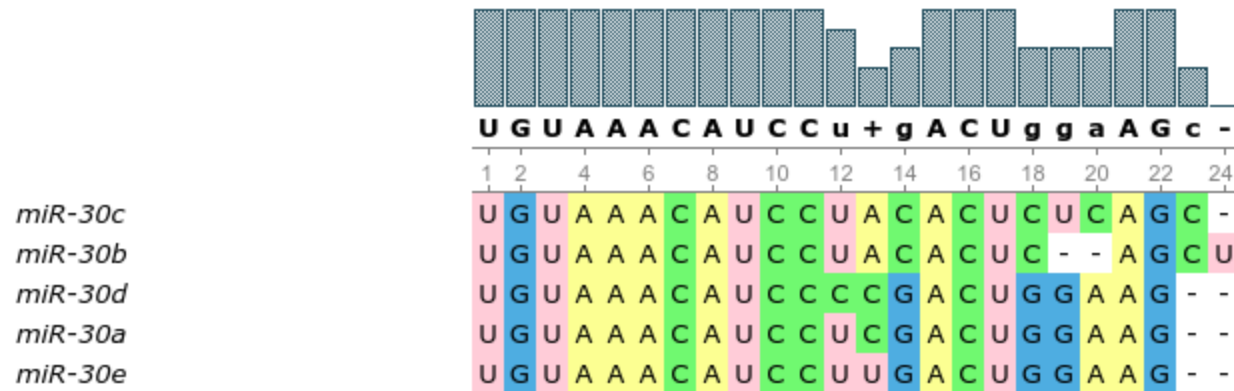
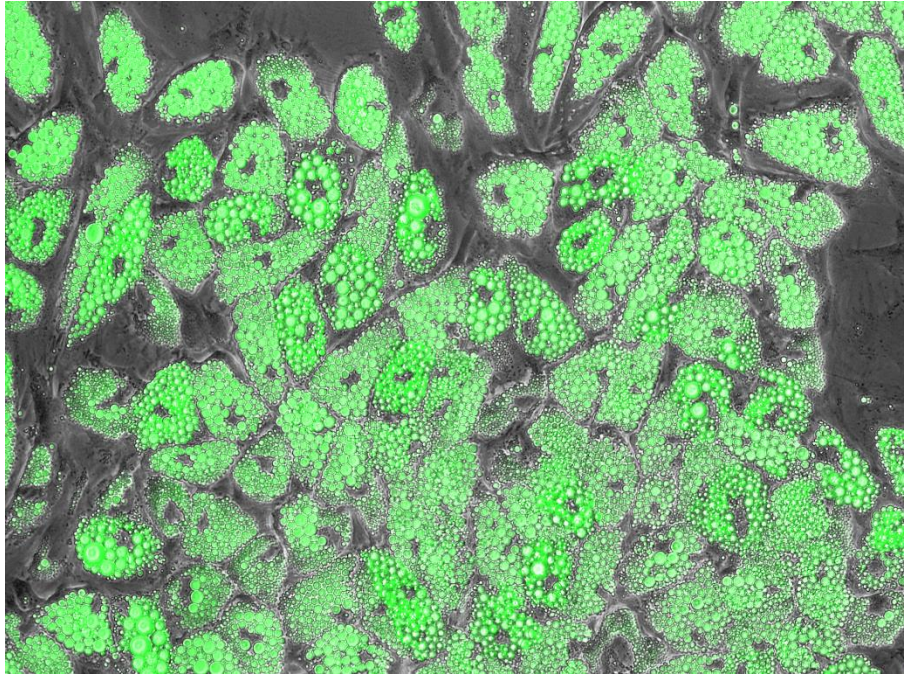


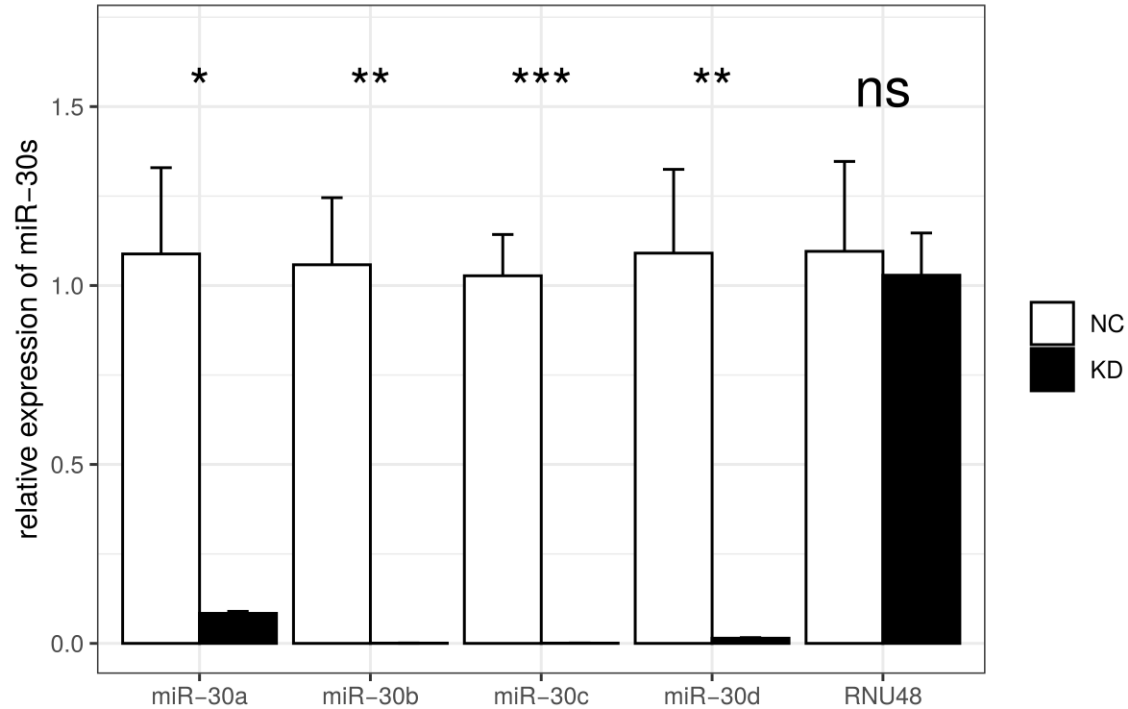
**Supplementary Figure 1.** Transfection of mature 3T3-L1 adipocytes with a miR-30a inhibitor (miR-30a KD) resulted in unspecific downregulation of miR-30d and transfection with a miR-30c inhibitor (miR-30c KD) resulted in unspecific downregulation of miR-30b and vice versa. Data shown as miRNA expression normalized to snoRNA202 and negative control, presented as the mean + SEM, n=3. \* $p < 0.05$  or as stated, calculated by two-tailed t-test with equal variance.



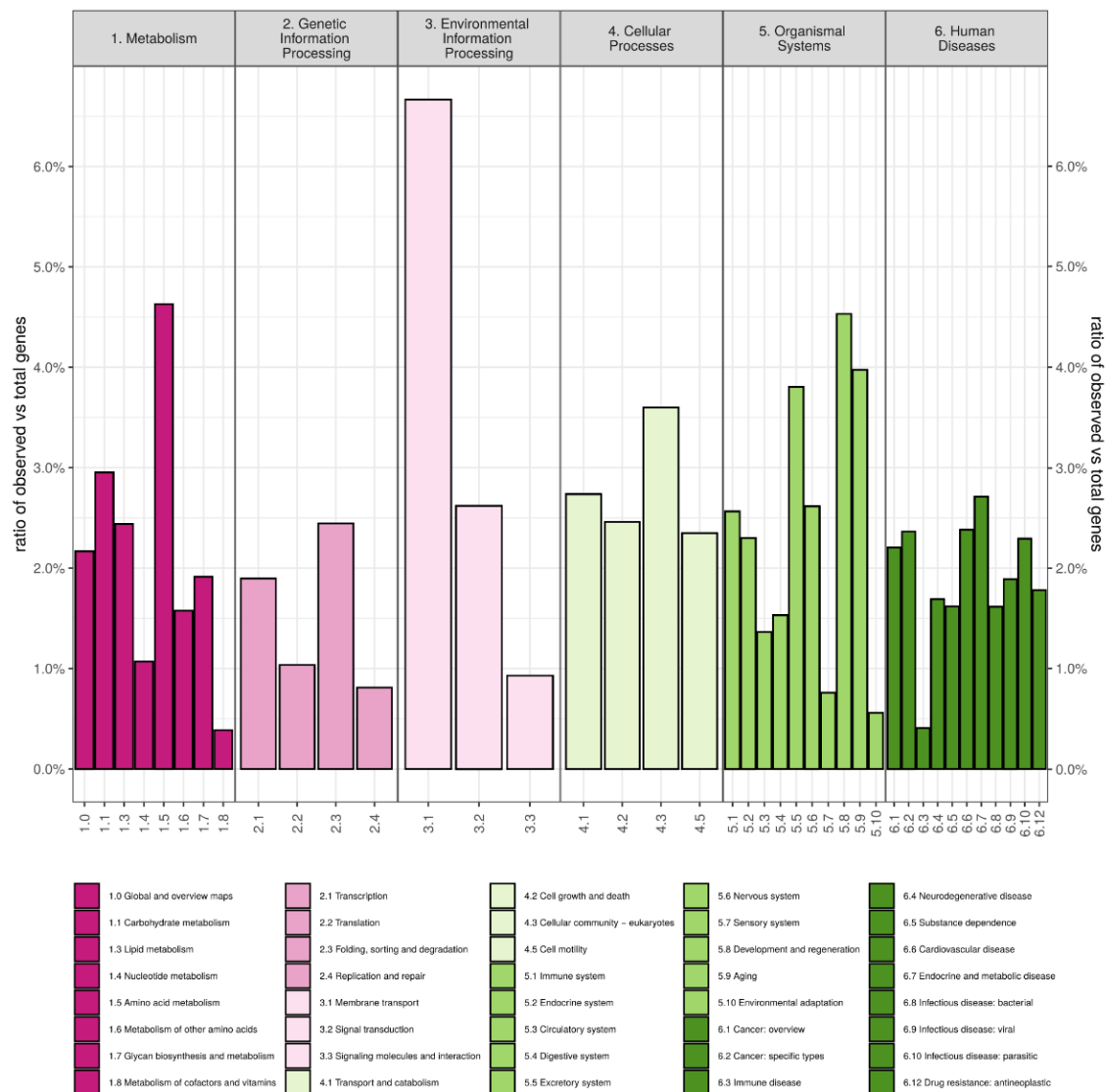
**Supplementary Figure 2.** Sequences of the miR-30 family show a large similarity between miR-30a and miR-30d (one nucleotide substitution), between miR-30a and miR-30e (one nucleotide substitution) and between miR-30c and mir-30b (two nucleotide deletions).



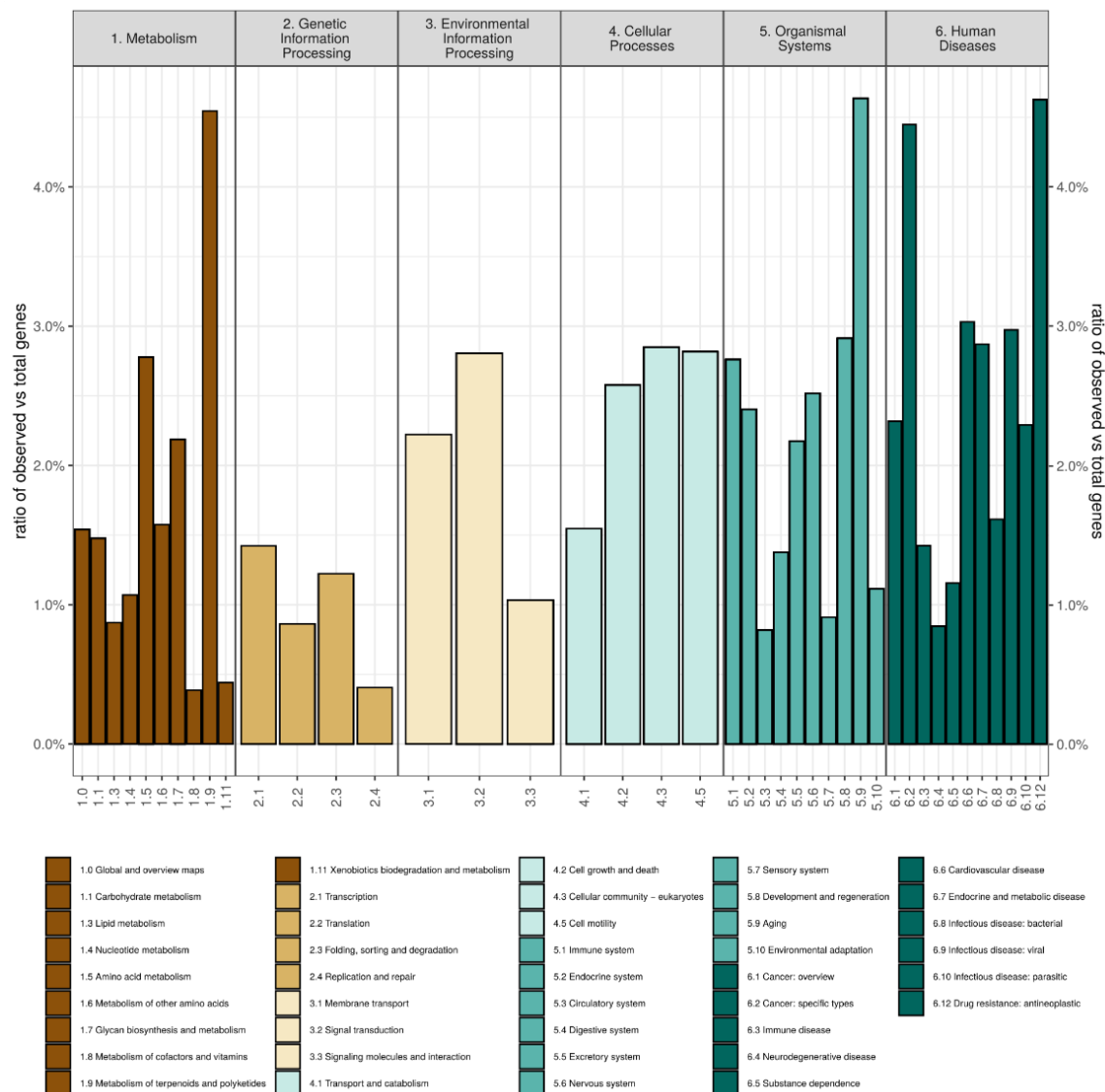
**Supplementary Figure 3.** To confirm the presence of lipid droplets indicating proper differentiation of SGBS cells, we stained fully differentiated cells (day 9) with BODIPY fluorescent lipid dye (Molecular Probe, Waltham, MA, USA) according to manufacturer instructions. Cells were observed under the Olympus TH4-200 microscope while using FITC filter (green channel) and images analysis were done by Fiji software (PMID 22743772).



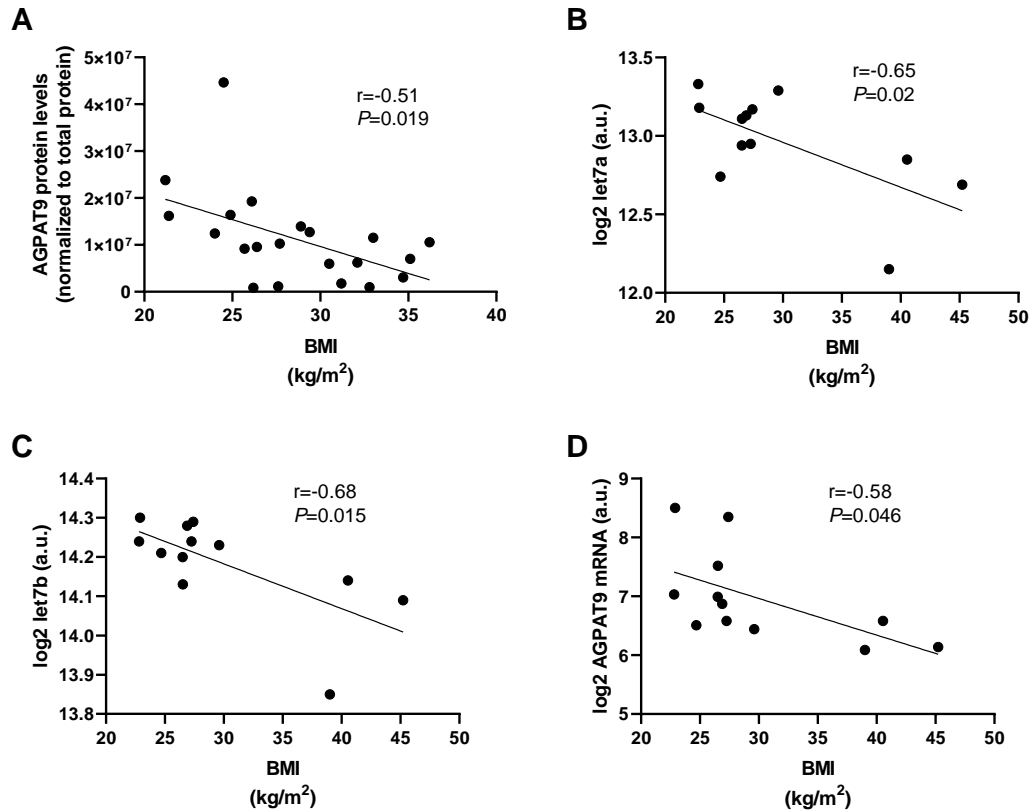
**Supplementary Figure 4.** The expression of miR-30a–d was silenced in human SGBS adipocytes (n=5) by co-transfecting the cells with the miR-30a-5p and miR-30c-5p inhibitors (KD). This resulted in knockdown of the four miRNAs (miR-30a, miR-30b, miR-30c and miR-30d) compared with the negative control (NC) with 7.7%, 0.07%, 0.08% and 1.3% remaining expression, respectively. Data are shown as miRNA expression normalized to RNU48 housekeeping gene and NC and presented as the mean + SEM. ns = non significant, \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$  calculated by two-tailed paired t-test.



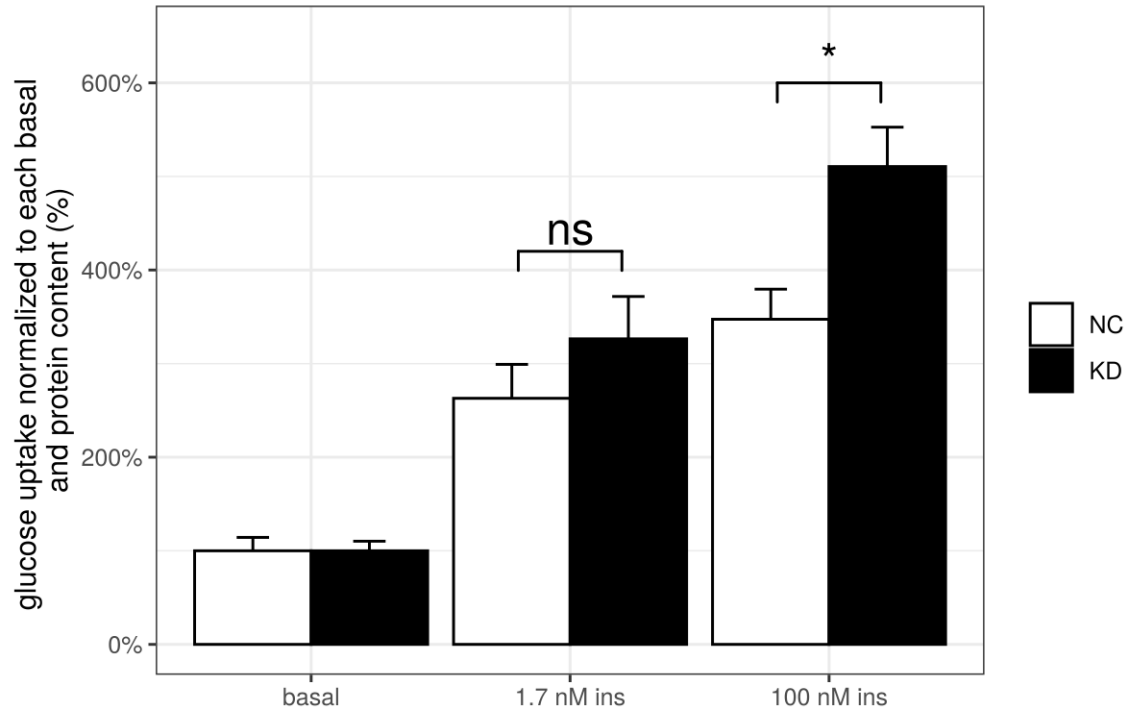
**Supplementary Figure 5.** KEGGREST package (Bioconductor, release 3.10) was used to identify pathways of the 285 predicted conserved targets for the human miR-30 family with differential expression in adipose tissue from T2D discordant twins. Data are shown as ratios of observed versus total number of genes (%).



**Supplementary Figure 6.** KEGGREST package (Bioconductor, release 3.10) was used to identify pathways of the 210 predicted conserved targets for the human let-7 family with differential expression in adipose tissue from T2D discordant twins. Data are shown as ratios of observed versus total number of genes (%).

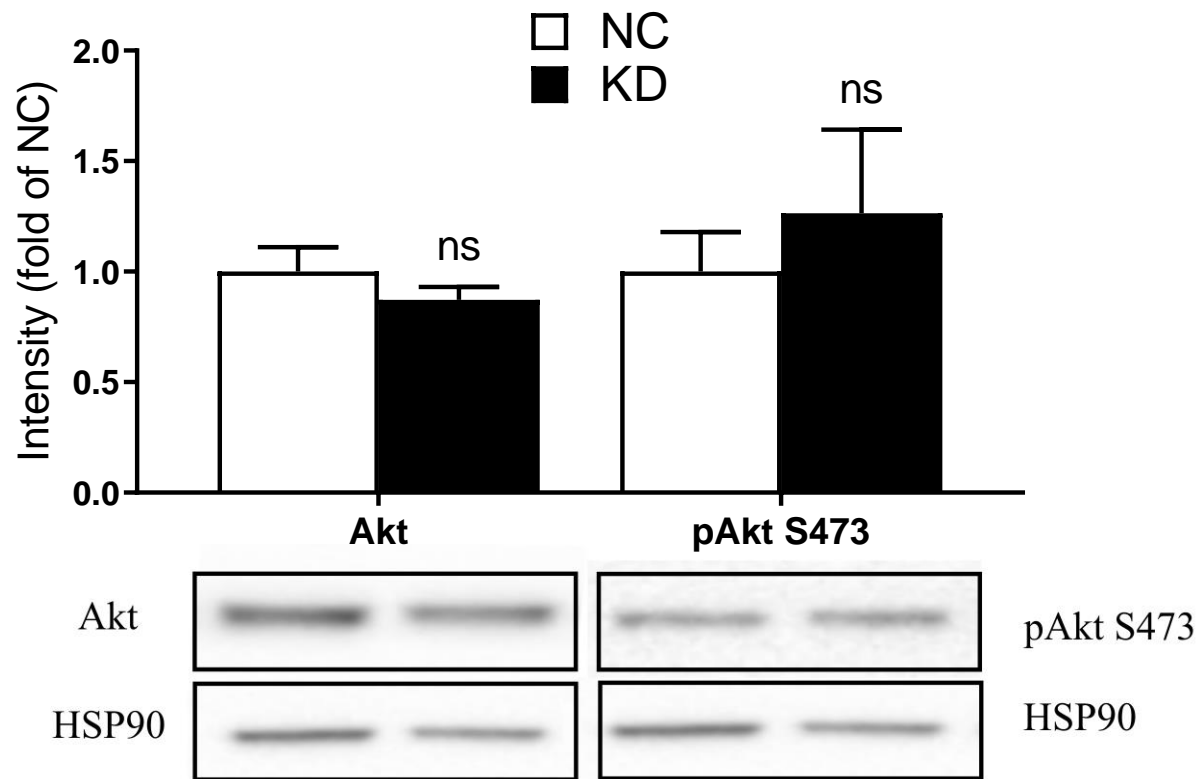


**Supplementary Figure 7.** There were significant negative Pearson correlations between BMI and (A) AGPAT9 protein, (B) let7a, (C) let7b and (D) AGPAT9 mRNA levels, respectively, in human adipose tissue.

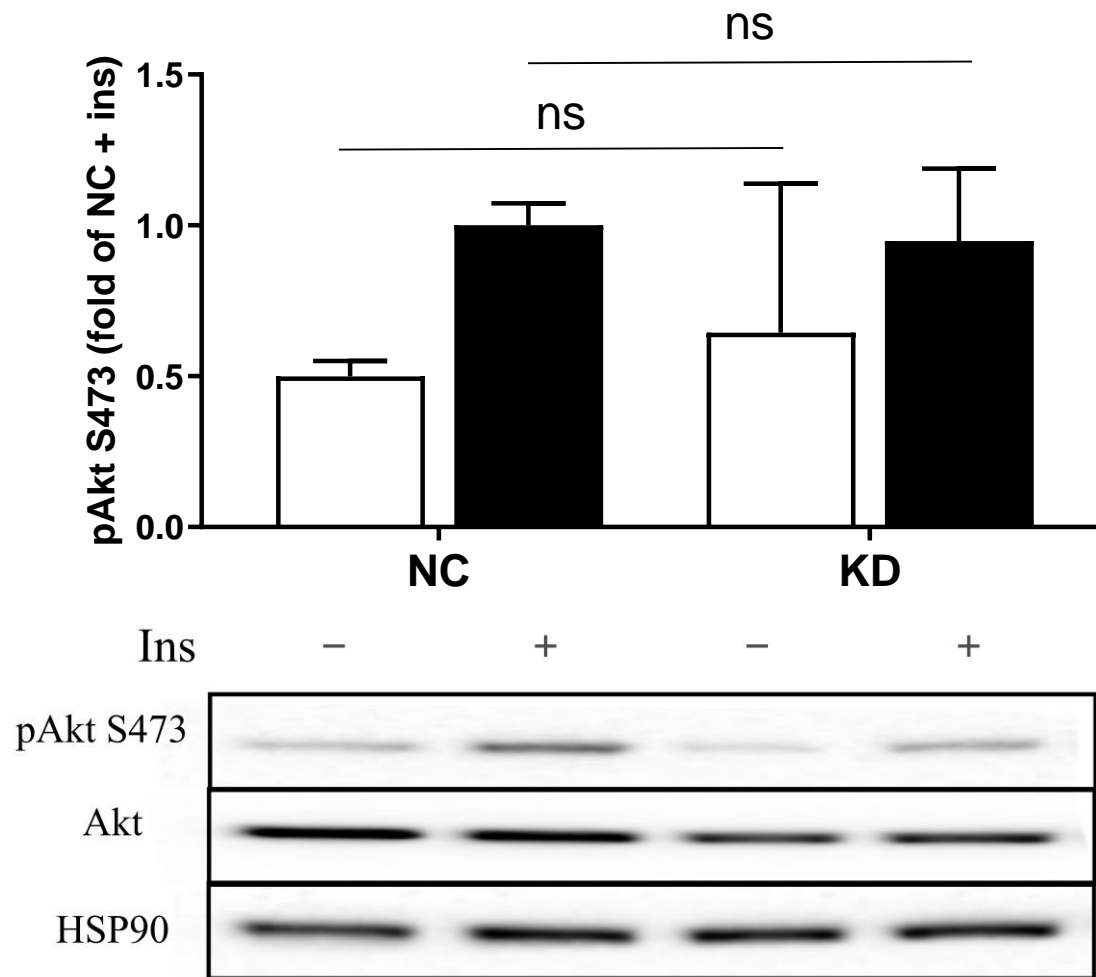


**Supplementary Figure 8.** There was either no effect (1.7 nM) or an *increase* (100 nM) in the induction of glucose uptake by insulin in miR-30 silenced 3T3-L1 adipocytes (n=5), when calculated as the fold increase compared to the basal glucose uptake of miR-30 silenced adipocytes (KD) or negative control (NC). Data are presented as the mean + SEM. ns = non significant, \* $p < 0.05$  calculated by two-tailed paired t-test with false discovery rate (FDR) correction.

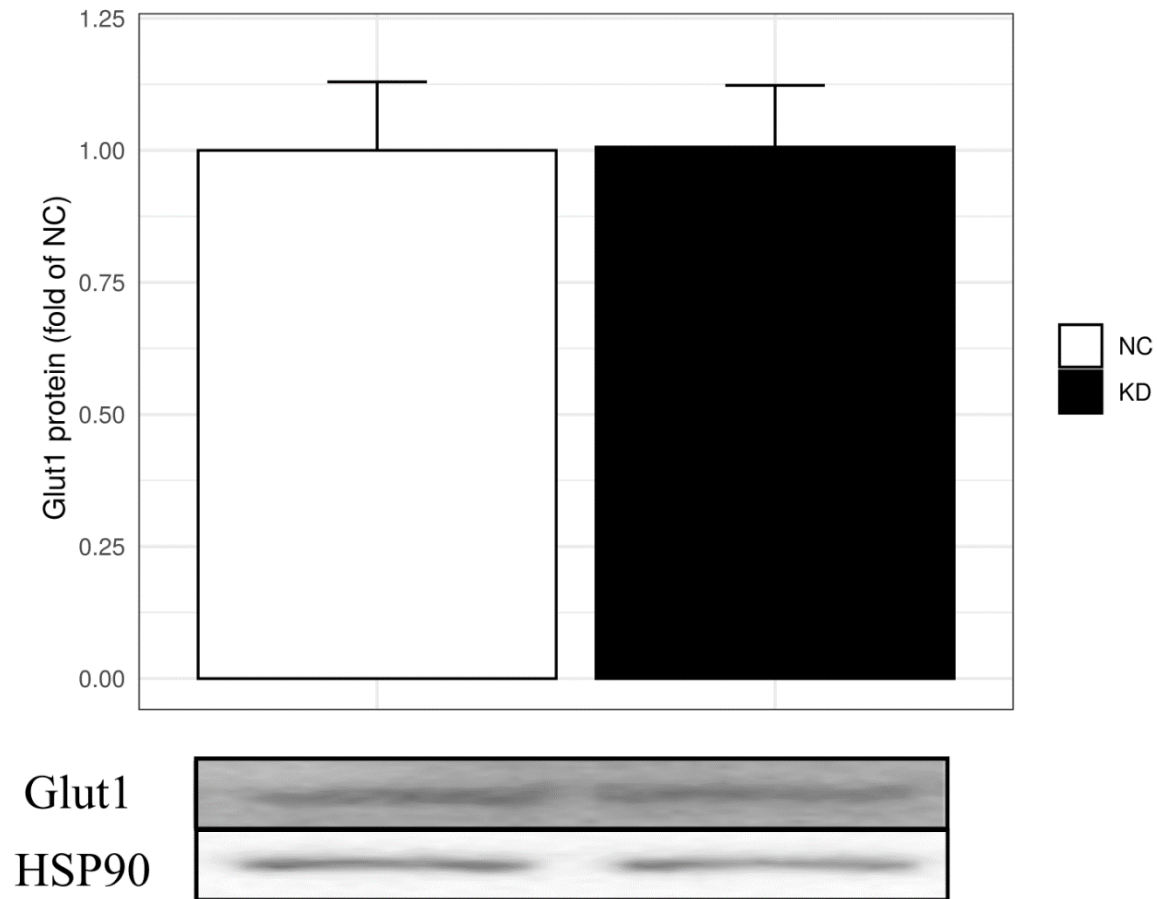




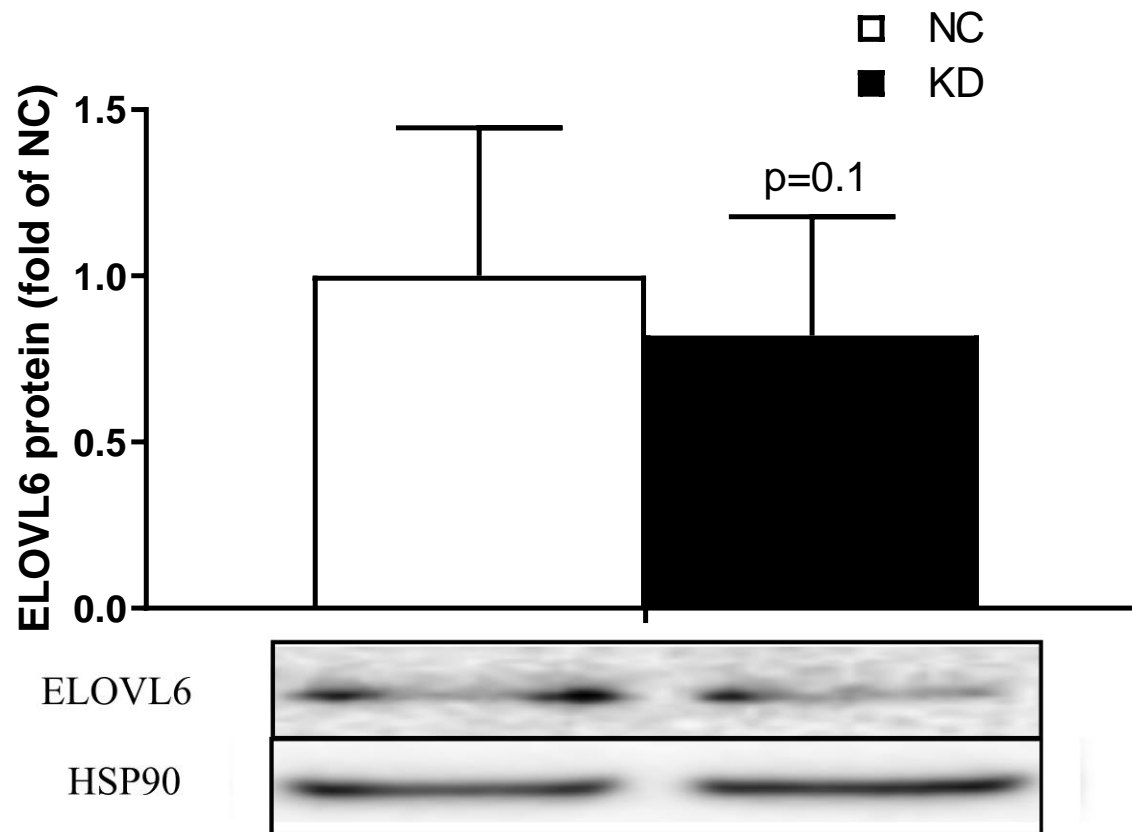
**Supplementary Figure 9A.** There were no changes in protein levels or phosphorylation of Akt at the activity-controlling site Ser473, after silencing miR-30 (KD) in 3T3-L1 adipocytes ( $p>0.05$ ). Data are presented as the mean + SEM and normalized to negative control (NC) and HSP90 housekeeping gene. ns = non significant. *P*-values were calculated by two-tailed paired t-test,  $n=6$ .



**Supplementary Figure 9B.** There was no change in protein levels or phosphorylation of Akt at the activity-controlling site Ser473, after silencing miR-30 (KD) in insulin stimulated (+, 1 nM, 15 min) or non-insulin stimulated (-) 3T3-L1 adipocytes. Data are presented as the mean + SEM and normalized to insulin stimulated negative control (NC) and HSP90 housekeeping gene. ns = non significant,  $p > 0.05$ .  $P$ -values were calculated by two-tailed paired t-test,  $n = 3$ .



**Supplementary Figure 10.** There was no difference in GLUT1 protein levels in miR-30-silenced 3T3-L1 adipocytes (KD) as compared with negative control (NC). Data are presented as the mean + SEM and normalized to HSP90 housekeeping gene and NC.  $p > 0.05$  was calculated by two-tailed t-test,  $n=6$ .



**Supplementary Figure 11.** ELOVL6 protein levels in miR-30 silenced SGBS adipocytes (KD) versus negative control (NC). Data are presented as the mean + SEM and normalized to HSP90 housekeeping gene and NC. *P*-value calculated by a one-tailed paired t-test,  $n=3$ .