

Product Data Sheet

Product Name: CM-4620

Cat. No.: GC19107

Chemical Properties

Cas. No. 1713240-67-5

SMILES O=C(NC1=NC=C(C2=C(Cl)C=C(OC(F)(F)O3)C3=C2)N=C1)C4=C(C)C=CC=C4F

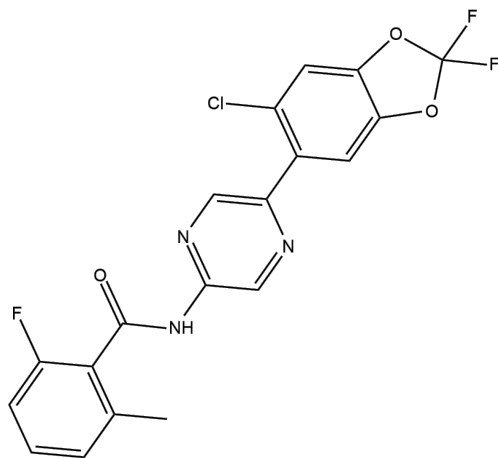
Formula $C_{19}H_{11}ClF_3N_3O_3$ M.Wt 421.76

Solubility DMSO : ≥ 100 mg/mL (237.10 mM); Water : < 0.1 mg/mL (insoluble) Storage Store at -20°C

General tips For obtaining a higher solubility, please warm the tube at 37°C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution : ship with blue ice All other available size: ship with RT, or blue ice upon request.

Structure



Protocol

Cell experiment [1]:

Cell lines Mouse cardiac fibroblasts

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

Preparation Method

Mouse cardiac fibroblast cultures were maintained at 37°C and 5% CO₂ in complete Dulbecco's modified Eagle's medium (DMEM) containing 4.5g/L glucose, 10% FBS, 100U/mL penicillin, and 100µg/mL streptomycin. Mouse cardiac fibroblasts were seeded in Seahorse 24-well tissue culture plates at a density of 4.5×10⁴ cells/well, adherent for 12h, and then treated with CM-4620 (2µM) for 48h. After treatment, the medium was replaced with unbuffered DMEM and the cells were equilibrated for 60min at 37°C in a CO₂ -free incubator. After the basal respiration rate was measured, oligomycin (1.5µM), carbonyl cyano-4-(trifluoromethoxyl) phenylhydrazone (FCCP)(1µM), and rotenone/antimycin mixture (1µM) were injected sequentially. Oxygen consumption rate (OCR) was measured in 3-minute increments over a 2-hour period. Basal mitochondrial respiration, ATP-linked respiration, proton leak, maximal respiration, nonmitochondrial respiration, and reserve respiration capacities were determined in whole cells.

Reaction Conditions

2µM; 48h

Applications

CM-4620 treatment reduced cellular oxygen consumption, resulting in a decreased relative utilization of mitochondrial oxidative phosphorylation (OXPHOS) capacity in cells under stress.

Animal experiment [2]:

Animal models

C57Bl/6 male mice

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

C57Bl/6 male mice (7 weeks old) were housed in groups with 3-5 mice per cage and maintained on a 12-h light-dark cycle with standard chow and sterile tap water ad libitum. Before the experiment, mice were acclimatized for 1 week and then randomly assigned to the following treatment groups: (1) saline group (n=3); (2) saline +20mg/kg CM-4620 group (n=3); (3) cerulein (50µg/kg) (n=4); Preparation Method (4) cerulein + 20mg/kg CM-4620 (n=4). Mice were intraperitoneally injected with 50µg/kg cerulein (or saline as a control) at 7-hour intervals, and CM-4620 (20mg/kg) was administered intraperitoneally at both time points. One hour after the last injection of cerulein/saline, mice were sacrificed by decannulation after carbon dioxide inhalation, and blood and pancreatic tissue were collected for analysis.

Dosage form 20mg/kg twice within 7h; i.p.

Applications CM-4620 treatment reduced pancreatitis responses and reduced cerulein-induced increases in blood amylase and lipase levels in mice.

References:

- [1] Pantoja Newman P S, Bajwa A, De Mario A, et al. Orai channel pharmacological manipulation reduces metabolic flexibility in cardiac fibroblasts[J]. American Journal of Physiology-Cell Physiology, 2025, 328(6): C1880-C1892.
- [2] Waldron R T, Chen Y, Pham H, et al. The Orai Ca²⁺ channel inhibitor CM4620 targets both parenchymal and immune cells to reduce inflammation in experimental acute pancreatitis[J]. The Journal of physiology, 2019, 597(12): 3085-3105.

Background

CM-4620 is a selective inhibitor of Orai channels, with IC₅₀ = 0.119µM for Orai1 and 0.895µM for Orai2^[1]. CM-4620 could inhibit the activation of the cell death pathway by inhibiting Store-operated Ca²⁺ entry (SOCE)^[2]. CM-4620 has been widely used to alleviate acute pancreatitis in mouse models^[3].

In vitro, CM-4620 (2µM) treatment for 72 hours resulted in upregulation of the expression of genes

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

involved in gluconeogenesis, glycolysis, citric acid cycle, carbohydrate metabolism, respiratory electron transport, and endoplasmic reticulum stress within mouse cardiac fibroblasts (CFs), without affecting cell proliferation^[4]. Pretreatment of pancreatic acinar cells (PAC) with 1 μ M CM-4620 for 30min resulted in a significant decrease in Ca^{2+} influx and prevented palmitic acid-induced cell necrosis^[5]. Treatment of Duchenne muscular dystrophy (DMD) patient-derived induced pluripotent stem cells (iPSCs) with 1 μ M of CM-4620 for one hour inhibited Ca^{2+} overload and reduced peak Ca^{2+} levels^[6].

In vivo, CM-4620 treatment via continuous intravenous infusion at a dose of 20mg/kg for 4 hours improved cerulein-induced acute pancreatitis and inhibited cell death signaling activation in rats^[7]. Intraperitoneal injection of CM-4620 (20mg/kg) every 12 hours for a day reduced systemic inflammatory response in a mouse model of lipopolysaccharide-induced sepsis^[8].

References:

- [1] Rubaiy H N. ORAI Calcium channels: Regulation, function, pharmacology, and therapeutic targets[J]. Pharmaceuticals, 2023, 16(2): 162.
- [2] Liang X, Zhang N, Pan H, et al. Development of store-operated calcium entry-targeted compounds in cancer[J]. Frontiers in pharmacology, 2021, 12: 688244.
- [3] Bhardwaj R, Parekh A B. CRAC channels and patho-physiology of peripheral organ systems[J]. Biochemical Society Transactions, 2025: BST20253062.
- [4] Pantoja Newman P S, Bajwa A, De Mario A, et al. Orai channel pharmacological manipulation reduces metabolic flexibility in cardiac fibroblasts[J]. American Journal of Physiology-Cell Physiology, 2025, 328(6): C1880-C1892.
- [5] Lewis S, Evans D L, Tsugorka T T, et al. Combination of the CRAC channel inhibitor CM4620 and galactose as a potential therapy for acute pancreatitis[J]. Function, 2024, 5(4): zqae017.
- [6] Skopin A Y, Glushankova L N, Gusev K O, et al. Vulnerability of Store-Operated Calcium Entry to Inhibitors and Microenvironment in Cells of Different Breast Cancer Subtypes[J]. Life, 2024, 14(3): 357.
- [7] Waldron R T, Chen Y, Pham H, et al. The Orai Ca^{2+} channel inhibitor CM4620 targets both parenchymal and immune cells to reduce inflammation in experimental acute pancreatitis[J]. The Journal of physiology, 2019, 597(12): 3085-3105.
- [8] Mei W, Zhang X, Niu M, et al. Deletion of myeloid-specific Orai1 calcium channel does not affect pancreatic tissue damage in experimental acute pancreatitis[J]. Pancreatology, 2024, 24(4): 528-537.

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA