**Table S4:** List of benchmark genes in top-20 and top-50 metrics.

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| **BRCA** | **Top 20** | ACAP1, CCL5, CD2, CD247, CD27, CD3D, CD3E, CD40LG, CD48, CD5, CD53, CD79A, CD96, CXCR3, FCRL5, GZMK, HLA-DMB, IKZF1, IL2RG, IRF4, ITK, KLRK1, LAPTM5, LCK, LY9, NCKAP1L, NKG7, PTPN7, PYHIN1, SAMD3, SASH3, SH2D1A, SIRPG, SIT1, SLA2, SLAMF1, SLAMF6, SPI1, TBX21, UBASH3A, WAS |
| **Top 50** | ACAP1, ARHGAP25, ARHGAP9, BTK, BTLA, BUB1, CCL5, CCR5, CD2, CD247, CD27, CD37, CD3D, CD3E, CD3G, CD4, CD40LG, CD48, CD5, CD53, CD6, CD79A, CD86, CD8A, CD96, COL1A1, COL5A1, COL5A2, COL6A3, CXCR3, CXCR6, CYTH4, DOCK2, EVI2B, FCRL5, FERMT3, FYB, GPR171, GZMA, GZMK, HAVCR2, HLA-DMB, IKZF1, IL10RA, IL12RB1, IL2RG, IRF4, ITK, KLRK1, LAPTM5, LAX1, LCK, LCP2, LILRB1, LST1, LY9, MYO1F, NCF4, NCKAP1L, NKG7, PLEK, PRF1, PRKCB, PTPN7, PTPRC, PYHIN1, S1PR4, SAMD3, SASH3, SCML4, SH2D1A, SIRPG, SIT1, SLA2, SLAMF1, SLAMF6, SLAMF7, SNX20, SPARC, SPI1, SPN, TBC1D10C, TBX21, THEMIS, TIGIT, TMC8, TPX2, TRAT1, UBASH3A, WAS, ZAP70, ZNF831 |
| **COAD** | **Top 20** | AEBP1, ANTXR1, ARHGAP25, ARHGEF6, ATP8B2, C1QB, C1QC, C1R, C1S, C3AR1, CALD1, CD27, CD300LF, CD4, CD53, CD86, CLEC7A, CNRIP1, DDR2, DOCK2, EMILIN1, EVC, FBN1, FBXL7, FLI1, FPR3, FSTL1, HCK, HCLS1, IGSF6, IKZF1, ITGB2, LAIR1, LAPTM5, LCP1, LILRB4, MAP4K1, MS4A4A, MS4A7, MSRB3, NCKAP1L, PDGFRB, RAB31, RASSF2, RCSD1, S1PR1, SIGLEC7, SPI1, TCF4, TFEC, TLR8, VIM, ZEB2 |
| **Top 50** | AEBP1, AIF1, ANTXR1, APBB1IP, ARHGAP25, ARHGAP9, ARHGEF6, ATP8B2, BNC2, BTK, C10orf72, C17orf87, C1QA, C1QB, C1QC, C1R, C1S, C3AR1, CALD1, CCDC8, CCDC80, CD14, CD163, CD180, CD27, CD300A, CD300LF, CD37, CD4, CD53, CD84, CD86, CD93, CFH, CLEC7A, CMKLR1, CNRIP1, COL1A2, COL3A1, COL5A2, COL6A2, CSF1R, CSF2RB, CYBB, CYTH4, DDR2, DOCK10, DOCK2, DOK2, DZIP1, EFEMP2, EMILIN1, EVC, EVI2B, FBN1, FBXL7, FCER1G, FCRL5, FERMT2, FLI1, FMNL1, FPR3, FSTL1, GIMAP4, GLI3, GNB4, GPC6, HAVCR2, HCK, HCLS1, HEG1, HLA-DPB1, IGSF6, IKZF1, ITGAL, ITGB2, LAIR1, LAPTM5, LAX1, LCP1, LILRB1, LILRB2, LILRB4, LRRC25, LSP1, LY9, MAP4K1, MNDA, MRC2, MS4A4A, MS4A6A, MS4A7, MSRB3, MYLK, MYO1F, NCF1, NCKAP1L, OLFML1, PDCD1LG2, PDGFRB, PEG3, PIK3R5, PTPRC, RAB31, RASSF2, RCSD1, RHOJ, S1PR1, SASH3, SHE, SIGLEC7, SIGLEC9, SIRPB2, SLA, SLAMF8, SPI1, SULF1, SYDE1, SYT11, TCF4, TFEC, TLR8, TNS1, TRAF3IP3, TYROBP, VIM, VSIG4, WAS, ZEB1, ZEB2 |
| **GBM** | **Top 20** | ALOX5, ARL11, BUB1, C1QB, C1QC, C3AR1, CD4, CD53, CD68, CD86, CKAP2L, CNDP1, CYTH4, DDX3Y, DOCK2, EIF1AY, FCGR3A, FERMT3, HAVCR2, HCK, HLA-DMA, HLA-DMB, ITGB2, KDM5D, LAIR1, LAPTM5, MYO1F, NCKAP1L, NKX6-2, NLGN4Y, PTPN6, RPS4Y1, SASH3, SPI1, STXBP2, SYK, TBXAS1, TYROBP, USP9Y, VAV1, WAS, ZFY |
| **Top 50** | ABI3, ADAP2, ADORA3, ALOX5, APBB1IP, ARHGAP30, ARHGAP9, ARL11, BTK, BUB1, C19orf70, C1QA, C1QB, C1QC, C3AR1, CARNS1, CCNA2, CD33, CD4, CD53, CD68, CD86, CDCA5, CKAP2L, CNDP1, CORO1A, CSF1R, CTSS, CYTH4, DDX3Y, DENND1C, DOCK2, EIF1AY, EVI2B, FCER1G, FCGR1A, FCGR3A, FERMT3, GPSM3, HAVCR2, HCK, HJURP, HLA-DMA, HLA-DMB, HLA-DRA, IKZF1, IL10RA, ITGAM, ITGB2, KDM5D, KIF11, KIF2C, KLK6, LAIR1, LAPTM5, LILRB1, LILRB4, LRRC25, LY86, MAG, MKI67, MOG, MYO1F, NCAPG, NCAPH, NCKAP1L, NKX6-2, NLGN4Y, PARVG, PIK3AP1, PLCG2, PLEK, PTPN6, PTPRC, RASAL3, RASGRP4, RIPK3, RPL27, RPS4Y1, SAMSN1, SASH3, SIGLEC9, SLC6A17, SPI1, STXBP2, SYK, SYN2, TBXAS1, TFEC, TLR2, TPX2, TRPM2, TTK, TYROBP, USP9Y, VAMP8, VAV1, WAS, ZFY |