

Supplemental Figure Legends

Figure S1. ER-targeting liposome treatment is able to modify the abundance of specific PC species in hepatocytes.

A-B) Content of PC species with 20:4 (A) and 18:0 (B) at sn-2 position (X/20:4 and X/18:0 PC) in microsomes isolated from WT primary hepatocytes treated with indicated ER targeting liposome ((30 μ M total phospholipid concentration) for 3.5 h. The abundance of the major PC species in microsomes were shown on the right. Statistical analysis was by Student's t test.

Figure S2. The effect of Lpcat3 inhibition on Srebp1 processing is lost in the setting of Brefeldin-A treatment.

Primary hepatocytes were harvested from *Lpcat3*^{F/F} mice as described and treated with GFP or CRE-expressing adenovirus at an MOI of 10. All of the cells also received LXR ligand (GW3965 1 μ M). After 24 h, cells were treated with brefeldin A at 2 μ g/ml for 5 h. Membrane and nuclear Srebp-1 were analyzed by western blotting and quantified by imageJ. The ratio of mSrebp-1 to pSrebp-1 was calculated and normalized to GFP-treated control in each treatment group.

Figure S3. Regioisomer analysis of major PC species in the ER fraction from livers.

Regioisomer analysis of major PC species in the ER fraction from livers of C57BL/6 mice fasted 12 h or fasted 12 h and refed 12 h with high-fat diet (60% fat) were performed as described in the method. The ratio of ion intensity for the loss of the fatty acyl chain from the sn-1 position versus the sn-2 position were calculated.

Figure S4. Regulation of ER phospholipid acyl chain composition during feeding.

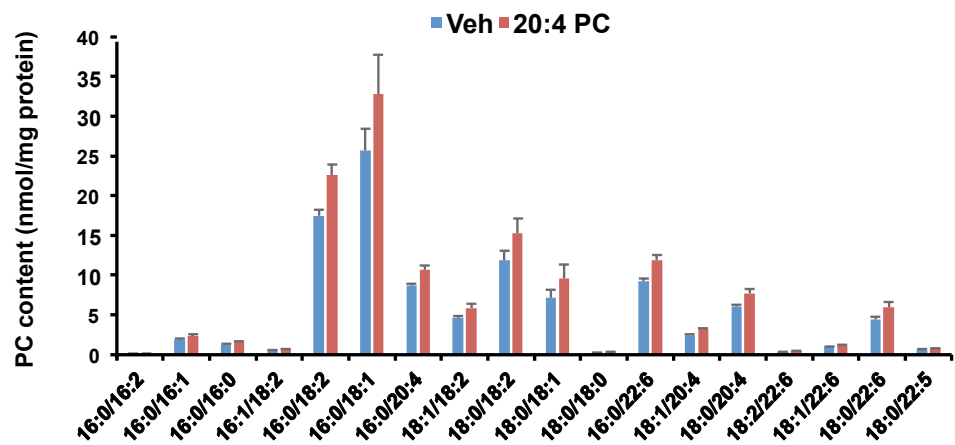
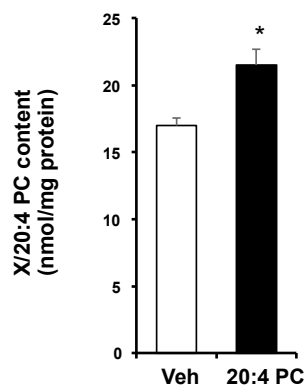
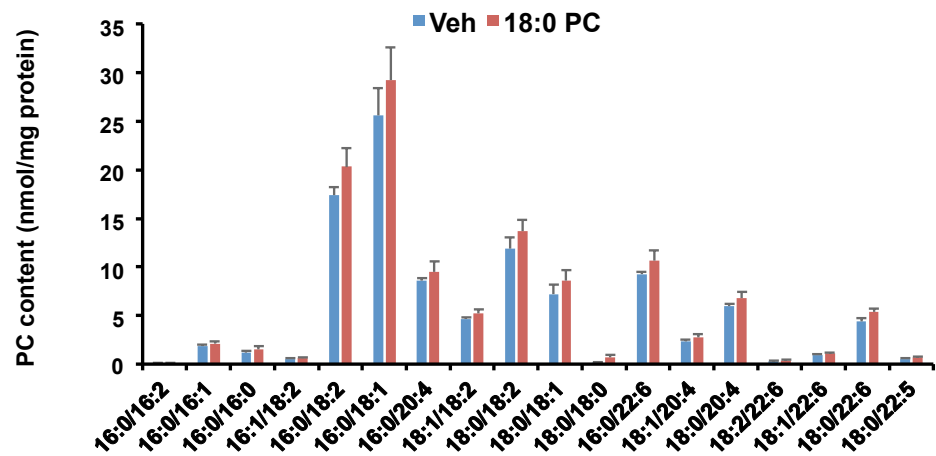
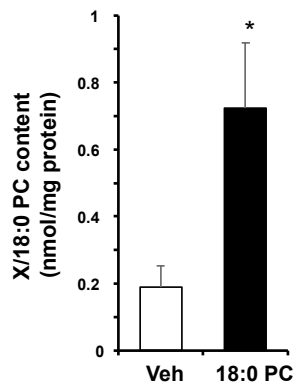
A) ESI-MS/MS analysis of PE species in the ER fraction from livers of C57BL/6 mice fasted 12 h or fasted 12 h and refed 12 h with high carbohydrate diet.

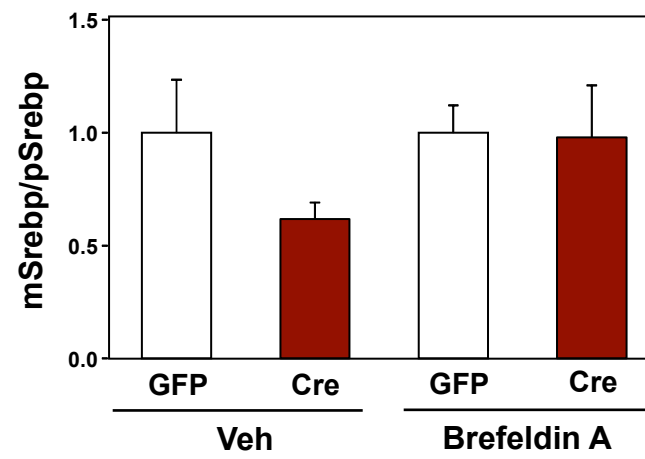
B) ESI-MS/MS analysis of PC species in the ER fraction from livers of L-*Lpcat3*^{-/-} mice fasted 12 h or fasted 12 h and refed 12 h with high carbohydrate diet.

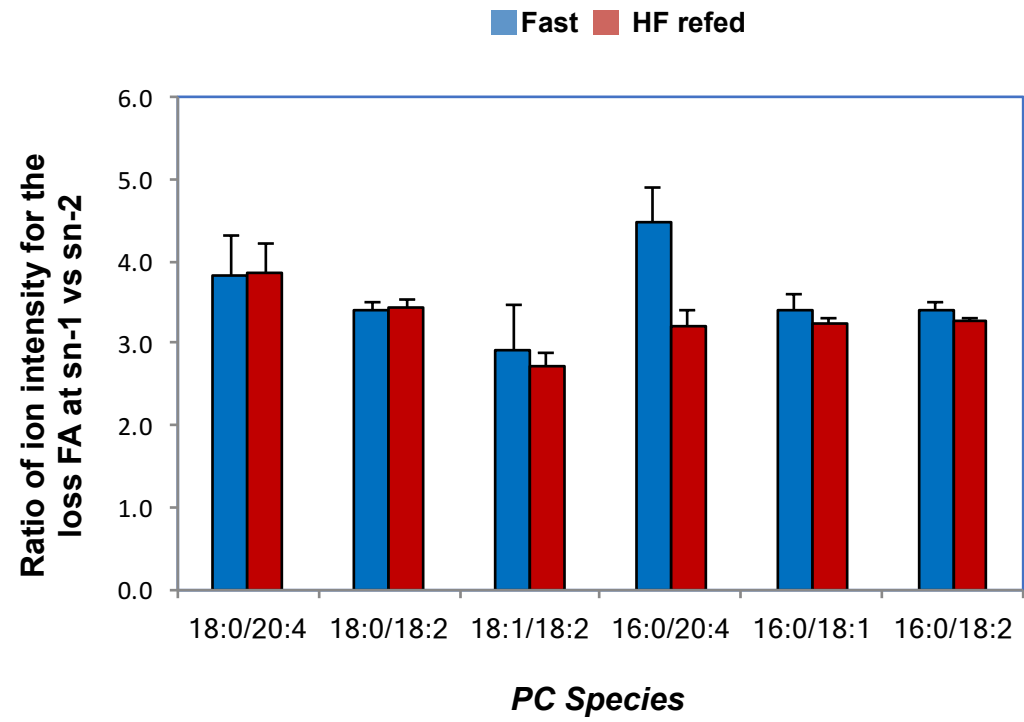
Statistical analysis was by Student's t test with correction for multiple comparisons using the Holm-Sidak method (A,B). * $p < 0.05$; NS, not significant. Values are means \pm SEM.

Figure S5. Regulation of ER phospholipid acyl chain composition in obesity.

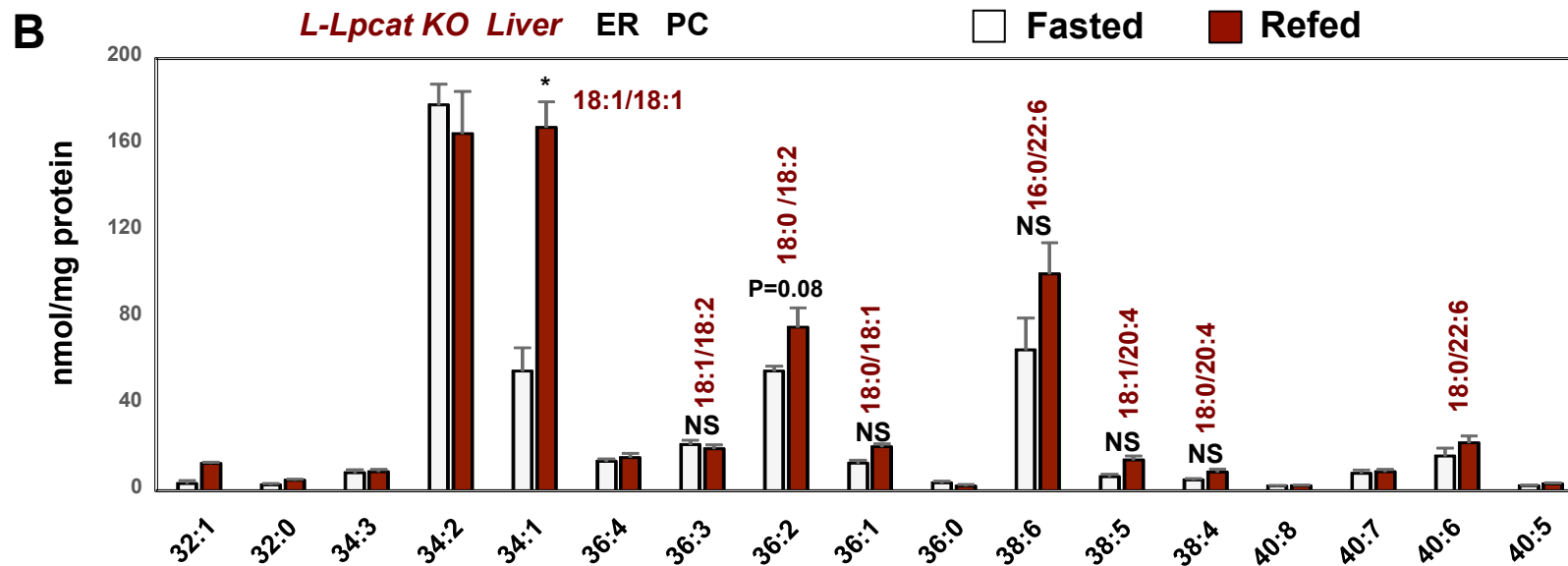
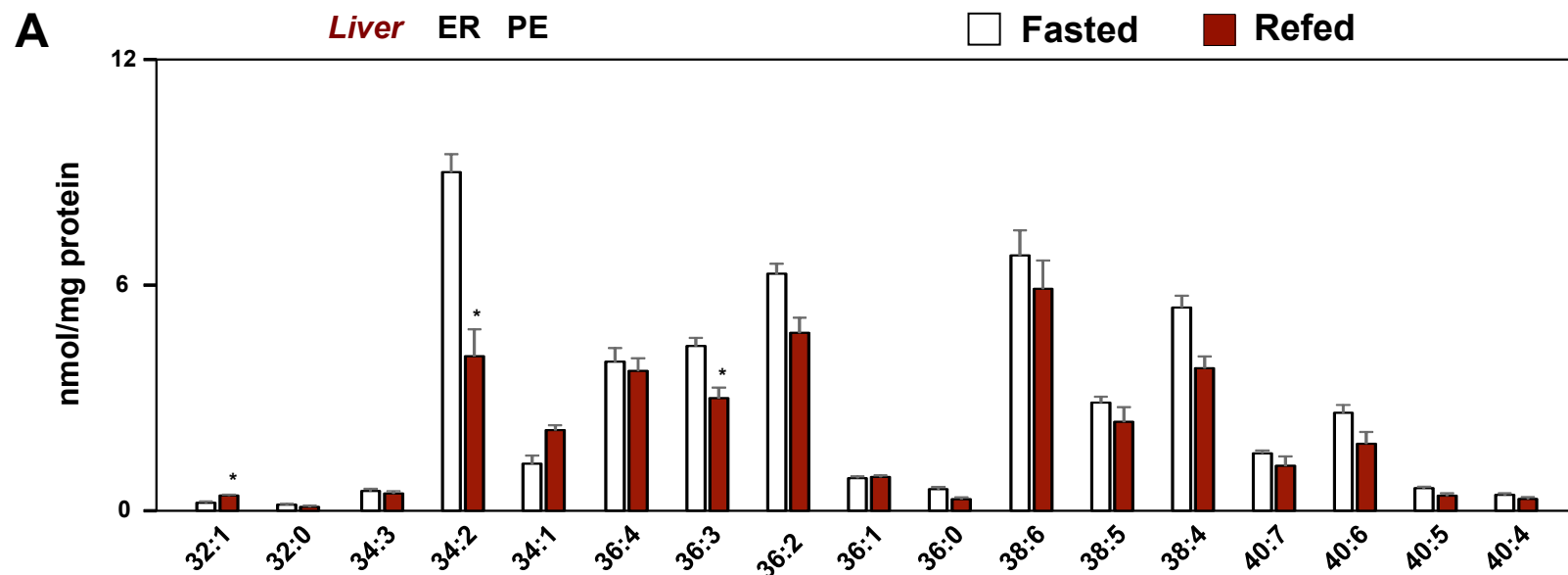
ESI-MS/MS analysis of PE species in the ER fraction from C57BL/6 and *ob/ob* mouse liver. n = 6 per group. Statistical analysis was by Student's t test with correction for multiple comparisons using the Holm-Sidak method. Values are means \pm SEM.

A**B**

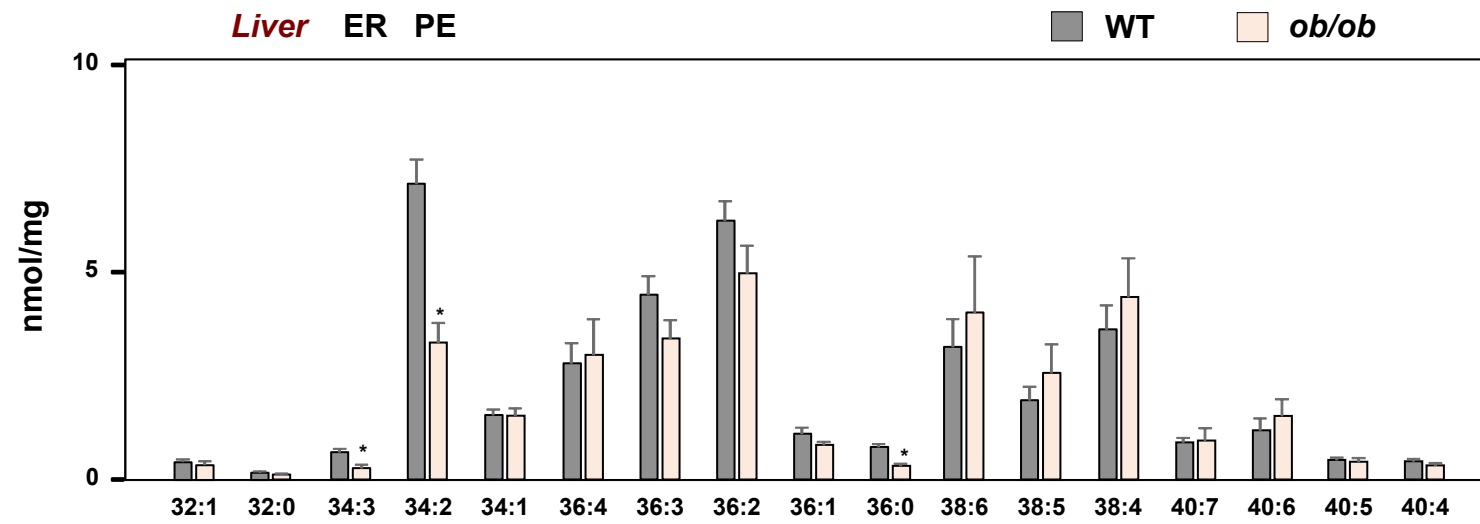




Rong Fig. S3



Rong Fig. S4



Rong Fig. S5