

Additional file 5: List of genes selected for real time qPCR validation. Genes were selected for their involvement in lipid metabolism or muscle / fat development. A summary of the gene function and involved in KEGG pathways is indicated.

Symbol	Gene Name	Function	KEGG Pathways (<i>H. sapiens</i>)
ACACA	Acetyl-CoA carboxylase 1	Biosynthesis of fatty acids	PATH: hsa00061 Fatty acid biosynthesis PATH: hsa00620 Pyruvate metabolism PATH: hsa00640 Propanoate metabolism PATH: hsa04910 Insulin signaling pathway
ADIPOR2	Adiponectin receptor protein 2	Adiponectin receptor. Adipocyte differentiation.	PATH: hsa04920 Adipocytokine signaling pathway
AGPAT2	1-acyl-sn-glycerol-3-phosphate acyltransferase beta	Associated with fat tissue differentiation. Mutation of this gene causes lipodystrophies.	PATH: hsa00561 Glycerolipid metabolism PATH: hsa00564 Glycerophospholipid metabolism PATH: hsa00565 Ether lipid metabolism
APOE	Apolipoprotein E	Transport of plasma lipids	PATH: hsa01510 Neurodegenerative Diseases PATH: hsa05010 Alzheimer's disease
AQP4	Aquaporin 4	Water channel expressed at very high levels in muscle. Function unknown.	
CEBPD	CCAAT/enhancer binding protein delta	Factor that starts adipose differentiation in pig	
CES3	Liver carboxylesterase 1 precursor (ACAT)	Cholesterol esterification	PATH: hsa00960 Alkaloid biosynthesis II PATH: hsa00983 Drug metabolism - other enzymes
CIDEA	Cell death activator CIDE-A	Triglycerides storing in fat droplets.	
DGAT2	diacylglycerol O-acyltransferase homolog 2	Synthesis of triglycerides	PATH: hsa00561 Glycerolipid metabolism PATH: hsa00830 Retinol metabolism
ELOVL6	long-chain fatty-acyl alongase family member 6	Elongation of long-chain fatty acids.	PATH: hsa01040 Biosynthesis of unsaturated fatty acids
FABP4	Fatty acid-binding protein, adipocyte	Uptake of lipids to the cell cytoplasm	PATH: hsa03320 PPAR signaling pathway
FASN	Fatty acid synthase	Fatty acids biosynthesis	PATH: hsa00061 Fatty acid biosynthesis PATH: hsa01040 Biosynthesis of unsaturated fatty acids PATH: hsa04910 Insulin signaling pathway
IGFBP5	Insulin-like growth factor binding protein 5 precursor	Regulation of IGF1/IGF2 growth factors	
IRS2	Insulin receptor substrate-2	Initiator of insulin signal transduction	PATH: hsa04910 Insulin signaling pathway PATH: hsa04920 Adipocytokine signaling pathway PATH: hsa04930 Type II diabetes mellitus

LIPE	Hormone sensitive lipase	Hydrolyse stored triglycerides to free fatty acids	PATH: hsa04910 Insulin signaling pathway
LPIN1	Lipin 1	Uptake of lipids to the cell cytoplasm	
LRP11	Low-density lipoprotein receptor-related protein 11 precursor.	Receptor activity	
MEF2A	Myocyte-specific enhancer factor 2A	Muscular differentiation factor. Inhibits adipose tissue differentiation	
NPC1	Niemann-Pick C1 protein precursor	Uptake of cholesterol to the cell cytoplasm	
PIK3C2A	phosphoinositide-3-kinase, class 2, alpha polypeptide	Secondary messenger	PATH: hsa04070 Phosphatidylinositol signaling system
PIK3R1	Phosphatidylinositol 3-kinase regulatory alpha subunit	Secondary messenger associated to diabetes mellitus. Regulates lipitin plasma levels.	PATH: hsa04012 ErbB signaling pathway PATH: hsa04070 Phosphatidylinositol signaling system PATH: hsa04150 mTOR signaling pathway PATH: hsa04210 Apoptosis PATH: hsa04370 VEGF signaling pathway PATH: hsa04510 Focal adhesion PATH: hsa04620 Toll-like receptor signaling pathway PATH: hsa04630 Jak-STAT signaling pathway PATH: hsa04650 Natural killer cell mediated cytotoxicity PATH: hsa04660 T cell receptor signaling pathway PATH: hsa04662 B cell receptor signaling pathway PATH: hsa04664 Fc epsilon RI signaling pathway PATH: hsa04670 Leukocyte transendothelial migration PATH: hsa04810 Regulation of actin cytoskeleton PATH: hsa04910 Insulin signaling pathway PATH: hsa04930 Type II diabetes mellitus PATH: hsa05210 Colorectal cancer PATH: hsa05211 Renal cell carcinoma PATH: hsa05212 Pancreatic cancer PATH: hsa05213 Endometrial cancer PATH: hsa05214 Glioma PATH: hsa05215 Prostate cancer PATH: hsa05218 Melanoma PATH: hsa05220 Chronic myeloid leukemia PATH: hsa05221 Acute myeloid leukemia

			PATH: hsa05222 Small cell lung cancer PATH: hsa05223 Non-small cell lung cancer
PPARD	Peroxisome proliferator activated receptor delta	Activator of lipogenesis and adipose tissue differentiation	PATH: hsa03320 PPAR signaling pathway PATH: hsa04310 Wnt signaling pathway PATH: hsa05221 Acute myeloid leukemia
PPARG	Peroxisome proliferator activated receptor gamma	Activator of lipogenesis and adipose tissue differentiation	PATH: hsa03320 PPAR signaling pathway PATH: hsa05216 Thyroid cancer
PPARGC1A	Peroxisome proliferator activated receptor gamma coactivator 1 alpha	Activator of lipogenesis and adipose tissue differentiation	PATH: hsa04910 Insulin signaling pathway PATH: hsa04920 Adipocytokine signaling pathway
RXR	Retinoic acid receptor RXR-Gamma	Cholesterol homeostasis; Gene transactivation in response to bioactive lipid uptake in peripheral cells	PATH: hsa03320 PPAR signaling pathway PATH: hsa04920 Adipocytokine signaling pathway PATH: hsa05216 Thyroid cancer PATH: hsa05222 Small cell lung cancer PATH: hsa05223 Non-small cell lung cancer
SCD	Acyl-CoA desaturase	Fatty acid desaturation	PATH: hsa01040 Biosynthesis of unsaturated fatty acids PATH: hsa03320 PPAR signaling pathway
TBC1D1	TBC1 domain family member 1	Regulation of the glucose transporter GLUT4 availability; Related to obesity syndrome	PATH: hsa04910 Insulin signaling pathway
VEGFA	Vascular endothelial growth factor A precursor	Vascular permeability, inducing angiogenesis and vasculogenesis	PATH: hsa04060 Cytokine-cytokine receptor interaction PATH: hsa04150 mTOR signaling pathway PATH: hsa04370 VEGF signaling pathway PATH: hsa04510 Focal adhesion PATH: hsa05211 Renal cell carcinoma PATH: hsa05212 Pancreatic cancer PATH: hsa05219 Bladder cancer
CAV1	Caveolin-1	Cholesterol binding	Excluded from analysis → wrong annotation
LIPA	Lysosomal acid lipase/cholesterol ester hydrolase	Cholesterol and fatty acid esterification	Excluded from analysis → wrong annotation
OSBPL6	Oxysterol binding protein-related protein6	Intracellular lipid receptors. HDL-levels regulator	Excluded from analysis → wrong annotation