Figure S1

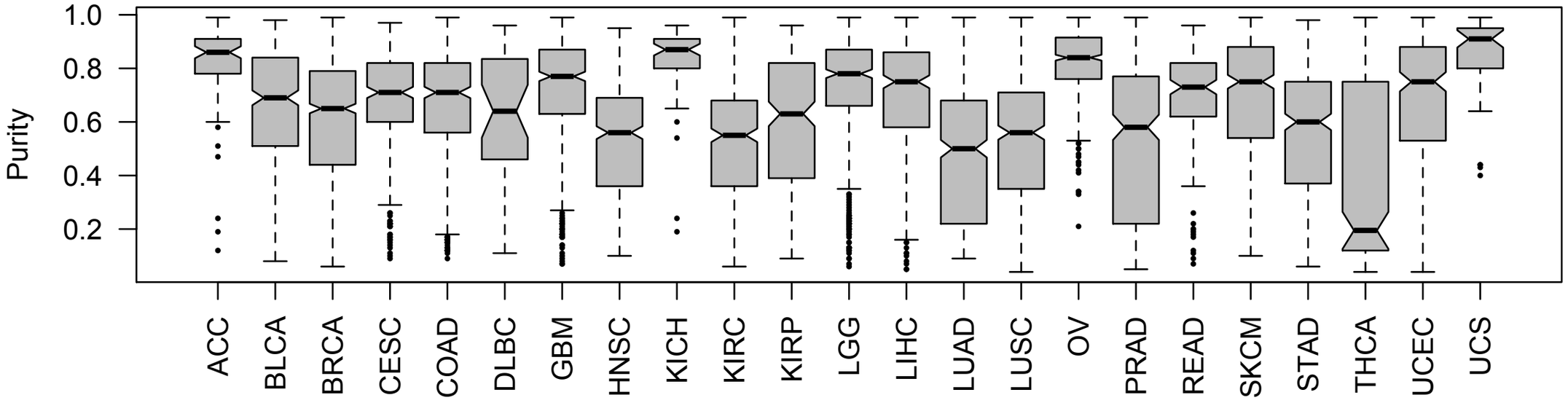

Purity
1.0
0.8
0.6
0.4
0.2
ACC
BLCA
BRCA
CESC
COAD
DLBC
GBM
HNSC
KICH
KIRC
KIRP
LGG
LIHC
LUAD
LUSC
OV
PRAD
READ
SKCM
STAD
THCA
UCEC
UCS

Figure S2

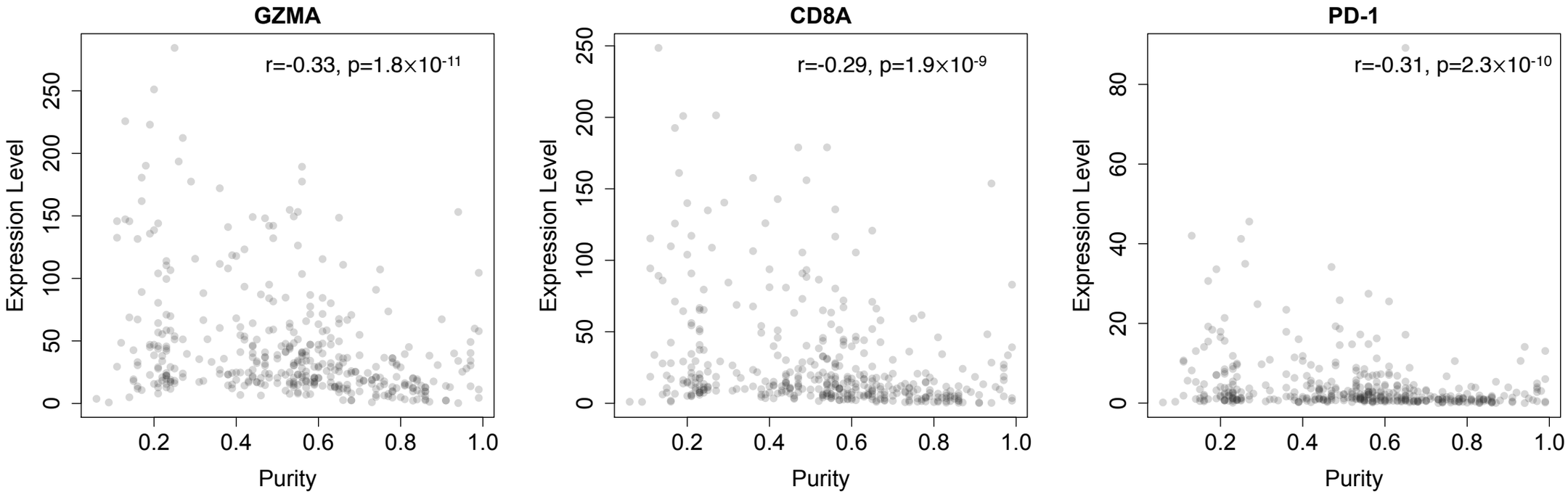

GZMA
r=-0.33, p=1.8×10-11
Expression Level
0
50
100
150
200
250
0.2
0.4
0.6
0.8
1.0
Purity
CD8A
r=-0.29, p=1.9×10-9
Expression Level
0
50
100
150
200
250
0.2
0.4
0.6
0.8
1.0
Purity
PD-1
r=-0.31, p=2.3×10-10
Expression Level
0
20
40
60
80
0.2
0.4
0.6
0.8
1.0
Purity

Figure S3

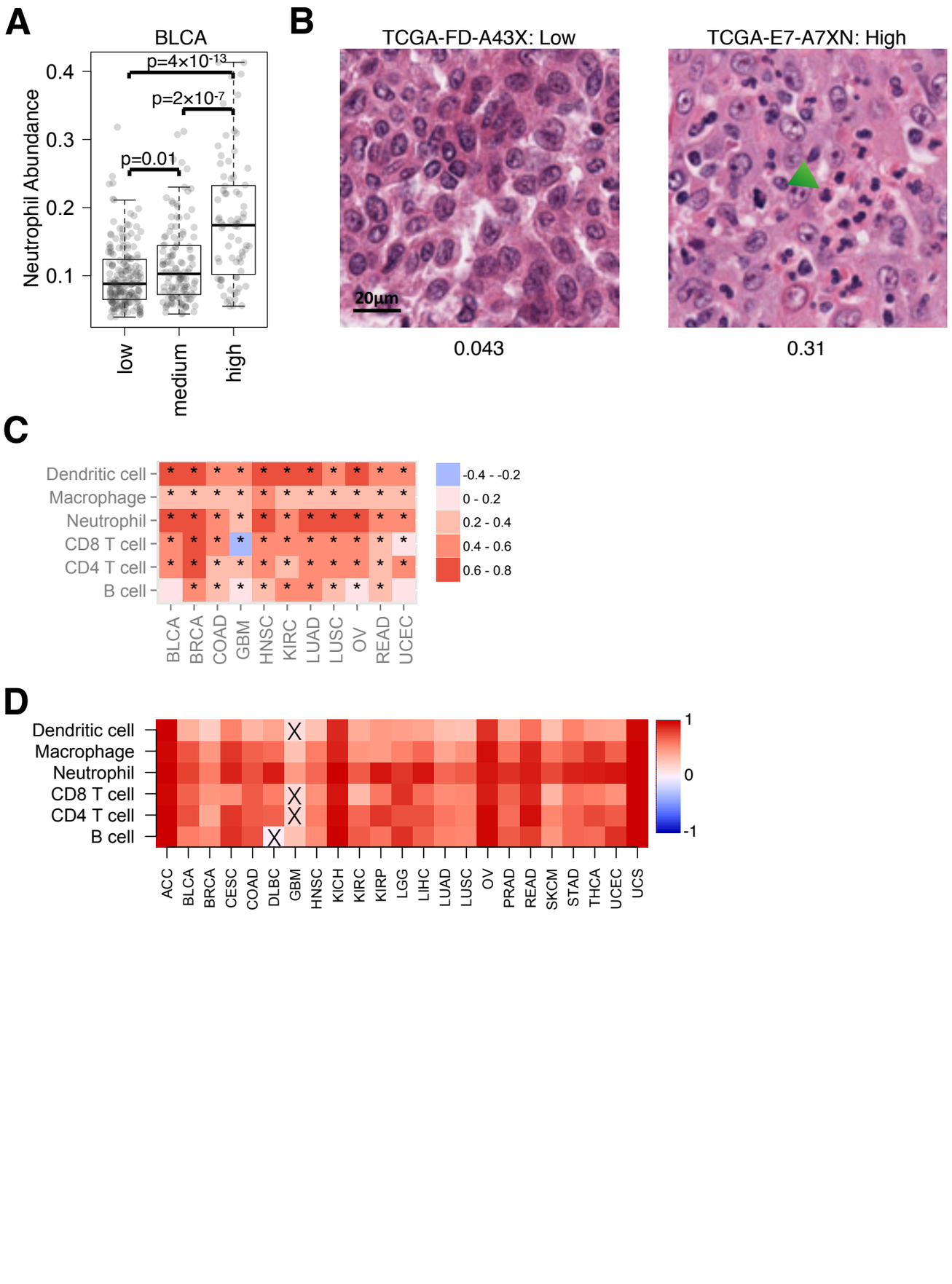

A
BLCA
p=4×10-13
p=2×10-7
p=0.01
Neutrophil Abundance
0.4
0.3
0.2
0.1
low
medium
high
B
TCGA-FD-A43X: Low
TCGA-E7-A7XN: High
20μm
0.043
0.31
C
Dendritic cell
Macrophage
Neutrophil
CD8 T cell
CD4 T cell
B cell
BLCA
BRCA
COAD
GBM
HNSC
KIRC
LUAD
LUSC
OV
READ
UCEC
-0.4 - -0.2
0 - 0.2
0.2 - 0.4
0.4 - 0.6
0.6 - 0.8
D
Dendritic cell
Macrophage
Neutrophil
CD8 T cell
CD4 T cell
B cell
ACC
BLCA
BRCA
CESC
COAD
DLBC
GBM
HNSC
KICH
KIRC
KIRP
LGG
LIHC
LUAD
LUSC
OV
PRAD
READ
SKCM
STAD
THCA
UCEC
UCS
1
0
-1

Figure S4

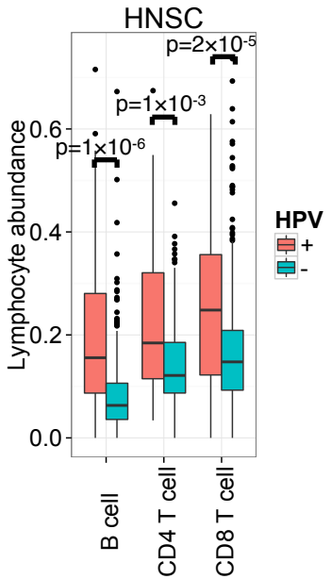

HNSC
p=2×10-5
p=1×10-3
p=1×10-6
Lymphocyte abundance
0.6
0.4
0.2
0.0
B cell
CD4 T cell
CD8 T cell
HPV
+
-

Figure S5

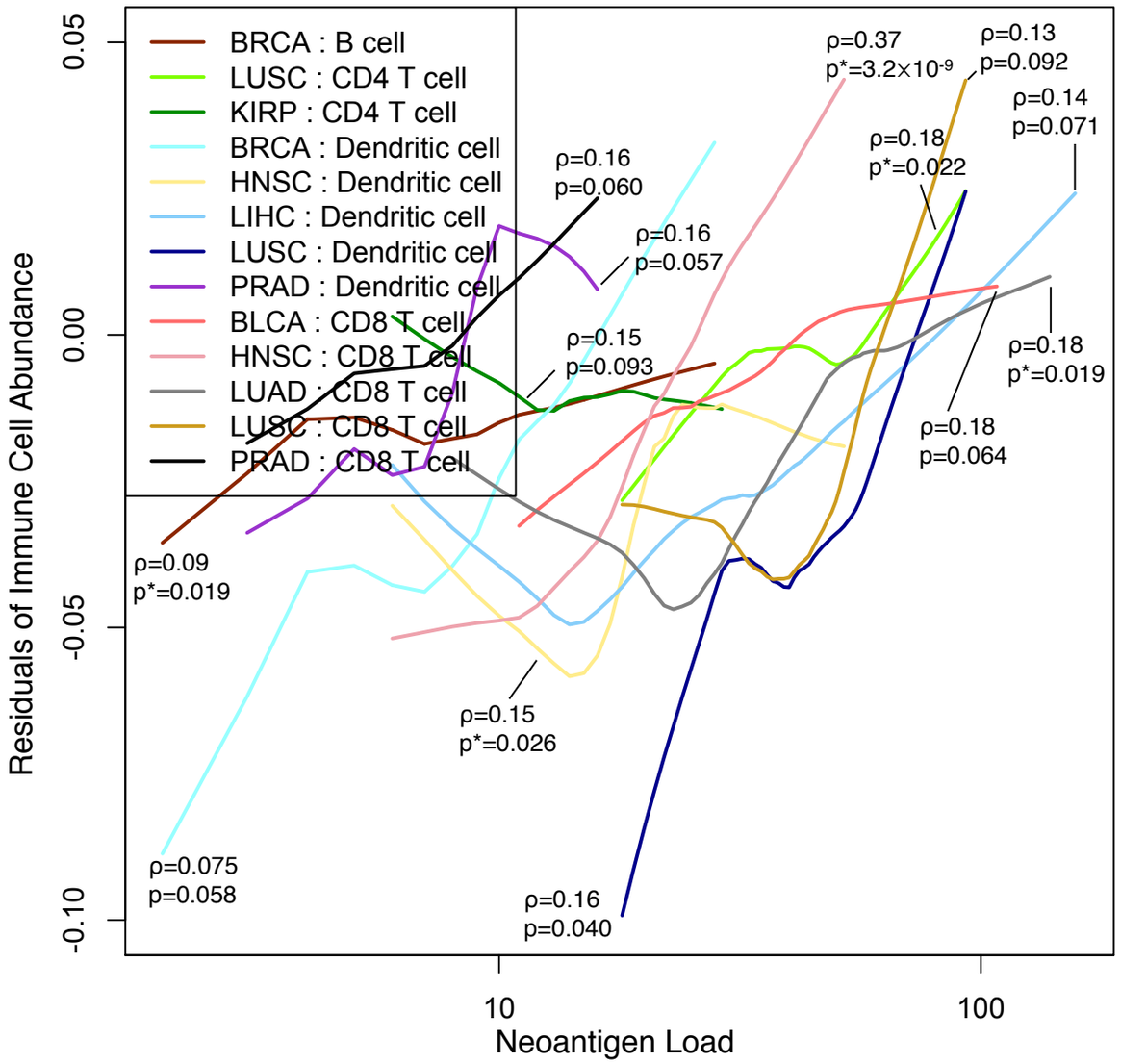

BRCA : B cell
LUSC : CD4 T cell
KIRP : CD4 T cell
BRCA : Dendritic cell
HNSC : Dendritic cell
LIHC : Dendritic cell
LUSC : Dendritic cell
PRAD : Dendritic cell
BLCA : CD8 T cell
HNSC : CD8 T cell
LUAD : CD8 T cell
LUSC : CD8 T cell
PRAD : CD8 T cell
ρ=0.09
p*=0.019
ρ=0.075
p=0.058
ρ=0.16
p=0.060
ρ=0.16
p=0.057
ρ=0.15
p=0.093
ρ=0.15
p*=0.026
ρ=0.37
p*=3.2×10-9
ρ=0.16
p=0.040
ρ=0.18
p*=0.022
ρ=0.13
p=0.092
ρ=0.14
p=0.071
ρ=0.18
p*=0.019
ρ=0.18
p=0.064
Residuals of Immune Cell Abundance
0.05
0.00
-0.05
-0.10
10
100
Neoantigen Load

Figure S6

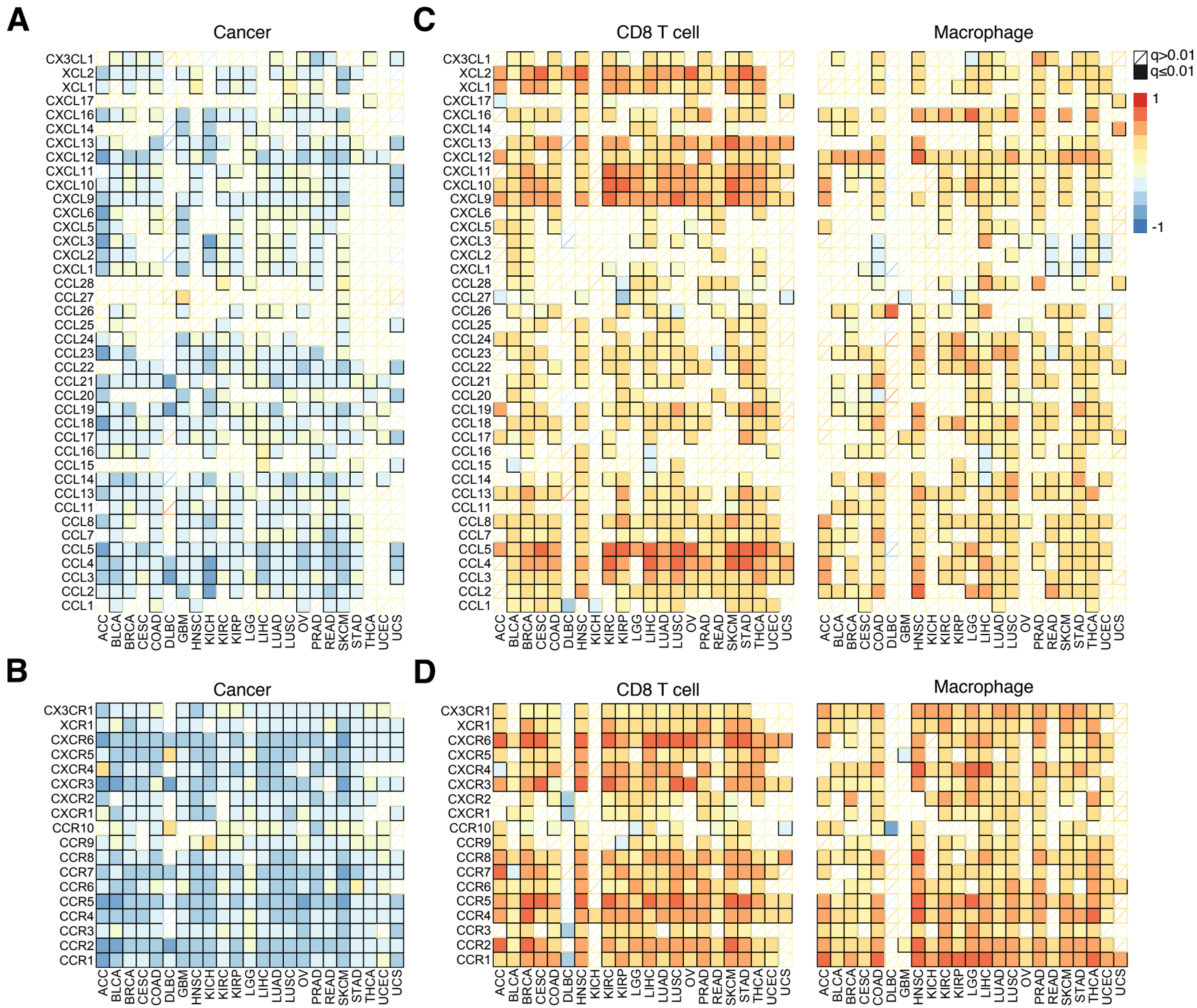

A
Cancer
B
Cancer
C
CD8 T cell
Macrophage
D
CD8 T cell
Macrophage
q>0.01
q≤0.01
1
-1
CX3CL1
XCL2
XCL1
CXCL17
CXCL16
CXCL14
CXCL13
CXCL12
CXCL11
CXCL10
CXCL9
CXCL6
CXCL5
CXCL3
CXCL2
CXCL1
CCL28
CCL27
CCL26
CCL25
CCL24
CCL23
CCL22
CCL21
CCL20
CCL19
CCL18
CCL17
CCL16
CCL15
CCL14
CCL13
CCL11
CCL8
CCL7
CCL5
CCL4
CCL3
CCL2
CCL1
CX3CR1
XCR1
CXCR6
CXCR5
CXCR4
CXCR3
CXCR2
CXCR1
CCR10
CCR9
CCR8
CCR7
CCR6
CCR5
CCR4
CCR3
CCR2
CCR1
ACC
BLCA
BRCA
CESC
COAD
DLBC
GBM
HNSC
KICH
KIRC
KIRP
LGG
LIHC
LUAD
LUSC
OV
PRAD
READ
SKCM
STAD
THCA
UCEC
UCS

Figure S7

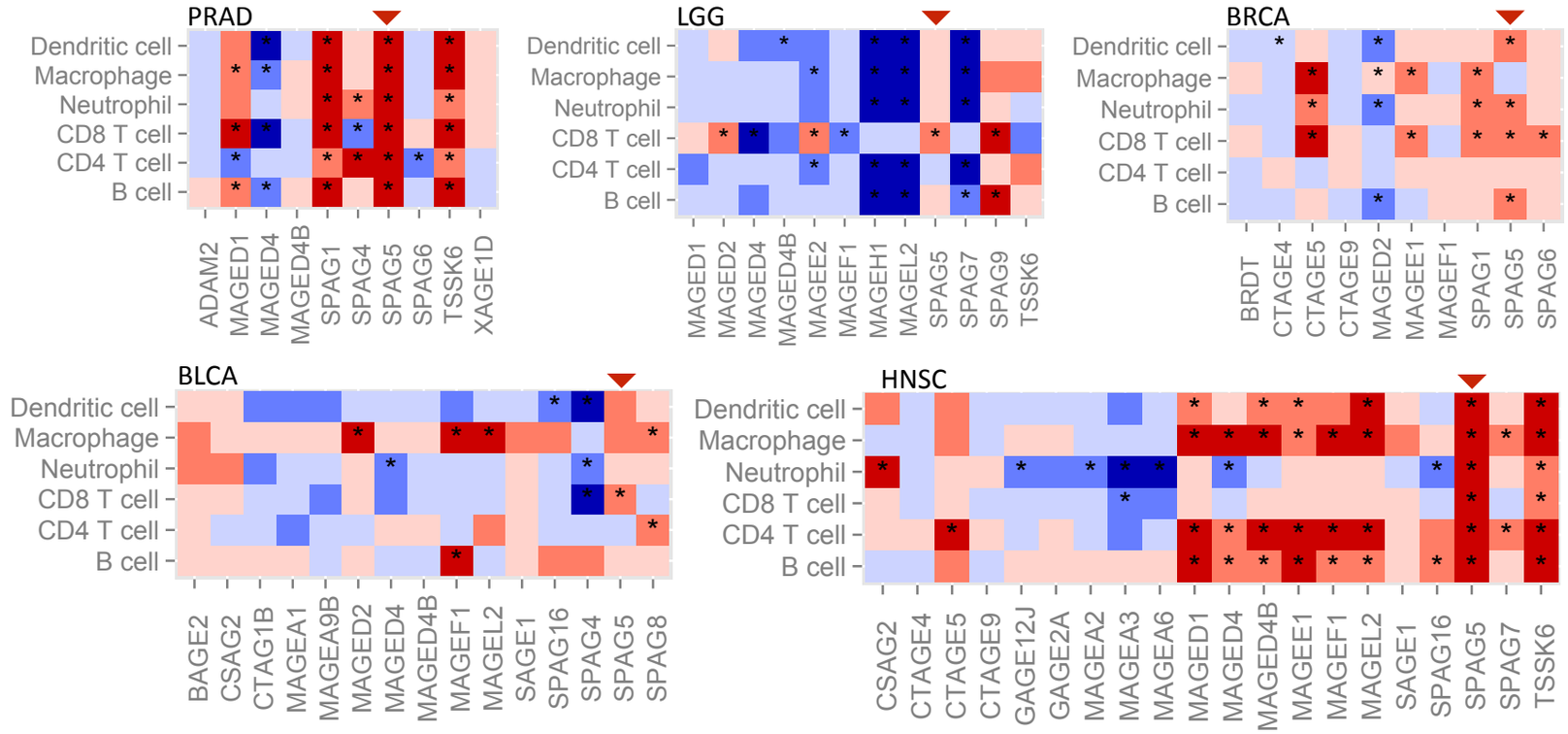

PRAD
Dendritic cell
Macrophage
Neutrophil
CD8 T cell
CD4 T cell
B cell
ADAM2
MAGED1
MAGED4
MAGED4B
SPAG1
SPAG4
SPAG5
SPAG6
TSSK6
XAGE1D
LGG
MAGED1
MAGED2
MAGED4
MAGED4B
MAGEE2
MAGEF1
MAGEH1
MAGEL2
SPAG5
SPAG7
SPAG9
TSSK6
BRCA
BRDT
CTAGE4
CTAGE5
CTAGE9
MAGED2
MAGEE1
MAGEF1
SPAG1
SPAG5
SPAG6
BLCA
BAGE2
CSAG2
CTAG1B
MAGEA1
MAGEA9B
MAGED2
MAGED4
MAGED4B
MAGEF1
MAGEL2
SAGE1
SPAG16
SPAG4
SPAG5
SPAG8
HNSC
CSAG2
CTAGE4
CTAGE5
CTAGE9
GAGE12J
GAGE2A
MAGEA2
MAGEA3
MAGEA6
MAGED1
MAGED4
MAGED4B
MAGEE1
MAGEF1
MAGEL2
SAGE1
SPAG16
SPAG5
SPAG7
TSSK6

Figure S8

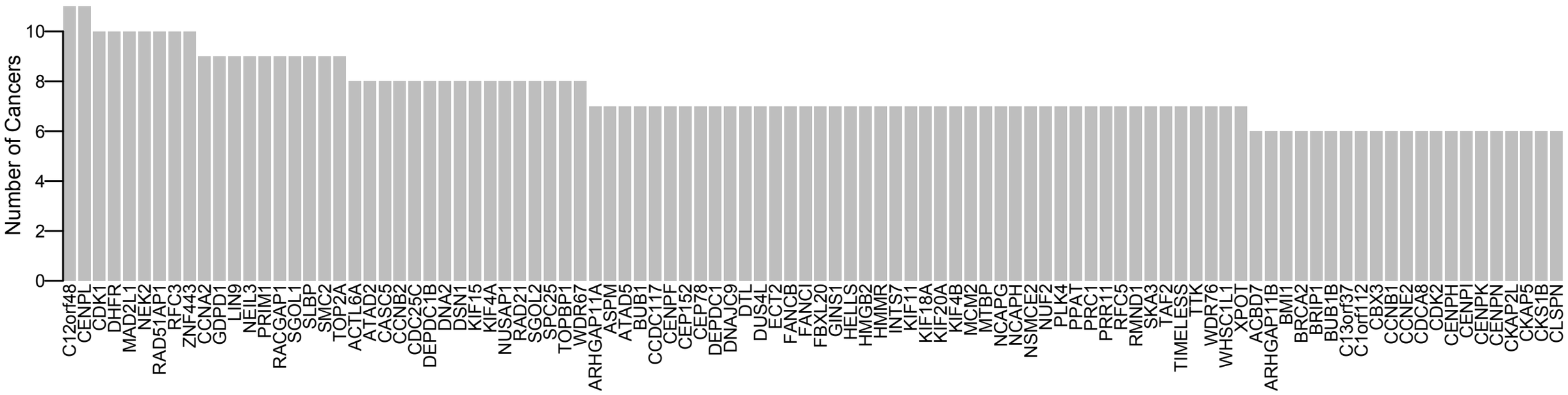
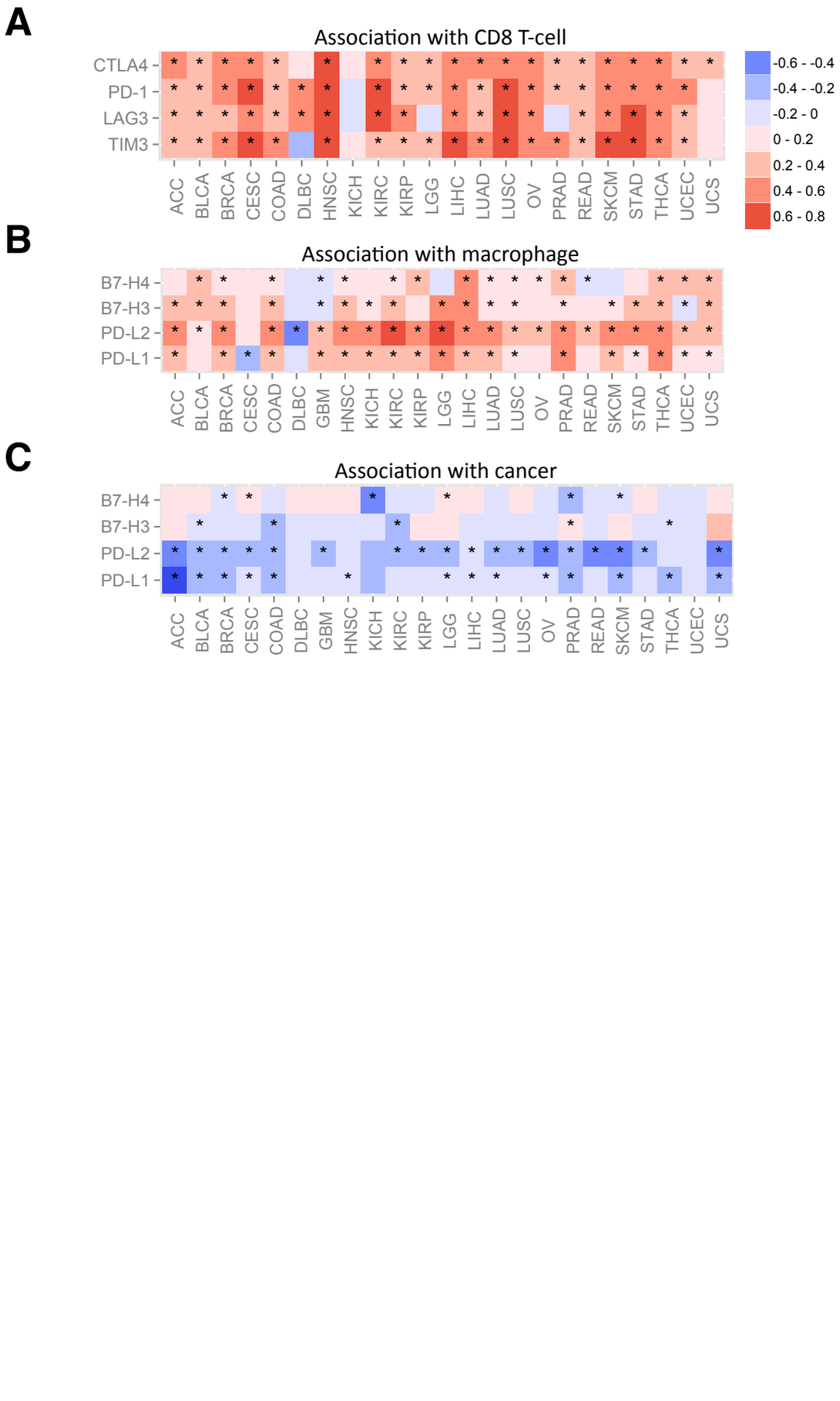

Number of Cancers
0
2
4
6
8
10
C12orf48
CENPL
CDK1
DHFR
MAD2L1
NEK2
RAD51AP1
RFC3
ZNF443
CCNA2
GDPD1
LIN9
NEIL3
PRIM1
RACGAP1
SGOL1
SLBP
SMC2
TOP2A
ACTL6A
ATAD2
CASC5
CCNB2
CDC25C
DEPDC1B
DNA2
DSN1
KIF15
KIF4A
NUSAP1
RAD21
SGOL2
SPC25
TOPBP1
WDR67
ARHGAP11A
ASPM
ATAD5
BUB1
CCDC117
CENPF
CEP152
CEP78
DEPDC1
DNAJC9
DTL
DUS4L
ECT2
FANCB
FANCI
FBXL20
GINS1
HELLS
HMGB2
HMMR
INTS7
KIF11
KIF18A
KIF20A
KIF4B
MCM2
MTBP
NCAPG
NCAPH
NSMCE2
NUF2
PLK4
PPAT
PRC1
PRR11
RFC5
RMND1
SKA3
TAF2
TIMELESS
TTK
WDR76
WHSC1L1
XPOT
ACBD7
ARHGAP11B
BMI1
BRCA2
BRIP1
BUB1B
C13orf37
C1orf112
CBX3
CCNB1
CCNE2
CDCA8
CDK2
CENPH
CENPI
CENPK
CENPN
CKAP2L
CKAP5
CKS1B
CLSPN

Figure S9


A
Association with CD8 T-cell
CTLA4
PD-1
LAG3
TIM3
ACC BLCA BRCA CESC COAD DLBC HNSC KICH KIRC KIRP LGG LIHC LUAD LUSC OV PRAD READ SKCM STAD THCA UCEC UCS
-0.6 - -0.4
-0.4 - -0.2
-0.2 - 0
0 - 0.2
0.2 - 0.4
0.4 - 0.6
0.6 - 0.8
B
Association with macrophage
B7-H4
B7-H3
PD-L2
PD-L1
ACC BLCA BRCA CESC COAD DLBC GBM HNSC KICH KIRC KIRP LGG LIHC LUAD LUSC OV PRAD READ SKCM STAD THCA UCEC UCS
C
Association with cancer
B7-H4
B7-H3
PD-L2
PD-L1
ACC BLCA BRCA CESC COAD DLBC GBM HNSC KICH KIRC KIRP LGG LIHC LUAD LUSC OV PRAD READ SKCM STAD THCA UCEC UCS

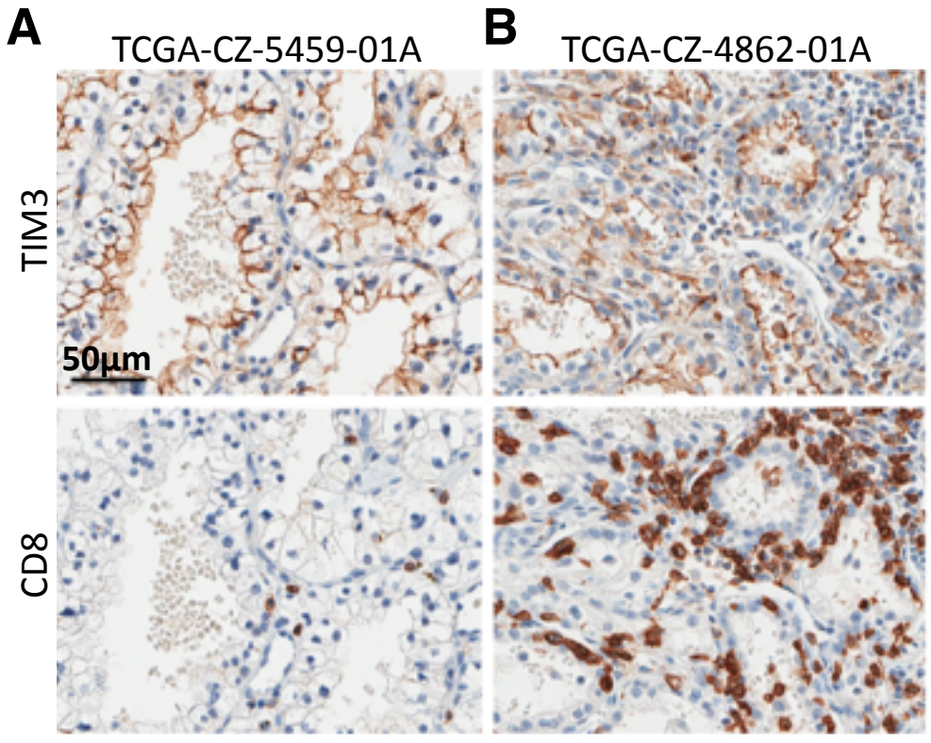



Figure S10