SANTA CRUZ BIOTECHNOLOGY, INC.

AAT (48D2): sc-69752

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 14 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 α 1-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 α 1-antitrypsin-deficient variant with mutation on a predicted conserved residue of the serpin backbone. J. Biol. Chem. 266: 12627-12632.
3. Rosenberg, S., et al. 1994. Synthesis in yeast of a functional oxidation-resistant mutant of human α-antitrypsin. Nature 312: 77-80.
4. Graziadei, I., et al. 2000. A novel-binding site for the native hepatic acute-phase protein α-antitrypsin expressed on the human hepatoma cell line Hep G2 and intestinal cell line Caco 2. Liver 20: 240-246.
5. Rollini, P. and Fournier, R.E. 2000. Differential regulation of gene activity and chromatin structure within the human serpin gene cluster at 14q32.1 in macrophage microcell hybrids. Nucleic Acids Res. 28: 1767-1777.
6. Hsu, P.I., et al. 2007. α 1-antitrypsin precursor in gastric juice is a novel biomarker for gastric cancer and ulcer. Clin. Cancer Res. 13: 876-883.
7. Churg, A., et al. 2007. α 1-antitrypsin suppresses TNF-α and MMP-12 production by cigarette smoke-stimulated macrophages. Am. J. Respir. Cell Mol. Biol. 37: 144-151.
8. Zhang, B., et al. 2007. α 1-antitrypsin protects β-cells from apoptosis. Diabetes 56: 1316-1323.

CHROMOSOMAL LOCATION

Genetic locus: SERPINA1 (human) mapping to 14q32.13; Serpina1e (mouse) mapping to 12 E.

SOURCE

AAT (48D2) is a mouse monoclonal antibody raised against purified AAT of human origin.

PRODUCT

Each vial contains IgG_1 in 100 µl of PBS with < 0.1% sodium azide and 0.1% gelatin.

APPLICATIONS

AAT (48D2) is recommended for detection of AAT of mouse, rat and human origin by Western Blotting (starting dilution to be determined by researcher, dilution range 1:100-1:5000) and immunoprecipitation [1-2 µl per 100-500 µg of total protein (1 ml of cell lysate)].

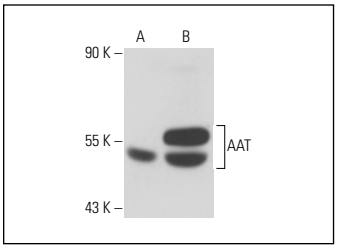
Suitable for use as control antibody for AAT siRNA (h): sc-40945, AAT siRNA (m): sc-40946, AAT shRNA Plasmid (h): sc-40945-SH, AAT shRNA Plasmid (m): sc-40946-SH, AAT shRNA (h) Lentiviral Particles: sc-40945-V and AAT shRNA (m) Lentiviral Particles: sc-40946-V.

Molecular Weight of luminal AAT: 51 kDa.

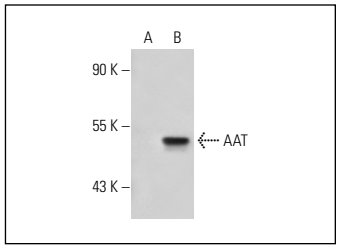
Molecular Weight of mature AAT: 55 kDa.

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

DATA



AAT (48D2): sc-69752. Western blot analysis of AAT expression in Hep G2 whole cell lysate (**A**) and human liver tissue extract (**B**).



AAT (48D2): sc-69752. Western blot analysis of AAT expression in non-transfected: sc-117752 (**A**) and human AAT transfected: sc-112989 (**B**) 293 whole cell lysates.

SELECT PRODUCT CITATIONS

1. Loison, F., et al. 2014. Proteinase 3-dependent caspase-3 cleavage modulates neutrophil death and inflammation. J. Clin. Invest. 124: 4445-4458.
2. Chang, Y.S., et al. 2017. Low levels of IgG recognizing the α-1-antitrypsin peptide and its association with Taiwanese women with primary Sjögren's syndrome. Int. J. Mol. Sci. 18: 2750.
3. Pallister, E.G., et al. 2020. Utility of ion-mobility spectrometry for deducing branching of multiply charged glycans and glycopeptides in a high-throughput positive ion LC-FLR-IMS-MS workflow. Anal. Chem. 92: 15323-15335.
4. Ruiz-Duque, B., et al. 2021. Methodologies for the determination of blood α1 antitrypsin levels: a systematic review. J. Clin. Med. 10: 5132.

STORAGE

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

RESEARCH USE

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