SANTA CRUZ BIOTECHNOLOGY, INC.

AAT (13702): sc-73431

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. α1-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 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.
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. α1-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. α1-antitrypsin suppresses TNFα and MMP-12 production by cigarette smoke-stimulated macrophages. Am. J. Respir. Cell Mol. Biol. 37: 144-151.
8. Zhang, B., et al. 2007. α1-antitrypsin protects β cells from apoptosis. Diabetes 56: 1316-1323.

CHROMOSOMAL LOCATION

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

SOURCE

AAT (13702) is a mouse monoclonal antibody raised against α1-antitrypsin of human origin.

PRODUCT

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

APPLICATIONS

AAT (13702) is recommended for detection of AAT of human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000) and immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)]; non cross-reactive with α1-antichymotrypsin (AACT).

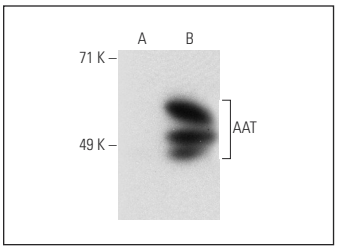
Suitable for use as control antibody for AAT siRNA (h): sc-40945, AAT shRNA Plasmid (h): sc-40945-SH and AAT shRNA (h) Lentiviral Particles: sc-40945-V.

Molecular Weight of luminal AAT: 51 kDa.

Molecular Weight of mature AAT: 55 kDa.

Positive Controls: human plasma extract: sc-364374, AAT (h): 293 Lysate: sc-112989 or Hep G2 cell lysate: sc-2227.

DATA



AAT (13702): sc-73431. Western blot analysis of AAT expression in non-transfected: sc-110760 (**A**) and human AAT transfected: sc-112989 (**B**) 293 whole cell lysates.

SELECT PRODUCT CITATIONS

1. Novotna, A., et al. 2011. Construction and characterization of hepatocyte nuclear factor HNF4α1 over-expressing cell line derived from human hepatoma Hep G2 cells. Eur. J. Pharmacol. 669: 45-50.
2. Novotna, A., et al. 2013. Construction and characterization of peroxisome proliferator-activated receptor-γ co-activator 1 alpha (PGC-1α over-expressing cell line derived from human hepatocyte carcinoma Hep G2 cells). Biomed. Pap. Med. Fac. Univ. Palacky Olomouc Czech. Repub. 157: 214-221.
3. Yu, Y.B., et al. 2018. Differentiation of umbilical cord mesenchymal stem cells into hepatocytes in comparison with bone marrow mesenchymal stem cells. Mol. Med. Rep. 18: 2009-2016.

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.

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.