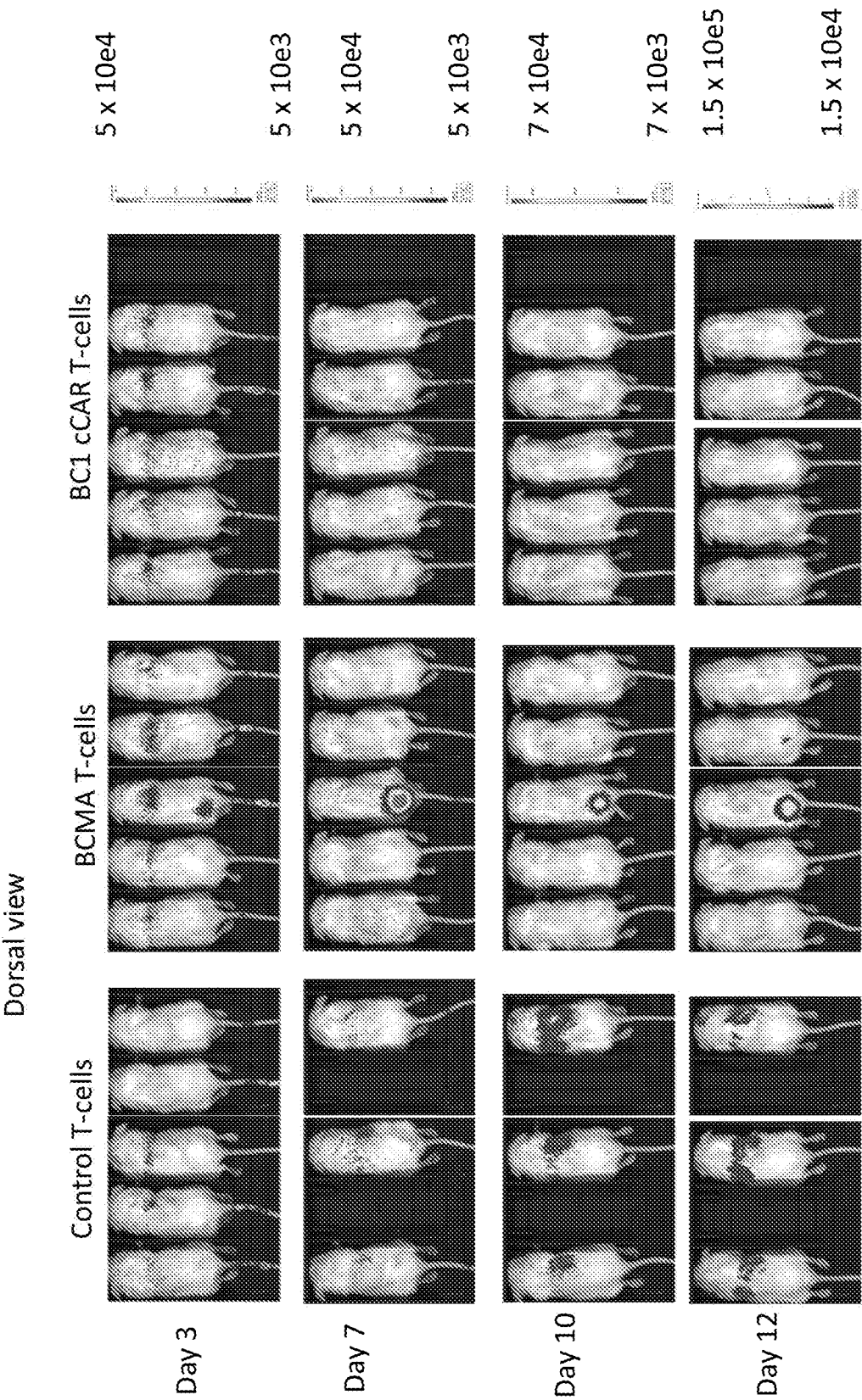


FIGURE 29D

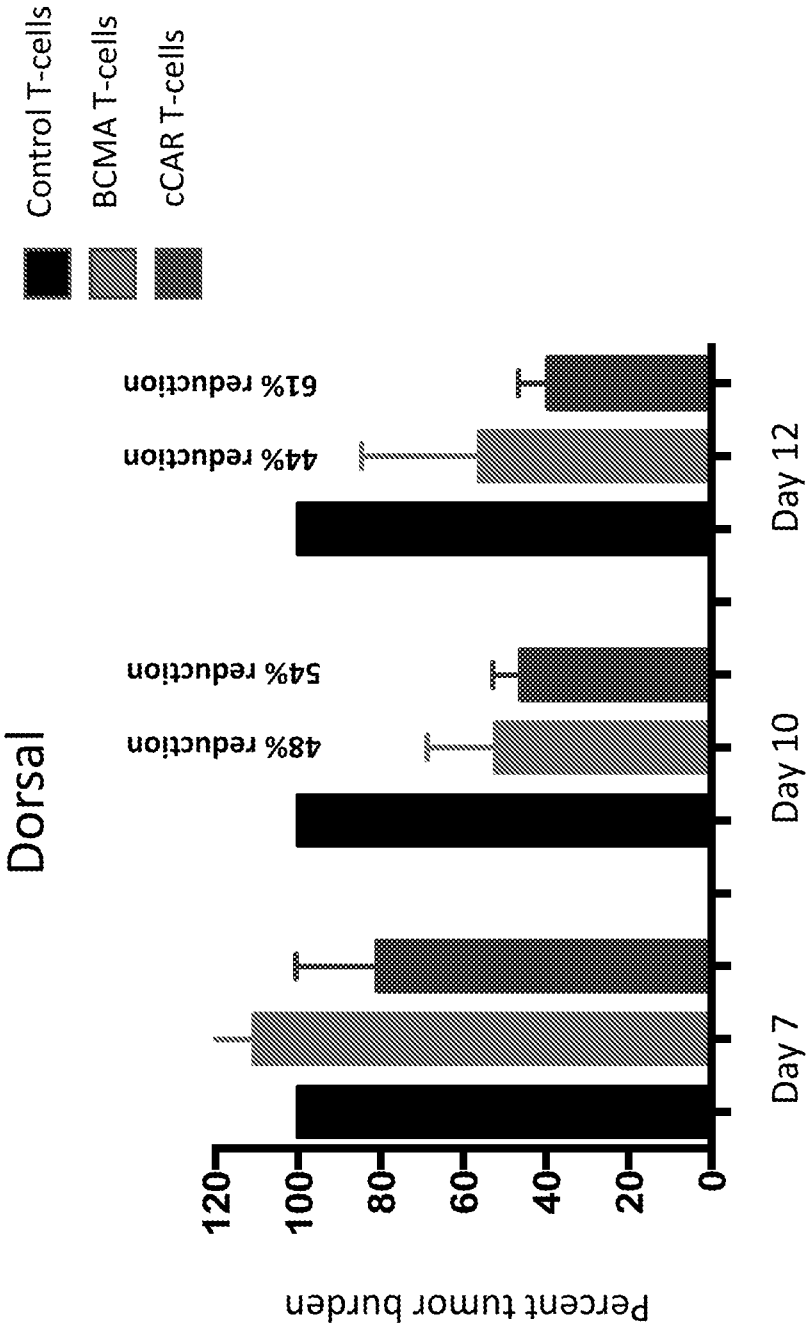


FIGURE 29E

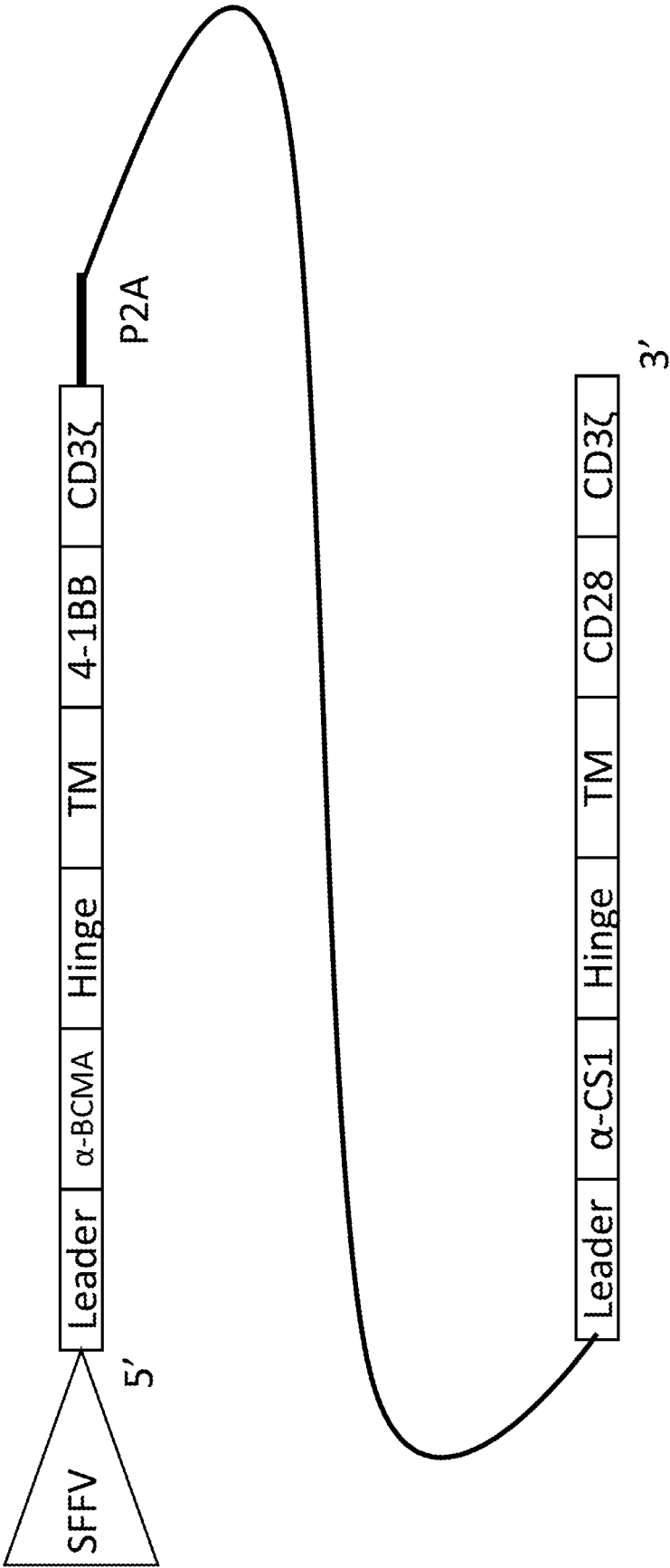
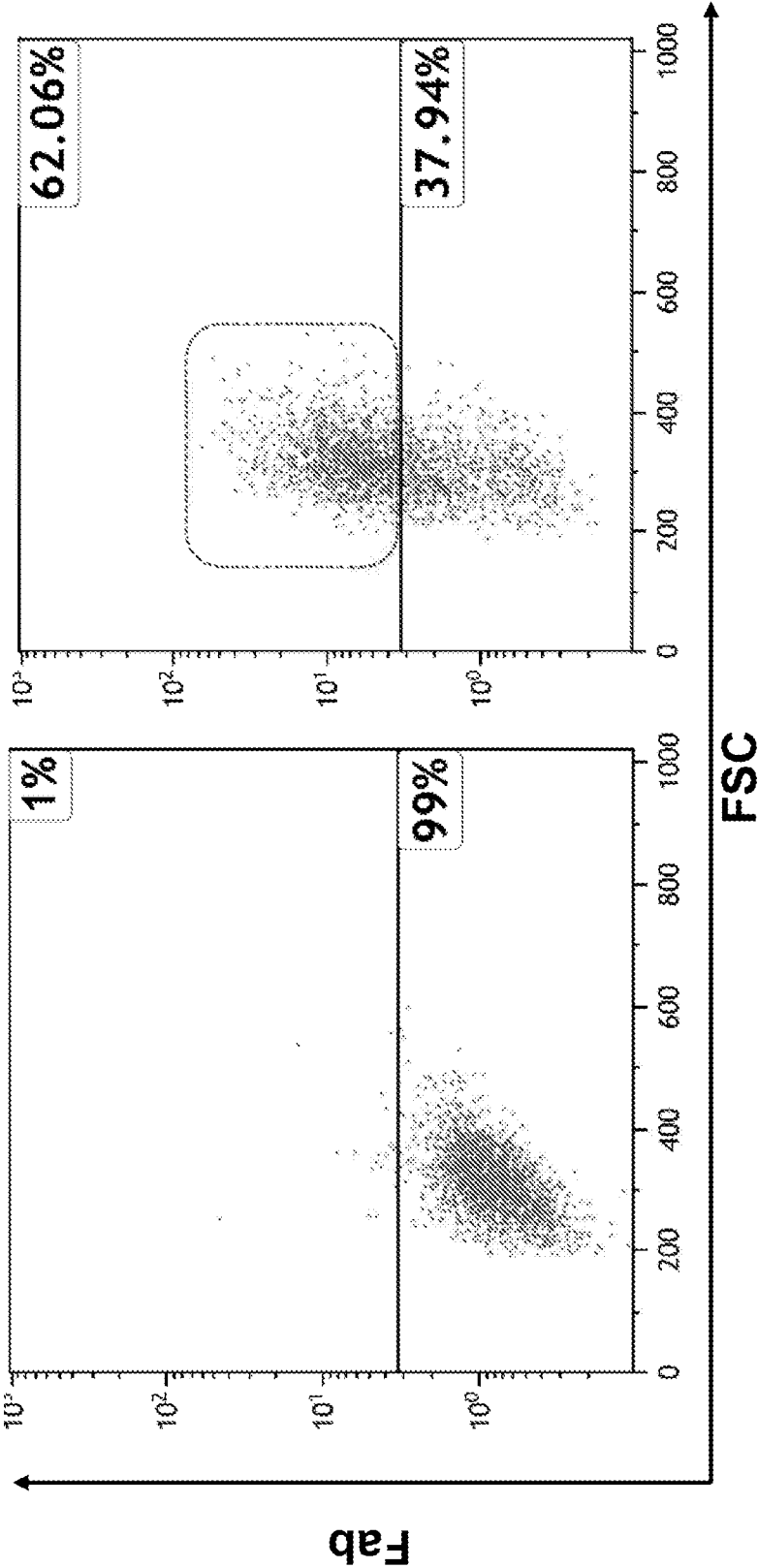


FIGURE 30A

FIGURE 30B



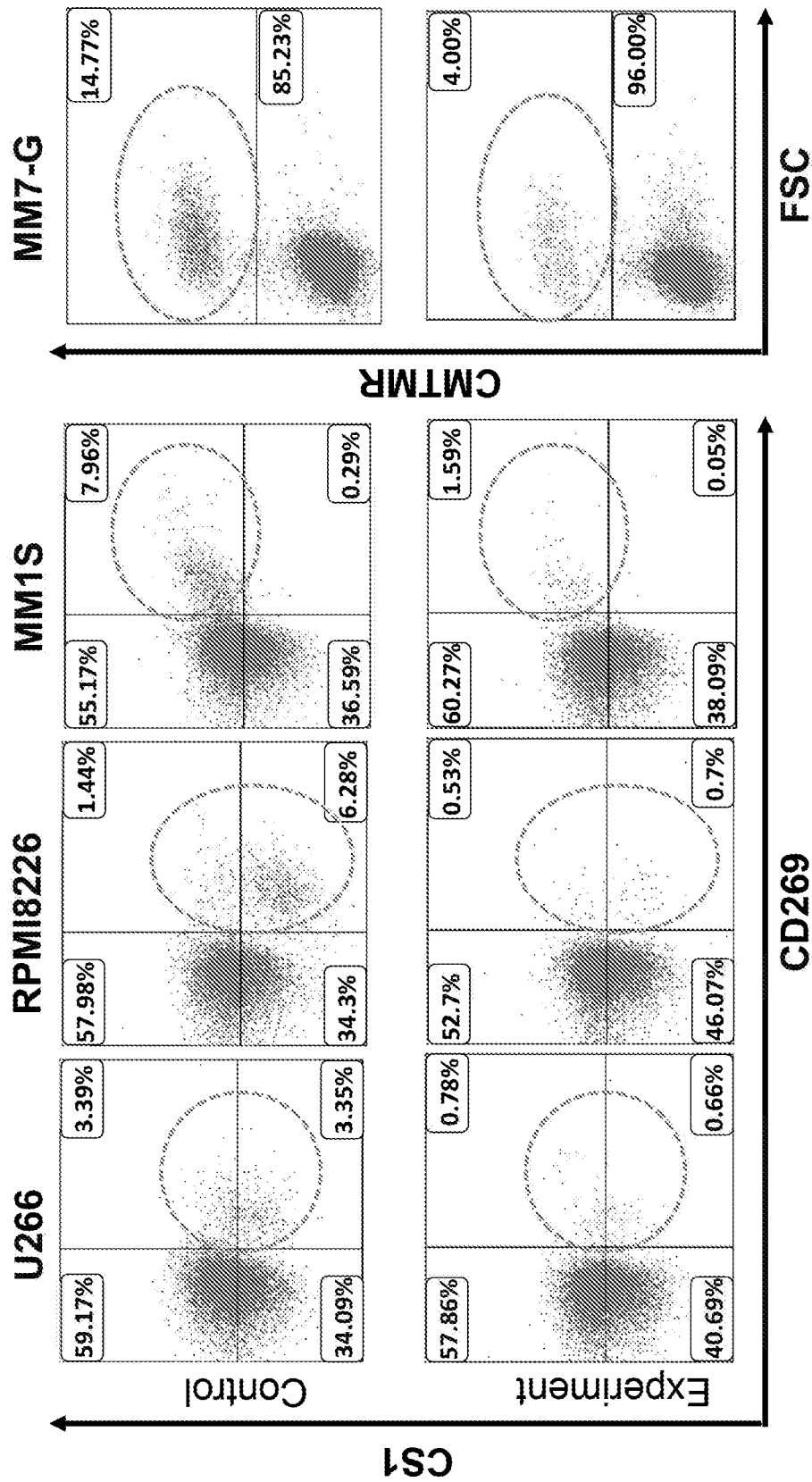


FIGURE 31A

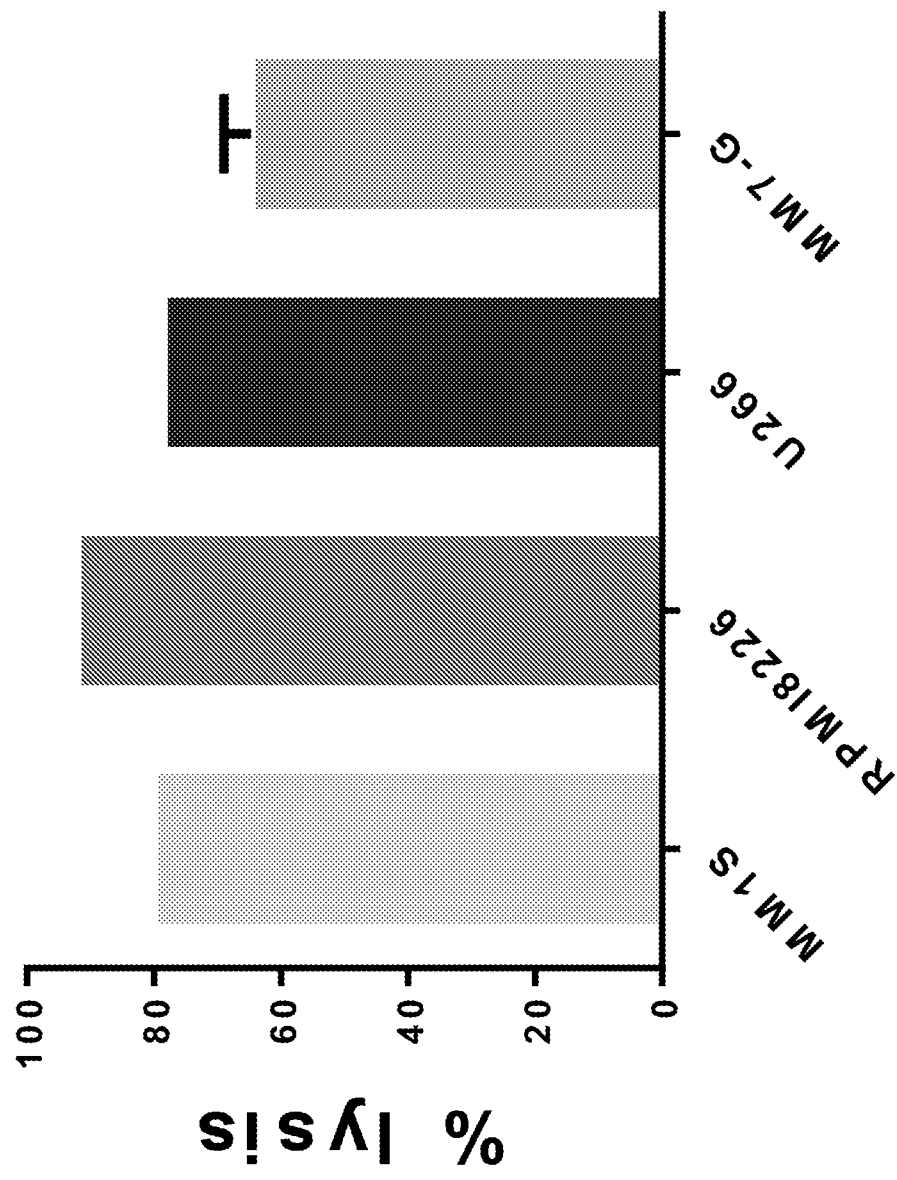


FIGURE 31B

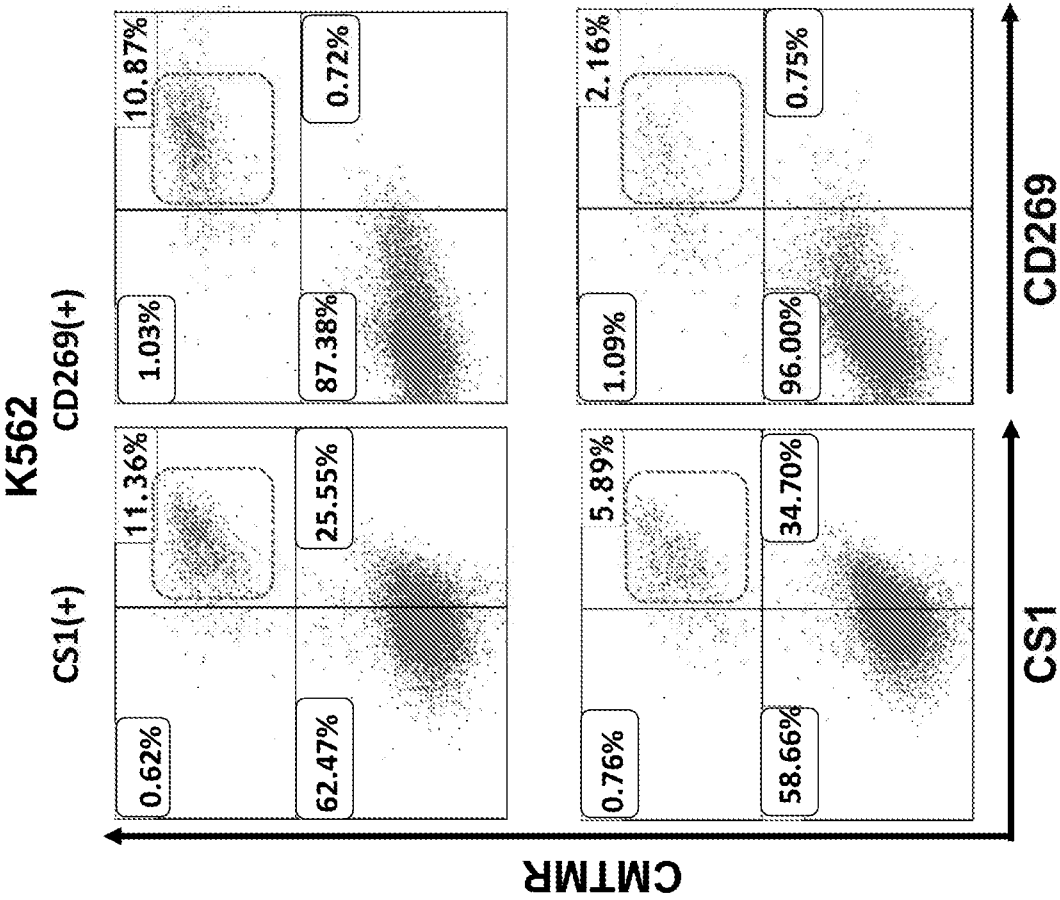
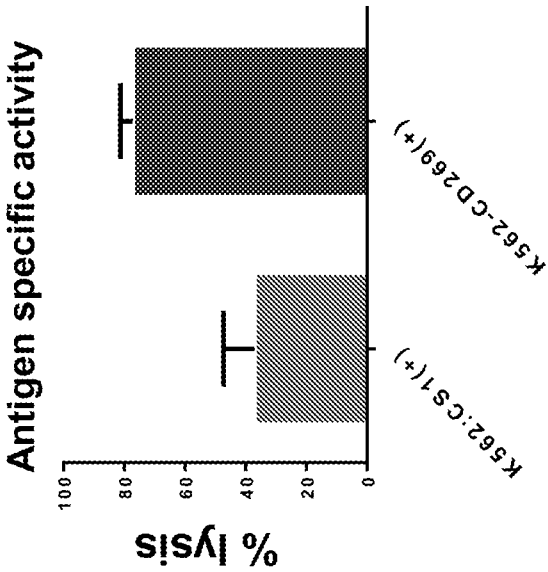
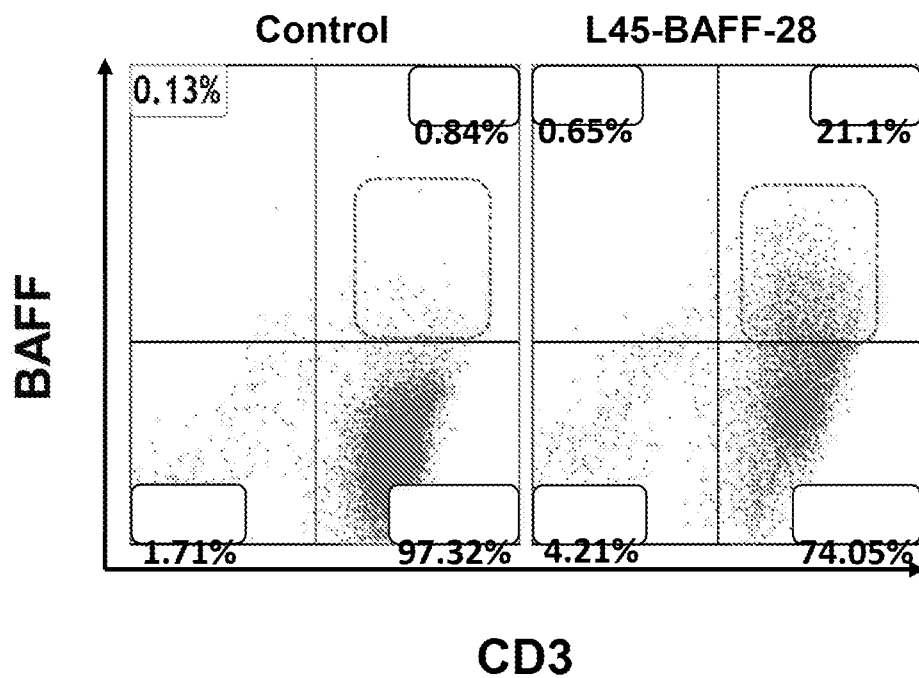
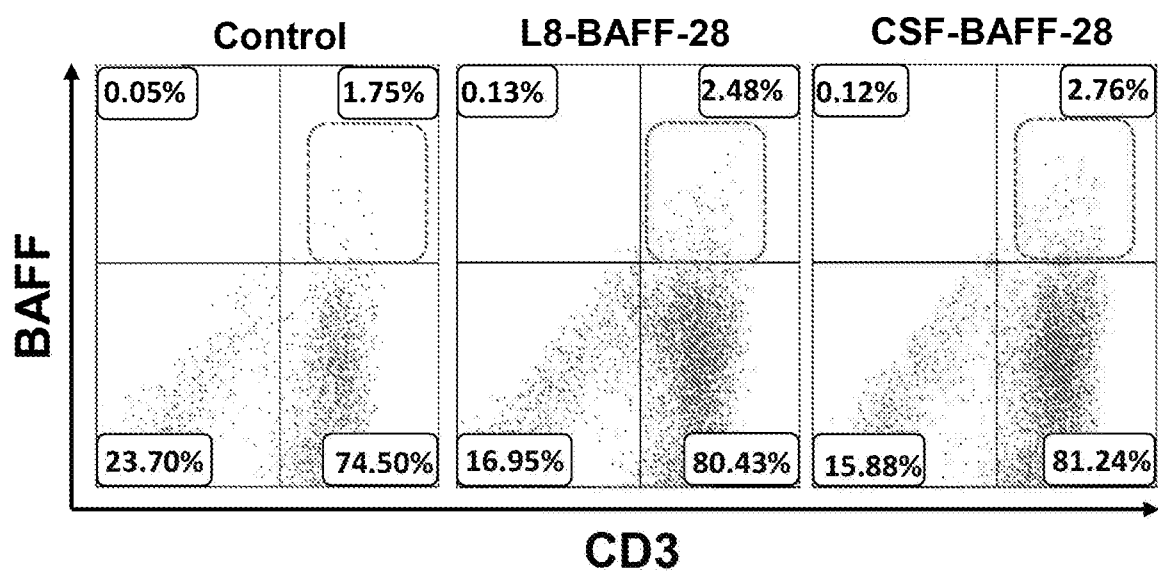


FIGURE 31C

FIGURE 32A**FIGURE 32B**

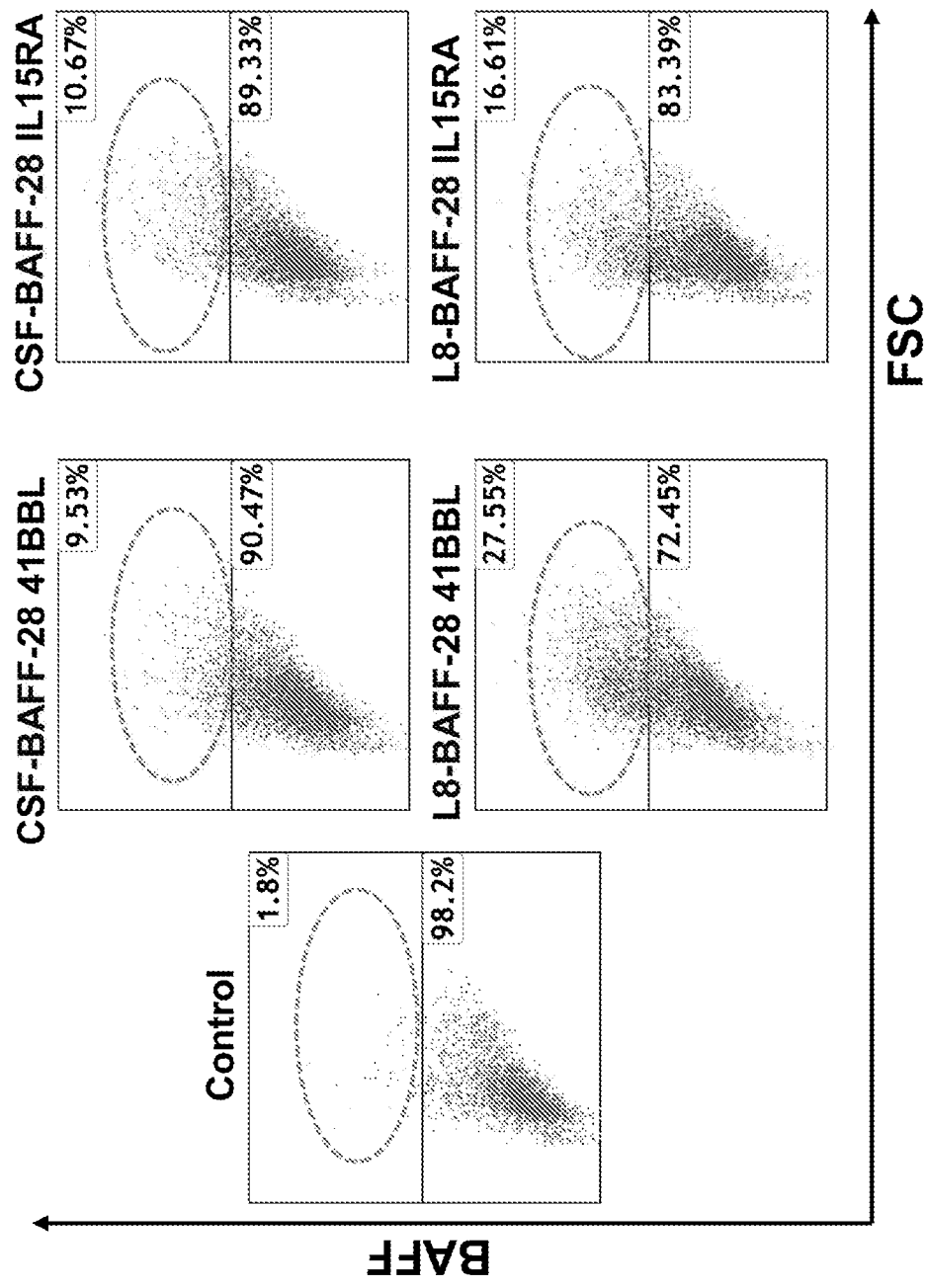


FIGURE 32C

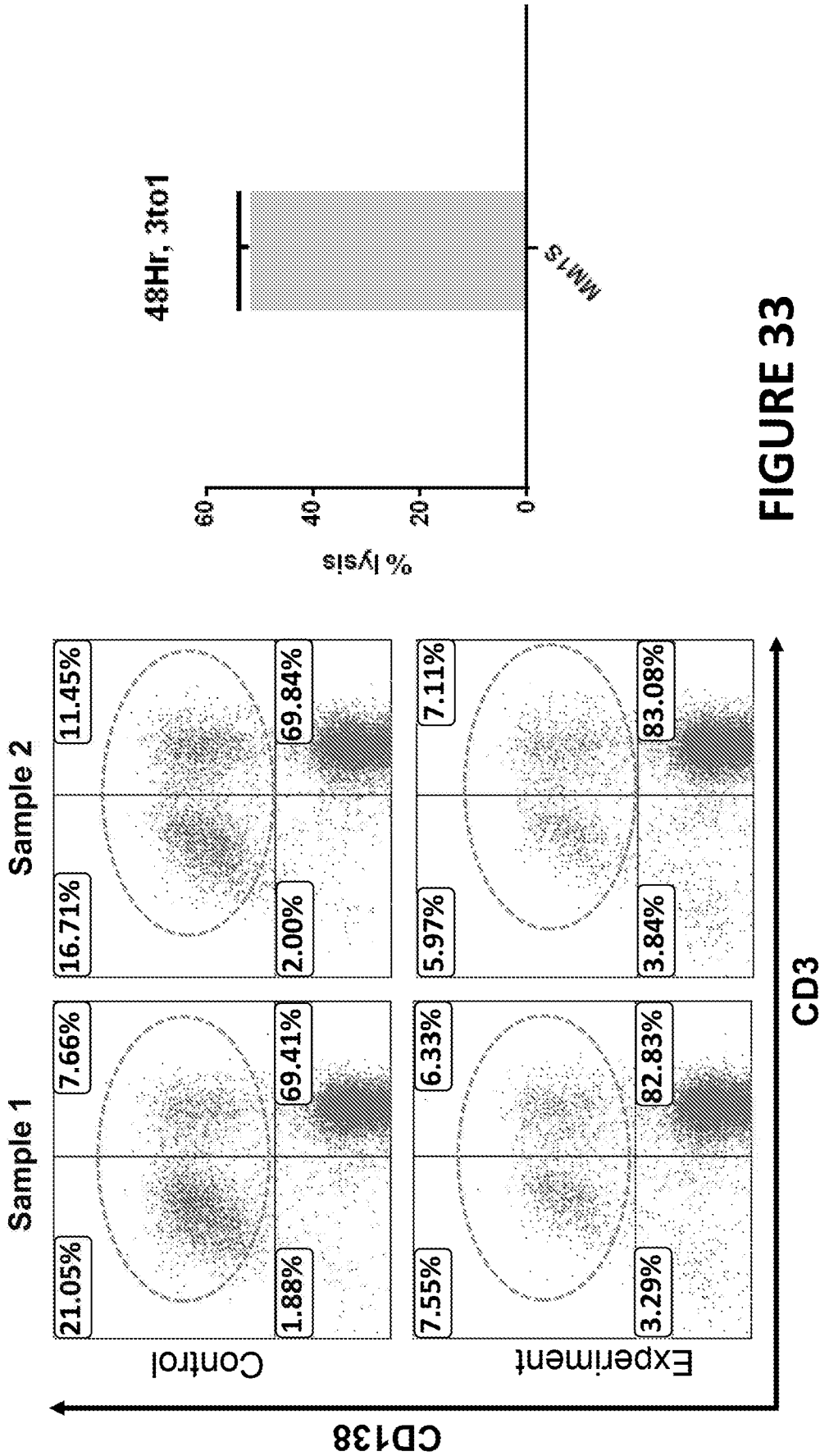


FIGURE 33

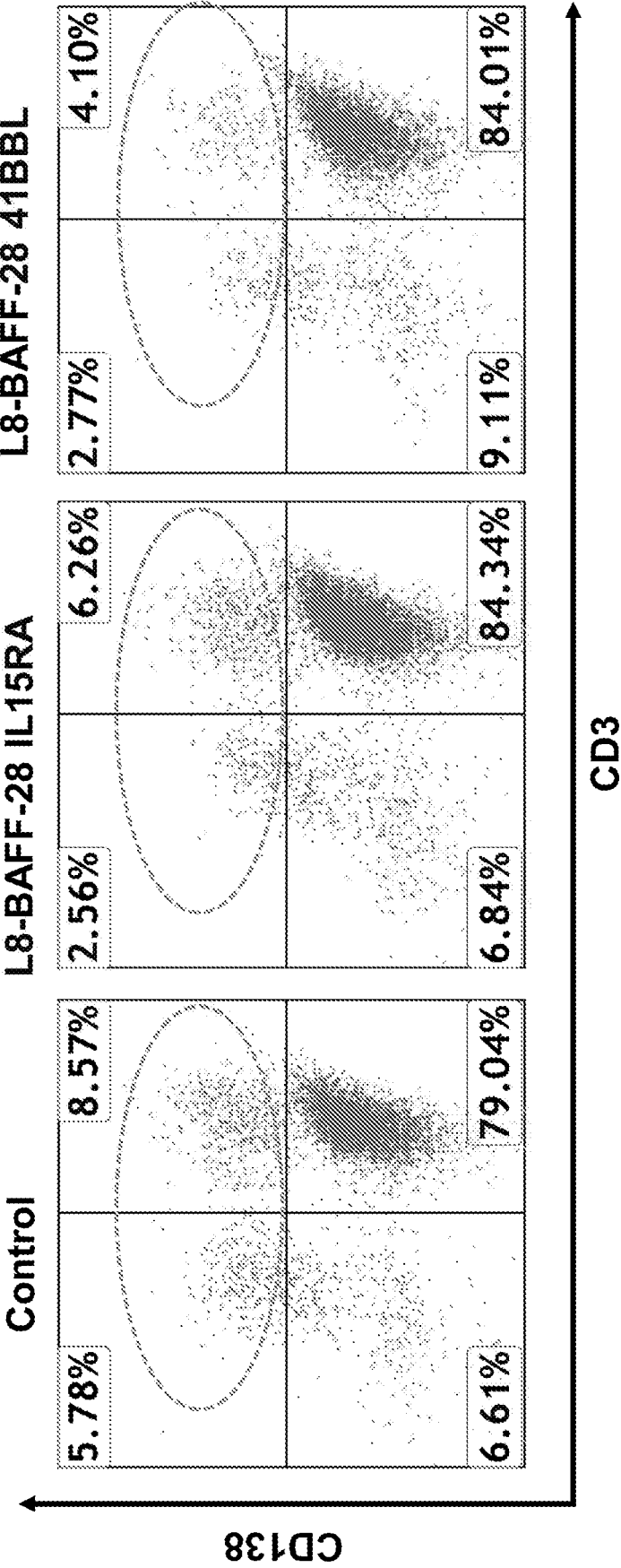
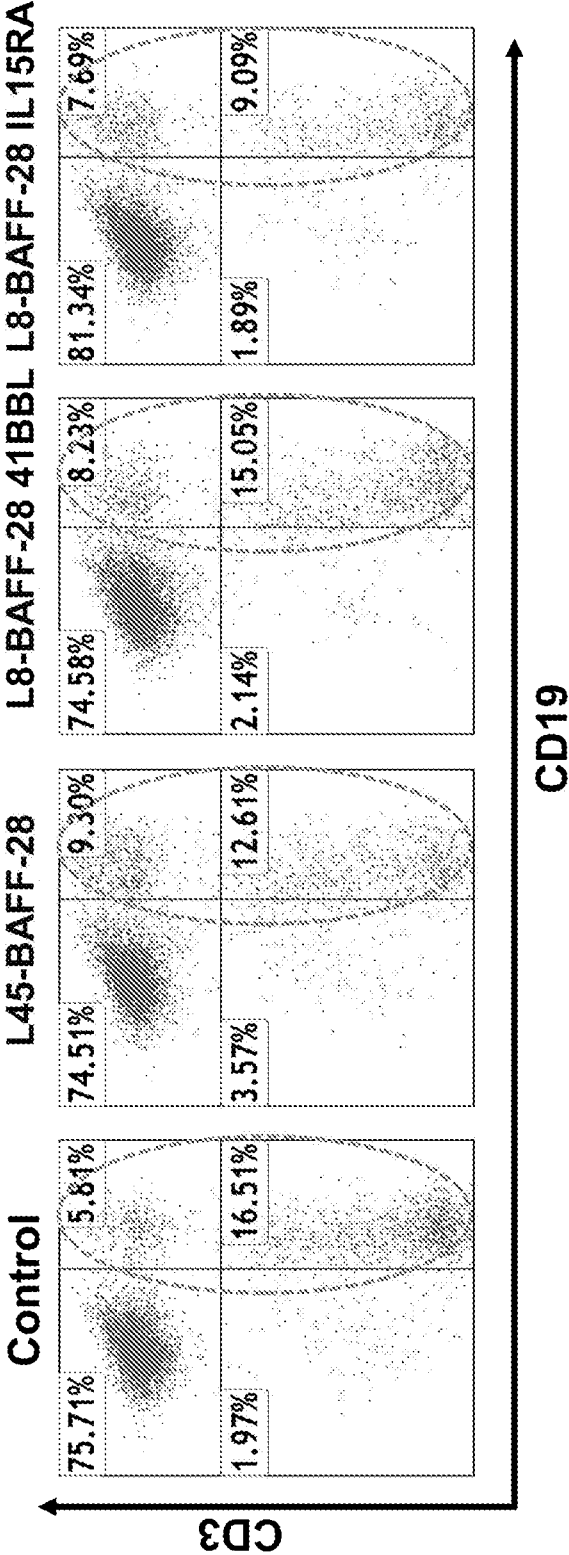


FIGURE 34A

FIGURE 34B



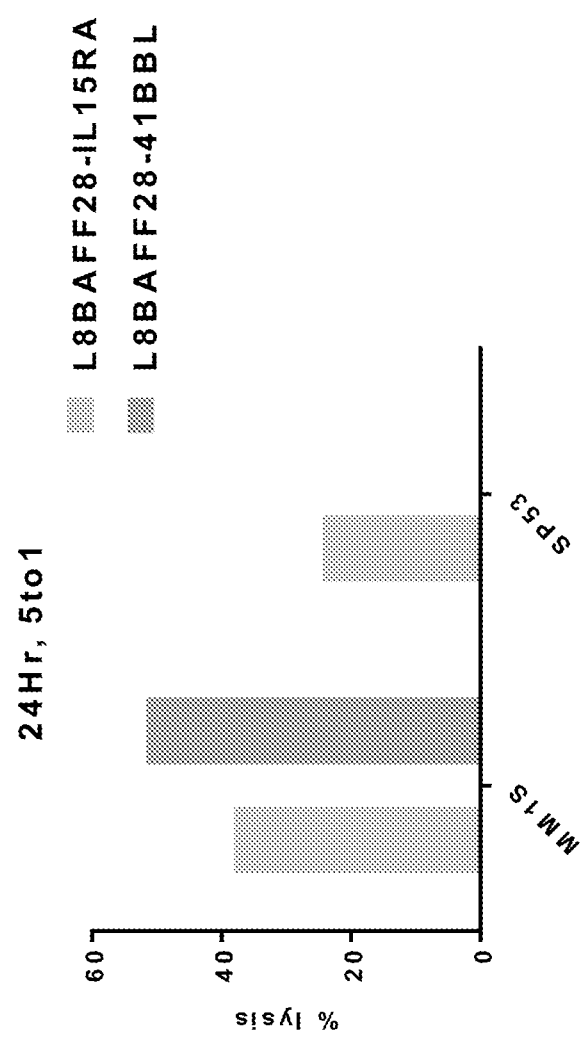
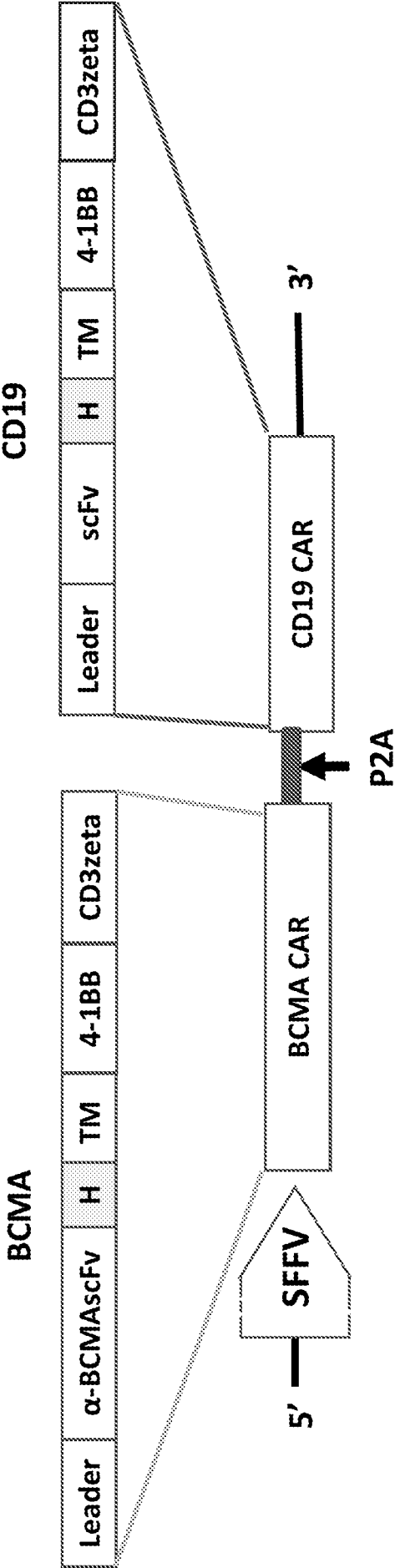


FIGURE 34C

FIGURE 35



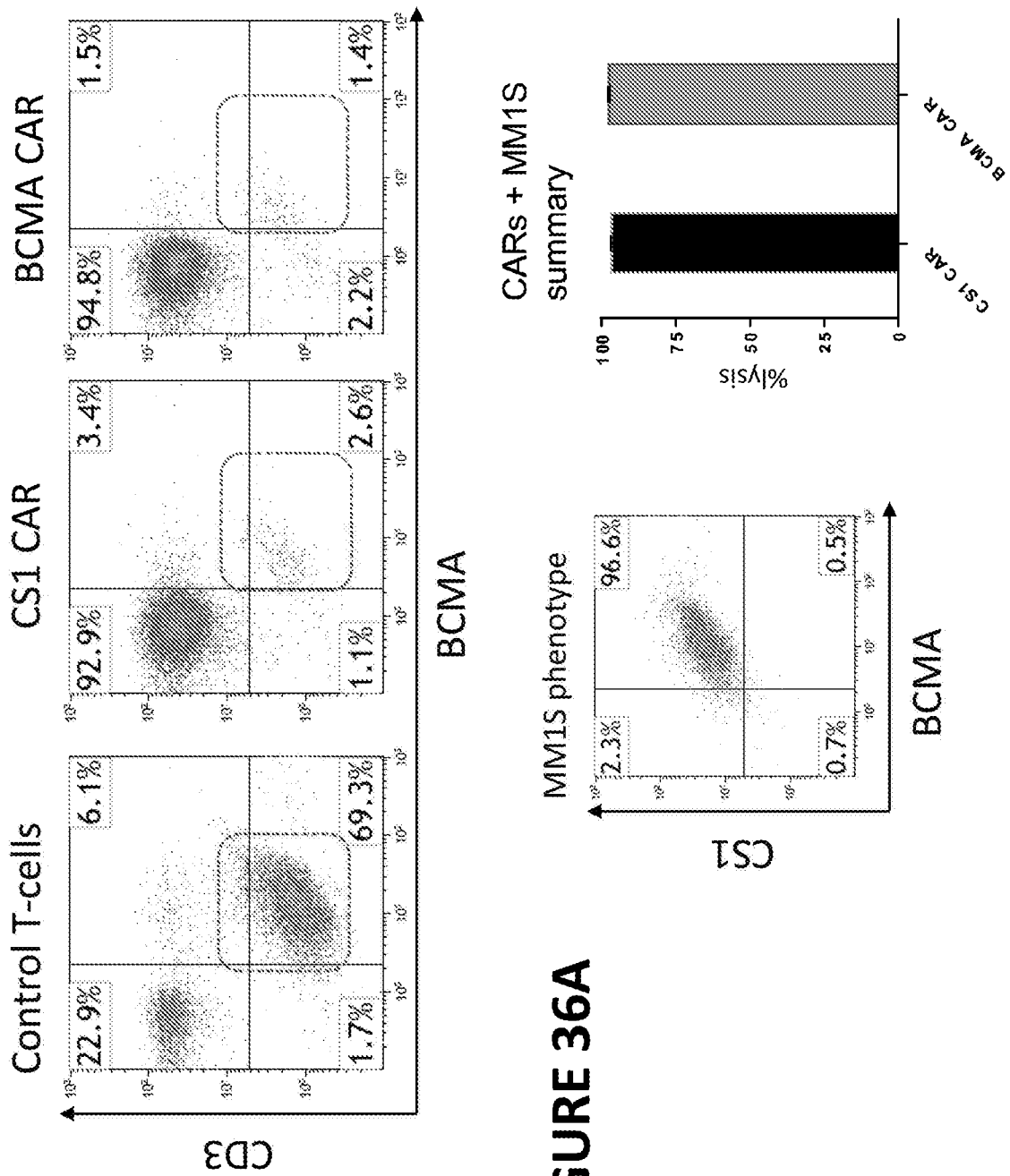
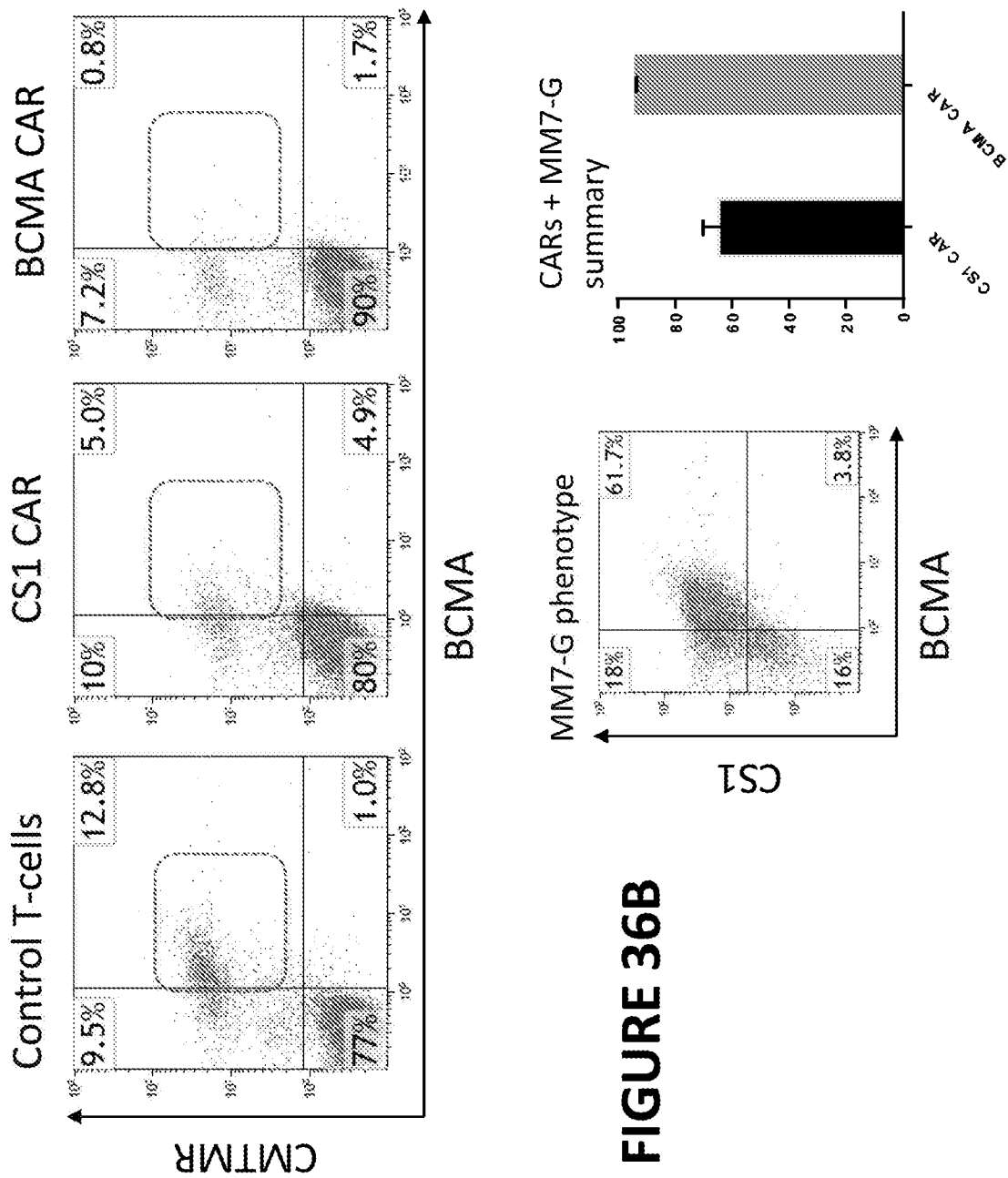


FIGURE 36A



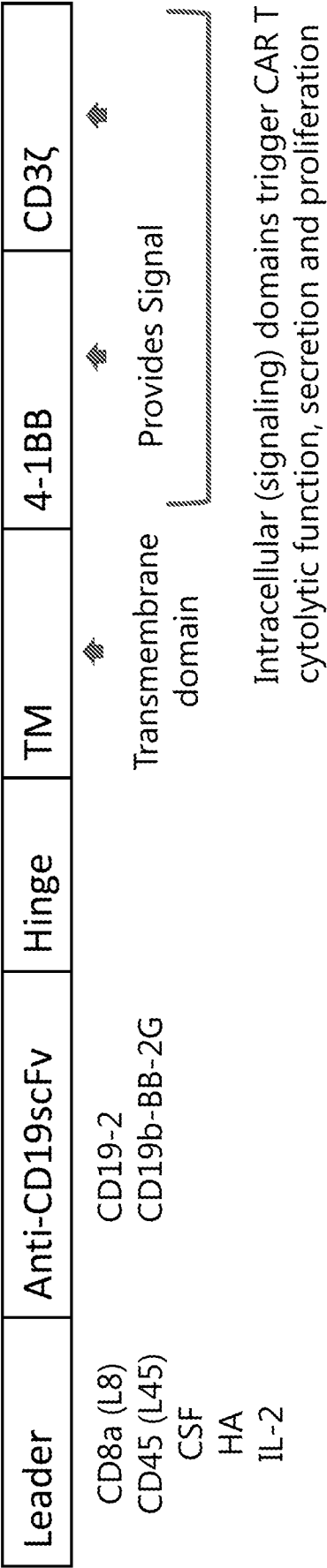


FIGURE 37A

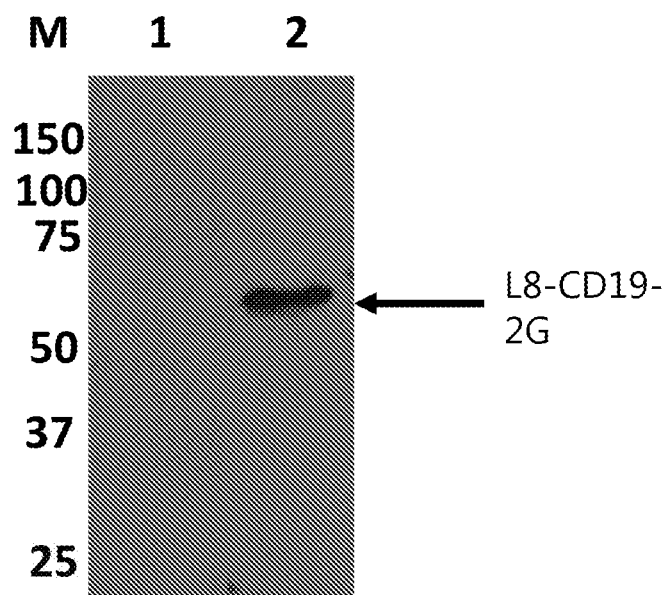
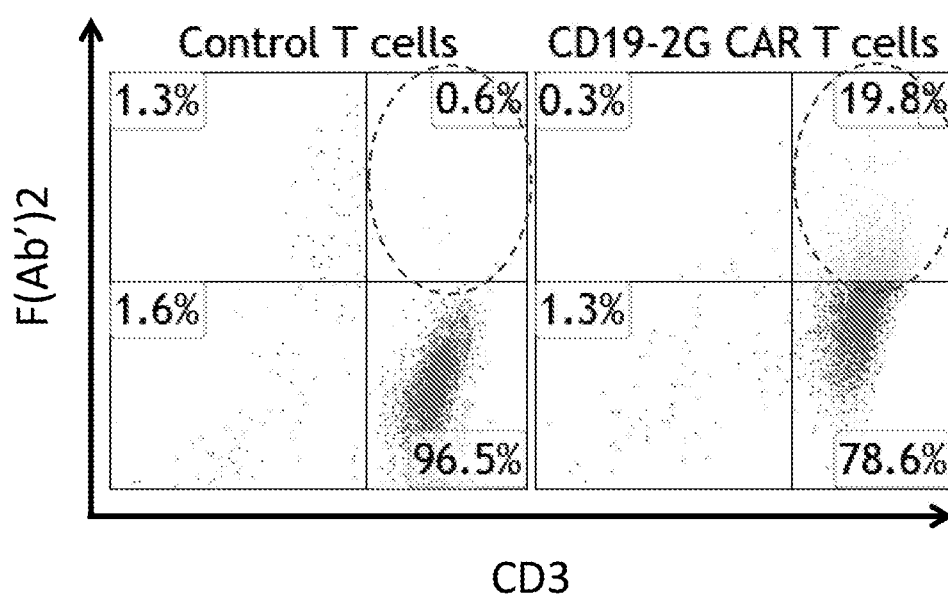
FIGURE 37B**FIGURE 37C**

FIGURE 38A

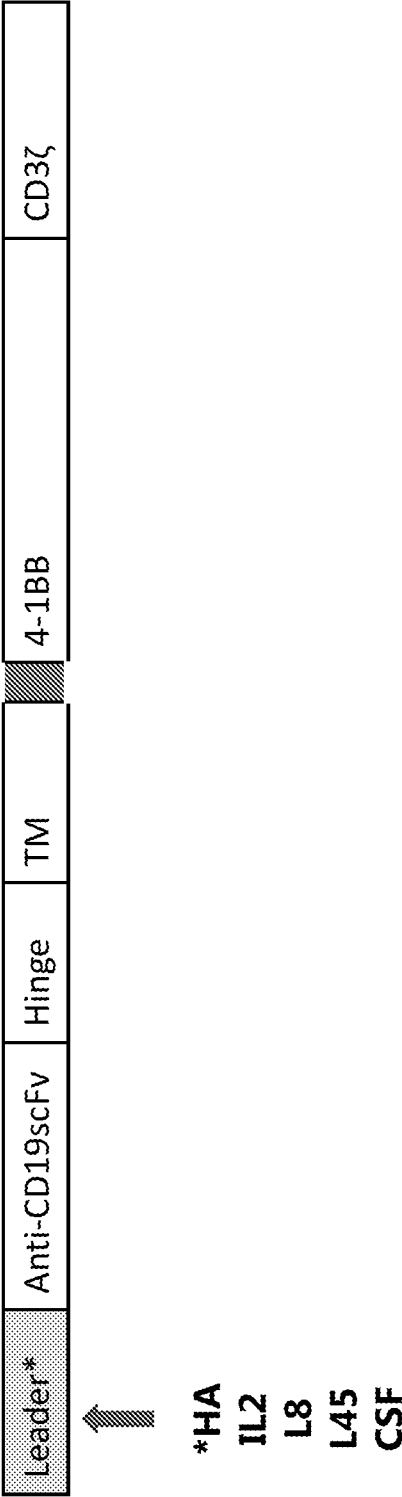


FIGURE 38B

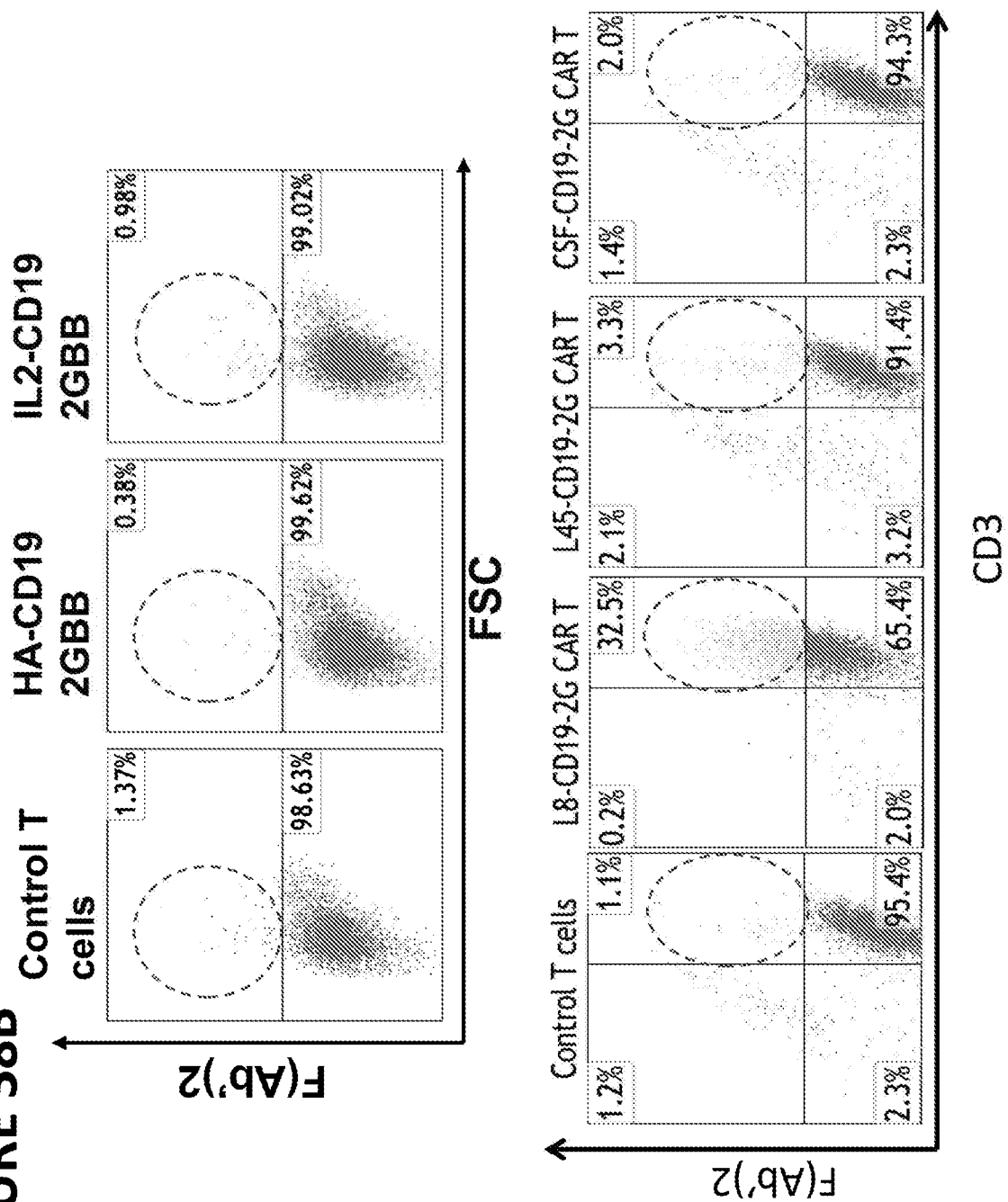


FIGURE 39A

Leader	Anti-CD19*scFv	Hinge	TM	CD28	4-1BB	CD3ζ
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*L8-CD19-2G or
L8-CD19b-BB-2G

FIGURE 39B

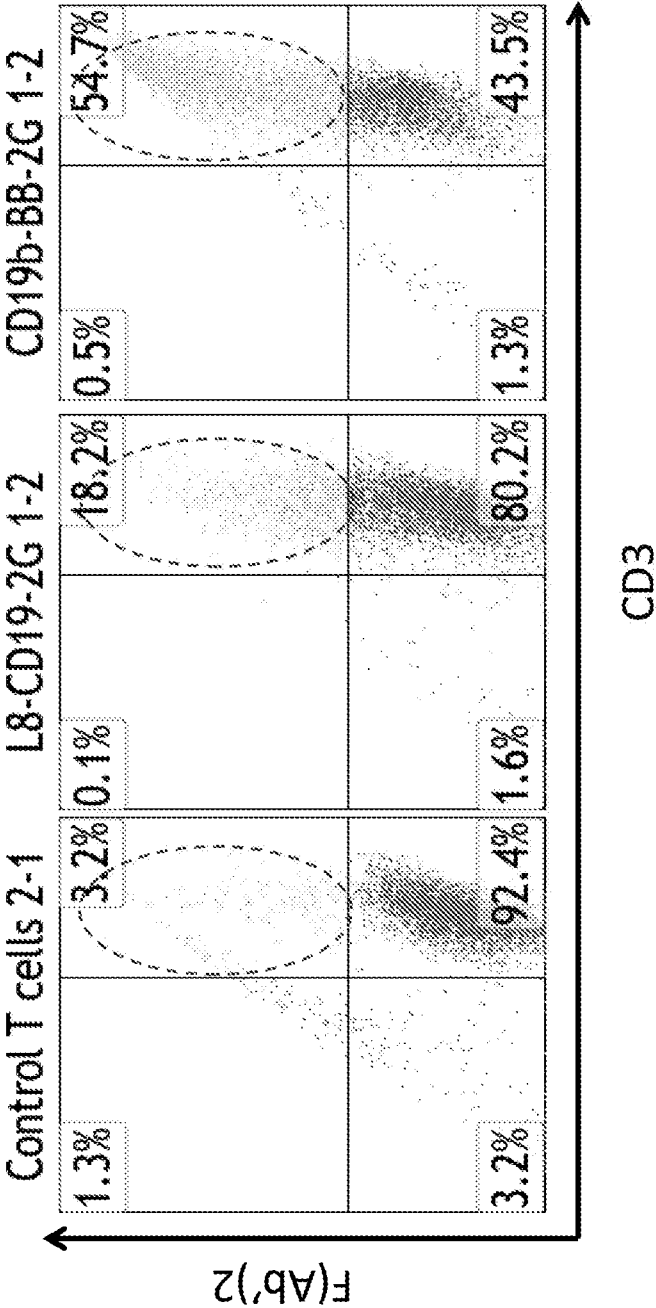


FIGURE 40

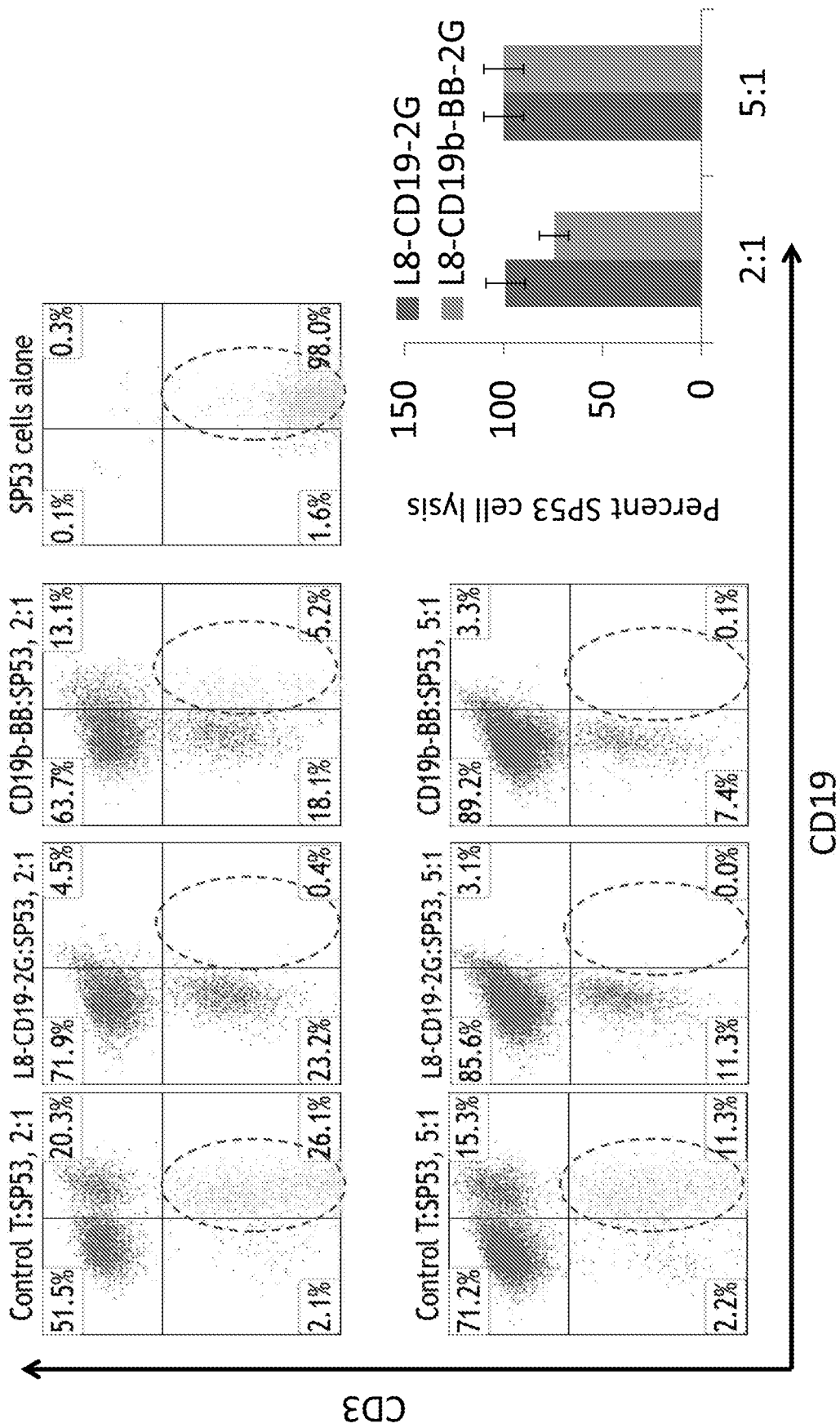


FIGURE 41

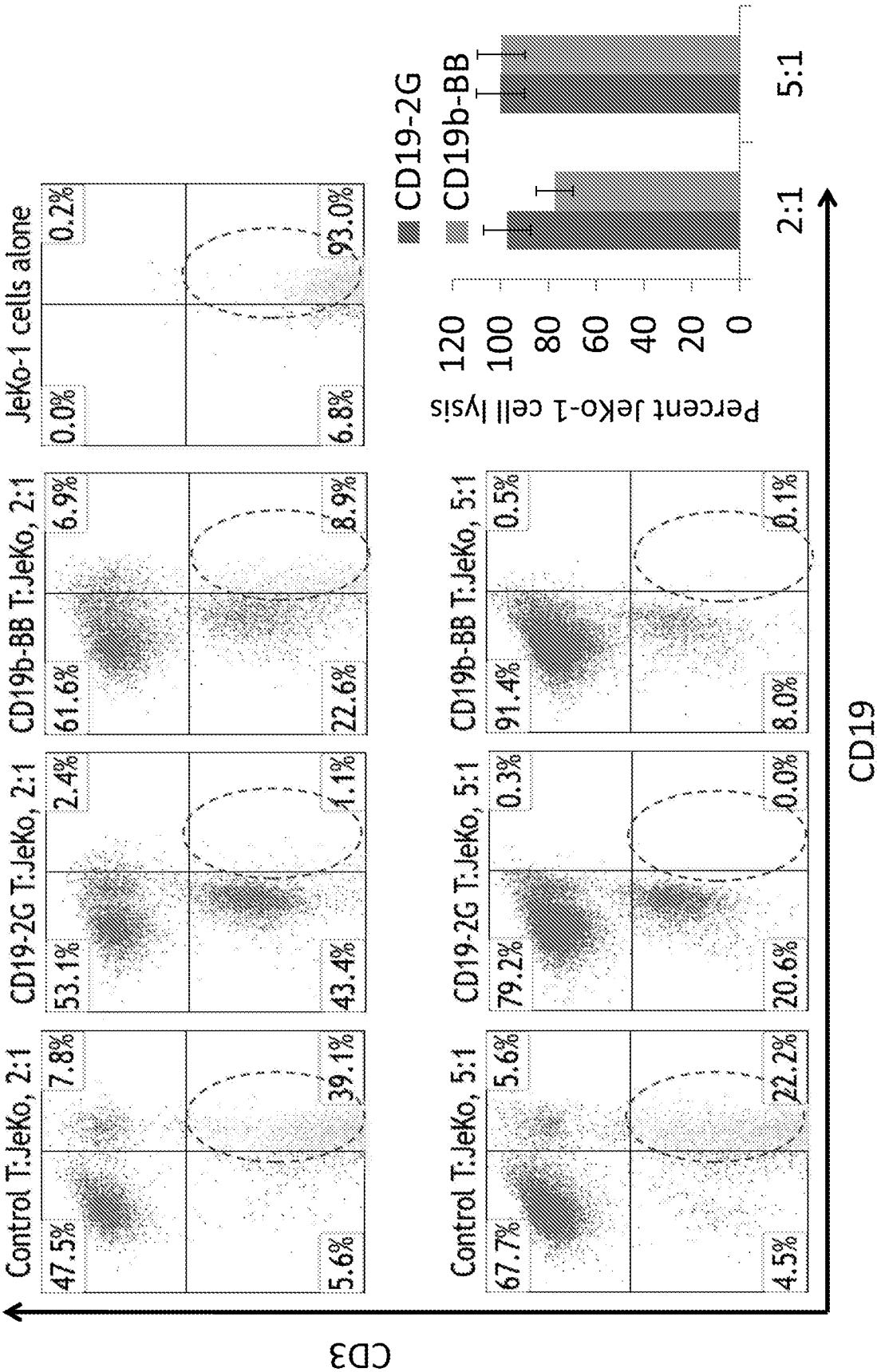


FIGURE 42

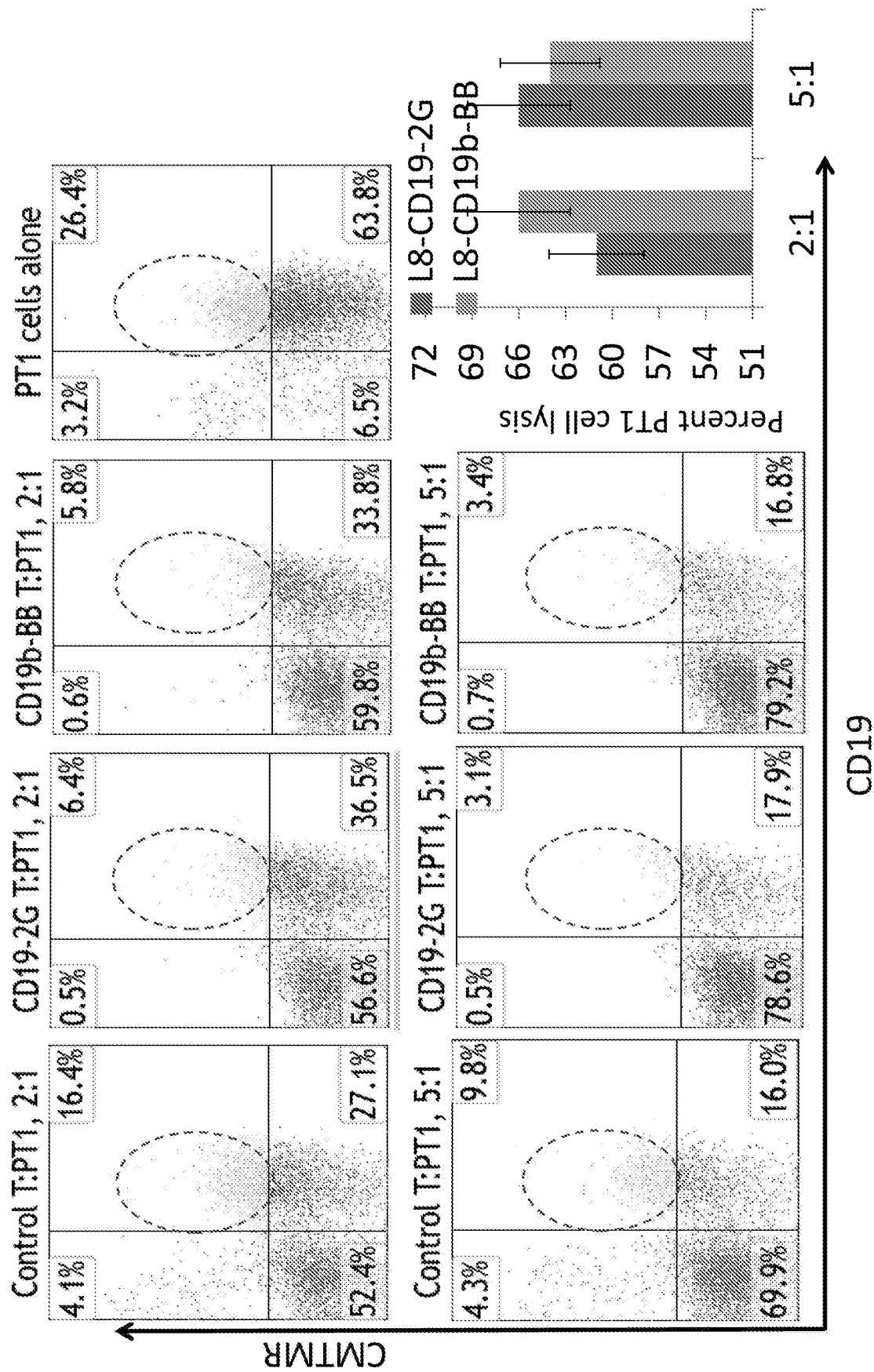


FIGURE 43

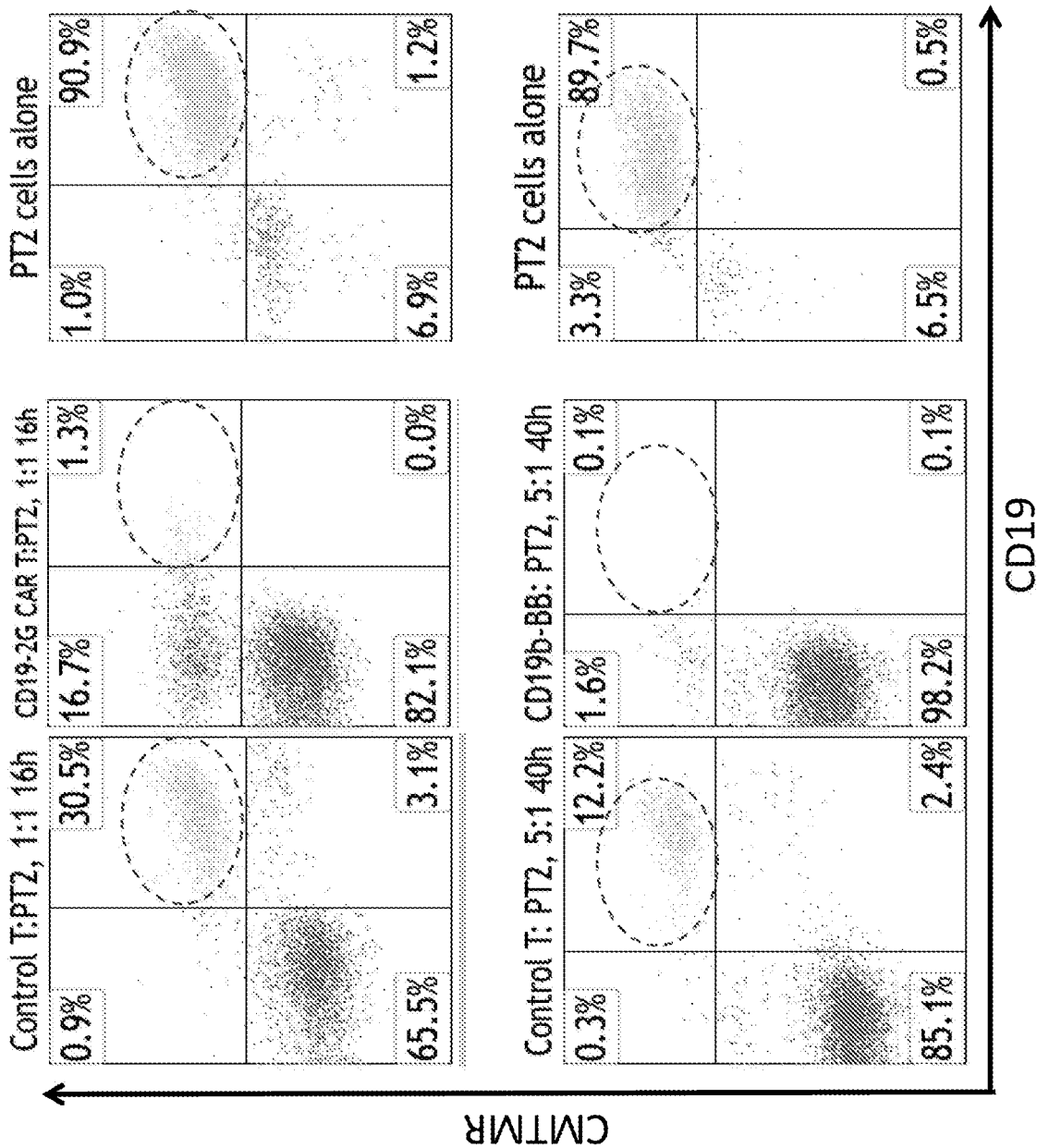


FIGURE 44

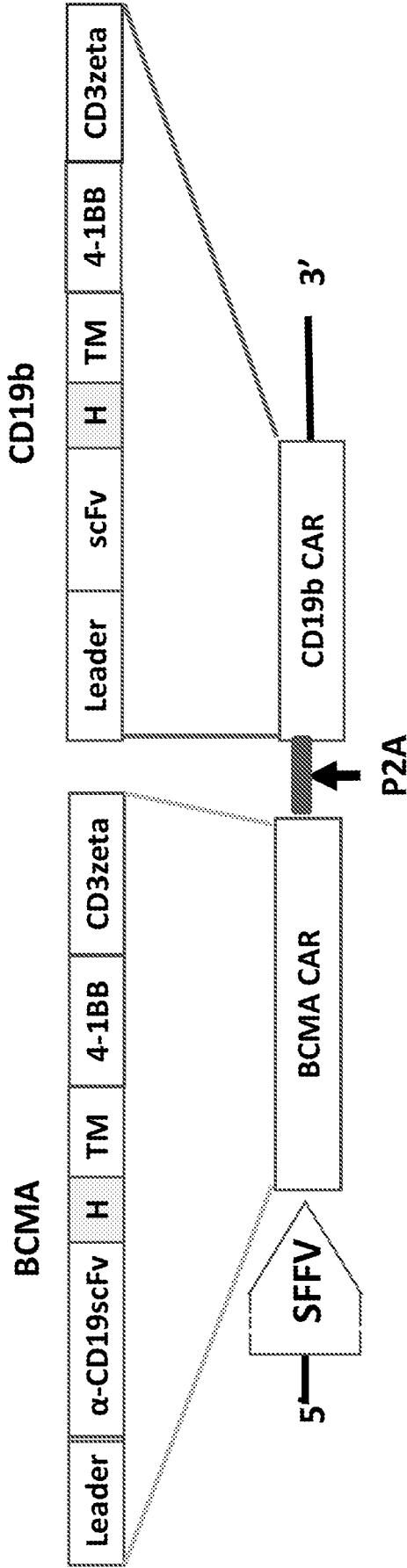


FIGURE 45A

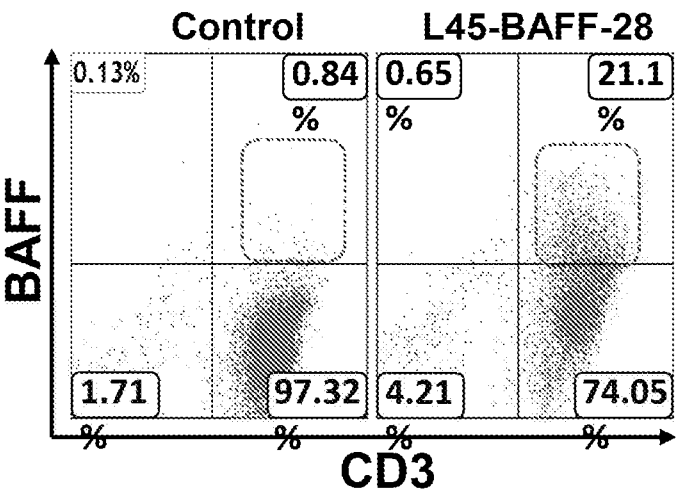
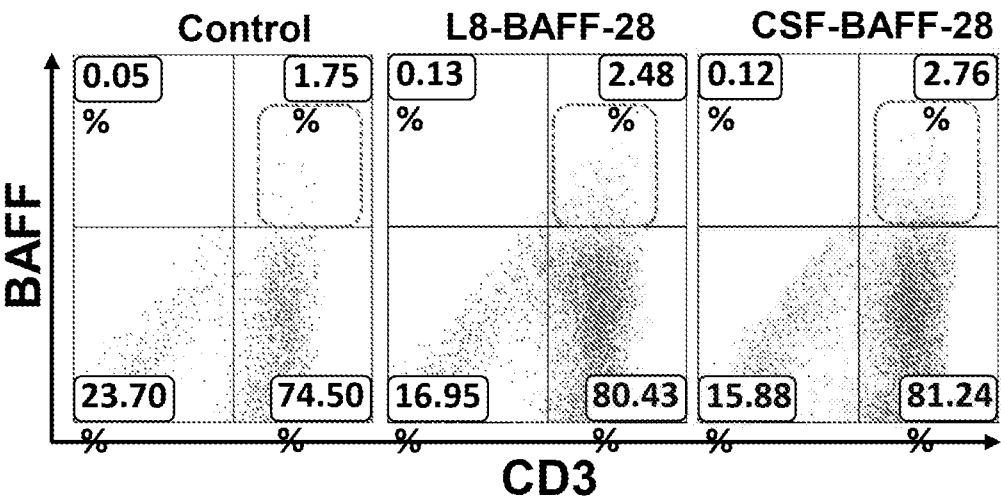


FIGURE 45B



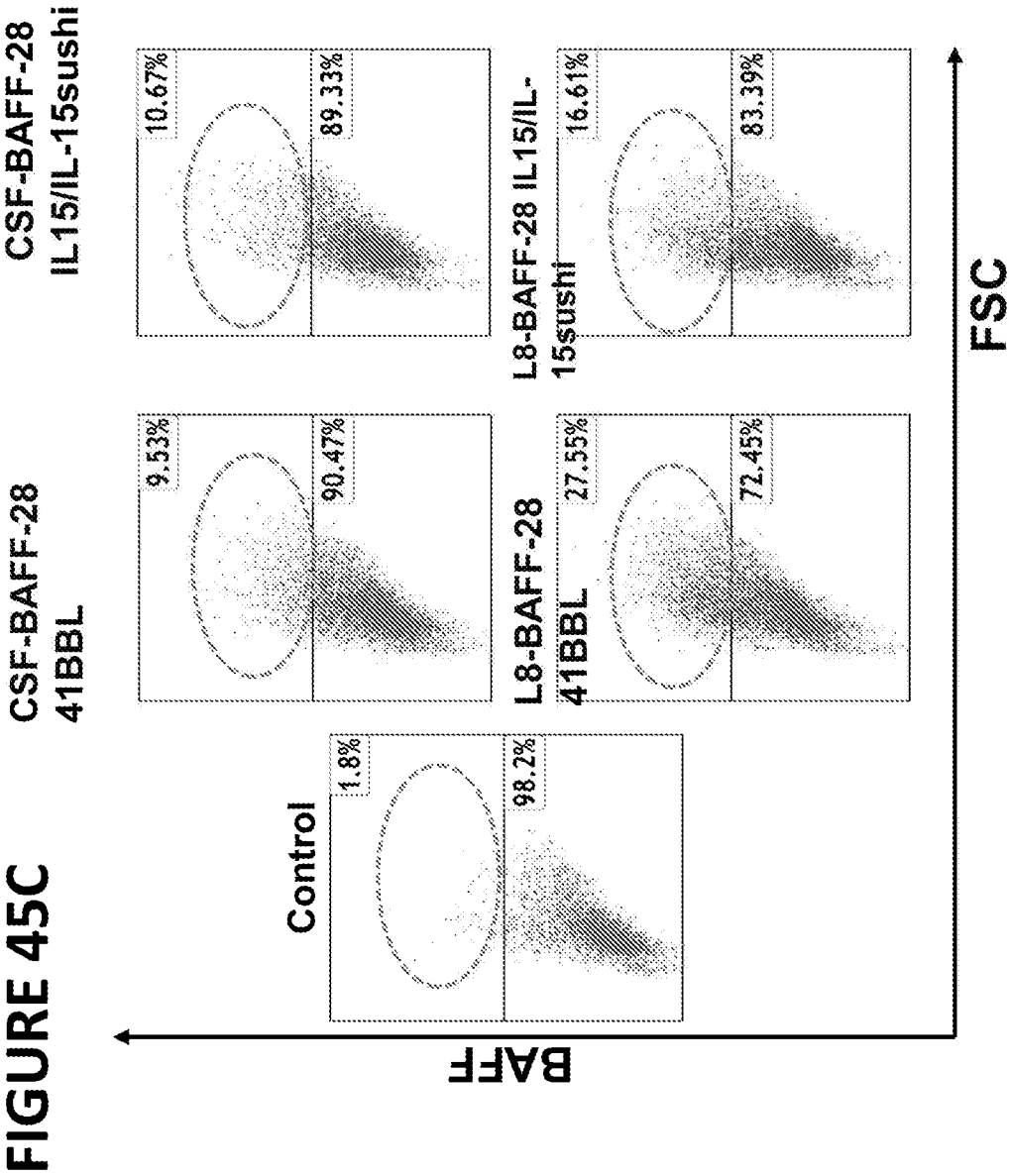
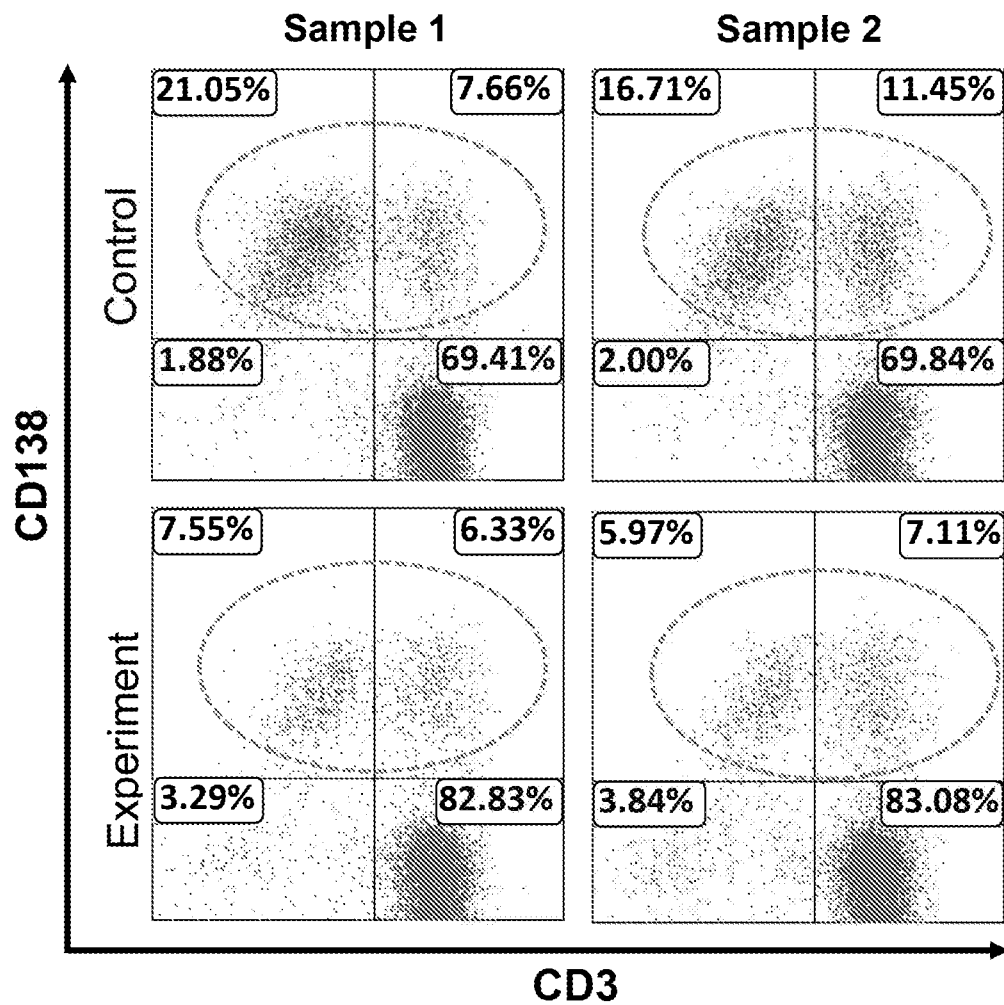
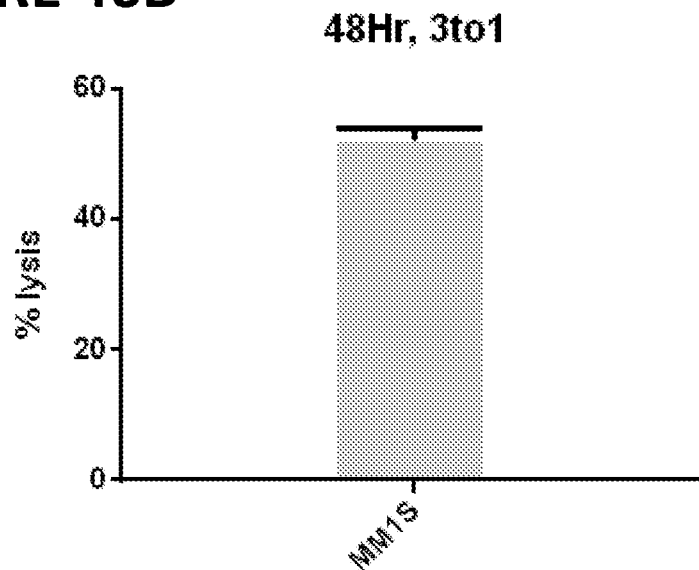


FIGURE 46A**FIGURE 46B**

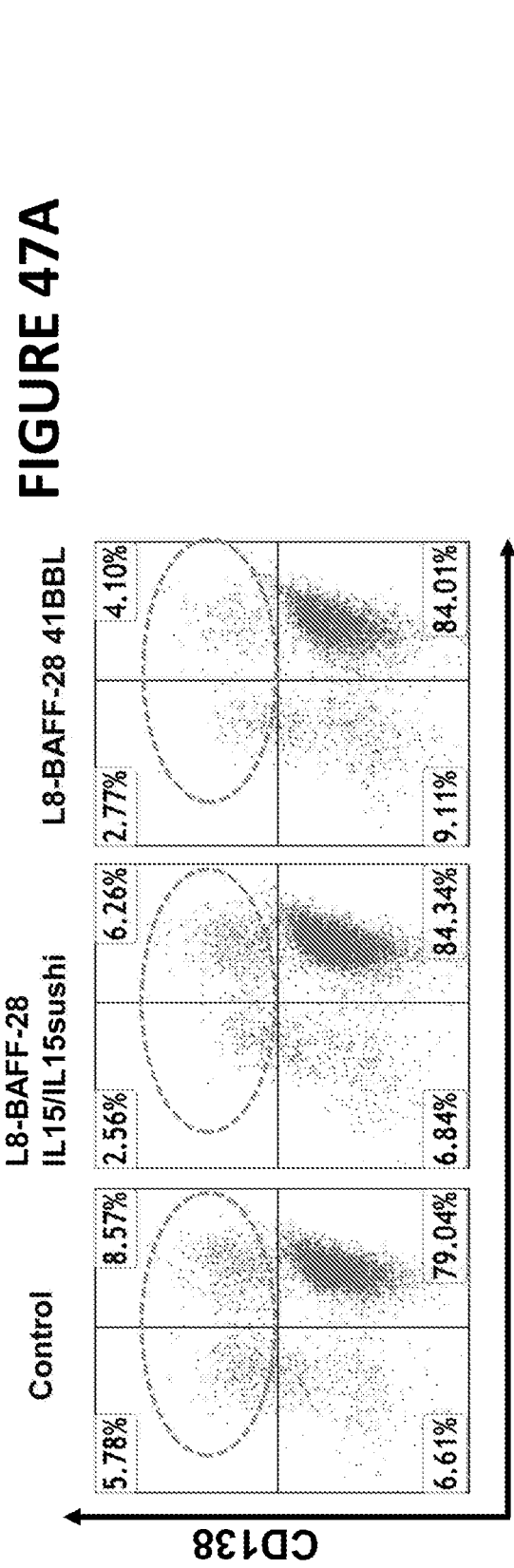
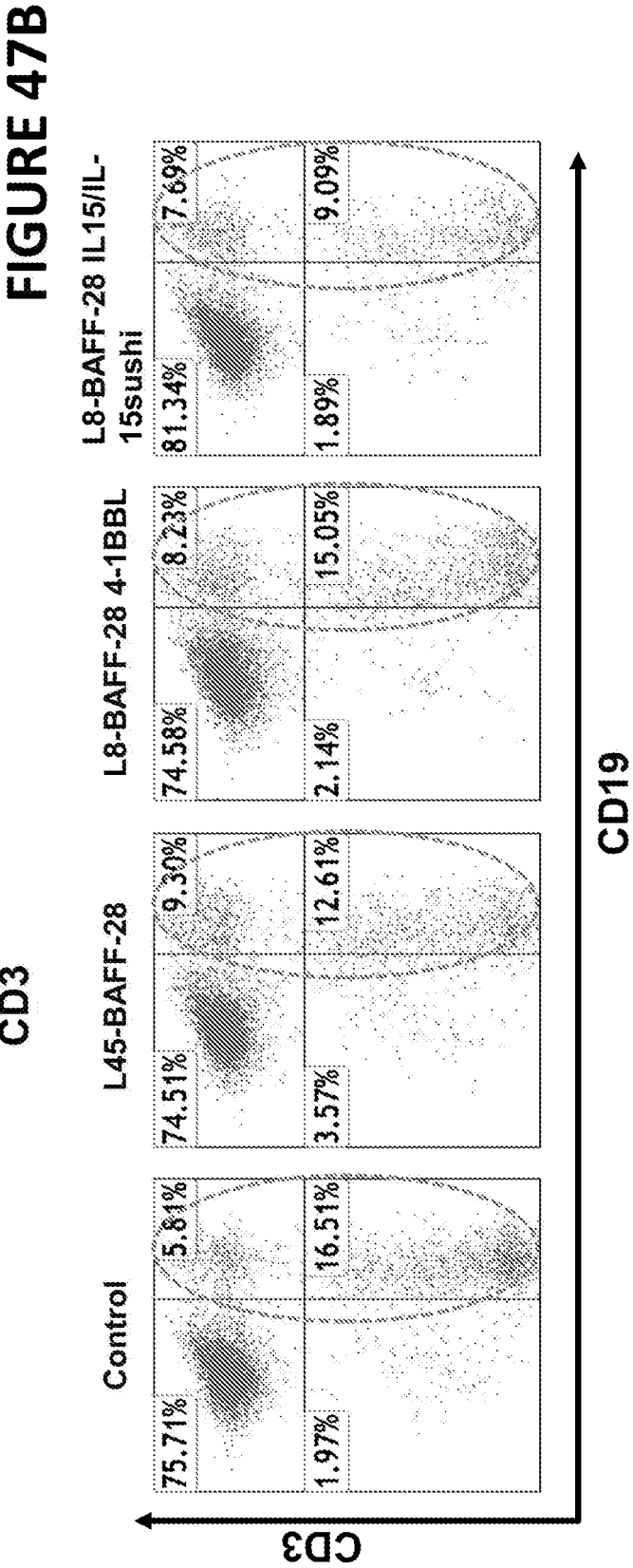


FIGURE 48

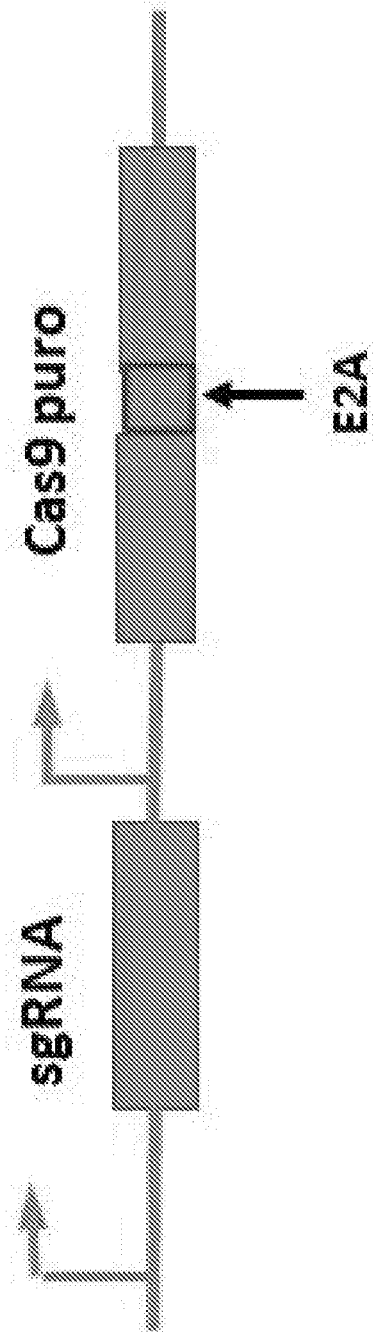
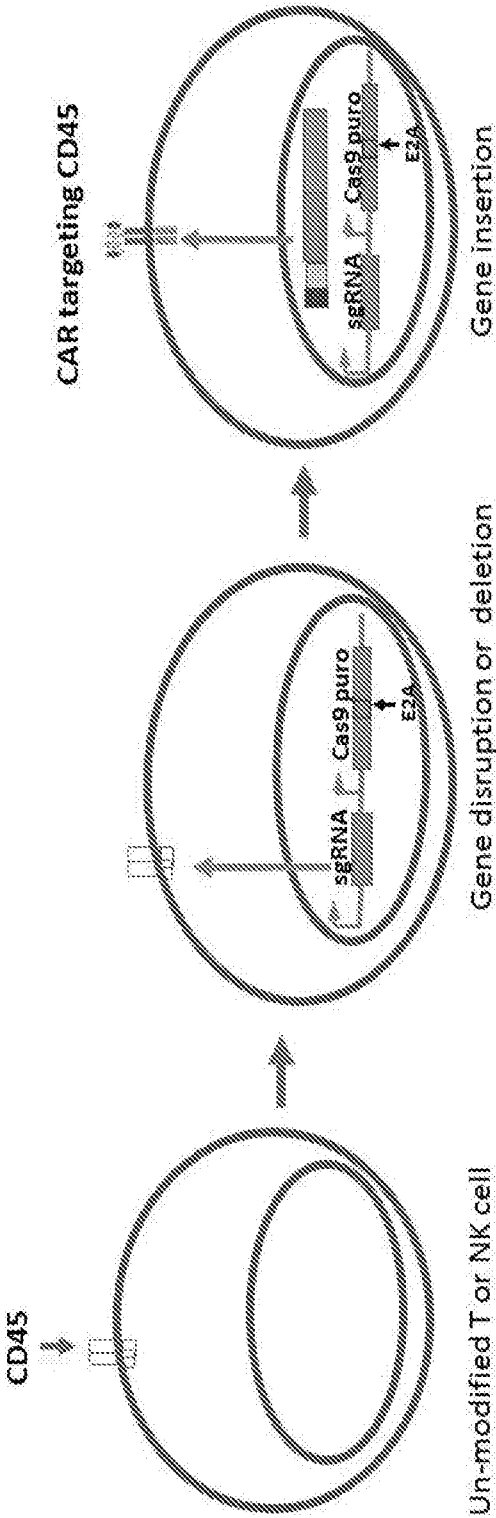
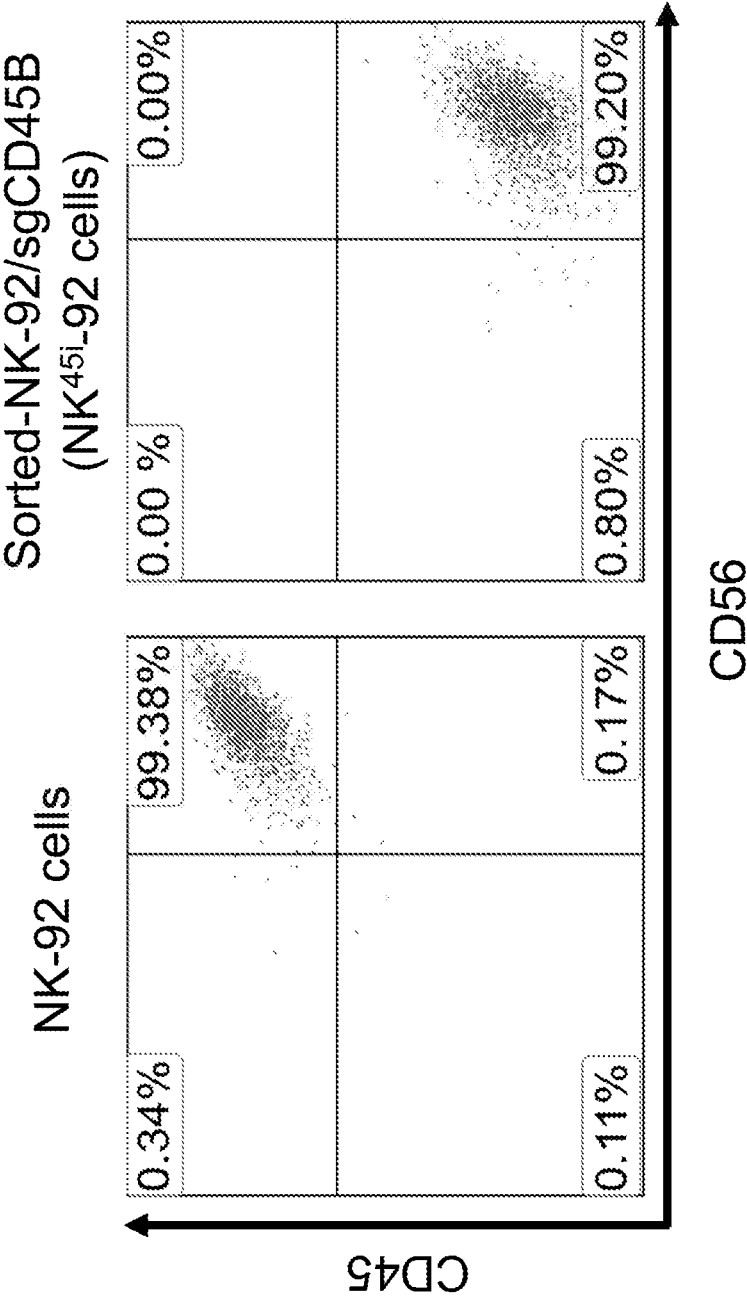


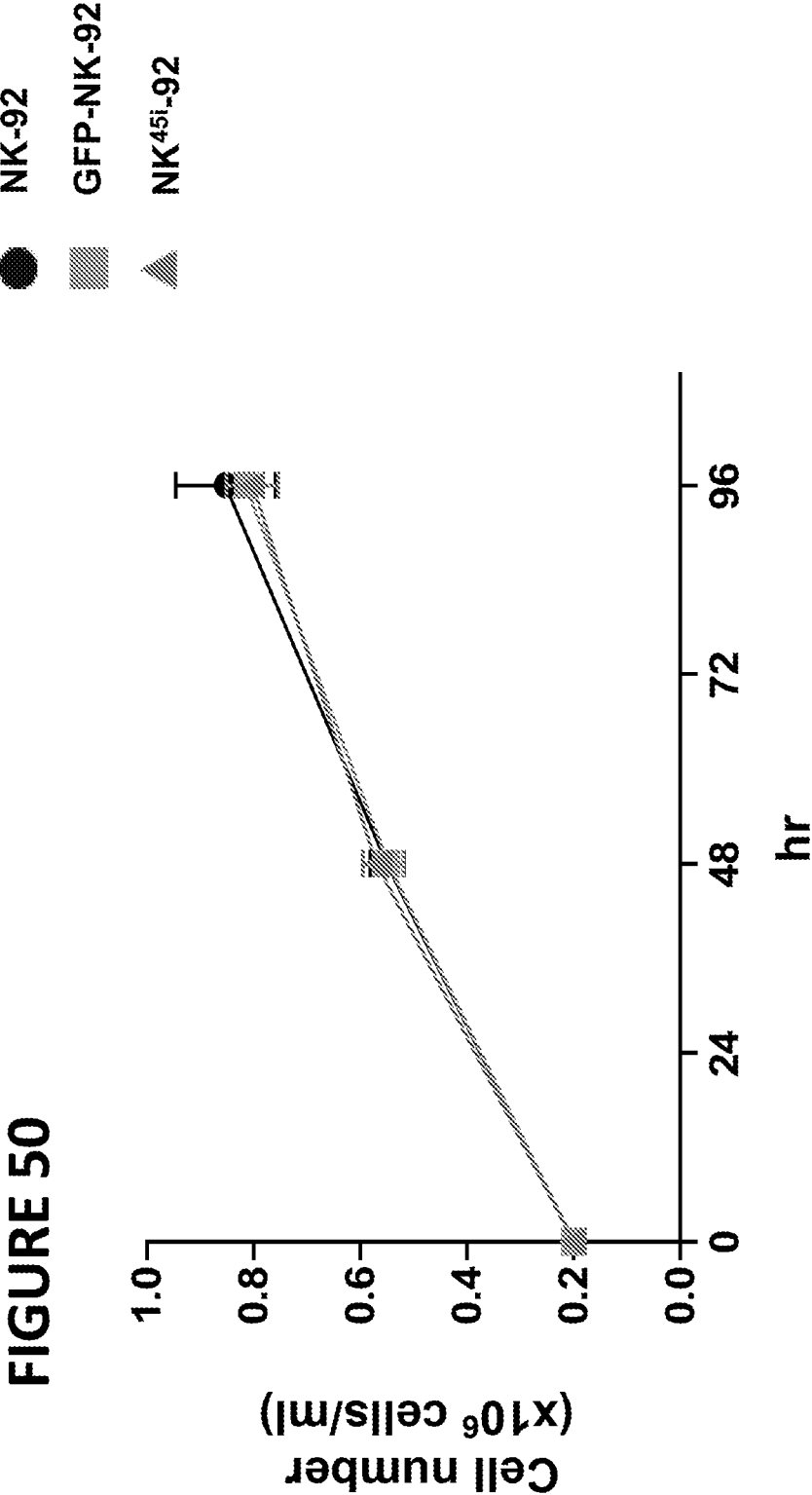
FIGURE 49A

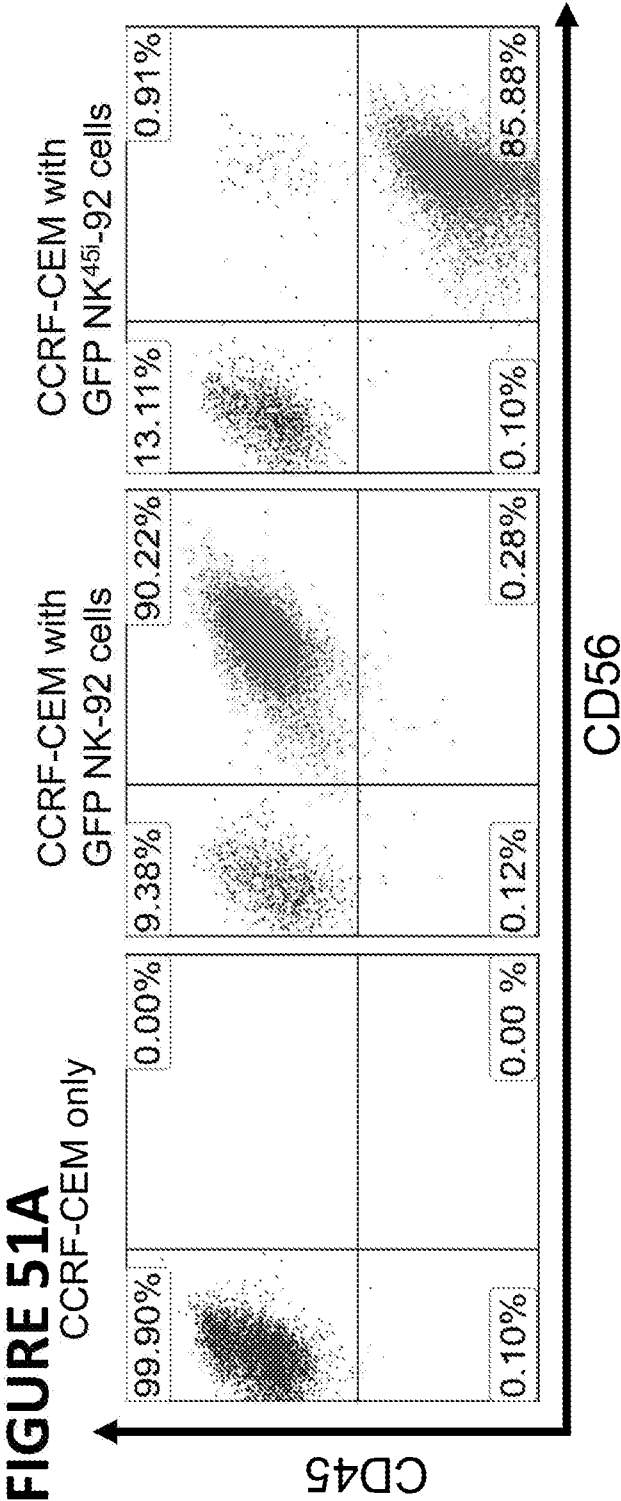
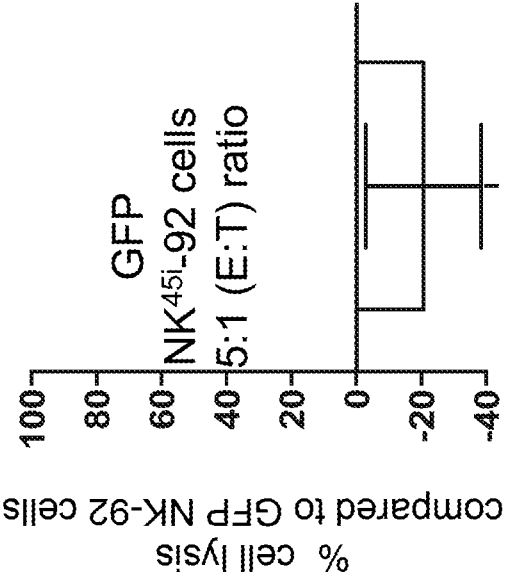


- Steps:
- 1. Donor T cells or NK cells
 - 2. Gene disruption or deletion of CD45
 - 3. Insert of scFv CAR targeting CD45

FIGURE 49B







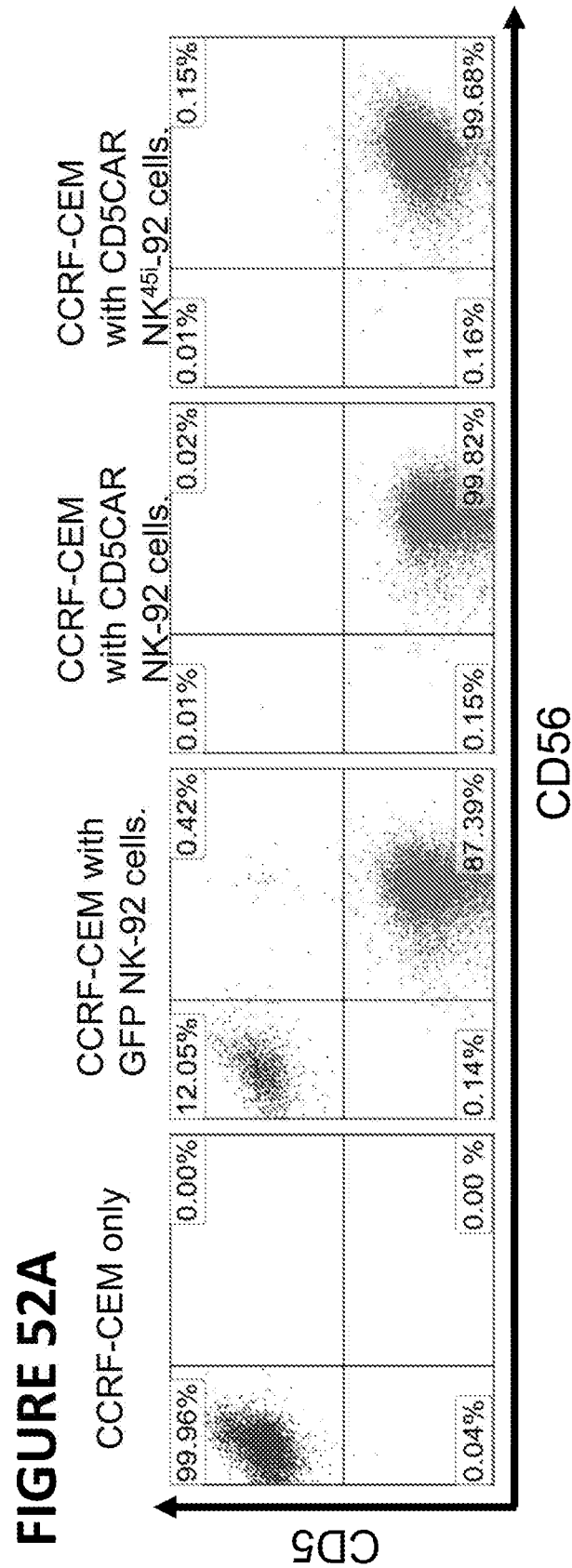
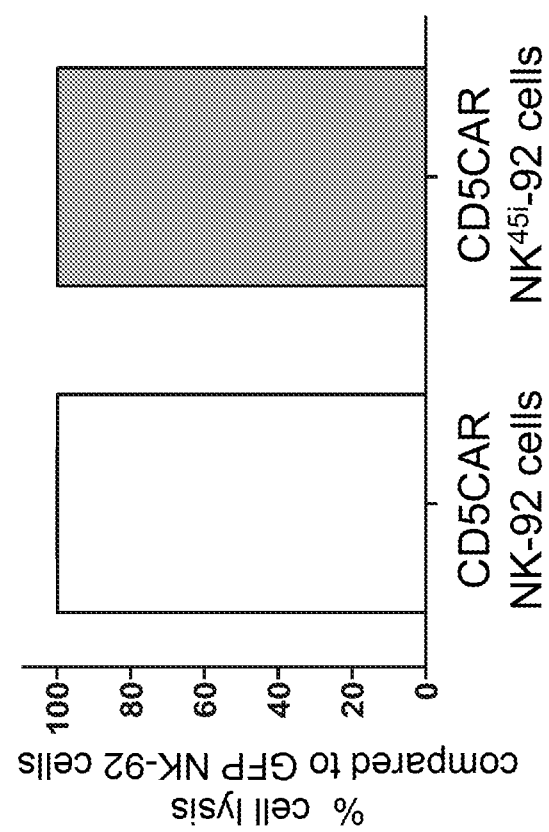


FIGURE 53A

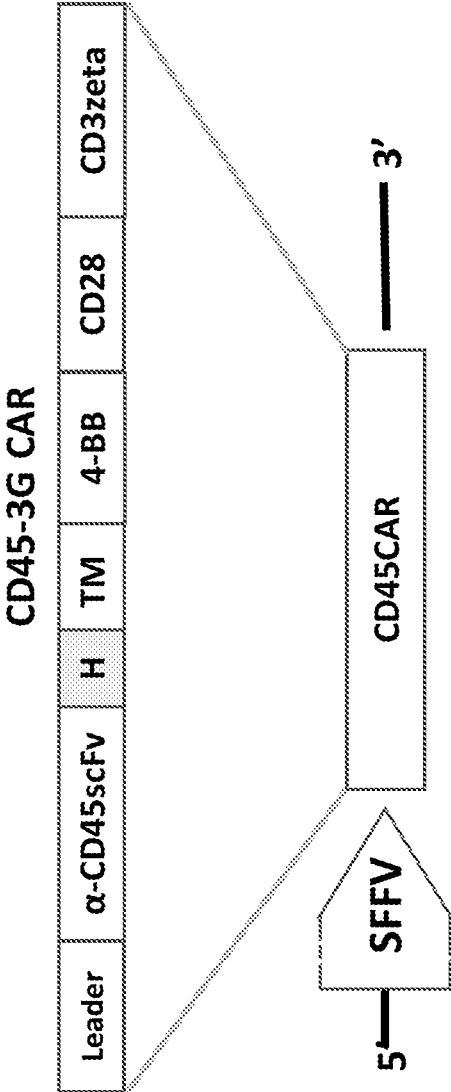


FIGURE 53B

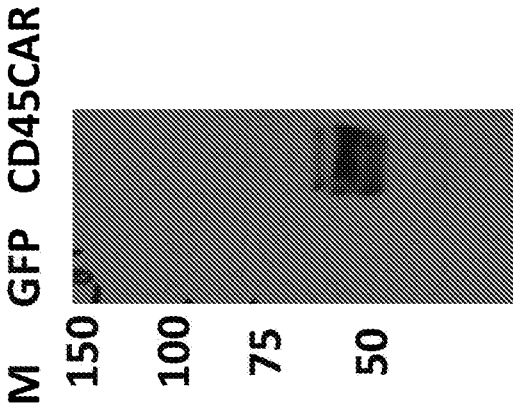


FIGURE 54

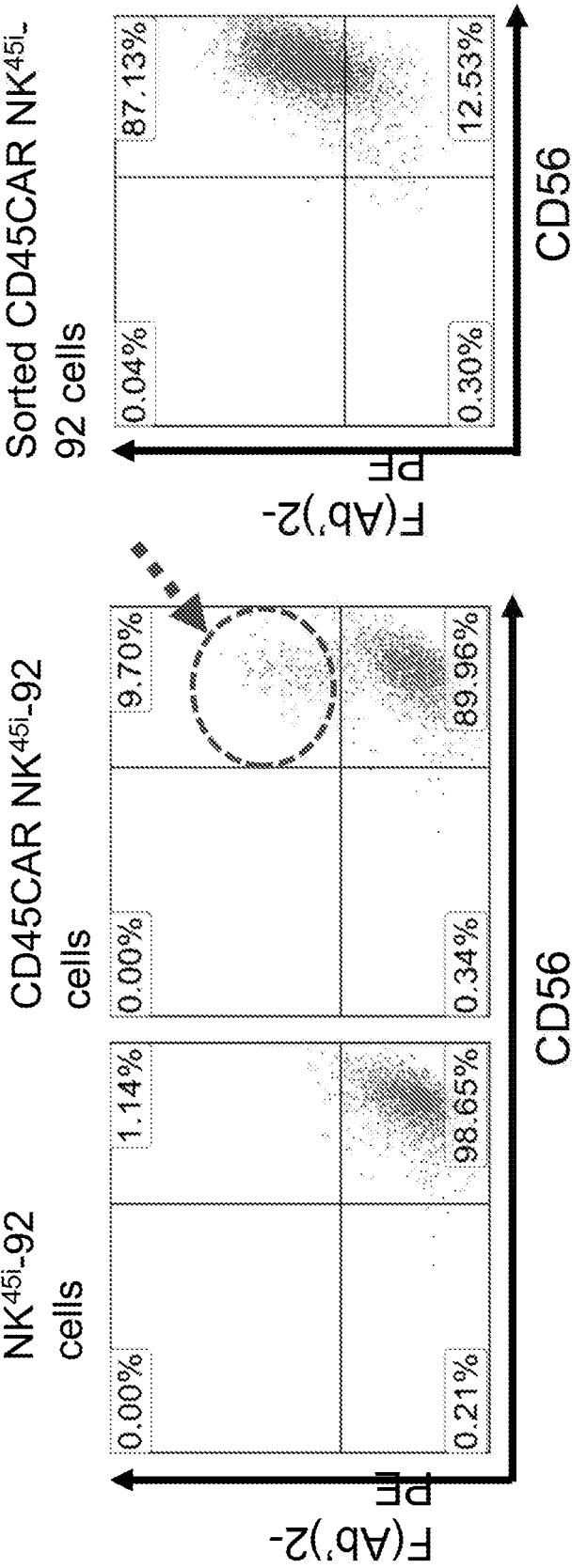


FIGURE 55A

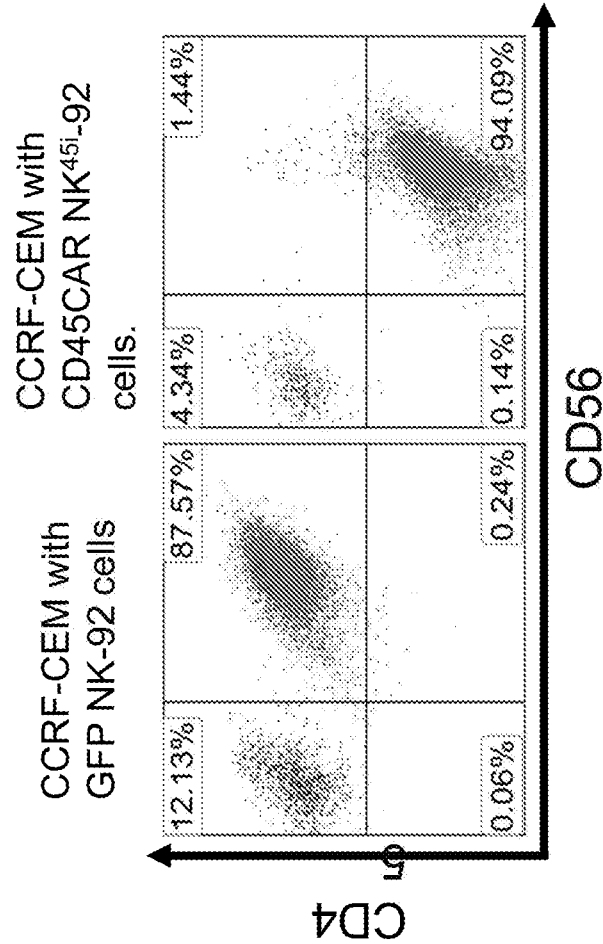
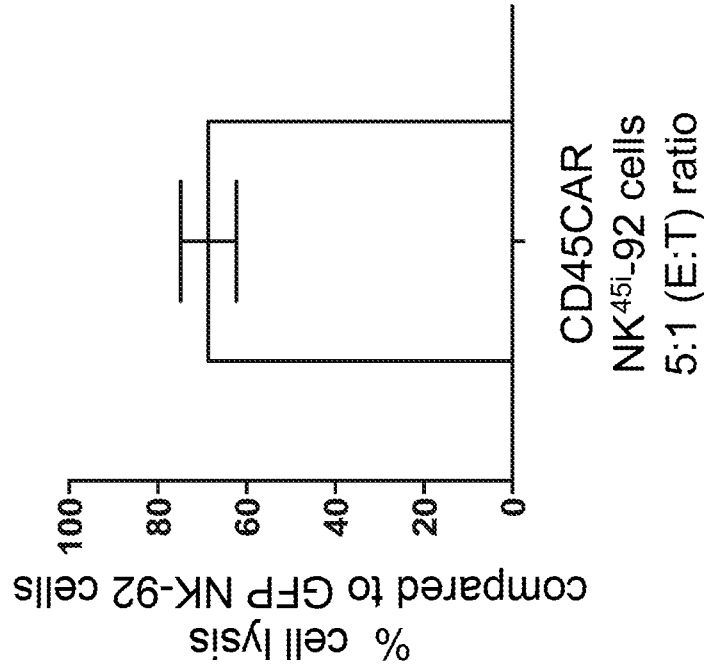


FIGURE 55B



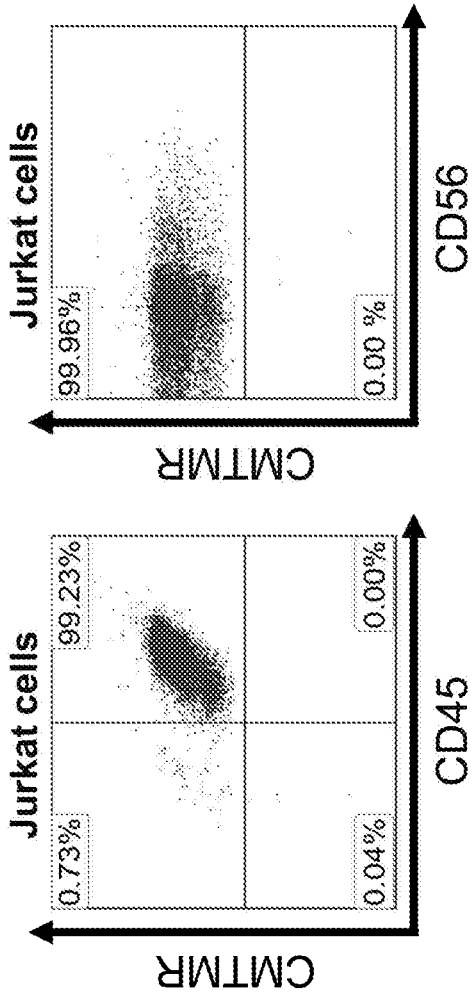
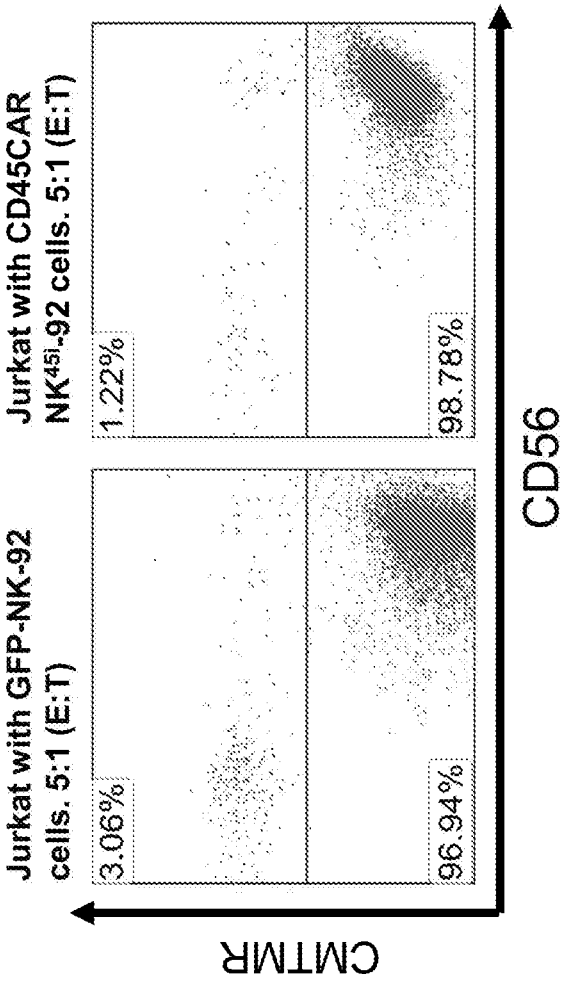
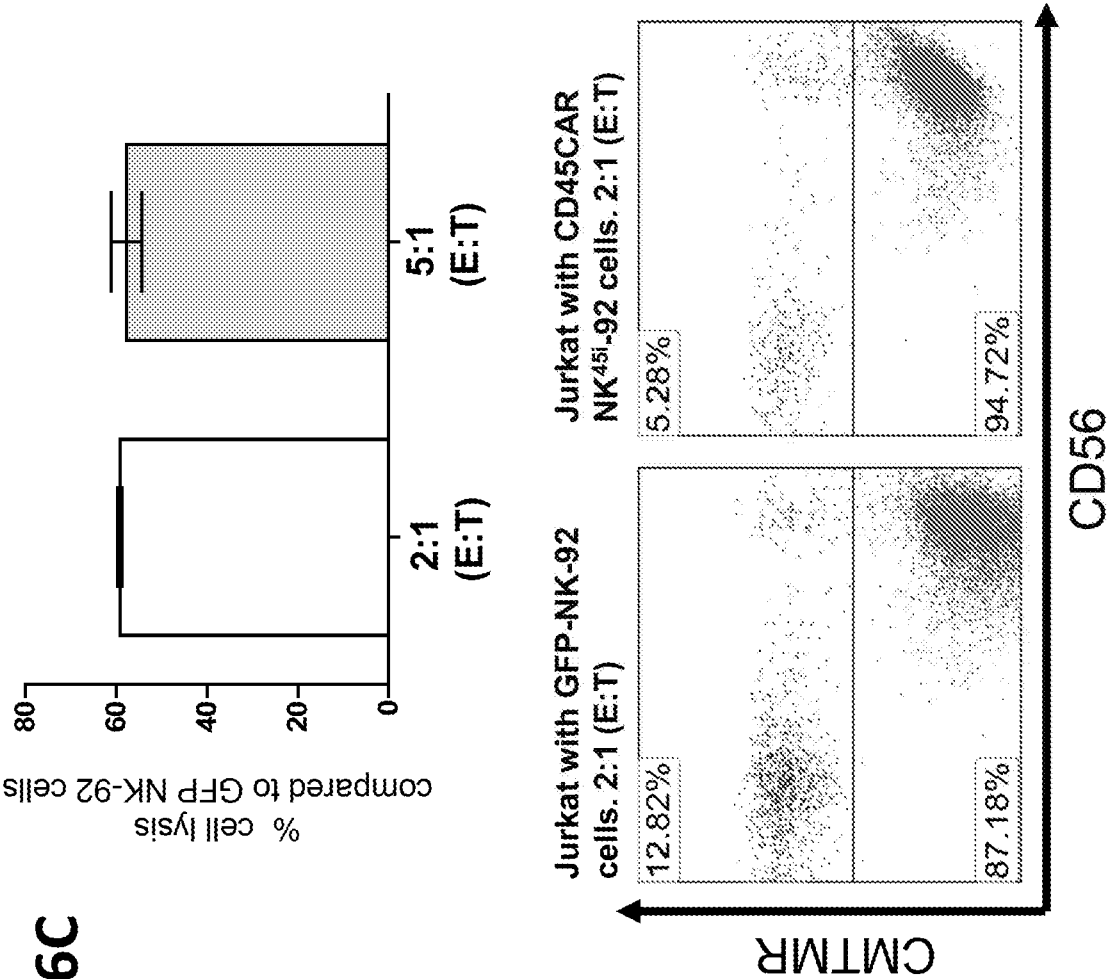


FIGURE 56C



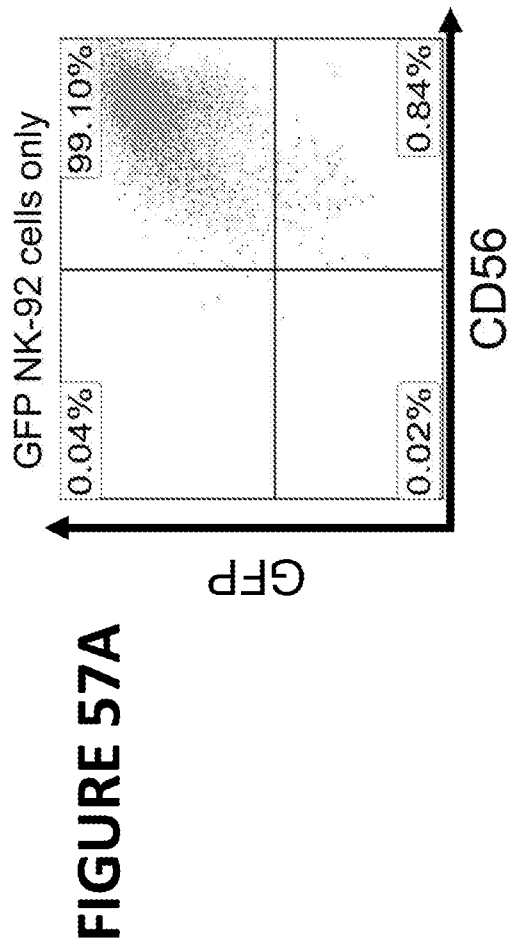
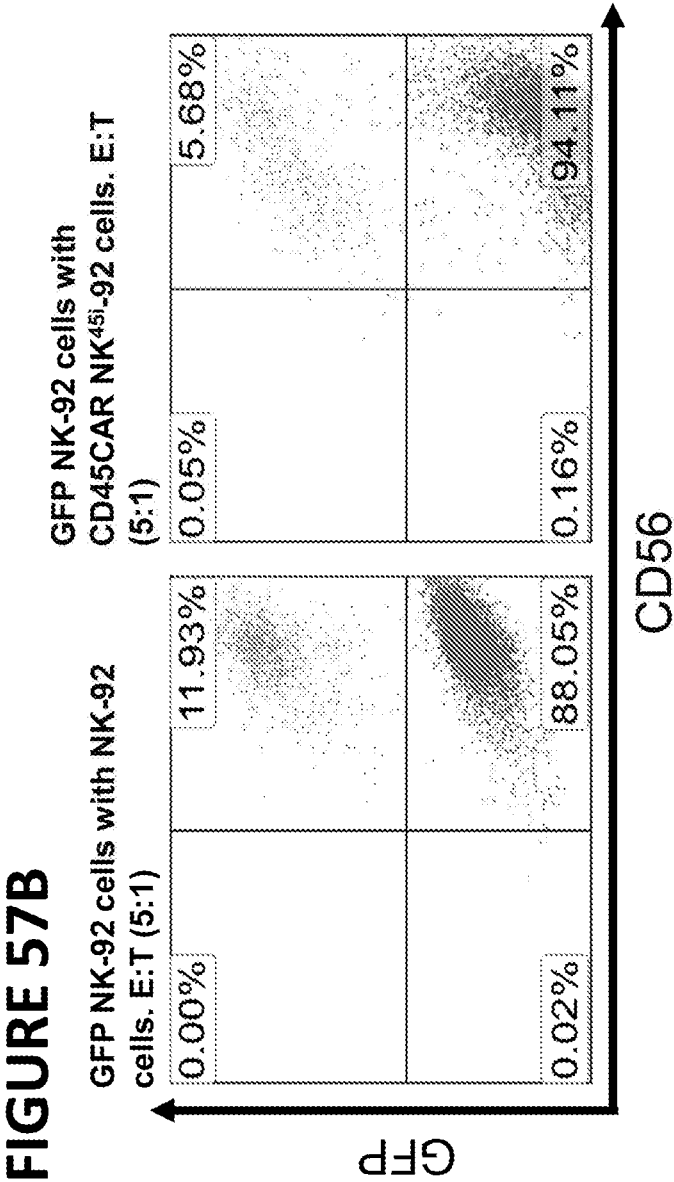
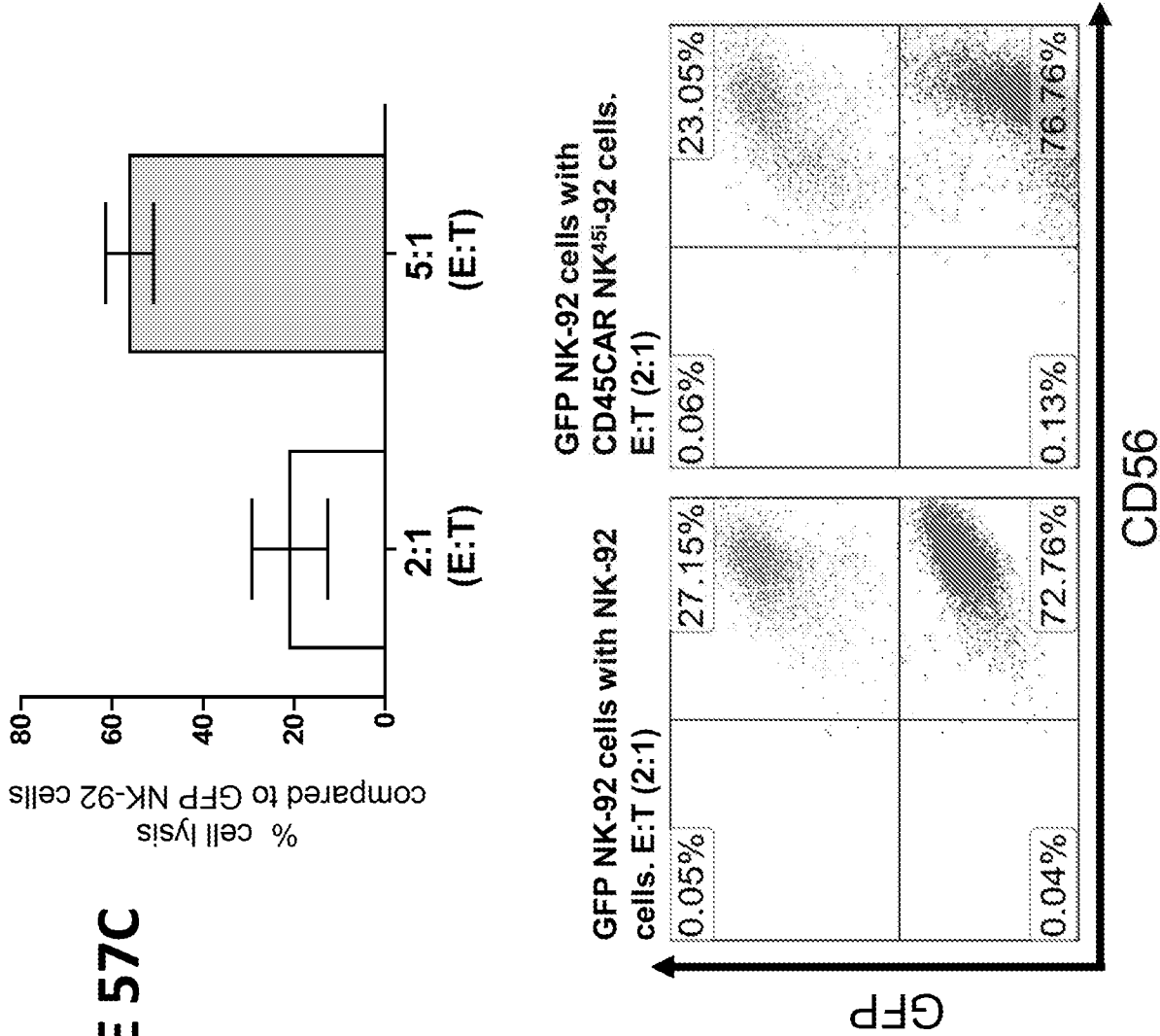


FIGURE 57C



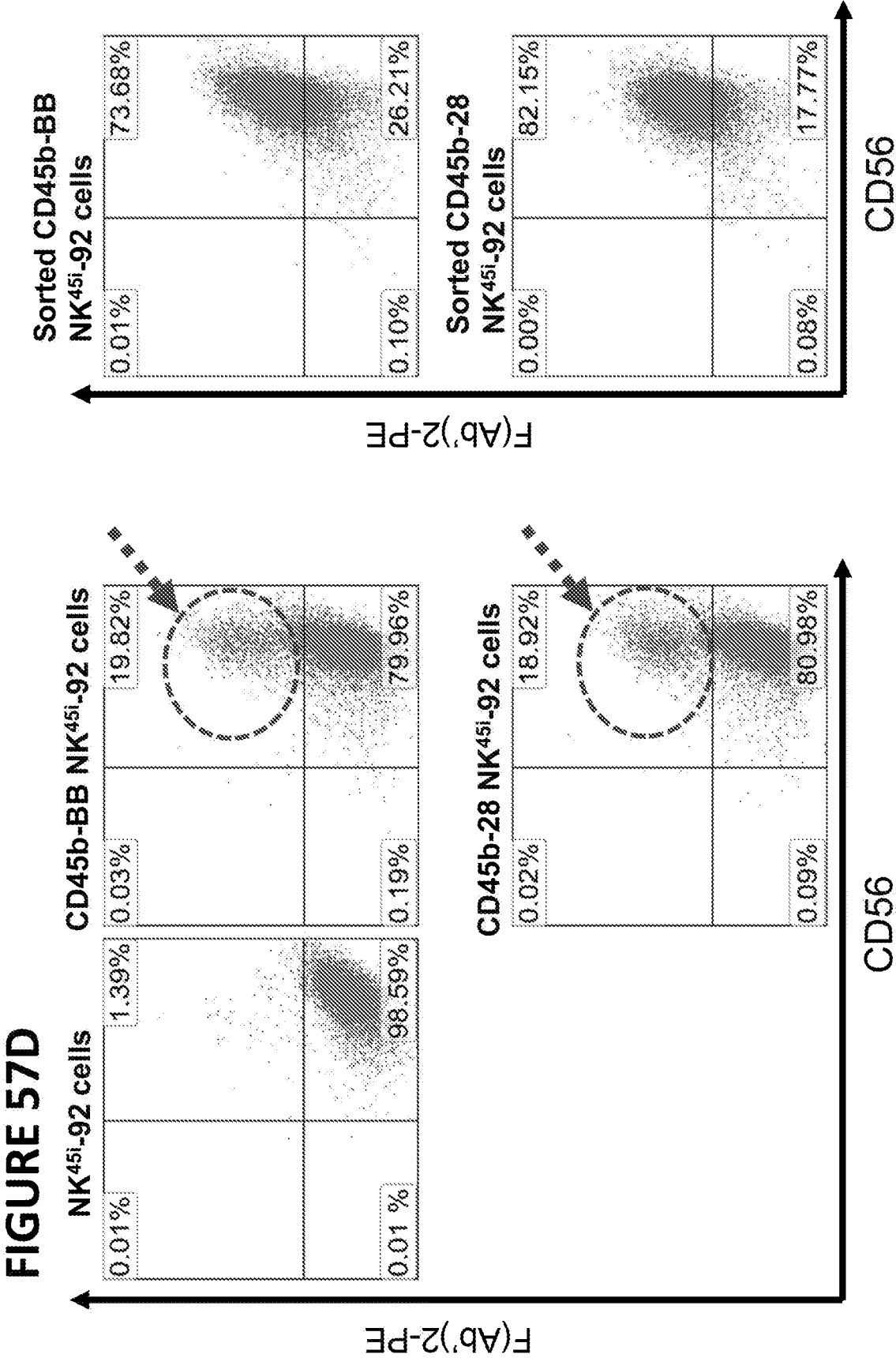
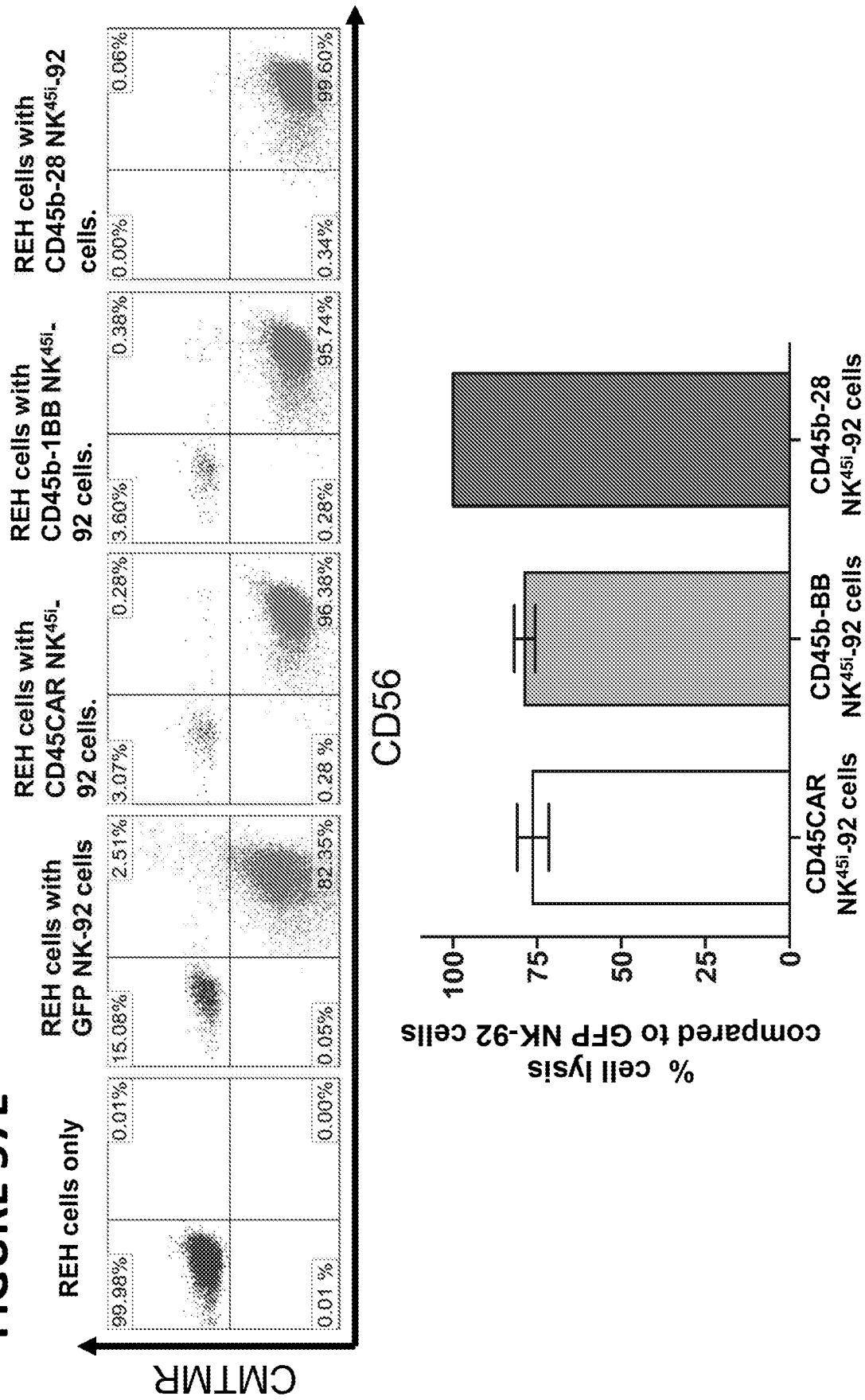
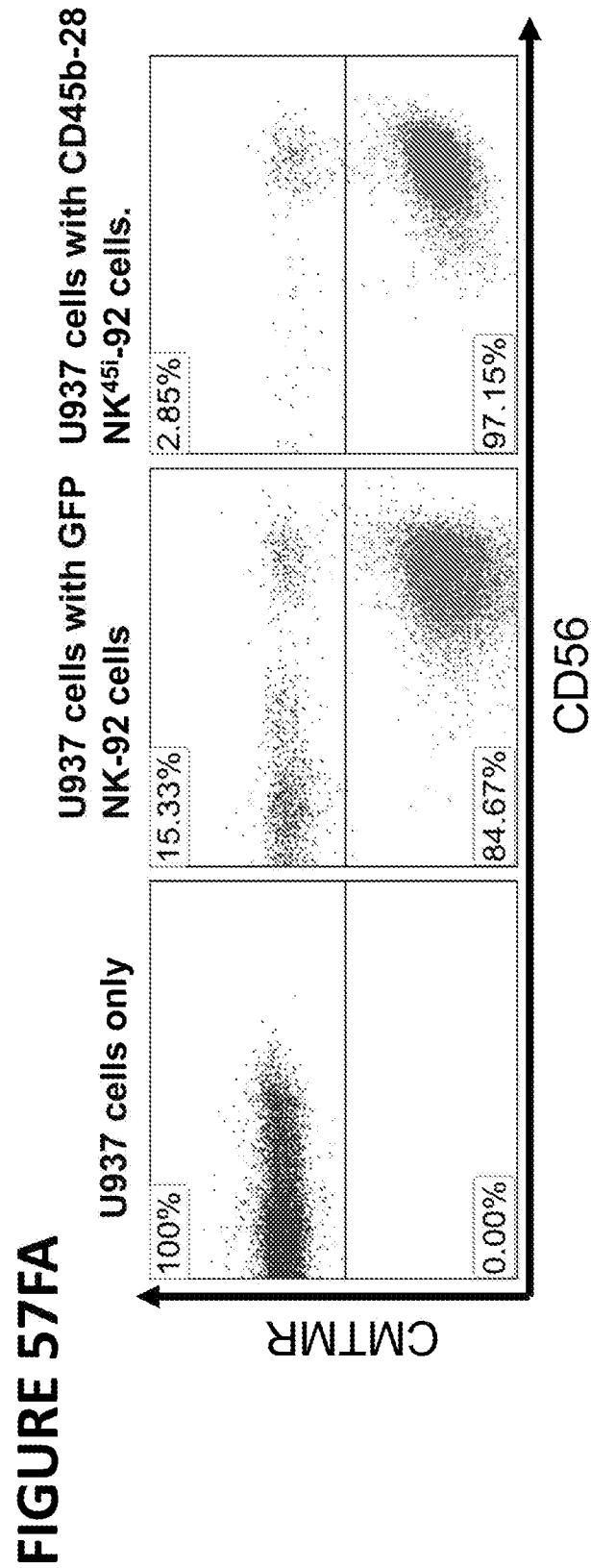
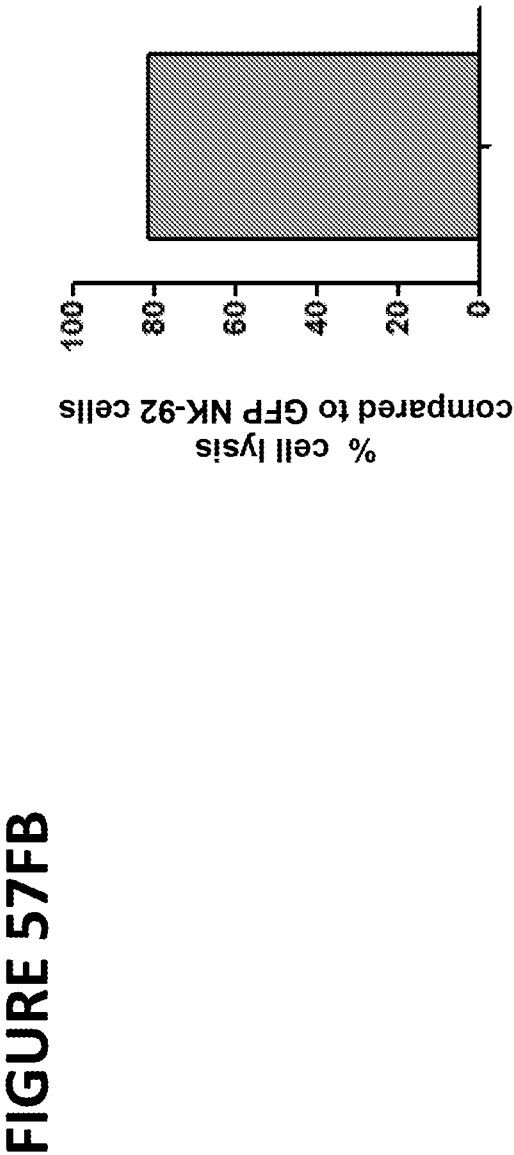
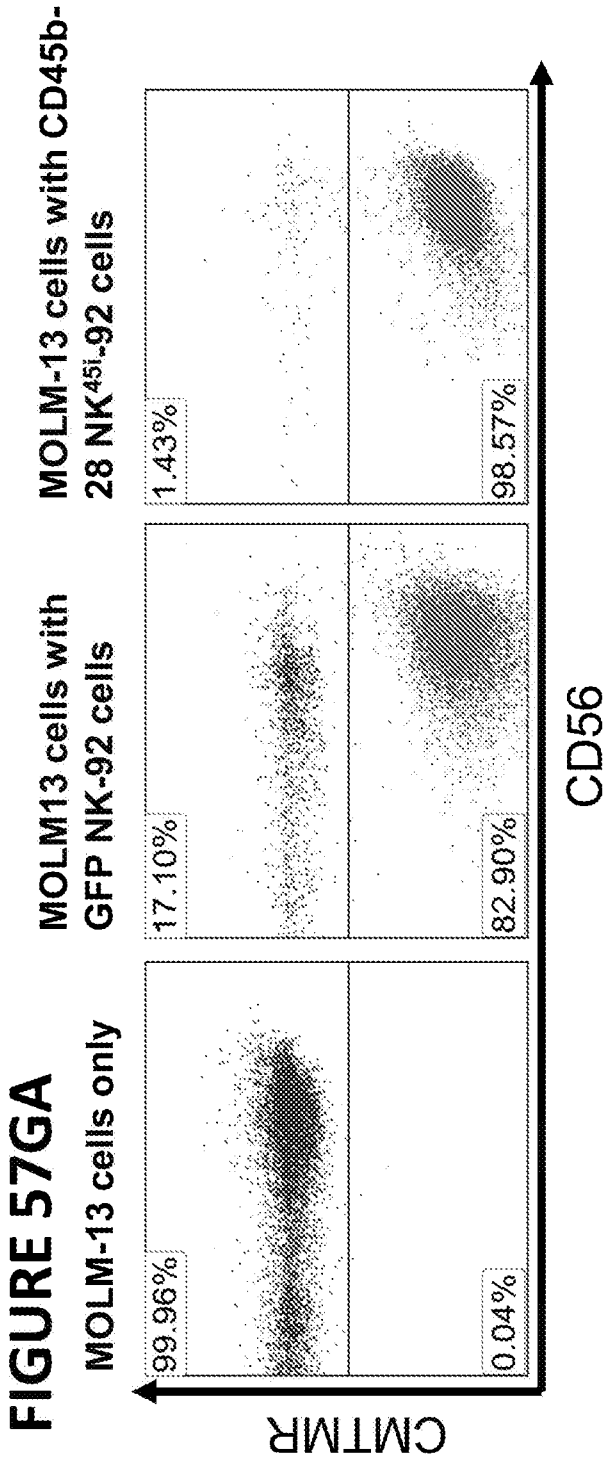
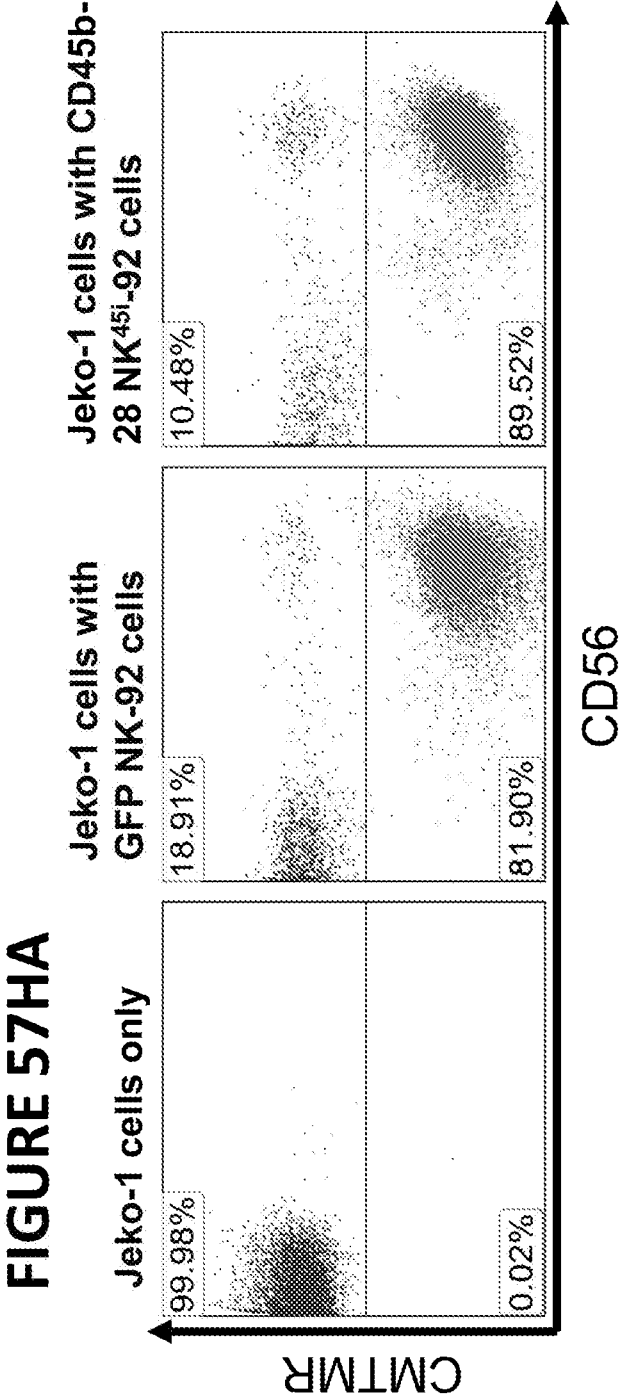
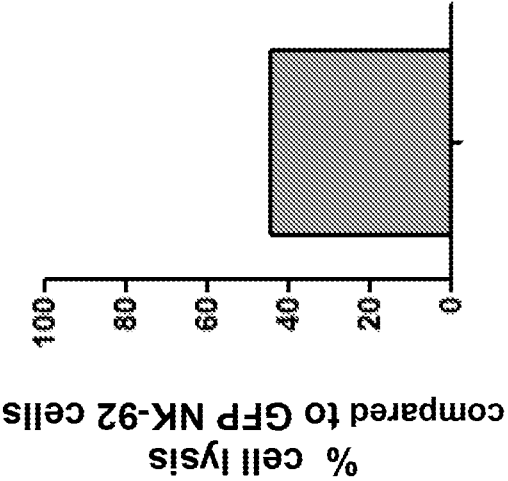


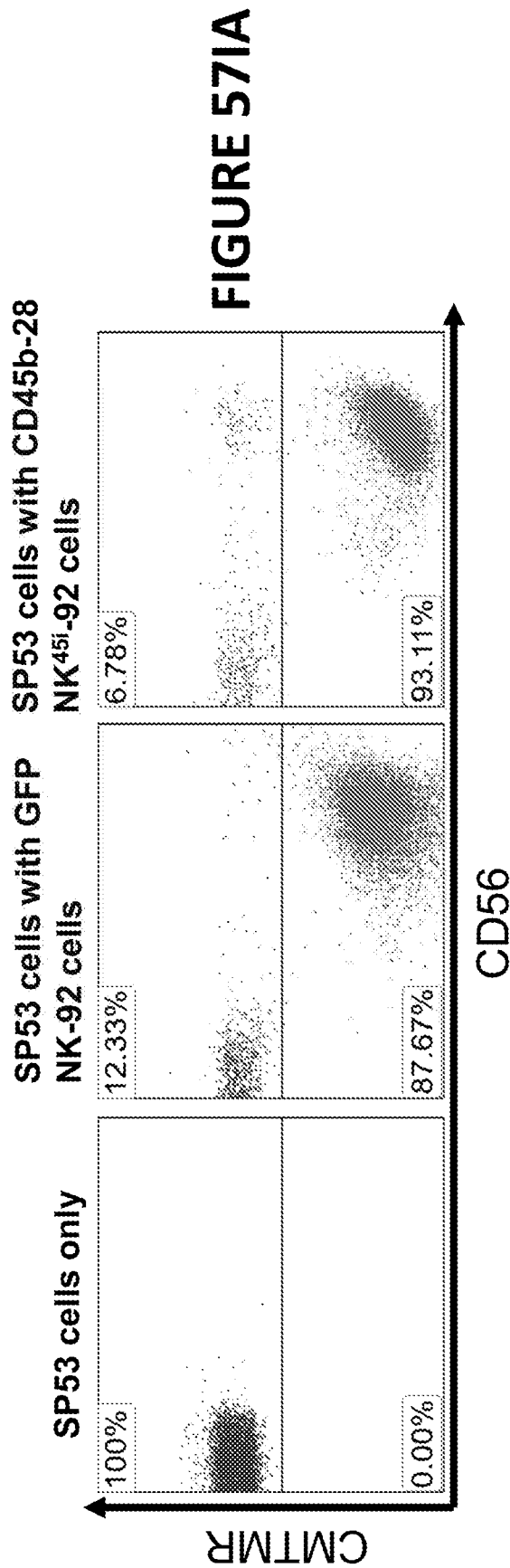
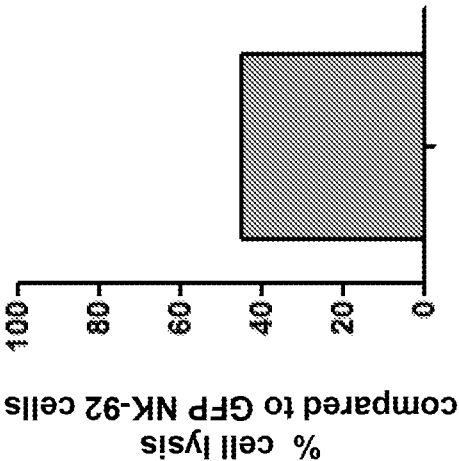
FIGURE 57E











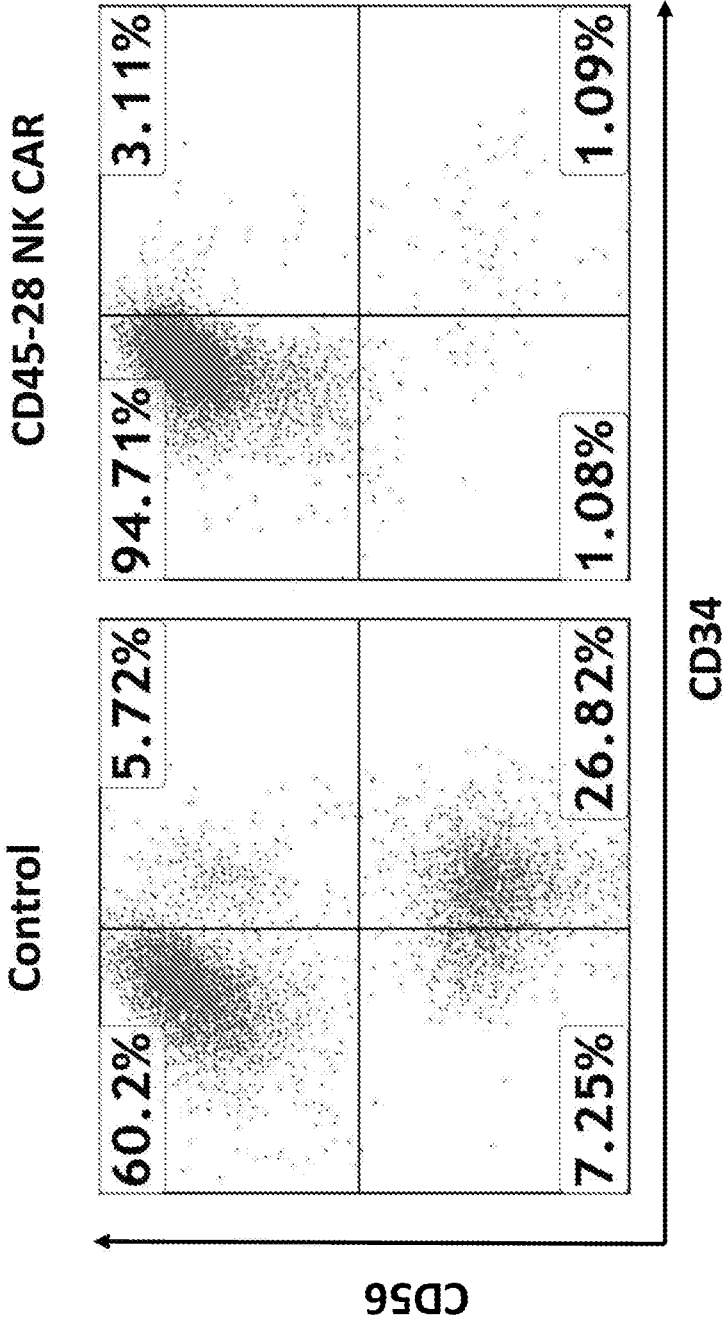


FIGURE 57J

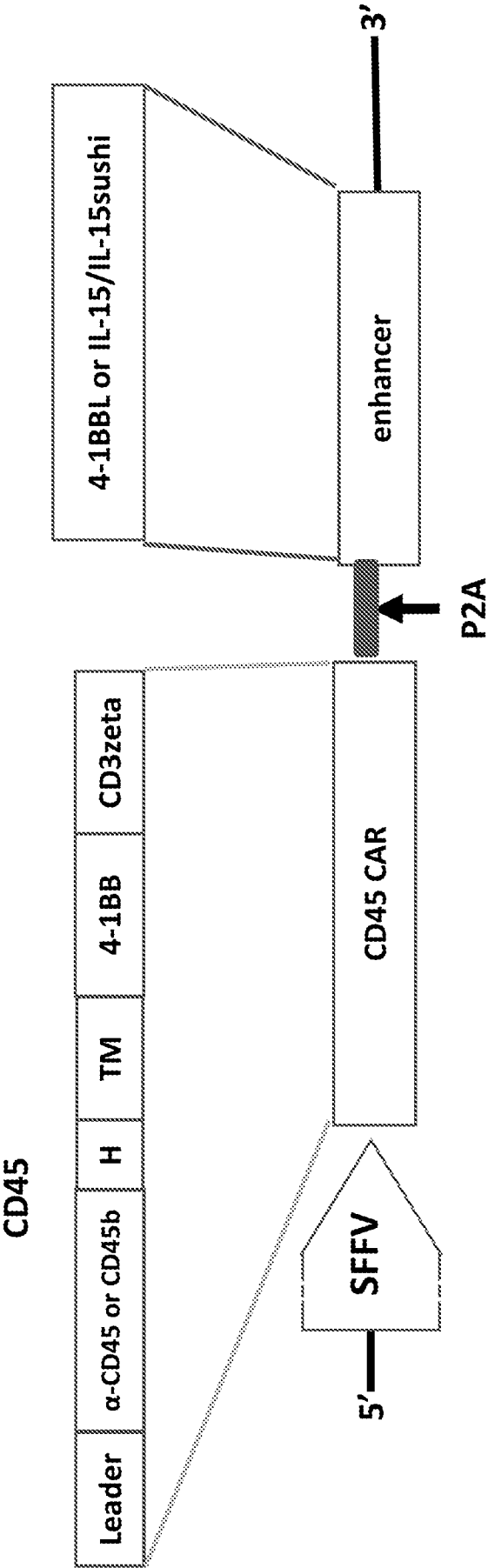


FIGURE 58A

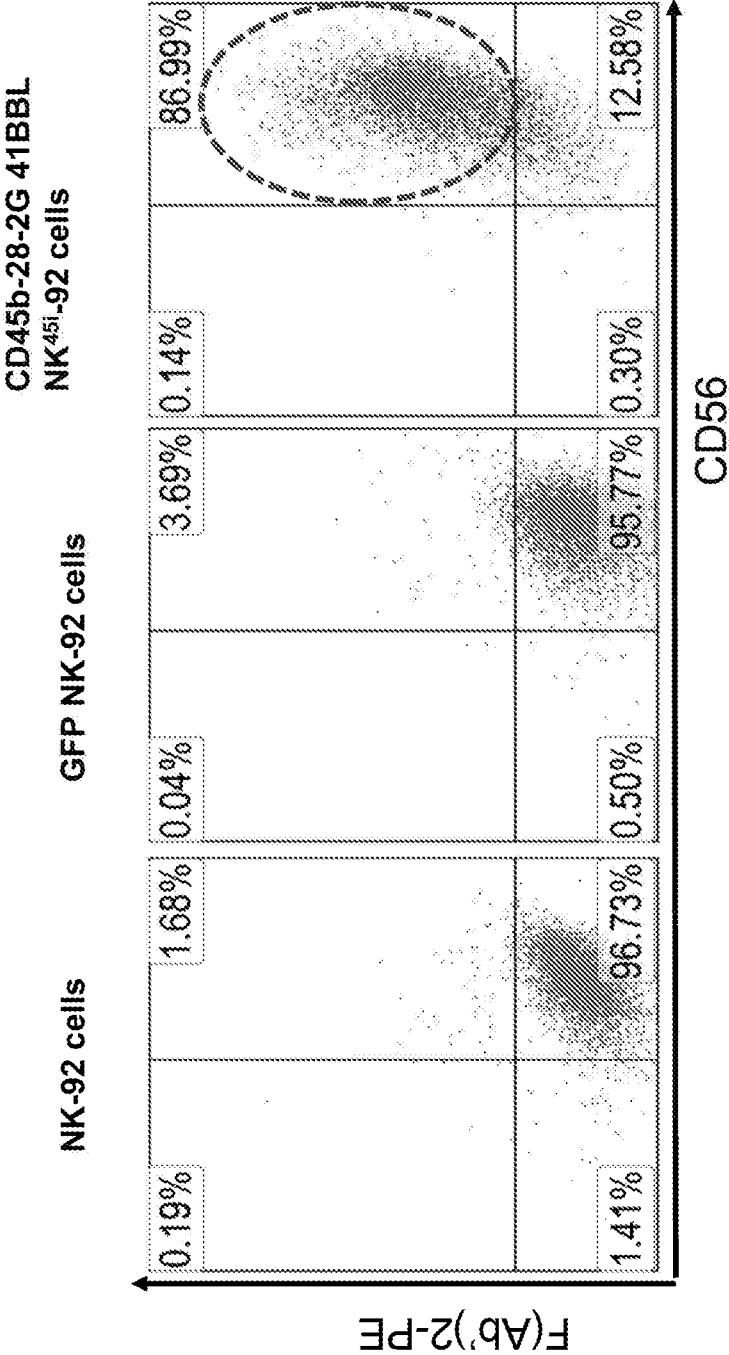


FIGURE 58B

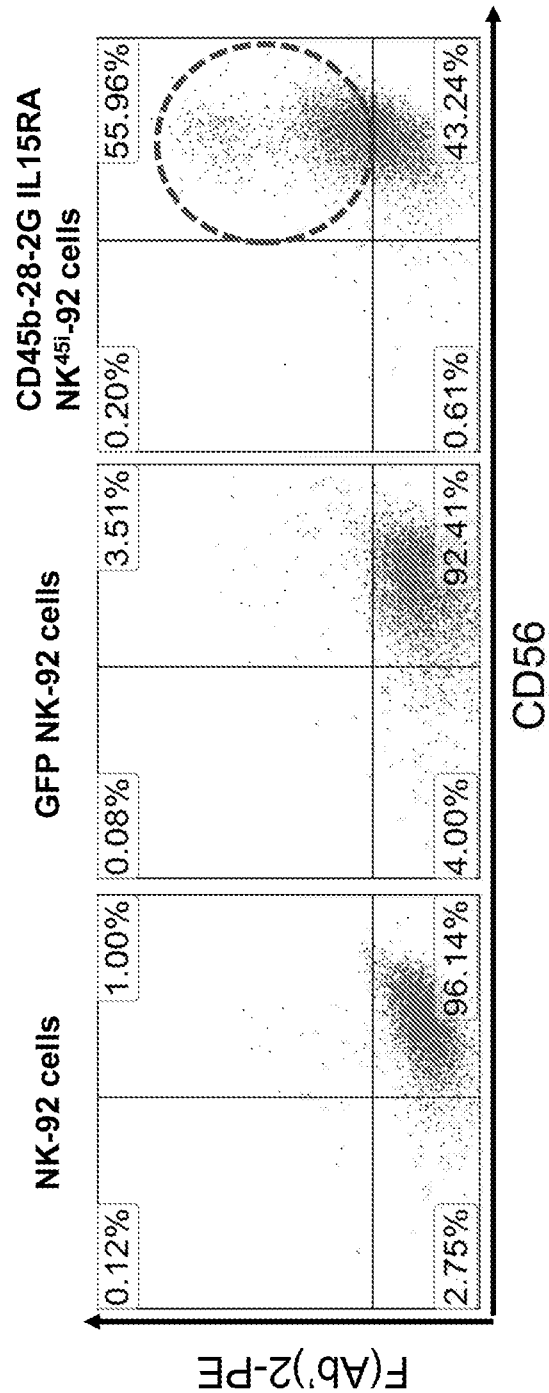


FIGURE 58C

FIGURE 59A

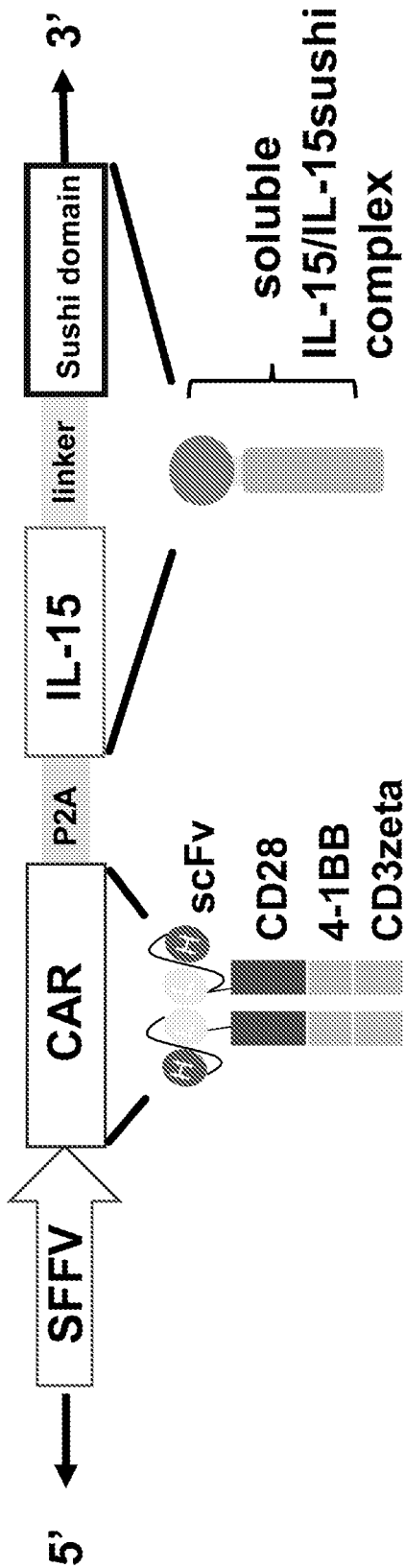


FIGURE 59B

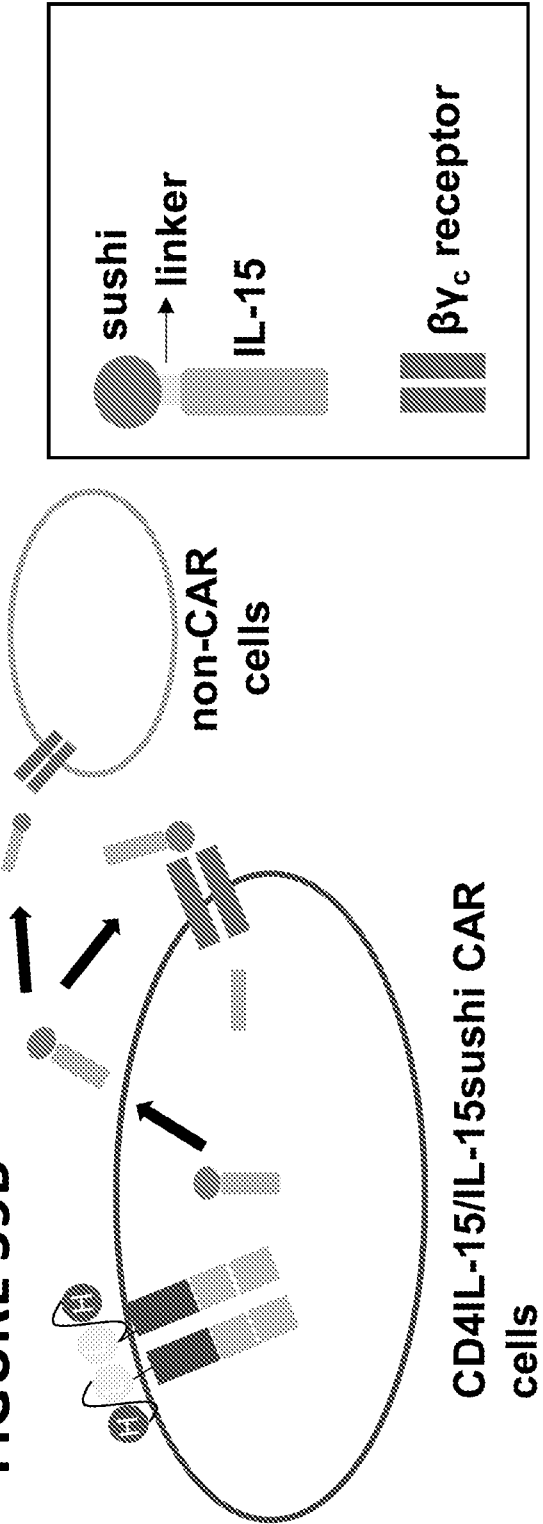
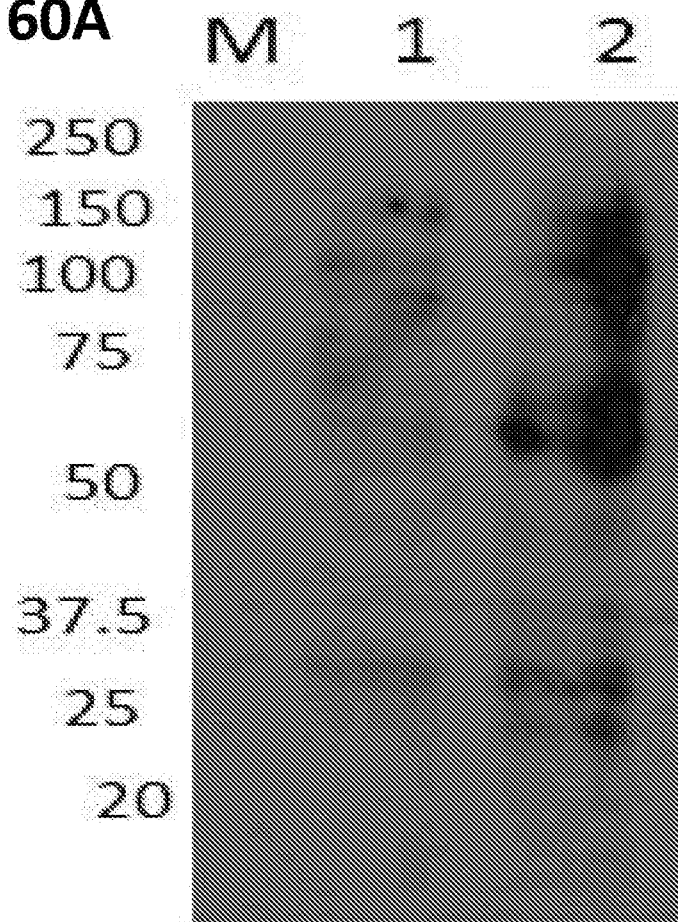
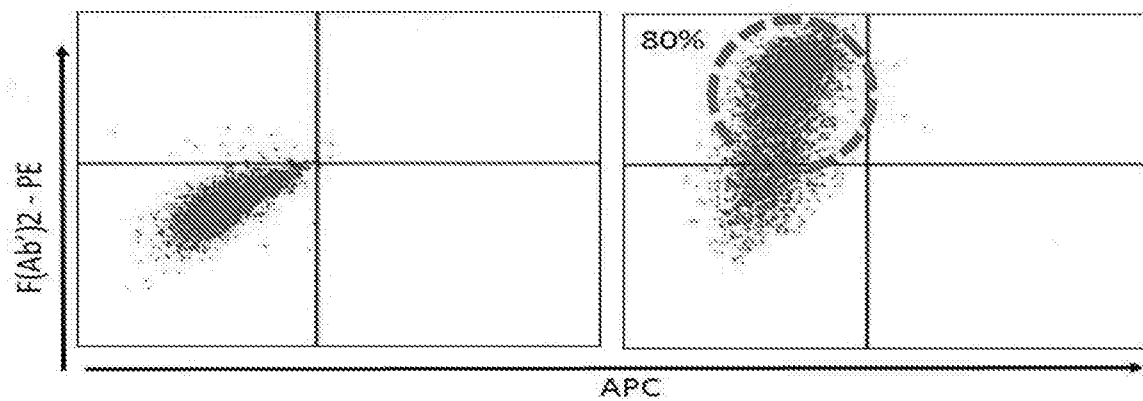


FIGURE 60A**FIGURE 60B**

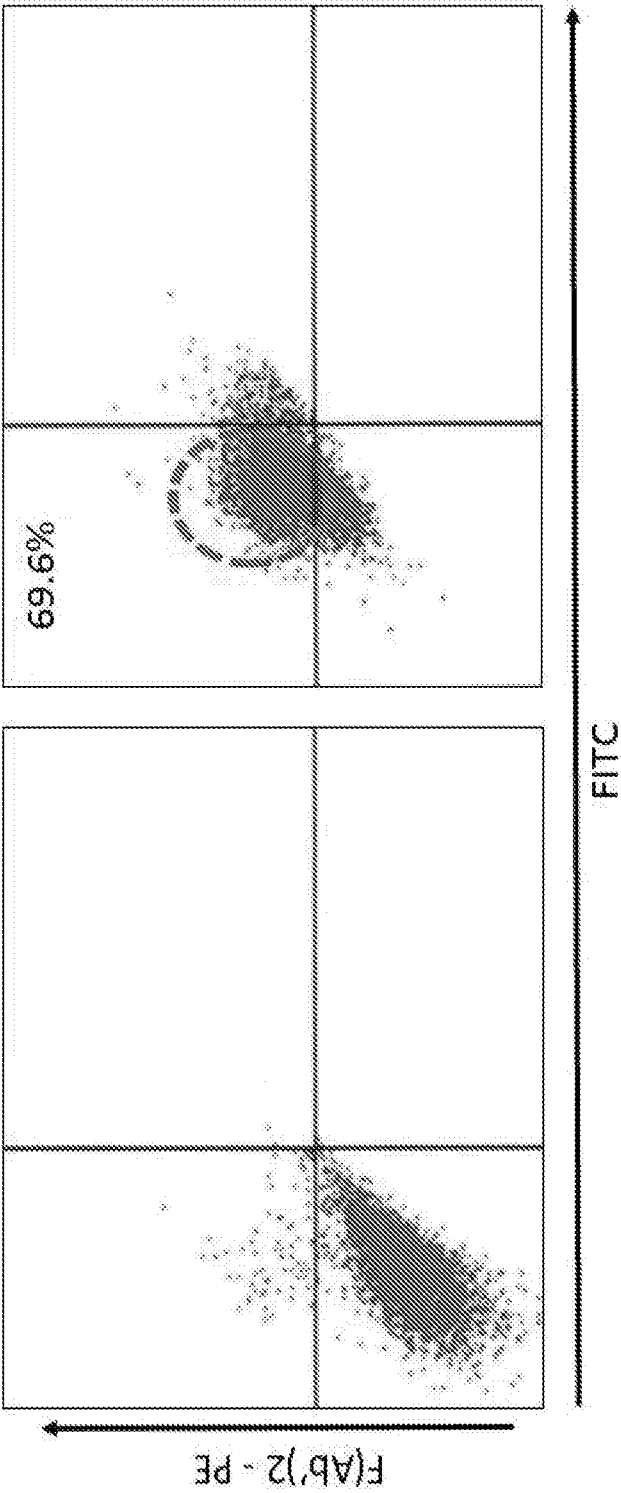
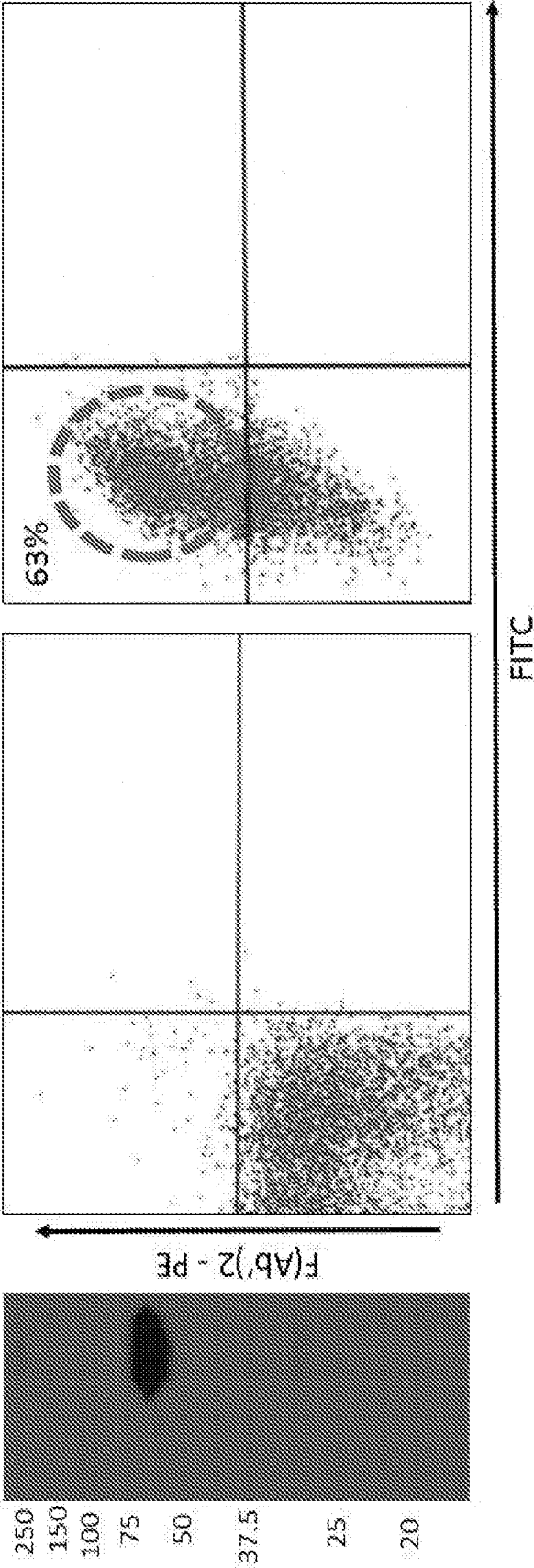
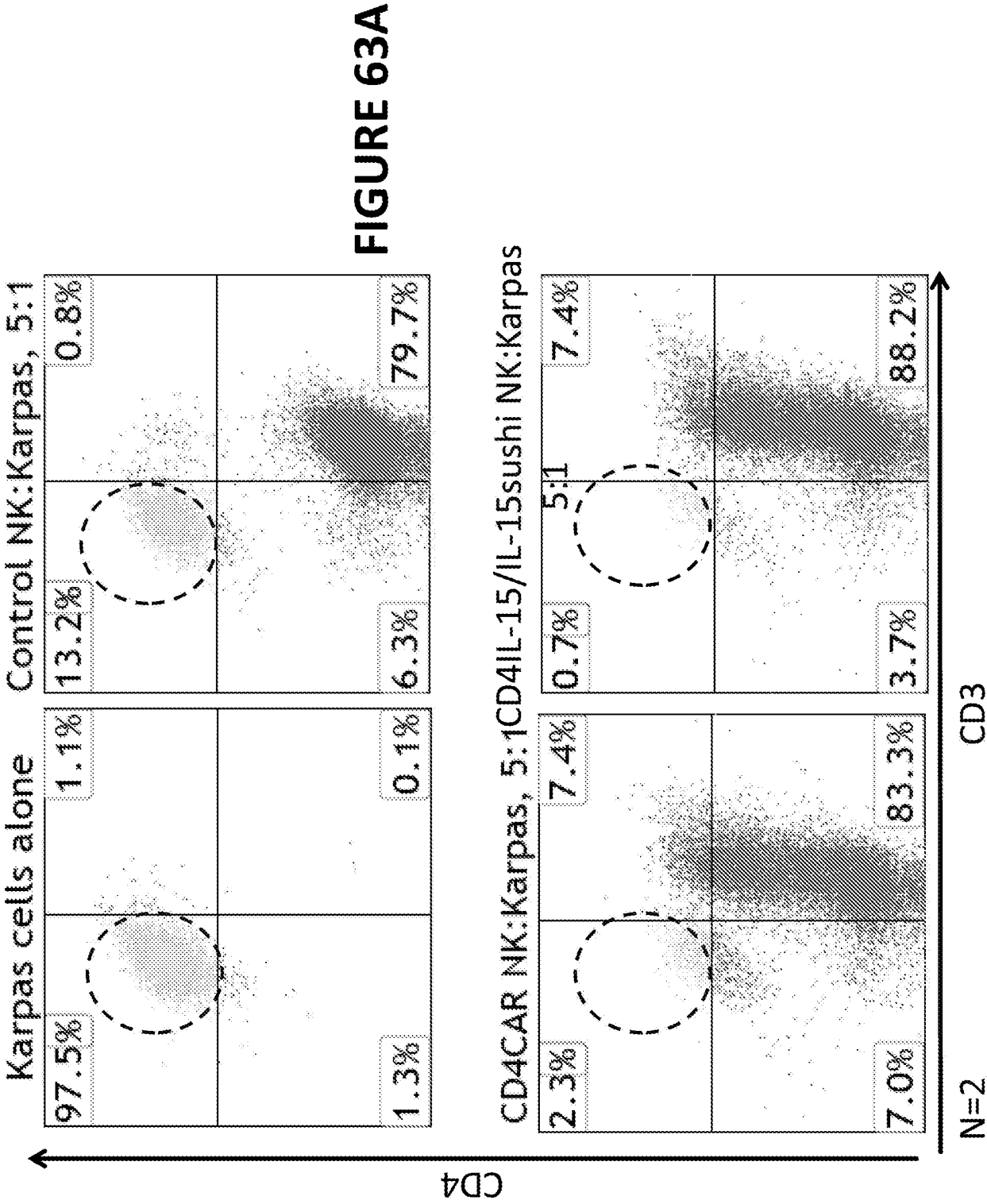


FIGURE 61

FIGURE 62





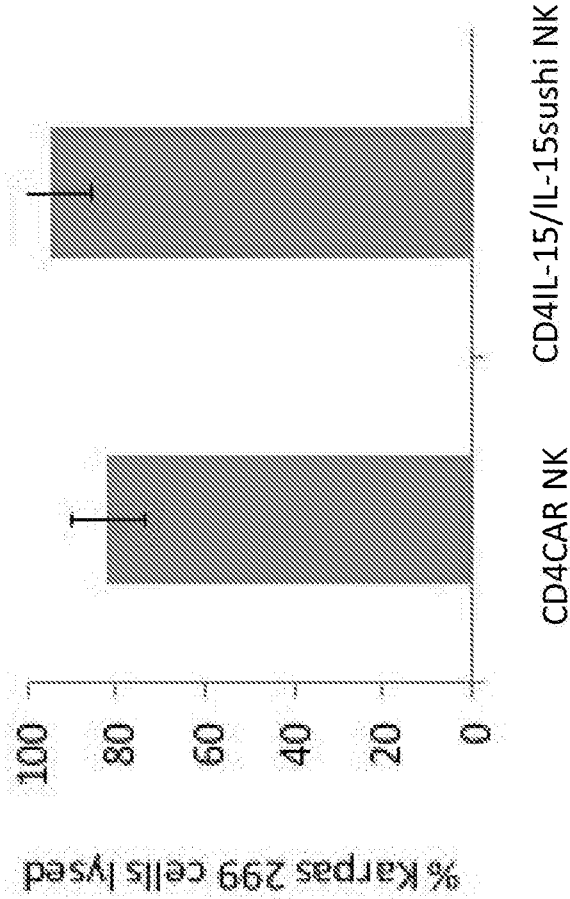


FIGURE 63B

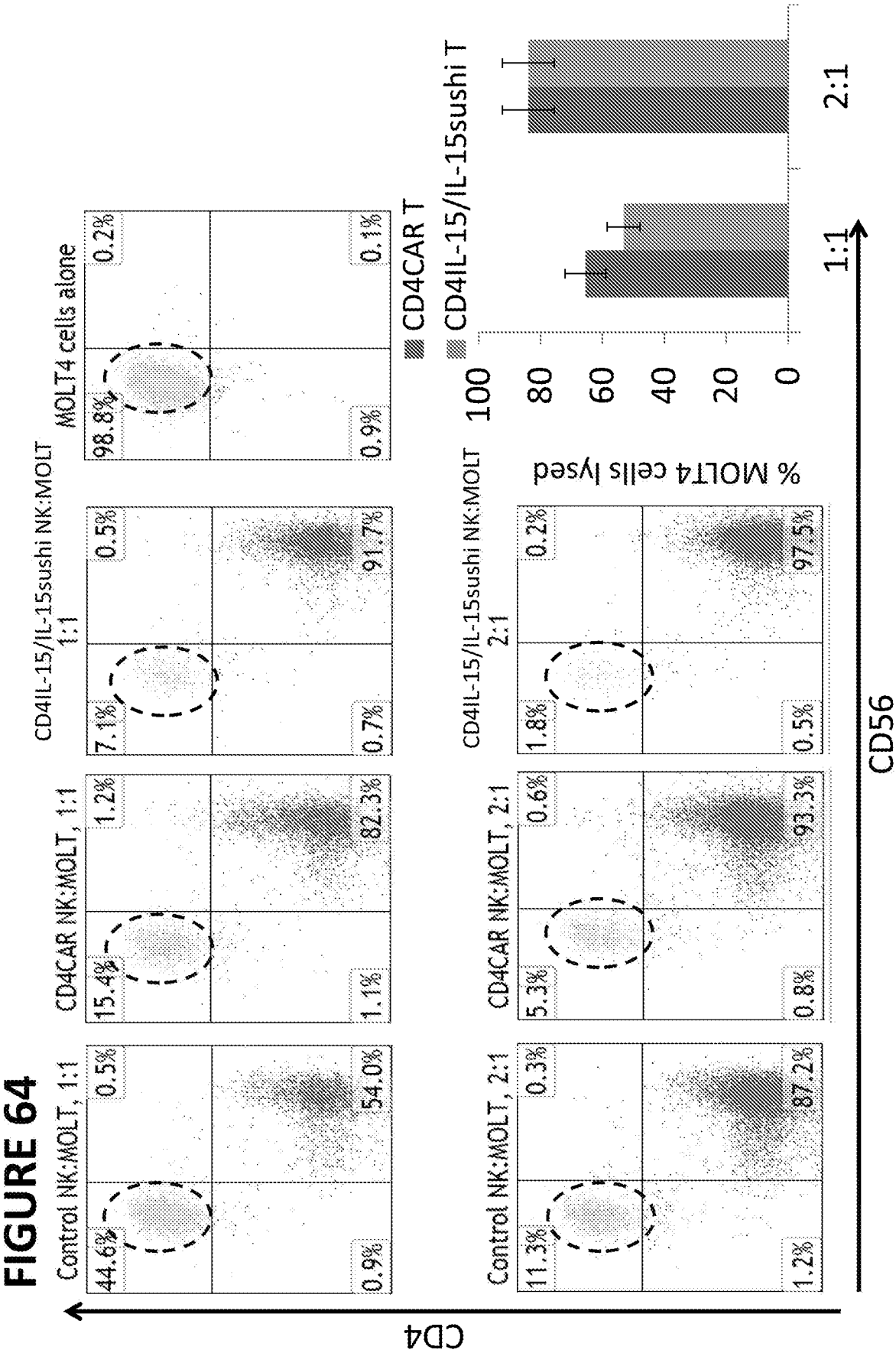
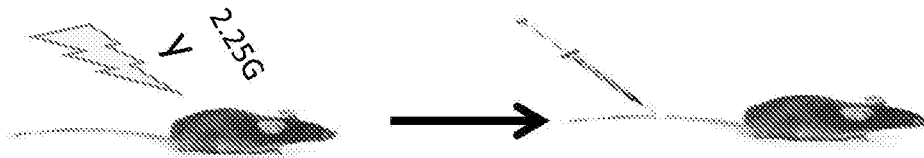
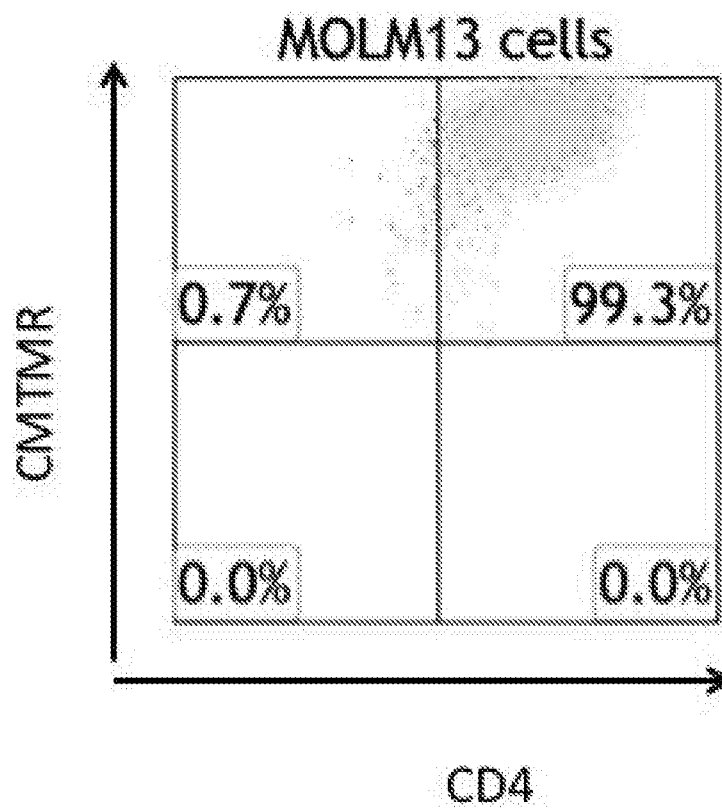
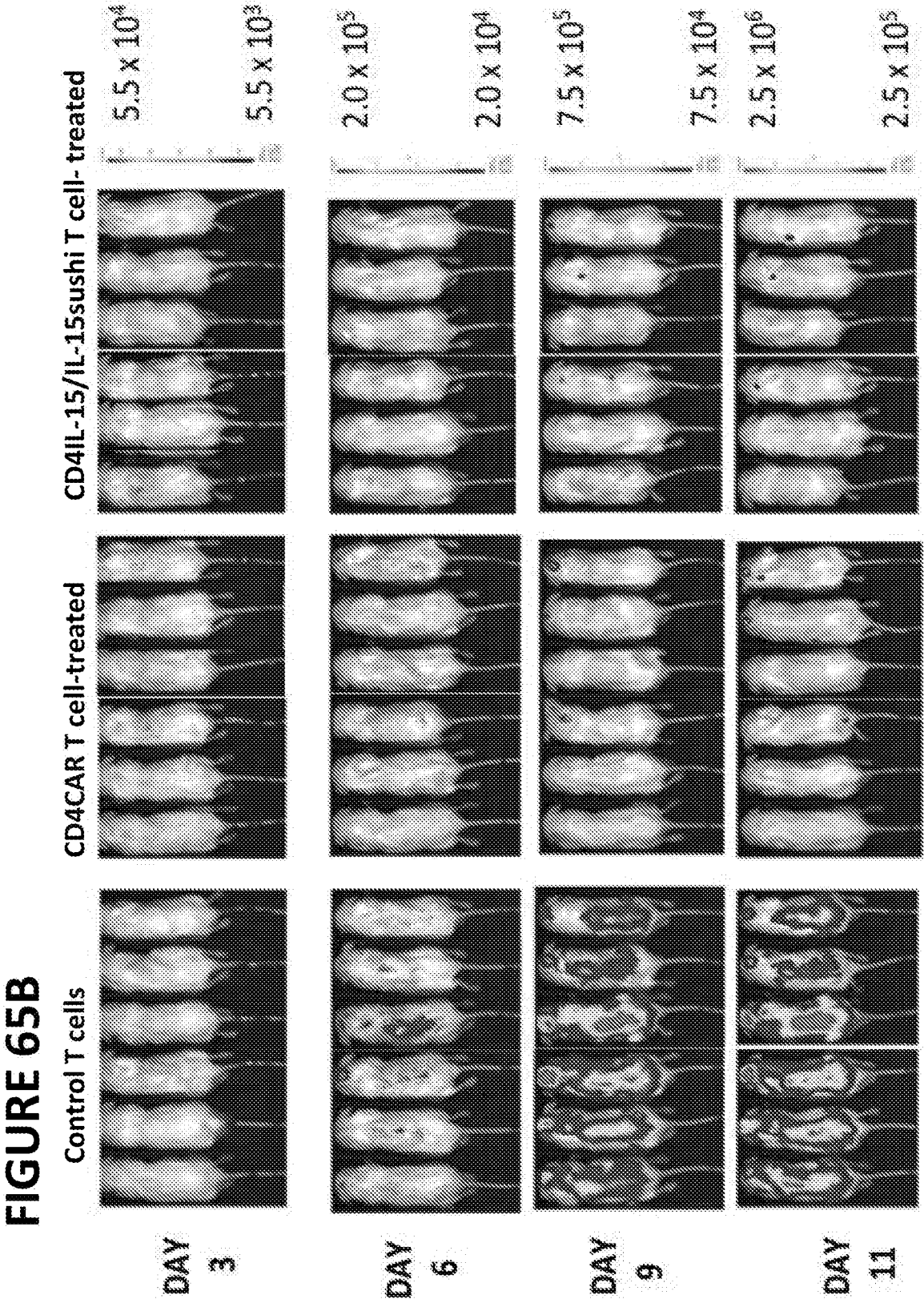
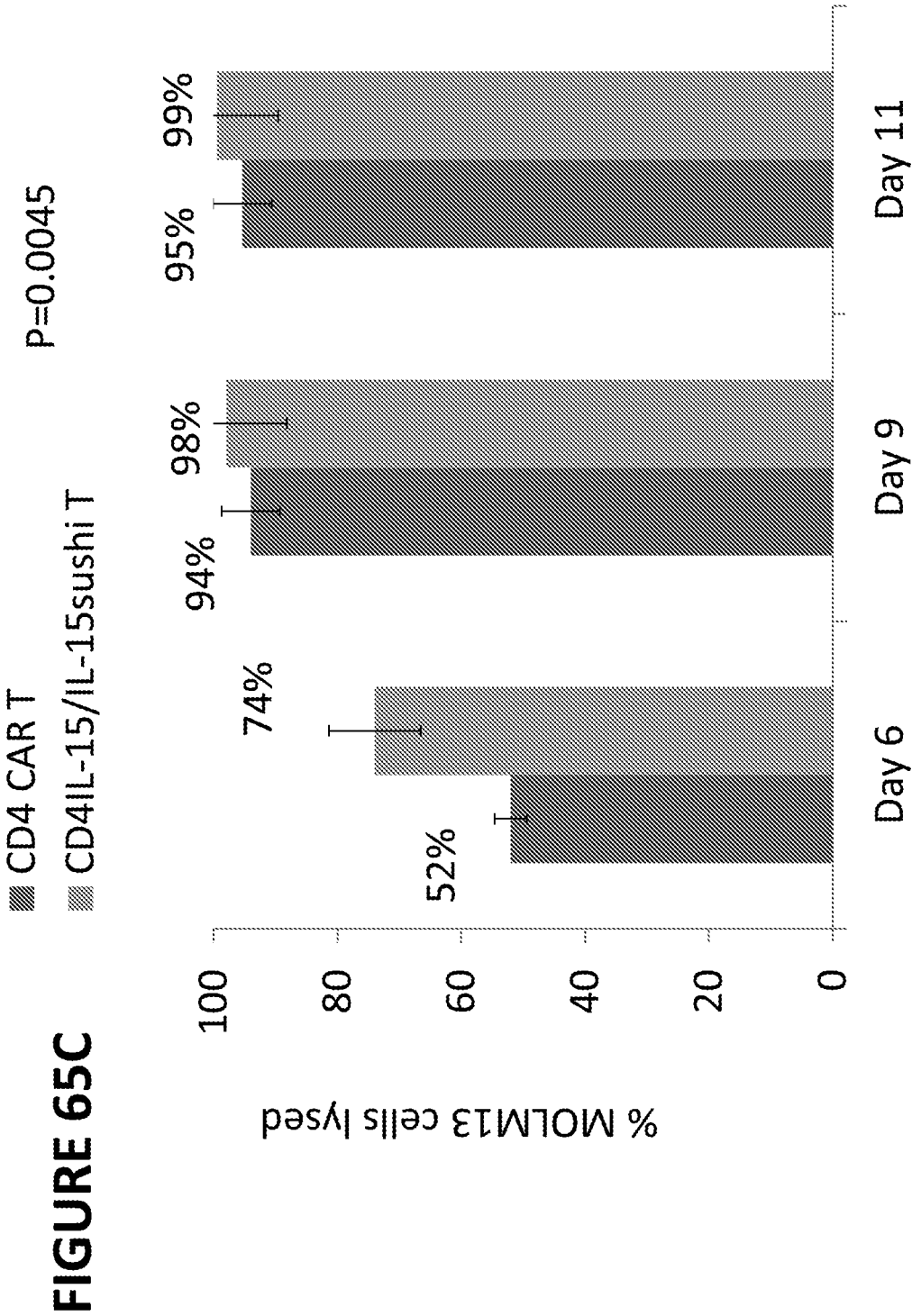


FIGURE 65A

CD4 expression in AML (MOLM13) cells







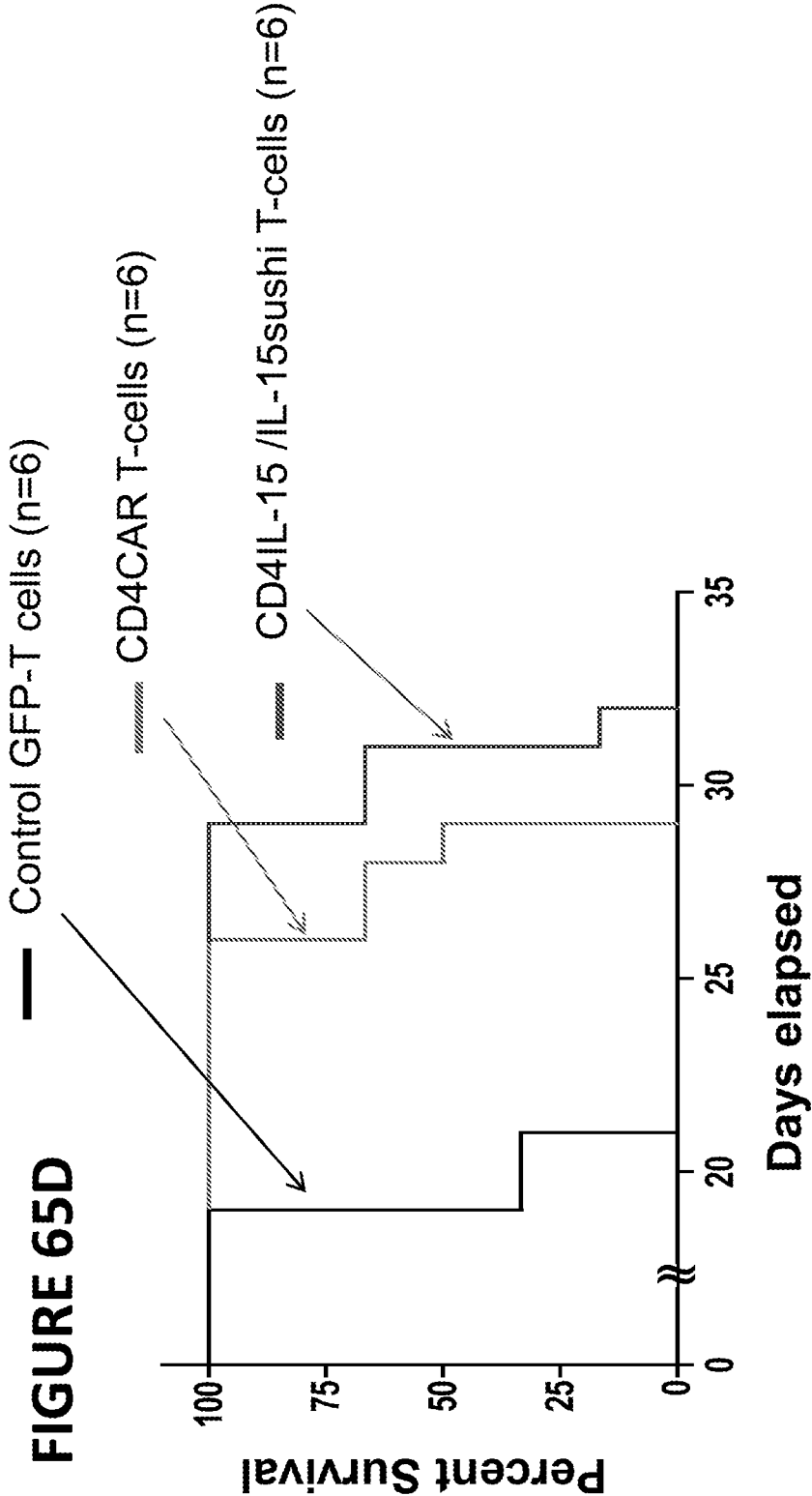


FIGURE 66A



CD4 expression in MOLM13 and Jurkat cell lines

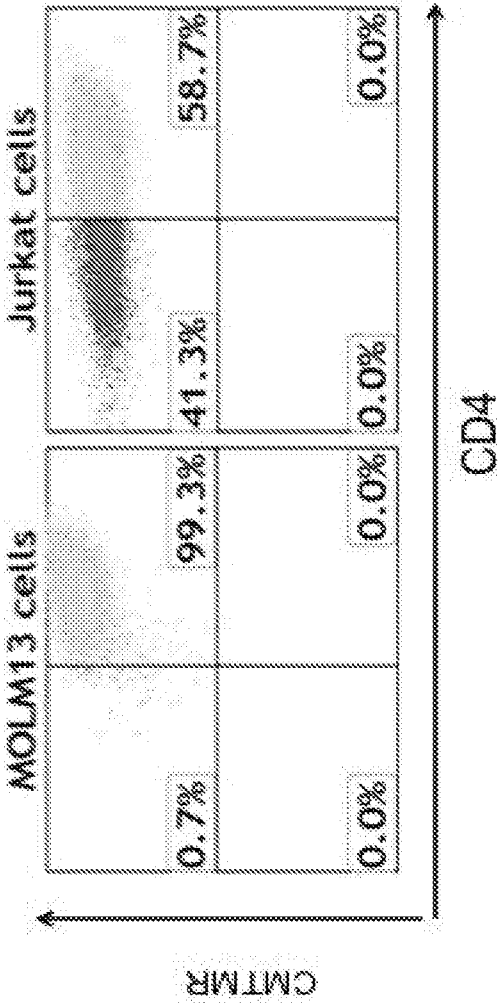
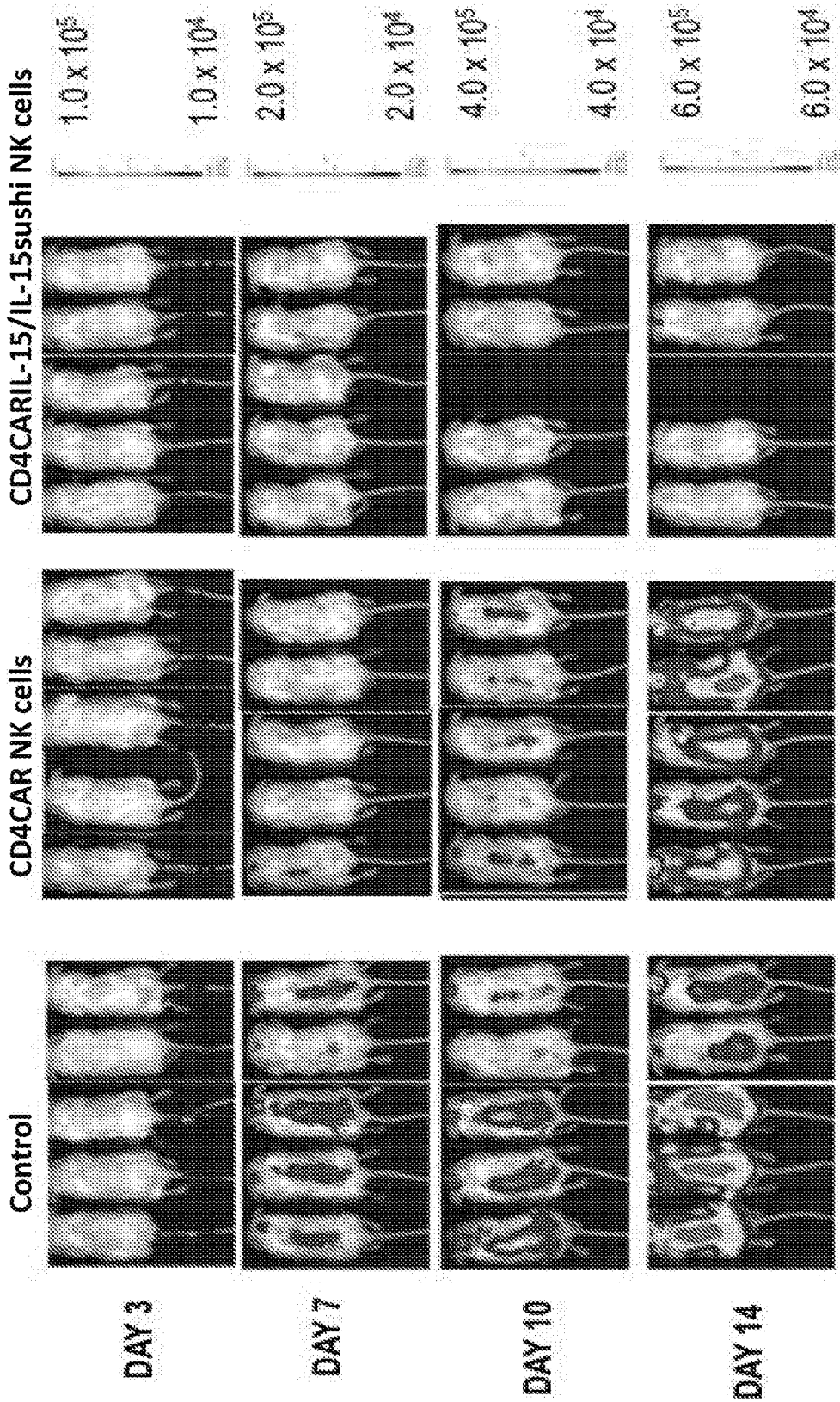


FIGURE 66B



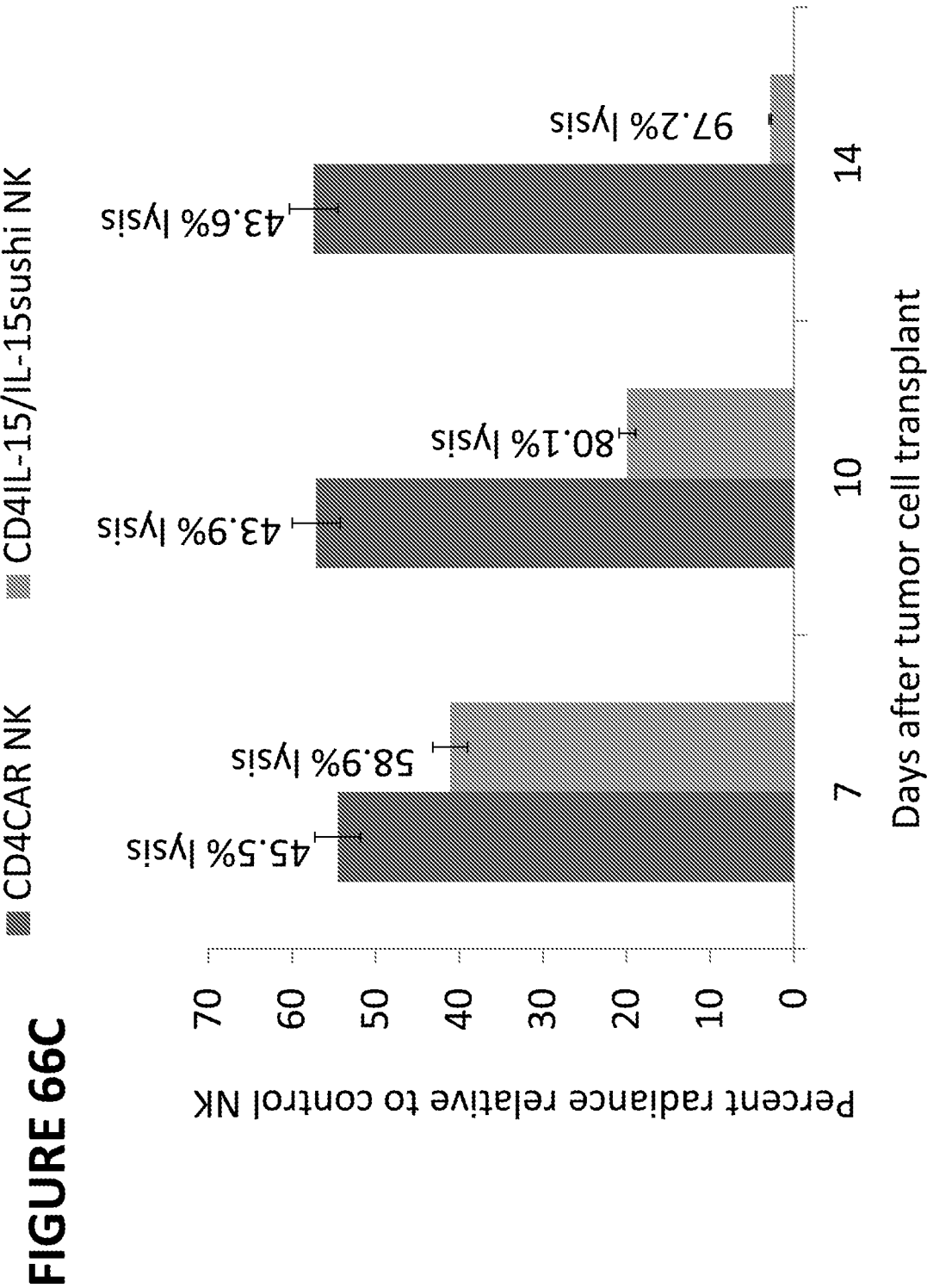


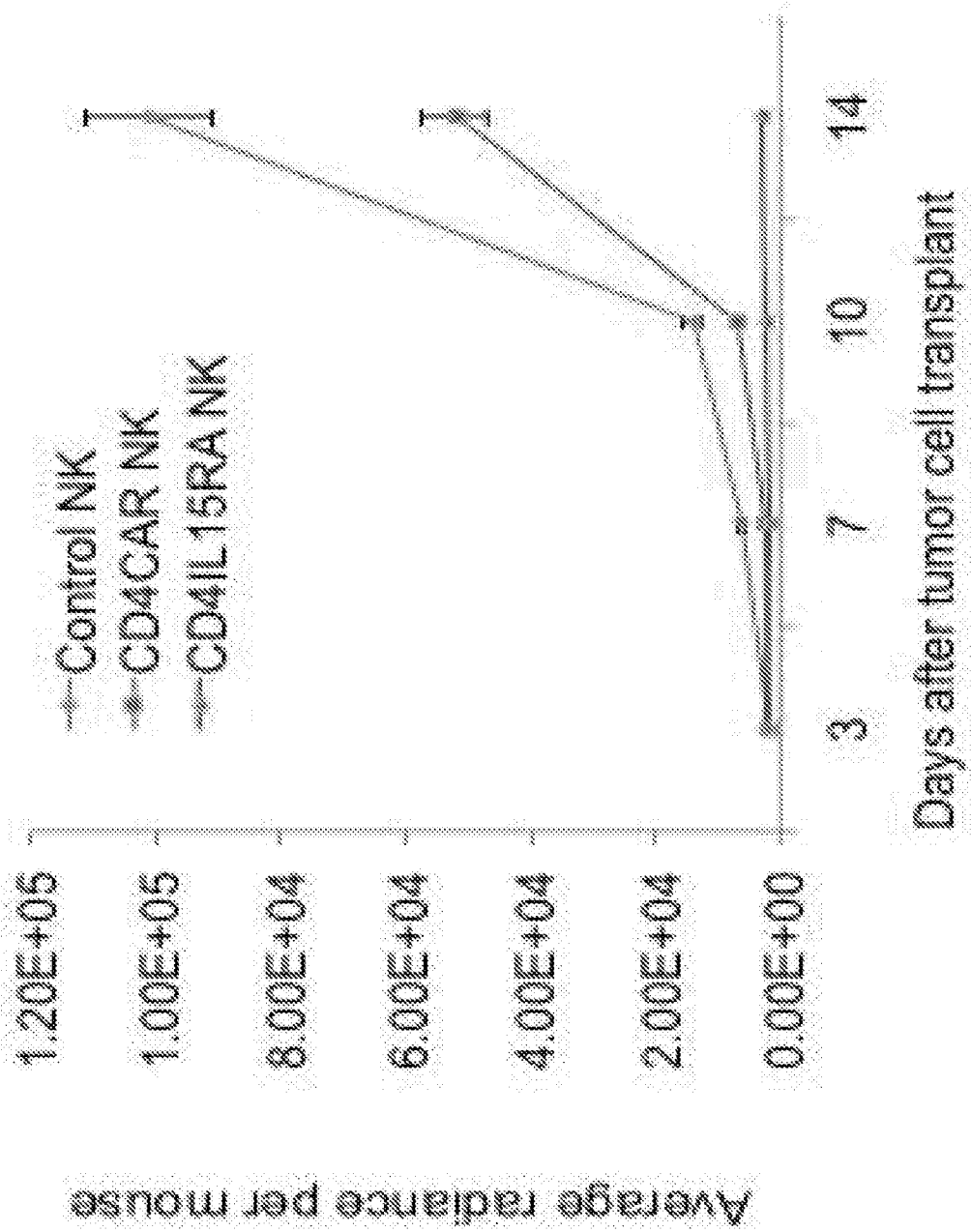
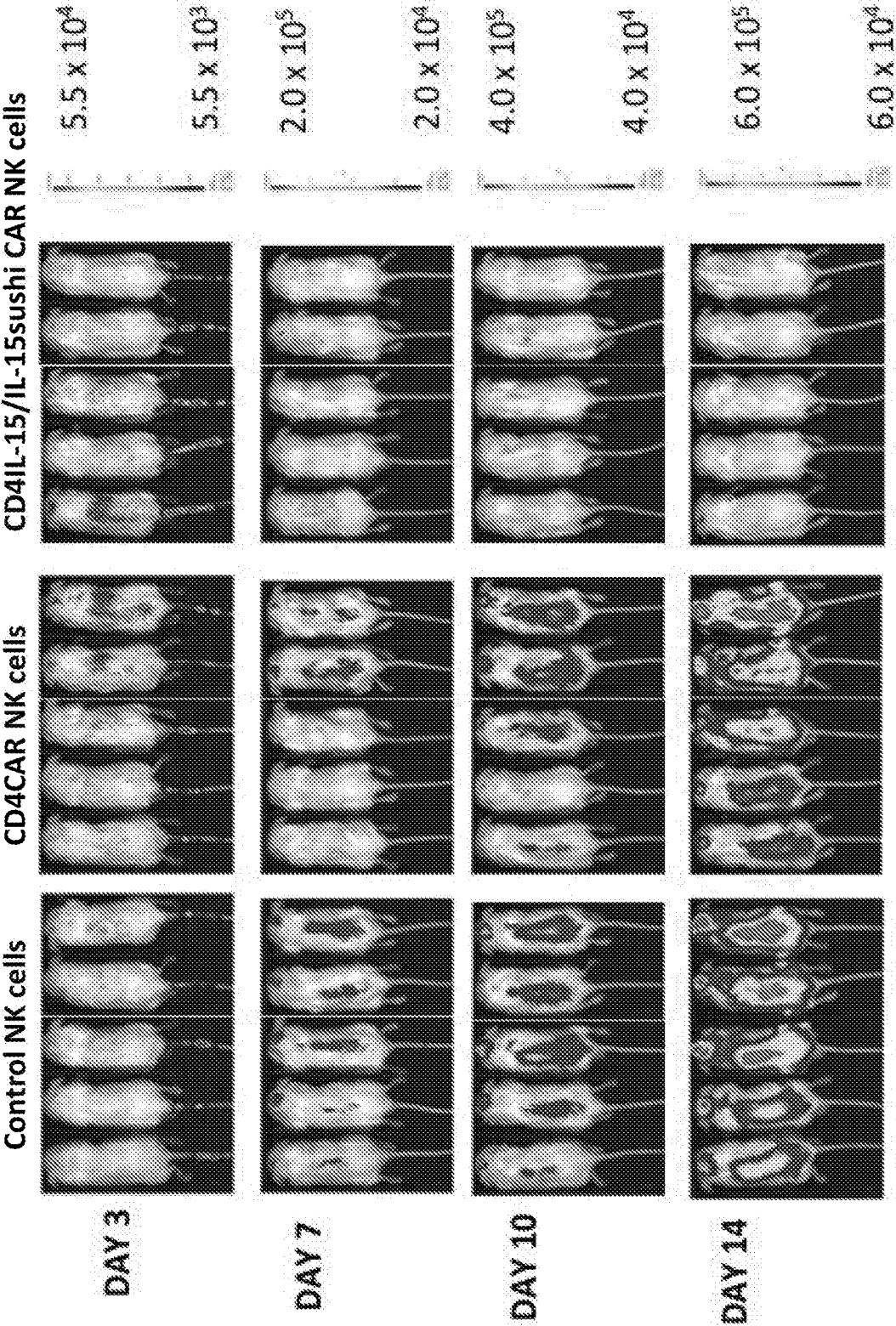
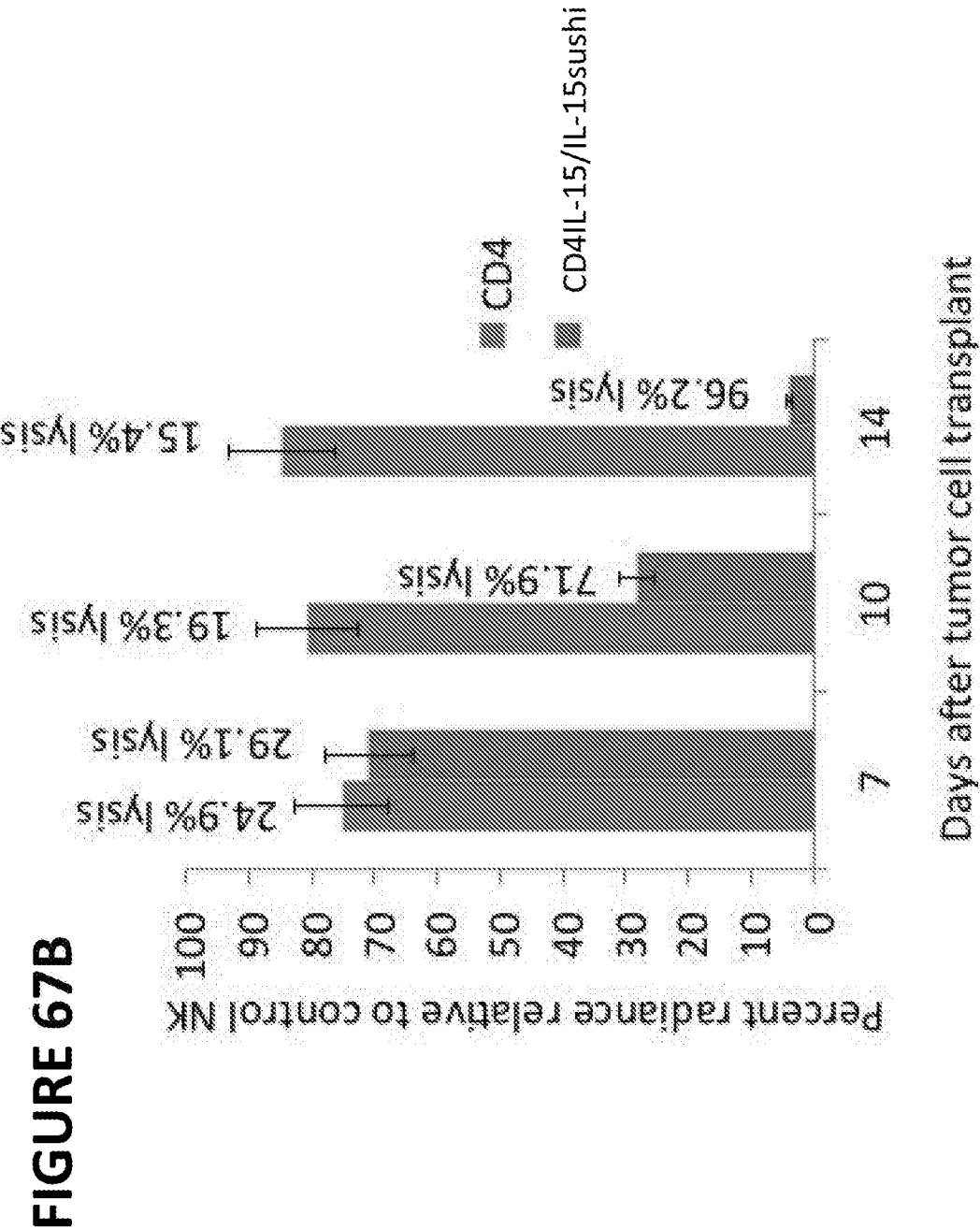
FIGURE 66D

FIGURE 67A





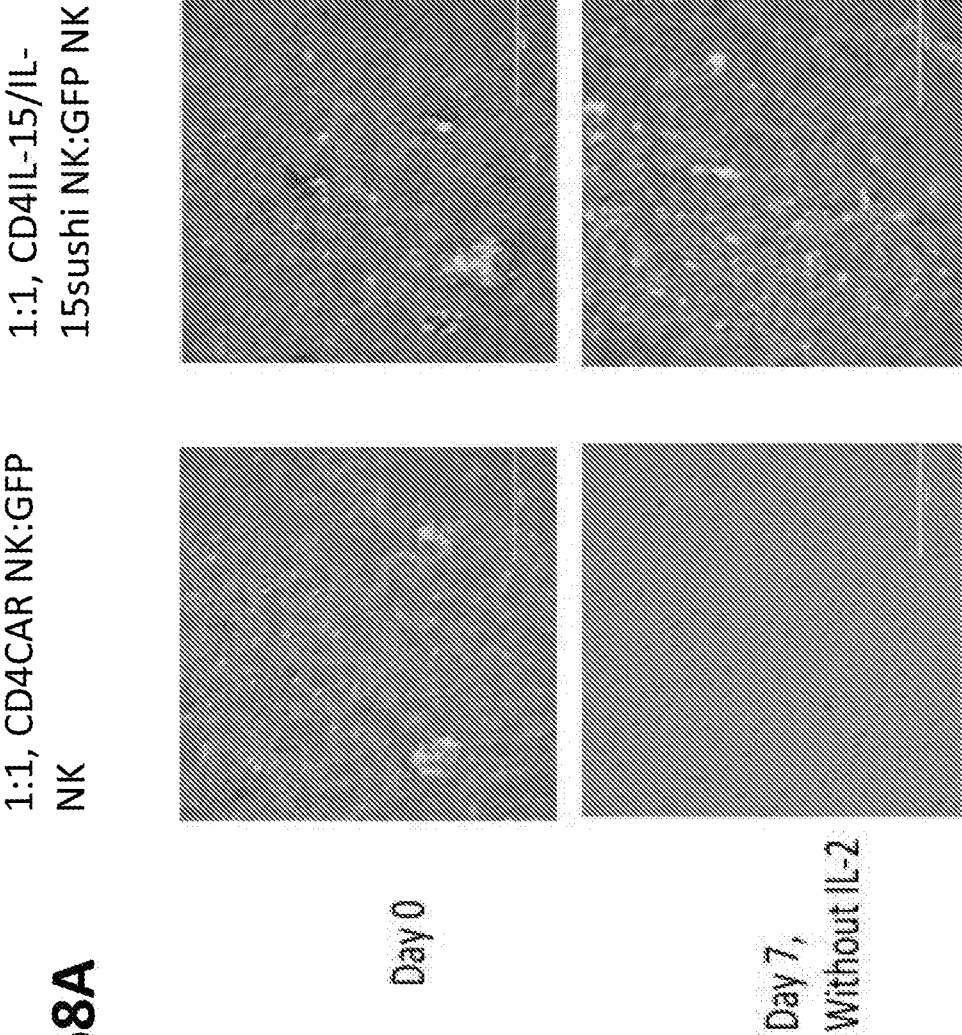
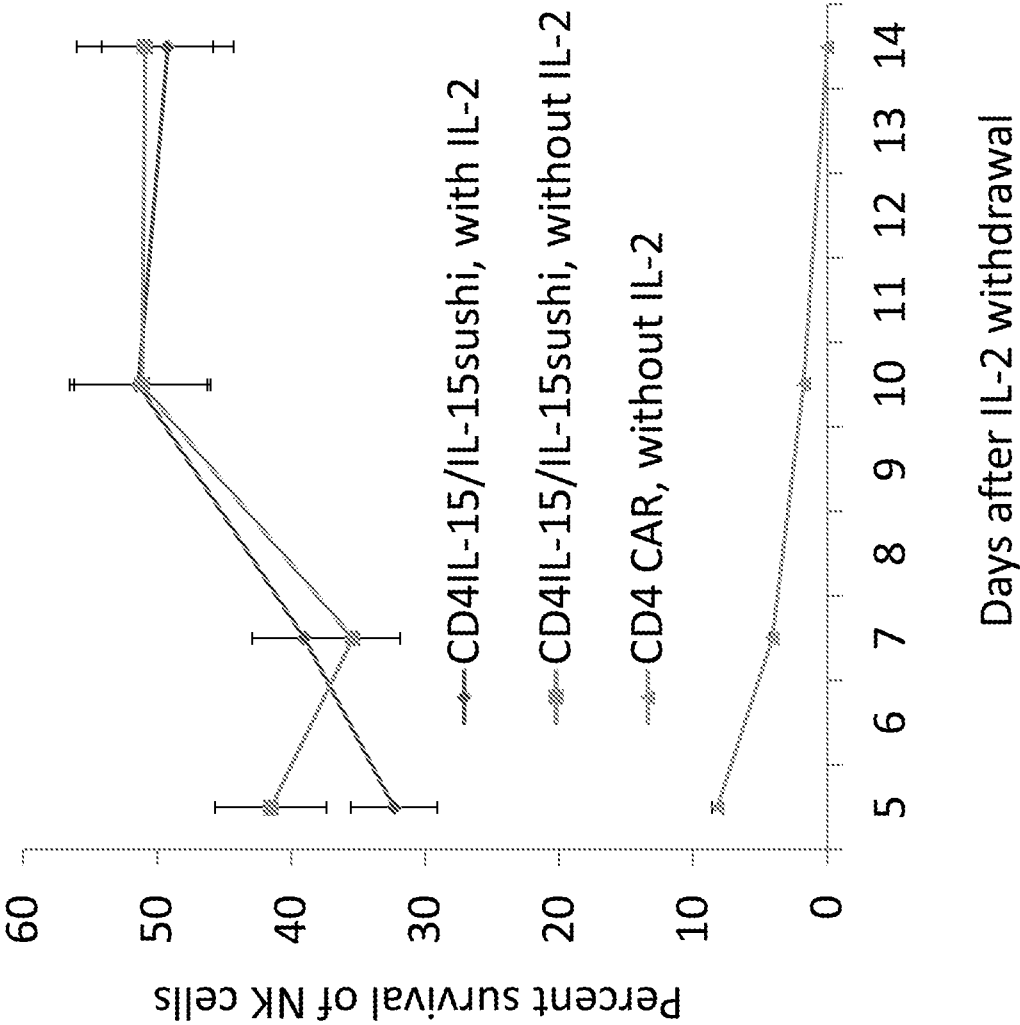


FIGURE 68A

FIGURE 68B



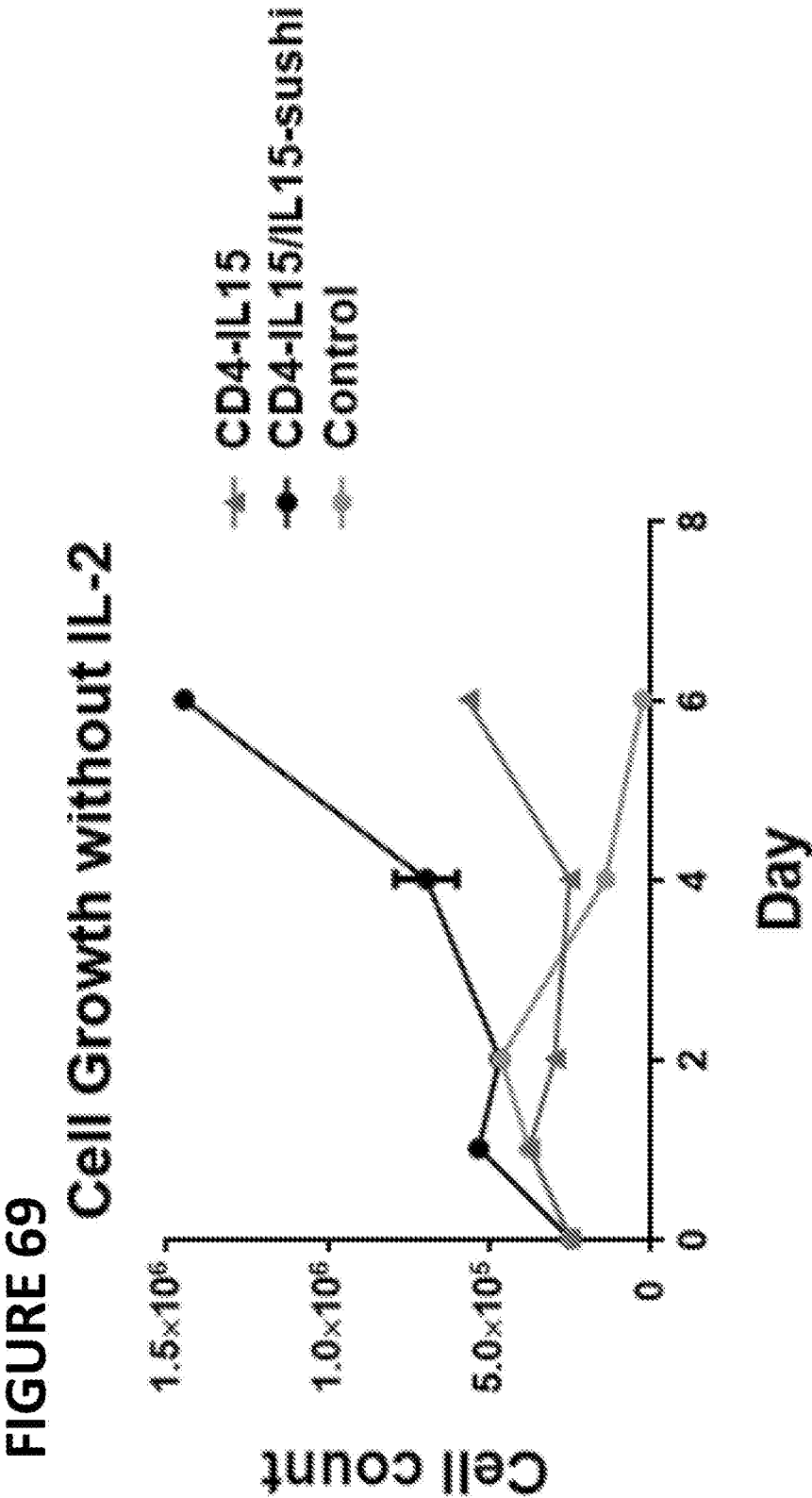


FIGURE 70

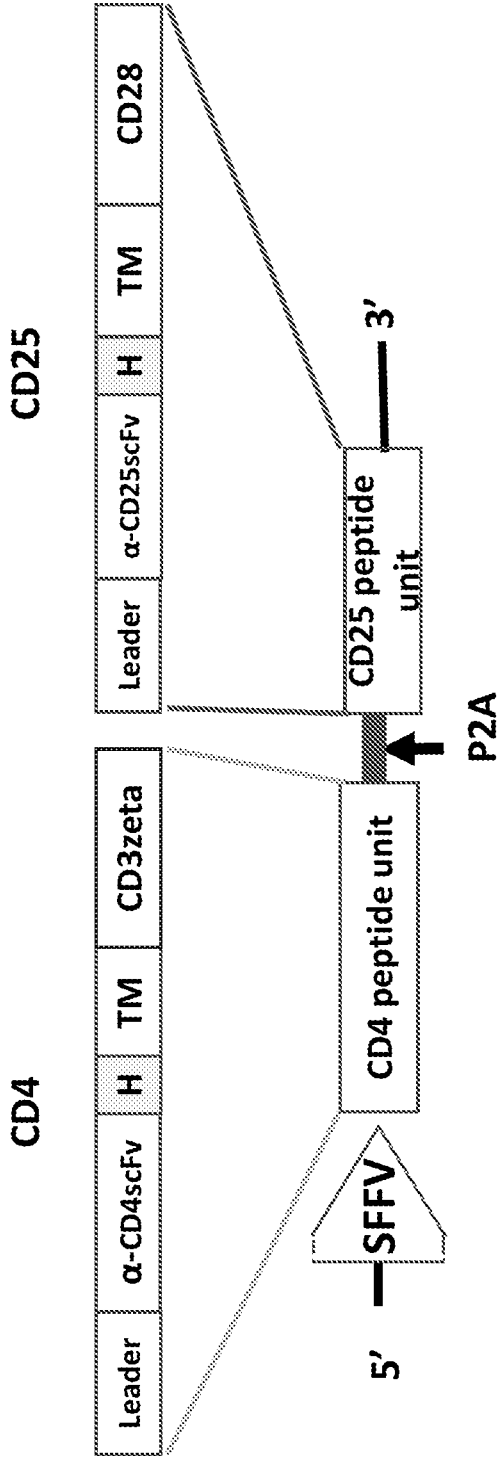


FIGURE 71A

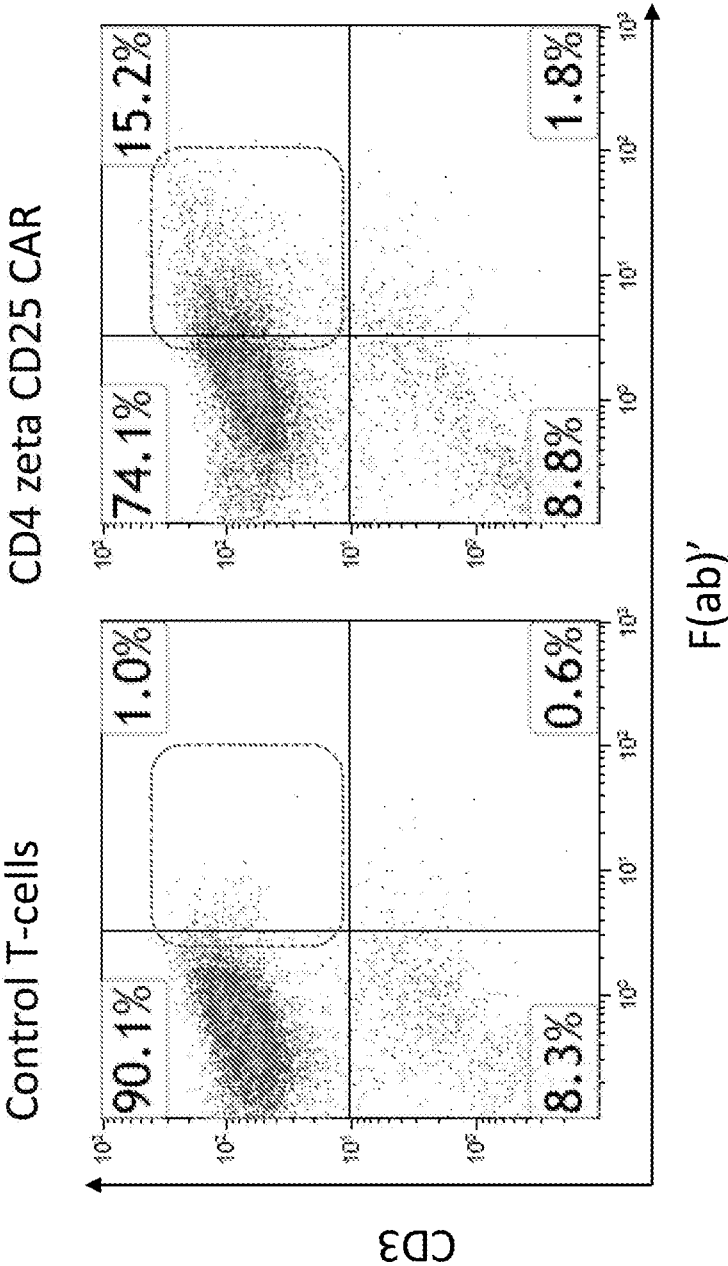
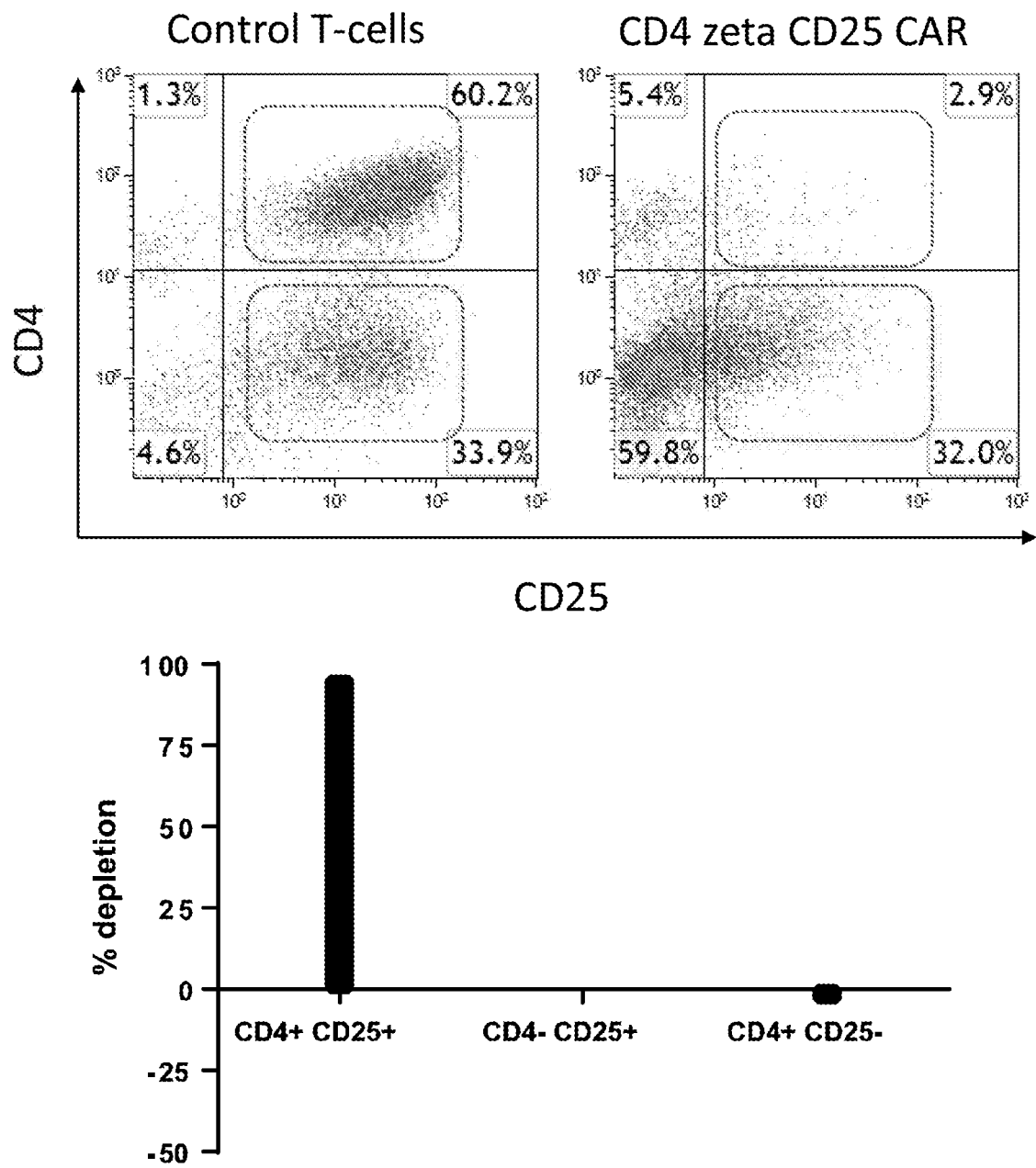


FIGURE 71B



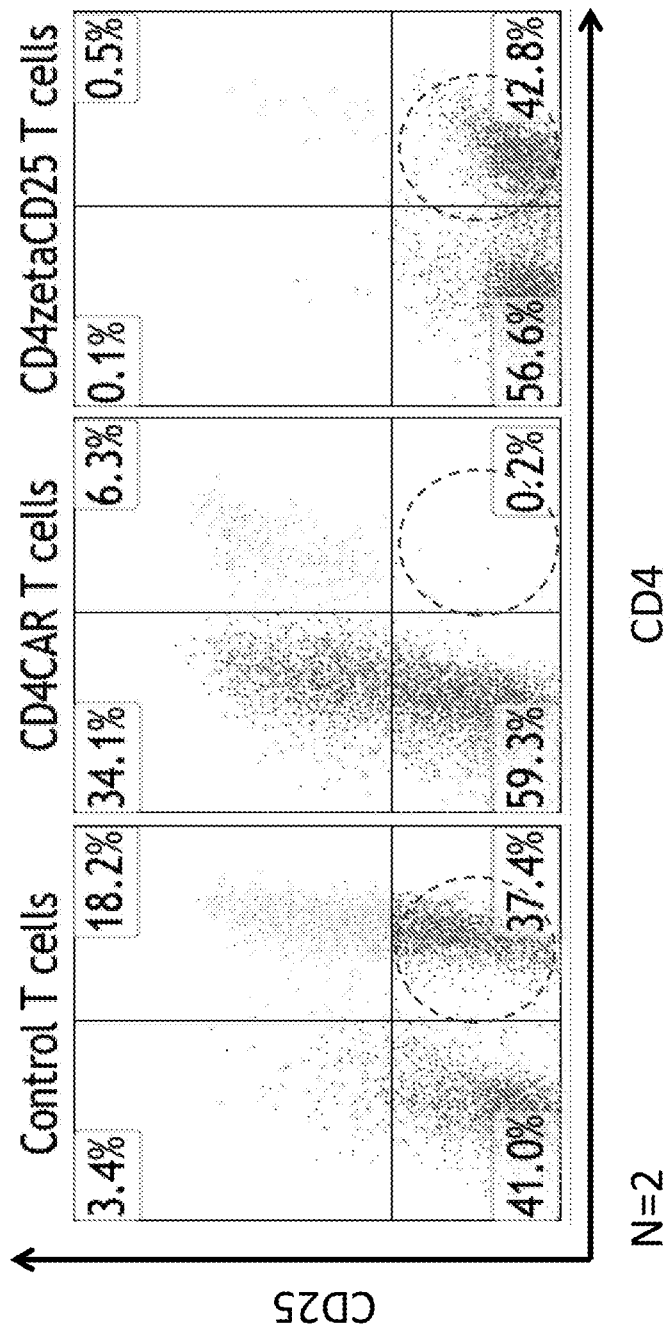


FIGURE 72

CD52

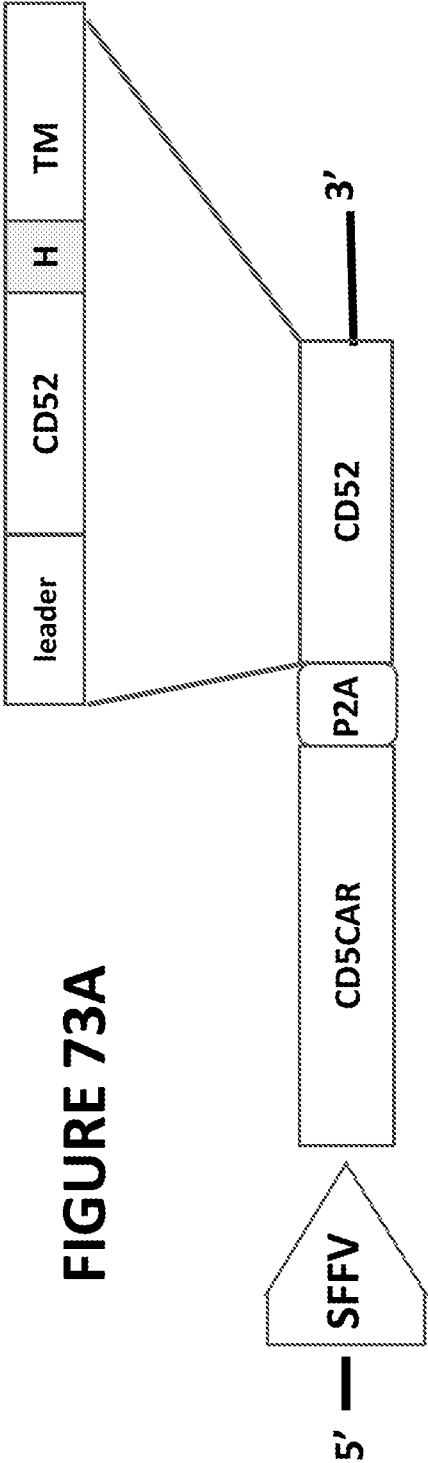
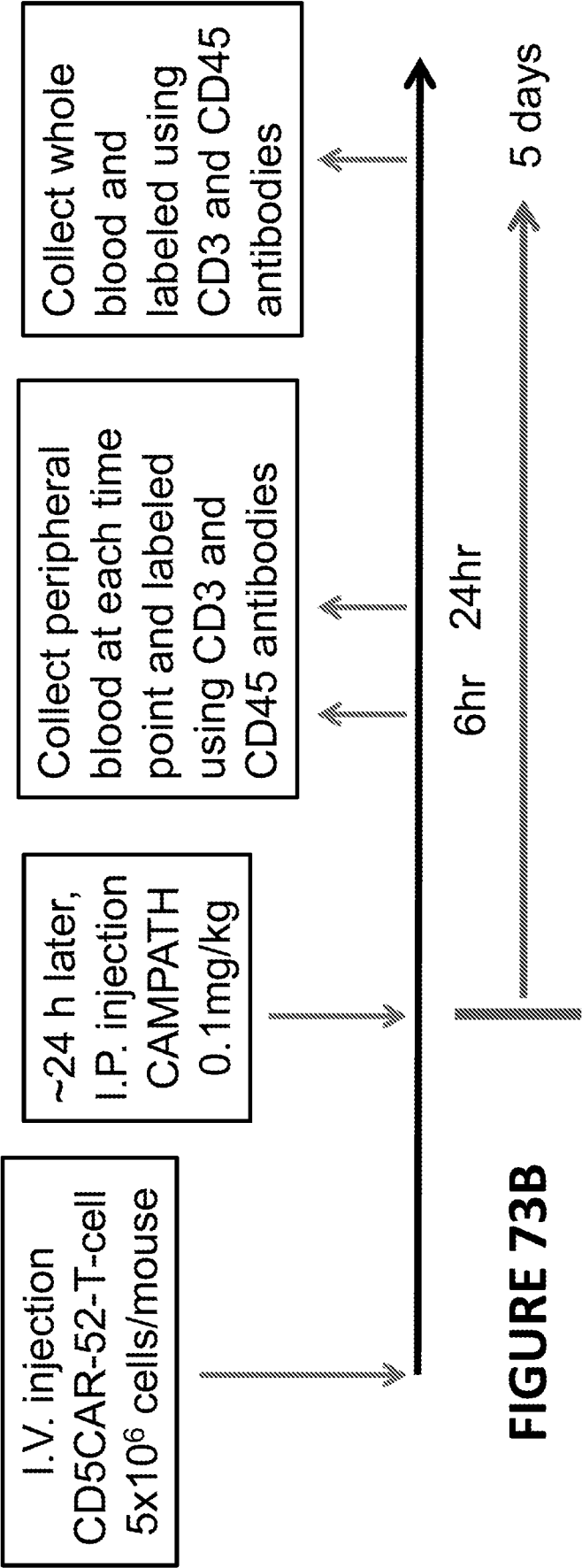


FIGURE 73A



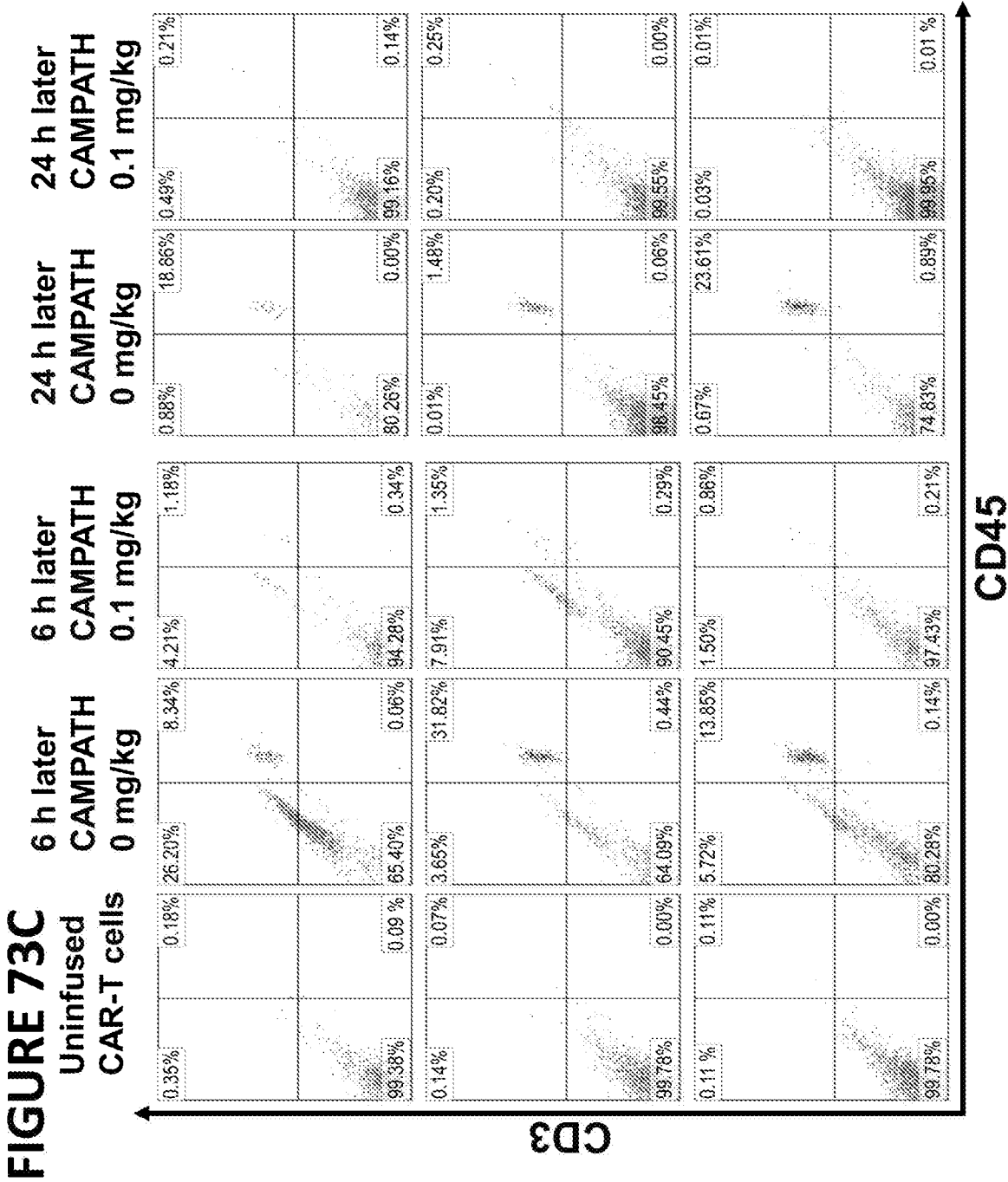


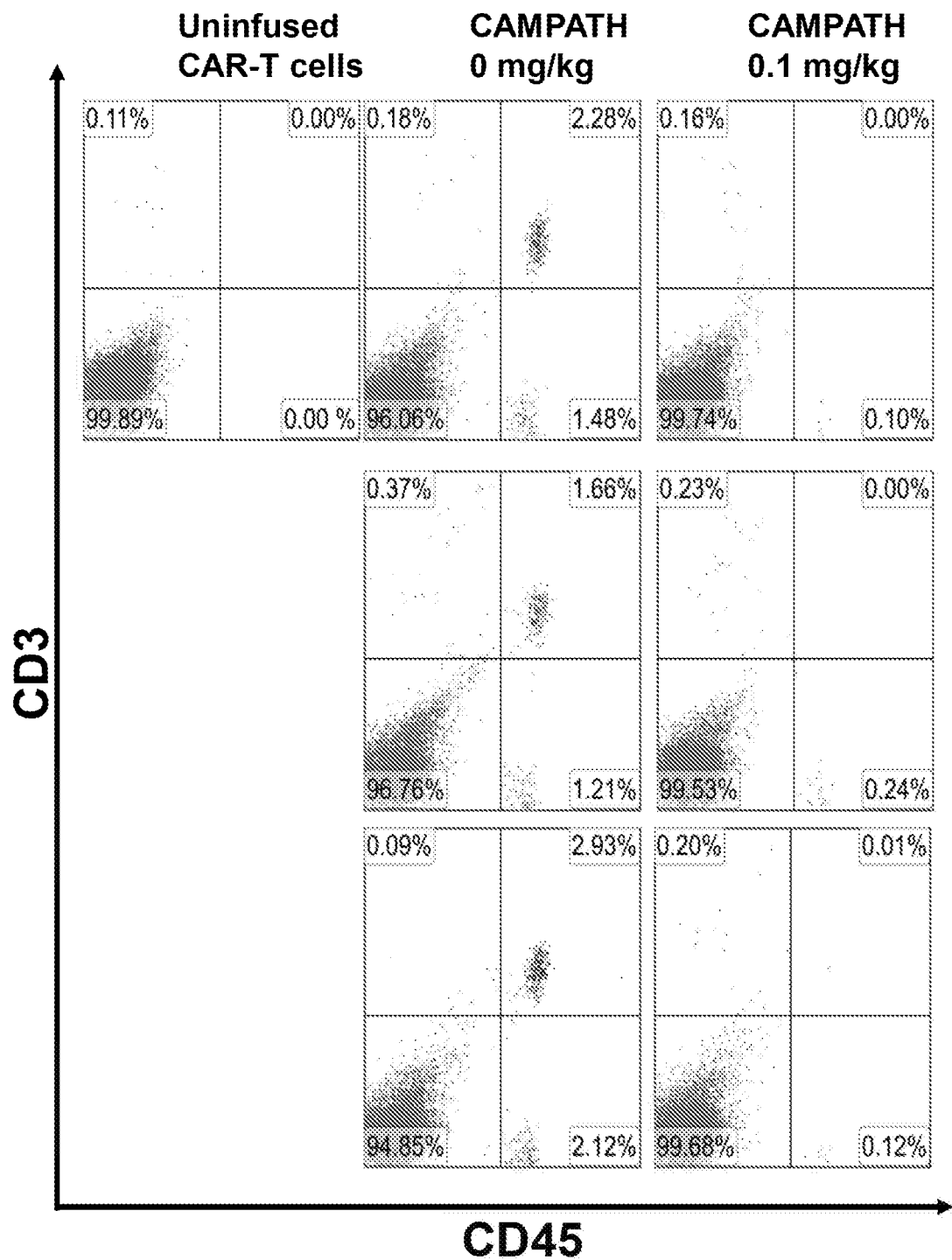
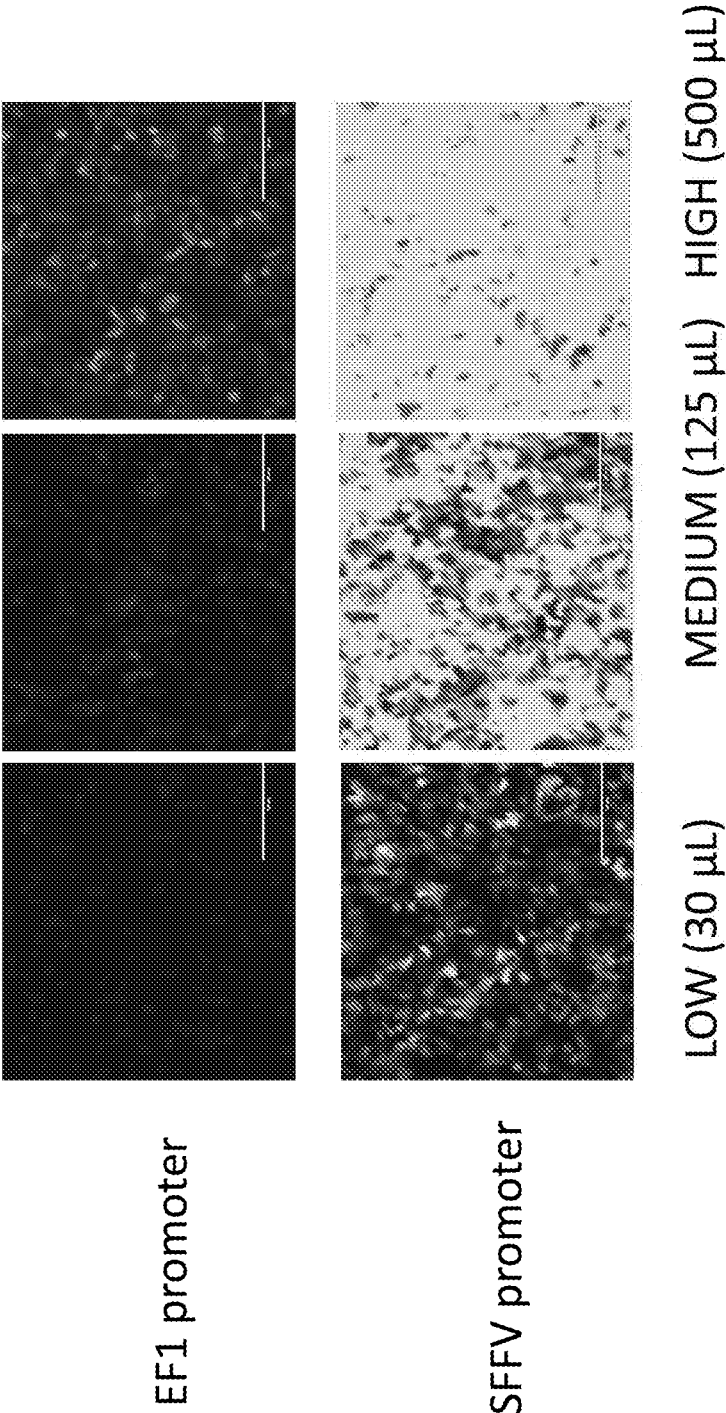
FIGURE 73D

FIGURE 74



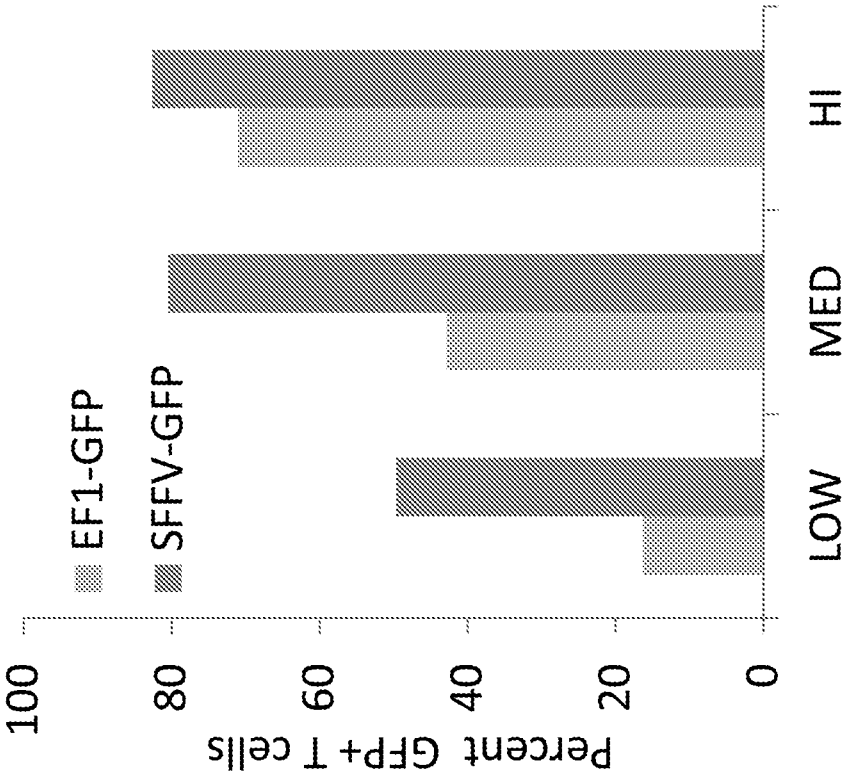


FIGURE 75

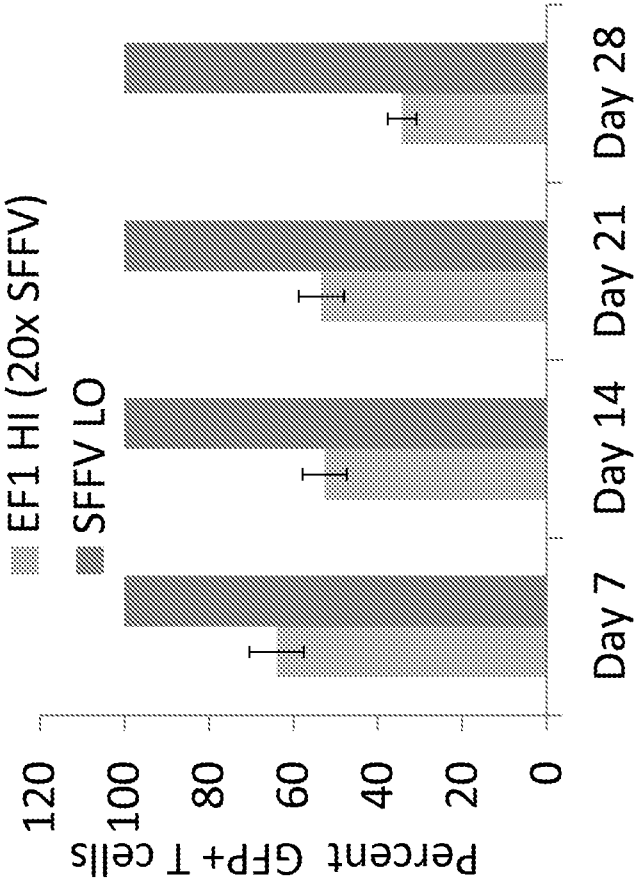


FIGURE 76B

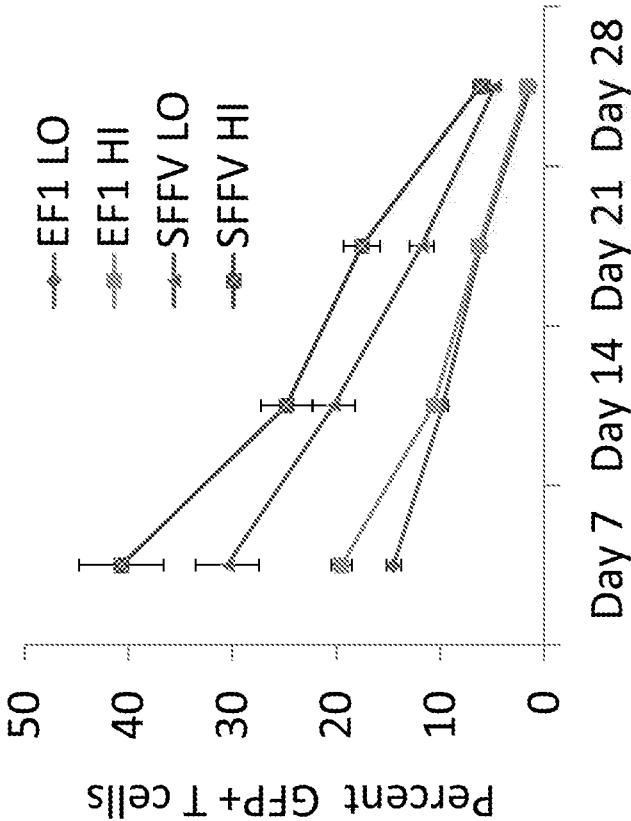


FIGURE 76A

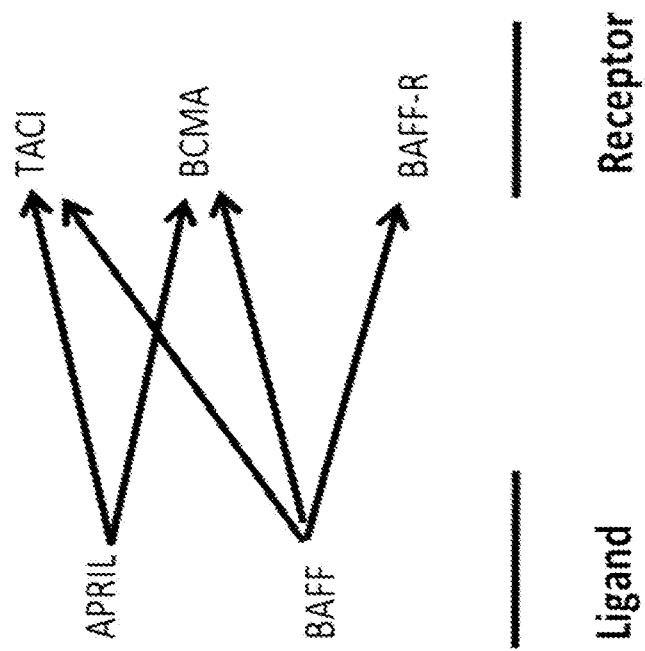
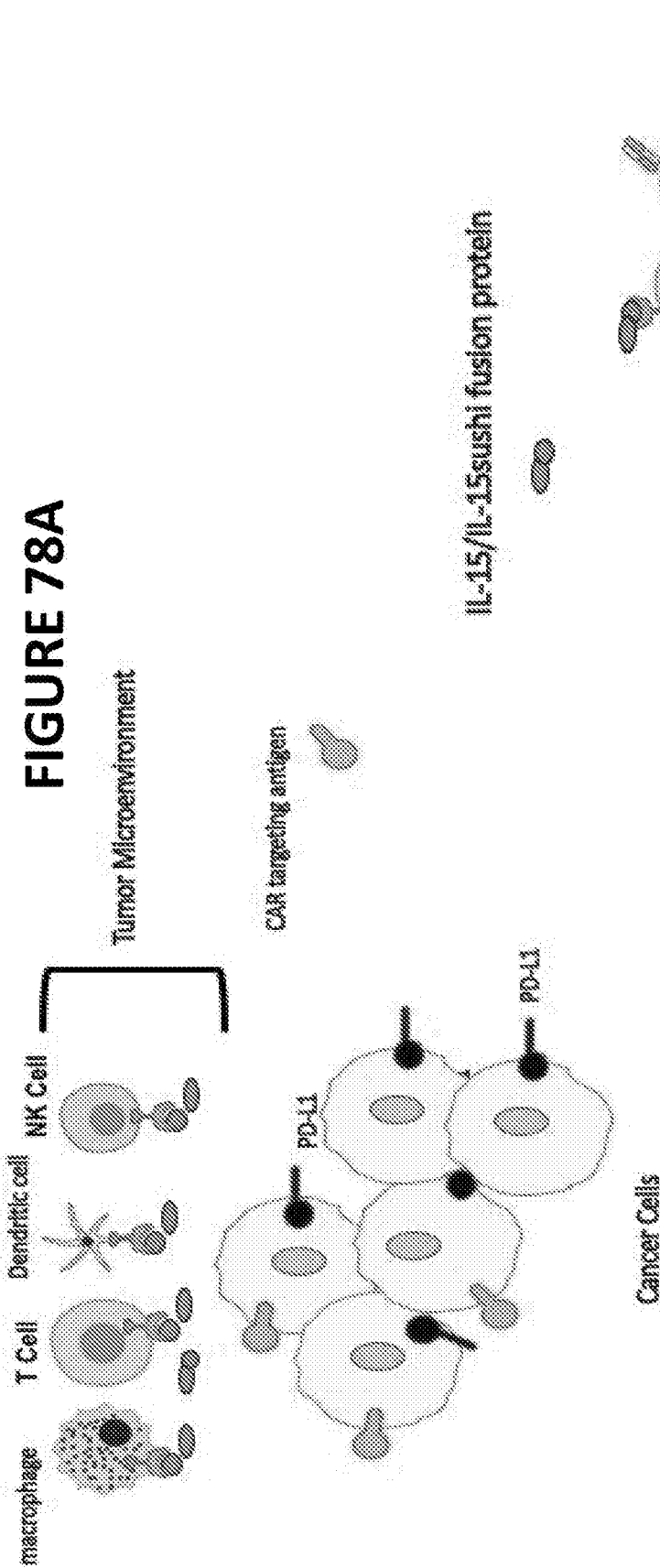
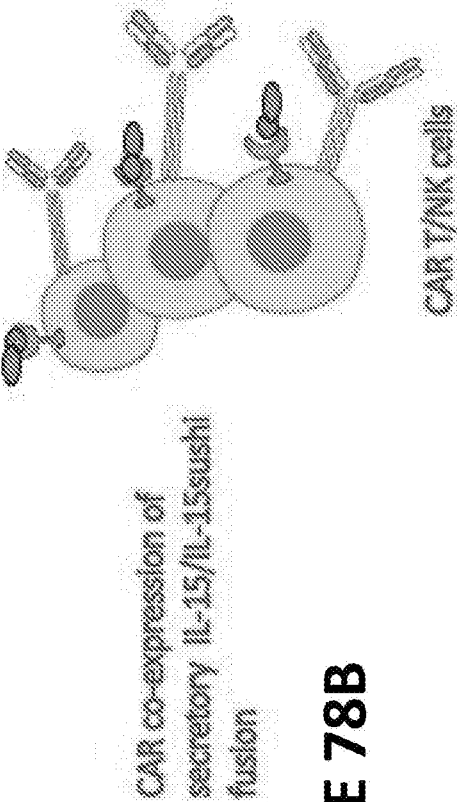
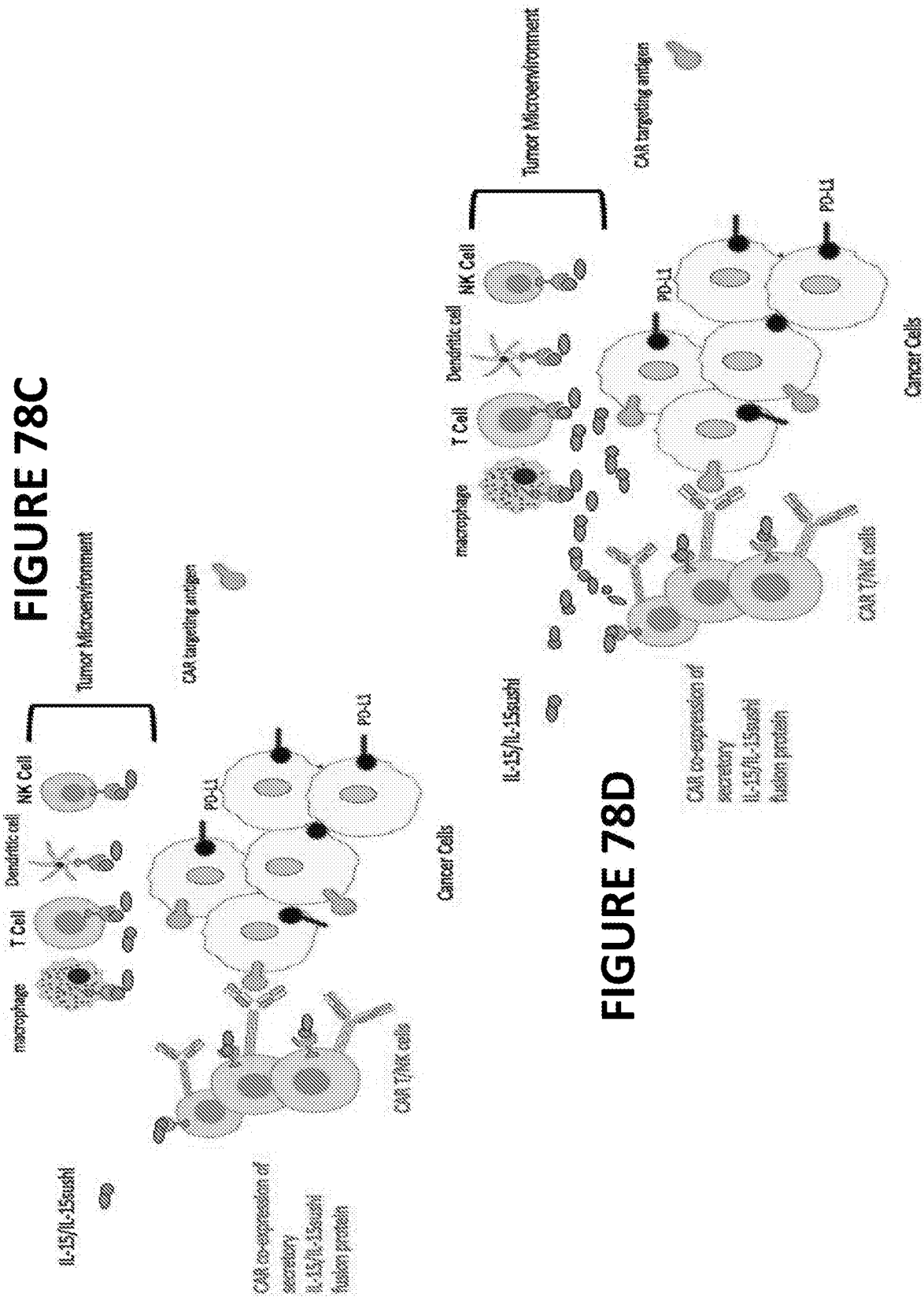


FIGURE 77





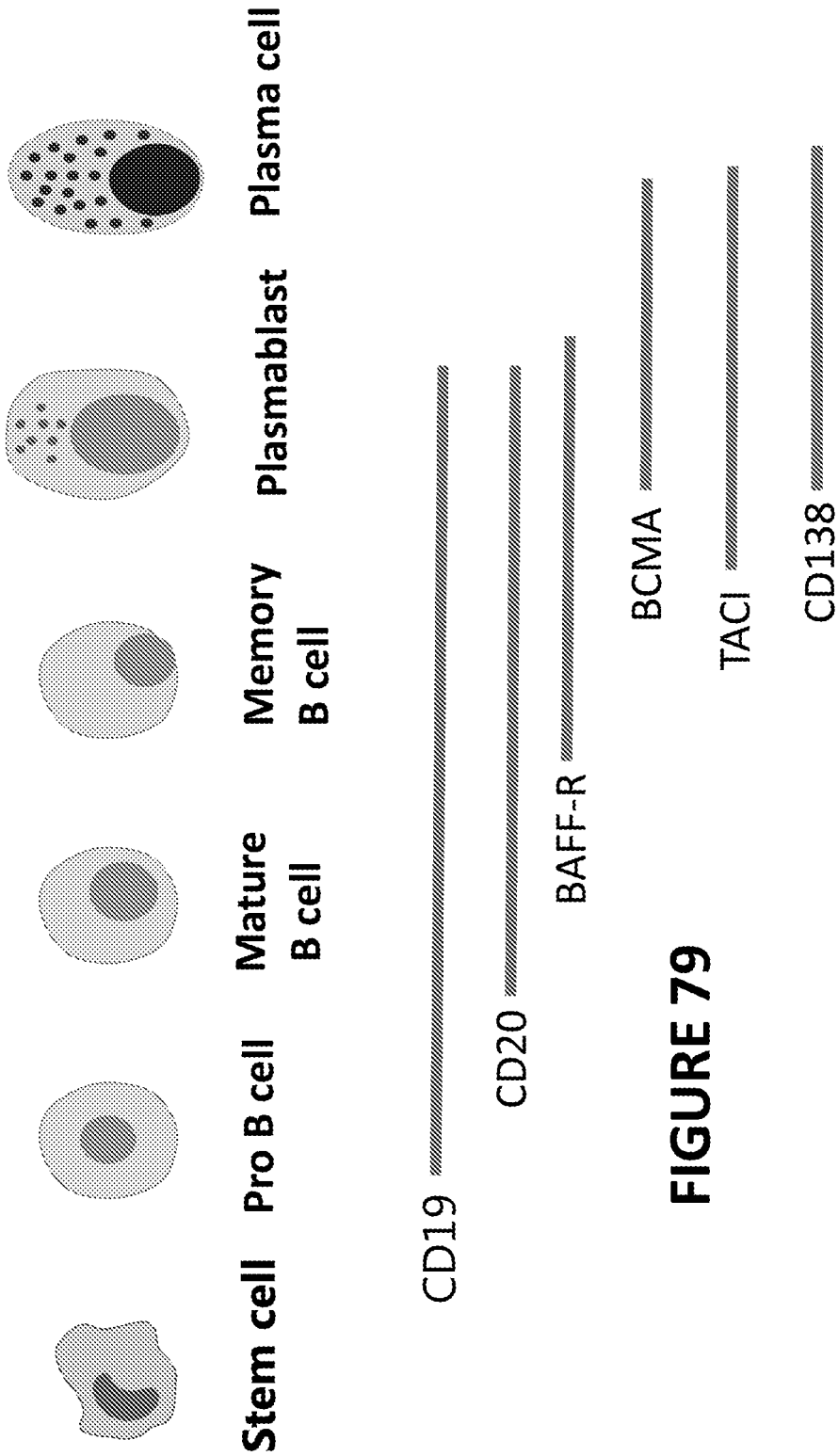


FIGURE 79

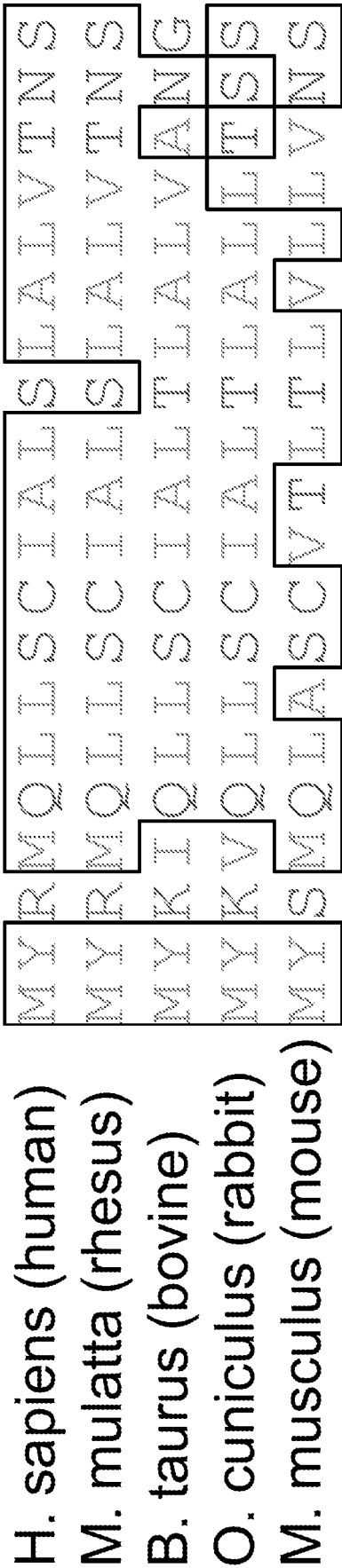


FIGURE 80

H. sapiens (human)	1	QVAALQCGDIASLRAELQGHAEKLEP---	AGAGAPKAGLE	EEAPAVTAGLK	--	EEPPATG	54
M. mulatta (rhesus)	1	QVAALQCGDIASLRAELQSHAEKLEP---	AGAGAPKAGLE	EEAPAVTAGLK	--	EEPPATG	54
B. taurus (bovine)	1	-VASLQAEELGSLRAELQSRFG---	APQAGAPFRE---	APSVTPALKQK	QA	EEPPATG	50
O. cuniculus (rabbit)	1	RVAALQADILSLRAAVQGHQAEQLPELPQSSGA	APKATLQ	EEAPAVTAGLKG	--	EEPPATG	59
M. musculus (mouse)	1	QVAALQADILNNLENELOSYRGSATP---	AAAG---	APELTAGVK	--	ELTPAATP	46
H. sapiens (human)	55	EGNSSQNSSENKRAVQGP	EEETVTDCLQLLIADSEETTI	QKGSYTFVFWL	LSFKRGS	SALEEK	114
M. mulatta (rhesus)	55	EGNSSQNSSENKRAVQGP	EEETVTDCLQLLIADSEETTI	QKGSYTFVFWL	LSFKRGS	SALEEK	114
B. taurus (bovine)	51	ESNSSQSSSRKRAVQGP	EEETVTDCLQLLIADSDTTT	IRKGA	YTFVFWL	LSFKRGR	110
O. cuniculus (rabbit)	60	ESNSSQSSSRKRAVQGP	EEETVTDCLQLLIADSDTTT	IRKGS	YTFVFWL	LSFKRGR	119
M. musculus (mouse)	47	FENSSRGHKNRAVQGP	EEETVTDCLQLLIADSDTTT	IRKGT	YTFVFWL	LSFKRGR	106
H. sapiens (human)	115	ENKILVKETGYPFFIYGQVLYTDK	TYAMCHLIQRKKVHV	FGDELS	LVTLERCIQN	MPETLP	174
M. mulatta (rhesus)	115	ENKILVKETGYPFFIYGQVLYTDK	TYAMCHLIQRKKVHV	FGDELS	LVTLERCIQN	MPETLP	174
B. taurus (bovine)	111	ENKILVKETGYPFFIYGQVLYTDN	TFAMCHLIQRKKVHV	FGDELS	LVTLERCIQN	MPETLP	170
O. cuniculus (rabbit)	120	ENKILVKETGYPFFIYGQVLYTD	TFAMCHLIQRKKVHV	FGDELS	LVTLERCIQN	MPETLP	179
M. musculus (mouse)	107	ENKILVFRQYGFPIYSQVLYTD	TFAMCHVIFQRKKVHV	FGDELS	LVTLERCIQN	MPKFLP	166
H. sapiens (human)	175	NNSCYSAGIAKALEECDEILQLAIFREENAQISL	DG	VDVTFEFCAL	KLL		218
M. mulatta (rhesus)	175	NNSCYSAGIAKALEECDEILQLAIFREENAQISL	DG	VDVTFEFCAL	KLL		218
B. taurus (bovine)	171	NNSCYSAGIAKALEECDEILQLAIFREENDAKISR	DG	VDGCTEFCAL	KLL		214
O. cuniculus (rabbit)	180	NNSCYSAGIAKALEECDEILQLAIFREENAQISR	DG	VDGCTEFCAL	KLL		223
M. musculus (mouse)	167	NNSCYSAGIAKALEECDEILQLAIFREENAQISR	N	GDVTFEFCAL	KLL		210

FIGURE 81

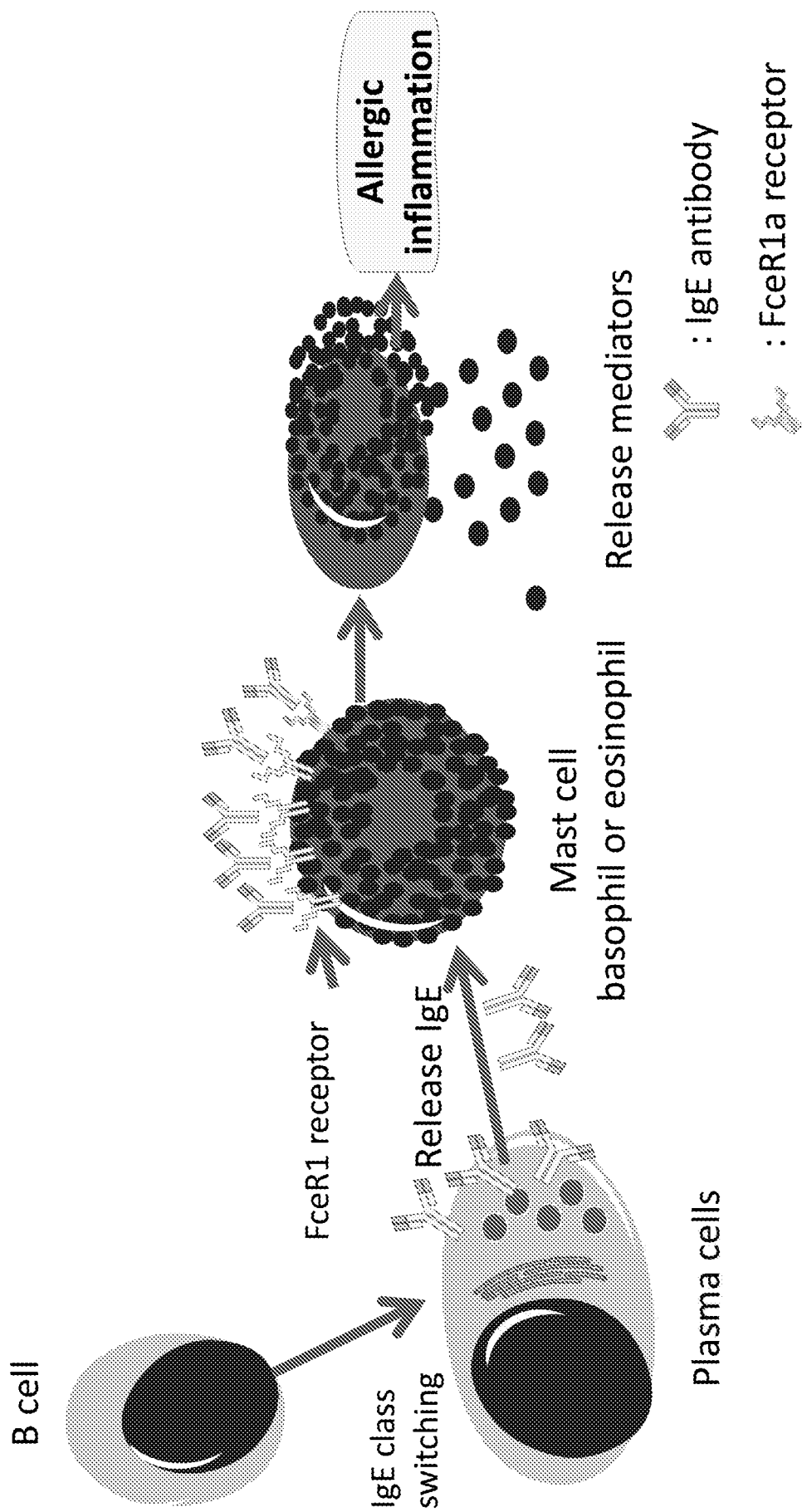


FIGURE 82A

FcεR1a CAR targeting Ig-secreting plasma cells
FcεR1 scFv CAR targeting mast cells, basophils

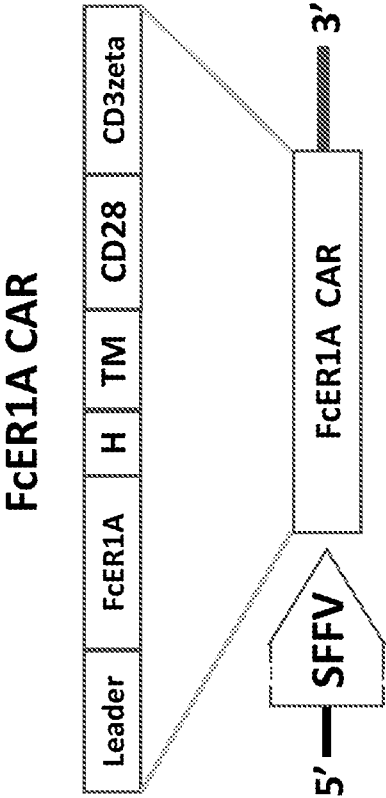


FIGURE 82B

H. sapiens (human)	1	QEDKPAVSLNPPWNRKICGEMVTLTCGNGK	KEVSI-KEEHSGKLSSE	ENSSLSNIVNAK	59
M. mulatta (rhesus)	1	EPQKPTVSLNPPWNRKICGEMVTLTCGNGK	KEVSI-KWPNQSGUSE	VANSSLSIVNAD	59
B. taurus (bovine)	1	--KSKVSLNPPWNRKICGEMVTLTCGNGK	KEVSI-KWPNQSGUSE	VANSSLSIVNAD	56
O. cuniculus (rabbit)	1	EMKSVSLNPPWNRKICGEMVTLTCGNGK	KEVSI-KWPNQSGUSE	VANSSLSIVNAD	59
M. musculus (mouse)	1	--EKSVSLNPPWNRKICGEMVTLTCGNGK	KEVSI-KWPNQSGUSE	VANSSLSIVNAD	58
H. sapiens (human)	60	EDSGEITACQDQVNESEERYVLEVFSDWLLIQASAEVVMGQ	LEFLRCHS	RRNDVYKVI	119
M. mulatta (rhesus)	60	EDSGEYKQCHQDQVNESEERYVLEVFSDWLLIQASAEVVMGQ	LEFLRCHS	RRNDVYKVI	119
B. taurus (bovine)	57	EDSGEYQCRKQDQVNESEERYVLEVFSDWLLIQASAEVVMGQ	LEFLRCHS	RRNDVYKVI	116
O. cuniculus (rabbit)	60	EDSGEYQCRKQDQVNESEERYVLEVFSDWLLIQASAEVVMGQ	LEFLRCHS	RRNDVYKVI	119
M. musculus (mouse)	59	EDSGEYQCRKQDQVNESEERYVLEVFSDWLLIQASAEVVMGQ	LEFLRCHS	RRNDVYKVI	118
H. sapiens (human)	120	YKDGDAALXVYWNHNSITNATVEDSGTYVCTG	CAVWQIDEESE	ELNITVIXA-PRKVI	177
M. mulatta (rhesus)	120	YKDGDAALXVYWNHNSITNATVEDSGTYVCTG	CAVWQIDEESE	ELNITVIXA-PRKVI	177
B. taurus (bovine)	117	YKDGDAALXVYWNHNSITNATVEDSGTYVCTG	CAVWQIDEESE	ELNITVIXA-PRKVI	176
O. cuniculus (rabbit)	120	YKDGDAALXVYWNHNSITNATVEDSGTYVCTG	CAVWQIDEESE	ELNITVIXA-PRKVI	177
M. musculus (mouse)	119	YKDGDAALXVYWNHNSITNATVEDSGTYVCTG	CAVWQIDEESE	ELNITVIXA-PRKVI	176
H. sapiens (human)	178	WLD			180
M. mulatta (rhesus)	178	WLD			180
B. taurus (bovine)	177	WLD			179
O. cuniculus (rabbit)	178	WLD			179
M. musculus (mouse)	177	WLD			179

FIGURE 82C

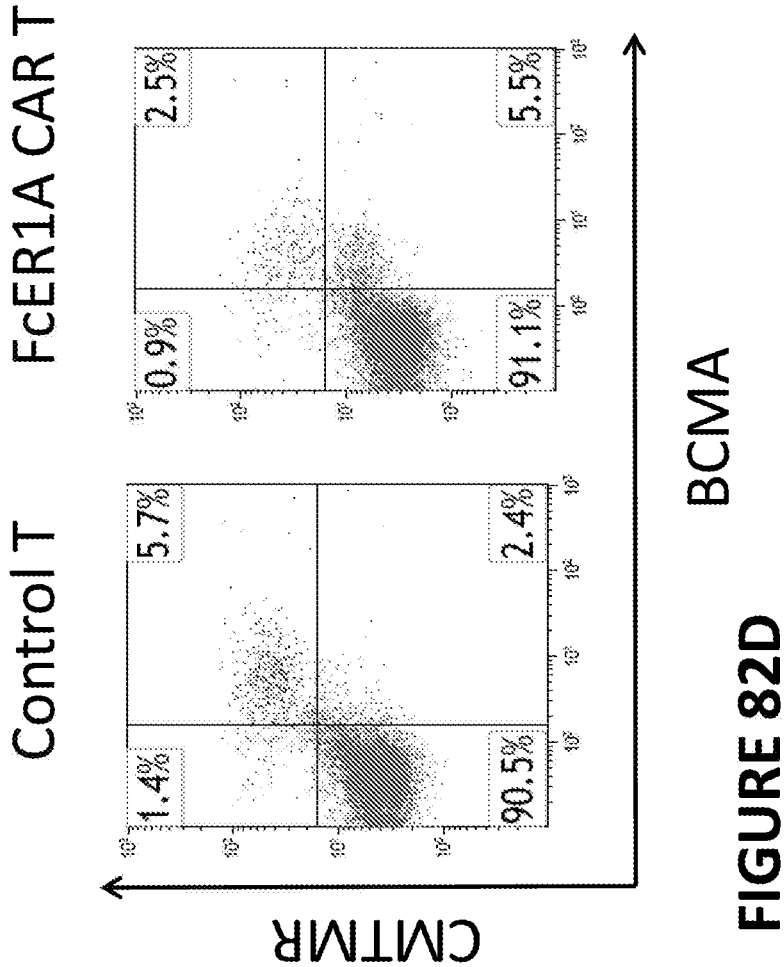


FIGURE 82D

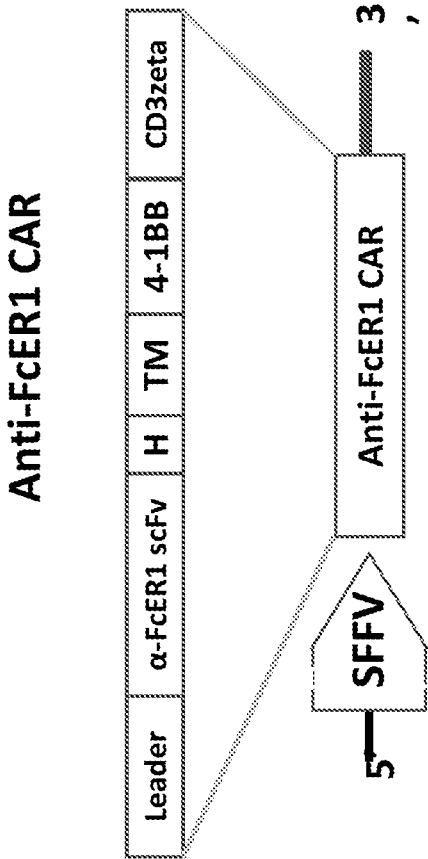


FIGURE 82E

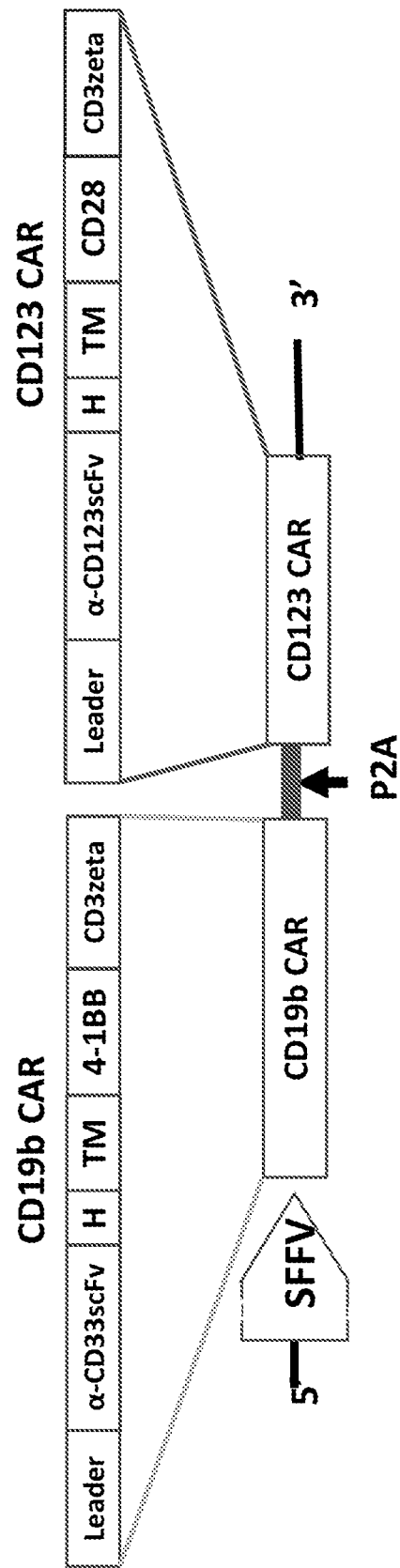


FIGURE 83A

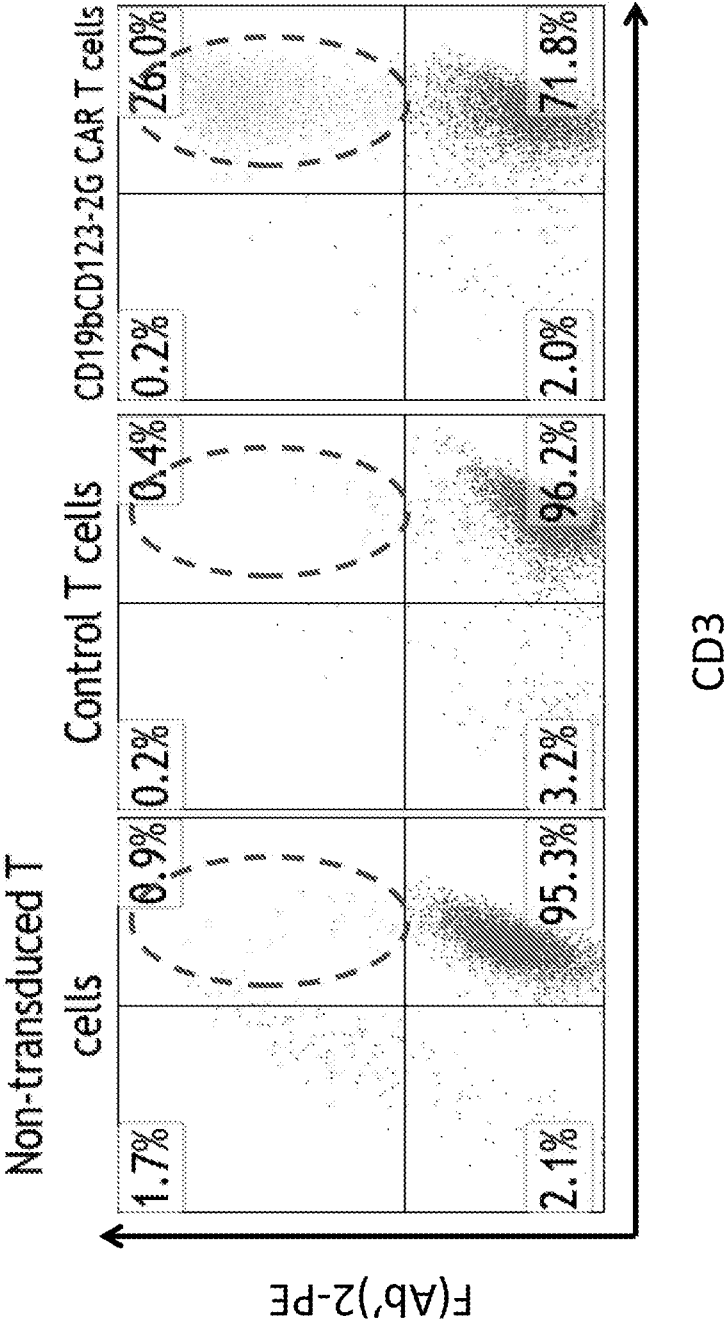


FIGURE 83B

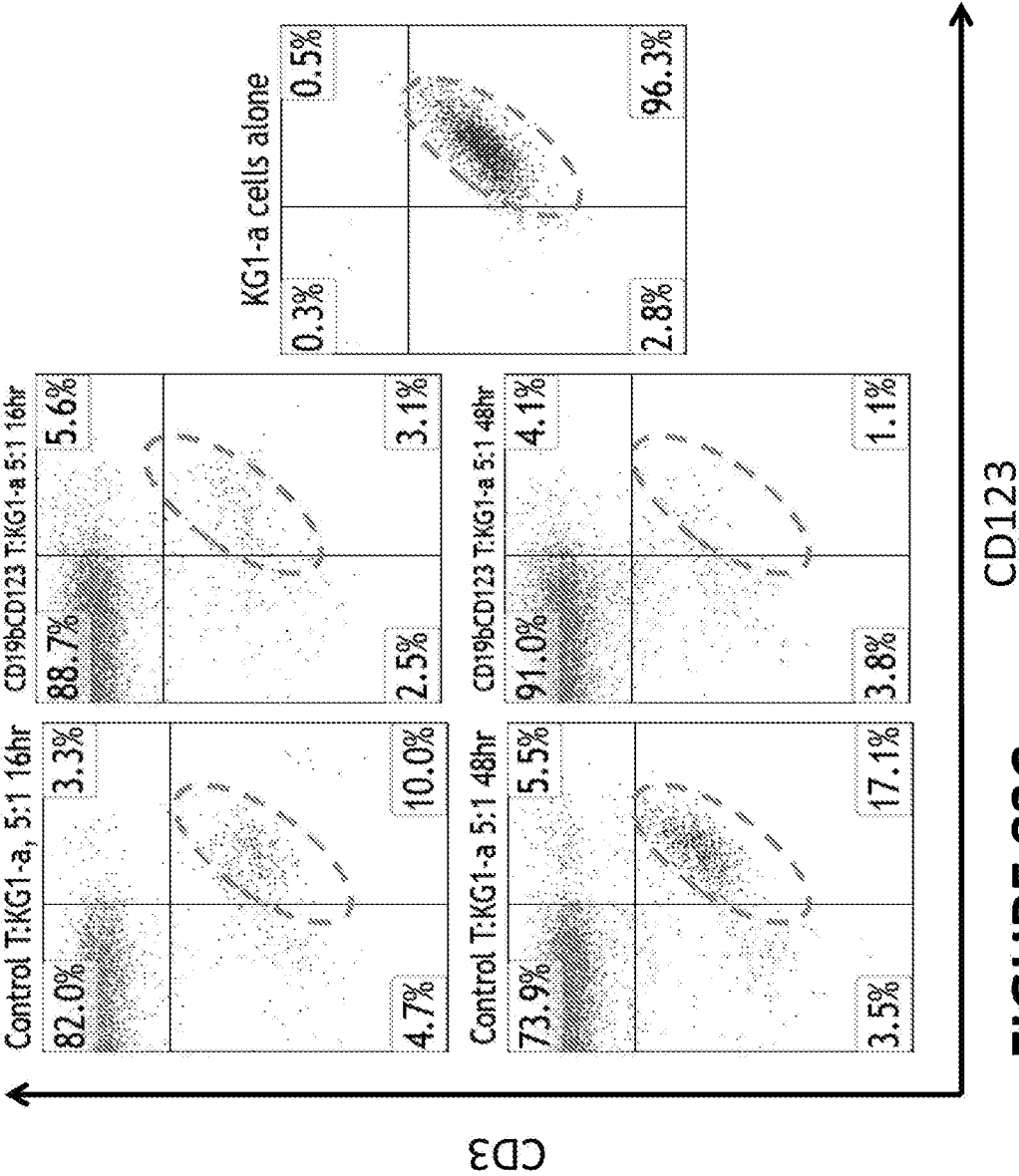


FIGURE 83C

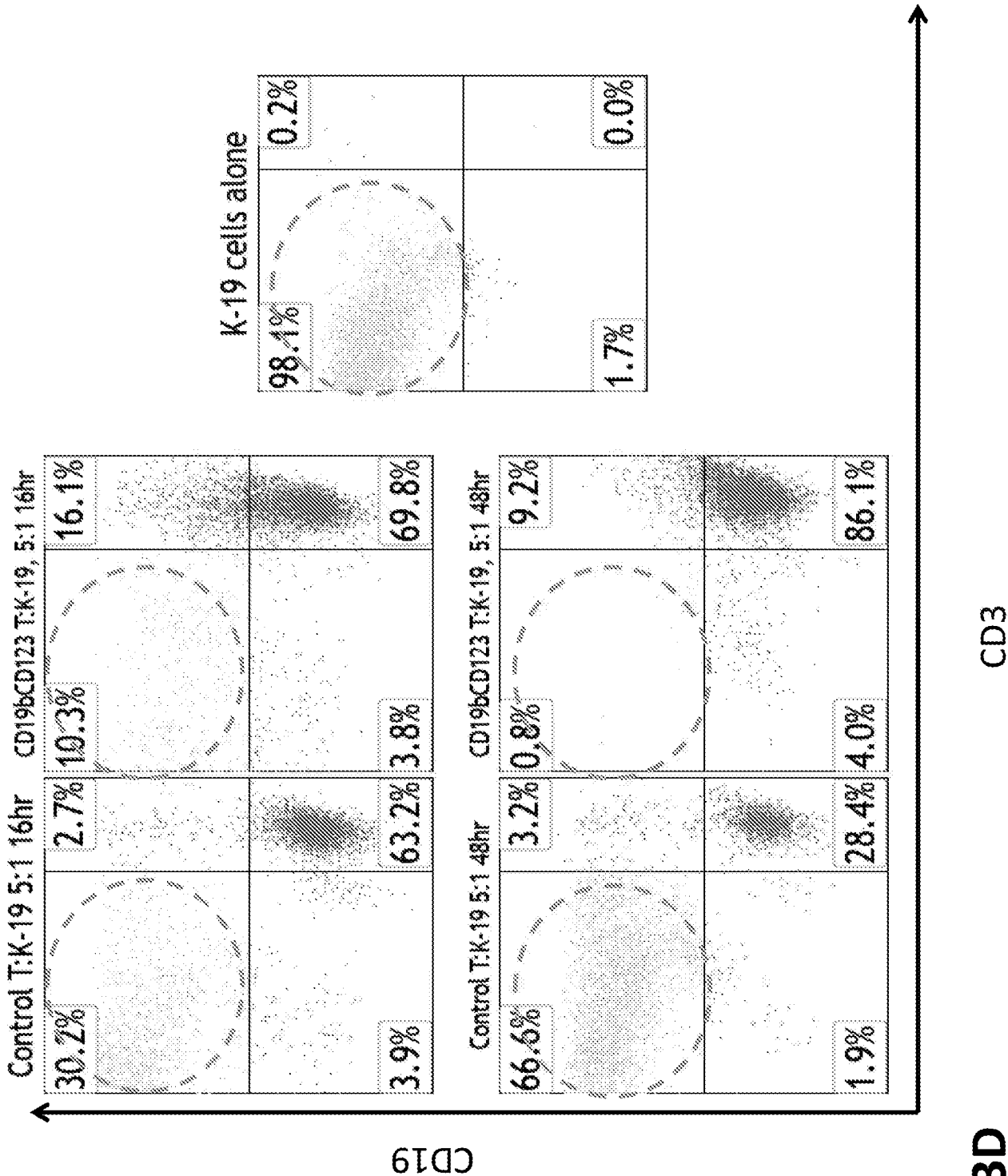


FIGURE 83D

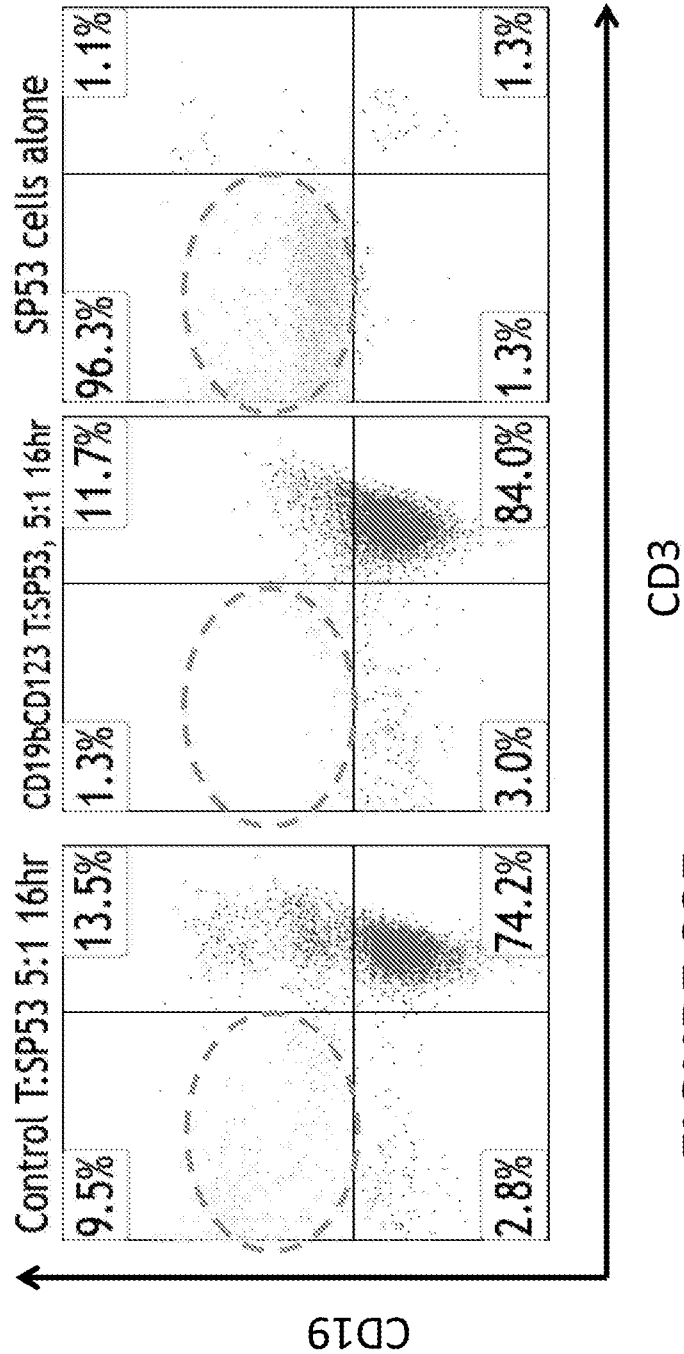
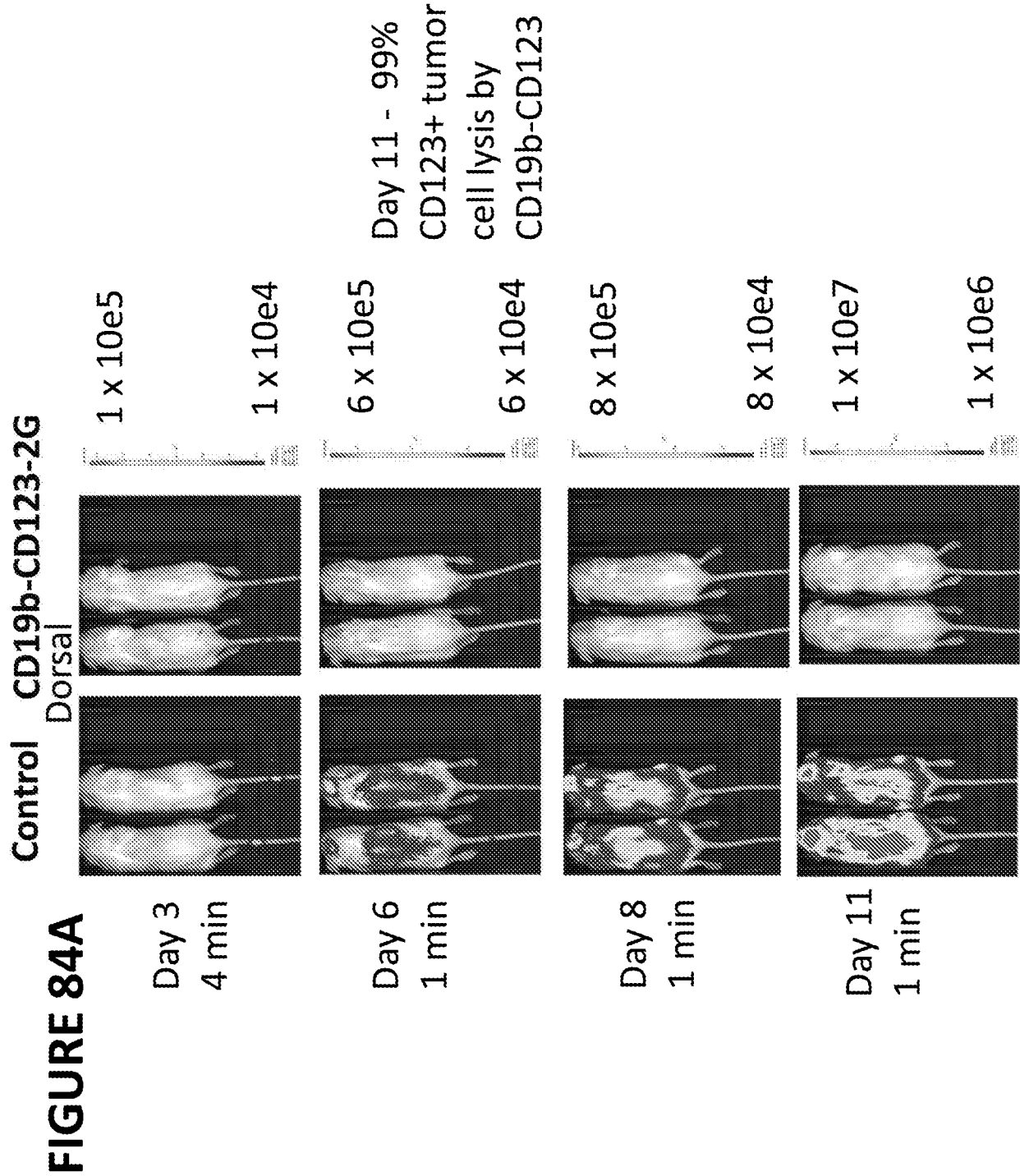
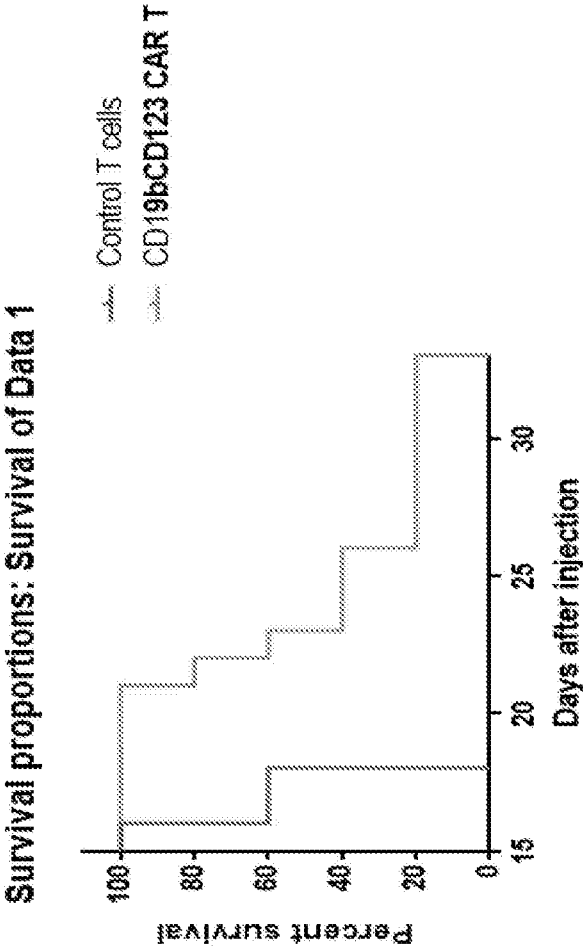


FIGURE 83E





Mantel-Cox: $P=0.0031$
Gehan-Breslow-Wilcox:
 $P=0.0043$

FIGURE 84B

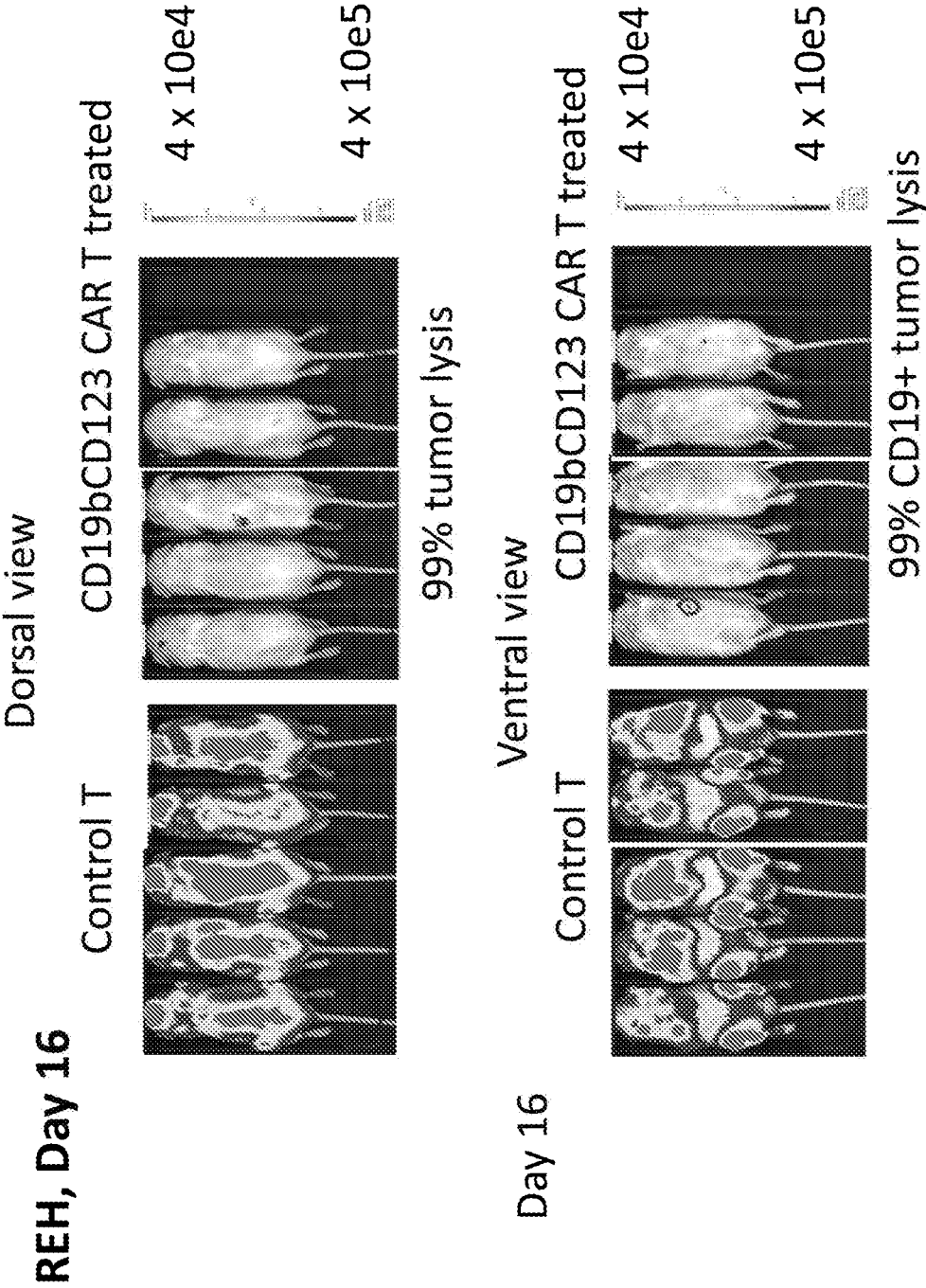


FIGURE 84C

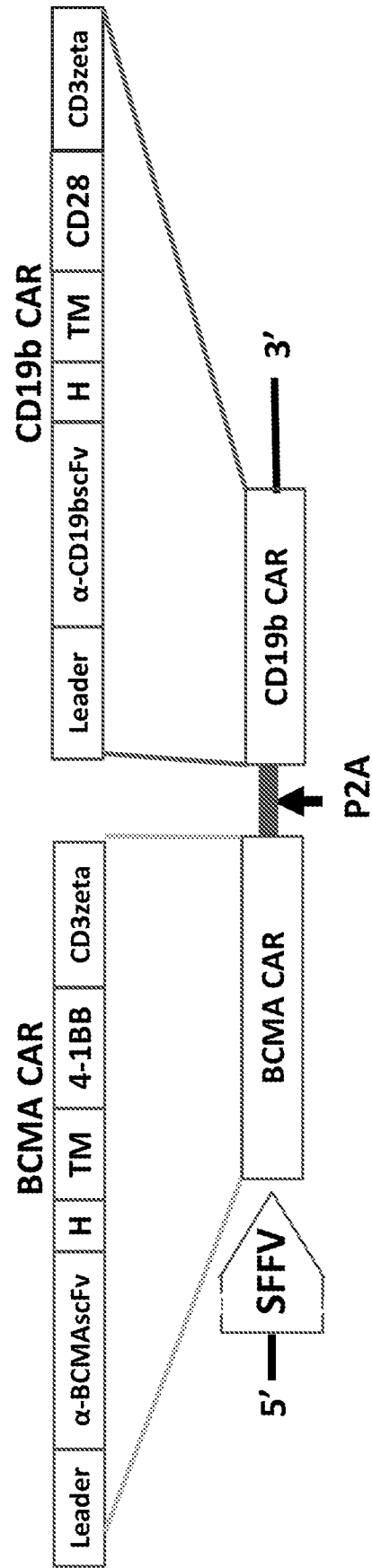


FIGURE 85A

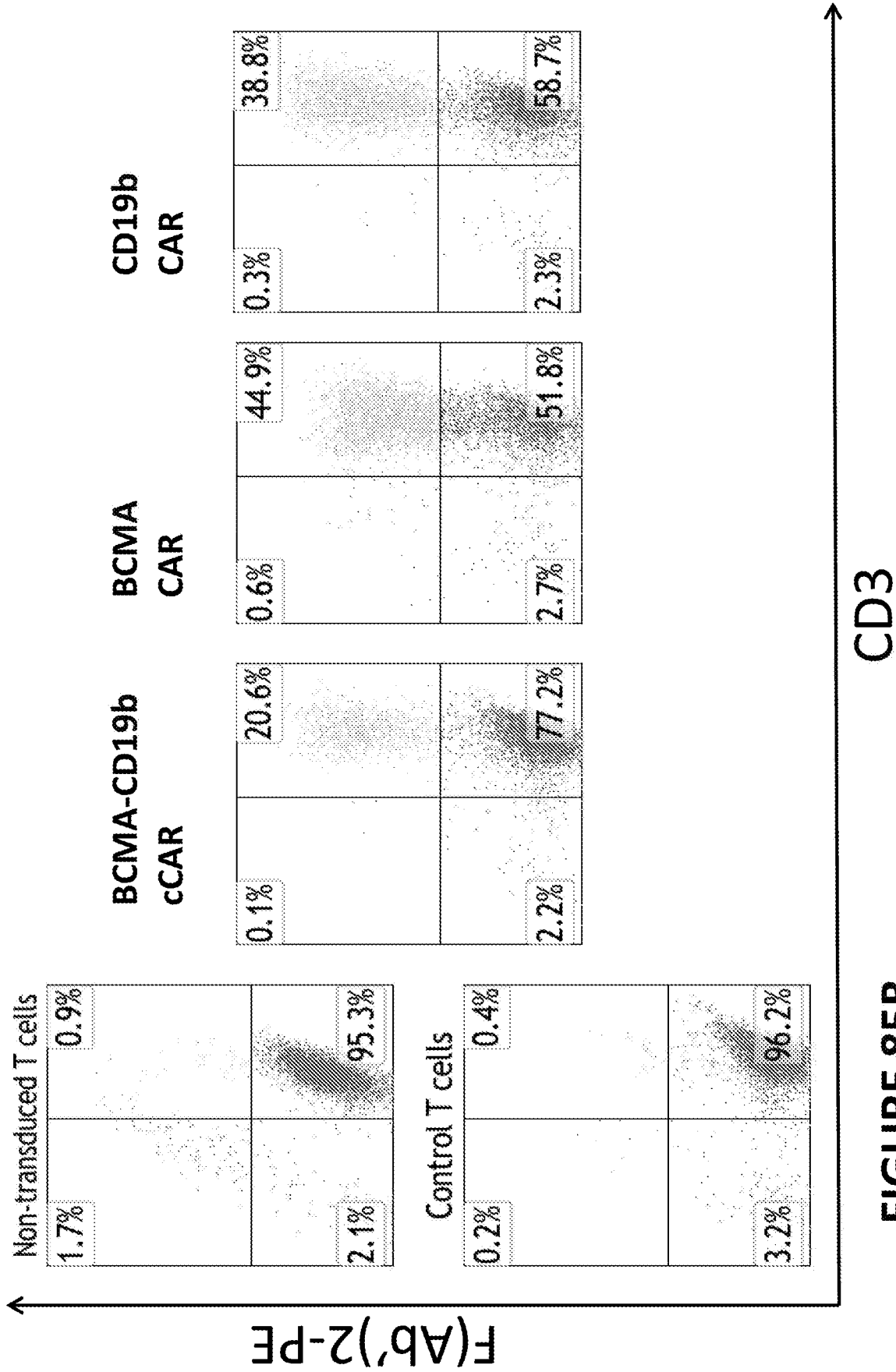
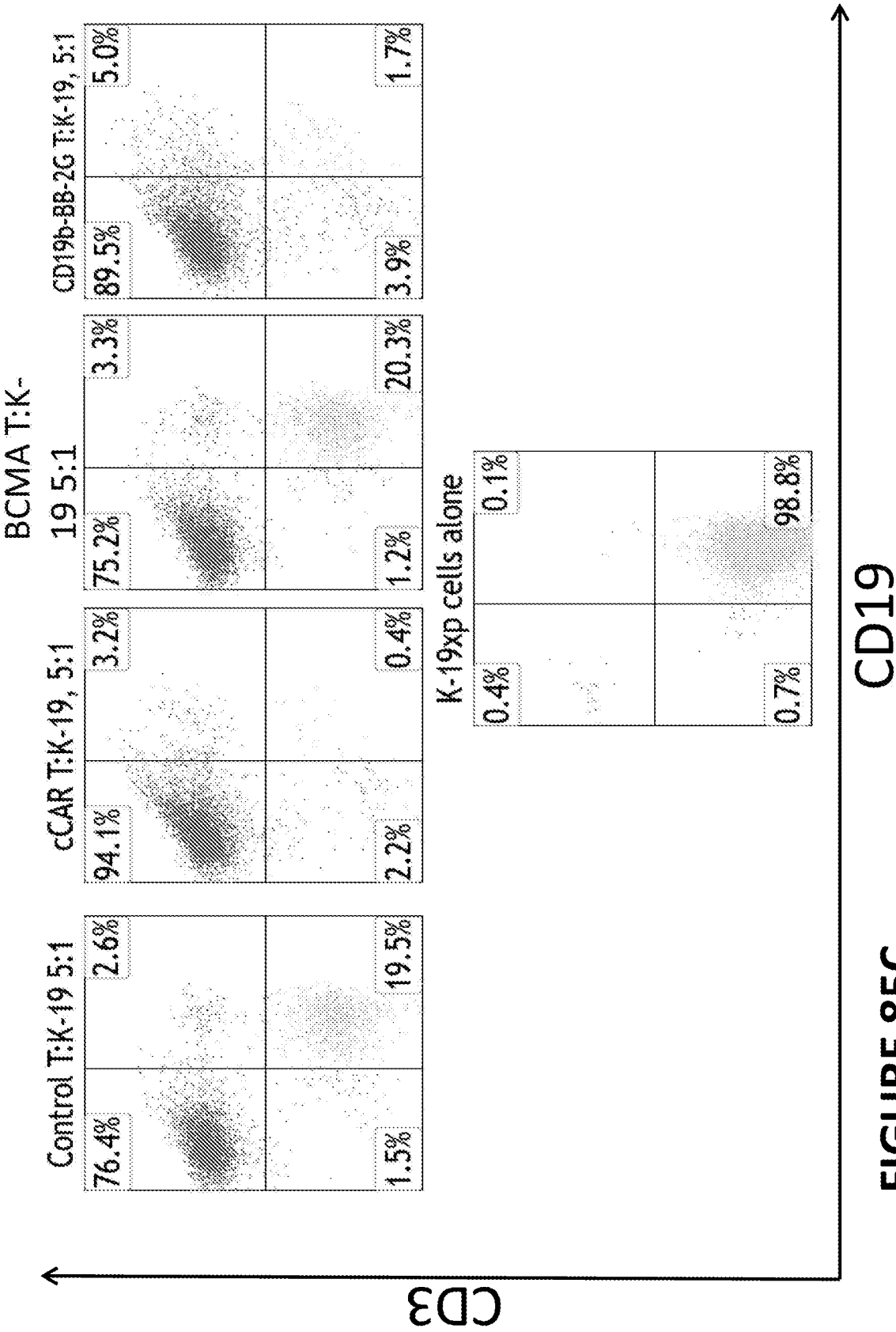
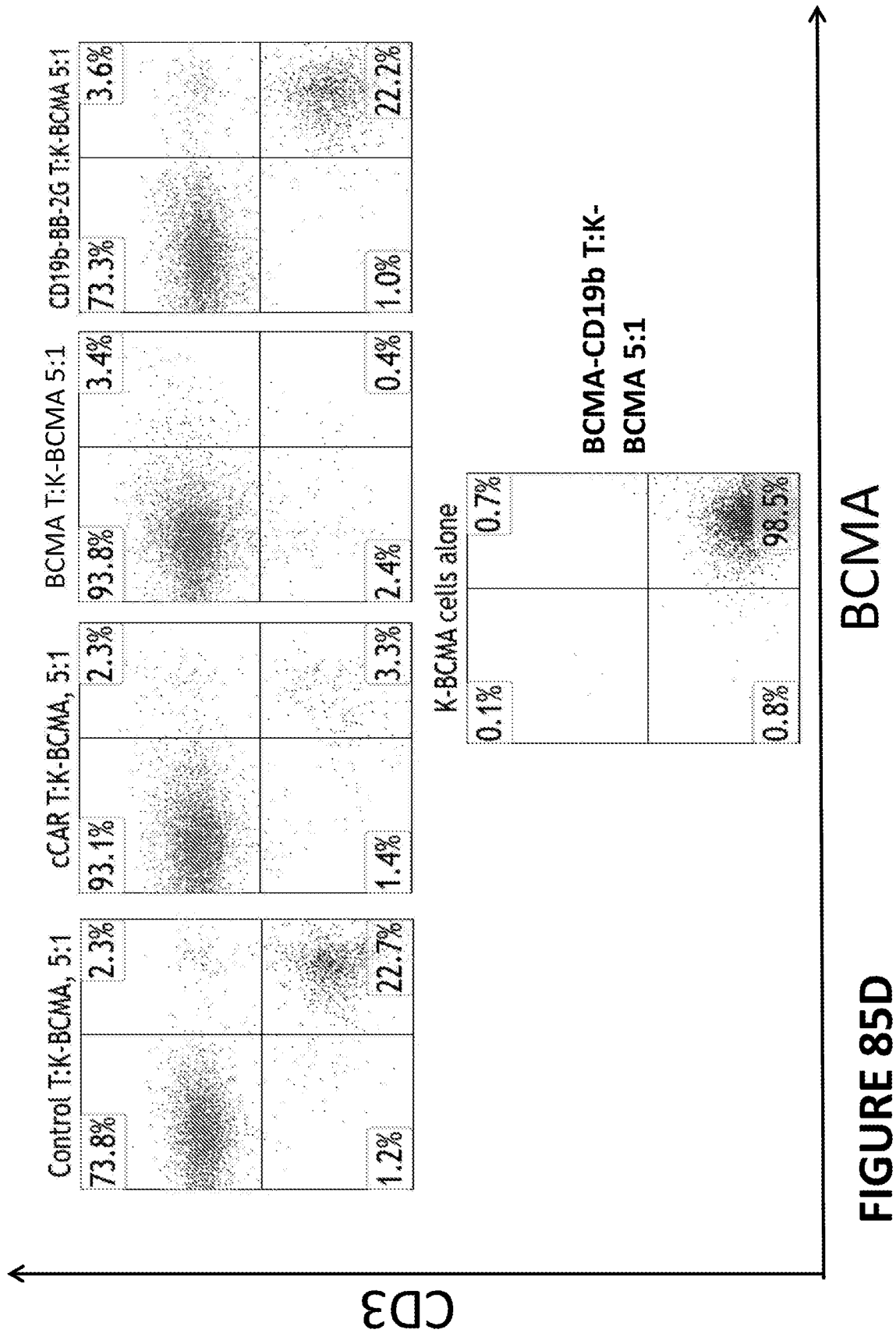


FIGURE 85B





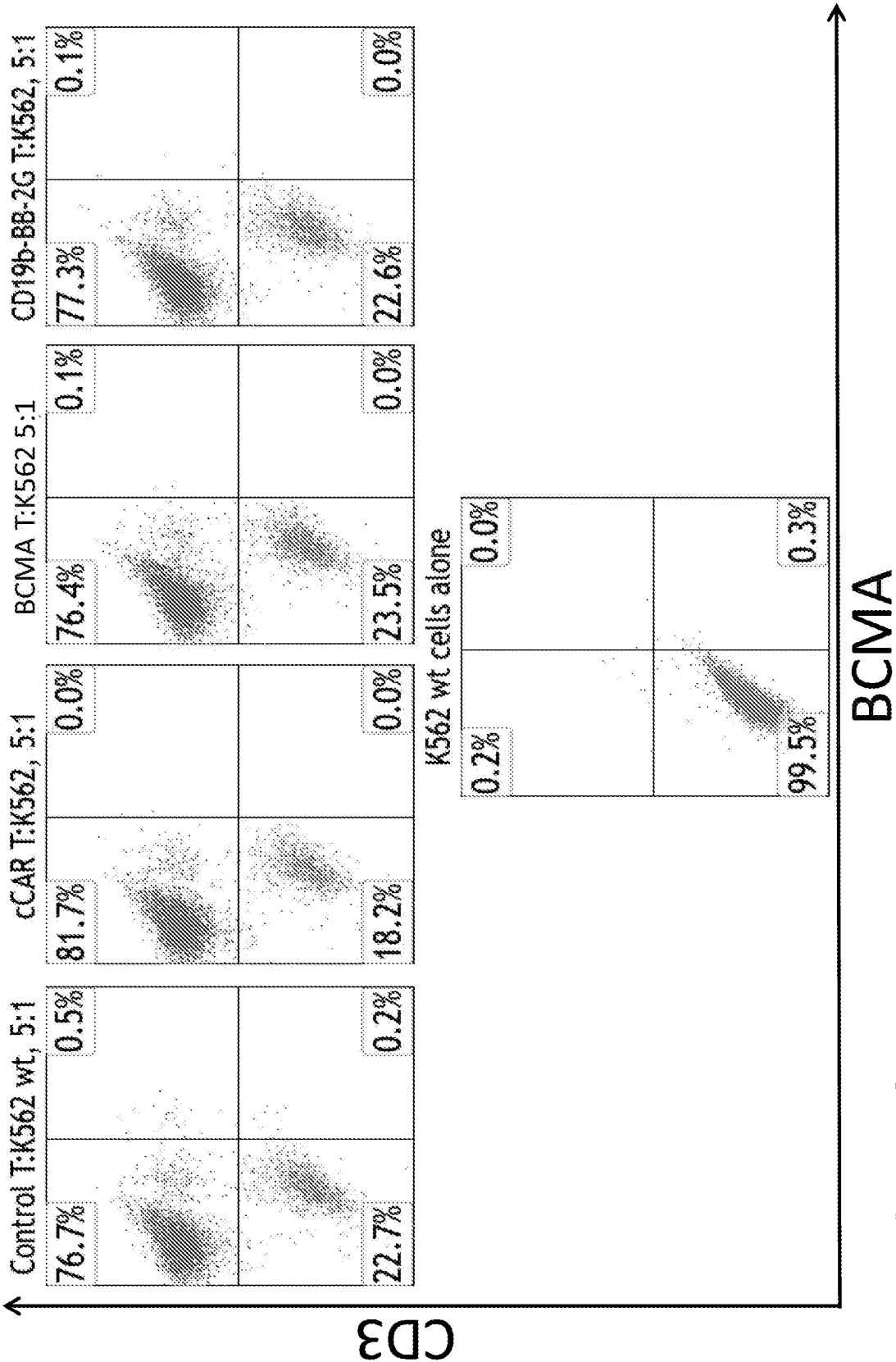


FIGURE 85E

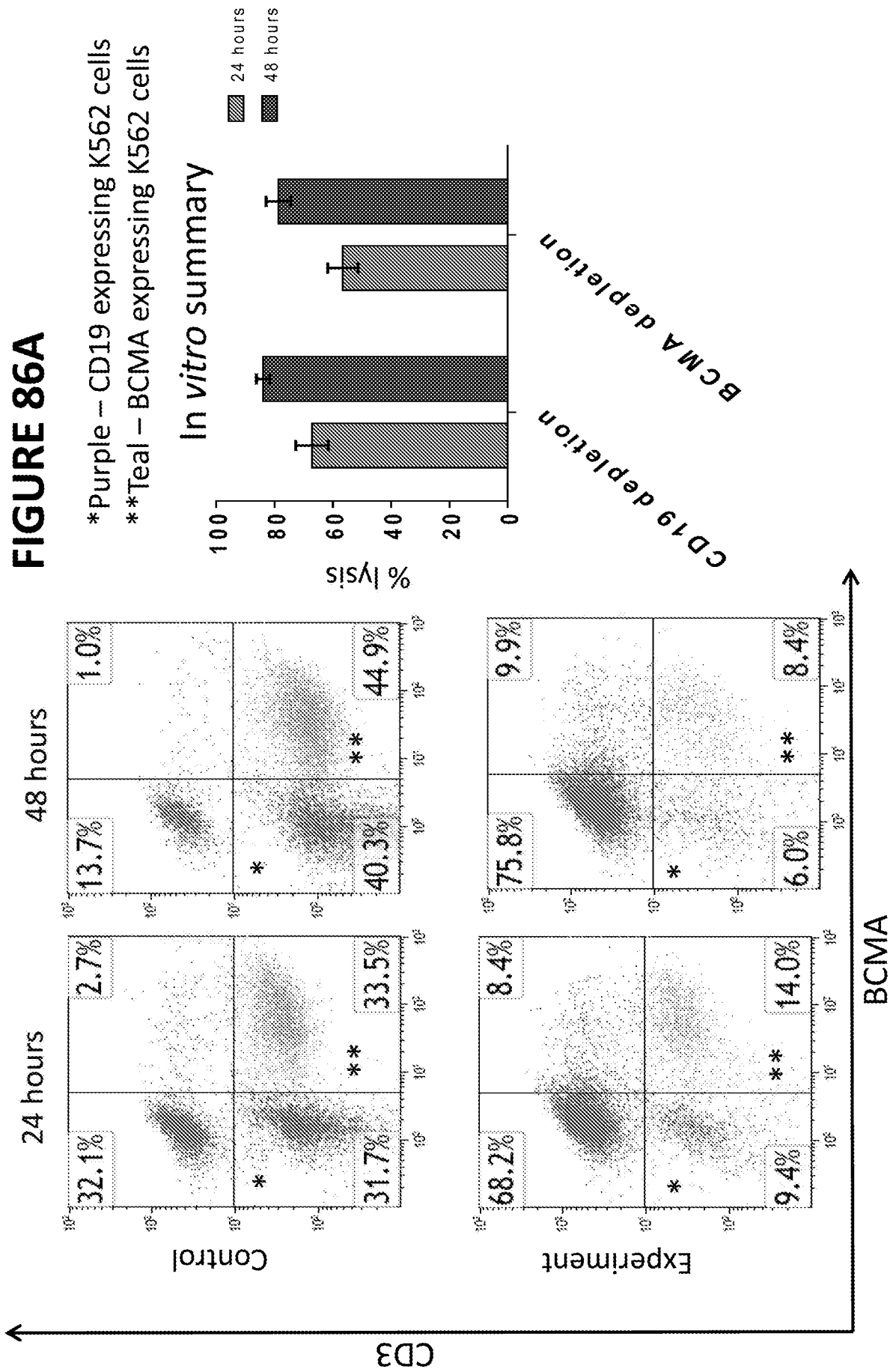


FIGURE 86B

*Purple – BCMA expressing MM1S cells

In vitro summary

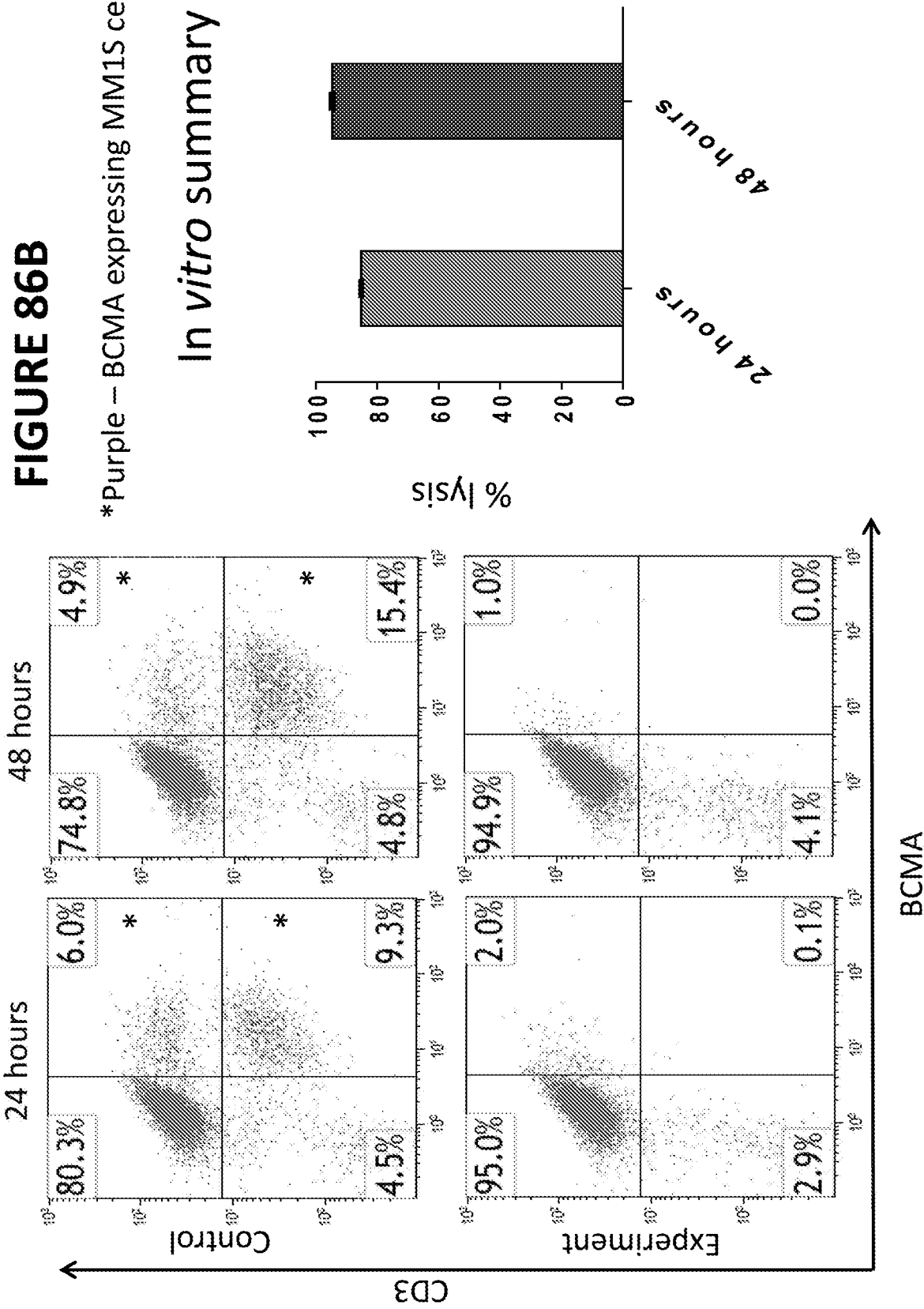
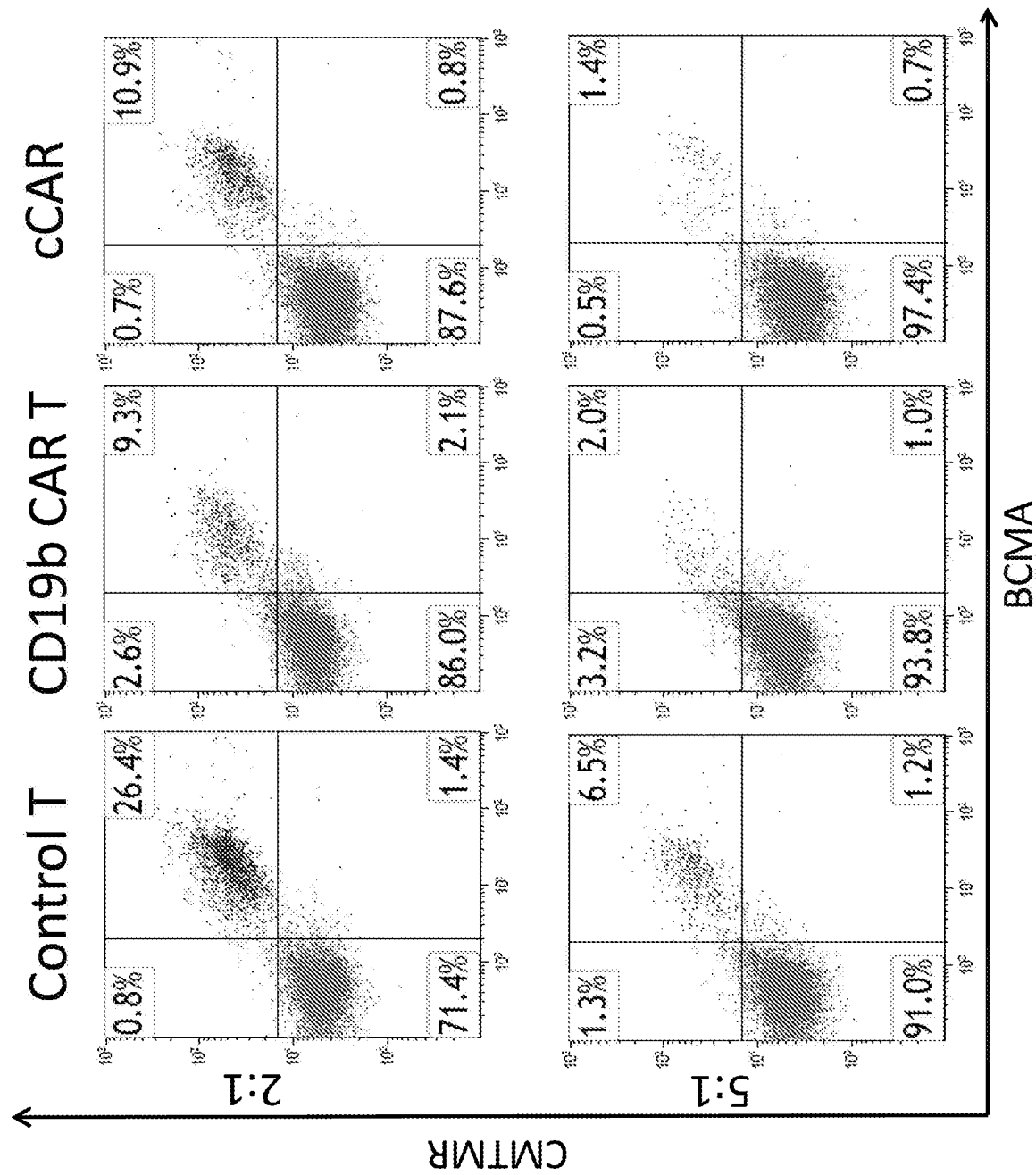


FIGURE 86C



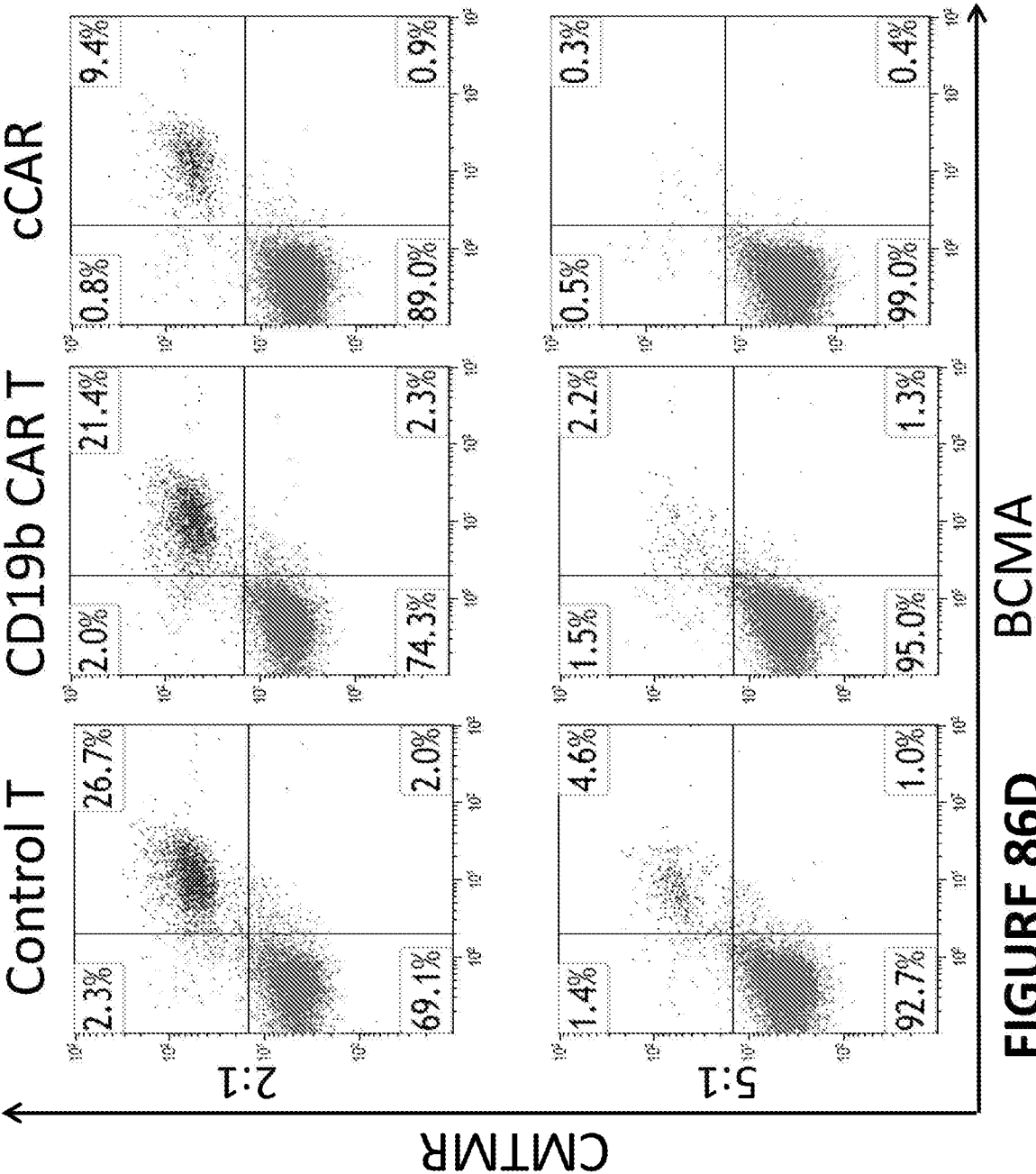
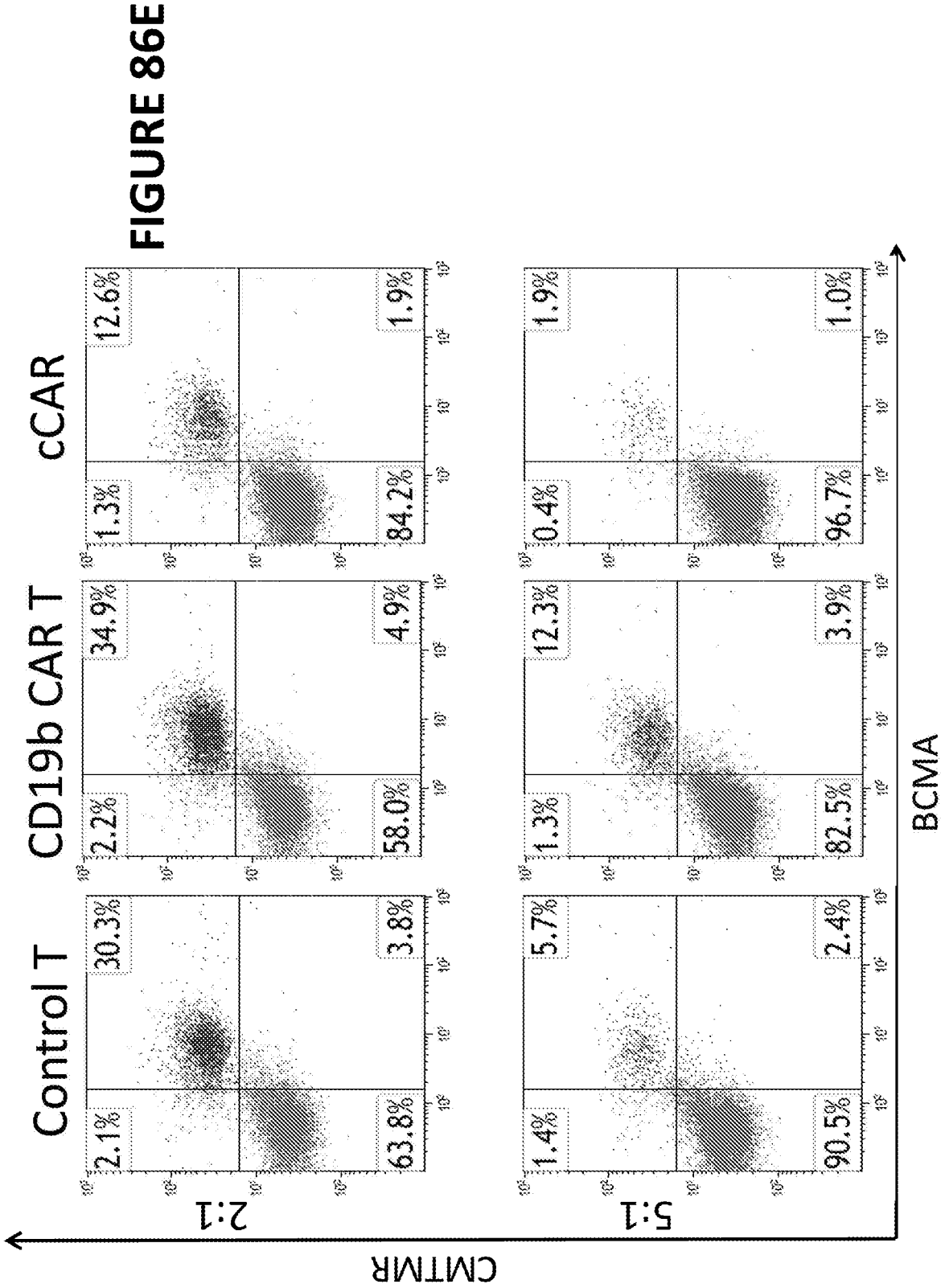
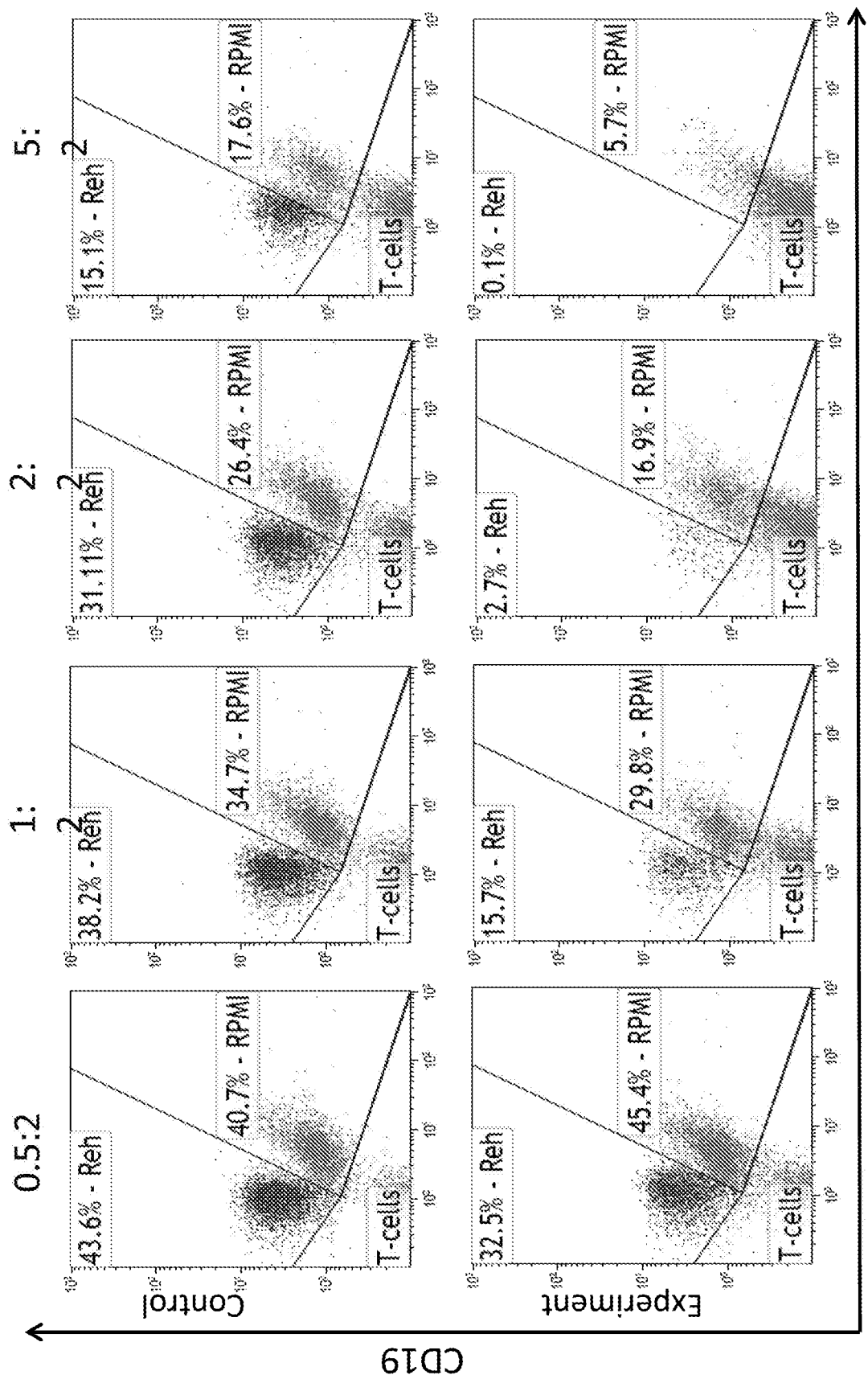


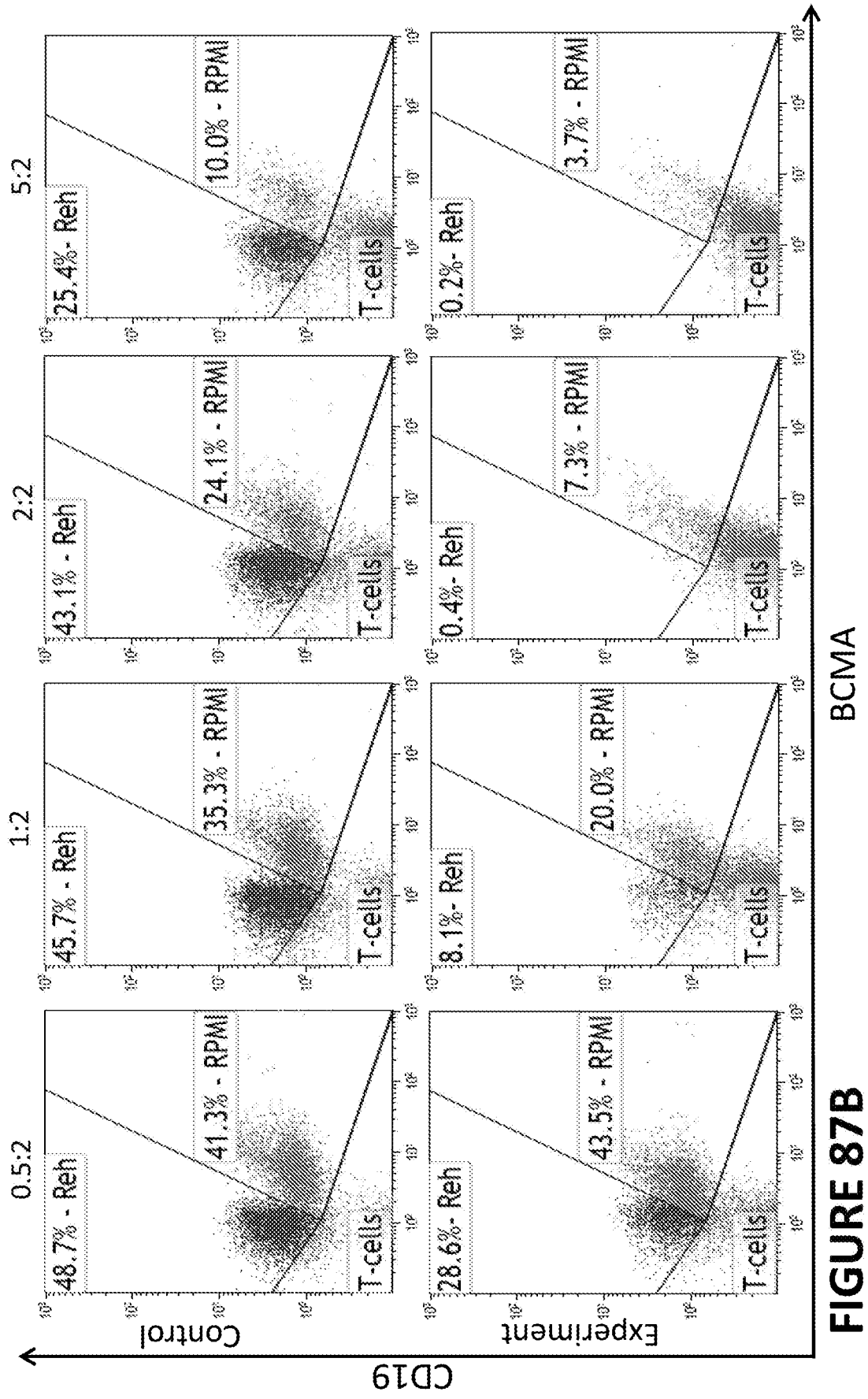
FIGURE 86D





BCMA

FIGURE 87A



BCMA

FIGURE 87B

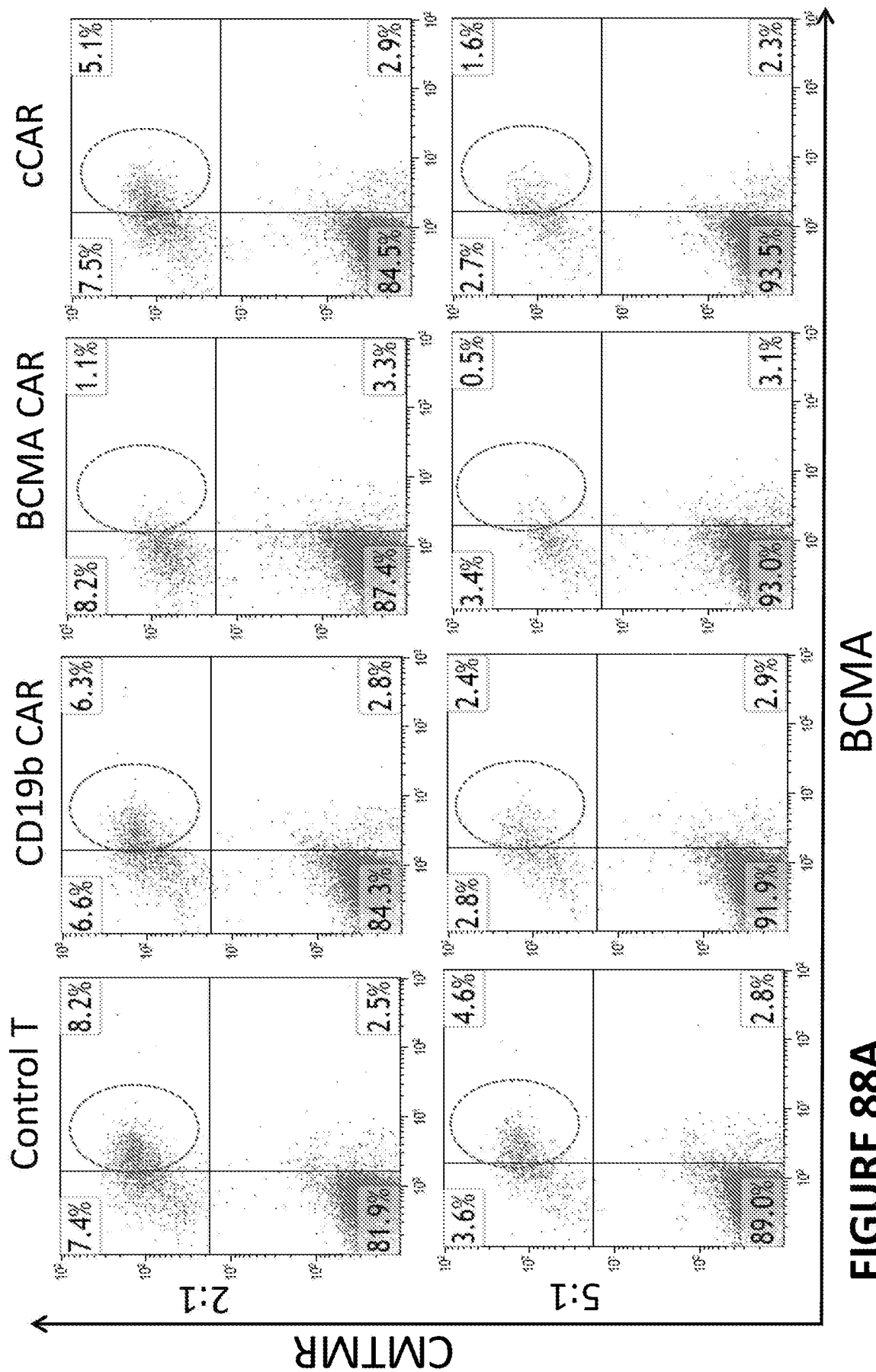
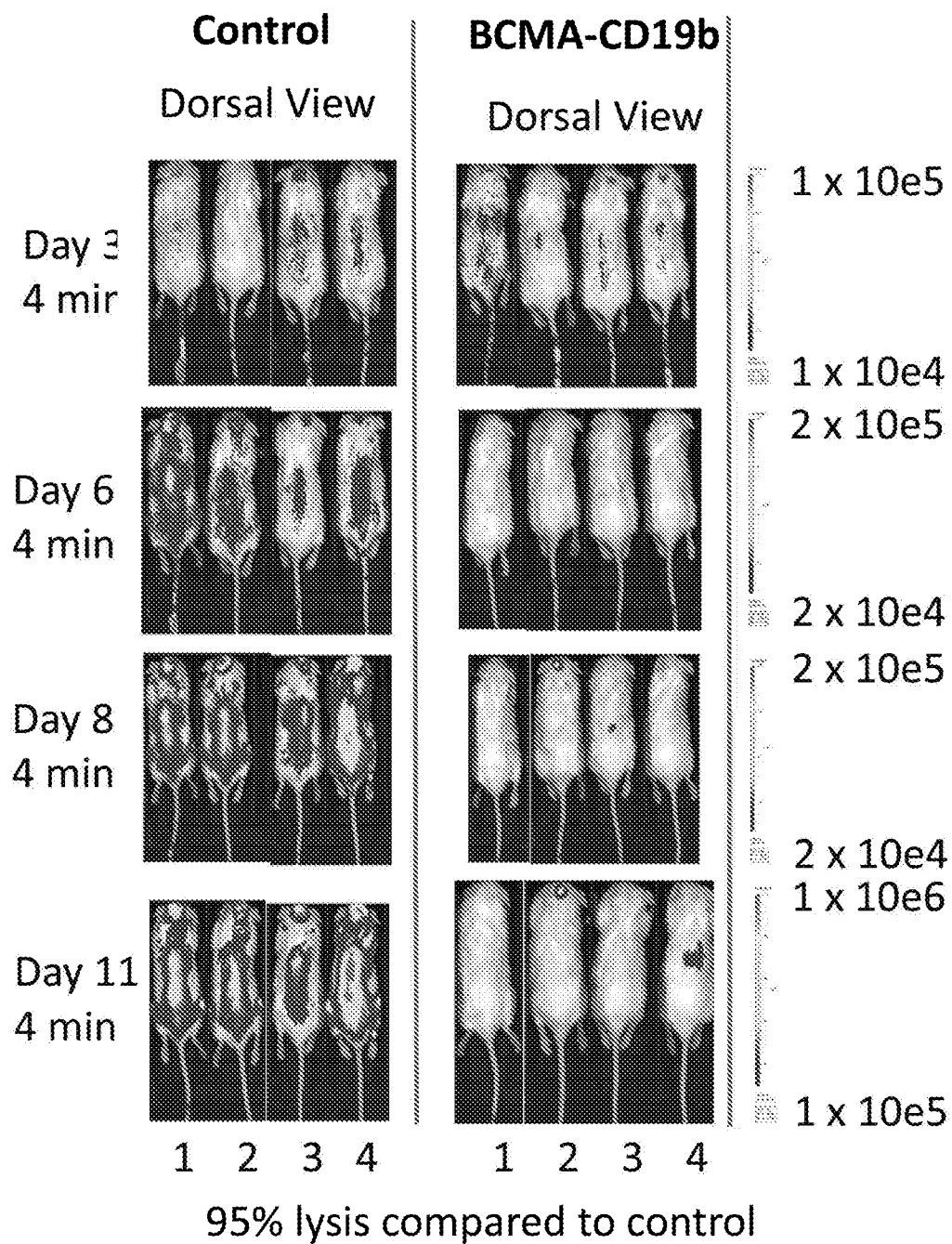
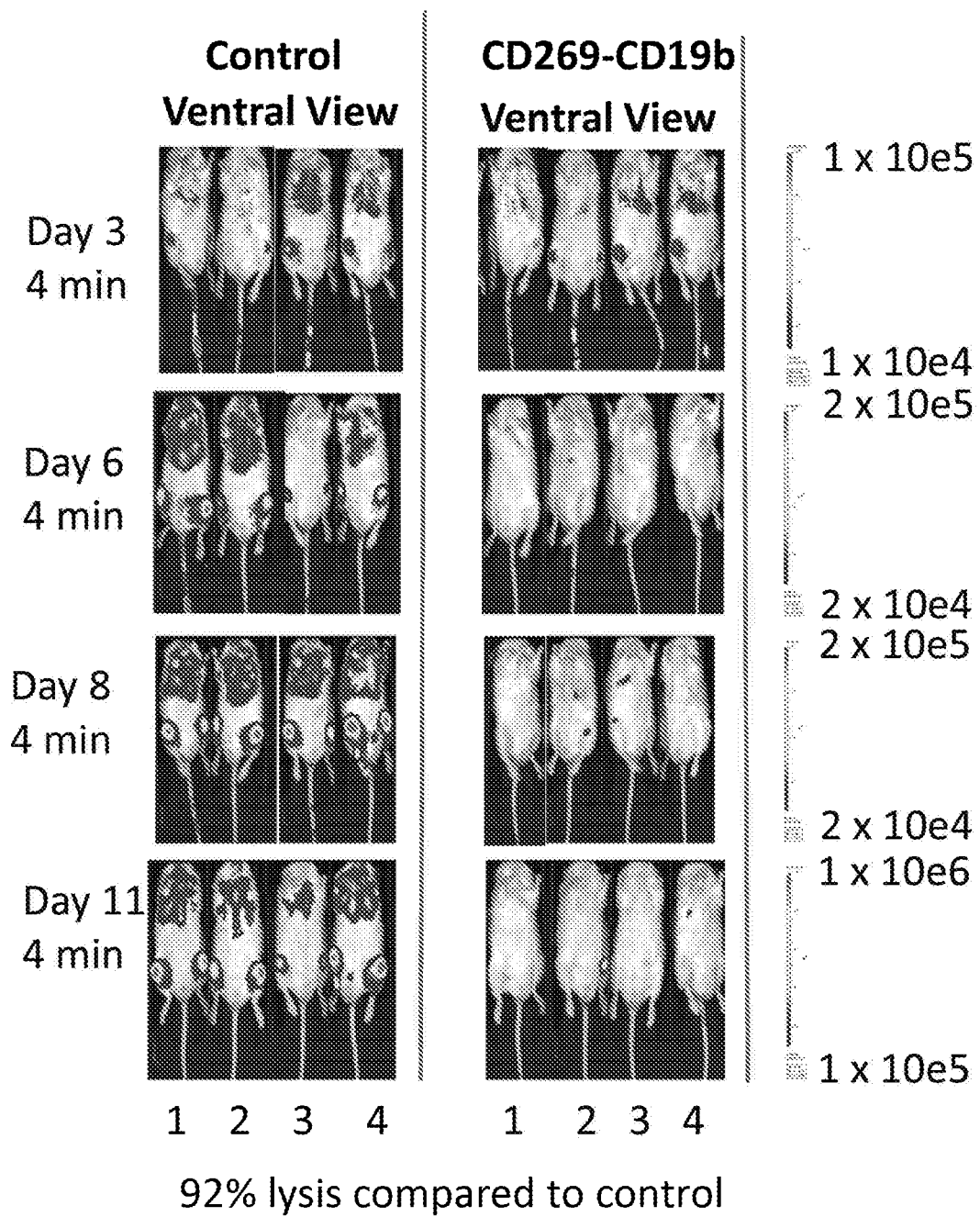


FIGURE 88A

**FIGURE 88B**

**FIGURE 88C**

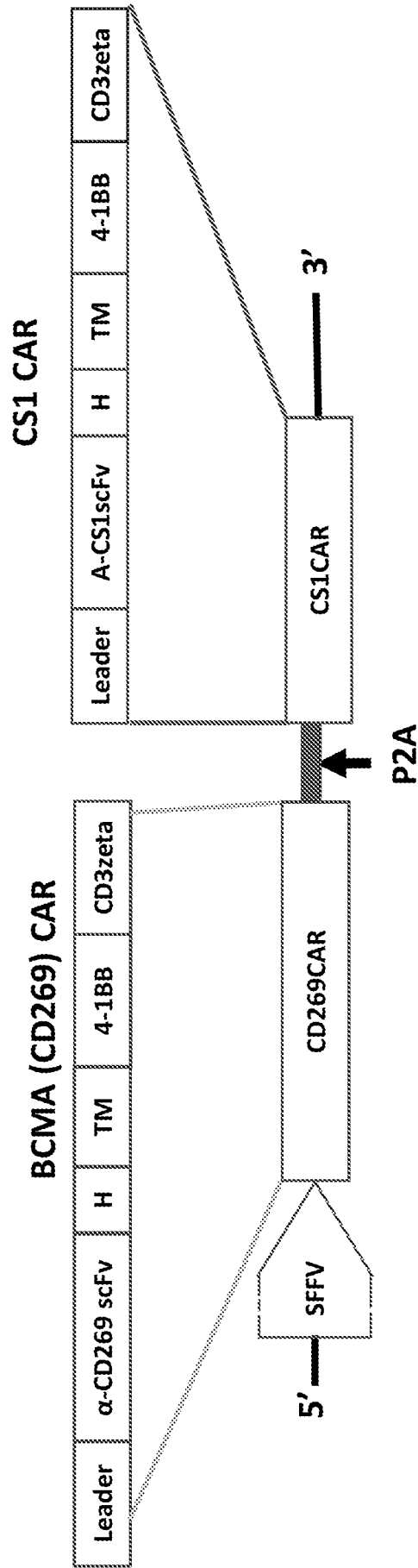
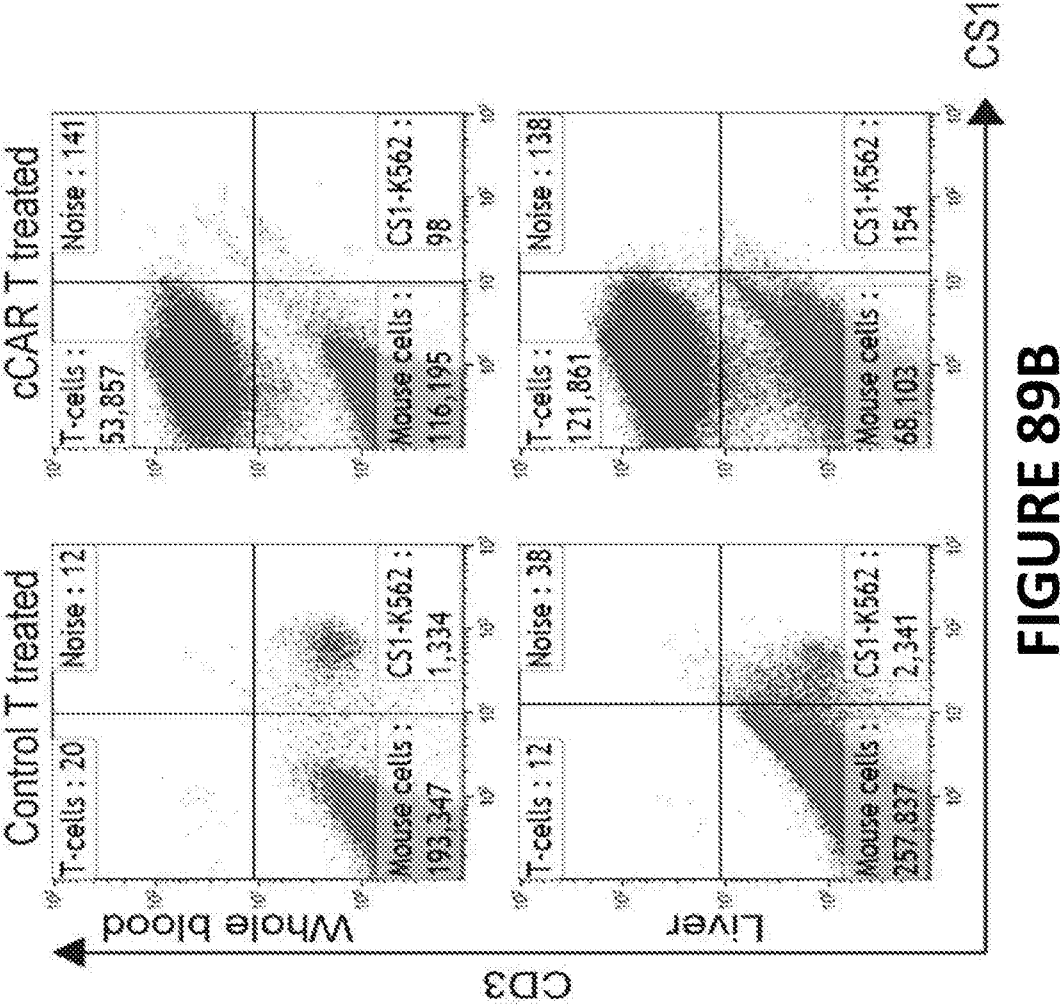


FIGURE 89A

Analysis of CS1-K562 injected mice tissues at time of sacrifice



**Analysis of BCMA-K562 injected mice
tissues at time of sacrifice**

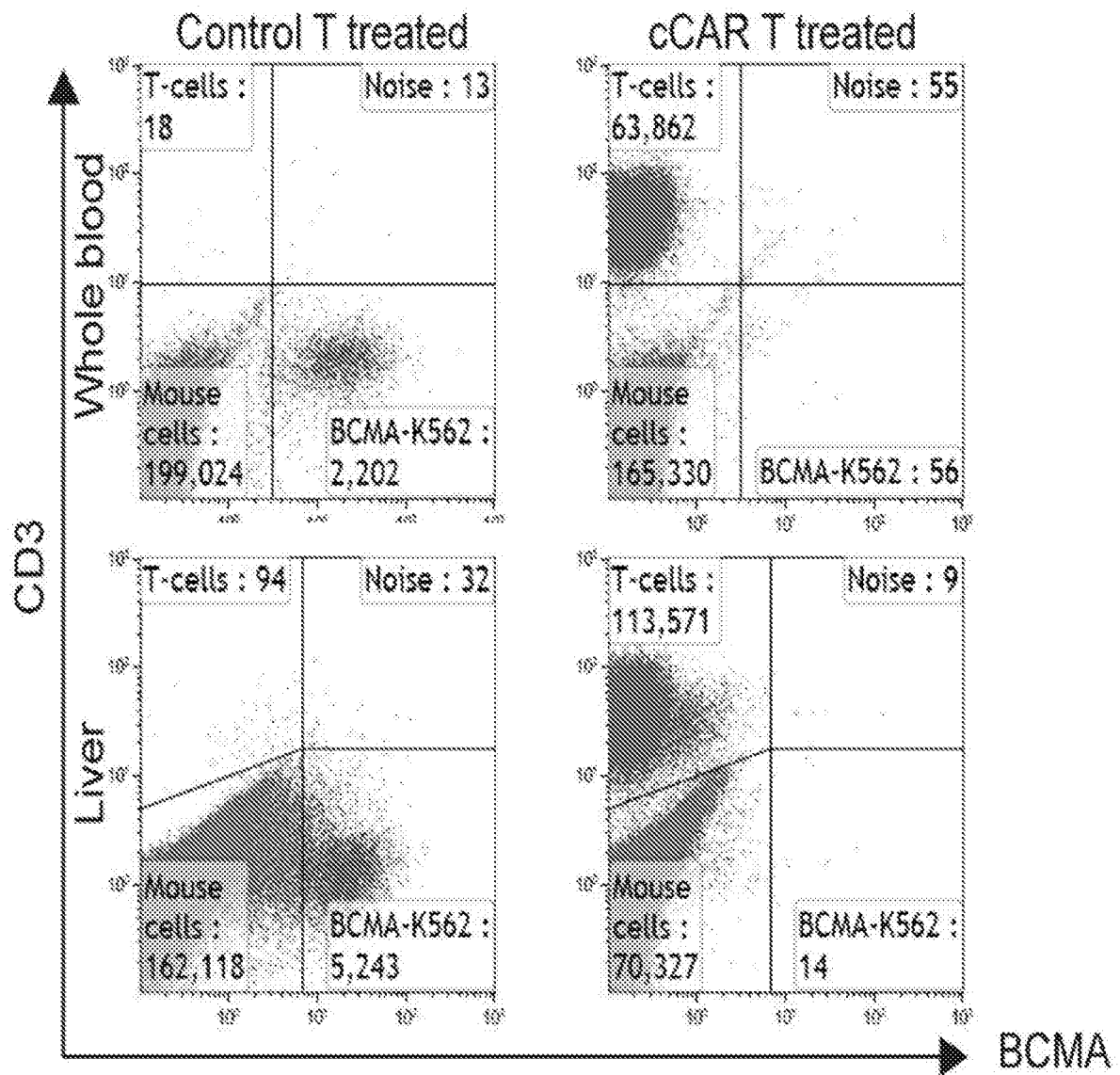
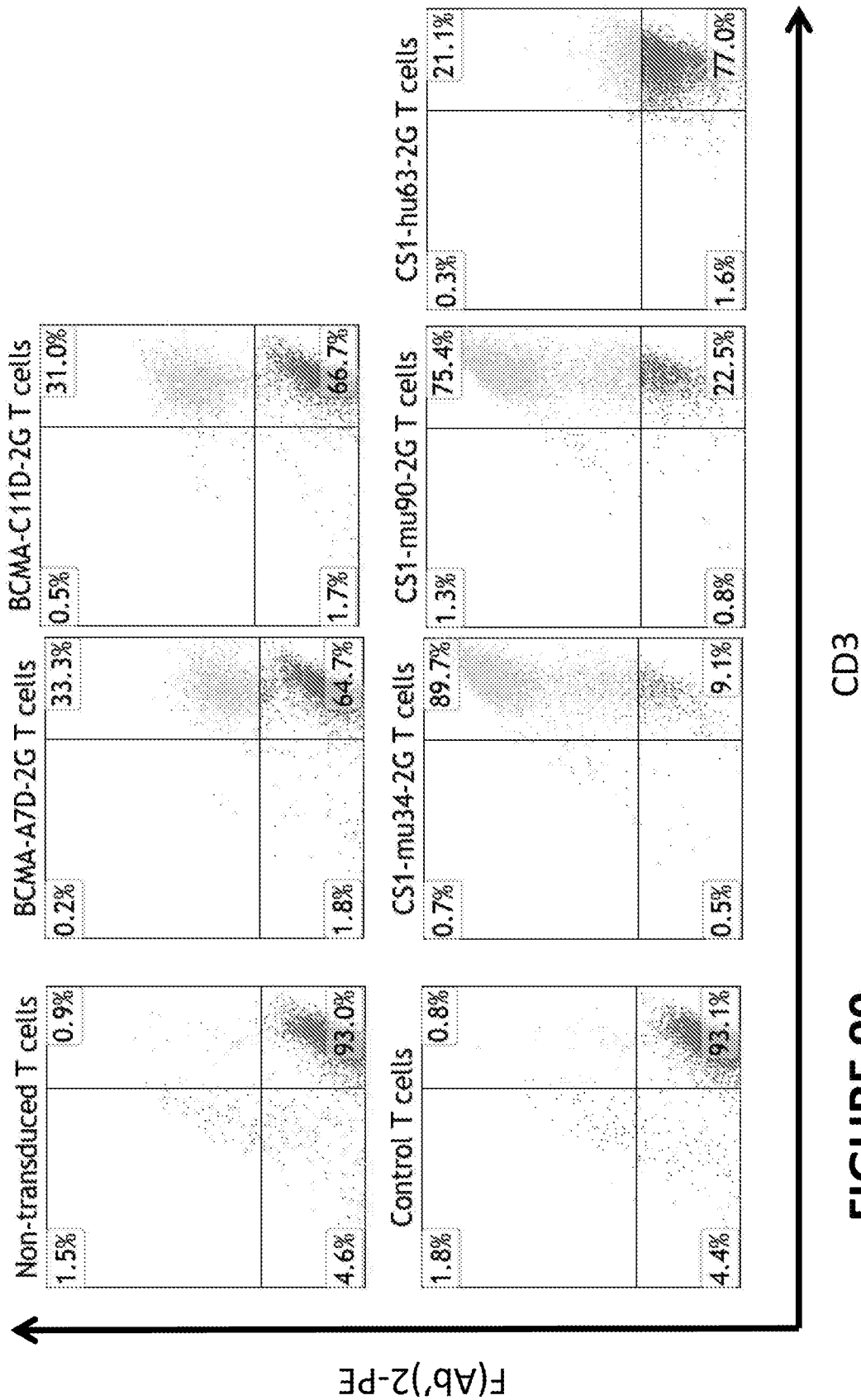


FIGURE 89C



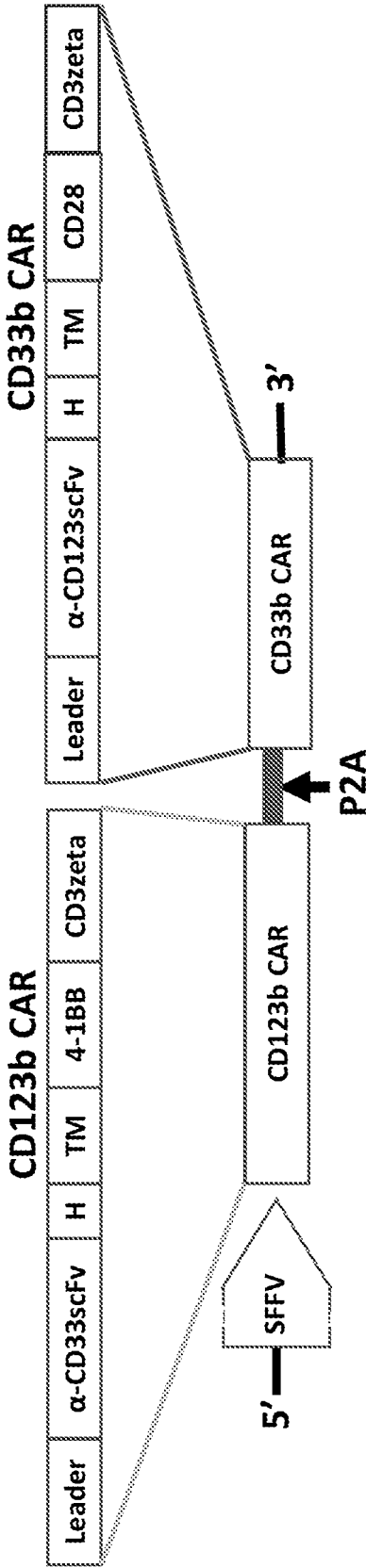


FIGURE 91A

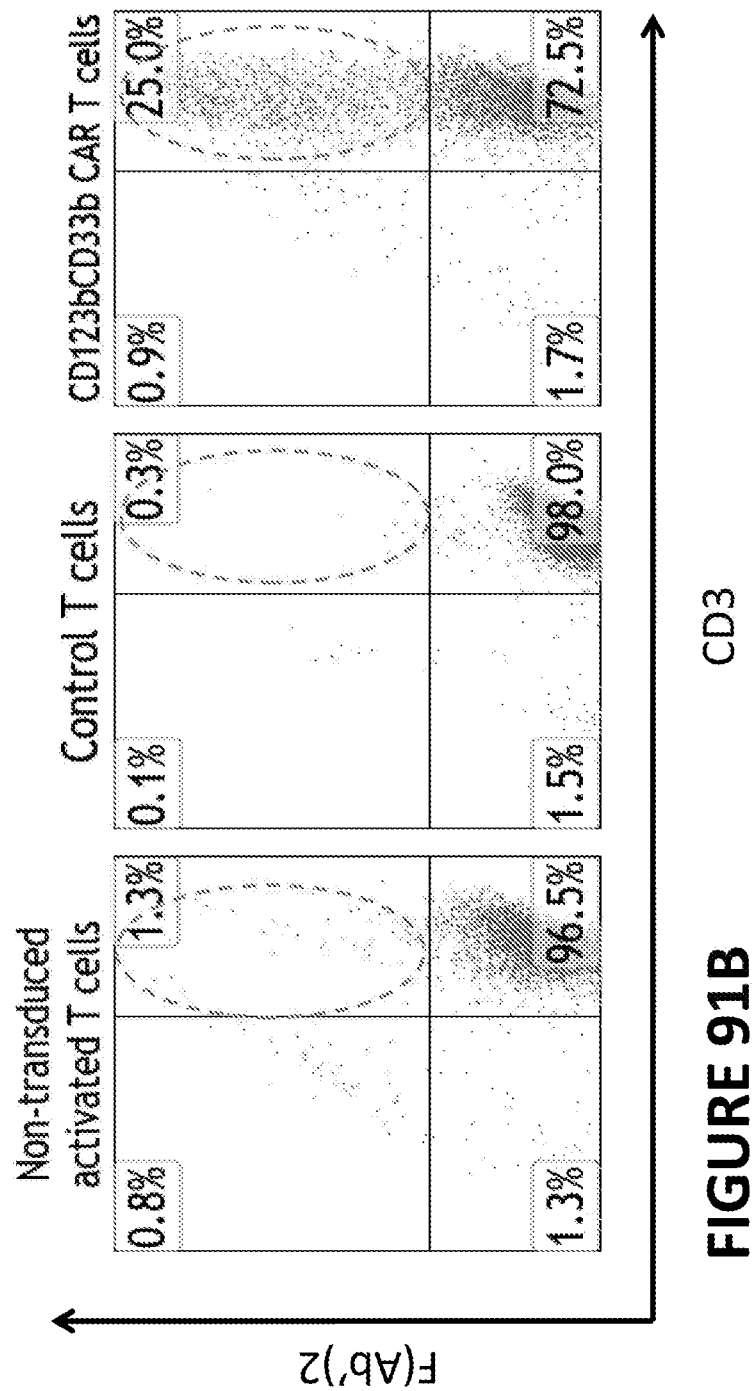
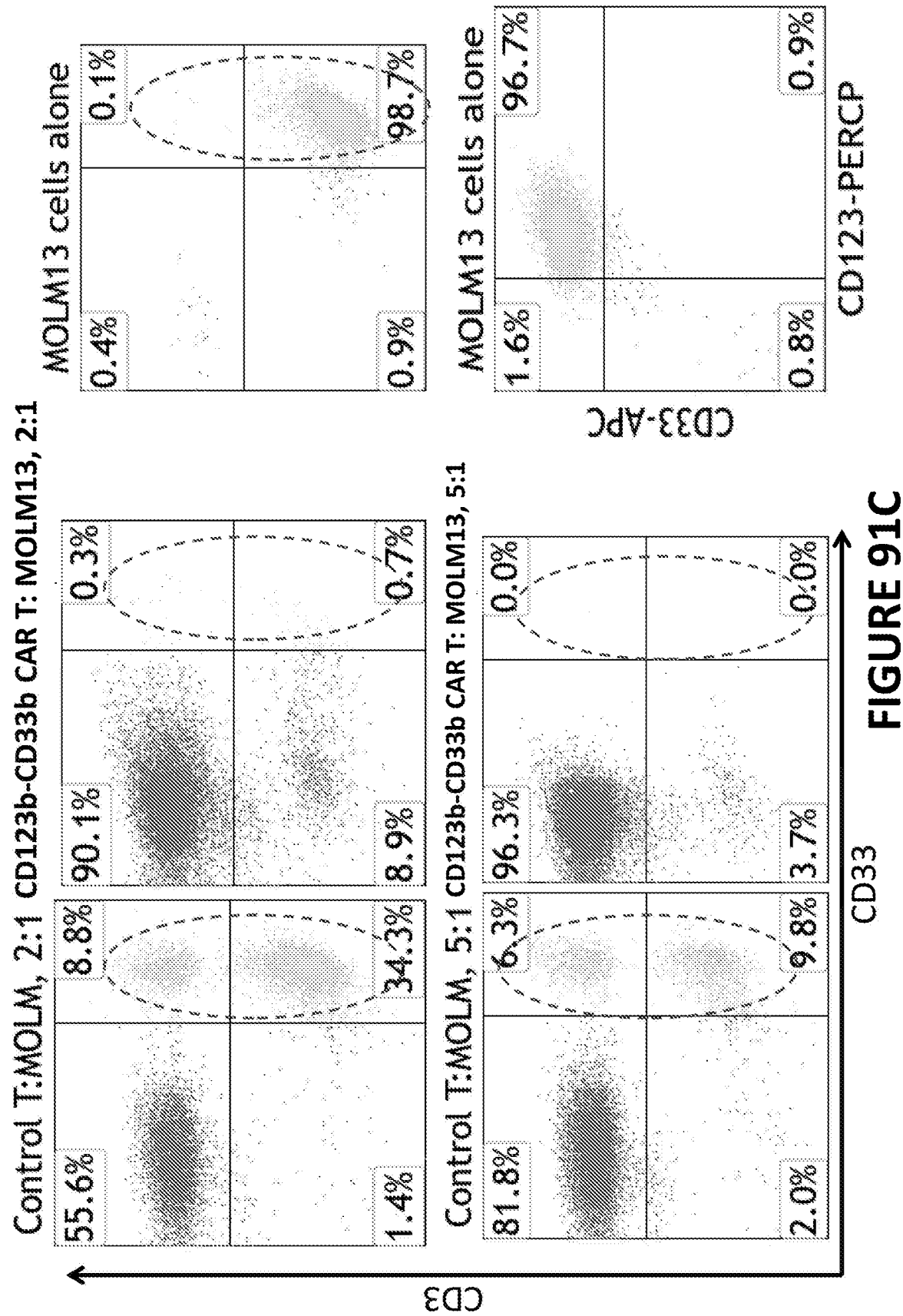
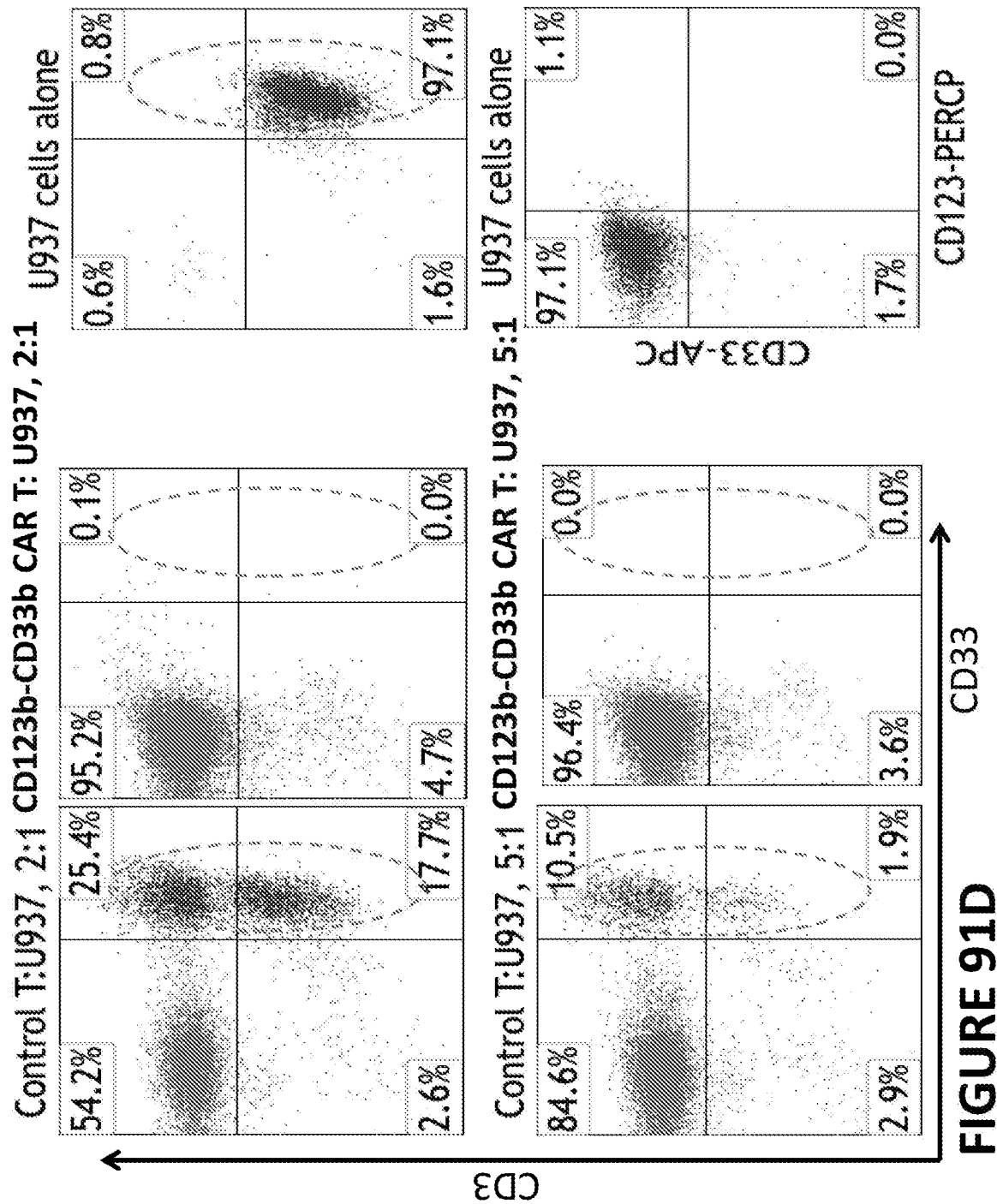
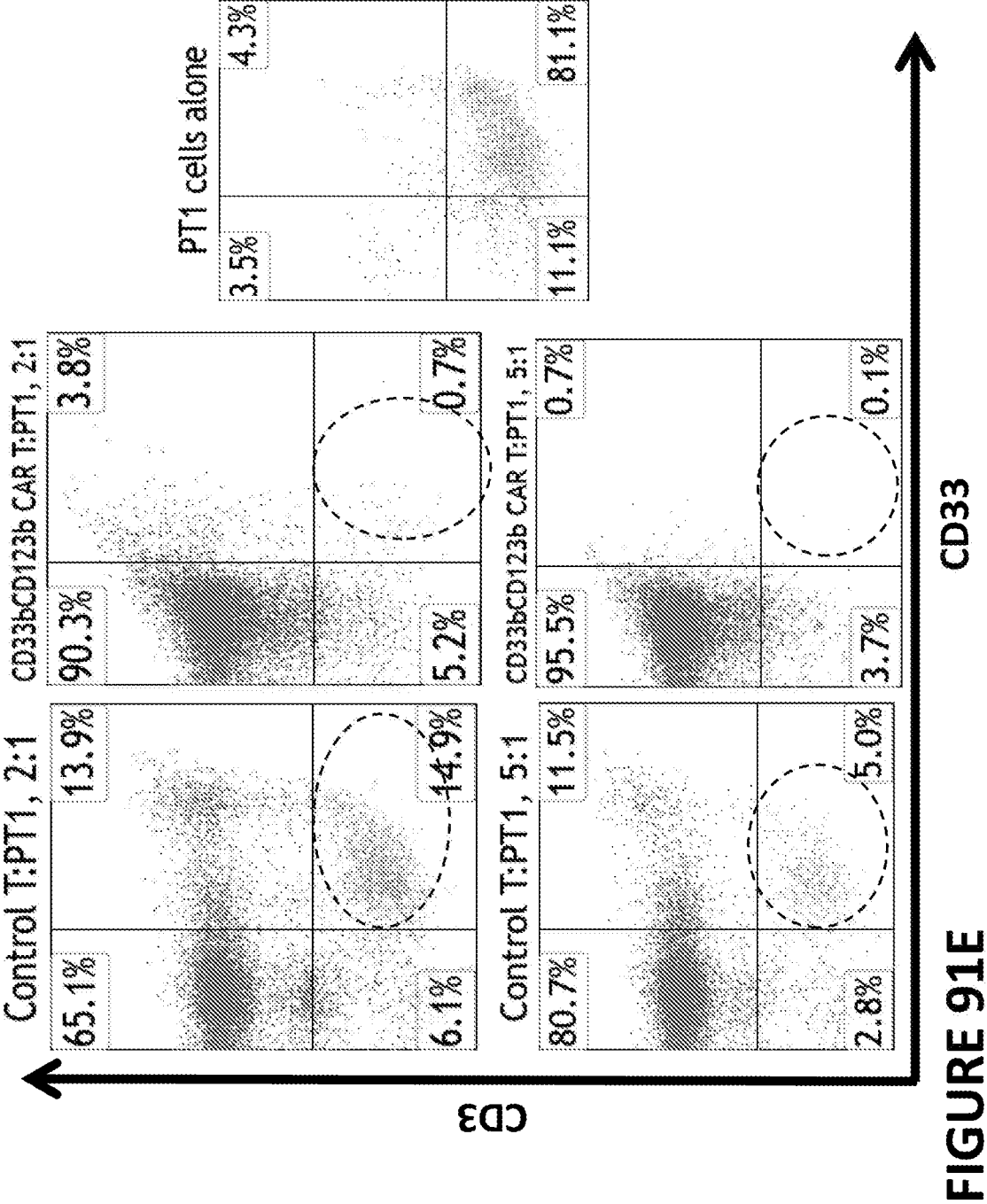


FIGURE 91B







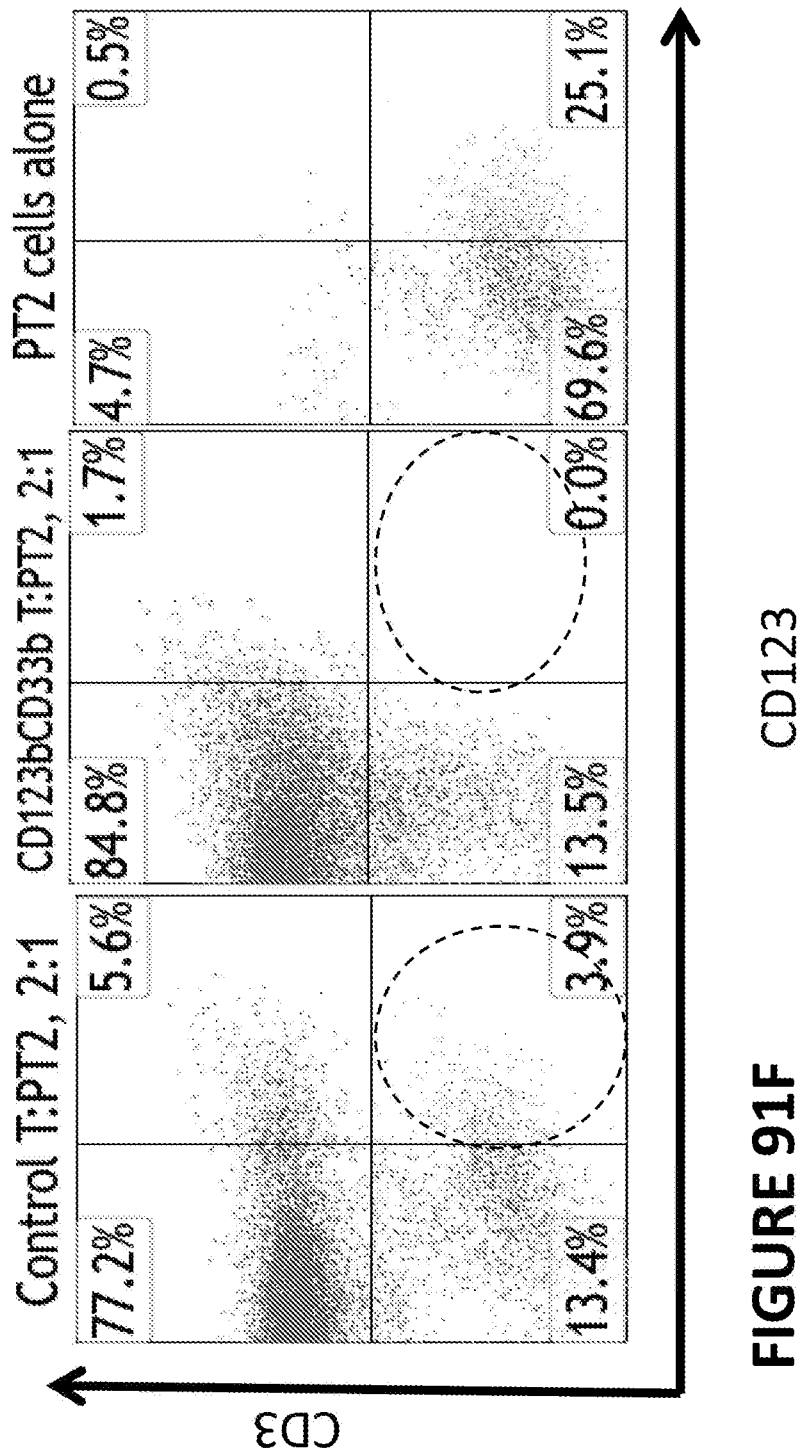
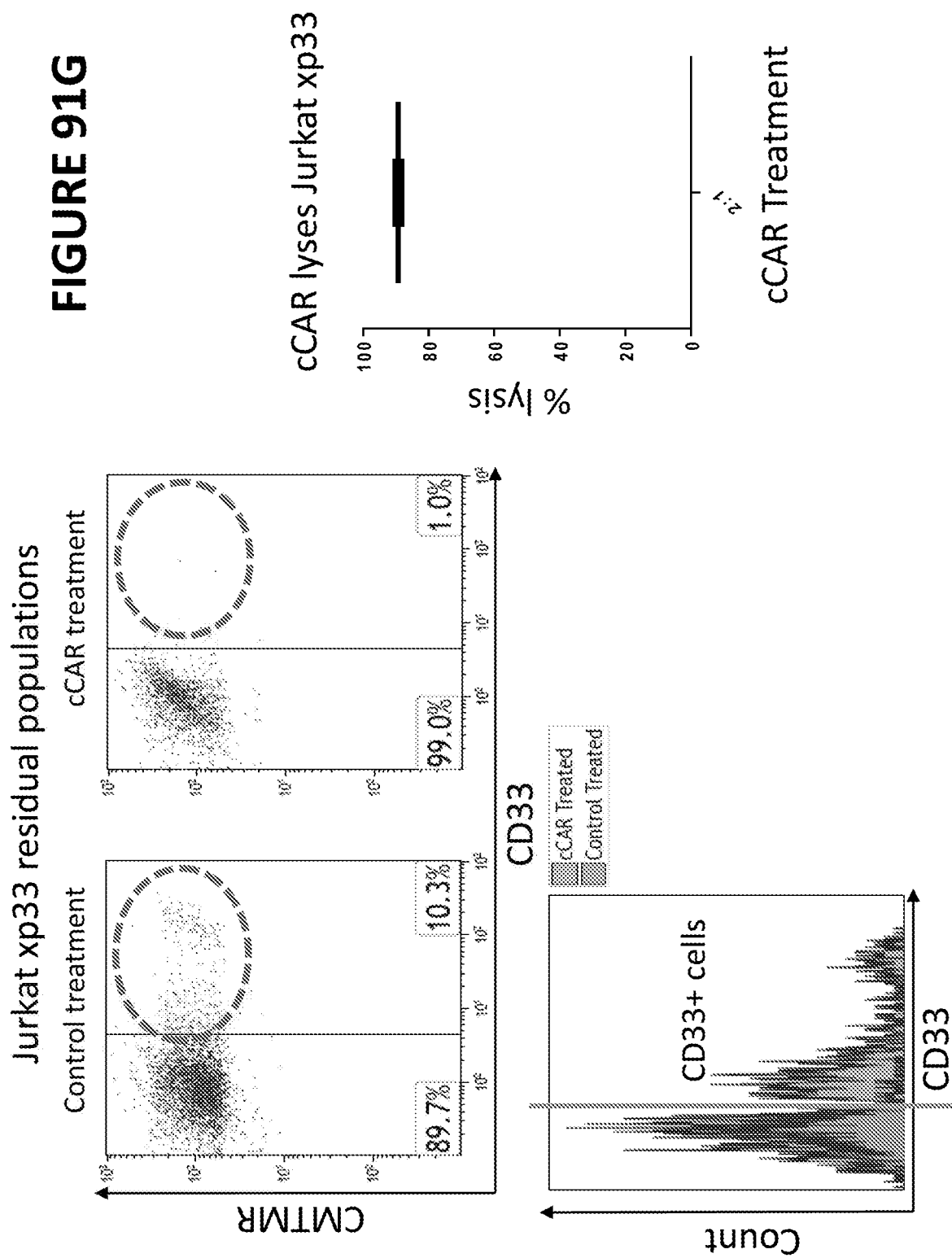


FIGURE 91F

FIGURE 91G



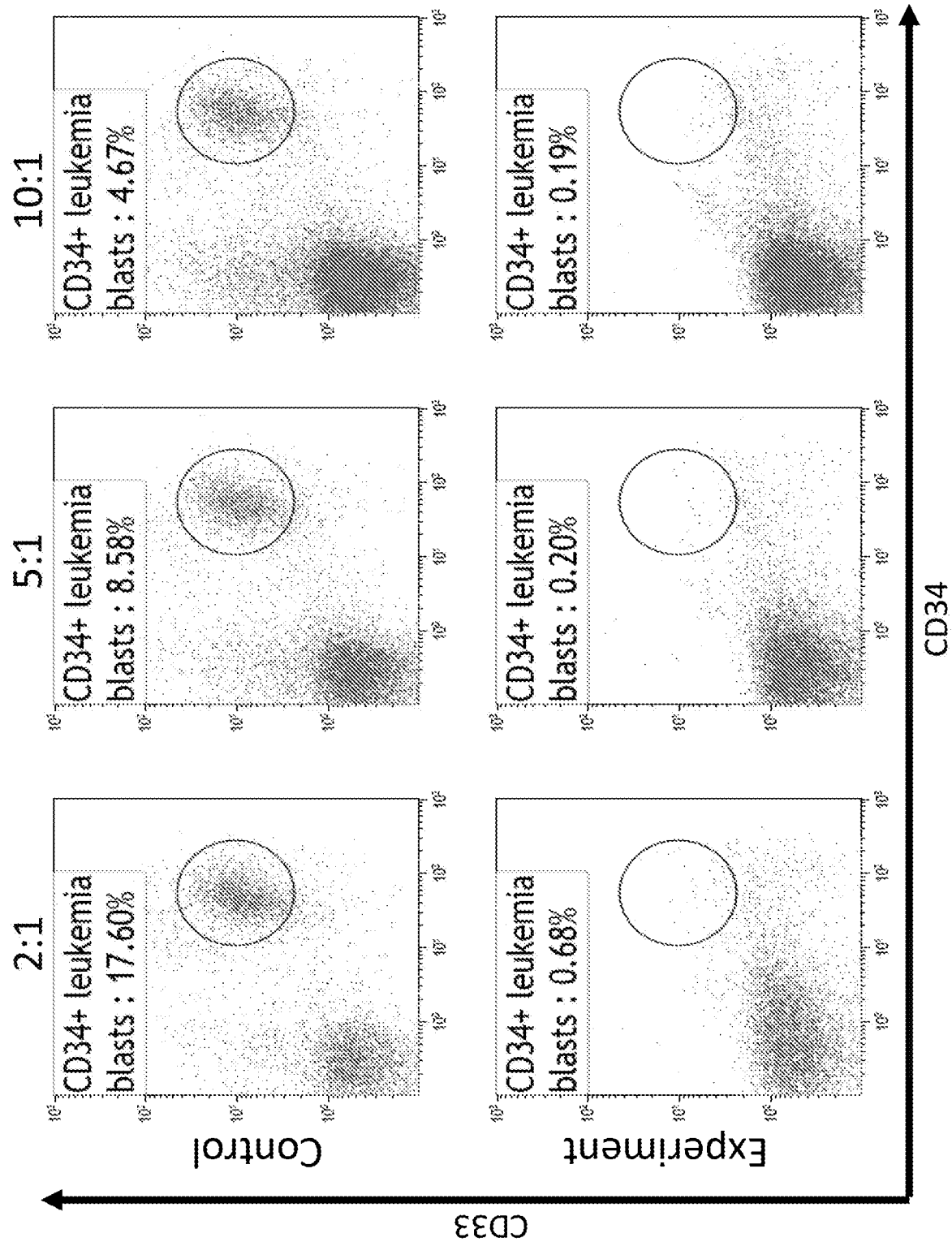
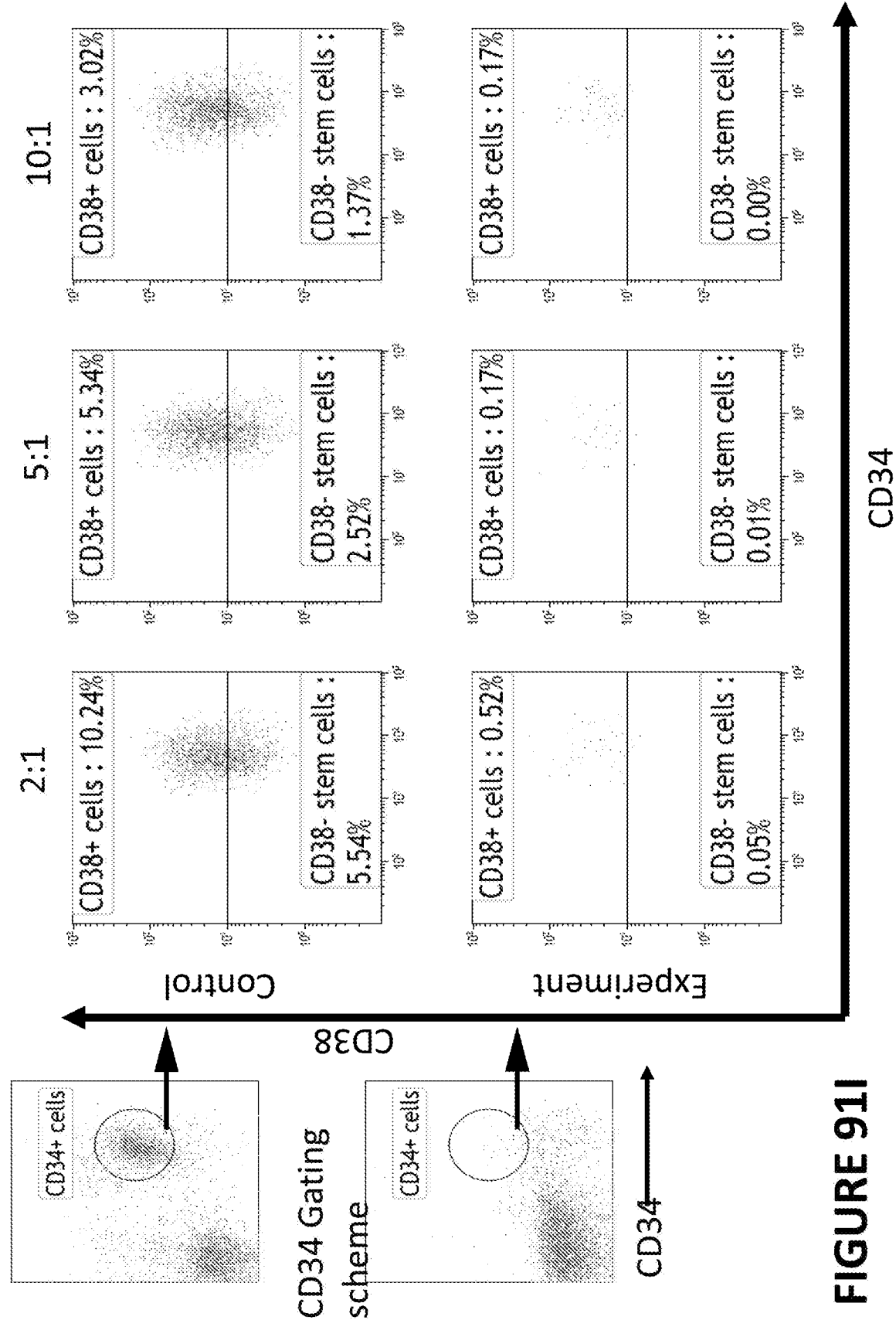
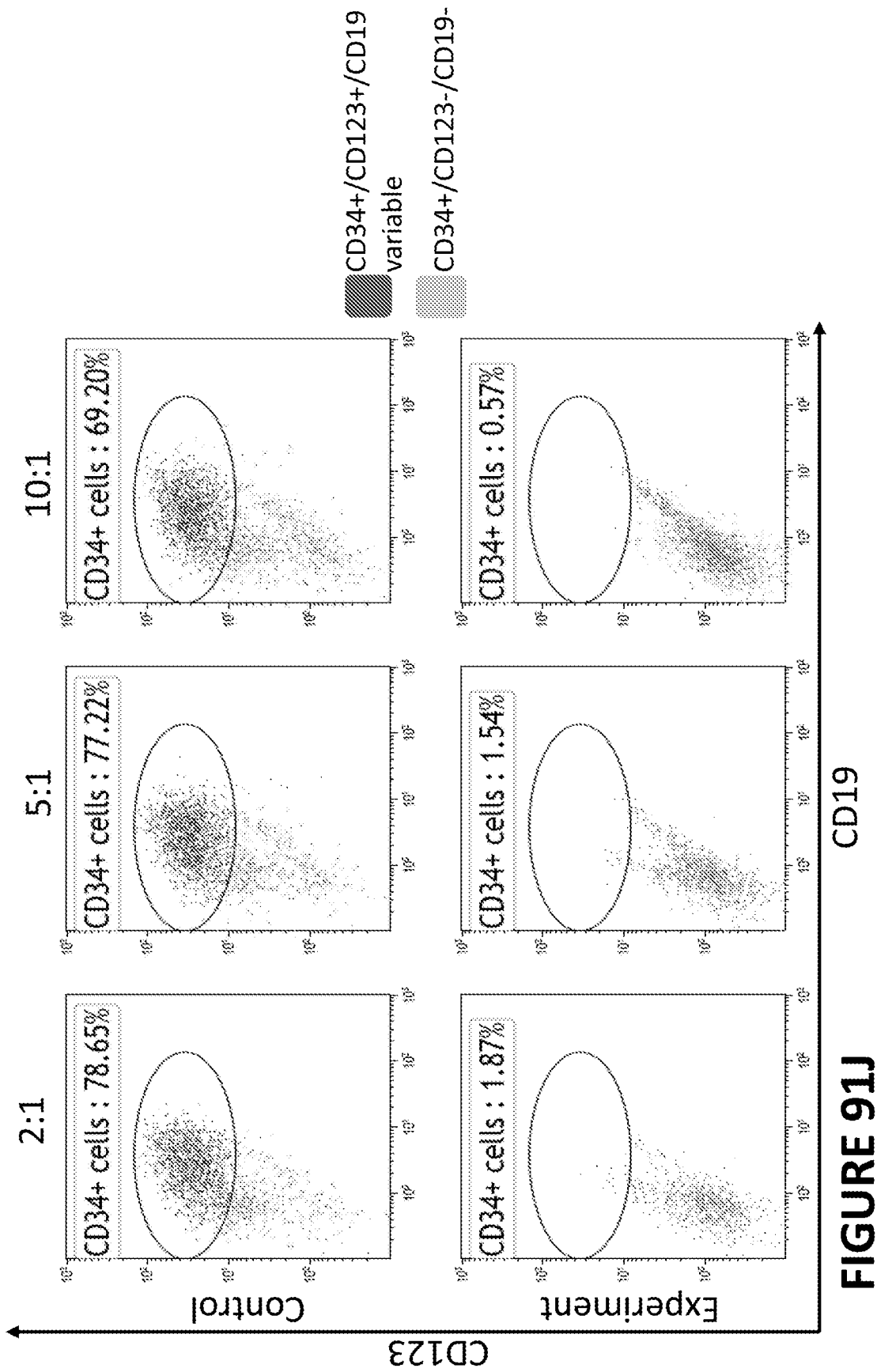


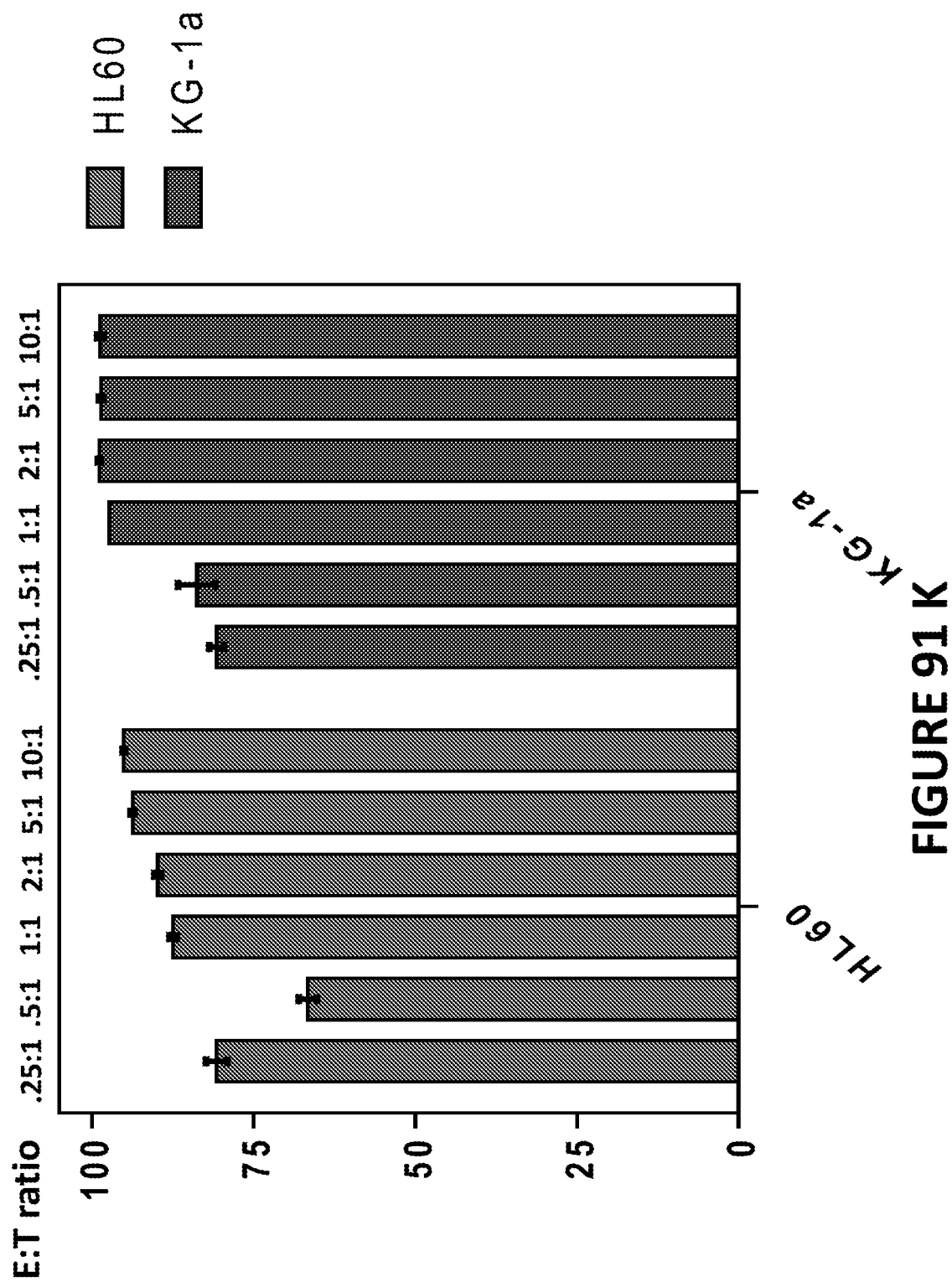
FIGURE 91H

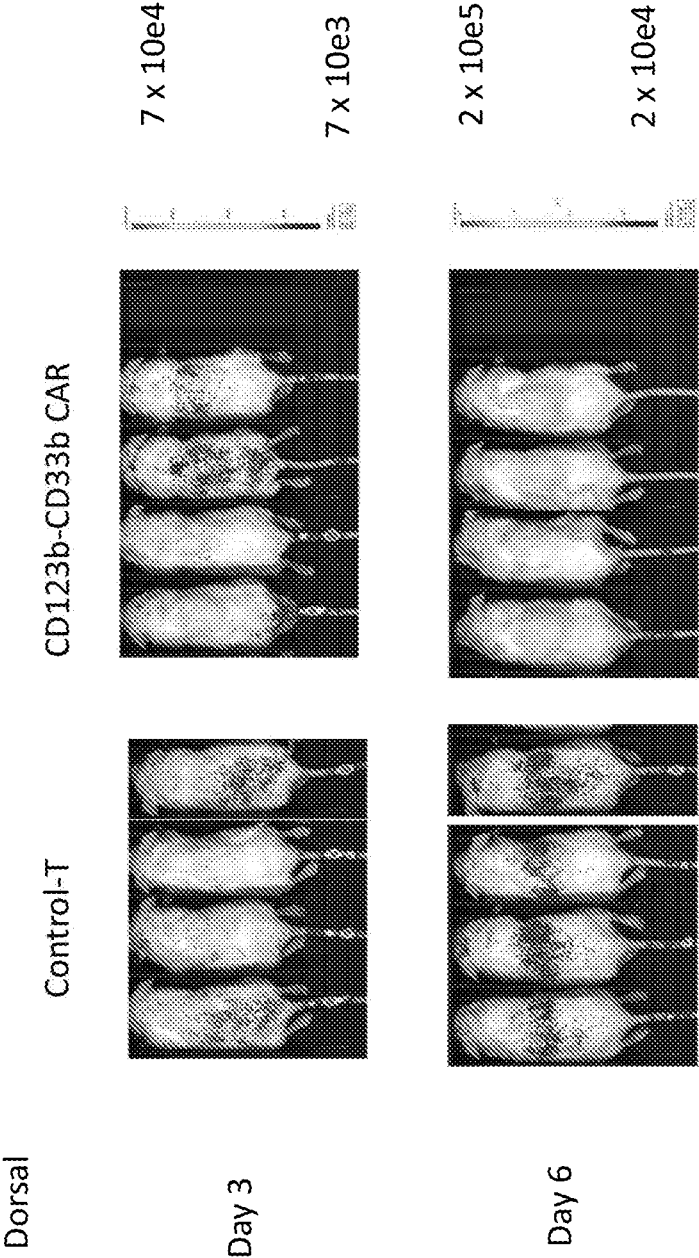




CD19

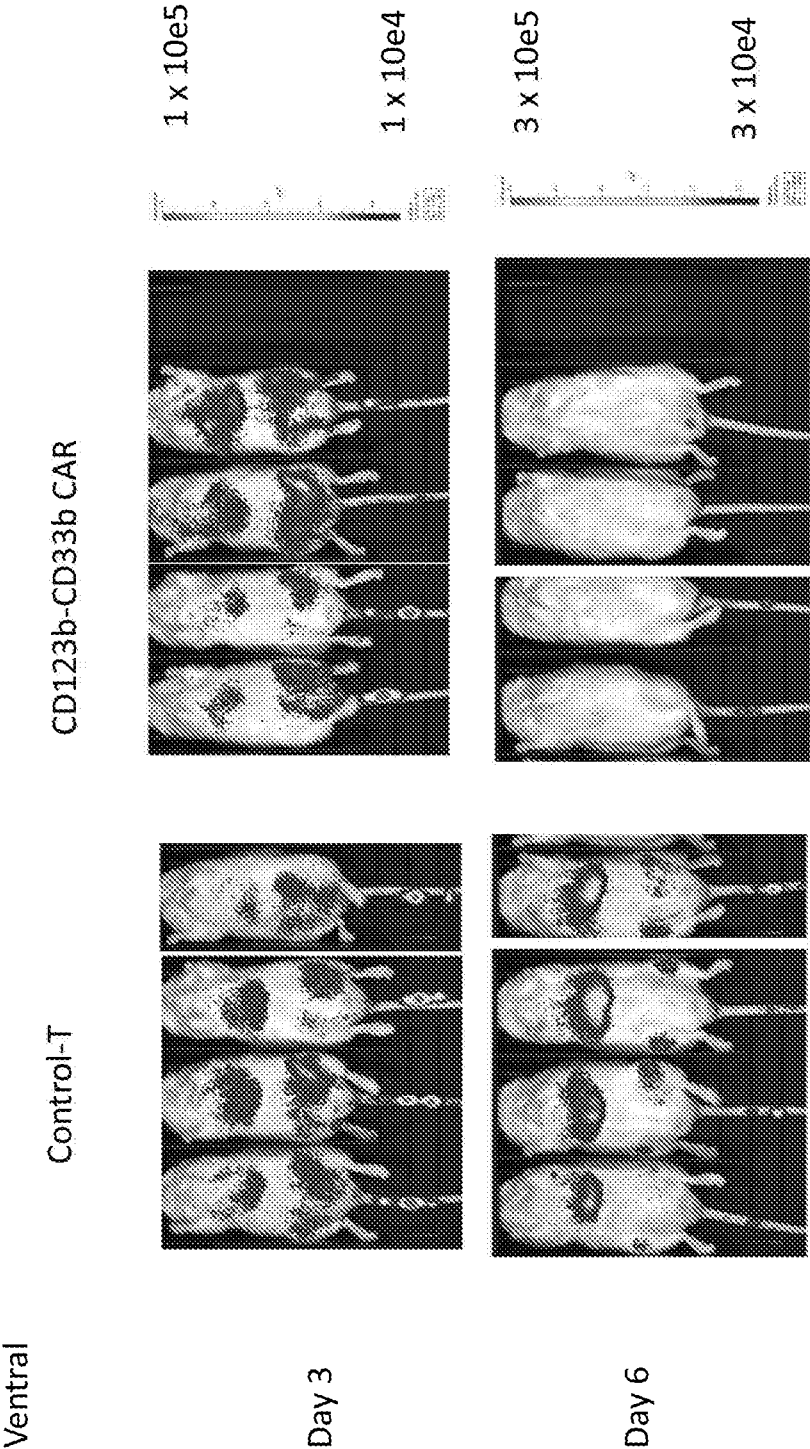
FIGURE 91J





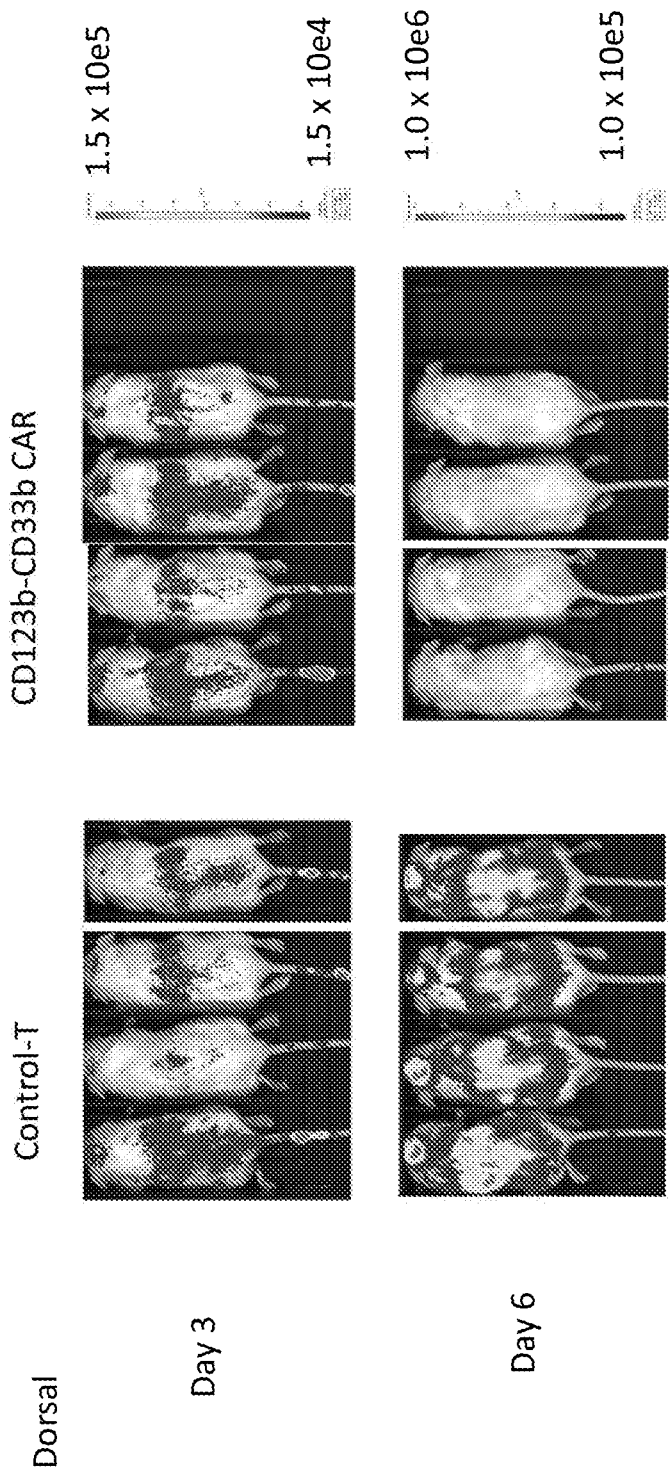
91% lysis, dorsal field in U937 leukemic mice

FIGURE 91 L



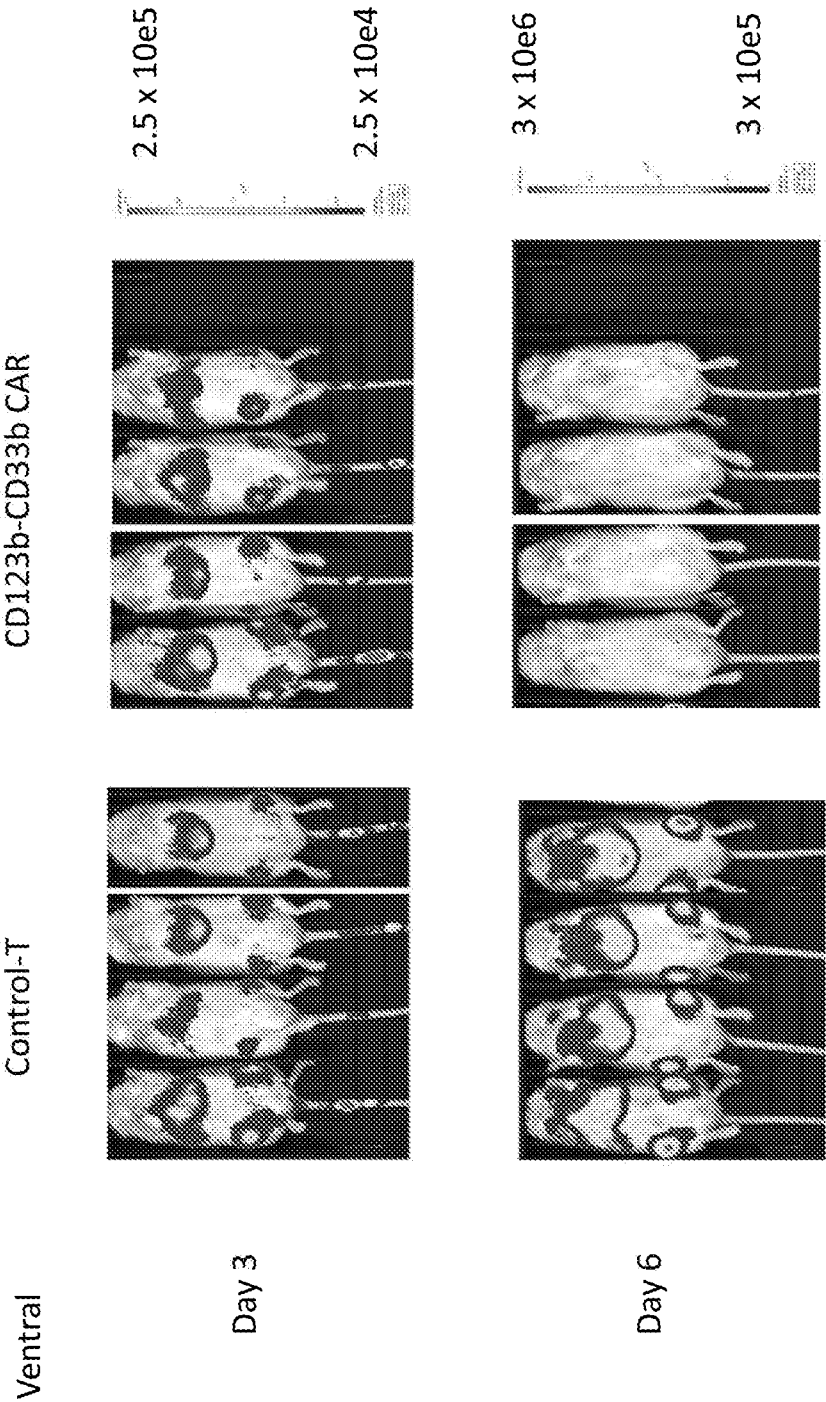
78% lysis, ventral field in U937 leukemic mice

FIGURE 91 M



97% lysis, dorsal field in MOLM13 leukemic mice

FIGURE 91 N



95% lysis, ventral field in MOLM13 leukemic mice

FIGURE 91 O

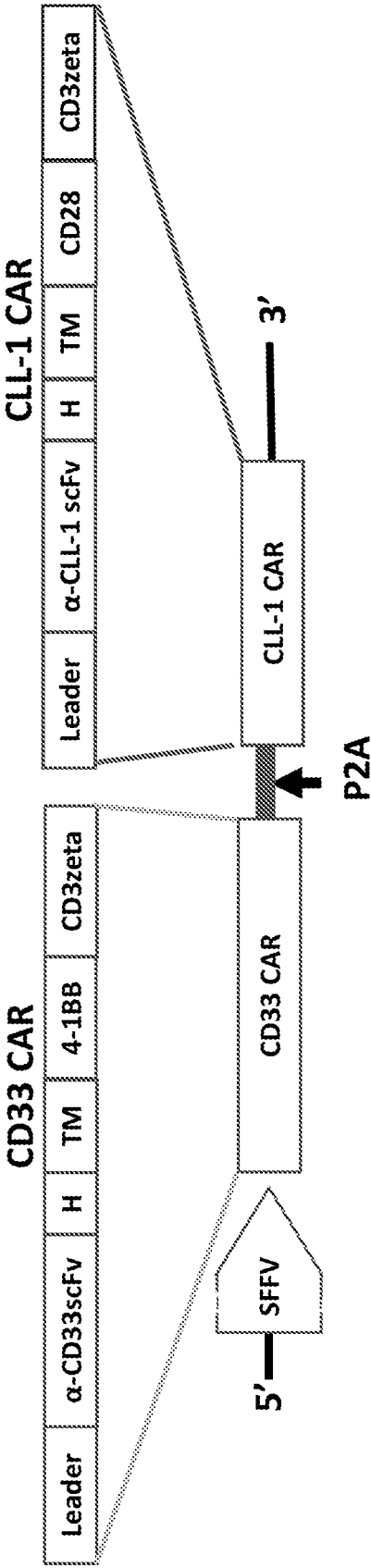


FIGURE 92

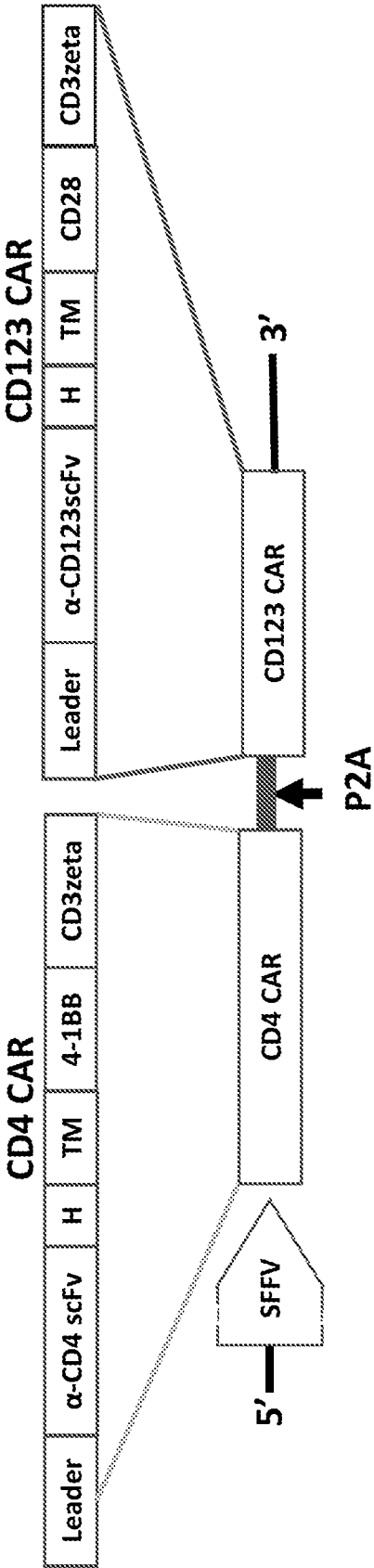


FIGURE 93

FIGURE 94A

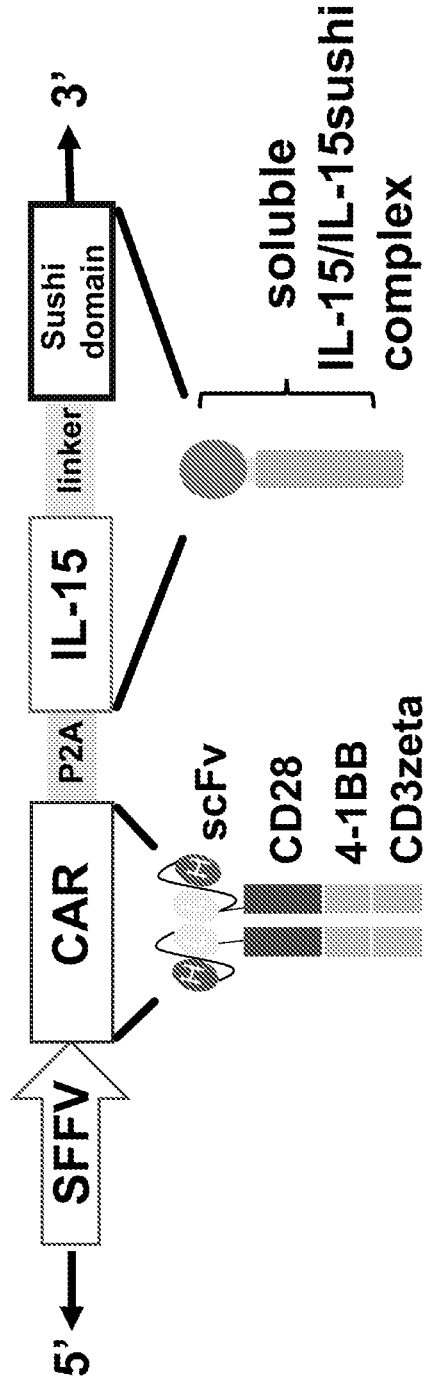
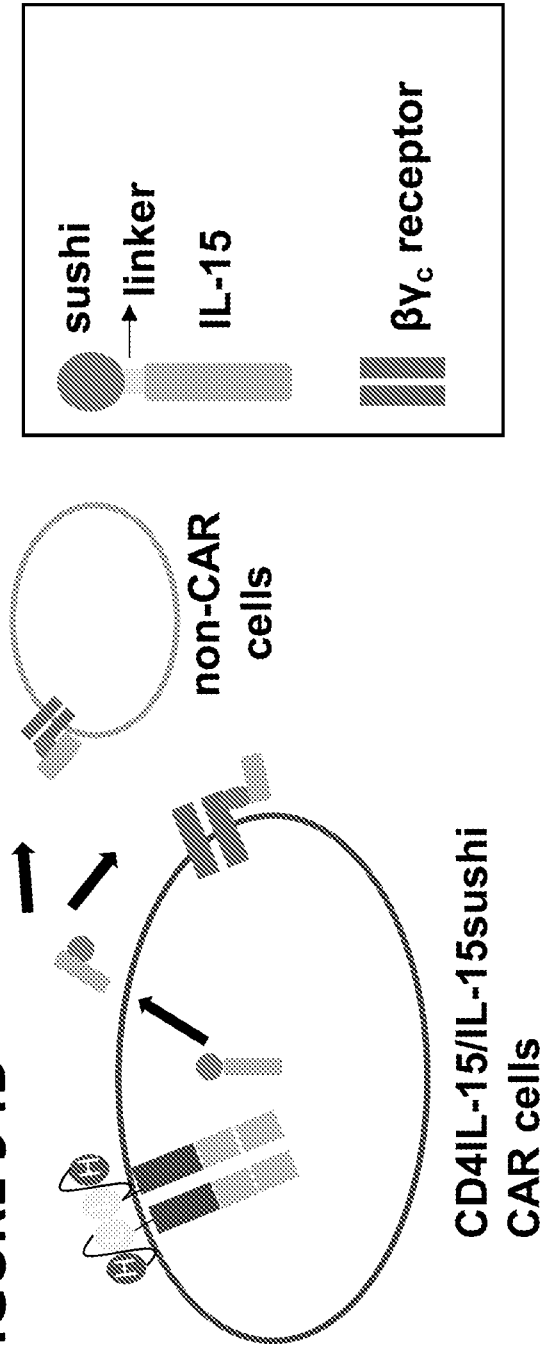


FIGURE 94B



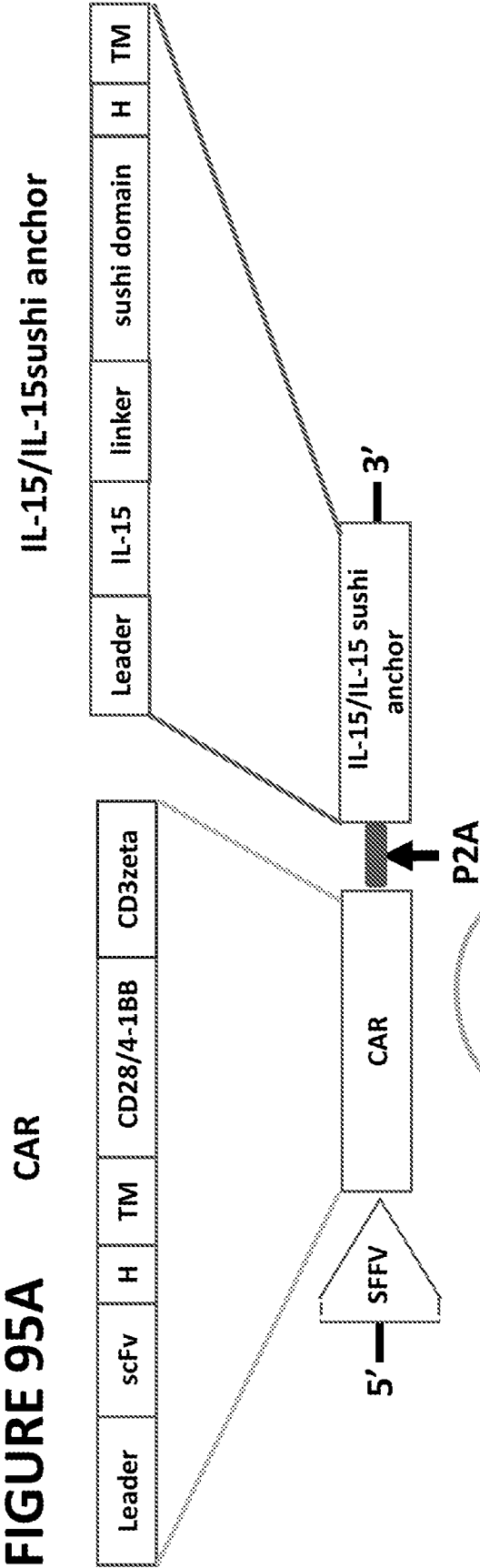
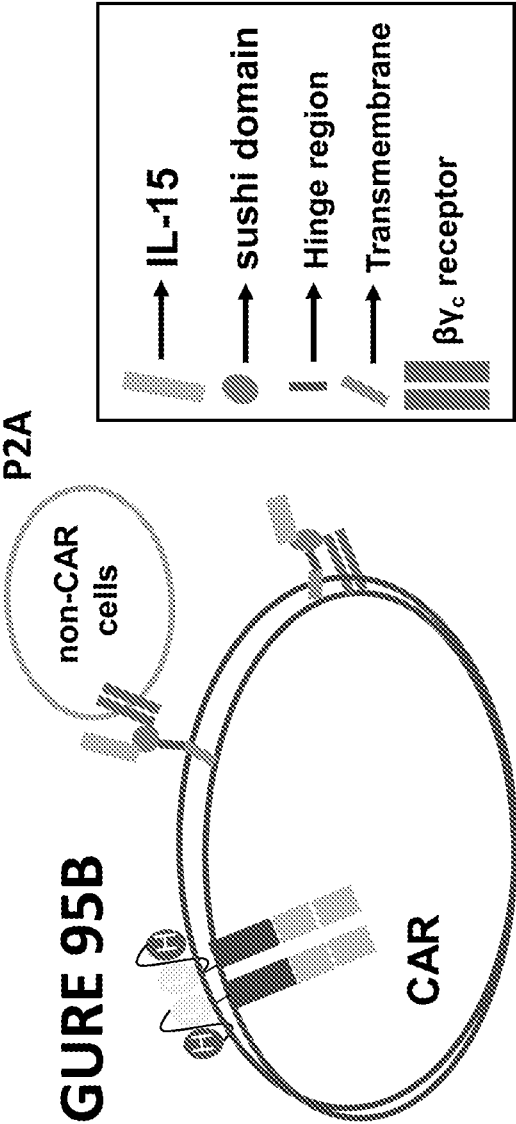


FIGURE 95B



IL-15/IL-15 sushi CAR cells

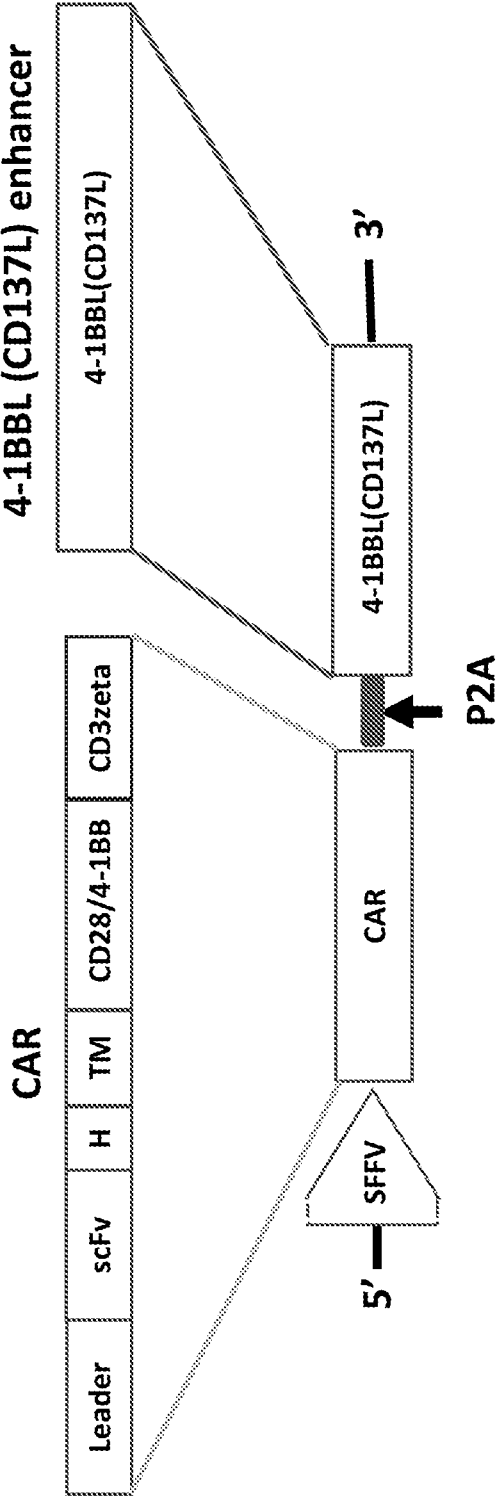


FIGURE 96A

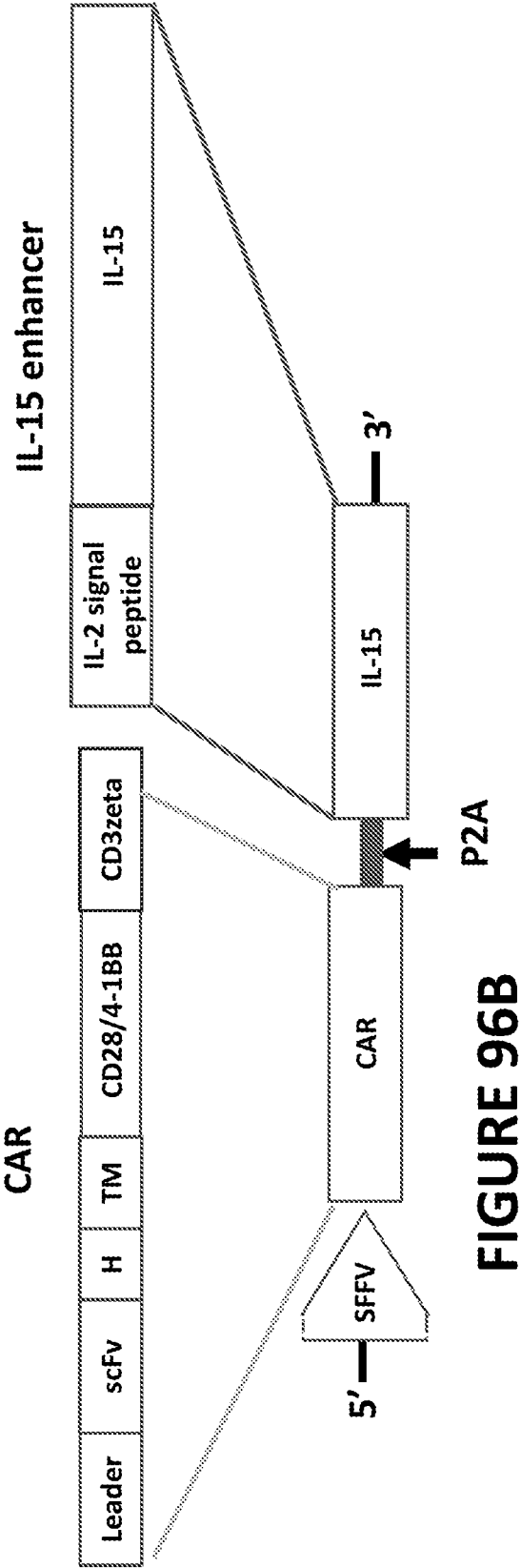


FIGURE 96B

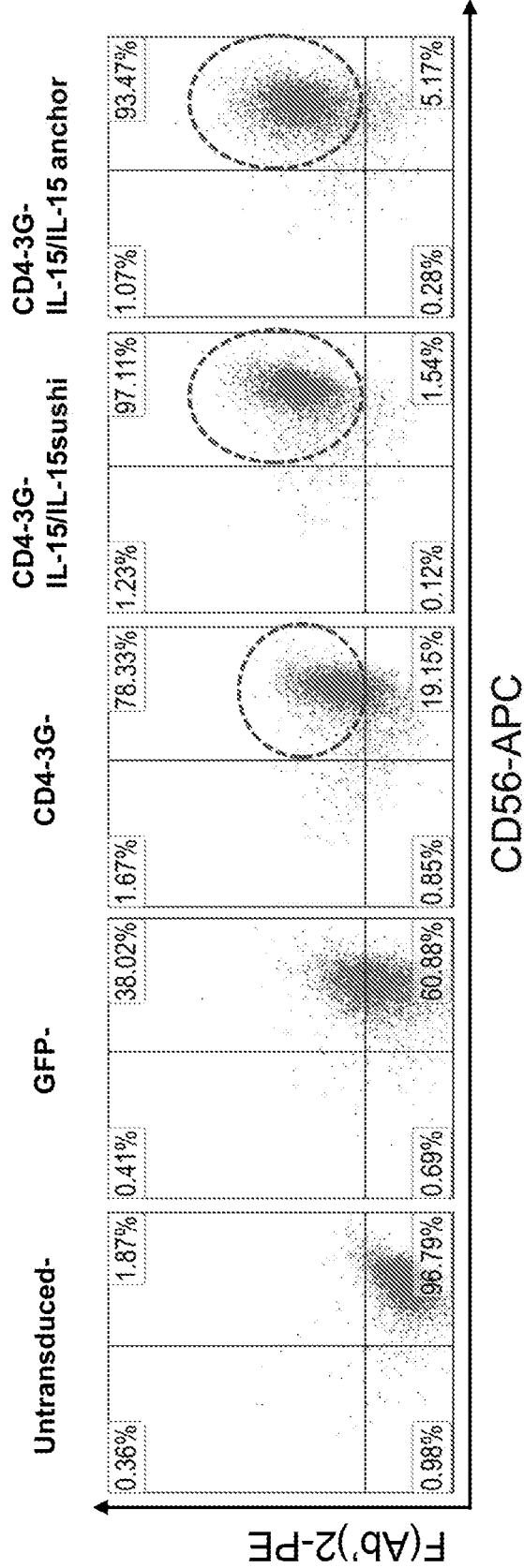


FIGURE 97A

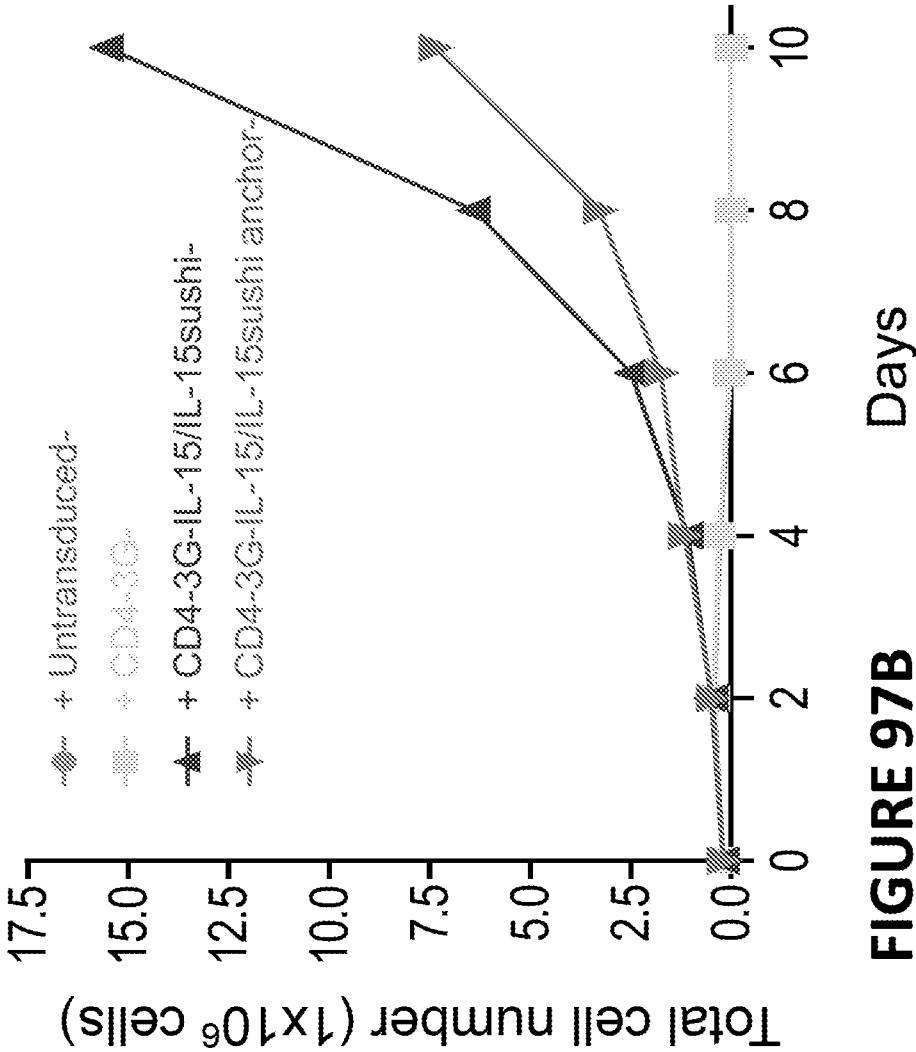
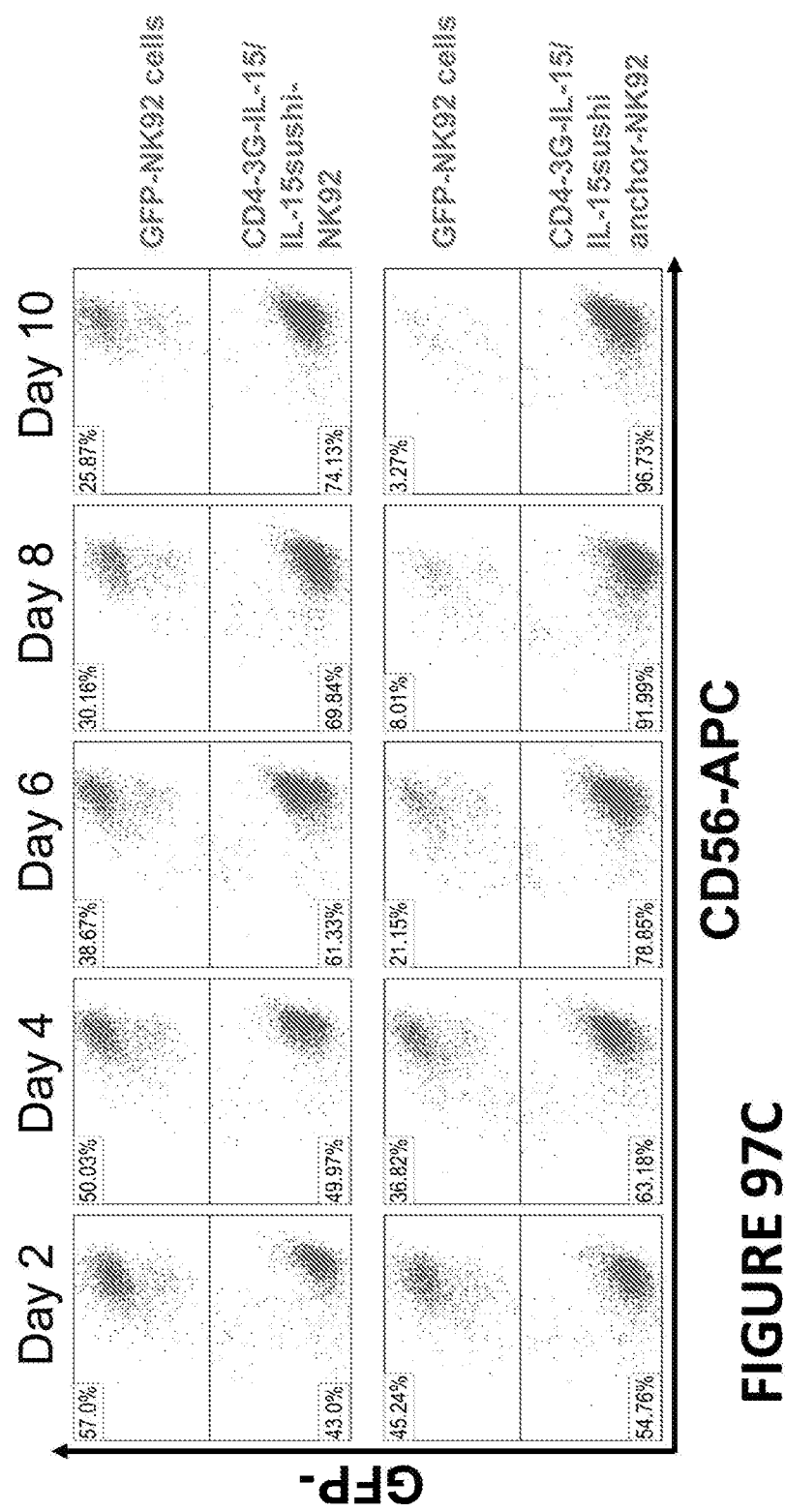


FIGURE 97B



CD56-APC

FIGURE 97C

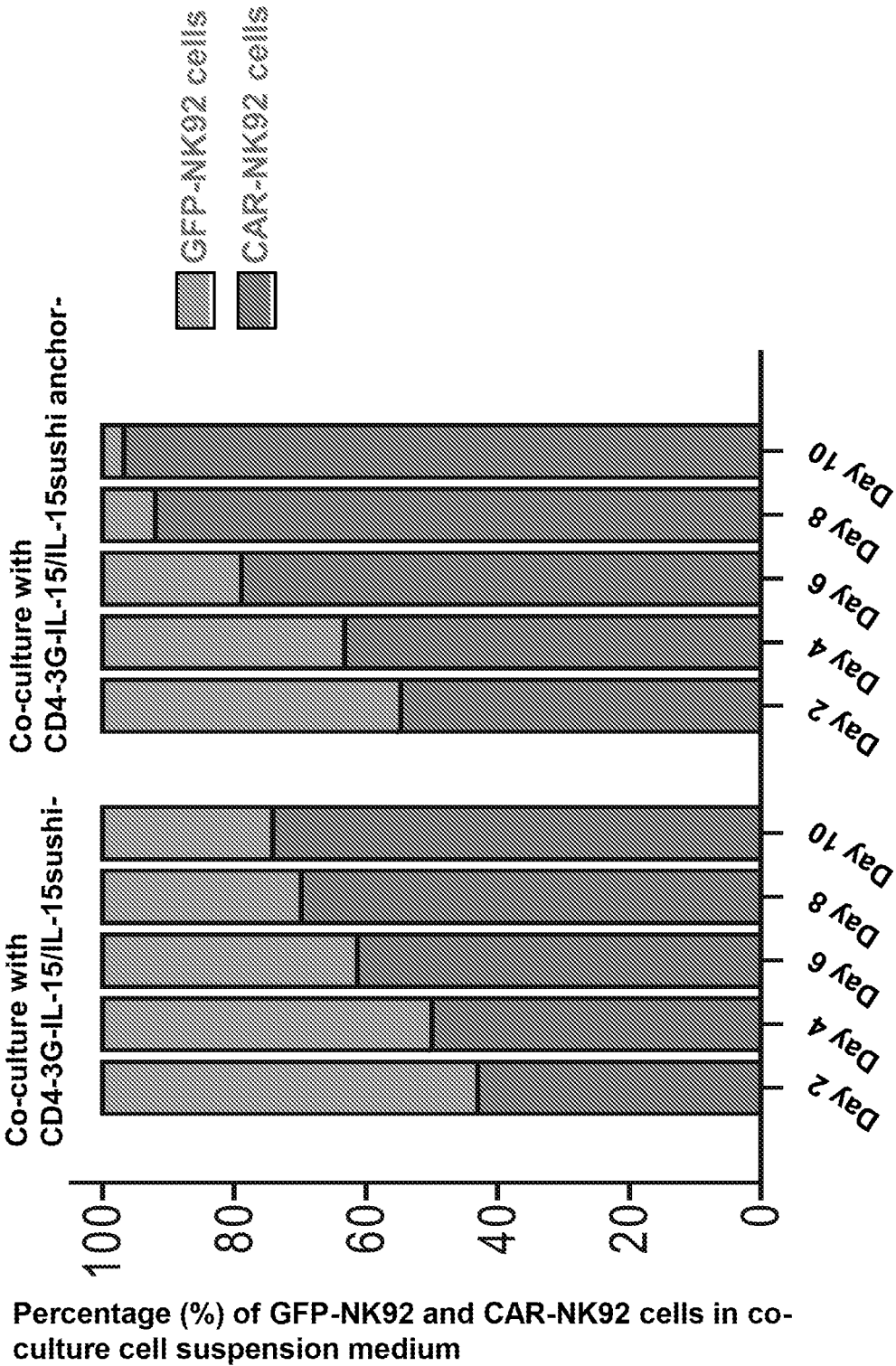
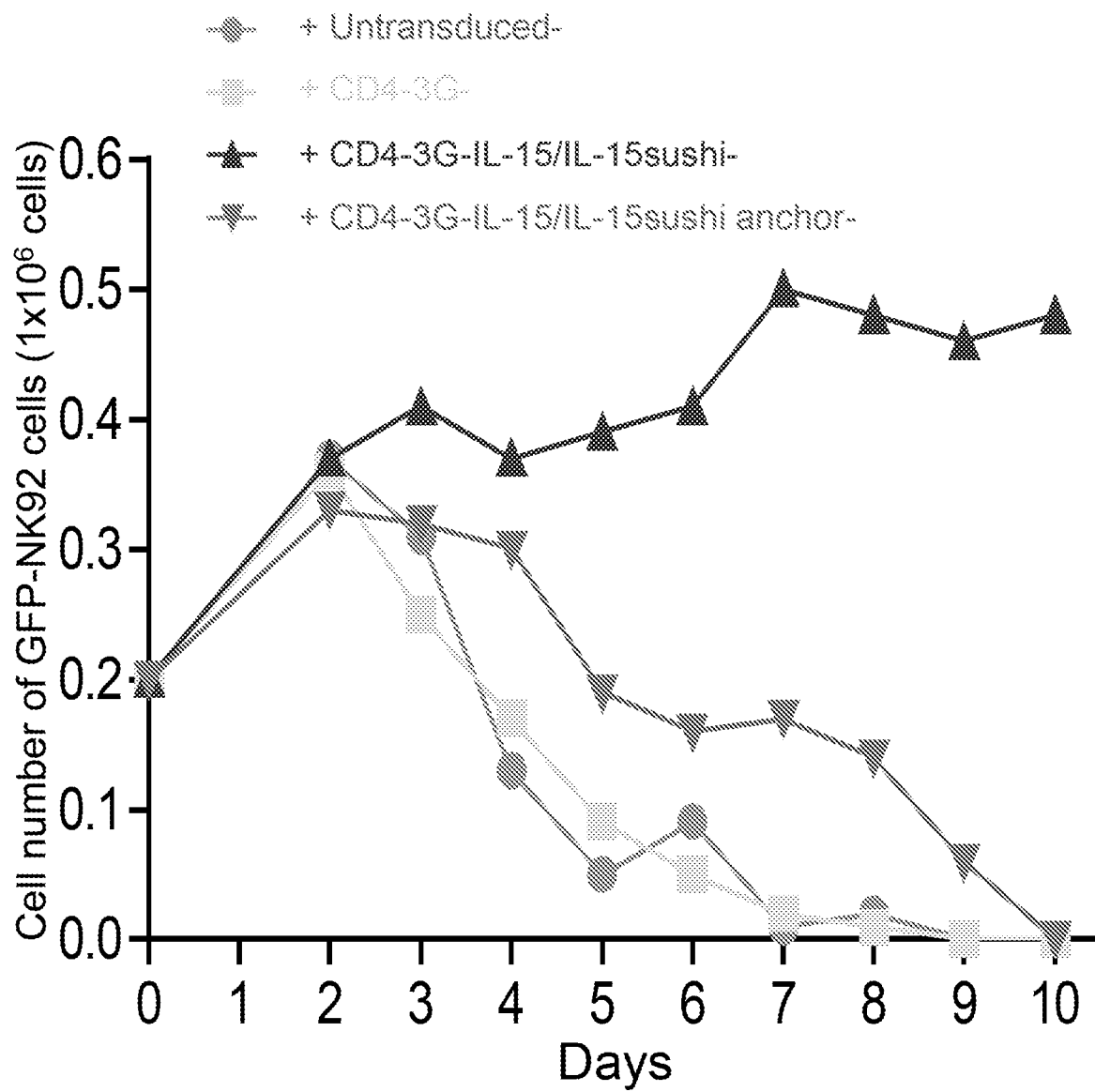


FIGURE 97D

**FIGURE 97E**

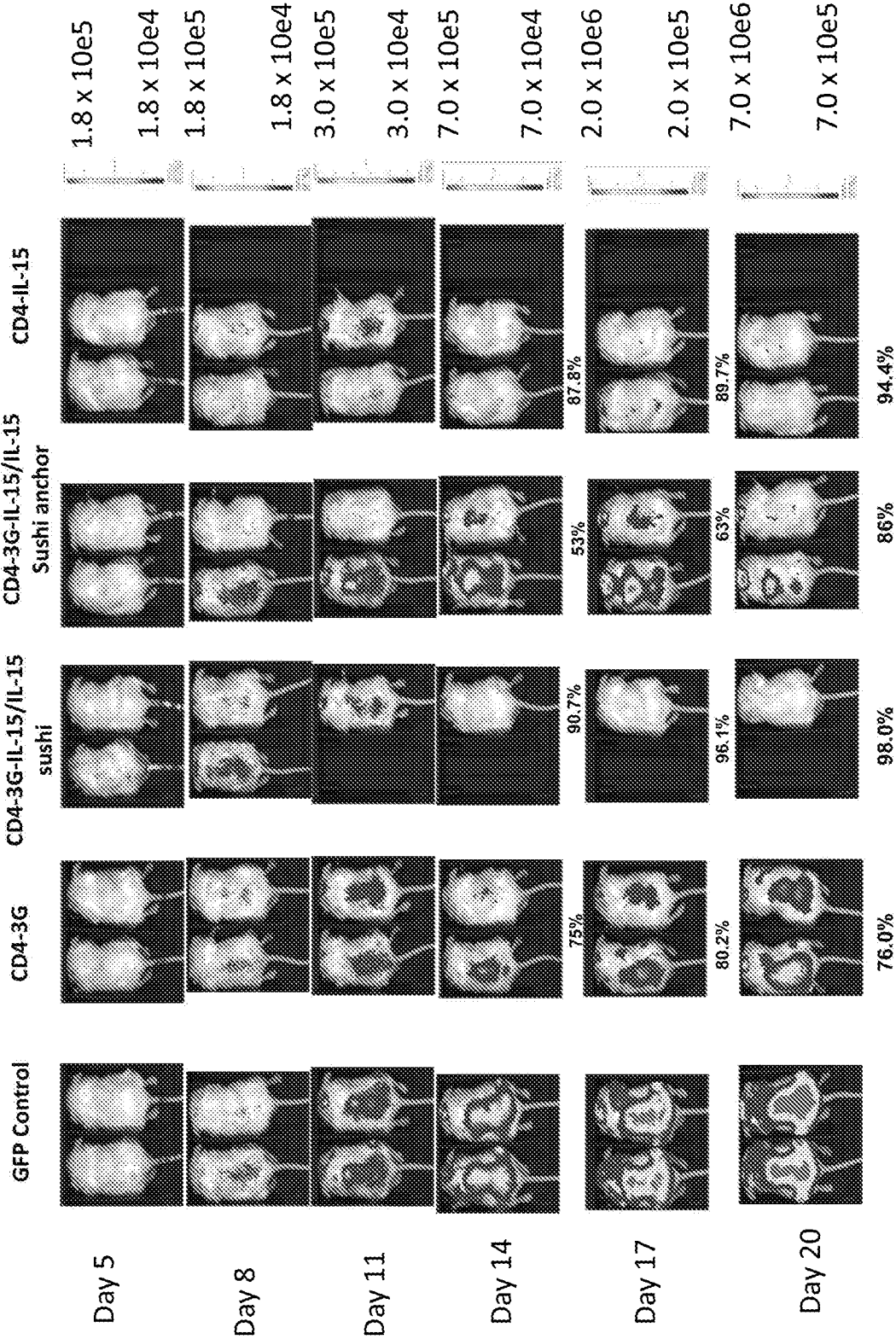


FIGURE 97F

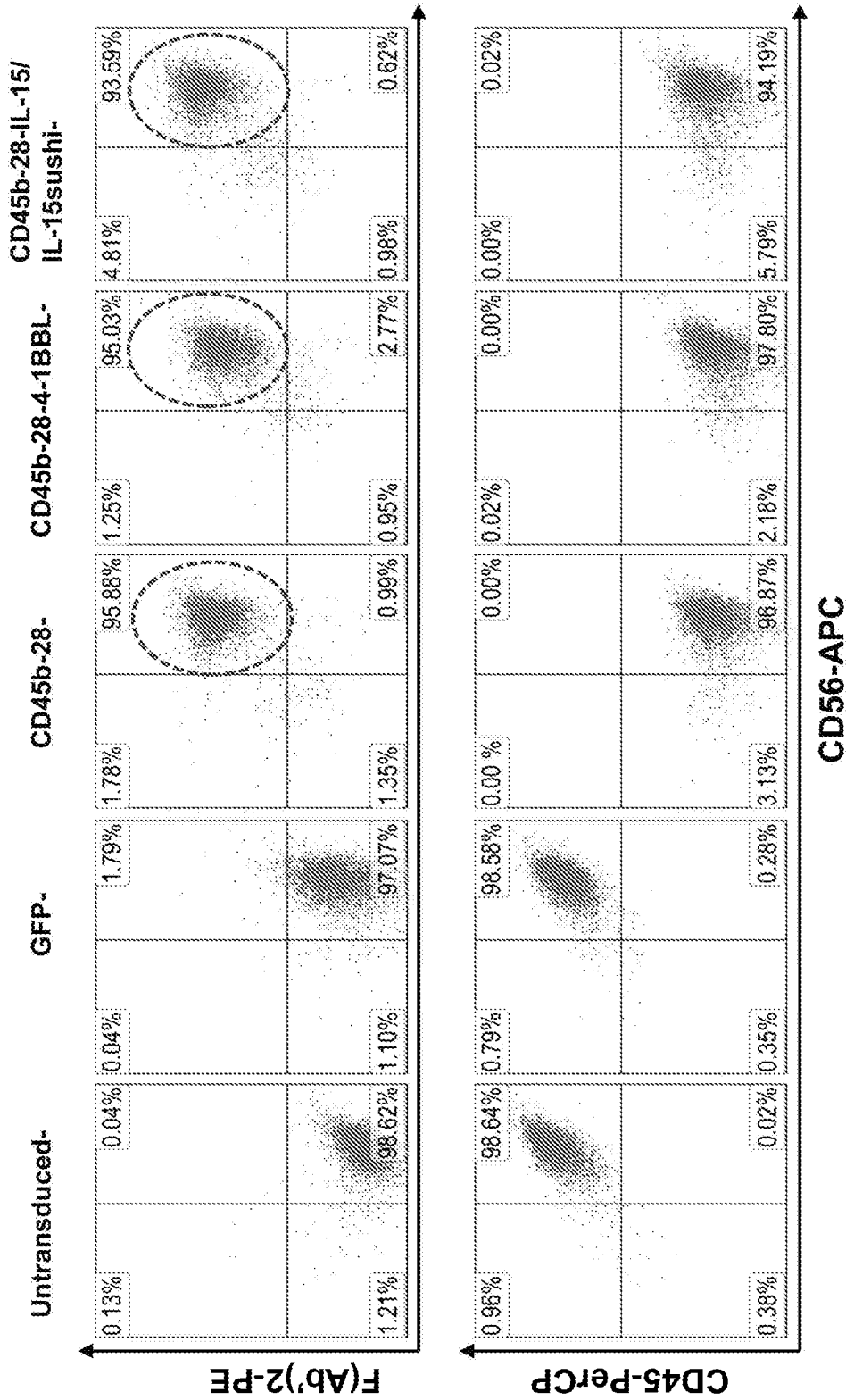


FIGURE 98A

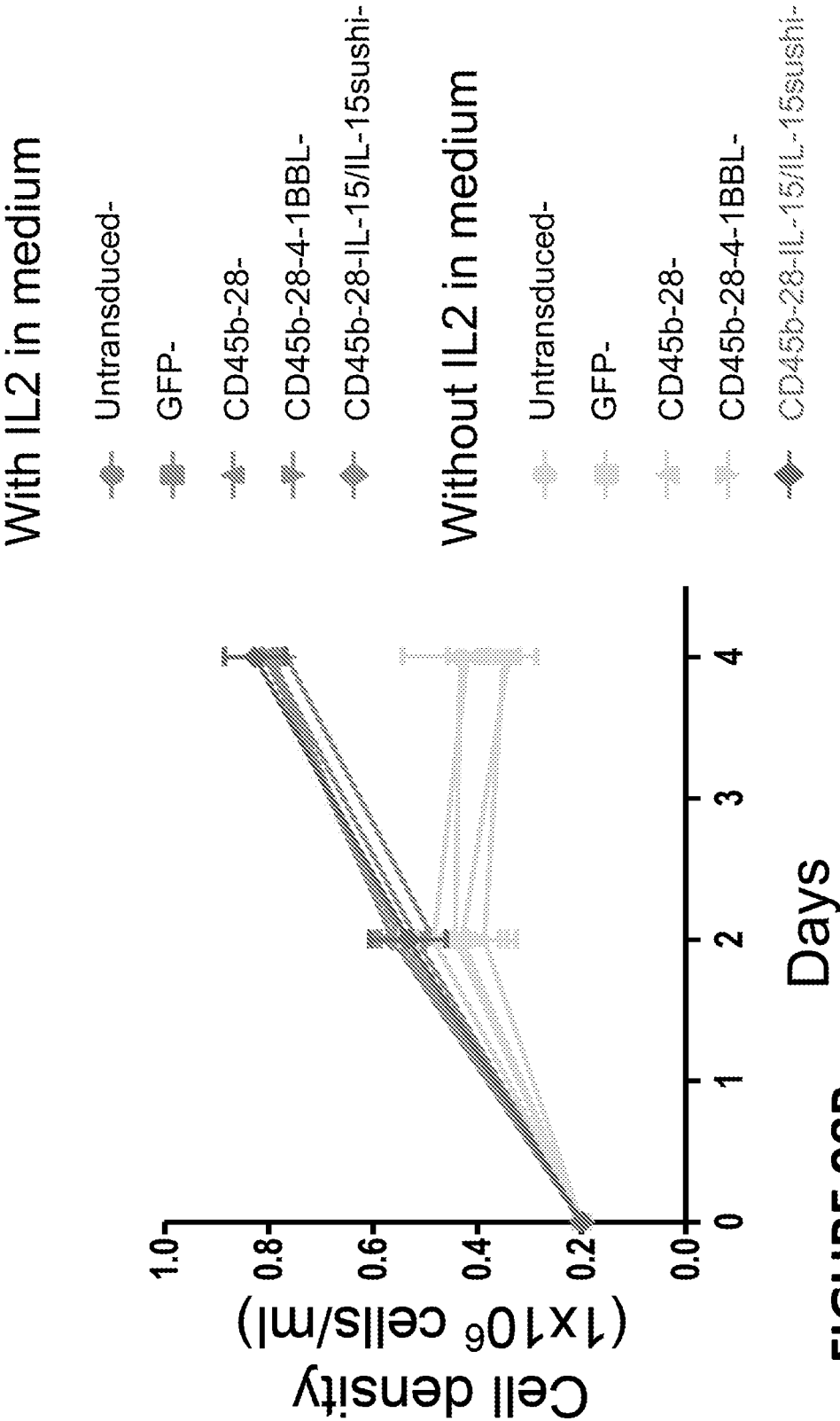
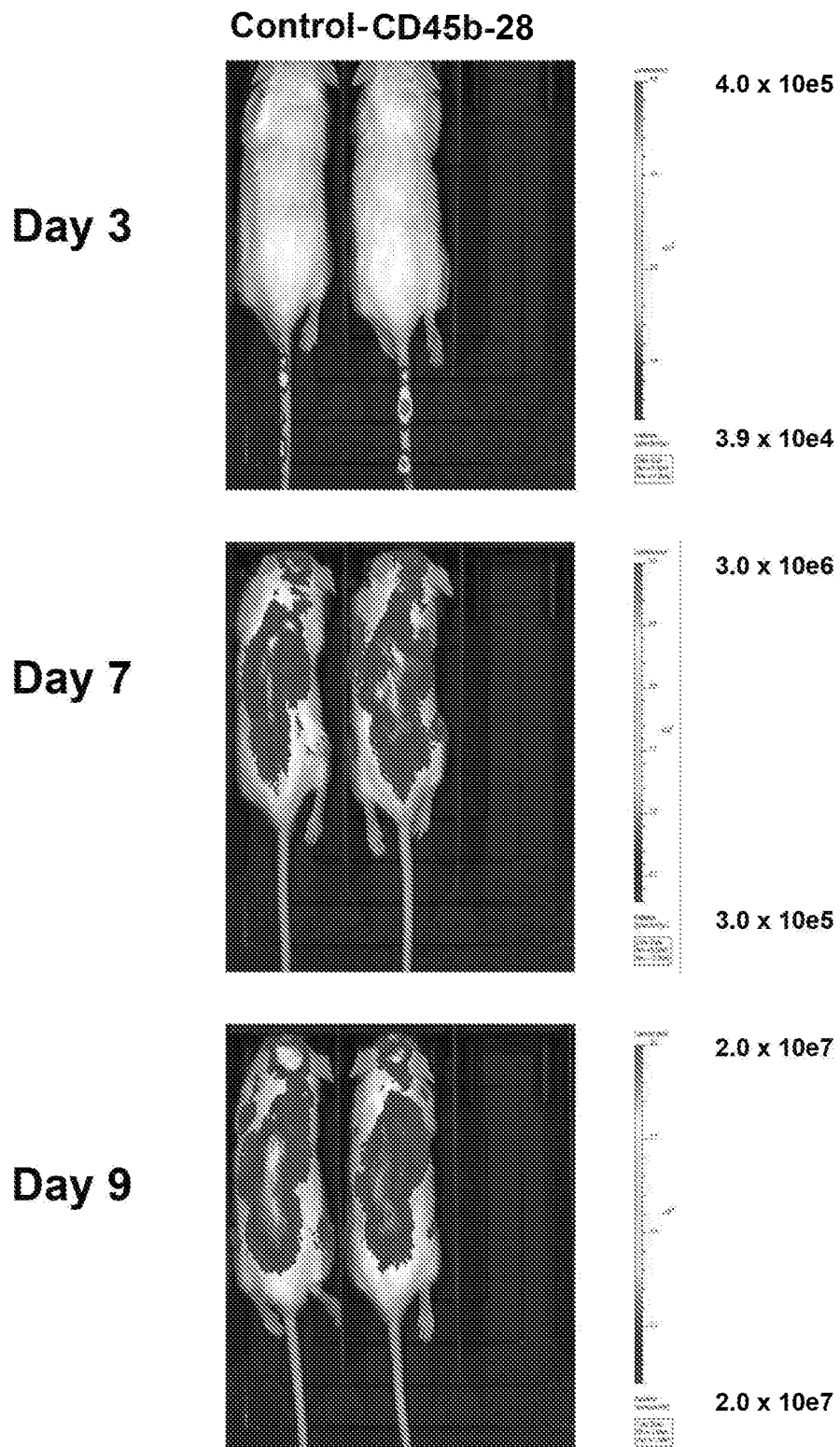


FIGURE 98B

**FIGURE 98C**

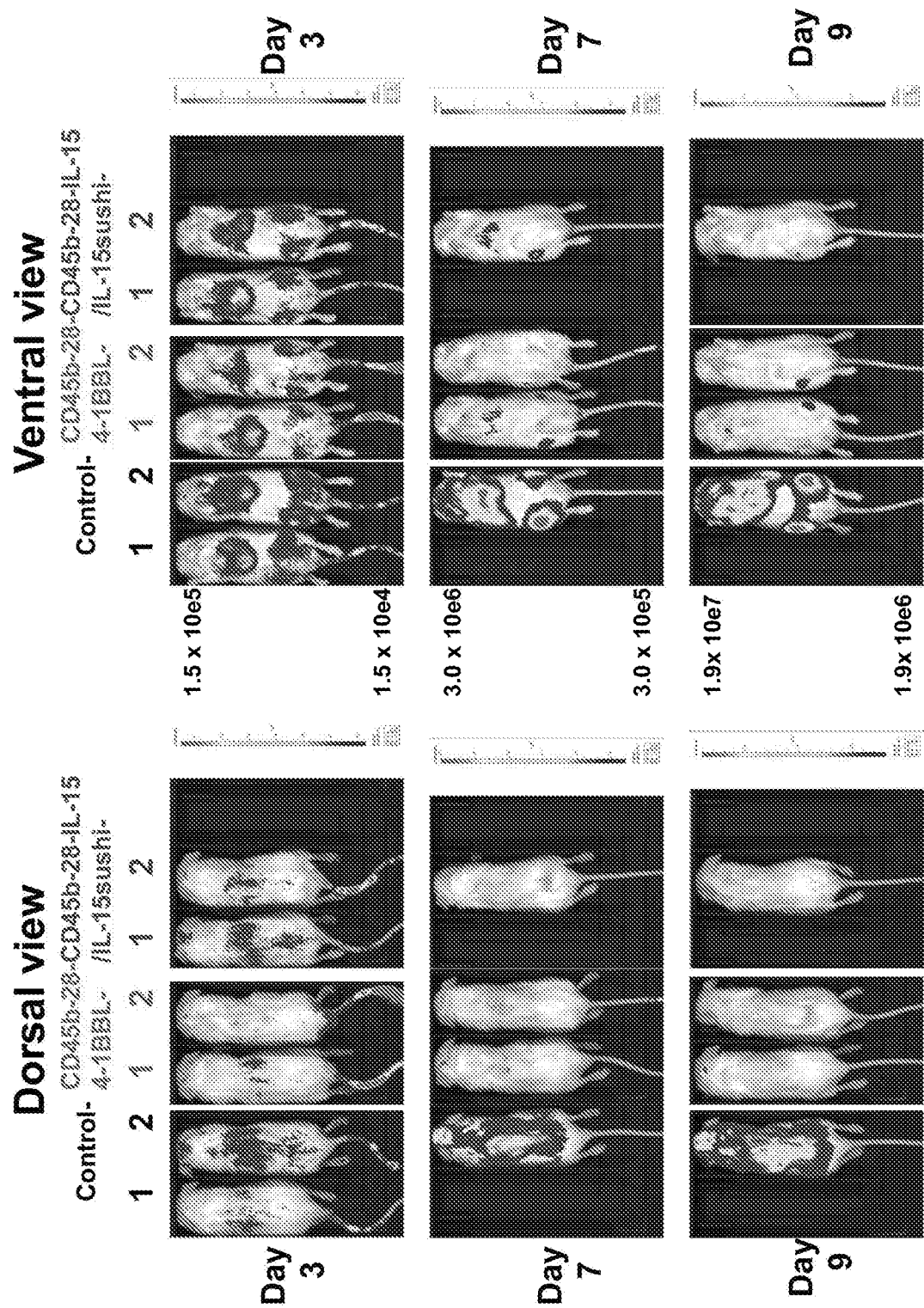


FIGURE 98D

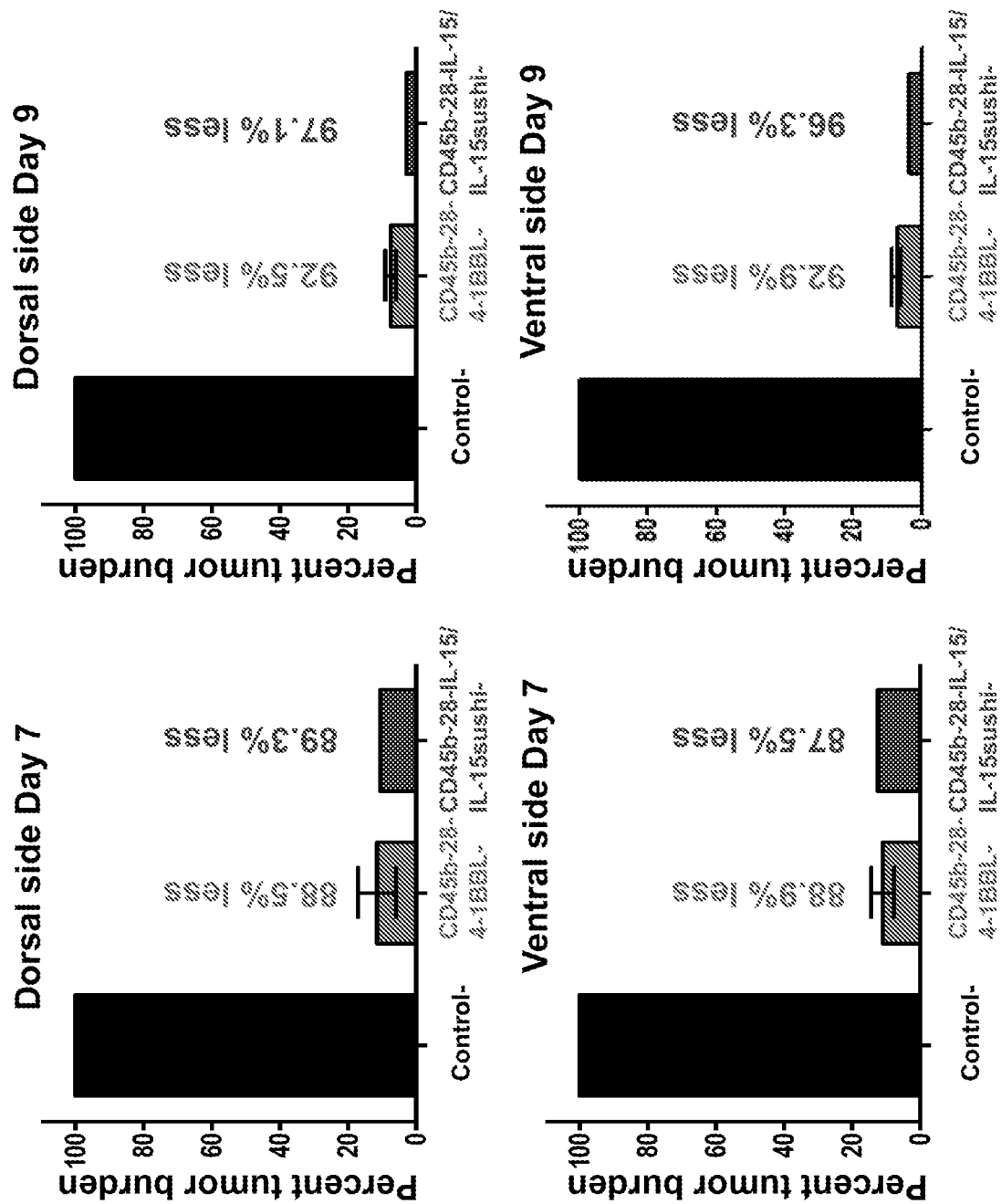


FIGURE 98E

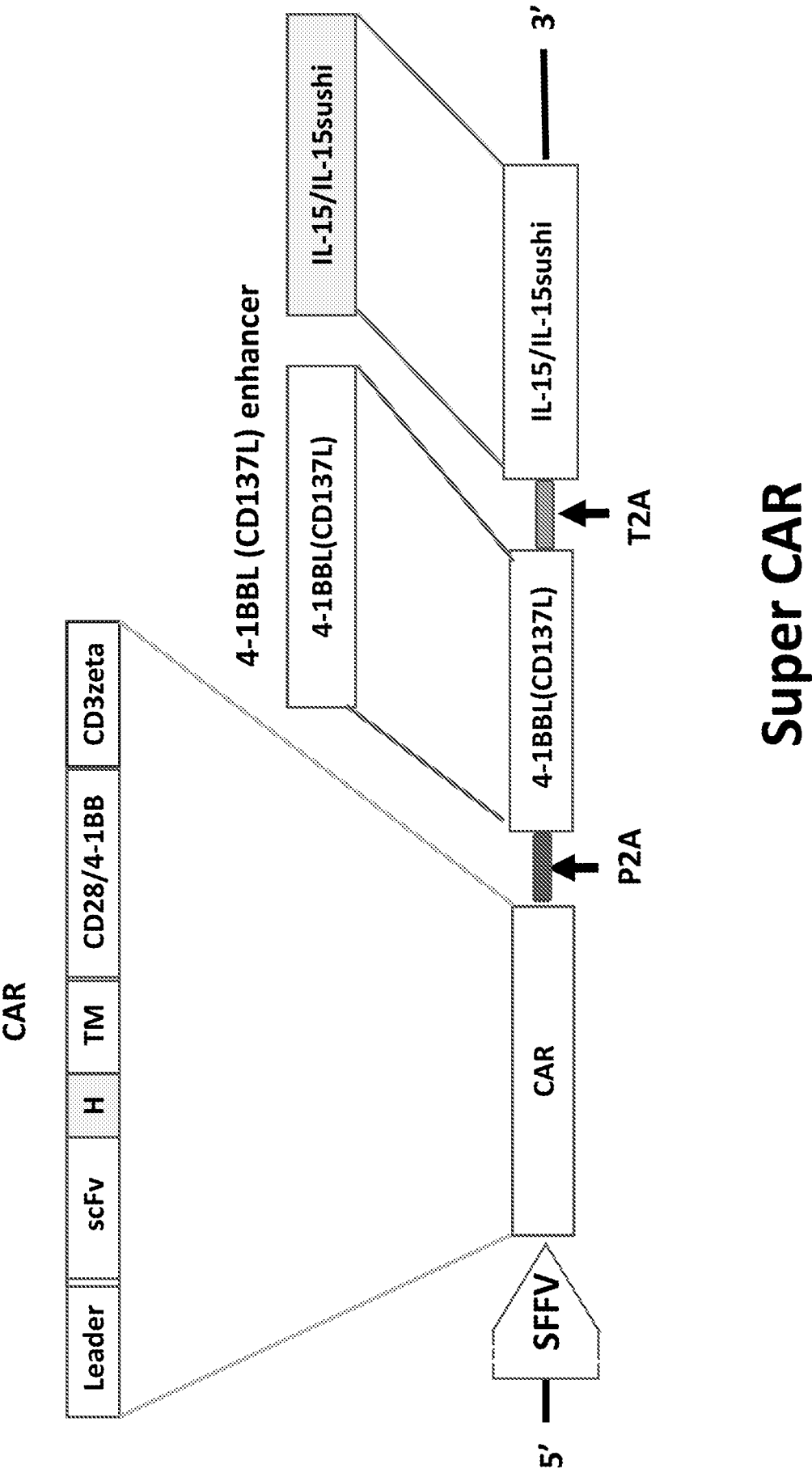


FIGURE 98F

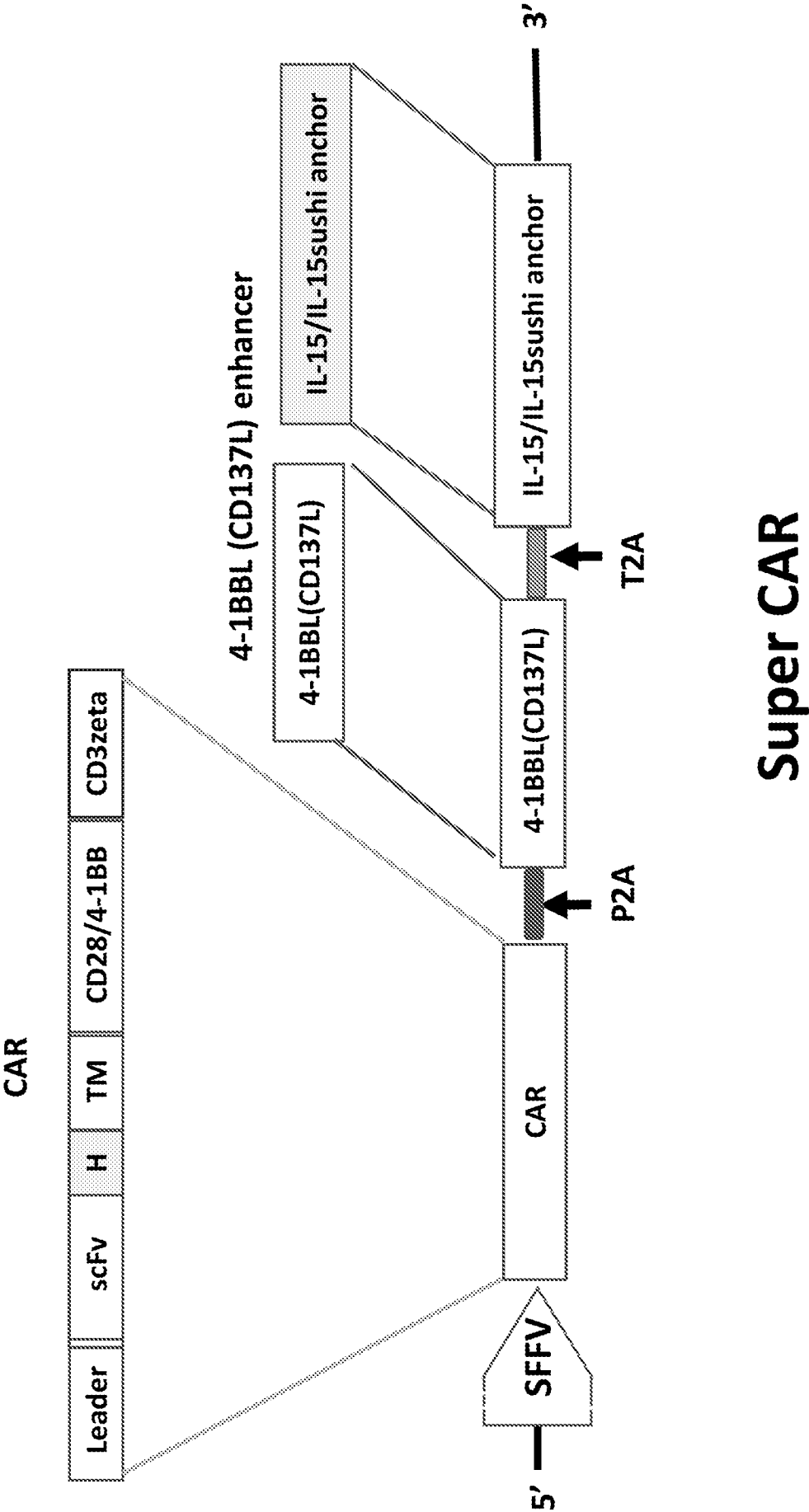


FIGURE 98G

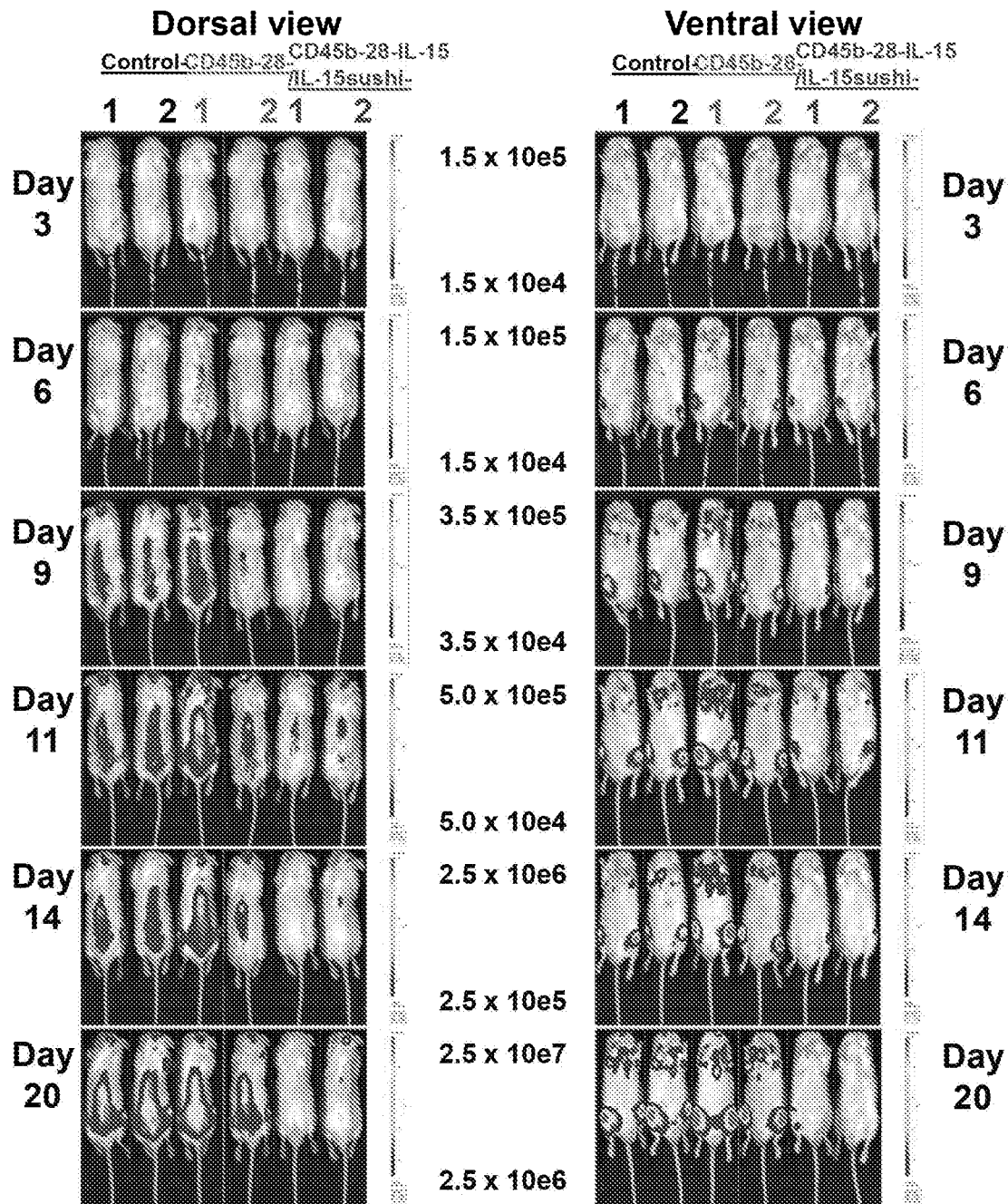


FIGURE 99A

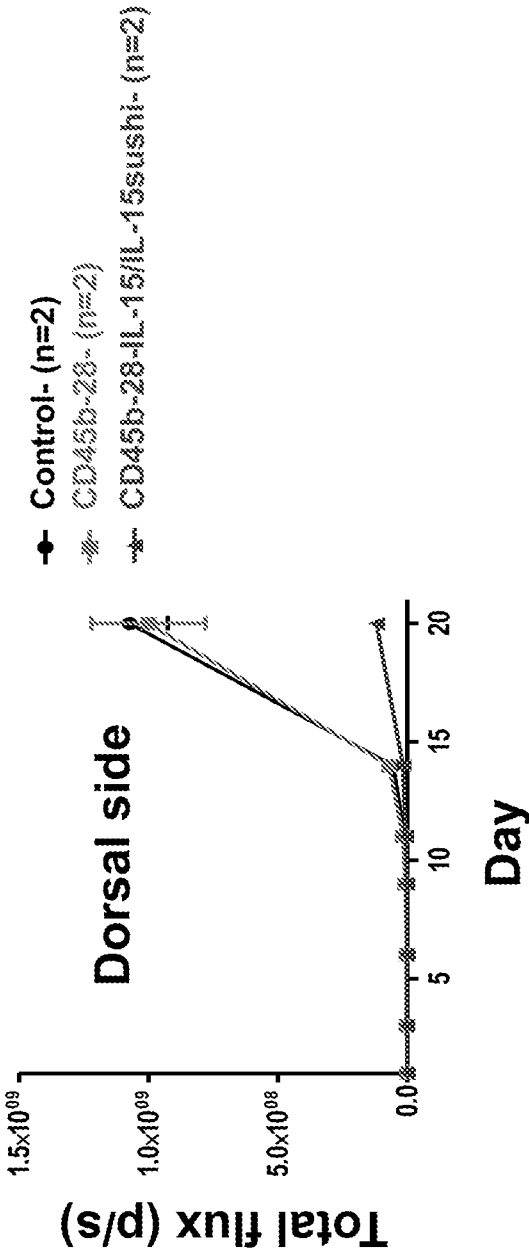
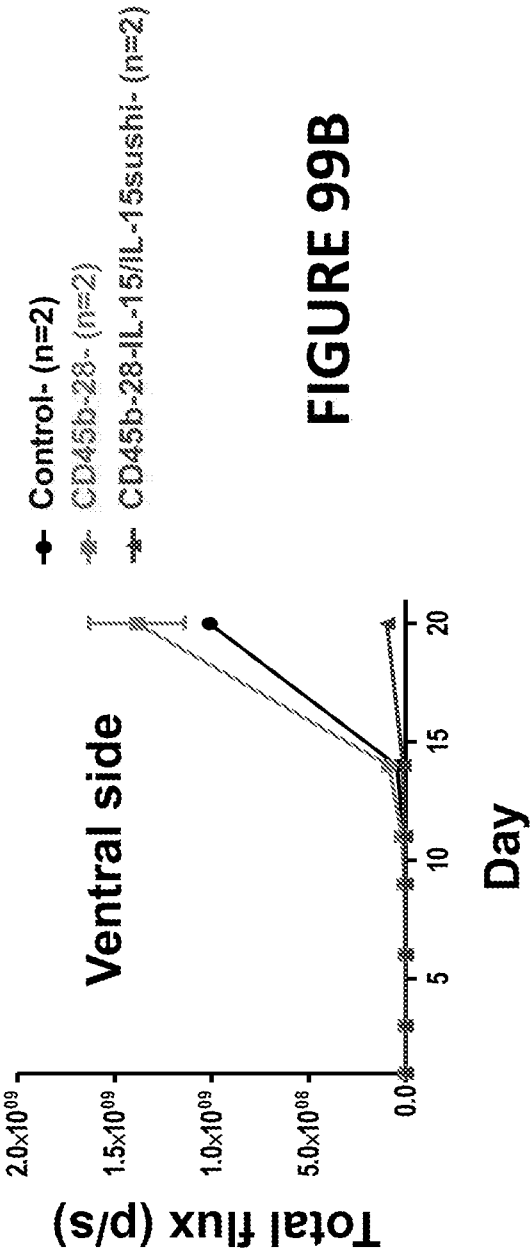
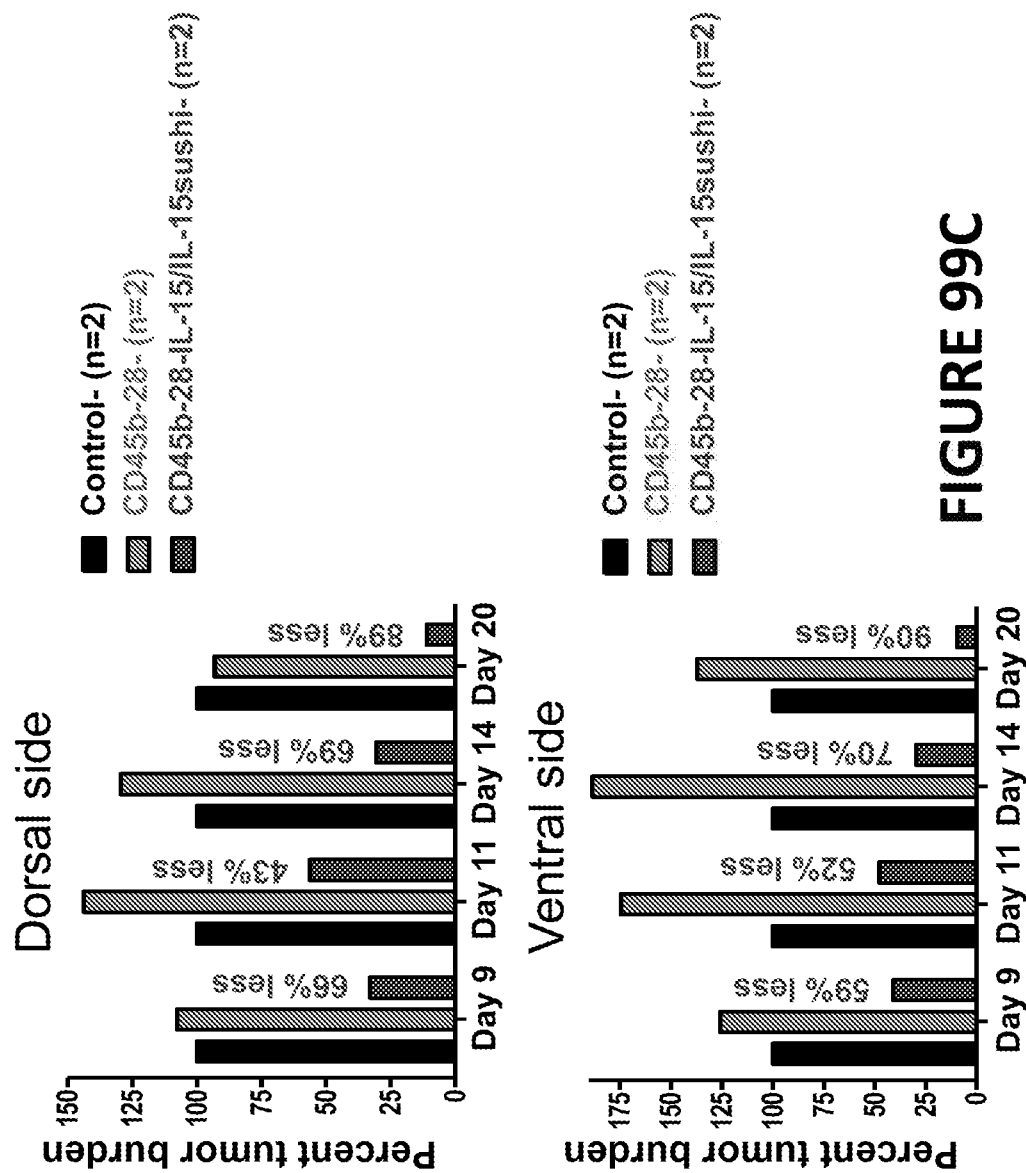
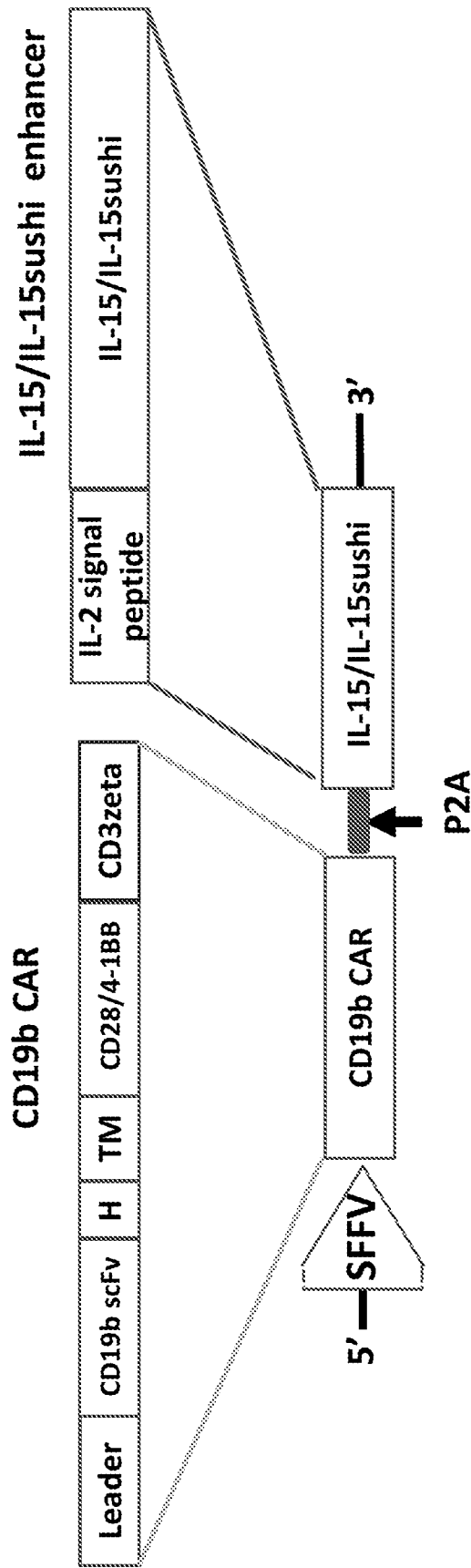
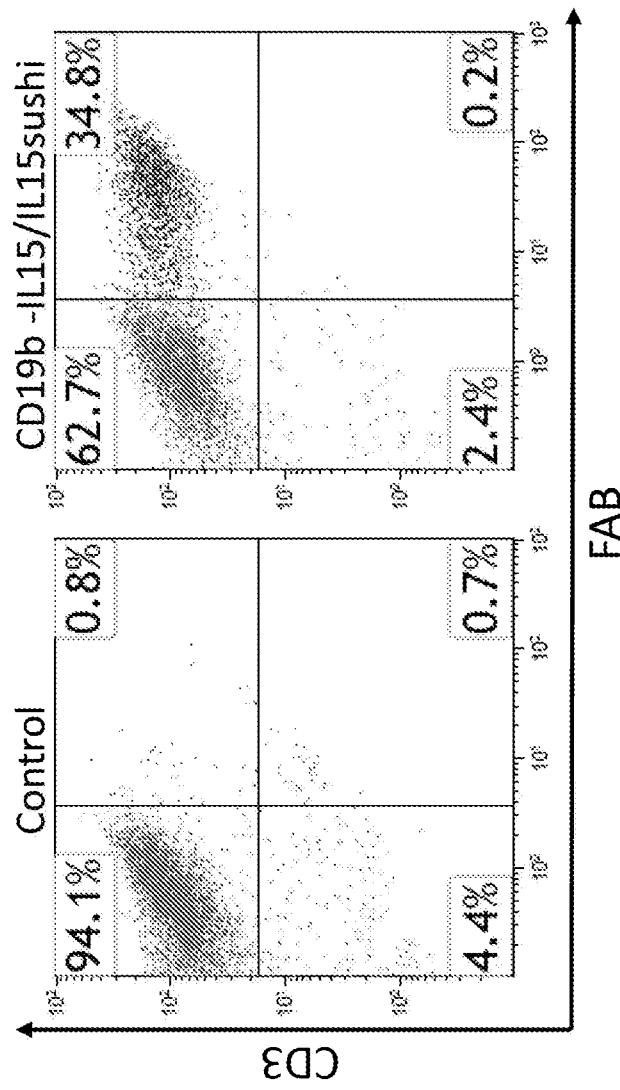


FIGURE 99B





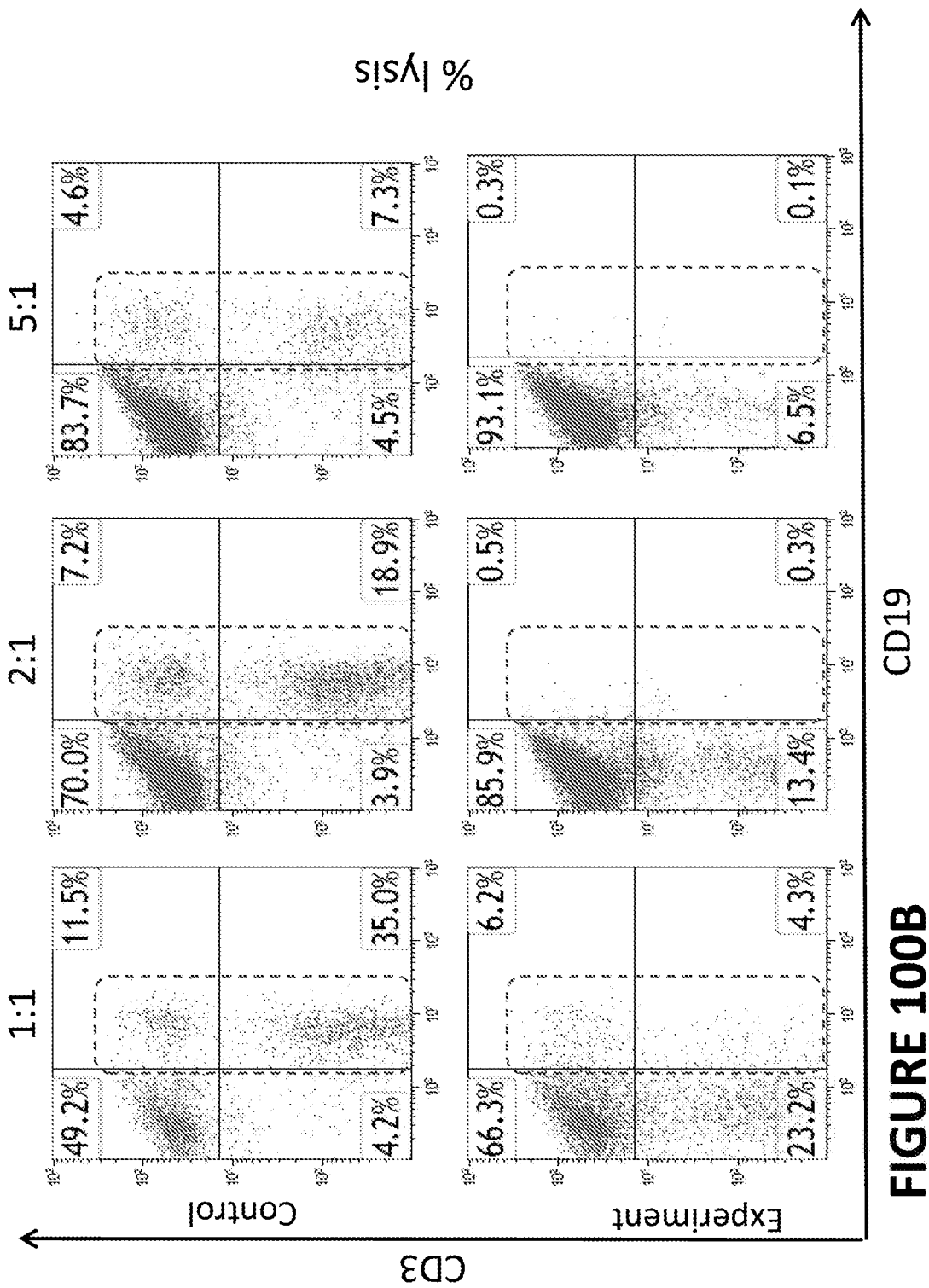


FIGURE 100B

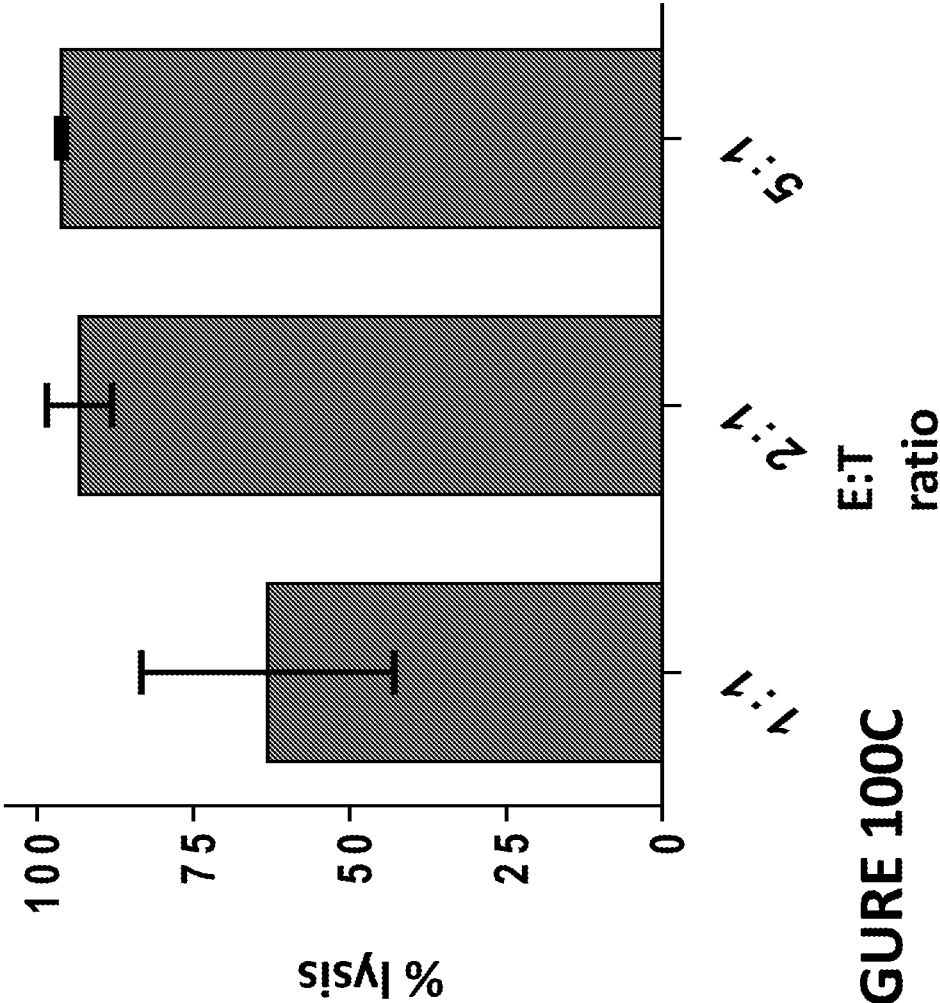


FIGURE 100C

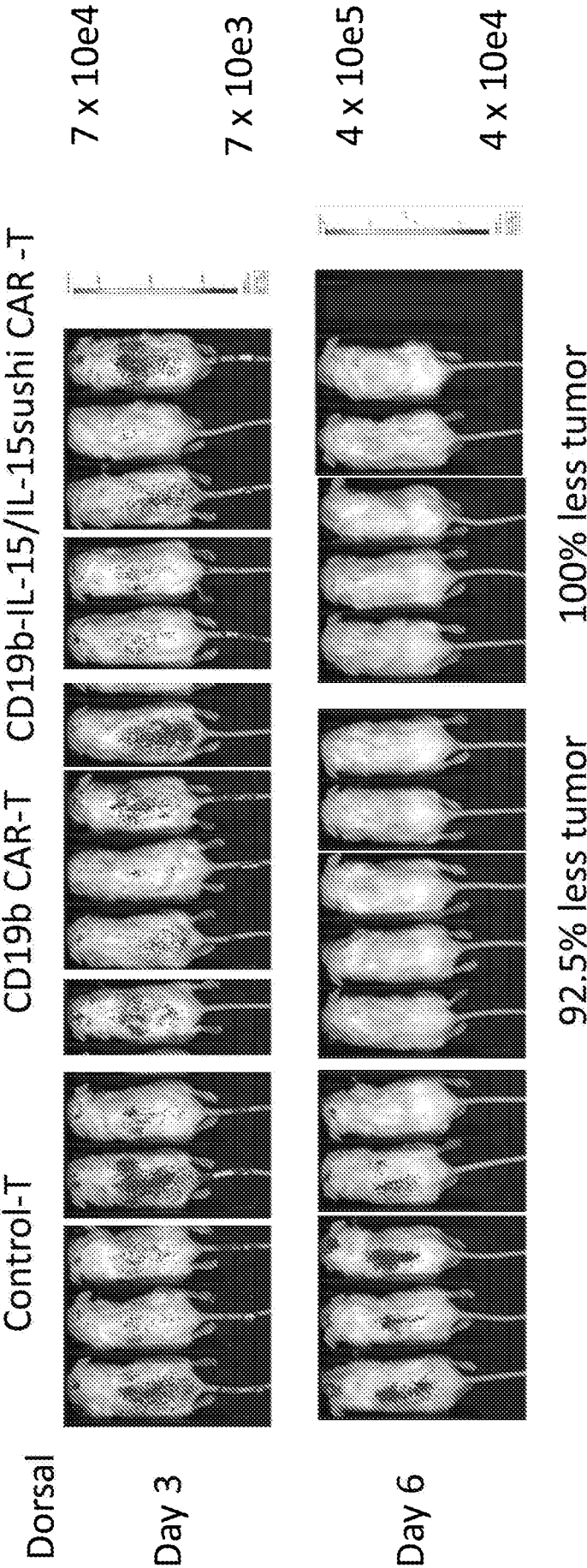


FIGURE 100D

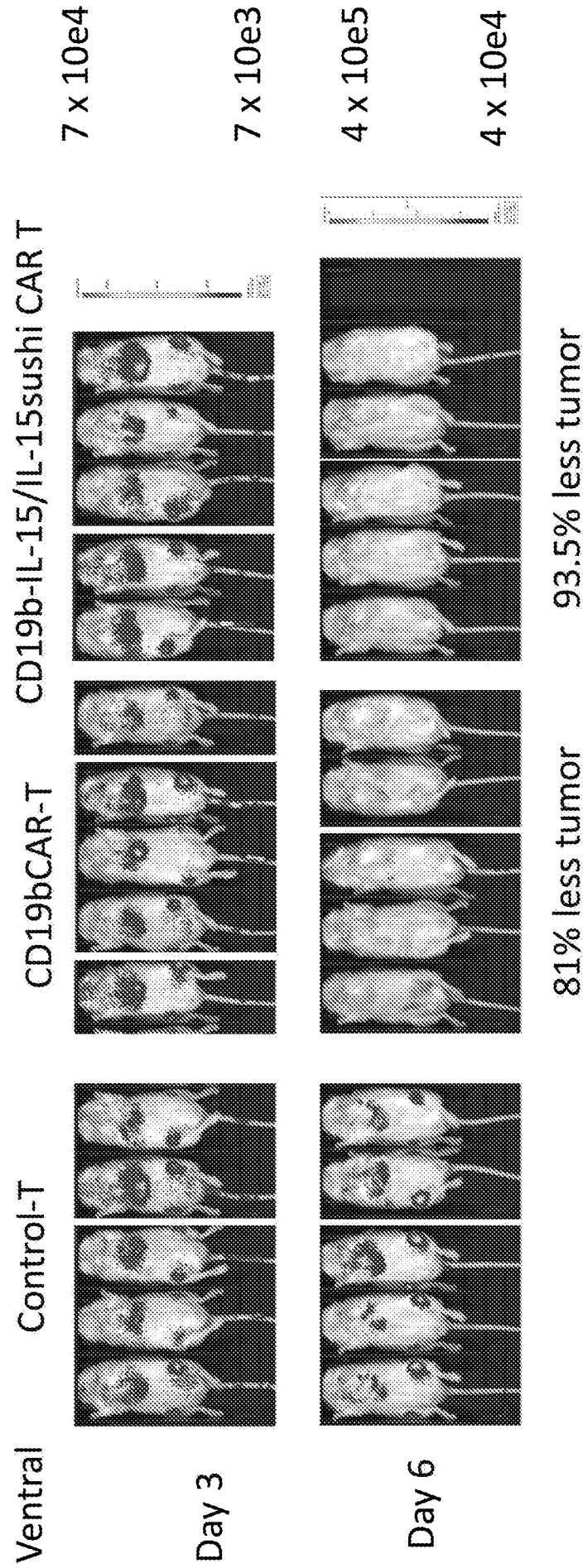


FIGURE 100E

Experimental design to confirm depletion of CD4CAR T cells in mouse body

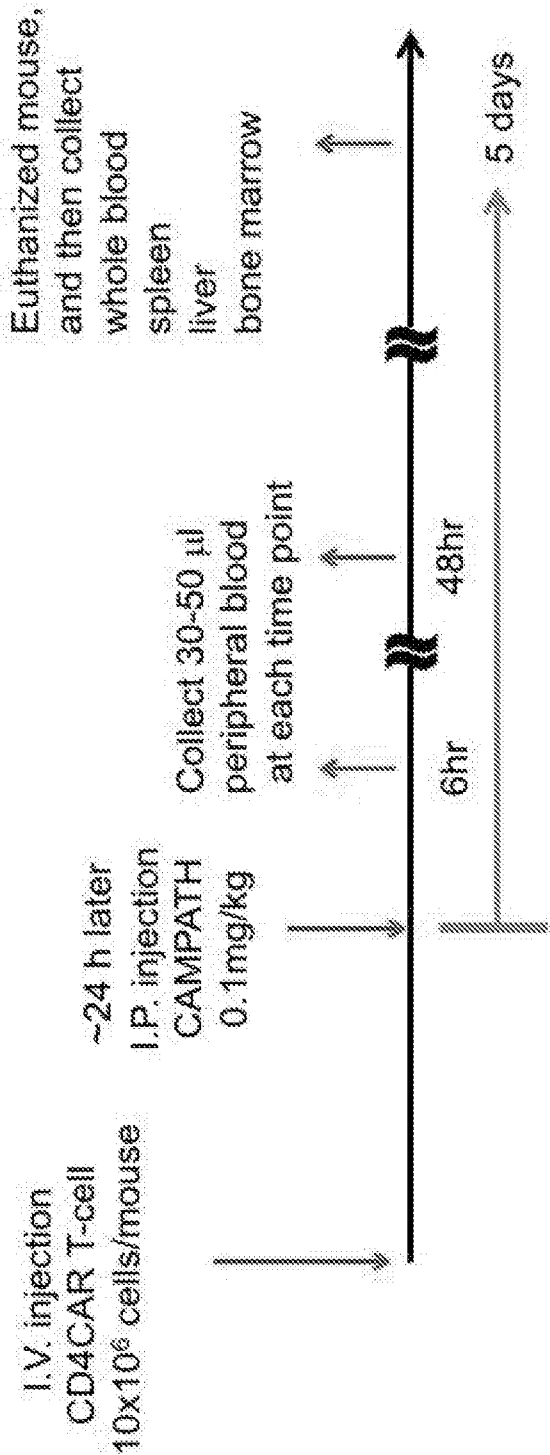
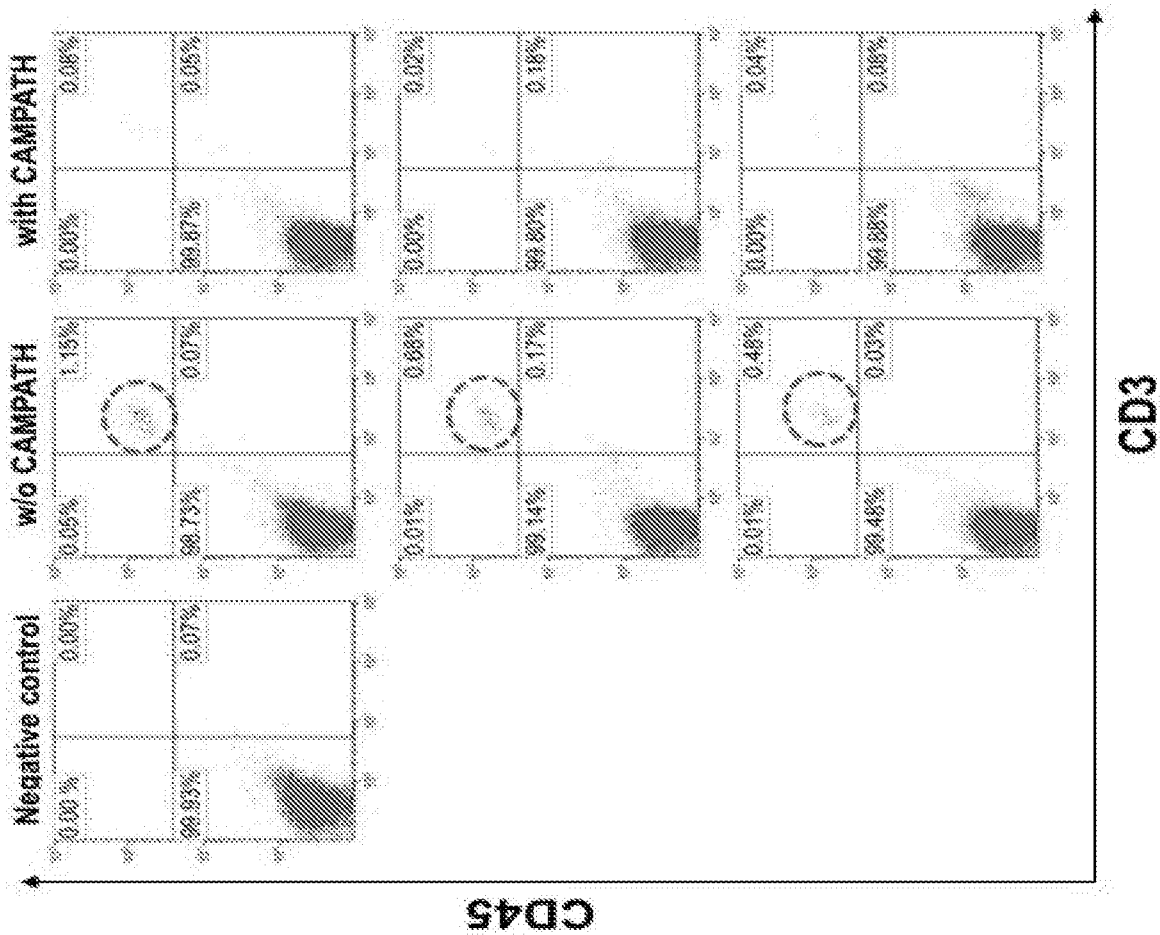


FIGURE 101A

FIGURE 101B



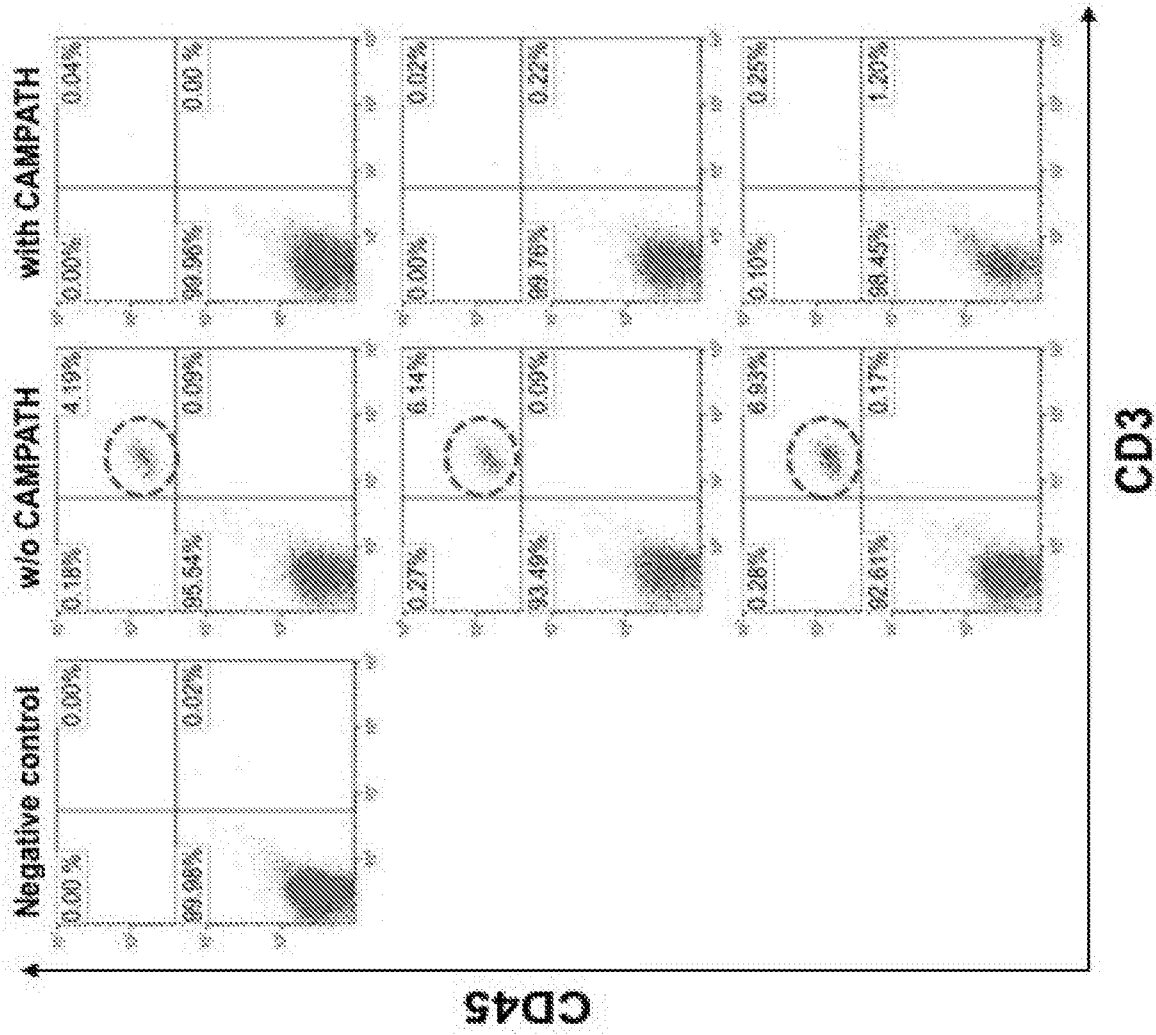


FIGURE 101C

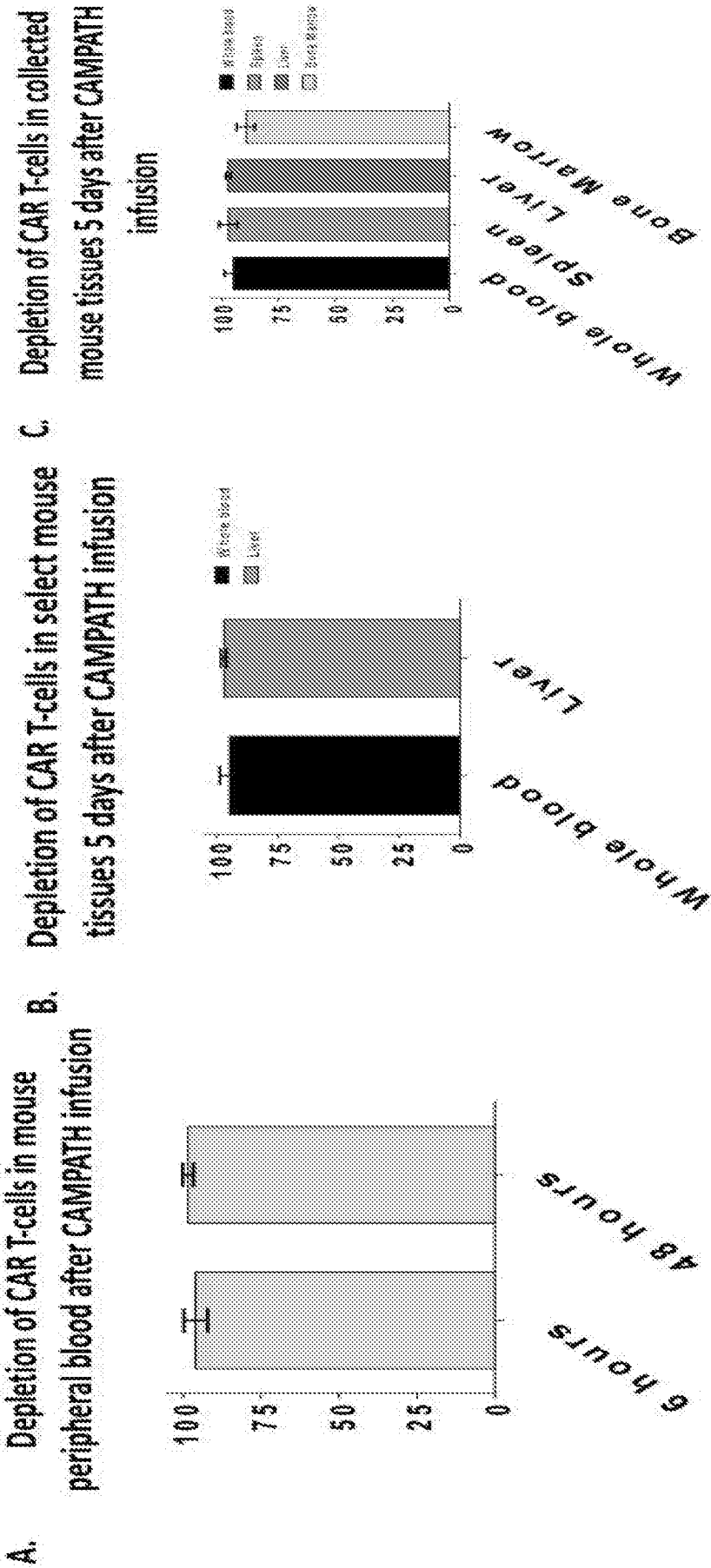


FIGURE 102

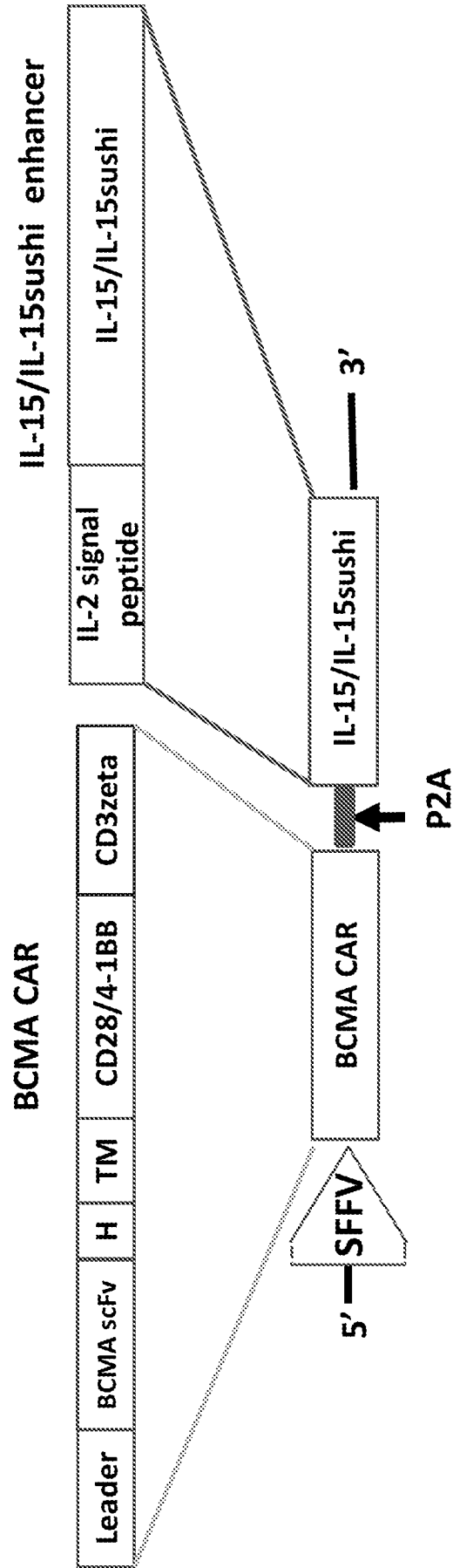


FIGURE 103

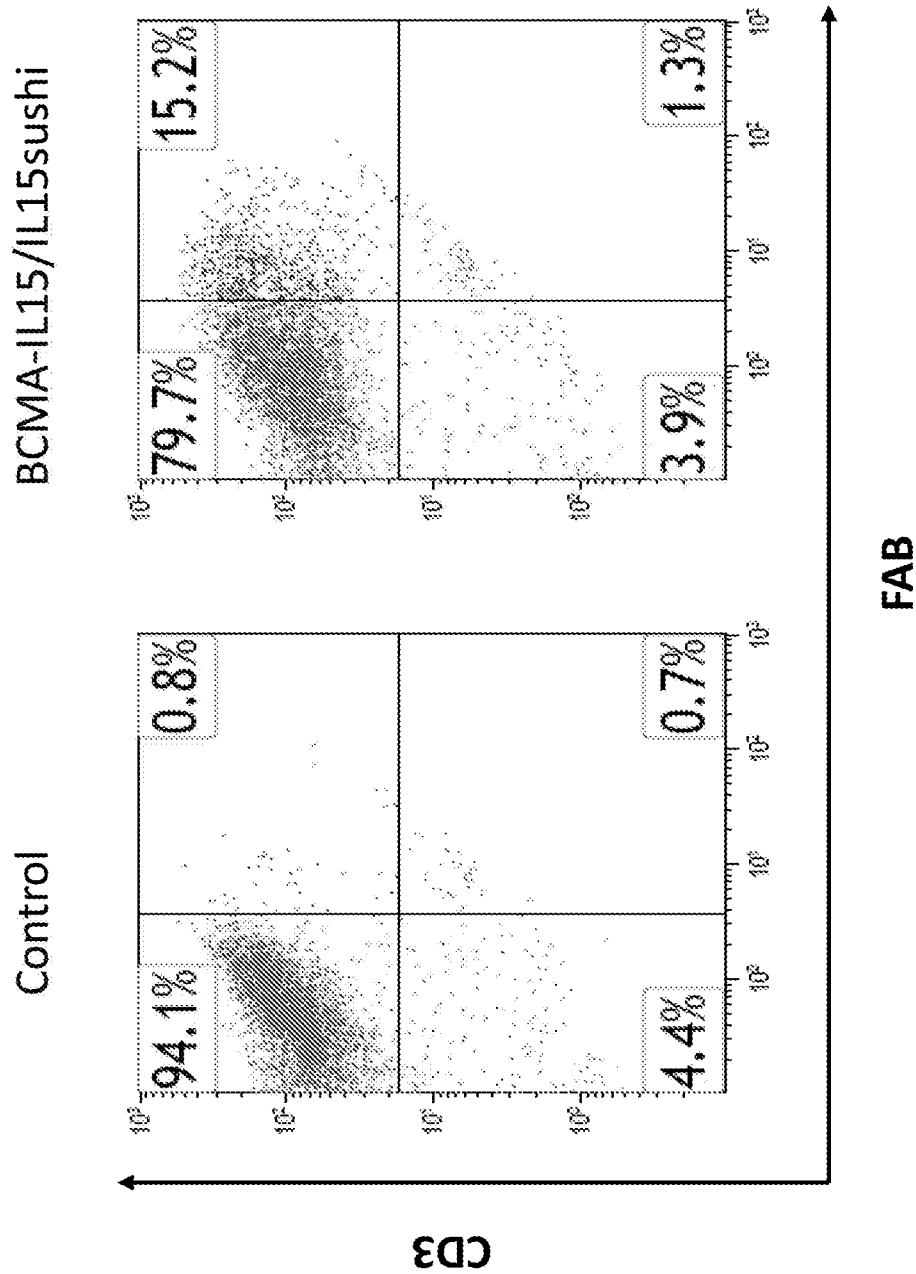
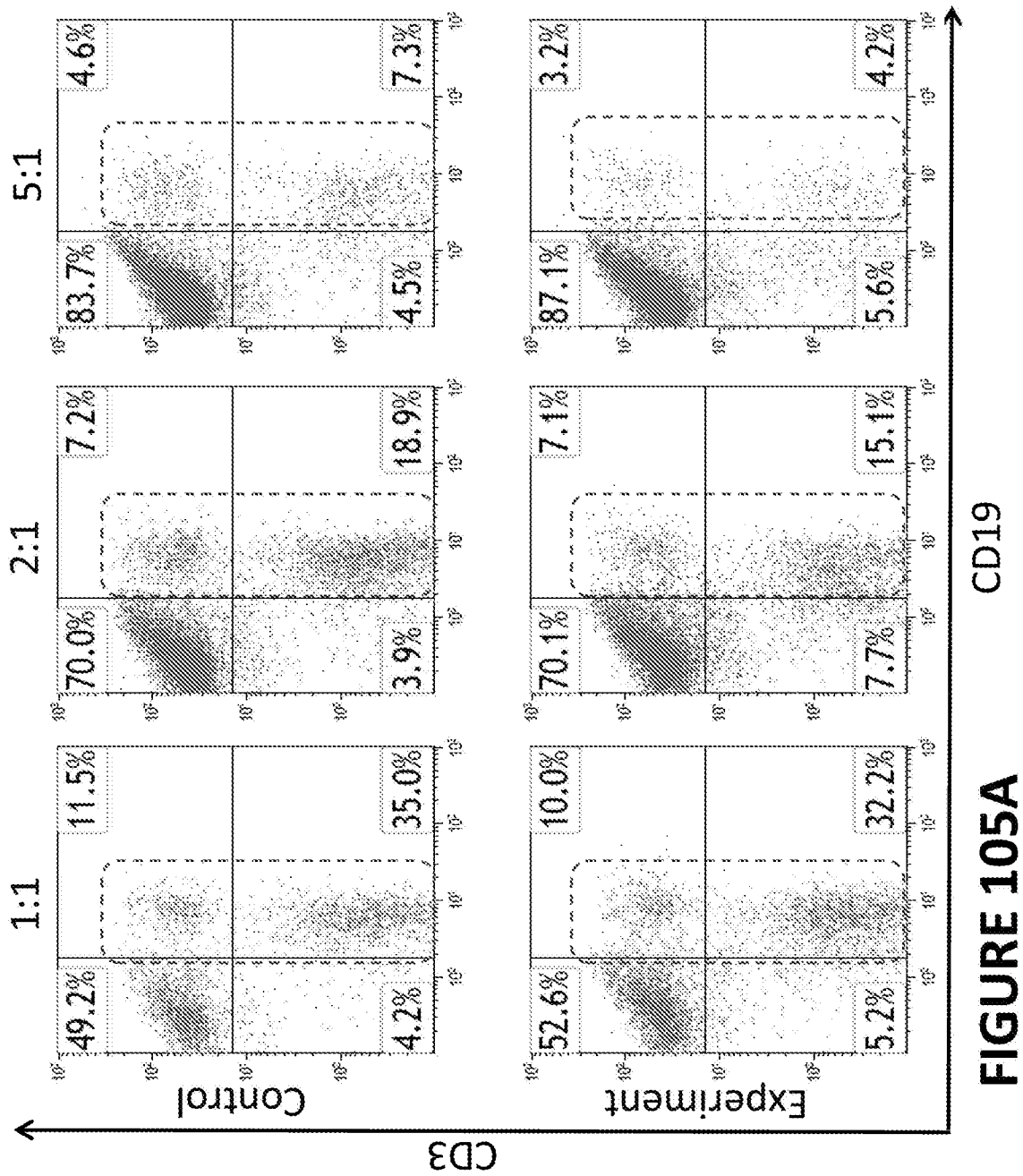


FIGURE 104



CD19

FIGURE 105A

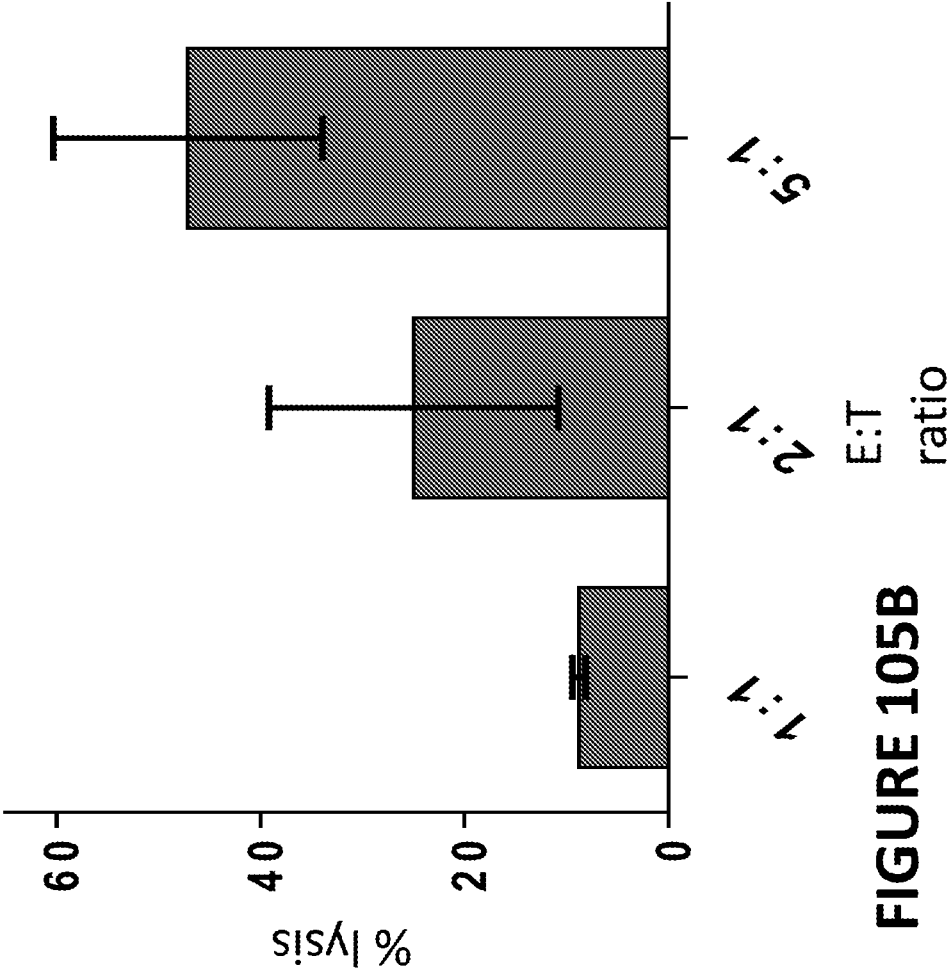


FIGURE 105B

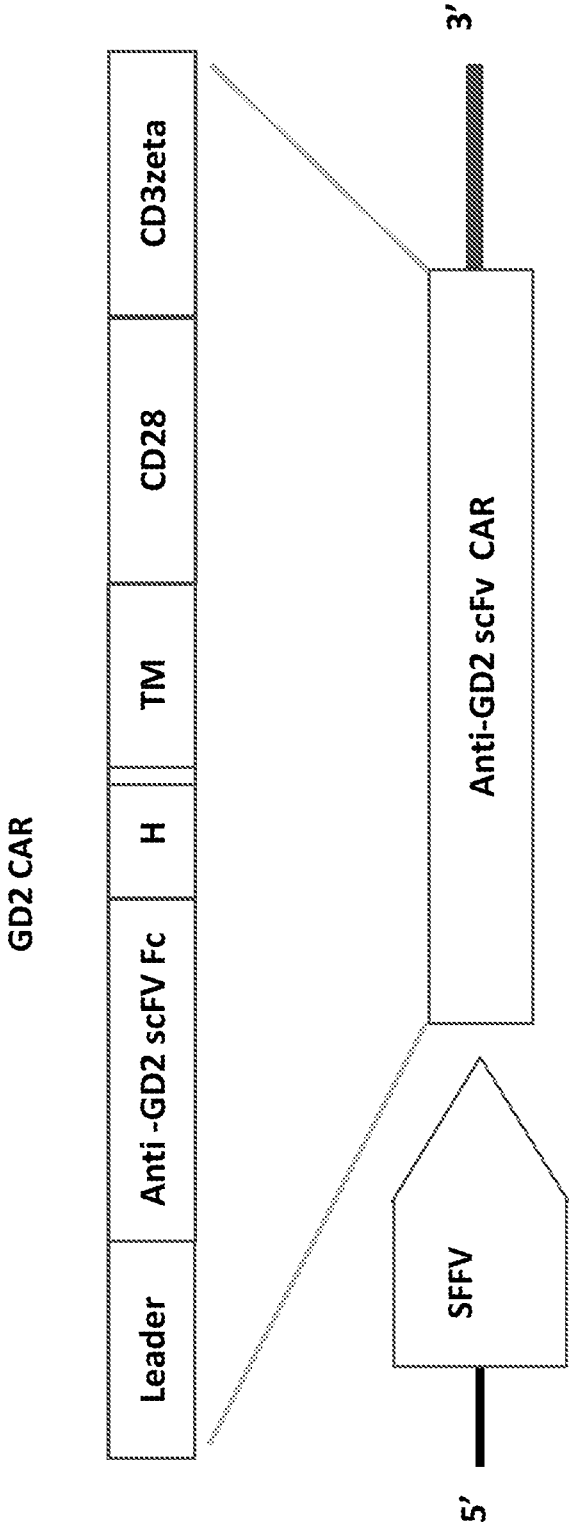


FIGURE 106A

GD3 CAR

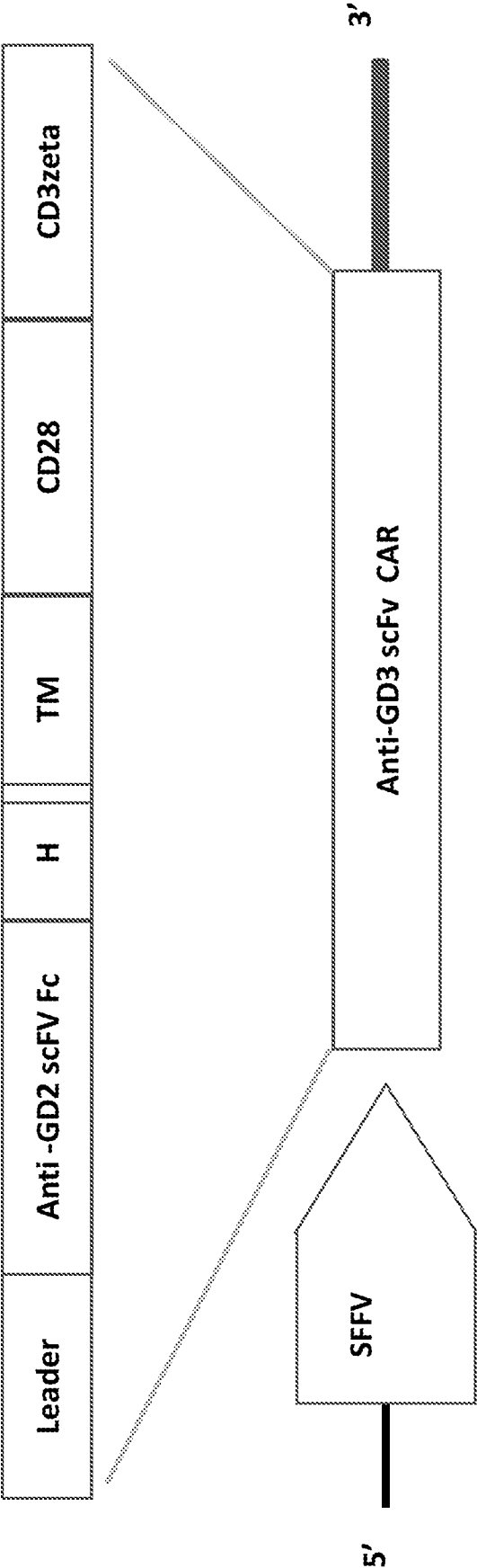


FIGURE 106B

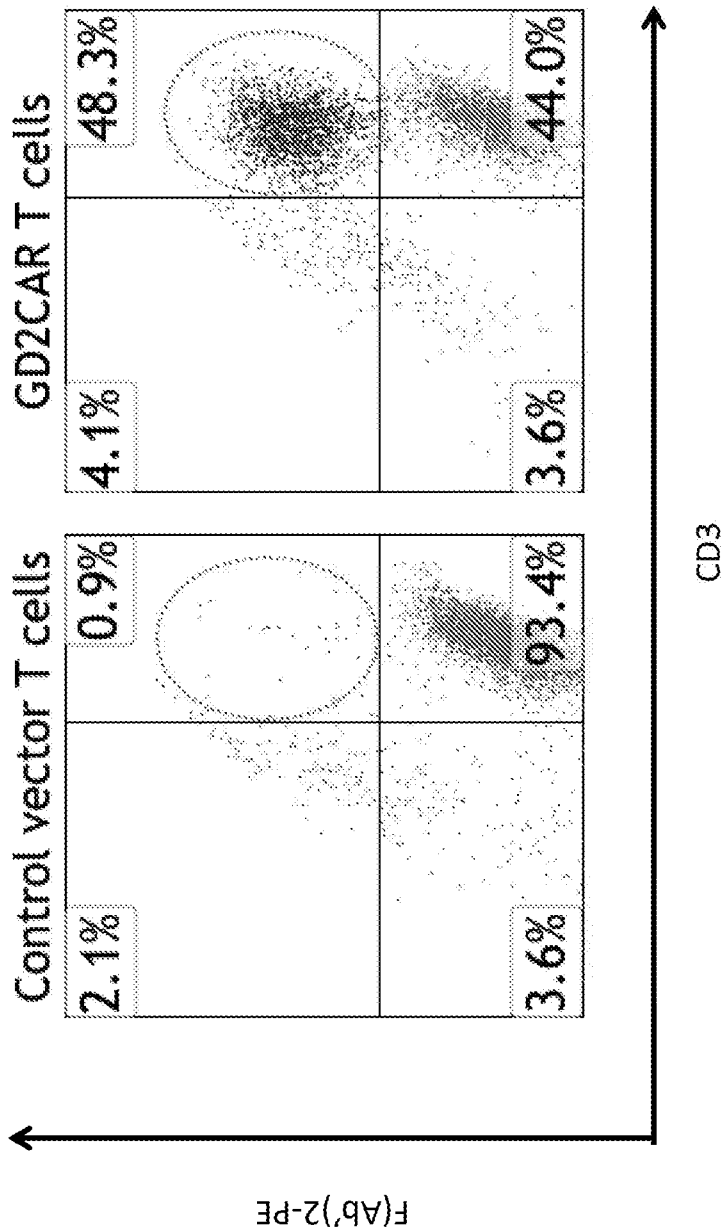


FIGURE 107A

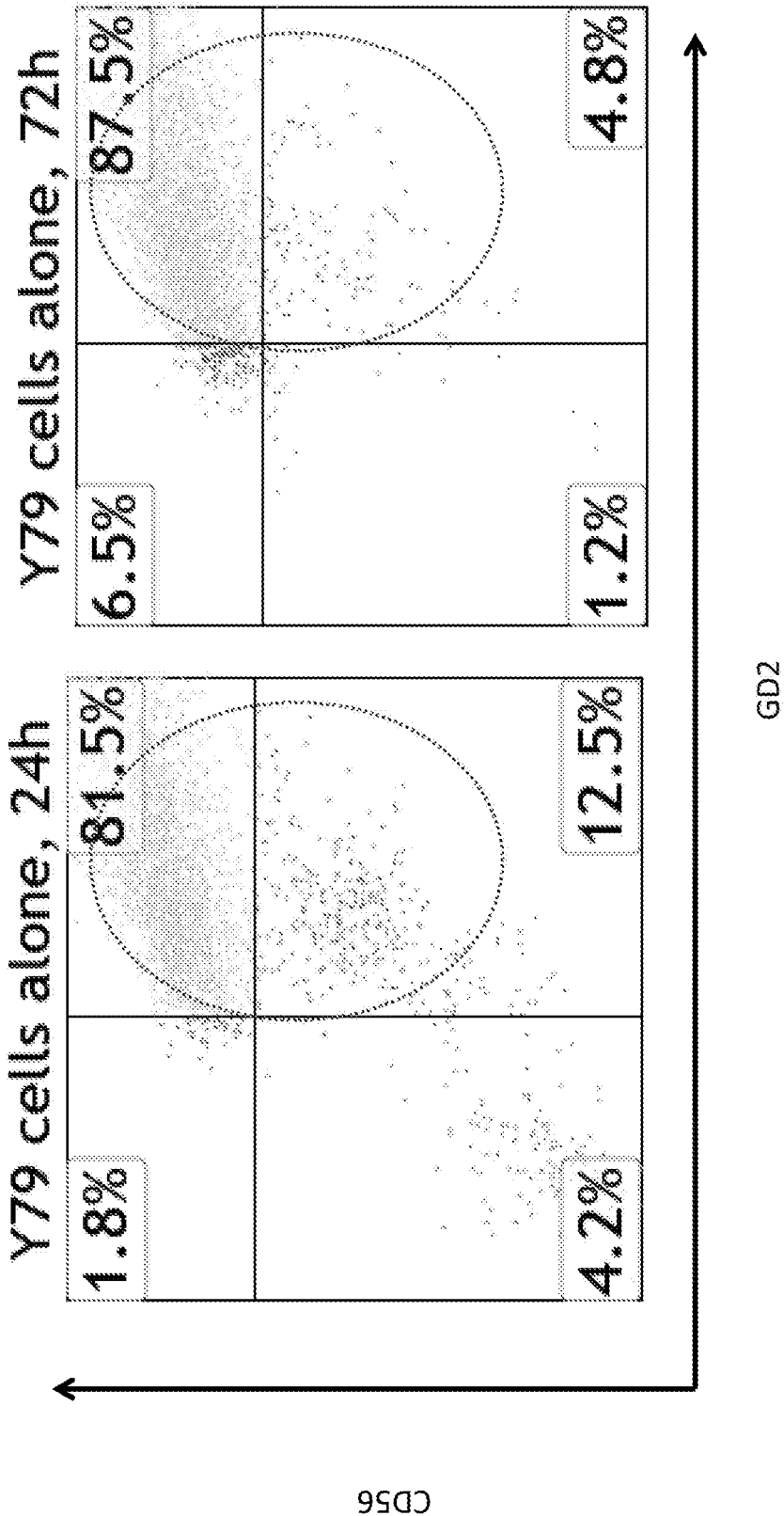


FIGURE 107B

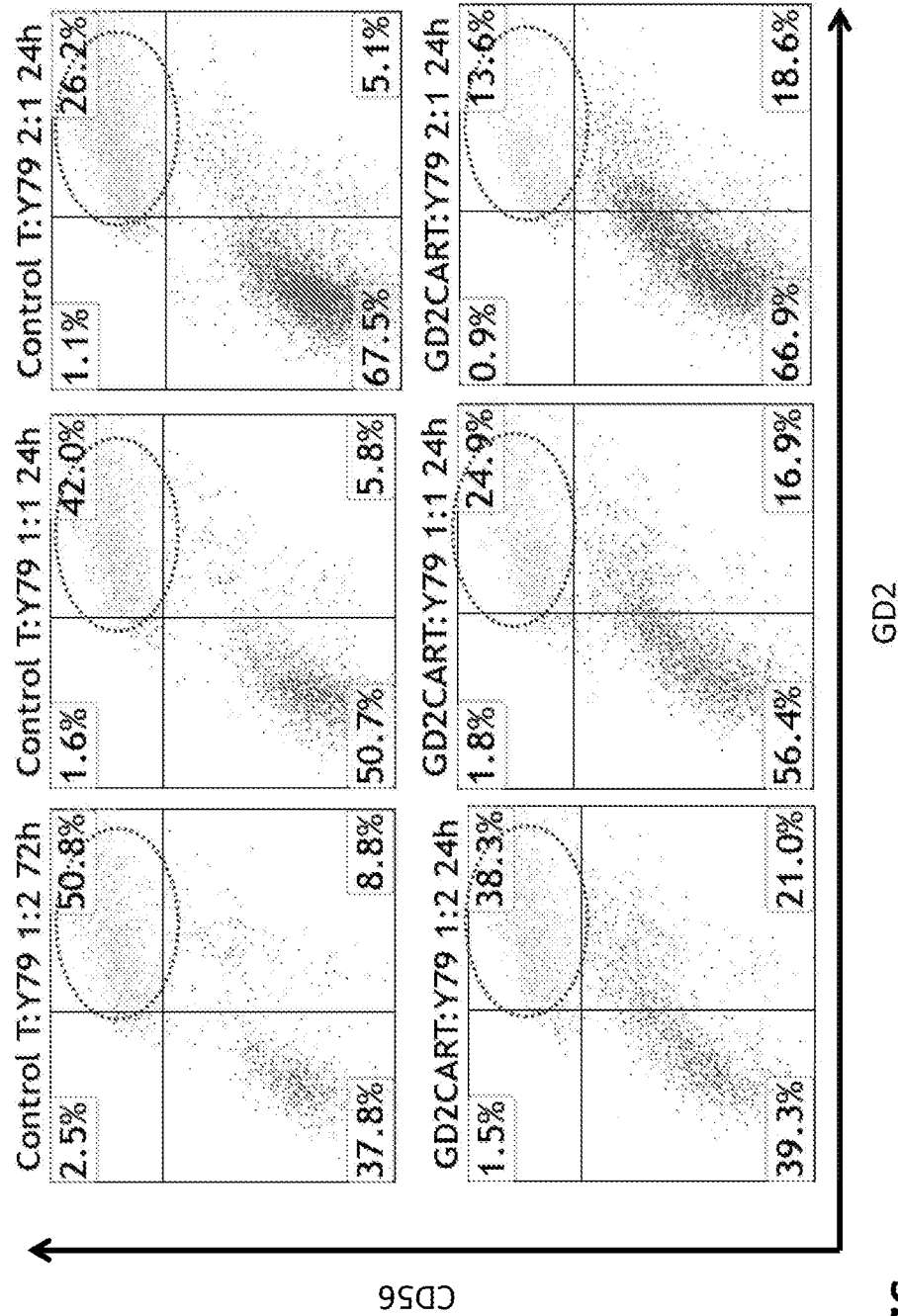


FIGURE 107C

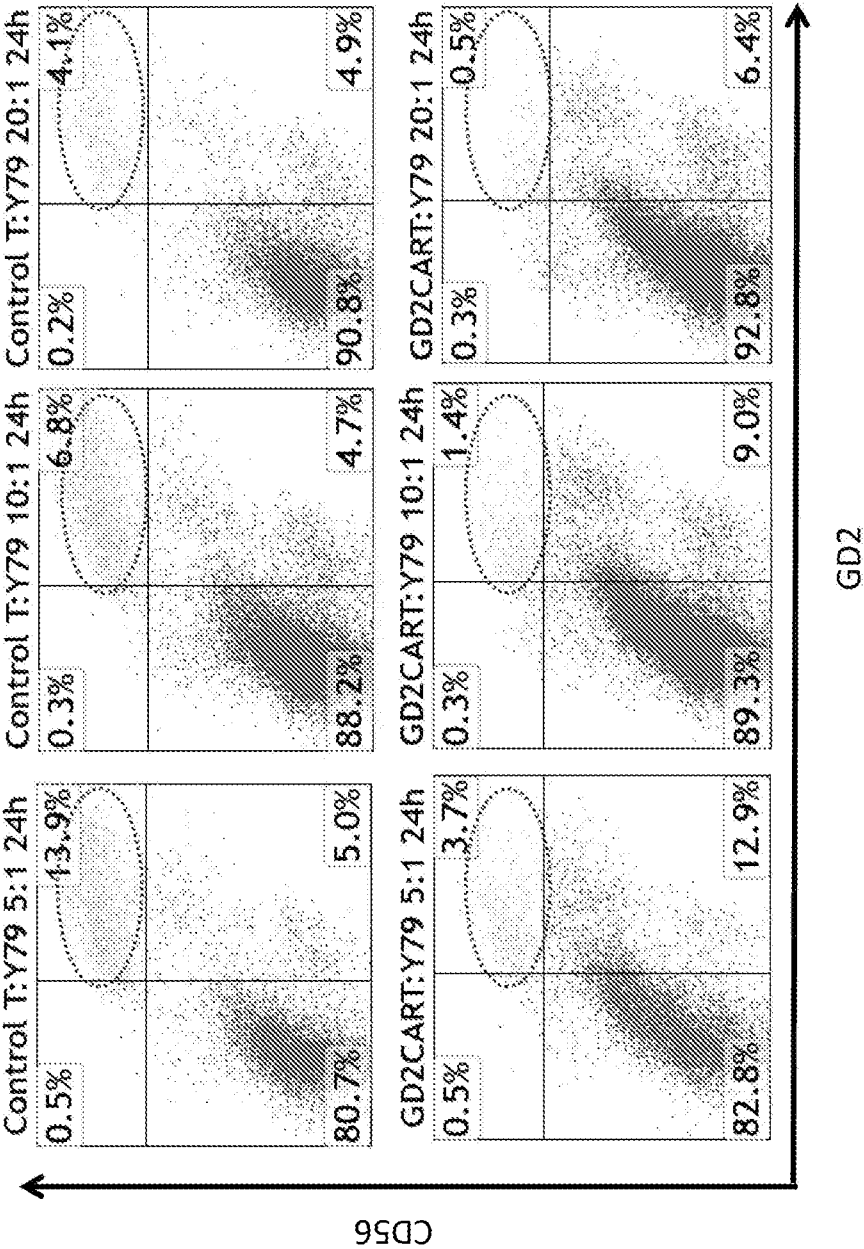


FIGURE 107D

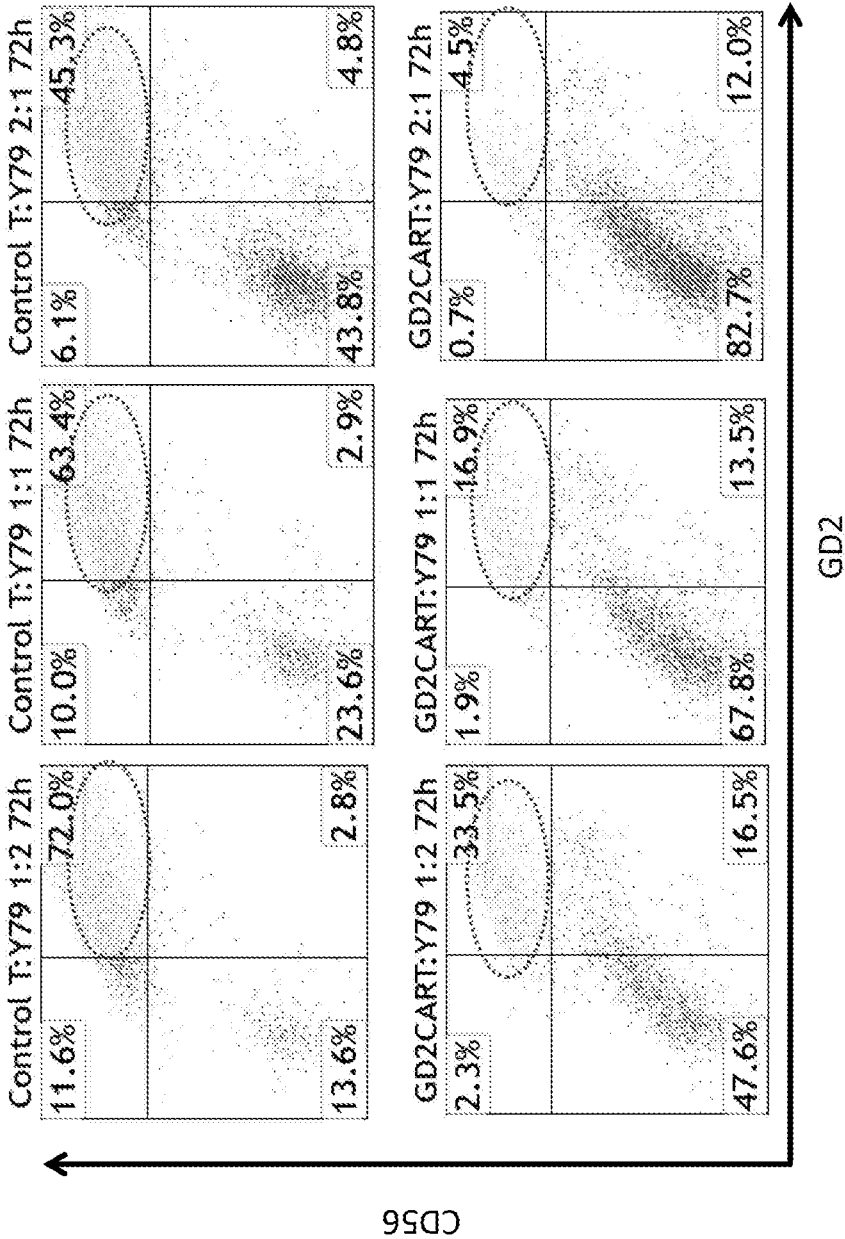


FIGURE 107E

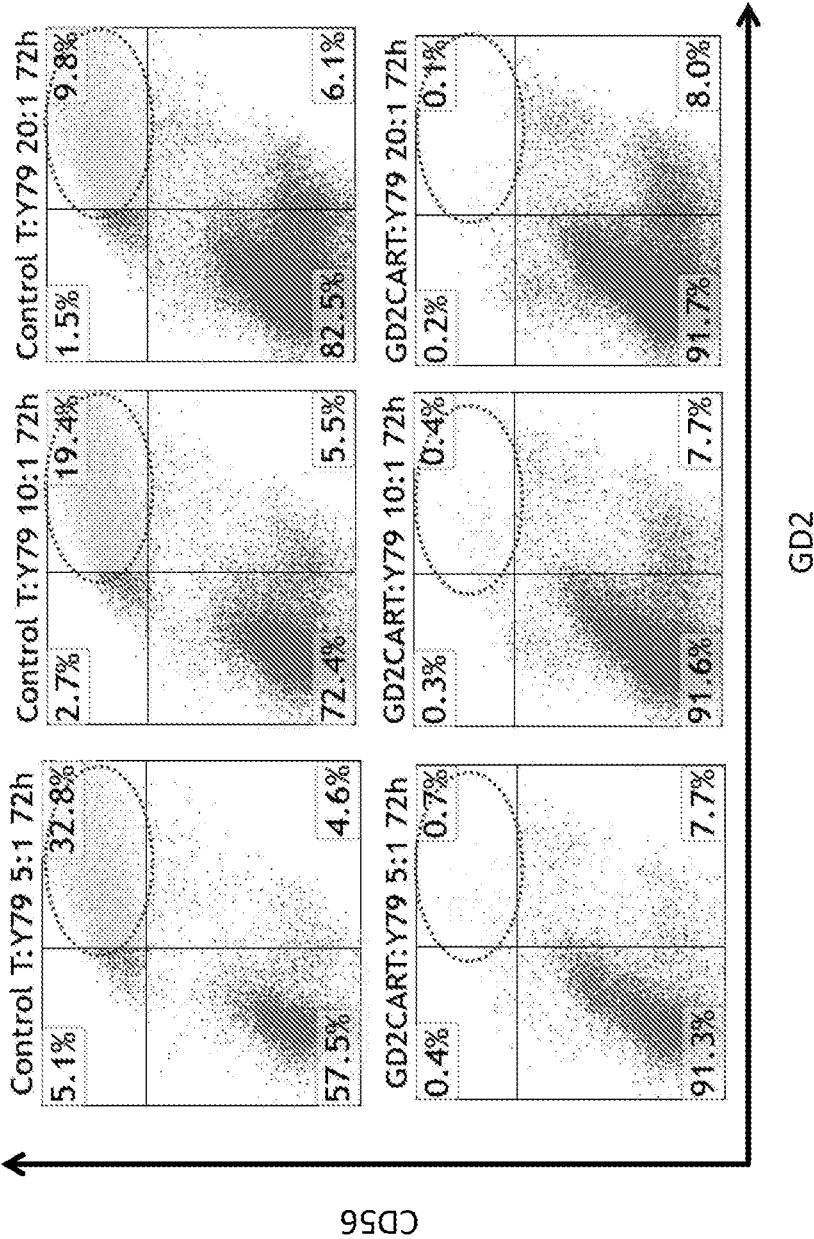


FIGURE 107F

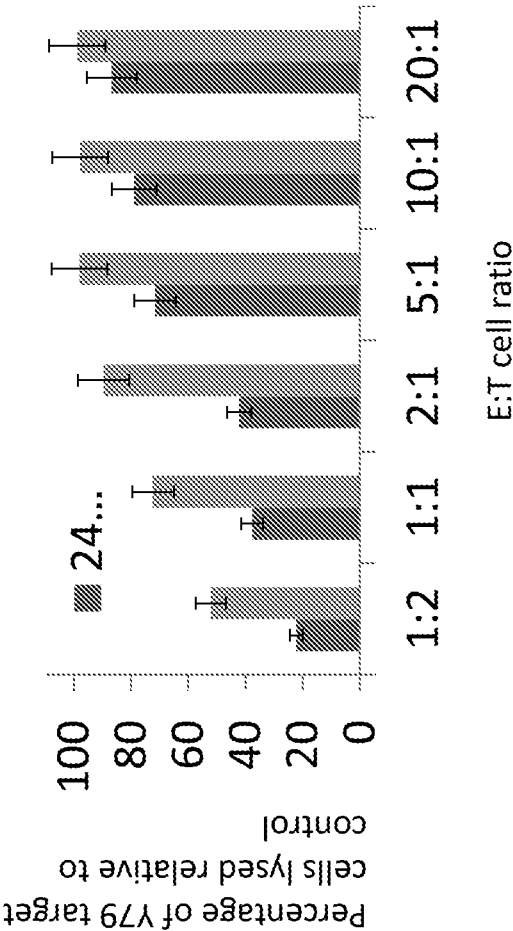


FIGURE 107G

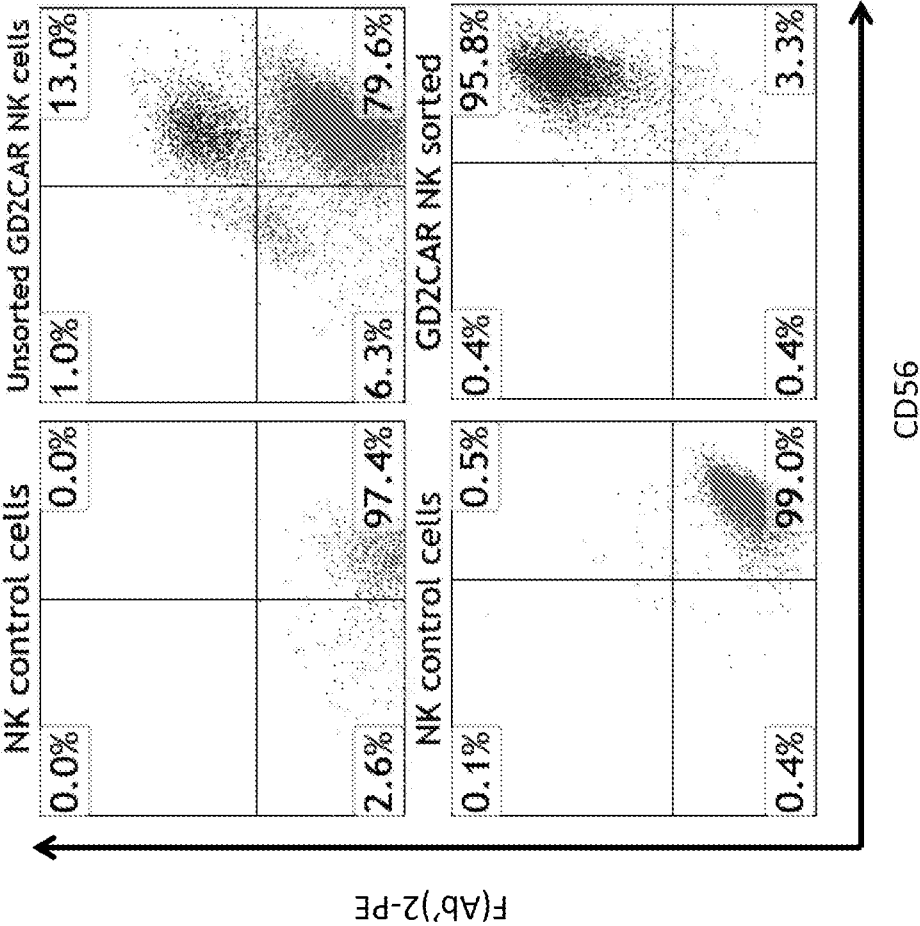


FIGURE 108A

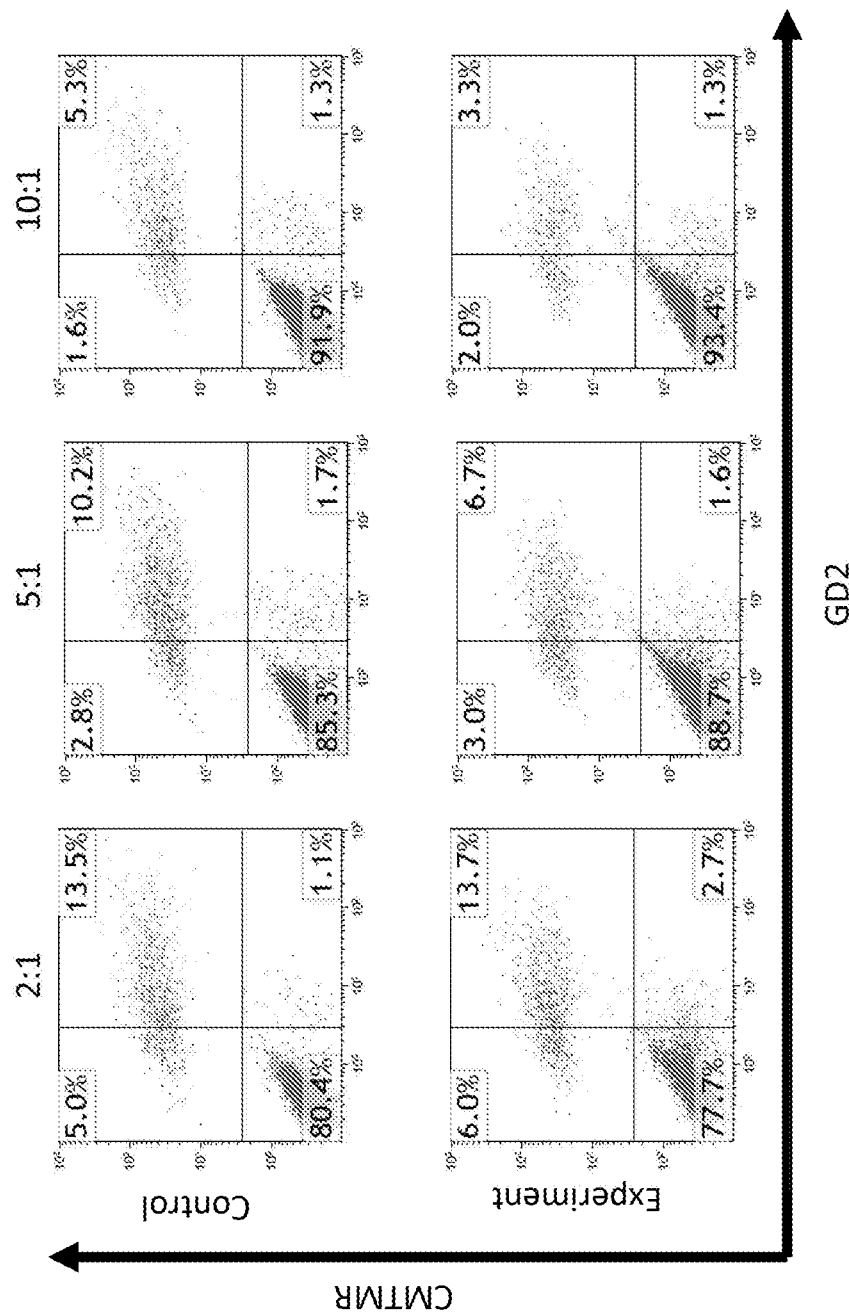


FIGURE 108B

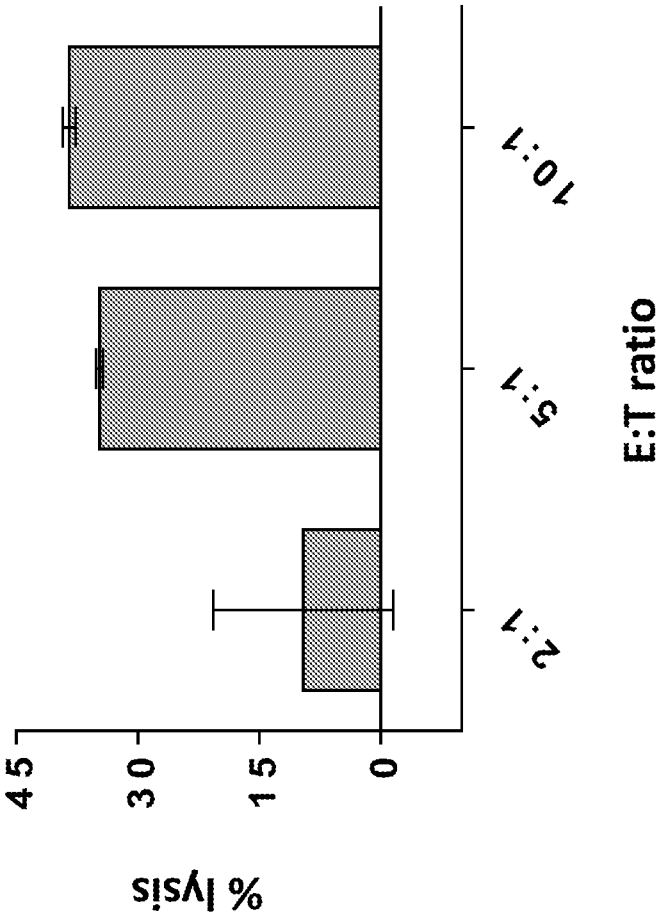


FIGURE 108C

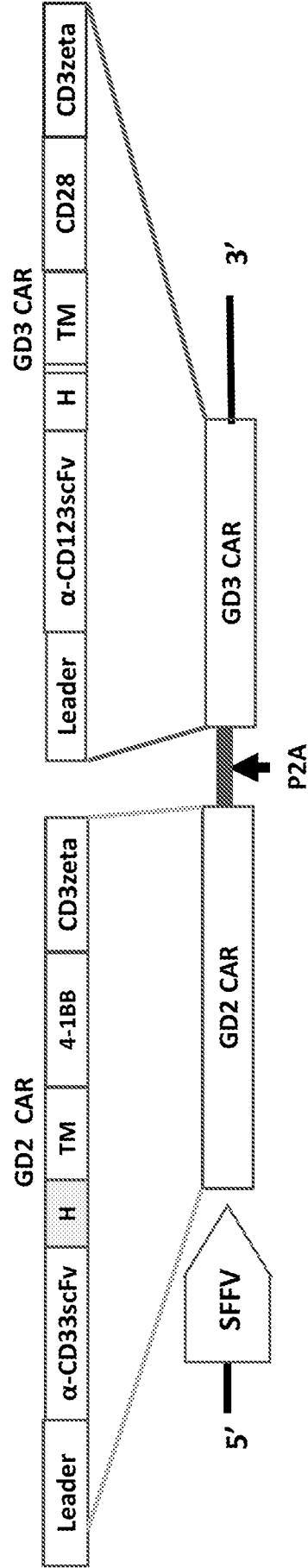


FIGURE 109