

AAT (3B7): sc-80461

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, predominately 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. AAT maps to a region of human chromosome 14q32.1 that includes a related serine protease inhibitor (serpin) gene which encodes corticosteroid-binding globulin. Oxidation of the Methionine 358 residue located at the active center of AAT results in a dramatic decrease in inhibitory activity towards elastase which effectively inactivates the protective function. AAT also has a moderate affinity for plasmin and Thrombin. AAT deficiency associates with a 20-30 fold increased risk of precocious pulmonary emphysema.

REFERENCES

- Okayama, H., Brantly, M., Holmes, M. and Crystal, R.G. 1991. Characterization of the molecular basis of the α 1-antitrypsin F allele. *Am. J. Hum. Genet.* 48: 1154-1158.
- Seyama, K., Nukiwa, T., Takabe, K., Takahashi, H., Miyake, K. and Kira, S. 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.
- Rosenberg, S., Barr, P.J., Najarian, R.C. and Hallelwell, R.A. 1994. Synthesis in yeast of a functional oxidation-resistant mutant of human α -antitrypsin. *Nature* 312: 77-80.
- Graziadei, I., Vogel, W. and Bomford, A. 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.
- 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.
- Hsu, P.I., Chen, C.H., Hsieh, C.S., Chang, W.C., Lai, K.H., Lo, G.H., Hsu, P.N., Tsay, F.W., Chen, Y.S., Hsiao, M., Chen, H.C. and Lu, P.J. 2007. α 1-antitrypsin precursor in gastric juice is a novel biomarker for gastric cancer and ulcer. *Clin. Cancer Res.* 13: 876-883.

CHROMOSOMAL LOCATION

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

SOURCE

AAT (3B7) is a mouse monoclonal antibody raised against AAT isolated from plasma of human origin.

PRODUCT

Each vial contains 100 μ g IgG_{2a} in 1.0 ml PBS with < 0.1% sodium azide and 0.1% gelatin.

APPLICATIONS

AAT (3B7) is recommended for detection of native and denatured AAT of human and rat origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000) and immunoprecipitation [1-2 μ g per 100-500 μ g of total protein (1 ml of cell lysate)].

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.

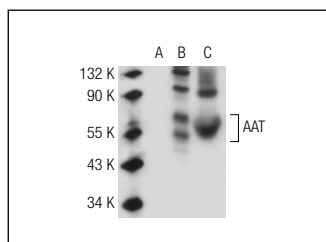
Molecular Weight of mature AAT: 55 kDa.

Positive Controls: AAT (h): 293 Lysate: sc-112989, rat liver extract: sc-2395 or Hep G2 cell lysate: sc-2227.

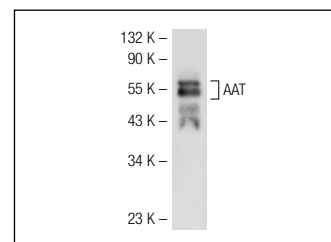
RECOMMENDED SECONDARY REAGENTS

To ensure optimal results, the following support (secondary) reagents are recommended: 1) Western Blotting: use goat anti-mouse IgG-HRP: sc-2005 (dilution range: 1:2000-1:32,000) or Cruz Marker™ compatible goat anti-mouse IgG-HRP: sc-2031 (dilution range: 1:2000-1:5000), Cruz Marker™ Molecular Weight Standards: sc-2035, TBS Blotto A Blocking Reagent: sc-2333 and Western Blotting Luminol Reagent: sc-2048. 2) Immunoprecipitation: use Protein A/G PLUS-Agarose: sc-2003 (0.5 ml agarose/2.0 ml).

DATA



AAT (3B7): sc-80461. Western blot analysis of AAT expression in non-transfected: sc-110760 (A) and human AAT transfected: sc-112989 (B) 293 whole cell lysates and rat liver tissue extract (C).



AAT (3B7): sc-80461. Western blot analysis of AAT expression in Hep G2 whole cell lysate.

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 or our catalog for detailed protocols and support products.