SUPPLEMENTAL INFORMATION

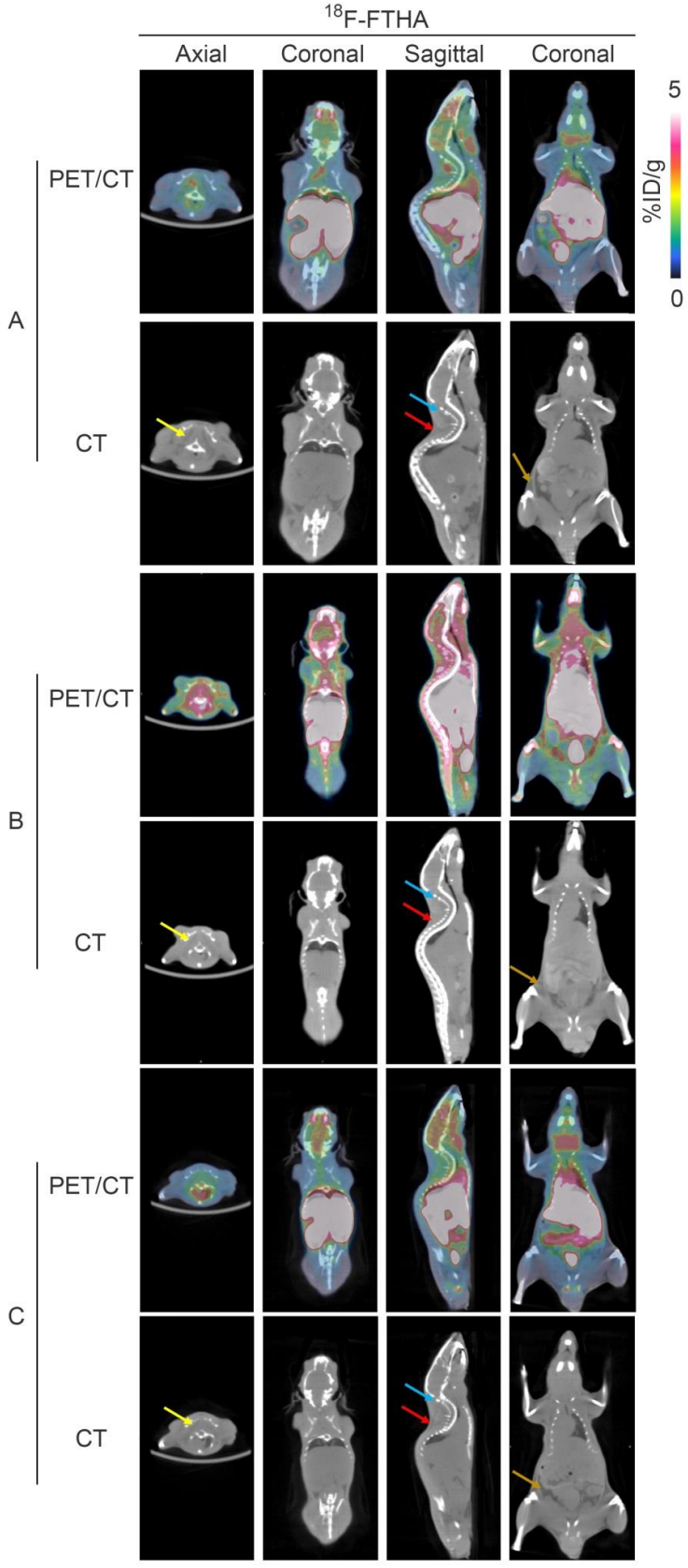
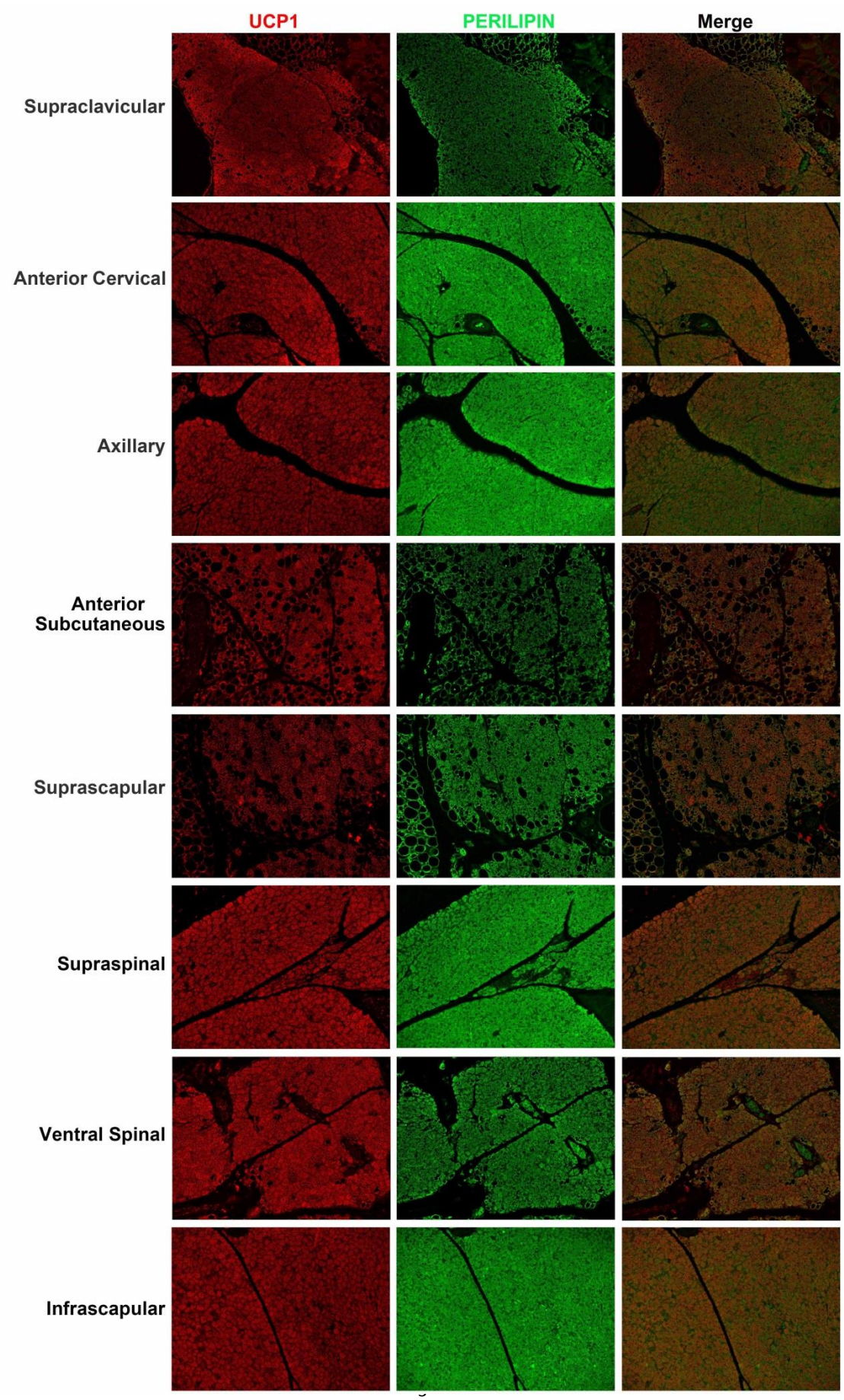
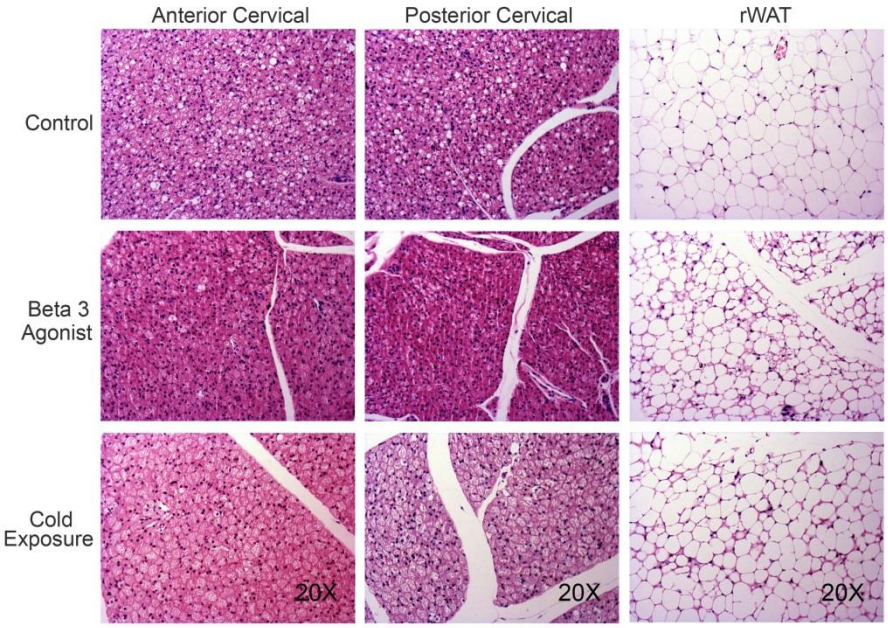


Figure S1 (Related to Figure 2): ^{18}F-FTHA uptake and retention in mice fat pads is low and inconsistent. Panels A-C are from different mice. In each panel, the left to right images are from the axial, coronal, sagittal planes and an additional coronal plane to illustrate the iWAT. A. ^{18}F-FTHA PET/CT scan in a mouse shows asymmetric activity in the infrascapular fat pads with yellow arrow and some activity in the supraspinal fat pad indicated by blue arrow. On the other hand signal was faint in classical iBAT indicated by red arrow and non-existent in iWAT with beige arrow. B. ^{18}F-FTHA PET/CT scan in a mouse with classical iBAT activity visible. Panel C. ^{18}F-FTHA PET/CT scan in a mouse with no signal in the fat pads of interest. It is important to note to generate images with activity in the fat very narrow windows are displayed (%ID/g of 5) which results in saturation of activity in the liver, bowel, and kidneys. Ventral spinal activity was not observed but would be obscured because of the liver activity.


UCP1
PERILIPIN
Merge
Supraclavicular
Anterior Cervical
Axillary
Anterior Subcutaneous
Suprascapular
Supraspinal
Ventral Spinal
Infrascapular

<u>Figure S2 (Related to Figure 5):</u> Immunofluorescent Staining for Additional Fat Pads in Baseline, β3 Agonist-Treated and Cold-Stimulated Mice. Images of immunofluorescence stains for UCP1, PERILIPIN or DAPI explore a series of additional regions of high metabolic activity around supraclavicular, anterior cervical, axillary, anterior subcutaneous, suprascapular, supraspinal, ventral spinal and infrascapular regions as indicated in the cartoon in Fig. 5. All the fat pads are either from control mice, β3 agonist - treated or cold-stimulated mice respectively.



<u>Figure S3 (Related to Figures 4 and 5):</u> H&E Staining for Anterior Cervical/ Frontal Cervical, Posterior Cervical and Retroperitoneal WAT Fat Pads in 3 Groups of Mice. The histological analysis shows regions around frontal cervical which is also labeled as anterior cervical, posterior cervical and retroperitoneal WAT (rWAT) in mice under baseline, β3 Agonist-treated and cold-stimulated status. Clearly apparent are the unilocular resp. multilocular characteristics of each of the fat pads of control, β3 agonist-treated and cold-stimulated mice.

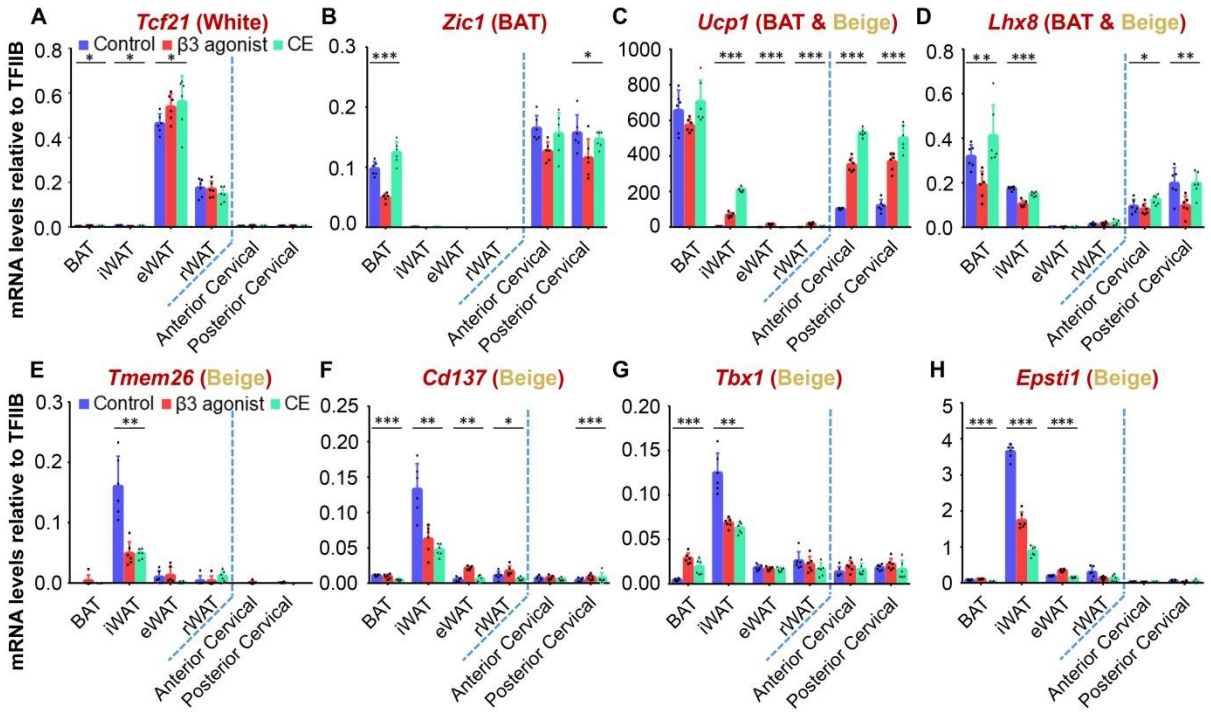


Figure S4 (Related to Figure 6): Expression Levels of Marker Genes Classify the Additional Fat Pads into the Three Categories of Fat Pads including WAT, BAT and Beige. A series of marker genes including *Tcf21* for WAT, *Zic1* for BAT depots, *Ucp1* and *Lhx8* for BAT and beige depots and *Tmem26*, *Cd137*, *Tbx1* and *Epsti1* for beige depots were used to examine the mRNA expression patterns of frontal cervical labeled as anterior cervical, posterior cervical, retroperitoneal WAT (rWAT) as well as classical BAT, iWAT and eWAT regions in mice under control, β3 agonist-treated and cold-stimulated conditions. Results are shown as mean ± SD, *p <0.05, **p < 0.01 and ***p < 0.001.

Table S1 (Related to Figure 6): Primer sequences for representative gene markers of fat tissues (de Jong et al., 2015; Shao et al., 2016; Sharp et al., 2012; Walden et al., 2012; Wu et al., 2012).

Gene Name	Forward (5'-3')	Reverse (5'-3')
Cd137	CGTGCAGAACTCCTGTGATAAC	GTCCACCTATGCTGGAGAAGG
Epsti1	ACCCTGATAGCACCAAACGA	AGGTCTGCCAGTTCTTGCTC
Tbx1	GGCAGGCAGACGAATGTTC	TTGTCATCTACGGGCACAAAG
Tcf21	CATTCACCCAGTCAACCTGA	TTCCTTCAGGTCATTCTCTGG
Lhx8	GAGCTCGGACCAGCTTCA	TTGTTGTCCTGAGCGAACTG
Zic1	AACCTCAAGATCCACAAAAGGA	CCTCGAACTCGCACTTGAA
Tmem26	ACCCTGTCATCCCACAGAG	TGTTTGGTGGAGTCCTAAGGTC
Ucp1	GGCCTCTACGACTCAGTCCA	TAAGCCGGCTGAGATCTTGT
TFIIB	TGGAGATTTGTCCACCATGA	GAATTGCCAAACTCATCAAAACT