

Table S1

# Cells (median UMIs/cell)	CD45+ Tumor	CD45- Tumor	CD45+ Normal	CD45- Normal
Patient1: stage pT1a, grade 2	4673 (2297)	2074 (3015)	3615 (2146)	797 (2997)
Patient2: stage pT3a, grade 2	2946 (3107.5)	6912 (5115.5)	1649 (3051)	2267 (4232)
Patient3: stage pT3a, grade 1	5422 (3145.5)	5357 (6949)	2204 (2296)	1729 (3327)
Patient4: stage pT1a, grade 1	6678 (3421.5)	14274 (4520)	6505 (3232)	819 (3560)
Patient5: stage pT3aNOM1, grade 4	6579 (2624)	7584 (4264)	8317 (3138)	5917 (3536)
Patient6: stage pT1a, grade 2	6721 (4036)	1318 (5743.5)	6817 (4505)	1369 (6029.5)
Patient7: stage pT3a, grade 3	3227 (4864)	4593 (5820)	7199 (3492)	1104 (5486)
Patient8: stage pT1a, grade 2	5681 (3595)	3919 (8129)	1090 (4473.5)	1363 (4176)
PatientA: stage pT3a, grade 3	2825 (2260)	NA	1683 (2615)	NA
PatientB: stage pT1a, grade 2	5864 (3596)	NA	3519 (3185)	NA
PatientC: stage pT1a, grade 2	7090 (4267)	NA	2205 (3952)	NA

Table S3

Lymphoid Panel					
Antibody	Fluorophore	Clone	Vendor	Catalog #	Dilution
CD19	BB515	H1B19	BD	564456	Neat
CD45RA	FITC	HI100	BioLegend	304105	Neat
FoxP3	PE	236A/E7	Thermofisher	12-4777-42	1:10
PD1	PE-Dz594	EH12.2H7	BioLegend	329939	Neat
CD127	PE-Cy5	A019D5	BioLegend	351323	Neat
CD38	PerCP	HIT2	BioLegend	303519	1:10
CD39	PerCP-Cy5.5	A1	BioLegend	328218	Neat
CD25	Pe-Cy7	BC96	BioLegend	302611	1:10
CD14	APC	63D3	BioLegend	367117	1:40
CTLA-4	A647	L3D10	BioLegend	349919	Neat
CD3	A700	HIT3a	BioLegend	300324	Neat
Live/Dead	Zombie NIR		Biolegend	423105	1:1000
CD73	APC-Cy7	AD2	BioLegend	344021	1:32
CXCR3	BV421	G025H7	BioLegend	353715	Neat
CD8	Pac Blue	RPA-T8	BioLegend	301026	Neat
CD4	BV480	SK3	BD	566104	Neat
CD16	BV570	3G8	BioLegend	302035	Neat
CRTH2	BV605	BM16	BioLegend	350121	Neat
HLA-DR	BV650	L243	Biolegend	307649	Neat
CD161	BV711	DX12	BD	563865	Neat
CD56	BV750	5.1H11	BioLegend	362555	Neat
CCR7	BV785	G043H7	BioLegend	353229	Neat
CD45	Qdot800	HI30	Thermofisher	Q10156	Neat

Myeloid Panel					
Antibody	Fluorophore	Clone	Vendor	Catalog #	Dilution
CD19	BB515	H1B19	BD	564456	Neat
CD38	PerCP	HIT2	BioLegend	303519	1:10
CD3	A700	HIT3a	BioLegend	300324	Neat
Live/Dead	Zombie NIR		Biolegend	423105	1:1000
CD16	BV570	3G8	BioLegend	302035	Neat
HLA-DR	BV650	L243	Biolegend	307649	Neat
CD56	BV750	5.1H11	BioLegend	362555	Neat
CD45	Qdot800	HI30	Thermofisher	Q10156	Neat
CD86	FITC	BU63	Biolegend	374203	Neat
PDL1	PE-Dazzle594	29E.2A3	Biolegend	329731	Neat
CD14	A532	61D3	Thermo	58-0149-41	Neat
CD141	PE	M80	Biolegend	344103	Neat
CD1c	BV421	L161	Biolegend	331525	Neat
CD123	Pac Blue	6H6	Biolegend	306043	Neat
HLA ABC	BV786	G46-2.6	BD	740982	Neat
CD68	APC	Y1/82A	Biolegend	333809	Neat
CD206	APC-Fire750	15-2	Biolegend	321133	Neat
CD11b	PE-Cy5	ICRF44	Biolegend	301307	Neat
CD163	BV480	GHI/61	BD	746549	Neat
CD169	BV605	7-239	Biolegend	346009	Neat
CD33	BV711	P67.6	Biolegend	366623	Neat
CD204	PE-Cy7	PSL204	Thermofisher	25-2045-42	Neat
CXCR2	PerCP-Cy5.5	5E8/CXCR2	Biolegend	320717	Neat

Table S5

		Gene Expression Clustering with All Genes									
		CD4 T-cell	NK cell 1	NK cell 2	Macrophage	Monocyte	CD8 T-cell	Treg	B-cell	Mast cell	Plasma Cell
VIPER clustering with CyTEK panel genes only	CD4 T-cell	5465	82	43	1	19	1037	169	317	5	0
	NK Cell	195	3056	755	0	12	256	1	2	2	0
	Macrophage	5	1	0	3804	394	10	0	4	1	6
	Monocyte	0	5	2	139	3650	6	1	0	0	0
	CD8 T-cell	57	21	6	4	11	1945	22	1	1	87
	Treg	96	10	1	5	7	134	423	11	220	1
	B-cell	1	1	0	3	0	1	0	330	0	49

Table S6

Staining Order	Antibody	Source	Catalog#	Clone	Isotype	Reactivity	Opal fluorophore
1	TREM2	CST	91068S	D8I4C	rlgG	H	650
2	C1q	AbCam	ab268120	C1QA/2956	rlgG	H	520
3	CD3	Leica	NCL-L-CD3-565	LN10	-	H	690
4	ApoE	CST (Same protein BLAST as ab1906)	13366S	D17N	rlgG	H	620
5	CA-9	AbCam	ab15086	Polyclonal	rlgG	H	540
6	CD68	BioGeneX	AM416-5M	KP1	m		570
	CD163	AbCam	ab74604	10D6	mlgG1	H	