SANTA CRUZ BIOTECHNOLOGY, INC.

TFEB siRNA (m): sc-38510

BACKGROUND

The DNA-binding factor TFE3 contains adjacent helix-loop-helix (HLH) and leucine zipper (LZ) domains flanked by an upstream basic region. These protein motifs are frequently observed in other transcription factors and are particularly common to members of the Myc family. TFE3 is ubiquitously expressed and can directly associate with DNA as either a homodimer or a heterodimer formed with two related proteins, TFEB or TFEC. TFE3 binds to and activates the microE3 motif of the immunoglobulin heavy-chain enhancer to induce B cell-specific gene transcription and DNA recombination. TFEB binds to the major late promoter of adenovirus and specifically associates with DNA as both a homodimer and a heterodimer with TFE3. TFEB is expressed at low levels in the embryo but at high levels in the trophoblast cells of the placenta, where it plays a critical role in regulating normal vascularization of the placenta. TFEC shares a bHLH/LZ structure with TFE3 and a closely related protein microphthalmia-associated transcription factor (MITF), which is critically involved in melanocyte differentiation. Unlike TFE3, the expression of TFEC is largely restricted to fibroblasts, myoblasts, chondrosarcoma cells and myeloma cells.

CHROMOSOMAL LOCATION

Genetic locus: Tfeb (mouse) mapping to 17 C.

PRODUCT

TFEB siRNA (m) 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 TFEB shRNA Plasmid (m): sc-38510-SH and TFEB shRNA (m) Lentiviral Particles: sc-38510-V as alternate gene silencing products.

For independent verification of TFEB (m) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-38510A, sc-38510B and sc-38510C.

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

TFEB siRNA (m) is recommended for the inhibition of TFEB expression in mouse 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 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 TFEB gene expression knockdown using RT-PCR Primer: TFEB (m)-PR: sc-38510-PR (20 µl, 483 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Bao, J., et al. 2016. Deacetylation of TFEB promotes fibrillar Aβ degradation by upregulating lysosomal biogenesis in microglia. Protein Cell 7: 417-433.
2. Kim, H.J., et al. 2018. Carbon monoxide-induced TFEB nuclear translocation enhances mitophagy/mitochondrial biogenesis in hepatocytes and ameliorates inflammatory liver injury. Cell Death Dis. 9: 1060.
3. Wang, K., et al. 2018. Identification of ANXA2 (Annexin A2) as a specific bleomycin target to induce pulmonary fibrosis by impeding TFEB-mediated autophagic flux. Autophagy 14: 269-282.
4. Zhang, Y., et al. 2018. TFEB-dependent induction of thermogenesis by the hepatocyte SLC2A inhibitor trehalose. Autophagy 14: 1959-1975.
5. Hayama, Y., et al. 2018. Lysosomal protein LAMTOR1 controls innate immune responses via nuclear translocation of transcription factor EB. J. Immunol. 200: 3790-3800.
6. Mikoshiba, Y., et al. 2018. A randomized clinical trial evaluating choroidal blood flow and morphology after conventional and pattern scan laser panretinal photocoagulation. Sci. Rep. 8: 14128.
7. Wang, Y.T., et al. 2019. Contribution of transcription factor EB to adipoRon-induced inhibition of arterial smooth muscle cell proliferation and migration. Am. J. Physiol., Cell Physiol. 317: C1034-C1047.
8. Zhang, Y., et al. 2020. Simvastatin improves lysosome function via enhancing lysosome biogenesis in endothelial cells. Front. Biosci. 25: 283-298.
9. Sul, O.J., et al. 2021. 7-ketocholesterol enhances autophagy via the ROS-TFEB signaling pathway in osteoclasts. J. Nutr. Biochem. 96: 108783.

RESEARCH USE

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