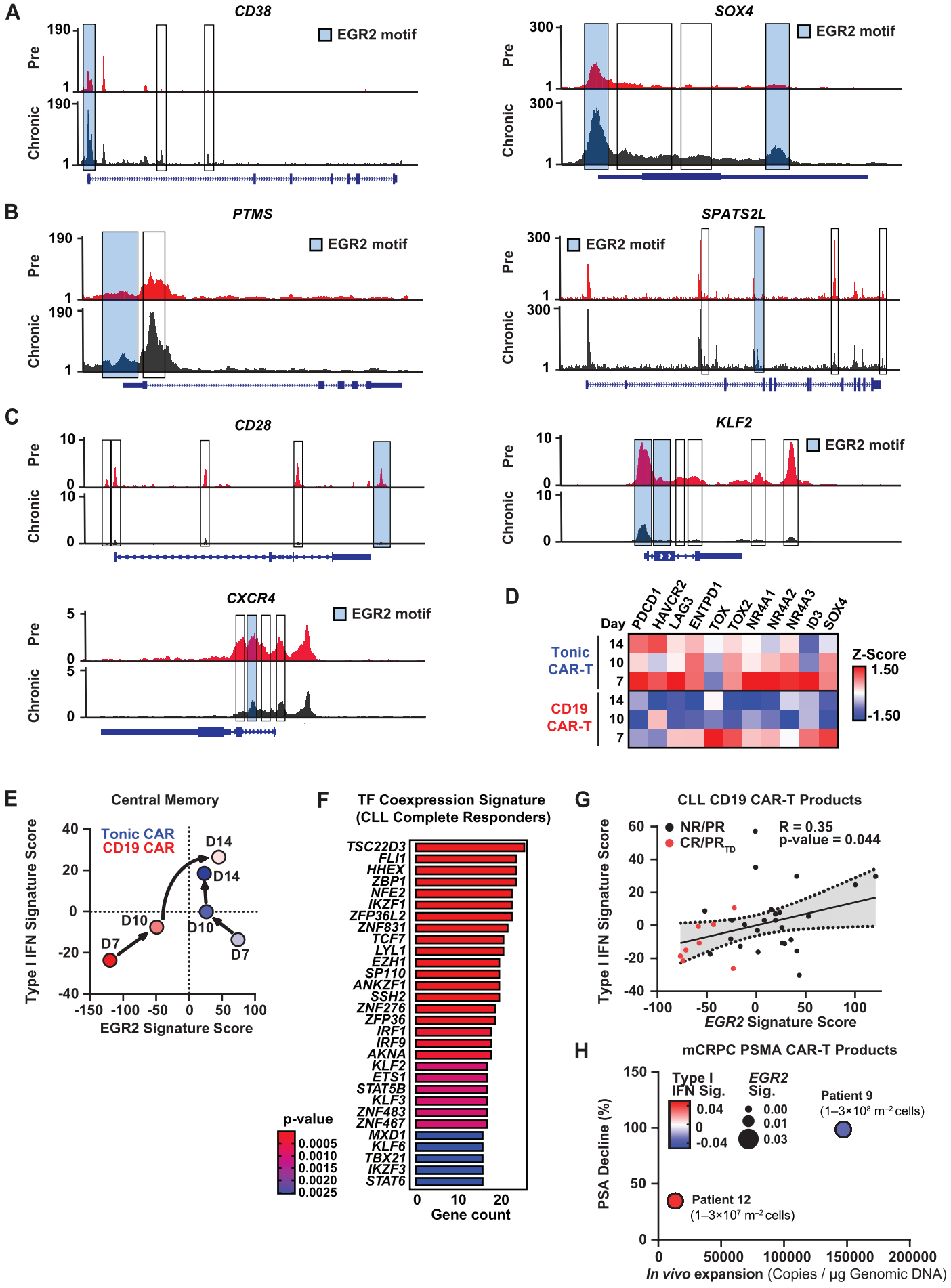
Figure S1


A
CD38
SOX4
EGR2 motif
Pre
Chronic
B
PTMS
SPATS2L
C
CD28
KLF2
CXCR4
D
Day
PDCD1
HAVCR2
LAG3
ENTPD1
TOX
TOX2
NR4A1
NR4A2
NR4A3
ID3
SOX4
Tonic CAR-T
CD19 CAR-T
Z-Score
1.50
-1.50
E
Central Memory
Tonic CAR
CD19 CAR
D14
D10
D7
Type I IFN Signature Score
EGR2 Signature Score
F
TF Coexpression Signature
(CLL Complete Responders)
TSC22D3
FLI1
HHEX
ZBP1
NFE2
IKZF1
ZFP36L2
ZNF831
TCF7
LYL1
EZH1
SP110
ANKZF1
SSH2
ZNF276
ZFP36
IRF1
IRF9
AKNA
KLF2
ETS1
STAT5B
KLF3
ZNF483
ZNF467
MXD1
KLF6
TBX21
IKZF3
STAT6
p-value
0.0005
0.0010
0.0015
0.0020
0.0025
Gene count
G
CLL CD19 CAR-T Products
NR/PR
CR/PR_TD
R = 0.35
p-value = 0.044
Type I IFN Signature Score
EGR2 Signature Score
H
mCRPC PSMA CAR-T Products
Type I IFN Sig.
EGR2 Sig.
0.04
0
-0.04
0.00
0.01
0.03
Patient 9
(1–3×10⁸ m⁻² cells)
Patient 12
(1–3×10⁷ m⁻² cells)
PSA Decline (%)
In vivo expansion (Copies / µg Genomic DNA)

Supplementary Figure 1. Analysis of EGR2 and type I IFN pathway regulation in CAR T-cells. (**A-C**) ATAC-seq tracks of genes associated with dysfunction, type I IFN signaling, and memory differentiation are shown, with differentially accessible regions indicated. **D,** Heatmap showing expression of exhaustion genes in tonically signaling GD2 and functional CD19 naïve $CD8^+$ CAR-T cells (GSE136891). **E,** Comparison of EGR2 and type I IFN gene signature scores in central memory $CD8^+$ T-cells expressing a tonically signaling GD2 CAR and control CD19 CAR. CAR T-cells were generated using T-cells from a healthy donor (GSE136891). **F,** Top transcription factor co-expression signatures overexpressed in CD19 CAR T-cell products of CLL complete responders. **G,** Comparison of EGR2 and type I IFN signature scores in unstimulated CD19 CAR T-cell products from CLL patients (CR: complete response, PR_{TD}: very good partial response, PR: conventional partial response, NR: no response). **H,** Comparison of type I IFN and EGR2 module scores in PSMA CAR T-cells from lymphodepleted prostate cancer patients, and their association with *in vivo* CAR T-cell proliferation and PSA decline.