SANTA CRUZ BIOTECHNOLOGY, INC.

ferritin heavy chain siRNA (h): sc-40575

BACKGROUND

Mammalian ferritins consist of 24 subunits made up of 2 types of polypeptide chains, ferritin heavy chain and ferritin light chain, which each have unique functions. Ferritin heavy chains catalyze the first step in iron storage, the oxidation of Fe^{II}, whereas ferritin light chains promote the nucleation of ferrihydrite, enabling storage of Fe^{III}. The most prominent role of mammalian ferritins is to provide iron-buffering capacity to cells. In addition to iron buffering, heavy chain ferritin is also involved in the regulation of thymidine biosynthesis via increased expression of cytoplasmic serine hydroxymethyltransferase, which is a limiting factor in thymidylate synthesis in MCF7 cells. Light chain ferritin is involved in cataracts by at least two mechanisms: hereditary hyperferritinemia cataract syndrome, in which light chain ferritin is overexpressed; and oxidative stress, an important factor in the development of aging-related cataracts.

REFERENCES

1. Worwood, M., et al. 1985. Assignment of human ferritin genes to chromosomes 11 and 19q13.3—19qter. Hum. Genet. 69: 371-374.
2. Hempstead, P.D., et al. 1997. Comparison of the three-dimensional structures of recombinant human H and horse L ferritins at high resolution. J. Mol. Biol. 268: 424-448.

CHROMOSOMAL LOCATION

Genetic locus: FTH1 (human) mapping to 11q12.3.

PRODUCT

ferritin heavy chain 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 ferritin heavy chain shRNA Plasmid (h): sc-40575-SH and ferritin heavy chain shRNA (h) Lentiviral Particles: sc-40575-V as alternate gene silencing products.

For independent verification of ferritin heavy chain (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-40575A, sc-40575B and sc-40575C.

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

ferritin heavy chain siRNA (h) is recommended for the inhibition of ferritin heavy chain 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

ferritin heavy chain (B-12): sc-376594 is recommended as a control antibody for monitoring of ferritin heavy chain 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 ferritin heavy chain gene expression knockdown using RT-PCR Primer: ferritin heavy chain (h)-PR: sc-40575-PR (20 µl, 553 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Li, R., et al. 2006. Chemokine CXCL12 induces binding of ferritin heavy chain to the chemokine receptor CXCR4, alters CXCR4 signaling, and induces phosphorylation and nuclear translocation of ferritin heavy chain. J. Biol. Chem. 281: 37616-37627.
2. Buranrat, B. and Connor, J.R. 2015. Cytoprotective effects of ferritin on doxorubicin-induced breast cancer cell death. Oncol. Rep. 34: 2790-2796.
3. Karlsson, M. and Kurz, T. 2016. Attenuation of iron-binding proteins in ARPE-19 cells reduces their resistance to oxidative stress. Acta Ophthalmol. 94: 556-564.
4. Ravi, V., et al. 2019. Liposomal delivery of ferritin heavy chain 1 (FTH1) siRNA in patient xenograft derived glioblastoma initiating cells suggests different sensitivities to radiation and distinct survival mechanisms. PLoS ONE 14: e0221952.
5. Brown, C.W., et al. 2019. Prominin2 drives ferroptosis resistance by stimulating iron export. Dev. Cell 51: 575.e4-586.e4.
6. Koike, T., et al. 2022. Intracellular ferritin heavy chain plays the key role in artesunate-induced ferroptosis in ovarian serous carcinoma cells. J. Clin. Biochem. Nutr. 71: 34-40.

RESEARCH USE

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

PROTOCOLS

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