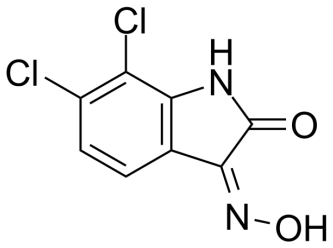
NS309

Cat. No.:	HY-15416
CAS No.:	18711-16-5
Molecular Formula:	$C_8H_4Cl_2N_2O_2$
Molecular Weight:	231.04
Target:	Potassium Channel
Pathway:	Membrane Transporter/Ion Channel
Storage:	Powder -20°C 3 years 4°C 2 years In solvent -80°C 2 years -20°C 1 year



SOLVENT & SOLUBILITY

In Vitro

DMSO : 100 mg/mL (432.83 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	4.3283 mL	21.6413 mL	43.2826 mL
	5 mM	0.8657 mL	4.3283 mL	8.6565 mL
	10 mM	0.4328 mL	2.1641 mL	4.3283 mL

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

BIOLOGICAL ACTIVITY

Description

NS309 is a potent and selective activator of the Ca^{2+}-activated SK/IK potassium channels, but displays no activity at BK channels[1][2][3][4].

IC_{50} & Target

EC50: 0.62 μM (SK2)[1], 0.3 μM (SK3)[2], ⊠20 nM (K_{Ca}3.1/SK4)[3], ⊠600 nM (K_{Ca}2/SK channels)[3], 10 nM (hIK)[4]

In Vitro

NS309 (40 nM) activates both hSK3 and hIK channels, with the largest effect on hIK channels (8.5-fold increase in current compares to 1.9-fold increase in current for hSK3 channels)[2].

NS309 (10 μM) significantly increases the whole cell SK currents and hyperpolarized detrusor smooth muscle (DSM) cells resting membrane potential[5].

NS309 inhibits the spontaneous phasic contraction amplitude, force, frequency, duration and tone of isolated DSM strips in a concentration-dependent manner[5].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

In Vivo

NS309 (2 mg/kg; i.p.) protects against SCI/R in rabbits[6].

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Animal Model:	Adult New Zealand white rabbits (2.5-3.0 kg)[6]
Dosage:	2 mg/kg
Administration:	Intraperitoneal injection
Result:	Significantly improved neurological outcome of SCI/R challenged rabbits.

REFERENCES

[1]. Specific enhancement of SK channel activity selectively potentiates the afterhyperpolarizing current I(AHP) and modulates the firing properties of hippocampal pyramidal neurons.

[2]. C Hougaard, et al. Selective positive modulation of the SK3 and SK2 subtypes of small conductance Ca2+-activated K+ channels. Br J Pharmacol. 2007 Jul; 151(5): 655–665.

[3]. Nichole Coleman, et al. New Positive Ca2+-Activated K+ Channel Gating Modulators with Selectivity for KCa3.1. Mol Pharmacol. 2014 Sep; 86(3): 342–357.

[4]. Dorte Strøbaek, et al. Activation of human IK and SK Ca2+-activated K+ channels by NS309 (6,7-dichloro-1H-indole-2,3-dione 3-oxime). Biochim Biophys Acta. 2004 Oct 11;1665(1-2):1-5.

[5]. Shankar P Parajuli, et al. NS309 decreases rat detrusor smooth muscle membrane potential and phasic contractions by activating SK3 channels. Br J Pharmacol. 2013 Apr; 168(7): 1611–1625.

[6]. Jie Zhu, et al. Activation of SK/KCa Channel Attenuates Spinal Cord Ischemia-Reperfusion Injury via Anti-oxidative Activity and Inhibition of Mitochondrial Dysfunction in Rabbits. Front Pharmacol. 2019; 10: 325.

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