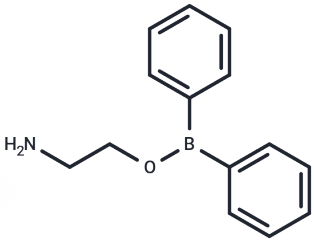
Data Sheet (Cat.No.T4693)

TargetMol

2-Aminoethyl diphenylborinate

Chemical Properties



CAS No. : 524-95-8

Formula: C14H16BNO

Molecular Weight: 225.09

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	2-Aminoethyl diphenylborinate (2-APB) is a cell-permeable inhibitor of IP3R and TRP channels. 2-Aminoethyl diphenylborinate also inhibits store-operated Ca2+ (SOC) channels and activates certain TRP channels (V1, V2, and V3). 2-Aminoethyl diphenylborinate also inhibits vasospasm. 2-Aminoethyl diphenylborinate can be used in research on calcium biology, cell signaling, oncology, and neurobiology.
Targets(IC50)	Calcium Channel,TRP/TRPV Channel
In vitro	**Methods**: RAW264.7 mouse macrophages were pretreated with 2-Aminoethyl diphenylborinate (0, 25, 50, 100 μM) for 2 hours, then co-incubated with LPS (1000 ng/mL) or IL-4 (20 ng/mL) for 24 hours. Western blot analysis detected M1/M2 markers iNOS (M1), Arg-1 (M2), and immunofluorescence analysis for $iNOS^+$ and $Arg\text{-}1^+$ cells. **Results**: 2-Aminoethyl diphenylborinate dose-dependently reduced iNOS protein expression while increasing Arg-1 and CD206 levels. Immunofluorescence confirmed that 2-Aminoethyl diphenylborinate decreased $iNOS^+$ cells and increased $Arg\text{-}1^+$ cells. [1] **Methods**: Neonatal rat atrial myocytes (NRAMs) expressing the cytoplasmic cAMP FRET sensor EPAC-SH187 were preincubated with 2-Aminoethyl diphenylborinate (2.5 μM) for 20 min. Following PE (3 μM) stimulation, cAMP levels were monitored in real-time for approximately 20 min. **Results**: 2-Aminoethyl diphenylborinate pretreatment significantly suppressed PE-induced FRET elevation, reducing the peak to 5.89 ± 5.66%. [2]
In vivo	**Methods**: DBA/1J mice, collagen-induced arthritis (CIA) model. Starting from day 28 post-immunization, intra-articular injections of 2-Aminoethyl diphenylborinate@DGP-MM (5 μL/joint, 100 μM solution) were administered every 4 days until day 49, totaling approximately 3 weeks of treatment. **Results**: The 2-Aminoethyl diphenylborinate@DGP-MM treatment group demonstrated the most significant effects in reducing arthritis scores, alleviating paw swelling, and improving joint pathology scores. [1]

Solubility Information

Solubility	DMSO: 255 mg/mL (1132.88 mM),Sonication is recommended. Ethanol: 10 mM,Heating is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)

In vivo Formulation	5% DMSO+95% Saline: 1.13 mg/mL (5.02 mM),Solution. *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	4.4427 mL	22.2133 mL	44.4267 mL
5 mM	0.8885 mL	4.4427 mL	8.8853 mL
10 mM	0.4443 mL	2.2213 mL	4.4427 mL
50 mM	0.0889 mL	0.4443 mL	0.8885 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

Zhou R, et al. Macrophage membrane-camouflaged biomimetic nanoparticles for rheumatoid arthritis treatment via modulating macrophage polarization. J Nanobiotechnology. 2024 Sep 19;22(1):578.

Zheng Q, Zou Y, Teng P, et al. Mechanosensitive Channel PIEZO1 Senses Shear Force to Induce KLF2/4 Expression via CaMKII/MEKK3/ERK5 Axis in Endothelial Cells. Cells. 2022, 11(14): 2191

Zhan C S, Chen J, Chen J, et al. CaMK4-dependent phosphorylation of Akt/mTOR underlies Th17 excessive activation in experimental autoimmune prostatitis. The FASEB Journal. 2020, 34(10): 14006-14023

Akerman EC, et al. Activation of IP3R in atrial cardiomyocytes leads to generation of cytosolic cAMP. Am J Physiol Heart Circ Physiol. 2024 Oct 1;327(4):H830-H846.

Togashi et al (2008) Inhibition of the transient receptor potential cation channel TRPM2 by 2-aminoethoxydiphenyl borate (2-APB). Br.J.Pharmacol. 153 1324

Zhang Z, Zhou H, Gu W, et al.CGI1746 targets σ1R to modulate ferroptosis through mitochondria-associated membranes.Nature Chemical Biology.2024: 1-11.

Gan P, Wu H, Zhu Y, et al.A new look at angiogenesis inhibition of geniposide in experimental arthritis by blocking angiopoietin-2 exocytosis.Phytotherapy Research.2024

Zhan C S, Chen J, Chen J, et al. CaMK4-dependent phosphorylation of Akt/mTOR underlies Th17 excessive activation in experimental autoimmune prostatitis[J]. The FASEB Journal. 2020, 34(10): 14006-14023

Zhong T, Chen S, Deng K, et al.Magnesium alleviates extracellular histone-induced apoptosis and defective bacterial phagocytosis in macrophages by regulating intracellular calcium signal.International Immunopharmacology.2024, 132: 111870.

Qu Y, Wang S, Jiang H, et al.The Ca2+-dependent phosphatase calcineurin dephosphorylates TBK1 to suppress antiviral innate immunity.Journal of Virology.2024: e00016-24.

Qu Y, Wang S, Jiang H, et al.Newcastle disease virus infection induces parthanatos in tumor cells via calcium waves.PLoS pathogens.2024, 20(12): e1012737.