

Product Information

α_1 -Antichymotrypsin from human plasma

Catalog Number **A9285**
Storage Temperature $-20\text{ }^\circ\text{C}$

CAS RN 141176-92-3
Synonyms: AACT, ACT, Cell growth-inhibiting gene
24/25 protein, SERPINA3, α -1-Achy

Product Description

Molecular mass: 68 kDa (chymotrypsin binding)¹;
65 kDa (sedimentation equilibrium)²; 55–66 kDa³
pI:¹ 3.75–4.0
Extinction coefficient:² $E^{1\%} = 6.2$ (280 nm)

α_1 -Antichymotrypsin (AACT) is a single-chain glycoprotein and member of the serine protease inhibitor (serpin) family. Mature AACT contains 394 amino acids, with one disulfide bond.^{1,4} AACT can vary in molecular mass over a range of 55–66 kDa because of varying degrees of glycosylation, where carbohydrate comprises ~25% of the molecular mass of AACT.^{3,4} One MALDI-MS analysis of AACT gave a mass value of 55,106 Da.⁵

AACT is a specific inhibitor of chymotrypsin-like proteinases. It forms stable complexes with pancreatic chymotrypsin, leukocyte cathepsin G, and mast cell chymotrypsin. No inhibition of pancreatic trypsin nor leukocyte elastase could be demonstrated.⁶ The rate at which it forms complexes is by far the fastest with cathepsin G and at least 1,000 times slower with bovine and human chymotrypsin.⁷

A comparison of the amino acid sequences among AACT, α_1 -antitrypsin, and antithrombin III has been reported.⁸ The crystal structure of uncleaved wild-type AACT, expressed recombinantly, has been published.⁹

Purified AACT loses its inhibitory activity above $50\text{ }^\circ\text{C}$, and below pH 5.5. Inactivation occurs above pH 10.5. Oxidizing agents do not affect its inhibitory activity.¹⁰

Preparation Instructions

To recover the product fully, it is recommended to centrifuge the container prior to opening. Subsequent resuspension of the material in deionized water, to a concentration of 2–4 mg/mL, gives a stock solution that contains Tris-buffer and NaCl. Dilutions of the stock solution can be made into buffer of 20 mM Tris, pH 7.4, and 150 mM NaCl.

Storage/Stability

Because of its single disulfide bond, AACT is labile in acidic solutions (e.g., pH 5) and at higher temperatures (e.g., 30 minutes at $56\text{ }^\circ\text{C}$).¹ Dilute AACT solutions at low concentrations and at pH 8.0 can be stored for 1 month at $4\text{ }^\circ\text{C}$. Frozen preparations have been reported to be stable indefinitely.²

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Safety Data Sheet for information regarding hazards and safe handling practices.

References

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HJ,GCY,HLD,JRC,MAM 02/16-2