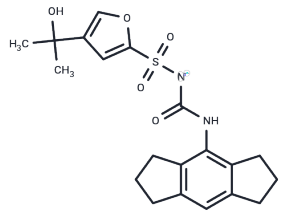
Data Sheet (Cat.No.T6887)

TargetMol

MCC950 sodium

Chemical Properties



CAS No. : 256373-96-3

Formula: C20H23N2O5S·Na

Molecular Weight: 426.46

Storage: Powder: -20°C for 3 years | In solvent: -80°C for 1 year
Actual storage temperature shall be subject to the COA.

Biological Description

Description	MCC950 sodium (CP-456773 sodium) is a potent and selective inhibitor of the inflammatory vesicle NLRP3 (IC50=7.5 nM in BMDMs; IC50=8.1 nM in HMDMs). MCC950 sodium has no effect on other inflammatory vesicles such as AIM2, NLRC4 or NLRP1.
Targets(IC50)	NOD-like Receptor (NLR),NOD
In vitro	**METHODS**: Mouse bone marrow-derived macrophages BMDM were stimulated with LPS (10 ng/mL) for 3 h, stimulated with MCC950 sodium (1-1000 nM) for 30 min, and then treated with ATP (5 mM) for 1 h. Levels of IL-1β and TNF-α were measured by ELISA. **RESULTS**: MCC950-treated cells dose-dependently inhibited the release of IL-1β in BMDM, and LPS-dependent TNF-α secretion was not impaired by MCC950. [1] MCC950 was used in the treatment of BMDM cells. **METHODS**: Mouse macrophages, human coronary artery endothelial cells and smooth muscle cells were treated with MCC950 sodium (0.02-20 μM) for 3 days, and cell viability was measured by Alamar Blue assay. **RESULTS**: MCC950 sodium had no toxic effect on the three cells. [2]
In vivo	**METHODS**: To detect anti-NLRP3 activity in vivo, MCC950 sodium (20 mg/kg) was injected intraperitoneally into a mouse model of the human CAPS disease MWS once daily for four weeks. **RESULTS**: MCC950 rescued the CAPS mouse model and inhibited NLRP3 in human MWS cells. [1] **METHODS**: To investigate the pharmacological effects on experimental spinal cord injury models in vivo and neuronal injury in vitro, MCC950 sodium (10-50 mg/kg) was intraperitoneally injected into C57BL/6 mice with spinal cord injury (SCI). **RESULTS**: MCC950 improved grip strength, hindlimb movement, spinal cord edema, and pathological damage in SCI mice. It exerted this effect by blocking NLRP3 inflammatory vesicle assembly and the release of the pro-inflammatory cytokines TNF-α, IL-1β, and IL-18. [3]
Kinase Assay	kinase activity assays: All assays are carried out in 384-well white microtiter plates. Compounds are 4-fold serially diluted in 8 steps, starting from 10 μM. The reaction mixture consisted of 25 μL assay buffer (50 mM HEPES pH 7.5, 10 mM MgCl2, 5 mM MnCl2, 1 mM DTT, 0.1 mM Na3VO4, 5 mM β-glycerol phosphate). For FLT3 assays, the reaction contains 2.0 μg/mL FLT3 enzyme, 5 μM of poly(Glu,Tyr) substrate and 4 μM of ATP. For JAK1 assays, the reaction contains 2.5 μg/mL of JAK1 enzyme, 10 μM of poly (Glu,Ala,Tyr) substrate and 1.0 μM of ATP. For JAK2 assays, the reaction contained 0.35

Kinase Assay	μg/mL of JAK2 enzyme, 10 μM of poly (Glu,Ala,Tyr) substrate and 0.15 μM of ATP. For JAK3 assays, the reaction contained 3.5 μg/mL of JAK3 enzyme, 10 μM of poly (Glu,Ala, Tyr) substrate and 6.0 μM of ATP. For TYK2 assays, the reaction contained 2.5 μg/mL of TYK2 enzyme, 10 μM of poly (Glu,Ala,Tyr) substrate and 0.15 μM of ATP. The reaction is incubated at room temperature for 2 h prior to addition of 13 μL PKLight? detection reagent. After 10 min incubation luminescent signals are read on a multi-label plate reader.
Cell Research	MCC950 is dissolved in DMSO and stored, and then diluted with appropriate media before use[1]. BMDM are seeded at 5×105/mL or 1×106/mL, HMDM at 5×105/mL and PBMC at 2×106/mL or 5×106/mL in 96 well plates. The following day the overnight medium is replaced and cells are stimulated with 10 ng/mL LPS from Escherichia coli serotype EH100 (ra) TLRgrad for 3 h. Medium is removed and replaced with serum free medium (SFM) containing DMSO (1:1,000), MCC950 (0.001-10 μM), glyburide (200 μM), Parthenolide (10 μM) or Bayer cysteinyl leukotriene receptor antagonist 1-(5-carboxy-2 {3-[4-(3-cyclohexylpropoxy)phenyl]propoxy}benzoyl)piperidine-4-carboxylic acid (40 μM) for 30 min. Cells are then stimulated with inflammasome activators: 5 mM adenosine 5'-triphosphate disodium salt hydrate (ATP) (1 h), 1 μg/mL Poly (deoxyadenylic-thymidylic) acid sodium salt (Poly dA:dT) transfected with Lipofectamine 200 (3-4 h), 200 μg/mL MSU (overnight) and 10 μM nigericin (1 h) or S. typhimurium UK-1 strain. Cells are also stimulated with 25 μg/mL Polyadenylic-polyuridylic acid (4 h). For non-canonical inflammasome activation cells are primed with 100 ng/mL Pam3CSK4 for 4 h, medium is removed and replaced with SFM containing DMSO or MCC950 and 2 μg/mL LPS is transfected using 0.25% FuGENE for 16 h. Supernatants are removed and analysed using ELISA kits. LDH release is measured using the CytoTox96 non-radioactive cytotoxicity assay[1].
Animal Research	C57BL/6 mice were injected intraperitoneally with 50 mg/kg MCC950.

Solubility Information

Solubility	H2O: 42.7 mg/mL (100.13 mM),Sonication is recommended. DMSO: 250 mg/mL (586.22 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)
In vivo Formulation	10% DMSO+40% PEG300+5% Tween 80+45% Saline: 5 mg/mL (11.72 mM),Sonication is recommended. *Please add the solvents sequentially, clarifying the solution as much as possible before adding the next one. Dissolve by heating and/or sonication if necessary. Working solution is recommended to be prepared and used immediately. The formulation provided above is for reference purposes only. In vivo formulations may vary and should be modified based on specific experimental conditions.*

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	2.3449 mL	11.7244 mL	23.4489 mL
5 mM	0.469 mL	2.3449 mL	4.6898 mL
10 mM	0.2345 mL	1.1724 mL	2.3449 mL
50 mM	0.0469 mL	0.2345 mL	0.469 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.

Note: The dilution table applies only to solid products. For liquid products, please calculate the stock solution based on the stated concentration and/or density.

Reference

Coll RC, et al. A small-molecule inhibitor of the NLRP3 inflammasome for the treatment of inflammatory diseases. Nat Med. 2015 Mar;21(3):248-55.
Luo F, Lin J.Effects of Propofol Anesthesia on Pyroptosis and the Nod-Like Receptor Protein 3/Caspase-1 Pathway in the Neonatal Rat Hippocampus.Indian Journal of Pharmaceutical Sciences.2023, 85(2): 338-343.
Grant AJ, et al. Selective NLRP3 Inflammasome Inhibitor MCC950 Suppresses Inflammation and Facilitates Healing in Vascular Materials. Adv Sci (Weinh). 2023 Jul;10(20):e2300521.
Wu X, Yi X, Zhao B, et al.The volume regulated anion channel VRAC regulates NLRP3 inflammasome by modulating itaconate efflux and mitochondria function.Pharmacological Research.2023: 107016.
Li B, Li P, Wei L, et al.Discovery and Development of NLRP3 Inhibitors Targeting the LRR Domain to Disrupt NLRP3-NEK7 Interaction for the Treatment of Rheumatoid Arthritis.Journal of Medicinal Chemistry.2024
Jiao J, et al. MCC950, a Selective Inhibitor of NLRP3 Inflammasome, Reduces the Inflammatory Response and Improves Neurological Outcomes in Mice Model of Spinal Cord Injury. Front Mol Biosci. 2020 Mar 3;7:37.