

## Transthyretin Protein, Human, Recombinant (His)

### General Information

Synonyms:	PALB;HEL111;CTS;transthyretin;CTS1;HsT2651;TBPA
Protein Construction:	Gly21-Glu147
Species:	Human
Expression Host:	HEK293 Cells
Accession:	NP_000362
Molecular Weight:	14.9 kDa (predicted)

### QC Testing

Biological Activity:	Activity has not been tested. It is theoretically active, but we cannot guarantee it.
Purity:	> 95% as determined by Bis-Tris PAGE; > 95% as determined by HPLC
Endotoxin:	< 1.0 EU/ $\mu$ g of the protein as determined by the LAL method.
Formulation:	Lyophilized from 0.22 $\mu$ m filtered solution in PBS (pH 7.4). Normally 8% trehalose is added as protectant before lyophilization.

### Preparation and Storage

#### Reconstitution:

Reconstitute the lyophilized protein in distilled water. The product concentration should not be less than 100  $\mu$ g/ml. Before opening, centrifuge the tube to collect powder at the bottom. After adding the reconstitution buffer, avoid vortexing or pipetting for mixing.

#### Stability & Storage:

It is recommended to store recombinant proteins at -20°C to -80°C for future use. Lyophilized powders can be stably stored for over 12 months, while liquid products can be stored for 6-12 months at -80°C. For reconstituted protein solutions, the solution can be stored at -20°C to -80°C for at least 3 months. Please avoid multiple freeze-thaw cycles and store products in aliquots.

Actual storage temperature shall be subject to the COA.

#### Shipping:

In general, lyophilized powders are shipped with blue ice, while solutions are shipped with dry ice.

### Protein Background

Prealbumin/Transthyretin, also known as ATTR, Prealbumin, TTR and PALB, is a secreted and cytoplasm protein that belongs to the Prealbumin / Transthyretin family. Prealbumin / Transthyretin is detected in serum and cerebrospinal fluid (at protein level). It is highly expressed in choroid plexus epithelial cells. It is also detected in retina pigment epithelium and liver. Each monomer of Prealbumin / Transthyretin has two 4-stranded beta sheets and the shape of a prolate ellipsoid. Antiparallel beta-sheet interactions link monomers into dimers. A short loop

from each monomer forms the main dimer-dimer interaction. These two pairs of loops separate the opposed, convex beta-sheets of the dimers to form an internal channel. Prealbumin/Transthyretin is a carrier protein. It transports thyroid hormones in the plasma and cerebrospinal fluid, and also transports retinol (vitamin A) in the plasma. Defects in Prealbumin / Transthyretin are the cause of amyloidosis type 1 (AMYL1) which is a hereditary generalized amyloidosis due to Prealbumin / Transthyretin amyloid deposition. Protein fibrils can form in different tissues leading to amyloid polyneuropathies, amyloidotic cardiomyopathy, carpal tunnel syndrome, systemic senile amyloidosis. The diseases caused by mutations include amyloidotic polyneuropathy, euthyroid hyperthyroxinaemia, amyloidotic vitreous opacities, cardiomyopathy, oculoleptomeningeal amyloidosis, meningocerebrovascular amyloidosis, carpal tunnel syndrome, etc.

### Reference

Westermarck P, et al. (1990) Fibril in senile systemic amyloidosis is derived from normal transthyretin. Proc Natl Acad Sci U S A. 87(7): 2843-5.

Colon W, et al. (1992) Partial denaturation of transthyretin is sufficient for amyloid fibril formation in vitro. Biochemistry. 31(36): 8654-60.

Hammarström P, et al. (2003) Prevention of transthyretin amyloid disease by changing protein misfolding energetics. Science. 299(5607): 713-6.

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