Figure S1

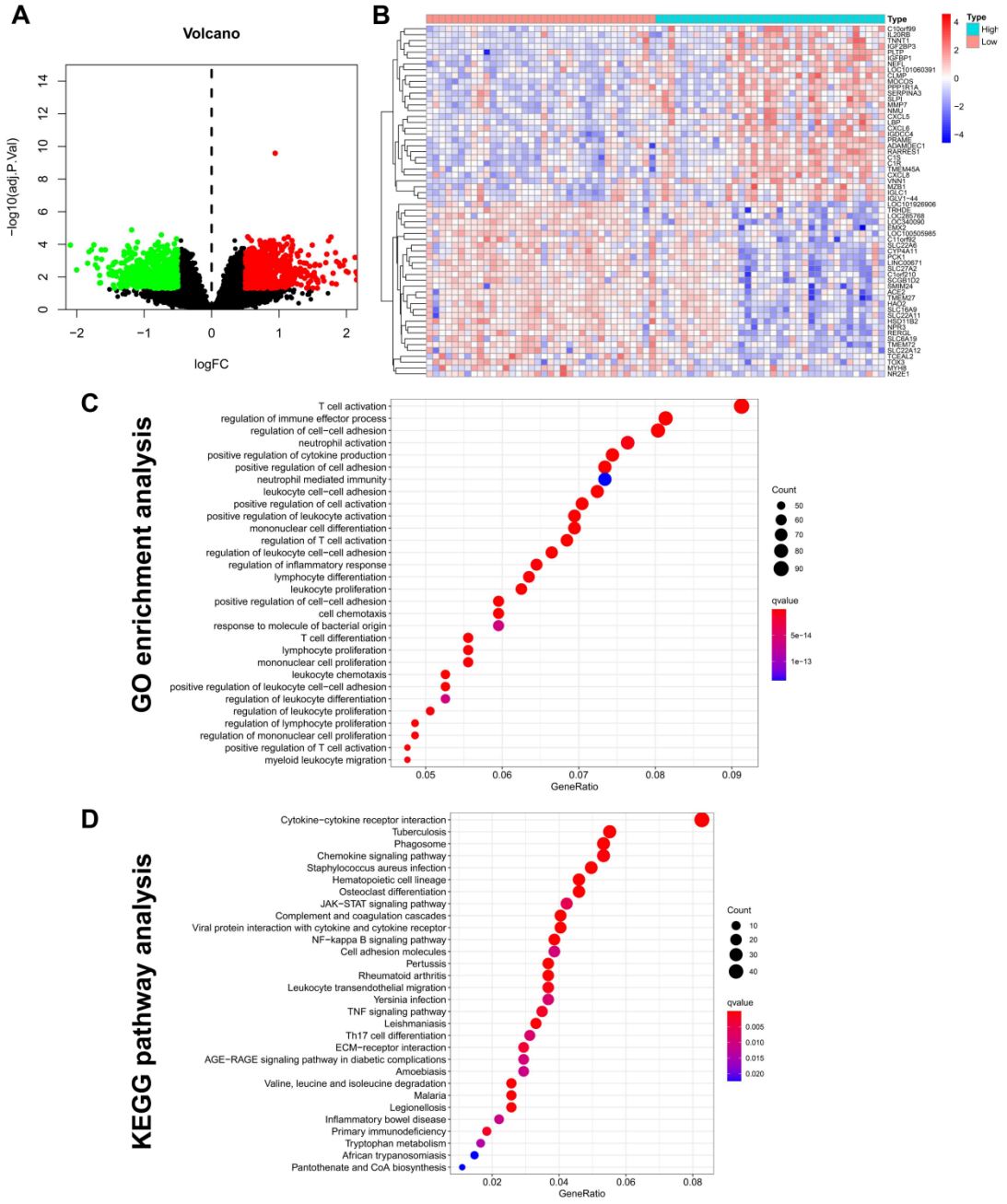

Figure S1 Enrichment analysis of DEGs between high-MICALL2 and low-MICALL2 expression samples from GEO dataset.

(A) Volcano map **(B)** Heatmap of DEGs between high-MICALL2 group and low-MICALL2 group in GSE53757. **(C)** The top 30 GO terms and **(D)** the top 30 KEGG pathways by enrichment analysis of the downregulated and upregulated genes. **Abbreviations:** GEO, Gene Expression Omnibus; GO, Gene Ontology; DEGs, differentially expressed genes.

Table S1 Univariate and multivariate Cox regression analysis for predictive factors

	Univariate analysis			Multivariate analysis		
Parameters	**HR**	**95%CI**	***P***	**HR**	**95%CI**	***P***
age	1.03	1.02-1.04	**0.000**	1.04	1.02-1.05	**0.000**
gender	0.94	0.69-1.30	0.726	1.05	0.76-1.46	0.763
grade	2.24	1.82-2.76	**0.000**	1.37	1.08-1.74	**0.010**
stage	1.88	1.64-2.15	**0.000**	1.50	0.96-2.33	0.075
T	1.90	1.60-2.25	**0.000**	0.93	0.62-1.40	0.731
M	4.40	3.21-6.05	**0.000**	1.58	0.81-3.06	0.178
MICALL2	1.16	1.11-1.20	**0.000**	1.12	1.07-1.17	**0.000**

Abbreviations: HR, hazard ratio; CI, confidence interval.

Table S2 The immunoregulatory genes applied for co-expression analysis

Immunoregulation	Gene set
MHC	TAPBP, TAP2, TAP1, HLA-G, HLA-F, HLA-E, HLA-DRB1, HLA-DRA, HLA-DQB1, HLA-DQA2, HLA-DQA1, HLA-DPB1, HLA-DPA1, HLA-DOB, HLA-DOA, HLA-DMB, HLA-DMA, HLA-C, HLA-B, HLA-A, B2M
Immunosuppression	VTCN1, TIGIT, TGFBR1, TGFB1, PDCD1LG2, PDCD1, NECTIN2, LGALS9, LAG3, KIR2DL3, KIR2DL1, KDR, IL10RB, IL10, IDO1, HAVCR2, CTLA4, CSF1R, CD96, CD274, CD244, CD160, BTLA, ADORA2A, CD47, SIGLEC15
Immune activation	VSIR, ULBP1, TNFSF9, TNFSF4, TNFSF18, TNFSF15, TNFSF14, TNFSF13B, TNFSF13, TNFRSF9, TNFRSF8, TNFRSF4, TNFRSF25, TNFRSF18, TNFRSF17, TNFRSF14, TNFRSF13C, TNFRSF13B, TMIGD2, STING1, RAET1E, PVR, NT5E, MICB, LTA, KLRK1, KLRC1, IL6R, IL6, IL2RA, ICOSLG, ICOS, HHLA2, ENTPD1, CXCR4, CXCL12, CD86, CD80, CD70, CD48, CD40LG, CD40, CD28, CD276, CD27, BTNL2
Chemokine receptors	XCR1, CXCR6, CXCR5, CXCR4, CXCR3, CXCR2, CXCR1, CX3CR1, CCR10, CCR9, CCR8, CCR7, CCR6, CCR5, CCR4, CCR3, CCR2, CCR1
Chemokines	XCL2, XCL1, CXCL17, CXCL16, CXCL14, CXCL13, CXCL12, CXCL11, CXCL10, CXCL9, CXCL8, CXCL6, CXCL5, CXCL3, CXCL2, CXCL1, CX3CL1, CCL28, CCL27, CCL26, CCL25, CCL24, CCL23, CCL22, CCL21, CCL20, CCL19, CCL18, CCL17, CCL16, CCL14, CCL13, CCL11, CCL8, CCL7, CCL5, CCL4, CCL3, CCL2, CCL1

Abbreviations: MHC, major histocompatibility complex.

Table S3 The comparison of 11 immune signatures by ssGSEA algorithm

Immune signatures	Gene set
APC co inhibition	C10orf54, CD274, LGALS9, PDCD1LG2, PVRL3
APC co stimulation	CD40, CD58, CD70, ICOSLG, SLAMF1, TNFSF14, TNFSF15, TNFSF18, TNFSF4, TNFSF8, TNFSF9
CCR	CCL16, TPO, TGFBR2, CXCL2, CCL14, TGFBR3, IL11RA, CCL11, IL4I1, 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, TGFB1I1, IFNGR1, IL9R, IL1RAPL1, IL11, CSF1, IL20RA, IL25, TNFRSF4, IL18, ILF3, CCL20, TNFRSF12A, IL6ST, CXCL13, IL12B, TNFRSF8, IL6R, BMPR2, IFNE, IL1RAPL2, IL3RA, BMP4, CCL24, TNFSF13B, CCR4, IL2RA, IL32, TNFRSF10C, IL22RA1, BMPR1A, 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, TGFBI, TNFSF10, TNFRSF11A, CXCL5, IL5RA, TNFSF9, IL1RL2, TNFRSF13C, IL36G, IL15RA, TNFRSF21, CXCL8, IL22RA2, TNFAIP8L2, IL18R1, IFNLR1, CXCR6, CCL3L3, TNFRSF1A, IL17RE, IFNGR2, IL17RC, TNFAIP8L3, ILVBL, TGFBRAP1, 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, BMPR1B, 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, TGFBR1, IFNA5, BMP7, IFNA14, IL20RB, IL10RA, IFNA17, CCR6, TGFB3, CCL15, CCL4, CCL27, TNFRSF13B, TNFAIP2, IL31, IL17A, TNFSF15, CCL19, IFNA6, IL9
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
Inflammation-promoting	CCL5, CD19, CD8B, CXCL10, CXCL13, CXCL9, GNLY, GZMB, IFNG, IL12A, IL12B, IRF1, PRF1, STAT1, TBX21
MHC class I	B2M, HLA-A, TAP1
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
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
Type I IFN Reponse	DDX4, IFIT1, IFIT2, IFIT3, IRF7, ISG20, MX1, MX2, RSAD2, TNFSF10
Type II IFN Reponse	GPR146, SELP, AHR

Abbreviations: CCR, chemokine receptors.