

Supplementary Table 8. Antibody panel used for CyTOF.

	Marker	Clone		Marker	Clone
1	CD45	HI30	19	CD95	DX2
2	CD57	HNK1	20	CD45RO	UCHL1
3	CD19	HIB19	21	NKG2D	ON72
4	HLA-DR	L243	22	CD25	2A3
5	CD69	FN50	23	CD3	UCHT1
6	CD4	RPA-T4	24	CD38	HIT2
7	CD8	RPA-T8	25	CXCR4	12G5
8	CD14	M5E2	26	PD-1	EH12.2H7
9	CD127	A019D5	27	KLRG1	*SA231A2
10	†Biotin	1D4-C5	28	CD56	HCD56
11	CD45RA	*HI100	29	CD16	3G8
12	TIGIT	MBSA43	30	#TCF1	7F11A10
13	CD138	*MI15	31	#Tbet	4B10
14	CD27	L128	32	#FOXP3	PCH101
15	PD-L1	29E.2A3	33	#EOMES	**WD1928
16	4-1BB	*4B4-1	34	#GATA3	TWAJ
17	CCR7	G043H7	35	#Ki67	Ki-67
18	CD28	CD28.2	36	#Granzyme	GB11

All metal conjugated antibodies were purchased from Fluidigm

Purified antibodies purchased from *BioLegend and ** Invitrogen were metal tagged using Fluidigm metal conjugation kit following manufacturers methods.

#Intracellular markers

† Anti-biotin antibody was used for the detection of biotinylated-BCMA (Creative BioMart).

Supplementary Table 9. TotalSeq-C antibody panel used for CITE-Seq.

	Marker	Clone		Marker	Clone
1	CD117 (c-kit)	104D2	29	CD10	HI10a
2	CD226 (DNAM-1)	11A8	30	CD45	HI30
3	LAG-3	11C3C65	31	CD19	HIB19
4	NKG2D	1D11	32	CD38	HIT2
5	BDCA-2	201A	33	CD161	HP-3G10
6	PD-L1	29E.2A3	34	IgD	IA6-2
7	KLRG1	2F1/KLRG1	35	CD11b	ICRF44
8	CD20	2H7	36	CXCR5	J252D4
9	CD16	3G8	37	CD1c	L161
10	CD66b	6/40c	38	HLA-DR	L243
11	CD14	63D3	39	CCR4	L291H4
12	CD123	6H6	40	CD141	M80
13	CLEC9A	8F9	41	Ig light chain κ	MHK-49
14	DC-SIGN	9E9A8	42	Ig light chain λ	MHL-38
15	CD127	A019D5	43	CD138	MI15
16	TIGIT	A15153G	44	CD27	O323
17	CD25	BC96	45	CD33	P67.6
18	CD294 (CRTH2)	BM16	46	CD57	QA17A04
19	CD21	Bu32	47	CD56	QA17A16
20	CD244 (2B4)	C1.7	48	CD4	RPA-T4
21	CD79b (Ig β)	CB3-1	49	CD8a	RPA-T8
22	CD28	CD28.2	50	CD11c	S-HCL-3
23	PD-1	EH12.2H7	51	CD155 (PVR)	SKII.4
24	CD69	FN50	52	CD45RO	UCHL1
25	CXCR3	G025H7	53	CD3	UCHT1
26	CCR6	G034E3	54	CXCR4	12G5

27	CCR7	G043H7	55	†Biotin	1D4-C5
28	CD45RA	HI100			

TotalSeq-C antibodies were purchased from BioLegend and used following manufacturers methods.

†Anti-biotin was used for the detection of biotinylated BCMA (Creative BioMart).