Supplementary Table 9. Reagents used in this study.

Antibodies

Antibody	Company	Catalogue number
αGM-CSF (PerCp/Cy5.5)	Biolegend	502311
αIL-2 (APC)	Biolegend	500310
αIL-17A (bv605)	Biolegend	512325
αIL-22 (PE)	Biolegend	366703
αIFNg (APC/Cy7)	Biolegend	502530
αIL-10 (bv421)	Biolegend	501421
αFoxP3 (eFluor 660)	eBioscience	50-4777-42 (clone 236A/E7)
αTNFa (FITC)	Biolegend	502906
αCD4 (PE-TR)	Invitrogen	MHCD0417
αCD25 (PC5)	Beckman Coulter	IM2646
αCD45RA (QD655)	Invitrogen	Q10069
αCCR7 (bv421)	Biolegend	353208
αCD4 (FITC)	Beckman Coulter	A07750
αCD25 (PE)	Biolegend	356103
αCD127 (PE-CF594)	BD Pharmingen	562397
αCCR6 (QD605)	Biolegend	353420
αCXCR3 (APC)	BD Pharmingen	550967
αCCR4 (PE-Cy7)	BD Pharmingen	557864
αCXCR3 (AlexaFluor647)	Biolegend	353712
αCCR6 (BV605)	Biolegend	353420
αCD3 (TR66)	Recombinant antibody, provided by in-house facility	
αCD28	BD Pharmingen	555725
PE-Cy7 Mouse anti-NF-κB p65 (pS529)	BD Biosciences	560335 (Clone K10-895.12.50 (RUO))
Anti-Human/Mouse phospho-IκBa (S32/S36) eFluor® 660	eBioscience	50-9035-41
Western blot antibodies		
αDEC1 (S-8)	SantaCruz	sc-101023 (mouse)
αFLAG	Sigma-Aldrich	F1804
αGAPDH	Millipore	MAB374
α-rabbit-HRP (goat)	Sigma	A0545
α-mouse-HRP (goat)	Southern Biotech	1031-05
αNF-κB p65 Antibody (C-20)	SantaCruz	sc-372
αNF-κB p65 (phospho S536)	Abcam	ab76302

Primers for SYBR qPCR

Target gene	Primer fw	Primer rv
CSF2	5′-TGTGAATGCCATCCAGGAGG-3′	5′-GCTTGTACAGCTCCAGGCG-3′

BHLHE40	5′-ATTGCCCTGCAGAGTGGTTT-3′	5′-GATACTGAAGCACCTCCCGG-3′
IL10	5′-CCAAGACCCAGACATCAAGG-3′	5′- GGCCTTGCTCTTGTTTTCAC-3′
IL22	5′-TGCAAAAGCTGAAGGACACA-3′	5′-TTTGCTCTGGTCAAATGCAG-3′
CTLA4	5′-TTCATCCCTGTCTTCTGCAA-3′	5′-AGTGGCTTTGCCTGGAGAT-3′
TIGIT	5′-GTCATCTGCACAGCAGTCATC-3′	5′-TCCTGTCCAGCTGATTTTCTC-3′
IL23R	5′-TACTGGCAGCCTTGGAGTTC-3′	5′-TGCCCTGTAGAGATGGAAGC-3′
IL2	5′-CCCAGGGACTTAATCAGCAA-3′	5′-GGTTGCTGTCTCATCAGCAT-3′
IFNG	5′-CGAGATGACTTCGAAAAGCTG-3′	5′-CAGTTCAGCCATCACTTGGA-3′
IL17A	5′-CCACCTCACCTTGGAATCTC-3′	5′-TGGTAGTCCACGTTCCCATC-3′
TNF	5′-TCAGCCTCTTCTCCTTCCTG-3′	5′-GCCAGAGGGCTGATTAGAGA-3′
ZC3H12D	5′-TCCTGGCAGCATTGTCCTTA-3′	5′-TCTCCGGGTGGTAGAACTTG-3′
ZC3H12A	5′-CCACTCCCAGAAGAGGAAAA-3′	5′-CGCTCCAGAAACCAGTTCAC-3′
Endogenous control		
UBE2D2	5′-GATCACAGTGGTCTCCAGCA-3′	5′-CGAGCAATCTCAGGCACTAA-3′

Taqman probes

Target genes	**Probe ID**	
CSF2	Hs00929873_m1	
BHLHE40	Hs01041212_m1	
RORC	Hs01076122_m1	
AHR	Hs00168233_m1	
FOXP3	Hs00203958_m1	
TBX21	Hs00894392_m1	
IL23R	Hs00332759_m1	
Endogenous control		
TBP	Hs99999910_m1	
Target miRNAs		
miR-146a	Hs_000468	
miR-181a	Hs_000480	
Endogenous controls		
RNU24	Hs_001001	
RNU48	Hs_001006	

Cloning primers

Name	**sequence**
BHLHE40 in Lenti-puro fw	5′-AATATTCTAGAATGGAGCGGATCCCCAGCGC-3′
BHLHE40 in Lenti-puro rv	5′-TTATAGAATTCGTCTTTGGTTTCTAAGTTTAAAGGGGGGATTGG-3′
BHLHE40 in Lenti-GFP fw	5′-AATATGAATTCATGGAGCGGATCCCCAGCGC-3′
BHLHE40 in Lenti-GFP rv	5′-TTATATCTAGATTAGTCTTTGGTTTCTAAGTTTAAAGGGGGGATTGG-3′

BHLHE40-1-297-stop fw	5′-GCAGCTTTCGGATGATtAAGGCCATTTCtagAGCAGTGACCTGATC-3′
BHLHE40-1-297-stop rv	5′-GATCAGGTCACTGCTctaGAAATGGCCTTaATCATCCGAAAGCTGC-3′
FlagHA into BHLHE40-GFP fw	5′-AATAAGAATTCGCCACCATGGACTACAAGGAC-3′
FlagHA into BHLHE40-GFP rv	5′-AATAAGAATTCTCCGGCGTAGTCGGGCAC-3′
miR146-fw-sponge PCR	5′-AACCCATGGACAGAGTTCTCACCGT-3′
miR146-rv-sponge PCR	5′-CTGTCCATGGGTTACGGTGAGAACT-3′
BHLHE40_binding_site	5′-GGTACCGAGCTCTTACGCGTGCTAGCAATCCTTGTGTCACGTGACA CAAGGATTGCTAGACGTCACGTGACACAAGGATTGCTAGCCCGGGCTCGA GATCTGCGATCT-3′
ZC3H12D Promoter Nhe	5′-AATAAGCTAGCCTGATCATCTTCTCAGCTGGAGG-3′
ZC3H12D Promoter Xho	5′-TTATTCTCGAGCTCCTCCTGCCTCTGCCCCG-3′
TNFa-3′UTR-pmirGLO NheI FW	5′-ATATGCTAGCGGAGGACGAACATCCAACCTTC-3′
TNFa-3′UTR-pmirGLO XbaI rv	5′-ATTCTAGATCTCGCCACTGAATAGTAGGGC-3′
IL22-3′UTR-pmirGLO EcoRI FW	5′-AAAGAATTCCCAGAGCAAAGCTGAAAAATG-3′
IL22-3′UTR-pmirGLO XbaI rv	5′-ATCTCTAGATTAGGATATCCAAGTGTTTATTG-3′
ZC3H12D D95N mutagenesis FW	5′-GCGACCCATAGTGATTAATGGCAGCAACGTGGCGATG-3′
ZC3H12D D95N mutagenesis RV	5′-CATCGCCACGTTGCTGCCATTAATCACTATGGGTCGC-3′

miRNA mimics

name	**Company**	**Sequence / catalogue number**
siGLO green transfection indicator	Fisher Scientific	Catalogue number 11537220
miR146a mimic	Exiqon	Catalogue number 472124-001
miRNA mimic negative control	Exiqon	Catalogue number 479903-001

Plasmids

Plasmid name	**Comment**
empty LV	pScalps with puromycin cassette
empty GFP	pLVX-EF1α-IRES-ZsGreen1 (Clontech 631982)

empty FlagHA-GFP	pLVX-EF1α-FlagHA-IRES-ZsGreen1
BHLHE40-LV	pScalps- BHLHE40
BHLHE40-1-297-stop-LV	pScalps- BHLHE40-1-297
BHLHE40-GFP	pLVX-EF1α- BHLHE40-IRES-ZsGreen1
FlagHA- BHLHE40-GFP	pLVX-EF1α-FlagHA- BHLHE40-IRES-ZsGreen1
mCherry-miR146a/sponge-LV	pScalps-miR146a/sponge-mCherry
pLenti BHLHE40 plasmid	ABM LV089481, pLenti-GIII-EF1a
psPAX2	Addgene 12260
psMD2.G	Addgene 12259
pGL4.74[hRluc/TK] (TK_Renilla)	Promega E6921
pGL3-promoter Luciferase	Promega E1761
pGL3-Luciferase-BHLHE40-4xbs	Containing 4 consensus binding sites for BHLHE40
pGL3-Basic Luciferase	Promega E1751
pGL3-Basic Luciferase-ZC3H12D-Promoter	Containing the *ZC3H12D* promoter
pGL3-Enhancer Luciferase	Promega E1771
pGL3-Enhancer Luciferase-ZC3H12D-Promoter	Containing the *ZC3H12D* promoter
pGL3-Basic Luciferase-ZC3H12D-Promoter _MUT	Containing the *ZC3H12D* promoter mutated in two putative BHLHE40 binding sites
pmiRGLO Dual-Luciferase	Empty vector generated from Addgene 78131 plasmid
pmiRGLO Dual-Luciferase-*TNF*-3′UTR	Containing the 3′UTR of *TNF*
pmiRGLO Dual-Luciferase-*IL22*-3′UTR	Containing the 3′UTR of *IL22*
ZC3H12D-WT-eGFP	EF1α-ZC3H12D-IRES-eGFP (Genecopoeia EX-Y4955-Lv165)
ZC3H12D-D95N-eGFP	Genecopoeia EX-Y4955-Lv165 containing ZC3H12D with D95N mutation

CRISPR-Cas9 deletion in primary T cells

Name	**Guide RNA sequence**	**PAM**
BHLHE40_Cas9_ crRNA_gA	5′-CCCGTCTTGACTTGTACACT-3′	5′-TGG-3′
BHLHE40_Cas9_ gRNA_gB	5′-CTGGAGCACGGAGACCTACC-3′	5′-AGG-3′
BHLHE40_Cas9_ gRNA_gC	5′-GCCAAAGGTTCGGAAGGTCC-3′	5′-TGG-3′
ZC3H12D_Cas9_ crRNA_gA	5′-CCTGGTCAACGACGTGCTGC-3′	5′-AGG-3′
ZC3H12D_Cas9_ crRNA_gB	5′-CACTATGGGTCGCAGAGAAC-3′	5′-TGG-3′

Primers for CRISPR-Cas9 knock-out screening

Name	**Sequence**
BHLHE40 Short-FW	5′-CTGGAGCACGGAGACCTACCAG-3′
BHLHE40 Short-Rev	5′-CCCCGTCTTGACTTGTACACTTGG-3′
ZC3H12D Short-FW	5′-CTGGTCAACGACGTGCTGCAGGA-3′
ZC3H12D Short-Rev	5′-CGCAGAGAACTGGCCAGGGTT-3′
BHLHE40_T7EndoLong-FW	5′-AACTGAAGCTGCATCTCAAAGC-3′
BHLHE40_T7EndoLong-RV	5′-CAAAGGACTGGGTTGGAAAGG-3′

ZC3H12D_T7EndoLong-FW	5′-AGTCTGAGAAACAAGAAACCTGTGT-3′
ZC3H12D_T7EndoLong-RV	5′-GTTAGGGACAGACTCCCAACAAG-3′

Primers for mutagenesis of two putative BHLHE40 sites in the *ZC3H12D* promoter

Name	**Sequence**
ZC3H12D site 1_FW	5′-CTCACGGAGGGTTTGTTTTGgATccGGTTGCTGAACTTTGATTCG-3′
ZC3H12D site 1_RV	5′-CGAATCAAAGTTCAGCAACCggATcCAAAACAAACCCTCCGTGAG-3′
ZC3H12D site 2_FW	5′-CCTCTGACTCCAGTGGgAtaTcGGGGCCTGGCCTCACT-3′
ZC3H12D site 2_RV	5′-AGTGAGGCCAGGCCCCgAtaTcCCACTGGAGTCAGAGG-3′