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AMPK α 1/2 siRNA (h): sc-45312

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 AMPK α 1 and AMPK α 2 genes encode 548 amino acid and 552 amino acid proteins, respectively. Human AMPK β 1 encodes a 271 amino acid protein and human AMPK β 2 encodes a 272 amino acid protein. The human AMPK γ 1 gene encodes a 331 amino acid protein. Human AMPK γ 2 and AMPK γ 3, 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 (human) mapping to 5p13.1, PRKAA2 (human) mapping to 1p32.2.

PRODUCT

AMPK α 1/2 siRNA (h) is a pool of 3 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 μ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see AMPK α 1/2 shRNA Plasmid (h): sc-45312-SH and AMPK α 1/2 shRNA (h) Lentiviral Particles: sc-45312-V as alternate gene silencing products.

For independent verification of AMPK α 1/2 (h) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-45312A, sc-45312B and sc-45312C.

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 μ l of the RNase-free water provided. Resuspension of the siRNA duplex in 330 μ l of RNase-free water makes a 10 μ M solution in a 10 μ M Tris-HCl, pH 8.0, 20 mM NaCl, 1 mM EDTA buffered solution.

APPLICATIONS

AMPK α 1/2 siRNA (h) is recommended for the inhibition of AMPK α 1/2 expression in human 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 μ M in 66 μ l. 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

AMPK α 1/2 (D-6): sc-74461 is recommended as a control antibody for monitoring of AMPK α 1/2 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

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- Wong, T.Y., et al. 2015. The flavone luteolin suppresses SREBP-2 expression and post-translational activation in hepatic cells. *PLoS ONE* 10: e0135637.
- Tsutsumi, Y., et al. 2015. Combined treatment with Exendin-4 and metformin attenuates prostate cancer growth. *PLoS ONE* 10: e0139709.
- Wang, Y., et al. 2015. CGK733-induced LC3 II formation is positively associated with the expression of cyclin-dependent kinase inhibitor p21^{Waf1/Cip1} through modulation of the AMPK and PERK/CHOP signaling pathways. *Oncotarget* 6: 39692-39701.
- Du, Y., et al. 2015. Insulin-like growth factor binding protein-3 mediates interleukin-24-induced apoptosis through inhibition of the mTOR pathway in prostate cancer. *Oncol. Rep.* 34: 2273-2281.
- Mukhopadhyay, S., et al. 2015. Reciprocal regulation of AMP-activated protein kinase and phospholipase D. *J. Biol. Chem.* 290: 6986-6993.
- Wang, L., et al. 2016. Curcumin inhibits lipolysis via suppression of ER stress in adipose tissue and prevents hepatic insulin resistance. *J. Lipid Res.* 57: 1243-1255.
- Wang, X.M., et al. 2016. FGF21 represses cerebrovascular aging via improving mitochondrial biogenesis and inhibiting p53 signaling pathway in an AMPK-dependent manner. *Exp. Cell Res.* 346: 147-156.

RESEARCH USE

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