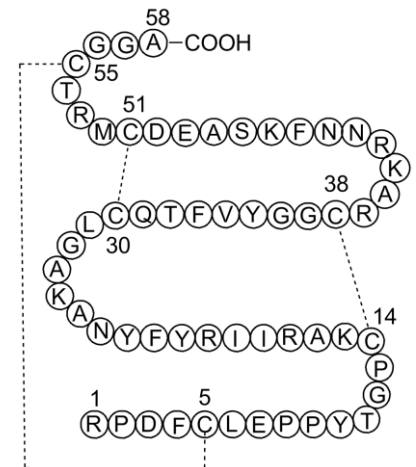


## Product Data Sheet

### Chemical Properties

<b>Product Name:</b>	Aprotinin
<b>Cas No.:</b>	9087-70-1
<b>M.Wt:</b>	6511.44
<b>Formula:</b>	C284H432N84O79S7
<b>Synonyms:</b>	Aprotinin, Trypsin inhibitor (basic)



<b>Chemical Name:</b>	N/A
<b>Canonical SMILES:</b>	<chem>CC(O)=O.CC.CC.CCccC.[R].[P].[2H].[L].[E].[P].[P].[Y].[3H].[G].[KH].[R].[R].[Y].F.[Y].[*].[L].F.[V].[Y].[G].[G].[R].[KH].[R].N.N.F.[KH].S.[*].[2H].[R].[G].[G].[*].[KH].[*].[3H].C.[*].F.[P].[*].I.I.N.[Q].[3H].[M]</chem>
<b>Solubility:</b>	≥195mg/mL in H <sub>2</sub> O
<b>Storage:</b>	Store at 2-8°C
<b>General tips:</b>	For obtaining a higher solubility, please warm the tube at 37° C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20° C for several months.
<b>Shopping Condition:</b>	Evaluation sample solution : ship with blue ice All other available size: ship with RT, or blue ice upon request

### Biological Activity

<b>Targets :</b>	Proteases
<b>Pathways:</b>	Serine Protease
<b>Description:</b>	

Aprotinin, a naturally occurring serine protease inhibitor, saves lives and decreases the risk of stroke and repeat surgery for massive bleeding<sup>1, 2, 3</sup>.

The use of aprotinin did not significantly increase the risk of renal failure or the need for

postoperative renal replacement despite an increase in the proportion of patients who had a doubling of serum creatinine levels. The adjudication of death did not identify renal failure as contributing to or causing death associated with aprotinin use. A Meta analysis by Brown and colleagues showed a nonsignificant relative risk of renal failure with high-dose aprotinin<sup>4</sup>. Although aprotinin is potentially more effective than other active agents in controlling hemostasis, we noted only a possible trend suggesting that it decreased massive bleeding. Only repeat surgeries and important blood losses through chest tubes, one of the main indications for surgery, were potentially improved by the use of aprotinin. Aprotinin did not appear to prevent massive bleeding or save the life of patients who had massive bleeding.

The adverse effects on mortality associated with aprotinin may also have been present among healthier patients, those under the age of 65 years, and those without coexisting illnesses at the time of surgery.

Despite the possibility of a modest reduction in the risk of massive bleeding, the strong and consistent negative mortality trend associated with aprotinin as compared with lysine analogues precludes its use in patients undergoing high-risk cardiac surgery<sup>5</sup>.

### **Reference:**

1. Henry DA, Carless PA, Moxey AJ, et al. *Anti-fibrinolytic use for minimising perioperative allogeneic blood transfusion. Cochrane Database Syst Rev 2007;4:CD001886.*
2. Levi M, Cromheecke ME, de Jonge E, et al. *Pharmacological strategies to decrease excessive blood loss in cardiac surgery: a meta-analysis of clinically relevant endpoints. Lancet 1999;354:1940-7.*
3. Sedrakyan A, Treasure T, Elefteriades JA. *Effect of aprotinin on clinical outcomes in coronary artery bypass graft surgery: a systematic review and meta-analysis of randomized clinical trials. J Thorac Cardiovasc Surg 2004;128:442-8.*
4. Brown JR, Birkmeyer NJ, O'Connor GT. *Meta-analysis comparing the effectiveness and adverse outcomes of antifibrinolytic agents in cardiac surgery. Circulation 2007;115:2801-13.*
5. Dean A, Fergusson, Paul C, Hébert et al, *A Comparison of Aprotinin and Lysine Analogues in High-Risk Cardiac Surgery, N Engl J Med 2008; 358:2319-2331*

## **Protocol**

### **Cell experiment:**

Cell lines	HUVEC cells
Preparation method	The solubility of this compound in DMSO is >10 mM. General tips for obtaining a higher concentration: Please warm the tube at 37 °C for 10 minutes and/or shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.
Reacting conditions	1600 kIU/mL, 60 min
Applications	Aprotinin dose-dependently inhibited the TNF- $\alpha$ -induced expression of ICAM-1 and VCAM-1, but not E-selectin.

## Animal experiment [3]:

Animal models	3- to 4-mo-old male Albino Wistar rats
Dosage form	The rats were anesthetized by 50 mg/kg of ketamine initially and treated with 12 mmHg pneumoperitoneum for 4h. Additional lower doses of ketamine were administered i.p. until the end of pneumoperitoneum to maintain anesthesia. A loading aprotinin dose of 28000 KIU/kg was given i.p. after the onset of pneumoperitoneum, followed by lower maintenance doses (7500 KIU/kg), which were administered per hour until the termination. Splanchnic reperfusion period lasted 60 or 180 min.
Applications	Treatment of aprotinin caused reduction of several cytokines and markers (TNF- $\alpha$ , IL-6, endothelin 1, C reactive protein, PAB and carbonyl proteins) of oxidative stress in all tissues (liver, small intestine, and lung) studied.
Other notes	Please test the solubility of all compounds indoor, and the actual solubility may slightly differ with the theoretical value. This is caused by an experimental system error and it is normal.

### Reference:

[1] Asimakopoulos G, Lidington E A, Mason J, et al. Effect of aprotinin on endothelial cell activation. *The Journal of thoracic and cardiovascular surgery*, 2001, 122(1): 123-128.

[2] Baltatzis M, Pavlidis T E, Ouroumidis O, et al. Aprotinin reduces oxidative stress induced by pneumoperitoneum in rats. *Journal of Surgical Research*, 2014, 189(2): 238-248.

## Product Citations

1. Ying Long, Xuri Zhang, et al. "Initial events in the breakthrough of the epithelial barrier of the small intestine by *Angiostrongylus cantonensis*." *Arch Biol Sci*. 2016;68(2):375-383

## Caution

**FOR RESEARCH PURPOSES ONLY.**

**NOT FOR HUMAN, VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.**

*Specific storage and handling information for each product is indicated on the product datasheet. Most ApexBio products are stable under the recommended conditions. Products are sometimes*

*shipped at a temperature that differs from the recommended storage temperature. Shortterm storage of many products are stable in the short-term at temperatures that differ from that required for long-term storage. We ensure that the product is shipped under conditions that will maintain the quality of the reagents. Upon receipt of the product, follow the storage recommendations on the product data sheet.*

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