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Supplemental information

The Lipid Droplet Knowledge Portal:

A resource for systematic analyses

of lipid droplet biology

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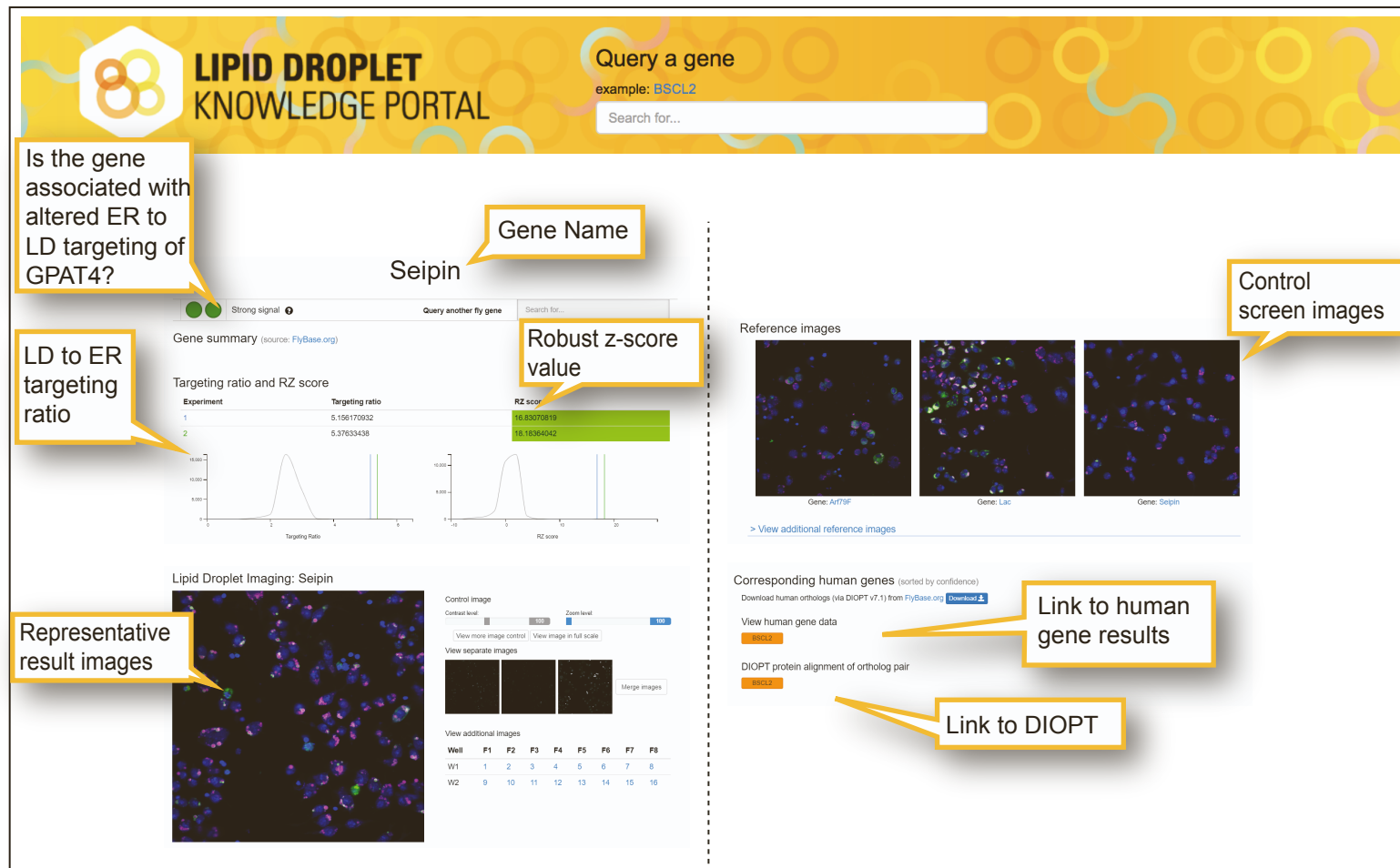
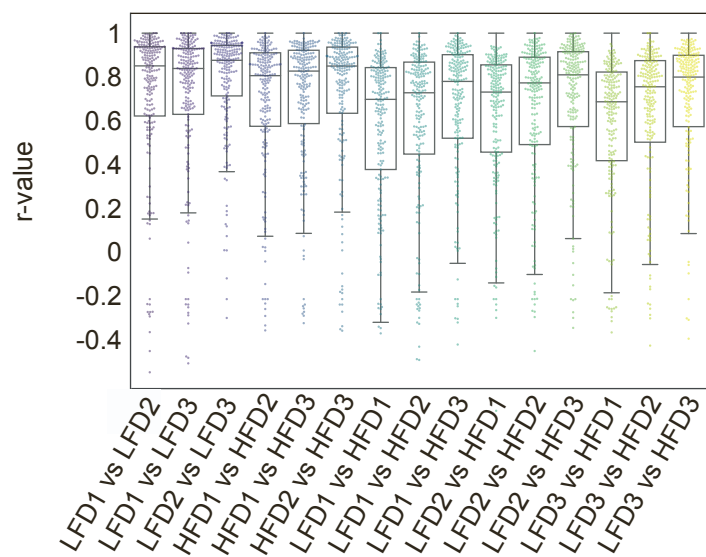
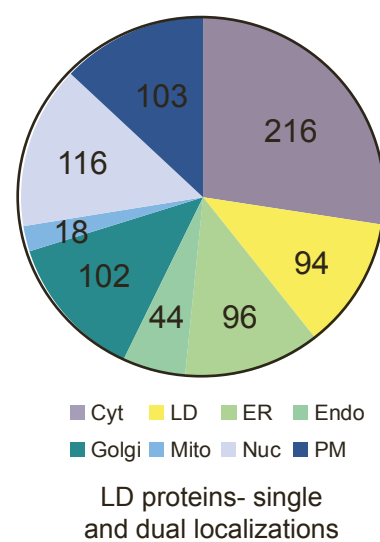


Figure S1 [Related to Figure 1]

A



B



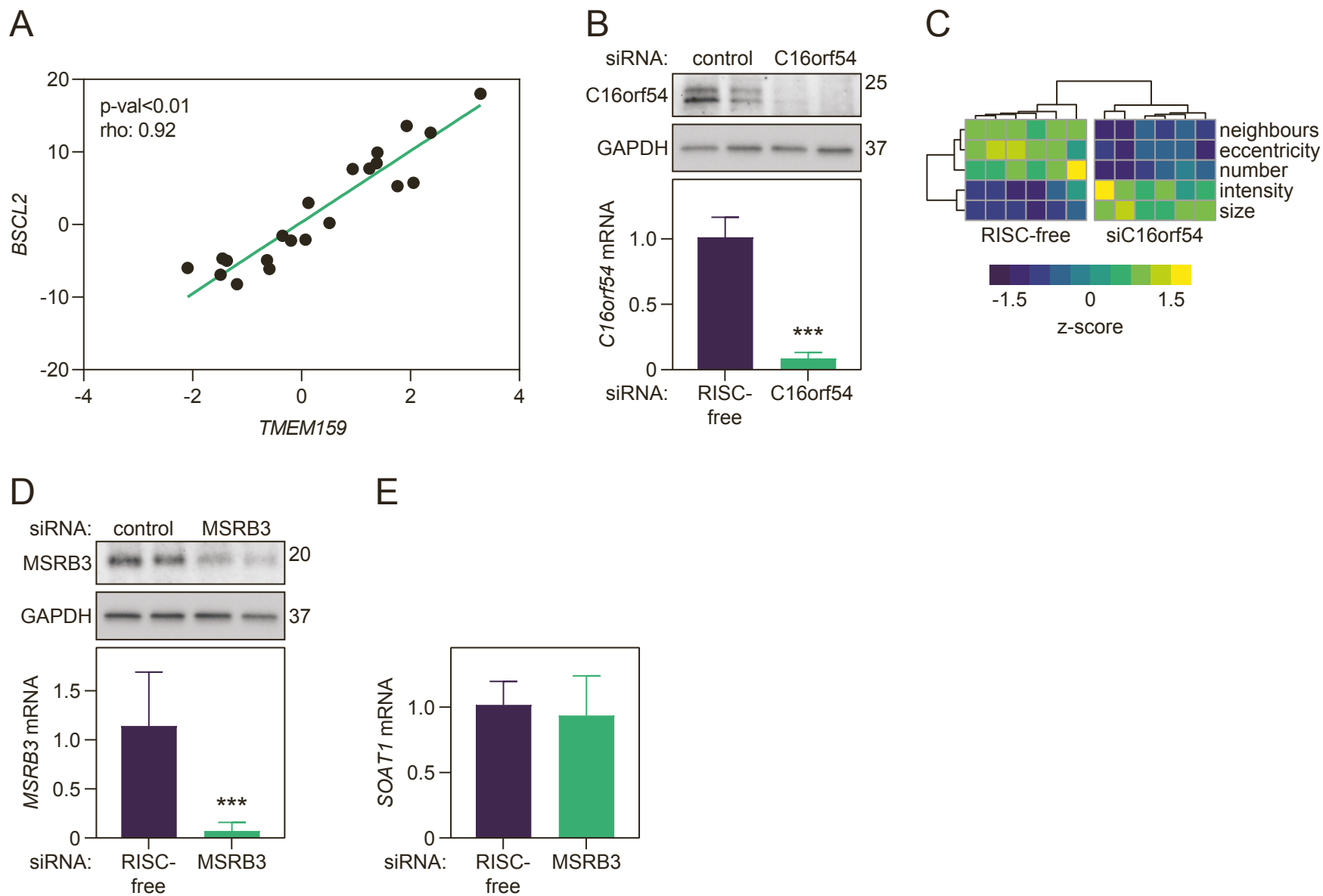


Figure S3 [Related to Figures 3-4]

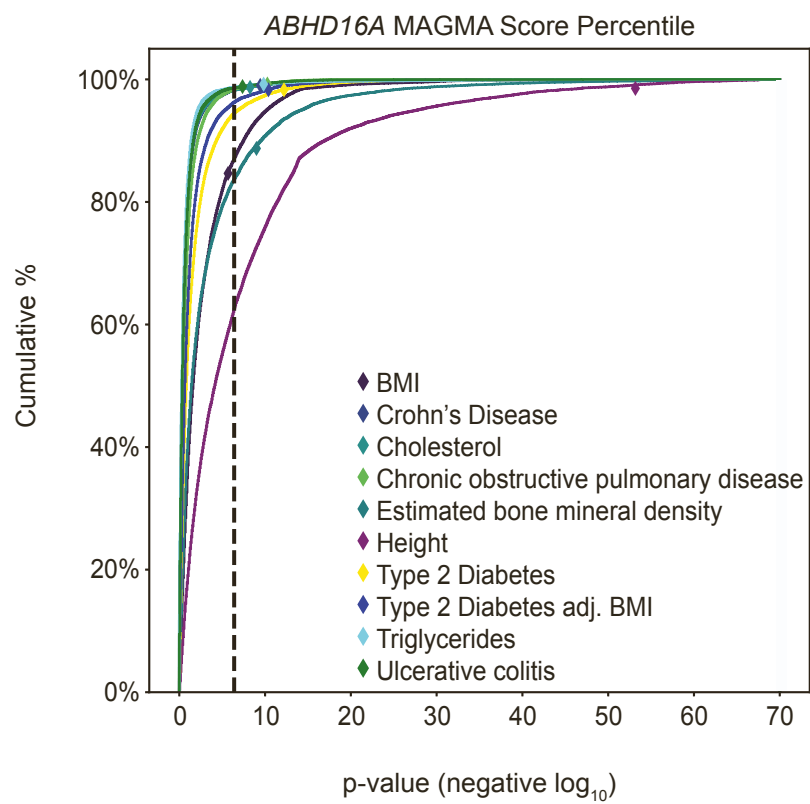


Figure S4 [Related to Figure 5]

SUPPLEMENTAL FIGURE TITLES AND LEGENDS

Figure S1 [Related to Figure 1]: Overview of the Fly Module of the Lipid Droplet Knowledge Portal.

Content of the Fly LD-Portal module. A graphical summary of the Fly LD-Portal module with key to the data interface is displayed.

Figure S2 [Related to Figure 2]: Murine liver PCP profiles indicate high reproducibility of sample replicates.

(A) Murine liver PCP data produce reproducible results. Boxplot indicating correlation of PCP profiles within the indicated biological replicates of the same or different conditions.

(B) A specific set of proteins localize uniquely to LDs in mouse liver. In the mouse liver PCP, 787 proteins localized to LDs: 94 had a unique LD localization (yellow) and others localized to LDs and the indicated second organelle.

Abbreviations: Cyt, cytosol; Endo, endosome; ER, endoplasmic reticulum; Golgi, the Golgi apparatus; HFD, high-fat diet; LD, lipid droplet; LFD, low-fat diet; Mito, mitochondria; Nuc, nucleus; PM, plasma membrane.

Figure S3 [Related to Figures 3-4]: Perturbation of lipid storage determinants.

(A) *BSCL2* and *TMEM159* silencing result in similar LD morphology in THP-1 macrophages. The LD phenotypes of *BSCL2*- and *TMEM159*-depleted cells from the THP-1 macrophage RNAi screen were compared using simple regression analysis across the filtered image parameters.

(B) *C16orf54* is efficiently depleted by RNAi in THP-1 macrophages. Differentiated THP-1 macrophages were transfected with RISC-free or *C16orf54* targeting siRNAs and effects on

C16orf54 protein levels (upper panel) and mRNA expression (lower panel) were determined. Results are based on six replicates and were evaluated using Student's t-test. Data are represented as mean $\pm$ SD and molecular weight markers are indicated on the right side of the membranes. *** = $p < 0.001$.

(C) Depletion of *C16orf54* in THP-1 macrophages alters LD morphology induced by oleic acid. After incubations with oleic acid (0.5 mM) for 1 day, LD image analysis of RISC-free control and C16orf54 transfected THP-1 macrophages was performed. Five features were selected and scaled to generate z-scores. The resulting matrix was plotted as a heatmap. Results are based on six replicates.

(D-E) Same experimental setup and statistical evaluation as in panel B, but cells were transfected with MSRB3-targeting siRNAs and effects on MSRB3 mRNA/protein (D) and *SOAT1* mRNA expression (E) are displayed. Molecular weight markers are indicated on the right side of the membranes.

Figure S4 [Related to Figure 5]: ABHD16A is significantly associated with 8 human traits.

Cumulative histogram of the $-\log_{10}$ p values for all genes for 10 selected traits. Significance cutoff ($p = 2.5e-6$) is represented by the black dotted line. ABHD16A trait percentile is marked with a diamond.

Abbreviations: ALT, alanine transaminase; BMI, body mass index; CAD, coronary artery disease; CHOL, cholesterol; ChildObesity, child obesity; FA160, palmitic acid; FA180, Palmitoleic acid; FA181n9, oleic acid; FG, fasting glucose; FI, fasting insulin; HDL, HDL cholesterol; IBD, Inflammatory bowel disease; LDL, LDL cholesterol; T2D, type 2 diabetes; TG, triglyceride; VAT, visceral adipose tissue volume; WAIST, waist circumference.