Nifedipine

Cat. No.: HY-B0284

CAS No.: 21829-25-4

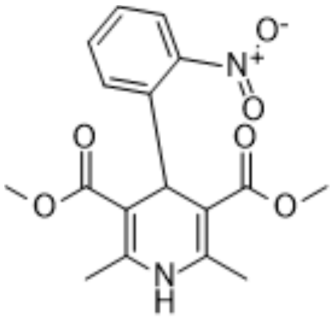
Molecular Formula: $C_{17}H_{18}N_2O_6$

Molecular Weight: 346.33

Target: Calcium Channel; Autophagy

Pathway: Membrane Transporter/Ion Channel; Neuronal Signaling; Autophagy

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



SOLVENT & SOLUBILITY

In Vitro

DMSO : 100 mg/mL (288.74 mM; Need ultrasonic)
H_2O : < 0.1 mg/mL (ultrasonic;warming;heat to 80°C) (insoluble)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	2.8874 mL	14.4371 mL	28.8742 mL
5 mM	0.5775 mL	2.8874 mL	5.7748 mL
10 mM	0.2887 mL	1.4437 mL	2.8874 mL

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

In Vivo

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
Solubility: ≥ 2.5 mg/mL (7.22 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Nifedipine (BAY-a-1040) is a potent calcium channel blocker and agent of choice for cardiac insufficiencies.

In Vitro

Nifedipine (BAY-a-1040) (100 μM) significantly lowers the viability of the WKPT-0293 Cl.2 Cells, and treatment of nifedipine (10 or 100 μM) plus FAC induces a significant reduction in cell viability, but there are no significant differences in viability between the control cells and the cells treated with 100 μM of FAC or 1 and 10 μM of nifedipine.Nifedipine (BAY-a-1040) (1, 10, or 100 μM) significantly increases iron level in WKPT-0293 Cl.2 cells. Nifedipine treatment also increases expression of TfR1, DMT1+IRE and DMT1-IRE in WKPT-0293 Cl.2 cells. In addition, co-treatment with nifedipine (100 μM) and FAC (100 μM) increases TfR1, DMT1+IRE and DMT1-IRE expression in WKPT-0293 Cl.2 cells[2]. Nifedipine plus ritodrine produces a significantly greater inhibition of contractility than each drug alone in the midrange of concentrations. The combination of nifedipine plus nitroglycerin or nifedipine plus atosiban produces a significantly greater inhibition than nitroglycerin or atosiban alone but not greater than nifedipine. The combination of nifedipine plus NS-1619 (Ca^{2+}-activated K^+ [BKCa] channel opener) reduces the inhibitory effect of each drug[3]. Nifedipine (BAY-a-1040) (2 μM) significantly inhibits P. capsici mycelial growth and sporulation. Nifedipine (BAY-a-1040)-induced inhibition of mycelial growth is calcium-dependent.

	Nifedipine (0.5 μM) increases P. capsici sensitivity to H_2O_2 in a calcium-dependent manner[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	In Nifedipine (BAY-a-1040) (50 mg/kg)- and CsA-treated rats, the BL dimensions (BLi and BLk), MD dimensions (MDk) and vertical dimensions (VHi and VHk) are significantly increased ($P < 0.05$) at the end of the 4th week[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Cell Assay [2]	Cell viability is assessed using an MTT assay. Briefly, a total of 25 μL MTT (1 g/L in PBS) is added to each well before incubation is conducted at 37°C for 4 h. The assay is stopped by the addition of a 100 μL lysis buffer (20% SDS in 50% N'Ndimethylformamide, pH 4.7). Optical density (OD) is measured at the 570 nm wavelength by the use of an ELX-800 microplate assay reader and the results are expressed as a percentage of the absorbance measured in the control cells. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Animal Administration [1]	All the 30 rats are randomLy distributed into three equal groups of ten animals each. Group 1 (control) receive olive oil for the 8 weeks. Group 2 and Group 3 receive a combination of CsA (30 mg/kg body weight) and Nf (50 mg/kg body weight) in olive oil for 8 weeks. In Group 3 rats, Azi (10 mg/kg body weight) is added to this regimen, in the 5th week. The total study period is 8 weeks. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Cell Stem Cell. 2024 Jan 4;31(1):52-70.e8.
- Biol Psychiatry. 2021 Jun 1;89(11):1084-1095.
- Cell Commun Signal. 2022 Aug 26;20(1):130.
- Phytomedicine. 23 August 2021, 153687.
- Sci Signal. 2020 Nov 24;13(659):eaax0273.

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REFERENCES

[1]. Ratre MS, et al. Effect of azithromycin on gingival overgrowth induced by cyclosporine A + nifedipine combination therapy: A morphometric analysis in rats. J Indian Soc Periodontol. 2016 Jul-Aug;20(4):396-401.

[2]. Yu SS, et al. Nifedipine Increases Iron Content in WKPT-0293 Cl.2 Cells via Up-Regulating Iron Influx Proteins. Front Pharmacol. 2017 Feb 13;8:60

[3]. Carvajal JA, et al. The Synergic In Vitro Tocolytic Effect of Nifedipine Plus Ritodrine on Human Myometrial Contractility. Reprod Sci. 2017 Apr;24(4):635-640.

[4]. Liu P, et al. The L-type Ca(2+) Channel Blocker Nifedipine Inhibits Mycelial Growth, Sporulation, and Virulence of Phytophthora capsici. Front Microbiol. 2016 Aug 4;7:1236.

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

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