SANTA CRUZ BIOTECHNOLOGY, INC.

AMPKα2 siRNA (r): sc-155985

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.

REFERENCES

1. Stapleton, D., et al. 1996. Mammalian AMP-activated protein kinase subfamily. J. Biol. Chem. 271: 611-614.
2. Stapleton, D., et al. 1997. AMP-activated protein kinase isoenzyme family: subunit structure and chromosomal location. FEBS Lett. 409: 452-456.

CHROMOSOMAL LOCATION

Genetic locus: Prkaa2 (rat) mapping to 5q34.

PRODUCT

AMPKα2 siRNA (r) 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 µM solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see AMPKα2 shRNA Plasmid (r): sc-155985-SH and AMPKα2 shRNA (r) Lentiviral Particles: sc-155985-V as alternate gene silencing products.

For independent verification of AMPKα2 (r) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-155985A, sc-155985B and sc-155985C.

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

AMPKα2 siRNA (r) is recommended for the inhibition of AMPKα2 expression in rat cells.

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.

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor AMPKα2 gene expression knockdown using RT-PCR Primer: AMPKα2 (r)-PR: sc-155985-PR (20 µl, 430 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Mo, L., et al. 2012. Nitrite activates AMP kinase to stimulate mitochondrial biogenesis independent of soluble guanylate cyclase. Free Radic. Biol. Med. 53: 1440-1450.
2. Wilson, C., et al. 2013. Testosterone increases Glut4-dependent glucose uptake in cardiomyocytes. J. Cell. Physiol. 228: 2399-2407.
3. Zhou, Y., et al. 2016. Ampelopsin improves Insulin resistance by activating PPARγ and subsequently up-regulating FGF21-AMPK signaling pathway. PLoS ONE 11: e0159191.
4. Zhang, B., et al. 2018. Cell-specific regulation of iNOS by AMP-activated protein kinase in primary rat hepatocytes. J. Surg. Res. 221: 104-112.
5. Lee, Y.J., et al. 2019. Cilostazol protects hepatocytes against alcohol-induced apoptosis via activation of AMPK pathway. PLoS ONE 14: e0211415.
6. Lin, L., et al. 2019. Rhynchophylline attenuates senescence of endothelial progenitor cells by enhancing autophagy. Front. Pharmacol. 10: 1617.
7. Zheng, T., et al. 2021. Salidroside alleviates diabetic neuropathic pain through regulation of the AMPK-NLRP3 inflammasome axis. Toxicol. Appl. Pharmacol. 416: 115468.
8. Ying, L., et al. 2021. Paracrine FGFs target skeletal muscle to exert potent anti-hyperglycemic effects. Nat. Commun. 12: 7256.
9. Fan, K., et al. 2022. Drp1-mediated mitochondrial metabolic dysfunction inhibits the tumor growth of pituitary adenomas. Oxid. Med. Cell. Longev. 2022: 5652586.
10. Tian, X., et al. 2022. Salidroside attenuates myocardial ischemia/reperfusion injury via AMPK-induced suppression of endoplasmic reticulum stress and mitochondrial fission. Toxicol. Appl. Pharmacol. 448: 116093.

RESEARCH USE

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