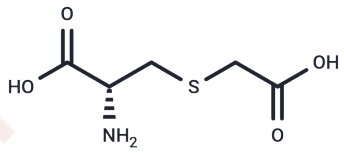
Data Sheet (Cat.No.T212858)

TargetMol

Carbocisteine

Chemical Properties



CAS No. : 638-23-3

Formula: C5H9NO4S

Molecular Weight: 179.2

Storage: Powder: -20°C for 3 years | In solvent: -80°C for 1 year
Actual storage temperature shall be subject to the COA.

Biological Description

Description	Carbocisteine is an orally effective mucolytic agent. It inhibits the phosphorylation of NF-κB p65 and ERK1/2, regulates the crosstalk between Nrf2/HO-1 and NF-κB, and inhibits apoptosis, making it applicable in chronic obstructive pulmonary disease (COPD) research.
Targets(IC50)	NF-κB,PERK
In vitro	Methods: A549 cells and human alveolar epithelial cells were treated with 10-1000 μM Carbocisteine for 24 h; human airway epithelial cells were pretreated with 10 μM L-Carbocisteine for 3 days before infection; in addition, human airway epithelial cells were treated with 10 μM L-Carbocisteine for 72 h. The inflammation, viral infection and cell apoptosis were detected respectively. Results: 1. Carbocisteine (10-1000 μM, 24 h) could alleviate hydrogen peroxide-induced inflammatory damage in A549 cells through the NF-κB and ERK1/2 MAPK pathways [4]. 2. Pretreatment with Carbocisteine (10 μM) 3 days before infection could inhibit seasonal influenza A virus infection in human airway epithelial cells [5]. 3. Carbocisteine (10 μM, 72 h) could inhibit oxidative stress-induced apoptosis in human airway epithelial cells [12]. 4. Carbocisteine (10-1000 μM, 24 h) could reduce TNF-α-induced inflammatory response in human alveolar epithelial cells by inhibiting the NF-κB and ERK1/2 MAPK pathways in vitro [13].
In vivo	Methods: Carbocisteine was administered to mice and rats via intragastric gavage or oral gavage in vivo. Different doses, frequencies and courses of treatment were used to intervene in animal models of cigarette smoke exposure, viral infection, emphysema, ulcerative colitis, COPD and SO_2 exposure respectively. Indicators such as pulmonary inflammation, phagocytic function, mucin expression, oxidative stress and steroid sensitivity were detected. Results: 1. Carbocisteine (100 mg/kg, intragastric gavage, twice a day, from 1 day before cigarette smoke exposure to the end of the experiment) could alleviate virus-induced pulmonary inflammation in mice exposed to cigarette smoke [2]. 2. Carbocisteine (100 mg/kg, oral administration) could promote the phagocytosis of apoptotic cells by alveolar macrophages in BALB/c mice [3]. 3. Carbocisteine (125-250 mg/kg/d, intragastric gavage, once a week for 3 consecutive

In vivo	weeks) could prevent emphysema induced by cigarette smoke extract in rats [6]. 4. Carbocisteine (500 mg/kg/d, oral administration, twice a day for 2 consecutive days) could inhibit oxidative stress, inflammatory response and cell apoptosis induced by acetic acid in rats with ulcerative colitis by regulating the interaction between Nrf2/HO-1 and NF-κB [7]. 5. Carbocisteine (112.5-225 mg/kg/d, intragastric gavage for 12 weeks) could inhibit the expression of Muc5b in a mouse model of COPD [8]. 6. Carbocisteine (300 mg/kg, oral administration, once a day for 6 consecutive weeks) could improve steroid resistance in a rat model of COPD [9]. 7. Carbocisteine (250 mg/kg, twice a day, oral administration for 25 days) could inhibit the abnormal changes in the activities of fucosidase, sialidase, fucosyltransferase and sialyltransferase in the lung tissue of rats exposed to SO_2, and down-regulate the mRNA and protein expression of Muc5ac [10]. 8. Carbocisteine (300 mg/kg, intragastric gavage, once a day, from week 6 to week 12 of smoking exposure) targeted histone deacetylase 2 in a thiol/GSH-dependent manner, restoring steroid sensitivity in rats [11].

Solubility Information

Solubility	H2O: 1.60 mg/mL (8.93 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	5.5804 mL	27.9018 mL	55.8036 mL
5 mM	1.1161 mL	5.5804 mL	11.1607 mL
10 mM	0.558 mL	2.7902 mL	5.5804 mL
50 mM	0.1116 mL	0.558 mL	1.1161 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Note: The dilution table applies only to solid products. For liquid products, please calculate the stock solution based on the stated concentration and/or density.

Reference

Yageta Y, et al. Carbocisteine reduces virus-induced pulmonary inflammation in mice exposed to cigarette smoke. Am J Respir Cell Mol Biol. 2014 May;50(5):963-73.
Song Y, et al. Carbocysteine restores steroid sensitivity by targeting histone deacetylase 2 in a thiol/GSH-dependent manner. Pharmacol Res. 2015 Jan;91:88-98.
Yoshida M, et al. Carbocisteine inhibits oxidant-induced apoptosis in cultured human airway epithelial cells. Respirology. 2009 Sep;14(7):1027-34.
Wang W, et al. Carbocisteine attenuates TNF-α-induced inflammation in human alveolar epithelial cells in vitro through suppressing NF-κB and ERK1/2 MAPK signaling pathways. Acta Pharmacol Sin. 2016 May;37(5):629-36.
Paola Rogliani, et al. Efficacy and safety profile of mucolytic/antioxidant agents in chronic obstructive pulmonary disease: a comparative analysis across erdosteine, carbocysteine, and N-acetylcysteine. Respir Res. 2019 May 27; 20(1):104.
Inoue M, et al. Carbocisteine promotes phagocytosis of apoptotic cells by alveolar macrophages. Eur J Pharmacol. 2012 Feb 29;677(1-3):173-9.
Wang W, et al. Carbocisteine attenuates hydrogen peroxide-induced inflammatory injury in A549 cells via NF-κB and ERK1/2 MAPK pathways. Int Immunopharmacol. 2015 Feb;24(2):306-313.
Yamaya M, et al. Inhibitory effects of carbocisteine on type A seasonal influenza virus infection in human airway epithelial cells. Am J Physiol Lung Cell Mol Physiol. 2010 Aug;299(2):L160-8.
Hanaoka M, et al. Carbocisteine protects against emphysema induced by cigarette smoke extract in rats. Chest. 2011 May;139(5):1101-1108.
Abdelhamid AM, et al. Carbocisteine as a Modulator of Nrf2/HO-1 and NFκB Interplay in Rats: New Inspiration for the Revival of an Old Drug for Treating Ulcerative Colitis. Front Pharmacol. 2022 Jun 8;13:887233.
Song Y, et al. Carbocisteine inhibits the expression of Muc5b in COPD mouse model. Drug Des Devel Ther. 2019 Sep 16;13:3259-3268.
Song Y, et al. A mucoactive drug carbocisteine ameliorates steroid resistance in rat COPD model. Pulm Pharmacol Ther. 2016 Aug;39:38-47.
Ishibashi Y, et al. Effects of carbocisteine on altered activities of glycosidase and glycosyltransferase and expression of Muc5ac in SO2-exposed rats. Eur J Pharmacol. 2004 Mar 8;487(1-3):7-15.

Tel:781-999-4286 E_mail:info@targetmol.com Address:34 Washington Street,Wellesley Hills,MA 02481