

# CREB-1 siRNA (r): sc-72030

## BACKGROUND

Eukaryotic gene transcription is regulated by sequence-specific transcription factors that bind modular *cis*-acting promoter and enhancer elements. The ATF/CREB transcription factor family binds the palindromic cAMP response element (CRE) octanucleotide TGACGTCA. The ATF/CREB family includes CREB-1, CREB-2 (also designated ATF-4), ATF-1, ATF-2 and ATF-3. This family of proteins contains highly divergent N-terminal domains, but shares a C-terminal leucine zipper for dimerization and DNA binding. Although CREB can bind to DNA in an unphosphorylated state, it cannot activate transcription. Phosphorylation of CREB on Ser 133 by protein kinase A facilitates its interaction with the CREB-binding protein (CBP) and activates the basal transcription complex. CREB functions in neoglucogenesis through interactions with the nuclear coactivator PGC-1. CREB may play a role in the pathogenesis of type II diabetes and dilated cardiomyopathy.

## REFERENCES

1. Montminy, M.R., et al. 1986. Identification of a cyclic-AMP-responsive element within the rat somatostatin gene. *Proc. Natl. Acad. Sci. USA* 83: 6682-6686.
2. Lin, Y.S., et al. 1988. Interaction of a common cellular transcription factor, ATF, with regulatory elements in both *Ela*- and cyclic AMP-inducible promoters. *Proc. Natl. Acad. Sci. USA* 85: 3396-3400.

## CHROMOSOMAL LOCATION

Genetic locus: *Creb1* (rat) mapping to 9q32.

## PRODUCT

CREB-1 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  $\mu$ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see CREB-1 shRNA Plasmid (r): sc-72030-SH and CREB-1 shRNA (r) Lentiviral Particles: sc-72030-V as alternate gene silencing products.

For independent verification of CREB-1 (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-72030A, sc-72030B and sc-72030C.

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

## APPLICATIONS

CREB-1 siRNA (r) is recommended for the inhibition of CREB-1 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  $\mu$ M in 66  $\mu$ 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

CREB-1 (D-12): sc-377154 is recommended as a control antibody for monitoring of CREB-1 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 CREB-1 gene expression knockdown using RT-PCR Primer: CREB-1 (r)-PR: sc-72030-PR (20  $\mu$ l, 425 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

## SELECT PRODUCT CITATIONS

1. Liu, G., et al. 2006. Requirement of Smad3 and CREB-1 in mediating transforming growth factor- $\beta$  (TGF  $\beta$ ) induction of TGF  $\beta$  3 secretion. *J. Biol. Chem.* 281: 29479-29490.
2. Zuloaga, R., et al. 2013. The cAMP response element binding protein (CREB) is activated by Insulin-like growth factor-1 (IGF-1) and regulates myostatin gene expression in skeletal myoblast. *Biochem. Biophys. Res. Commun.* 440: 258-264.
3. Wei, J., et al. 2014. Regulation of N-methyl-D-aspartate receptors by disrupted-in-schizophrenia-1. *Biol. Psychiatry* 75: 414-424.
4. Lin, L., et al. 2017. Inflammatory regulation by driving microglial M2 polarization: neuroprotective effects of cannabinoid receptor-2 activation in intracerebral hemorrhage. *Front. Immunol.* 8: 112.
5. Masuda, K., et al. 2018. Testosterone-mediated upregulation of delayed rectifier potassium channel in cardiomyocytes causes abbreviation of QT intervals in rats. *J. Physiol. Sci.* 68: 759-767.
6. Lucia, K., et al. 2020. Hypoxia and the hypoxia inducible factor 1 $\alpha$  activate protein kinase A by repressing RII  $\beta$  subunit transcription. *Oncogene* 39: 3367-3380.
7. Cai, Y., et al. 2021. Salt-inducible kinase 3 promotes vascular smooth muscle cell proliferation and arterial restenosis by regulating AKT and PKA-CREB signaling. *Arterioscler. Thromb. Vasc. Biol.* 41: 2431-2451.

## RESEARCH USE

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