PRODUCT INFORMATION

Transferrin (human, recombinant)

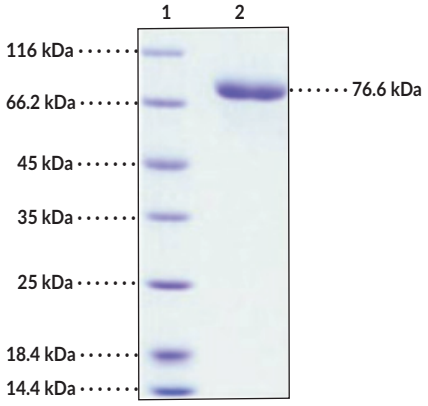
Item No. 32030

Overview and Properties

Synonyms:	HEL-S-71p, β-1 Metal-binding Globulin, TFQTL1, Serotransferrin, Siderophillin
Source:	Active recombinant human C-terminal His-tagged transferrin expressed in HEK293 cells
Amino Acids:	20-698
Molecular Weight:	76.6 kDa
Storage:	-80°C (as supplied)
Stability:	≥1 year
Purity:	≥95% estimated by SDS-PAGE
Supplied in:	Lyophilized from sterile PBS, pH 7.4
Endotoxin Testing:	<1.0 EU/µg, determined by the LAL endotoxin assay
Bioactivity:	Measured by its binding ability in a functional ELISA. Immobilized human CD71 at 10 µg/ml (100 µl/well) can bind human transferrin. The EC_{50} of human transferrin is 5.6 ng/ml. Activity also measured in cell proliferation assay, see figure for details.

Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Images



Lane 1: MW Markers
Lane 2: Transferrin (human, recombinant)

Figure 1: SDS-PAGE Analysis of Transferrin (human, recombinant)

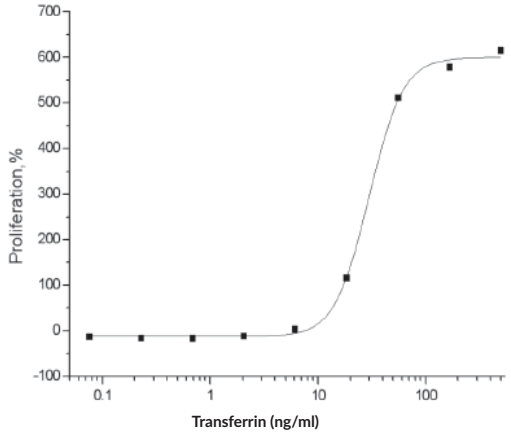


Figure 2: Measured in a serum-free cell proliferation assay using MCF-7 human breast cancer cells. The ED_{50} for this effect is typically 0.01-0.04 µg/ml.

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Description

Transferrin is a glycoprotein that binds and transports ferric iron.[1,2] It is a 679-amino acid bilobal protein composed of N- and C-terminal lobes, each housing a ferric iron binding site, connected by a seven-amino acid bridge.[1] Transferrin is predominately synthesized in hepatocytes, but is also expressed in Sertoli, ependymal, oligodendroglial, and metastatic melanoma cell lines, and is secreted into the circulation.[1,2] Iron-containing transferrin binds to the transferrin receptor (TfR1; Item No. 32031) on the surface of iron-requiring cells to form the transferrin/TfR complex, which undergoes clathrin-dependent endocytosis to facilitate intracellular iron release. The transferrin/TfR complex is then returned to the cell surface and apo-transferrin is released back into the circulation *via* dissociation or displacement by an iron-containing transferrin.[1] Immunodepletion of transferrin inhibits serum-induced ferroptosis of *Bax* and *Bak* double knockout mouse embryonic fibroblasts (MEFs), indicating that transferrin is a regulator of ferroptosis.[3] Exogenous administration of apo-transferrin to three-day-old rats increases expression of myelin constituents and enhances myelinogenesis in myelin-deficient rats.[4] It also normalizes labile plasma iron concentrations and red blood cell survival, increases hemoglobin production, and decreases reticulocytosis and splenomegaly in the $Hbb^{th1/th1}$ mouse model of β-thalassemia.[5] Cayman's Transferrin (human, recombinant) protein can be used for ELISA and cell-based assay applications. This protein consists of 690 amino acids, has a calculated molecular weight of 76.6 kDa, and a predicted N-terminus of Val20 after signal peptide cleavage.

References

1. Luck, A.N. and Mason, A.B. Transferrin-mediated cellular iron delivery. *Curr. Top. Membr.* **69**, 3-35 (2012).
2. Gomme, P.T. and McCann, K.B. Transferrin: Structure, function and potential therapeutic actions. *Drug Discov. Today* **10(4)**, 267-273 (2005).
3. Gao, M., Monian, P., Quadri, N., *et al.* Glutaminolysis and transferrin regulate ferroptosis. *Mol. Cell.* **59(2)**, 298-308 (2015).
4. Carden, T.R., Correale, J., Pasquini, J.M., *et al.* Transferrin enhances microglial phagocytic capacity. *Mol. Neurobiol.* **56(9)**, 6324-6340 (2019).
5. Li, H., Rybicki, A.C., Suzuka, S.M., *et al.* Transferrin therapy ameliorates disease in β-thalassemic mice. *Nat. Med.* **16(2)**, 177-182 (2010).

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