# PRODUCT INFORMATION

## Alpha-1 Antitrypsin

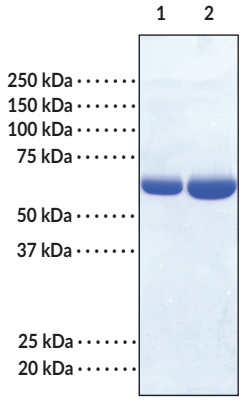
*Item No. 24560*

### Overview and Properties

**Synonyms:** $A_1A$, $A_1AT$, AAT, $\alpha_1$-Antitrypsin
**Source:** Human
**Uniprot No.:** P01009
**Molecular Weight:** 54,000 kDa
**Storage:** -80°C (as supplied)
**Stability:** ≥2 years
**Purity:** ***batch specific*** (≥90% estimated by SDS-PAGE)
**Supplied in:** Lyophilized in PBS, pH 7.4

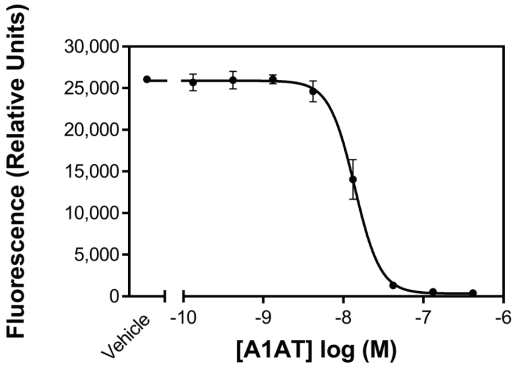
*Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.*

### Images




**Lane 1:** A1AT (2 µg)
**Lane 2:** A1AT (4 µg)

***Representative gel image shown; actual purity may vary between each batch.***




Neutrophil Elastase inhibition by A1AT using Cayman's Neutrophil Elastase Activity Assay Kit (600610)

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## Description

Alpha-1 antitrypsin is a serine protease inhibitor and member of the serpin superfamily.[1] It has a five-stranded A β-sheet and a mobile reactive center loop that acts as a pseudosubstrate for various proteases. Alpha-1 antitrypsin binds to a protease, undergoes proteolytic cleavage, and forms a covalent linkage between a carboxyl group in the reactive loop and the serine hydroxyl of the protease active site, effectively inactivating the enzyme which is then cleared from circulation. The primary targets of alpha-1 antitrypsin are neutrophil elastase and proteinase 3, however, it also inhibits trypsin, kallikreins 7 and 14, and matriptase.[2] Alpha-1 antitrypsin protects the lower respiratory tract from proteolytic destruction *via* inhibition of neutrophil elastase and reduced serum levels of alpha-1 antitrypsin have been linked to early-onset liver disease and emphysema.[3] Alpha-1 antitrypsin is an acute-phase protein that reduces production of inflammatory cytokines, inhibits apoptosis, blocks leukocyte degranulation and migration, as well as suppresses NF-κB nuclear translocation in monocytes. It delays disease onset in mouse models of inflammatory disease, including collagen-induced arthritis and experimental autoimmune encephalomyelitis (EAE).

## References


1. Elliott, P.R., Abrahams, J.P., and Lomas, D.A. Wild-type alpha 1-antitrypsin is in the canonical inhibitory conformation. *J. Mol. Biol.* **275(3)**, 419-425 (1998).
2. Janciauskiene, S.M., Bals, R., Koczulla, R., *et al.* The discovery of α1-antitrypsin and its role in health and disease. *Respir. Med.* **105(8)**, 1129-1139 (2011).
3. Ehlers, M.R. Immune-modulating effects of alpha-1 antitrypsin. *Biol. Chem.* **395(10)**, 1187-1193 (2014).



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