

# transferrin siRNA (h): sc-37176

## BACKGROUND

Iron (Fe) is a tightly metabolically controlled mineral and growth factor present in all living cells. Iron not bound in erythrocyte hemoglobin is transported by transferrin (Tf), the iron transport protein of vertebrate serum. The transferrin protein contains two homologous domains, each of which contain an Fe-binding site. The majority of transferrin is synthesized in the liver and secreted into the blood, but it is also produced in lower amounts in testis and brain as well as in oligodendrocytes, where transferrin is an early marker of oligodendrocyte differentiation. From the blood, transferrin is internalized by erythroblasts and reticulocytes upon binding the transferrin receptor (TfR), also designated CD71, through a system of coated pits and vesicles. After Fe release, transferrin is returned to the extracellular medium, where it can be reused. Defects in the transferrin gene results in atransferrinemia, a rare autosomal recessive disorder characterized by microcytic anemia and iron loading.

## REFERENCES

1. MacGillivray, R.T., et al. 1983. The primary structure of human serum transferrin. The structures of seven cyanogen bromide fragments and the assembly of the complete structure. *J. Biol. Chem.* 258: 3543-3553.
2. Yang, F., et al. 1984. Human transferrin: cDNA characterization and chromosomal localization. *Proc. Natl. Acad. Sci. USA* 81: 2752-2756.
3. Morgan, E.H., et al. 1986. Iron uptake and metabolism by hepatocytes. *Fed. Proc.* 45: 2810-2816.
4. Irie, S., et al. 1987. Transferrin-mediated cellular iron uptake. *Am. J. Med. Sci.* 293: 103-111.

## CHROMOSOMAL LOCATION

Genetic locus: TF (human) mapping to 3q22.1.

## PRODUCT

transferrin 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  $\mu$ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see transferrin shRNA Plasmid (h): sc-37176-SH and transferrin shRNA (h) Lentiviral Particles: sc-37176-V as alternate gene silencing products.

For independent verification of transferrin (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-37176A, sc-37176B and sc-37176C.

## 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  $\mu$ l of the RNase-free water provided. Resuspension of the siRNA duplex in 330  $\mu$ l of RNase-free water makes a 10  $\mu$ M solution in a 10  $\mu$ M Tris-HCl, pH 8.0, 20 mM NaCl, 1 mM EDTA buffered solution.

## APPLICATIONS

transferrin siRNA (h) is recommended for the inhibition of transferrin 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  $\mu$ M in 66  $\mu$ 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.

## GENE EXPRESSION MONITORING

transferrin (D-9): sc-365871 is recommended as a control antibody for monitoring of transferrin 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).

To ensure optimal results, the following support reagents are recommended: 1) Western Blotting: use m-IgG $\lambda$  BP-HRP: sc-516132 or m-IgG $\lambda$  BP-HRP (Cruz Marker): sc-516132-CM (dilution range: 1:1000-1:10000), Cruz Marker™ Molecular Weight Standards: sc-2035, UltraCruz® Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) Immunofluorescence: use m-IgG $\lambda$  BP-FITC: sc-516185 or m-IgG $\lambda$  BP-PE: sc-516186 (dilution range: 1:50-1:200) with UltraCruz® Mounting Medium: sc-24941 or UltraCruz® Hard-set Mounting Medium: sc-359850.

## RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor transferrin gene expression knockdown using RT-PCR Primer: transferrin (h)-PR: sc-37176-PR (20  $\mu$ l, 571 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

## SELECT PRODUCT CITATIONS

1. Ma, S., et al. 2016. Ferroptosis is induced following siramesine and lapatinib treatment of breast cancer cells. *Cell Death Dis.* 7: e2307.
2. Lee, S., et al. 2018. Transcription factor NFAT5 promotes migration and invasion of rheumatoid synoviocytes via coagulation factor III and CCL2. *J. Immunol.* 201: 359-370.
3. Ma, S., et al. 2021. Iron-dependent autophagic cell death induced by radiation in MDA-MB-231 breast cancer cells. *Front. Cell Dev. Biol.* 9: 723801.

## RESEARCH USE

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