SANTA CRUZ BIOTECHNOLOGY, INC.

AMPKα1/2 siRNA (m): sc-45313

BACKGROUND

AMPK (for 5'-AMP-activated protein kinase) is a heterotrimeric complex comprising a catalytic α subunit and regulatory β and γ subunits. It protects cells from stresses that cause ATP depletion by switching off ATP-consuming biosynthetic pathways. AMPK is activated by high AMP and low ATP through a mechanism involving allosteric regulation, promotion of phosphorylation by an upstream protein kinase known as AMPK kinase, and inhibition of dephosphorylation. Activated AMPK can phosphorylate and regulate *in vivo* hydroxymethylglutaryl-CoA reductase and acetyl-CoA carboxylase, which are key regulatory enzymes of sterol synthesis and fatty acid synthesis, respectively. The human AMPKα1 and AMPKα2 genes encode 548 amino acid and 552 amino acid proteins, respectively. Human AMPKβ1 encodes a 271 amino acid protein and human AMPKβ2 encodes a 272 amino acid protein. The human AMPKγ1 gene encodes a 331 amino acid protein. Human AMPKγ2 and AMPKγ3, which are 569 and 492 amino acid proteins, respectively, contain unique N-terminal domains and may participate directly in the binding of AMP within the AMPK complex.

CHROMOSOMAL LOCATION

Genetic locus: Prkaa1 (mouse) mapping to 15 A1; Prkaa2 (mouse) mapping to 4 C6.

PRODUCT

AMPKα1/2 siRNA (m) is a pool of 4 target-specific 19-25 nt siRNAs designed to knock down gene expression. Each vial contains 3.3 nmol of lyophilized siRNA, sufficient for a 10 µM solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see AMPKα1/2 shRNA Plasmid (m): sc-45313-SH and AMPKα1/2 shRNA (m) Lentiviral Particles: sc-45313-V as alternate gene silencing products.

For independent verification of AMPKα1/2 (m) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-45313A, sc-45313B, sc-45313C and sc-45313D.

STORAGE AND RESUSPENSION

Store lyophilized siRNA duplex at -20° C with desiccant. Stable for at least one year from the date of shipment. Once resuspended, store at -20° C, avoid contact with RNAses and repeated freeze thaw cycles.

Resuspend lyophilized siRNA duplex in 330 µl of the RNAse-free water provided. Resuspension of the siRNA duplex in 330 µl of RNAse-free water makes a 10 µM solution in a 10 µM Tris-HCl, pH 8.0, 20 mM NaCl, 1 mM EDTA buffered solution.

APPLICATIONS

AMPKα1/2 siRNA (m) is recommended for the inhibition of AMPKα1/2 expression in mouse cells.

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.

SUPPORT REAGENTS

For optimal siRNA transfection efficiency, Santa Cruz Biotechnology's siRNA Transfection Reagent: sc-29528 (0.3 ml), siRNA Transfection Medium: sc-36868 (20 ml) and siRNA Dilution Buffer: sc-29527 (1.5 ml) are recommended. Control siRNAs or Fluorescein Conjugated Control siRNAs are available as 10 µM in 66 µl. Each contain a scrambled sequence that will not lead to the specific degradation of any known cellular mRNA. Fluorescein Conjugated Control siRNAs include: sc-36869, sc-44239, sc-44240 and sc-44241. Control siRNAs include: sc-37007, sc-44230, sc-44231, sc-44232, sc-44233, sc-44234, sc-44235, sc-44236, sc-44237 and sc-44238.

GENE EXPRESSION MONITORING

AMPKα1/2 (D-6): sc-74461 is recommended as a control antibody for monitoring of AMPKα1/2 gene expression knockdown by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000) or immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500).

SELECT PRODUCT CITATIONS

1. Kim, S.J., et al. 2007. Activation of lipoprotein lipase by glucose-dependent Insulinotropic polypeptide in adipocytes. A role for a protein kinase B, LKB1, and AMP-activated protein kinase cascade. J. Biol. Chem. 282: 8557-8567.
2. Zhou, L., et al. 2011. Berberine attenuates cAMP-induced lipolysis via reducing the inhibition of phosphodiesterase in 3T3-L1 adipocytes. Biochim. Biophys. Acta 1812: 527-535.
3. Kim, H.S., et al. 2012. Berberine-induced AMPK activation inhibits the metastatic potential of melanoma cells via reduction of ERK activity and COX-2 protein expression. Biochem. Pharmacol. 83: 385-394.
4. Li, S., et al. 2014. Tert-Butylhydroquinone (tBHQ) protects hepatocytes against lipotoxicity via inducing autophagy independently of Nrf2 activation. Biochim. Biophys. Acta 1841: 22-33.
5. Xu, M., et al. 2014. Quercetin differently regulates Insulin-mediated glucose transporter 4 translocation under basal and inflammatory conditions in adipocytes. Mol. Nutr. Food Res. 58: 931-941.
6. Than, A., et al. 2015. Apelin enhances brown adipogenesis and browning of white adipocytes. J. Biol. Chem. 290: 14679-14691.
7. Liu, K., et al. 2016. Quercetin oppositely regulates Insulin-mediated glucose disposal in skeletal muscle under normal and inflammatory conditions: the dual roles of AMPK activation. Mol. Nutr. Food Res. 60: 551-565.
8. Xiao, H., et al. 2016. Metformin is a novel suppressor for transforming growth factor TGF-β1. Sci. Rep. 6: 28597.
9. Chen, Y., et al. 2016. Diosgenin regulates adipokine expression in perivascular adipose tissue and ameliorates endothelial dysfunction via regulation of AMPK. J. Steroid Biochem. Mol. Biol. 155: 155-165.

RESEARCH USE

For research use only, not for use in diagnostic procedures.