N-Ethylmaleimide

Cat. No.: HY-D0843

CAS No.: 128-53-0

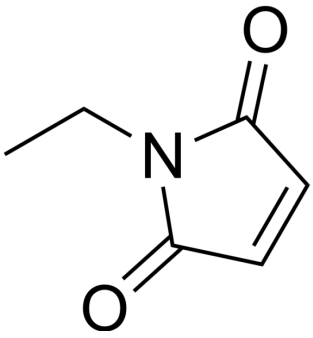
Molecular Formula: $C_6H_7NO_2$

Molecular Weight: 125.13

Target: Cathepsin; Deubiquitinase; Apoptosis

Pathway: Metabolic Enzyme/Protease; Cell Cycle/DNA Damage; Apoptosis

Storage: 4°C, protect from light
* In solvent : -80°C, 6 months; -20°C, 1 month (protect from light)



SOLVENT & SOLUBILITY

In Vitro

H_2O : 50 mg/mL (399.58 mM; Need ultrasonic)
DMSO : 50 mg/mL (399.58 mM; Need ultrasonic)
Ethanol : 12.5 mg/mL (99.90 mM; Need ultrasonic)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	7.9917 mL	39.9584 mL	79.9169 mL
5 mM	1.5983 mL	7.9917 mL	15.9834 mL
10 mM	0.7992 mL	3.9958 mL	7.9917 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 100 mg/mL (799.17 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.08 mg/mL (16.62 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (16.62 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (16.62 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

N-Ethylmaleimide (NEM) derives from maleic acid, it can alkylates free sulfhydryl. N-Ethylmaleimide is an irreversible cysteine protease inhibitor. N-ethylmaleimide specific inhibits phosphate transport in mitochondria. N-Ethylmaleimide inhibits prolyl endopeptidase with an IC_{50} value of 6.3 μM. N-Ethylmaleimide can be used to modify cysteine residues in proteins and peptides[1][2][3].

IC_{50} & Target	IC50: 6.3 μM (prolyl endopeptidase)[2]

In Vitro

N-Ethylmaleimide (20 μM;30 min) inhibits Akt Ser-473, Akt Thr-308 , p70S6K, ribosomal protein S6, 4E-BP1, eIF4E, BAD and FKHR-L1 phosphorylation[2].
N-Ethylmaleimide (20 μM;30 min) affects conversion of pro-caspase-3 in vascular smooth muscle cells[2].
N-Ethylmaleimide (20 μM;6 h) promotes vascular smooth muscle cells apoptosis[2].
N-Ethylmaleimide (20 μM;30 min) affects PP2A activity and ROS production in vascular smooth muscle cells[2].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Western Blot Analysis[2]

Cell Line:	Vascular smooth muscle cells
Concentration:	20 μM
Incubation Time:	2 hours
Result:	Effectively inhibited platelet-derived growth factor-BB (PDGF-BB)-stimulated Akt Ser-473 , Akt Thr-308, p70S6K, ribosomal protein S6, 4E-BP1, BAD and FKHR-L1 phosphorylation with a concentration of 20 μM.

Western Blot Analysis[2]

Cell Line:	Vascular smooth muscle cells
Concentration:	20 μM
Incubation Time:	2 hours
Result:	Increased of 1.8-fold in the conversion of pro-caspase-3 into active form, and showed better effect with 20 ng/ml PDGF-BB adding.

Apoptosis Analysis[2]

Cell Line:	Vascular smooth muscle cells
Concentration:	20 μM
Incubation Time:	6 hours
Result:	Induced vascular smooth muscle cells apoptosis by 3-fold, and exhibited 5-fold apoptosis with 20 ng/ml PDGF-BB adding.

Cell Viability Assay[2]

Cell Line:	Vascular smooth muscle cells
Concentration:	20 μM
Incubation Time:	30 min
Result:	Increased PP2A activity 1.7-flod and increased ROS production 2-fold in vascular smooth muscle cells.

In Vivo

N-Ethylmaleimide (10 mg/kg; i.h.) promotes the prevalence situation of mice with acute gastric ulcers[3].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Male Wistar rats with acute gastric ulcers induced by absolute ethanol injection[3]

Dosage:	10 mg/kg
Administration:	Subcutaneous injection; 10 mg/kg once
Result:	Increased the lesion area of acute gastric ulcers and attenuated the gastroprotective effect of PAG in rats.

CUSTOMER VALIDATION

- Adv Sci (Weinh). 2023 Jan 15;e2203869.
- J Exp Clin Cancer Res. 2023 Mar 30;42(1):77.
- Clin Transl Med. 2023 Jul;13(7):e1333.
- Cell Chem Biol. 2021 Nov 23;S2451-9456(21)00482-7.
- Cell Death Discov. 2022 Mar 9;8(1):107.

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REFERENCES

[1]. Moriyama A, et al. Porcine muscle prolyl endopeptidase and its endogenous substrates. J Biochem. 1988 Jul;104(1):112-7.

[2]. Yellaturu CR, et al. N-Ethylmaleimide inhibits platelet-derived growth factor BB-stimulated Akt phosphorylation via activation of protein phosphatase 2A. J Biol Chem. 2002 Oct 18;277(42):40148-55.

[3]. Matsuda H, et al. Roles of capsaicin-sensitive sensory nerves, endogenous nitric oxide, sulfhydryls, and prostaglandins in gastroprotection by momordin Ic, an oleanolic acid oligoglycoside, on ethanol-induced gastric mucosal lesions in rats. Life Sci. 1999;65(2):PL27-32.

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