

Table 1: Primer pairs sequences (Related to Fig. 1 and Fig. 4)

Gene	Primer	Sequence
grb10	Forward primer	5'-CGAAACTCACCGTCCAG-3'
	Reverse primer	5'-GGATTACACAGTGTGGTTGG-3'
fas	Forward primer	5'-TCGTCTATACCACGTCTACTAC-3'
	Reverse primer	5'-ACACCACTGAAACCTGAG-3'
acc	Forward primer	5'-TGCCCCACCTTATCCTATGTA-3'
	Reverse primer	5'-CCTGCCTGTCTCCATCCA-3'
hsl	Forward primer	5'-TGTGTCAGTGCCTATTGAG-3'
	Reverse primer	5'-GAACAGCGAAGTGTCT-3'
atgl	Forward primer	5'-GCTGTGGAATGAGGACATAGGA-3'
	Reverse primer	5'-GCATAGTGAGTGGCTGGTGAA-3'
ucp1	Forward primer	5'-AAGACAGAACAGAGCATAGCATTAC-3'
	Reverse primer	5'-CCAGTCATACTCCCACCTC-3'
pgc1-α	Forward primer	5'-CCGAAGACACTACAGGTTCCATAG-3'
	Reverse primer	5'-GGGAGGGAGAGAGGAGAGAGG-3'
prdm16	Forward primer	5'-TGAGGAAGCATTGAAAGTTAAAG-3'
	Reverse primer	5'-GTTCTTAGCCTGCCTGTAC-3'
ppar-γ	Forward primer	5'-TGTGGACCTCTCCGTGATGG-3'
	Reverse primer	5'-GGTTCTACTTTGATCGCACTTTGG-3'
β-actin	Forward primer	5'-GTTGGTTGGAGCAAACATC-3'
	Reverse primer	5'-CTTATTCATGGATACTTGGAAATG-3'

Supplemental Reference

- Ahmadian, M., Abbott, M.J., Tang, T., Hudak, C.S., Kim, Y., Bruss, M., Hellerstein, M.K., Lee, H.Y., Samuel, V.T., Shulman, G.I., Wang, Y., Duncan, R.E., Kang, C., and Sul, H.S. (2011). Desnutrin/ATGL is regulated by AMPK and is required for a brown adipose phenotype. *Cell metabolism* 13, 739-748.
- Langlais, P., Dong, L.Q., Ramos, F.J., Hu, D., Li, Y., Quon, M.J., and Liu, F. (2004). Negative Regulation of Insulin-Stimulated MAP Kinase Signaling By Grb10. *Mol. Endocrinol.* 18, 350-358.
- Liu, M., Xiang, R., Wilk, S.A., Zhang, N., Sloane, L.B., Azarnoush, K., Zhou, L., Chen, H., Xiang, G., Walter, C.A., Austad, S.N., Musi, N., DeFronzo, R.A., Asmis, R., Scherer, P.E., Dong, L.Q., and Liu, F. (2012). Fat-specific DsbA-L overexpression promotes adiponectin multimerization and protects mice from diet-induced obesity and insulin resistance. *Diabetes* 61, 2776-2786.
- Mancuso, D.J., Sims, H.F., Yang, K., Kiebish, M.A., Su, X., Jenkins, C.M., Guan, S., Moon, S.H., Pietka, T., Nassir, F., Schappe, T., Moore, K., Han, X., Abumrad, N.A., and Gross, R.W. (2010). Genetic ablation of calcium-independent phospholipase A2gamma prevents obesity and insulin resistance during high fat feeding by mitochondrial uncoupling and increased adipocyte fatty acid oxidation. *The Journal of biological chemistry* 285, 36495-36510.
- Mul, J.D., O'Duibhir, E., Shrestha, Y.B., Koppen, A., Vargovic, P., Toonen, P.W., Zarebidaki, E., Kvetnansky, R., Kalkhoven, E., Cuppen, E., and Bartness, T.J. (2013). Pmch-deficiency in rats is associated with normal adipocyte differentiation and lower sympathetic adipose drive. *PloS one* 8, e60214.
- Ramos, F.J., Langlais, P.R., Hu, D., Dong, L.Q., and Liu, F. (2006). Grb10 mediates insulin-stimulated degradation of the insulin receptor: a mechanism of negative regulation. *American journal of physiology. Endocrinology and metabolism* 290, E1262-E1266.
- Uldry, M., Yang, W., St-Pierre, J., Lin, J., Seale, P., and Spiegelman, B.M. (2006). Complementary action of the PGC-1 coactivators in mitochondrial biogenesis and brown fat differentiation. *Cell metabolism* 3, 333-341.
- Wang, L., Balas, B., Christ-Roberts, C.Y., Kim, R.Y., Ramos, F.J., Kikani, C.K., Li, C., Deng, C., Reyna, S., Musi, N., Dong, L.Q., DeFronzo, R.A., and Liu, F. (2007). Peripheral disruption of the Grb10 gene enhances insulin signaling and sensitivity in vivo. *Molecular and cellular biology* 27, 6497-6505.