**Supplementary Table 1. RT-PCR primer sequences**

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|  | **Forward Primer** | **Reverse Primer** |
| *Gapdh* | TGAAGCAGGCATCTGAGGG | CGAAGGTGGAAGAGTGGGAG |
| *Hsl* | GCTGGGCTGTCAAGCACTGT | GTAACTGGGTAGGCTGCCAT |
| *Atgl* | CAACGCCACTCACATCTACGG | TCACCAGGTTGAAGGAGGGAT |
| *Lpl* | GGGAGTTTGGCTCCAGAGTTT | TGTGTCTTCAGGGGTCCTTAG |
| *Fasn* | GGAGGTGGTGATAGCCGGTAT | TGGGTAATCCATAGAGCCCAG |
| *Acsl1* | TGCCAGAGCTGATTGACATTC | GGCATACCAGAAGGTGGTGAG |
| *Pgc1a* | TATGGAGTGACATAGAGTGTGCT | CCACTTCAATCCACCCAGAAAG |
| *Pparg* | GGAAGACCACTCGCATTCCTT | TCGCACTTTGGTATTCTTGGAG |
| *Glut4* | GTGACTGGAACACTGGTCCTA | CCAGCCACGTTGCATTGTAG |
| *Il6* | TAGTCCTTCCTACCCCAATTTCC | AAGGAACCCTTAGAGTGCTTACT |
| *Arg1* | CTCCAAGCCAAAGTCCTTAGAG | AGGAGCTGTCATTAGGGACATC |
| *Mcp1* | TTAAAAACCTGGATCGGAACCAA | GCATTAGCTTCAGATTTACGGGT |
| *Mgl1* | TGAGAAAGGCTTTAAGAACTGGG | GACCACCTGTAGTGATGTGGG |
| *Fads1* | CCAGCTTTGAACCCACCAA | CATGAGGCCCATTCGCTCTA |
| *Fads2* | TCAAAACCAACCACCTGTTCTTC | ACACTCTATCACTGGCATCC |

**Supplementary Figure 1.** **Tissue weights in response to HFD feeding and CL treatment.** (A) GWAT weight as % of body weight (B) IWAT weight as % of body weight (C) BAT weight as % of body weight (D) Liver weight as % of body weight. N=7-12 /group; \*p<0.05, \*\*p<0.01, \*\*\*p<0.005, \*\*\*\*p<0.0001; error bars are SEM. Comparisons of M ND PBS vs F ND PBS are shown as #p<0.05, ##p<0.01, ###p<0.005 and M HFD PBS vs F HFD PBS are shown as &p<0.05, &&p<0.01, &&&p<0.005, &&&&p<0.0001.

**Supplementary Figure 2.** **Free glycerol estimation in lean and obese male and female WAT and BAT depot explants with ADRB3 stimulated lipolysis.** Free glycerol estimation in lean and obese (A) GWAT (B) IWAT (C) BAT explant tissues. Free glycerol released calculated as fold change over basal conditions in lean and obese (D) GWAT (E) IWAT (F) BAT explant tissues. N=8 /group; \*p<0.05, \*\*p<0.01, \*\*\*p<0.005, \*\*\*\*p<0.0001; error bars are SEM. Comparisons of M ND PBS vs F ND PBS are shown as #p<0.05, ##p<0.01, ###p<0.005 and M HFD PBS vs F HFD PBS are shown as &p<0.05, &&p<0.01, &&&p<0.005, &&&&p<0.0001.

**Supplementary Figure 3. Gene expression** (A) *Akt1* and (B) *Glut4* gene expression in obese male and female GWAT with and without ADRB3 stimulation. A.U., arbitrary units, N=5-8; \*p<0.05, \*\*p<0.01, \*\*\*p<0.005, \*\*\*\*p<0.0001.

**Supplementary Figure 4. Flow cytometry assessment of ATMs in lean and obese IWAT SVF.** Quantitation of (A) IWAT percent ATMs (B) IWAT CD11c+ ATMs (C) IWAT CD11c-ATMs (D) IWAT dendritic cells (DC) numbers, N=7-12/group; \*p<0.05, \*\*p<0.01, \*\*\*p<0.005, \*\*\*\*p<0.0001.

**Supplementary Figure 5. Lipidomic assessment of lipid mediators in obese male and female GWAT.** (A) Relative hydroxy fatty acids (FAHFA) (B) Phosphatidylserine (PS) (C) Phosphatidylcholine (PC) (D) Lyso-PC (E) Phosphatidylethanolamine (PE) (F) Phosphatidylglycerol (PG) (G) Phosphatidylinositol (PI) content in obese male and female GWAT with and without CL treatment. N=6/group; \*p<0.05, \*\*p<0.01, \*\*\*p<0.005, \*\*\*\*p<0.0001.