SANTA CRUZ BIOTECHNOLOGY, INC.

HIF-1α siRNA (h2): sc-44225

BACKGROUND

Cell growth and viability is compromised by oxygen deprivation (hypoxia). Hypoxia-inducible factors, including HIF-1α, HIF-1β (also designated Arnt 1), EPAS-1 (also designated HIF-2α) and HIF-3α, induce glycolysis, erythropoiesis and angiogenesis in order to restore oxygen homeostasis. Hypoxia-inducible factors are members of the Per-Arnt-Sim (PAS) domain transcription factor family. In response to hypoxia, HIF-1α is upregulated and forms a heterodimer with Arnt 1 to form the HIF-1 complex. The HIF-1 complex recognizes and binds to the hypoxia responsive element (HRE) of hypoxia-inducible genes, thereby activating transcription. Hypoxia-inducible expression of some genes such as Glut-1, p53, p21 or Bcl-2, is HIF-1α dependent, whereas expression of others, such as p27, GADD 153 or HO-1, is HIF-1α independent. EPAS-1 and HIF-3α have also been shown to form heterodimeric complexes with Arnt 1 in response to hypoxia.

REFERENCES

1. Wang, G.L., et al. 1995. Hypoxia-inducible factor 1 is a basic-helix-loop-helix-PAS heterodimer regulated by cellular O_2 tension. Proc. Natl. Acad. Sci. USA 92: 5510-5514.
2. Tian, H., et al. 1997. Endothelial PAS domain protein 1 (EPAS-1), a transcription factor selectively expressed in endothelial cells. Genes Dev. 11: 72-82.
3. Luo, G., et al. 1997. Molecular characterization of the murine HIF-1α locus. Gene Expr. 6: 287-299.

CHROMOSOMAL LOCATION

Genetic locus: HIF1A (human) mapping to 14q23.2.

PRODUCT

HIF-1α siRNA (h2) 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 HIF-1α shRNA Plasmid (h2): sc-44225-SH and HIF-1α shRNA (h2) Lentiviral Particles: sc-44225-V as alternate gene silencing products.

For independent verification of HIF-1α (h2) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-44225A, sc-44225B and sc-44225C.

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

HIF-1α siRNA (h2) is recommended for the inhibition of HIF-1α 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

HIF-1α (28b): sc-13515 is recommended as a control antibody for monitoring of HIF-1α 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 HIF-1α gene expression knockdown using RT-PCR Primer: HIF-1α (h2)-PR: sc-44225-PR (20 µl, 506 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Acosta-Iborra, B., et al. 2009. Macrophage oxygen sensing modulates antigen presentation and phagocytic functions involving IFN-γ production through the HIF-1α transcription factor. J. Immunol. 182: 3155-3164.
2. Gomez-Maldonado, L., et al. 2015. EFNA3 long noncoding RNAs induced by hypoxia promote metastatic dissemination. Oncogene 34: 2609-2620.
3. Roche, O., et al. 2016. Identification of non-coding genetic variants in samples from hypoxemic respiratory disease patients that affect the transcriptional response to hypoxia. Nucleic Acids Res. 44: 9315-9330.
4. Conde, E., et al. 2017. HIF-1α induction during reperfusion avoids maladaptive repair after renal ischemia/reperfusion involving miR127-3p. Sci. Rep. 7: 41099.
5. Song, N., et al. 2018. miR-21 protects against ischemia/reperfusion-induced acute kidney injury by preventing epithelial cell apoptosis and inhibiting dendritic cell maturation. Front. Physiol. 9: 790.
6. Yago-Ibáñez, J., et al. 2020. Retinoic acid receptor-β prevents cisplatin-induced proximal tubular cell death. Biochim. Biophys. Acta Mol. Basis Dis. 1866: 165795.
7. Casillas, A.L., et al. 2021. Direct phosphorylation and stabilization of HIF-1α by PIM1 kinase drives angiogenesis in solid tumors. Oncogene 40: 5142-5152.

RESEARCH USE

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