

Product Data Sheet

Product Name: Adenosine 5'-diphosphoribose sodium

Cat. No.: GC19729

Chemical Properties

Cas. No. 68414-18-6

SMILES O[C@H]([C@@H](O)[C@@H](O[C@@H]1COP(OP(OC[C@@H](O)[C@@H](O)[C@@H](O)C=O)([O-])=O)(O)=O)N2C(N=CN=C3N)=C3N=C2.[Na+]

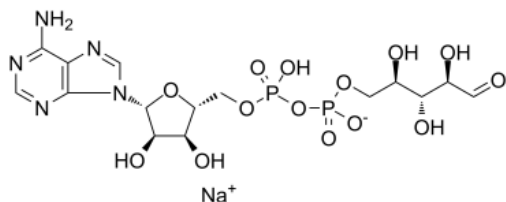
Formula $C_{15}H_{22}N_5NaO_{14}P_2$ M.Wt 581.3

Solubility Water : 125 mg/mL (215.04 mM) Storage Store at -20°C

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

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

Structure



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

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Protocol

Cell experiment [1]:

Cell lines RIN-5F cells (rat pancreatic β -cell line)

Preparation Method RIN-5F cells were cultured in RPMI 1640 medium containing 10% fetal bovine serum, 100U/ml penicillin, and 100 μ g/ml streptomycin at 37°C. Cells were treated with extracellular-added Adenosine 5'-diphosphoribose sodium (100 μ M) for 10–20 seconds.

Reaction Conditions 100 μ M; 10–20 seconds

Applications Extracellular Adenosine 5'-diphosphoribose sodium induced a transient increase in intracellular free Ca^{2+} concentration through Ca^{2+} release from thapsigargin-sensitive Ca^{2+} stores.

References:

[1] Ishii M, Shimizu S, Hagiwara T, et al. Extracellular-added ADP-ribose increases intracellular free Ca^{2+} concentration through Ca^{2+} release from stores, but not through TRPM2-mediated Ca^{2+} entry, in rat beta-cell line RIN-5F. J Pharmacol Sci. 2006 Jun;101(2):174-8.

Background

Adenosine 5'-diphosphoribose sodium is a nucleotide derivative and an agonist of Transient receptor potential melastatin 2 (TRPM2), playing an important role in various metabolic pathways within cells^[1]. Adenosine 5'-diphosphoribose sodium can modulate intracellular signaling pathways, affecting processes such as cell proliferation, differentiation, and apoptosis^[2]. Adenosine 5'-diphosphoribose sodium also plays a key role in cellular stress responses, helping cells cope with adverse conditions like oxidative stress^[3]. Adenosine 5'-diphosphoribose sodium is closely related to cellular immune responses, participating in the regulation of immune cell activity^[4].

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In vitro, treatment of RIN-5F cells with Adenosine 5'-diphosphoribose sodium (100 μ M) increases intracellular calcium ion (Ca^{2+}) concentration through the PLC-IP3 pathway^[5]. Treatment of microglial cells with Adenosine 5'-diphosphoribose sodium (1mM) induces Ca^{2+} and Mg^{2+} influx^[6].

References:

- [1] Fliegert R, Bauche A, Wolf Pérez AM, et al. 2'-Deoxyadenosine 5'-diphosphoribose is an endogenous TRPM2 superagonist. Nat Chem Biol. 2017 Sep;13(9):1036-1044.
- [2] Vyas S, Chang P. New PARP targets for cancer therapy. Nat Rev Cancer. 2014 Jul;14(7):502-9.
- [3] Dousa TP, Chini EN, Beers KW. Adenine nucleotide diphosphates: emerging second messengers acting via intracellular Ca^{2+} release. Am J Physiol. 1996 Oct;271(4 Pt 1):C1007-24.
- [4] Ji D, Luo ZW, Ovcjak A, et al. Role of TRPM2 in brain tumours and potential as a drug target. Acta Pharmacol Sin. 2022 Apr;43(4):759-770.
- [5] Ishii M, Shimizu S, Hagiwara T, et al. Extracellular-added ADP-ribose increases intracellular free Ca^{2+} concentration through Ca^{2+} release from stores, but not through TRPM2-mediated Ca^{2+} entry, in rat beta-cell line RIN-5F. J Pharmacol Sci. 2006 Jun;101(2):174-8.
- [6] Kraft R, Grimm C, Grosse K, et al. Hydrogen peroxide and ADP-ribose induce TRPM2-mediated calcium influx and cation currents in microglia. Am J Physiol Cell Physiol. 2004 Jan;286(1):C129-37.

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