

STAR★METHODS

KEY RESOURCES TABLE

REAGENT or RESOURCE	SOURCE	IDENTIFIER
Antibodies		
Anti-Myc tag (Alexa Fluor® 647 Conjugate)	Cell Signaling Technology	Cat# 2233S
Goat polyclonal anti-human IgG	Sigma-Aldrich	Cat# I1886-2ML
CD4 Pacific Blue	BioLegend	Cat# 300521; RRID: AB_493098
CD45RA APCCy7	BioLegend	Cat# 304128; RRID: AB_10708880
CD45RO BV570	BioLegend	Cat# 304226; RRID: AB_2563818
CD62L BV605	BD Biosciences	Cat# 562719; RRID: AB_2744441
CD95 PE	BioLegend	Cat# 305608; RRID: AB_314546
CD8 BV786	BD Biosciences	Cat# 563823; RRID: AB_2687487
anti-Myc-Tag (9B11) Mouse mAb HRP Conjugate	Cell Signaling Technology	Cat# 2040S
anti-CD95 Clone DX2 164Dy	Fluidigm	Cat# 3164008B
anti-CTLA-4 Clone 14D8 170Er	Fluidigm	Cat# 3170005B; RRID: AB_2858238
anti-CD62L Clone DREG56 153Eu	Fluidigm	Cat# 3153004B; RRID: AB_2858235
anti-PD-1 Clone EH12.2H7 155Gd	Fluidigm	Cat# 3155009B; RRID: AB_2811087
anti-CD45RO Clone UCHL1 165Ho	Fluidigm	Cat# 3165011B; RRID: AB_2756423
anti-CD244 polyclonal 142Nd	Novus Biologicals	Cat# AF1039
anti-CD4 Clone RPAT4 145Nd	Fluidigm	Cat# 3145001B
anti-CD8 Clone RPAT8 146Nd	Fluidigm	Cat# 3146001B
anti-EOMES clone 644730 148Nd	Novus Biologicals	Cat# MAB6166
anti-Lag-3 Clone 11C3C65 150Nd	Fluidigm	Cat# 3150030B
anti-CD3 Clone UCHT1 170Er	Fluidigm	Cat# 3170001B; RRID: AB_2811085
anti-TIGIT Clone MBSA43 154Sm	Fluidigm	Cat# 3154016B; RRID: AB_2888926
anti-CCR7 Clone G043H7 159Tb	Fluidigm	Cat# 3159003A
anti-CD45 Clone HI30 89Y	Fluidigm	Cat# 3089003B
anti-Granzyme B Clone GB11 171Yb	Fluidigm	Cat# 3171002B
anti-CD57 Clone HCD57 172Yb	Fluidigm	Cat# 3172009B; RRID: AB_2888930
T-cell receptor mimic (TCRm) monoclonal antibody	Kim et al. ⁵⁸	NA
Biological samples		
Primary T cells	University of Pennsylvania Human Immunology Core.	NA
CD34 ⁺ Cells	Lonza	Product number "Dn39444" for the experiment in Figures 5F–5K , 0 "CB21/0017/35" for the experiment in Figures 5G and 5I
Chemicals, peptides, and recombinant proteins		
anti-CD3/CD28 dynabeads	Invitrogen	Cat# 402.03D
anti-biotin microbeads	Miltenyi	Cat# 130-105-637
HER2 beads	Acro Biosystems	Cat# K006
PMA + ionomycin	eBioscience	Cat# 00-4970-93
Live/Dead Aqua	Thermo-Fischer Scientific	Cat# L-34966
RPMI 1640	GIBCO	Cat# 72400-047
Foetal bovine serum (FBS)	VWR	Cat# S170G
Peptides	This manuscript	Please see Table S2
Custom p/HLA multimers	Proimmune, Sarasota, FL	NA

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REAGENT or RESOURCE	SOURCE	IDENTIFIER
Critical commercial assays		
Amaxa P3 Primary Cell kit and protocol	Lonza	Cat# V4XP-3012
Experimental models: Cell lines		
HEK 293T	ATCC	CRL-3216
Jurkat E6.1	ATCC	TIB-152
CD19 ⁺ NALM6 human acute lymphoblastic leukemia	ATCC	CRL-3273
Engineered CBG ⁺ GFP ⁺ NALM6 human acute lymphoblastic leukemia	University of Pennsylvania, Dr. Saar Gill	NA
Parental human HER2 ⁺ ovarian cancer cell line SKOV3	ATCC	HBT-77
Engineered CBG ⁺ GFP ⁺ human HER2 ⁺ ovarian cancer cell line SKOV3	University of Pennsylvania, Dr. Saar Gill	NA
Parental HER2 ⁻ breast cancer cell line MDA-MB-468	ATCC	HBT-132
Engineered CBG ⁺ GFP ⁺ HER2 ⁻ breast cancer cell line MDA-MB-468	University of Pennsylvania, Dr. Saar Gill	NA
CD20 ⁺ Raji Burkitt's lymphoma	ATCC	CCL-86
Engineered CBG + GFP ⁺ Raji Burkitt's lymphoma	University of Pennsylvania, Dr. Saar Gill	NA
K562 erythro-megakaryoblastic leukemia cell line	ATCC	CRL-3343
Engineered CD20 ⁺ K562 erythro-megakaryoblastic leukemia cell line	University of Pennsylvania, Dr. Avery D. Posey, Jr.; Panjwani et al. ⁵⁴	NA
XL1-Blue Supercompetent Cells	Agilent Technologies	Cat# 200236
Experimental models: Organisms/strains		
NOD/scid/IL2rg	University of Pennsylvania Stem Cell and Xenograft Core	RRID:IMSR_JAX:005557
SGM3 (NOD.Cg-Prkdcscid Il2rgtm1Wjl Tg(CMV-IL3,CSF2,KITLG)1Eav/MloySzJ	The Jackson Laboratory	RRID:IMSR_JAX:013062
Recombinant DNA		
Lentiviral construct pASP4.2	This manuscript	Please see Table S1
Lentiviral construct pASP4.2.1	This manuscript	Please see Table S1
Lentiviral construct pASP5	This manuscript	Please see Table S1
Lentiviral construct pASP7	This manuscript	Please see Table S1
Lentiviral construct pASP8	This manuscript	Please see Table S1
Lentiviral construct pASP9	This manuscript	Please see Table S1
Lentiviral construct pASP18	This manuscript	Please see Table S1
Lentiviral construct pASP26	This manuscript	Please see Table S1
Lentiviral construct pASP28	This manuscript	Please see Table S1
Lentiviral construct pASP30	This manuscript	Please see Table S1
Lentiviral construct pASP36	This manuscript	Please see Table S1
Lentiviral construct pASP38	This manuscript	Please see Table S1
Lentiviral construct pASP52	This manuscript	Please see Table S1
Lentiviral construct pASP59	This manuscript	Please see Table S1
Lentiviral construct pASP72	This manuscript	Please see Table S1
Lentiviral construct pASP73	This manuscript	Please see Table S1
Lentiviral construct pASP75	This manuscript	Please see Table S1
Lentiviral construct pASP85	This manuscript	Please see Table S1
Lentiviral construct pASP89	This manuscript	Please see Table S1
Lentiviral construct pASP90	This manuscript	Please see Table S1
Lentiviral construct pASP96	This manuscript	Please see Table S1
Lentiviral construct pASP97	This manuscript	Please see Table S1

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REAGENT or RESOURCE	SOURCE	IDENTIFIER
Lentiviral construct ceGFP	This manuscript	Please see Table S1
Lentiviral construct chIL-12	This manuscript	Please see Table S1
Software and algorithms		
GraphPad Prism	GraphPad Software	https://www.graphpad.com/
FlowJo	BD	https://www.flowjo.com/
Cyt tool (R2016b)	Columbia University	https://www.c2b2.columbia.edu/danapeerlab/html/cyt-download.html