

Product Data Sheet

Product Name: NS 1619

Cat. No.: GC12547

Chemical Properties

Cas. No. 153587-01-0

Chemical Name 1-(2-hydroxy-5-(trifluoromethyl)phenyl)-5-(trifluoromethyl)-1H-benzo[d]imidazol-2(3H)-one

SMILES FC(F)(C1=CC=C(C(NC2=O)=C1)N2C(C=C(C(F)(F)F)C=C3)=C3O)F

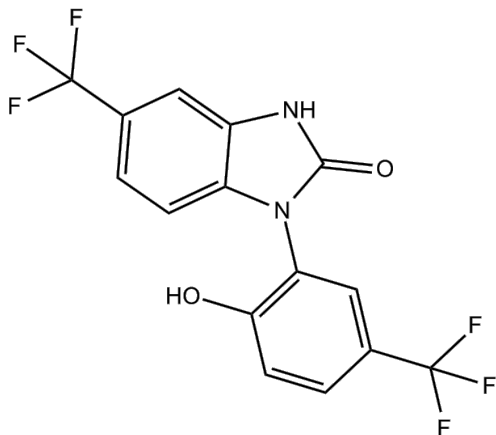
Formula $C_{15}H_8F_6N_2O_2$ M.Wt 362.23

Solubility $\geq 72.4\text{mg/mL}$ in DMSO 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 Human ovarian cancer A2780 cells

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Preparation Method The human ovarian cancer A2780 cells were cultured in RPMI 1640 supplemented with 10% fetal bovine serum at 37°C under 5% CO₂ in a humidified incubator. Cells were seeded in 96-well plates (6000cells/well) and the final volume of cell culture medium in each well was 0.1ml. The following day, cells were treated with various concentrations (5, 10, 30, 50, and 100μM) of NS 1619 for 48h. The effect of NS 1619 on cancer cell proliferation was evaluated by using the MTT colorimetric assay. The cultured cells were mounted on the stage of an inverted microscope and whole-cell K⁺ currents were recorded using glass pipettes pulled from a vertical puller and an EPC-9 patch-clamp amplifier. Fragmented DNA was analysed by agarose gel electrophoresis. Flow cytometry was used for cell apoptosis analysis. Proteins were extracted for west blotting analysis.

Reaction Conditions 5-100μM; 48h

Applications Treatment of A2780 ovarian cancer cells with NS 1619 inhibits cell proliferation in a dosage and time-dependent manner, induces cell apoptosis and DNA fragmentation, increases sub-G1 population, augments whole-cell K⁺ currents, and increases expression of p53, p21, and Bax proteins.

Animal experiment [2]:

Animal models Adult male outbred ICR mice

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Adult male outbred ICR mice were randomly assigned to two groups: Control group: mice received an intraperitoneal injection of 0.15ml of 1% DMSO 24h before heart isolation and ischemia/reperfusion (I/R); Experiment group: mice were pretreated with NS 1619 (1mg/kg; i.p.) 24h before I/R. No-flow global ischemia was attained by completely stopping the perfusate inflow. Reperfusion was achieved by reopening the buffer-perfusion line. Ventricular contractile

Preparation Method force was continuously measured with a force-displacement transducer attached to the apex of the heart and was recorded and analyzed with a computerized data acquisition and analysis system. The heart temperature was precisely maintained at 37°C throughout the experiment. Coronary flow rate was measured by timed collection of the outflow coronary perfusate. At the end of reperfusion, the heart was immediately removed from the perfusion apparatus, weighed, and stored overnight at -20°C for myocardial infarct size analysis.

Dosage form 1mg/kg; i.p.; 24 hours before ischemia/reperfusion

Applications NS 1619 significantly reduced infarct size and improved postischemic ventricular function in adult male ICR mice.

References:

[1] Han X, Xi L, Wang H, et al. The potassium ion channel opener NS1619 inhibits proliferation and induces apoptosis in A2780 ovarian cancer cells. *Biochem Biophys Res Commun*. 2008;375(2):205-209.

[2] Wang X, Yin C, Xi L, Kukreja RC. Opening of Ca²⁺-activated K⁺ channels triggers early and delayed preconditioning against I/R injury independent of NOS in mice. *Am J Physiol Heart Circ Physiol*. 2004;287(5):H2070-H2077.

Background

NS 1619 is a selective large conductance Ca²⁺-activated K⁺-channel activator^[1]. The Ca²⁺-activated K⁺ channel is a voltage- and Ca²⁺-gated potassium channel that plays a crucial role in regulating cellular excitability and ion homeostasis^[2]. NS 1619 is usually used in research on

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cardiovascular diseases and cancer^[3].

In vitro, treatment of A2780 ovarian cancer cells with NS 1619 (5-100 μ M; 48h) inhibits cell proliferation in a dosage and time-dependent manner, induces cell apoptosis and DNA fragmentation, increases sub-G1 population, augments whole-cell K⁺ currents, and increases expression of p53, p21, and Bax proteins^[4]. Treatment of rat ventricular myocytes with NS 1619 (10 μ M; 2min) inhibits L-type Ca²⁺ channels in a dose-dependent manner, and shifts the activation curve to more positive potentials but does not significantly affect the inactivation curve^[5].

In vivo, NS 1619 (1mg/kg; i.p.) significantly reduced leukocyte rolling and adhesion, prevented increases in intestinal TNF α levels, and preserved mucosal barrier function in wild-type C57BL/6J mice with intestinal ischemia/reperfusion injury^[6]. NS 1619 (1mg/kg; i.p.; 24 hours before ischemia/reperfusion) significantly reduced infarct size and improved postischemic ventricular function in adult male ICR mice^[7].

References:

- [1] Edwards G, Niederste-Hollenberg A, Schneider J, Noack T, Weston AH. Ion channel modulation by NS 1619, the putative BKCa channel opener, in vascular smooth muscle. *Br J Pharmacol*. 1994;113(4):1538-1547.
- [2] Latorre R, Brauchi S. Large conductance Ca²⁺-activated K⁺ (BK) channel: activation by Ca²⁺ and voltage. *Biol Res*. 2006;39(3):385-401.
- [3] Huang Y, Lau CW, Ho IH. NS 1619 activates Ca²⁺-activated K⁺ currents in rat vas deferens. *Eur J Pharmacol*. 1997;325(1):21-27.
- [4] Han X, Xi L, Wang H, et al. The potassium ion channel opener NS1619 inhibits proliferation and induces apoptosis in A2780 ovarian cancer cells. *Biochem Biophys Res Commun*. 2008;375(2):205-209.
- [5] Park WS, Kang SH, Son YK, et al. The mitochondrial Ca²⁺-activated K⁺ channel activator, NS 1619 inhibits L-type Ca²⁺ channels in rat ventricular myocytes. *Biochem Biophys Res Commun*. 2007;362(1):31-36.
- [6] Dai H, Wang M, Patel PN, et al. Preconditioning with the BK C_a channel activator NS-1619 prevents ischemia-reperfusion-induced inflammation and mucosal barrier dysfunction: roles for ROS and heme oxygenase-1. *Am J Physiol Heart Circ Physiol*. 2017;313(5):H988-H999.
- [7] Wang X, Yin C, Xi L, Kukreja RC. Opening of Ca²⁺-activated K⁺ channels triggers early and

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delayed preconditioning against I/R injury independent of NOS in mice. *Am J Physiol Heart Circ Physiol.* 2004;287(5):H2070-H2077.

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