

SUPPLEMENTARY TABLES

Supplementary Table 1. The genetic composition of 30 immune signatures.

aDCs	CD83;LAMP3;CCL1
APC_co_inhibition	C10orf54;CD274;LGALS9;PDCD1LG2;PVRL3
APC_co_stimulation	CD40;CD58;CD70;ICOSLG;SLAMF1;TNFSF14;TNFSF15;TNFSF18;TNFSF4;TNFSF8;TNFSF9
B_cells	BACH2;BANK1;BLK;BTLA;CD79A;CD79B;FCRL1;FCRL3;HVCN1;RALGPS2
CCR	CCL16;TPO;TGFB2;CXCL2;CCL14;TGFB3;IL11RA;CCL11;IL411;IL33;CXCL12;CXCL10;BMPER;BMP8A;CXCL11;IL21R;IL17B;TNFRSF9;ILF2;CX3CR1;CCR8;TNFSF12;CSF3;TNFSF4;BMP3;CX3CL1;BMP5;CXCR2;TNFRSF10D;BMP2;CXCL14;CCL28;CXCL3;BMP6;CCL21;CXCL9;CCL23;IL6;TNFRSF18;IL17RD;IL17D;IL27;CCL7;IL1R1;CXCR4;CXCR2P1;TGFB11;IFNGR1;IL9R;IL1RAPL1;IL11;CSF1;IL20RA;IL25;TNFRSF4;IL18;ILF3;CCL20;TNFRSF12A;IL6ST;CXCL13;IL12B;TNFRSF8;IL6R;BMP2;IFNE;IL1RAPL2;IL3RA;BMP4;CCL24;TNFSF13B;CCR4;IL2RA;IL32;TNFRSF10C;IL22RA1;BMP1A;CXCR5;CXCR3;IFNA8;IL17REL;IFNB1;IFNAR1;TNFRSF1B;CCL17;IFNL1;IL16;IL1RL1;ILK;CCL25;ILDR2;CXCR1;IL36RN;IL34;TGFB1;IFNG;IL19;ILKAP;BMP2K;CCR10;ILDR1;EPO;CCR7;IL17C;IL23A;CCR5;IL7;EPOR;CCL13;IL2RG;IL31RA;TNFAIP6;IFNL2;BMP1;IL12RB1;TNFAIP8;IL4R;TNFRSF6B;TNFAIP8L1;TNFRSF10B;IFNL3;CCL5;CXCL6;CXCL1;CCR3;TNFSF11;CSF1R;IL21;IL1RAP;IL12RB2;CCL1;IL17RA;CCR1;IL1RN;TNFRSF11B;TNFRSF14;IL13;IL2RB;BMP8B;CCL2;IL24;IL18RAP;TGFB1;TNFSF10;TNFRSF11A;CXCL5;IL5RA;TNFSF9;IL1RL2;TNFRSF13C;IL36G;IL15RA;TNFRSF21;CXCL8;IL22RA2;TNFAIP8L2;IL18R1;IFNLR1;CXCR6;CCL3L3;TNFRSF1A;IL17RE;IFNGR2;IL17RC;TNFAIP8L3;ILVBL;TGFBAP1;CCL4L1;CSF2RA;CCRN4L;CCL26;TNFAIP1;CCRL2;IFNA10;TNFRSF17;IFNA13;IL20;IL18BP;CCL3L1;TNFSF12-TNFSF13;IL5;IL23R;IL26;TNF;TGFA;CSF2;IL1F10;CXCL17;TNFSF13;IFNA4;IL37;IL12A;IL7R;IFNA1;IL1A;IL4;IL2;CCL22;CSF3R;IL10;IFNK;TGFB2;IL1R2;IL1B;IL17F;IL27RA;IL15;TNFSF8;IL36B;XCL1;CXCL16;TNFRSF19;IL3;CCL3;IFNA2;BMP1B;IFNA21;TNFSF18;CCL8;IL17RB;TNFRSF25;IL22;IL10RB;IFNAR2;CCL18;IFNA16;CSF2RB;IL36A;TNFAIP3;IL13RA2;IL13RA1;CCR9;TNFRSF10A;IFNA7;IFNW1;XCL2;TNFSF14;CCR2;BMP15;BMP10;CCL15;CCL14;TGFB1;IFNA5;BMP7;IFNA14;IL20RB;IL10RA;IFNA17;CCR6;TGFB3;CCL15;CCL4;CCL27;TNFRSF13B;TNFAIP2;IL31;IL17A;TNFSF15;CCL19;IFNA6;IL9
CD8+_T_cells	CD8A
CD4+ Regulatory T cells	C15orf53;CTLA4;FOXP3;GPR15;IL32;IL4;IL5
Check-point	IDO1;LAG3;CTLA4;TNFRSF9;ICOS;CD80;PDCD1LG2;TIGIT;CD70;TNFSF9;ICOSLG;KIR3DL1;CD86;PDCD1;LAIR1;TNFRSF8;TNFSF15;TNFRSF14;IDO2;CD276;CD40;TNFRSF4;TNFSF14;HHLA2;CD244;CD274;HAVCR2;CD27;BTLA;LGALS9;TMIGD2;CD28;CD48;TNFRSF25;CD40LG;ADORA2A;VTCN1;CD160;CD44;TNFSF18;TNFRSF18;BTNL2;C10orf54;CD200R1;TNFSF4;CD200;NRP1
Cytolytic_activity	PRF1;GZMA
DCs	CCL17;CCL22;CD209;CCL13
HLA	HLA-E;HLA-DPB2;HLA-C HLA-J;HLA-DQB1;HLA-DQB2;HLA-DQA2;HLA-DQA1;HLA-A;HLA-DMA;HLA-DOB;HLA-DRB1;HLA-H;HLA-B;HLA-DRB5;HLA-DOA;HLA-DPB1;HLA-DRA;HLA-DRB6;HLA-L;HLA-F;HLA-G;HLA-DMB;HLA-DPA1
iDCs	CD1A;CD1E
Inflammation-promoting	CCL5;CD19;CD8B;CXCL10;CXCL13;CXCL9;GNLY;GZMB;IFNG;IL12A;IL12B;IRF1;PRF1;STAT1;TBX21
Macrophages	C11orf45;CD68;CLEC5A;CYBB;FUCA1;GPNMB;HS3ST2;LGMN;MMP9;TM4SF19
Mast_cells	CMA1;MS4A2;TPSAB1
MHC_class_I	B2M;HLA-A;TAP1
Neutrophils	EVI2B;HSD17B11;KDM6B;MEGF9;MNDA;NLRP12;PADI4;SELL;TRANK1;VNN3
NK_cells	KLRC1;KLRF1
Parainflammation	CXCL10;PLAT;CCND1;LGMN;PLAUR;AIM2;MMP7;ICAM1;MX2;CXCL9;ANXA1;TLR2;PLA2G2D;ITGA2;MX1;HMOX1;CD276;TIRAP;IL33;PTGES;TNFRSF12A;SCARB1;CD14;BLNK;IFIT3;RETNLB;IFIT2;ISG15;OAS2;REL;OAS3;CD44;PPARG;BST2;OAS1;NOX1;PLA2G2A;IFIT1;IFITM3;IL1RN
pDCs	CLEC4C;CXCR3;GZMB;IL3RA;IRF7;IRF8;LILRA4;PHEX;PLD4;PTCRA
T_cell_co-inhibition	BTLA;C10orf54;CD160;CD244;CD274;CTLA4;HAVCR2;LAG3;LAIR1;TIGIT
T_cell_co-stimulation	CD2;CD226;CD27;CD28;CD40LG;ICOS;SLAMF1;TNFRSF18;TNFRSF25;TNFRSF4;TNFRSF8;TNFRSF9;TNFSF14
T_helper_cells	CD4
Tfh	PDCD1;CXCL13;CXCR5
Th1_cells	IFNG;TBX21;CTLA4;STAT4;CD38;IL12RB2;LTA;CSF2
Th2_cells	PMCH;LAIR2;SMAD2;CXCR6;GATA3;IL26

TIL	ITM2C;CD38;THEMIS2;GLYR1;ICOS;F5;TIGIT;KLRD1;IRF4;PRKCQ;FCRL5;SIRPG;LPXN;IL2RG;CCL5;LCK;TRAF3 IP3;CD86;MAL;LILRB1;DOK2;CD6;PAG1;LAX1;PLEK;PIK3CD;SLAMF1;XCL1;GPR171;XCL2;TBX21;CD2;CD53;KL HL6;SLAMF6;CD40;SIT1;TNFRSF4;CD79A;CD247;LCP2;CD3D;CD27;SH2D1A;FYB;ARHGAP30;ACAP1;CST7;CD3G ;IL2RB;CD3E;FCRL3;CORO1A;ITK;TCL1A;CYBB;CSF2RB;IKZF1;NCF4;DOCK2;CCR2;PTPRC;PLAC8;NCKAP1L;IL 7R;6-
	Sep;CD28;STAT4;CD8A;LY9;CD48;HCST;PTPRCAP;SASH3;ARHGAP25;LAT;TRAT1;IL10RA;PAX5;CCR7;DOCK11; PARVG;SPNS1;CD52;HCLS1;ARHGAP9;GIMAP6;PRKCB;MS4A1;GPR18;TBC1D10C;GVINP1;P2RY8;EVI2B;VAMP5 ;KLRK1;SELL;MPEG1;MS4A6A;ARHGAP15;MFNG;GZMK;SELPLG;TARP;GIMAP7;FAM65B;INPP5D;ITGA4;MZB1; GPSM3;STK10;CLEC2D;IL16;NLRC3;GIMAP5;GIMAP4;IFFO1;CFH;PVRIG;CFHR1
Treg	IL12RB2;TMPRSS6;CTSC;LAPTM4B;TFRC;RNF145;NETO2;ADAT2;CHST2;CTLA4;NFE2L3;LIMA1;IL1R2;ICOS;HS DL2;HTATIP2;FKBP1A;TIGIT;CCR8;LTA;SLC35F2;IL21R;AHCYL1;SOCS2;ETV7;BCL2L1;RRAGB;ACSL4;CHRNA6; BATF;LAX1;ADPRH;TNFRSF4;ANKRD10;CD274;CASP1;LY75;NPTN;SSTR3;GRSF1;CSF2RB;TMEM184C;NDFIP2;Z BTB38;ERH1;TRAF3;NAB1;HS3ST3B1;LAYN;JAK1;VDR;LEPROT;GCNT1;PTPRJ;IKZF2;CSF1;ENTPD1;TNFRSF18;M ETTL7A;KSR1;SSH1;CADM1;IL1R1;ACP5;CHST7;THADA;CD177;NFAT5;ZNF282;MAGEH1
Type_I_IFN_Reponse	DDX4;IFIT1;IFIT2;IFIT3;IRF7;ISG20;MX1;MX2;RSAD2;TNFSF10
Type_II_IFN_Reponse	GPR146;SELP;AHR

Supplementary Table 2. The mutational frequency of genes in the whole genome.

	Gene	Number
rs121913529	KRAS	90
rs113488022	BRAF	49
rs112445441	KRAS	31
rs104886003	PIK3CA	30
rs28934578	TP53	26
rs121913332	APC	25
rs781215815	RNF43	22
rs121913530	KRAS	19
rs782665429	DOCK3	18
rs121913279	PIK3CA	17
rs764719749	ACVR2A	15
rs121913333	APC	14
rs11540652	TP53	13
rs772920507	BMPR2	13
rs121913527	KRAS	13
rs28934574	TP53	12
rs28934576	TP53	12
rs587781392	APC	12
rs121913273	PIK3CA	12
rs770033147	SVIL	11
rs121913331	APC	11
rs121913287	PIK3CA	11
rs397516436	TP53	10
rs62619935	APC	10
rs549924573	RCVRN	10
rs759765382	RPL22	9
rs763321097	TEAD2	9
rs372217972	QKI	9
rs767148651	HNRNPL	8
rs137854574	APC	8
rs759448855	GLI1	8
rs121912651	TP53	8
rs137854580	APC	8
rs121913343	TP53	8
rs199566425	C9orf47	7
rs377767347	SMAD4	7
rs778658185	BCORL1	7
rs756774416	LMNTD2	7
rs781677398	ZDHHC8	7
rs766438669	CSMD3	7
rs397515734	APC	7
rs775633847	RAB28	7
rs762648935	MBD6	7
rs143104828	CSF2RA	6
rs746563015	CNTLN	6
rs762448666	ELMSAN1	6
rs121913237	NRAS	6
rs121913329	APC	6
rs777980924	FHOD3	6
rs762805003	CD93	6
rs761047150	C9orf131	6
rs563361433	ONECUT1	6
rs748072217	KIAA1024	6
rs778388564	PCDH19	6

rs151073460	FUS	6
rs748349403	SLC8A2	6
rs765803753	MICAL3	6
rs748850271	PHGR1	6

The table shows mutational frequency of locus more than 5.

Supplementary Table 3. The enrichment level of 30 immune signature in KRAS-mutated and wild-type groups were compared by Mann-Whitney test.

Immune Term	P Value
pDCs	0.000284
Treg	0.000637
Inflammation_promoting	0.002
Th1_cells	0.011
HLA	0.012
T_cell_co_stimulation	0.014
Cytolytic_activity	0.015
TIL	0.015
T_cell_co_inhibition	0.023
T_helper_cells	0.024
Neutrophils	0.026
Macrophages	0.033
Check_point	0.037
DCs	0.056
Tfh	0.067
CCR	0.069
aDCs	0.076
Type_II_IFN_Response	0.083
CD4+_Regulatory_T_cells	0.132
Type_I_IFN_Response	0.158
Th2_cells	0.176
B_cells	0.205
CD8+_T_Cells	0.225
Mast_cells	0.275
APC_co_stimulation	0.289
MHC_class_I	0.468
NK_cells	0.608
iDcs	0.67
Parainflammation	0.831
APC_co_inhibition	0.998