

Product Data Sheet

Product Name: EMD638683

Cat. No.: GC17986

Chemical Properties

Cas. No. 1181770-72-8

Chemical Name N'-[2-(3,5-difluorophenyl)-2-hydroxyacetyl]-2-ethyl-4-hydroxy-3-methylbenzohydrazide

SMILES CCC1=C(C=CC(=C1C)O)C(=O)NNC(=O)C(C2=CC(=CC(=C2)F)F)O

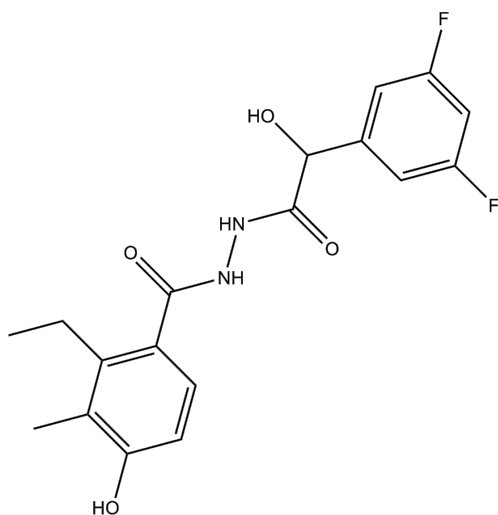
Formula $C_{18}H_{18}F_2N_2O_4$ M.Wt 364.34

Solubility ≥ 18.2 mg/mL in DMSO, ≥ 45.8 mg/mL in EtOH with gentle warming 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]:

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Cell lines	HK-2 cells (human renal proximal tubular epithelial cell line)
Preparation Method	HK-2 cells were maintained in DMEM/F12 medium supplemented with 10% fetal bovine serum (FBS) at 37°C, 5% CO ₂ . Cells were treated with the SGK1 inhibitor EMD638683 at 50μM for 72 hours under high glucose (HG; 30mM) conditions.
Reaction Conditions	50μM; 72h
Applications	EMD638683 significantly suppressed HG-induced pyroptosis in HK-2 cells, as evidenced by reduced cleavage of caspase-1 and GSDMD-N, decreased release of IL-1β and IL-18, and lower LDH activity. EMD638683 also inhibited HG-triggered phosphorylation of SGK1 and NF-κB p65, and reduced the proportion of TUNEL-positive and Annexin V-FITC/PI double-positive cells.
Animal experiment [2]:	
Animal models	Sprague-Dawley rats
Preparation Method	Rats were administered the SGK1 inhibitor EMD638683 (20mg/kg) intragastrically once daily starting 2 days prior to monocrotaline (MCT; 60mg/kg) subcutaneous injection. Rats were sacrificed 21 days after MCT injection for hemodynamic and histological analysis.
Dosage form	20mg/kg; i.g.

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Applications

EMD638683 treatment significantly attenuated MCT-induced pulmonary arterial hypertension, as evidenced by reduced right ventricular systolic pressure (RVSP) and right ventricular hypertrophy index (RVHI). EMD638683 markedly suppressed pulmonary vascular remodeling, decreasing medial wall thickness (%) of small pulmonary arteries, and inhibited macrophage infiltration in lung tissues.

References:

- [1] Shi X, Zou W, Li X, et al. SGLT2 inhibition attenuates diabetic tubulopathy by suppressing SGK1-mediated pyroptosis. *Front Endocrinol (Lausanne)*. 2025 Sep 15;16:1620230.
- [2] Towhid ST, Liu GL, Ackermann TF, et al. Inhibition of colonic tumor growth by the selective SGK inhibitor EMD638683. *Cell Physiol Biochem*. 2013;32(4):838-48.

Background

EMD638683 is a selective serum and glucocorticoid-induced kinase 1 (SGK1) inhibitor ($IC_{50}=3\mu M$)^[1]. EMD638683 can reduce the phosphorylation levels of mTOR and 4EBP1, thereby regulating cell proliferation and survival^[2]. EMD638683 has antitumor capabilities^[3]. EMD638683 also has the effect of protecting cardiac function^[4].

In vitro, co-treatment of MCF-7 breast cancer cells with EMD638683 (50 μM) and Testosterone albumin conjugates (100nM) for 24 hours significantly enhanced apoptosis and further activated Caspase-3 activity^[5]. Pretreatment of HK-2 human renal tubular epithelial cells stimulated by high glucose (30mmol/L) with EMD638683 (50 μM) for 72 hours significantly inhibited SGK1 phosphorylation and the NLRP3/caspase-1/GSDMD-N-mediated pyroptosis pathway, reduced the production of pro-inflammatory factors, and high glucose-induced apoptosis^[6].

In vivo, EMD638683 (20mg/kg) was administered orally once daily to pretreat rats with Monocrotaline (MCT; 60mg/kg)-induced pulmonary arterial hypertension (PAH). EMD638683 significantly inhibited the activity of SGK1, alleviated the increase in right ventricular systolic pressure (RVSP) and the right ventricular hypertrophy index (RVHI), and improved MCT-induced pulmonary vascular remodeling^[7]. EMD638683 (600mg/kg/day) was continuously fed to wild-type mice with chemically induced colon

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cancer by intraperitoneal injection of 1,2-dimethylhydrazine (DMH; 20mg/kg) combined with dextran sulfate sodium (DSS) in drinking water. EMD638683 significantly inhibited the growth of colon tumors, reduced the number of tumors, and increased colon length^[8].

References:

- [1] Ackermann TF, Boini KM, Beier N, et al. EMD638683, a novel SGK inhibitor with antihypertensive potency. *Cell Physiol Biochem*. 2011;28(1):137-46.
- [2] Schmid E, Stagno MJ, Yan J, et al. Serum and Glucocorticoid Inducible Kinase 1-Sensitive Survival, Proliferation and Migration of Rhabdomyosarcoma Cells. *Cell Physiol Biochem*. 2017;43(3):1301-1308.
- [3] Schmidt S, Liu G, Liu G, et al. Enhanced Orai1 and STIM1 expression as well as store operated Ca²⁺ entry in therapy resistant ovary carcinoma cells. *Oncotarget*. 2014 Jul 15;5(13):4799-810.
- [4] Wester M, Heller A, Gruber M, et al. Glucocorticoid stimulation increases cardiac contractility by SGK1-dependent SOCE-activation in rat cardiac myocytes. *PLoS One*. 2019 Sep 9;14(9):e0222341.
- [5] Liu G, Honisch S, Liu G, et al. Inhibition of SGK1 enhances mAR-induced apoptosis in MCF-7 breast cancer cells. *Cancer Biol Ther*. 2015;16(1):52-9.
- [6] Shi X, Zou W, Li X, et al. SGLT2 inhibition attenuates diabetic tubulopathy by suppressing SGK1-mediated pyroptosis. *Front Endocrinol (Lausanne)*. 2025 Sep 15;16:1620230.
- [7] Xi X, Liu S, Shi H, et al. Serum-glucocorticoid regulated kinase 1 regulates macrophage recruitment and activation contributing to monocrotaline-induced pulmonary arterial hypertension. *Cardiovasc Toxicol*. 2014 Dec;14(4):368-78.
- [8] Towhid ST, Liu GL, Ackermann TF, et al. Inhibition of colonic tumor growth by the selective SGK inhibitor EMD638683. *Cell Physiol Biochem*. 2013;32(4):838-48.

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