SANTA CRUZ BIOTECHNOLOGY, INC.

# AAT (B9): sc-59438

SANTA CRUZ BIOTECHNOLOGY

*The Power to Question*

## BACKGROUND

Cumulative damage to lung tissue by Neutrophil Elastase is responsible for the development of pulmonary emphysema, an irreversible lung disease characterized by loss of lung elasticity. α 1-antitrypsin (AAT), a 394 amino acid hepatic acute phase protein, predominantly inhibits Neutrophil Elastase. AAT is highly expressed in liver and in cultured hepatoma cells and, to a lesser extent, in macrophages. AAT is a highly polymorphic glycosylated serum protein with characteristic isoelectric-focusing patterns for most variants. The gene encoding AAT maps to a region of human chromosome 14q32.13 that includes a related serine protease inhibitor (serpin) gene which encodes corticosteroid-binding globulin. Oxidation of the methionine 358 residue in the active center of AAT results in a dramatic decrease in inhibitory activity towards elastase. AAT also has a moderate affinity for plasmin and Thrombin. AAT deficiency is associated with a 20-30 fold increased risk of precocious pulmonary emphysema.

## REFERENCES


1. Okayama, H., et al. 1991. Characterization of the molecular basis of the α1-antitrypsin F allele. Am. J. Hum. Genet. 48: 1154-1158.
2. Seyama, K., et al. 1991. Siiyama (Serine 53 (TCC) to phenylalanine 53 (TTC)). A new α1-antitrypsin-deficient variant with mutation on a predicted conserved residue of the serpin backbone. J. Biol. Chem. 266: 12627-12632.


## CHROMOSOMAL LOCATION

Genetic locus: SERPINA1 (human) mapping to 14q32.13.

## SOURCE

AAT (B9) is a mouse monoclonal antibody raised against full length AAT of human origin.

## PRODUCT

Each vial contains 100 µg $IgG_1$ in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

## APPLICATIONS

AAT (B9) is recommended for detection of AAT of human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500), immunohistochemistry (including paraffin-embedded sections) (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

Suitable for use as control antibody for AAT siRNA (h): sc-40945, AAT shRNA Plasmid (h): sc-40945-SH and AAT shRNA (h) Lentiviral Particles: sc-40945-V.

Molecular Weight of luminal AAT: 51 kDa.

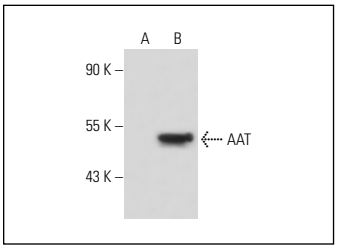
Molecular Weight of mature AAT: 55 kDa.

Positive Controls: human liver extract: sc-363766, Hep G2 cell lysate: sc-2227 or AAT (h): 293 Lysate: sc-112989.

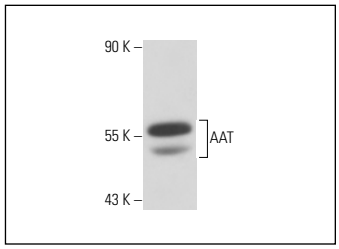
## STORAGE

Store at 4° C, **DO NOT FREEZE**. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

## DATA




AAT (B9): sc-59438. Western blot analysis of AAT expression in non-transfected: sc-110760 (**A**) and human AAT transfected: sc-112989 (**B**) 293 whole cell lysates.




AAT (B9): sc-59438. Western blot analysis of AAT expression in human liver tissue extract.

## SELECT PRODUCT CITATIONS


1. Janciauskiene, S., et al. 2008. α1-antitrypsin inhibits the activity of the matriptase catalytic domain *in vitro*. Am. J. Respir. Cell Mol. Biol. 39: 631-637.
2. Subramaniyam, D., et al. 2010. Cholesterol rich lipid raft microdomains are gateway for acute phase protein, SERPINA1. Int. J. Biochem. Cell Biol. 42: 1562-1570.
3. Burkard, A., et al. 2012. Generation of proliferating human hepatocytes using Upcyte® technology: characterisation and applications in induction and cytotoxicity assays. Xenobiotica 42: 939-956.
4. Ferrarotti, I., et al. 2015. How can we improve the detection of α1-antitrypsin deficiency? PLoS ONE 10: e0135316.
5. Izquierdo, I., et al. 2016. Proteomic identification of putative biomarkers for early detection of sudden cardiac death in a family with a LMNA gene mutation causing dilated cardiomyopathy. J. Proteomics 148: 75-84.
6. Pastore, N., et al. 2017. Activation of the c-Jun N-terminal kinase pathway aggravates proteotoxicity of hepatic mutant Z α1-antitrypsin. Hepatology 65: 1865-1874.
7. Matamala, N., et al. 2018. Characterization of novel missense variants of SERPINA1 gene causing α-1 antitrypsin deficiency. Am. J. Respir. Cell Mol. Biol. 58: 706-716.
8. Kim, E.K., et al. 2019. Proteomic analysis of primary colon cancer and synchronous solitary liver metastasis. Cancer Genomics Proteomics 16: 583-592.
9. Gómez-Mariano, G., et al. 2020. Liver organoids reproduce α1 antitrypsin deficiency-related liver disease. Hepatol. Int. 14: 127-137.


## RESEARCH USE

For research use only, not for use in diagnostic procedures.