

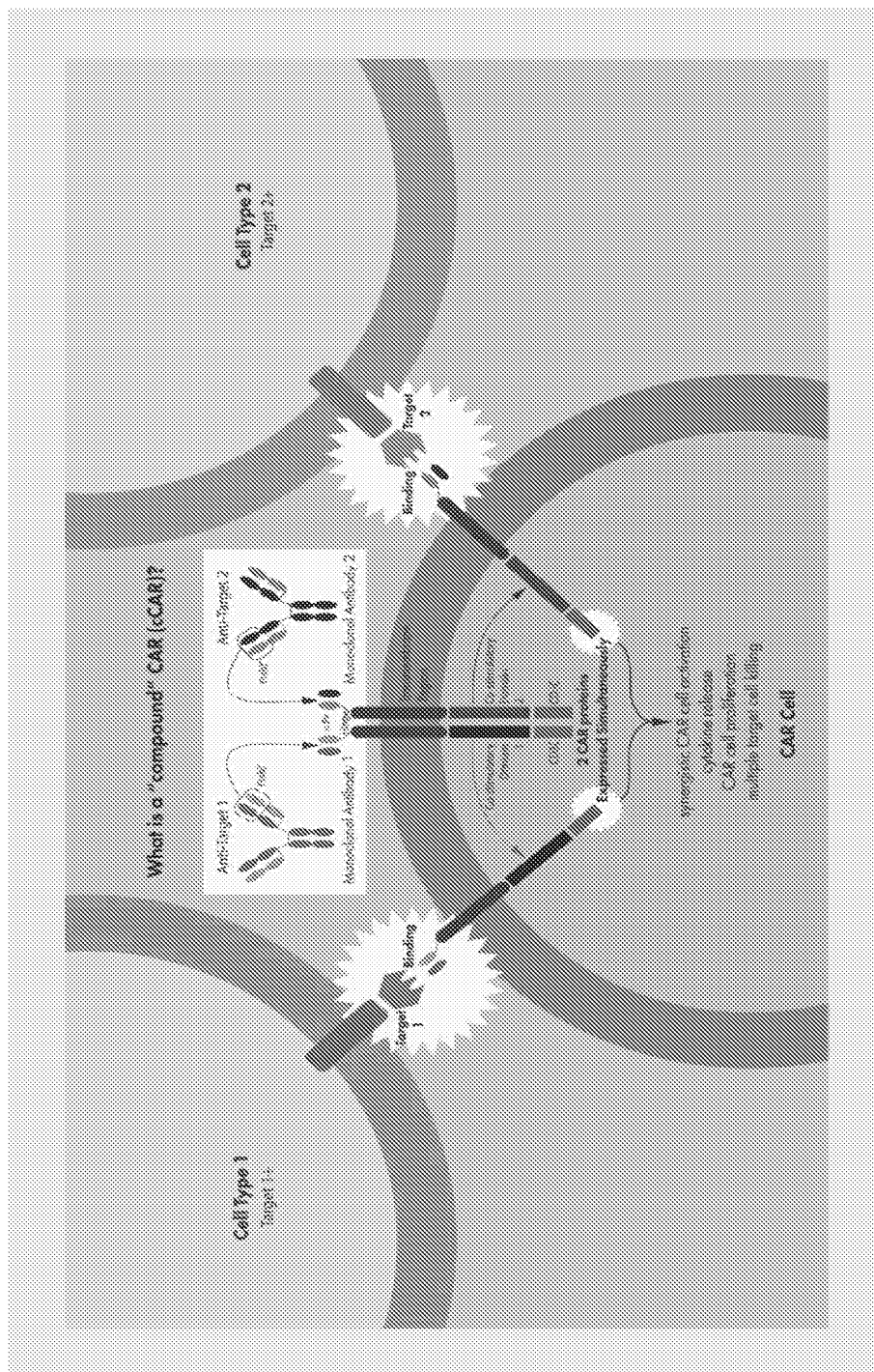


FIGURE 1

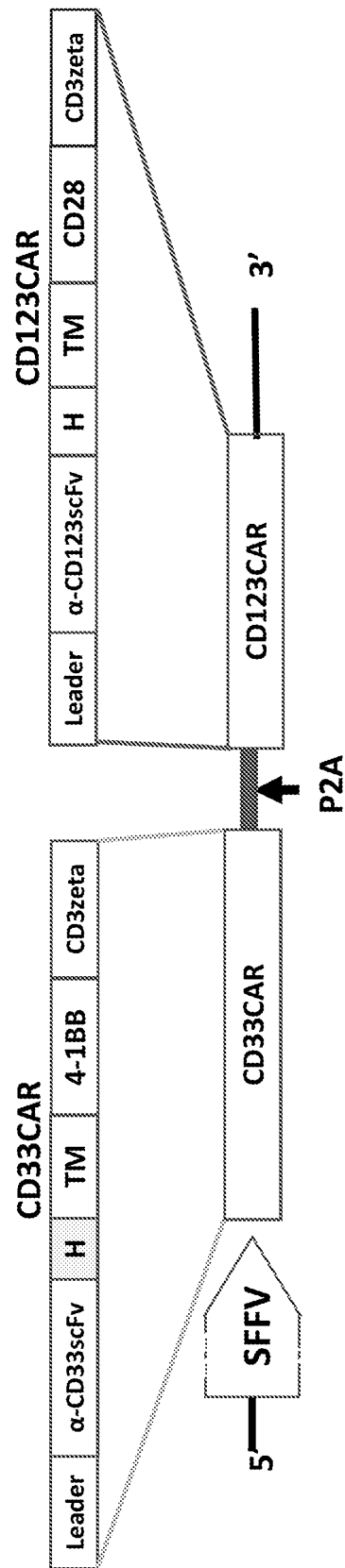
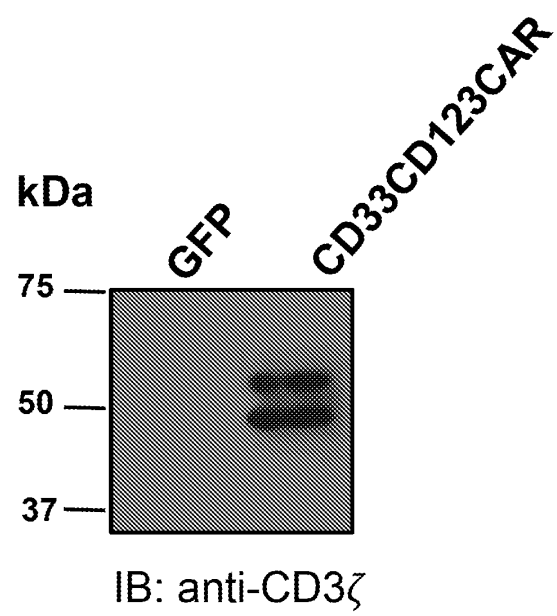
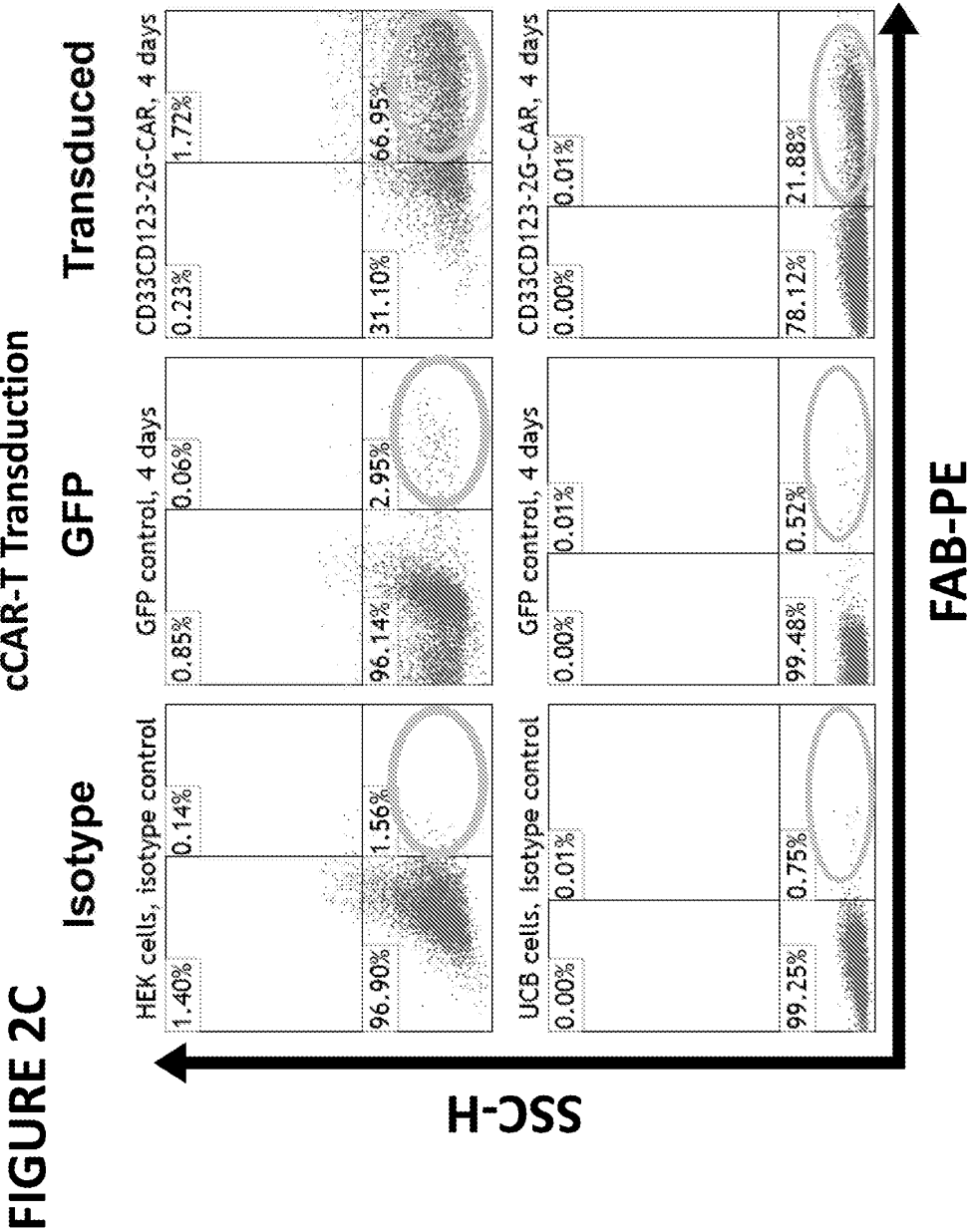
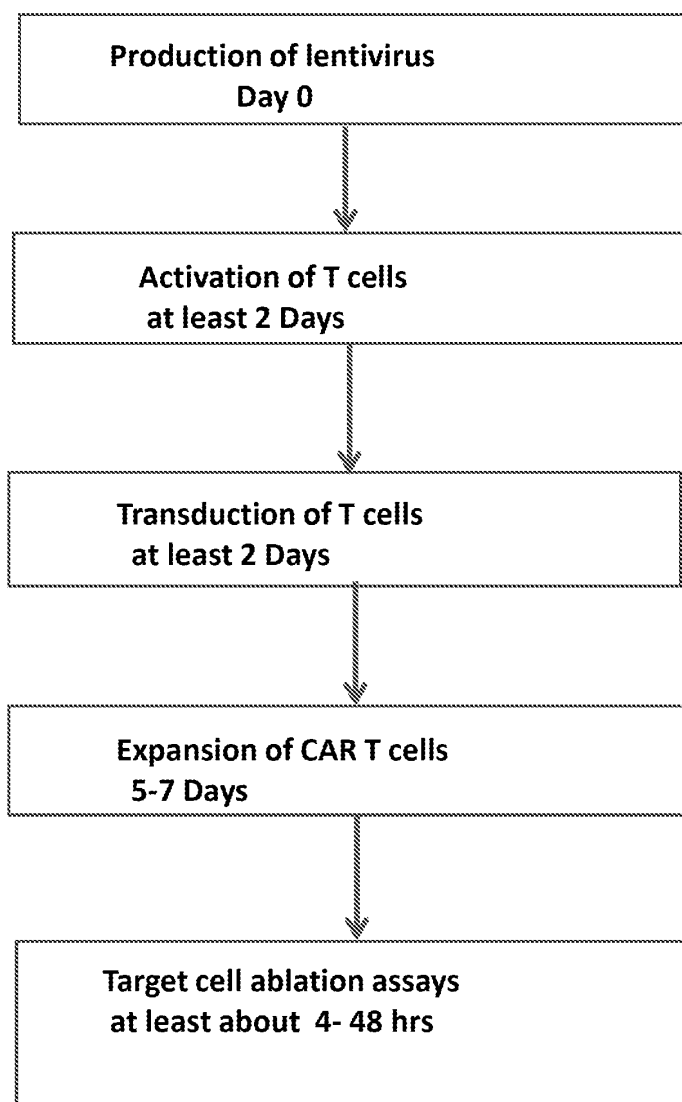


FIGURE 2A

**FIGURE 2B**



**FIGURE 3**

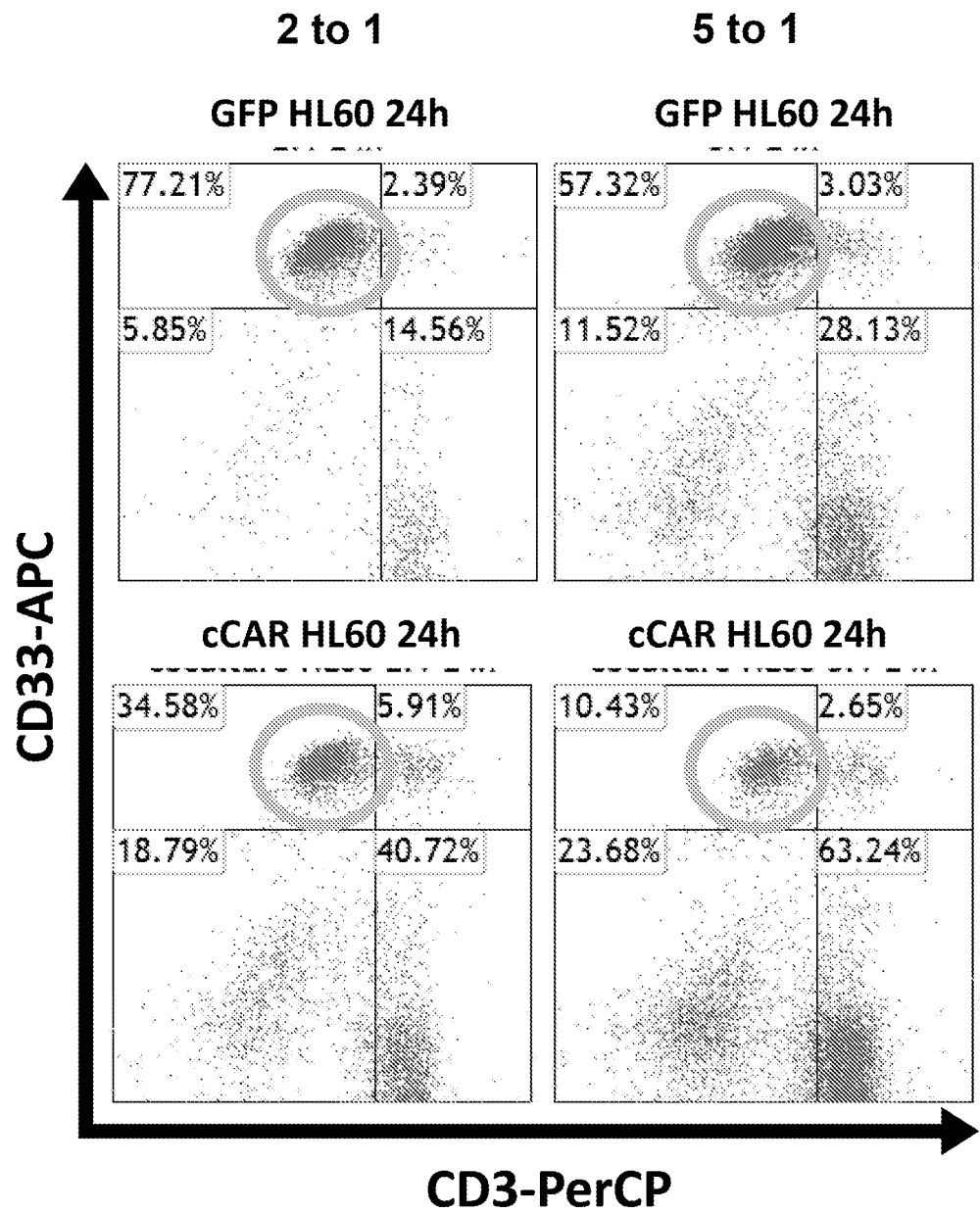


FIGURE 4

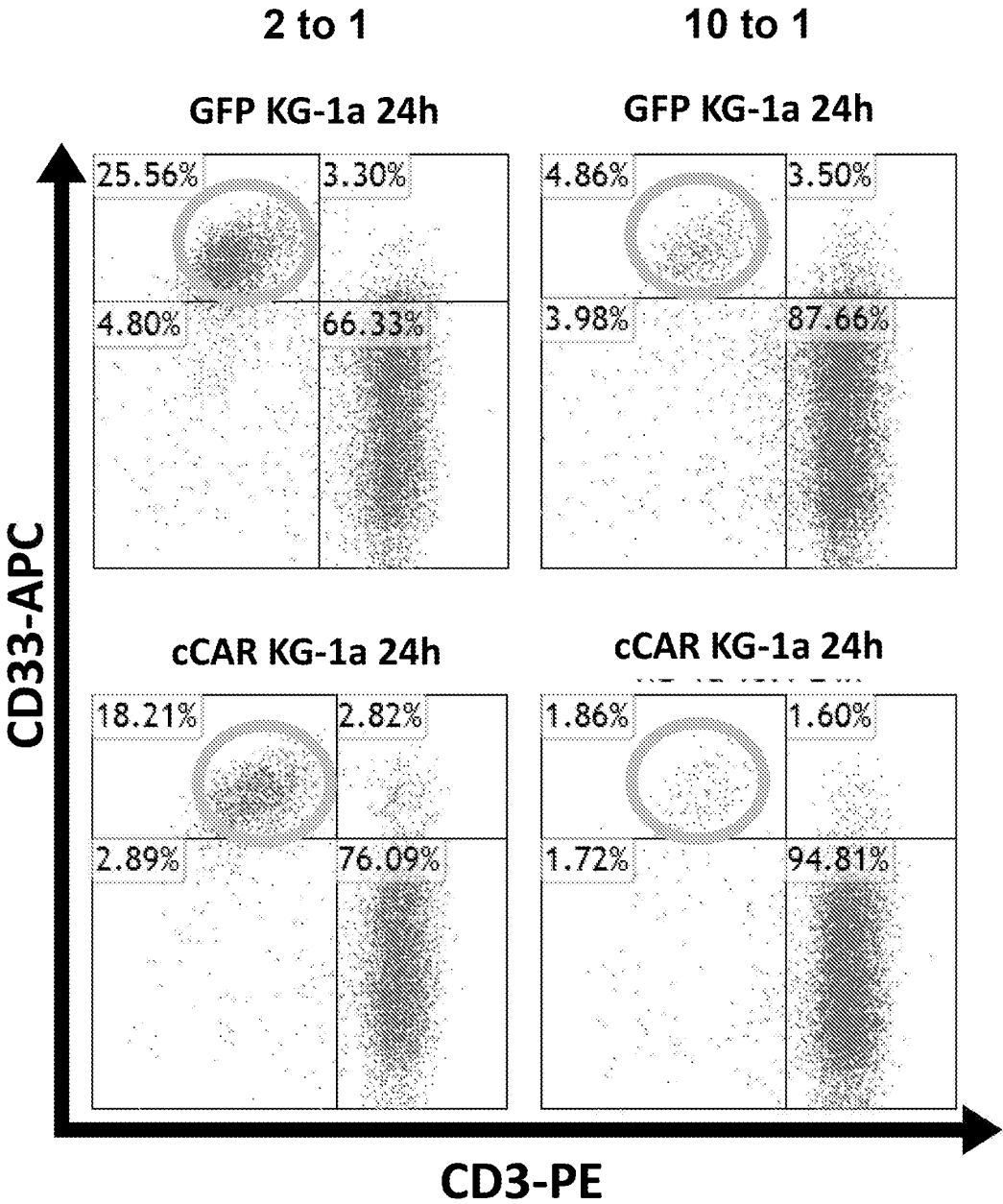


FIGURE 5

FIGURE 6

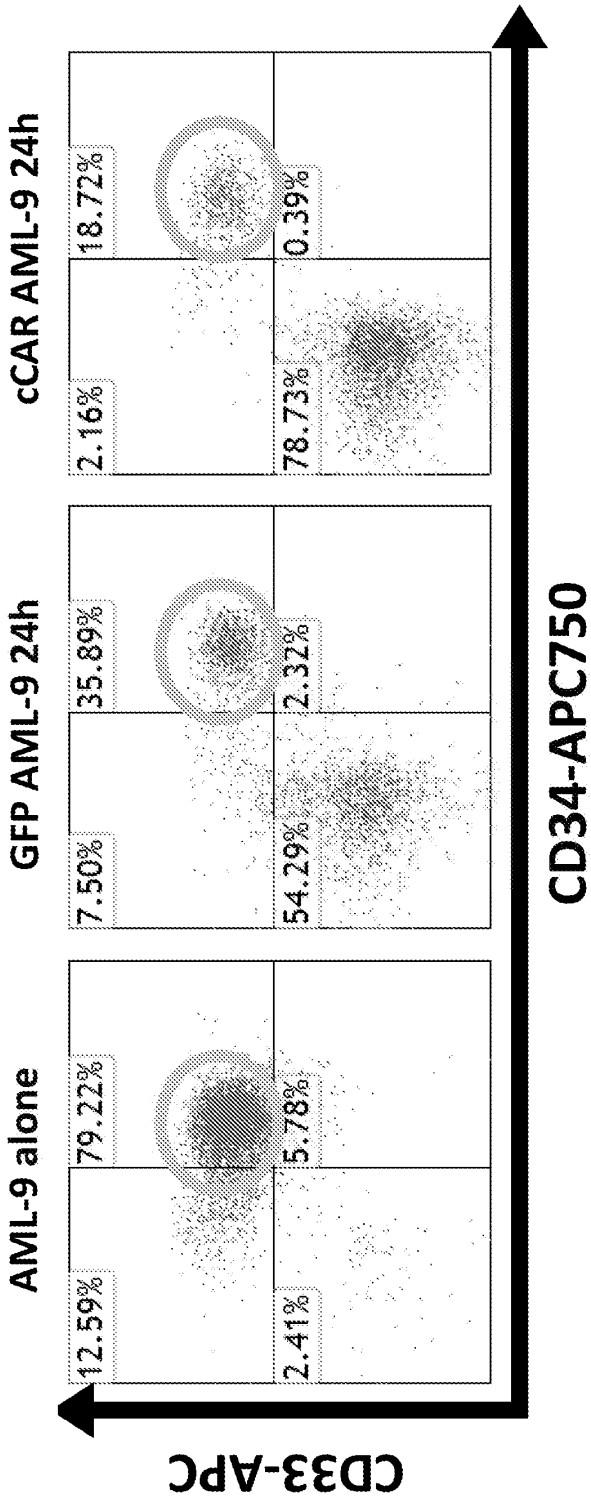


FIGURE 7

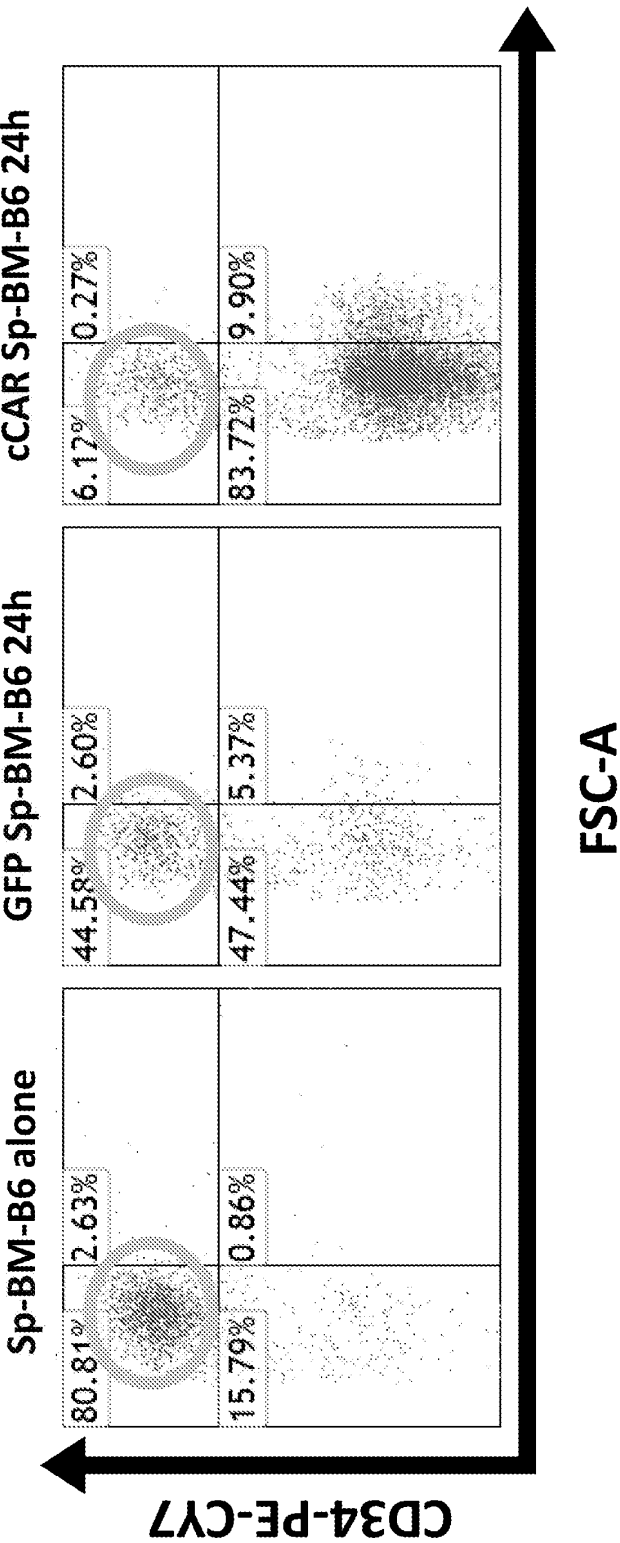
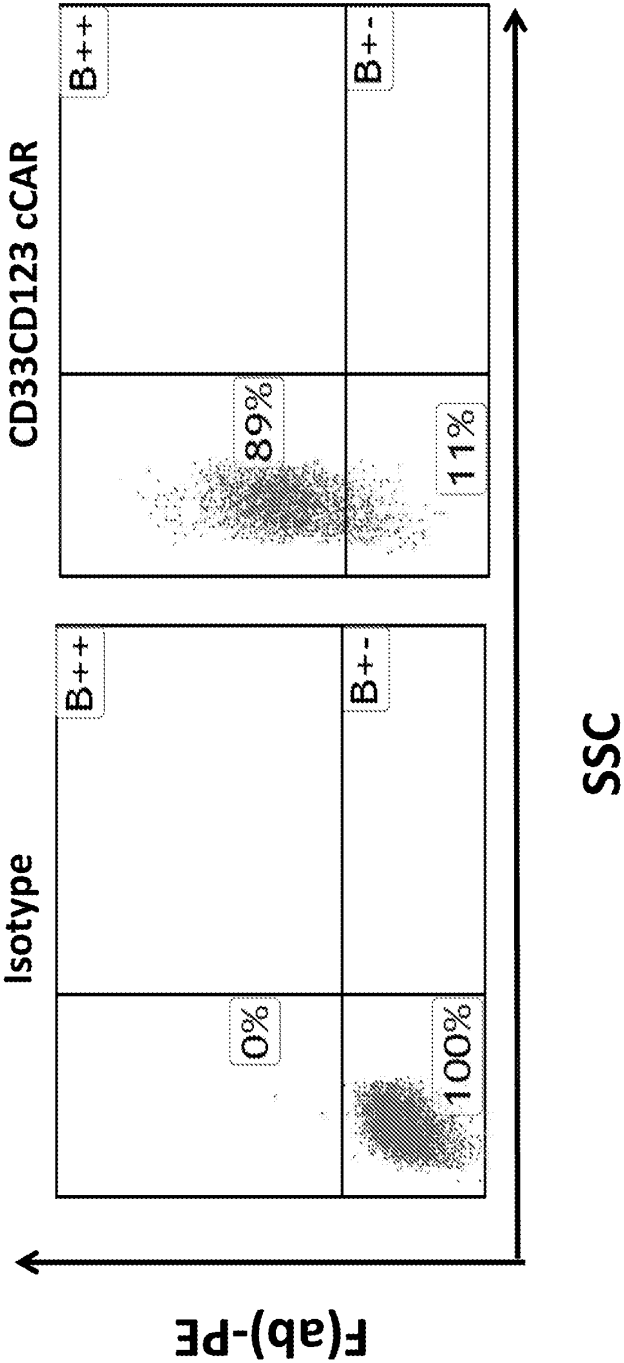
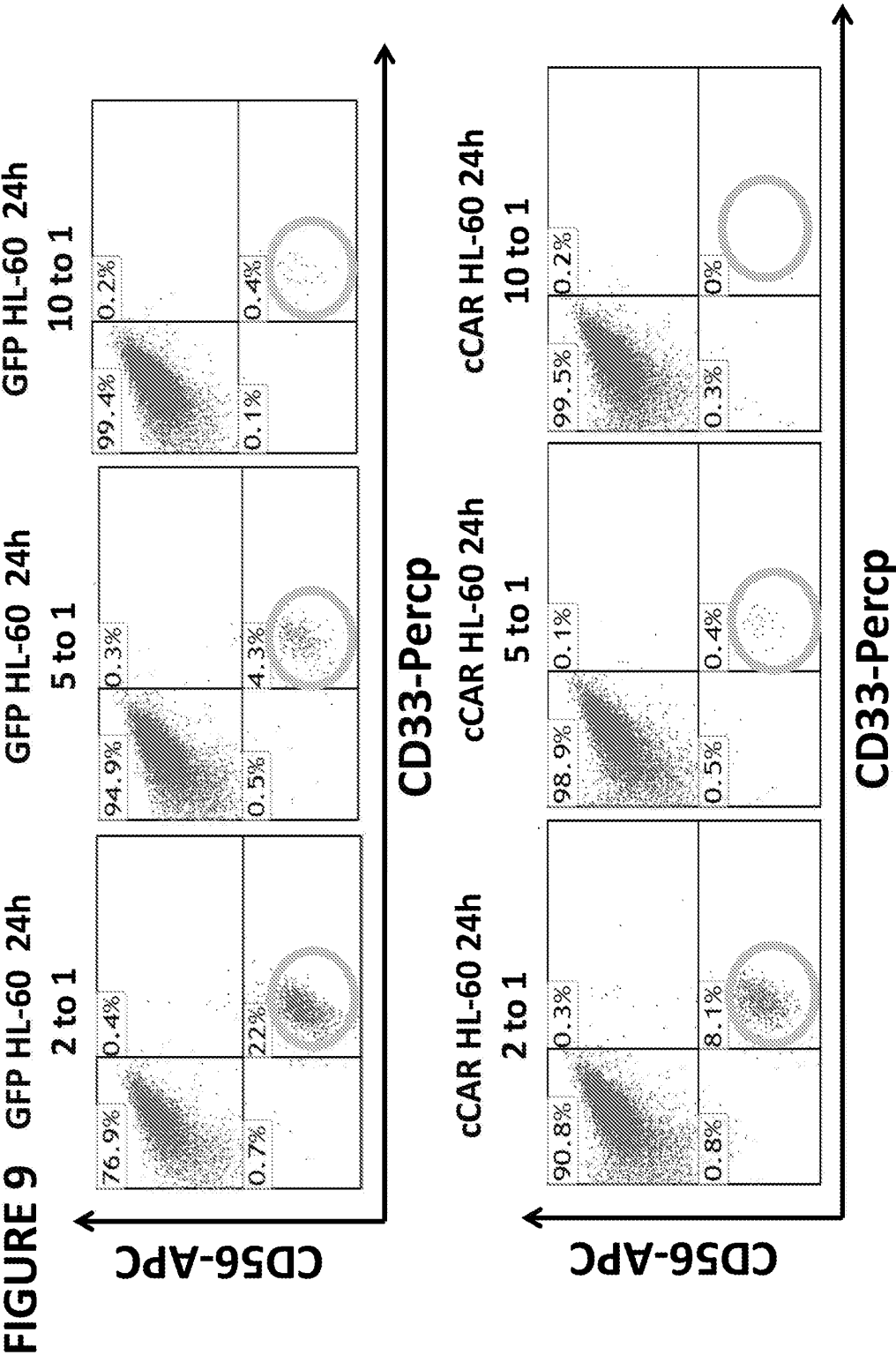


FIGURE 8





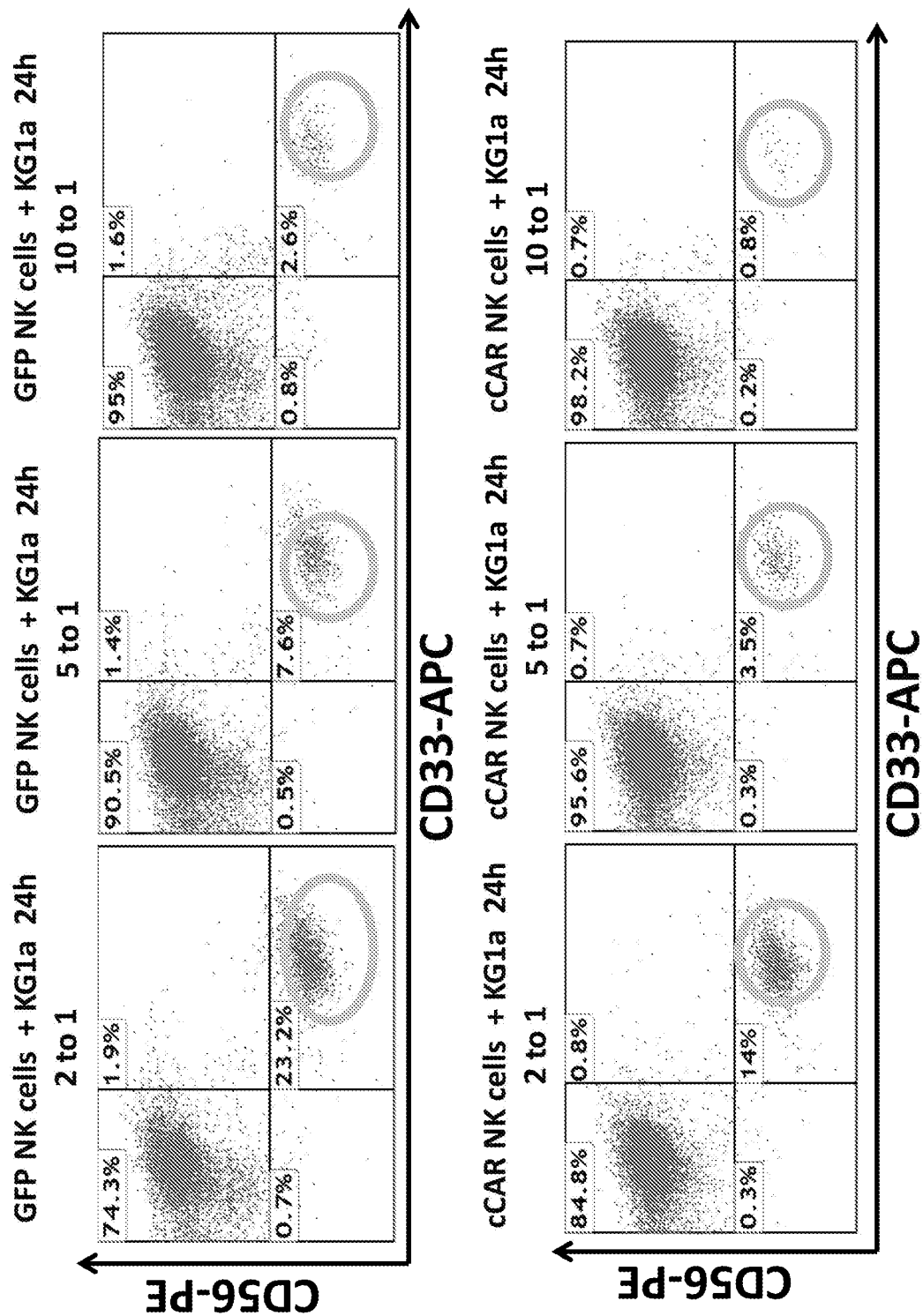


FIGURE 10

FIGURE 11

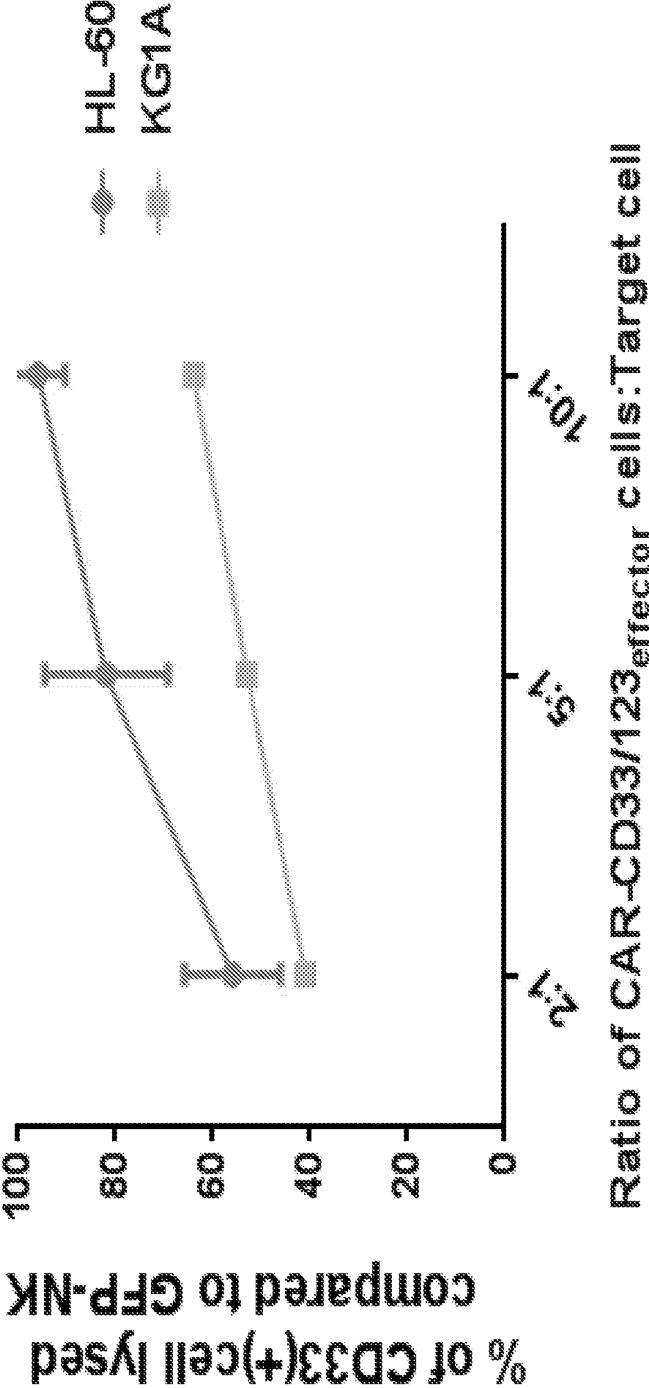
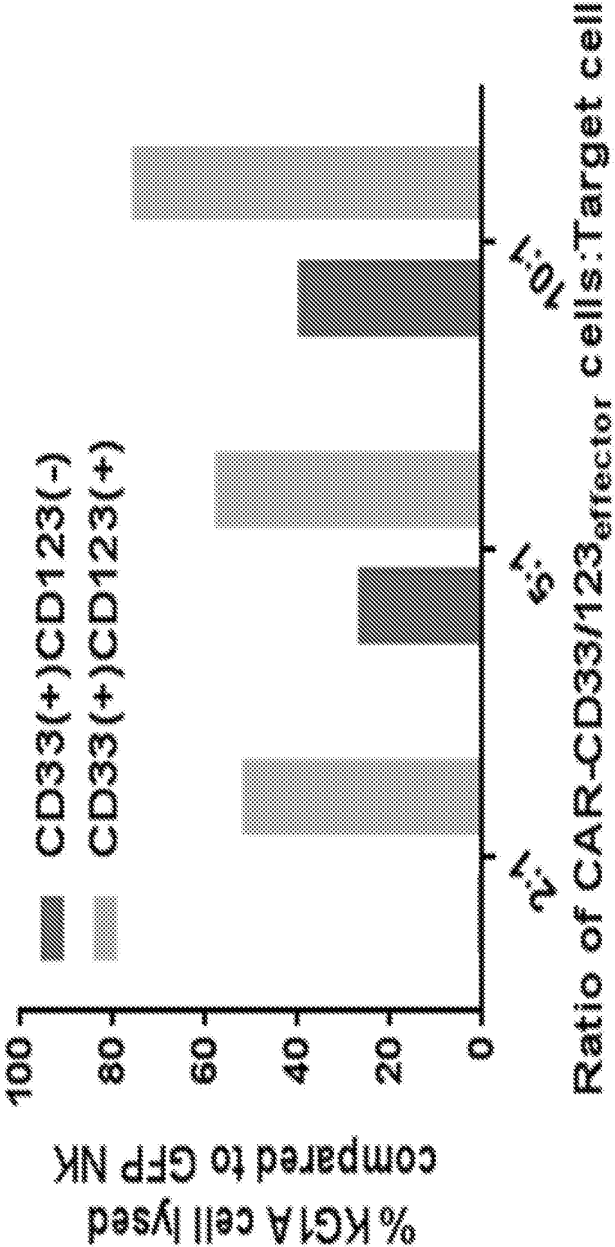


FIGURE 12



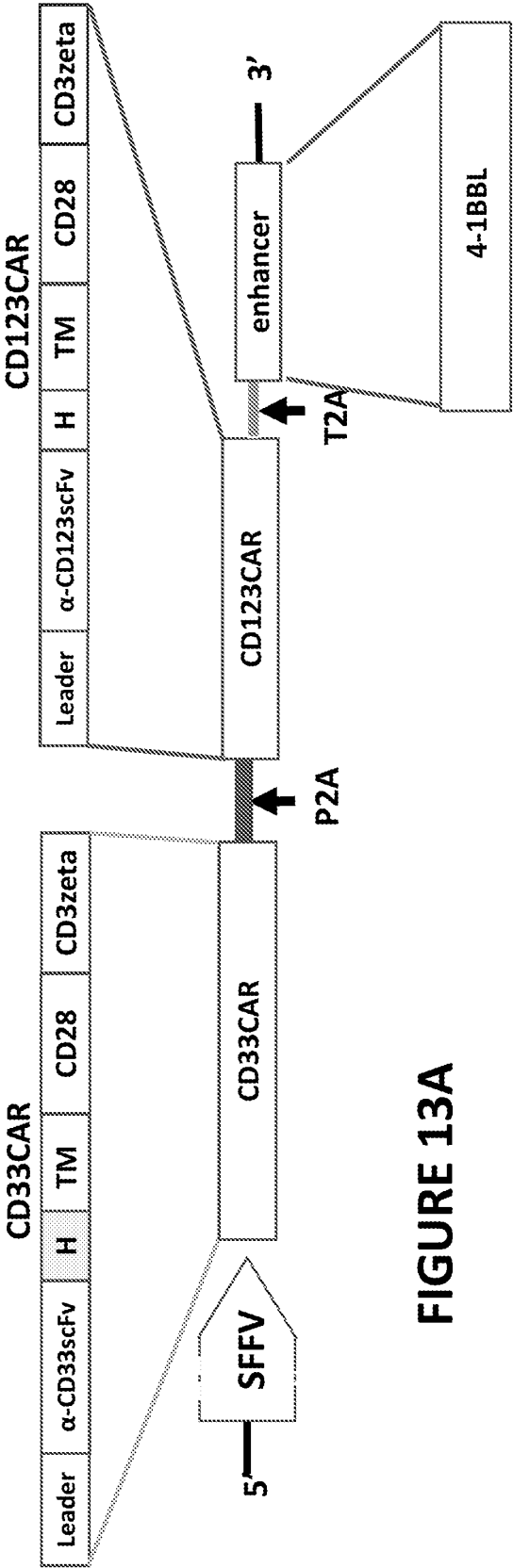


FIGURE 13A

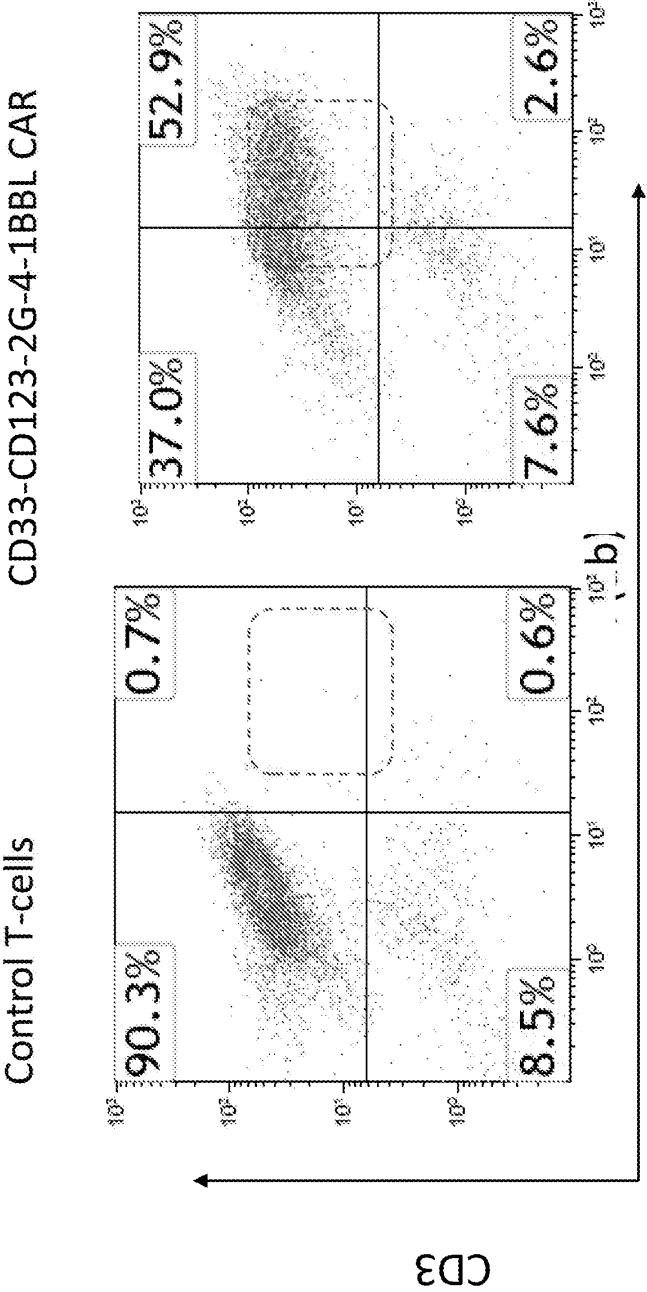


FIGURE 13B

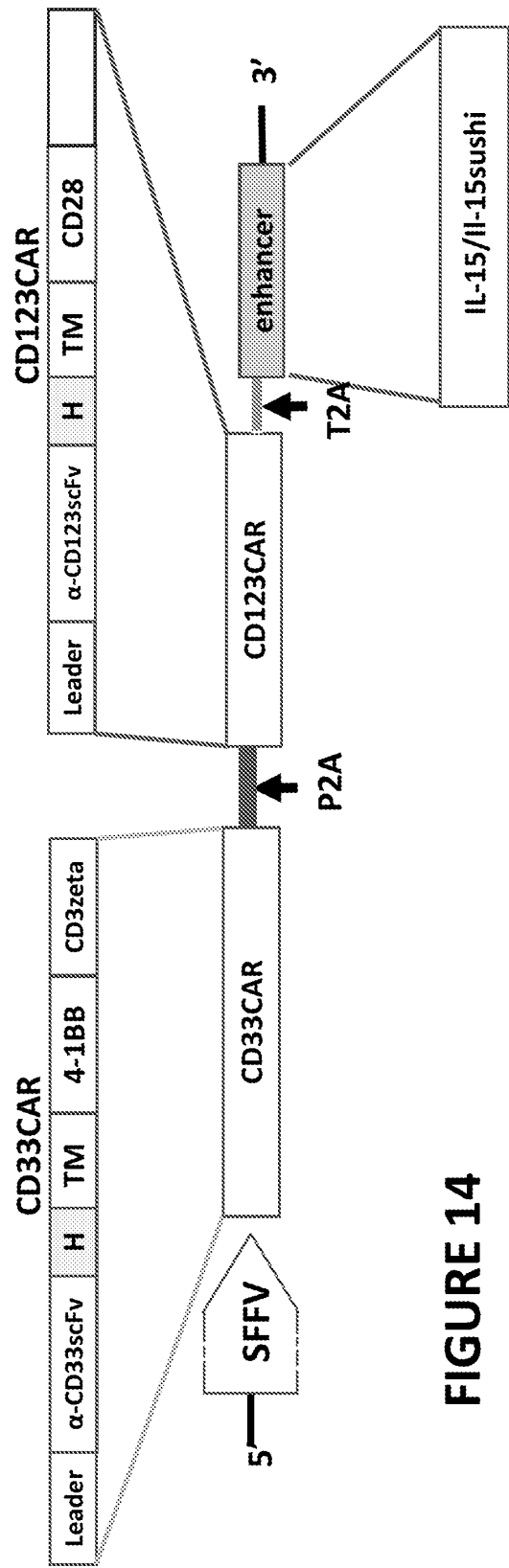


FIGURE 14

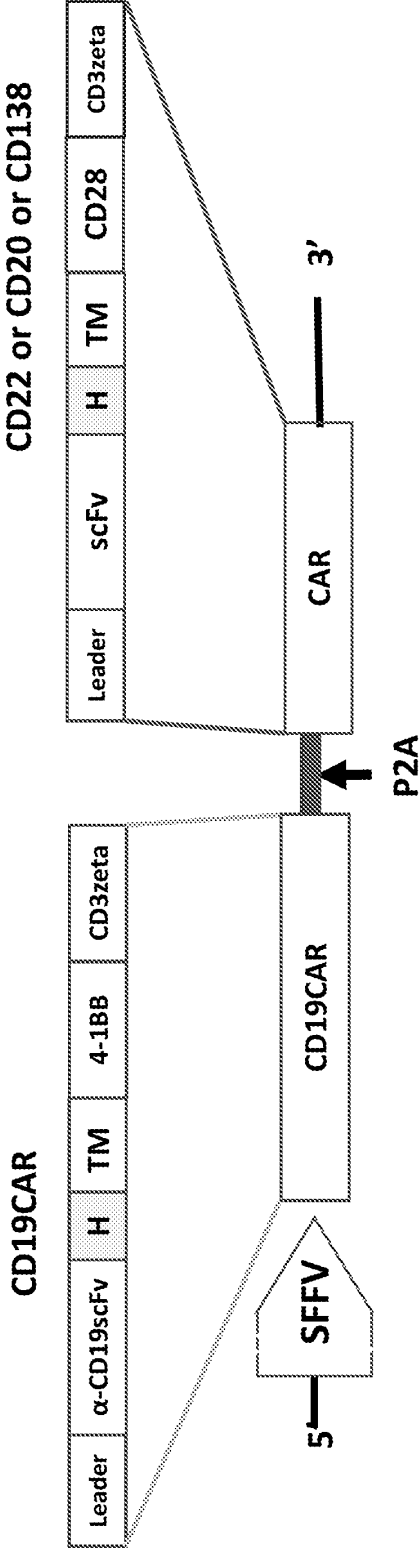
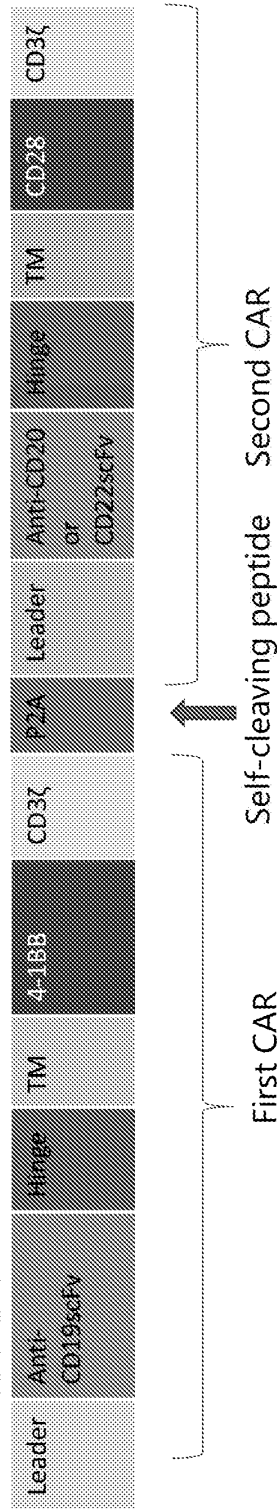


FIGURE 15

FIGURE 16A



M 1 2 3

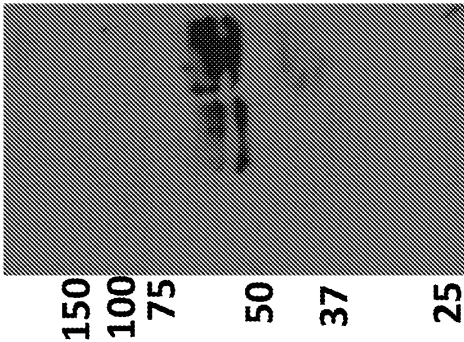
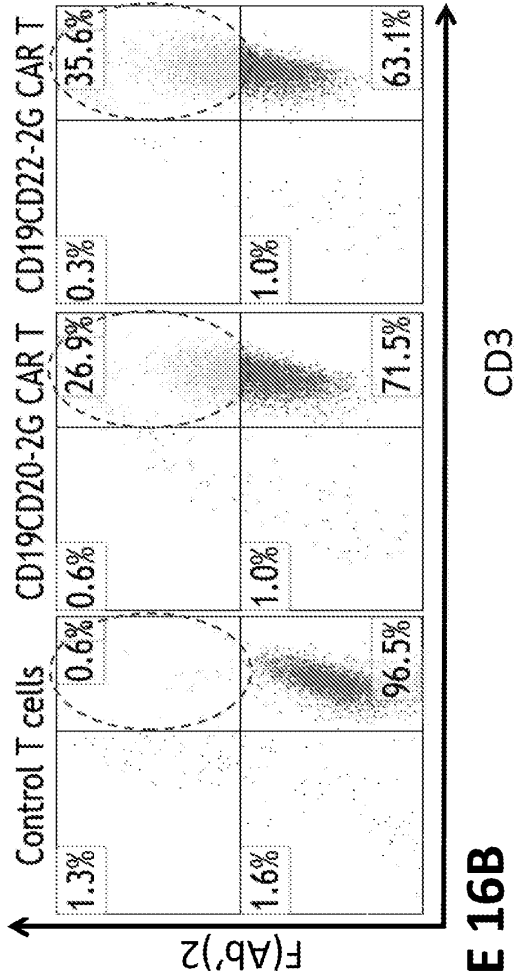
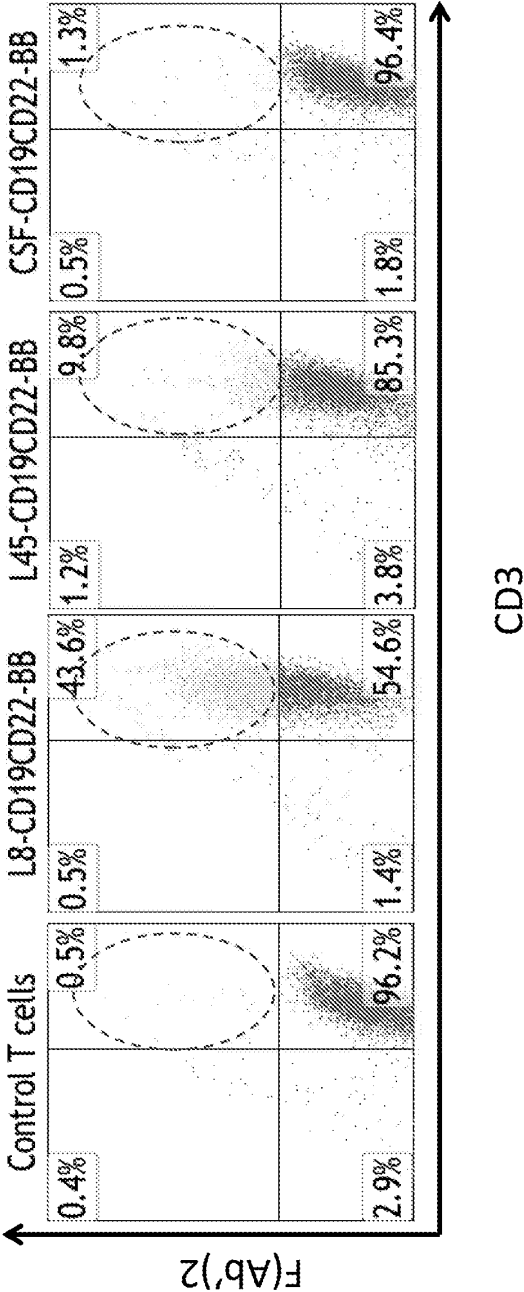


FIGURE 16B

FIGURE 17



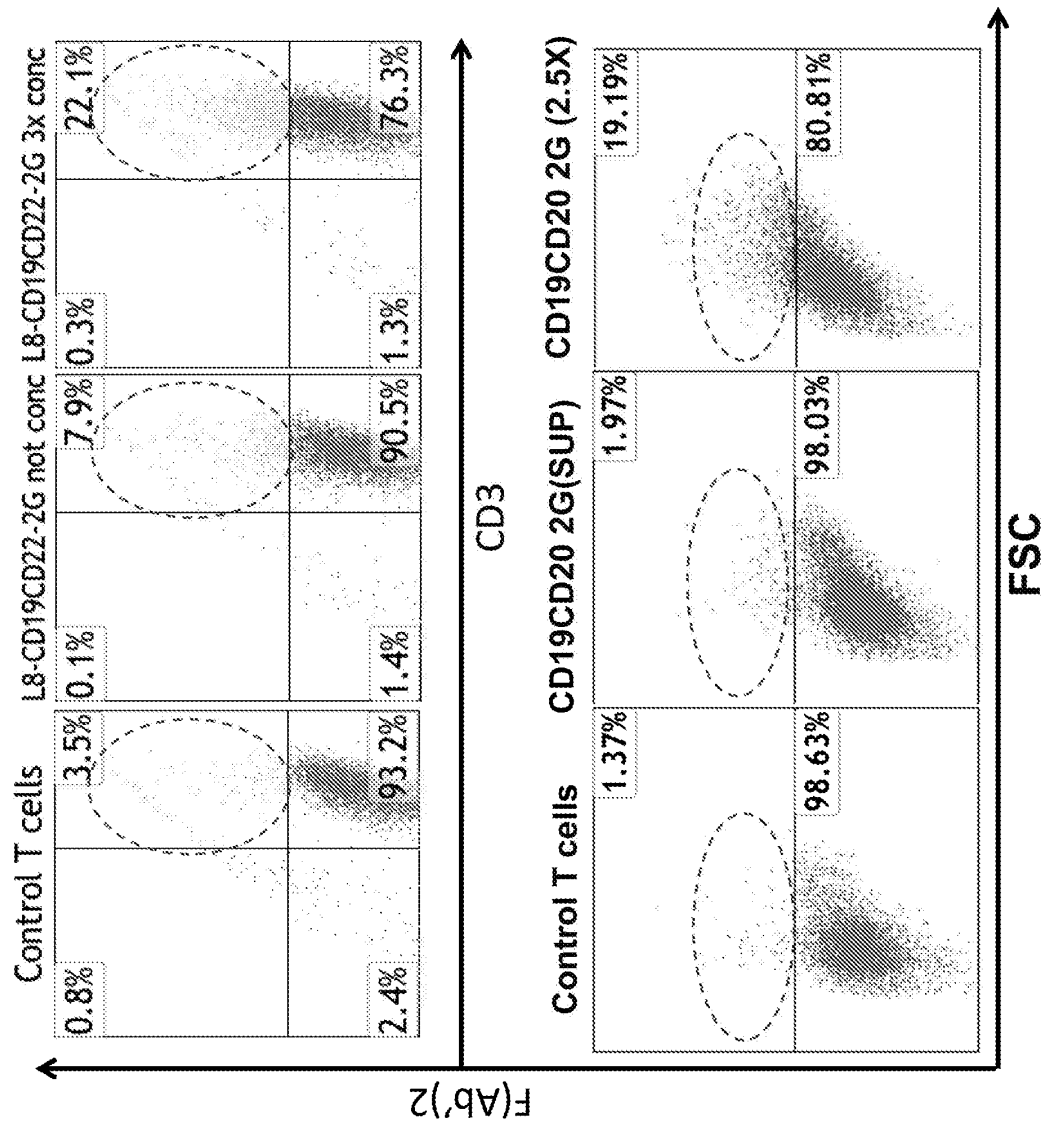
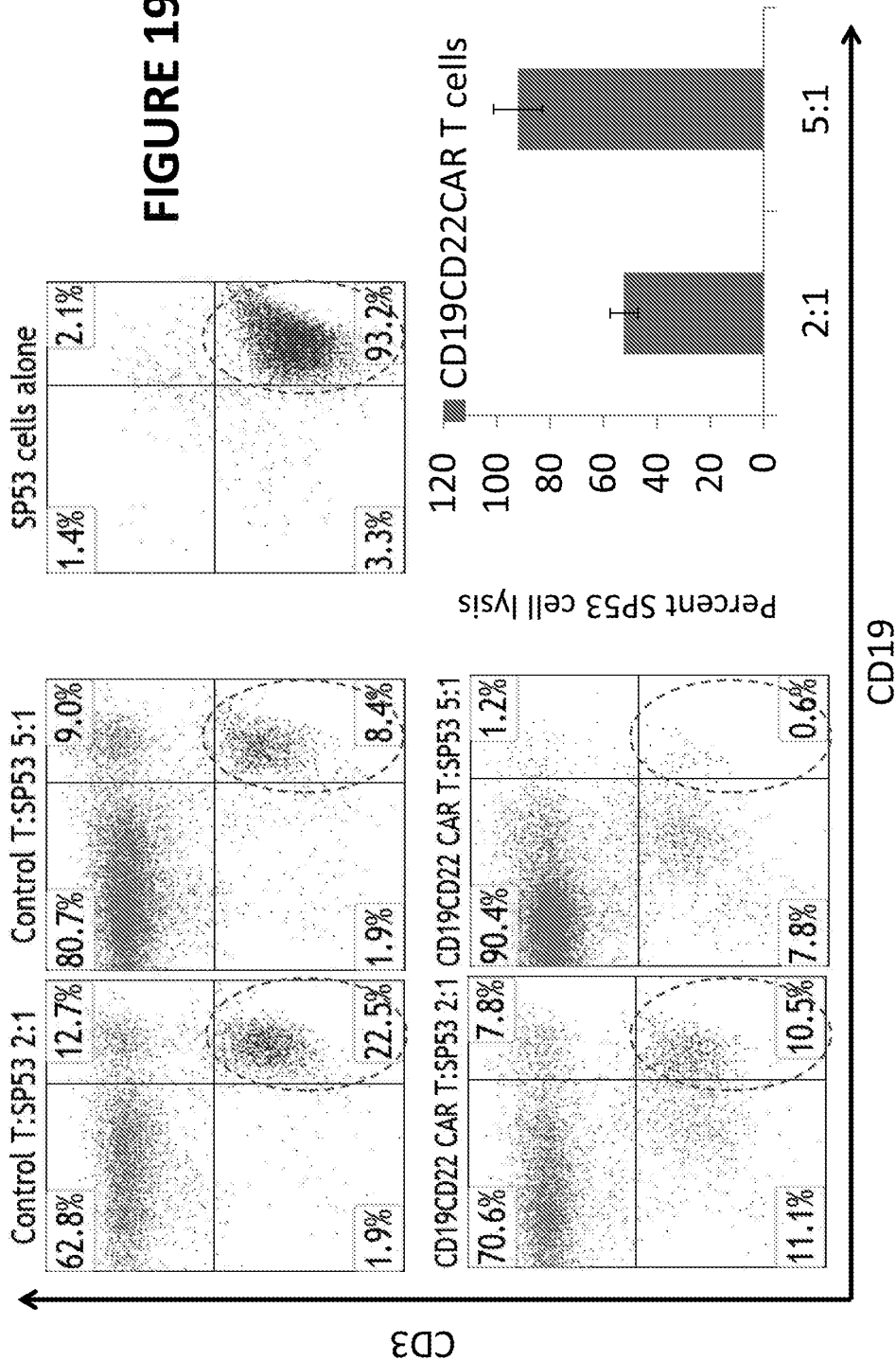
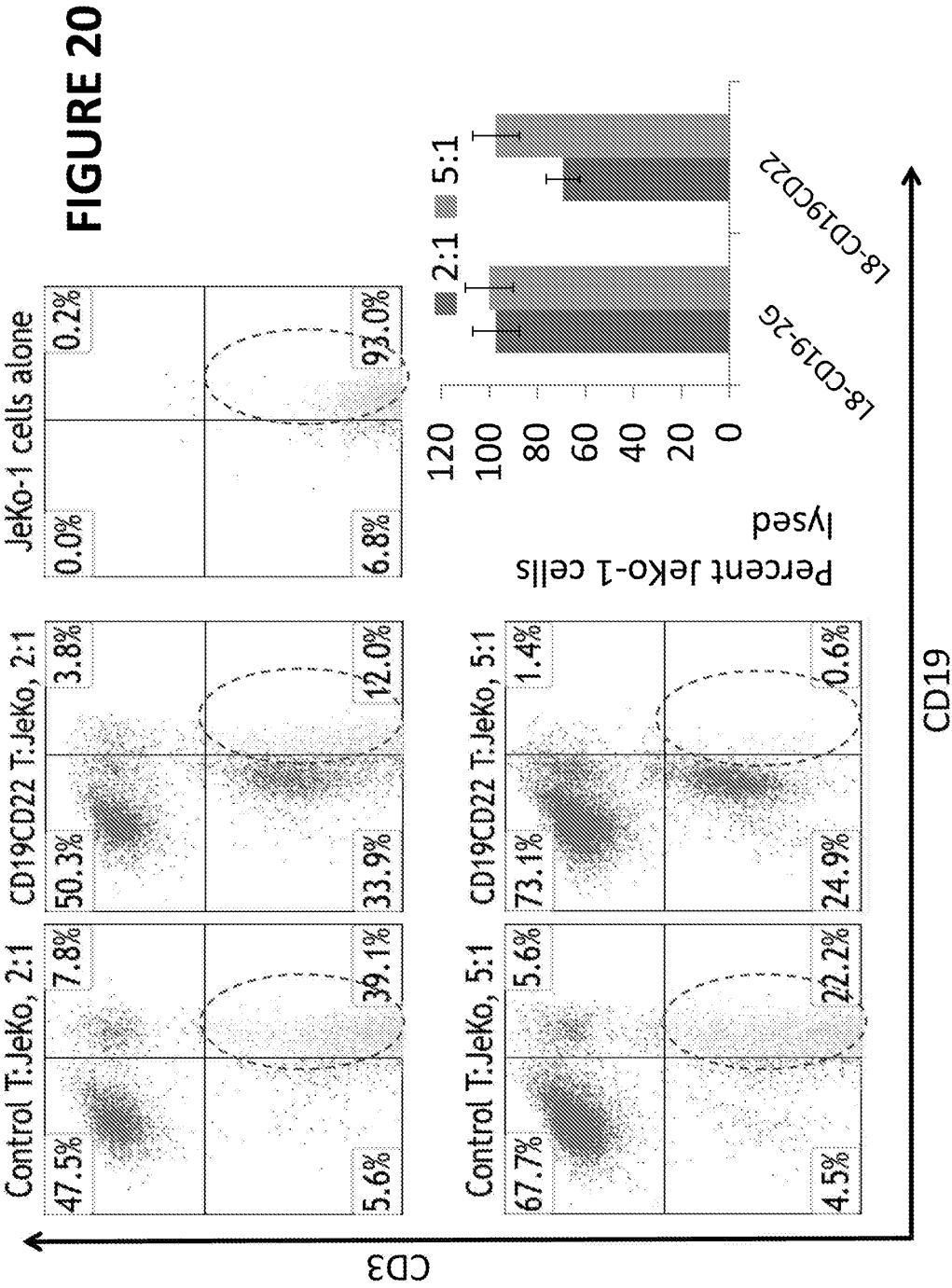


FIGURE 18

FIGURE 19





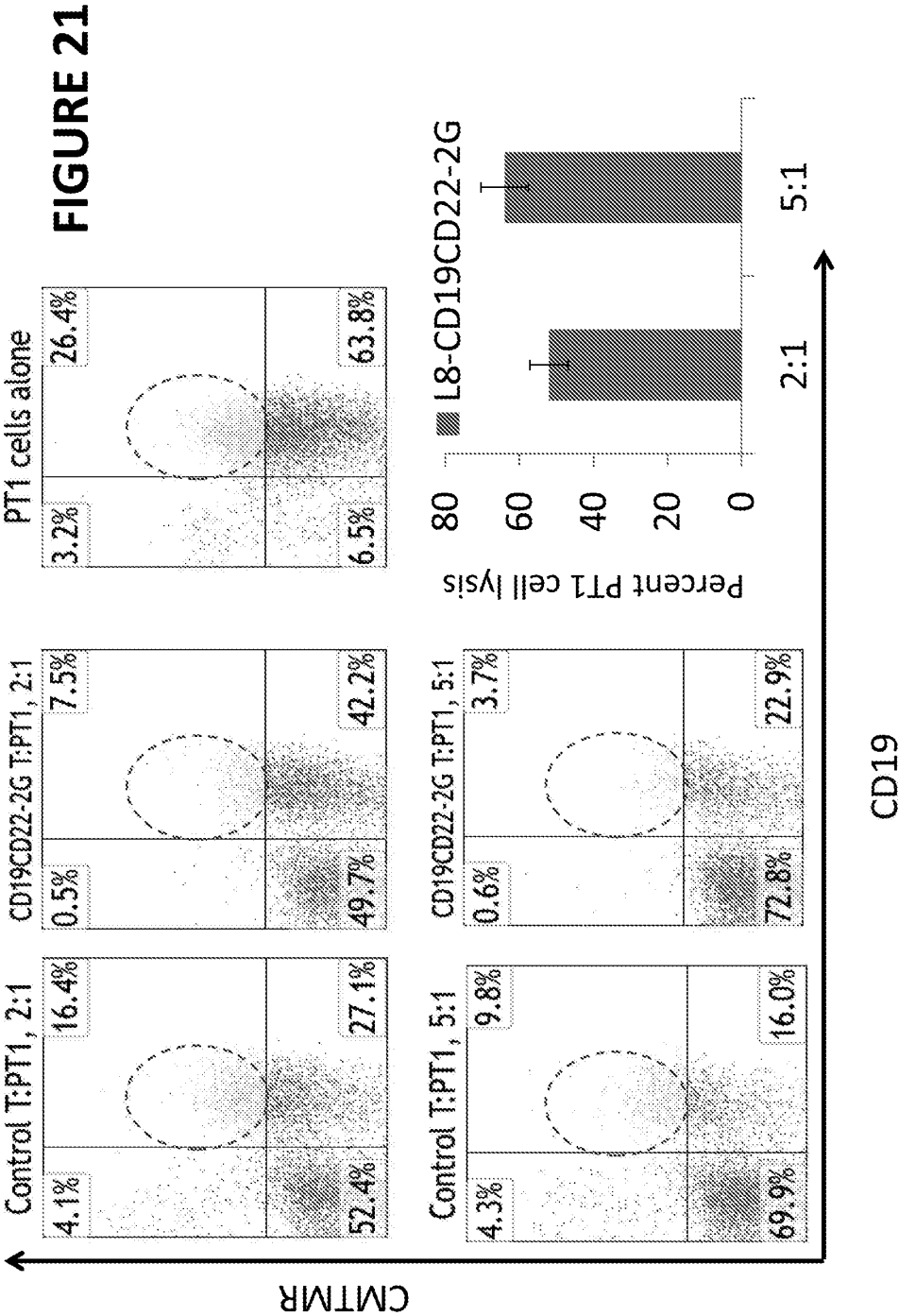
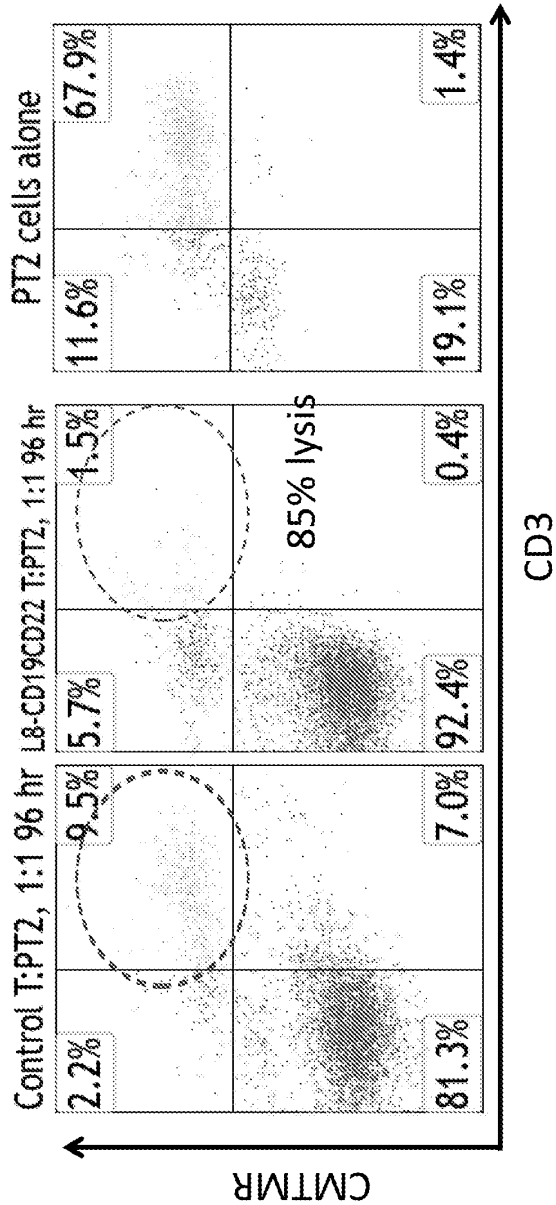


FIGURE 22A



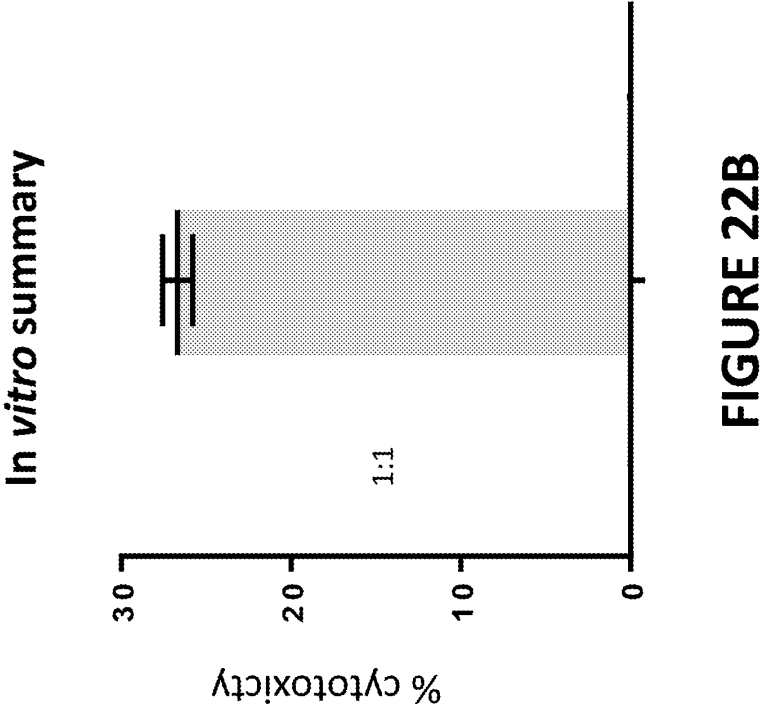


FIGURE 22B

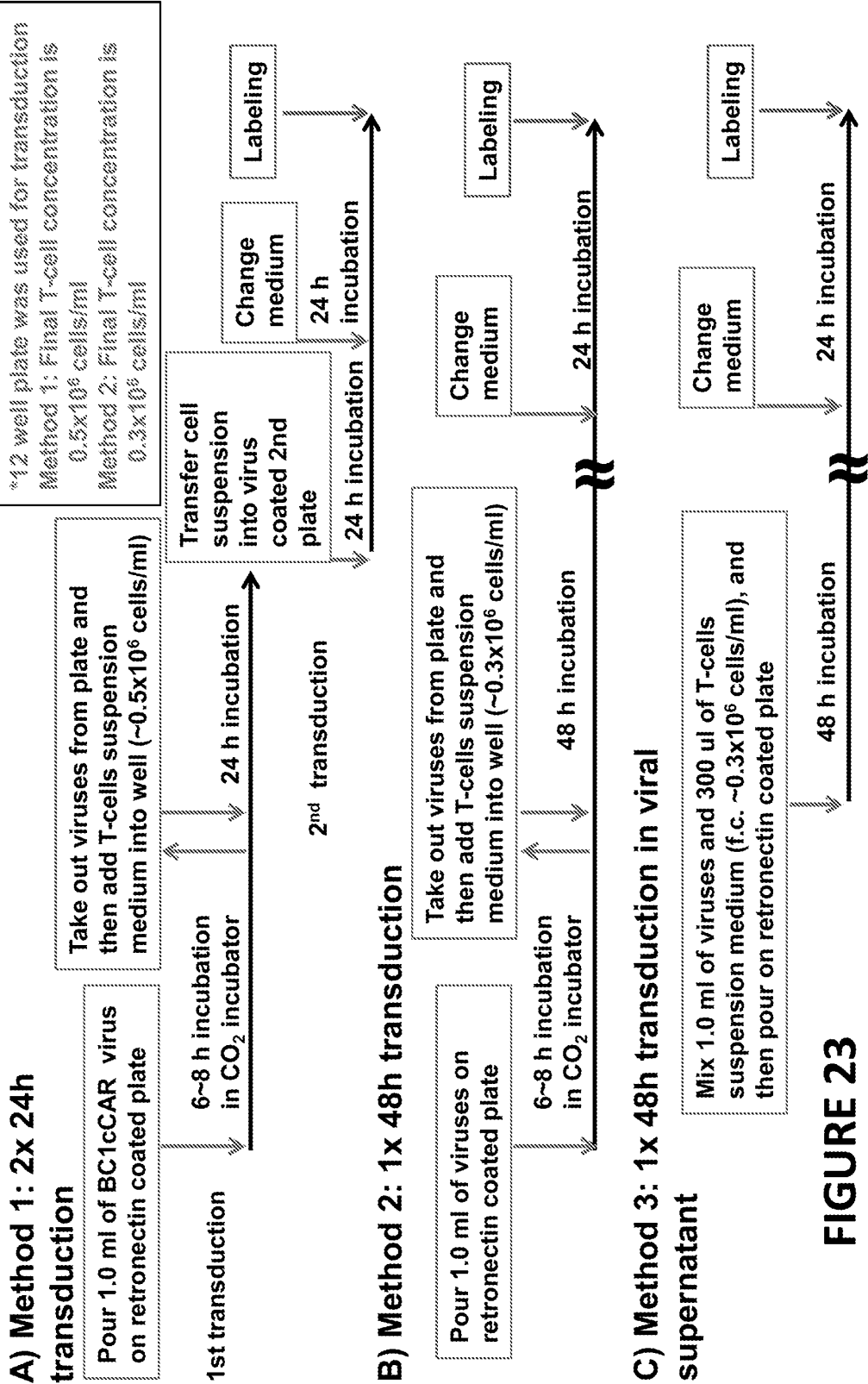


FIGURE 24A

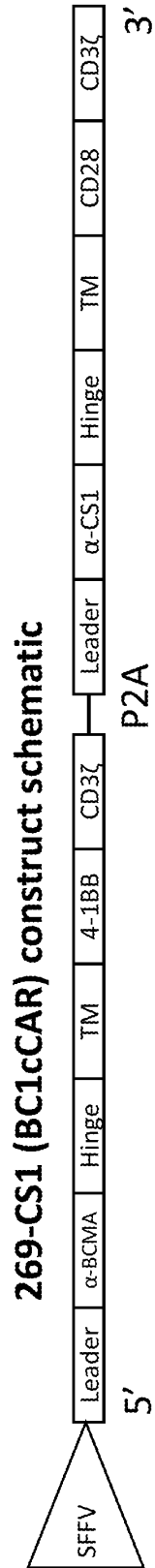
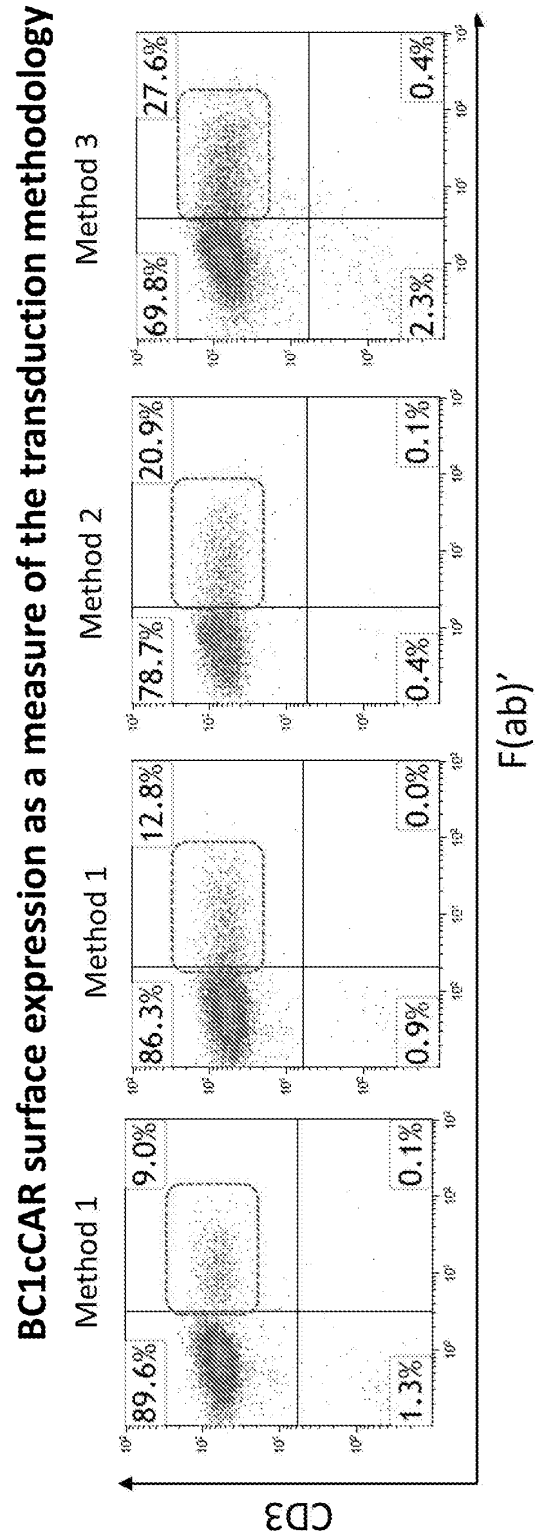


FIGURE 24B



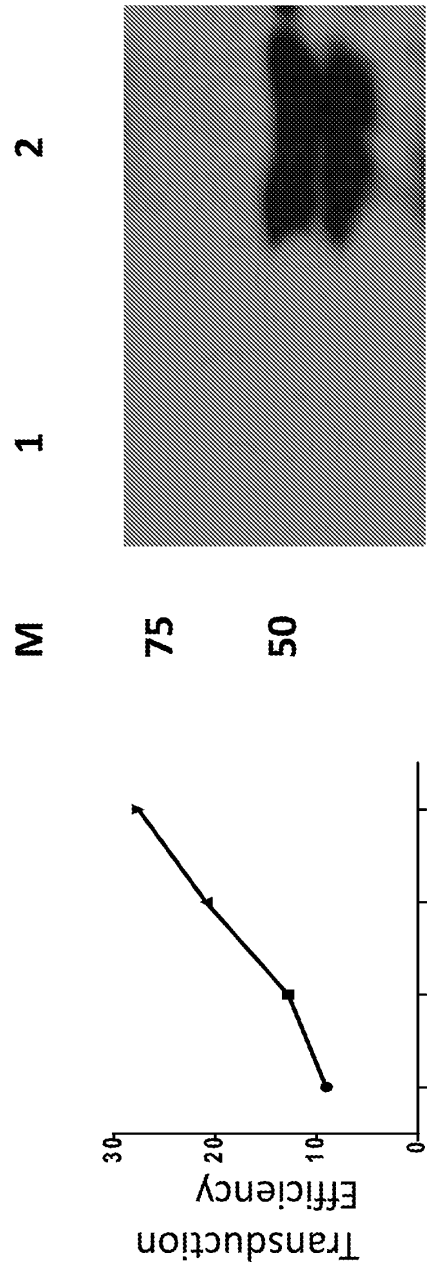


FIGURE 24D

FIGURE 24C

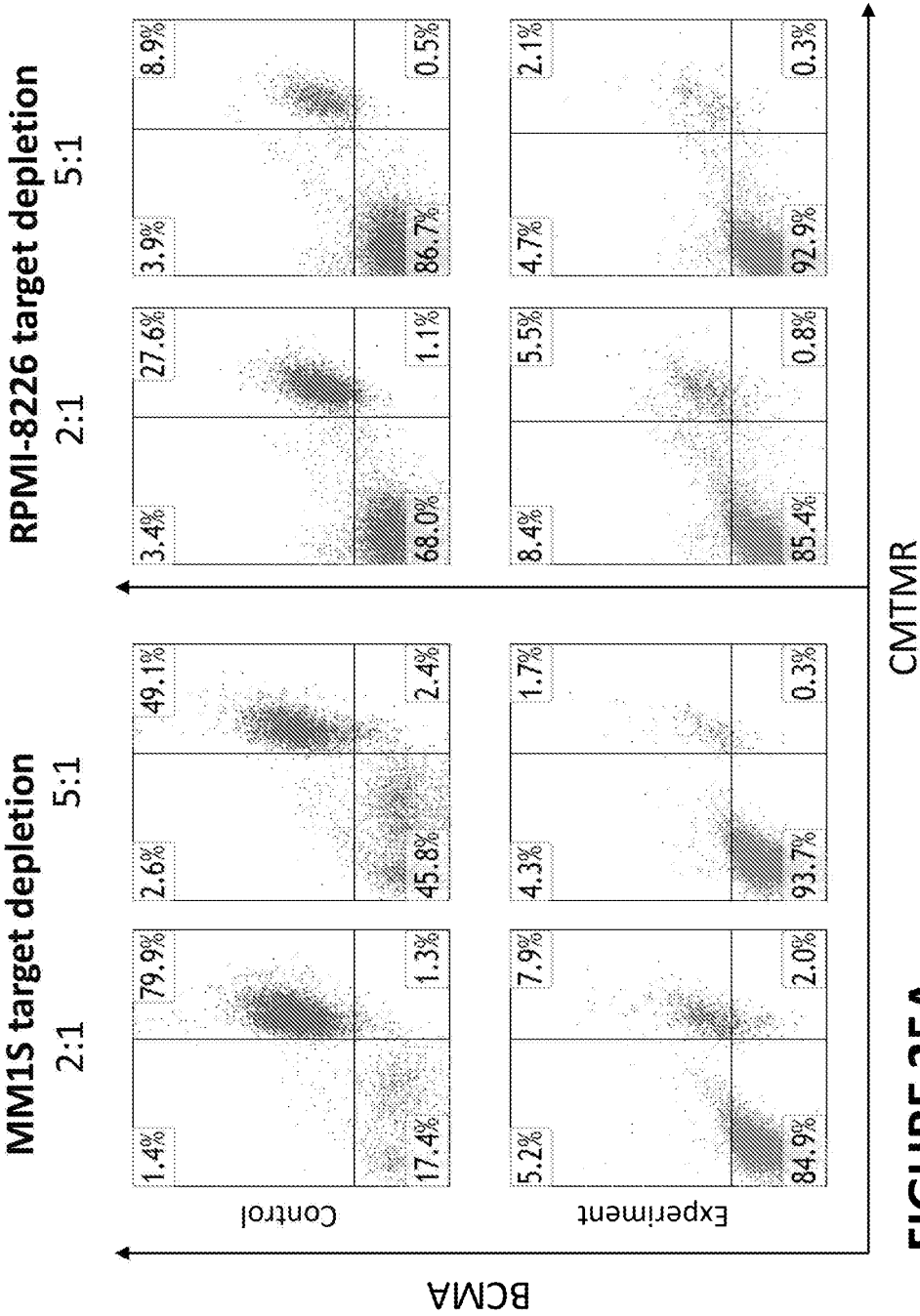
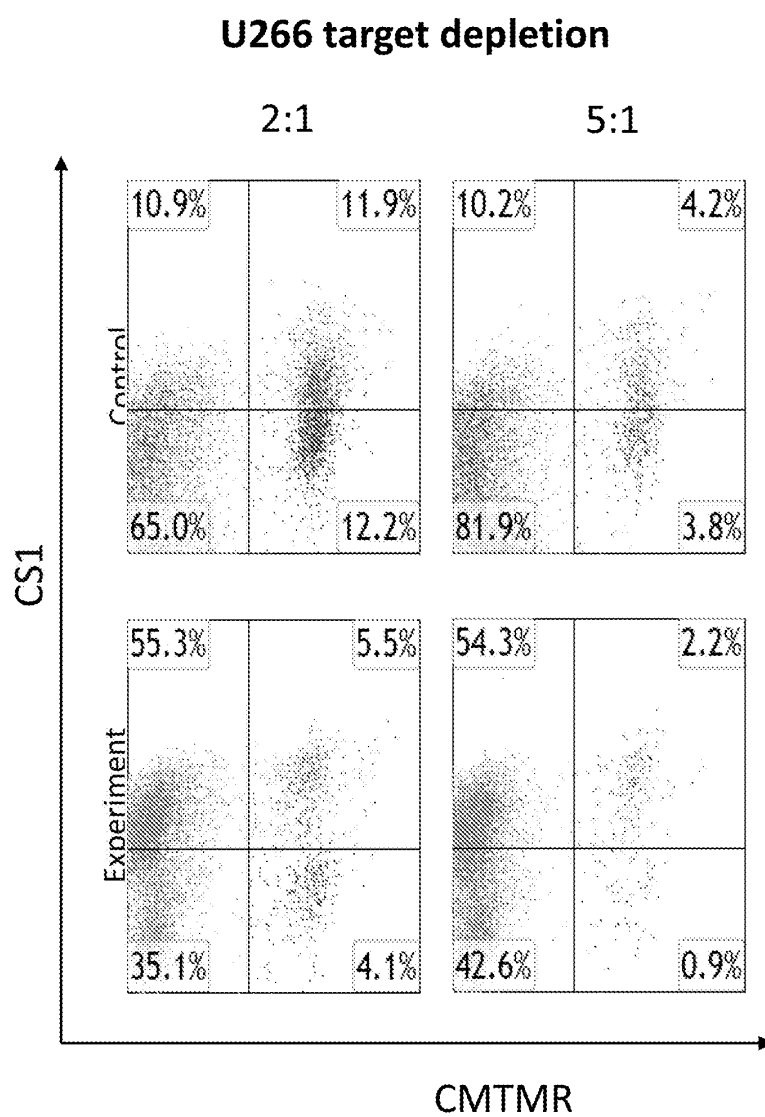


FIGURE 25A

**FIGURE 25B**

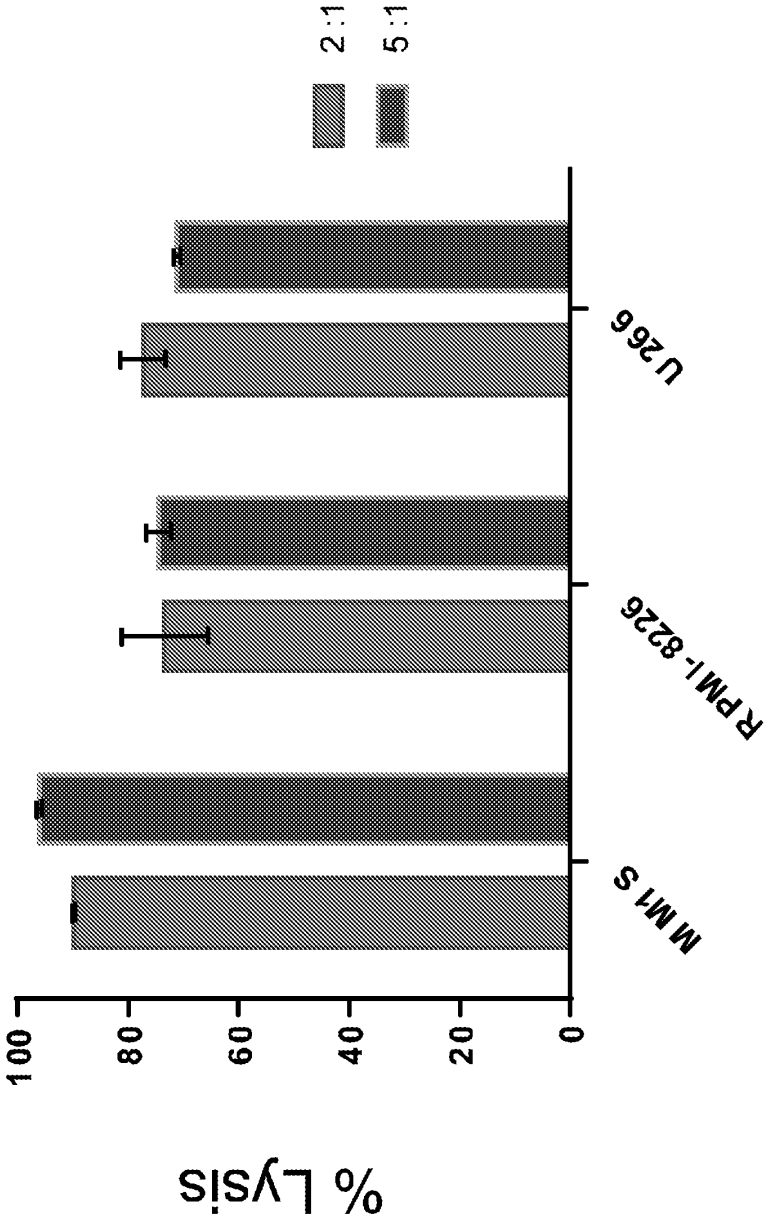


FIGURE 25C

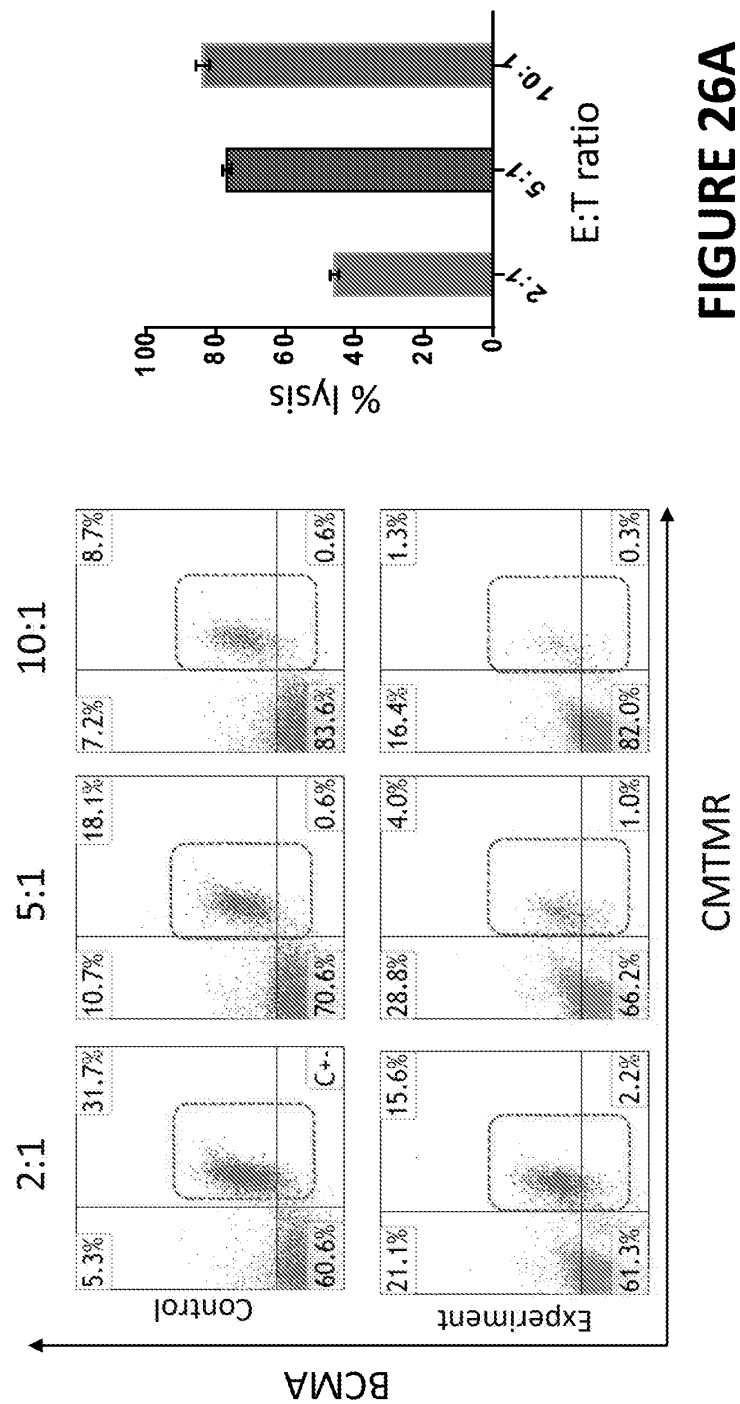


FIGURE 26A

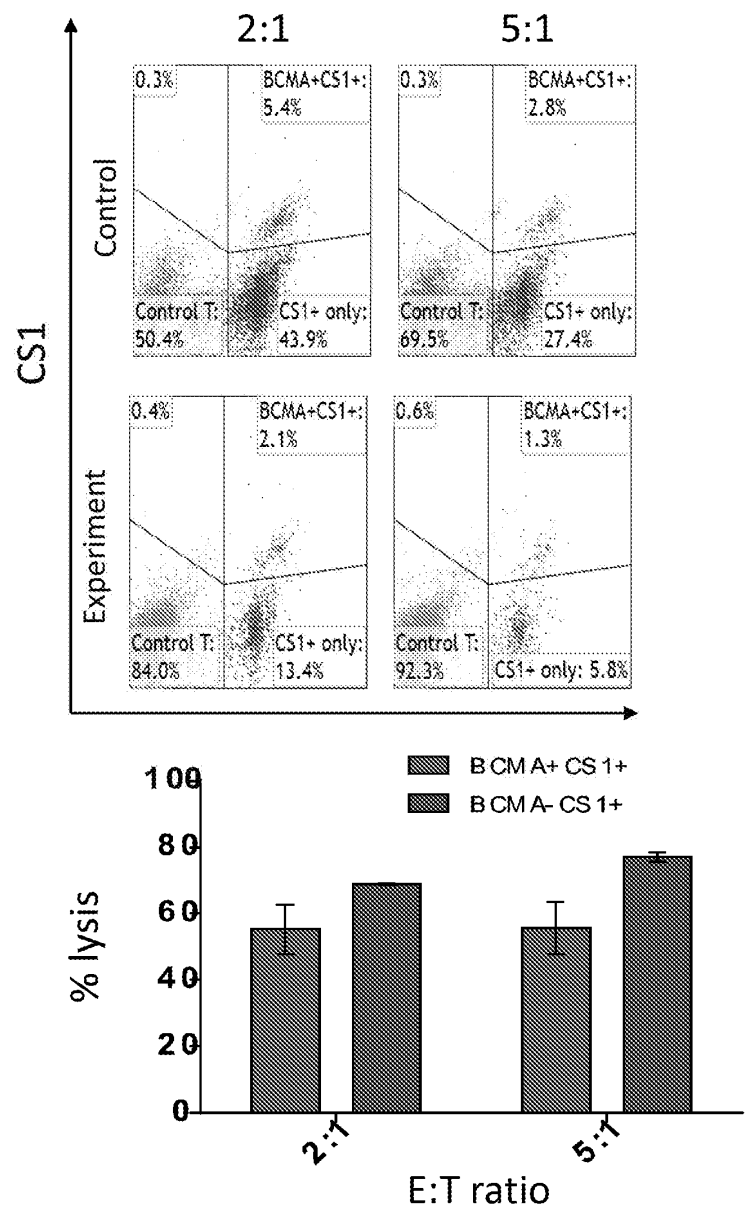


FIGURE 26B

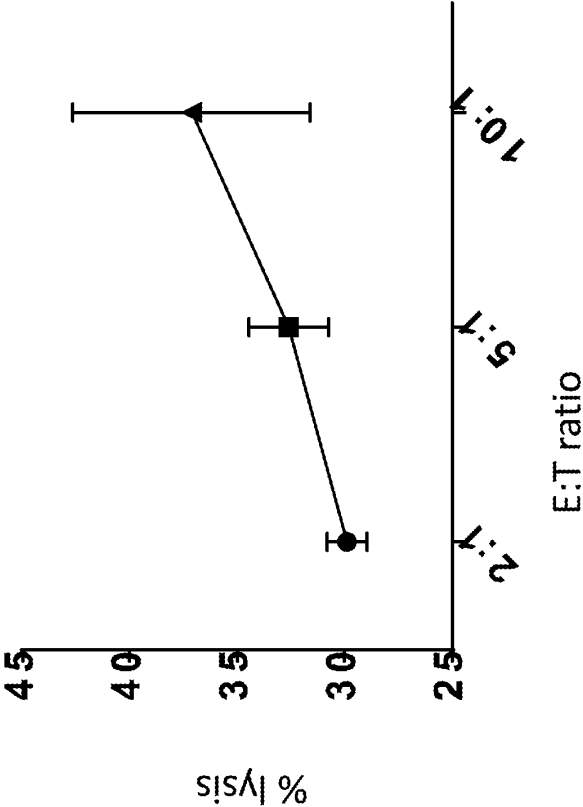


FIGURE 26C

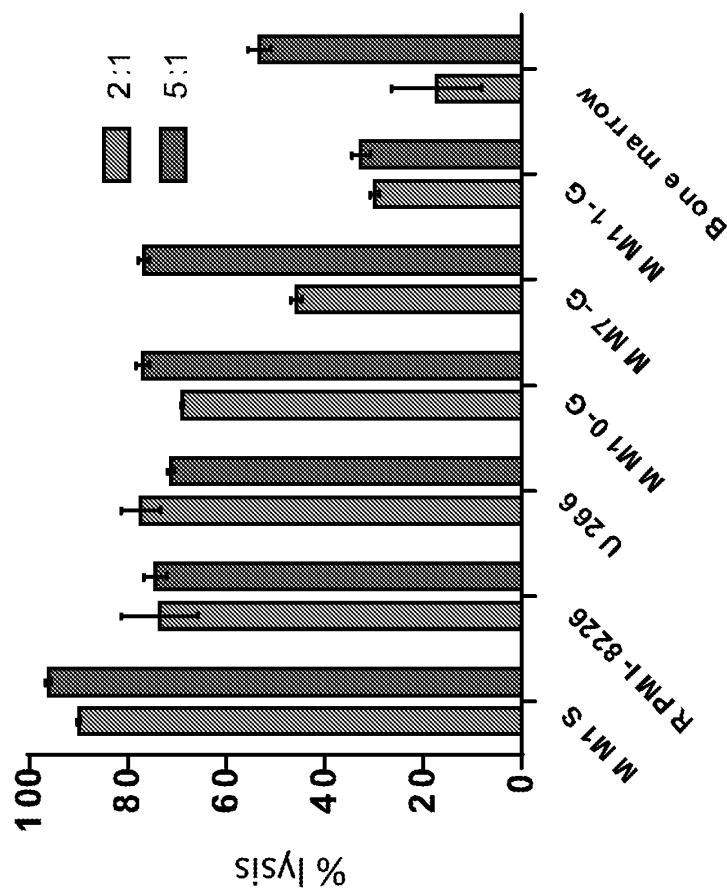
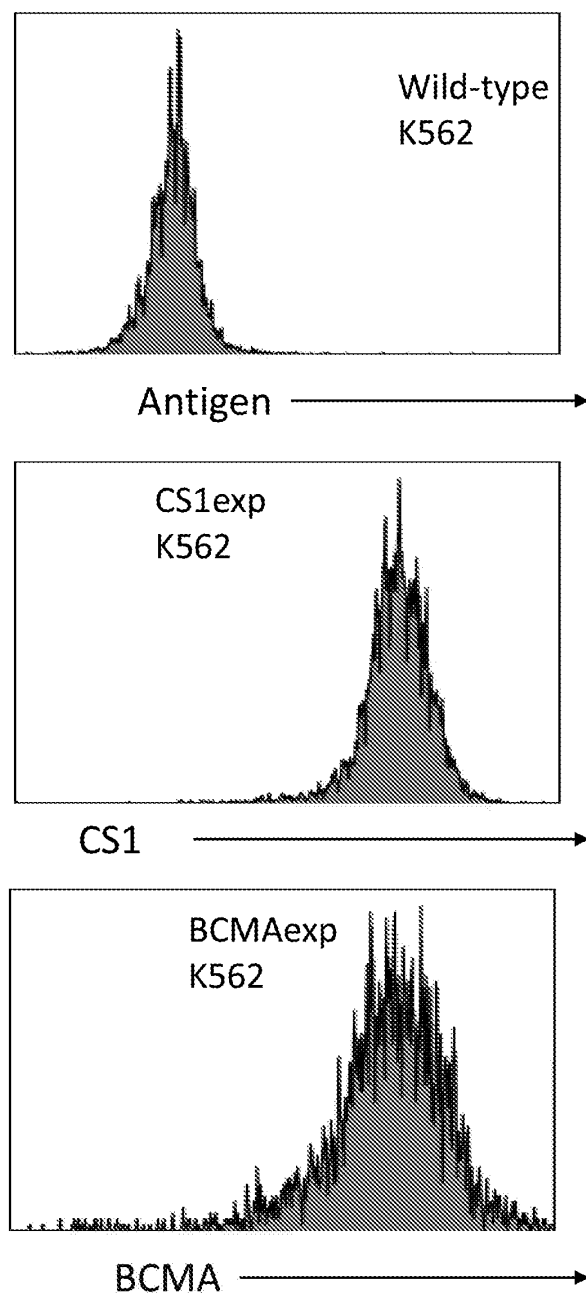


FIGURE 26D

**FIGURE 27A**

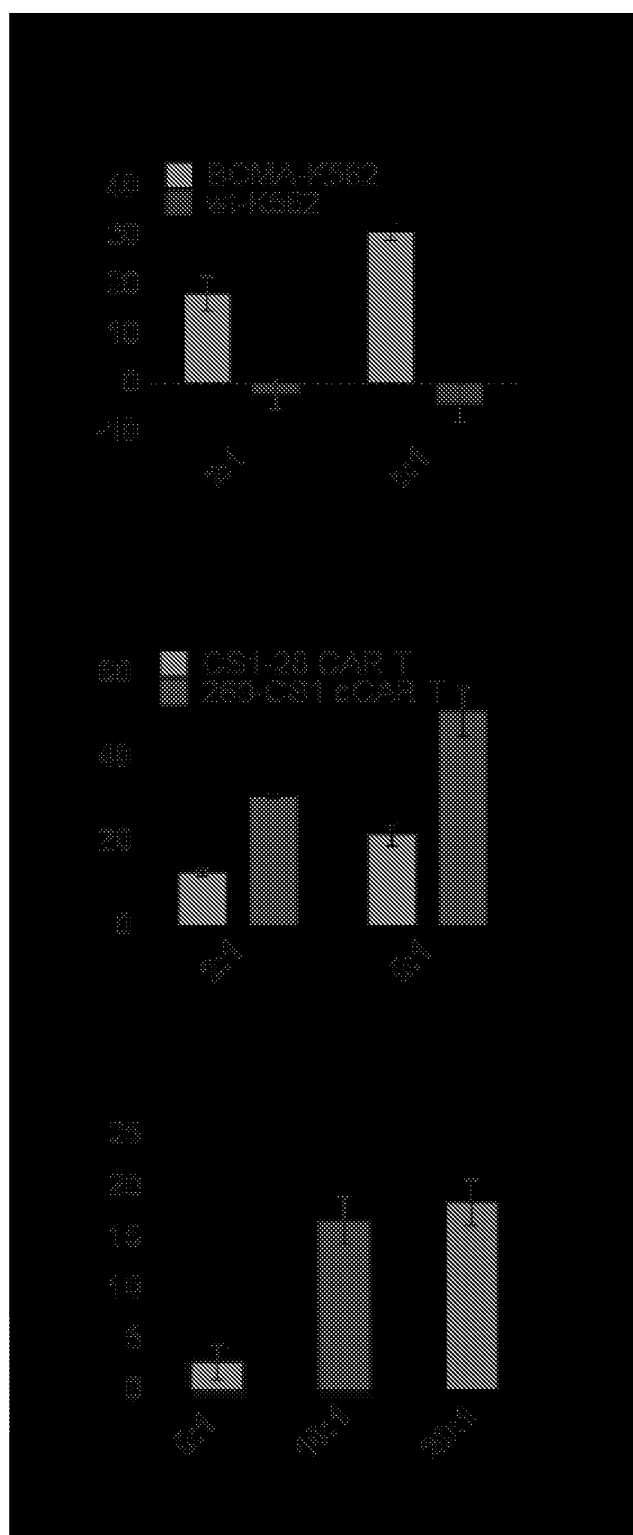
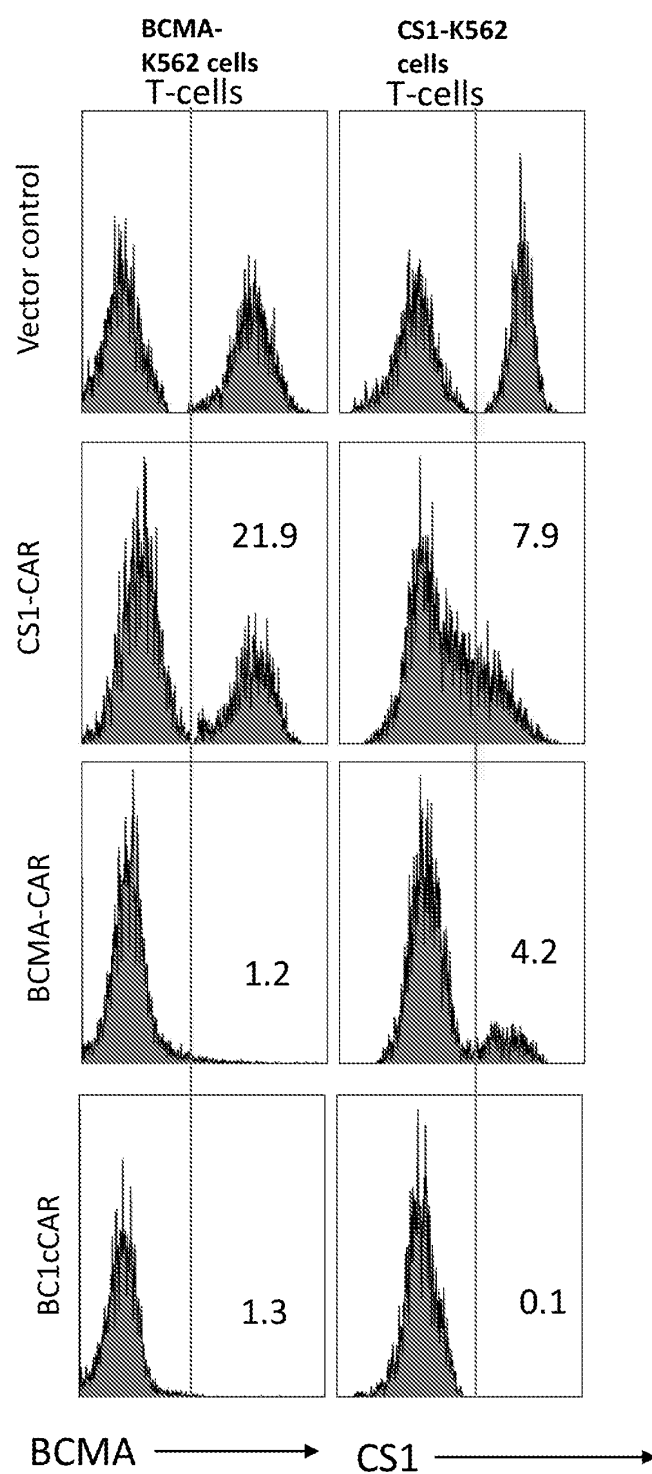
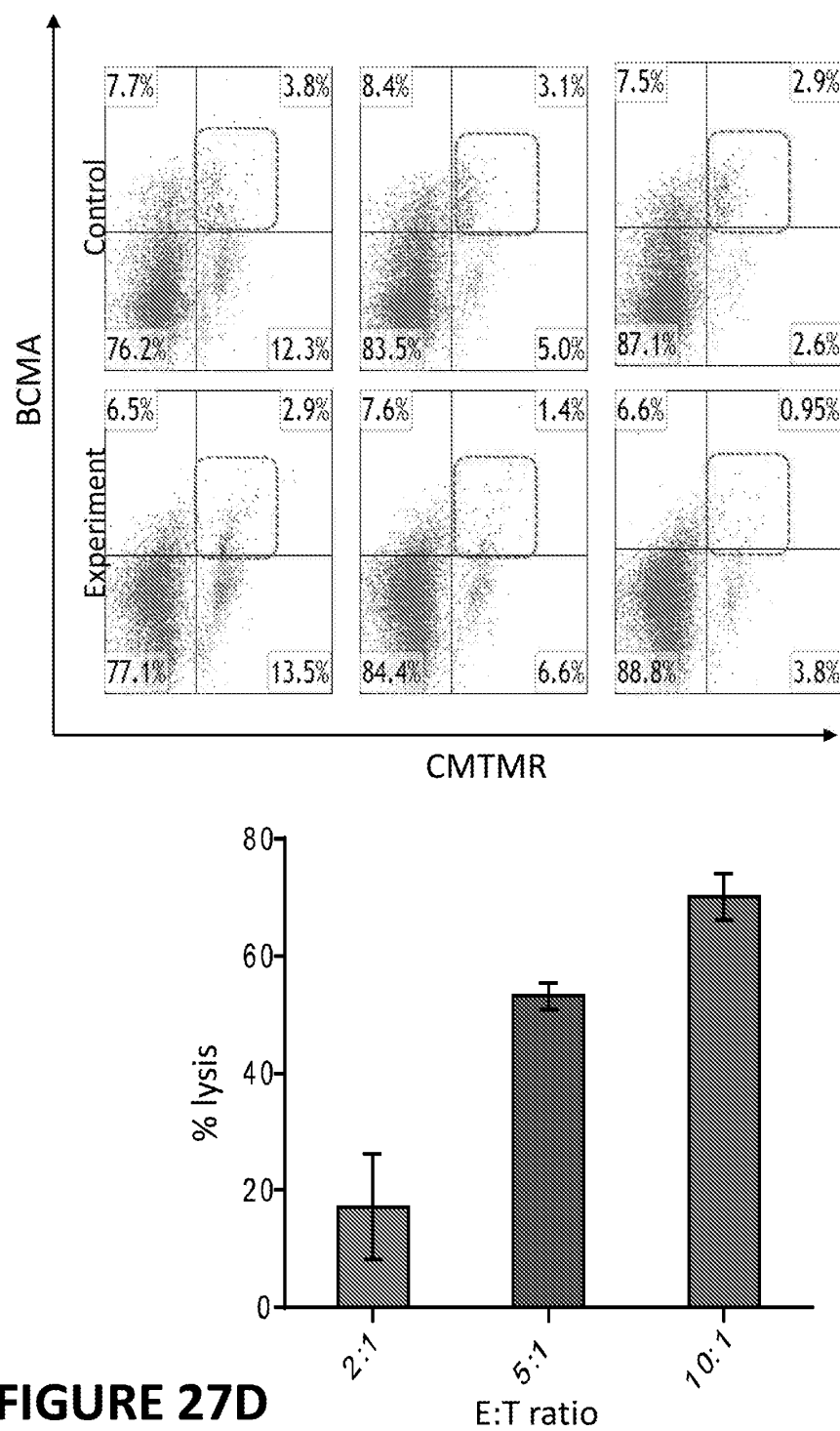


FIGURE 27B

**FIGURE 27C**

**FIGURE 27D**

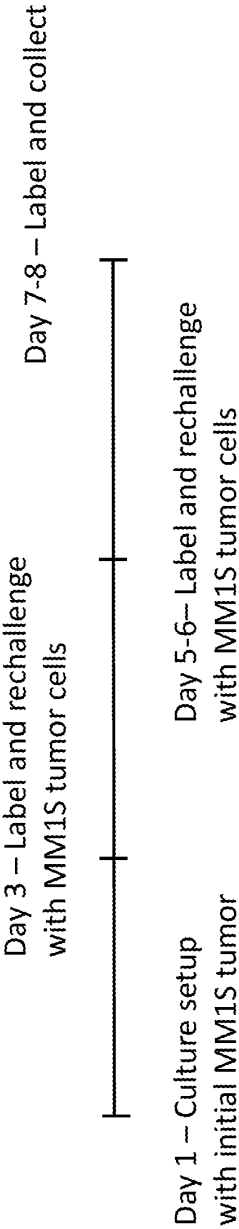


FIGURE 28A

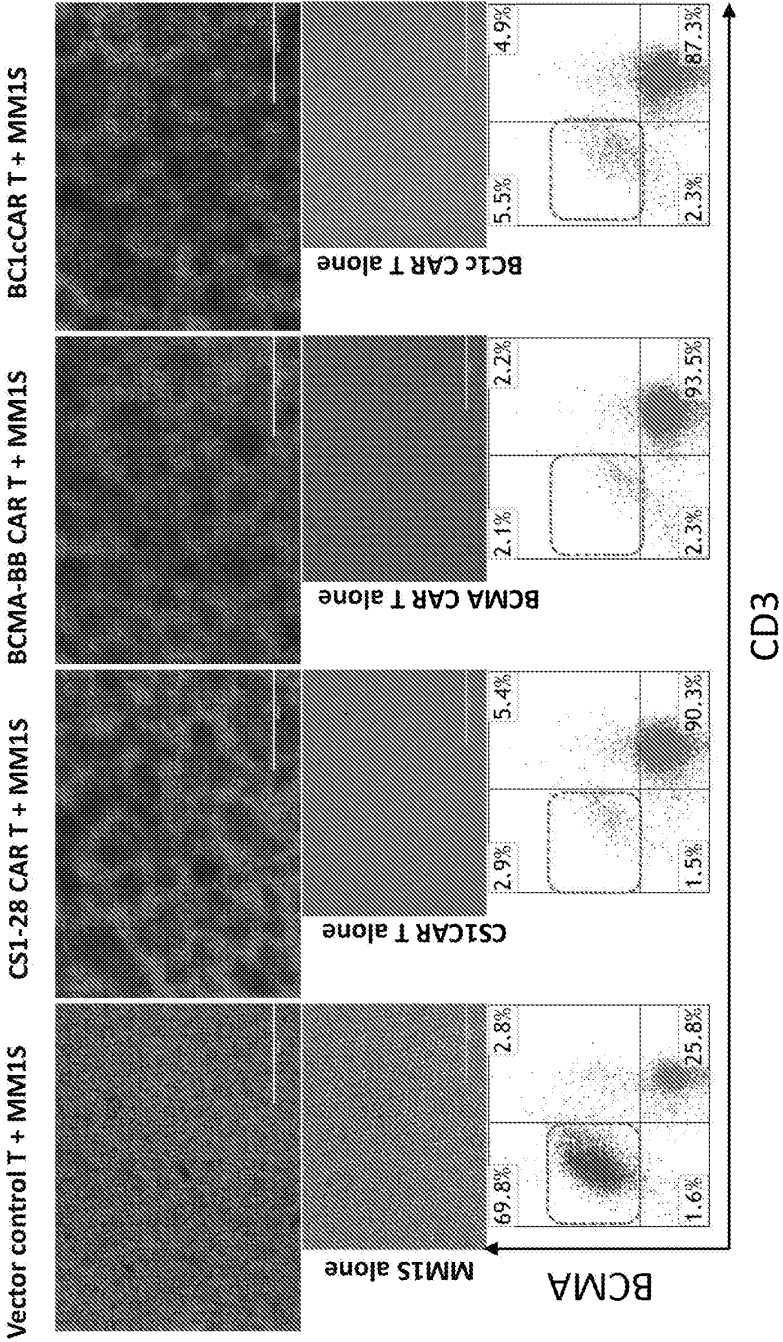


FIGURE 28B

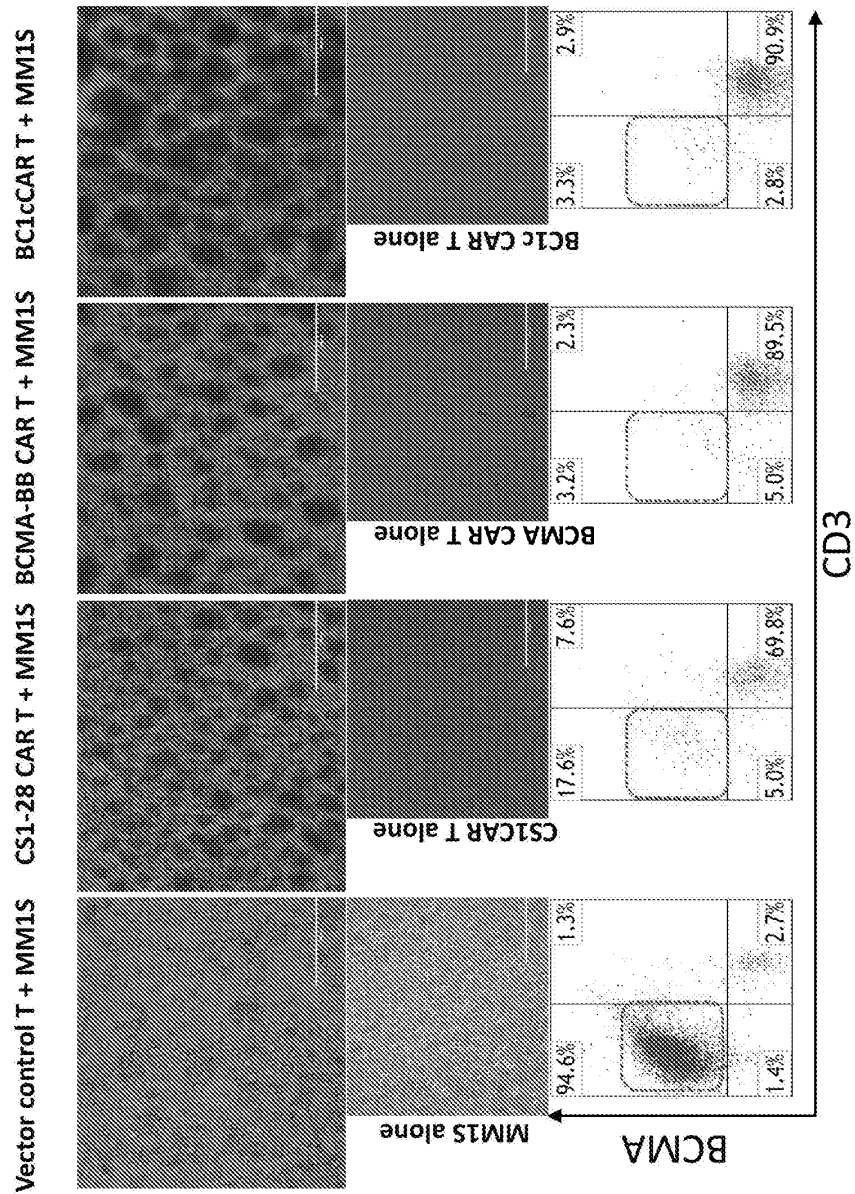


FIGURE 28C

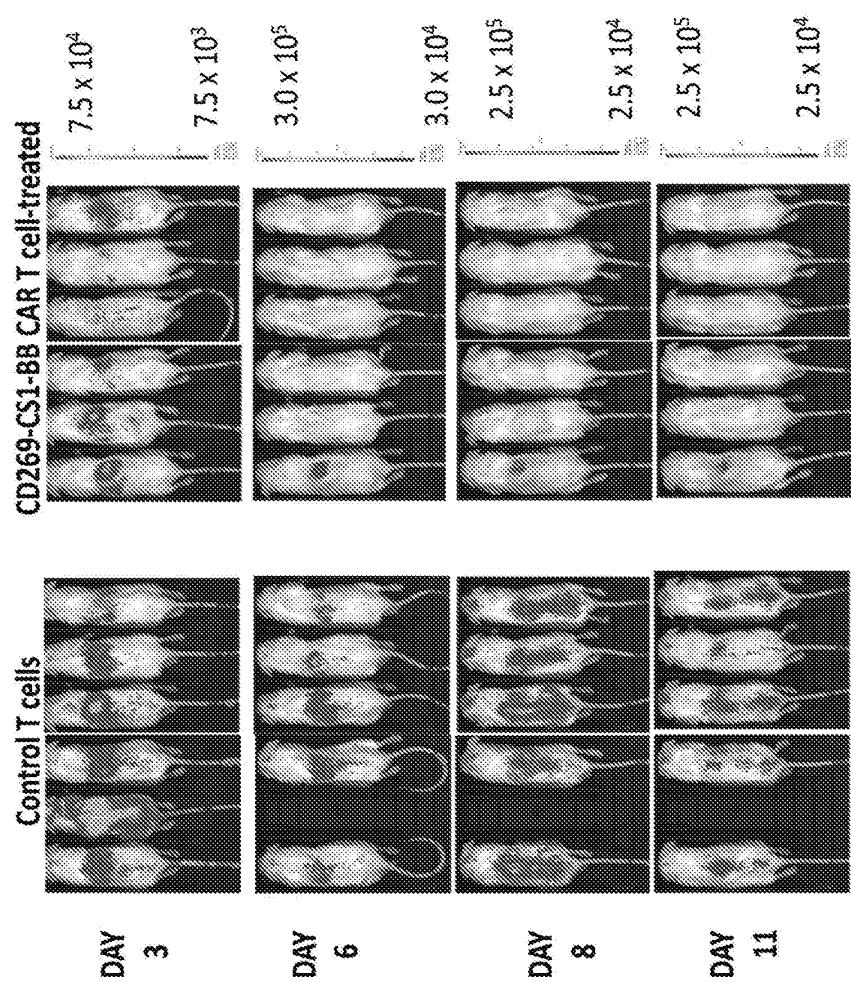


FIGURE 29A

BC1cCAR T-cells control MM1S tumor growth

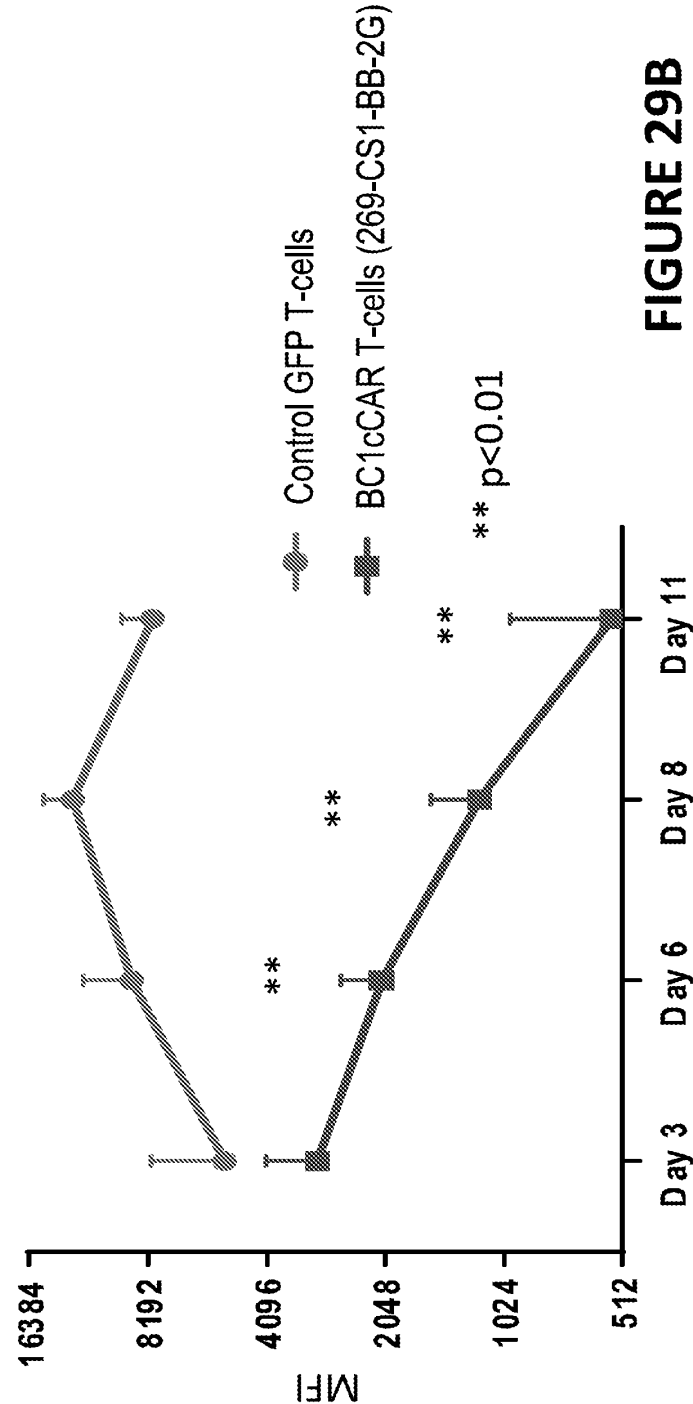


FIGURE 29B

BC1cCAR T-cells improve murine survival outlook

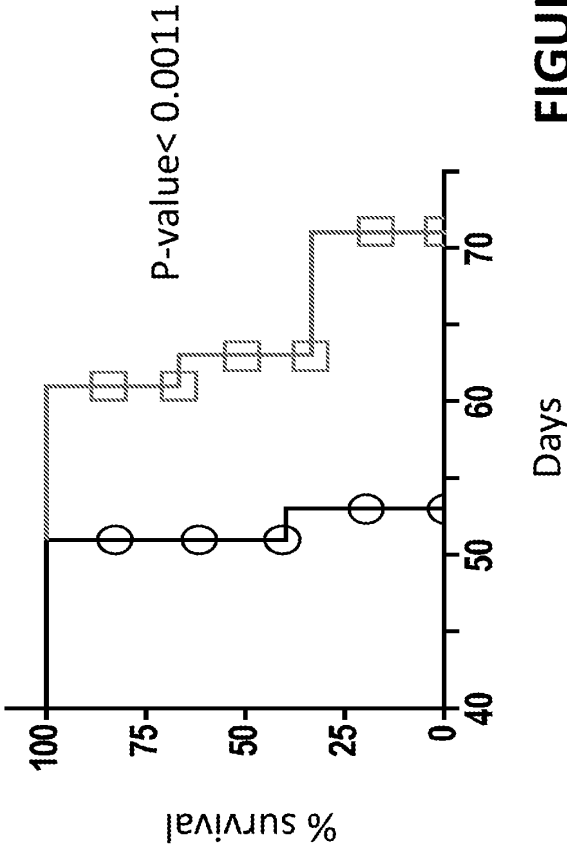


FIGURE 29C

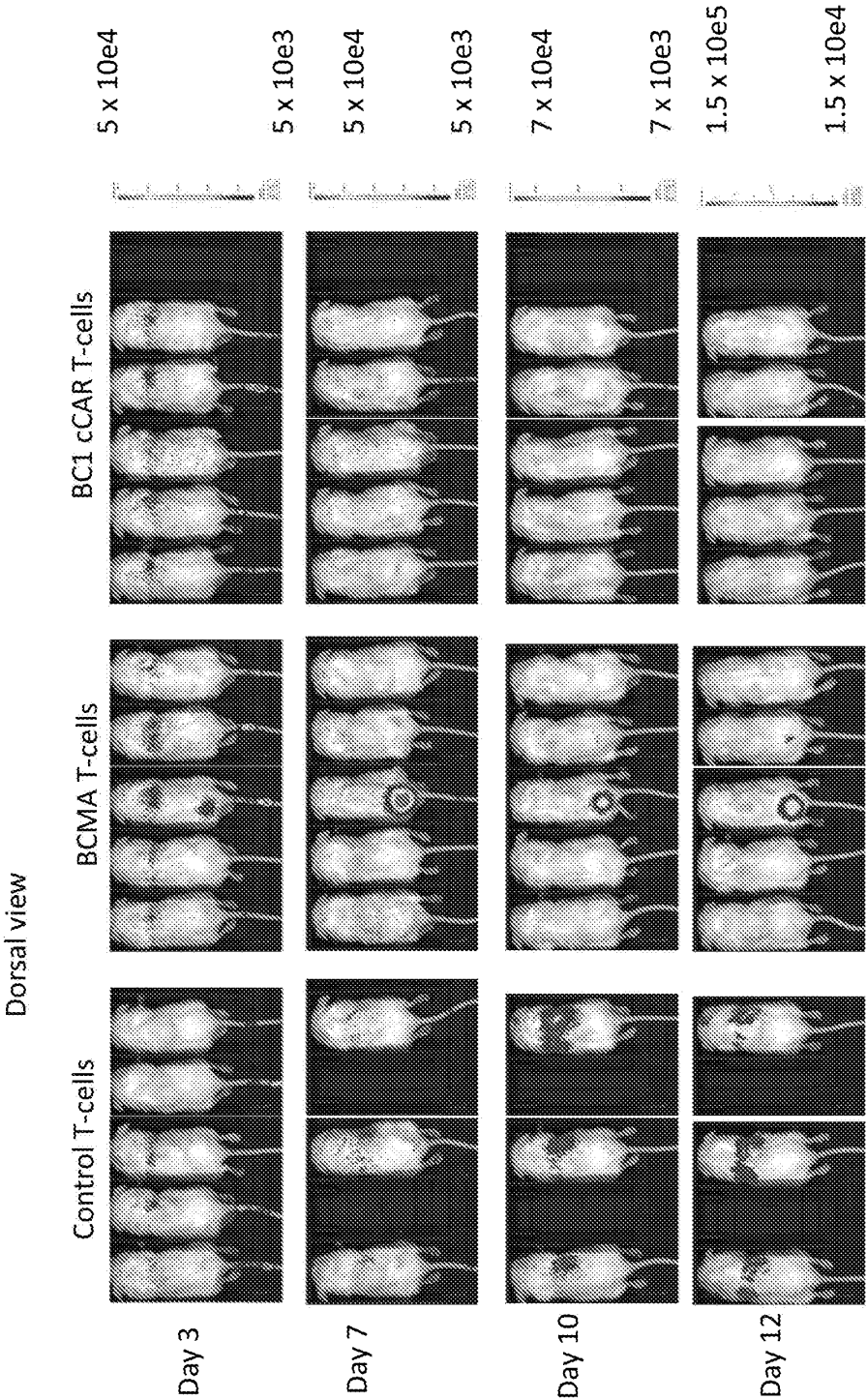


FIGURE 29D

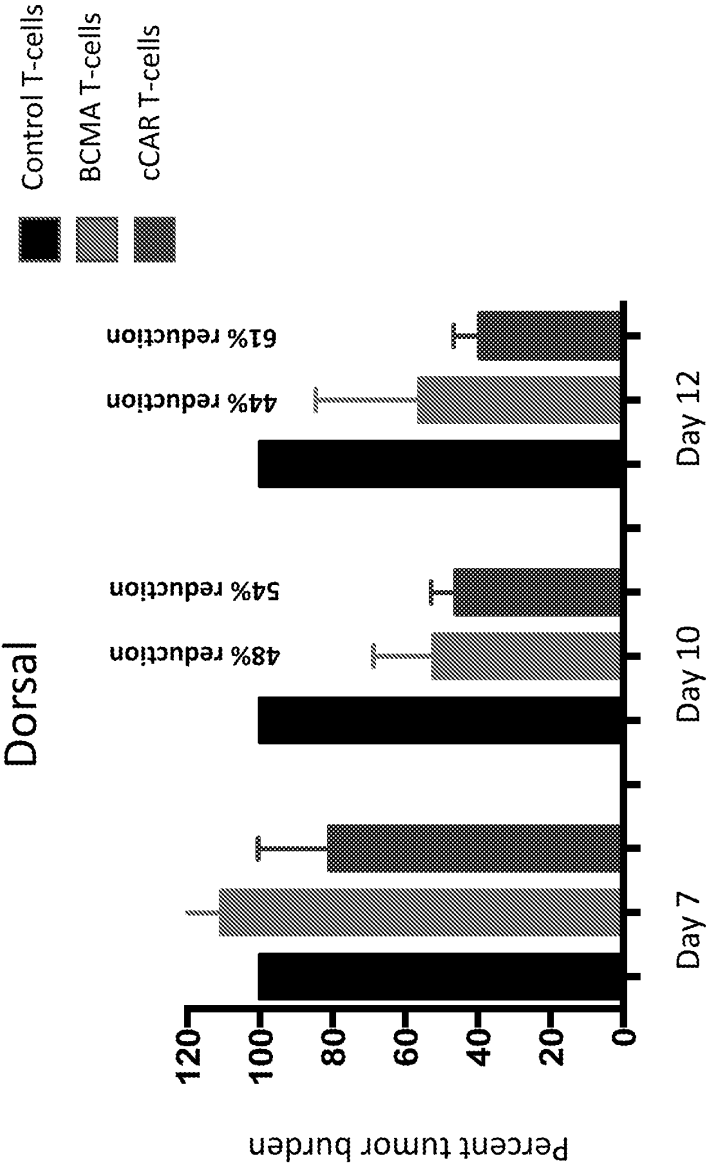


FIGURE 29E

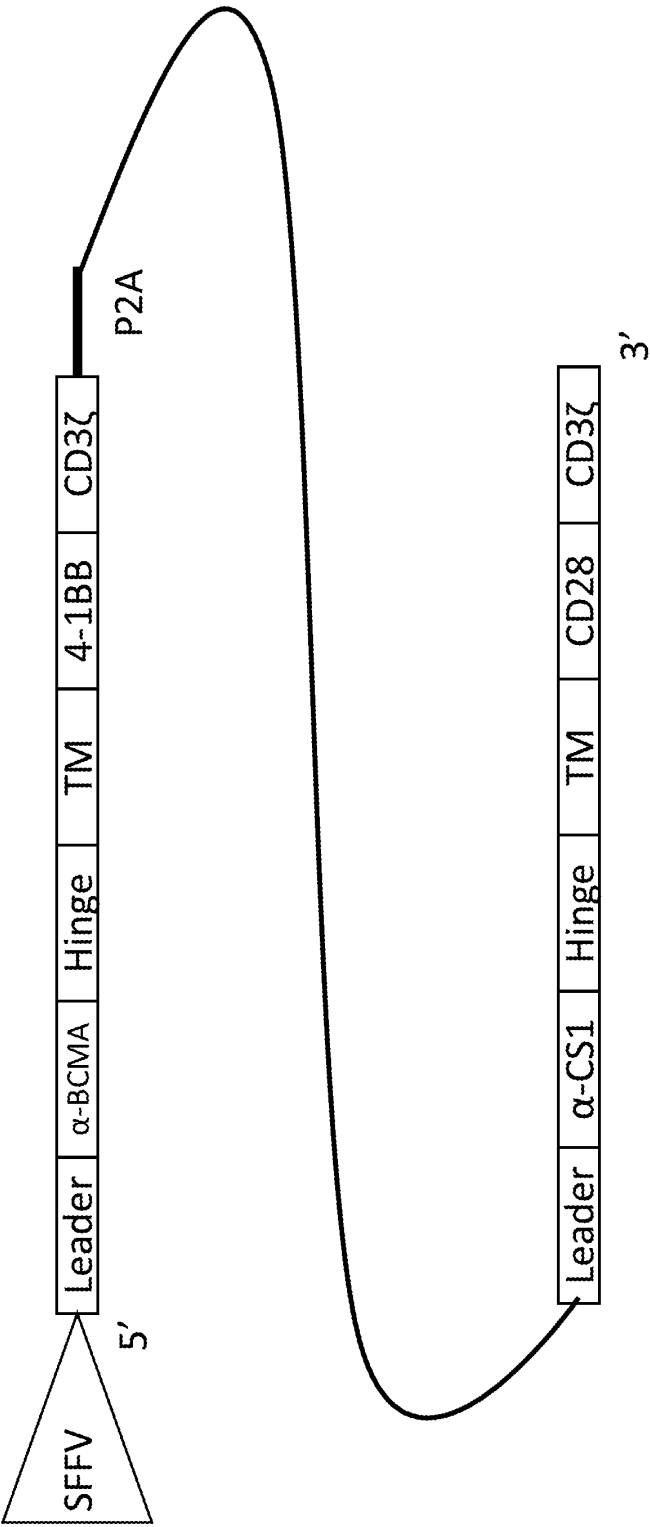
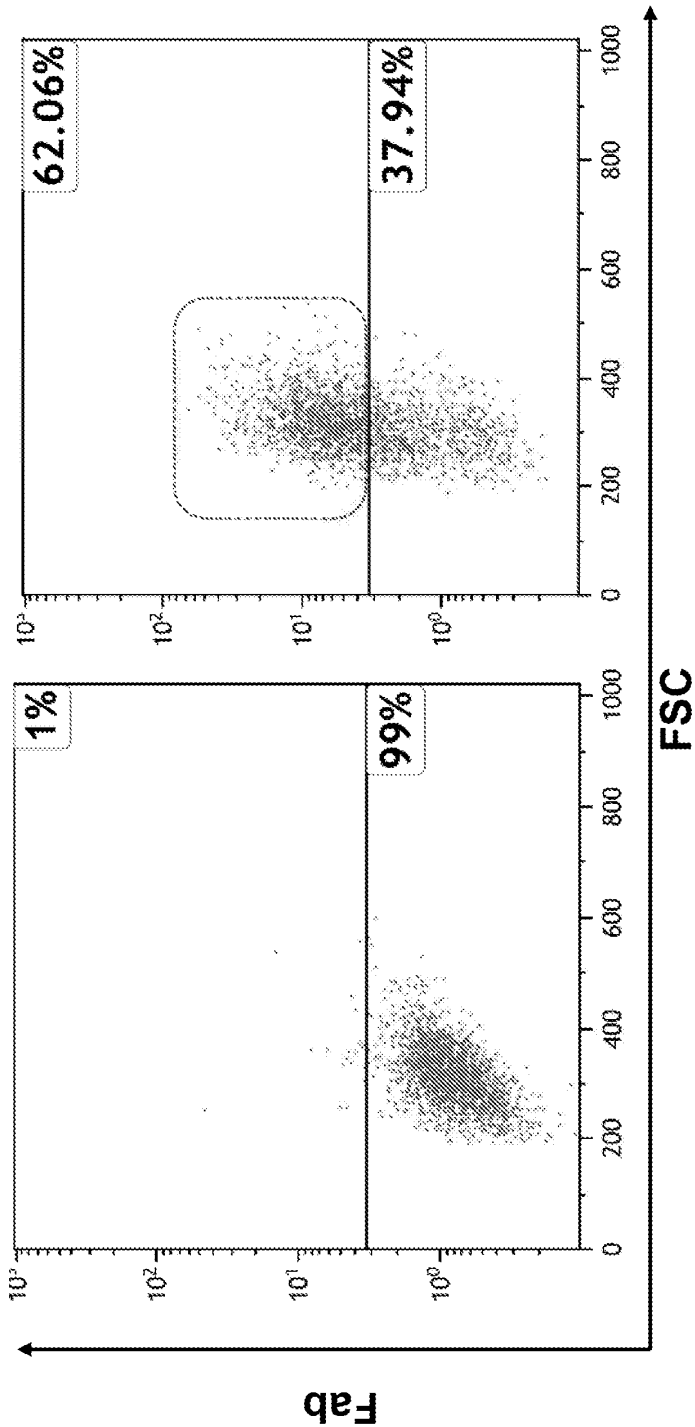


FIGURE 30A

FIGURE 30B



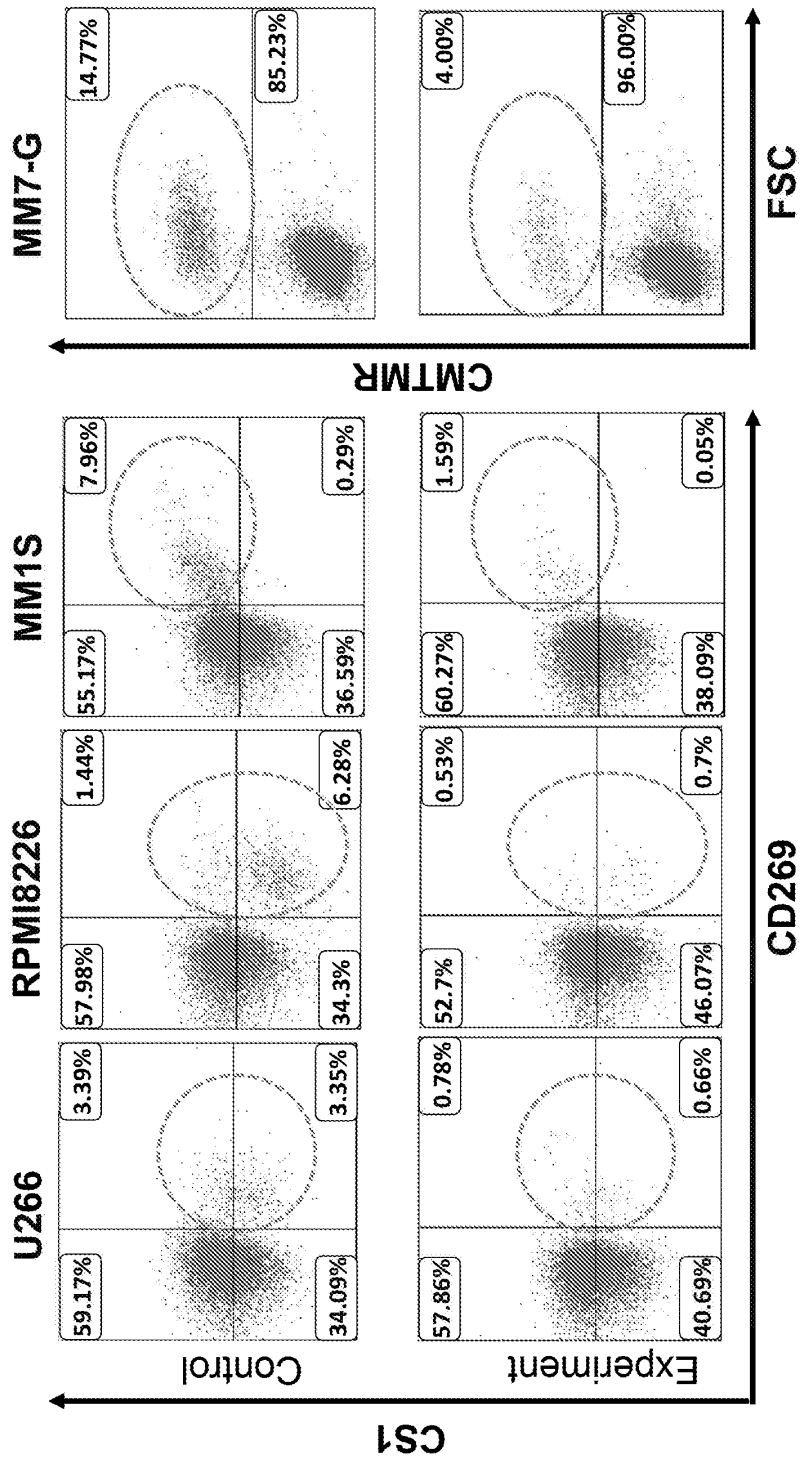


FIGURE 31A

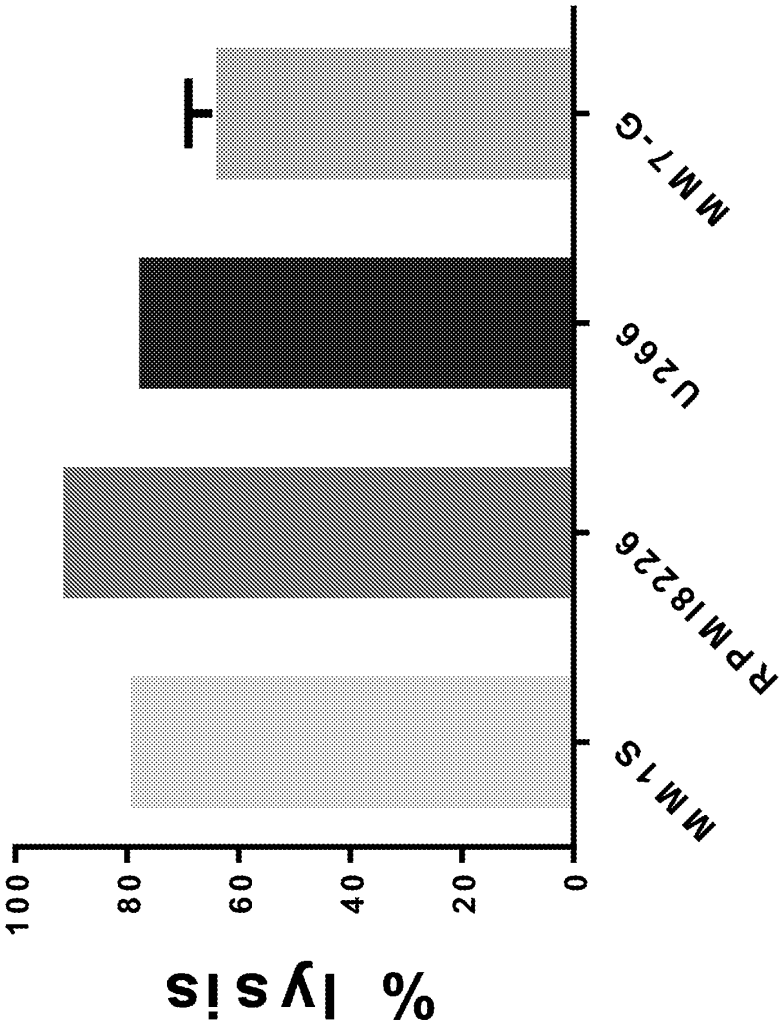


FIGURE 31B

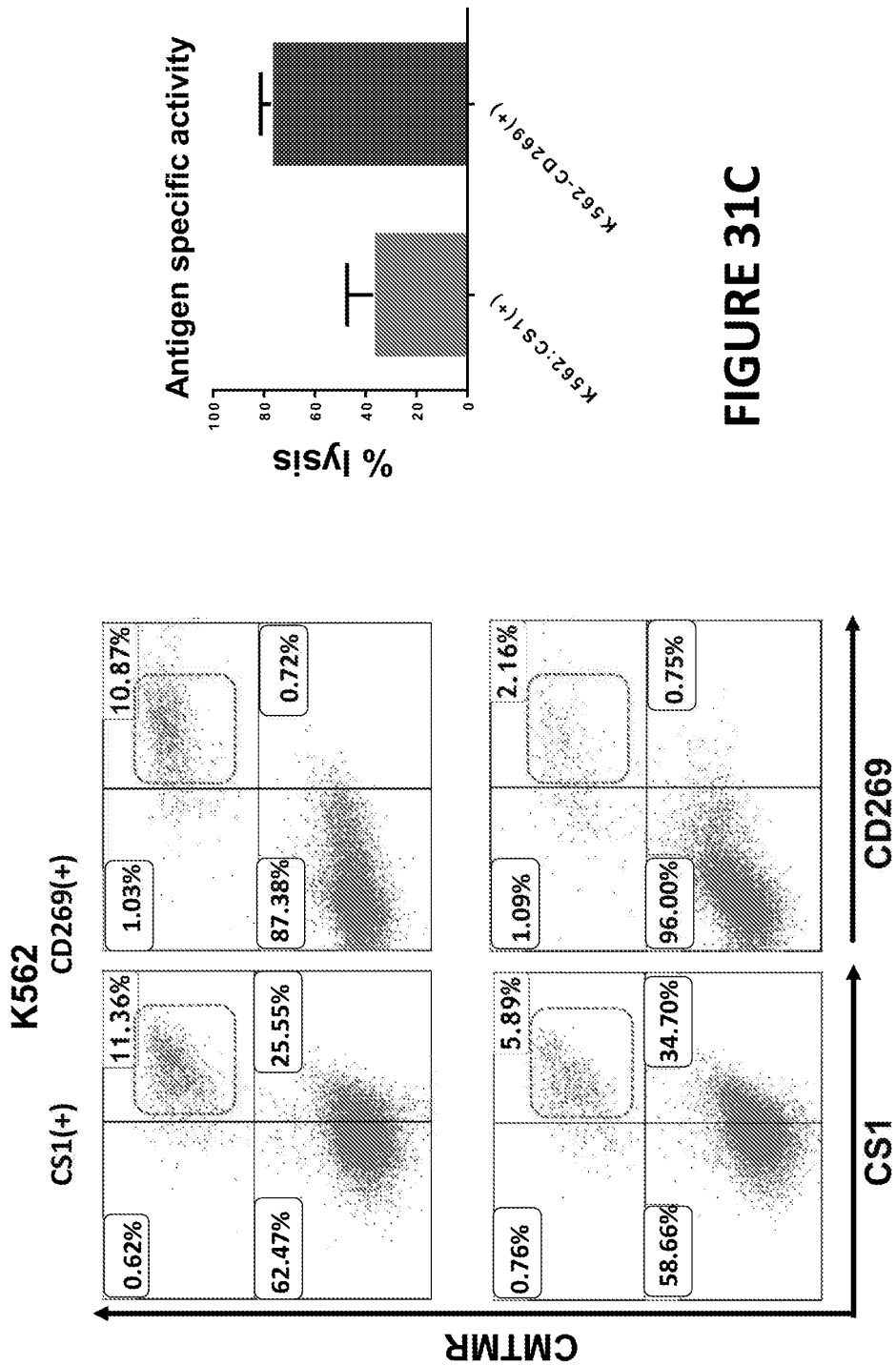


FIGURE 32A

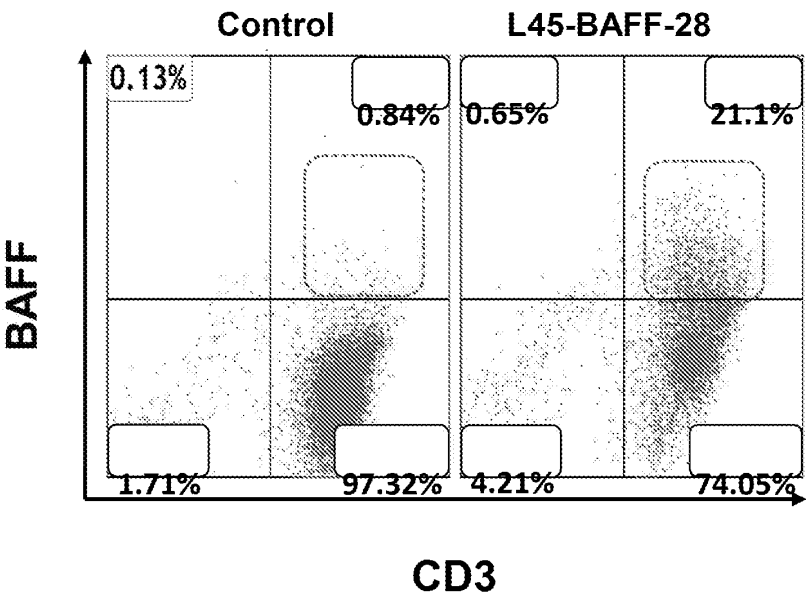
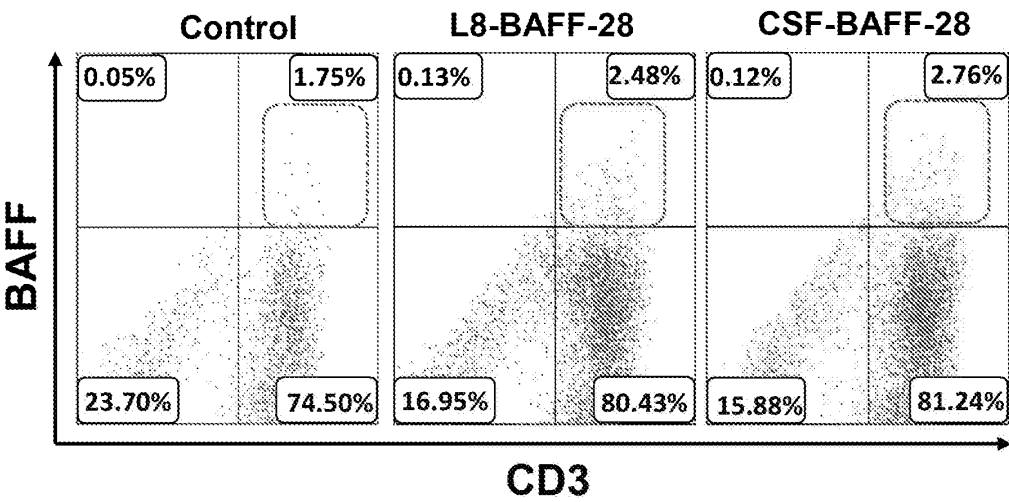


FIGURE 32B



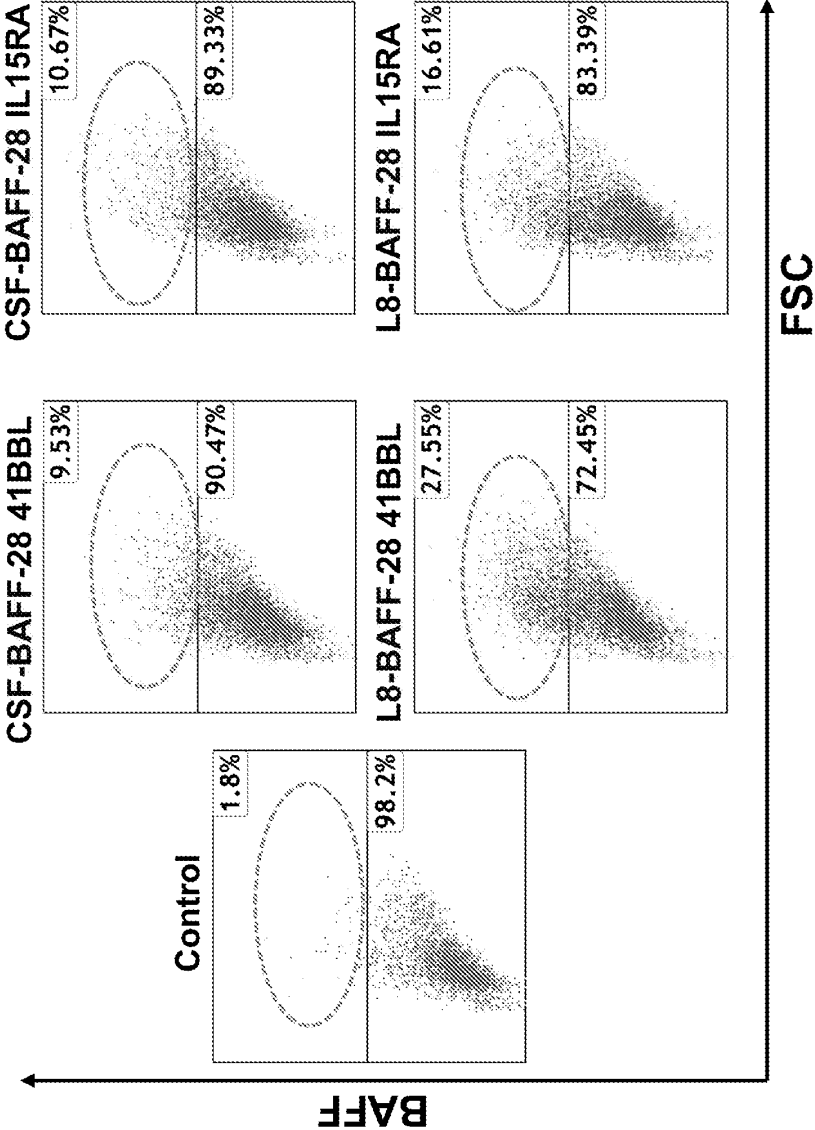


FIGURE 32C

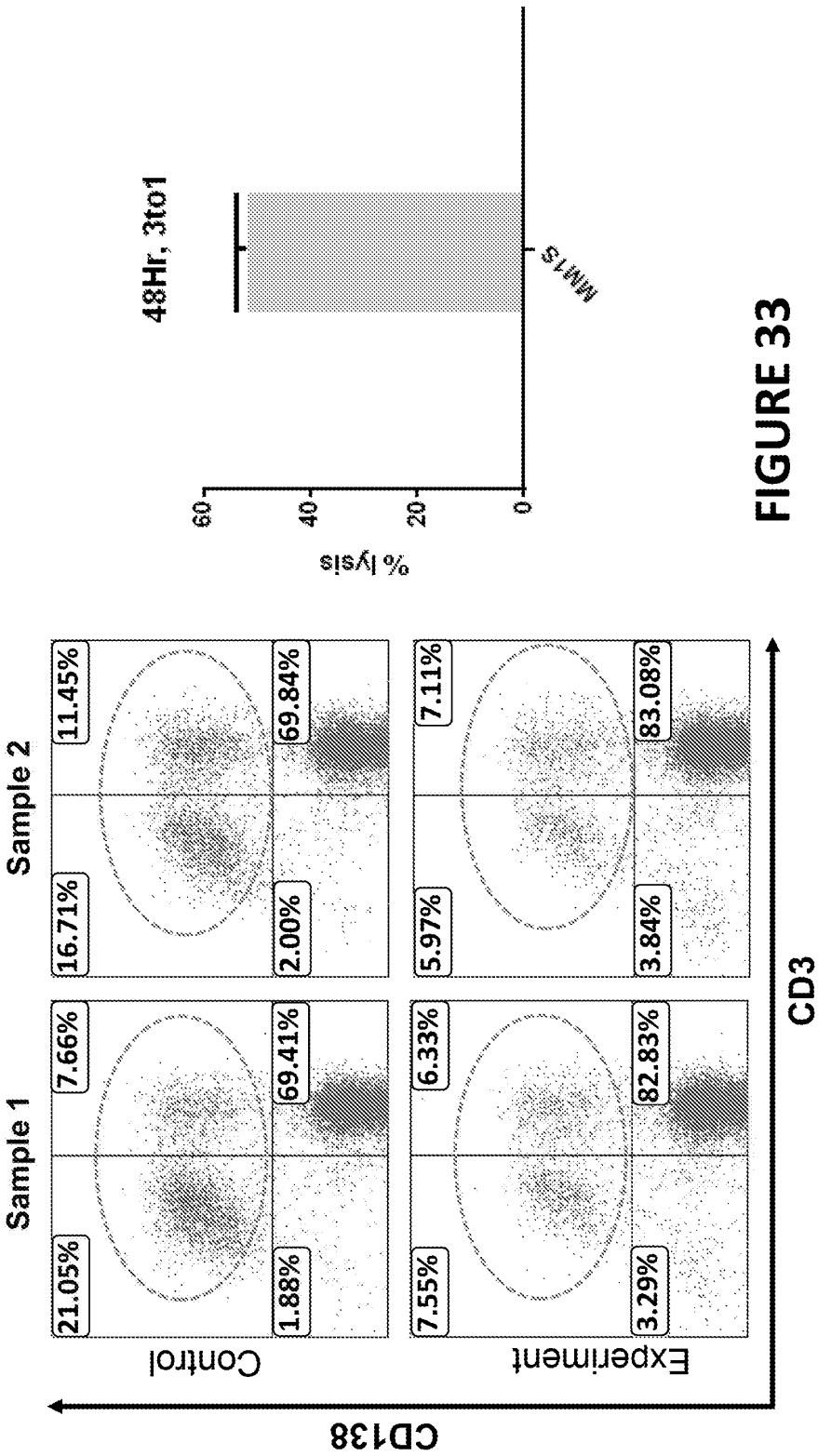


FIGURE 33

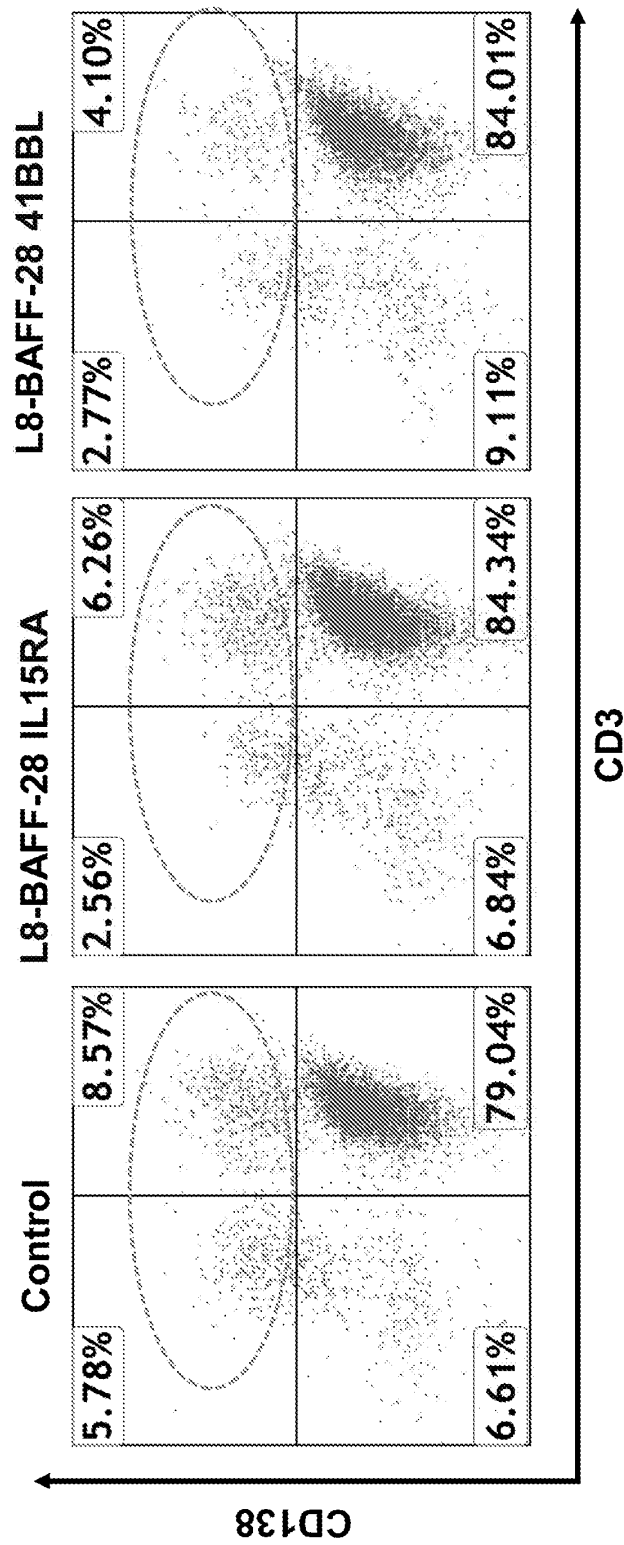
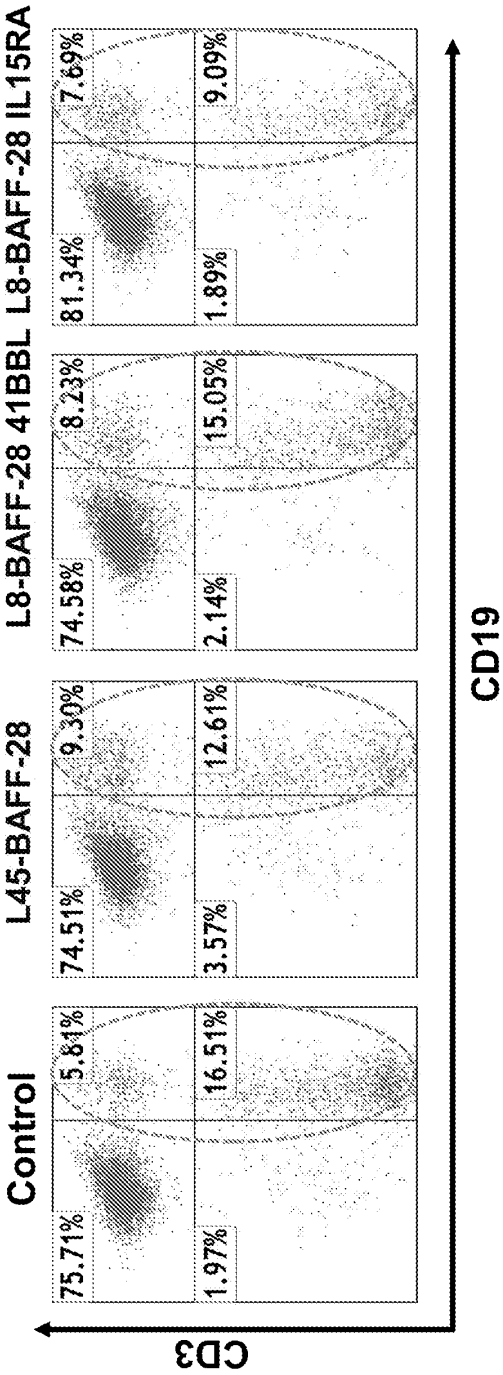


FIGURE 34A

FIGURE 34B



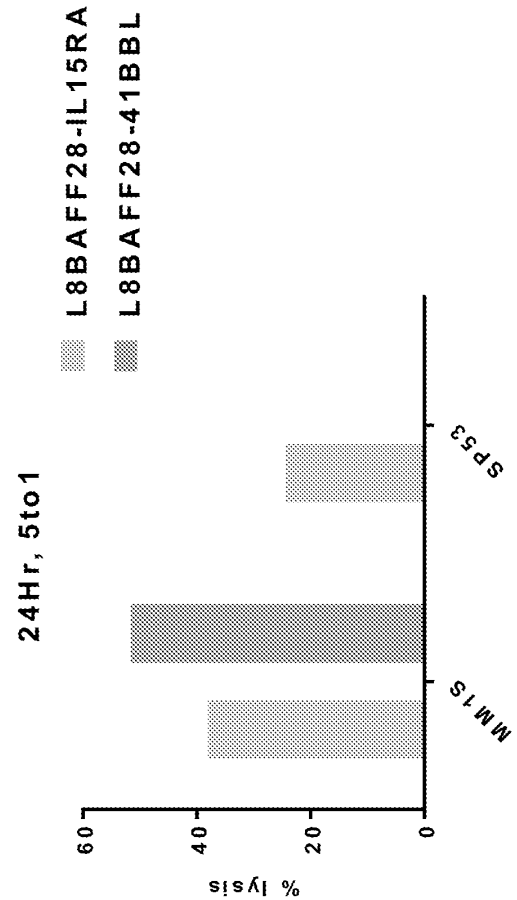
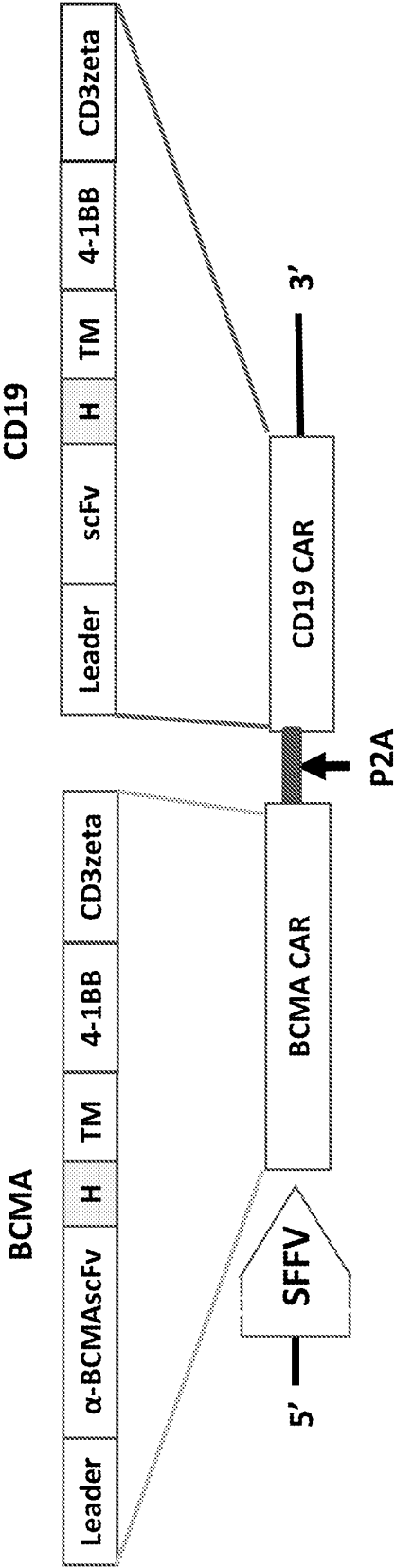
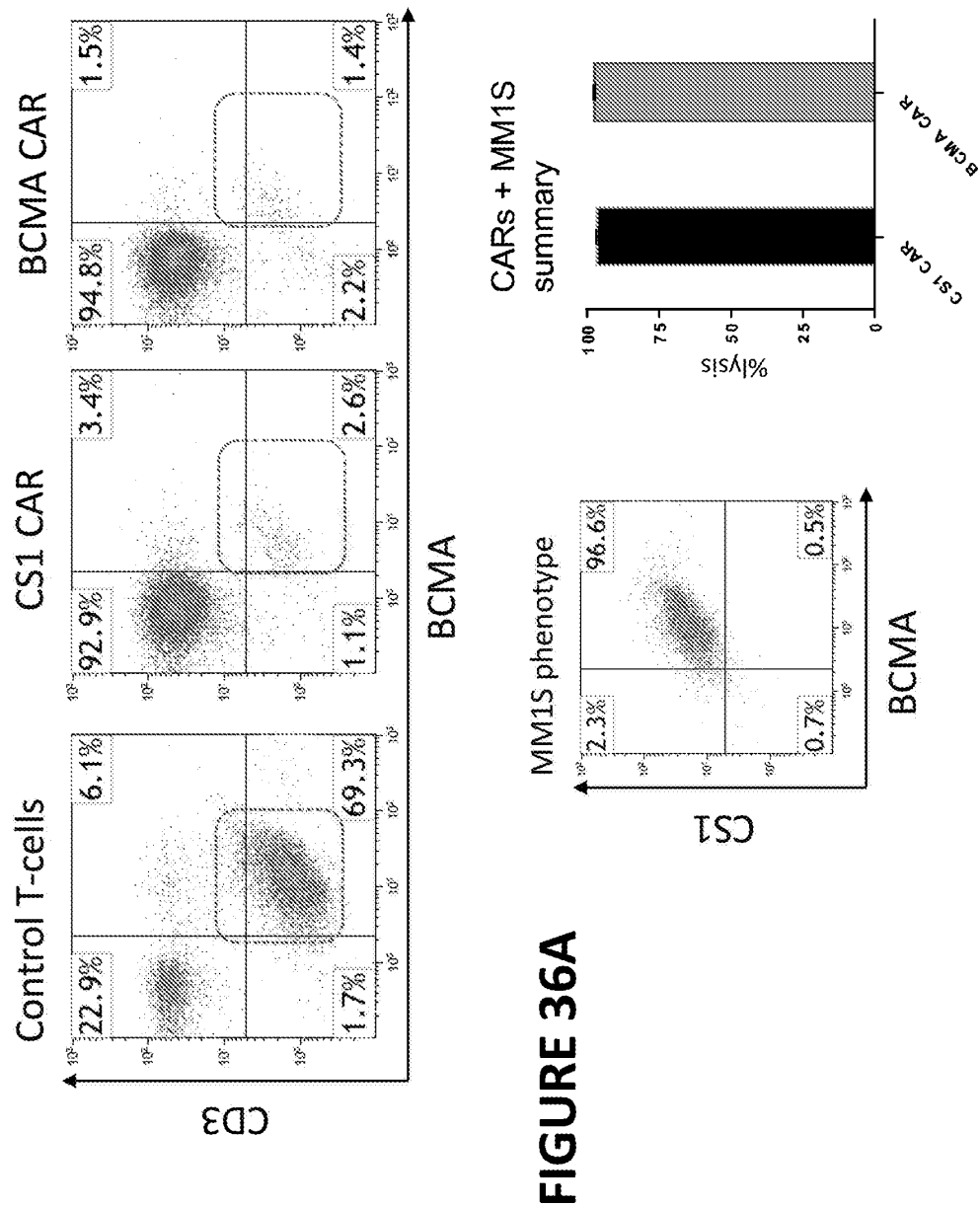
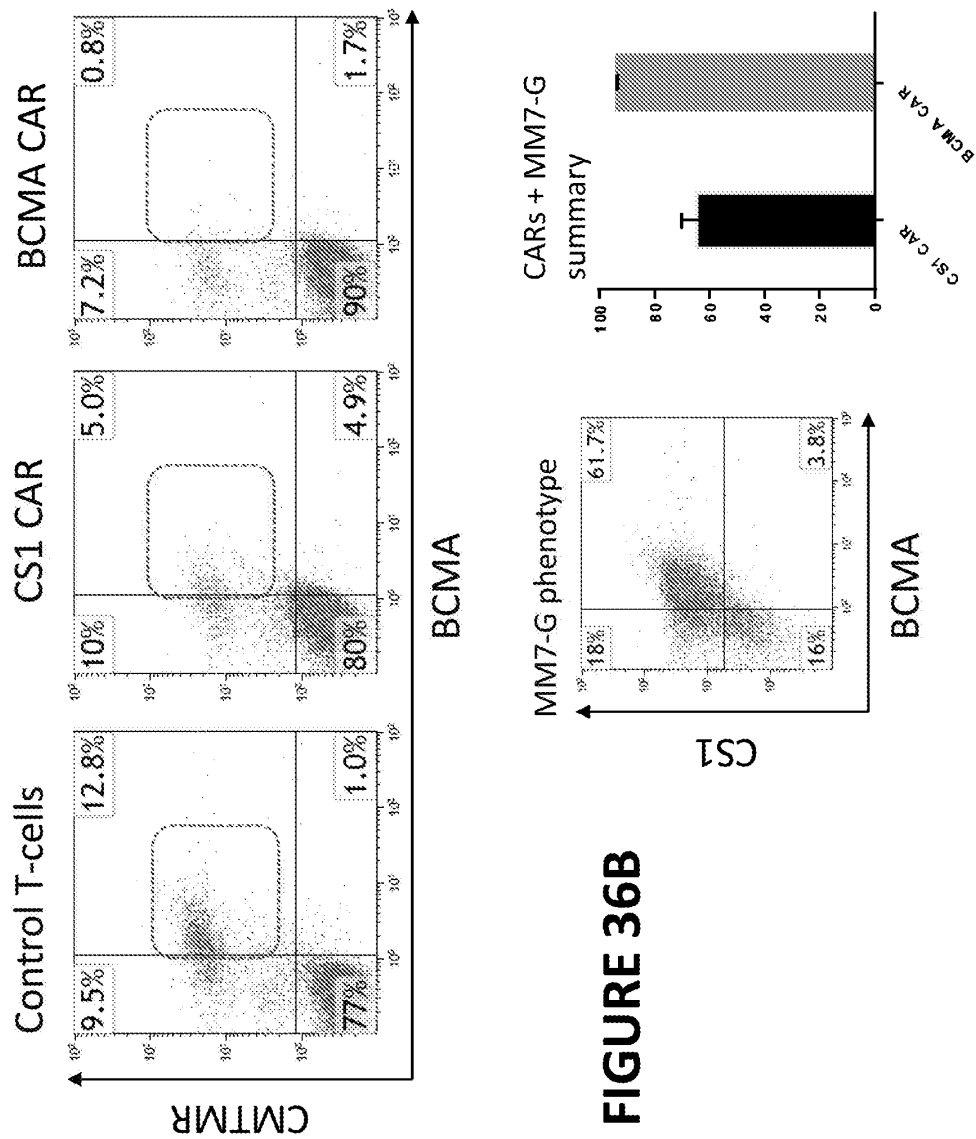


FIGURE 34C

FIGURE 35







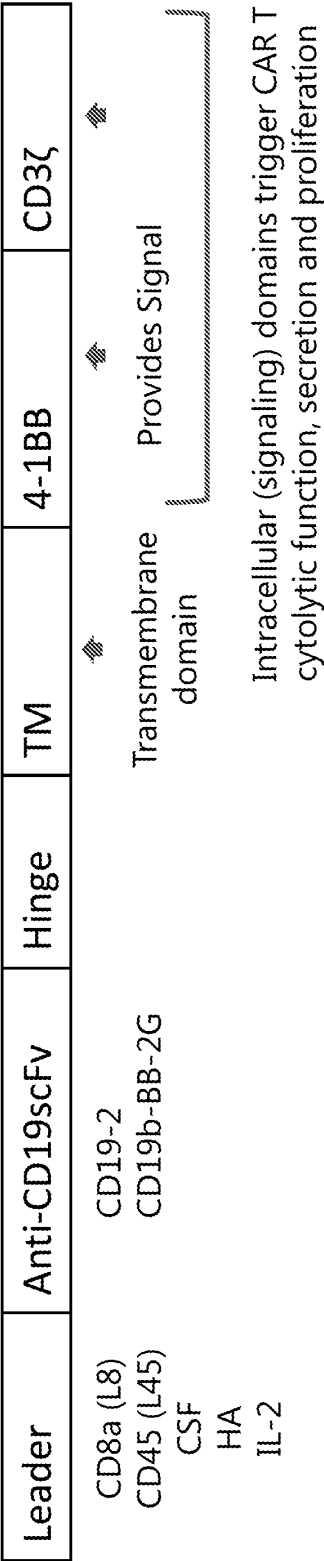


FIGURE 37A

FIGURE 37B

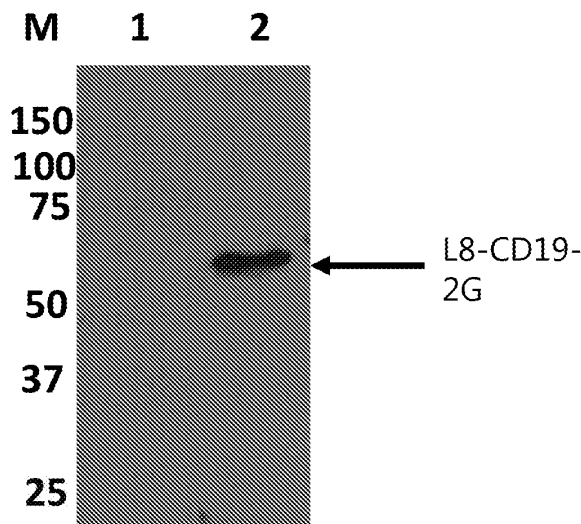


FIGURE 37C

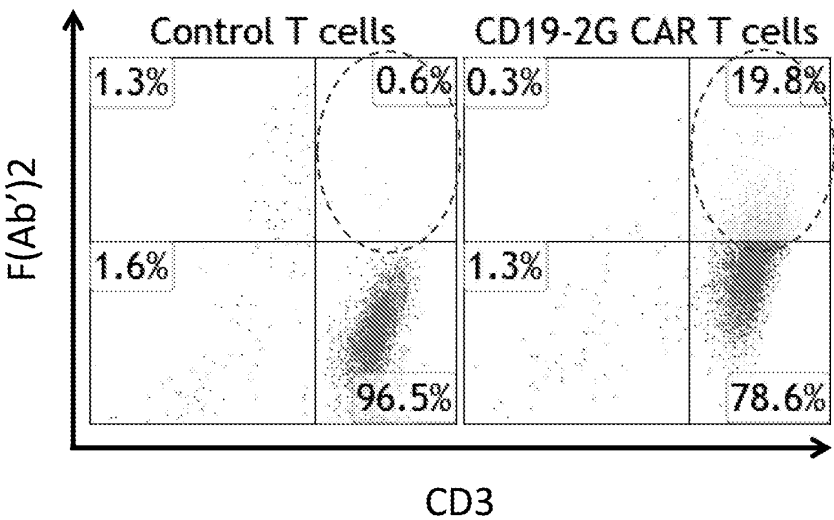
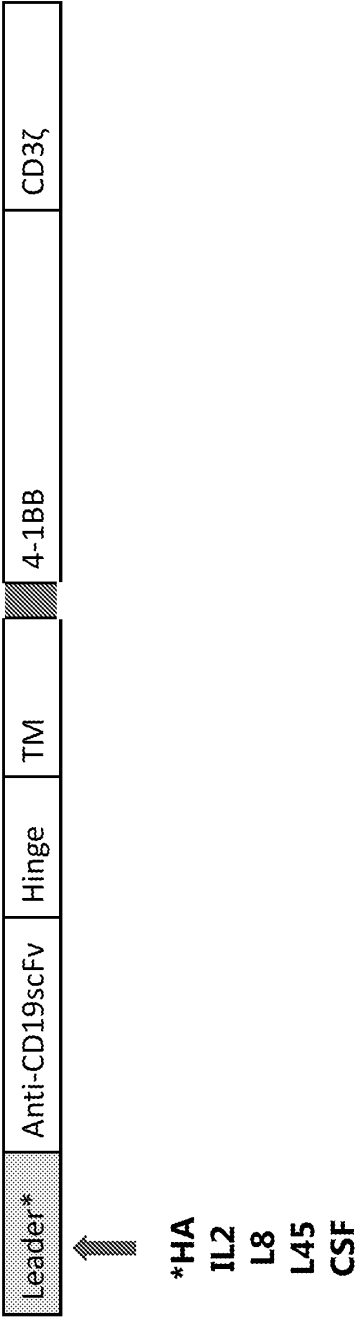


FIGURE 38A



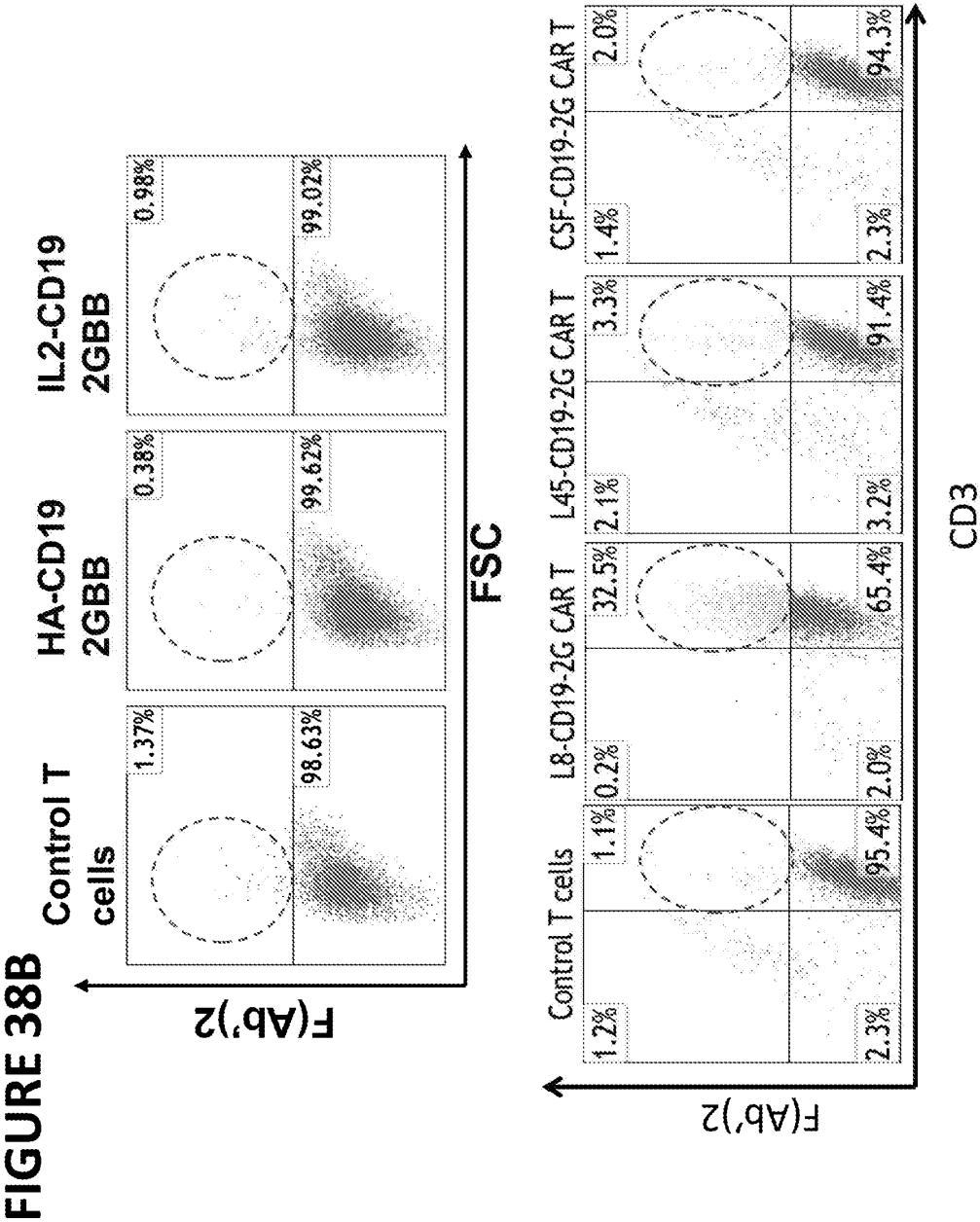


FIGURE 39A

Leader	Anti-CD19*scFv	Hinge	TM	CD28	4-1BB	CD3ζ
--------	----------------	-------	----	------	-------	------



*L8-CD19-2G or
L8-CD19b-BB-2G

FIGURE 39B

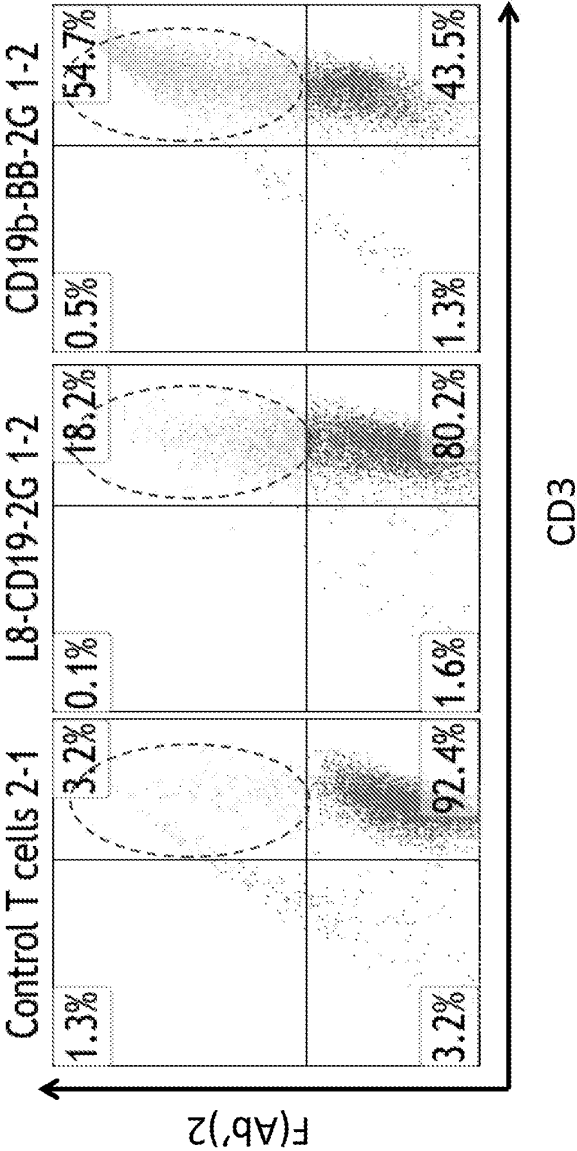


FIGURE 40

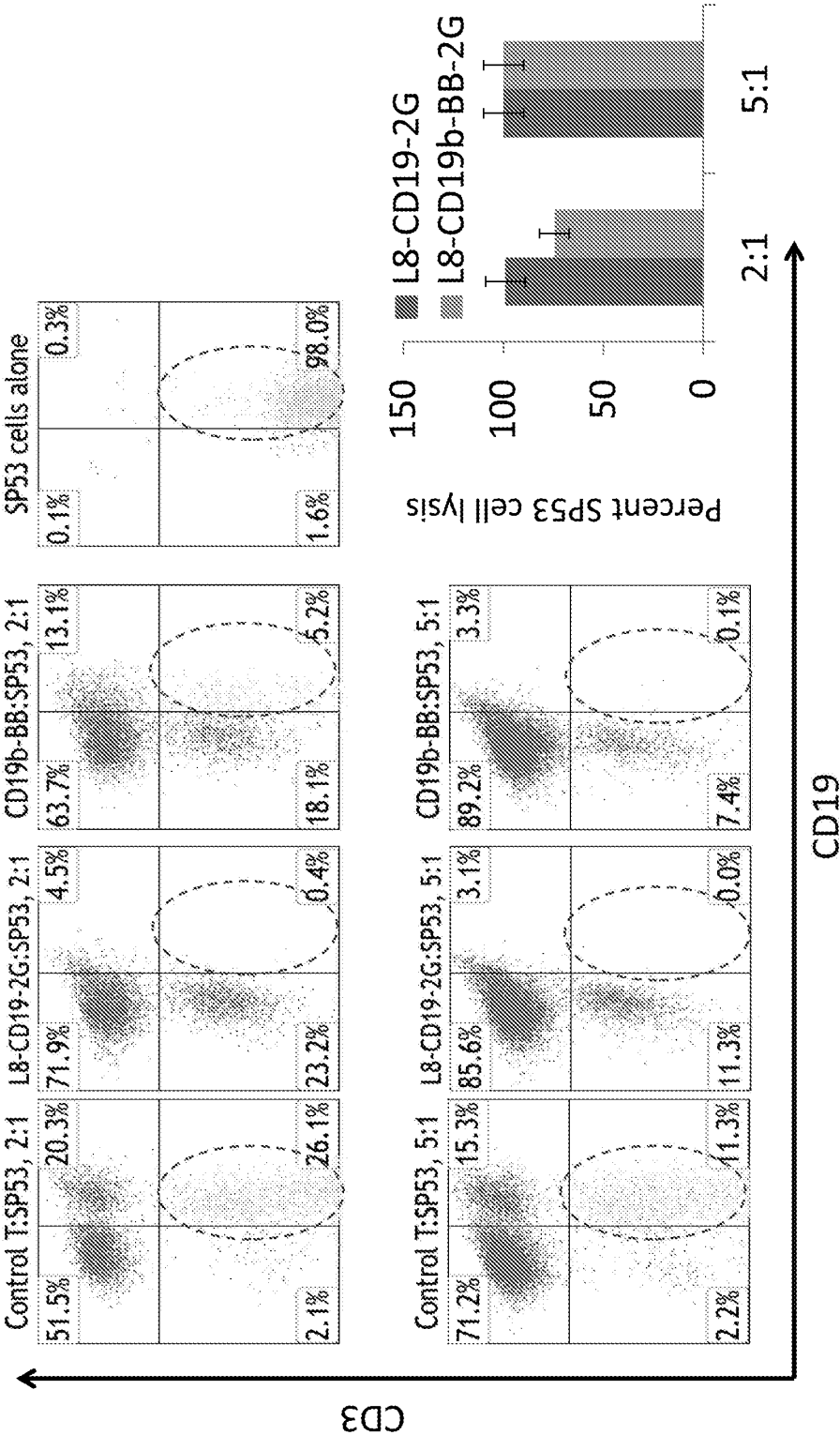


FIGURE 41

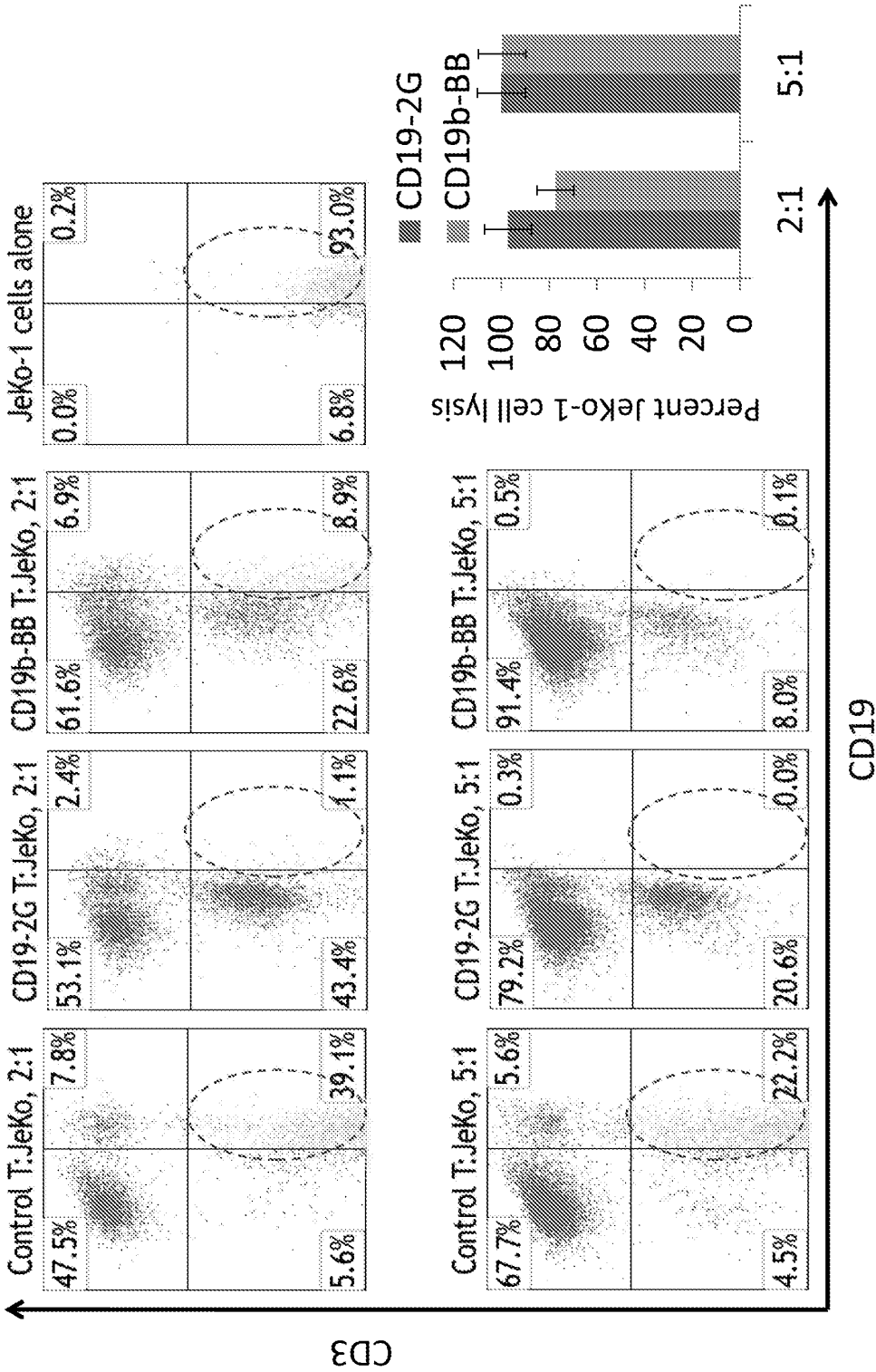


FIGURE 42

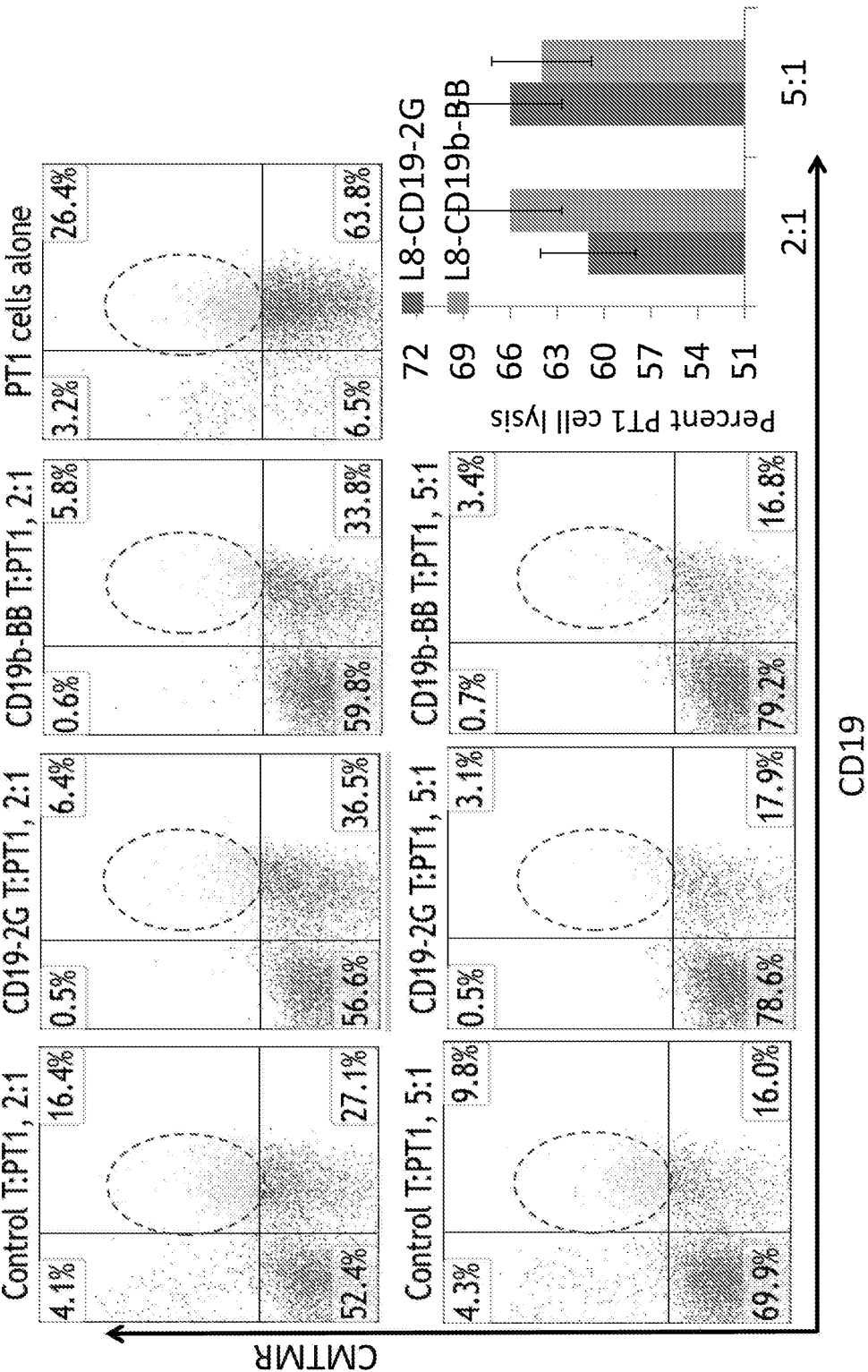


FIGURE 43

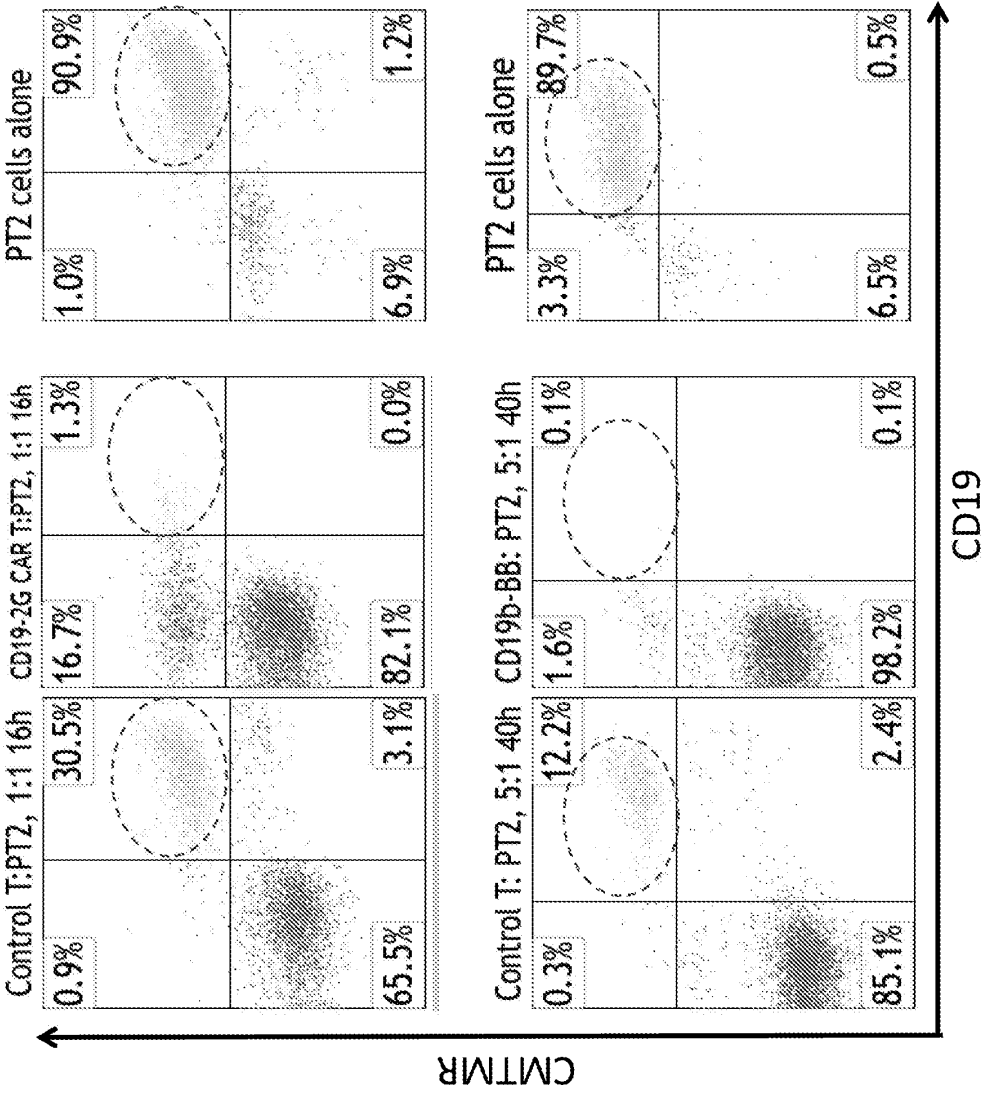


FIGURE 44

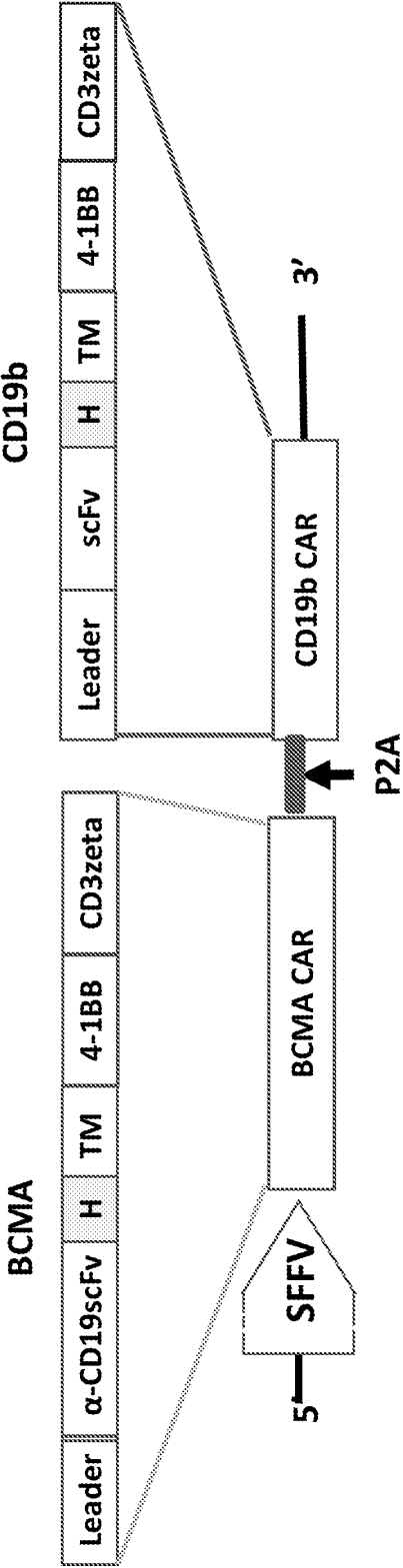


FIGURE 45A

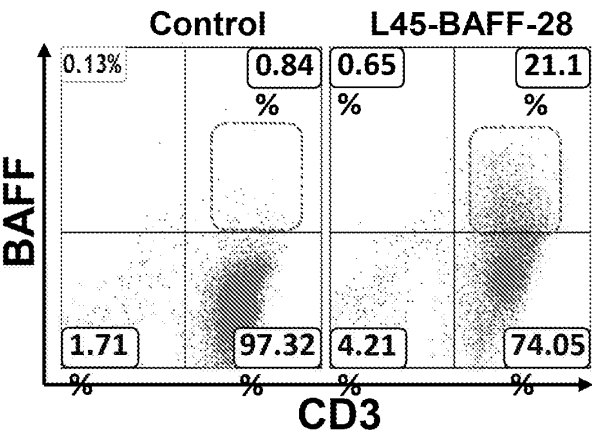
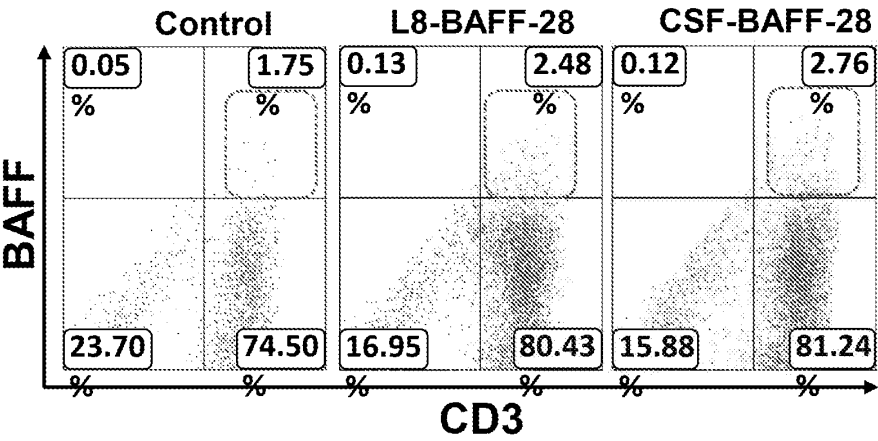


FIGURE 45B



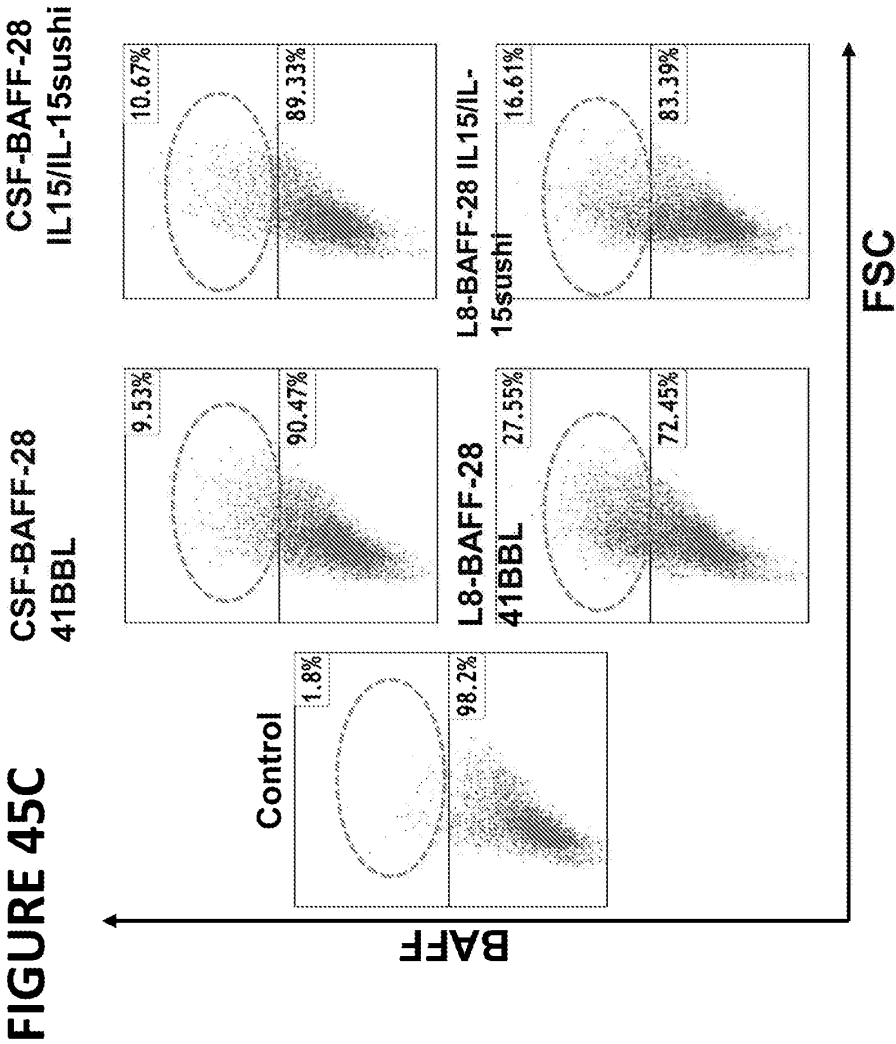


FIGURE 46A

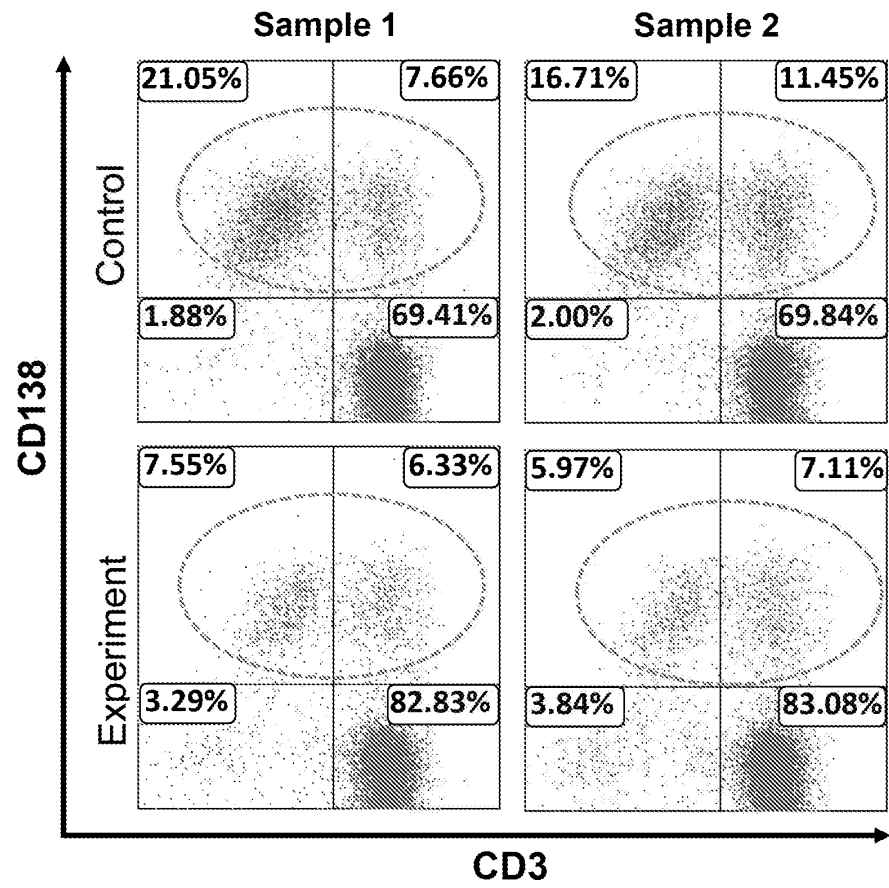


FIGURE 46B

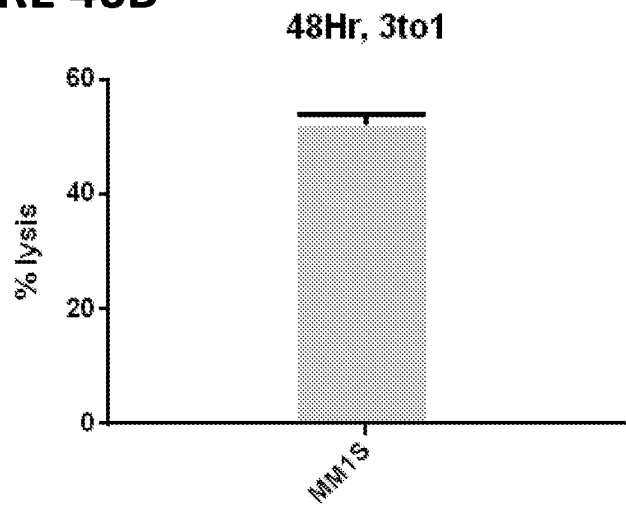


FIGURE 47A

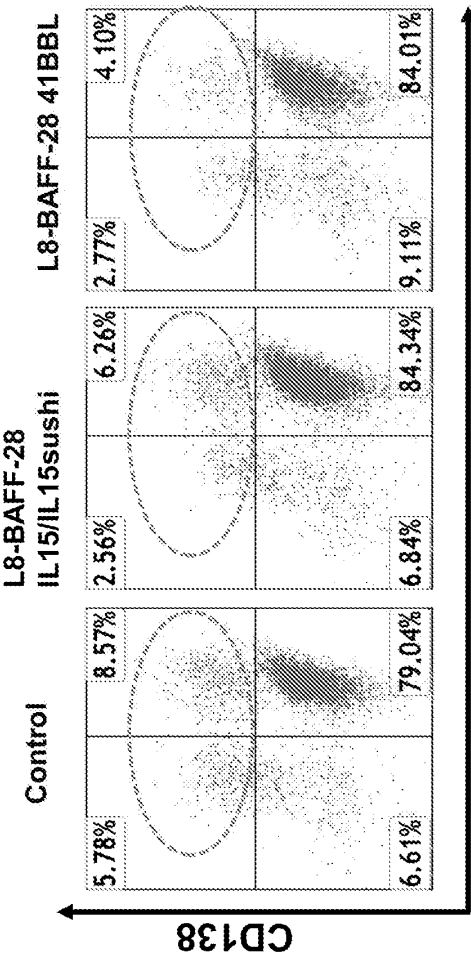


FIGURE 47B

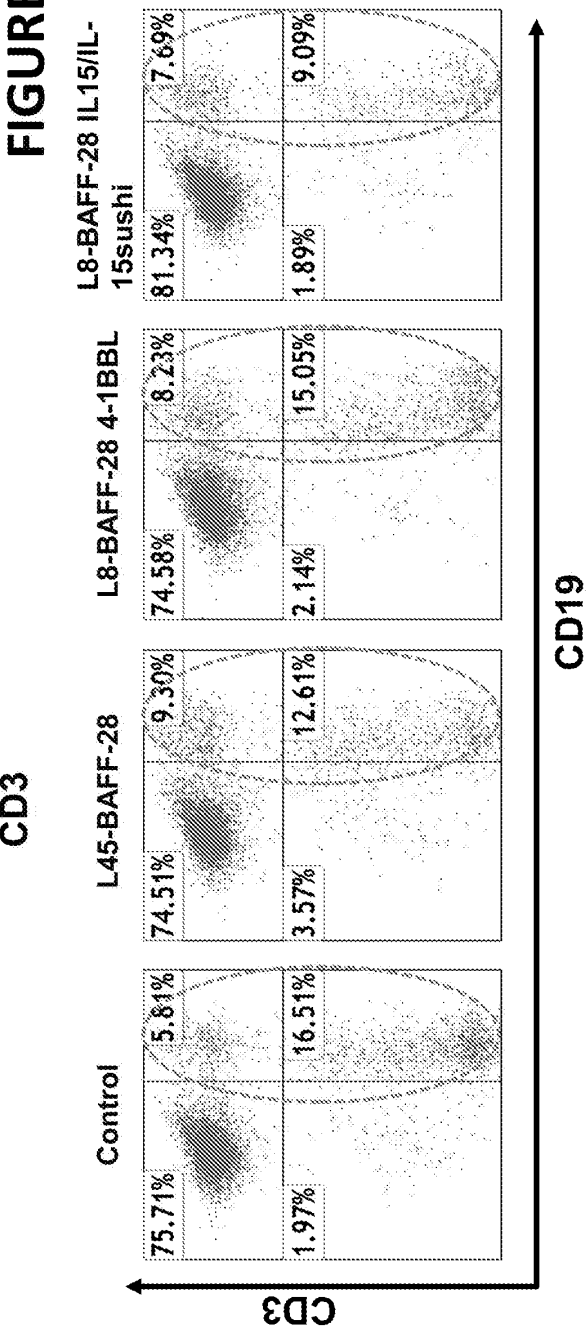


FIGURE 48

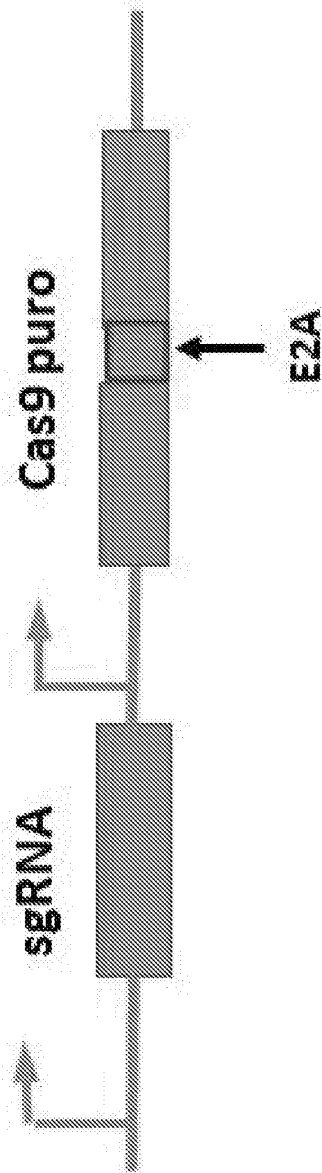
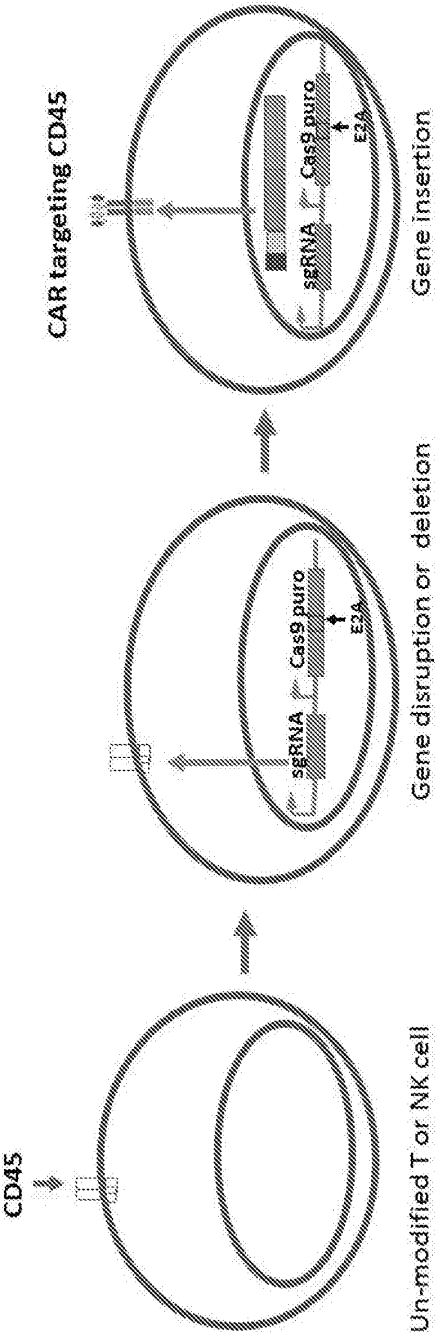
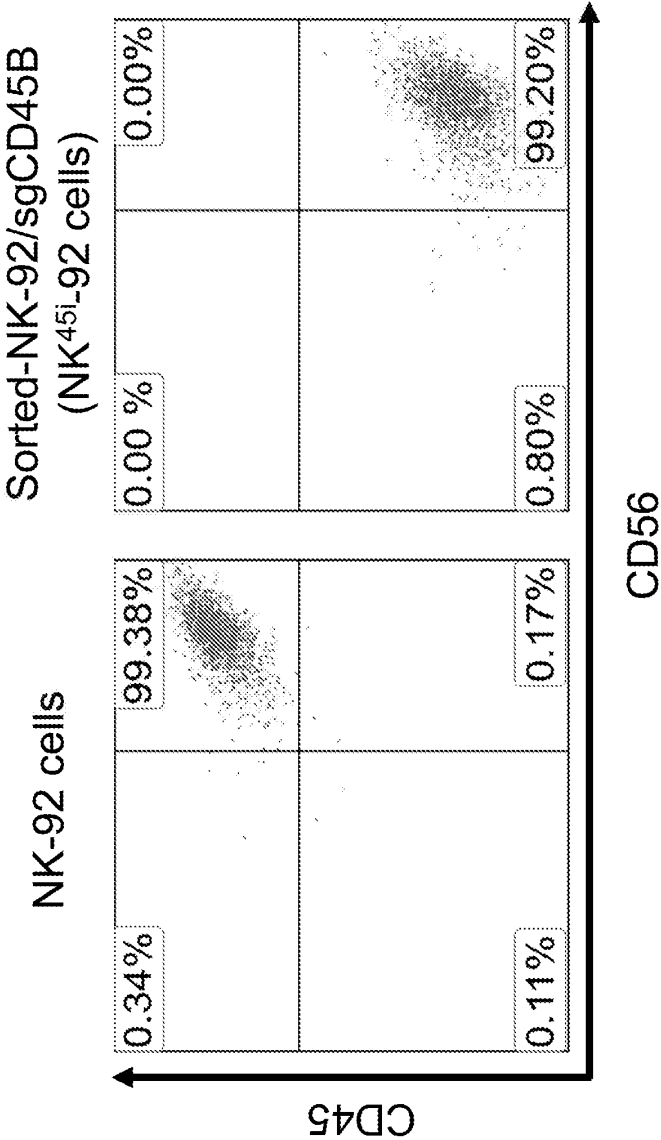


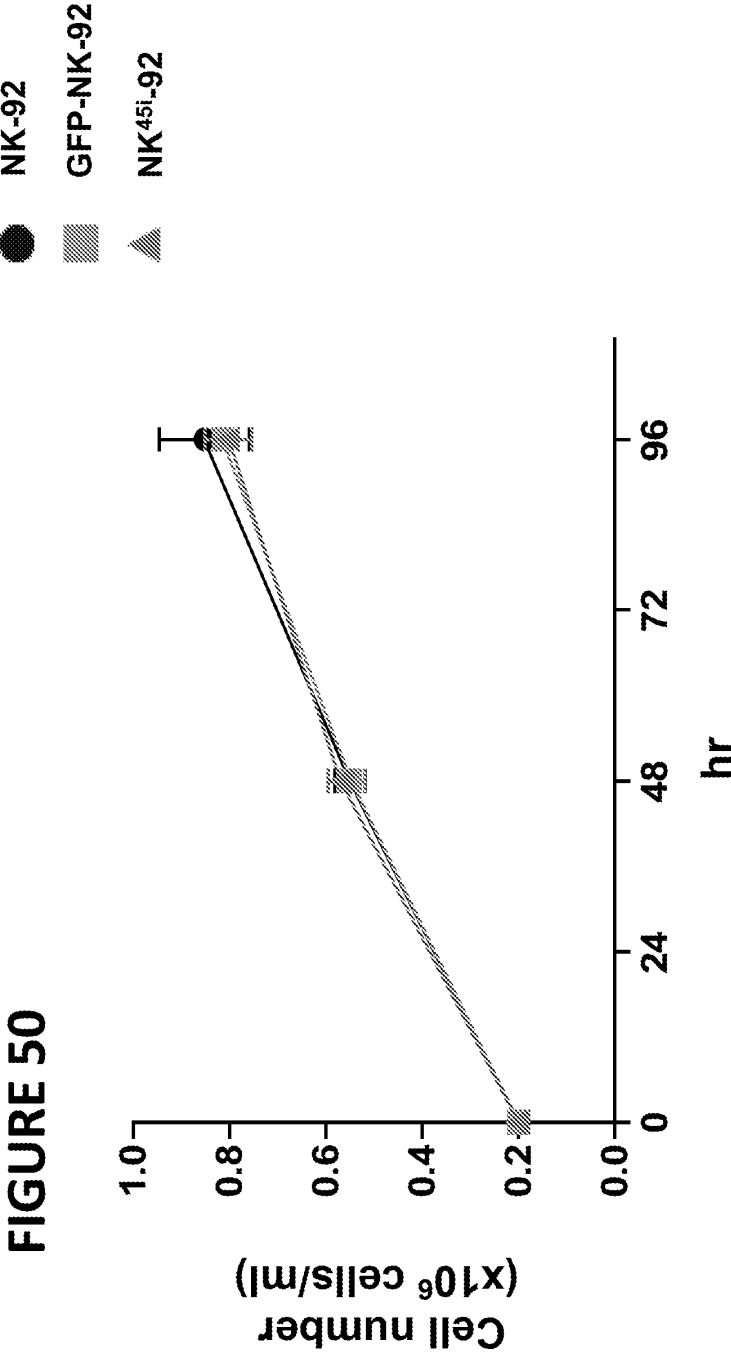
FIGURE 49A

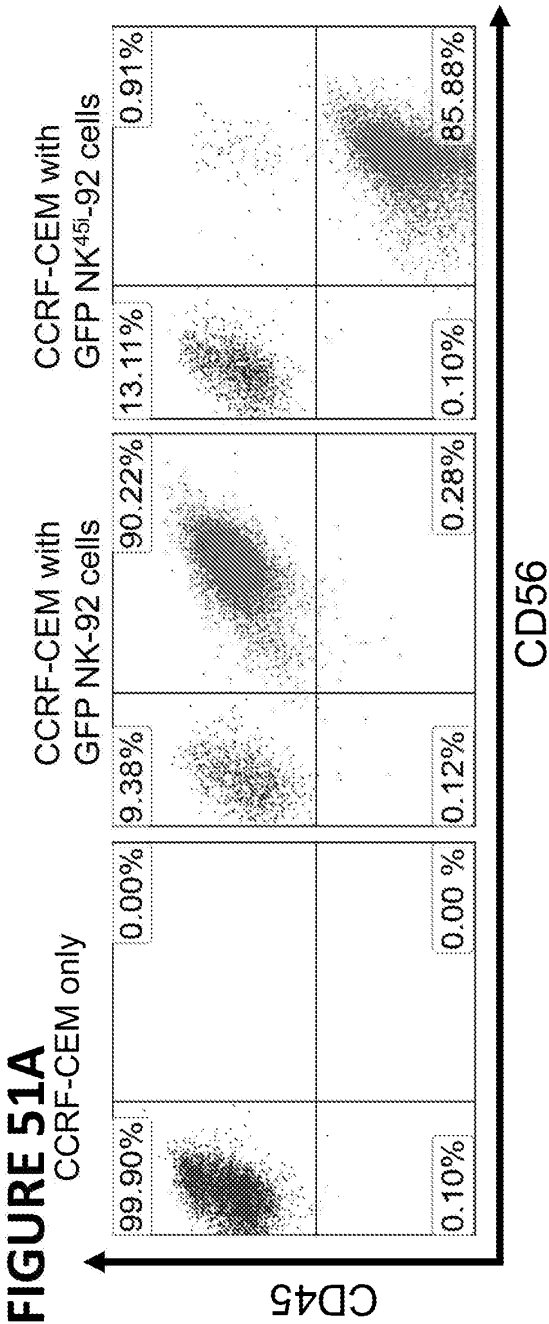


- Steps:
- 1. Donor T cells or NK cells
 - 2. Gene disruption or deletion of CD45
 - 3. Insert of scFv CAR targeting CD45

FIGURE 49B







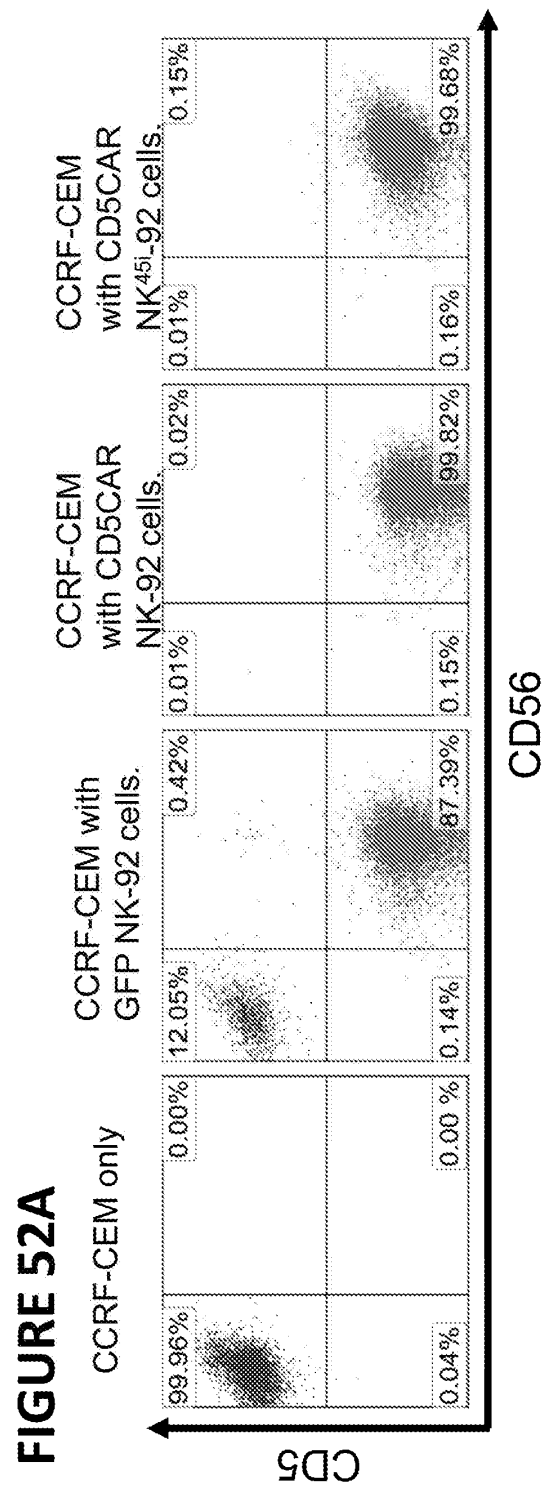
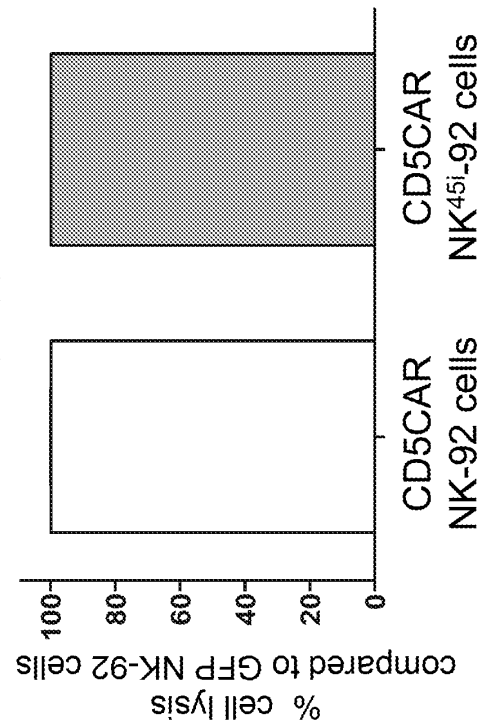


FIGURE 53A

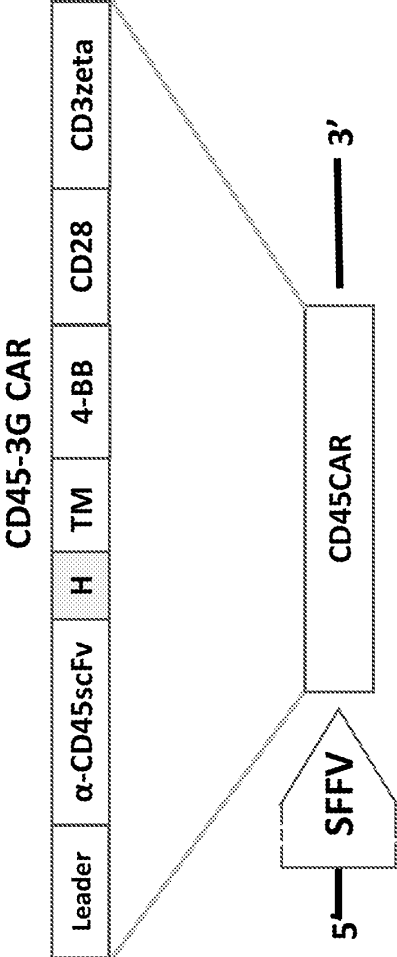


FIGURE 53B

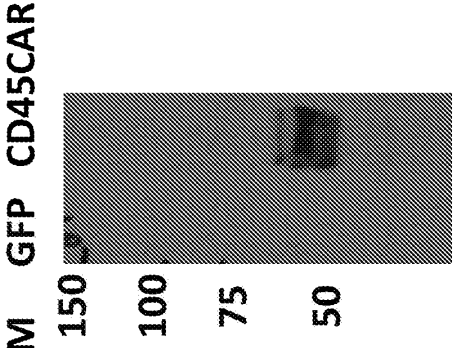


FIGURE 54

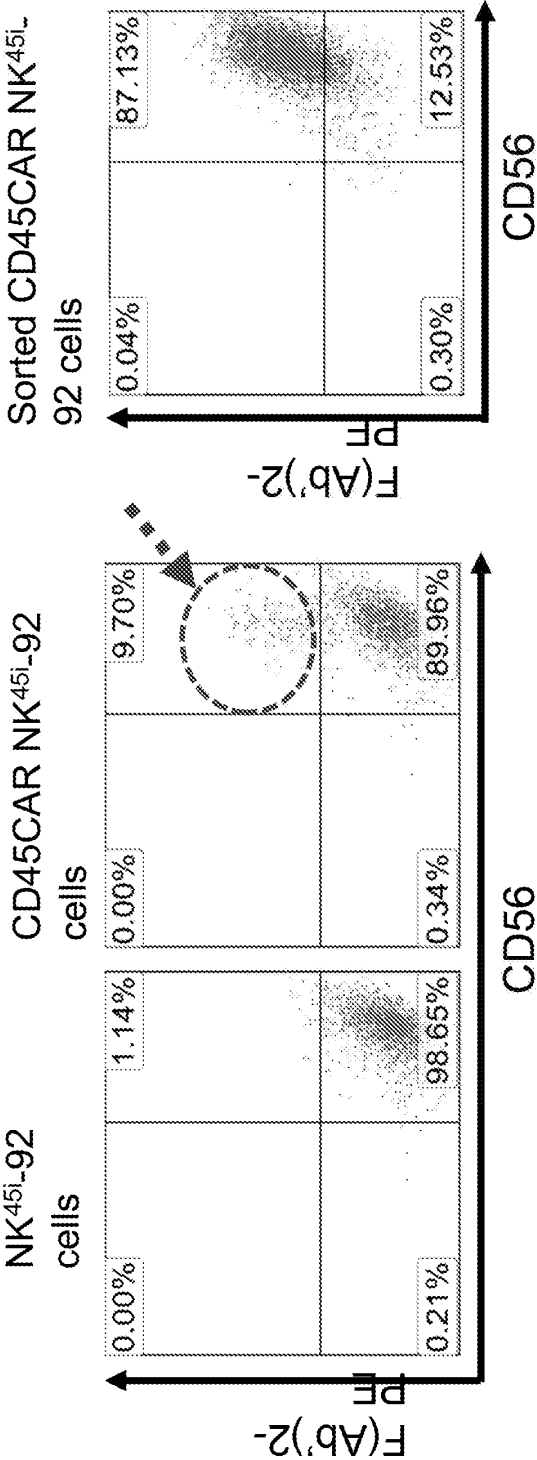


FIGURE 55A

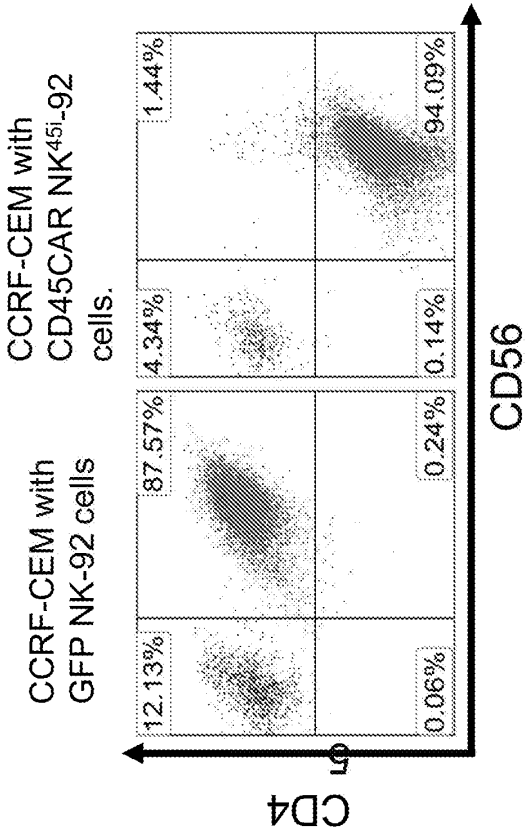
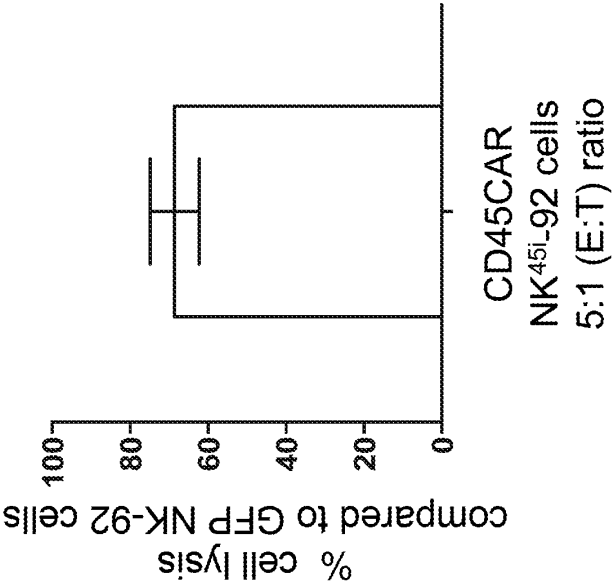


FIGURE 55B



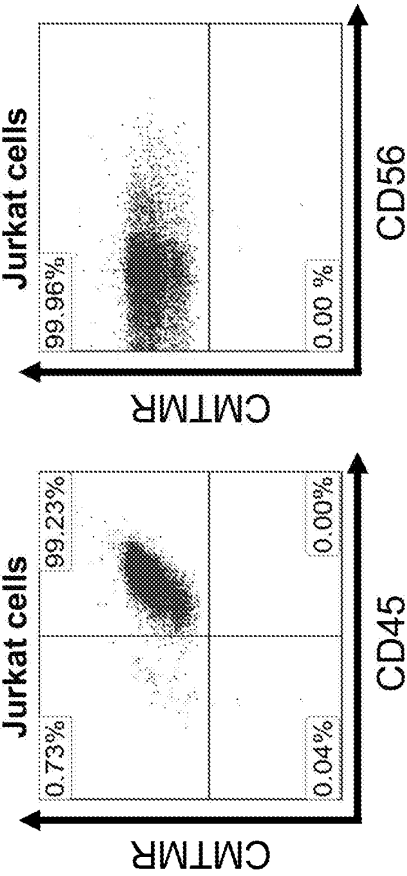


FIGURE 56A

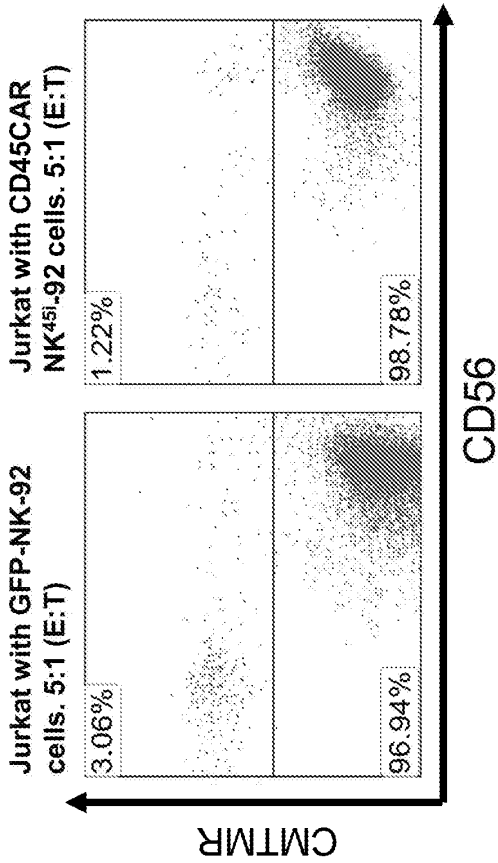


FIGURE 56B

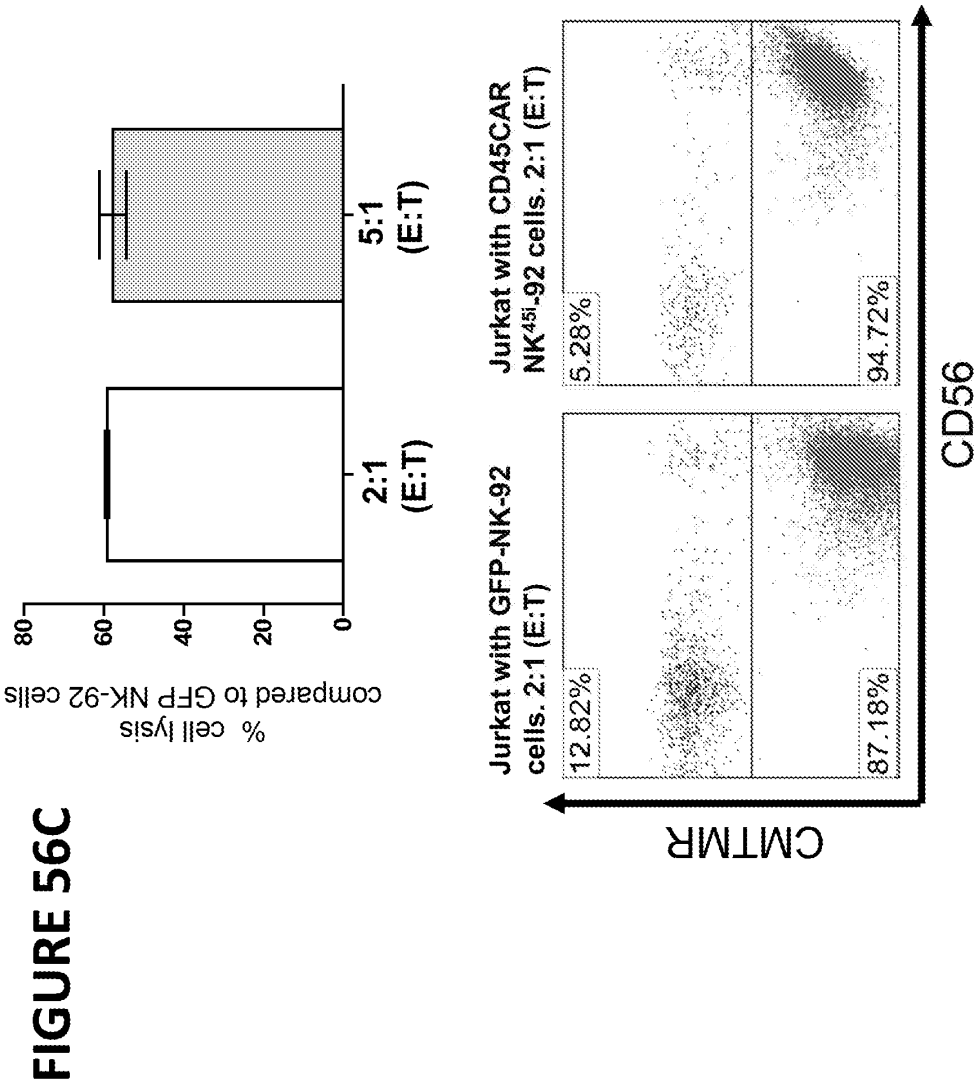


FIGURE 57A

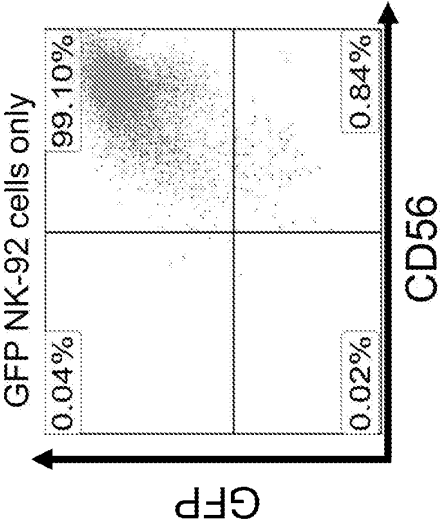
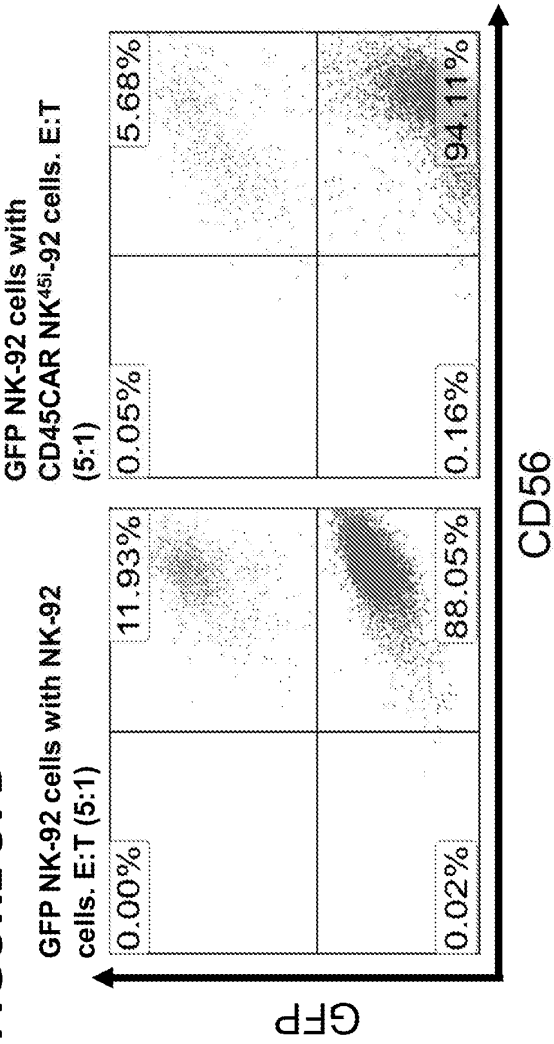
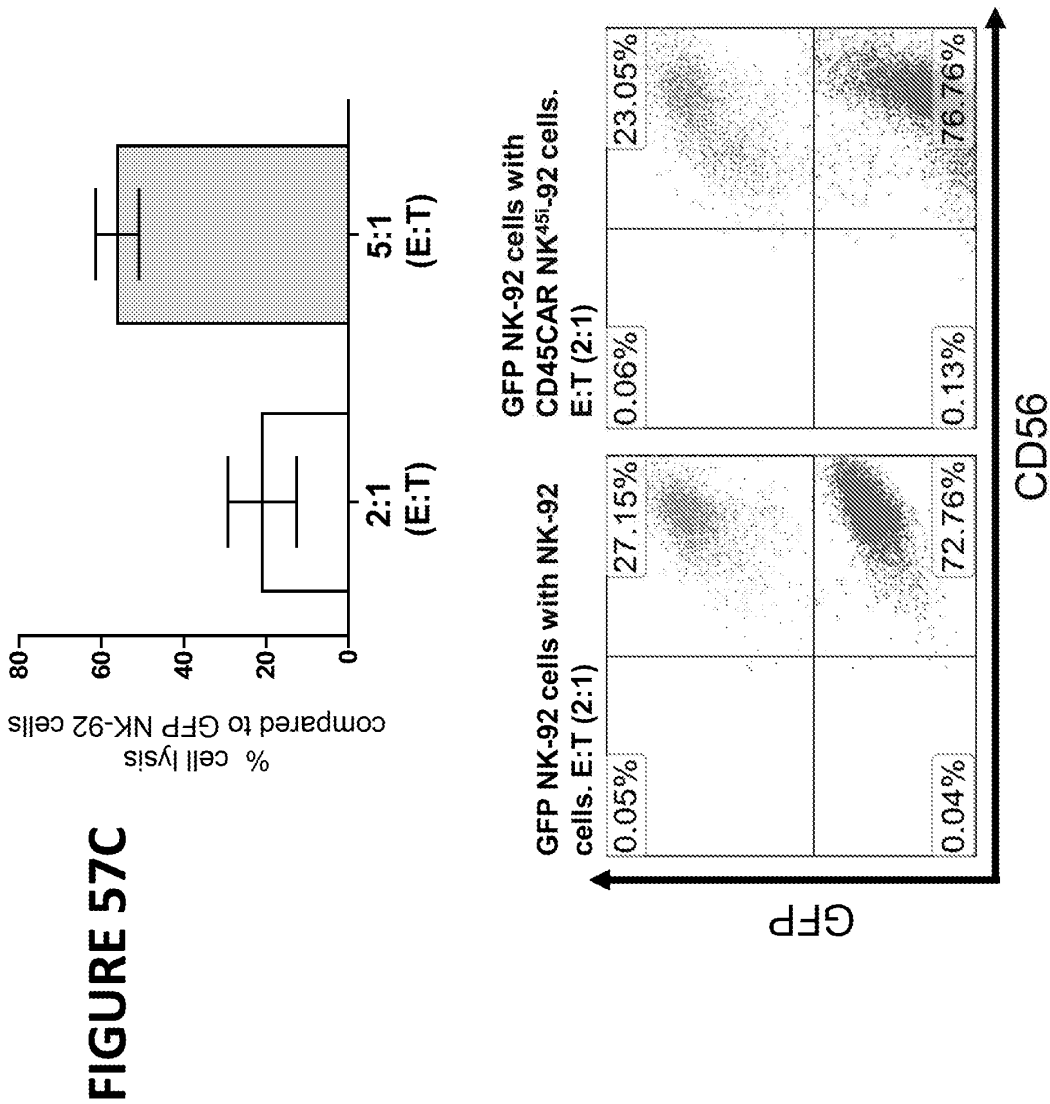


FIGURE 57B





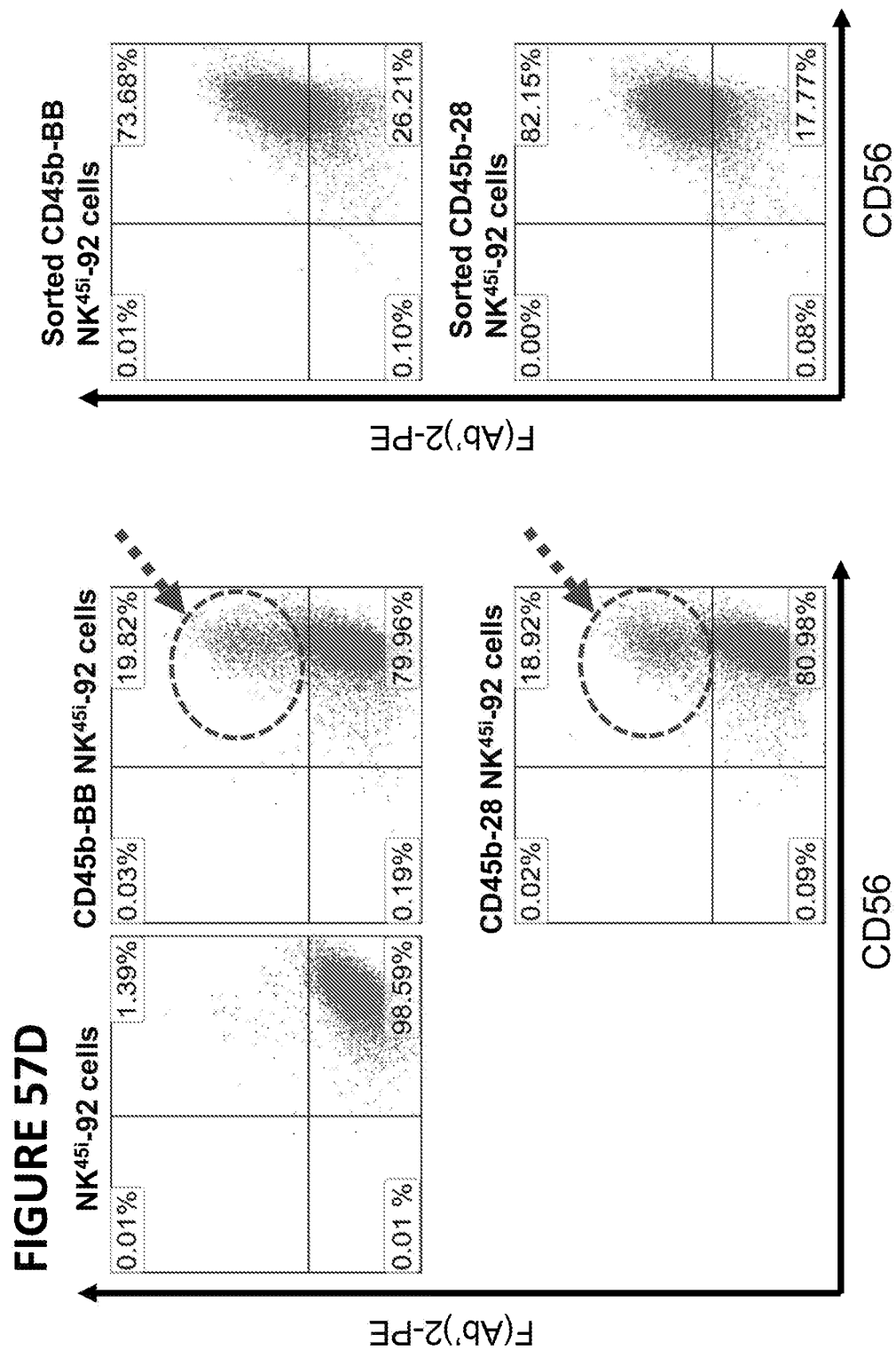
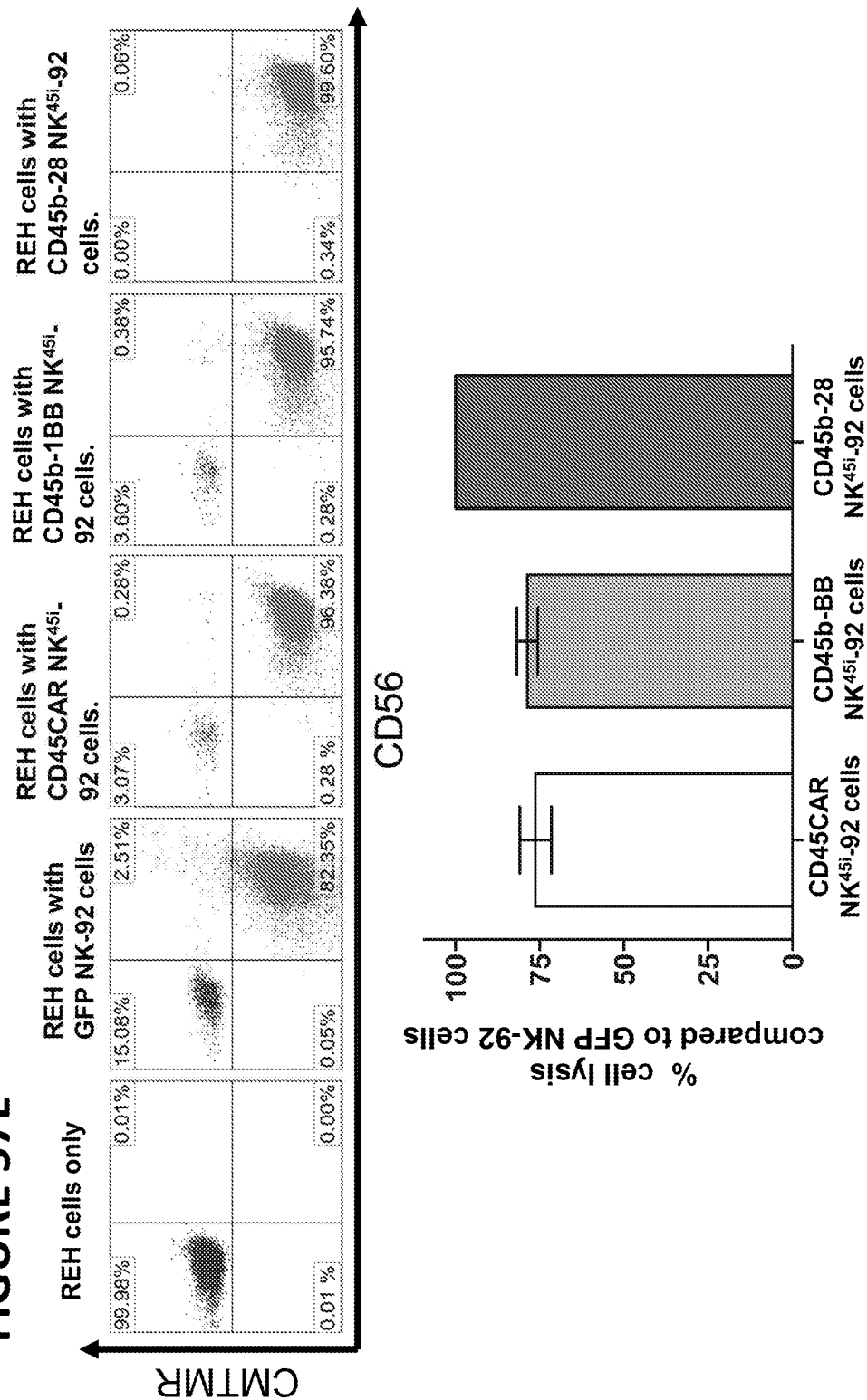
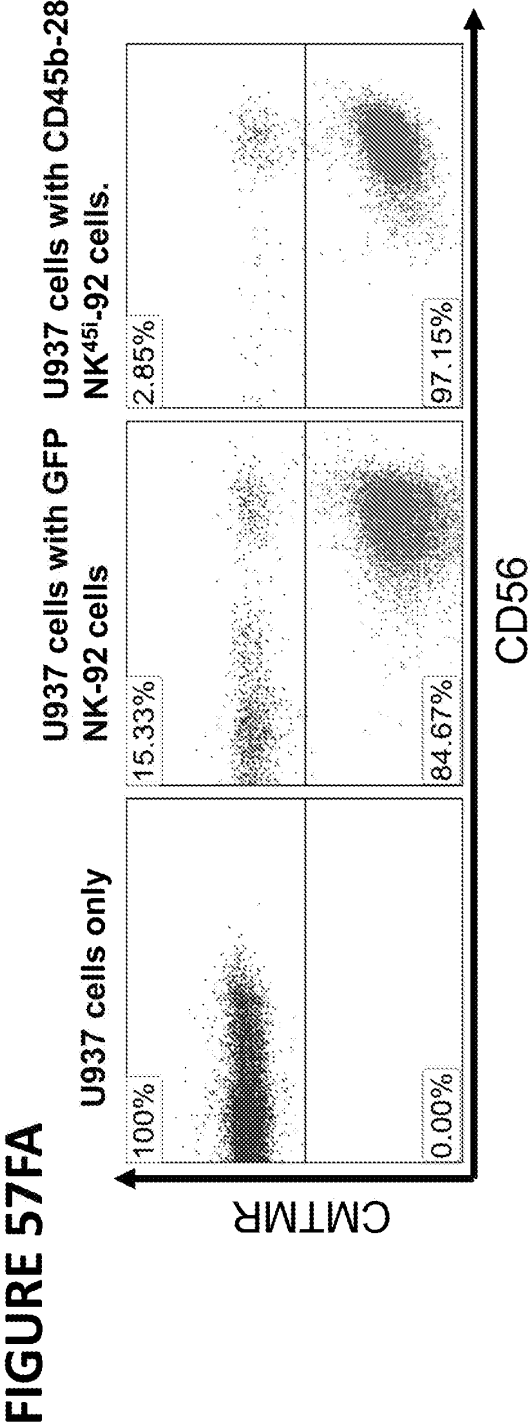
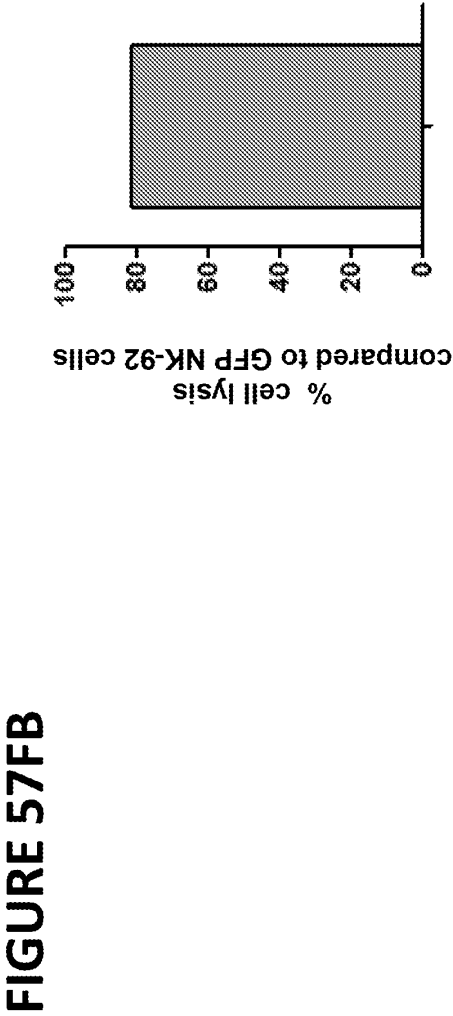
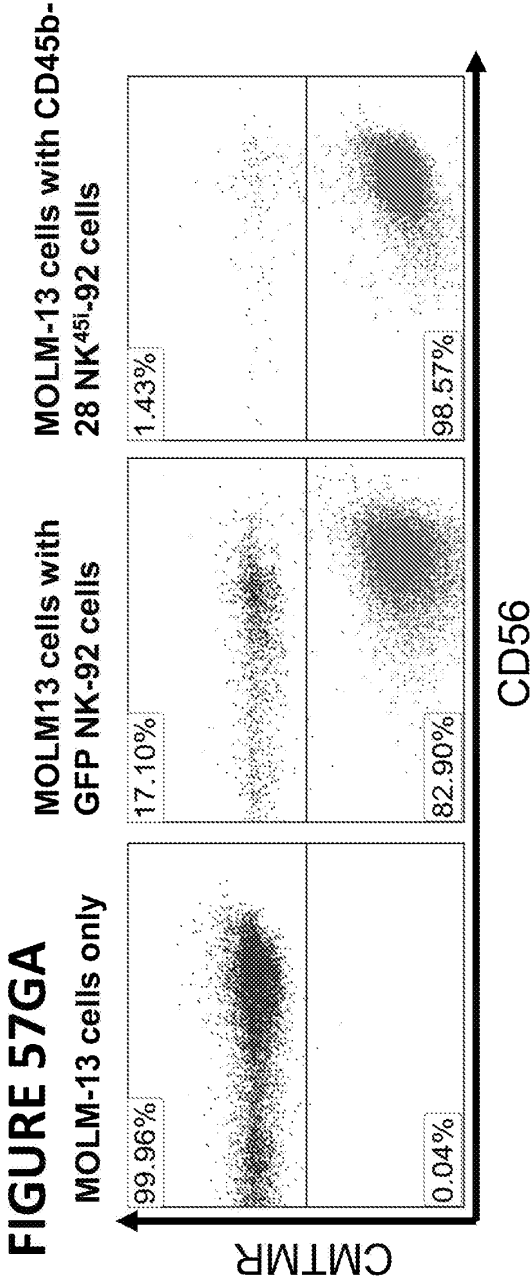
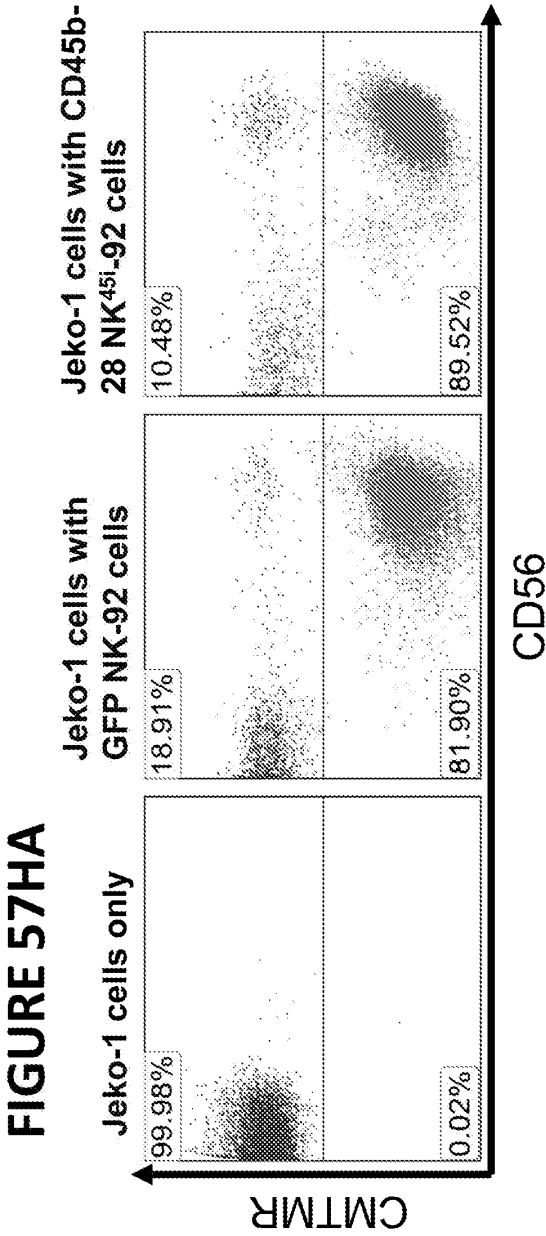
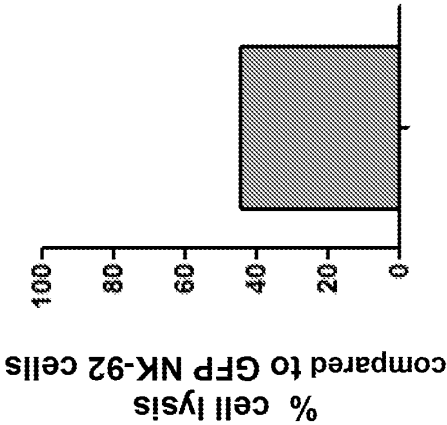


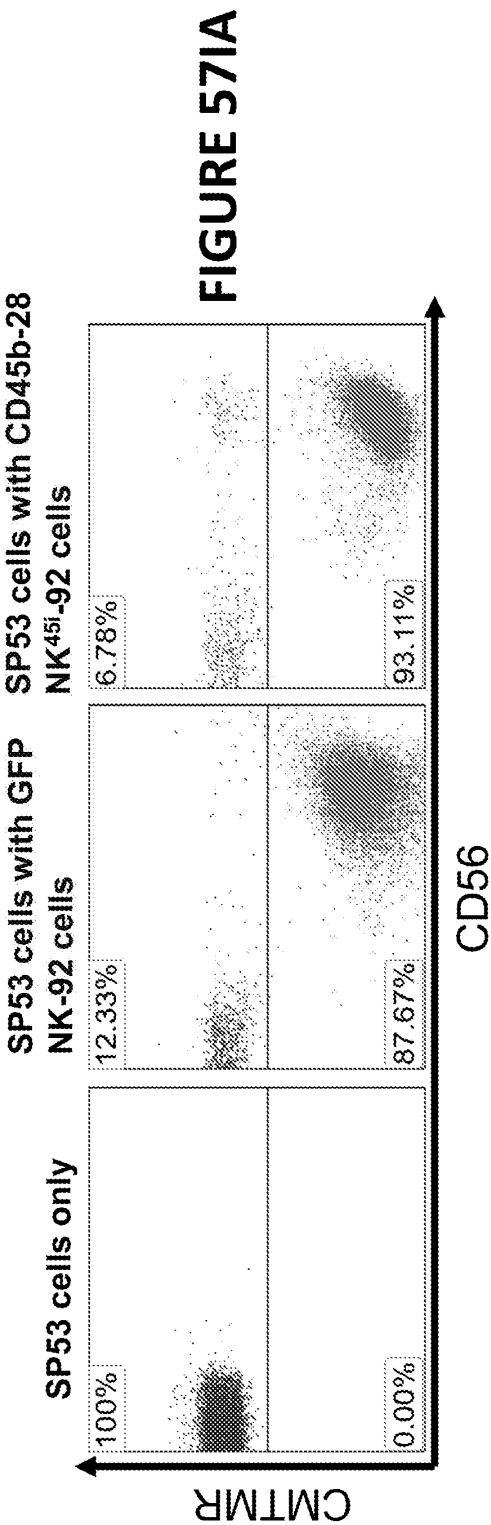
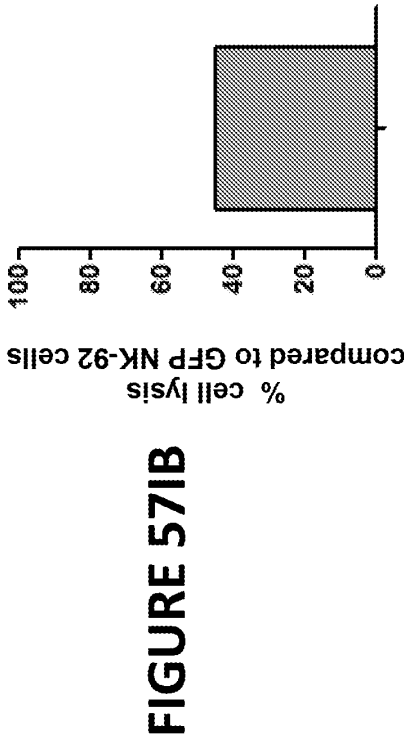
FIGURE 57E











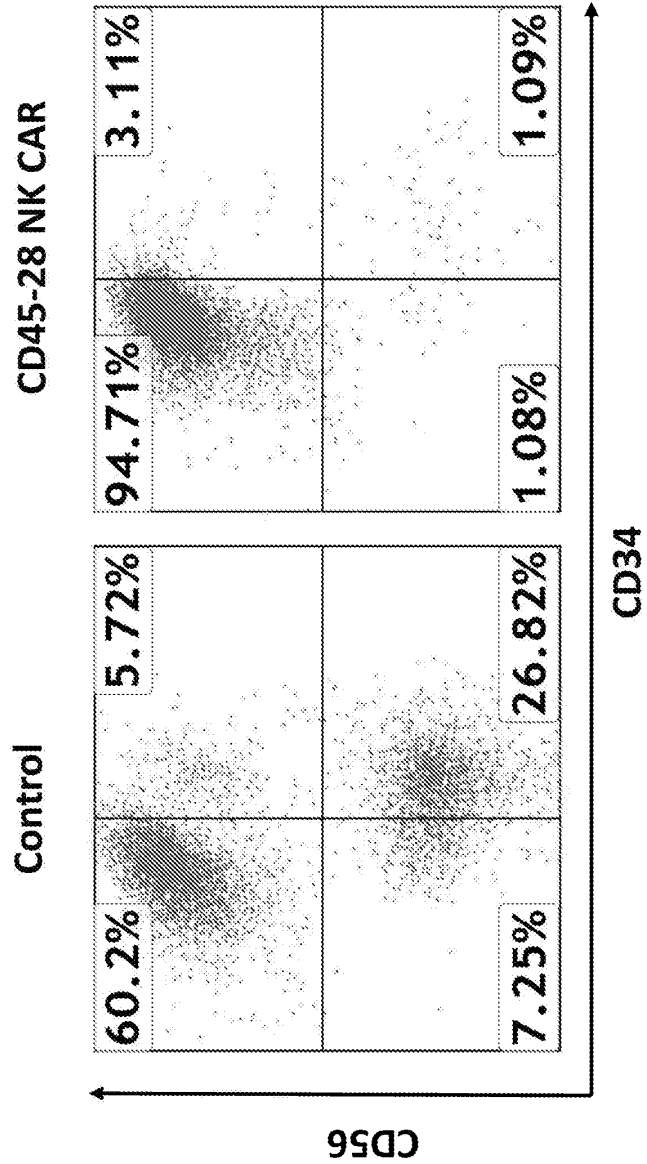


FIGURE 57J

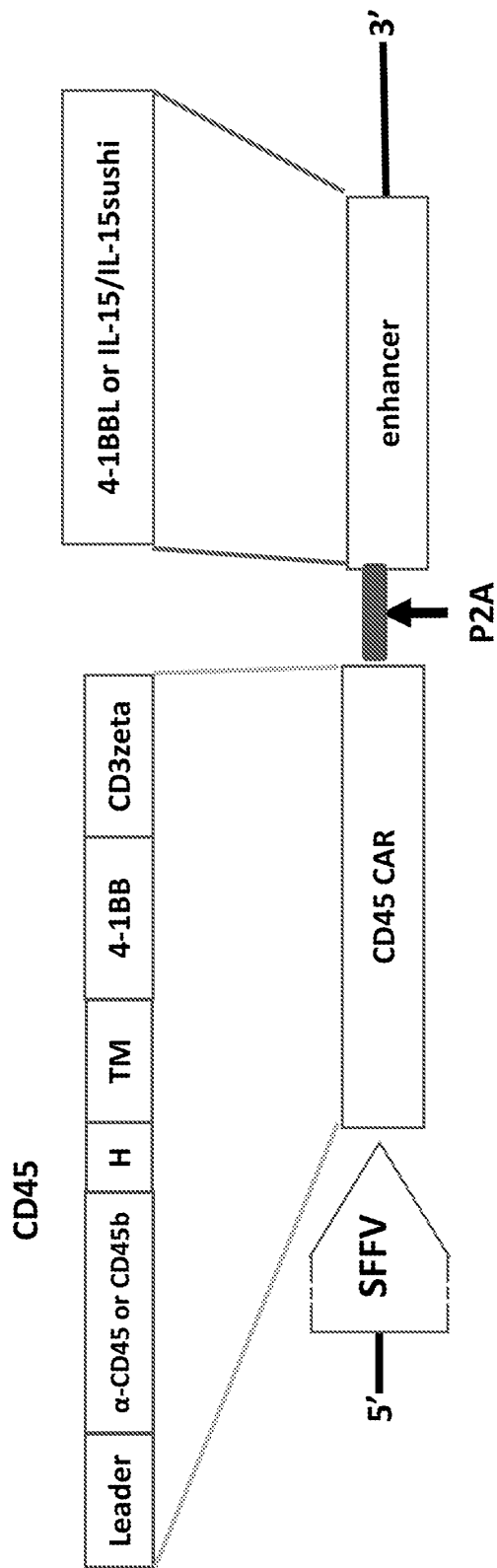


FIGURE 58A

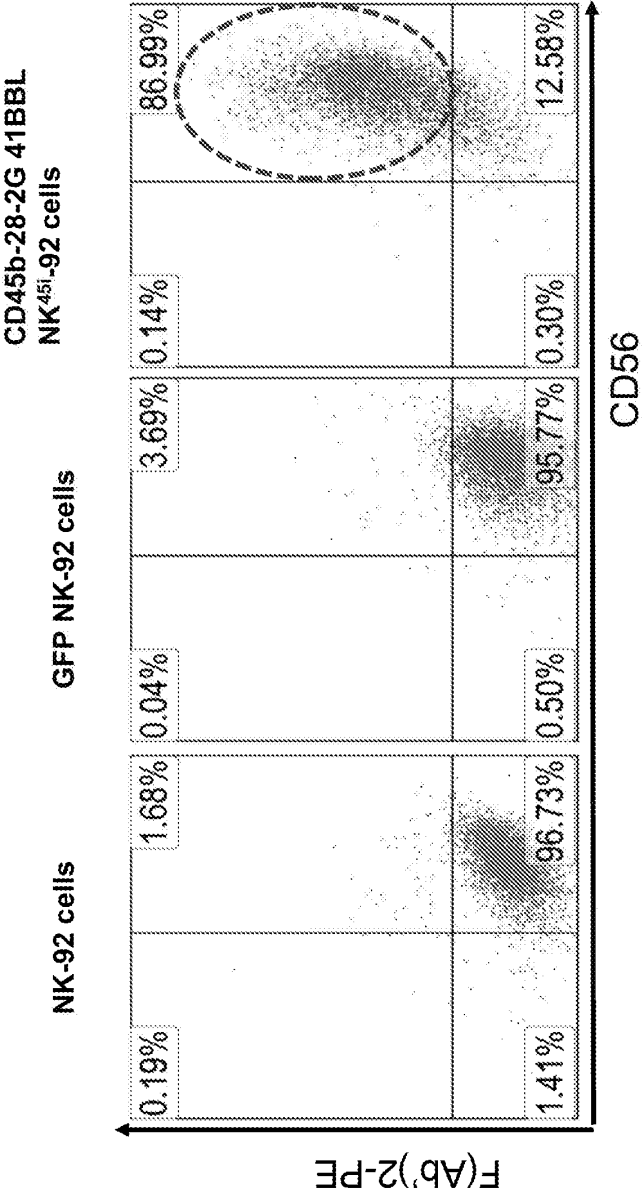


FIGURE 58B

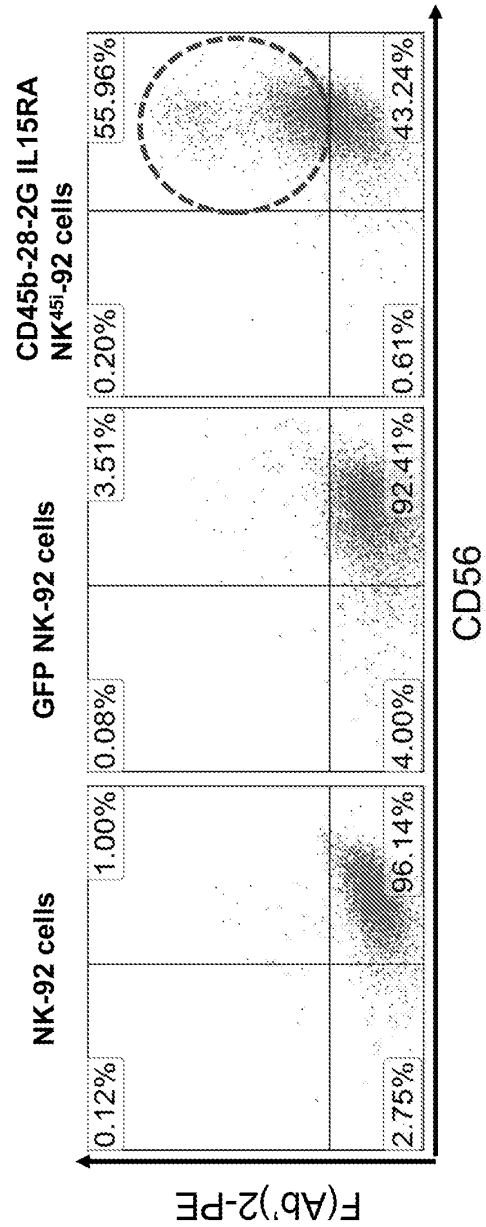


FIGURE 58C

FIGURE 59A

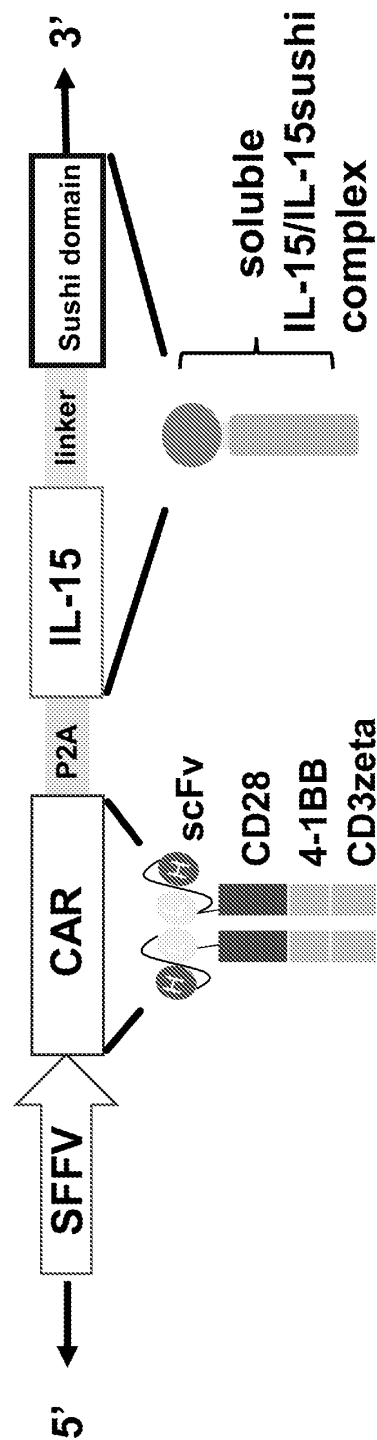


FIGURE 59B

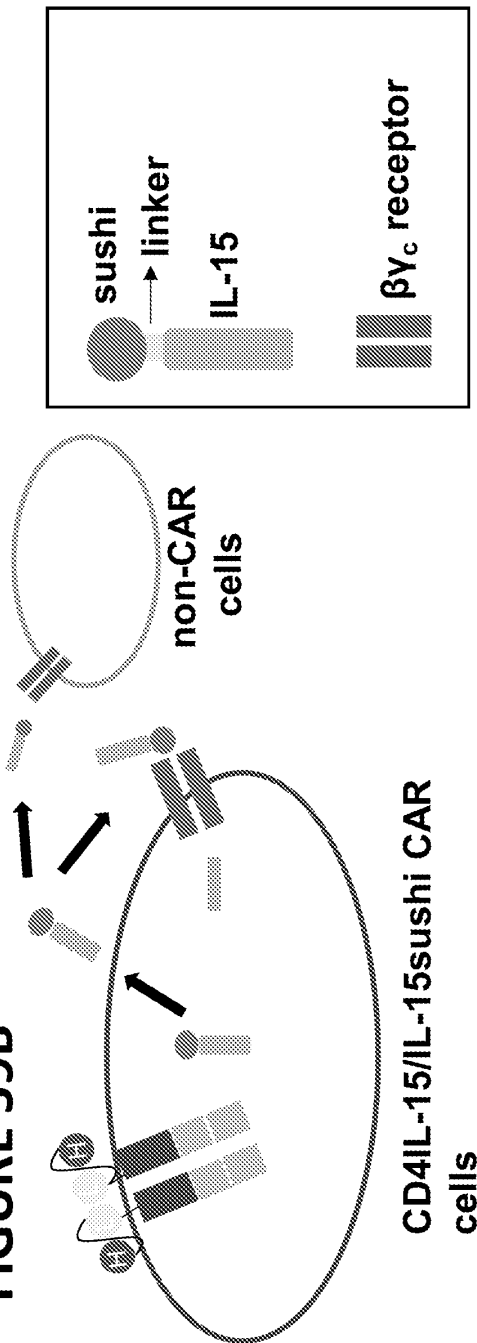


FIGURE 60A

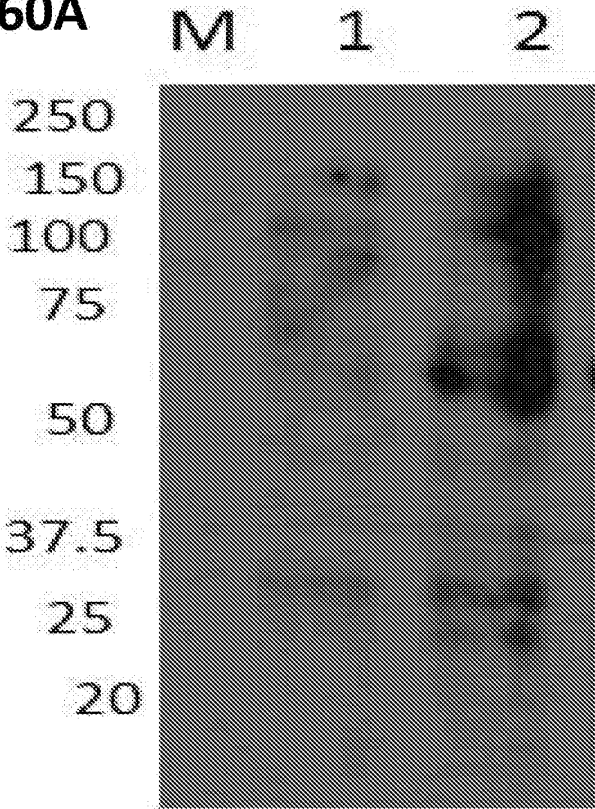
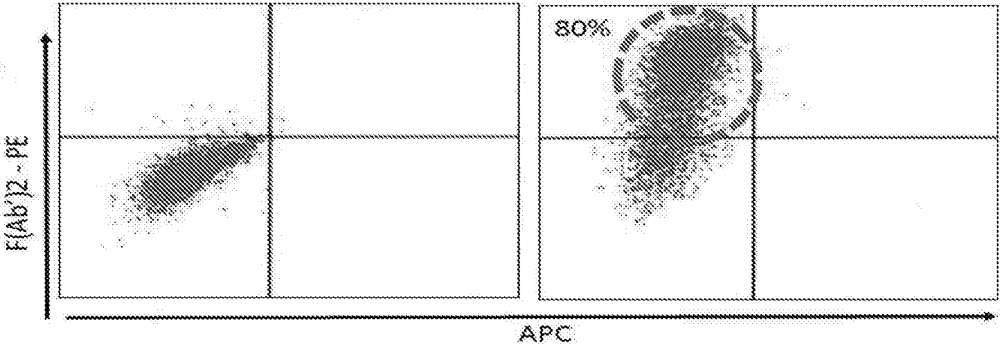


FIGURE 60B



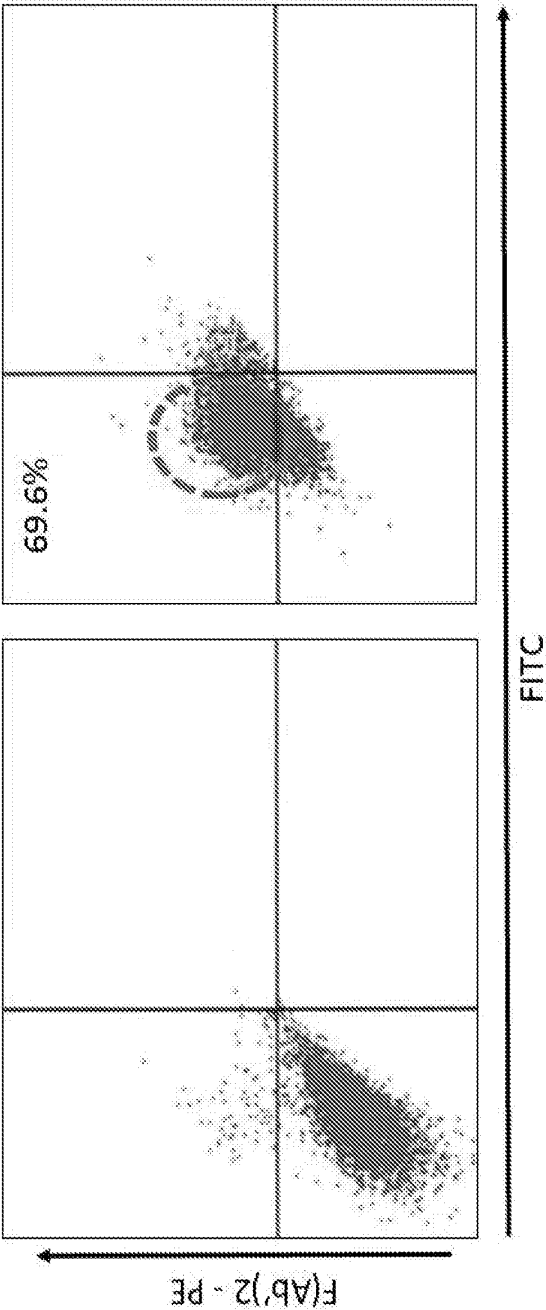
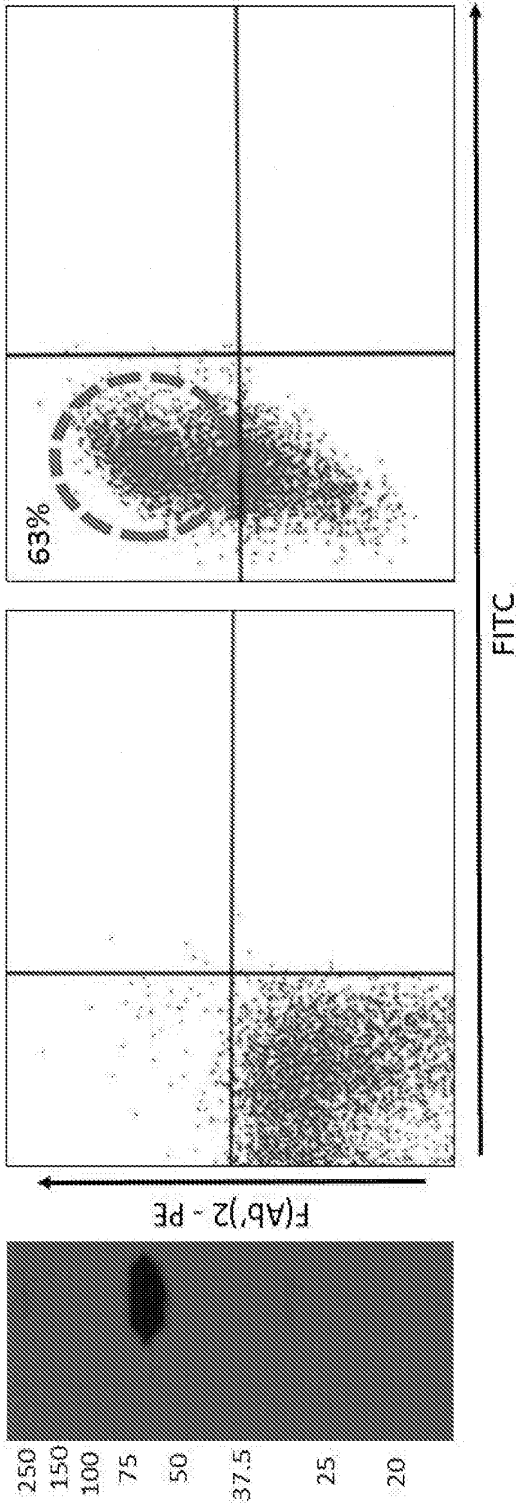
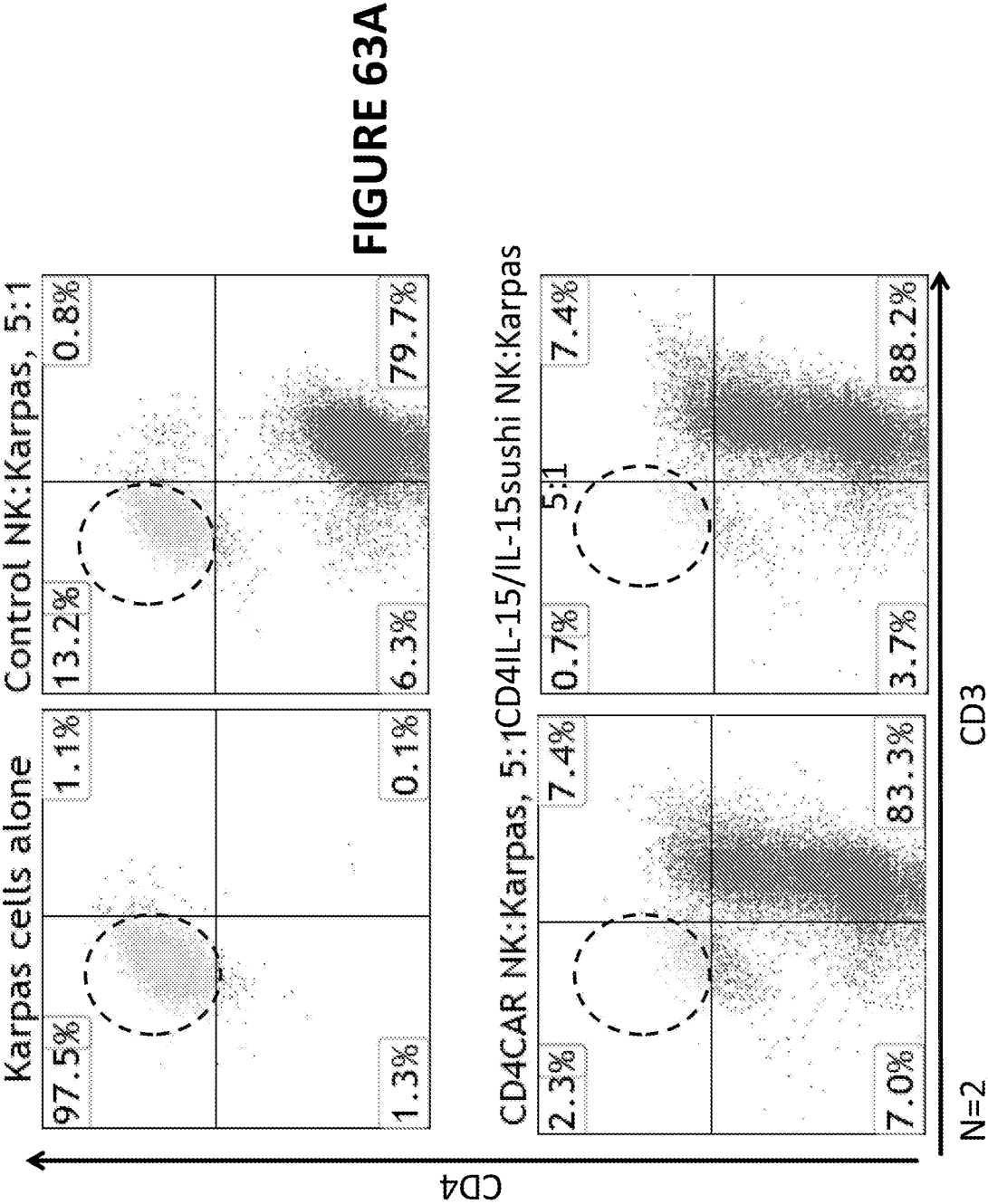


FIGURE 61

FIGURE 62





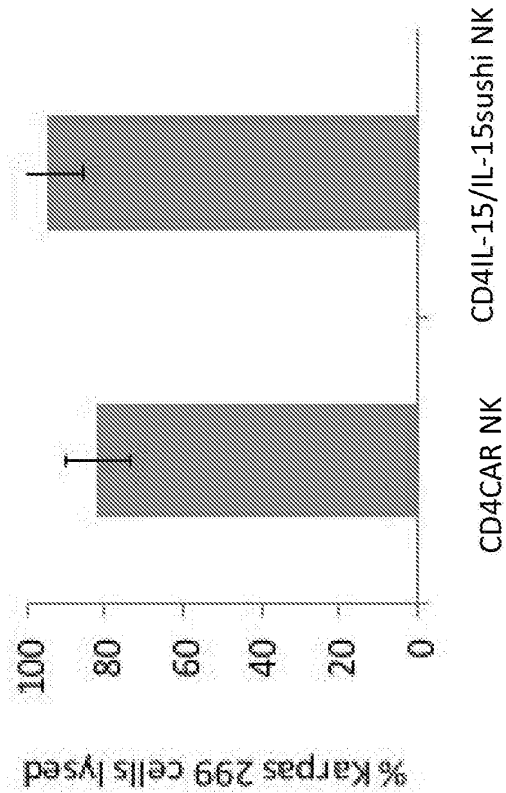


FIGURE 63B

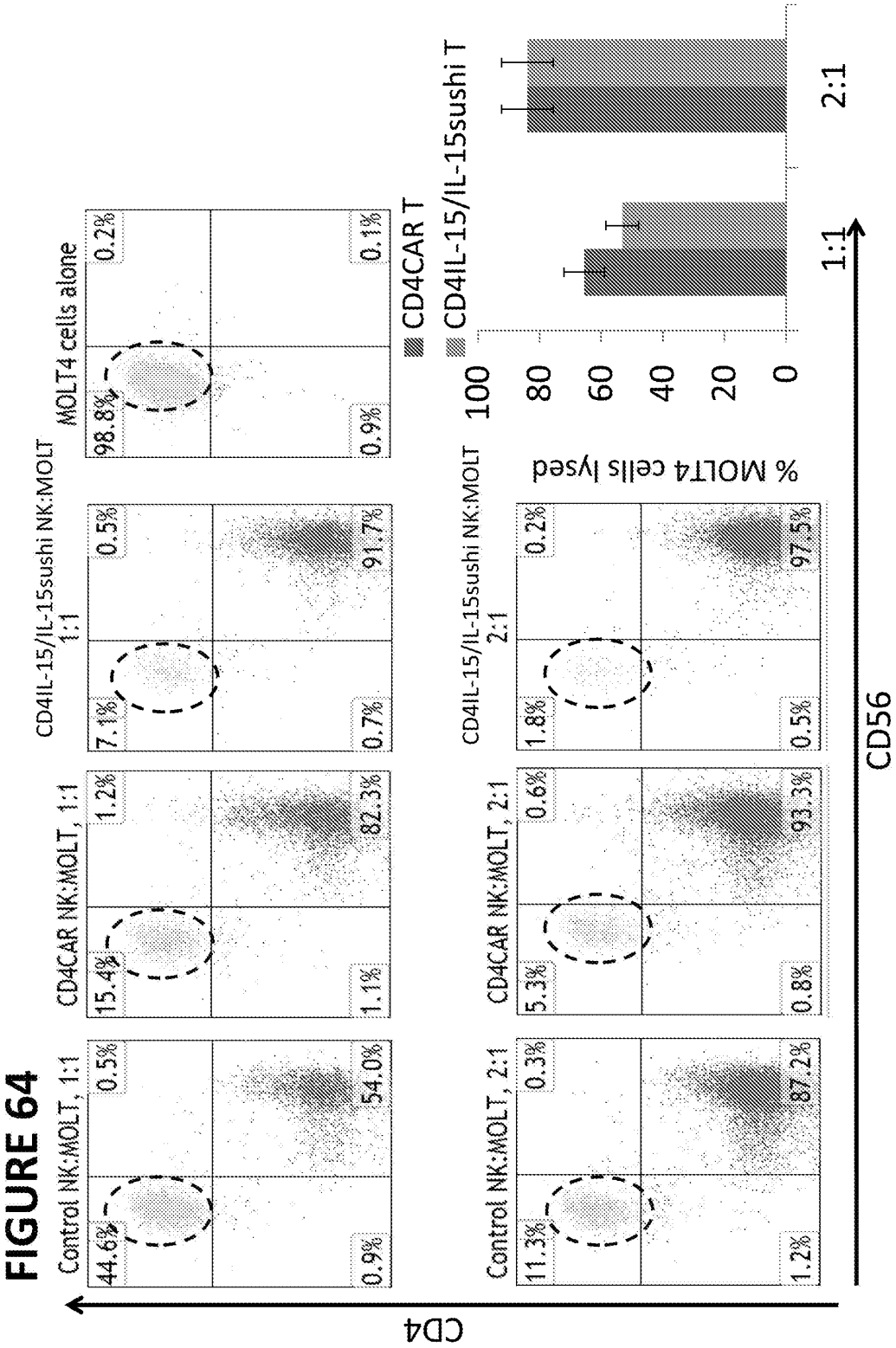
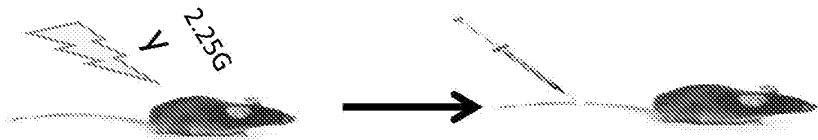
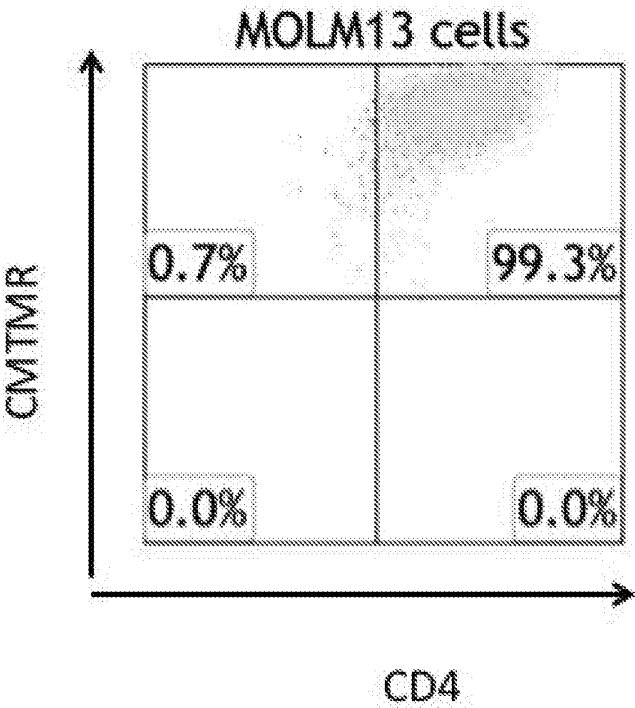
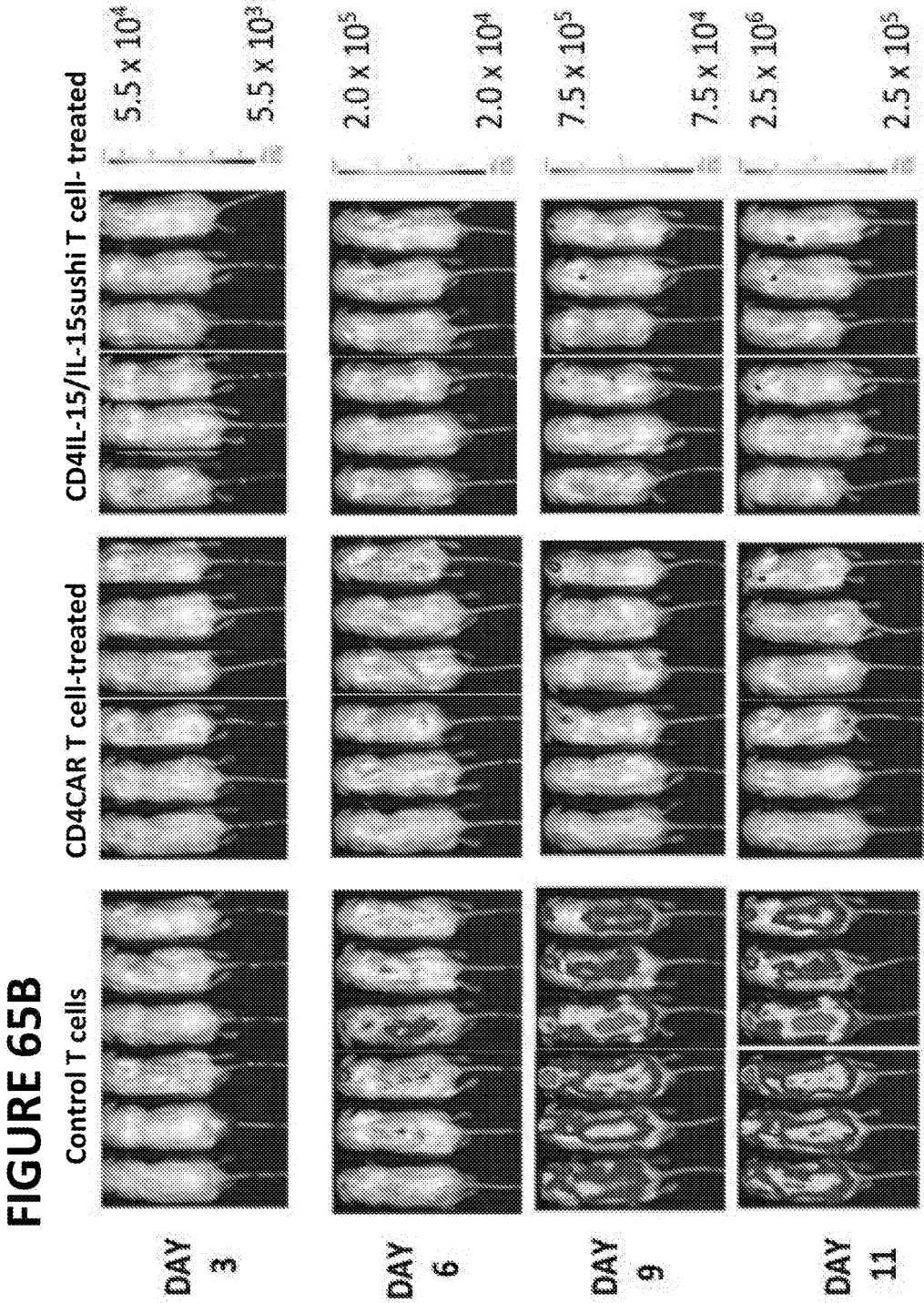


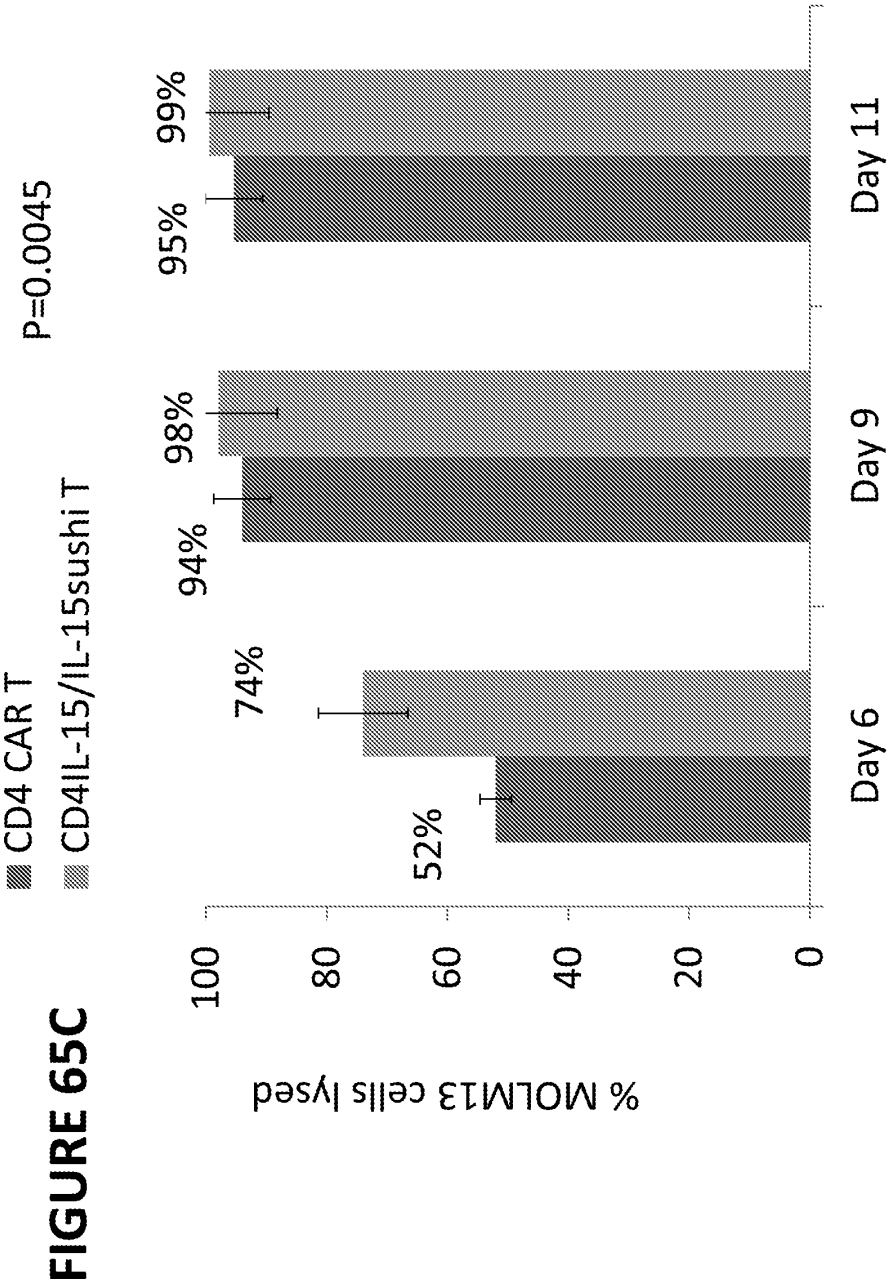
FIGURE 65A



**CD4 expression in AML
(MOLM13) cells**







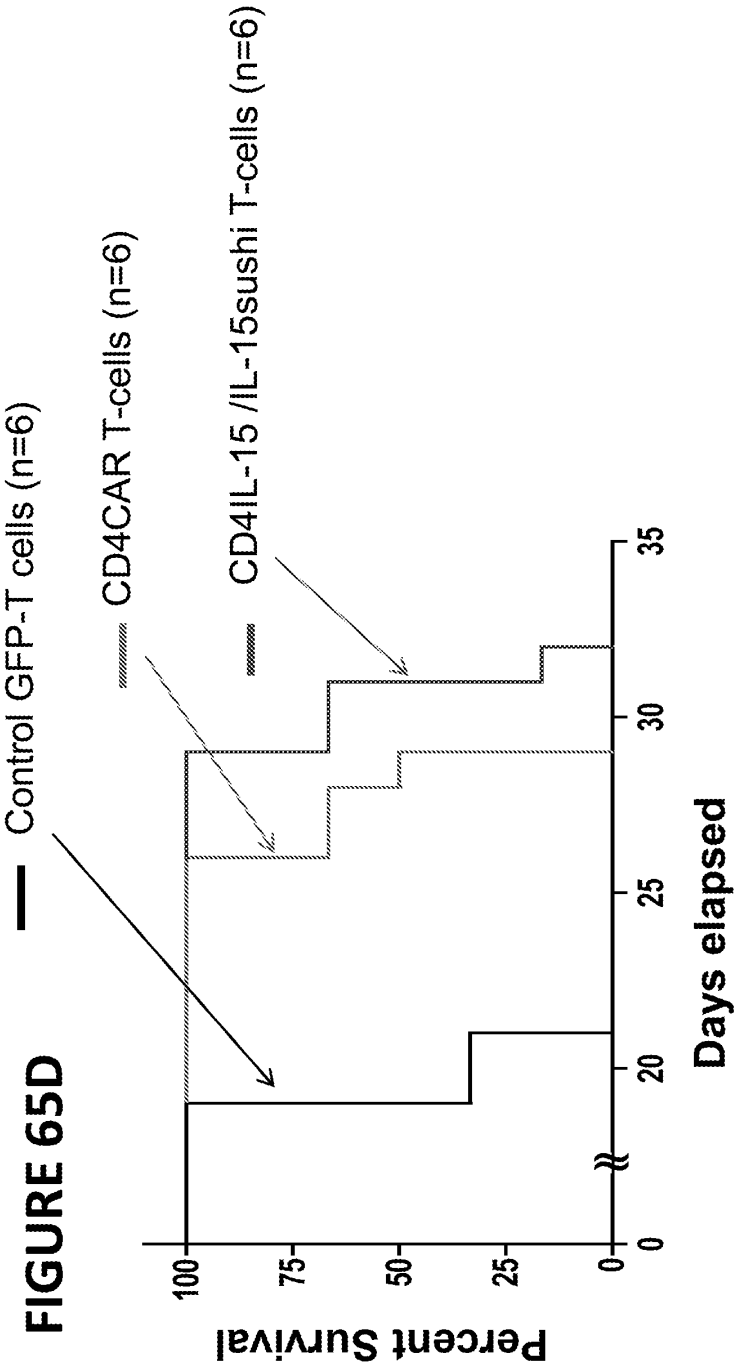
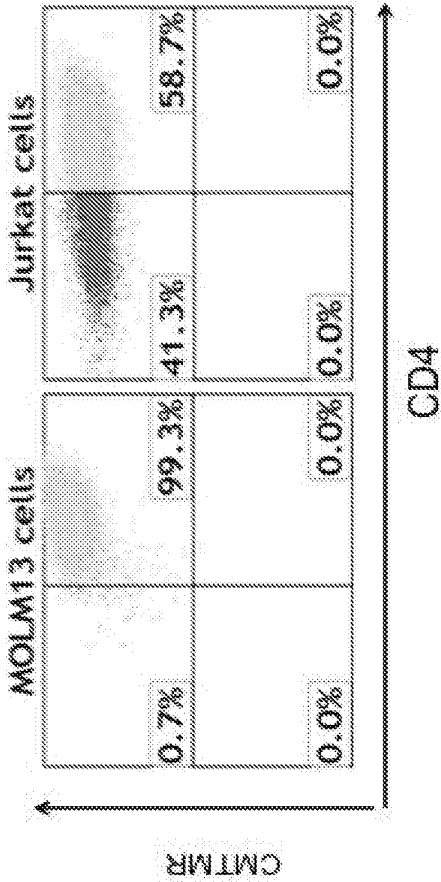
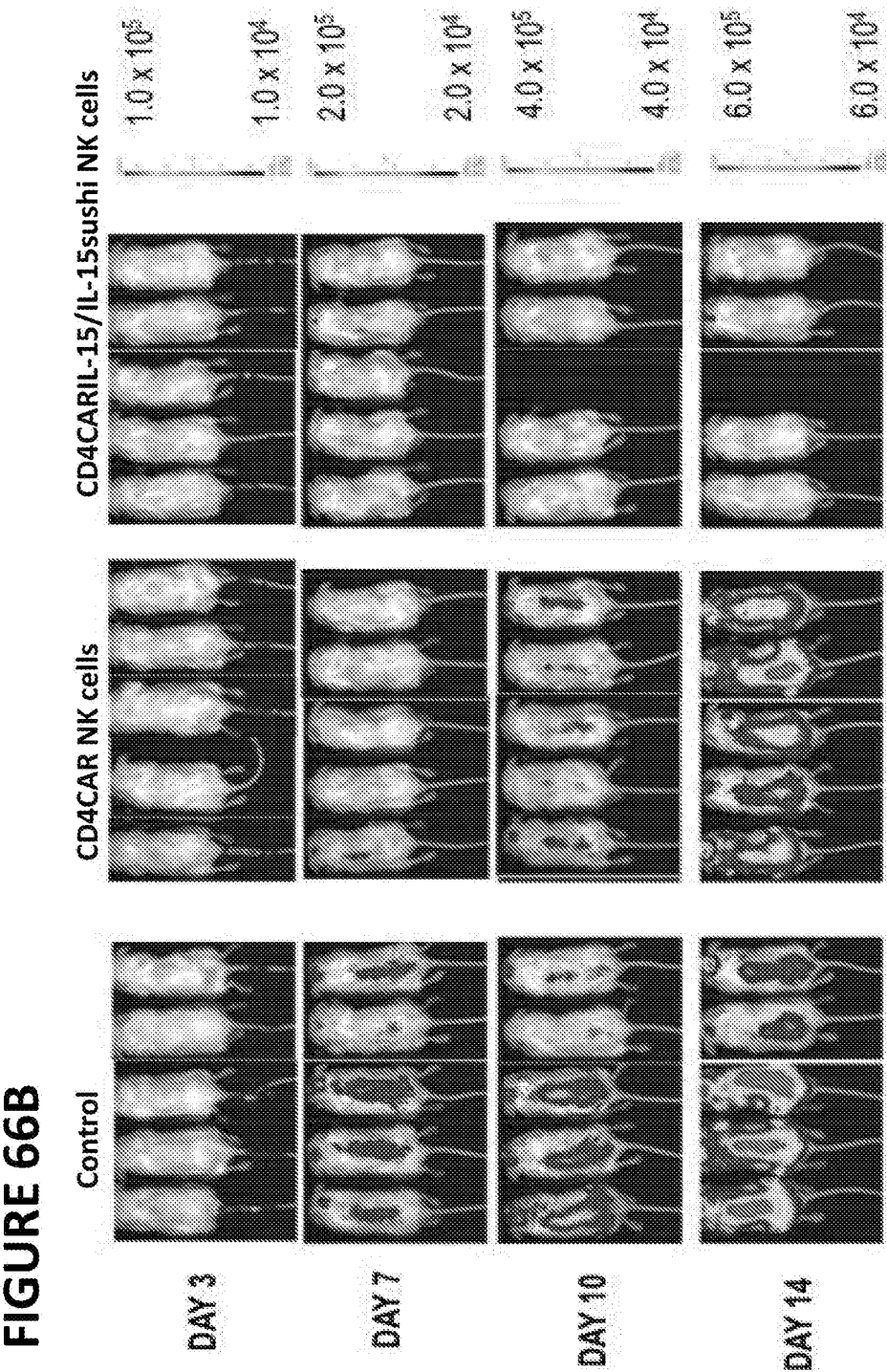


FIGURE 66A



CD4 expression in MOLM13 and Jurkat cell lines





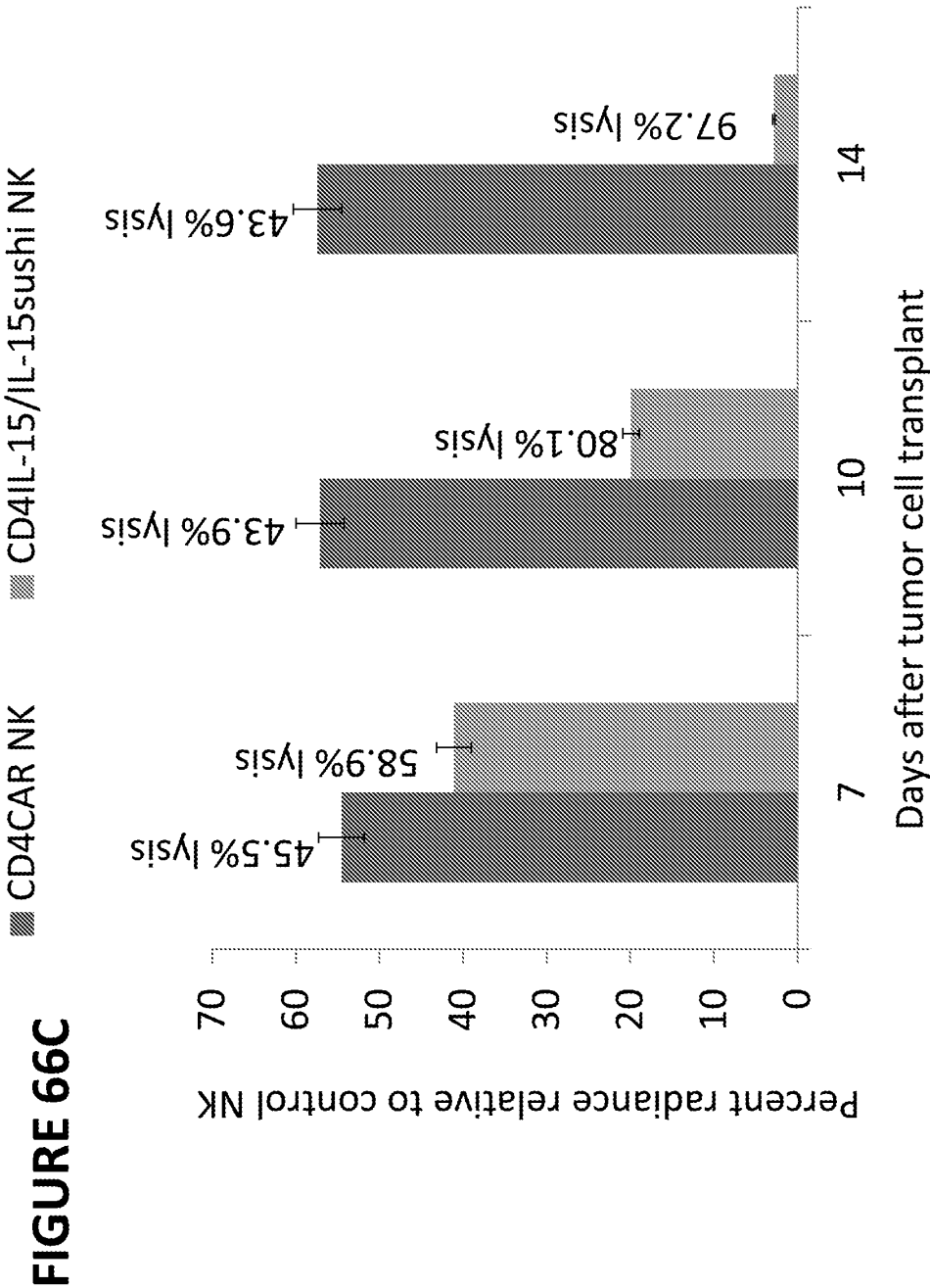
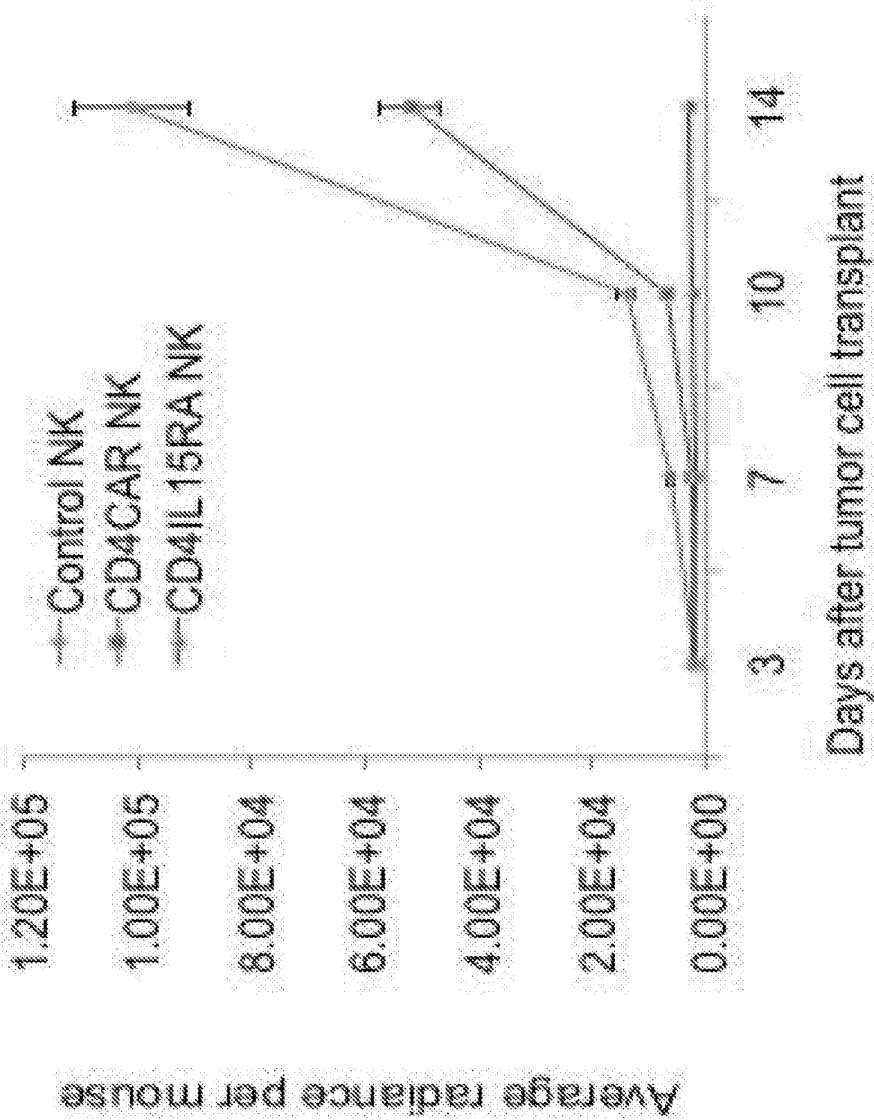
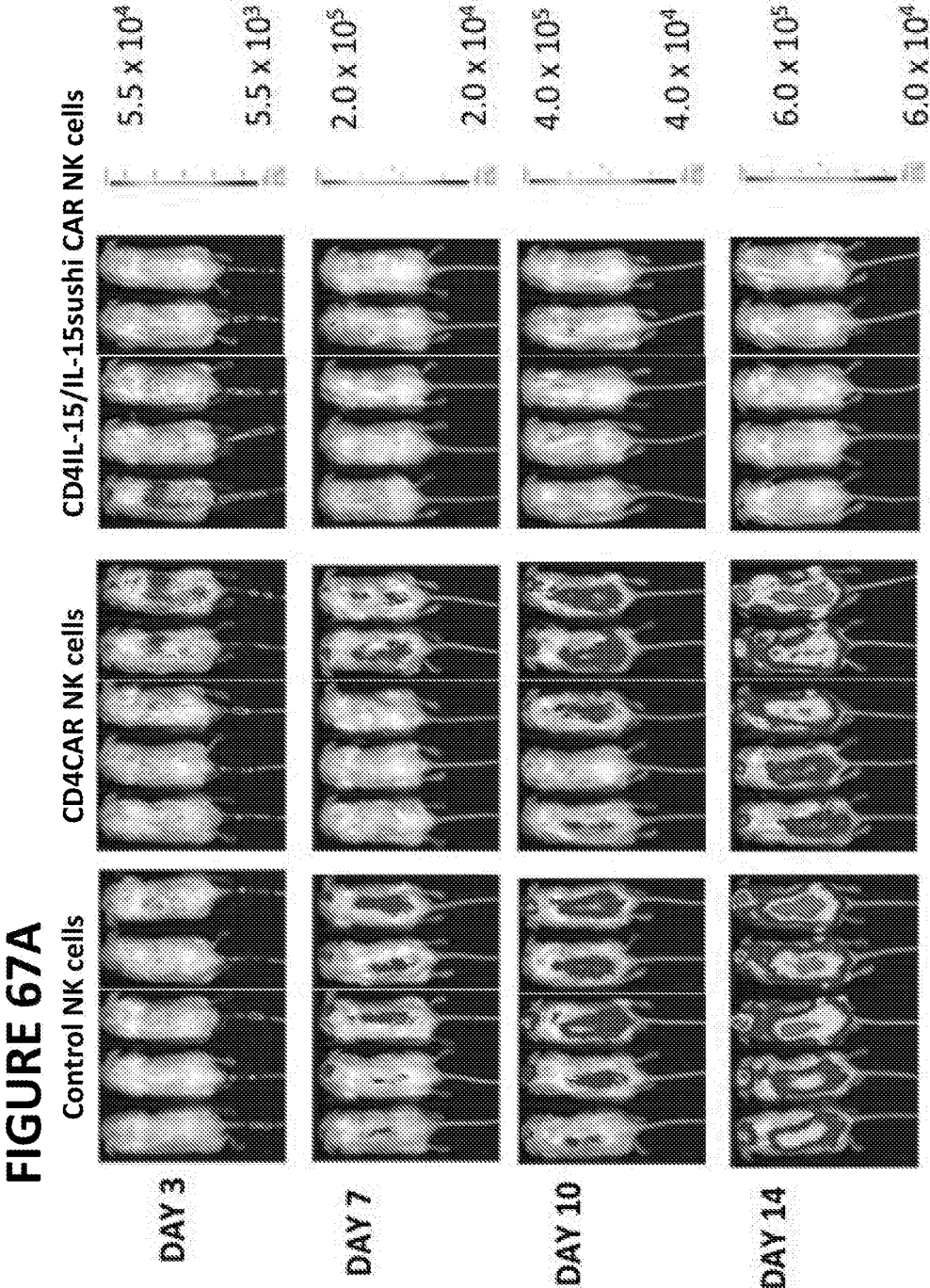
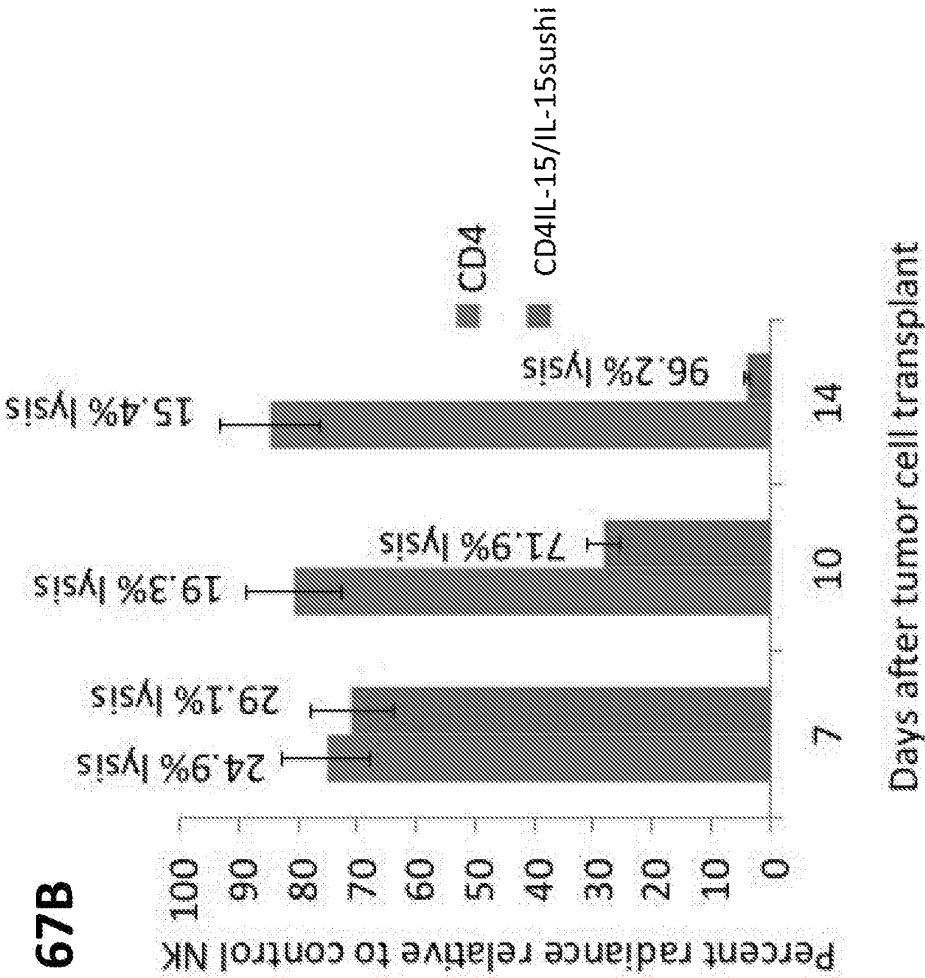


FIGURE 66D







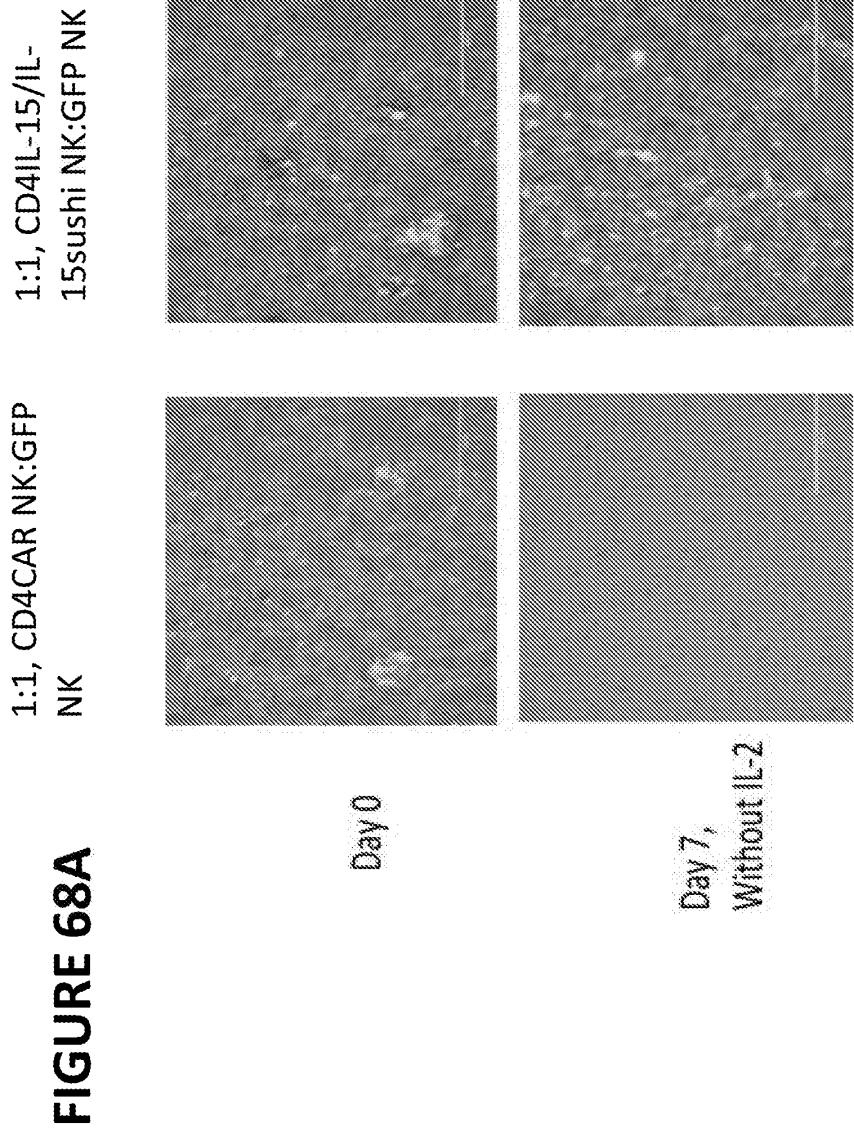
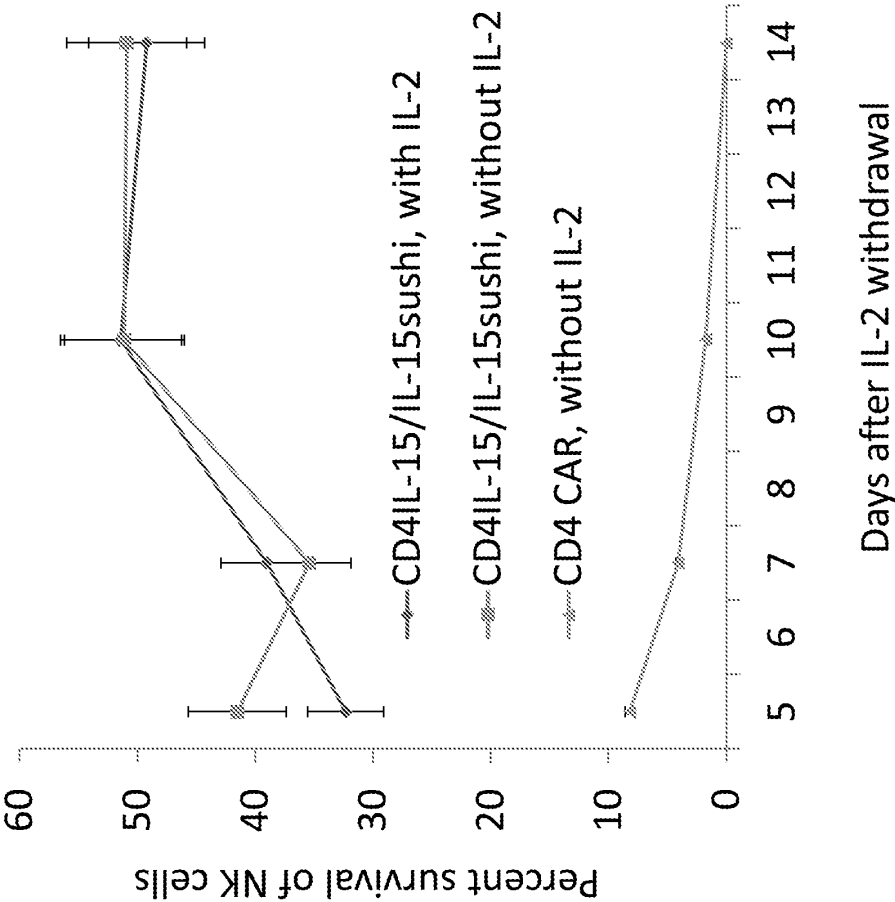


FIGURE 68B



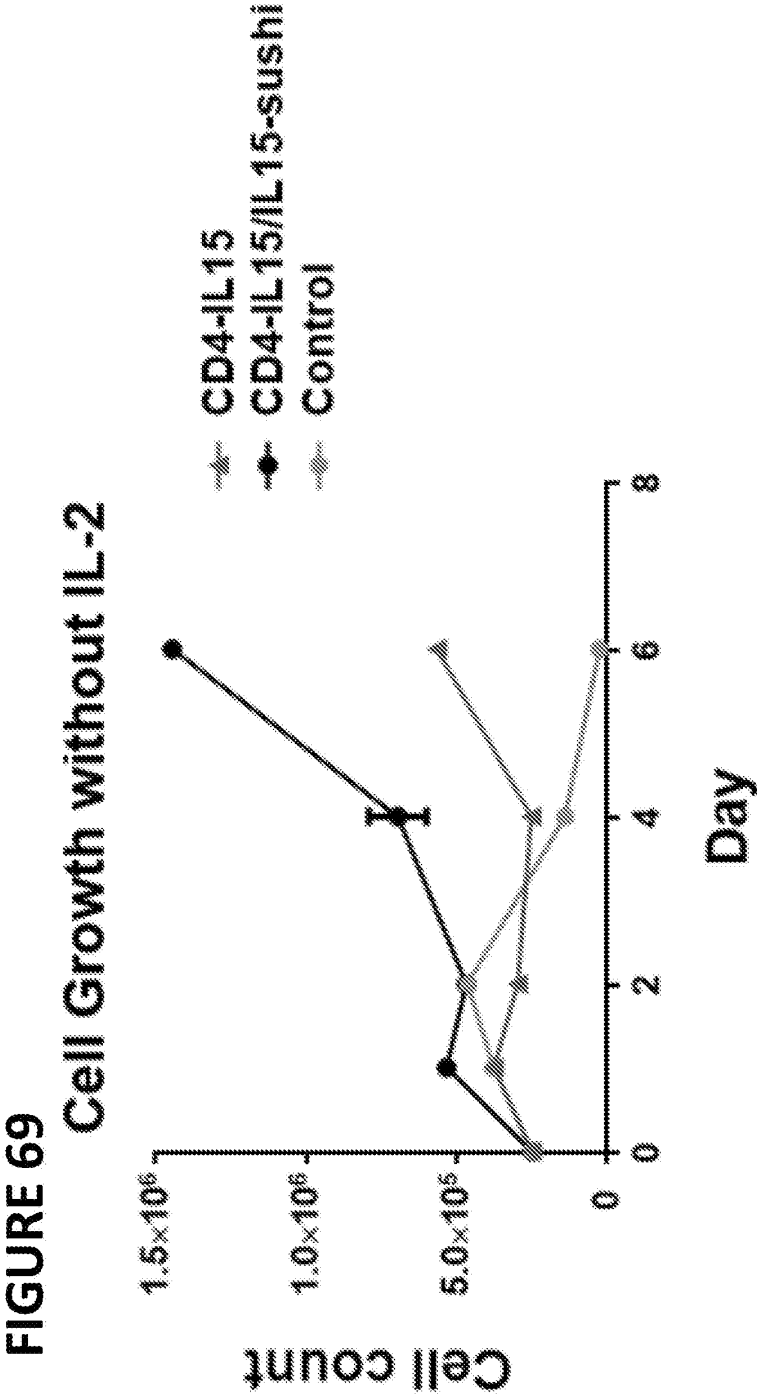


FIGURE 70

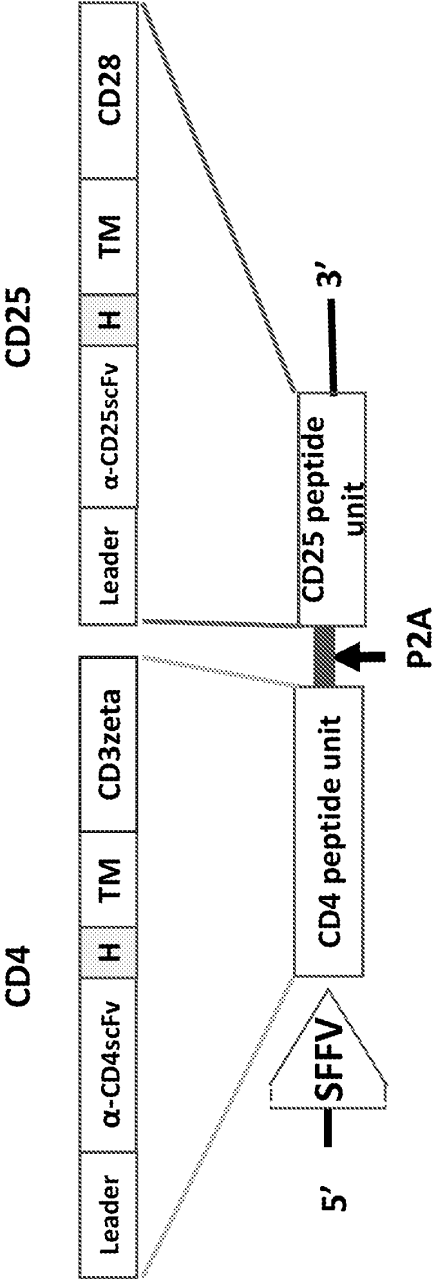


FIGURE 71A

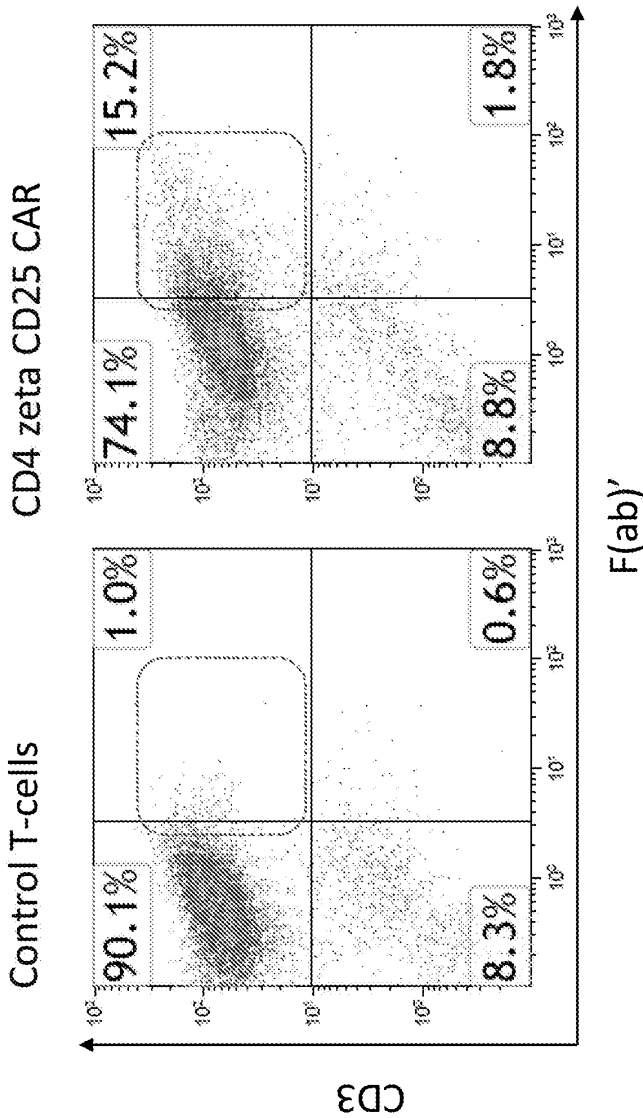
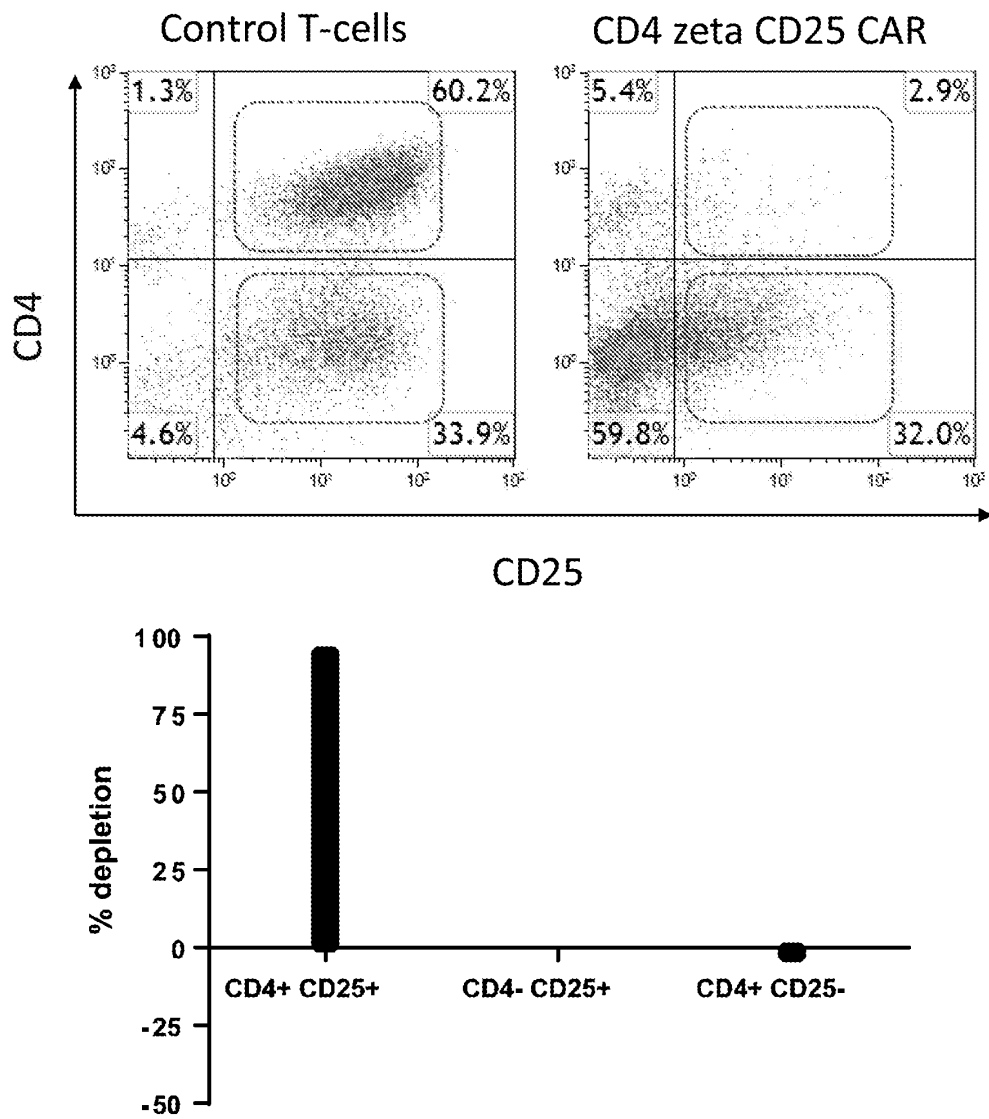


FIGURE 71B



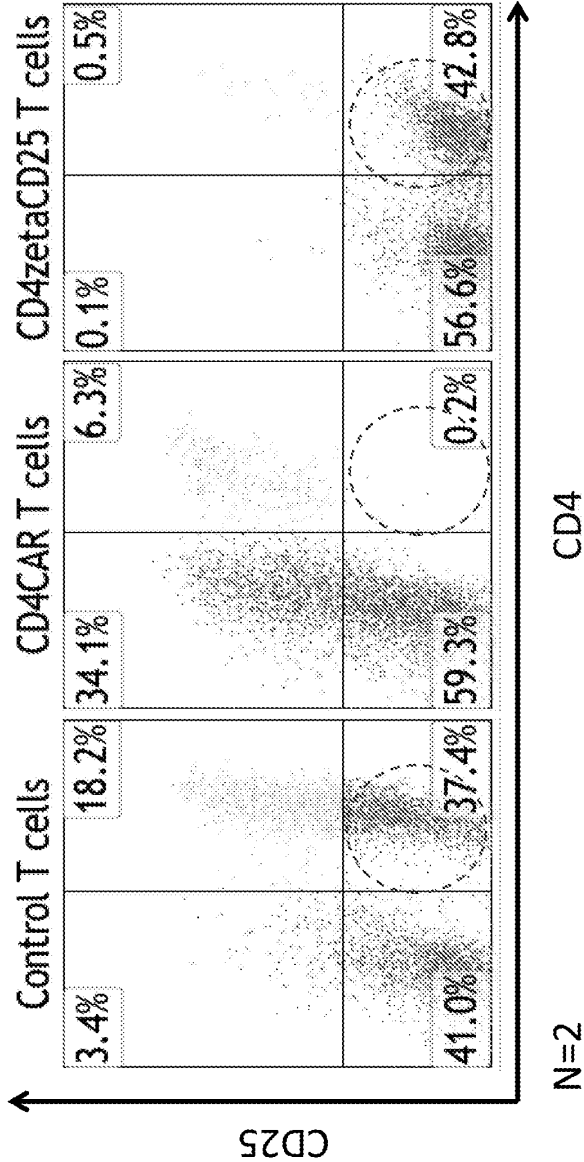
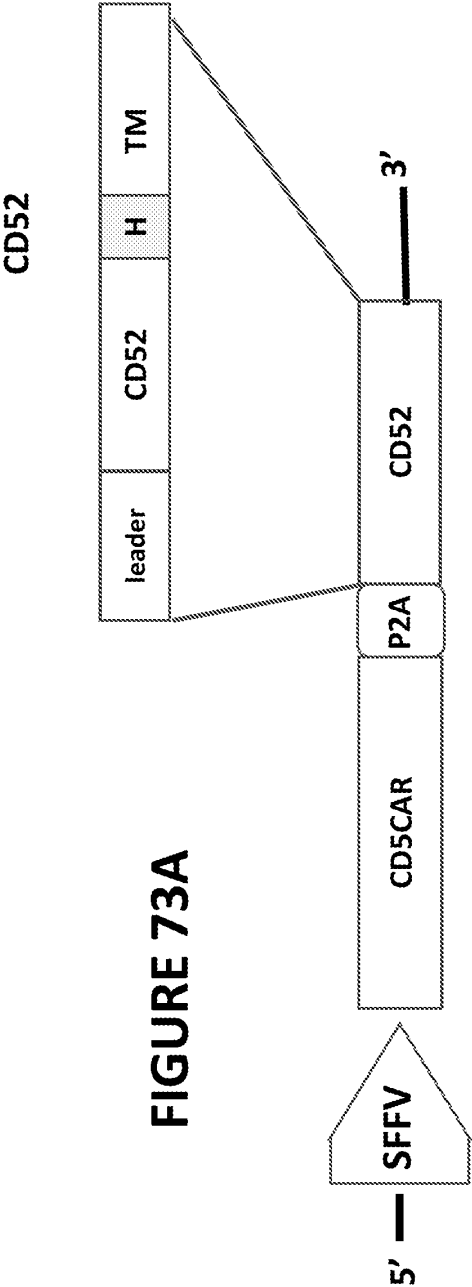


FIGURE 72



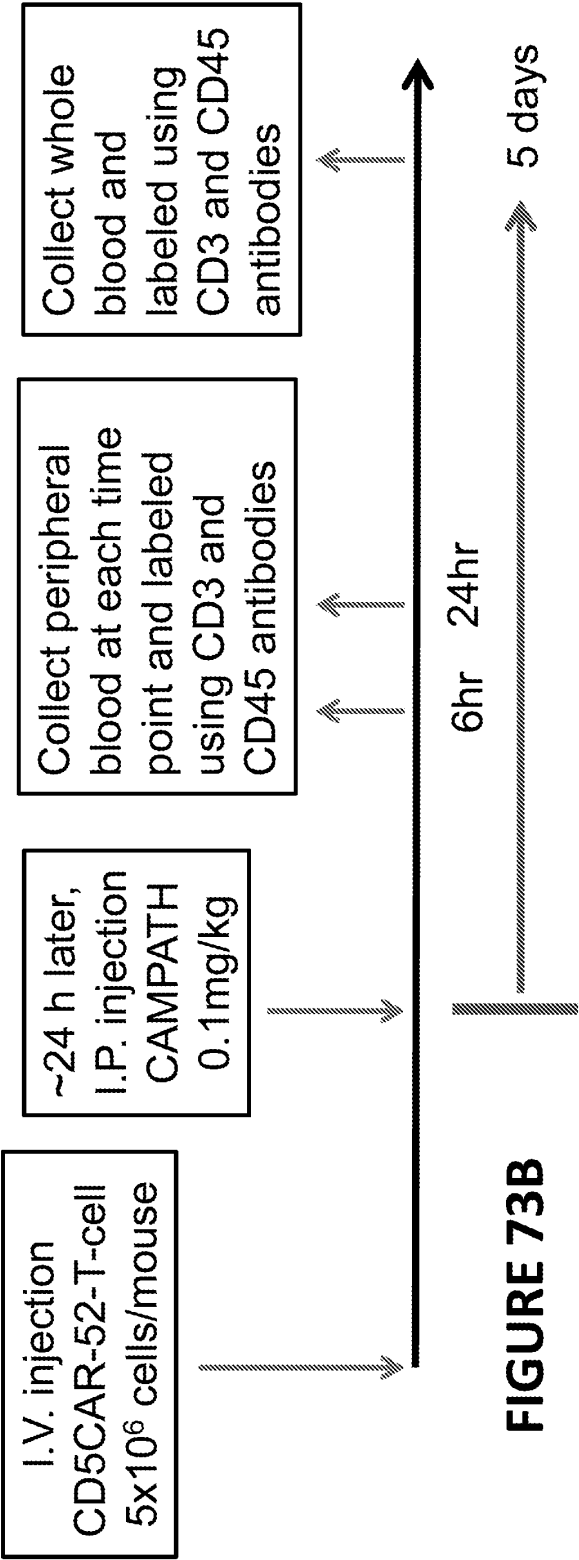


FIGURE 73B

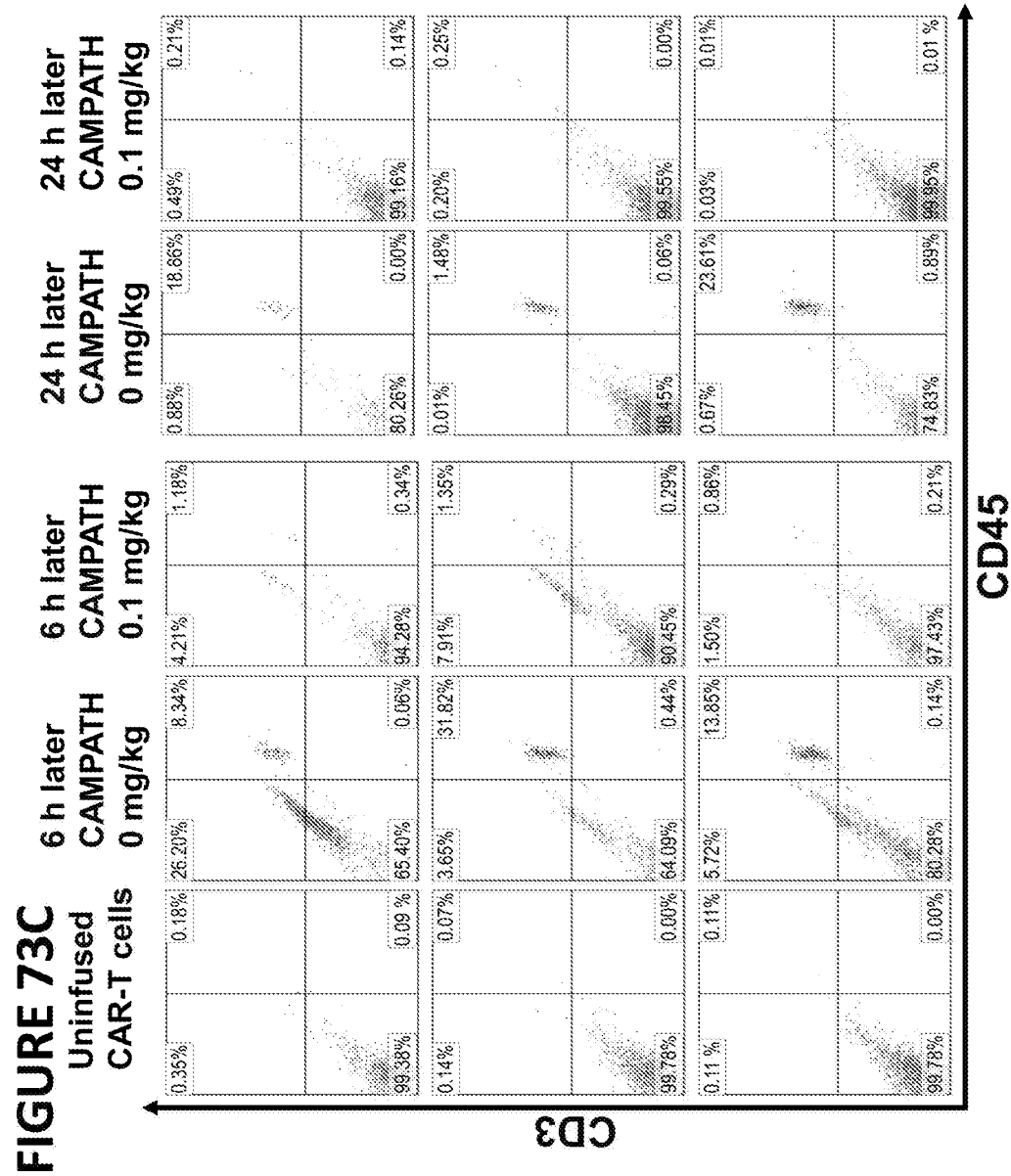


FIGURE 73D

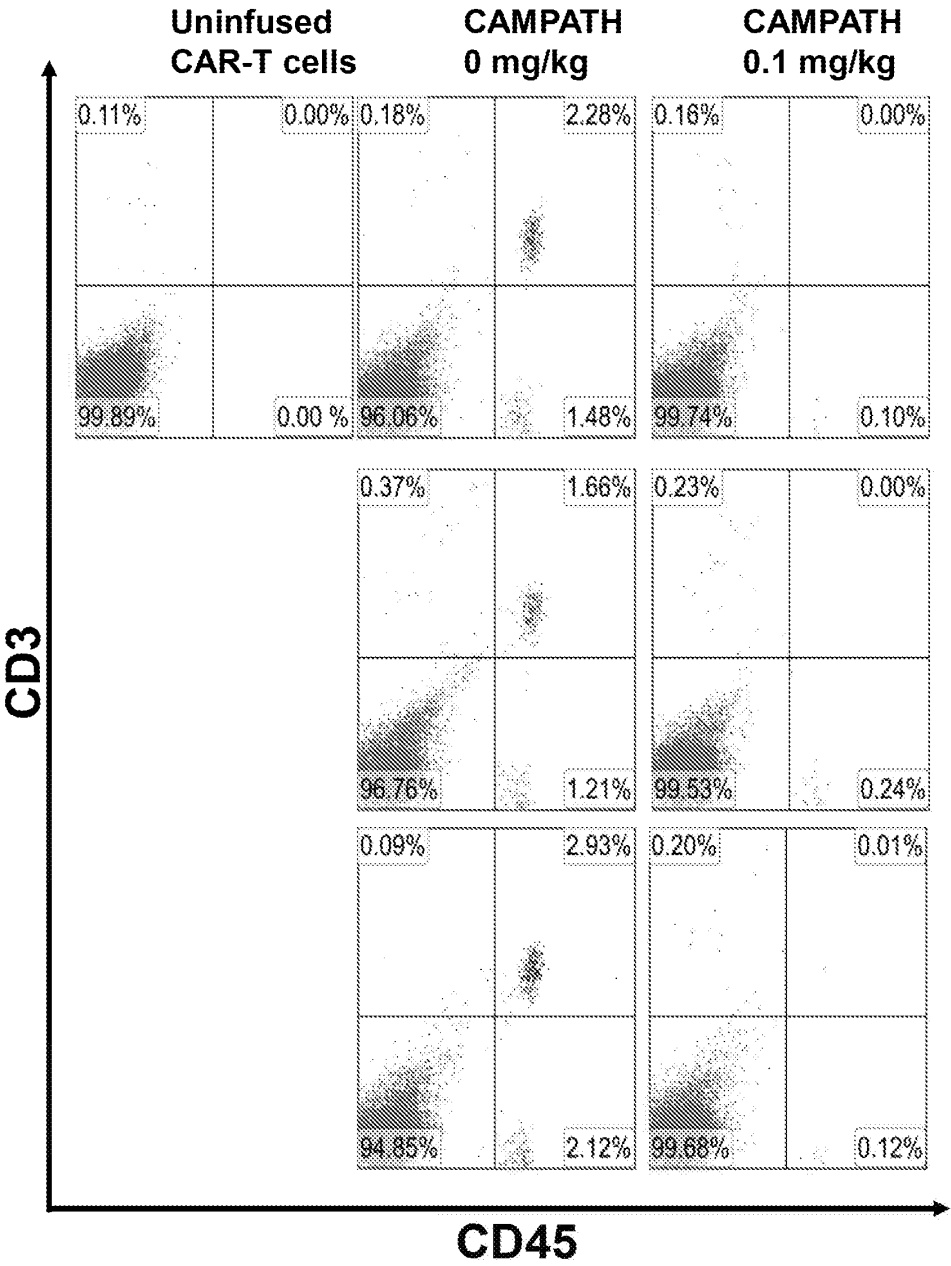
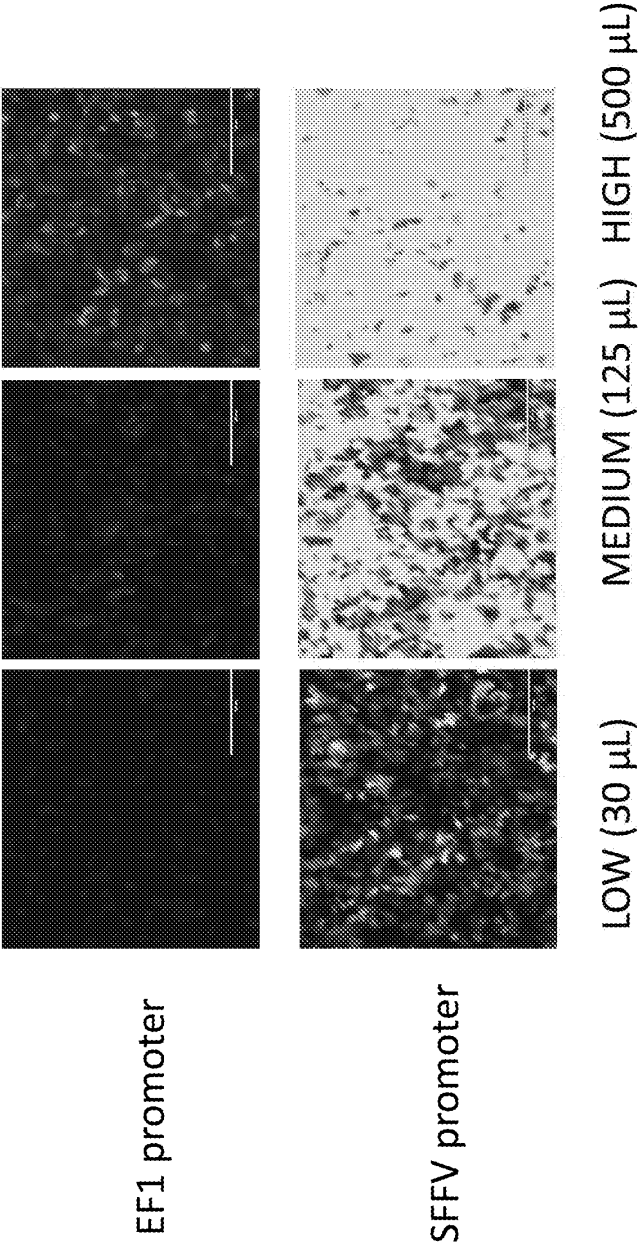


FIGURE 74



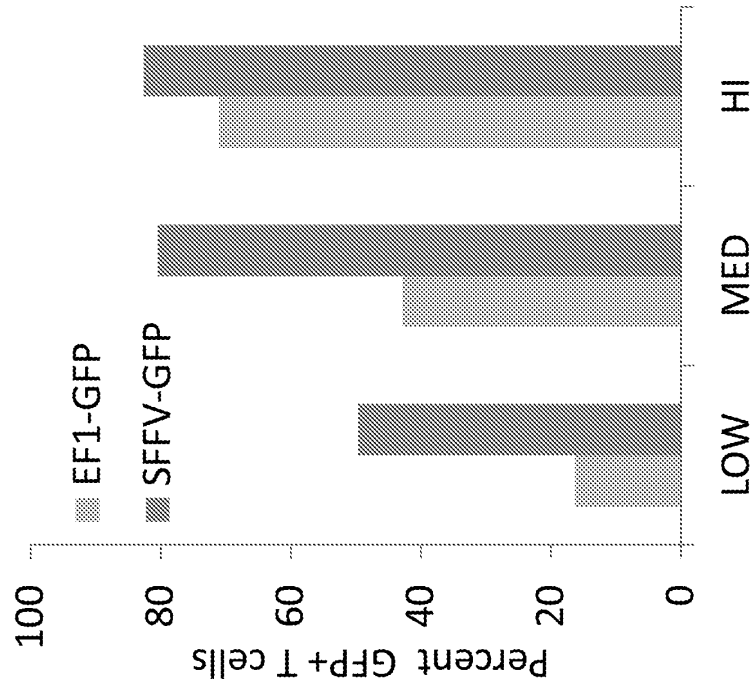


FIGURE 75

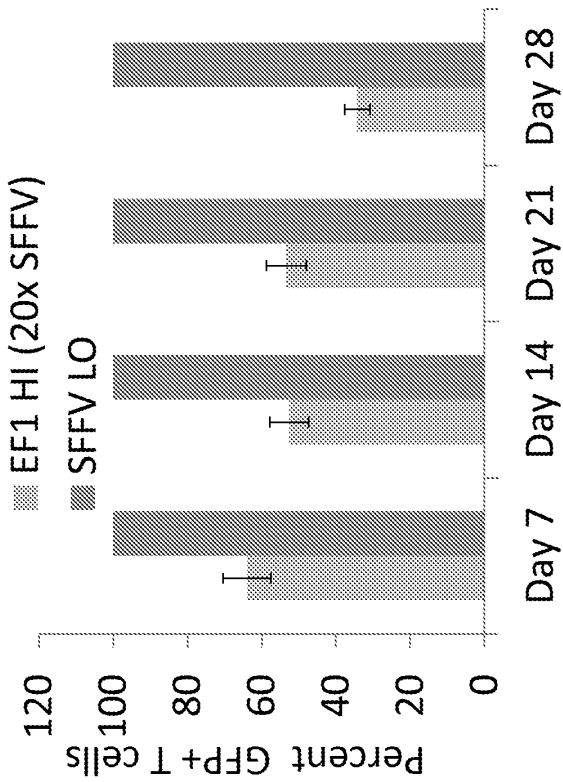


FIGURE 76B

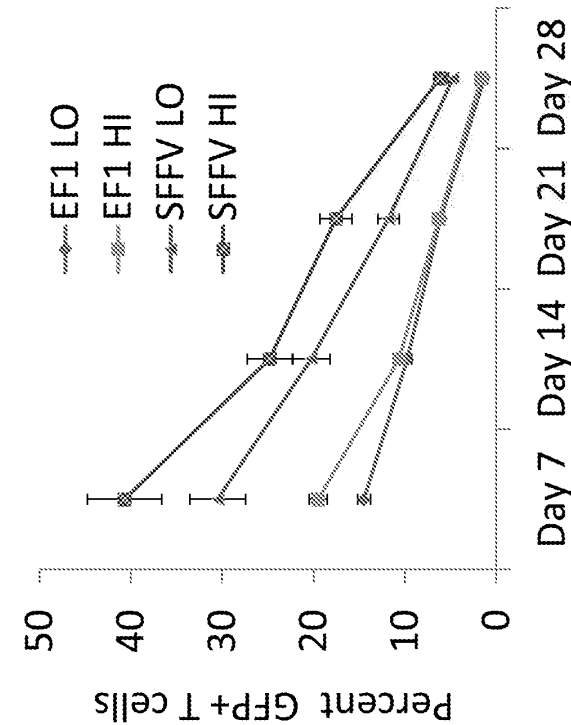


FIGURE 76A

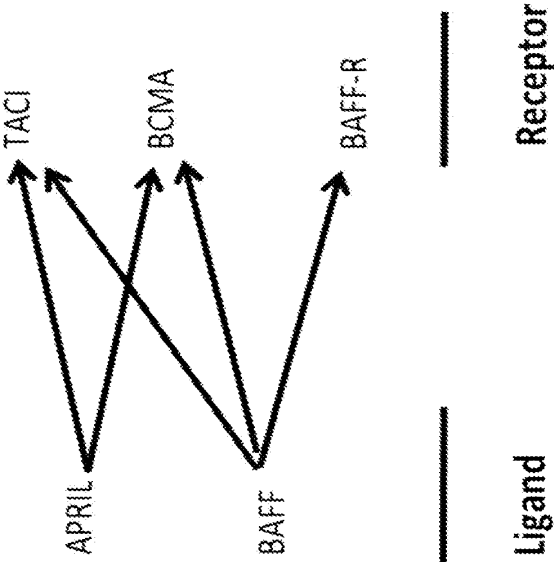
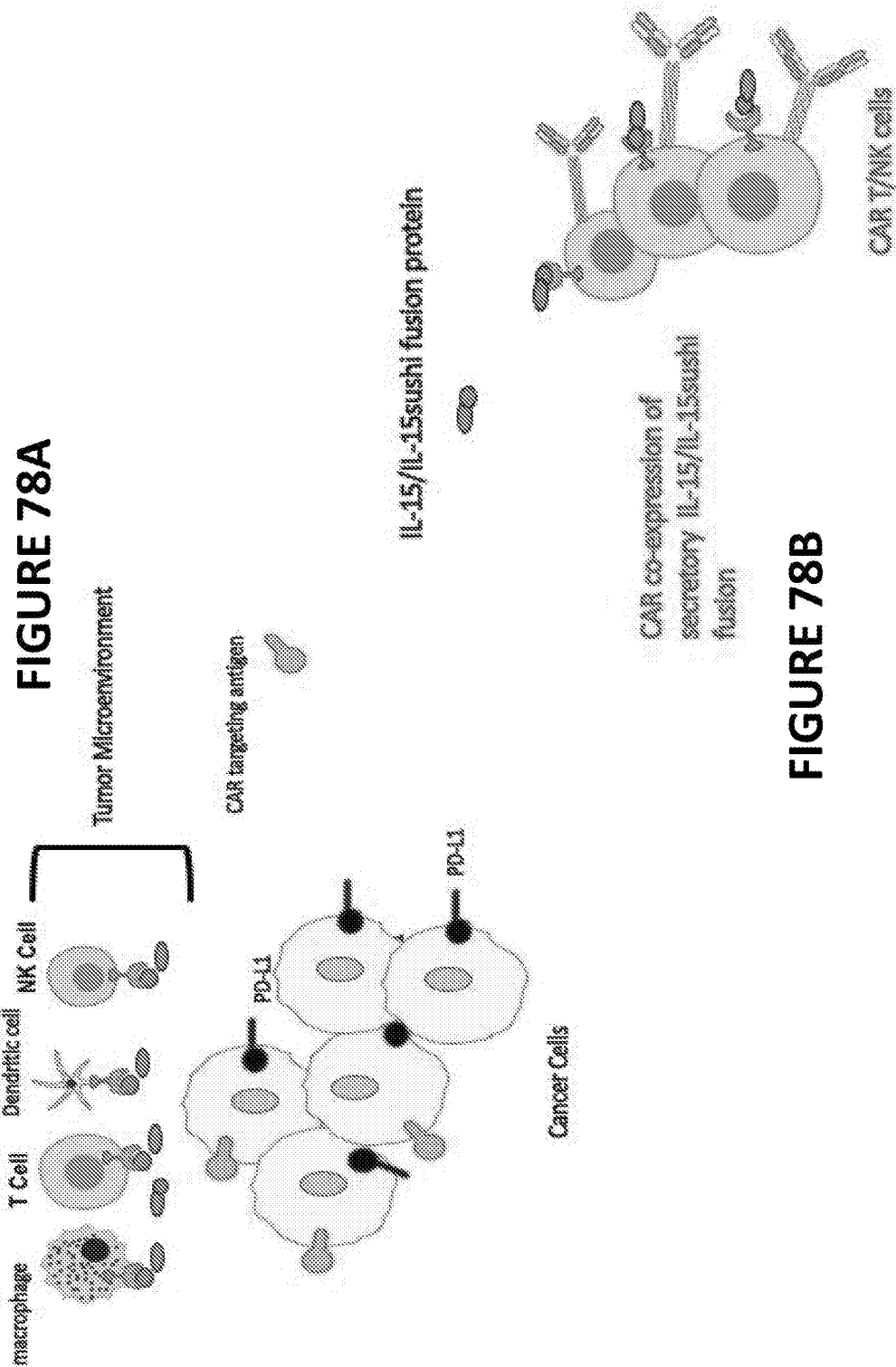
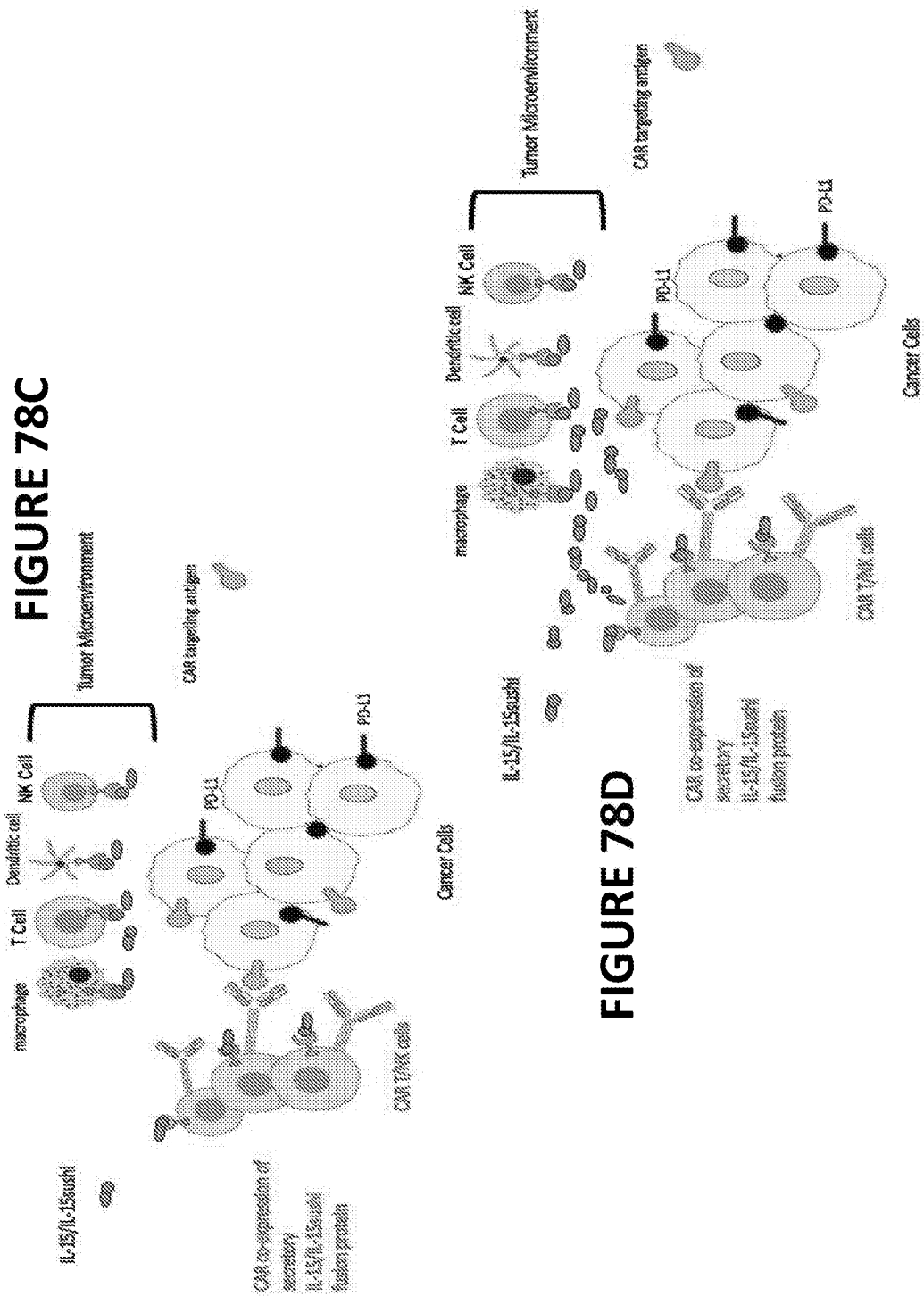


FIGURE 77





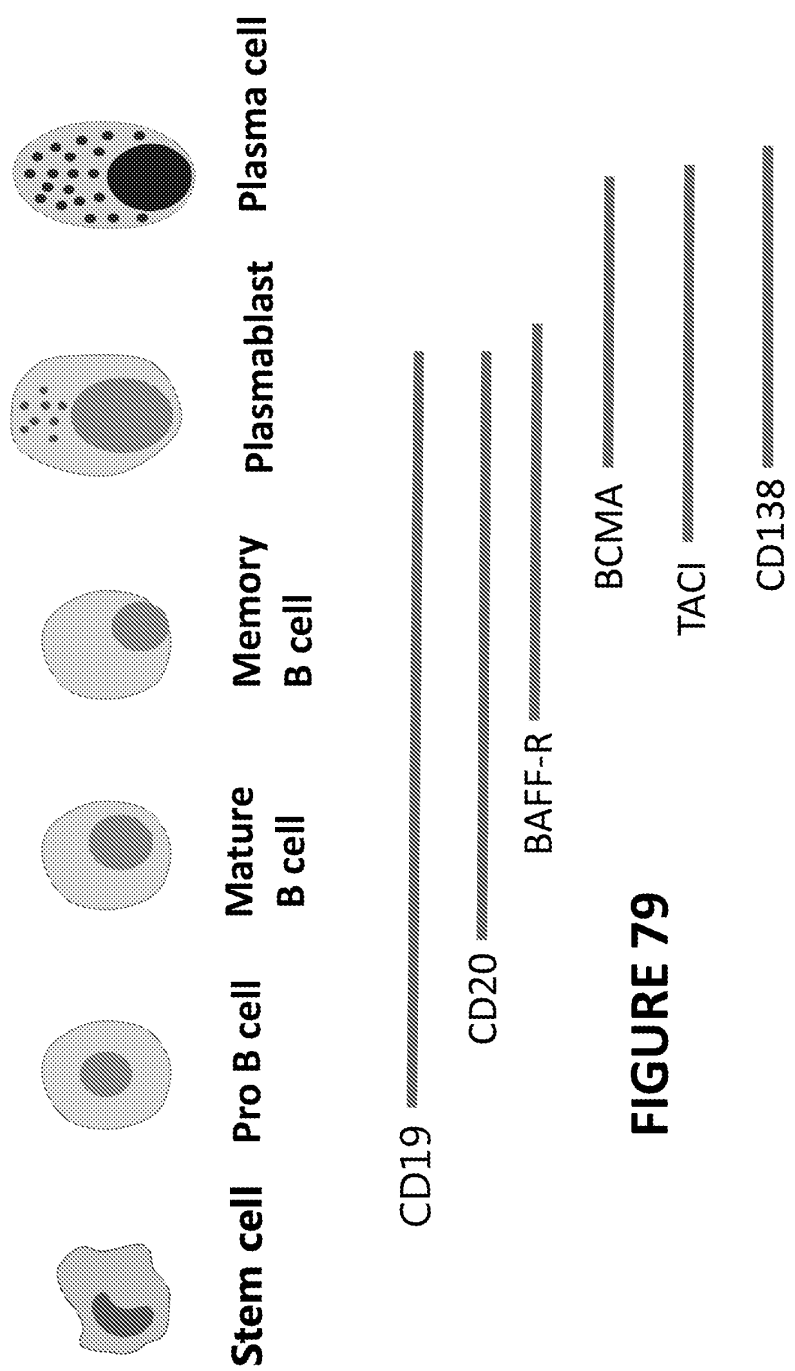


FIGURE 79

H. sapiens (human)	M	Y	R	M	Q	L	S	C	I	A	L	S	L	A	L	V	T	N	S	
M. mulatta (rhesus)	M	Y	R	M	Q	L	S	C	I	A	L	S	L	A	L	V	T	N	S	
B. taurus (bovine)	M	Y	K	I	Q	L	S	C	I	A	L	T	L	A	L	V	A	N	G	
O. cuniculus (rabbit)	M	Y	K	V	Q	L	S	C	I	A	L	T	L	A	L	L	T	S	S	
M. musculus (mouse)	M	Y	S	M	Q	L	A	S	C	V	T	L	T	L	V	L	L	V	N	S

FIGURE 80

H. sapiens (human)	1	QVAALQSGDLASLRAELQGHAEKLEP	---	AGAGAPKAGLEEEAPAVTACGR	---	LEPPAFPG	54
M. mulatta (rhesus)	1	QVAALQSGDLASLRAELQSHAEKLEP	---	ARARAPKAGLEEEAPAVTACGR	---	LEPPAFPG	54
B. taurus (bovine)	1	-VAELQAEFGSLRAELQSRPG	---	APQAGAAAPRE	---	APPVTPALKQRIETAPAFPG	50
O. cuniculus (rabbit)	1	RVAALQADLLSLRAAVQGHQAEQLEP	---	FELPGSSGAAPKATLEGEAPAVTAGIRG	---	LEPPAFPG	59
M. musculus (mouse)	1	QVAALQADLMNLRNELQSYRGSAEP	---	ARAG	---	APEDTAGVR	46
H. sapiens (human)	55	EGNSSQNSENKRAMQGP	EEETV	IQDCLQLIADS	EEETI	QKGSYTFVFWLLSEKRGSALEEK	114
M. mulatta (rhesus)	55	EGNSSQSSSENKRAMQGA	EEETV	IQDCLQLIADS	EEETI	QKGSYTFVFWLLSEKRGSALEEK	114
B. taurus (bovine)	51	EGNSSQSSSENKRAMQGA	EEETV	IQDCLQLIADS	EEETI	QKGSYTFVFWLLSEKRGSALEEK	110
O. cuniculus (rabbit)	60	EGNSSQSSSENKRAMQGA	EEETV	IQDCLQLIADS	EEETI	QKGSYTFVFWLLSEKRGSALEEK	119
M. musculus (mouse)	47	FENSSRGHENRRAMQGP	EEETV	IQDCLQLIADS	EEETI	QKGSYTFVFWLLSEKRGSALEEK	106
H. sapiens (human)	115	ENKILVVKETGYFFFIYQGVLYTDKTY	AMGHLLIQRKKAHVHVG	DELSLV	TFEFCIQNNPETLP		174
M. mulatta (rhesus)	115	ENKILVVKETGYFFFIYQGVLYTDKTY	AMGHLLIQRKKAHVHVG	DELSLV	TFEFCIQNNPETLP		174
B. taurus (bovine)	111	ENKILVVKETGYFFFIYQGVLYTDNFT	FAMGHLLIQRKKAHVHVG	DELSLV	TFEFCIQNNPETLP		170
O. cuniculus (rabbit)	120	ENKILVVKETGYFFFIYQGVLYTDST	FAMGHLLIQRKKAHVHVG	DELSLV	TFEFCIQNNPETLP		179
M. musculus (mouse)	107	ENKILVVRQVGYFFFIYQGVLYTDF	FAMGHVLIQRKKAHVHVG	DELSLV	TFEFCIQNNPKTLP		166
H. sapiens (human)	175	NNSCYSAGIAKLEEGDELCQAIFRENAQI	ISLDGCDV	TFEFCALKLL			218
M. mulatta (rhesus)	175	NNSCYSAGIAKLEEGDELCQAIFRENAQI	ISLDGCDV	TFEFCALKLL			218
B. taurus (bovine)	171	NNSCYSAGIAKLEEGDELCQAIFRENAQI	ISRDGCDGCTFEFCALKLL				214
O. cuniculus (rabbit)	180	NNSCYSAGIAKLEEGDELCQAIFRENAQI	ISRDGCDGCTFEFCALKLL				223
M. musculus (mouse)	167	NNSCYSAGIAKLEEGDELCQAIFRENAQI	ISRDGCDGCTFEFCALKLL				210

FIGURE 81

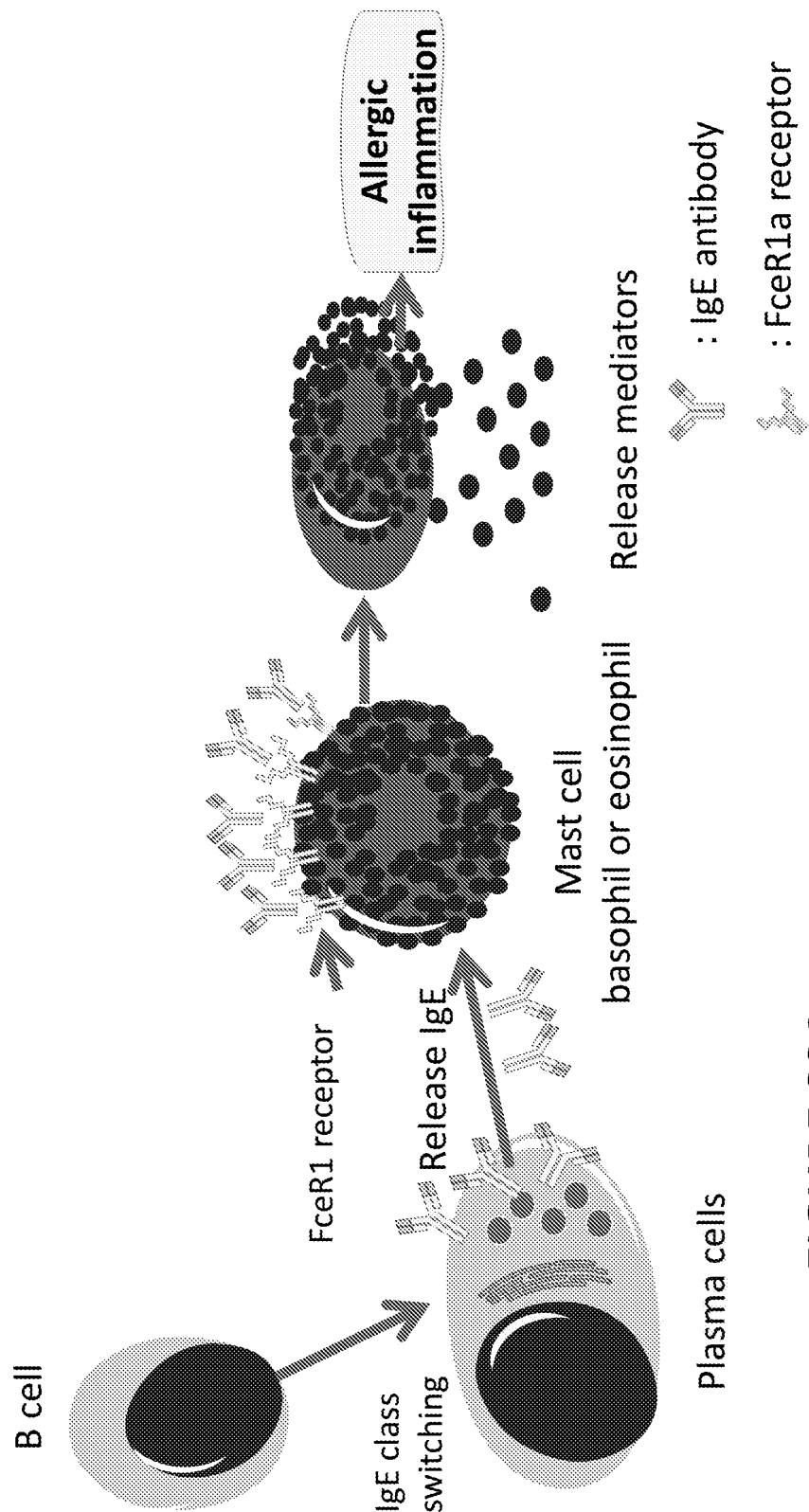


FIGURE 82A

FcεR1a CAR targeting Ig secreted plasma cells
FcεR1 scFv CAR targeting mast cells, basophil

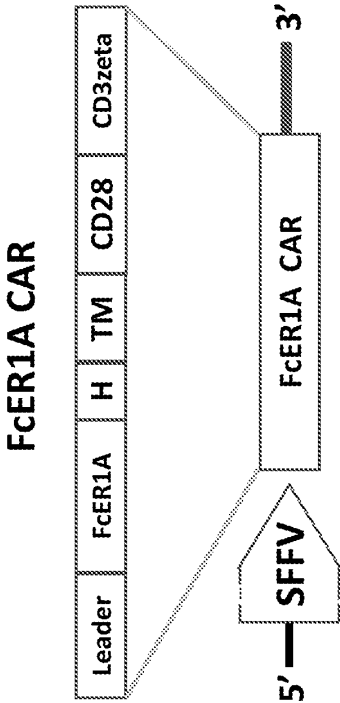


FIGURE 82B

H. sapiens (human)	1	FEQK	PPFSLNFPWNRIFAGE	MPFLTCGNNK	GVST	SE	ENFGKSL	SEETN	SE	ENLVNAK	59																						
M. mulatta (rhesus)	1	VPQ	RPFSUNPQNRIRKXG	MTTUNG	CF	EVSN	KW	ENGLSE	VANS	CL	SVNAD	59																					
B. taurus (bovine)	1	--	K	SLNFPWNR	IFAGDA	YFLTC	STN	SS	EDQS	-D	ENGTST	TNN	SVN	56																			
O. cuniculus (rabbit)	1	MAK	SPSL	PPWNRIRAGE	MTTUNG	DKSL	DONS	I	K	TRD	SL	AL	ET	SE	EN	59																	
M. musculus (mouse)	1	--	EKS	ATL	Q	EW	IR	YK	ET	SC	FG	NN	LQ	NN	ST	EN	58																
H. sapiens (human)	60	EDSG	ET	CO	Q	YNE	SE	RV	IE	VSS	DK	LL	Q	AS	AE	V	NE	Q	EL	FL	RC	HP	EN	VD	V	K	V	I	119				
M. mulatta (rhesus)	60	EDSG	ET	CO	Q	YNE	SE	RV	IE	VSS	DK	LL	Q	AS	AE	V	NE	Q	EL	FL	RC	HP	EN	VD	V	K	V	I	119				
B. taurus (bovine)	57	EDSG	ET	CO	Q	YNE	SE	RV	IE	VSS	DK	LL	Q	AS	AE	V	NE	Q	EL	FL	RC	HP	EN	VD	V	K	V	I	116				
O. cuniculus (rabbit)	60	EDSG	ET	CO	Q	YNE	SE	RV	IE	VSS	DK	LL	Q	AS	AE	V	NE	Q	EL	FL	RC	HP	EN	VD	V	K	V	I	119				
M. musculus (mouse)	59	EDSG	ET	CO	Q	YNE	SE	RV	IE	VSS	DK	LL	Q	AS	AE	V	NE	Q	EL	FL	RC	HP	EN	VD	V	K	V	I	118				
H. sapiens (human)	120	YKDG	EP	EL	XX	WY	EN	HN	IS	IT	NA	T	ED	SG	TY	Y	CH	CA	W	Q	ED	SE	PL	NI	TV	IX	A	-	PRE	K	I	-	177
M. mulatta (rhesus)	120	YKDG	EP	EL	XX	WY	EN	HN	IS	IT	NA	T	ED	SG	TY	Y	CH	CA	W	Q	ED	SE	PL	NI	TV	IX	A	-	PRE	K	I	-	177
B. taurus (bovine)	117	YKDG	EP	EL	XX	WY	EN	HN	IS	IT	NA	T	ED	SG	TY	Y	CH	CA	W	Q	ED	SE	PL	NI	TV	IX	A	-	PRE	K	I	-	176
O. cuniculus (rabbit)	120	YKDG	EP	EL	XX	WY	EN	HN	IS	IT	NA	T	ED	SG	TY	Y	CH	CA	W	Q	ED	SE	PL	NI	TV	IX	A	-	PRE	K	I	-	177
M. musculus (mouse)	119	YKDG	EP	EL	XX	WY	EN	HN	IS	IT	NA	T	ED	SG	TY	Y	CH	CA	W	Q	ED	SE	PL	NI	TV	IX	A	-	PRE	K	I	-	176
H. sapiens (human)	178	W	L	Q																												180	
M. mulatta (rhesus)	178	W	L	Q																												180	
B. taurus (bovine)	177	W	L	Q																												179	
O. cuniculus (rabbit)	178	W	L	-																												179	
M. musculus (mouse)	177	W	L	Q																												179	

FIGURE 82C

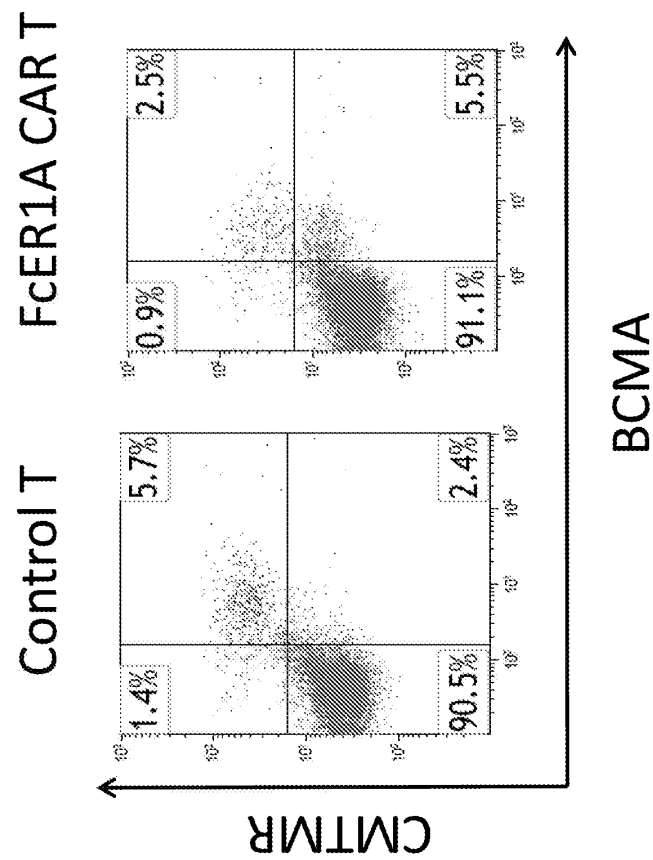


FIGURE 82D

Anti-FcER1 CAR

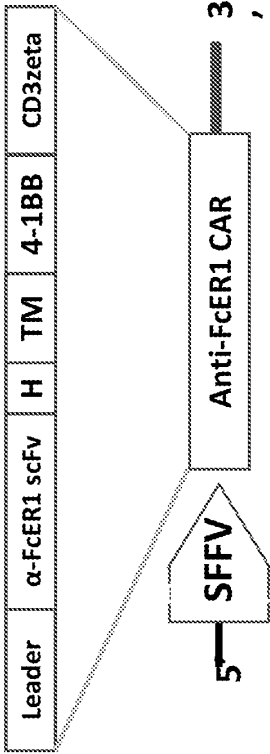


FIGURE 82E

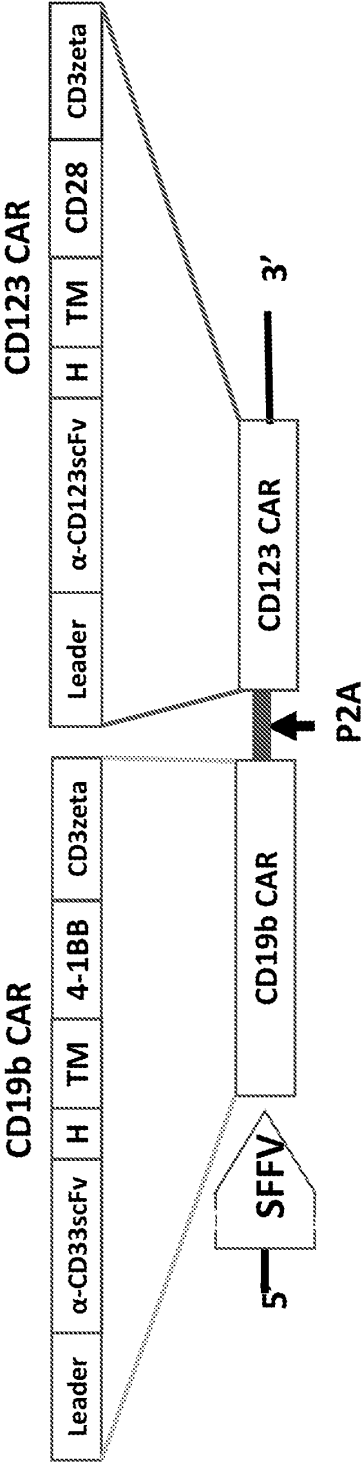
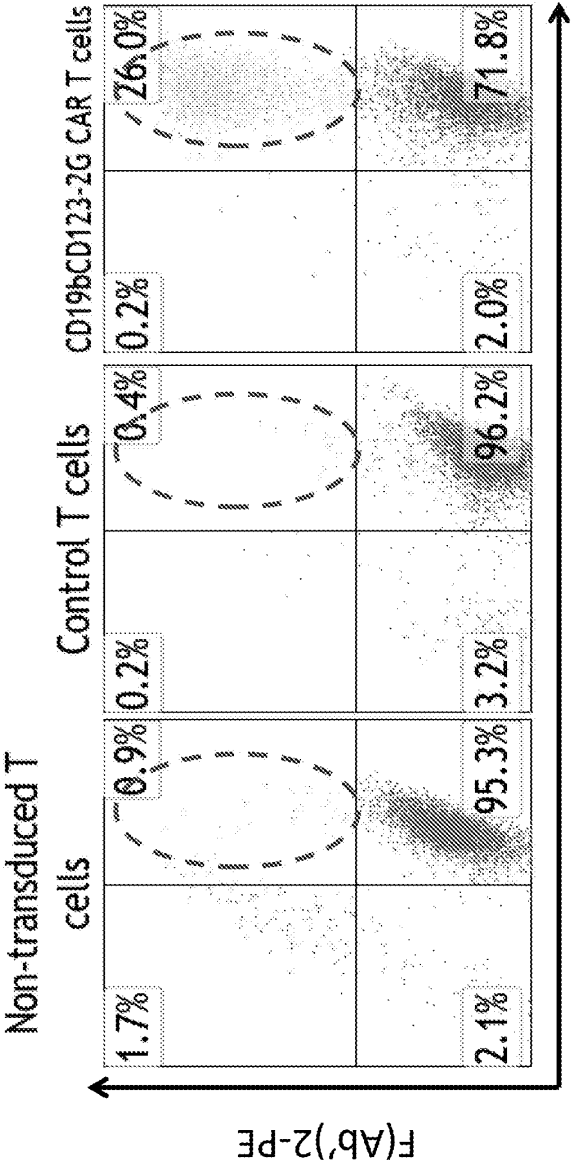


FIGURE 83A



CD3

FIGURE 83B

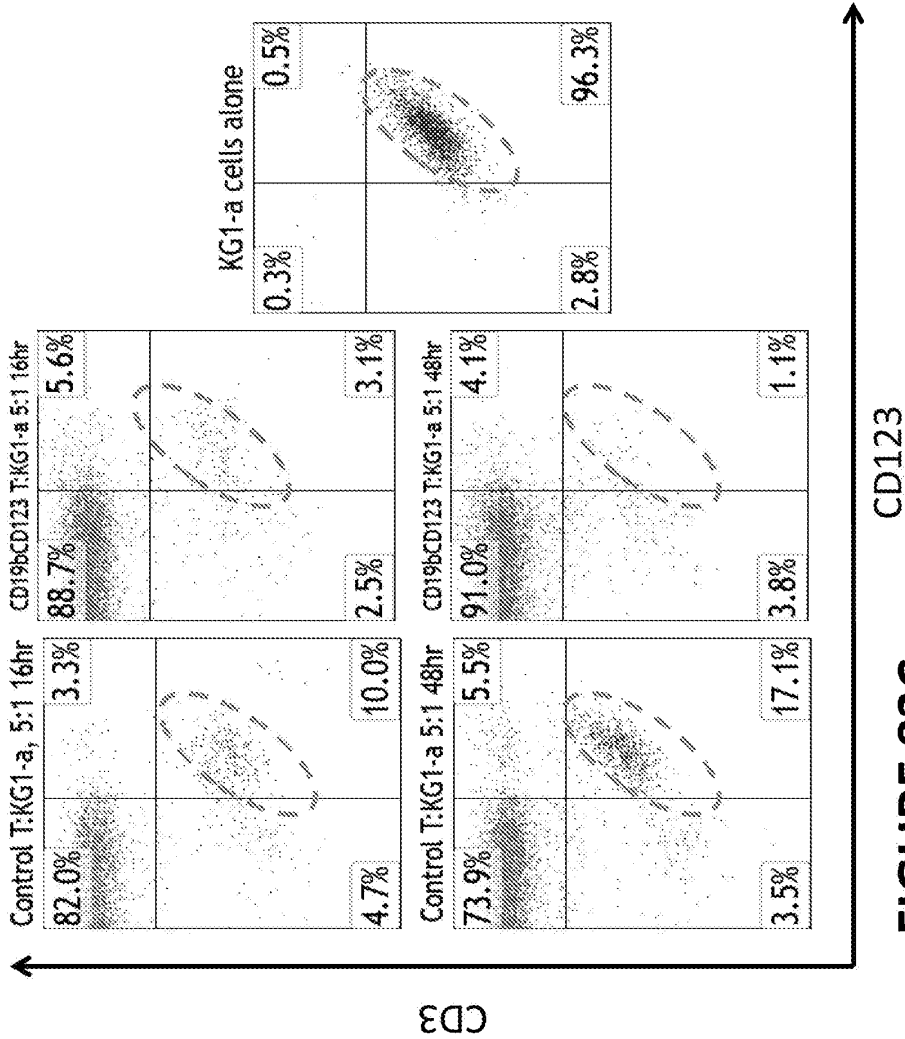


FIGURE 83C

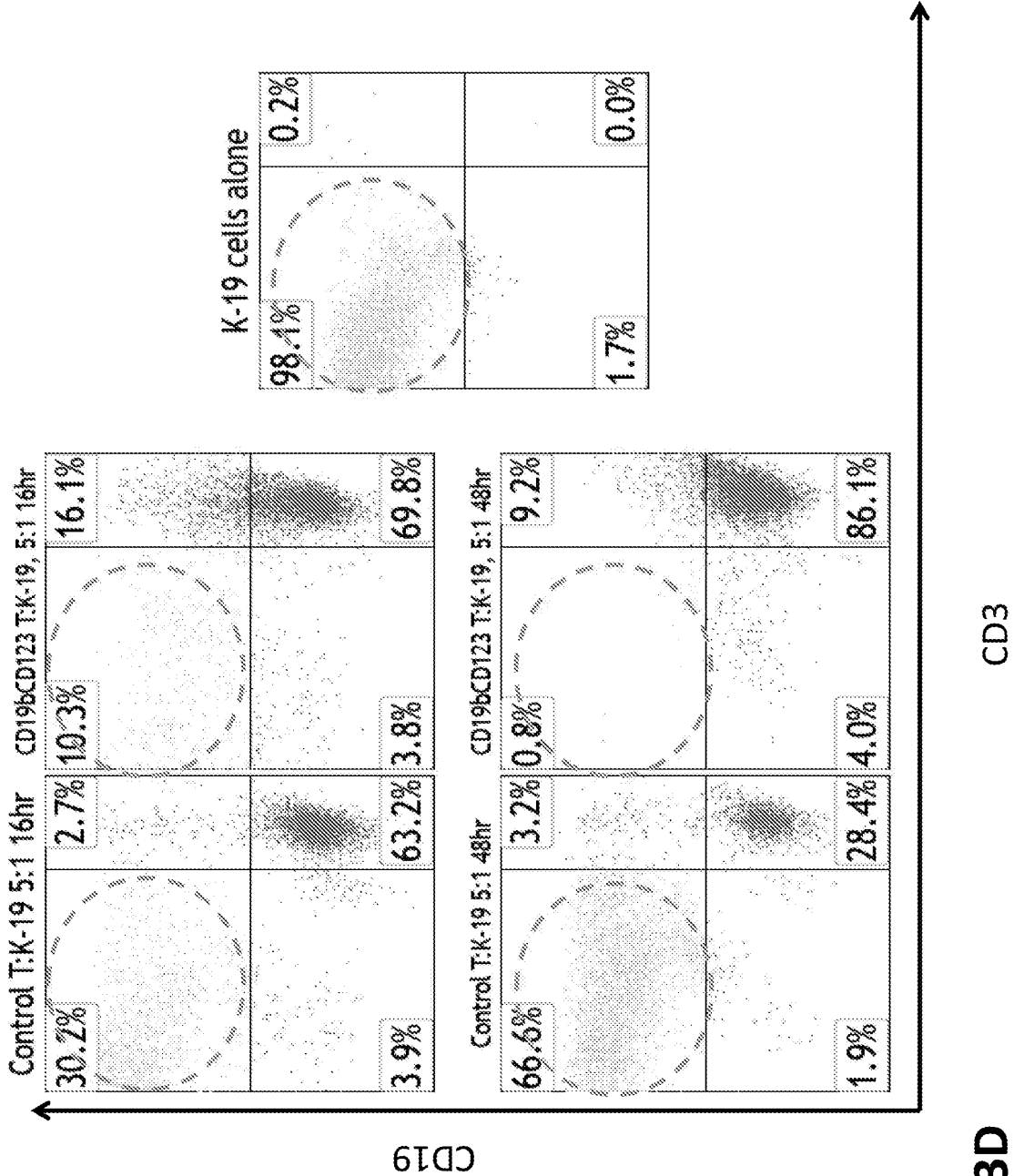


FIGURE 83D

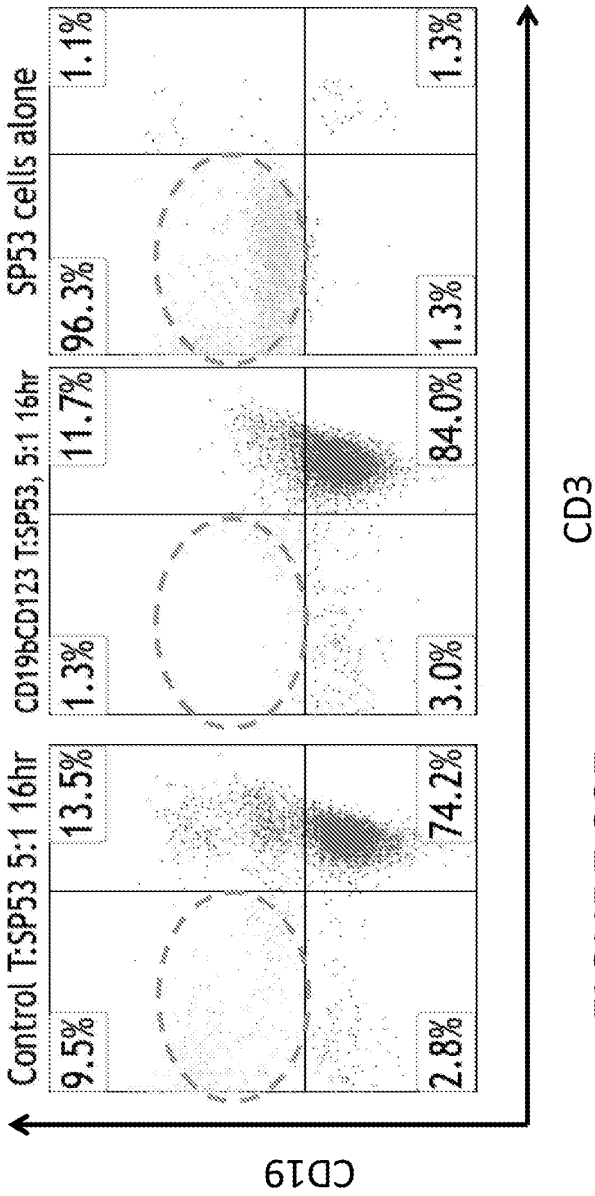
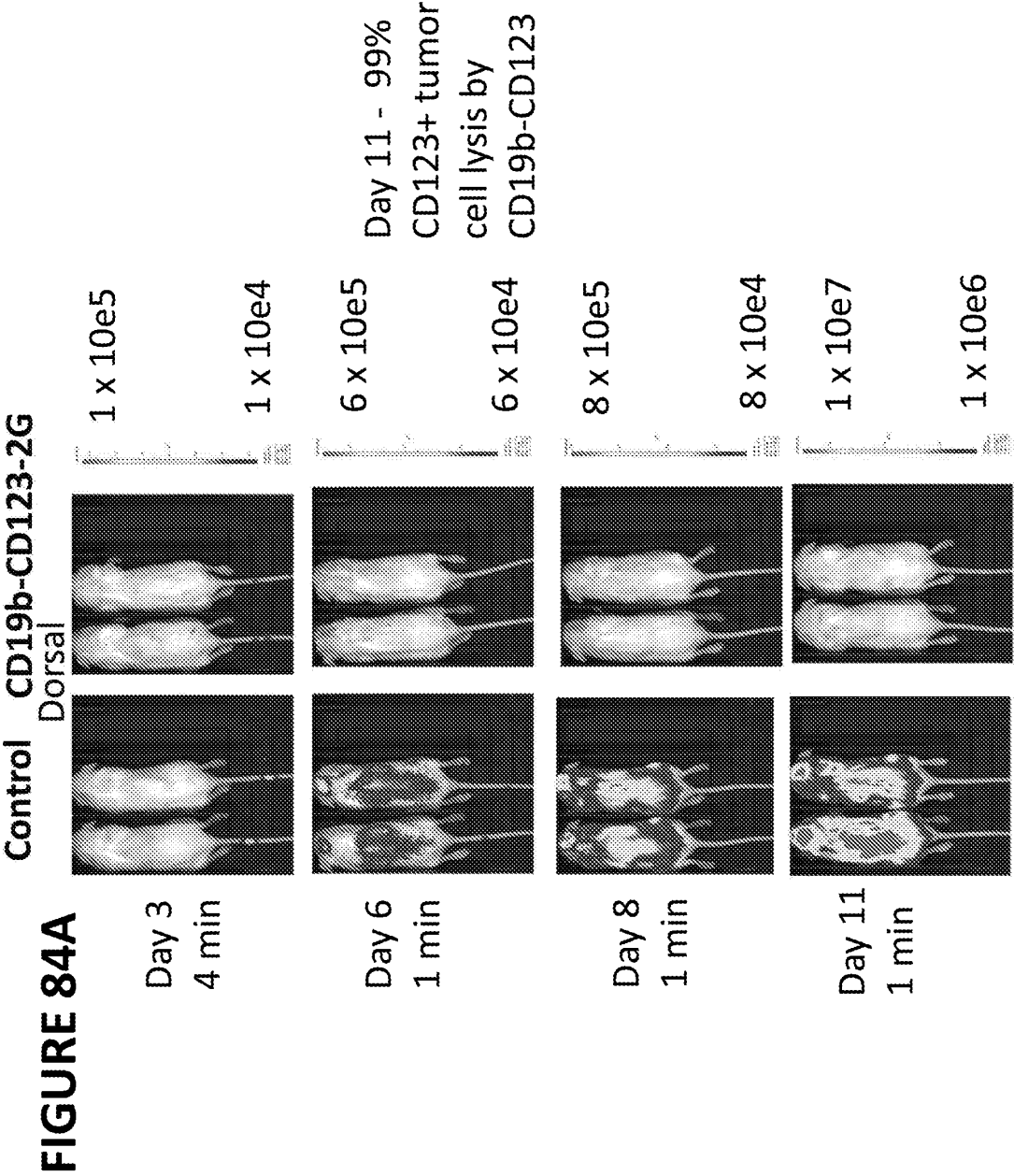
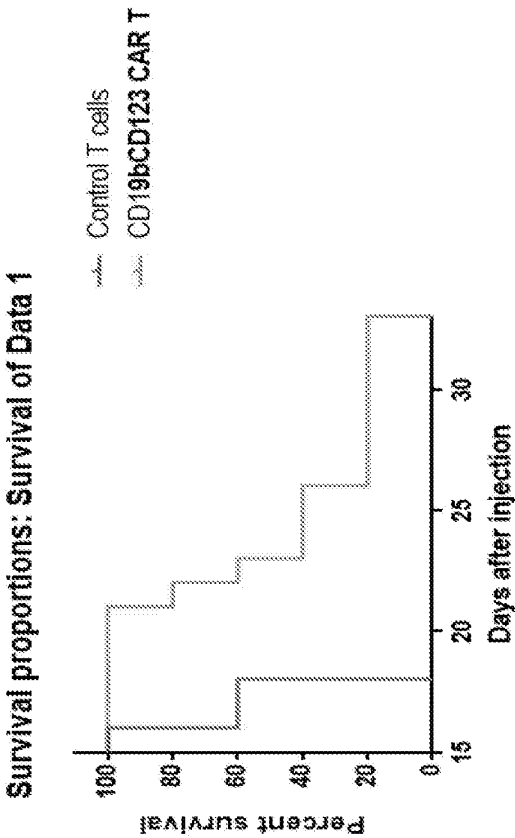


FIGURE 83E





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

FIGURE 84B

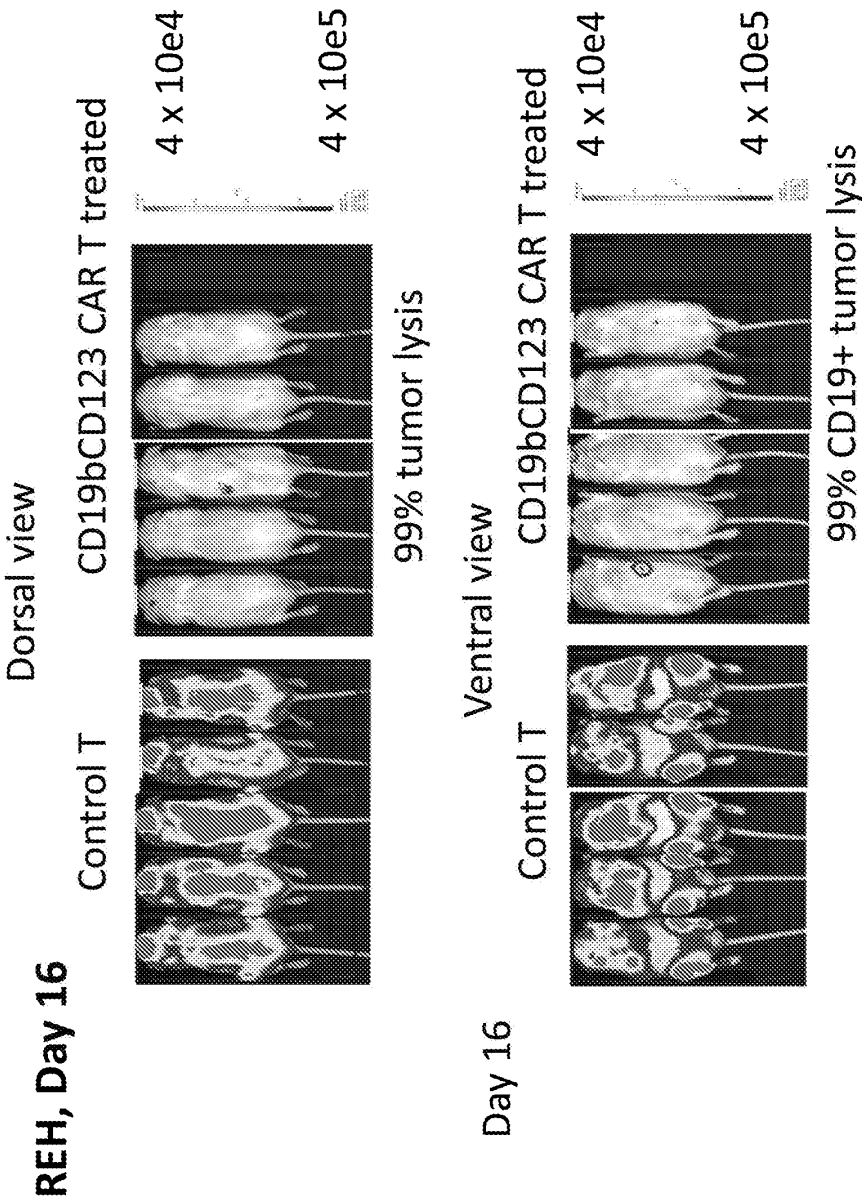


FIGURE 84C

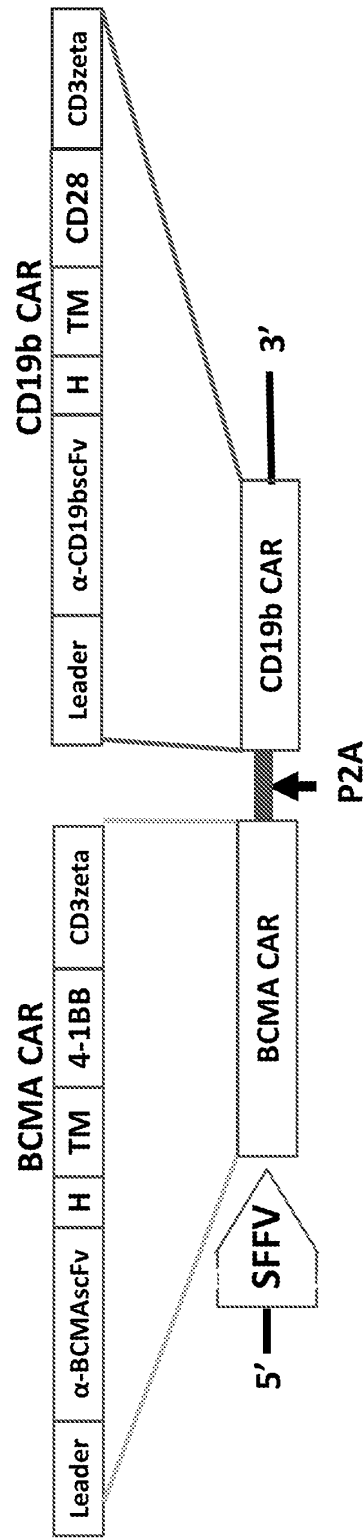


FIGURE 85A

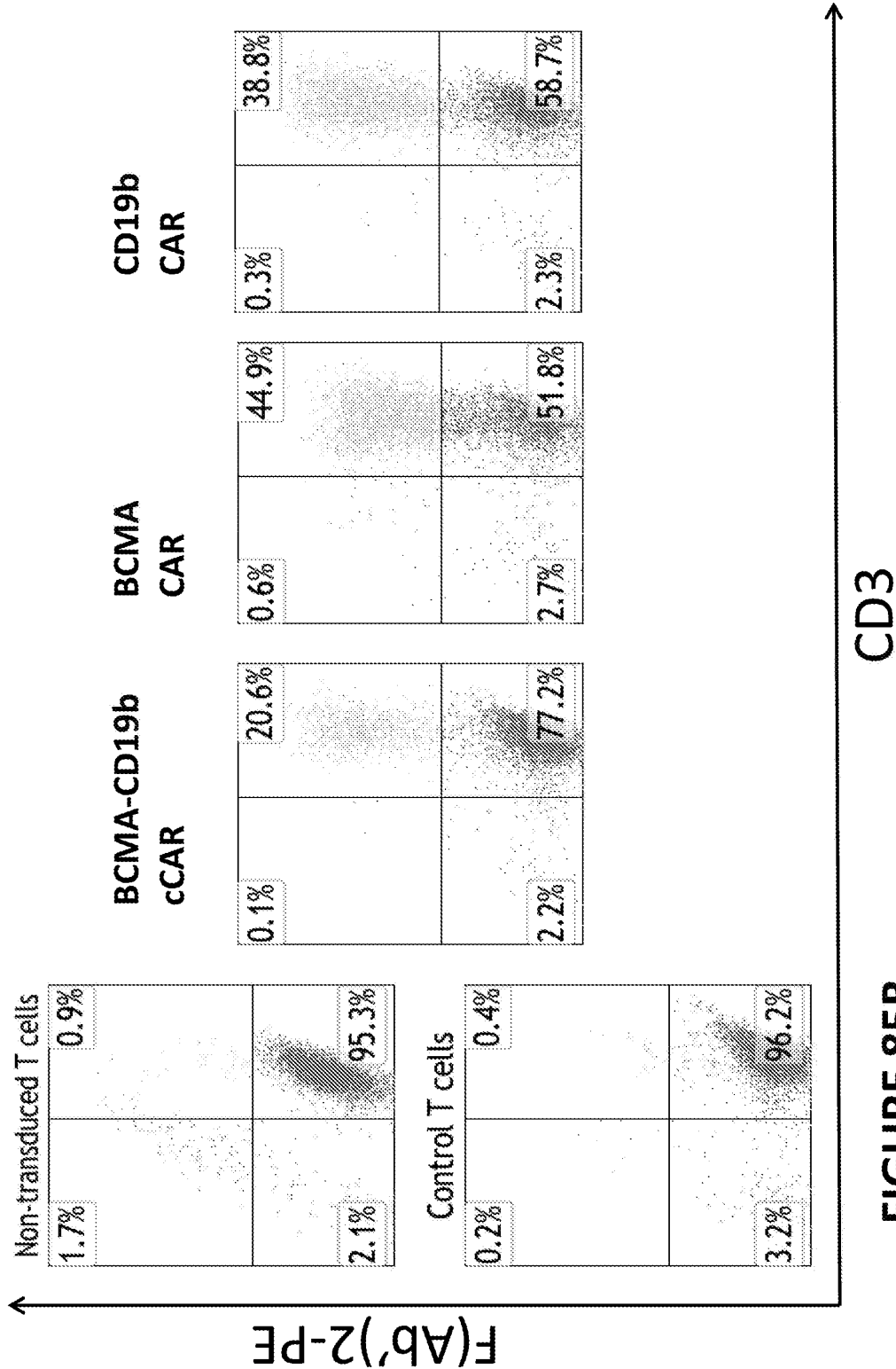
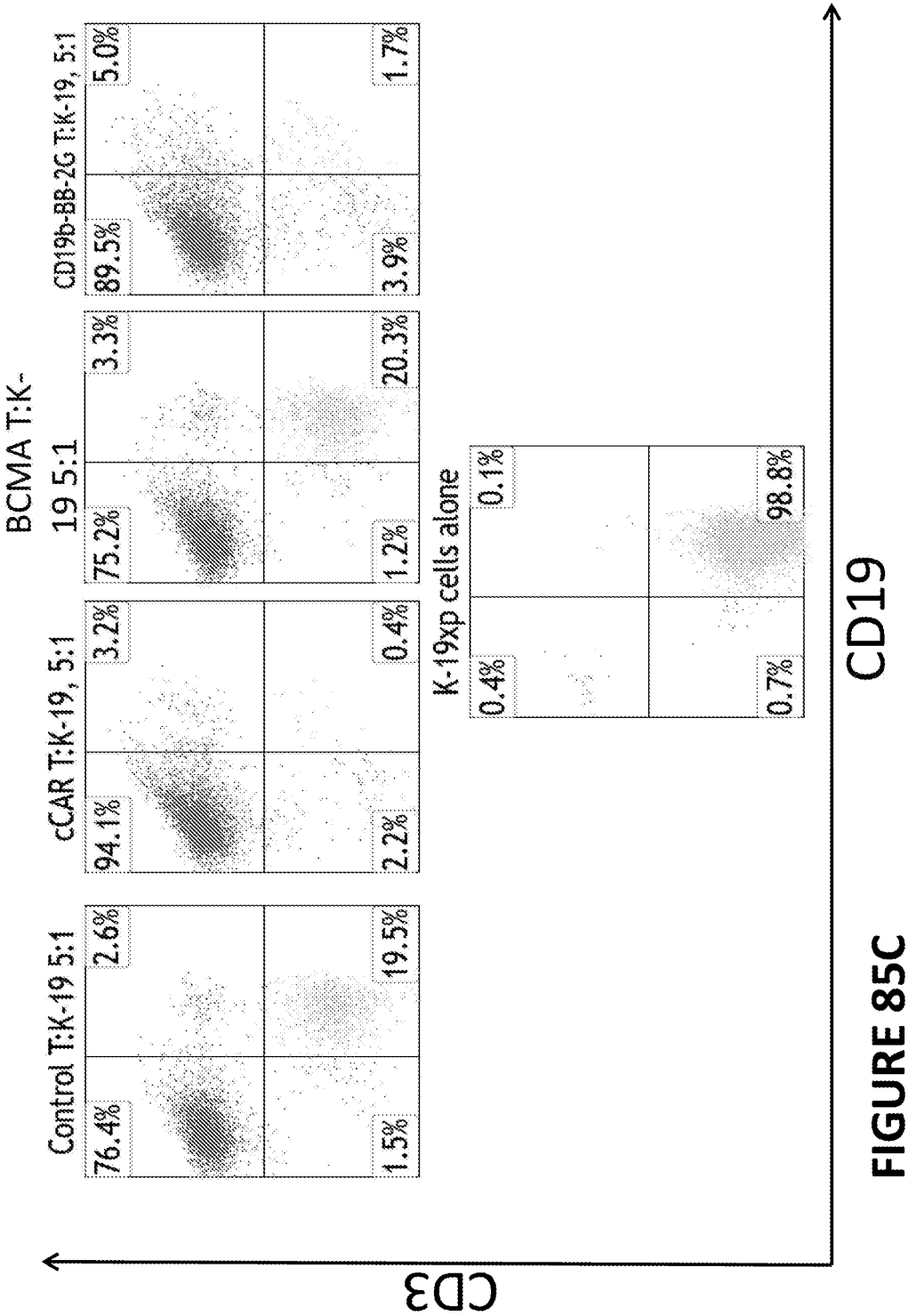
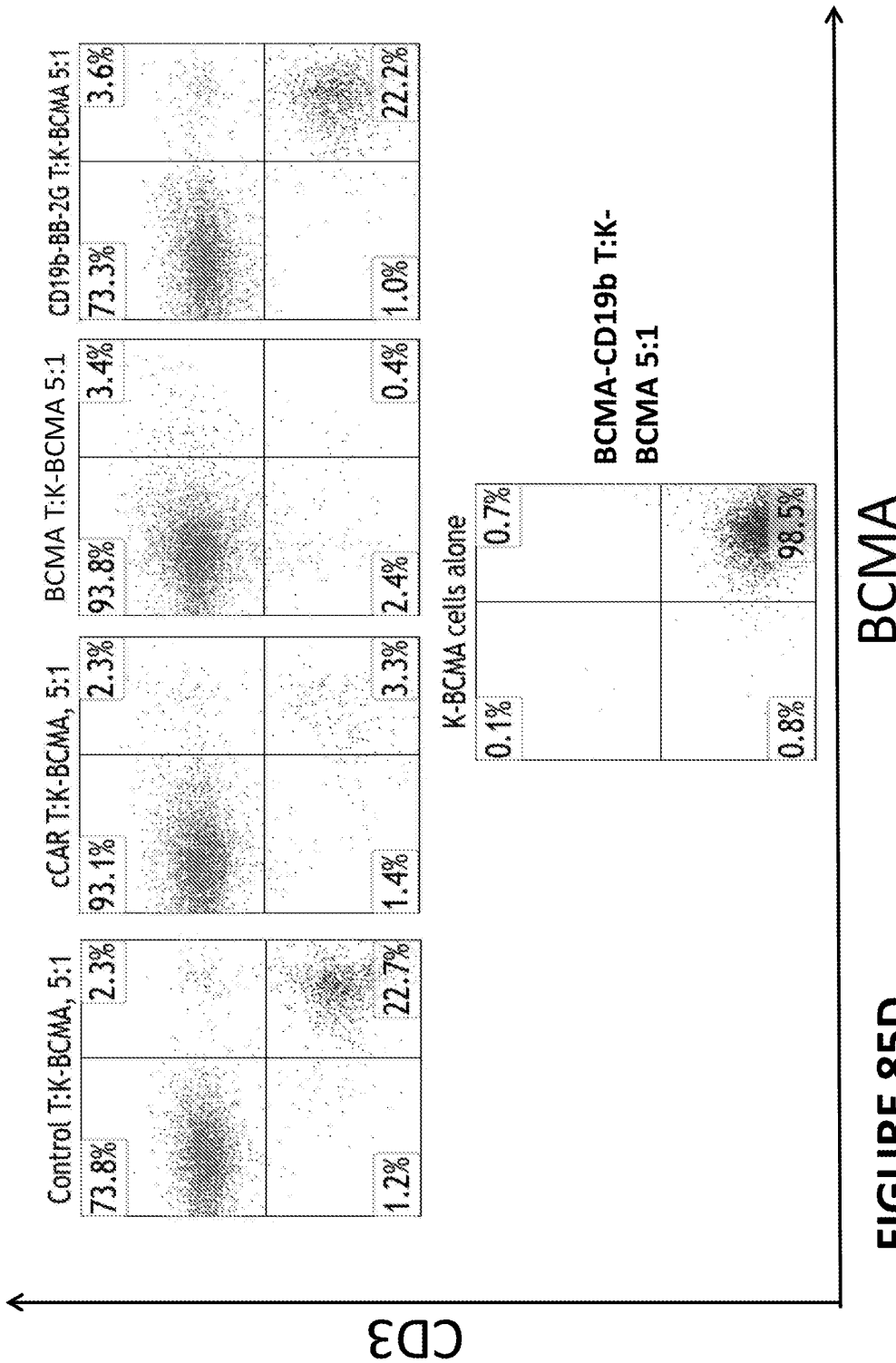


FIGURE 85B





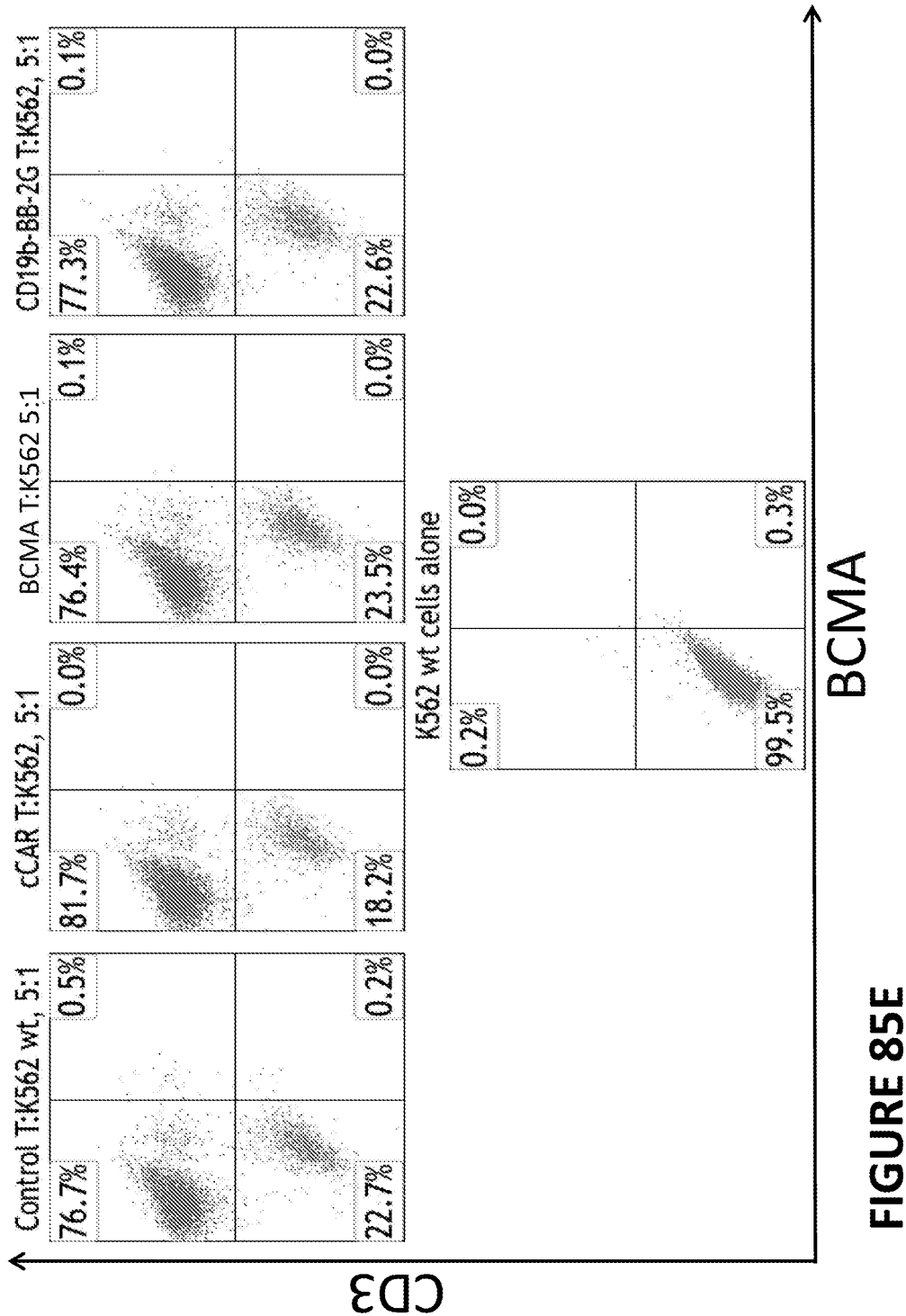
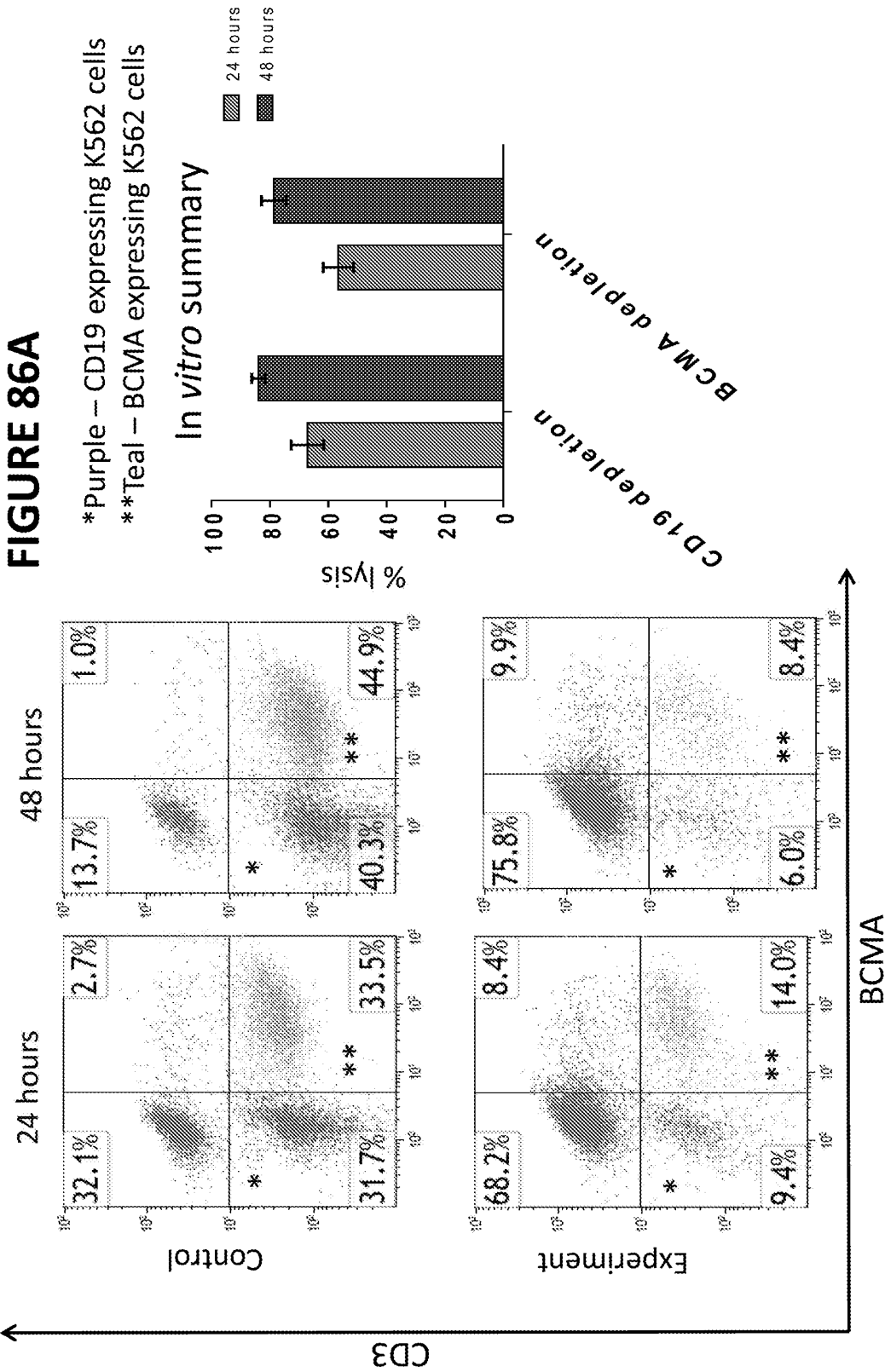


FIGURE 86A

*Purple – CD19 expressing K562 cells

**Teal – BCMA expressing K562 cells



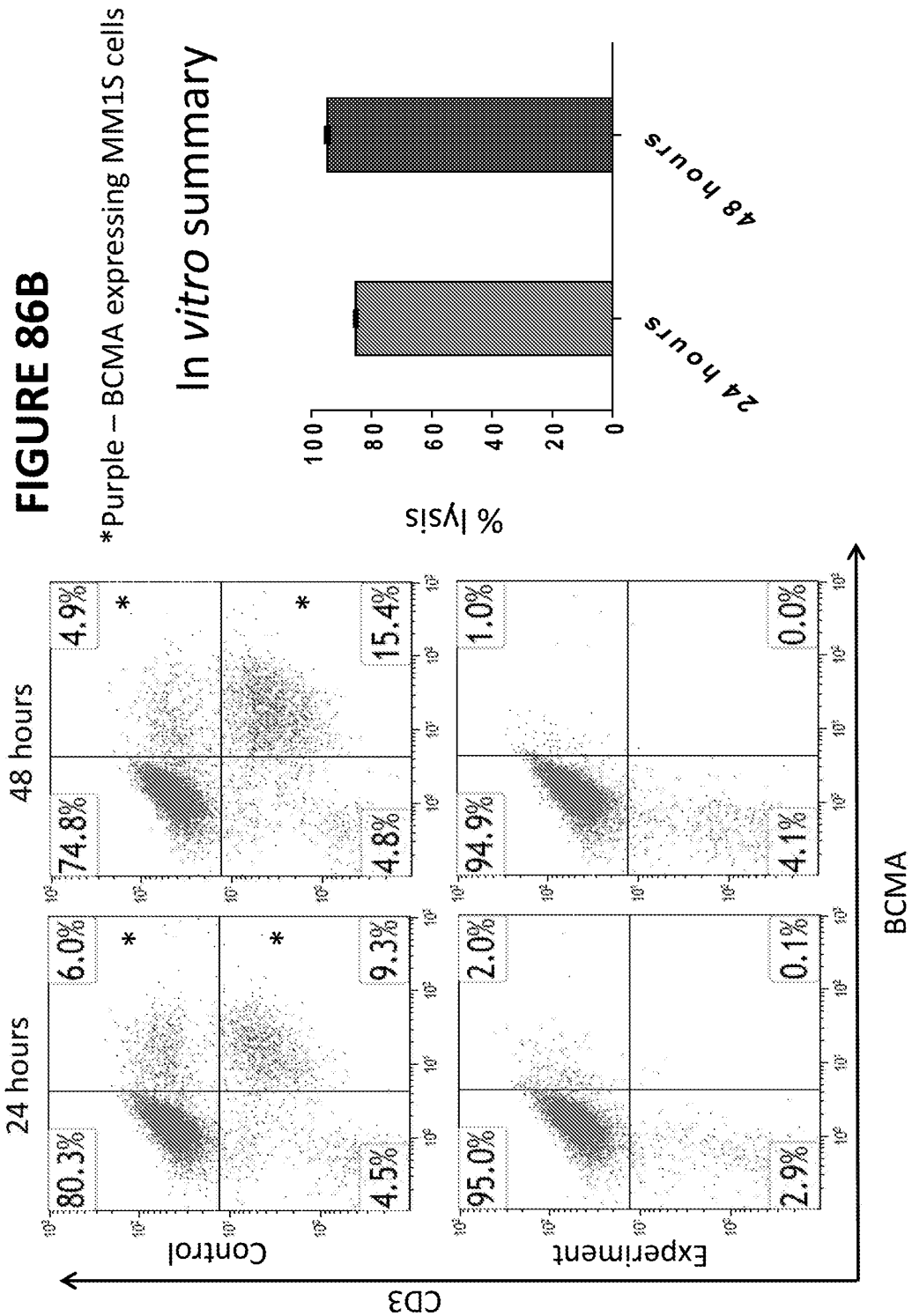
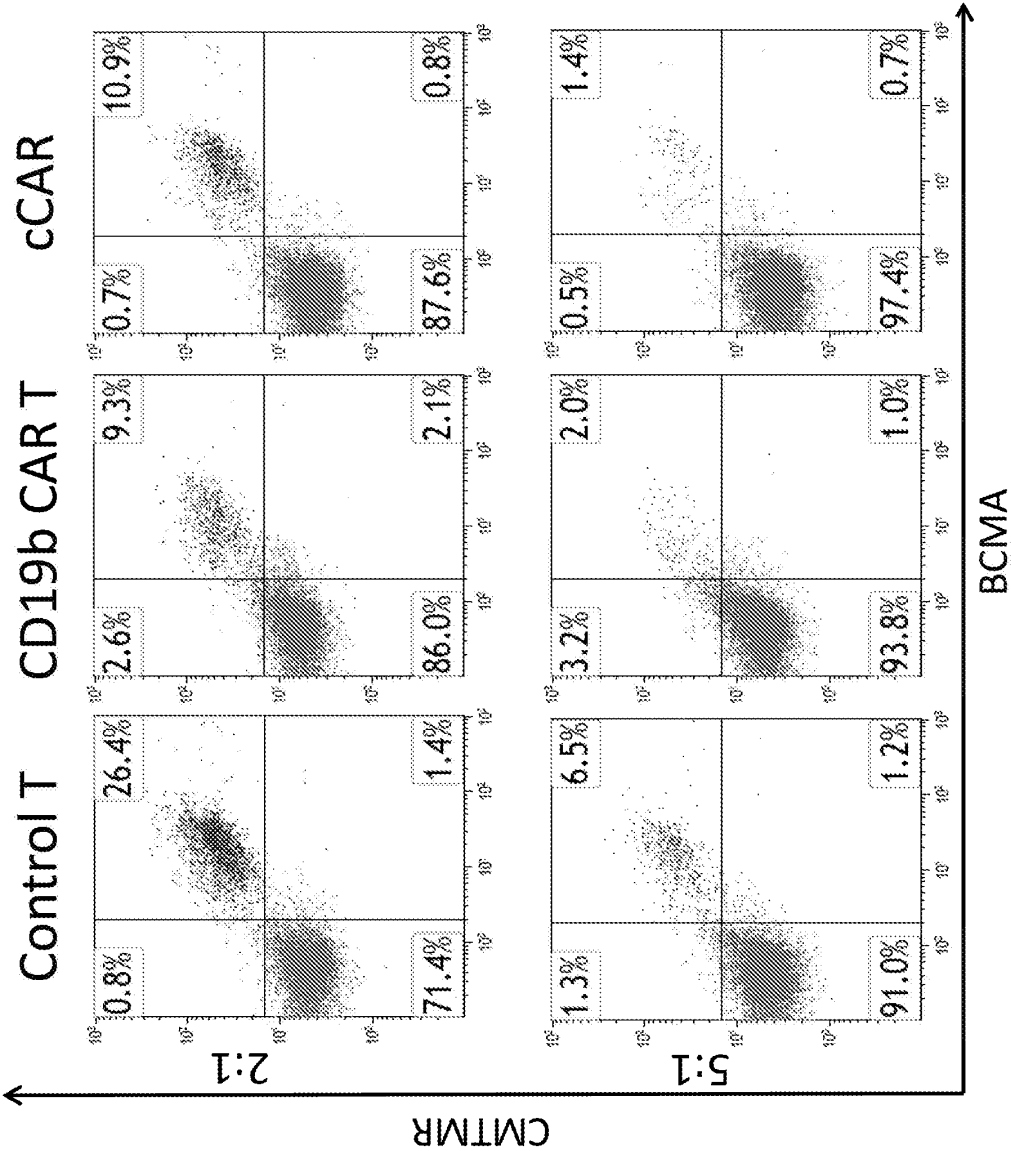
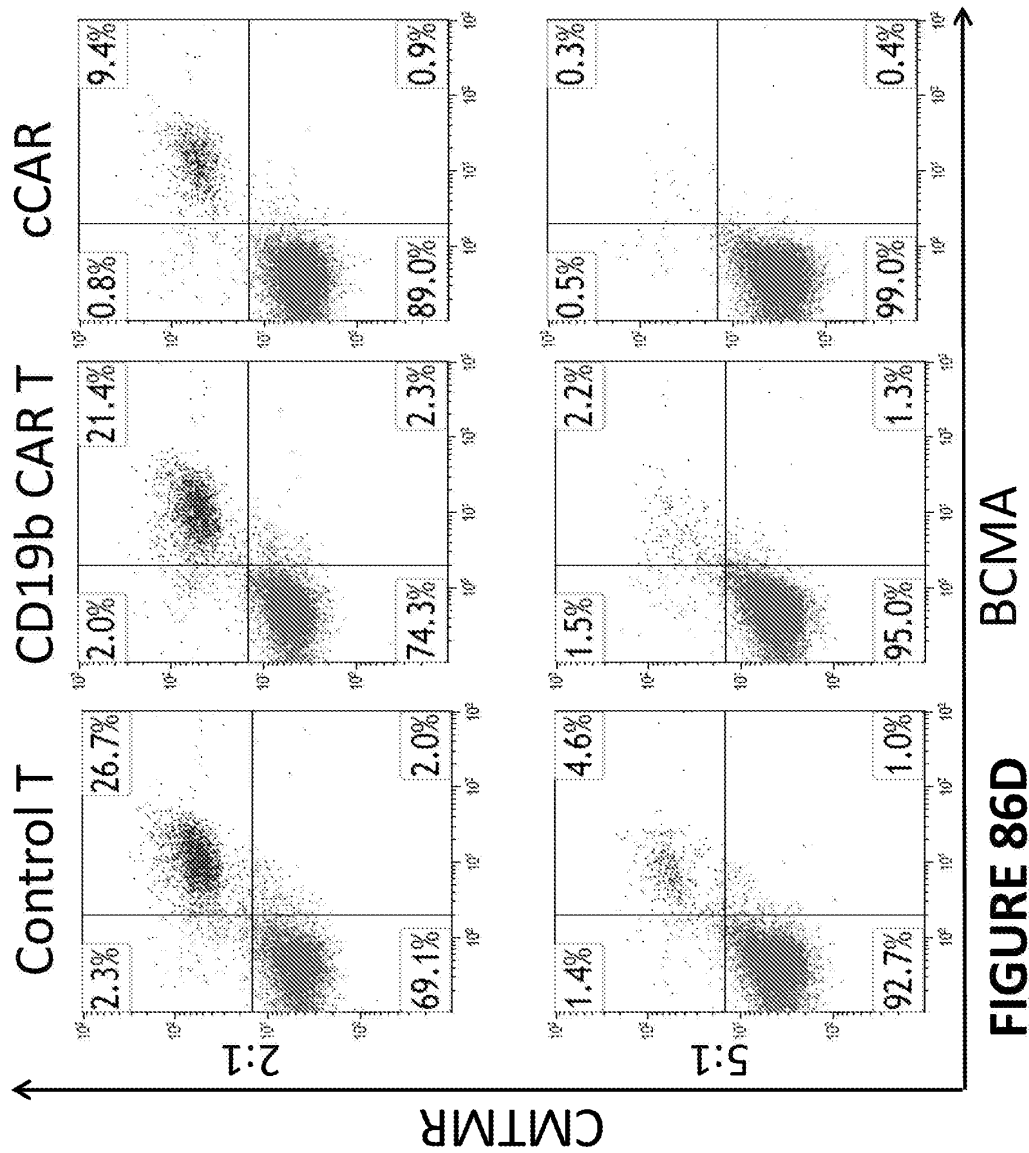
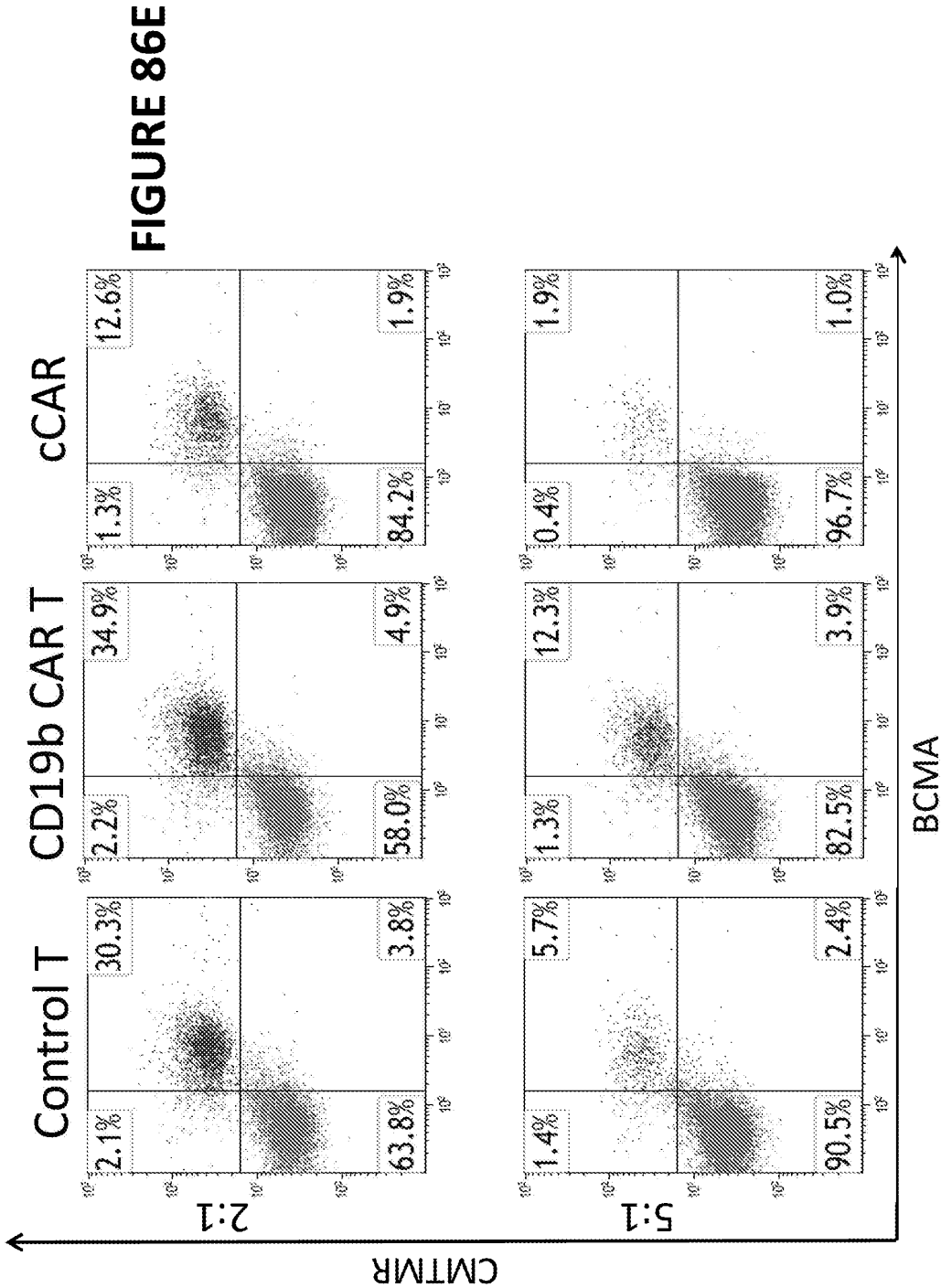


FIGURE 86C







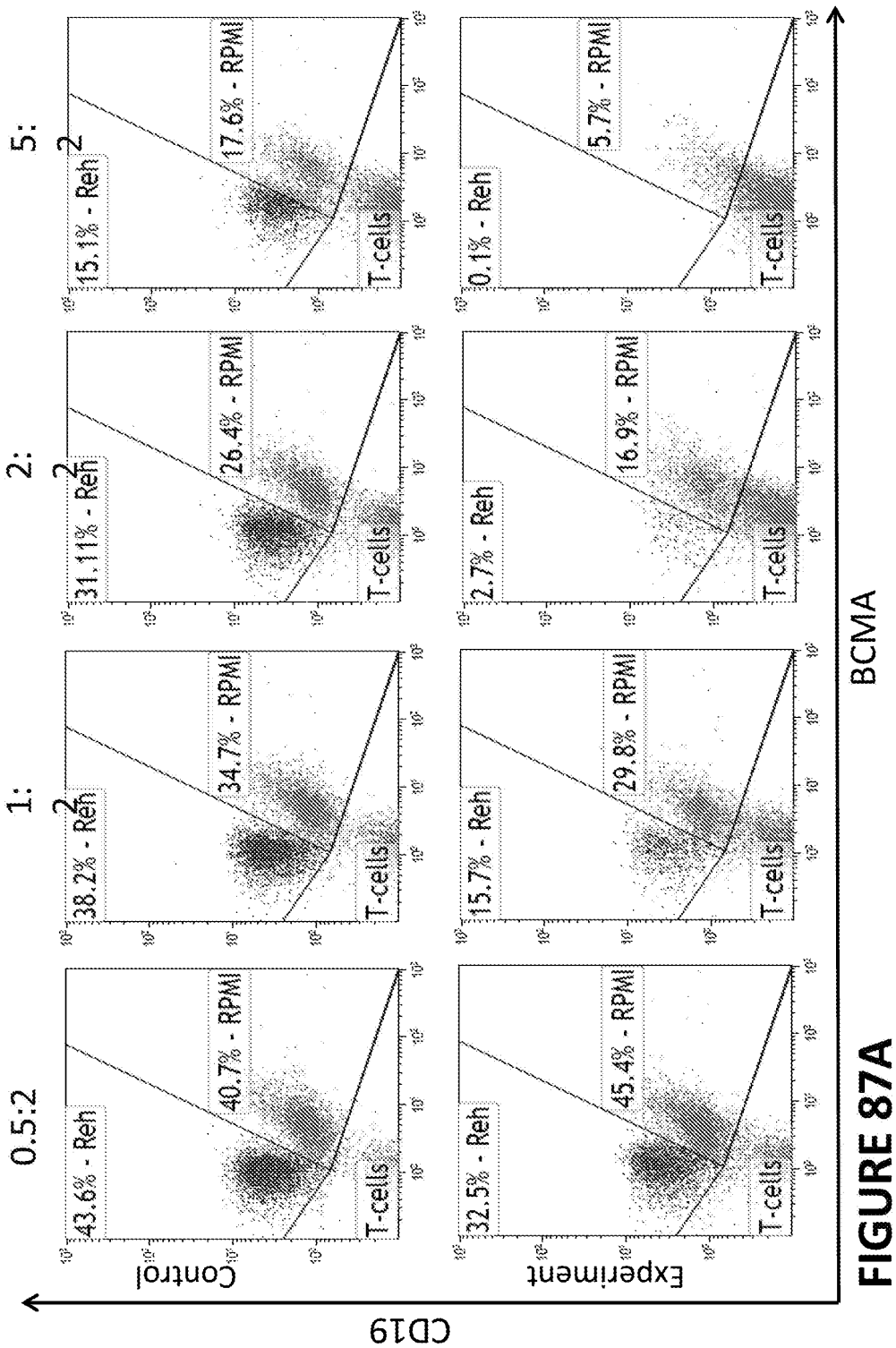


FIGURE 87A

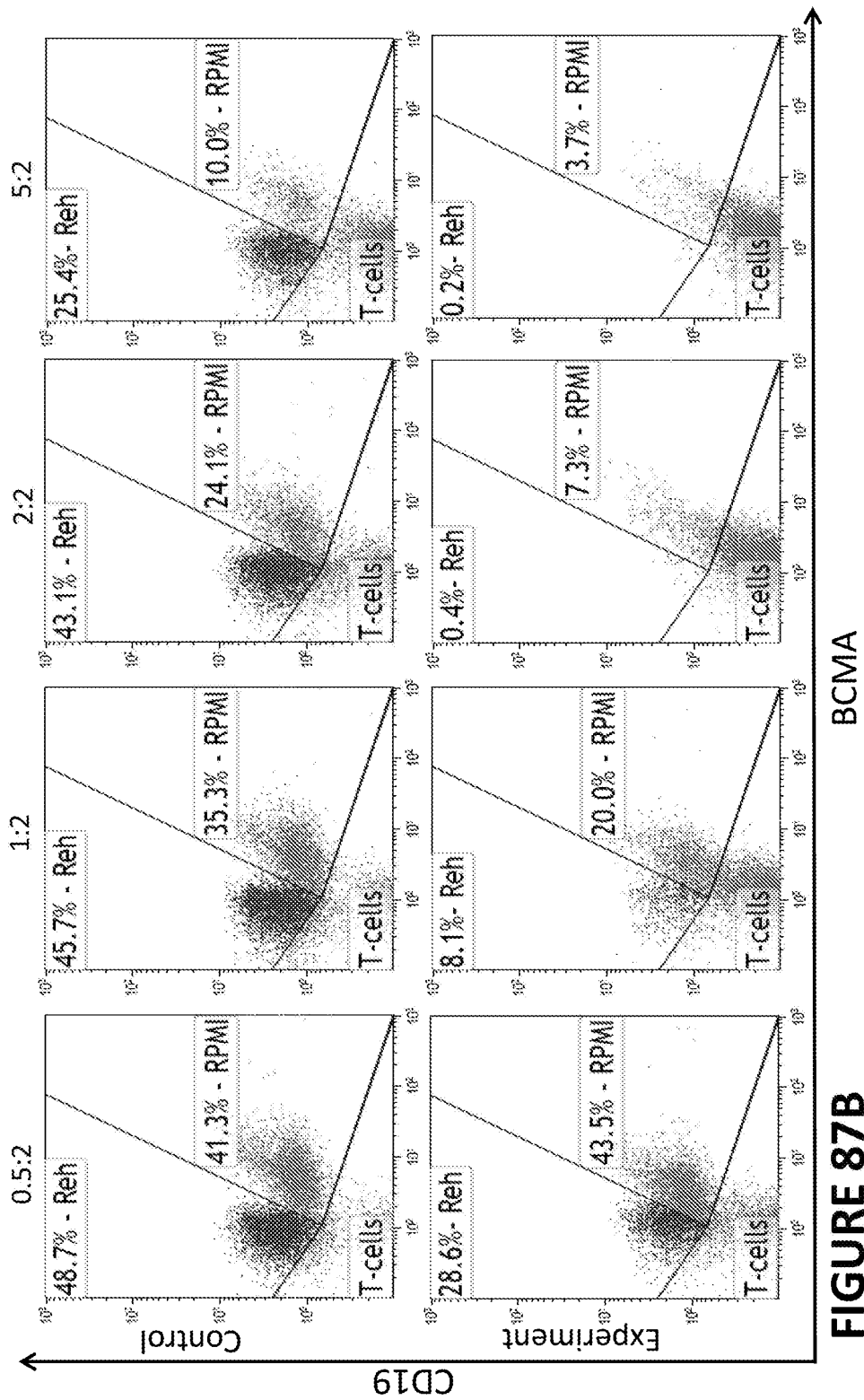


FIGURE 87B

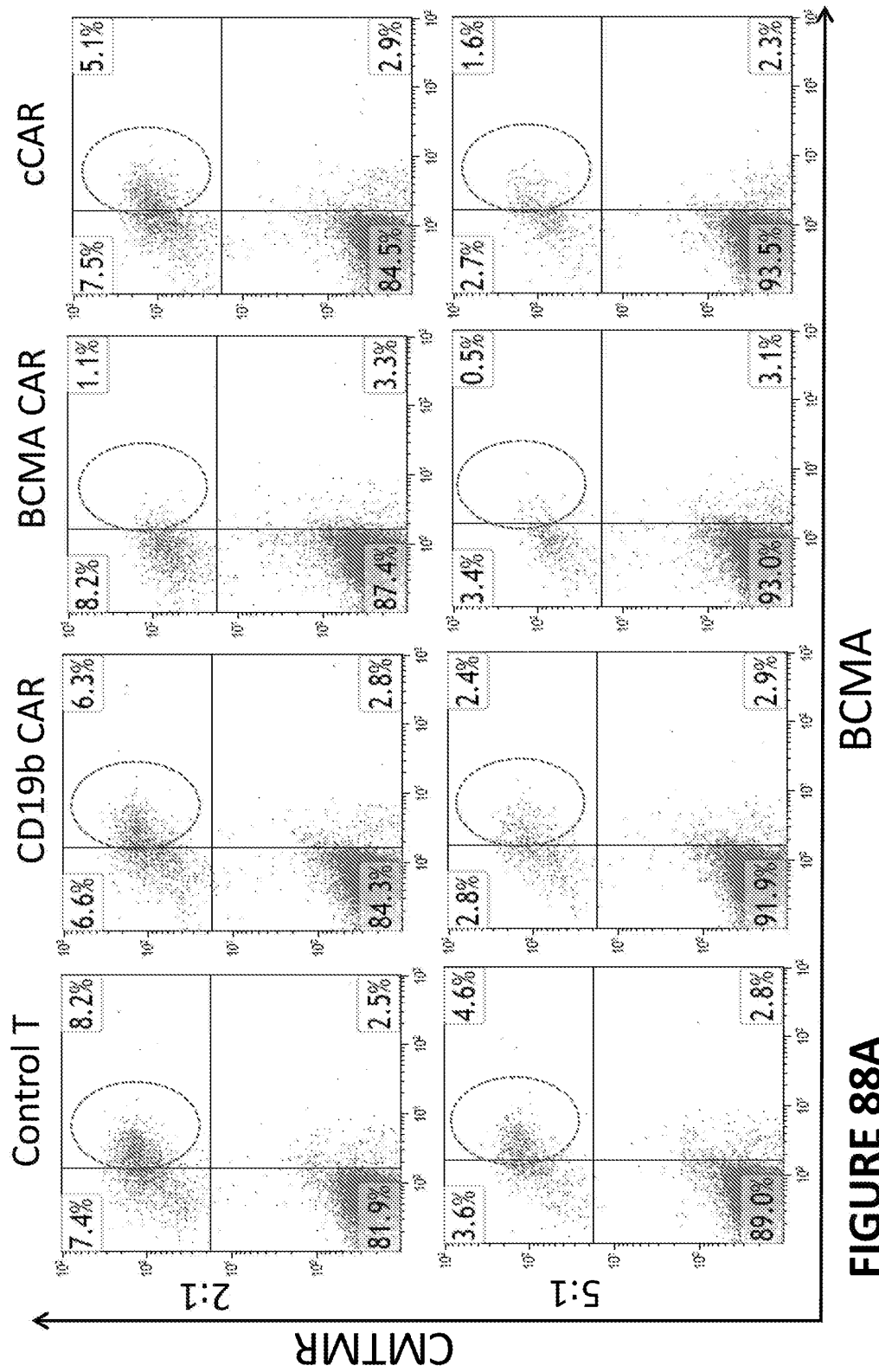


FIGURE 88A

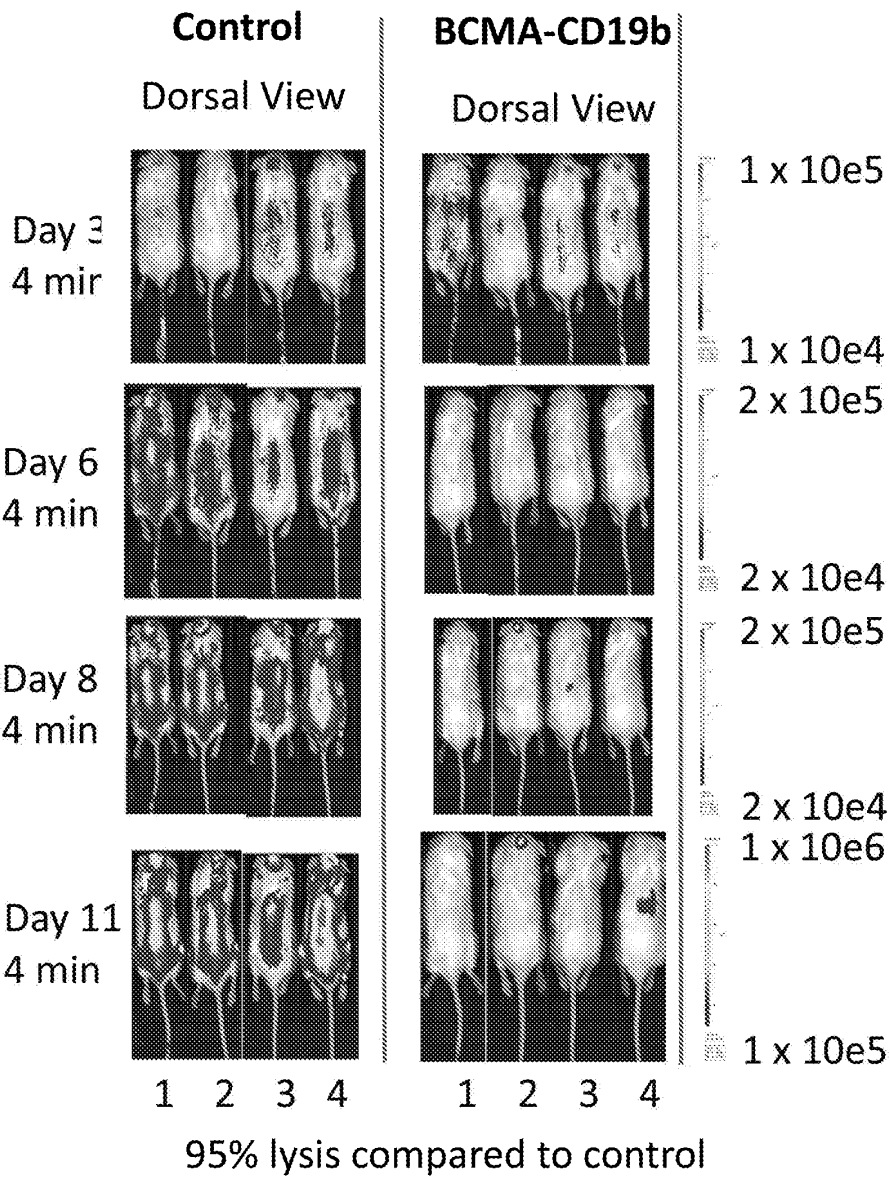


FIGURE 88B

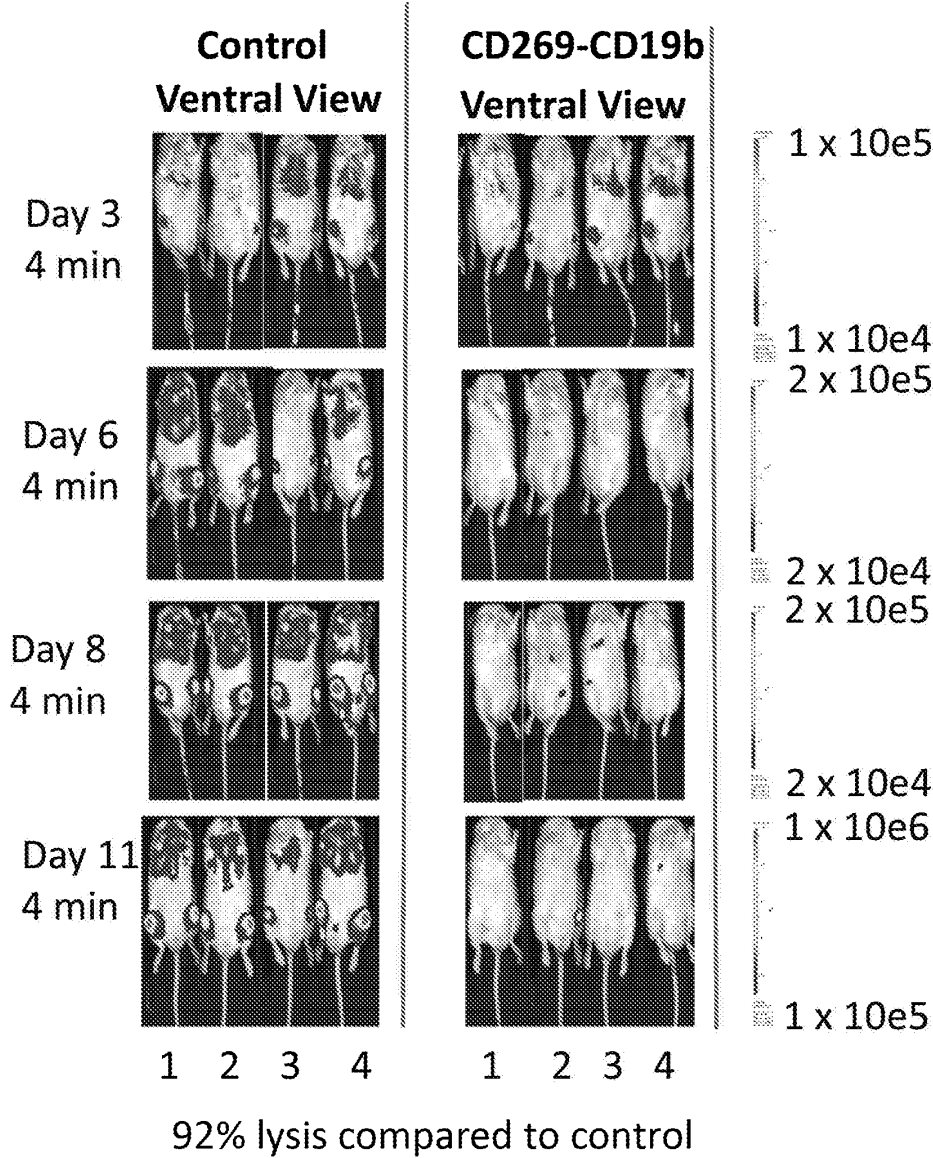


FIGURE 88C

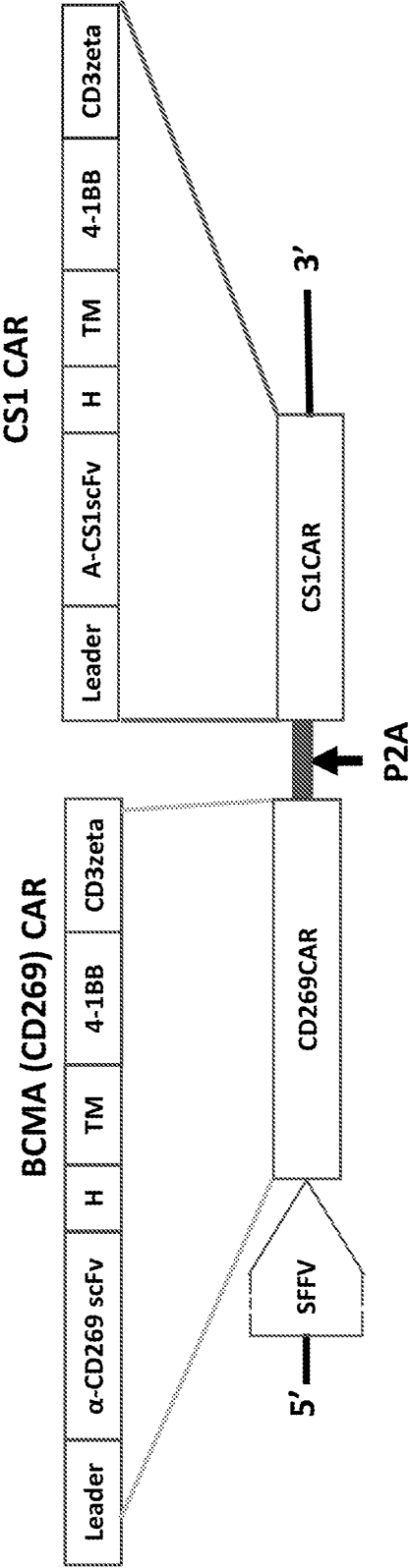
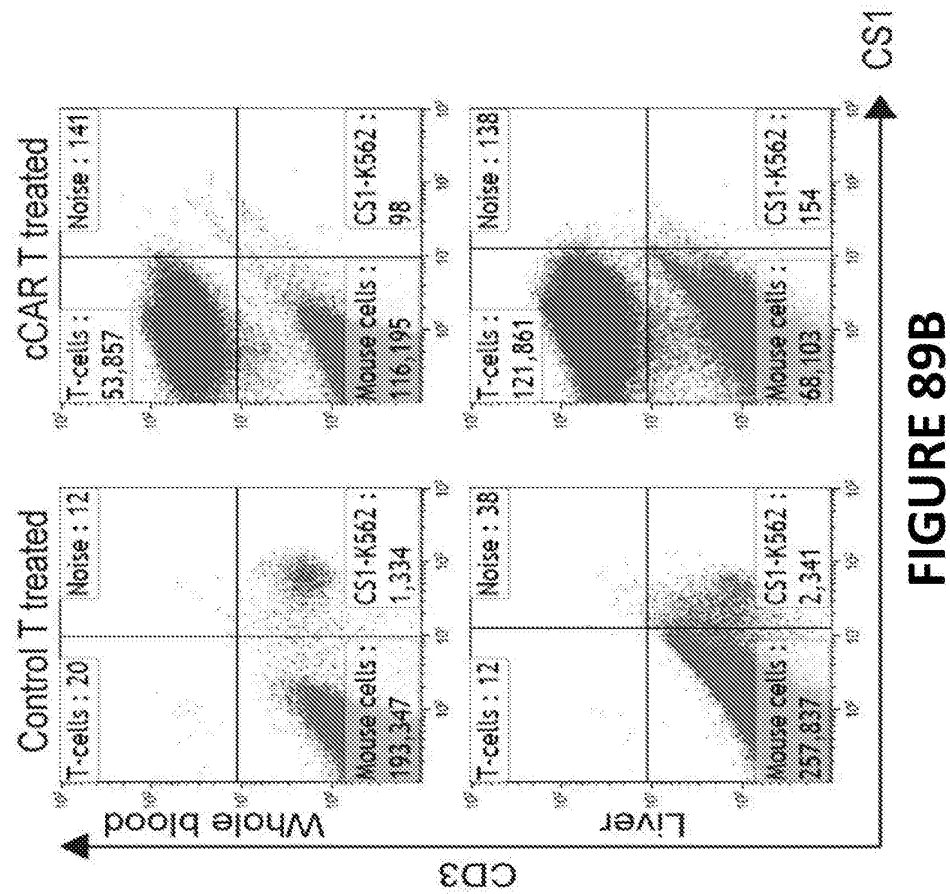


FIGURE 89A

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



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

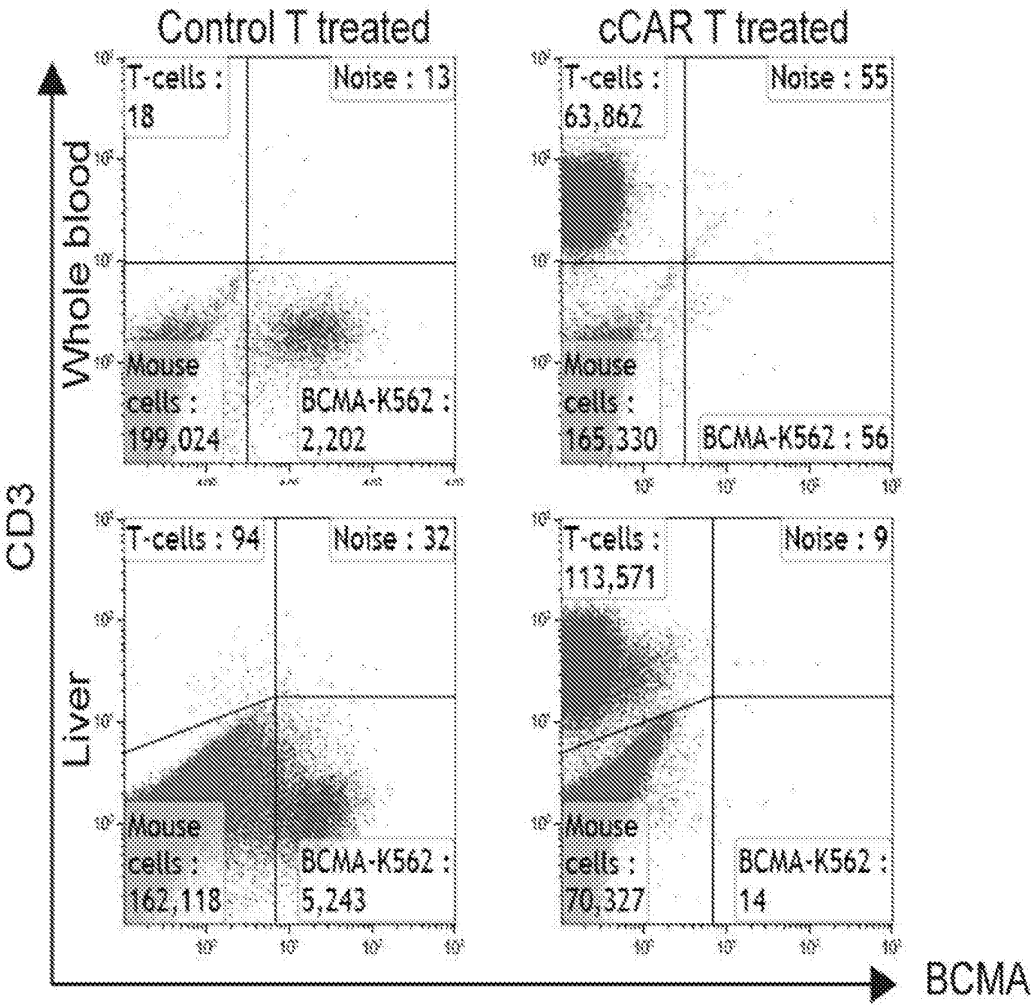
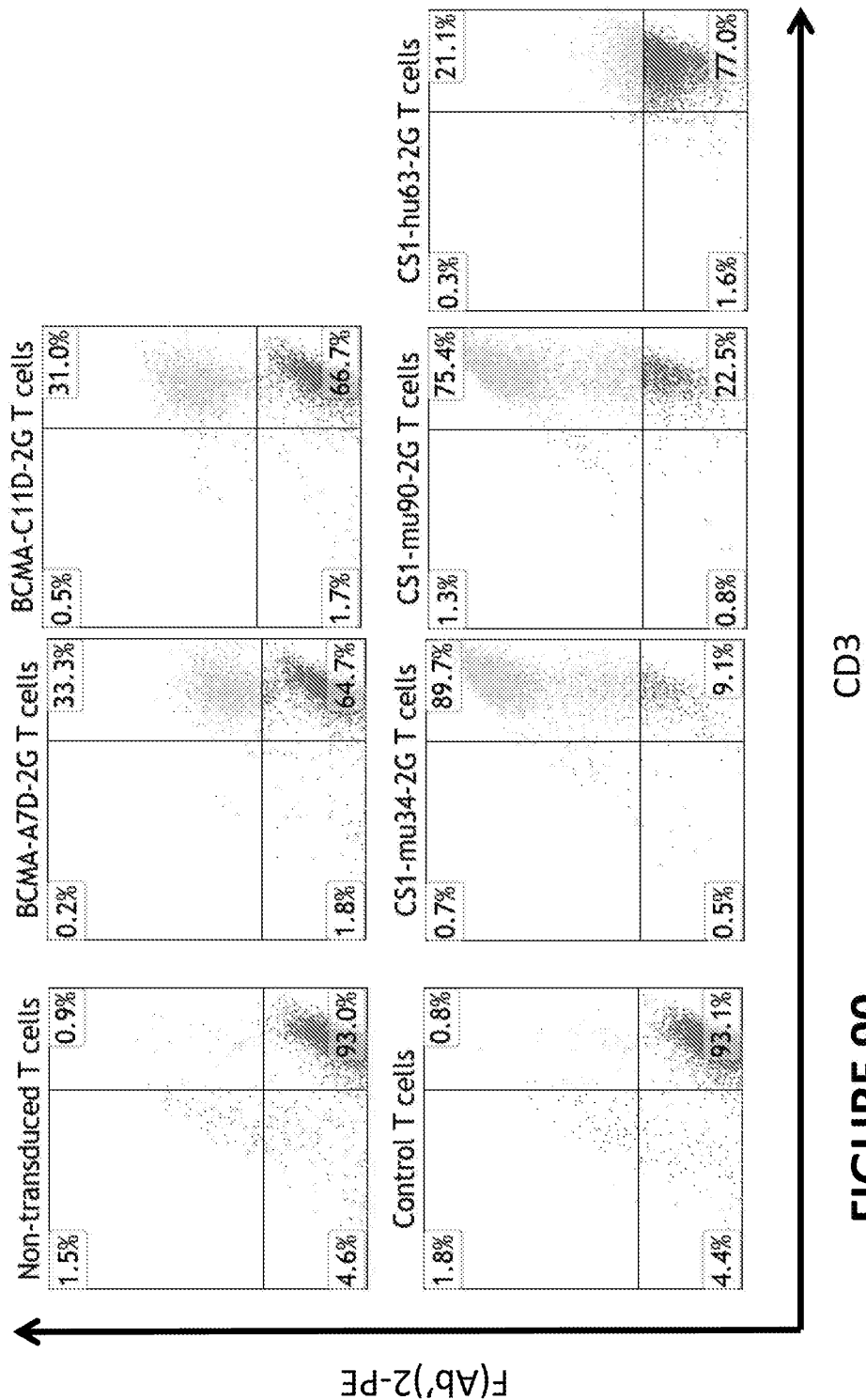


FIGURE 89C



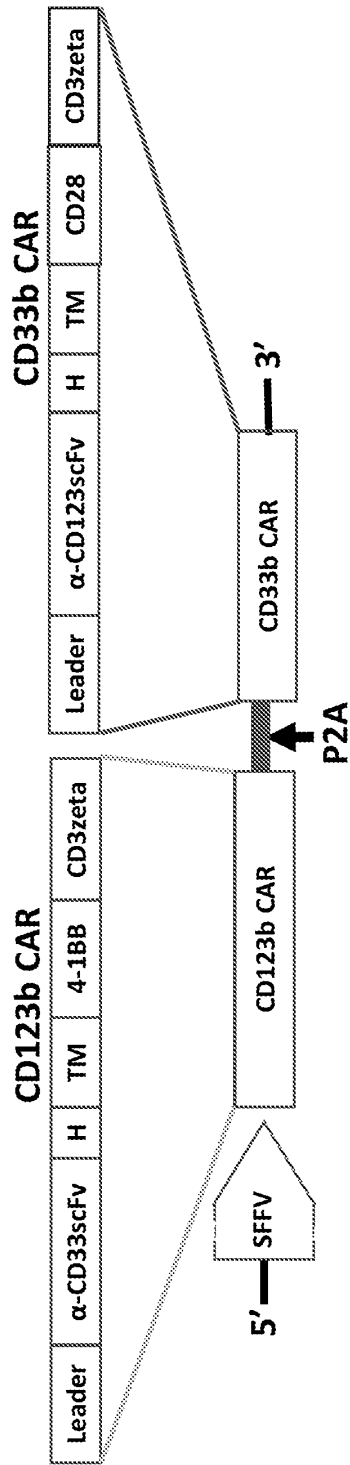


FIGURE 91A

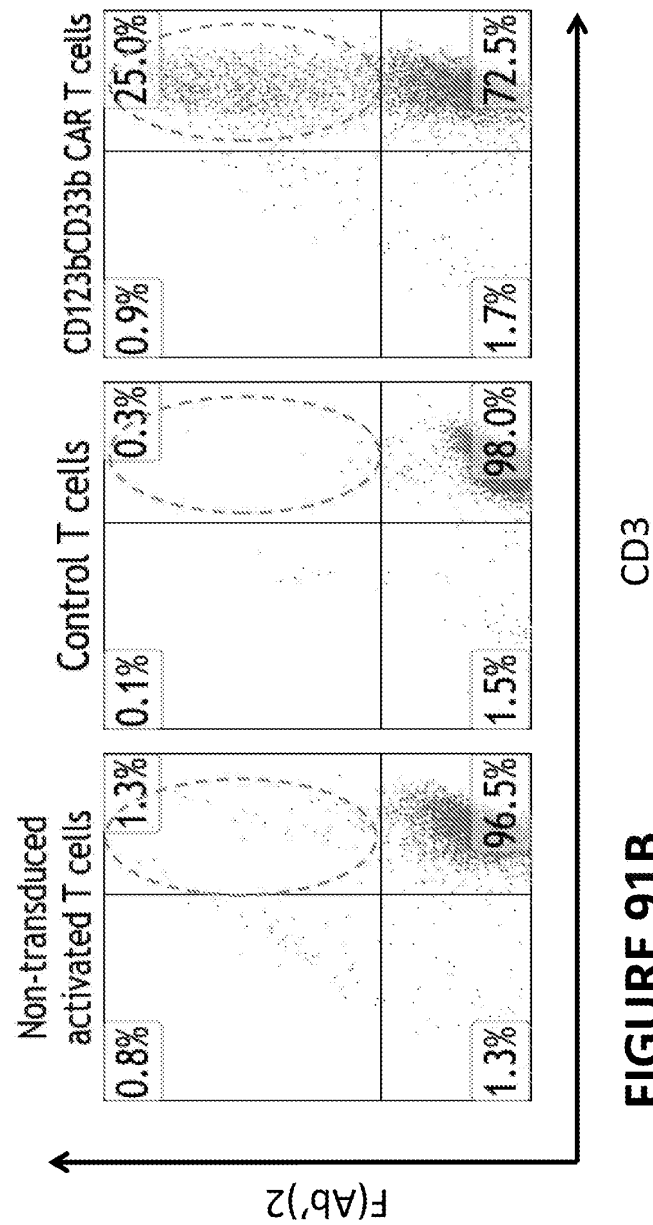
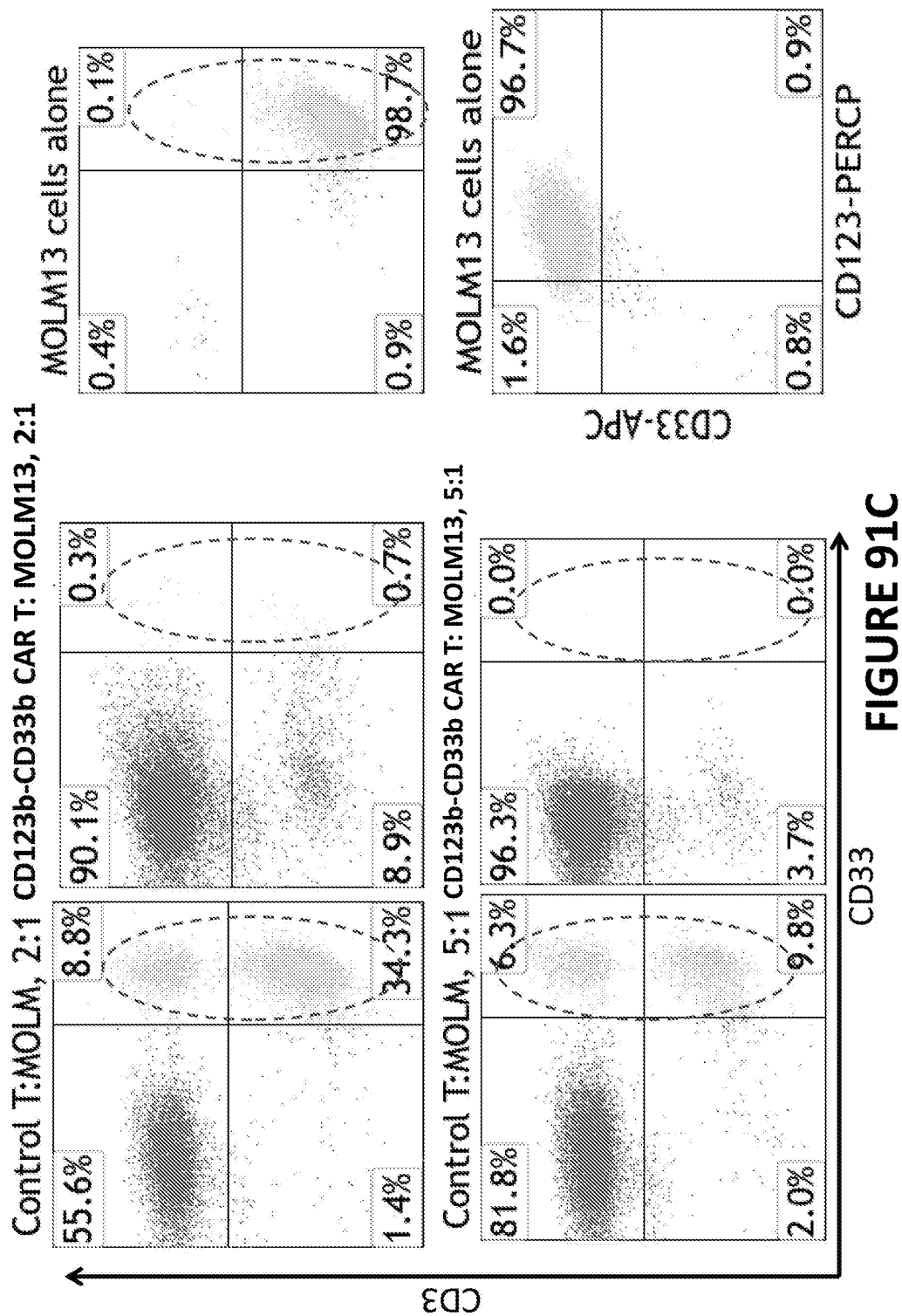
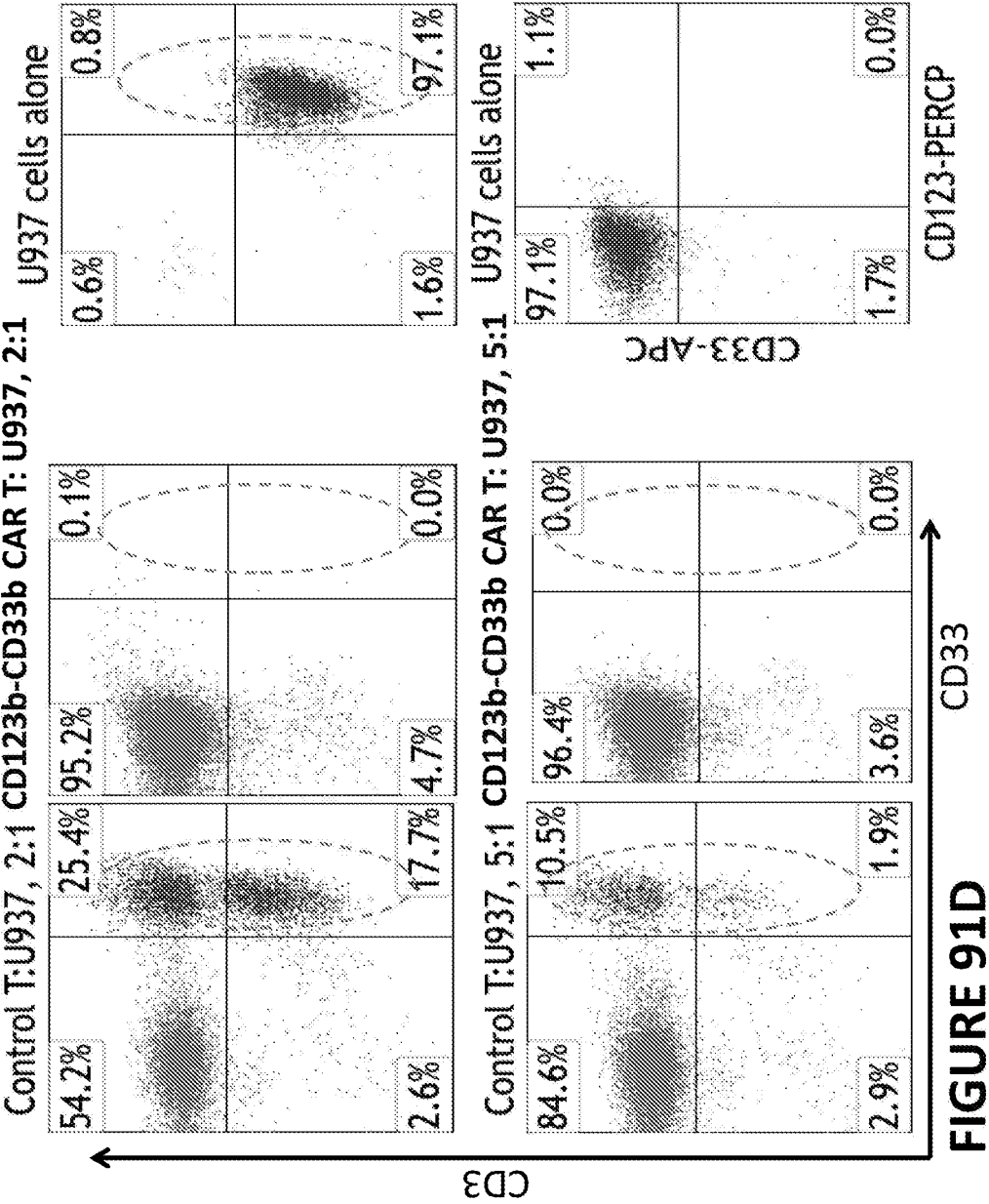


FIGURE 91B





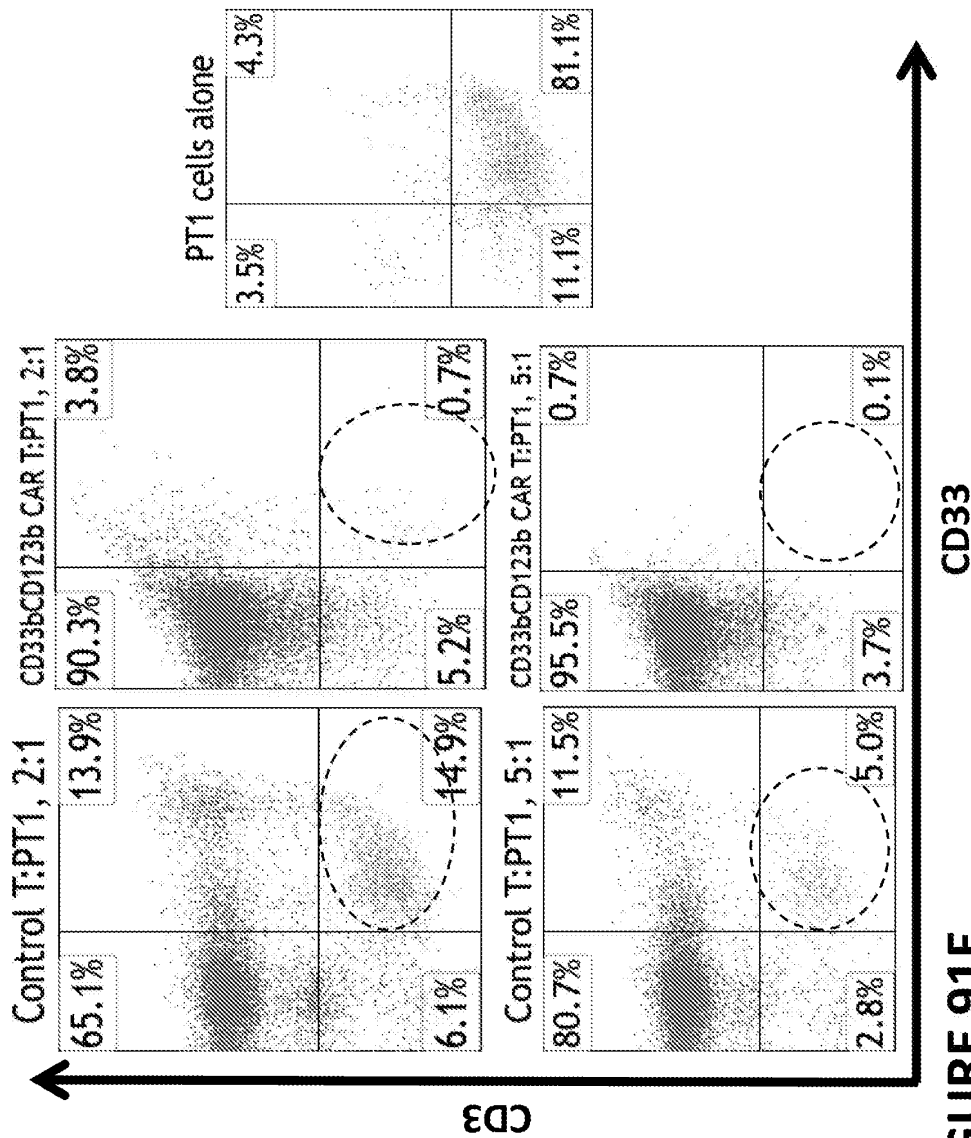
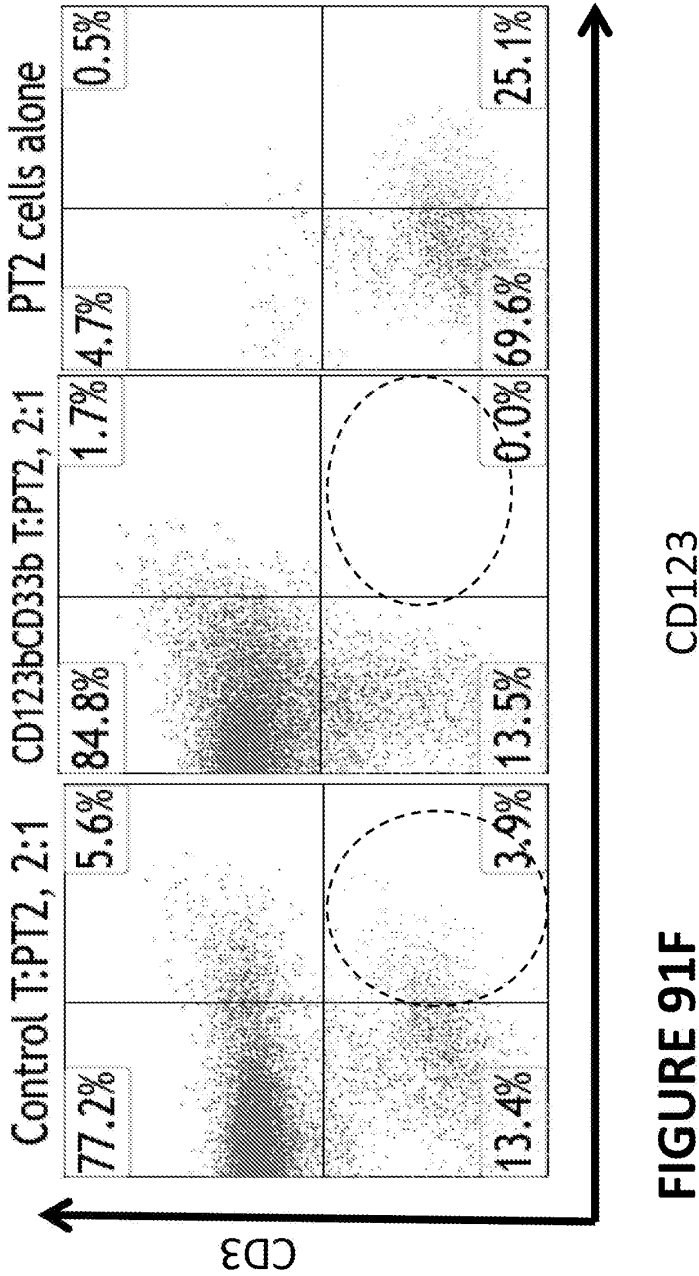
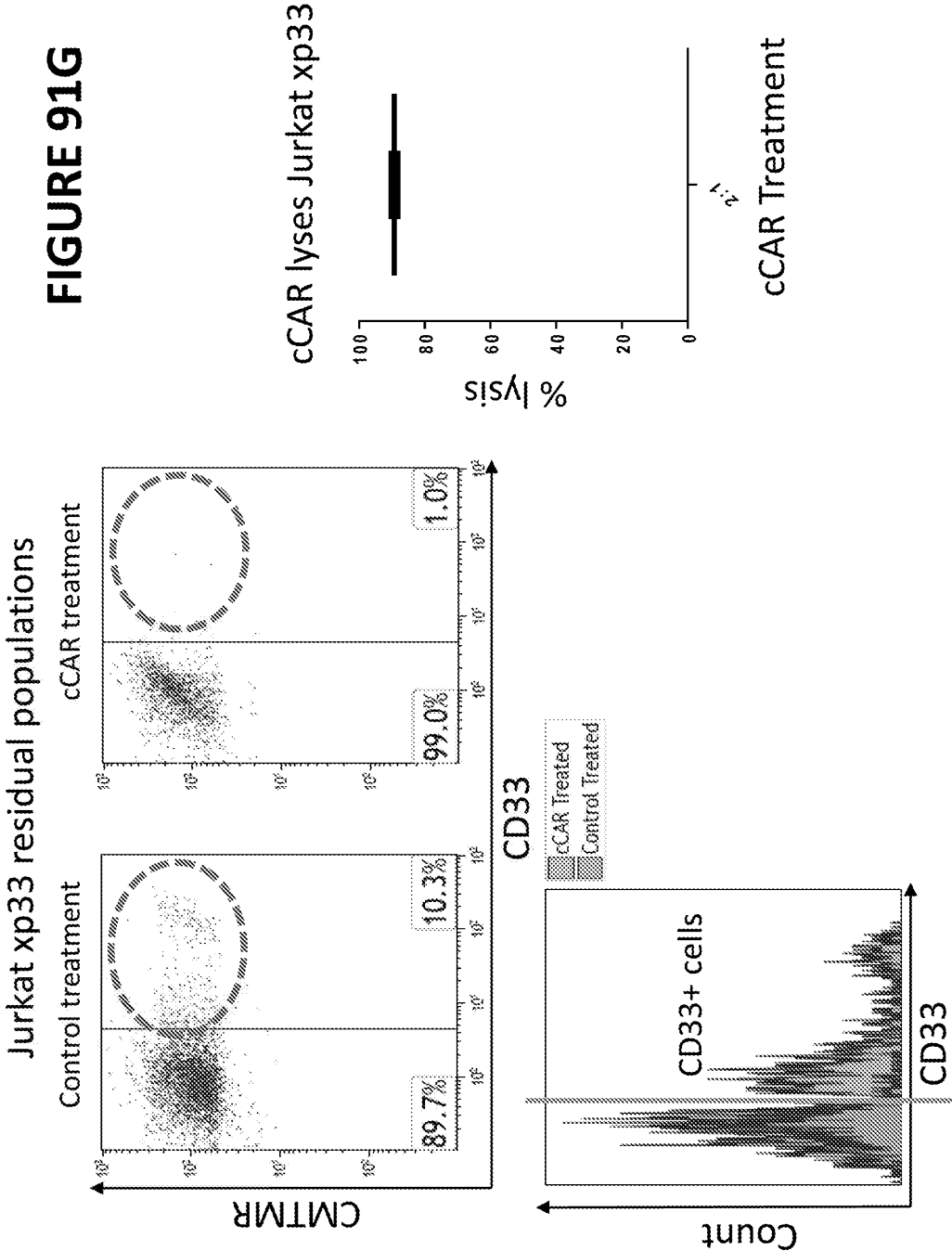


FIGURE 91E





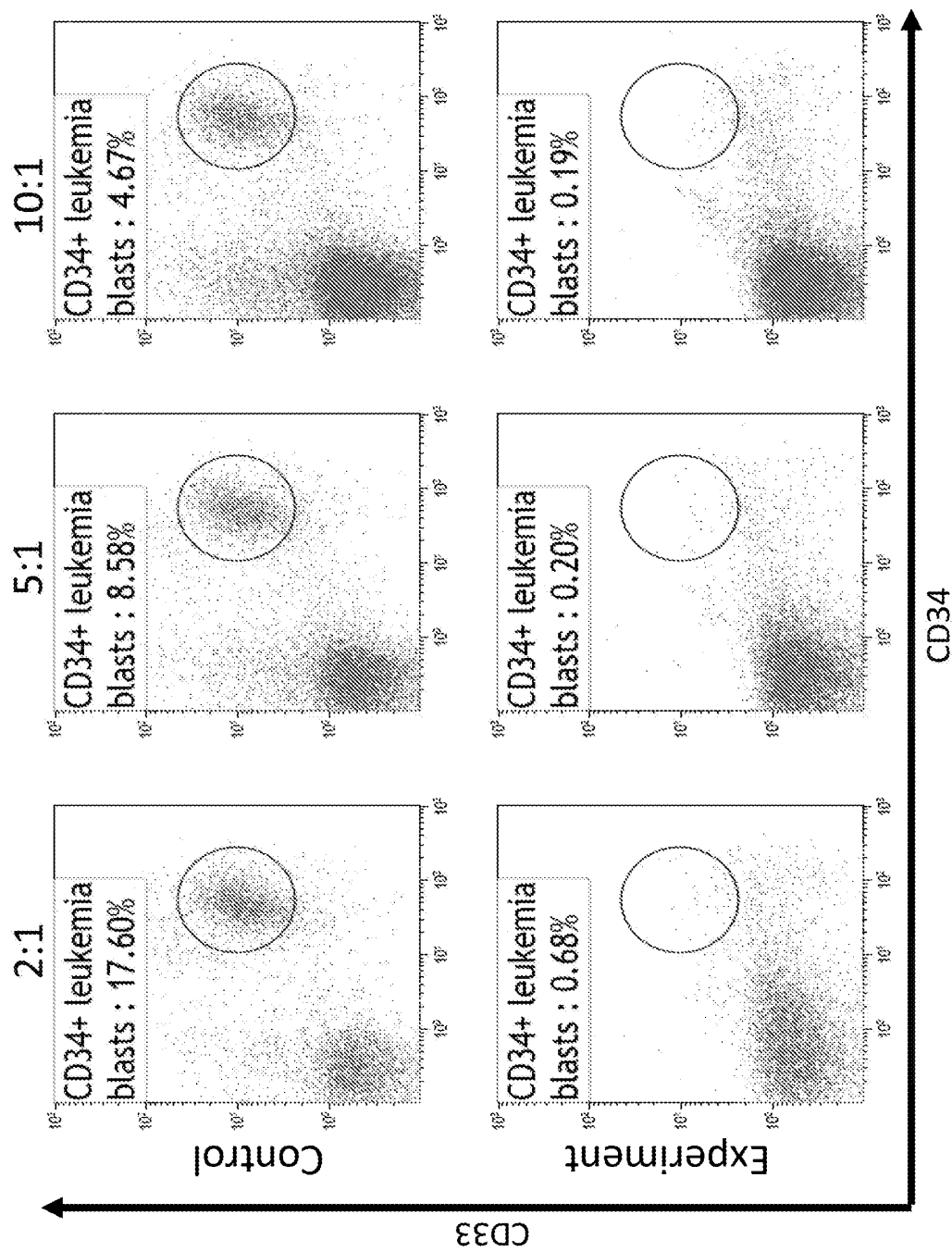
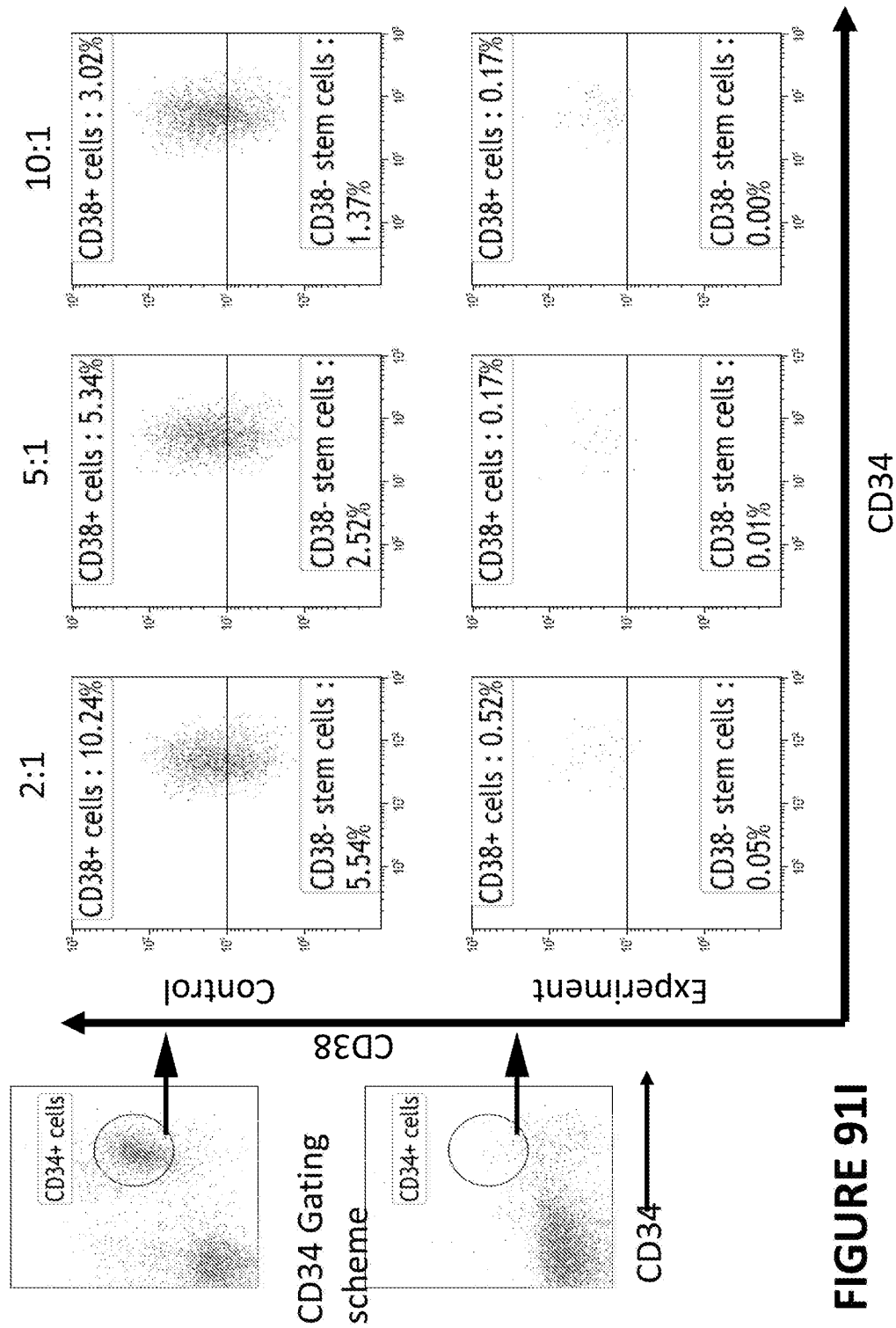


FIGURE 91H



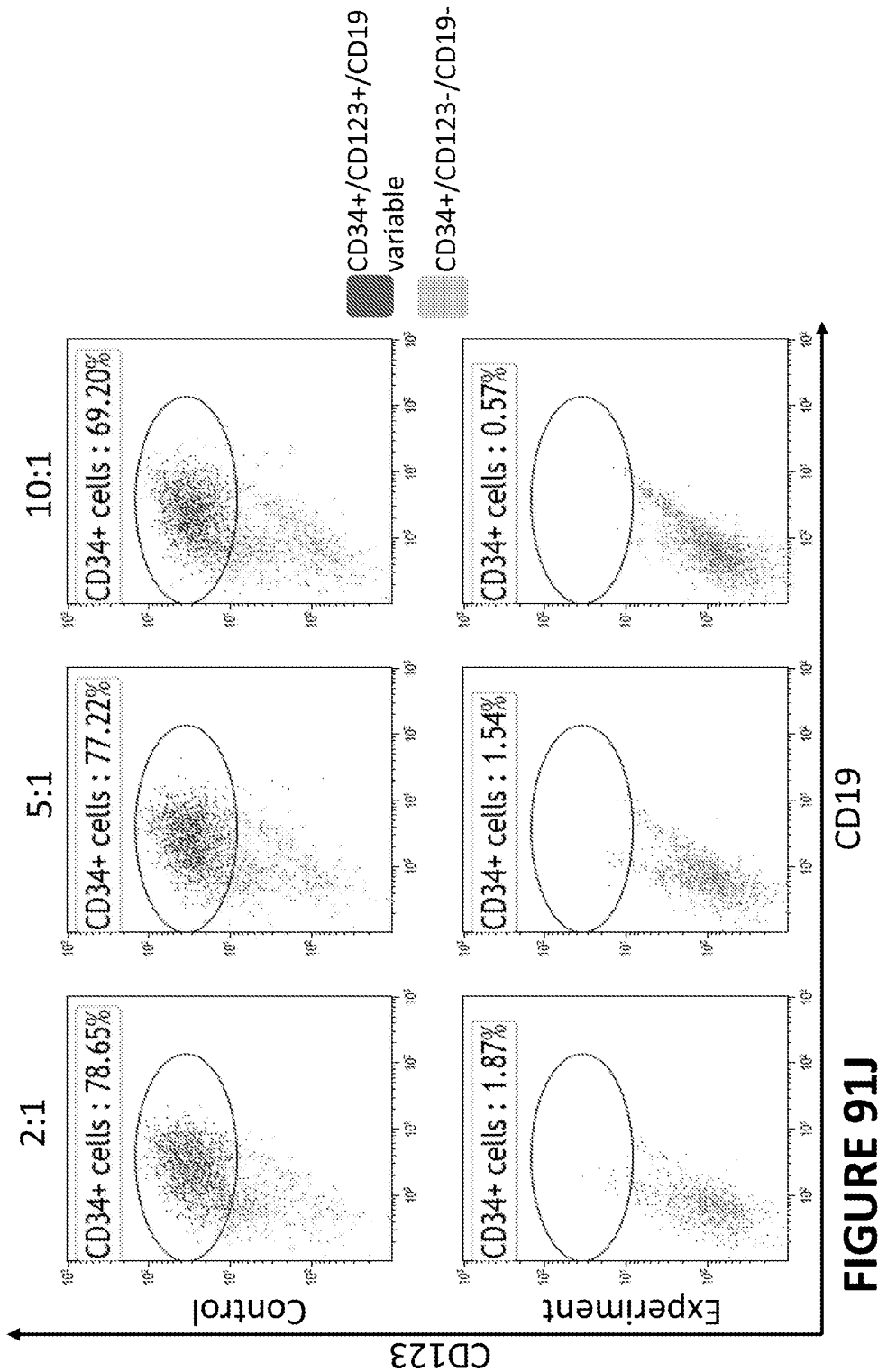


FIGURE 91J

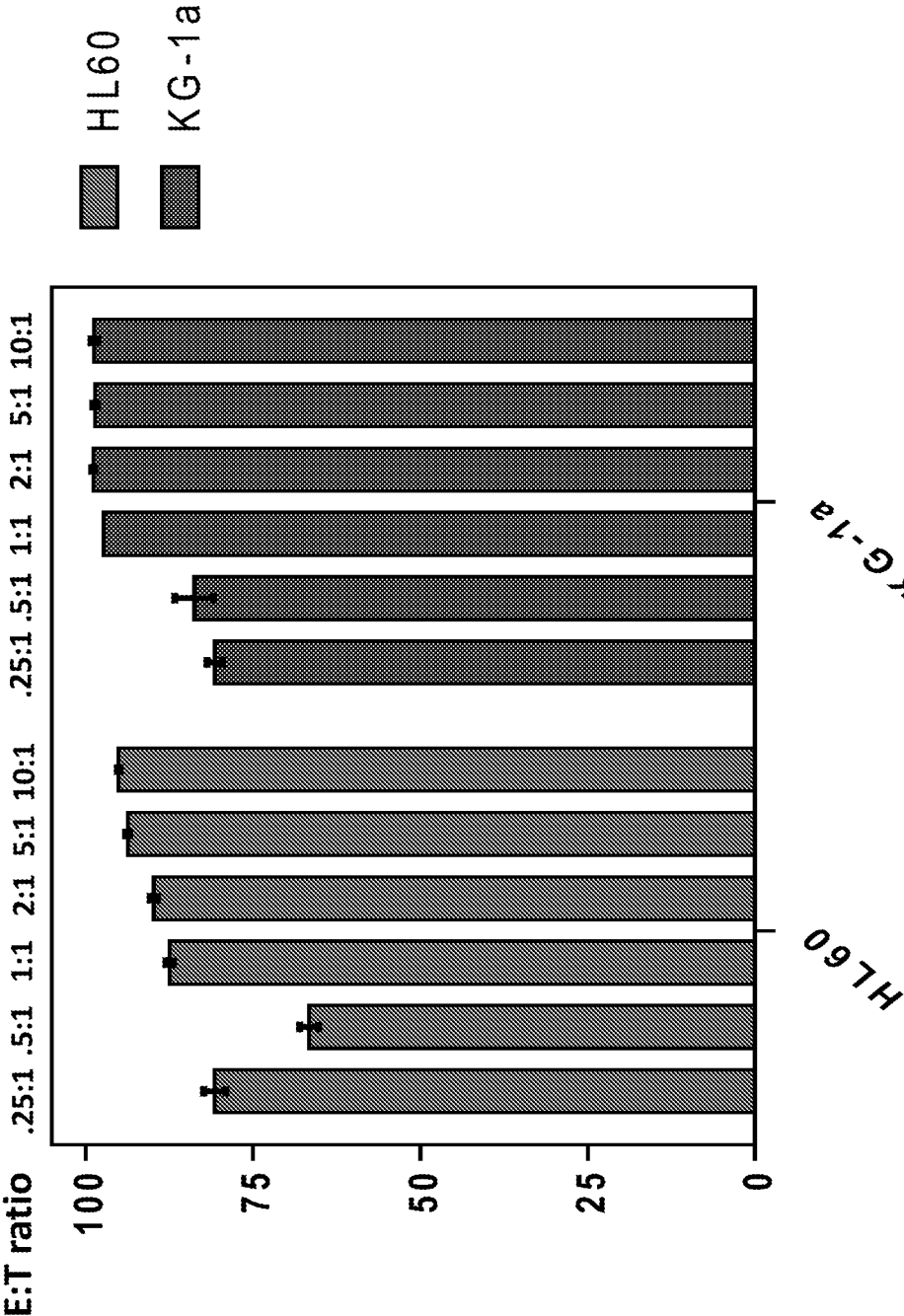
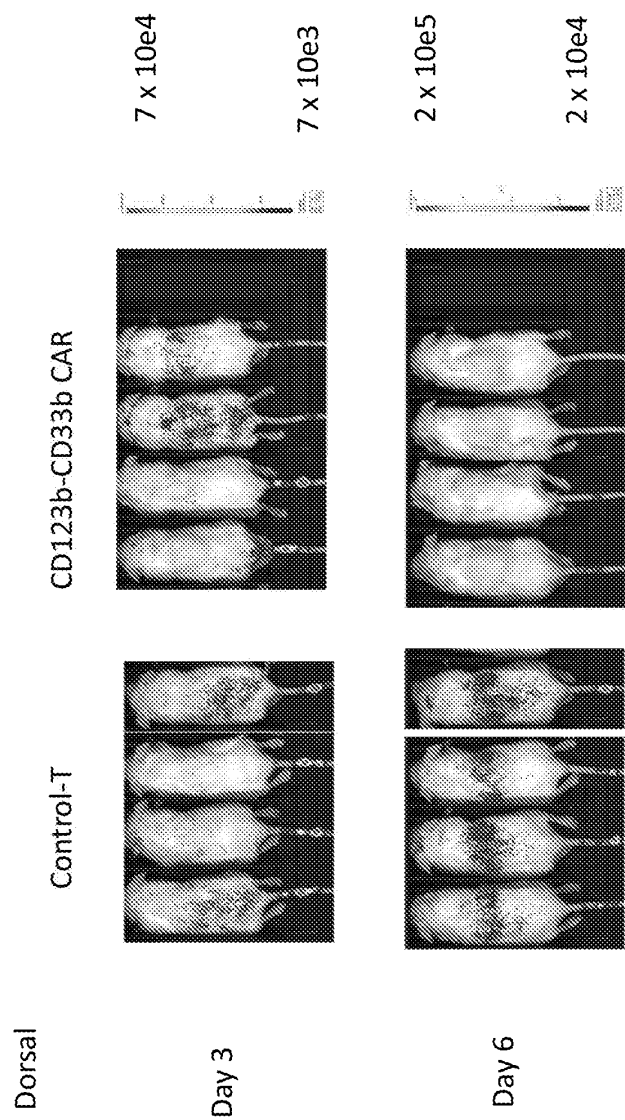
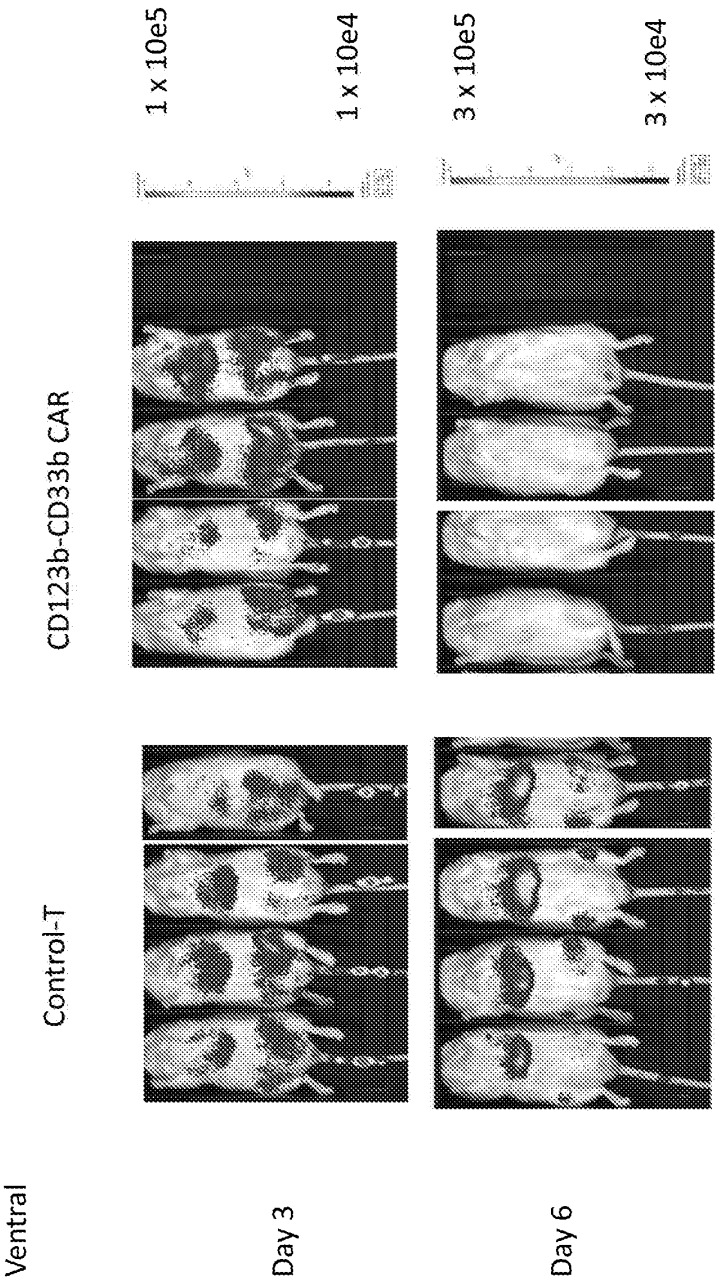


FIGURE 91 K



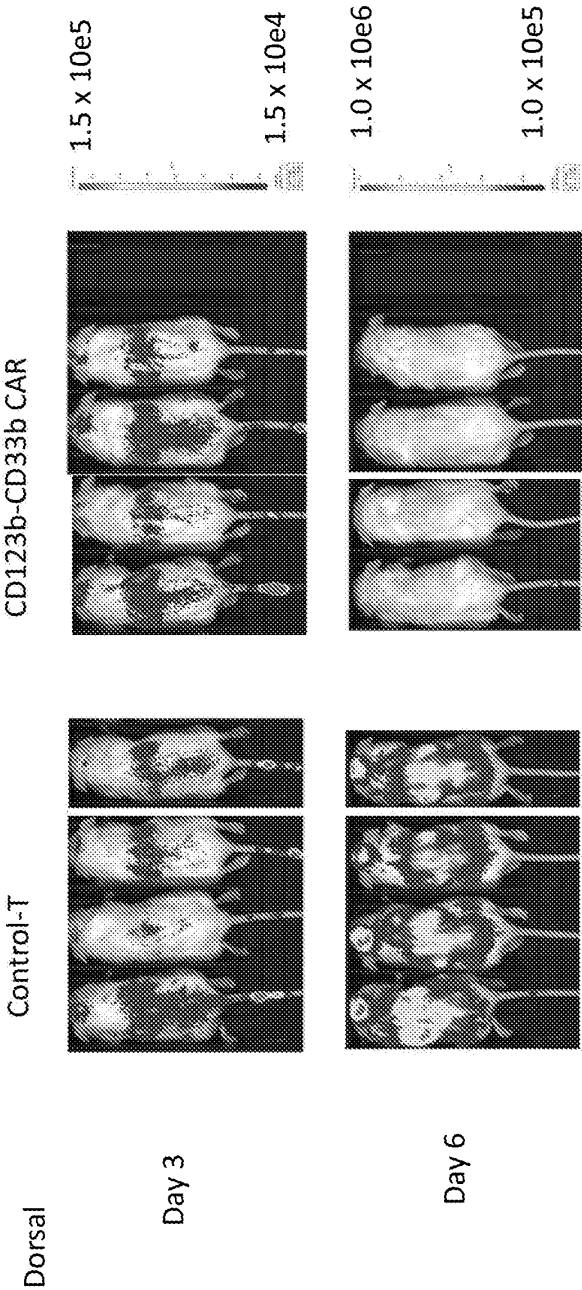
91% lysis, dorsal field in U937 leukemic mice

FIGURE 91 L



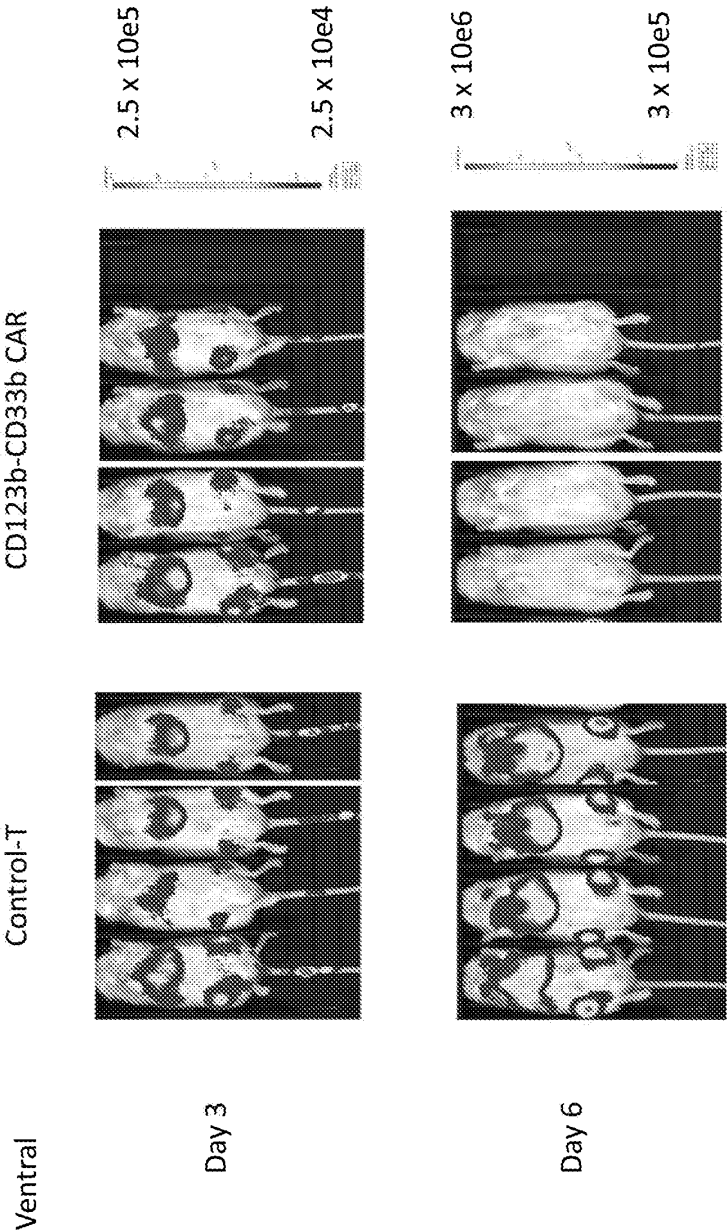
78% lysis, ventral field in U937 leukemic mice

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

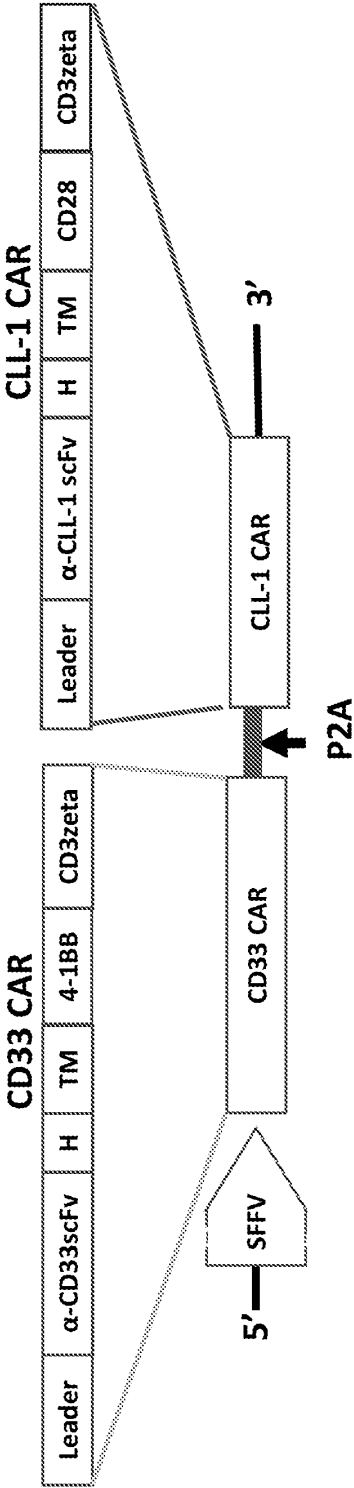
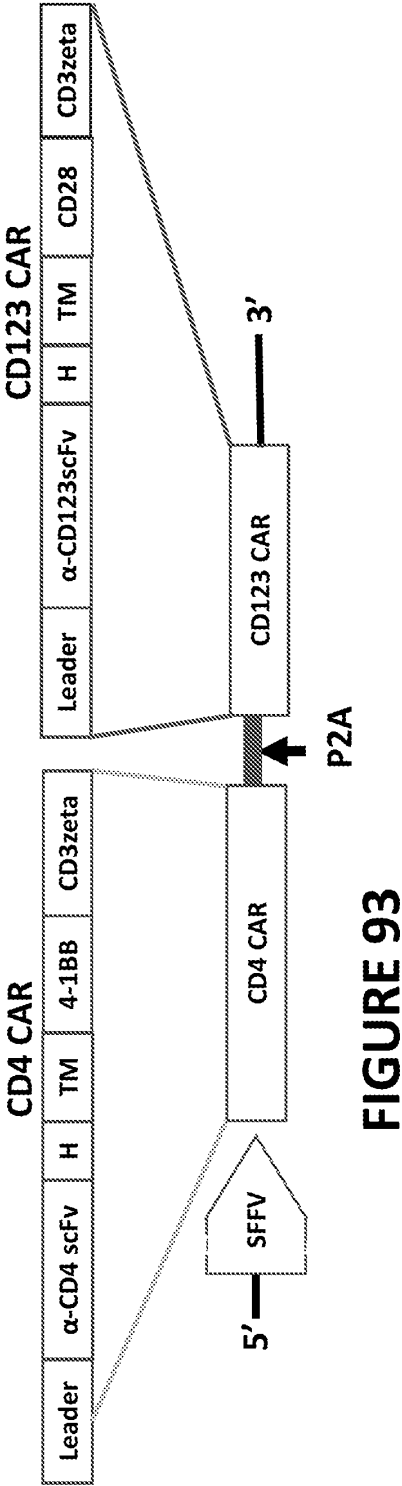
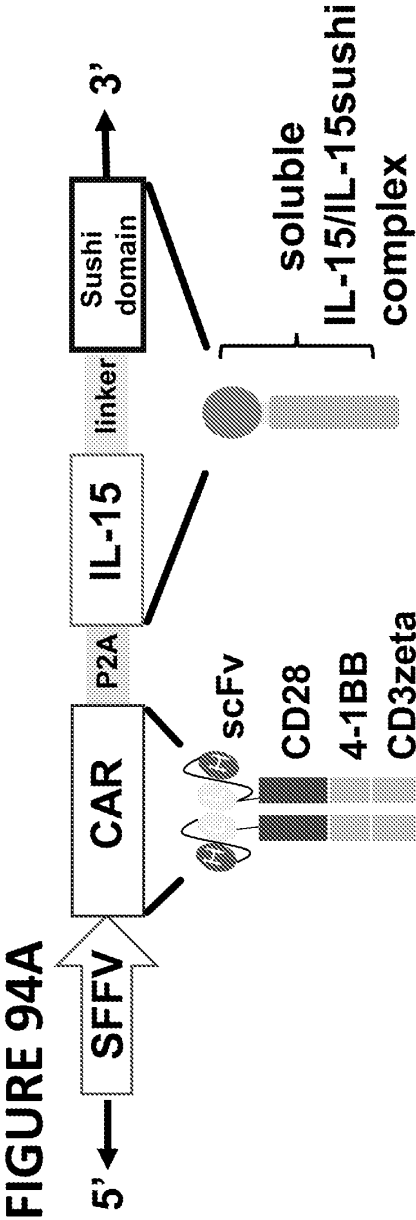
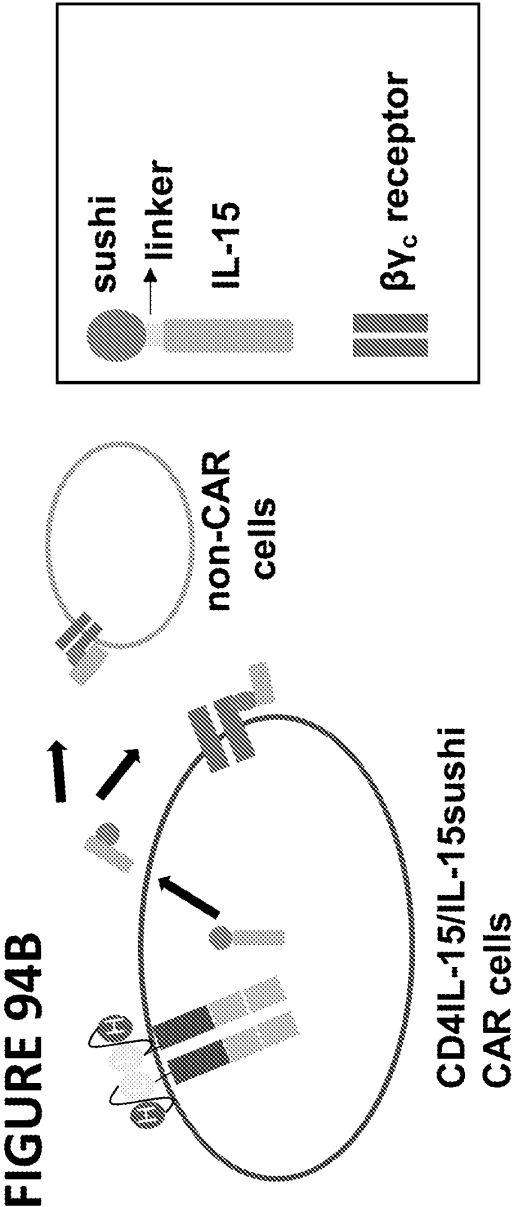
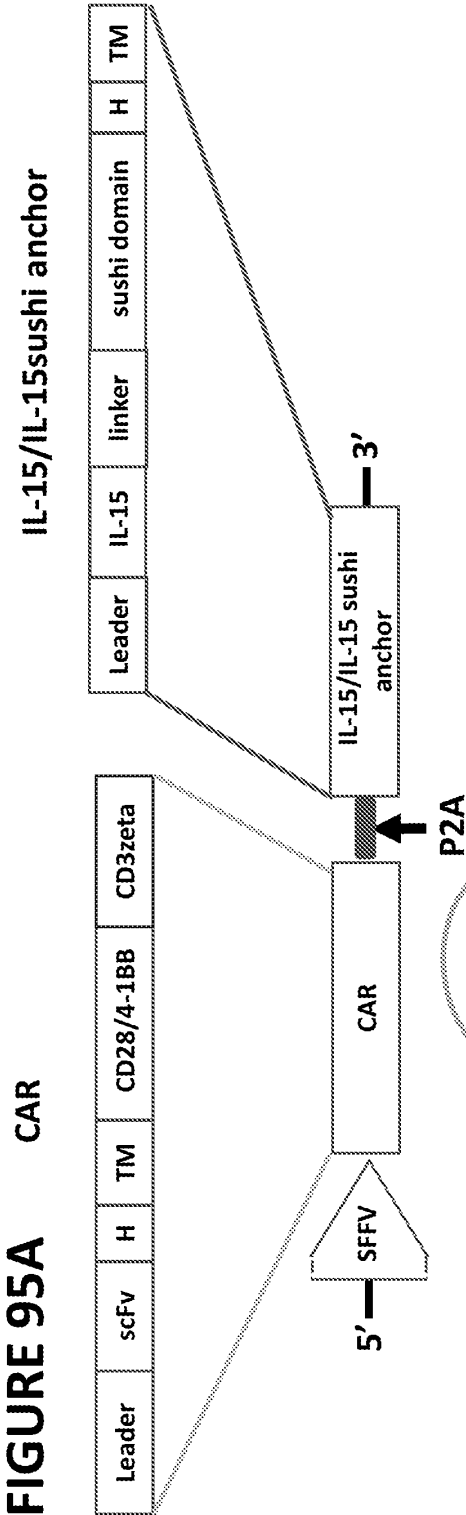
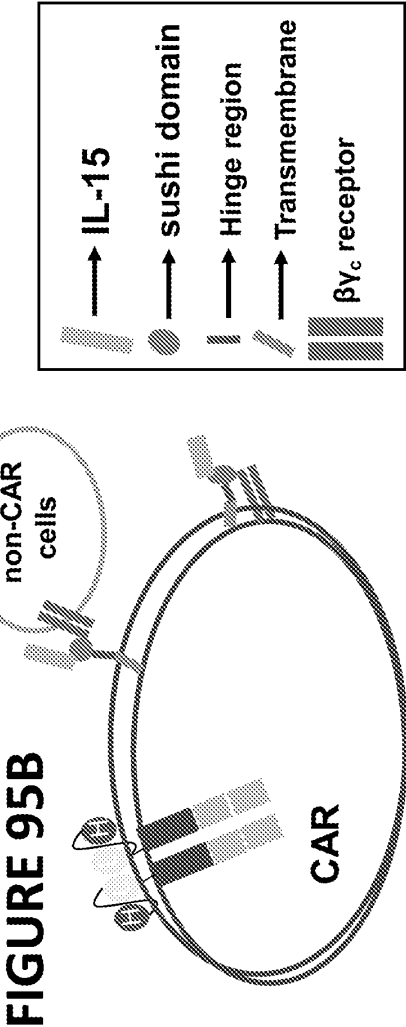


FIGURE 92







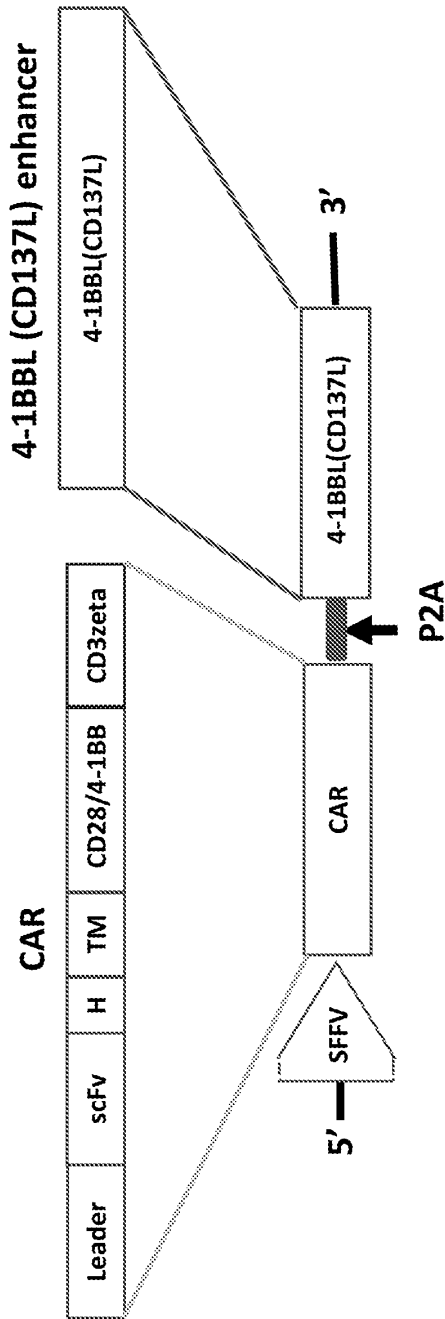


FIGURE 96A

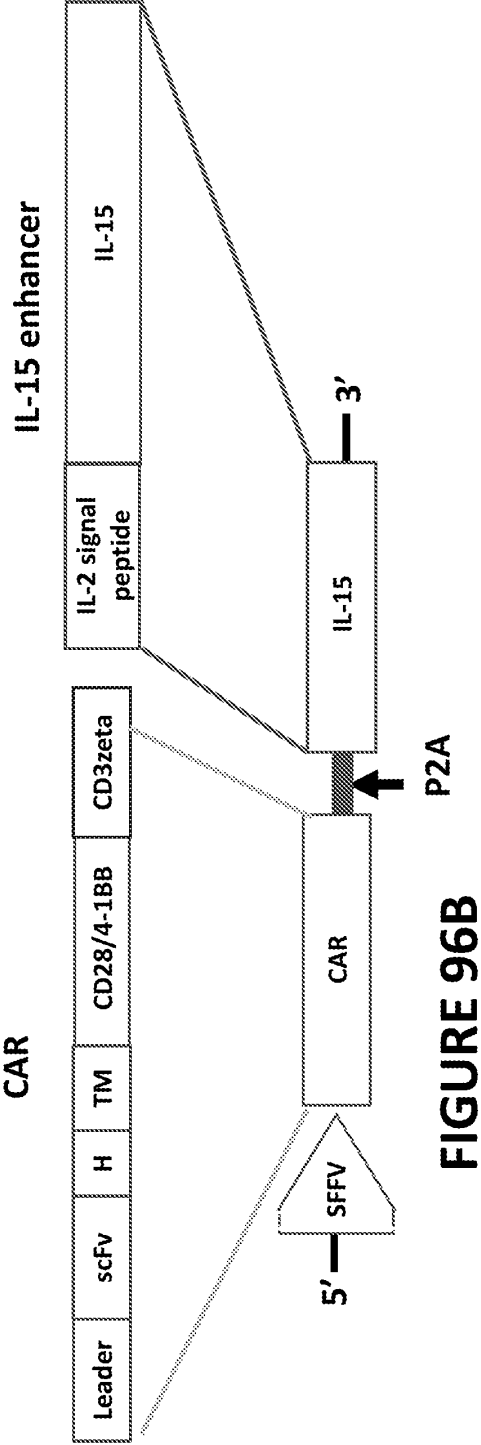


FIGURE 96B

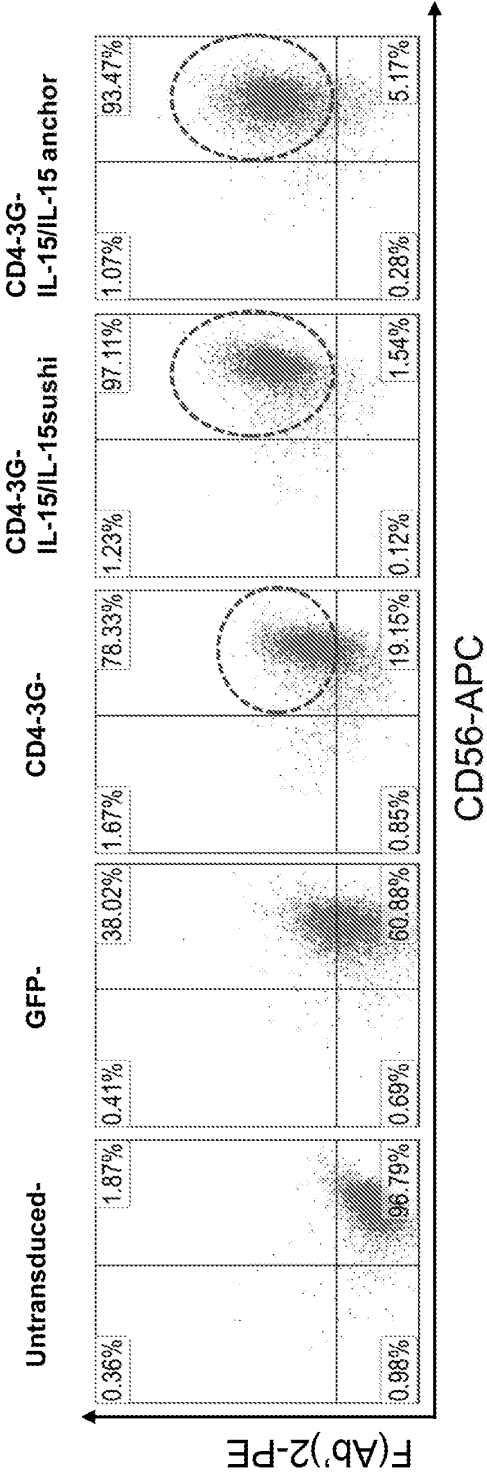


FIGURE 97A

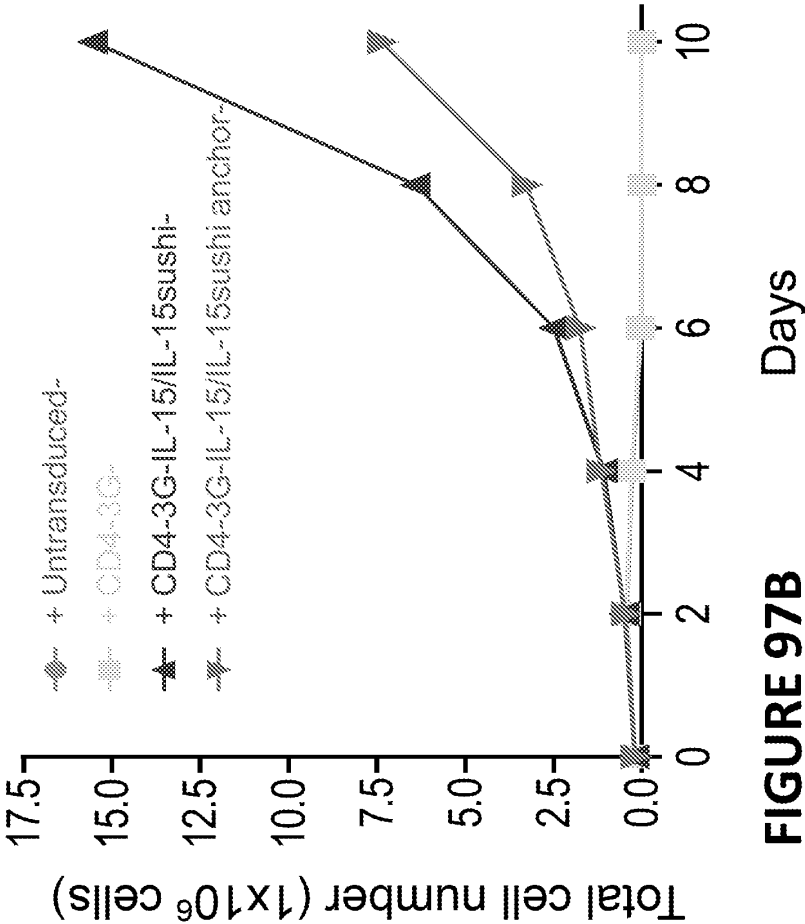


FIGURE 97B

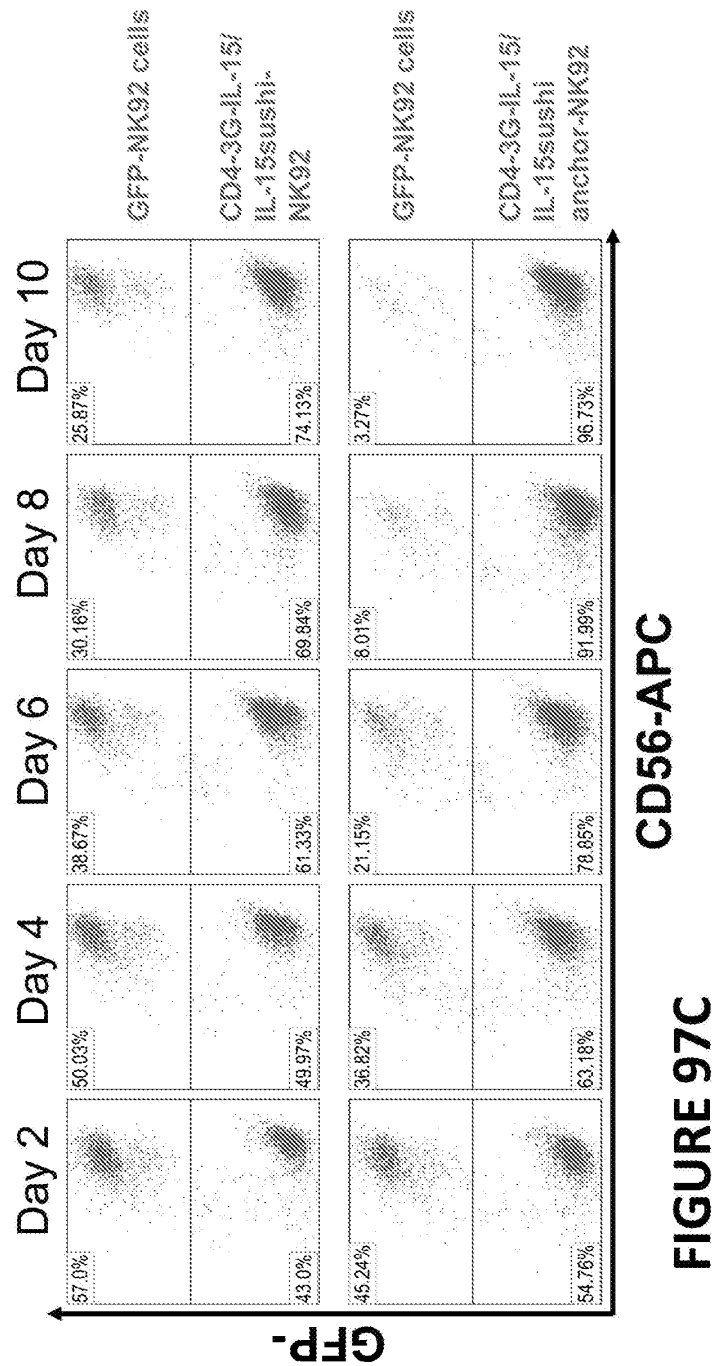


FIGURE 97C

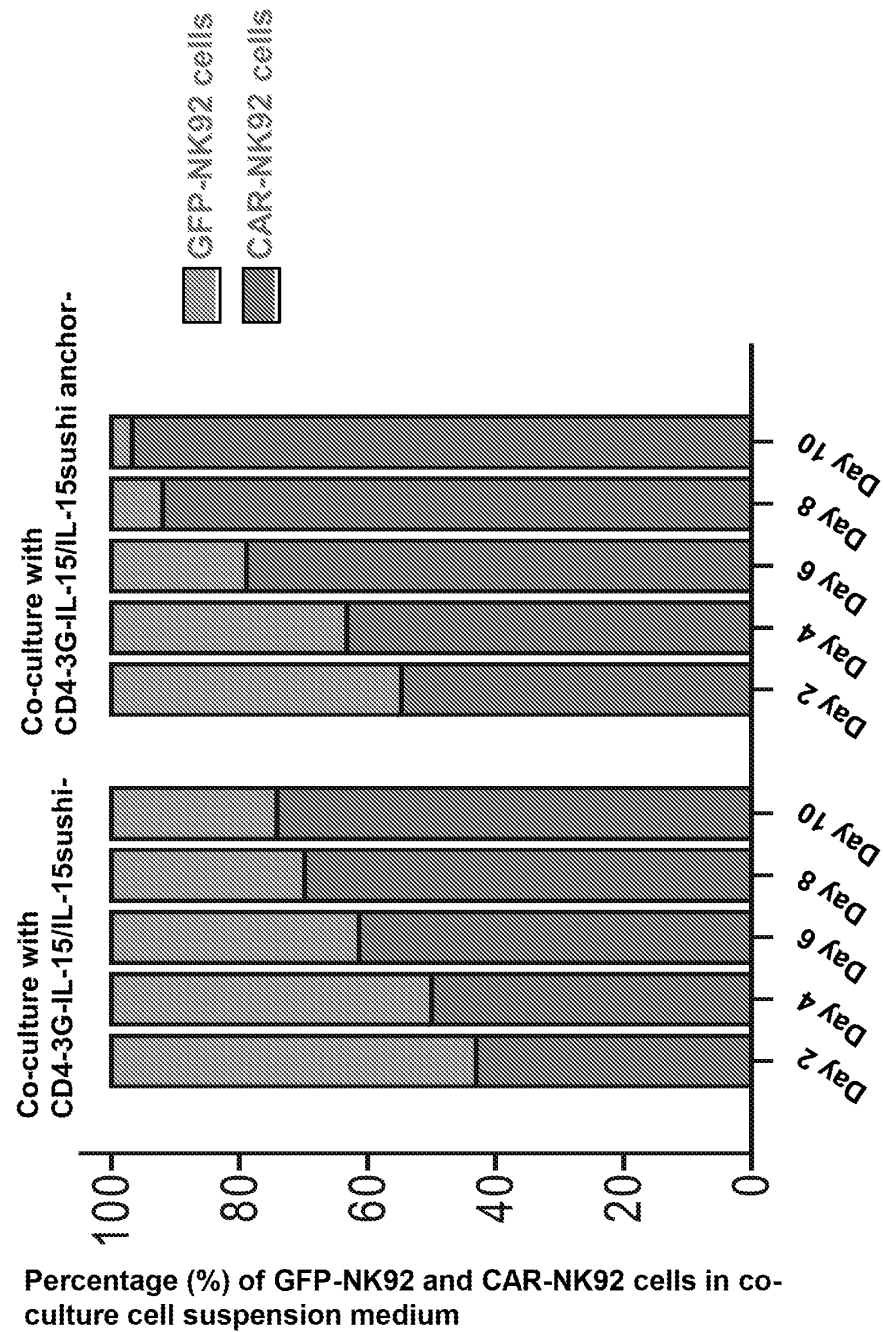


FIGURE 97D

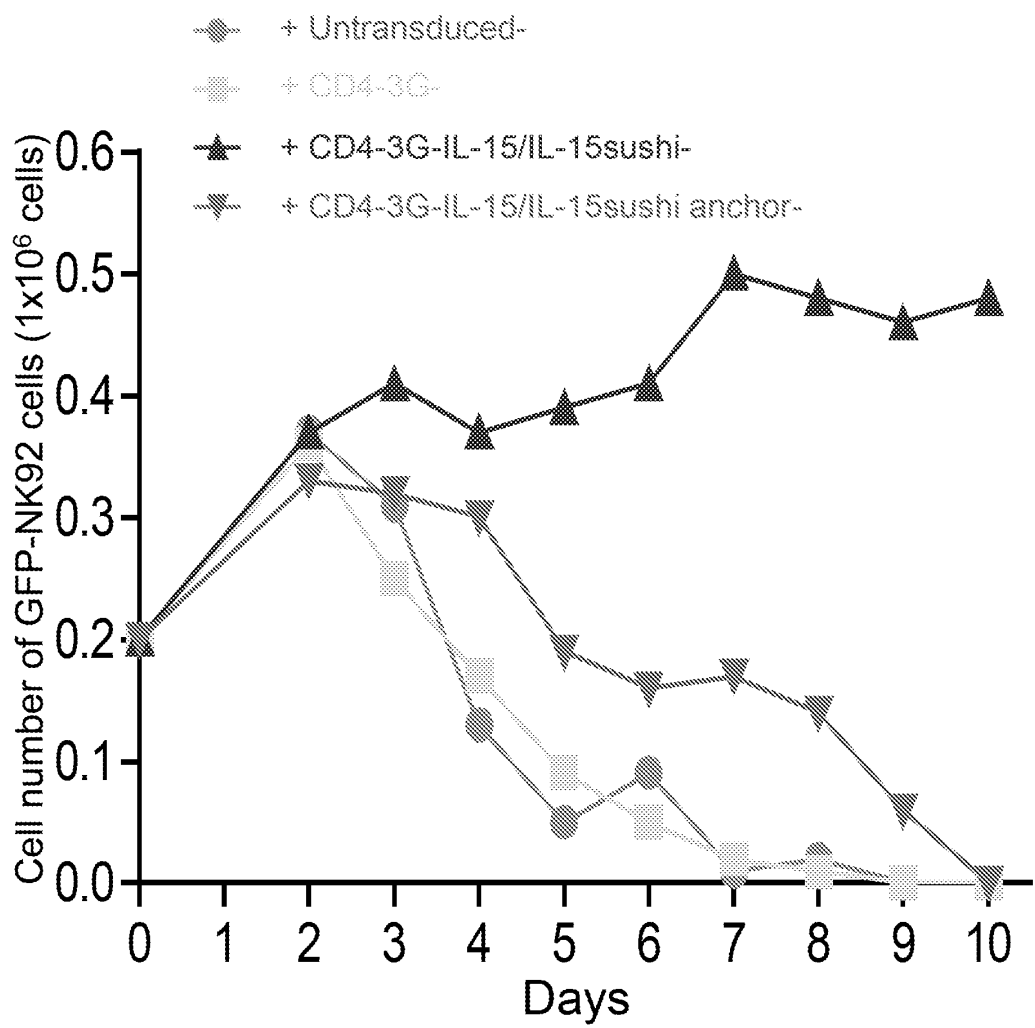


FIGURE 97E

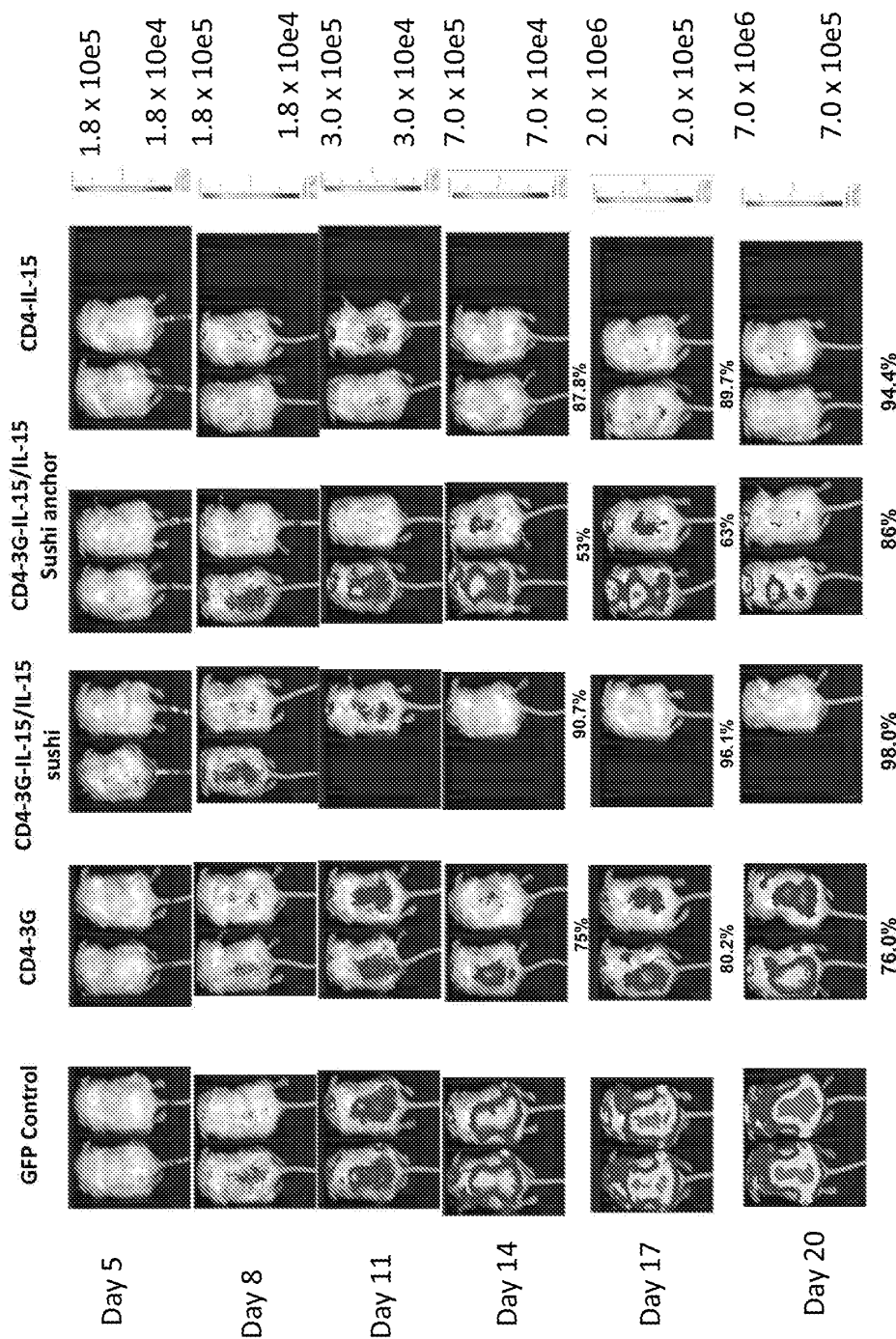


FIGURE 97F

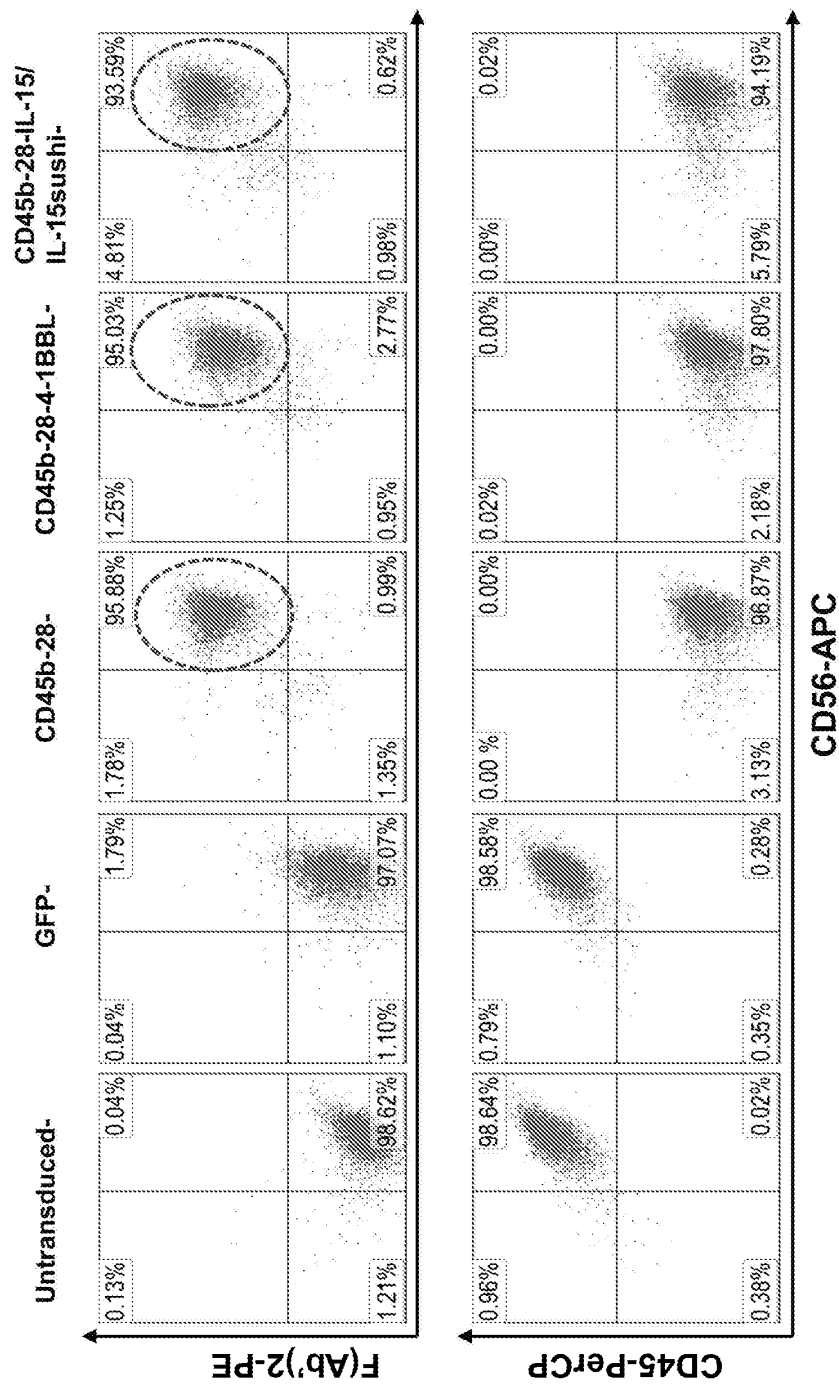


FIGURE 98A

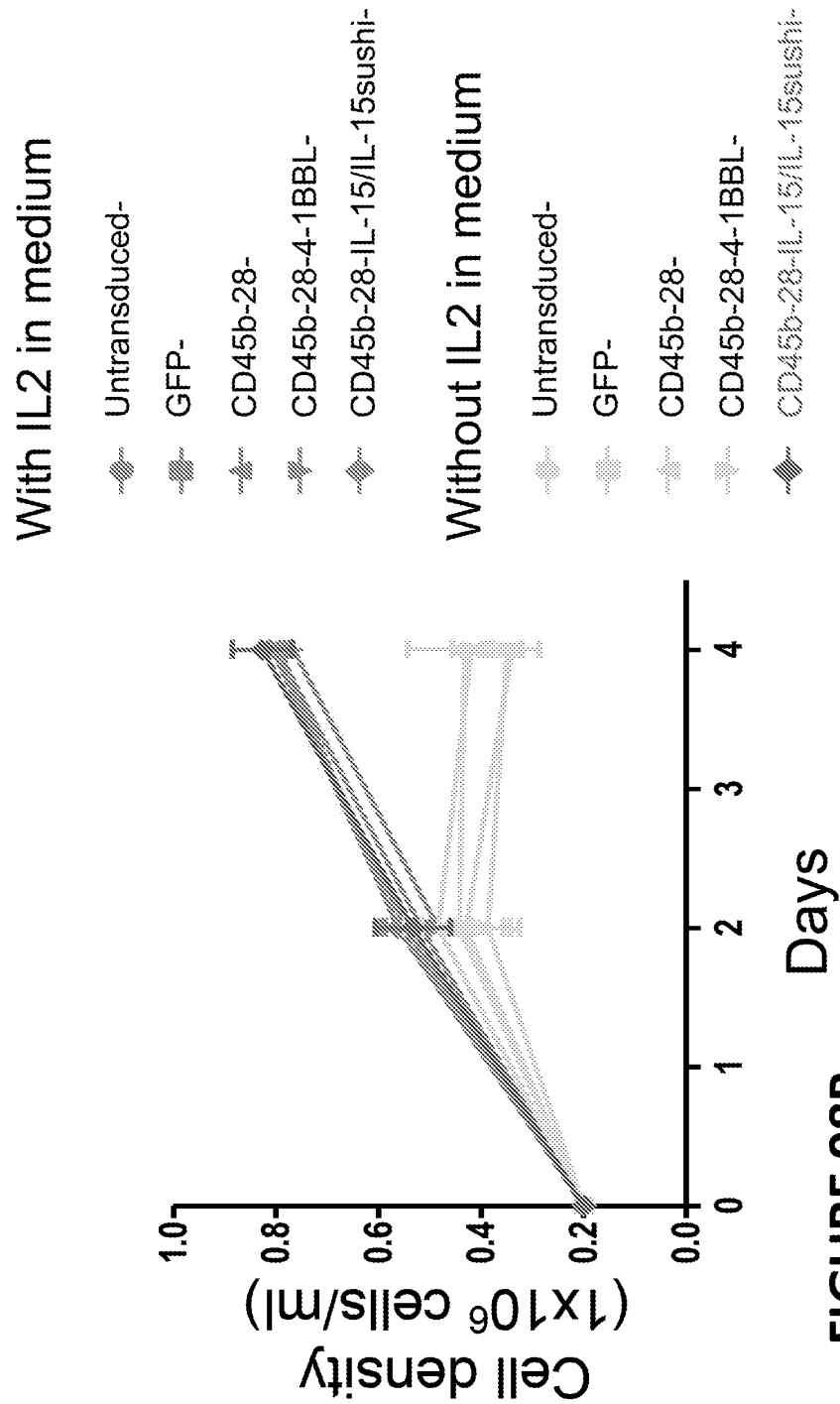
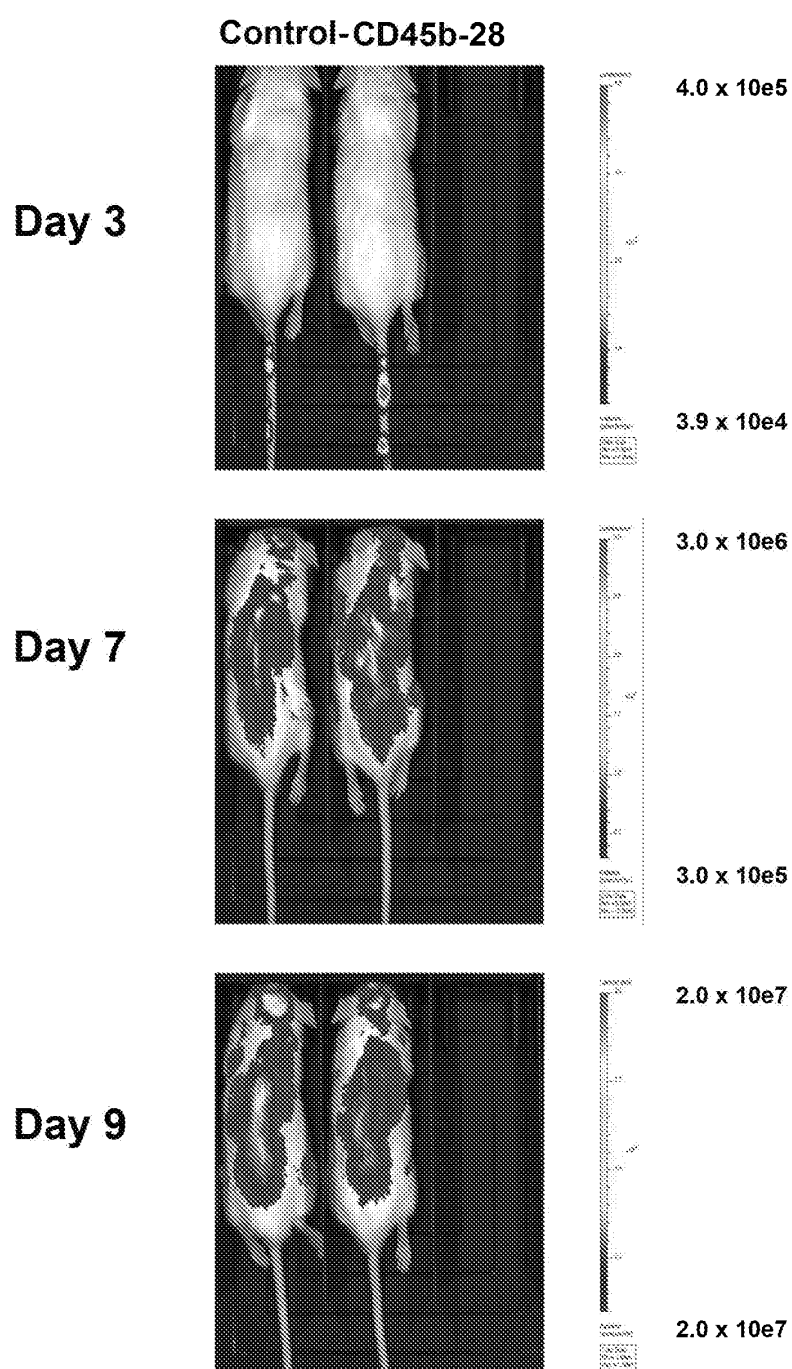


FIGURE 98B

**FIGURE 98C**

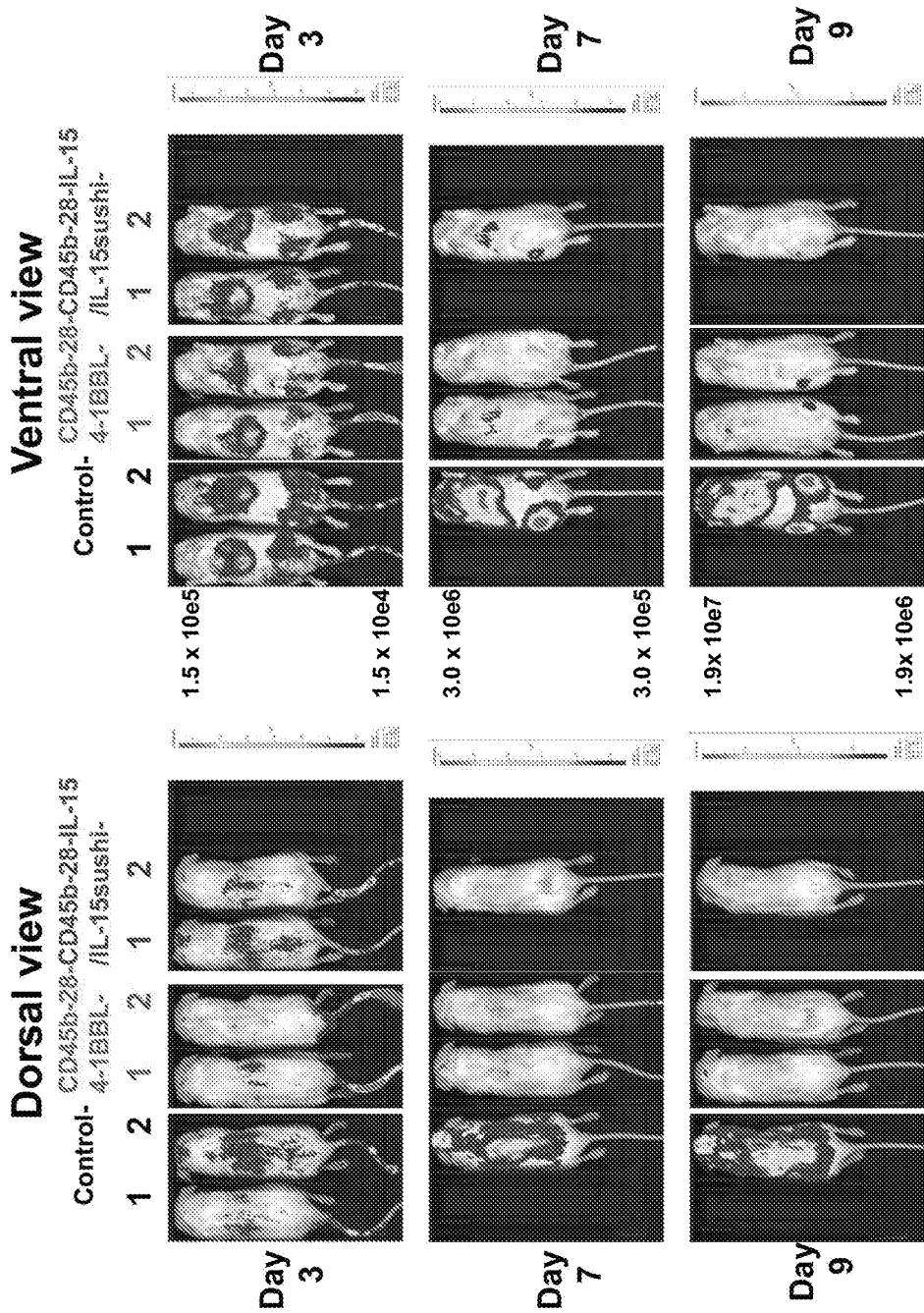


FIGURE 98D

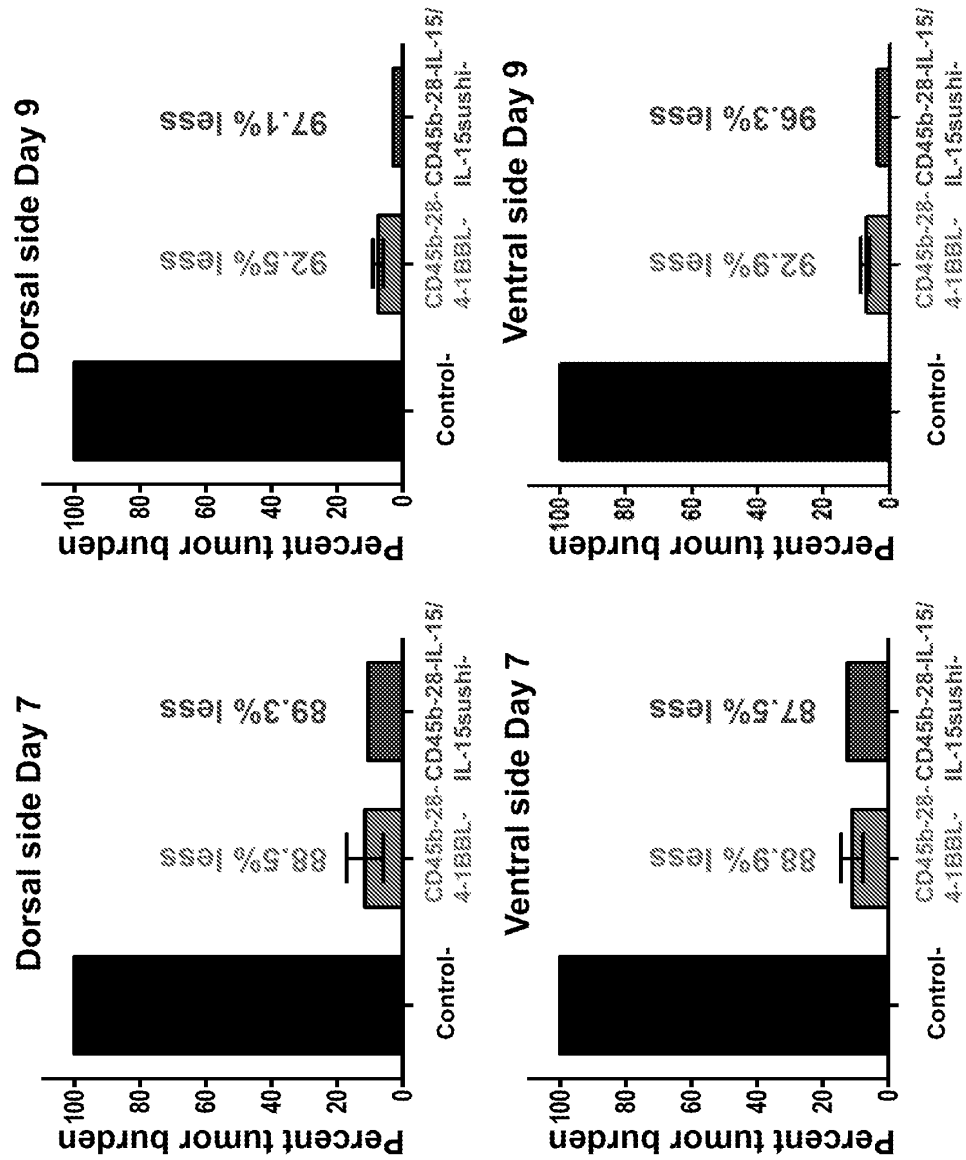


FIGURE 98E

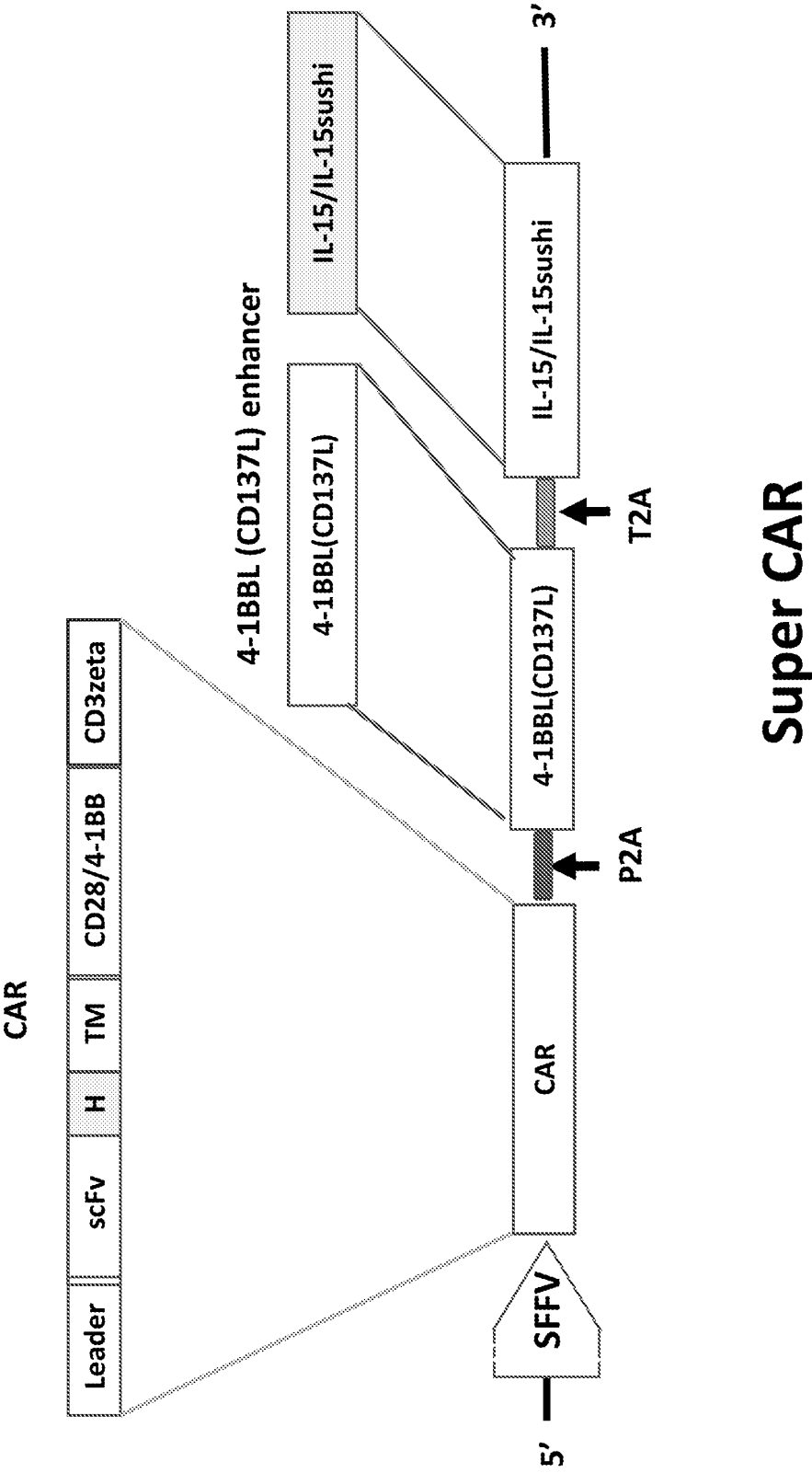


FIGURE 98F

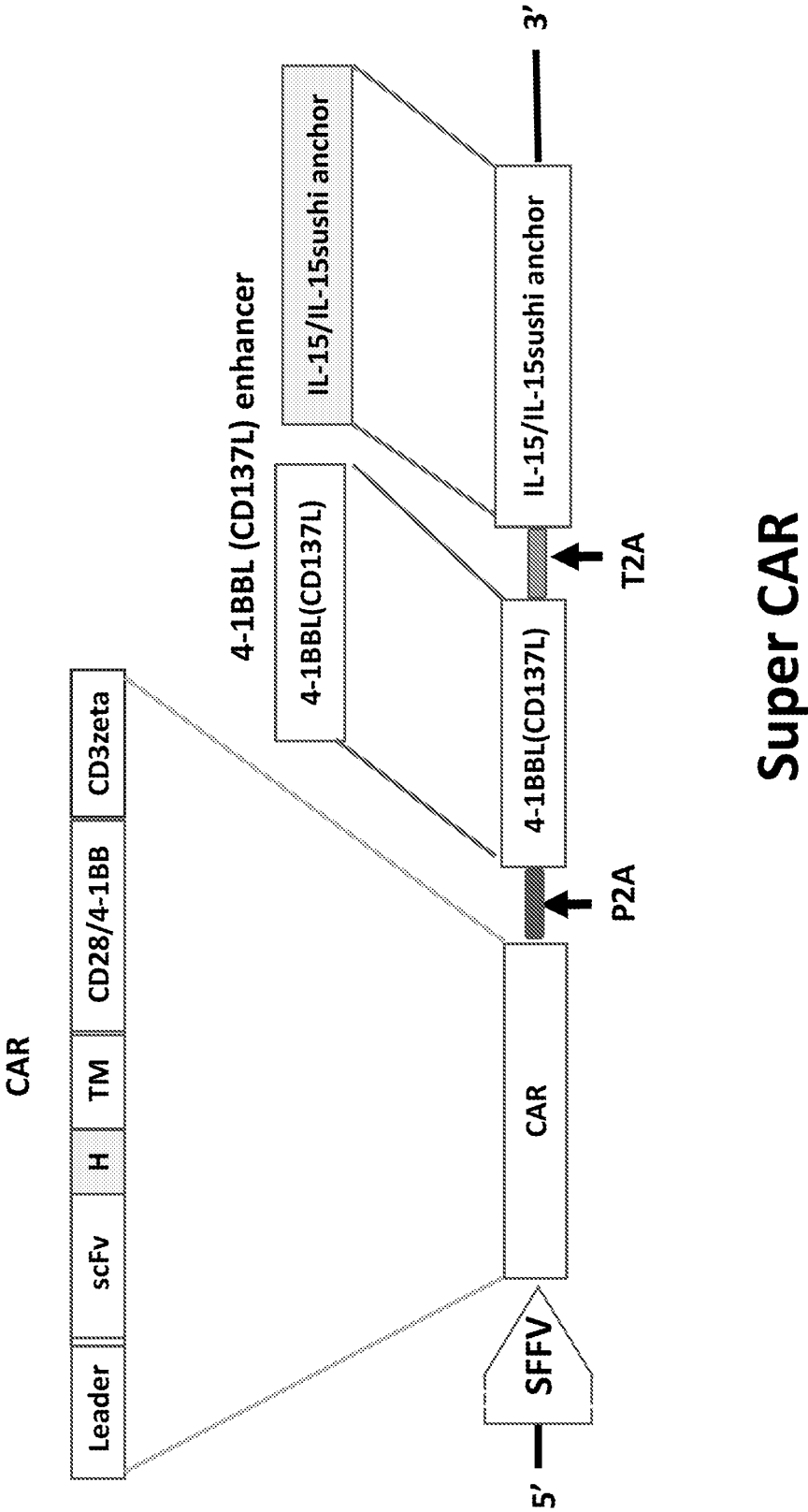


FIGURE 98G

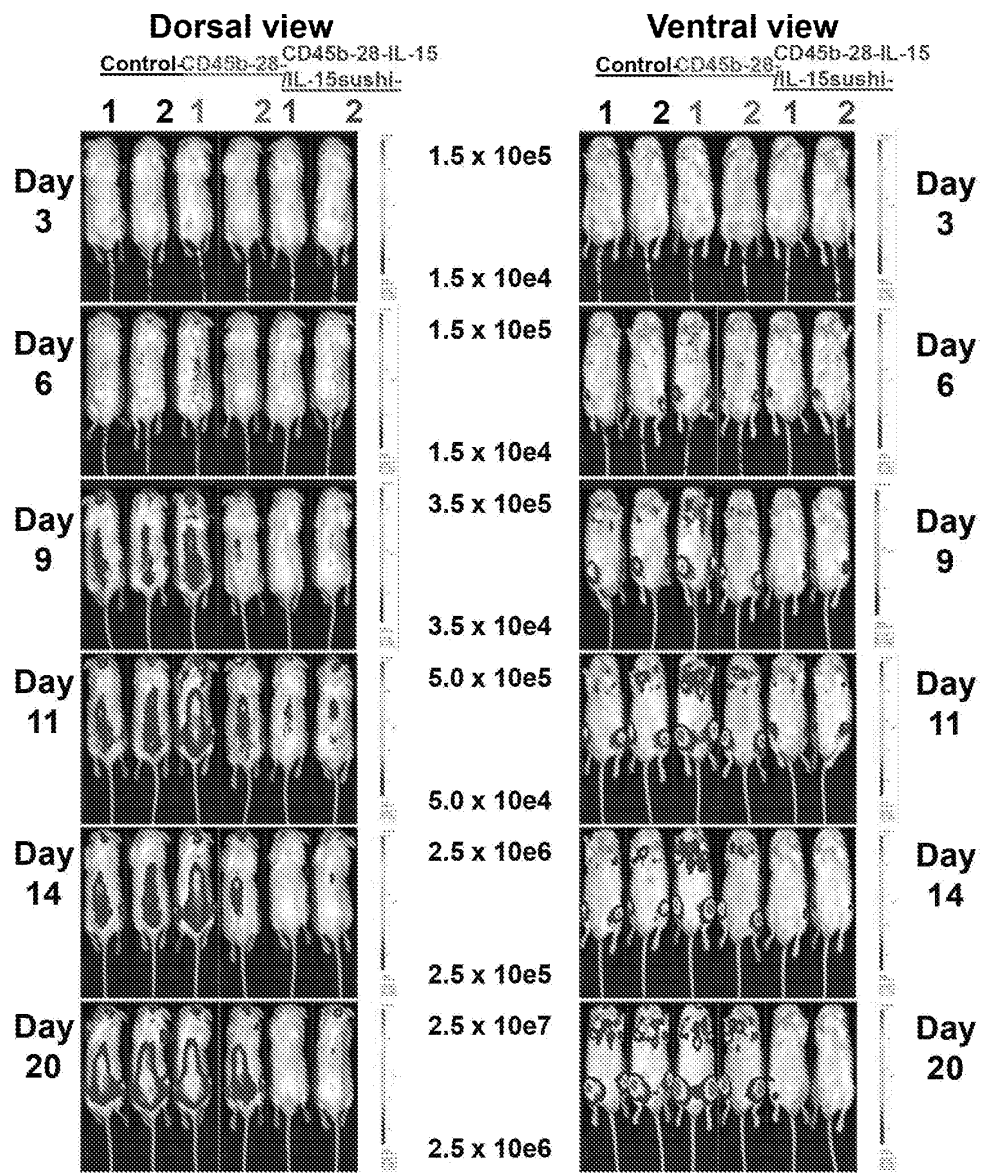


FIGURE 99A

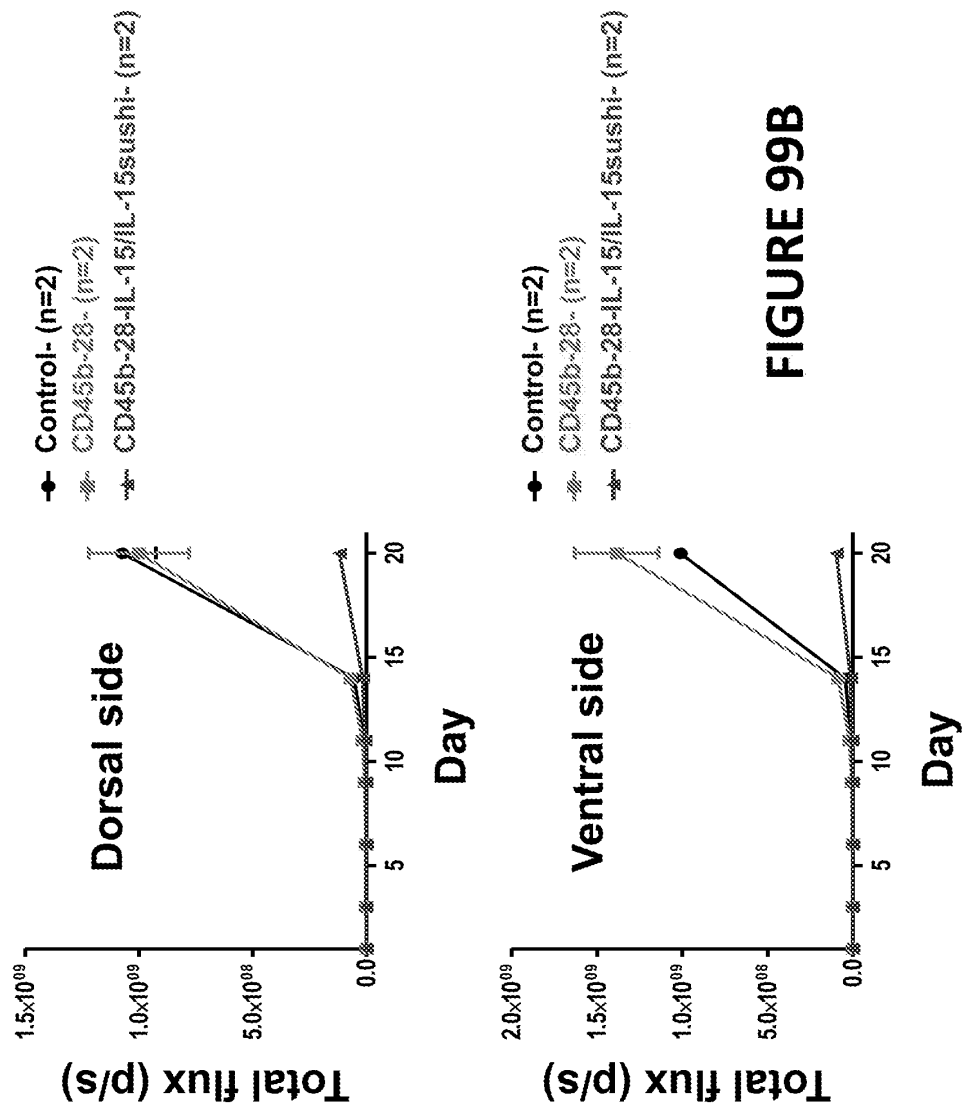


FIGURE 99B

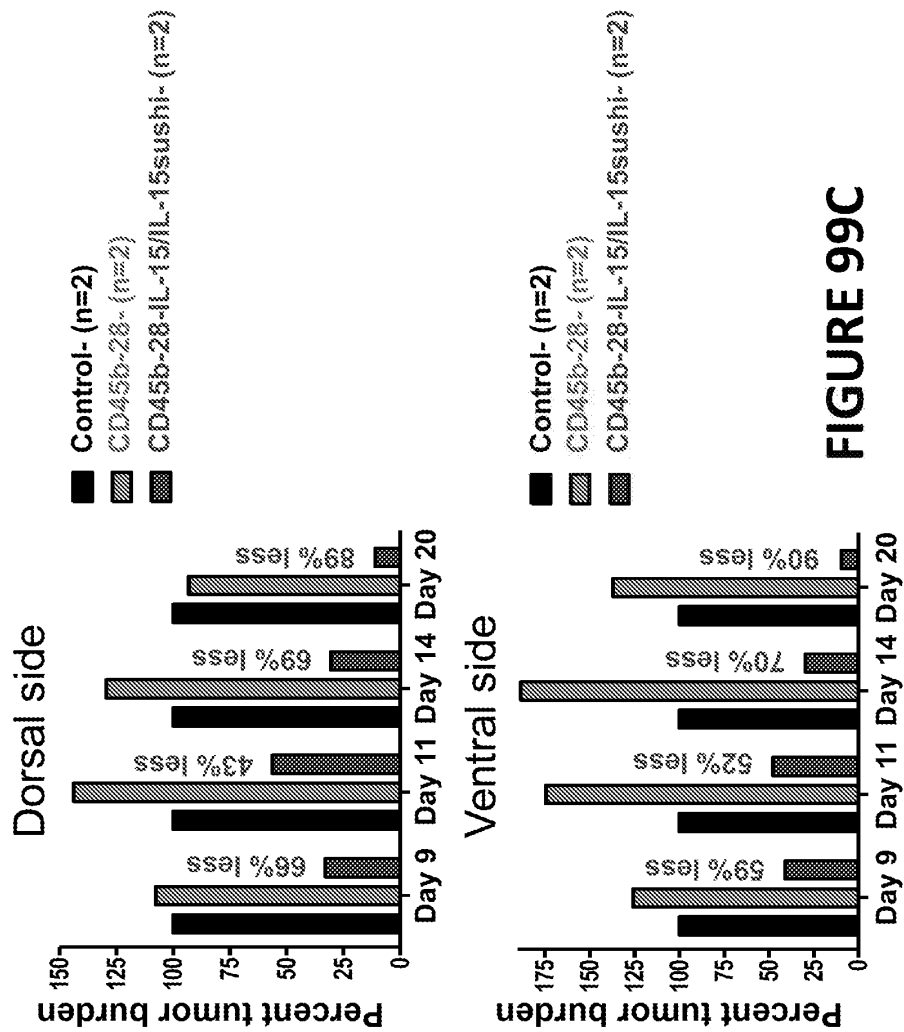
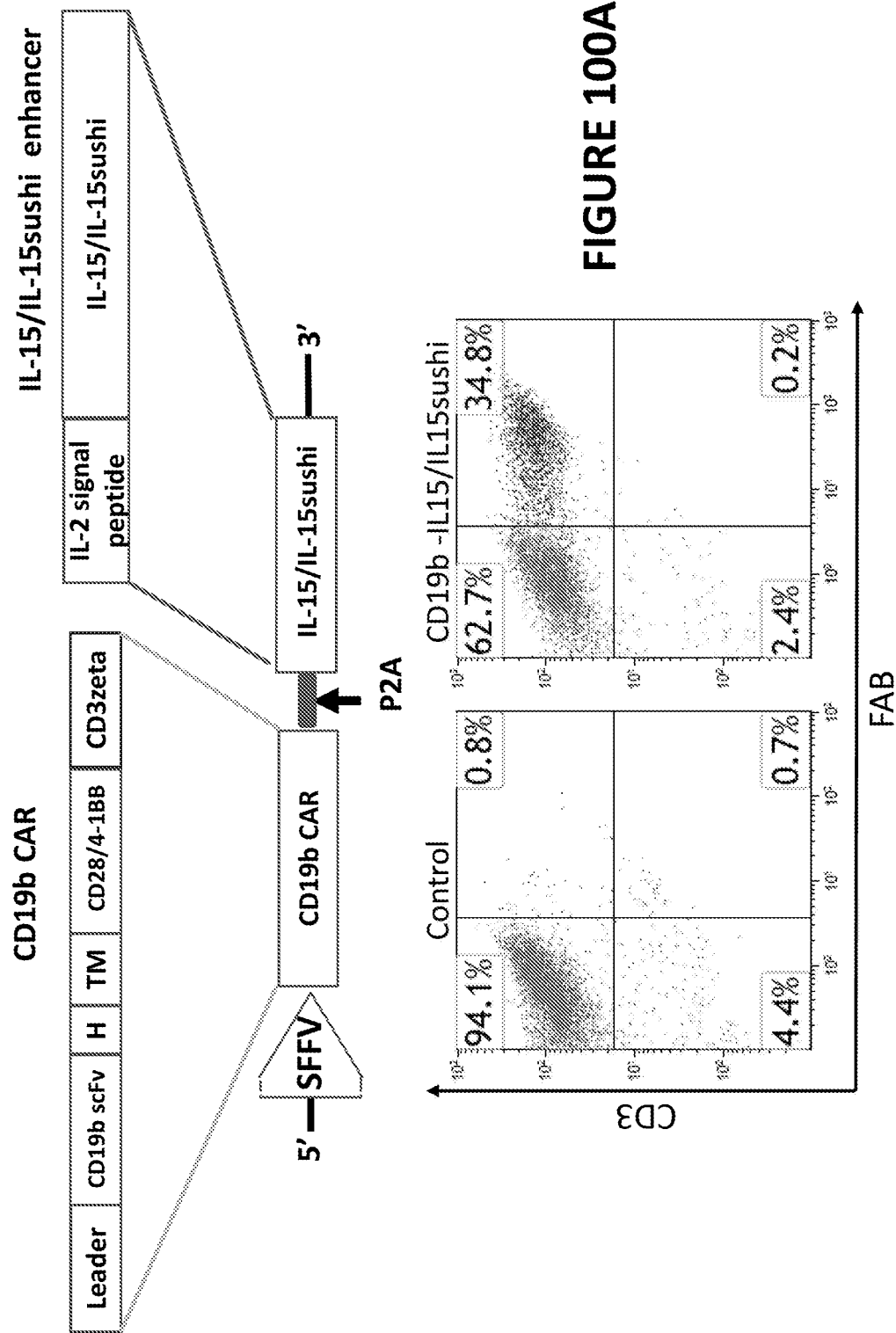


FIGURE 99C



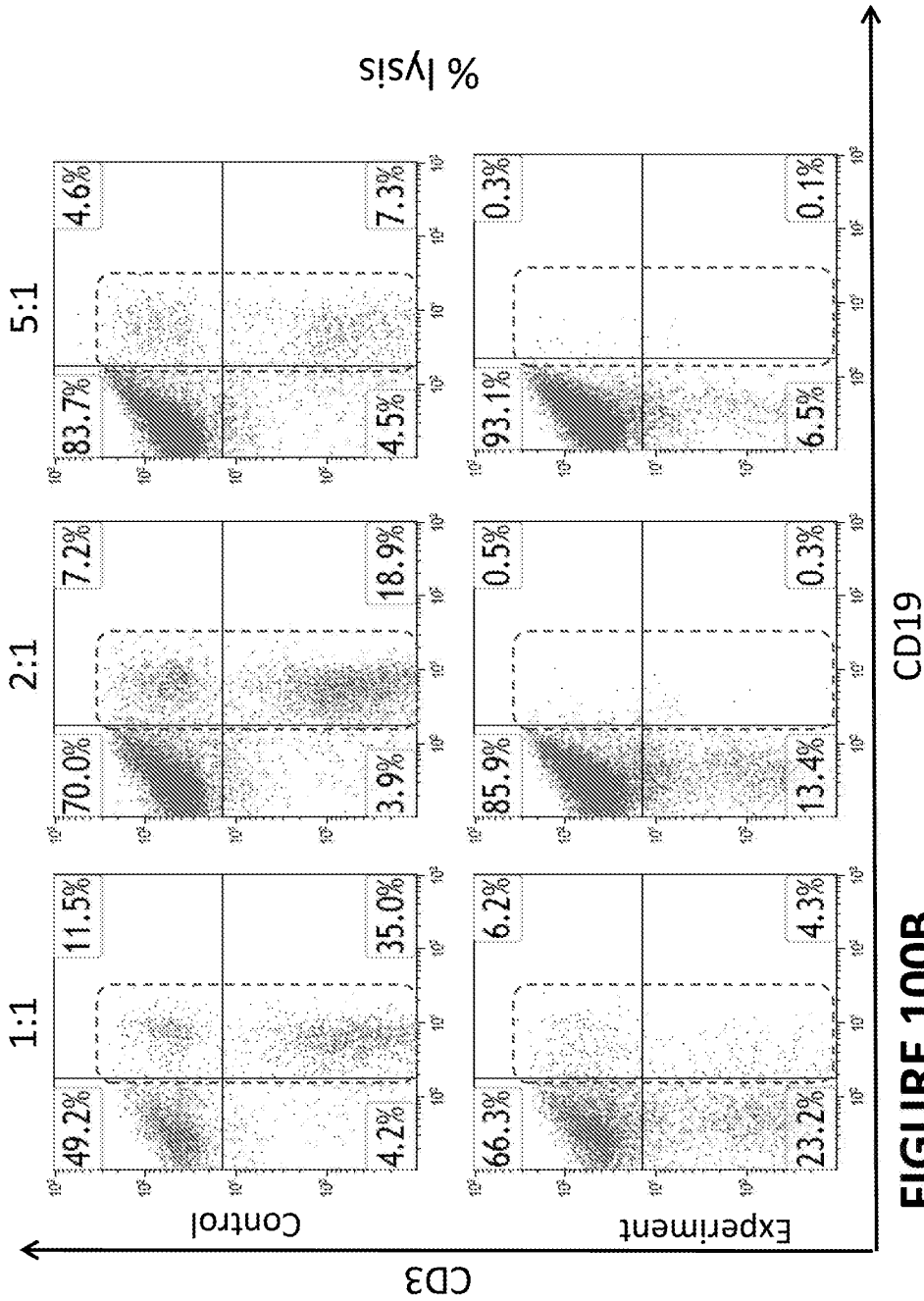
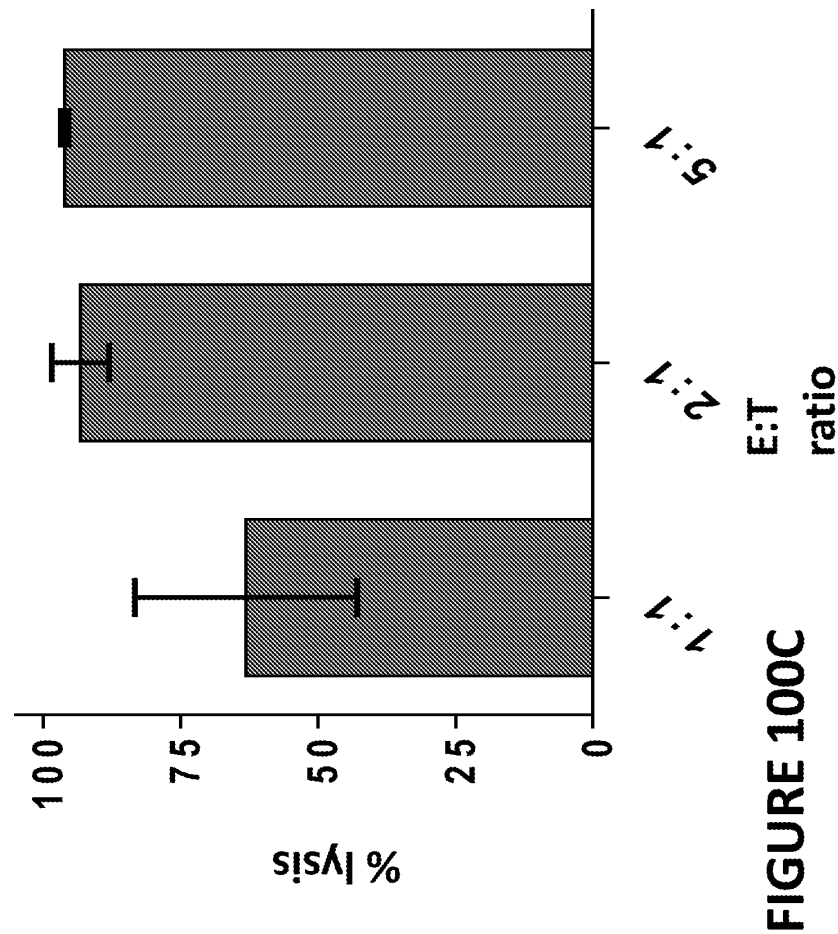


FIGURE 100B



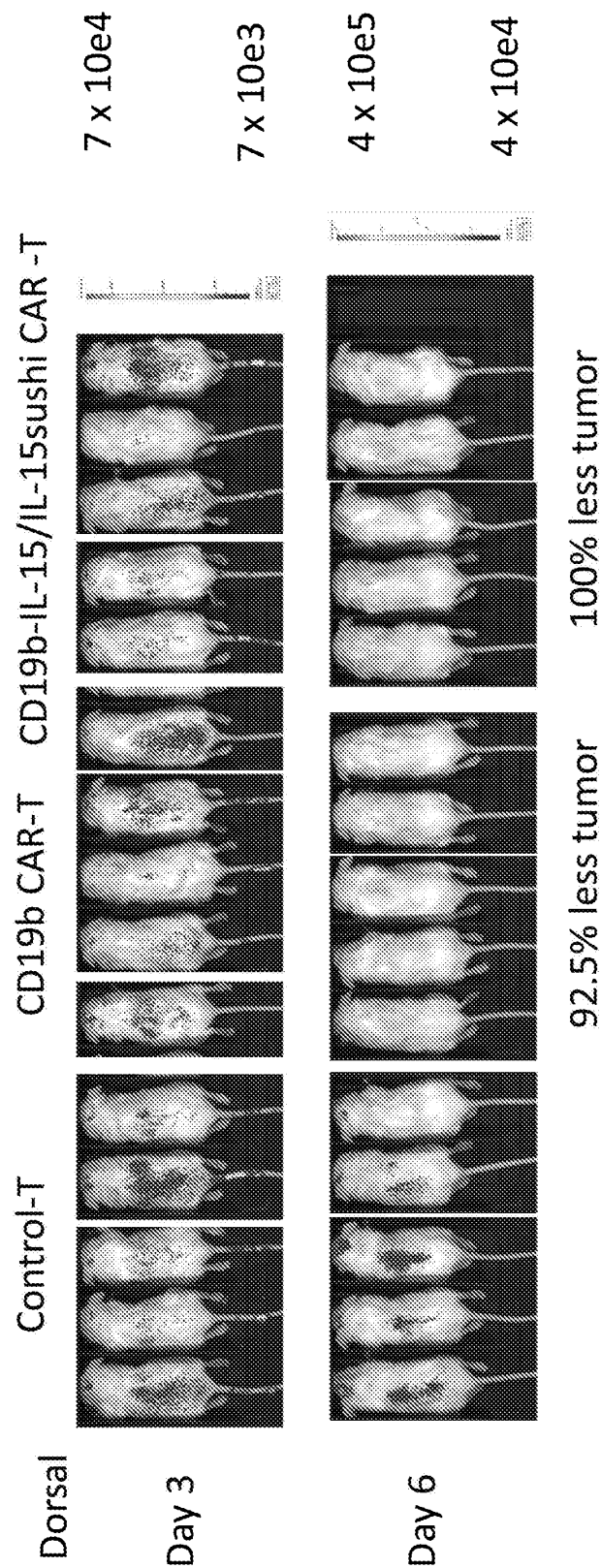


FIGURE 100D

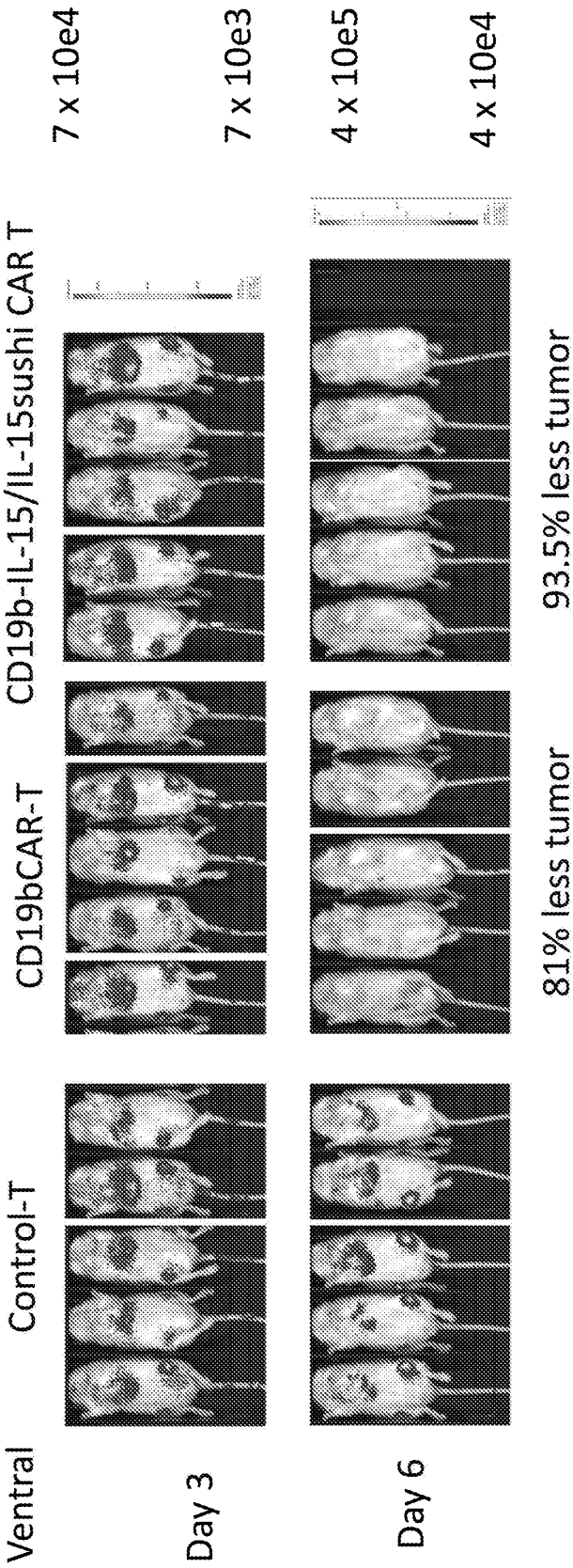


FIGURE 100E

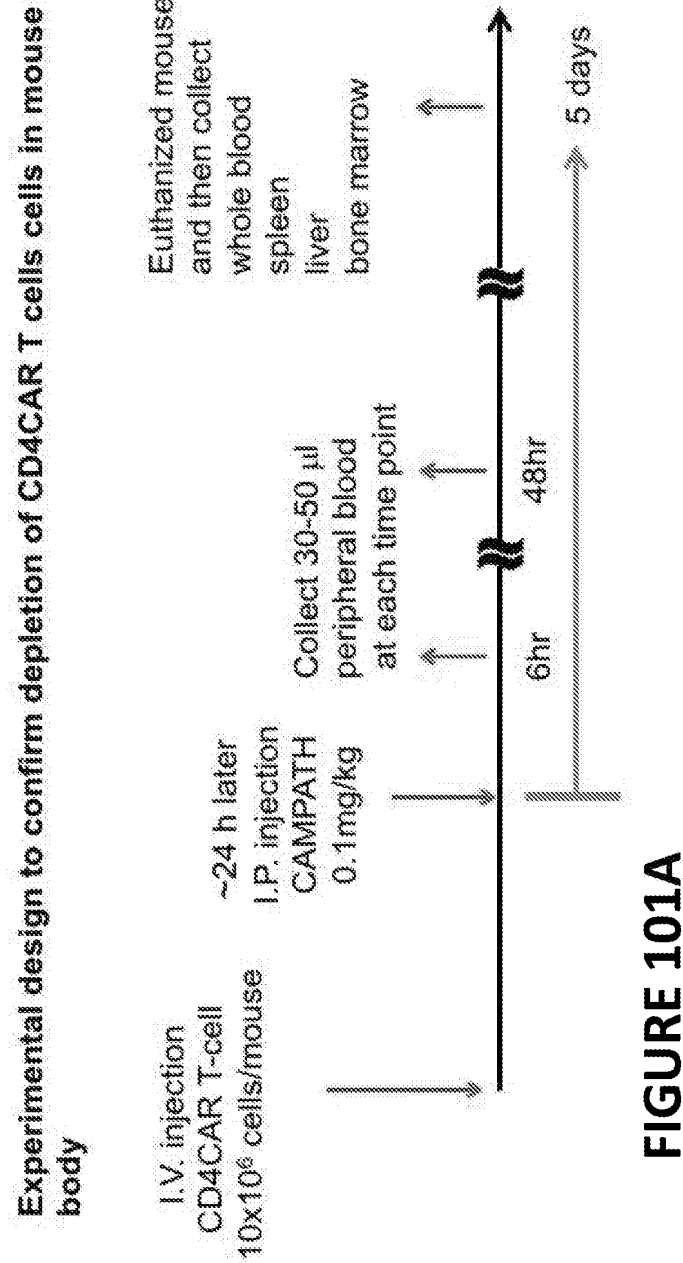
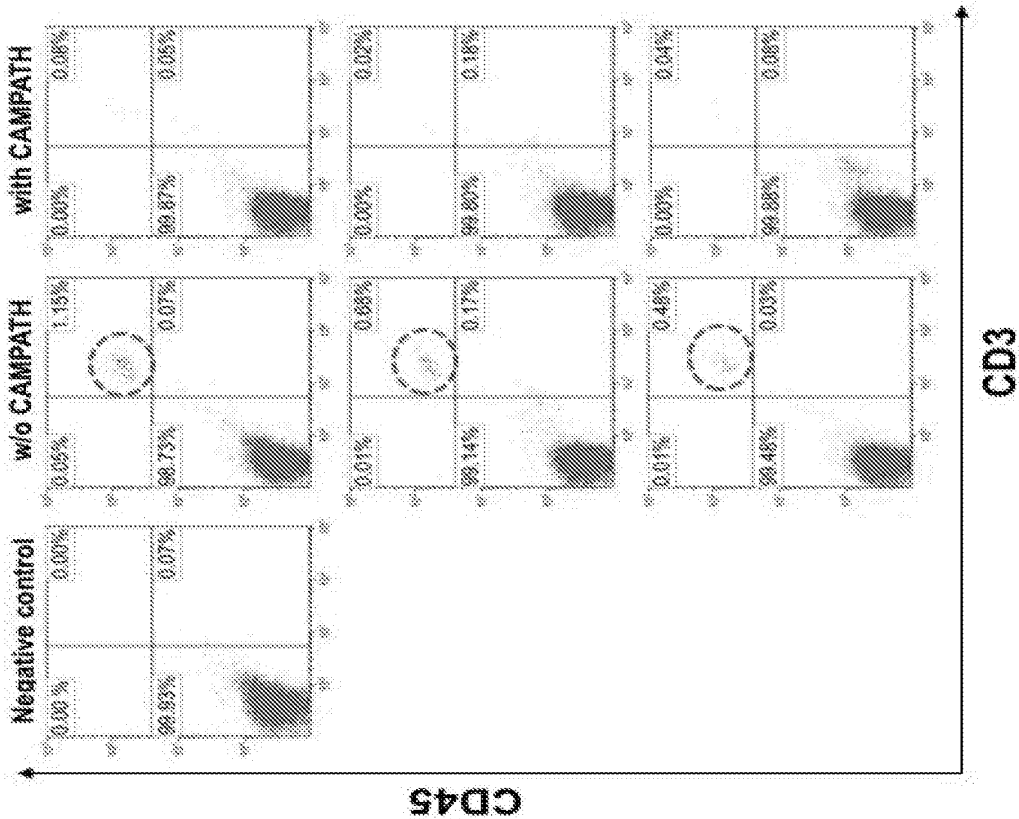


FIGURE 101A

FIGURE 101B



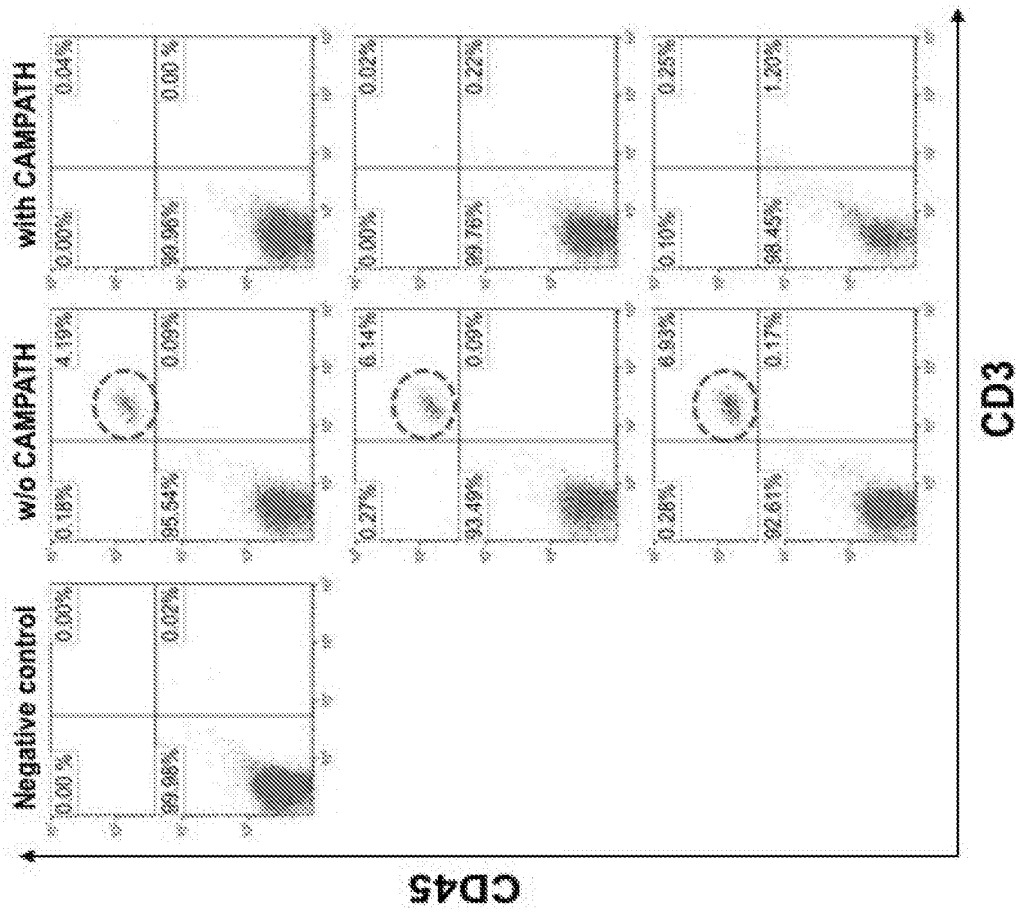


FIGURE 101C

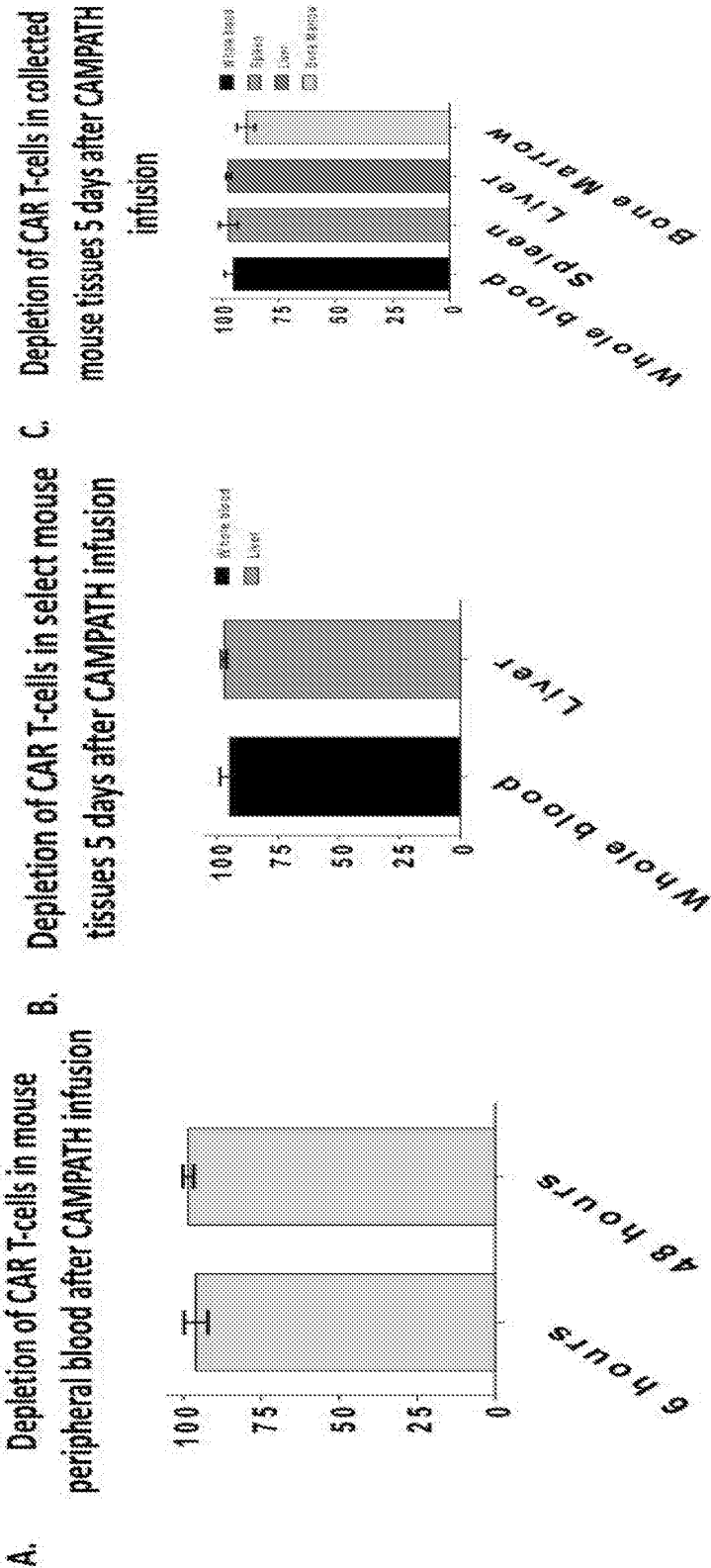


FIGURE 102

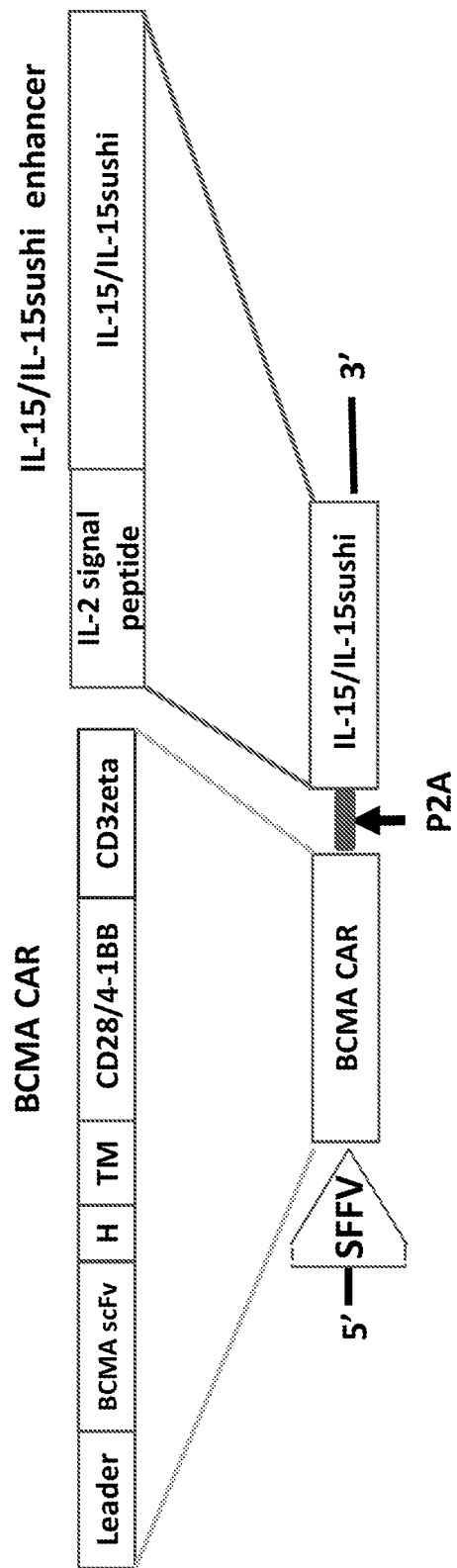


FIGURE 103

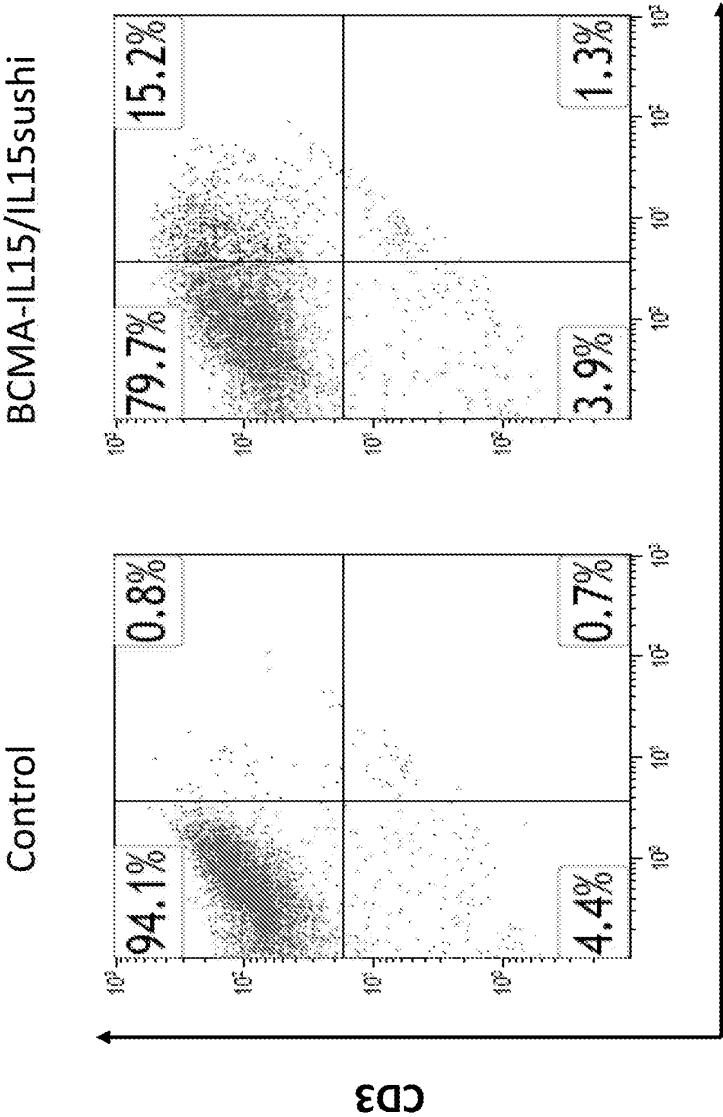


FIGURE 104

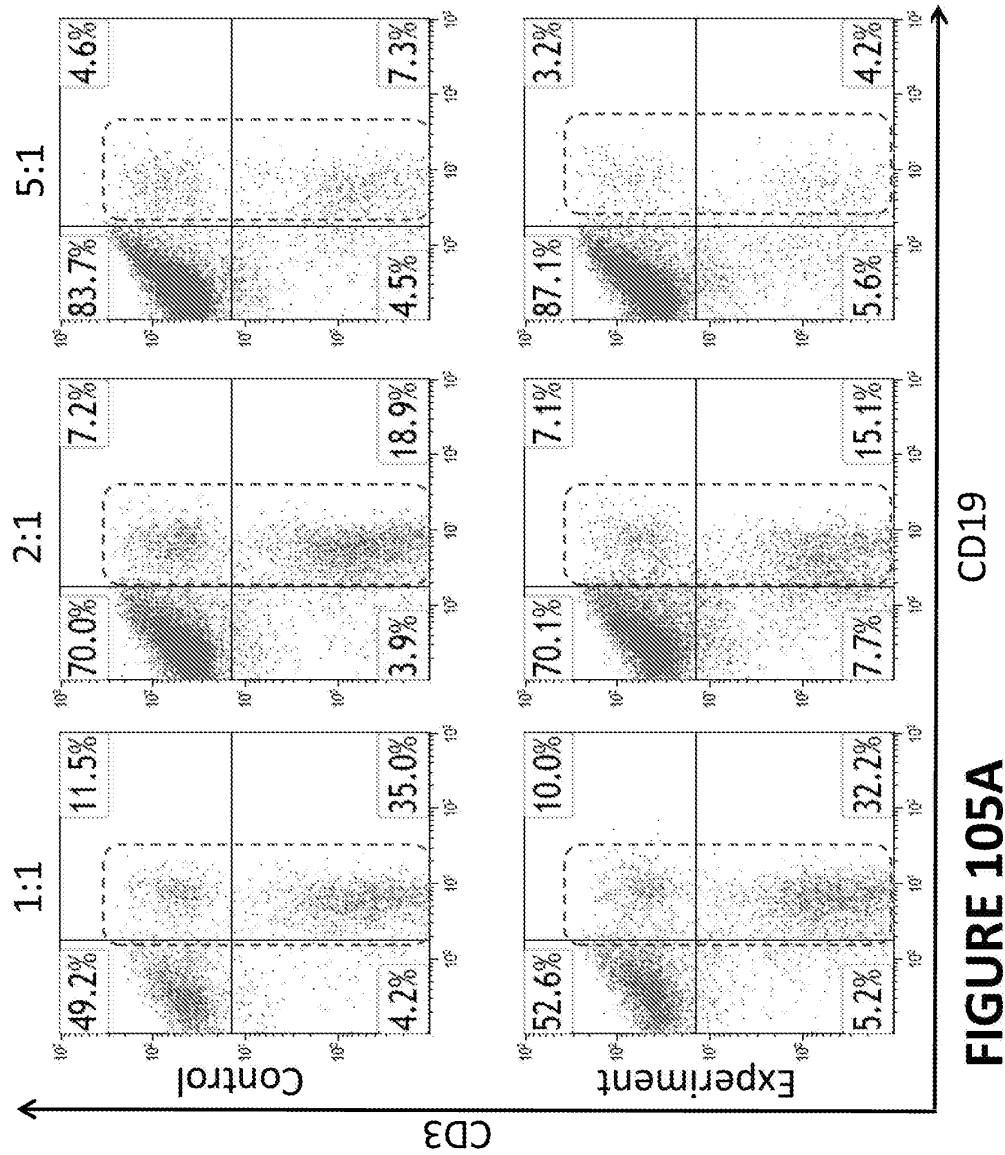


FIGURE 105A

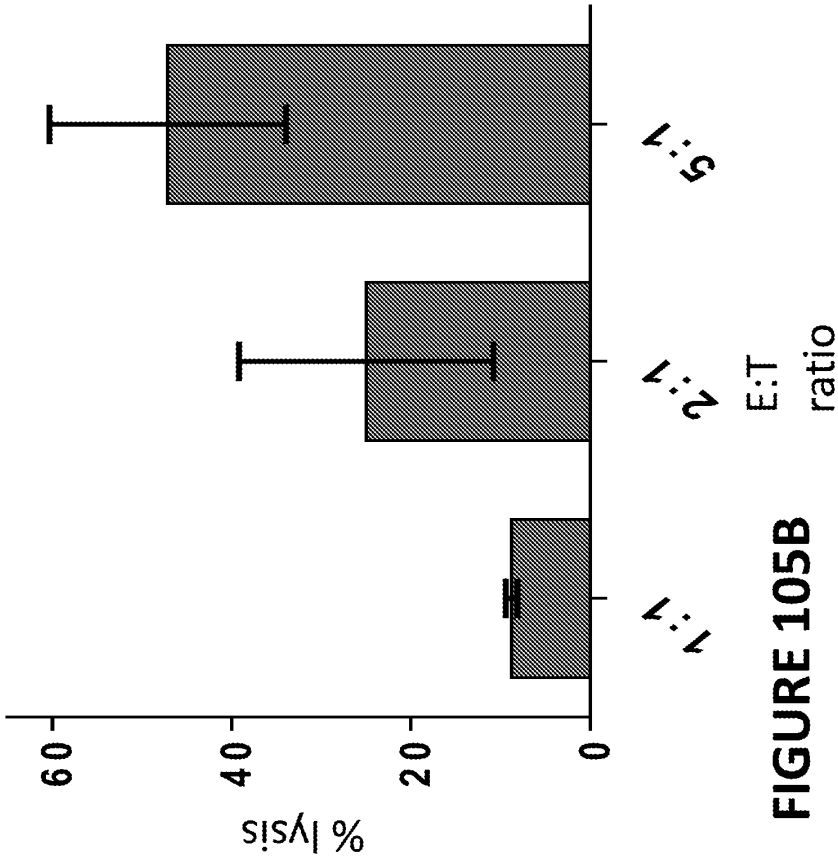


FIGURE 105B

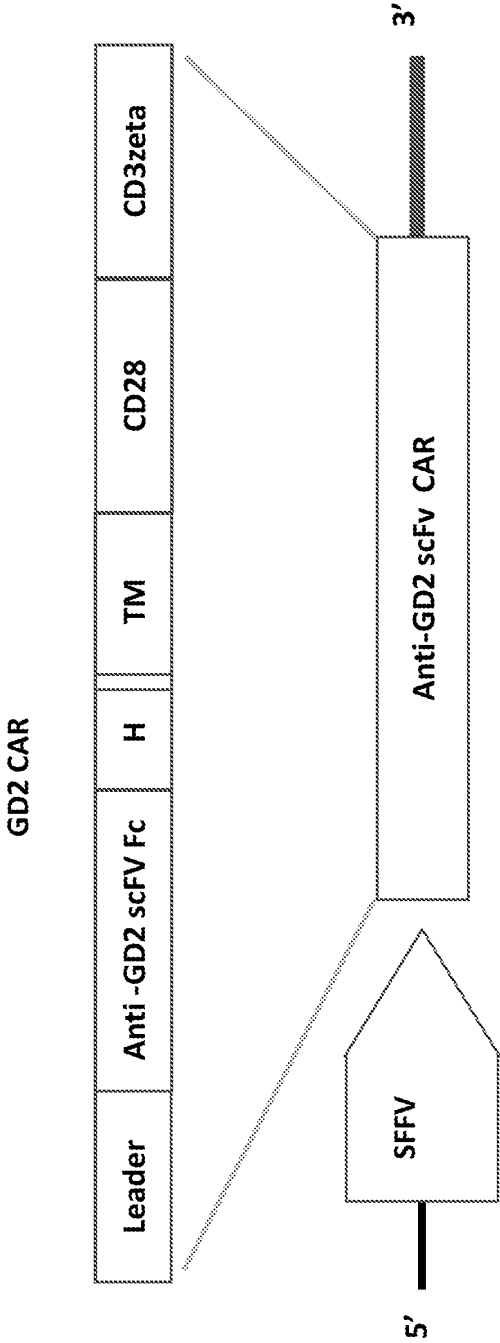


FIGURE 106A

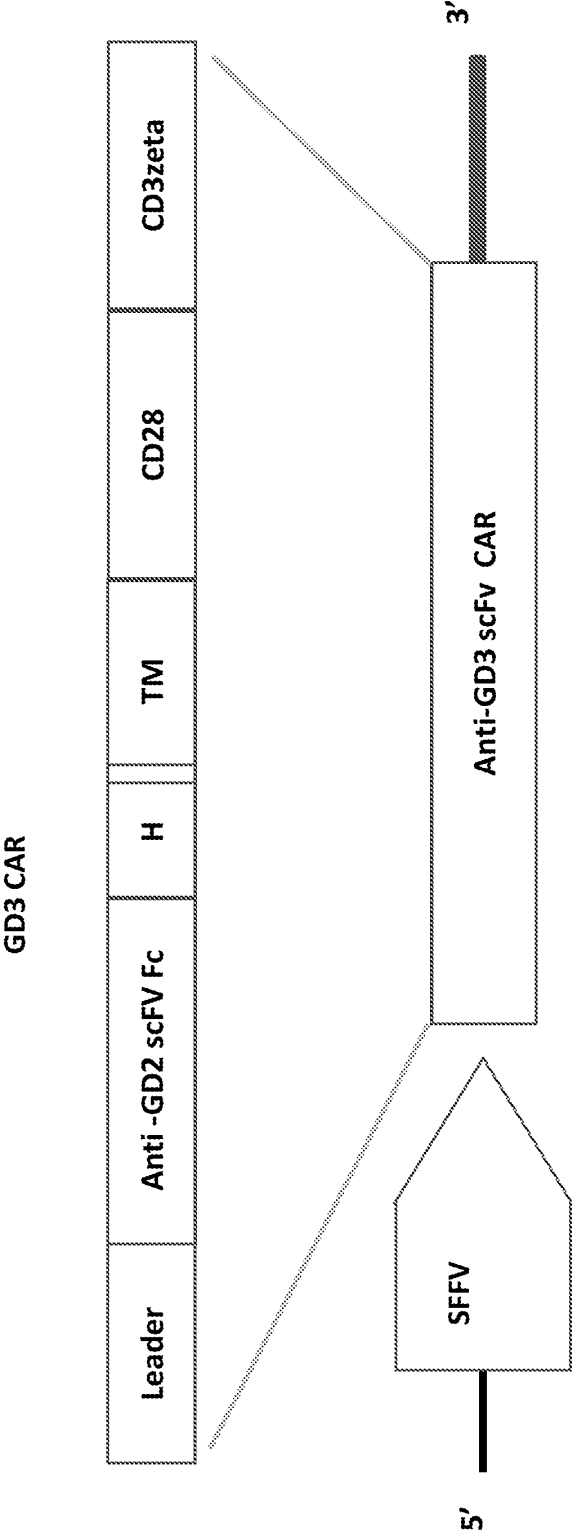


FIGURE 106B

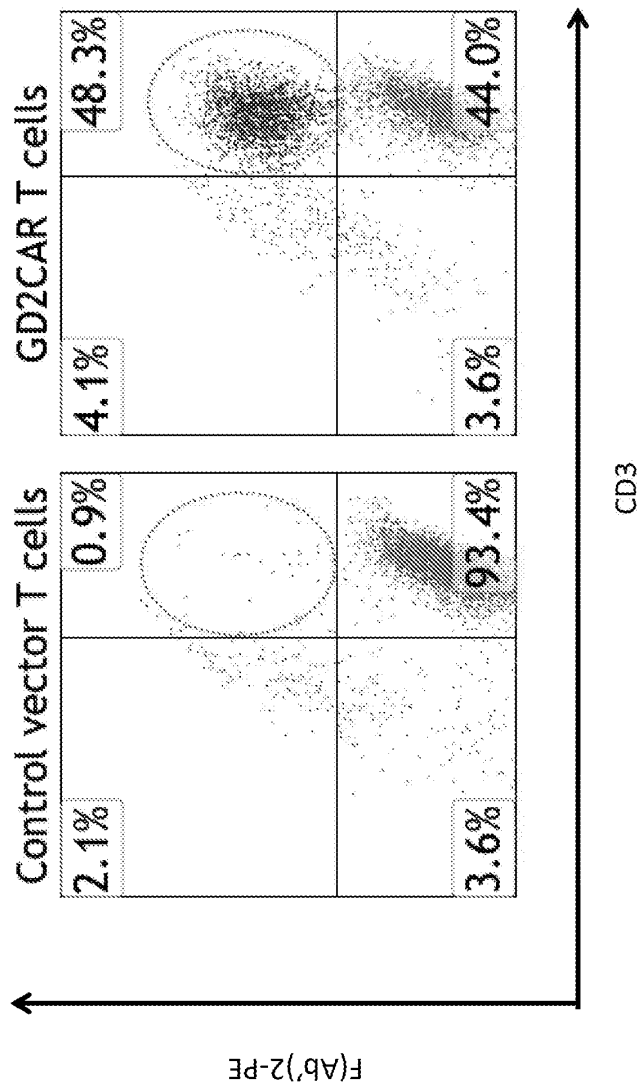


FIGURE 107A

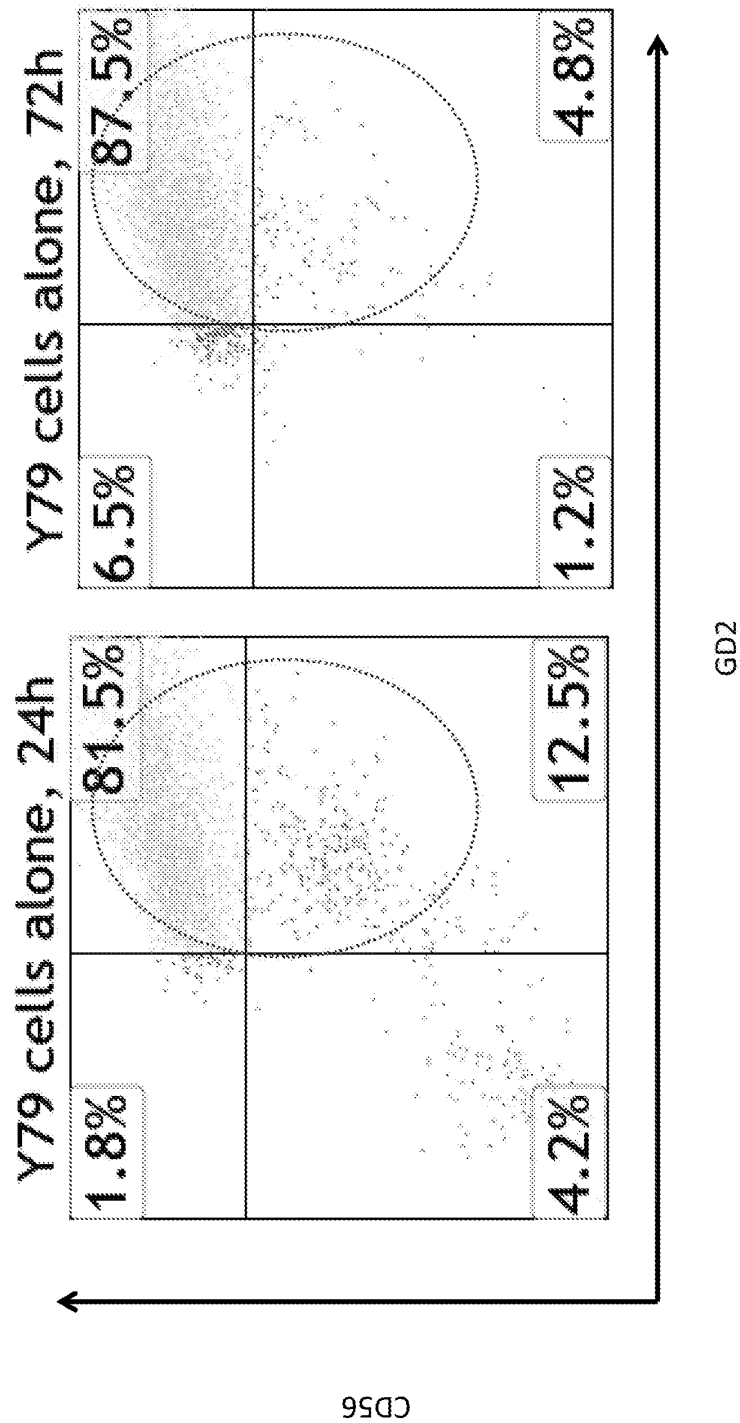


FIGURE 107B

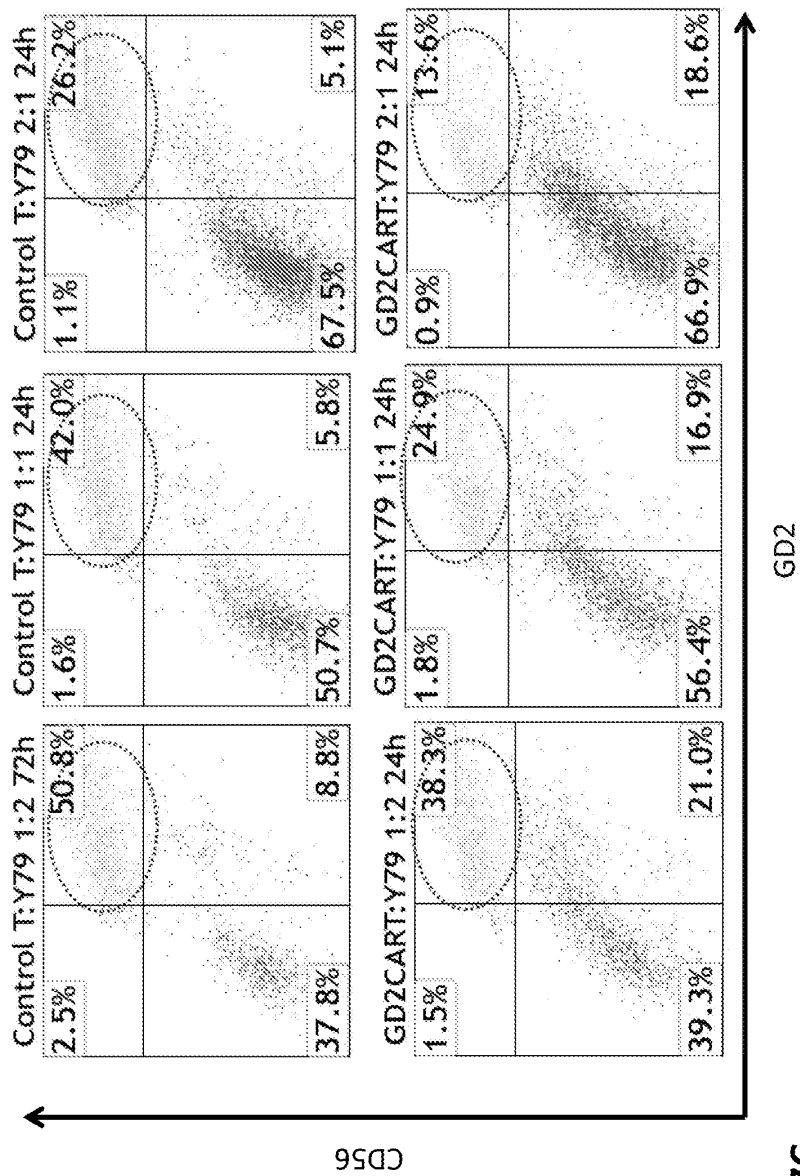


FIGURE 107C

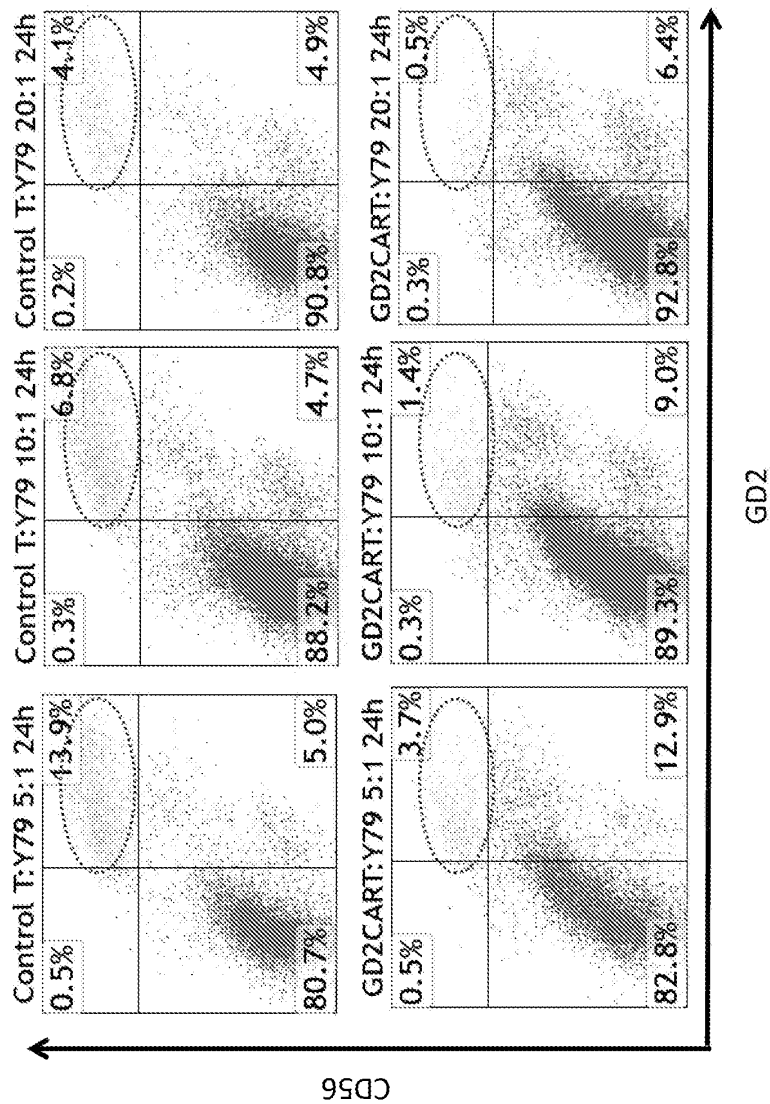


FIGURE 107D

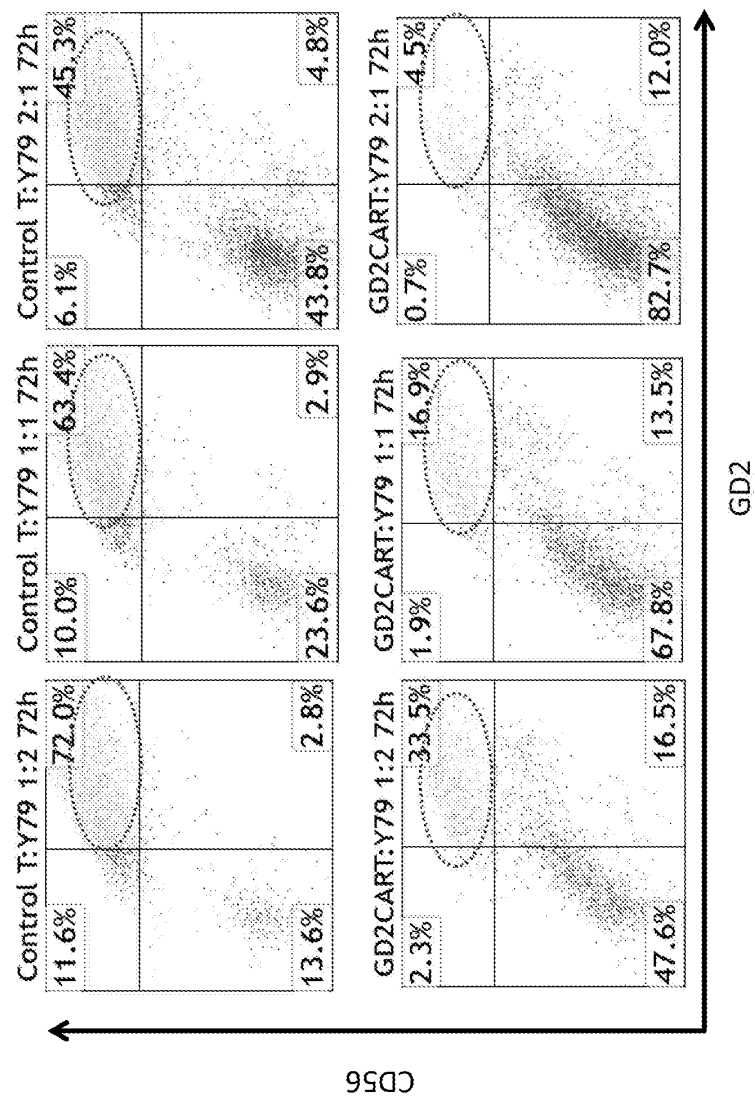


FIGURE 107E

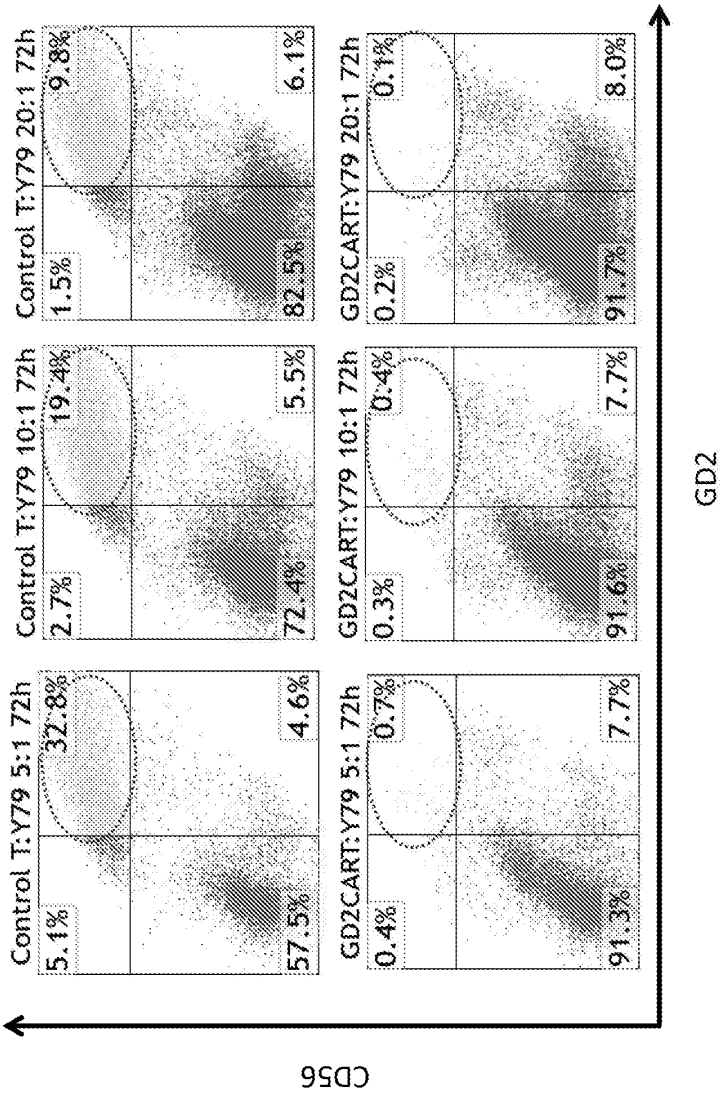


FIGURE 107F

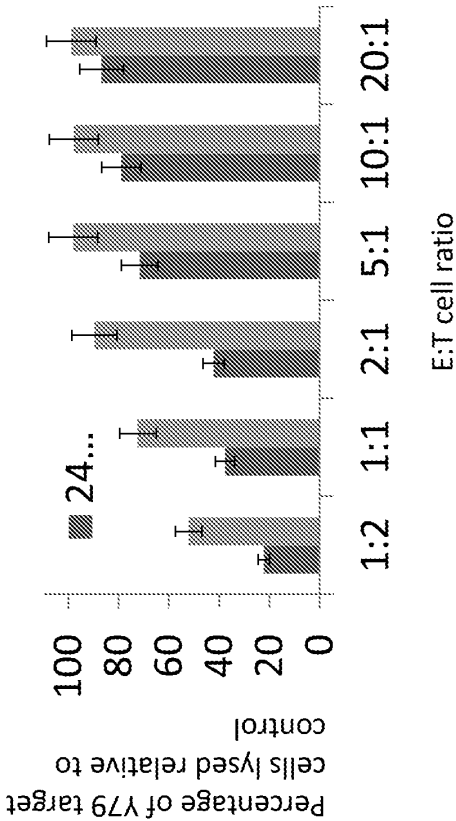


FIGURE 107G

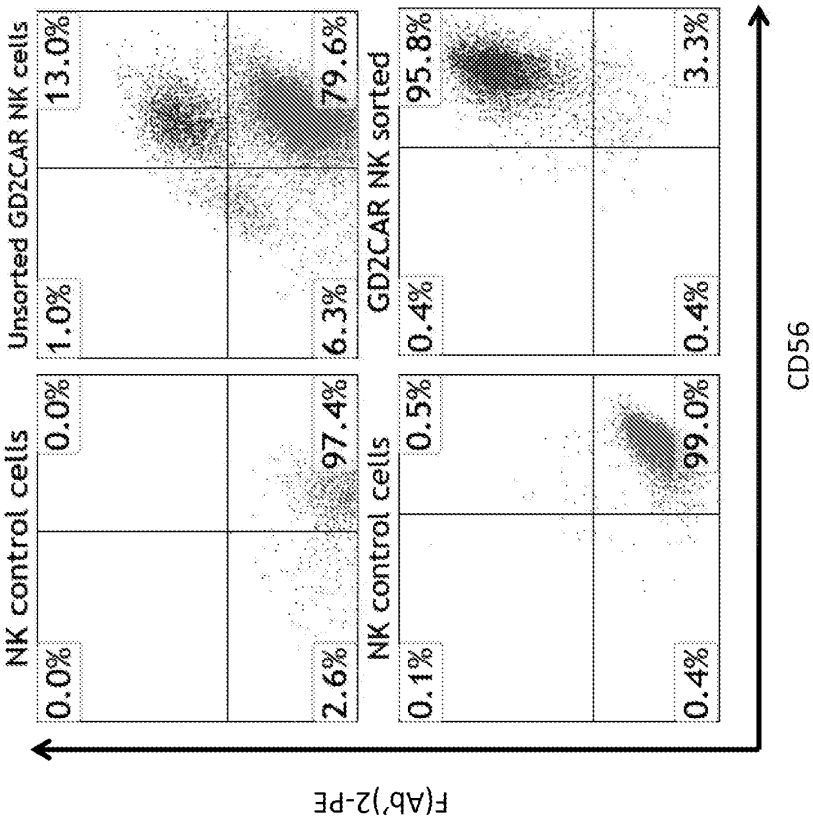


FIGURE 108A

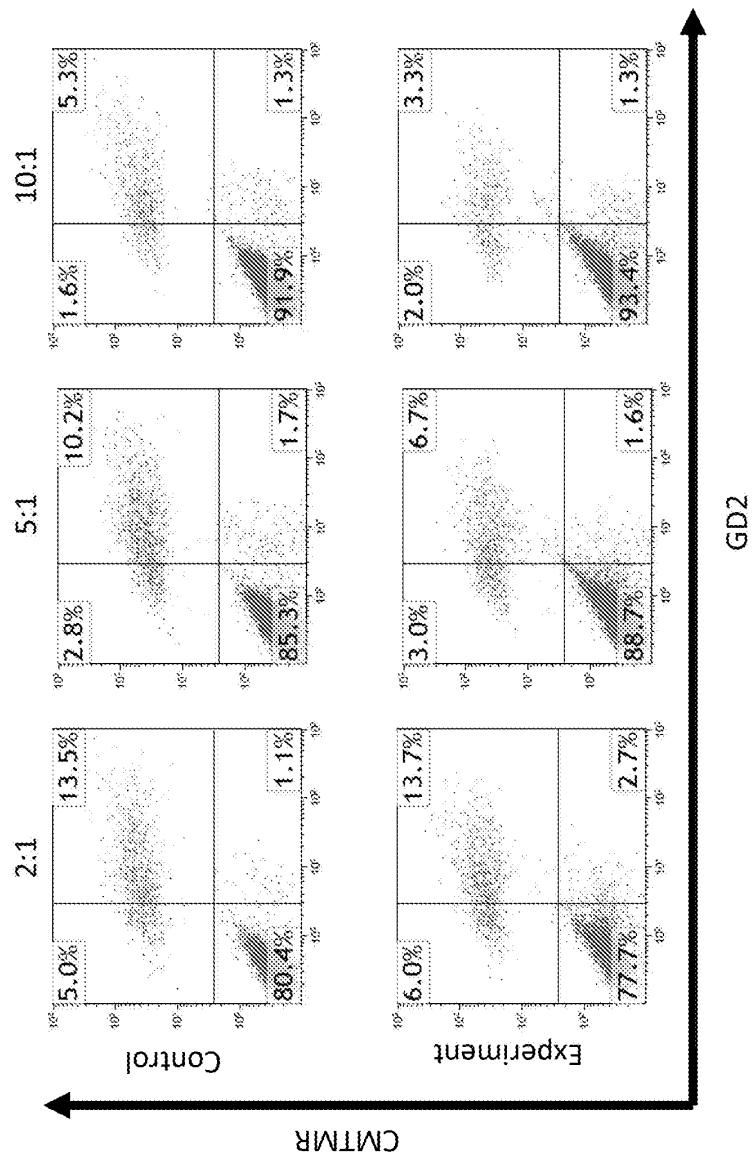


FIGURE 108B

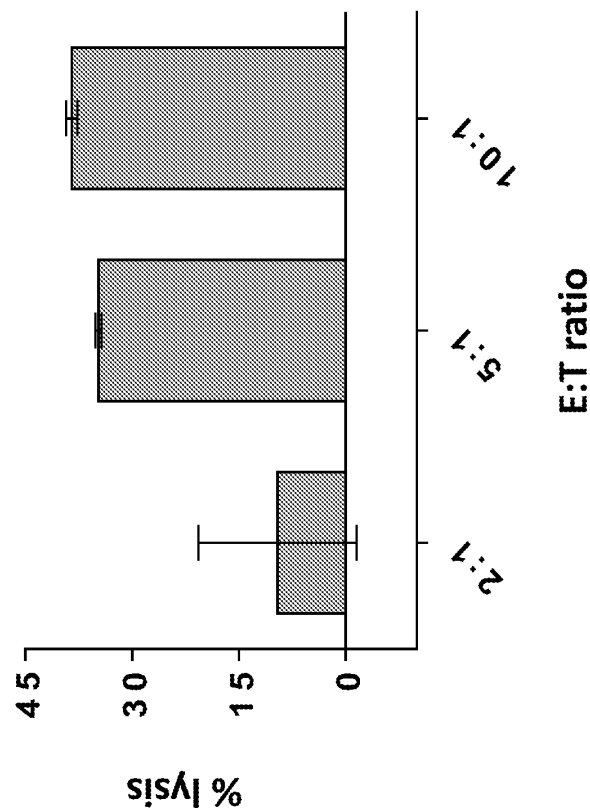


FIGURE 108C

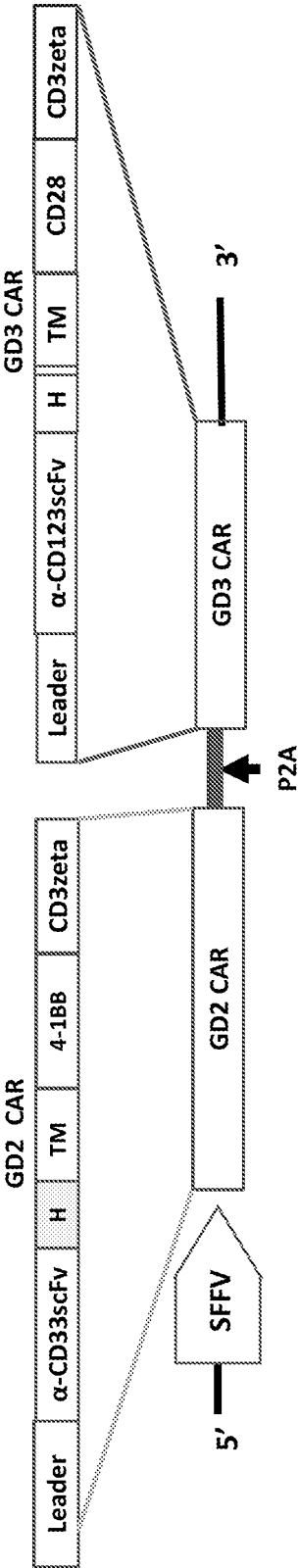


FIGURE 109