SANTA CRUZ BIOTECHNOLOGY, INC.

RUNX2 siRNA (h): sc-37145

BACKGROUND

The mammalian Runt-related transcription factor (RUNX) family comprises three members, RUNX1 (also designated AML-1, PEBP2αB, CBF-A2), RUNX2 (also designated AML-3, PEBP2αA, CBF-A1, Osf2) and RUNX3 (also designated AML-2, PEBPαC, CBF-A3). RUNX family members are DNA-binding proteins that regulate the expression of genes involved in cellular differentiation and cell cycle progression. RUNX2 is essential for skeletal mineralization in that it stimulates osteoblast differentiation of mesenchymal stem cells, promotes chondrocyte hypertrophy and contributes to endothelial cell migration and vascular invasion of developing bones. Regulating RUNX2 expression may be a useful therapeutic tool for promoting bone formation. Mutations in the C-terminus of RUNX2 are associated with cleidocranial dysplasia syndrome, an autosomal-dominant skeletal dysplasia syndrome that is characterized by widely patent calvarial sutures, clavicular hypoplasia, supernumerary teeth, and short stature.

REFERENCES

1. Kamachi, Y., et al. 1990. Purification of a mouse nuclear factor that binds to both the A and B cores of the polyomavirus enhancer. J. Virol. 64: 4808-4819.
2. Ogawa, E., et al. 1993. PEBP2/PEA2 represents a family of transcription factors homologous to the products of the *Drosophila* runt gene and the human AML-1 gene. Proc. Natl. Acad. Sci. USA 90: 6859-6863.

CHROMOSOMAL LOCATION

Genetic locus: RUNX2 (human) mapping to 6p21.1.

PRODUCT

RUNX2 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 RUNX2 shRNA Plasmid (h): sc-37145-SH and RUNX2 shRNA (h) Lentiviral Particles: sc-37145-V as alternate gene silencing products.

For independent verification of RUNX2 (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-37145A, sc-37145B and sc-37145C.

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

RUNX2 siRNA (h) is recommended for the inhibition of RUNX2 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.

GENE EXPRESSION MONITORING

RUNX2 (F-2): sc-390351 is recommended as a control antibody for monitoring of RUNX2 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 RUNX2 gene expression knockdown using RT-PCR Primer: RUNX2 (h)-PR: sc-37145-PR (20 µl, 438 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Lin, A.C., et al. 2009. Modulating hedgehog signaling can attenuate the severity of osteoarthritis. Nat. Med. 15: 1421-1425.
2. Kammerer, M., et al. 2013. Estrogen Receptor α (ERα) and Estrogen Related Receptor α (ERRα) are both transcriptional regulators of the RUNX2-I isoform. Mol. Cell. Endocrinol. 369: 150-160.
3. Hosen, M.J., et al. 2014. Perturbation of specific pro-mineralizing signalling pathways in human and murine pseudoxanthoma elasticum. Orphanet. J. Rare Dis. 9: 66.
4. Yang, F., et al. 2014. A feedback loop between RUNX2 and the E3 ligase SMURF1 in regulation of differentiation of human dental pulp stem cells. J. Endod. 40: 1579-1586.
5. Emma, M.R., et al. 2016. NUPR1, a new target in liver cancer: implication in controlling cell growth, migration, invasion and sorafenib resistance. Cell Death Dis. 7: e2269.
6. Zhang, Y., et al. 2017. MicroRNA-221 is involved in the regulation of osteoporosis through regulates RUNX2 protein expression and osteoblast differentiation. Am. J. Transl. Res. 9: 126-135.
7. Mümmler, C., et al. 2018. Cell-specific expression of Runt-related transcription factor 2 contributes to pulmonary fibrosis. FASEB J. 32: 703-716.
8. Hong, Z., et al. 2020. The significance of RUNX2 mediating alcohol-induced Brf1 expression and RNA Pol III gene transcription. Chem. Biol. Interact. 323: 109057.

RESEARCH USE

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