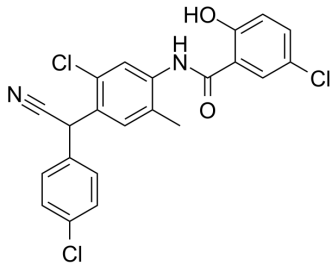
ZT-1a

Cat. No.:	HY-136532
CAS No.:	212135-62-1
Molecular Formula:	$C_{22}H_{15}Cl_3N_2O_2$
Molecular Weight:	445.73
Target:	Others
Pathway:	Others
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 (224.35 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	2.2435 mL	11.2176 mL	22.4351 mL
	5 mM	0.4487 mL	2.2435 mL	4.4870 mL
	10 mM	0.2244 mL	1.1218 mL	2.2435 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: ≥ 2.08 mg/mL (4.67 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (4.67 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (4.67 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

ZT-1a is a potent, non-ATP-competitive and selective SPAK inhibitor. ZT-1a inhibits SPAK activity with IC_{50}s of 44.3, 35.0, 46.7 μM at ATP concentrations of 0.01, 0.1 and 1 mM, respectively[1].

IC_{50} & Target

SPAK[1]

In Vitro

ZT-1a inhibits Na-K-2Cl cotransporter (NKCC1) and stimulates K-Cl cotransporters (KCCs) by decreasing their SPS1-related proline/alanine-rich kinase (SPAK)-dependent phosphorylation[1].

	ZT-1a inhibits phosphorylation of NKCC1 p-Thr203/207/212 by 72±5.2% at 1 μM ZT-1a and phosphorylation of KCC sites 1/2 by 65-77% at 3 μM in HEK-293 cells[1]. SPAK phosphorylation at Ser373 is inhibited by 70±3.8% inhibition at 3-10 μM ZT-1a[1]. ZT-1a (10 μM) inhibits NKCC1 but stimulates KCC3 activity[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	ZT-1a (10-100 mg/kg) inhibits SPAK-dependent cation-Cl− cotransporters (CCC) phosphorylation in vivo[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Naive mice[1]
Dosage:	10, 30, 50, and 100 mg/kg
Administration:	Intraperitoneal (i.p.) administration
Result:	Inhibited SPAK-dependent cation-Cl^- cotransporters (CCC) phosphorylation in vivo.

REFERENCES

[1]. Jinwei Zhang, et al. Modulation of Brain cation-Cl^- Cotransport via the SPAK Kinase Inhibitor ZT-1a. Nat Commun. 2020 Jan 7;11(1):78.

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