Supplemental Digital Content.

Generation of Transgenic Hluc+ mouse : The constitutive promoter was constructed by inserting a fragment ofrabbit beta globin intron amplified by PCR primers aaccgaagcttgatatcCAGATCCTGAGAACTTCAGGGTG and accacgaagcttAGATCTCAGTGGTATTTGTGAGCCAGG, the amplicon was digested with HindIII and ligated into the HindIII site of PGL3 Control Vector (Promega) to produce the pGL3Rbgl. The EF1a promoter sequence was excised from pLVX-EF1a-mCherry C1 (Clontech) by KpnI and EcoRV and inserted into the corresponding sites in pGL3Rbgl to produce pGL3RbglEF1a. A transgenic founder, HLuc, was produced by injection of pGL3RbglEF1a linearized by AagI into C57/Bl6 mice pronuclei.

Isolation and differentiation of ATMSCs: Visceral adipose tissue was dissected, minced and treated with 0.1% (w/v) collagenase type 2 and 0.1 µg/ml DNAase in Hank's Balanced Salt Solution (HBSS) at 37°C for 2 hours, the stroma-vascular fraction was pelleted at 400 g and plated in DMEM/F12 containing 50 % FCS and penicillin/streptomycin. The cells were then cultured at 37°C and 5 % CO_2 for one day before the medium was diluted to obtain 10 % FCS and 1:50 dilution of stem cell supplement B27 (Gibco, Carlsbad, CA, USA). Skin fibroblasts were obtained by culturing ear punctures from C57BL/6 animals in DMEM with 50% FCS until cells were seen in outgrowths from the biopsy. Tissue debris was then removed and cells were expanded in DMEM with 10% FCS and 1% penicillin-streptomycin.

Adipogenic differentiation was induced by culturing cells for 2 weeks in differentiation medium (DMEM (Life Technologies, Grand Island, NY) with 10% FBS, 0.5 mM isobutylmethylxanthine, 1 µM dexamethasone, 100 µM indomethacin, 10 µM insulin and 100 U/ml penicillin and 100 µg/ml streptomycin). Lipid droplets were then stained with Oil Red O (Sigma-Aldrich, St. Louis, MO). Osteogenic differentiation was induced by culturing cells in osteogenic differentiation medium (DMEM:F12 with 10% FBS, 100 U/ml Penicillin, 100 µg/ml Streptomycin, 0.1 µM dexamethasone,

10 mM β-glycerophosphate and 50 µM L-ascorbic acid 2-phosphate, Sigma-Aldrich, St. Louis, MO) for 2 weeks. Cells were subsequently fixed with 3% paraformaldehyde and stained with 40 mM Alizarin Red dissolved in water, pH 4.2.

Histochemistry and immunohistochemistry. Sections were de-paraffinised for CD31 IHC labelling as described in Supplemental Digital Content. by sequential immersion of slides graded alcohol (70-100% ethanol), in xylene/ethanol (50%/50%), and finally in Xylene (100%) Antigen retrieval was performed by immersion of slides in a 10 mM citrate buffer (pH6.0) containing 0.05% Tween 20 (Sigma, St. Louis, MO, USA). Sections were incubated in this solution at 90°C for 10 minutes, rinsed in PBS and submerged in PBS containing 1% bovine serum albumin (BSA) (Sigma, St. Louis, MO, USA). Sections were then immersed in PBS containing 0.03% hydrogen peroxidase (H_2O_2, Merck, Darmstadt, Germany) for five minutes and rinsed twice in PBS. Sections were then incubated with rabbit anti-CD31 antibodies (#ab28364, Abcam, Cambridge, MA, USA) diluted 1:100 in PBS containing 1% BSA and 0.05% Triton-X 100 for 16 hours at 4°C. Chromogenic visualization was performed using horseradish peroxidase-conjugated goat anti-rabbit secondary antibodies (K4010, DAKO, Glostrup, Denmark) and di-aminobenzidine (DAB) solution containing 0.03% H_2O_2, for seven minutes at RT before rinsing in PBS and counterstaining with hematoxylin (Mayers, Histolab AB, Gothenburg, Sweden). Sections were then dehydrated in 100% xylene before mounting in mounting medium (Pertex, Histolab AB).