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Supplemental information

Mesothelial cells are not a source of adipocytes in mice

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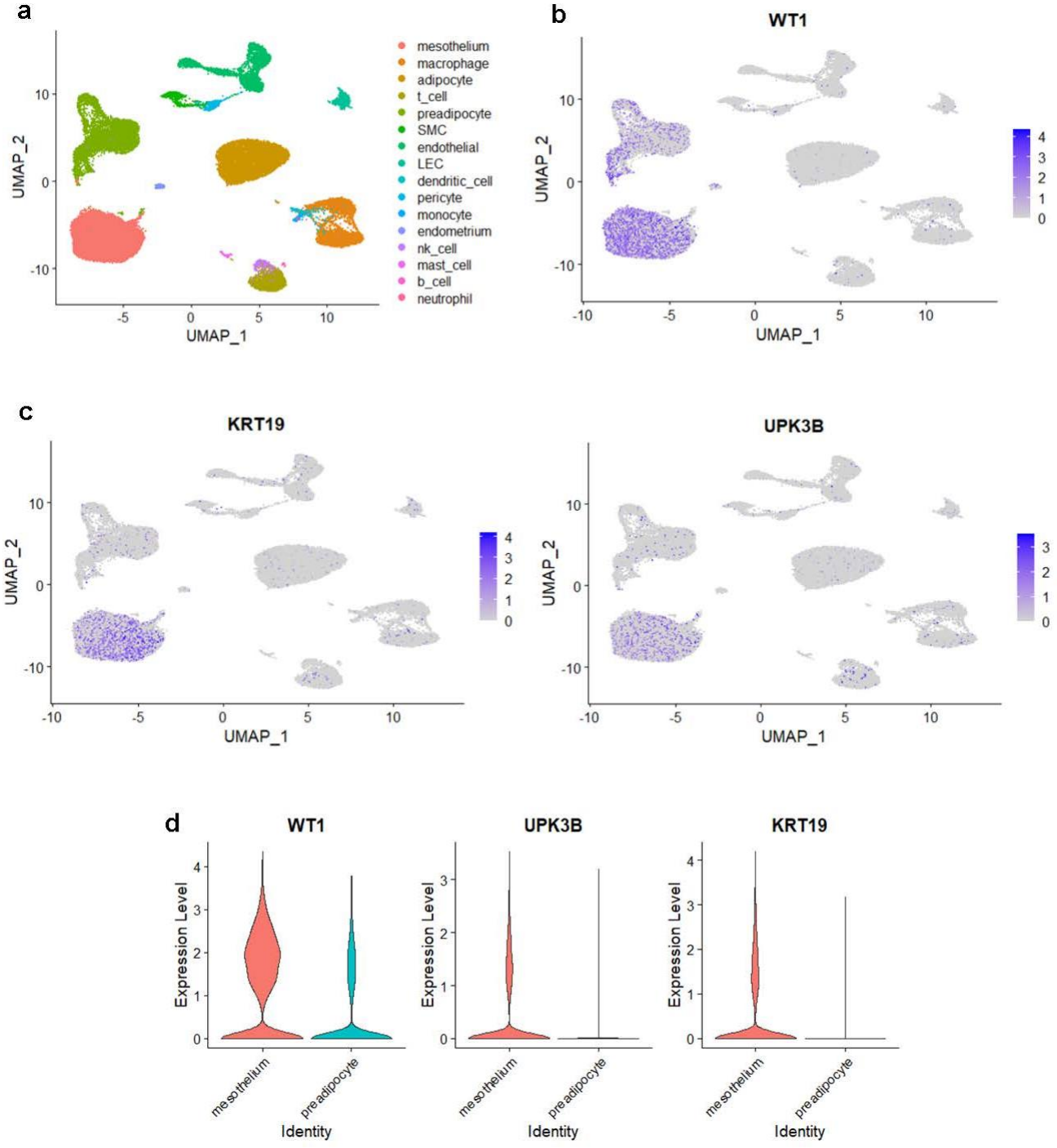
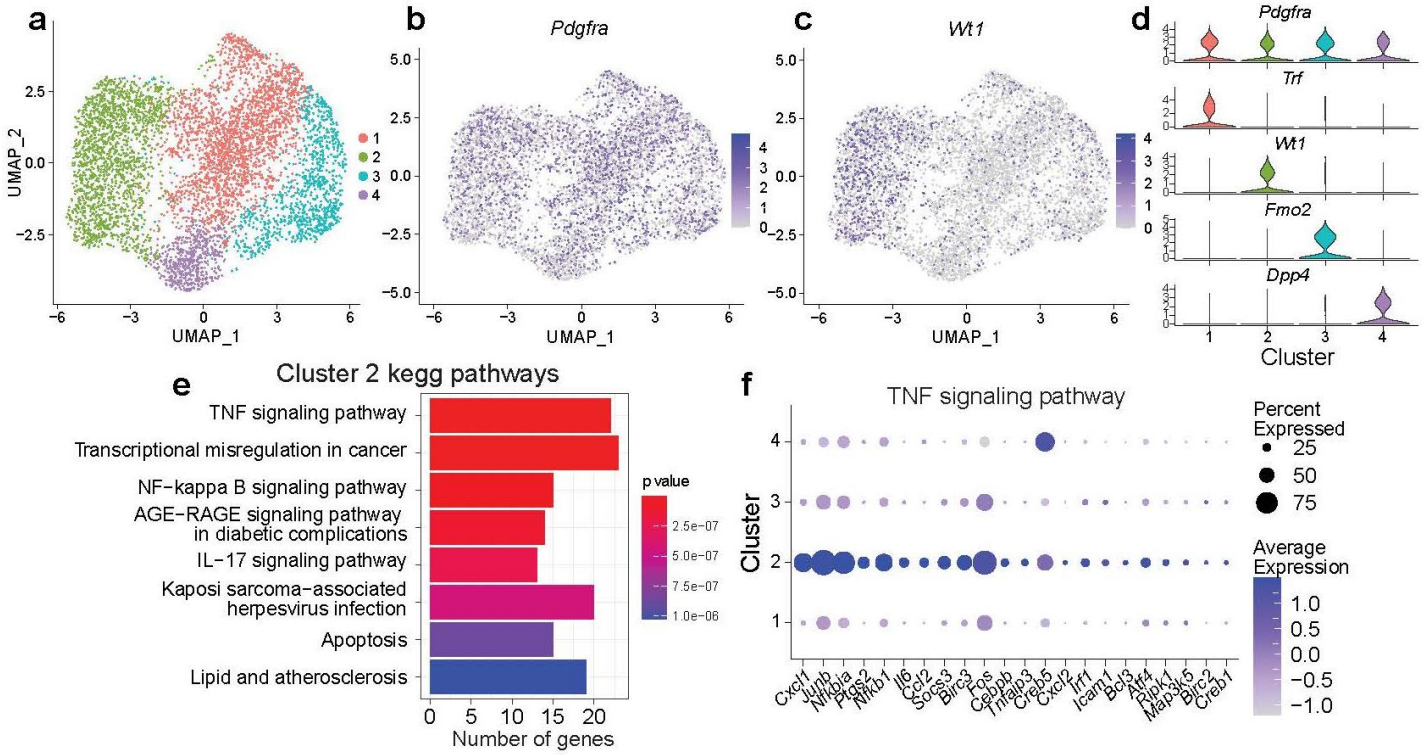
Figure S1, related to Figure 1. WT1 is expressed by both preadipocyte and mesothelial populations in human omental adipose tissue.



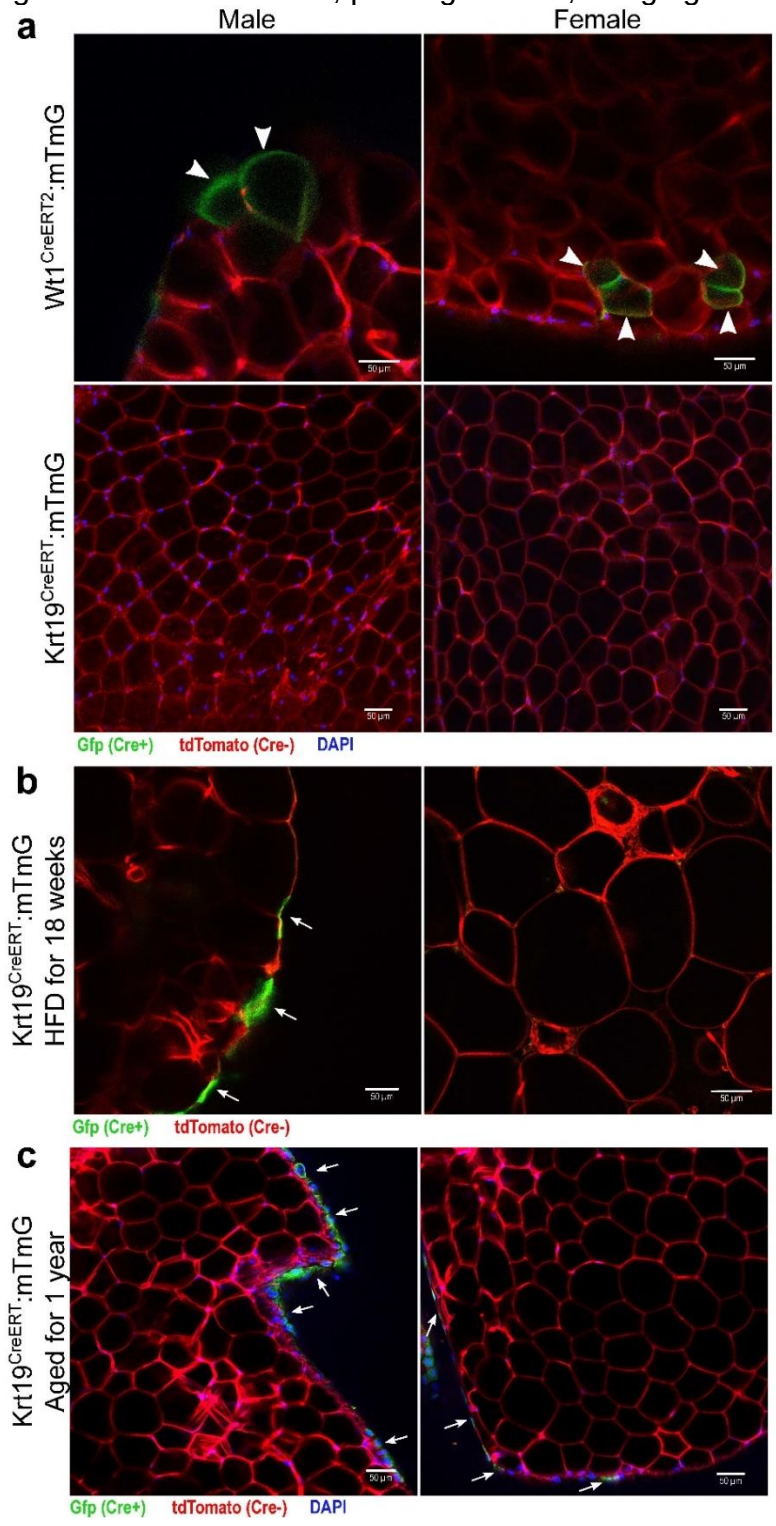
a, UMAP of human omental single-nucleus RNA-sequencing data demonstrates distinct preadipocytes and mesothelial populations. **b-c**: Feature plots of *WT1*, *KRT19*, *UPK3B*. **d**, Violin plots of *WT1*, *UPK3B*, and *KRT19* in mesothelial and preadipocyte populations. SMC, smooth muscle cell; LEC, lymphatic endothelial cell.

Figure S2, related to Figure 1. Wt1 marks a subpopulation of preadipocytes which expresses inflammatory pathways.



a, Four subclusters were identified in the mouse preadipocyte population. **b-c**, Feature plots for *Pdgfra* and *Wt1*. **d**, Violin plots for *Pdgfra* and marker genes for subclusters 1-4. **e**, KEGG pathways enriched in cluster 2. **f**, Dotplot of genes involved in the TNF signaling pathway.

Figure S3, related to Figure 4. Krt19+ mesothelial cells do not differentiate into adipocytes regardless of mouse sex, prolonged HFD, or aging.



a, Male and female perigonadal VAT depots were examined for the presence of GFP-labeled adipocytes. **b**, Perigonadal fat was examined after an 18-week course of HFD, and **c**, one year of aging post-tamoxifen. Arrow heads: GFP-positive adipocytes; arrows: GFP labeling of the mesothelial layer. Representative images are shown.

Table S1, related to Figures 2 and 3. qPCR primer sequences

Gene	Forward primer	Reverse primer
Adipoq	GCACTGGCAAGTTCTACTGCAA	GTAGGTGAAGAGAACGGCCTTGT
Dcn	TCTTGGGCTGGACCATTTGAA	CATCGGTAGGGGCACATAGA
Fabp4	ACACCGAGATTTCCTTCAAACTG	CCATCTAGGGTTATGATGCTCTTC
Krt19	GGGGGTTCAGTACGCATTGG	GAGGACGAGGTCACGAAGC
Msln	CTTGGGTGGATACCACGTCTG	CTTCTGTCTTACAGCCATAGCC
Pdgfra	AGCAGGCAGGGCTTCAACGG	ACACAGTCTGGCGTGCGTCC
Plin1	GATCGCCTCTGAACTGAAGG	CTTCTCGATGCTTCCCAGAG
Tbp	GAAGCTGCGGTACAATTCCAG	CCCCTTGTACCCTTCACCAAT
Upk3b	AGACCTGATTGCCTACGTGC	GGTGTCCTTAGTTGAGACATGCT
Wt1	AGCACGGTCACTTTCGACG	GTTTGAAGGAATGGTTGGGGAA