Data Sheet (Cat.No.TMPY-00915)

TargetMol

Serpin A1 Protein, Human, Recombinant (His)

General Information

Synonyms:	PRO2275;SerpinA1;serpin peptidase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 1;serpin peptidase inhibitor, clade A (α-1 antiproteinase, antitrypsin), member 1; α1AT;AAT;PI1;PI;MGC9222;MGC23330;A1A;alpha1AT;A1AT
Protein Construction:	A DNA sequence encoding the human SerpinA1 (NP_000286.3) pre-protein (Met 1-Lys 418) was expressed with a C-terminal polyhistidine tag. Predicted N terminal: Glu 25
Species:	Human
Expression Host:	HEK293 Cells
Accession:	P01009-1
Molecular Weight:	45.7 kDa (predicted); 55-60 kDa (reducing condition, due to glycosylation)

QC Testing

Biological Activity:	Measured by its ability to inhibit trypsin cleavage of a fluorogenic peptide substrate, Mca-RPKPVE-Nval-WRK(Dnp)-NH2. The IC50 value is < 3.0 nM, as measured in 100μL reaction mixture containing 1.25 ng trypsin, 10 μM substrate, 50 mM Tris, 10 mM CaCl2, 0.15 M NaCl, pH 7.5.
Purity:	> 95 % as determined by SDS-PAGE
Endotoxin:	< 1.0 EU/μg of the protein as determined by the LAL method.
Formulation:	Lyophilized from a solution filtered through a 0.22 μm filter, containing PBS, pH 7.4. Typically, a mixture containing 5% to 8% trehalose, mannitol, and 0.01% Tween 80 is incorporated as a protective agent before lyophilization.

Preparation and Storage

Reconstitution:

Reconstituted with sterile deionized water to 0.25 mg/mL. Reconstitution conditions may vary depending on the lot.

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

SerpinA1, also known as Alpha-1 antitrypsin (AAT), is a prototype member of the Serpin superfamily of the serine

protease inhibitors. This serine protease inhibitor blocks the protease, neutrophil elastase. Alpha-1 antitrypsin is mainly produced in the liver and acts as an antiprotease. Its principal function is to inactivate neutrophil elastase, preventing tissue damage. SerpinA1 (alpha1-antitrypsin), an acute phase protein and the classical neutrophil elastase inhibitor, is localized within lipid rafts in primary human monocytes in vitro. Its association with monocytes is inhibited by cholesterol depleting/efflux-stimulating agents (nystatin, filipin, MbetaCD (methyl-beta-cyclodextrin) and oxidized low-density lipoprotein (oxLDL) and conversely, enhanced by free cholesterol. Furthermore, SerpinA1/monocyte association per se depletes lipid raft cholesterol as characterized by the activation of extracellular signal-regulated kinase 2, formation of cytosolic lipid droplets, and complete inhibition of oxLDL uptake by monocytes. Previous population studies have suggested that heterozygote status for the AAT gene (SerpinA1) is a risk factor for chronic rhinosinusitis with nasal polyposis (CRSwNP). Alpha-1 antitrypsin deficiency is a recently identified genetic disease that occurs almost as frequently as cystic fibrosis. It is caused by various mutations in the SerpinA1 gene, and has numerous clinical implications. Alpha-1 antitrypsin deficiency is an inherited disease affecting the lung and liver. In the liver, alpha-1 antitrypsin deficiency may manifest as benign neonatal hepatitis syndrome; a small percentage of adults develop liver fibrosis, with progression to cirrhosis and hepatocellular carcinoma. Its most important physiologic functions are the protection of pulmonary tissue from aggressive proteolytic enzymes and regulation of pulmonary immune processes.

Reference

Khnlein T,et al.(2008) Alpha-1 antitrypsin deficiency: pathogenesis, clinical presentation, diagnosis, and treatment. Am J Med. 121(1): 3-9.

Camelier AA,et al.(2008) Alpha-1 antitrypsin deficiency: diagnosis and treatment. J Bras Pneumol. 34(7): 514-27.

Subramaniyam D,et al.(2010) Cholesterol rich lipid raft microdomains are gateway for acute phase protein, SERPINA1. Int J Biochem Cell Biol. 42(9): 1562-70.

Kilty SJ,et al.(2010) Polymorphisms in the SERPINA1 (Alpha-1-Antitrypsin) gene are associated with severe chronic rhinosinusitis unresponsive to medical therapy. Am J Rhinol Allergy. 24(1): e4-9.