

Product Data Sheet

Human Transferrin (Tf) Protein, Apo-transferrin

Cat. # TF25-N-10

Human Transferrin, Apo (Plasma)

SIZE: 10 mg

Elemental iron is required for a variety of normal cellular functions and vital for proper growth and development. However, natural iron is quite insoluble and excess iron is harmful, since it can catalyze the formation of potentially damaging reactive oxygen species. The major pool of body iron (~85%; 40-50 mg/kg) is found in circulating hemoglobin and muscle myoglobin. Iron absorption occurs primarily in the intestine (duodenum) and inversely related to body iron reserve. Several proteins including **Ferritin, transferrin (Tf), transferrin receptors (TfRs)**, and **iron regulatory proteins (IRPs)** etc play a key role in iron metabolism.

Transferrin is a glycoprotein that binds iron very tightly but reversibly. Although iron bound to transferrin is less than 0.1% (4 mg) of the total body iron, it is the most important iron pool, with the highest rate of turnover (25 mg/24 h). Transferrin has a molecular weight of around 80 kiloDaltons and contains 2 specific high-affinity Fe(III) binding sites. The affinity of transferrin for Fe(III) is extremely high (10^{23} M⁻¹ at pH 7.4) but decreases progressively with decreasing pH below neutrality. When not bound to iron, it is known as "**apo-transferrin**". Tf with iron is called "**Holo-Transferrin**". Several variants of Tf have been identified with varying iron binding ability.

Transferrin (Tf, human chromosome 3, 679 aa), a serum glycoprotein of ~80 kDa and synthesized in the liver, is the primary protein of inter-organ transport of nonheme iron. Tf can bind two iron atoms. Tf binds to membrane **Transferrin receptors (TfRs)** and taken up by endocytosis. Iron is released from Tf, within acidic endosomes, into the cytoplasm apparently through the action of DMT1. The apoTf-TfR complex is returned to the cell surface, where, apo-Tf dissociates from TfR at the extracellular pH. The classical TfR, now termed **TfR1**, is a homodimeric (95 kDa subunits) type II membrane glycoprotein that binds two molecules of Tf. A monomeric serum form or **soluble TfR1** (~80 kDa) also exists that lacks residues 1-100 aa. Recently, a second Tf receptor, **TfR2**, has been cloned and characterized.

Source of Antigen

Prepared from plasma shown to be non-reactive for HBsAg, anti-HCV, anti-HBc, and negative for anti-HIV 1 & 2 by FDA required tests. US origin.

Purity: Purified human plasma Tf (>97% purity by SDS-PAGE)

Form: lyophilized from in 10 mM phosphate buffer, pH 7.4.

Iron content: 0.01 ug/mg protein;

Storage: -20oC or below

Stability: 6-12 months at -20oC or below.

Shipping: 4oC for solutions and room temp for powder.

General References: Bowman, B. H. et al (1988) Adv. Genet. 25: 1-38; Evans, R. W. et al (1982) Biochem. J. 201: 19-26; MacGillivray, R. T. A et al (1982) PNAS 79: 2504-2508; Park, I. et al (1985) PNAS 82, 3149; Uzan, G. et al (1984) BBRC 119, 273; Yang, F. et al (1984) PNAS 81, 2752-2756; Nelson N (1999) EMBO J. 18, 4361; Cairo G I (2000) Biochem. J. 352, 241-250

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Related material available from ADI

Antibodies NRAMP1/2, MTP1, Transferrin, and TfRs receptors (TfR1 and TfR2), Ferritin, H and L-chain, HOX1-3, HFE, Dcytb, IRP1 and IRP2, Frataxin;

Human and Mouse Transferrin ELISA Kits

TF25-N-10

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