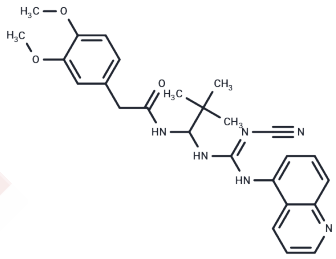
Data Sheet (Cat.No.T3690)

TargetMol

A-740003

Chemical Properties



CAS No. : 861393-28-4

Formula: C26H30N6O3

Molecular Weight: 474.55

Appearance: no data available

Storage: Powder: -20°C for 3 years | In solvent: -80°C for 1 year

Biological Description

Description	A-740003 (A 740003) is an effective and specific P2X7 receptor antagonist (IC50: 18/40 nM, for rat/human). It can reduce nociception in animal models of persistent neuropathic and inflammatory pain, and also reduce neuroblastoma tumor growth in mice.
Targets(IC50)	P2X Receptor
In vitro	A-438079 and A-740003 (10 μM) effectively inhibit the prolonged phase of BzATP-induced responses[1] and mitigate SE-induced TNF-α expression in dentate granule neurons while increasing SE-induced neuronal death[2]. Compared to other antagonists, both compounds exhibit superior efficacy in inhibiting P2X7 receptor activation across various species, with heightened activity in rat and human compared to mouse P2X7 receptors[3]. Specifically, A-740003 robustly inhibits agonist-induced IL-1β release (IC50=156 nM) and pore formation (IC50=92 nM) in differentiated human THP-1 cells[4].
In vivo	Administering A-740003 systemically results in a dose-dependent reduction of pain (antinociception) in rats, as evidenced in a spinal nerve ligation model (ED50=19 mg/kg i.p.), indicating its potency. Furthermore, A-740003 diminishes sensitivity to touch (tactile allodynia) in models of neuropathic pain, including chronic constriction of the sciatic nerve and vincristine-induced neuropathy. It also significantly lowers increased sensitivity to heat (thermal hyperalgesia) following the intraplantar introduction of carrageenan or complete Freund's adjuvant (ED50=38-54 mg/kg i.p.). However, A-740003 does not affect acute thermal pain in healthy rats and does not impair motor skills at doses that relieve pain.

Solubility Information

Solubility	DMSO: 9.5 mg/mL (20.02 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	2.1073 mL	10.5363 mL	21.0726 mL
5 mM	0.4215 mL	2.1073 mL	4.2145 mL
10 mM	0.2107 mL	1.0536 mL	2.1073 mL
50 mM	0.0421 mL	0.2107 mL	0.4215 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Reference

Kim, J., Ryu, H., & Kang, T. (2011). P2X7 receptor activation ameliorates CA3 neuronal damage via a tumor necrosis factor-α-mediated pathway in the rat hippocampus following status epilepticus. Journal Of Neuroinflammation, 8 (1), 62. doi: 10.1186/1742-2094-8-62

Xiao Z, Xu M, Lan L, et al. Activation of the P2X7 receptor in the dental pulp tissue contributes to the pain in rats with acute pulpitis. Molecular Pain. 2022, 18: 17448069221106844

Donnelly-Roberts DL, et al. Mammalian P2X7 receptor pharmacology: comparison of recombinant mouse, rat and human P2X7 receptors.Br J Pharmacol. 2009 Aug;157(7):1203-14. Epub 2009 Jun 22.

Tian C, Han X, He L, et al. Transient receptor potential ankyrin 1 contributes to the ATP-elicited oxidative stress and inflammation in THP-1-derived macrophage. Molecular and Cellular Biochemistry. 2020: 1-14

Honore P, et al. A-74202003 [N-(1-{[(cyanoimino)(5-quinolinylamino) methyl]amino}-2,2-dimethylpropyl)-2-(3,4-dimethoxyphenyl)acetamide], a novel and selective P2X7 receptor antagonist, dose-dependently reduces neuropathic pain in the rat. J Pharmacol Exp Th

Tian C, Han X, He L, et al. Transient receptor potential ankyrin 1 contributes to the ATP-elicited oxidative stress and inflammation in THP-1-derived macrophage[J]. Molecular and Cellular Biochemistry. 2020: 1-14.