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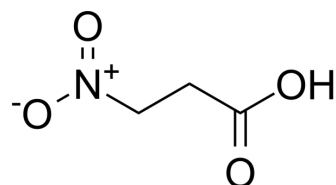
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3-Nitropropanoic acid

Cat. No.:	HY-W012875
CAS No.:	504-88-1
Molecular Formula:	C ₃ H ₅ NO ₄
Molecular Weight:	119.08
Target:	Apoptosis; Bacterial; Autophagy
Pathway:	Apoptosis; Anti-infection; Autophagy
Storage:	4°C, sealed storage, away from moisture and light * In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture and light)



SOLVENT & SOLUBILITY

In Vitro	DMSO : 125 mg/mL (1049.71 mM; Need ultrasonic)			
	H ₂ O : 100 mg/mL (839.77 mM; Need ultrasonic)			
		Solvent Concentration	Mass	
			1 mg	5 mg
Preparing Stock Solutions	1 mM	8.3977 mL	41.9886 mL	83.9772 mL
	5 mM	1.6795 mL	8.3977 mL	16.7954 mL
	10 mM	0.8398 mL	4.1989 mL	8.3977 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: ≥ 2.17 mg/mL (18.22 mM); Clear solution 2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline) Solubility: ≥ 2.08 mg/mL (17.47 mM); Clear solution 3. Add each solvent one by one: 10% DMSO >> 90% corn oil Solubility: ≥ 2.08 mg/mL (17.47 mM); Clear solution			

BIOLOGICAL ACTIVITY

Description	3-Nitropropanoic acid (β-Nitropropionic acid) is an irreversible and orally active inhibitor of succinate dehydrogenase. 3-Nitropropanoic acid exhibits potent antimycobacterial activity with a MIC value of 3.3 μM. 3-Nitropropanoic acid can induce cell apoptosis ^{[1][2]} .
IC₅₀ & Target	succinate dehydrogenase ^[1]
In Vitro	3-Nitropropanoic acid (5 mM, 3 h) induces autophagy and disrupts mitochondrial morphology in SH-SY5Y cells ^[3] .

3-Nitropropanoic acid (5 mM, 24 h) induces oxidative stress and apoptosis of granulosa cells in geese^[4].
3-Nitropropanoic acid (0-15 mM, 48 h) induces cell death in cultured rat hippocampal neurons^[5].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Western Blot Analysis^[4]

Cell Line:	Granulosa cells
Concentration:	5 mM
Incubation Time:	24 h
Result:	Increased the levels of Bax, p53 and cleaved-Caspase 3 proteins, and the ratio of Bax/Bcl-2.

In Vivo

3-Nitropropanoic acid (20 mg/kg, i.p., BW/day for 4 days) induces oxidative stress, and increases lipid peroxidation in brain regions of the Wistar rat^[6].
3-Nitropropanoic acid (100-200 mg/kg, i.p.) evokes seizures in mice^[7].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

REFERENCES

- [1]. Solesio ME, et al. 3-Nitropropionic acid induces autophagy by forming mitochondrial permeability transition pores rather than activating the mitochondrial fission pathway. *Br J Pharmacol*. 2013 Jan;168(1):63-75.
- [2]. Kang B, et al. Effect of 3-nitropropionic acid inducing oxidative stress and apoptosis of granulosa cells in geese. *Biosci Rep*. 2018 Sep 12;38(5):BSR20180274.
- [3]. Pang Z, Geddes JW. Mechanisms of cell death induced by the mitochondrial toxin 3-nitropropionic acid: acute excitotoxic necrosis and delayed apoptosis. *J Neurosci*. 1997 May 1;17(9):3064-73.
- [4]. Túnez I, et al. Protective effect of melatonin on 3-nitropropionic acid-induced oxidative stress in synaptosomes in an animal model of Huntington's disease. *J Pineal Res*. 2004 Nov;37(4):252-6.
- [5]. Urbanska EM, et al. A. Mitochondrial toxin 3-nitropropionic acid evokes seizures in mice. *Eur J Pharmacol*. 1998 Oct 16;359(1):55-8.
- [6]. Huang LS, et al. 3-nitropropionic acid is a suicide inhibitor of mitochondrial respiration that, upon oxidation by complex II, forms a covalent adduct with a catalytic base arginine in the active site of the enzyme. *J Biol Chem*. 2006 Mar 3;281(9):5965-72.
- [7]. Chomcheon P, et al. 3-Nitropropionic acid (3-NPA), a potent antimycobacterial agent from endophytic fungi: is 3-NPA in some plants produced by endophytes? *J Nat Prod*. 2005 Jul;68(7):1103-5.

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

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