SANTA CRUZ BIOTECHNOLOGY, INC.

CaMKKβ siRNA (h): sc-38955

BACKGROUND

The Ca^{2+}/calmodulin-dependent protein kinases (CaM kinases) are a structurally related subfamily of serine/threonine kinases that includes CaMKI, CaMKII and CaMKIV. CaMKI and CaMKIV are stimulated by Ca^{2+} and CaM, but phosphorylation by a CaMK is also required for full activation. CaMKKα and CAMKKβ function to activate CaMKI through the specific phosphorylation of the regulatory threonine residue at position 177. CAMKKβ is also capable of phosphorylating CAMKIV on threonine residue 200.

CHROMOSOMAL LOCATION

Genetic locus: CAMKK2 (human) mapping to 12q24.31.

PRODUCT

CaMKKβ 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 µM solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see CaMKKβ shRNA Plasmid (h): sc-38955-SH and CaMKKβ shRNA (h) Lentiviral Particles: sc-38955-V as alternate gene silencing products.

For independent verification of CaMKKβ (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-38955A, sc-38955B and sc-38955C.

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

CaMKKβ siRNA (h) is recommended for the inhibition of CaMKKβ expression in human 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.

PROTOCOLS

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

GENE EXPRESSION MONITORING

CaMKKβ (C-11): sc-271674 is recommended as a control antibody for monitoring of CaMKKβ 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).

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor CaMKKβ gene expression knockdown using RT-PCR Primer: CaMKKβ (h)-PR: sc-38955-PR (20 µl, 464 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Zhang, J., et al. 2008. Identification of nitric oxide as an endogenous activator of the AMP-activated protein kinase in vascular endothelial cells. J. Biol. Chem. 283: 27452-27461.
2. Hattori, Y., et al. 2009. Cilostazol inhibits cytokine-induced nuclear factor-κB activation via AMP-activated protein kinase activation in vascular endothelial cells. Cardiovasc. Res. 81: 133-139.
3. Chung, B.H., et al. 2012. Syringaresinol causes vasorelaxation by elevating nitric oxide production through the phosphorylation and dimerization of endothelial nitric oxide synthase. Exp. Mol. Med. 44: 191-201.
4. Zhang, L., et al. 2013. Pterostilbene, a natural small-molecular compound, promotes cytoprotective macroautophagy in vascular endothelial cells. J. Nutr. Biochem. 24: 903-911.
5. Dong, G.Z., et al. 2014. AMPK activation by isorhamnetin protects hepatocytes against oxidative stress and mitochondrial dysfunction. Eur. J. Pharmacol. 740: 634-640.
6. Deshmukh, R.R. and Dou, Q.P. 2015. Proteasome inhibitors induce AMPK activation via CaMKKβ in human breast cancer cells. Breast Cancer Res. Treat. 153: 79-88.
7. Liu, D.M., et al. 2016. CAMKK2, regulated by promoter methylation, is a prognostic marker in diffuse gliomas. CNS Neurosci. Ther. 22: 518-524.
8. Choi, Y.K., et al. 2018. Heme oxygenase metabolites improve astrocytic mitochondrial function via a Ca^{2+}-dependent HIF-1α/ERRα circuit. PLoS ONE 13: e0202039.
9. Sun, P., et al. 2019. Inhibition of calcium/calmodulin-dependent protein kinase kinase (CaMKK) exacerbates impairment of endothelial cell and blood-brain barrier after stroke. Eur. J. Neurosci. 49: 27-39.
10. Woo, S.M., et al. 2019. Hispidulin enhances TRAIL-mediated apoptosis via CaMKKβ/AMPK/USP51 axis-mediated Bim stabilization. Cancers 11: 1960.
11. Wei, X., et al. 2020. Activation of TRPV1 channel antagonizes diabetic nephropathy through inhibiting endoplasmic reticulum-mitochondria contact in podocytes. Metab. Clin. Exp. 105: 154182.

RESEARCH USE

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