

Product Data Sheet

Product Name: ML351
Cat. No.: GC13386

Chemical Properties

Cas. No. 847163-28-4

Chemical Name 5-(methylamino)-2-(1-naphthalenyl)-4-oxazolecarbonitrile

SMILES CNC1=C(C#N)N=C(O1)C2=C3C(C=CC=C3)=CC=C2

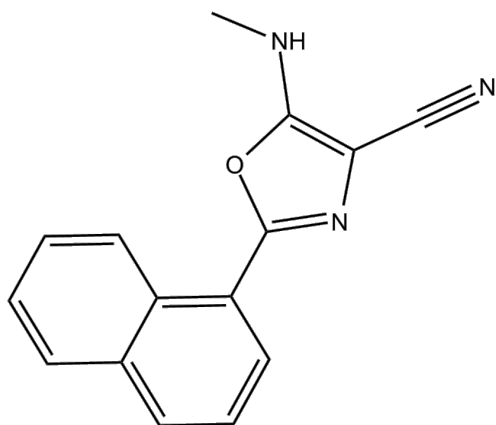
Formula $C_{15}H_{11}N_3O$ M.Wt 249.3

Solubility $\leq 25\text{mg/ml}$ in DMSO; 25mg/ml in dimethyl formamide 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]:

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

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Cell lines	Peritoneal macrophage (PM ϕ)
Preparation method	PM ϕ were isolated from male C57BL/6 mice after injection of cold media (DMEM with 10% heat inactivated FBS, 1% antibiotic/antimycotic) into the peritoneal cavity. After 4–6 h at 37°C, 5% CO ₂ in the incubator, cells are well attached and ready for experiments. ML351 (10 μ M) was added in direct contact to the cells for 2 h.
Reaction Conditions	10 μ M ; 2 h
Applications	ML351 decreased 12LOX gene expression (0.52 fold) and 15LOX gene expression (0.73 fold) with no change in 5LOX expression compared with the control group.
Animal experiment [2]:	
Animal models	NOD/ShiLTJ (NOD) mice
Preparation method	Six-week-old NOD mice were injected intraperitoneally with vehicle or 24 mg/kg ML351 daily for 2 weeks.
Dosage form	24 mg/kg; i.p.

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Applications

Treatment of NOD mice with ML351 led to improved glycemic control and significantly reduced insulinitis.

References:

- [1]Tourki B, Black L M, Kain V, et al. Lipoyxygenase inhibitor ML351 dysregulated an innate inflammatory response leading to impaired cardiac repair in acute heart failure[J]. Biomedicine & Pharmacotherapy, 2021, 139: 111574.
- [2]Hernandez-Perez M, Chopra G, Fine J, et al. Inhibition of 12/15-lipoyxygenase protects against β -cell oxidative stress and glycemic deterioration in mouse models of type 1 diabetes[J]. Diabetes, 2017, 66(11): 2875-2887.

Background

ML351 is a selective 15-lipoyxygenase-1 (15-LOX-1; 12/15-LOX) inhibitor with an IC₅₀ of 200nM^[1]. 15-LOX-1 is a member of the lipid oxidase family that can trigger phospholipid peroxidation in the plasma membrane. By inhibiting 15-LOX-1, ML351 can reduce the production of harmful oxidative products in cells^[2].

In vitro, HT-22 cells treated with ML351 (0-10 μ M) dose-dependently reversed glutamate-induced cell death^[1]. ML351 (10 μ M) treatment of peritoneal macrophages (PM ϕ) cells for 2 h inhibited the inflammatory response induced by Kdo2-Lipid A and suppressed the mRNA expression of 12/15LOX and inducible nitric oxide synthase (iNOS)^[3].

In vivo, ML351 (50 mg/kg) treated with acute heart failure mice by subcutaneous injection significantly reduced myocardial infarction size on days 1 and 5, increased CD11b expression, and reduced inflammatory responses in the heart and spleen^[3]. ML351 (24 mg/kg) treated with intraperitoneal injection in non-obese diabetic (NOD) mice for 8 weeks reduced blood glucose levels, reduced oxidative stress markers in pancreatic β cells, and increased antioxidant enzyme levels^[4]. ML351 (50 μ M/kg) treated with intraperitoneal injection in rats undergoing orthodontic treatment for 14 days strongly inhibited orthodontic-induced root resorption (OIRR) and suppressed the appearance of osteoclasts and odontoclasts^[5].

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References:

- [1] Rai G, Joshi N, Perry S, et al. Discovery of ML351, a potent and selective inhibitor of human 15-lipoxygenase-1[J]. Probe Reports from the NIH Molecular Libraries Program [Internet], 2014.
- [2] Cakir-Aktas C, Bodur E, Yemisci M, et al. 12/15 Lipoxygenase Inhibition Attenuates Neuroinflammation by Suppressing Inflammasomes[J]. Frontiers in cellular neuroscience, 2023, 17: 1277268.
- [3] Tourki B, Black L M, Kain V, et al. Lipoxygenase inhibitor ML351 dysregulated an innate inflammatory response leading to impaired cardiac repair in acute heart failure[J]. Biomedicine & Pharmacotherapy, 2021, 139: 111574.
- [4] Hernandez-Perez M, Chopra G, Fine J, et al. Inhibition of 12/15-lipoxygenase protects against β -cell oxidative stress and glycemic deterioration in mouse models of type 1 diabetes[J]. Diabetes, 2017, 66(11): 2875-2887.
- [5] Nashiro-Oyakawa Y, Hotokezaka Y, Hotokezaka H, et al. Inhibition of 12/15-lipoxygenase reduces orthodontically induced root resorption in rats[J]. The Angle Orthodontist, 2024.

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