

Product Data Sheet

Product Name: Trientine (hydrochloride)

Cat. No.: GC45085

Chemical Properties

Cas. No. 38260-01-4

Chemical Name N1,N2-bis(2-aminoethyl)-1,2-ethanediamine, dihydrochloride

SMILES NCCNCCNCCN.Cl.Cl

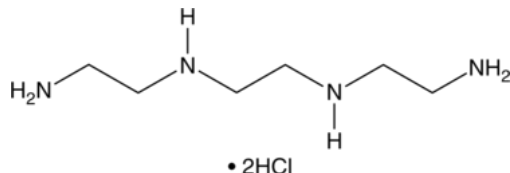
Formula $C_6H_{18}N_4 \cdot 2HCl$ M.Wt 219.2

Solubility Slightly soluble in Water Storage Store at -20°C

General tips 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.

Shipping Condition Evaluation sample solution: ship with blue ice. All other available size: ship with RT, or blue ice upon request.

Structure



Protocol

Cell experiment [1]:	
Cell lines	QRsp-11 cells
Preparation Method	QRsp-11 cells were cultured in DMEM medium, supplemented with 10% fetal bovine serum, 1% penicillin-streptomycin at 37°C in an incubator with 5% CO ₂ . Cells were seeded in triplicate into 96-well plates (5×10^3 cells/well) and allowed to adhere overnight. Cells were incubated with Trientine at 10mM for 1, 2, 3, 4, and 5 days, respectively. The cell viability was tested.

Caution: Product has not been fully validated for medical applications. For research use only.

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Reaction Conditions	10mM; 1, 2, 3, 4, and 5 days
Applications	Trientine treatment markedly reduced cell viability of QRsp-11 cells in a time-dependent manner.
Animal experiment [2]:	
Animal models	Male Sprague Dawley rats
Preparation Method	Male Sprague Dawley rats (180-220g) were kept at room temperature ($25 \pm 2^{\circ}\text{C}$), with a light-dark cycle of 12h and a humidity of $60 \pm 10\%$. Water was available to the rats at all times. Rats were fed a low-copper diet with a copper content of approximately 2mg/kg for 28 days prior to experimental procedures. Under thiopental sodium anesthesia (20mg/kg; i.p.), a midline neck incision was made to expose the trachea, and BLM was administered. 3 days before BLM administration, rats received Trientine at 110mg/kg/day. The lung tissues of the rats were collected for analysis.
Dosage form	110mg/kg/day; 3 days; p.o.
Applications	Trientine treatment mitigated BLM-induced pulmonary fibrosis and lung injury in rats.
References:[1] Hayashi M, Nishiya H, Chiba T, et al. Trientine, a copper-chelating agent, induced apoptosis in murine fibrosarcoma cells in vivo and in vitro[J]. Journal of Veterinary Medical Science, 2007, 69(2): 137-142. [2] Khalil I T, Elshal M, Elsayed N M, et al. Trientine ameliorates bleomycin-induced pulmonary fibrosis in rats through copper chelation and modulation of the CTR1/LOX/COL pathway[J]. Inflammopharmacology, 2026, 34(4): 2759-2775.	

Background

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Trientine (hydrochloride) is a synthetic polyamine that enhances intracellular polyamine metabolism and acts as a selective and orally active copper-chelating agent^[1]. Trientine reduces interstitial fibrosis by inhibiting tissue inhibitor metalloproteinase 1/2 (TIMP1/2), leading to an increase in matrix metalloproteinases (MMPs), and elevates the expression of COX11 and COX17, SCO1/2, and PGC-1 α , which improves mitochondrial biogenesis and function^[2]. Trientine has been widely used in preclinical models to inhibit the development of hepatitis and bile duct fibrosis^[3].

In vitro, Trientine treatment (4.6 μ M) for 96 hours significantly inhibited the proliferation of human umbilical vein endothelial cells (HUVECs)^[4]. Treatment with 10mM Trientine for 7 days increased p38 MAPK expression in QRsP-11 fibrosarcoma cells and induced cell apoptosis^[5].

In vivo, Trientine treatment via oral administration at a dose of 100mg/kg/day for 30 days alleviated AlCl₃-induced anxiety-like behaviors and short-term memory dysfunction, and reduced lipid peroxidation, inflammation, GSK-3 β , and acetylcholinesterase activity in the hippocampus of Wistar rats^[6]. Oral administration of Trientine at a dose of 180mg/kg/day for 3 months reduced A β deposition and synaptic loss in the brain of a transgenic mouse model of Alzheimer's disease^[7]. Oral administration of Trientine at a dose of 110mg/kg/day starting three days before intratracheal bleomycin (BLM) instillation alleviated BLM-induced pulmonary fibrosis, mitigated lung injury, and decreased collagen deposition in rats^[8]. Intragastric administration of Trientine (21.9mg/kg/day) for 6 weeks suppressed cardiac hypertrophy and reduced myocardial fibrosis in Sprague-Dawley rats undergoing transverse aortic constriction (TAC) surgery^[9].

References:

- [1] Pietrocola F, Castoldi F, Madeo F, et al. Triethylenetetramine (trientine): a caloric restriction mimetic with a new mode of action[J]. Autophagy, 2020, 16(8): 1534-1536.
- [2] Ramli F F, Hashim S A S, Raman B, et al. Role of trientine in hypertrophic cardiomyopathy: a review of mechanistic aspects[J]. Pharmaceuticals, 2022, 15(9): 1145.
- [3] Hayashi M, Miyane K, Senou M, et al. Inhibitory effects of trientine, a copper-chelating agent, on induction of DNA strand breaks in kidney cells of Long-Evans Cinnamon (LEC) rats[J]. Experimental animals, 2005, 54(5): 403-412.
- [4] Yoshii J, Yoshiji H, Kuriyama S, et al. The copper-chelating agent, trientine, suppresses tumor development and angiogenesis in the murine hepatocellular carcinoma cells[J]. International journal of cancer, 2001, 94(6): 768-773.

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- [5] Hayashi M, Nishiya H, Chiba T, et al. Trientine, a copper-chelating agent, induced apoptosis in murine fibrosarcoma cells in vivo and in vitro[J]. Journal of Veterinary Medical Science, 2007, 69(2): 137-142.
- [6] Mousavi-Nasab K, Amani M, Mostafalou S. The effect of trientine on AlCl₃-induced cognitive dysfunction and biochemical changes in the hippocampus of rats[J]. Drug Research, 2024, 74(08): 405-414.
- [7] Wang C Y, Xie J W, Xu Y, et al. Trientine reduces BACE1 activity and mitigates amyloidosis via the AGE/RAGE/NF-κB pathway in a transgenic mouse model of Alzheimer's disease[J]. Antioxidants & redox signaling, 2013, 19(17): 2024-2039.
- [8] Khalil I T, Elshal M, Elsayed N M, et al. Trientine ameliorates bleomycin-induced pulmonary fibrosis in rats through copper chelation and modulation of the CTR1/LOX/COL pathway[J]. Inflammopharmacology, 2026, 34(4): 2759-2775.
- [9] Liu J, Chen C, Liu Y, et al. Trientine selectively delivers copper to the heart and suppresses pressure overload-induced cardiac hypertrophy in rats[J]. Experimental Biology and Medicine, 2018, 243(14): 1141-1152.

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