

ATF-3 siRNA (r): sc-72029

BACKGROUND

Eukaryotic gene transcription is regulated by sequence-specific transcription factors which bind modular *cis* acting promoter and enhancer elements. The cAMP response element (CRE), one of the best studied of such elements, consists of the palindromic octanucleotide TGACGTCA. Several CRE binding proteins have been identified within the ATF/CREB family, the best characterized of which include CREB-1, CREB-2 (also designated ATF-4), ATF-1, ATF-2 and ATF-3. These proteins share highly related COOH-terminal leucine zipper dimerization and basic DNA binding domains but are highly divergent in their amino-terminal domains. Although each of the ATF/CREB proteins appear capable of binding CRE in its homodimeric form, certain of these also bind as heterodimers, both within the ATF/CREB family and even with members of the AP-1 transcription factor family.

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.
3. Hoeffler, J.P., et al. 1988. Cyclic AMP-responsive DNA-binding protein: structure based on a cloned placental cDNA. *Science* 242: 1430-1433.
4. Hai, T., et al. 1989. Transcription factor ATF cDNA clones: an extensive family of leucine zipper proteins able to selectively form DNA-binding heterodimers. *Genes Dev.* 8: 2083-2090.
5. Kara, C.J., et al. 1990. A cDNA for a human cyclic AMP response element-binding protein which is distinct from CREB and expressed preferentially in brain. *Mol. Cell. Biol.* 10: 1347-1357.
6. Hai, T. et al. 1991. Cross-family dimerization of transcription factors Fos/Jun and ATF/CREB alters DNA binding specificity. *Proc. Natl. Acad. Sci. USA* 88: 3720-3724.

CHROMOSOMAL LOCATION

Genetic locus: *Atf3* (rat) mapping to 13q27.

PRODUCT

ATF-3 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 μ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see ATF-3 shRNA Plasmid (r): sc-72029-SH and ATF-3 shRNA (r) Lentiviral Particles: sc-72029-V as alternate gene silencing products.

For independent verification of ATF-3 (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-72029A, sc-72029B and sc-72029C.

RESEARCH USE

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

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

ATF-3 siRNA (r) is recommended for the inhibition of ATF-3 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 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.

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor ATF-3 gene expression knockdown using RT-PCR Primer: ATF-3 (r)-PR: sc-72029-PR (20 μ l, 588 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Kim, J.Y., et al. 2013. *In vivo* activating transcription factor 3 silencing ameliorates the AMPK compensatory effects for ER stress-mediated β -cell dysfunction during the progression of type-2 diabetes. *Cell. Signal.* 25: 2348-2361.
2. Kim, J.Y., et al. 2014. Chronic ethanol consumption inhibits glucokinase transcriptional activity by ATF-3 and triggers metabolic syndrome *in vivo*. *J. Biol. Chem.* 289: 27065-27079.
3. Salinas-Abarca, A.B., et al. 2018. ATF2, but not ATF-3, participates in the maintenance of nerve injury-induced tactile allodynia and thermal hyperalgesia. *Mol. Pain* 14: 1744806918787427.
4. Ding, S., et al. 2020. Activation of ATF3/AP-1 signaling pathway is required for P2X3-induced endometriosis pain. *Hum. Reprod.* E-published.

PROTOCOLS

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