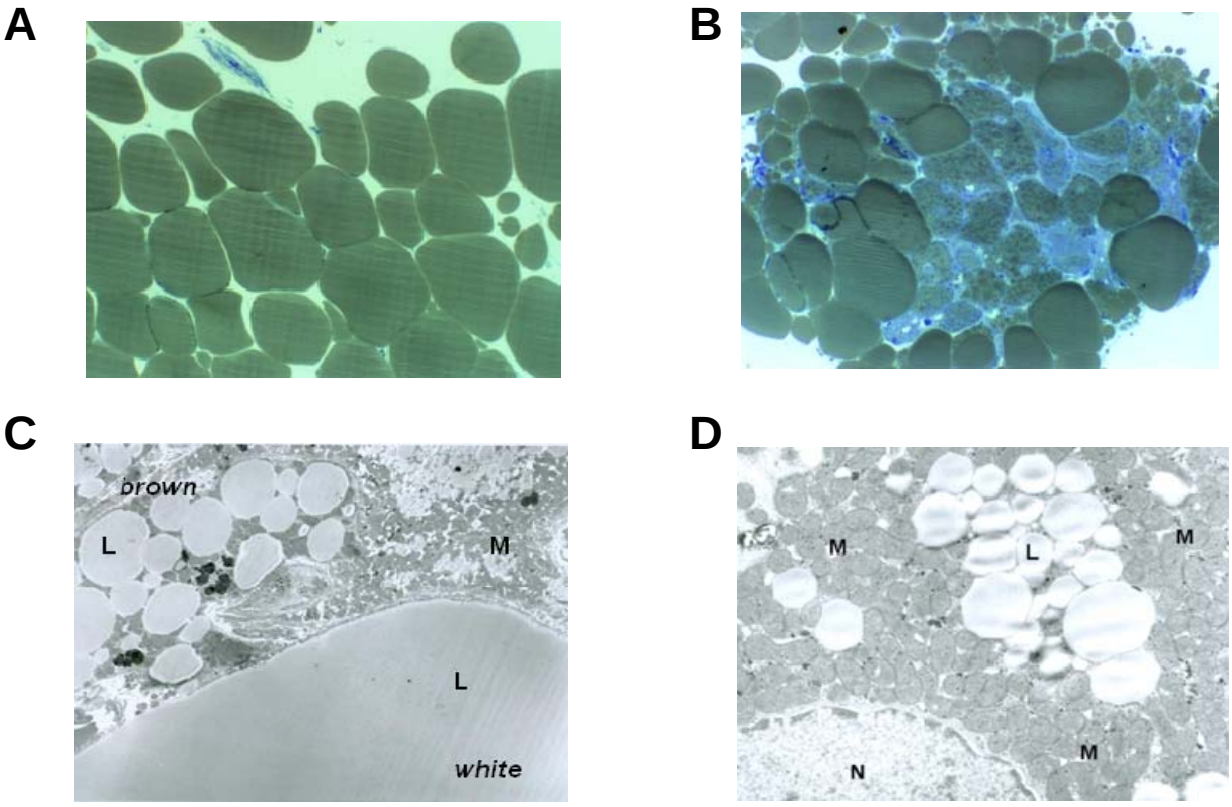
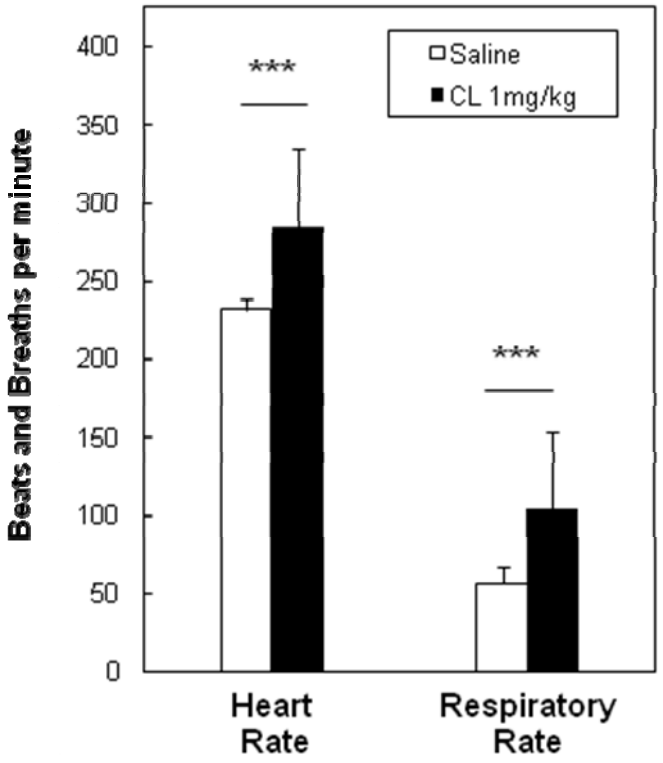
Supplemental Figures 1-2

Histologic and Ultrastructural Appearance of Human White and Brown Adipose Tissue



Supplemental Figure 1. A 57-y-old woman with clinical hyperparathyroidism. (A and B) Osmium tetroxide staining of the biopsied tissue showing individual white (A) and brown (B) adipocytes. (C) Electron micrograph showing a brown (*upper*) and white (*lower*) adipocyte. (D) Higher magnification of mitochondria and lipid droplets. L = lipid droplets; M = mitochondria; N = nucleus.



Supplemental Figure 2. Male 129SVE mice, 8–12 wk old, were treated with the β_3-adrenergic receptor agonist CL-316,243 (CL) (1 mg/kg) (*n* = 15) or saline control (*n* = 16). Effects on heart rate and respiratory rate after CL injection were measured over 30 min. ****P* < 0.001.

Supplemental Table 1. Primer sequences used in quantitative RT-PCR for lineage marker analysis.

Gene		Sequences
UCP-1	Forward	5'-ACCGCAGGGAAAGAAACAGC-3'
	Reverse	5'-TCAGATTGGGAGTAGTCCCT-3'
DIO2	Forward	5'-AGTGCAGAAGGAGGTGACAACAGT-3'
	Reverse	5'-AAAGTCAAGAAGGTGGCATGTGGC-3'
CideA	Forward	5'-CCTTTCCGGGTCTCCAAC-3'
	Reverse	5'-CATCTTCCTCCAGCACCAGA-3'
PGC1α	Forward	GGAATCCTGAGCGGTACGATG
	Reverse	CTGGCAGGTGTATGTCCCATT
Leptin	Forward	5'-TCTATGTCCAAGCTGTGC-3'
	Reverse	5'-TTGGAGGAGACTGACTGC-3'

Supplemental Methods

Human Imaging

All patients were injected with 740 MBq (20 mCi) of ^{99m}Tc-MIBI, and planar dual-phase imaging was performed with standard parameters after 20 min and 2 h using a Philips Medical Systems Precedence SPECT/CT. The hybrid SPECT/CT consists of a dual-head γ camera and a diagnostic capability 6-slice CT scanner. The γ camera consists of 2 detectors with a field of view of 40 × 54 cm with 3/8-in. Ultrahigh-resolution and low-sensitivity collimators were used with a 180° detector angle. Matrix size was 128 × 128 over a 360° arc with a 2.8° step and step-and-shoot acquisition: 20-s duration per frame, 64 stops, zoom factor of 1, and noncircular orbits. Images were reconstructed from raw data to transaxial slices by back projection with a Hann filter. Sagittal and coronal slices were then generated. Total acquisition time was approximately 25 min. The CT system consists of a 6-slice system. Acquisition parameters were as follows: collimation, 6 × 1.5 mm; pitch, 0.85; gantry rotation, 750 ms; field of view, 600 mm; tube current, 75 mA; and tube voltage, 120 kV. Images were reconstructed with 5-mm slice width with 5-mm increments using filtered back projection (matrix: 512 × 512). No IV contrast was administered for the acquisition. Images were used for attenuation correction and anatomic localization. Static views were done 20 min after tracer injection, then SPECT/CT imaging after the 20-min static views, and finally 2-h planar views.

Animal Imaging

Imaging was performed on a NanoSPECT/CT (Bioscan) and a NanoPET/CT (Mediso Medical Imaging Systems), each equipped with an 8-W x-ray source running at 55 kVp (145 mA) and a 48-μm pitch CMOSCCD x-ray detector. Continuous helical micro-CT scanning was employed with the following parameters: 0.5-s exposure, 240 angles, 1.3 magnification, 37-mm pitch (1 field of view), and a 512 × 256 pixel frame size (192-μm pixels). Images were reconstructed as 170 × 170 pixel transverse matrices with varying axial length and slice thickness of 0.4 mm (isotropic voxel size, 0.4 mm) using filtered back projection (Shepp–Logan filtering). Helical micro-SPECT was performed using a 4-headed γ camera outfitted with multipinhole collimators (1.0-mm-diameter pinholes) for a single mouse scan. Images were acquired over 360 angles in 48 projections of 50 s each using a 256 × 256 frame size (1.0-mm pixels). The micro-SPECT images were reconstructed as 86 × 86 pixel transverse matrices with varying axial length and slice thickness of 0.8 mm (isotropic voxel size, 0.8 mm). Static PET was acquired for 30 min using with a 1:3 coincidence mode, 5-ns coincidence time window, normal coincidence rate mode, and fine timestamp list mode type. FOV was 94.7 mm, with 50% axial overlap.

Reconstruction was performed using Nucline software (Mediso Medical Imaging Systems) in 2D mode with a matrix size of 149 × 150 × 150 mm, for a final voxel size of 0.2925 mm. An OSEM reconstruction algorithm was used with a SSRB 2DLOR rebinning method; further reconstruction parameters include a 400- to 600-keV energy window, 1:1 coincidence mode, and ring difference of 16. ^{18}F-FDG and ^{99m}Tc-sestamibi uptake was assessed using InVivoScope software (Bioscan).