**Supplementary table 1. Name of gene used to prepare heatmap of TME**

|  |  |
| --- | --- |
| **TME axis** | **Genes to be analyzed** |
| **CD8+ T cell** | *BCL11B, CCL5, CD2, CD247, CD27, CD3D, CD3E, CD3G, CD6, CD69, CD7, CD8A, CD8B, CD96, CRTAM, CST7, CTSW, DPP4, DSC1, DUSP2, FCMR, FLT3LG, GNLY, GPR171, GRAP2, GZMA, GZMB, GZMH, GZMK, GZMM, ICOS, IGKC, IL7R, ITK, KLRB1, KLRC3, KLRC4, KLRD1, KLRF1, KLRK1, LAG3, LCK, LEF1, LIME1, LTB, LY9, MAP4K1, MAP9, NCR3, NKG7, PIK3IP1, PRF1, PTGDR, PTPRCAP, PVRIG, RASA3, RPL3P7, SH2D1A, SIRPG, TCF7, TRAC, TRAT1, TRAV12-2, TRAV13-1, TRBC1, TRDC, UBASH3A, ZAP70* |
| **NK cell activation** | *APOBEC3G, APOL6, CCL4, CCL5, CCND2, CD244, CD247, CD69, CD7, CD96, CDK6, CSF2, CST7, CTSW, DPP4, FASLG, GNLY, GPR171, GPR18, GRAP2, GZMA, GZMB, GZMH, GZMM, IFNG, IL12RB2, IL18R1, IL18RAP, IL2RB, KIR2DL1, KIR2DL4, KIR2DS4, KIR3DL2, KLRB1, KLRC3, KLRD1, KLRF1, KLRK1, LCK, LTA, LTB, NAALADL1, NCR3, NKG7, OSM, PRF1, PRR5L, PTGDR, PTGER2, PTPRCAP, PVRIG, S1PR5, SH2D1A, SOCS1, TBX21, TNFSF14, TRDC, TXK, ZAP70* |
| **DC cell activation** | *ARHGAP22, BIRC3, CCL1, CCL13, CCL17, CCL18, CCL19, CCL20, CCL22, CCL5, CCL8, CCR7, CD1B, CD1E, CD80, CD86, CHST7, CLIC2, CXCL10, CXCL11, CYP27A1, DHX58, EBI3, ETV3, FPR3, HESX1, HTR2B, IDO1, IFI44L, IL12B, IL2RA, KYNU, LAMP3, MAP3K13, MMP12, MSC, NR4A3, PDCD1LG2, PLA1A, PLA2G7, PTGIR, RASSF4, RSAD2, SIGLEC1, SLC15A3, SLC2A6, SLCO5A1, ST3GAL6, TMEM255A, TNFAIP6, TNFRSF11A, TNFRSF4, TREM2* |
| **IFN-γ signaling** | *ADAR, APOL6, ARID5B, ARL4A, AUTS2, B2M, BANK1, BATF2, BPGM, BST2, BTG1, C1R, C1S, CASP1, CASP3, CASP4, CASP7, CASP8, CCL2, CCL5, CCL7, CD274, CD38, CD40, CD69, CD74, CD86, CDKN1A, CFB, CFH, CIITA, CMKLR1, CMPK2, CMTR1, CSF2RB, CXCL10, CXCL11, CXCL9, IL10RA, DDX58, DDX60, DHX58, EIF2AK2, EIF4E3, EPSTI1, FAS, FCGR1A, FGL2, FPR1, GBP4, GBP6, GCH1, GPR18, GZMA, HELZ2, HERC6, HIF1A, HLA-A, HLA-B, LATS2, HLA-DMA, HLA-DQA1, HLA-DRB1, HLA-G, ICAM1, IDO1, IFI27, IFI30, IFI35, IFI44, IFI44L, IFIH1, IFIT1, IFIT2, IFIT3, IFITM2, IFITM3, IFNAR2, IL15, IL15RA, IL18BP, IL2RB, IL4R, IL6, IL7, IRF1, IRF2, IRF4, IRF5, IRF7, IRF8, IRF9, ISG15, ISG20, ISOC1, ITGB7, JAK2, KLRK1, LAP3, LCP2, LGALS3BP, LY6E, LYSMD2, METTL7B, MT2A, MTHFD2, MVP, MX1, MX2, MYD88, NAMPT, NCOA3, NFKB1, NFKBIA, NLRC5, NMI, NOD1, NUP93, OAS2, OAS3, OASL, OGFR, P2RY14, PARP12, PARP14, PDE4B, PELI1, PFKP, PIM1, PLA2G4A, PLSCR1, PML, PNP, PNPT1, PSMA2, PSMA3, PSMB10, PSMB2, PSMB8, PSMB9, PSME1, PSME2, PTGS2, PTPN1, PTPN2, PTPN6, RAPGEF6, RBCK1, RIPK1, RIPK2, RNF213, RNF31, RSAD2, RTP4, SAMD9L, SAMHD1, SECTM1, SELP, SERPING1, SLAMF7, SLC25A28, SOCS1, SOCS3, SOD2, SP110, SPPL2A, SRI, SSPN, ST3GAL5, ST8SIA4, STAT1, STAT2, STAT3, STAT4, TAP1, TAPBP, TDRD7, TNFAIP2, TNFAIP3, TNFAIP6, TNFSF10, TOR1B, TRAFD1, TRIM14, TRIM21, TRIM25, TRIM26, TXNIP, UBE2L6, UPP1, USP18, VAMP5, VAMP8, VCAM1, WARS, XAF1, XCL1, ZBP1, ZNFX1, STAT4* |
| **Inhibitory molecules**  **(Immune escape)** | *ARG1, BTLA, CCL2, CCL22, CD163, CD80, CD86, COL17A1, CSF1, CTLA4, ENTPD1, FOXP3, GDF15, HAVCR2, HGF, ICOS, IDO1, IDO2, IL10, IL13, IL4, IL6, IL6ST, JAK2, KIR2DL1, KIR2DL2, KIR2DL3, LAG3, LAIR1, LGALS1, LGALS3, MCL1, MRC1, MSR1, MYC, NT5E, PDCD1, CD274, PDCD1LG2, PIM1, PTGS1, PTGS2, PVR, SOCS3, STAT3, STAT5B, TGFB1, TIGIT, TIMP1, TNFRSF14, VEGFA, VTCN1* |
| **Regulatory T cells** | *BARX2, BCL11B, CD2, CD247, CD27, CD28, CD3D, CD3E, CD3G, CD4, CD5, CD6, CD70, CD96, CEMP1, CLEC2D, CTLA4, DGKA, DPP4, EFNA5, FOXP3, FRMD8, GPR1, GPR171, GPR19, GZMM, HIC1, HMGB3P30, ICOS, IL2RA, IL2RB, ITK, KIRREL, LAIR2, LCK, LILRA4, LOC126987, LTB, MAP4K1, MBL2, NPAS1, NTN3, PCDHA5, PLCH2, PMCH, PTGIR, PTPRG, RCAN3, RYR1, SEC31B, SEPT5, SH2D1A, SIRPG, SIT1, SKAP1, SPOCK2, SSX1, TRAC, TRAT1, TRAV9-2, TRBC1, TYR, UBASH3A, ZAP70* |
| **Myeloid-derived suppressor cells** | *ADORA3, C11orf96, ARG1, BIN2, C1orf162, CAPS, KIT, ITGAM, ITGAX, IL4R, CD14, FUT4, CD163L1, CR2, FCER2, CD274, PECAM1, CR1, CD40, SPN, CD44, COX2, CTR9, EBP, SUPT20H, TMEM255B, FCGRT, FERMT3, FLOT1, FLT1, GIMAP7, GLI4, GNA15, GPR34, GPSM3, IDO1, IKZF1, IL13, IL18BP, IL1R1, INPP5D, ITGA3, KDR, KRIT1, LGALS3, MGAT4A, NAIP, NEK3, NOG, PARVG, PDRG1, PIK3R5, PPP1R2P4, PSAP, PTGES2, PTPRE, RNASE1, PRPF31, S100A8, S100A9, SELPLG, SLA, SLC36A1, SLC44A1, ST8SIA4, STAT3, STAT6, TBXAS1, TGFB1, TGFB2, TGFB3, TFRC, TPP1, VTCN1* |
| **Antigen presentation and recognition of tumor cells** | *ANAPC1, ANAPC10, ANAPC11, ANAPC13, ANAPC2, ANAPC4, ANAPC5, ANAPC7, ARIH2, ASB1, ASB11, ASB12, ASB13, ASB15, ASB16, ASB17, ASB2, ASB3, ASB4, ASB5, ASB6, ASB7, ASB8, ASB9, ATG7, B2M, BLMH, BTRC, CALR, CANX, CBLB, CD207, CD36, CDC16, CDC20, CDC23, CDC26, CDC26P1, CDC27, CDC34, CTSS, CUL1, CUL2, CUL3, CUL5, CUL7, CYBA, CYBB, DCAF1, DET1, DTX3L, DZIP3, ELOB, ELOC, ELOCP3, ERAP1, FBXO17, FBXO2, FBXO27, FBXO3, FBXO4, FBXO44, FBXO6, FBXW11, FBXW7, FBXW8, FCGR1A, FCGR1B, GAN, HECTD3, HERC2, HLA-A, HLA-B, HLA-C, HLA-F, HLA-G, HLA-K, HSPA5, HUWE1, ITGAV, ITGB5, KEAP1, KLHL13, KLHL20, KLHL9, LNPEP, LOC644006, LRR1, LRRC41, LRSAM1, MKRN1, MRC1, MRC2, NCF2, NCF4, NEDD4, NPEPPS, PARK2, PDIA3, PJA1, PJA2, PSMA1, PSMA2, PSMA3, PSMA4, PSMA5, PSMA6, PSMA7, PSMA8, PSMB1, PSMB10, PSMB2, PSMB3, PSMB4, PSMB5, PSMB6, PSMB7, PSMB8, PSMB9, PSMC1, PSMC2, PSMC3, PSMC4, PSMC5, PSMC6, PSMD1, PSMD10, PSMD11, PSMD12, PSMD13, PSMD14, PSMD2, PSMD3, PSMD4, PSMD5, PSMD6, PSMD7, PSMD8, PSMD9, PSME1, PSME2, PSME4, PSMF1, RBCK1, RBX1, RCHY1, RNF123, RNF138, RNF144B, RNF182, RNF220, RNF25, RNF34, RNF4, RNF41, RNF6, RPS27A, RPS27AP11, SAE1, SAR1B, SEC13, SEC23A, SEC24B, SEC24C, SEC24D, SEC31A, SEC61A1, SEC61A2, SEC61B, SEC61G, SKP1, SKP2, SMURF1, SMURF2, SOCS1, SOCS3, SPSB1, SPSB2, SPSB4, STUB1, TAP1, TAP2, TMEM189-UBE2V1, TPP2, TRIM11, TRIM21, TRIM32, TRIM36, TRIM37, TRIM63, TRIM9, TRIP12, UBA1, UBA2, UBA3, UBA5, UBA52, UBA6, UBA7, UBE2A, UBE2B, UBE2C, UBE2D1, UBE2D2, UBE2D3, UBE2D4, UBE2E1, UBE2E2, UBE2E3, UBE2F, UBE2G1, UBE2G2, UBE2H, UBE2HP1, UBE2J1, UBE2J2, UBE2K, UBE2L3, UBE2L6, UBE2M, UBE2N, UBE2O, UBE2Q1, UBE2Q2, UBE2R2, UBE2S, UBE2U, UBE2V2, UBE2W, UBE2Z, UBE3A, UBE3B, UBE3C, UBE4A, UBOX5, UBR1, UBR2, UBR4, VHL, WSB1, WWP1, ZBTB16* |