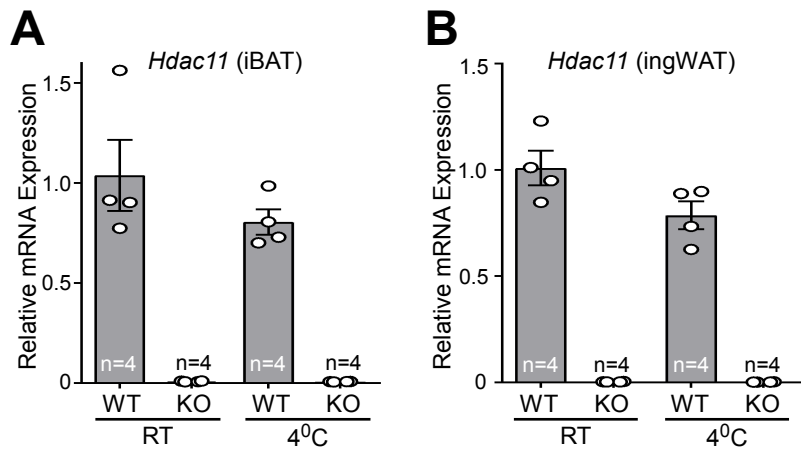
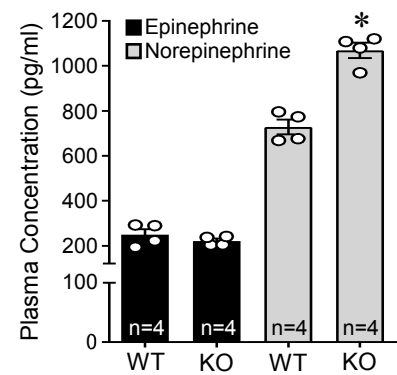


Supplemental Fig. 1



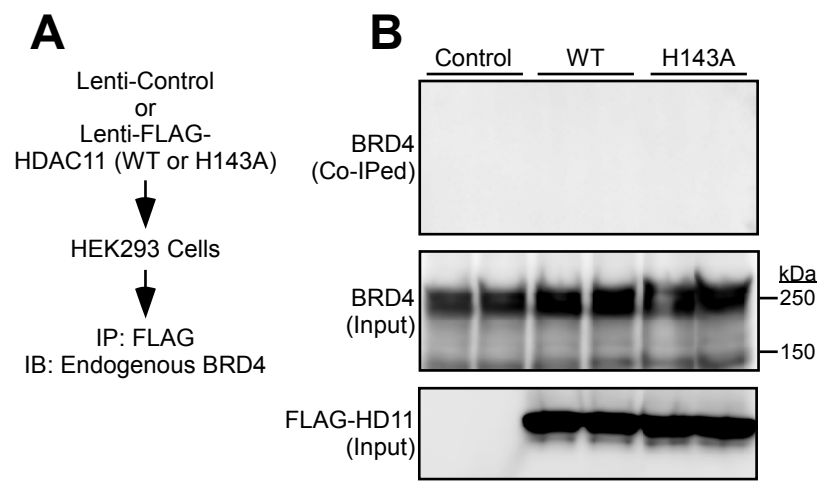
Supplemental Figure 1. *Hdac11* mRNA is undetectable in KO adipose tissue. Quantitative PCR analysis of *Hdac11* mRNA expression in mouse iBAT (**A**) and ingWAT (**B**) tissues. Values represent means ± SEM.

Supplemental Fig. 2



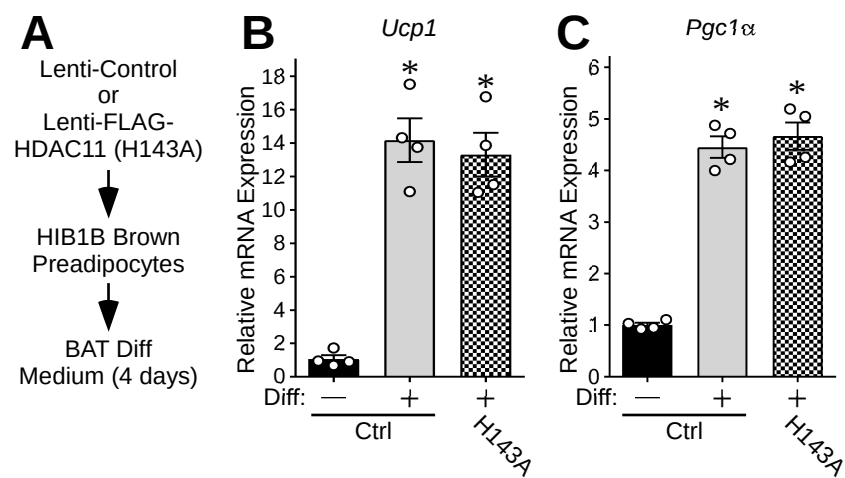
Supplemental Figure 2. HDAC11 deficient mice have higher levels of circulating norepinephrine. Plasma catecholamine (epinephrine and norepinephrine) concentrations in 10 week-old male mice fed normal chow were determined by ELISA. Values for the graph represent means $\pm$ SEM; * P <0.05 vs. WT. Student's t-test was used for statistical analysis.

Supplemental Fig. 3



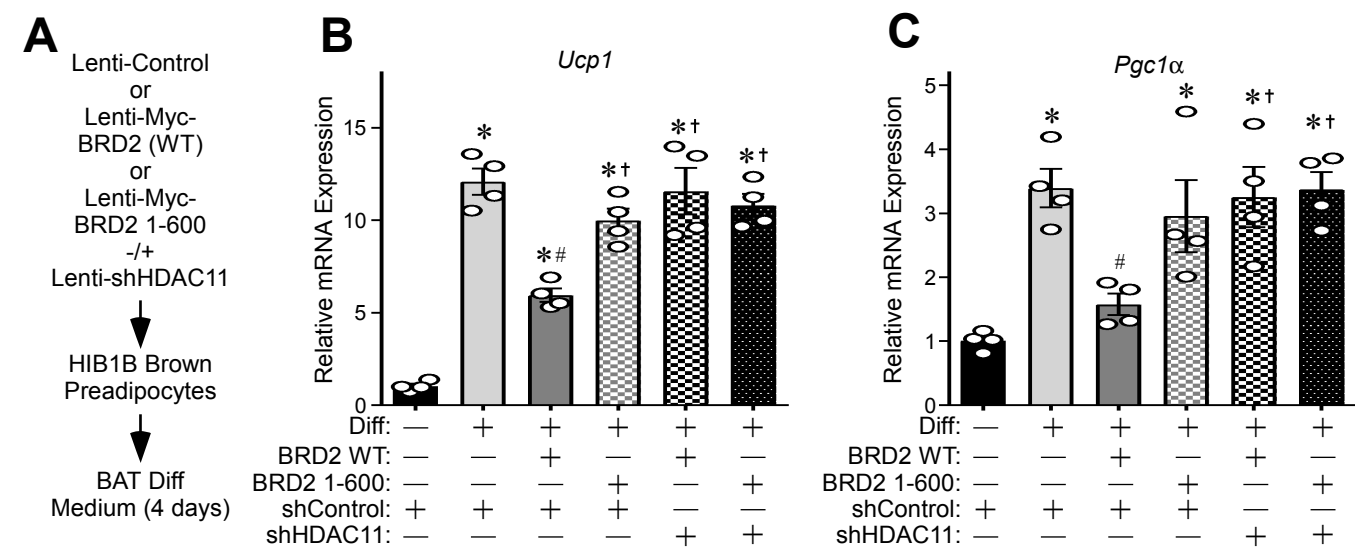
Supplemental Figure 3. HDAC11 does not associate with BRD4.
(**A**) Schematic representation of the HDAC11:BRD4 co-immunoprecipitation (IP) assay; IB, immunoblot. (**B**) Immunoblotting revealed the absence of BRD4 in HDAC11 immunoprecipitates. Total amounts of HDAC11 and endogenous BRD4 in homogenates were also determined (input).

Supplemental Fig. 4



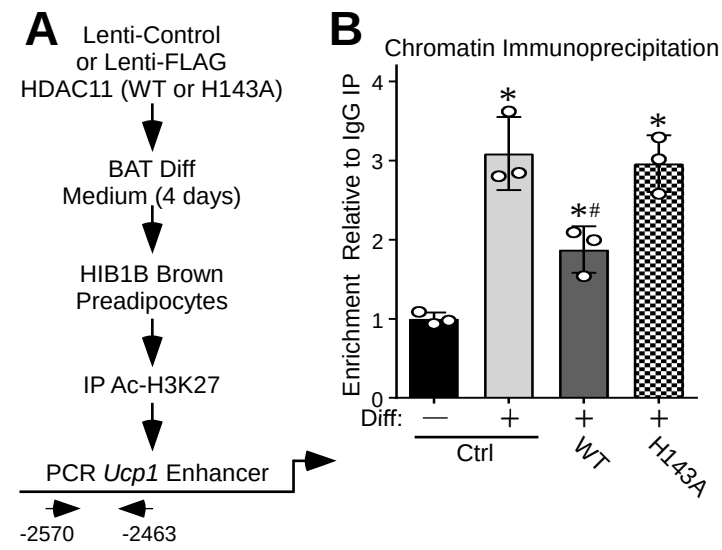
Supplementary Figure 4. Catalytically inactive HDAC11 fails to suppress thermogenic gene expression. (A) Schematic representation of the experiment. The H143A amino acid substitution renders HDAC11 catalytically inactive. (B-C) Quantitative PCR analysis of *Ucp1* and *Pgc1α* mRNA expression; n = 4 plates of cells/condition. Values for all graphs represent means ± SEM; *P<0.05 vs. Lenti-Control undifferentiated. Two-way ANOVA with Tukey's multiple comparisons test was employed.

Supplemental Fig. 5



Supplementary Figure 5. BRD2-mediated suppression of brown adipocyte differentiation requires association with HDAC11. (A) Schematic representation of the experiment. (B-C) Quantitative PCR analysis of *Ucp1* and *Pgc1α* mRNA expression; n = 4 plates of cells/condition. Values for all graphs represent means ±SEM; **P*<0.05 vs. Lenti-Control undifferentiated; #*P*<0.05 vs. Lenti-Control differentiated; †*P*<0.05 vs. Lenti-BRD2 WT differentiated. Two-way ANOVA with Tukey's multiple comparisons test was employed.

Supplemental Fig. 6



Supplementary Figure 6. HDAC11 blunts H3K27 acetylation of a *Ucp1* enhancer element. (A) Schematic representation of the chromatin immunoprecipitation (ChIP) experiment. (B) ChIP-qPCR analysis showing relative enrichment of H3K27 acetylation at the *Ucp1* enhancer. Values for the graph represent means $\pm$ SEM; * P <0.05 vs. Control undifferentiated; # P <0.05 vs. control differentiated. Two-way ANOVA with Tukey's multiple comparisons test was employed.

Supplemental Tables

Supplemental Table 1: Primers for qPCR

Target	5' oligo	3' oligo
<i>Ucp1</i>	CCGAAACTGTACAGCGGTCT	CCGAGAGAGGCAGGTGTTTC
<i>Pgc1α</i>	TGTGTGCTGTGTGTCAGAGT	ACCAGAGCAGCACACTCTATG
<i>β_3-AR</i>	GGAAGCTTGCTTGATCCCCA	GCCGTTGCTTGTCTTTCTGG
<i>Hdac11</i>	TTACAACCGCCACATCTACC	GACATTCTCTCCACCTTCTC
<i>Brd2</i>	AGCTGGGTTTGCCGGATTAT	GGACAATATCATCGGTGGGCT
<i>Ucp1 enhancer (ChIP)</i>	AGCGTCACAGAGGGTCAGTC	GTGAGGCTGATATCCCCAGA

Supplemental Table 2: Primers for cloning

Target	5' oligo	3' oligo
BRD2 (1-600)	CCATCGATCTGCAAACGTGA CTCCCCACAATAAG	CCGCTGAGTTATAAAGCAGCACT GCCACCCCCAC
HDAC11 (H143A)	GGGGGTGGCTTCCACGCCTG CTCCAGCGACCGT	ACGGTCGCTGGAGCAGGCGTGG AAGCCACCCCC
HDAC11 (1-300)	CCATCGATCTACACACAACCC AGCTGTACCAGCAT	GCTCTAGATCAGGTCACCATAAG GATGGGCACCCG
HDAC11 (1-250)	CCATCGATCTACACACAACCC AGCTGTACCAGCAT	GCTCTAGATCACAGGTGCTCCTG GAGGGATTTCTT
HDAC11 (1-200)	CCATCGATCTACACACAACCC AGCTGTACCAGCAT	GCTCTAGATCAGATGTACACACG CTTGTCGTCCAT

Supplemental Table 3: Primers for genotyping

Target	5' oligo	3' oligo
HDAC11 WT	TGCTGCCTGTGAGCCACTGC	AGAATGGCTGTCTCCCTAGG
HDAC11 KO	TGCTGCCTGTGAGCCACTGC	CCTTGAATAGCATCTCAGG

Supplemental Table 4: Patient characteristics

Brown Adipose Tissue-Deep Neck

Patient ID	Diagnosis	Age (years)	Gender	BMI
BAT-003	Multinodular goiter/ follicular adenoma	81	Female	37.70
BAT-009	Multinodular goiter	49	Male	34.40
BAT-013	Papillary thyroid carcinoma	70	Female	40.00
BAT-018	Parathyroid adenoma	56	Female	19.20
BAT-019	Benign follicular nodules	39	Female	26.90
BAT-020	Parathyroid adenoma	63	Female	42.80

White Adipose Tissue-Abdominal subcutaneous

Patient ID	Age (years)	Gender	BMI
Ori-023	49	Female	23.90
Ori-033	34	Female	34.70
Ori-038	42	Female	22.30
Ori-054	51	Male	32.00
Ori-070	23	Male	20.40
Ori-076	29	Female	33.90
Ori-078	38	Female	37.90
Ori-079	27	Female	21.10
Ori-081	42	Female	21.10