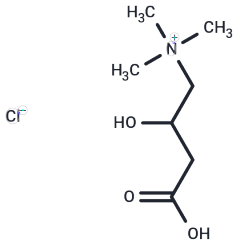
Data Sheet (Cat.No.T6475)

TargetMol

(±)-Carnitine chloride

Chemical Properties



CAS No. : 461-05-2

Formula: C7H15NO3·HCl

Molecular Weight: 197.66

Appearance: no data available

Storage: Powder: -20°C for 3 years | In solvent: -80°C for 1 year

Biological Description

Description	(±)-Carnitine chloride (Monocamin) is a quaternary ammonium compound biosynthesized from the amino acids lysine and methionine.
Targets(IC50)	Reactive Oxygen Species
In vitro	L-carnitine primarily facilitates the translocation of long-chain fatty acids across the inner mitochondrial membrane by transforming acyl-CoA into acyl-carnitine via carnitine palmitoyl transferase (CPT)-I activation. This acyl-carnitine is then converted back into acyl-CoA within the mitochondrial matrix by CPT-II. L-carnitine's introduction enhances palmitoyl-CoA-induced mitochondrial respiration, further accelerated by ADP, showcasing a concentration-dependent effect that reaches saturation at 5 mM L-carnitine[1]. Additionally, L-carnitine pre-treatment enhances Nrf2 nuclear translocation, its DNA binding activity, and heme oxygenase-1 (HO-1) expression in Water2-treated HL7702 cells, providing protection against Water2-induced cell damage through Akt-mediated Nrf2 signaling pathway activation[2].
In vivo	L-carnitine has been shown to modulate the ubiquitin-proteasome pathway and enhance IGF-1 levels in animal studies. Its administration over two weeks can mitigate muscle mass and fiber size reduction in the soleus muscle caused by hindlimb suspension. Additionally, L-carnitine inhibits atrogin-1 mRNA expression, crucial for preventing muscle atrophy. Concurrent L-carnitine treatment also reduces renal fibrosis–associated with lowered plasma TGF-β1 levels–and addresses the enhanced oxidative and inflammatory states observed in L-NAME treated groups, alongside promoting PPAR-γ expression.
Kinase Assay	Mitochondria (0.6 mg protein/mL) are incubated in 2.5 mM Hepes (pH7.4) containing 225 mM mannitol, 75 mM sucrose and 100 μM ethylene glycol tetraacetic acid (EGTA) with or without 5 mM L-carnitine at 25°C. To measure oxygen uptake, 10 min after inorganic phosphate (Pi) 4 mM are added, the mitochondria are treated with palmitoyl-CoA (50 μM) and then ADP is added (200 μM). Oligomycin (5 μM) and rotenone (10 μM) are added 3-4 min after the ADP treatment. HPG (0-10 mM), which can specifically inhibit carnitine palmitoyl transferase (CPT)-I activity in the mitochondria, is added in the Hepes medium before incubation of the mitochondria[1].

Solubility Information

Solubility	H2O: 37 mg/mL (187.19 mM),Sonication is recommended. Ethanol: < 1 mg/mL (insoluble or slightly soluble), DMSO: 45 mg/mL (227.66 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	5.0592 mL	25.296 mL	50.5919 mL
5 mM	1.0118 mL	5.0592 mL	10.1184 mL
10 mM	0.5059 mL	2.5296 mL	5.0592 mL
50 mM	0.1012 mL	0.5059 mL	1.0118 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.

Reference

Oyanagi E, et al. Protective action of L-carnitine on cardiac mitochondrial function and structure against fatty acidstress. Biochem Biophys Res Commun. 2011 Aug 19;412(1):61-7.

Li J, et al. l-carnitine protects human hepatocytes from oxidative stress-induced toxicity through Akt-mediated activation of Nrf2 signaling pathway. Can J Physiol Pharmacol. 2016 May;94(5):517-25.

Jang J, et al. l-Carnitine supplement reduces skeletal muscle atrophy induced by prolonged hindlimb suspension in rats. Appl Physiol Nutr Metab. 2016 Dec;41(12):1240-1247.

Zambrano, S., Blanca, A., Ruiz-Armenta, M., Miguel-Carrasco, J., Arevalo, M., Mate, A., & Vazquez, C. (2014). L-Carnitine Attenuates the Development of Kidney Fibrosis in Hypertensive Rats by Upregulating PPAR-. American Journal Of Hypertension, 27(3), 460-470. doi: 10.1093/ajh/hpt268