

Product Data Sheet

Product Name: ML-7 hydrochloride

Cat. No.: GC11411

Chemical Properties

Cas. No. 110448-33-4

Chemical Name 1-((5-iodonaphthalen-1-yl)sulfonyl)-1,4-diazepane hydrochloride

SMILES IC1=CC=CC2=C1C=CC=C2S(=O)(=O)N3CCCCNCC3

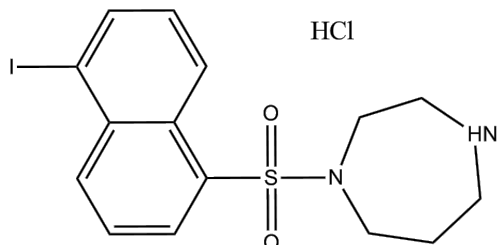
Formula $C_{15}H_{18}ClIN_2O_2S$ M.Wt 452.74

Solubility ≥ 15.95 mg/mL in DMSO, ≥ 8.82 mg/mL in Water with ultrasonic and warming
Storage Store at 2-8°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 Leukocyte

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

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The white cell layer at the separating fluid boundary was collected and washed three times with PBS. Cell pellet was resuspended in RPM1640 medium and seeded in glass slides coated with polyL. Cell was collected at 0h or 24h for TUNEL or immunofluorescence staining after incubating with ML-7 hydrochloride (20μM) or vehicle.

Reaction Conditions 20μM; 24h

Applications ML-7 hydrochloride treatment induces lysosome-mediated cell death in neutrophils from patients with sepsis.

Animal experiment [2]:

Animal models Lewis lung carcinoma cell subcutaneous tumor mice model

For *in vivo* experiments, Lewis lung carcinoma (LLC) cells were implanted subcutaneously in 6-week-old male C57BL/6 mice and irradiated when the tumor size reached approximately 150mm². For ML-7 treatment, LLC tumor-bearing mice were injected with ML-7 (0.25mg/kg) or vehicle intraperitoneally every day for 7 days before 15 Gy IR.

Dosage form 0.25mg/kg; ip; 7d

Applications ML-7 hydrochloride pretreated tumors were significantly smaller than those pretreated with vehicle control.

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References:

- [1]. Wu J, Barkat MQ, Su J, et al. Inhibition of non-muscular myosin light chain kinase accelerates the clearance of inflammatory cells by promoting the lysosome-mediated cell death. *Biomedicine & Pharmacotherapy*. 2024 Jan 1; 170: 115986.
- [2]. Kim YE, Gwak SH, Hong BJ, et al. Effects of ultra-high dose rate FLASH irradiation on the tumor microenvironment in Lewis lung carcinoma: role of myosin light chain. *International Journal of Radiation Oncology* Biology* Physics*. 2021 Apr 1;109(5):1440-1453.

Background

ML-7 hydrochloride is a selective myosin light chain kinase ($IC_{50} = 300nM$) [1]. ML-7 hydrochloride competitively inhibits the ATP binding activity of myosin light chain kinase (MLCK), thereby inhibiting MLC phosphorylation and regulating cytoskeleton, contraction and migration behavior [2]. ML-7 hydrochloride is used in research on cell biology, oncology, vascular physiology [3-4].

In leukocyte, ML-7 hydrochloride (20 μ M; 24h) treatment induces lysosome-mediated cell death in neutrophils from patients with sepsis [5]. In *Klebsiella pneumoniae*, ML-7 hydrochloride (64 μ g/mL; 24h) treatment could enhance the killing activity of tigecycline [6]. In oeFOXP2 cells, ML-7 hydrochloride (40 μ M; 48h) administration markedly increased the proliferation of cell [7].

In Lewis lung carcinoma cell subcutaneous tumor mice model, ML-7 hydrochloride (0.25mg/kg; ip; 7d) pretreated tumors were significantly smaller than those pretreated with vehicle control [8]. In the mouse model treated with trimellitic anhydride, injection of ML-7 hydrochloride (1mg/kg; ip; 5d) significantly inhibited the exacerbation of scratching behavior induced by immobilization stress [9].

References:

- [1]. Simoes RL, Fierro IM. Involvement of the Rho-kinase/myosin light chain kinase pathway on human monocyte chemotaxis induced by ATL-1, an aspirin-triggered lipoxin A4 synthetic analog. *The Journal of Immunology*. 2005 Aug 1; 175(3): 1843-1850.
- [2]. Ran Q, Li A, Tan Y, et al. Action and therapeutic targets of myosin light chain kinase, an important cardiovascular signaling mechanism. *Pharmacological Research*. 2024 Jun 27: 107276.
- [3]. Xiong Y, Wang C, Shi L, et al. Myosin light chain kinase: a potential target for treatment of

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inflammatory diseases. *Frontiers in pharmacology*. 2017 May 23; 8: 292.

[4]. Gu LZ, Hu WY, Antic N, et al. Inhibiting myosin light chain kinase retards the growth of mammary and prostate cancer cells. *European journal of cancer*. 2006 May 1; 42(7): 948-957.

[5]. Wu J, Barkat MQ, Su J, et al. Inhibition of non-muscular myosin light chain kinase accelerates the clearance of inflammatory cells by promoting the lysosome-mediated cell death. *Biomedicine & Pharmacotherapy*. 2024 Jan 1; 170: 115986.

[6]. Sun L, Sun L, Li X, et al. A novel tigecycline adjuvant ML-7 reverses the susceptibility of tigecycline-resistant *Klebsiella pneumoniae*. *Frontiers in Cellular and Infection Microbiology*. 2022 Jan 5; 11: 809542.

[7]. Chang S. Effect of forkhead box protein P2-mediated activation of myosin light-chain kinase on the invasion and migration of endometrial cancer cells. *CytoJournal*. 2025 May 14; 22: 54.

[8]. Kim YE, Gwak SH, Hong BJ, et al. Effects of ultra-high dose rate FLASH irradiation on the tumor microenvironment in Lewis lung carcinoma: role of myosin light chain. *International Journal of Radiation Oncology* Biology* Physics*. 2021 Apr 1;109(5):1440-1453.

[9]. Cho DE, Hong JP, Kim Y, et al. Role of gut-derived bacterial lipopolysaccharide and peripheral TLR4 in immobilization stress-induced itch aggravation in a mouse model of atopic dermatitis. *Scientific reports*. 2024 Mar 15; 14(1): 6263.

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