

1 **Table S1.** Correlation analysis between transcription factors and immune genes.

TF	Immune Gene	Cor	p-value	Regulation
BATF	XCL2	0.424516	3.43E-06	positive
BATF	TNFRSF4	0.601698	2.87E-12	positive
BATF	LCK	0.512234	9.10E-09	positive
BATF	ZAP70	0.637383	5.41E-14	positive
BATF	TRBC1	0.588121	1.14E-11	positive
BATF	TRBJ2-3	0.431588	2.25E-06	positive
BRCA1	TFRC	0.408153	8.72E-06	positive
CBX2	TFRC	0.460781	3.60E-07	positive
CBX2	CYSLTR2	0.481622	8.73E-08	positive
CBX8	AHNAK	-0.41835	4.90E-06	negative
E2F7	TFRC	0.478171	1.11E-07	positive
EPO	EPO	1	0	positive
ETS1	AHNAK	0.534818	1.48E-09	positive
ETS1	AQP9	0.458408	4.21E-07	positive
ETS1	PROK2	0.516409	6.57E-09	positive
ETS1	FPR2	0.549834	4.10E-10	positive
ETS1	IL13RA2	0.468028	2.22E-07	positive
FOXP3	CCL2	0.485323	6.72E-08	positive
FOXP3	CYSLTR2	0.413787	6.36E-06	positive

FOXP3	TNFRSF4	0.528236	2.55E-09	positive
FOXP3	LCK	0.421399	4.11E-06	positive
FOXP3	TRBC1	0.651512	9.70E-15	positive
HEY1	TFRC	0.434745	1.86E-06	positive
HOXB7	RBP1	0.420537	4.32E-06	positive
IRF3	AHNAK	-0.41772	5.08E-06	negative
IRF3	TNFRSF25	0.491935	4.18E-08	positive
IRF4	LCK	0.439471	1.40E-06	positive
IRF4	TRBC1	0.625879	2.06E-13	positive
IRF4	TRBJ2-3	0.46984	1.97E-07	positive
KAT2B	TRBC1	0.444093	1.05E-06	positive
LEF1	TFRC	0.453283	5.86E-07	positive
LEF1	PPARG	0.42827	2.75E-06	positive
PAX5	LCK	0.525846	3.09E-09	positive
PAX5	TRBC1	0.628142	1.59E-13	positive
PAX5	TRBJ2-3	0.538738	1.07E-09	positive
PPARG	TFRC	0.515169	7.24E-09	positive
PPARG	PPARG	1	0	positive
SOX4	LCK	0.407428	9.08E-06	positive
TBL1XR1	TFRC	0.569743	6.75E-11	positive
TP63	TFRC	0.544433	6.55E-10	positive
TP63	PPARG	0.475191	1.37E-07	positive

USF1	AHNAK	-0.47708	1.20E-07	negative
USF1	TNFRSF25	0.457628	4.43E-07	postive

2 TF: transcription factors; Cor: Pearson's correlation coefficient