Supplementary Figures

Supplementary Fig. 1: Effects of *Lep* knockdown on leptin transcription and secretion in perigonadal adipose tissue explants from mice fed with high fat diet.

Supplementary Fig. 2: Effects of *Adig* knockdown on leptin transcription and secretion in perigonadal adipose tissue explants from mice fed with high fat diet.

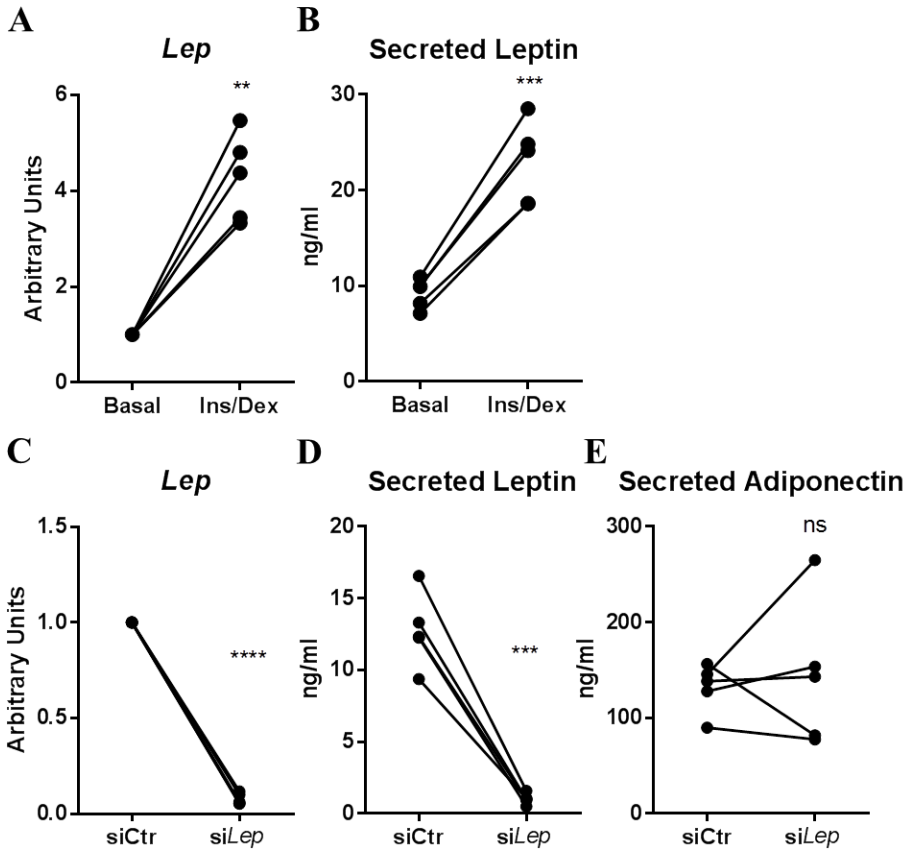
Supplementary Fig. 3: Effects of *Ift172* knockdown on leptin transcription and secretion in perigonadal adipose tissue explants from mice fed with high fat diet.

Supplementary Fig. 4: Effects of *Mpv17* knockdown on leptin transcription and secretion in perigonadal adipose tissue explants from mice fed with high fat diet.

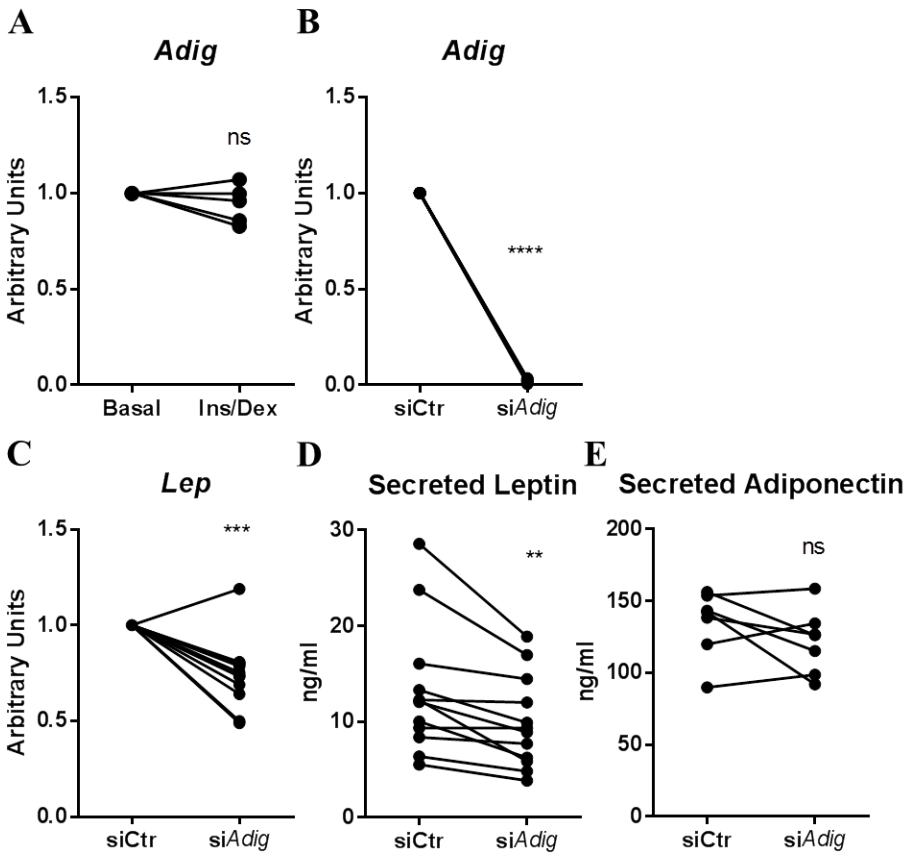
Supplementary Fig. 5: Effects of *Tiparp* knockdown on leptin transcription and secretion in perigonadal adipose tissue explants from mice fed with high fat diet.

Supplementary Fig. 6: Effects of *Cobll1* knockdown on leptin transcription and secretion in perigonadal adipose tissue explants from mice fed with high fat diet.

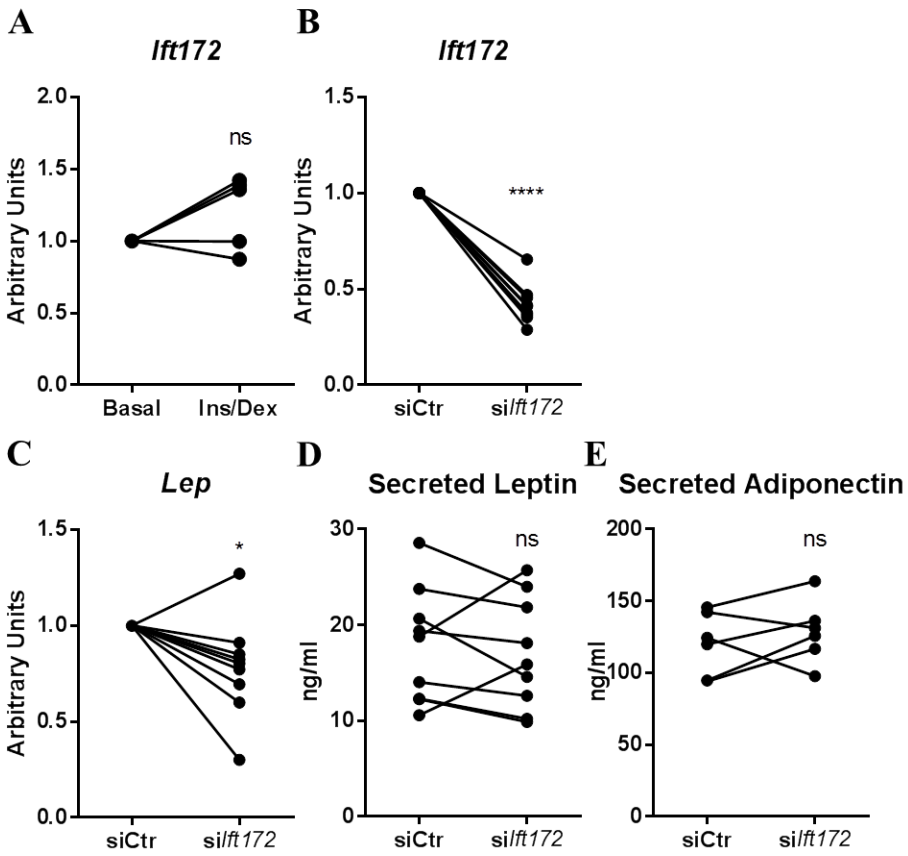
Supplementary Fig. 7: Expression of murine homologs of genes located within leptin-associated loci in the liver and hypothalamus.



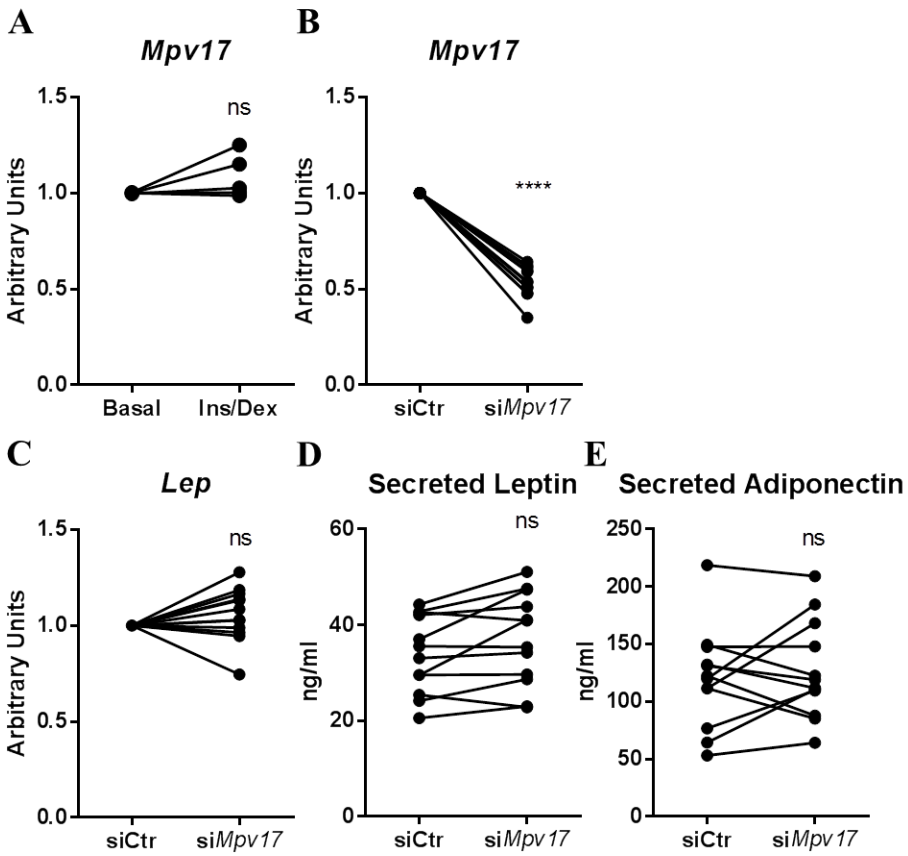
Supplementary Fig. 1. Effects of *Lep* knockdown on leptin transcription and secretion in perigonadal adipose tissue explants from mice fed with high fat diet. *Lep* transcription (**A**) and secretion (**B**) by explants in the basal or Ins/Dex stimulated state. N=5 mice per group. *Lep* knockdown (**C**) decreased LEP secretion (**D**) following stimulation with insulin and dexamethasone for 12 hours. Adiponectin secretion (**E**) remained unchanged. N=5 mice per group. Each point represents the average of 3 samples. 2 way repeated measures ANOVA. *p<0.05, **p<0.01, ***p<0.001, ****p<0.0001.



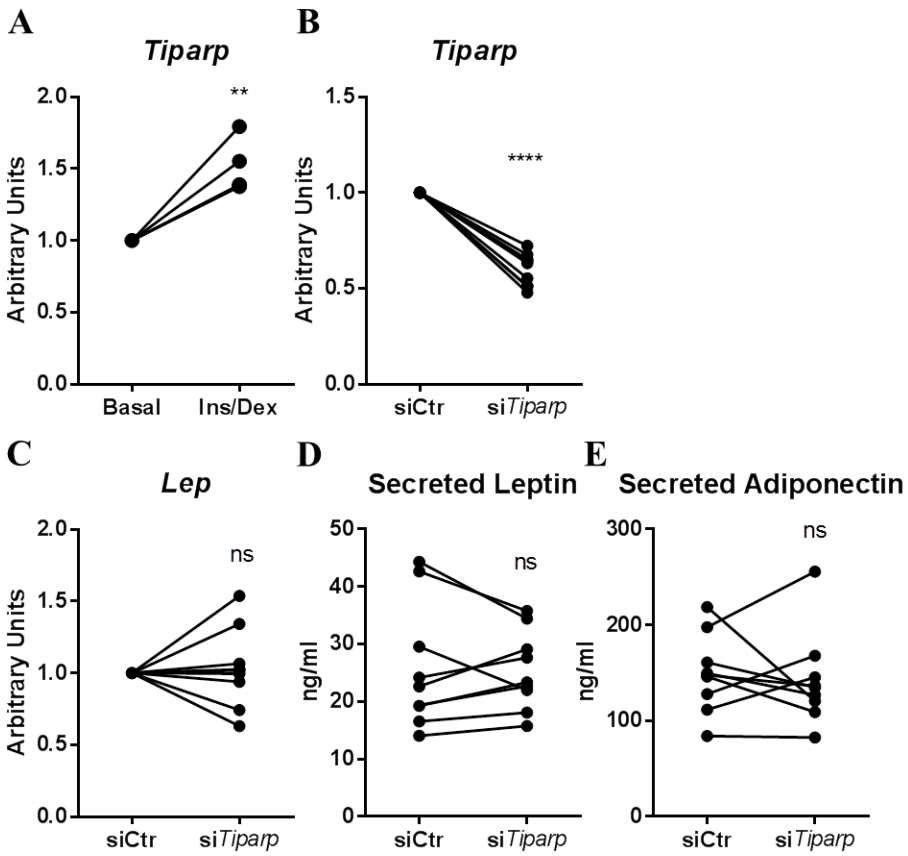
Supplementary Fig. 2 Effects of *Adig* knockdown on leptin transcription and secretion in perigonadal adipose tissue explants from mice fed with high fat diet. *Adig* expression (**A**) by explants in the basal or Ins/Dex stimulated state. N=5 mice per group. *Adig* knockdown (**B**) decreased both *Lep* expression (**C**) and LEP secretion (**D**) following stimulation with insulin and dexamethasone for 12 hours. N=12 mice per group. Adiponectin secretion (**E**) remained unchanged. N=7 mice per group. Each point represents the average of 3 samples. 2 way repeated measures ANOVA. *p<0.05, **p<0.01, ***p<0.001, ****p<0.0001.



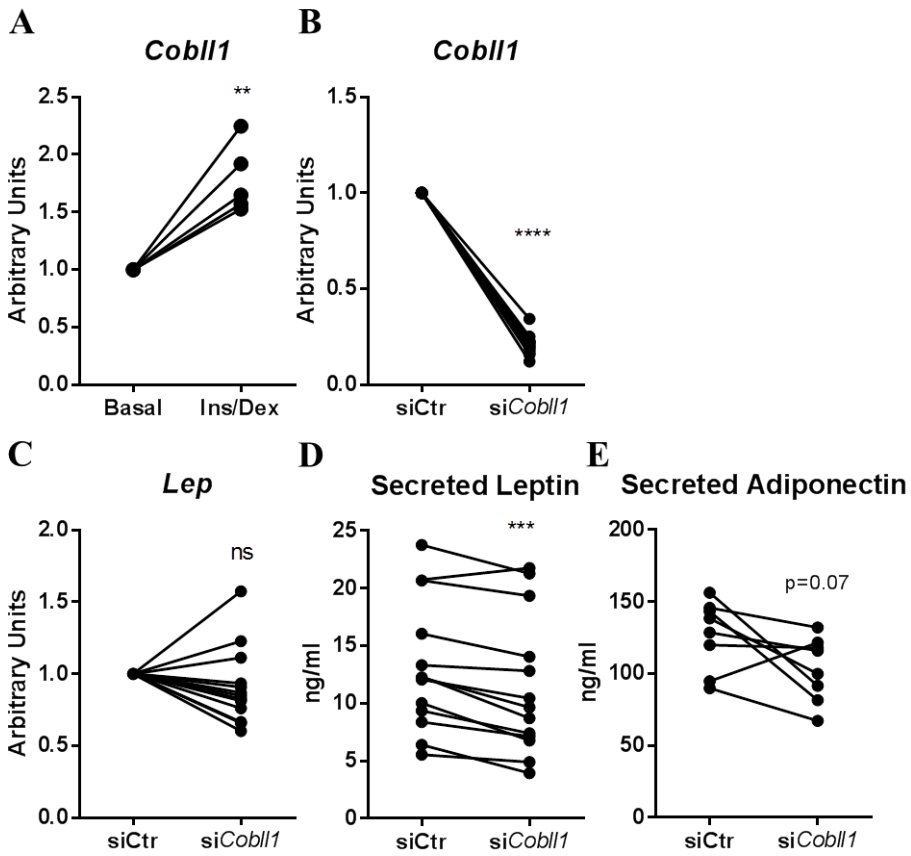
Supplementary Fig. 3. Effects of *Ift172* knockdown on leptin transcription and secretion in perigonadal adipose tissue explants from mice fed with high fat diet. *Ift172* expression (**A**) by explants in the basal or Ins/Dex stimulated state. N=5 mice per group. *Ift172* knockdown (**B**) decreased *Lep* expression (**C**) but did not change leptin secretion (**D**) following stimulation with insulin and dexamethasone for 12 hours. N=9 mice per group. Adiponectin secretion (**E**) remained unchanged. N=6 mice per group. Each point represents the average of 3 samples. 2 way repeated measures ANOVA. *p<0.05, **p<0.01, ***p<0.001, ****p<0.0001.



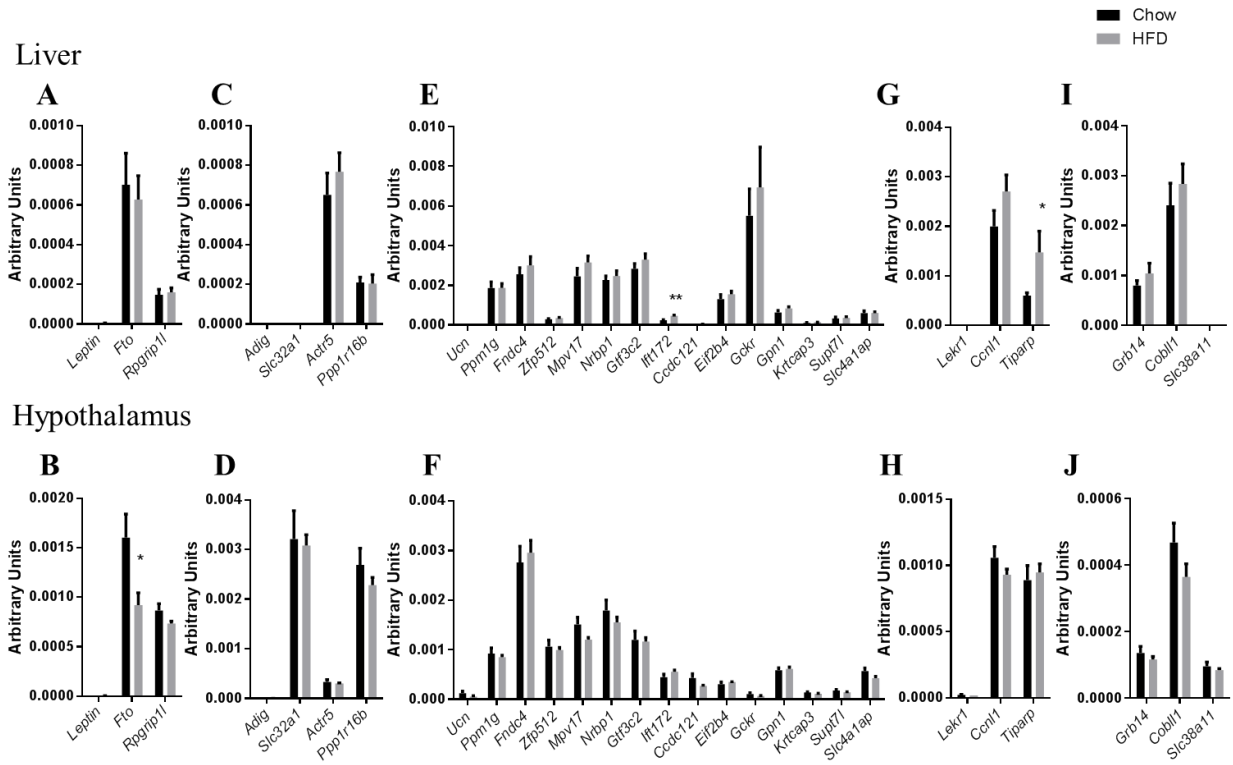
Supplementary Fig. 4. Effects of *Mpv17* knockdown on leptin transcription and secretion in perigonadal adipose tissue explants from mice fed with high fat diet. *Mpv17* expression (**A**) by explants in the basal or Ins/Dex stimulated state. N=5 mice per group. *Mpv17* knockdown (**B**) did not change *Lep* expression (**C**) or secretion (**D**) following stimulation with insulin and dexamethasone for 12 hours. Adiponectin secretion (**E**) remained unchanged. N=12 mice per group. Each point represents the average of 3 samples. 2 way repeated measures ANOVA. *p<0.05, **p<0.01, ***p<0.001, ****p<0.0001.



Supplementary Fig. 5. Effects of *Tiparp* knockdown on leptin transcription and secretion in perigonadal adipose tissue explants from mice fed with high fat diet. *Tiparp* expression (**A**) by explants in the basal or Ins/Dex stimulated state. N=5 mice per group. *Tiparp* knockdown (**B**) did not change *Lep* expression (**C**) or secretion (**D**) following stimulation with insulin and dexamethasone for 12 hours. Adiponectin secretion (**E**) remained unchanged. N=9 mice per group. Each point represents the average of 3 samples. 2 way repeated measures ANOVA. *p<0.05, **p<0.01, ***p<0.001, ****p<0.0001.



Supplementary Fig. 6. Effects of *Cobll1* knockdown on leptin transcription and secretion in perigonadal adipose tissue explants from mice fed with high fat diet. *Cobll1* expression (**A**) by explants in the basal or Ins/Dex stimulated state. N=5 mice per group. *Cobll1* knockdown (**B**) did not change *Lep* expression (**C**) but decreased Lep secretion (**D**) following stimulation with insulin and dexamethasone for 12 hours. N=13 mice per group. Adiponectin secretion (**E**) remained unchanged. N=8 mice per group. Each point represents the average of 3 samples. 2 way repeated measures ANOVA. *p<0.05, **p<0.01, ***p<0.001, ****p<0.0001.



Supplementary Fig. 7. Expression of murine homologs of genes located within *Lep* (A, B), *Slc32a1* (C, D), *Gckr* (E, F), *Ccnl1* (G, H), and *Cobll1* loci (I, J) in liver and hypothalamus from 4 month old mice fed chow (black bars) or high fat diet (HFD; gray bars). qPCR transcripts were normalized using *ActB*, *36B4*, *Gapdh* and *Ppia* as housekeeping genes. N=5 mice per group. Paired t-test.