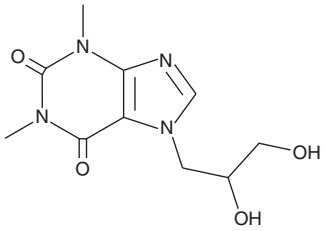
PRODUCT INFORMATION

Dyphylline

Item No. 17958

CAS Registry No.: 479-18-5
Formal Name: 7-(2,3-dihydroxypropyl)-3,7-dihydro-1,3-dimethyl-1H-purine-2,6-dione
Synonyms: 7-(2,3-Dihydroxypropyl)theophylline, Dilor, Diprophylline, Lufyllin, NSC 14305, NSC 40844, Neothyllin
MF: $C_{10}H_{14}N_4O_4$
FW: 254.2
Purity: ≥98%
UV/Vis.: λ_{max}: 273 nm
Supplied as: A crystalline solid
Storage: -20°C
Stability: ≥4 years



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Laboratory Procedures

Dyphylline is supplied as a crystalline solid. A stock solution may be made by dissolving the dyphylline in the solvent of choice. Dyphylline is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide (DMF), which should be purged with an inert gas. The solubility of dyphylline in ethanol is approximately 1 mg/ml and approximately 10 mg/ml in DMSO and DMF.

Further dilutions of the stock solution into aqueous buffers or isotonic saline should be made prior to performing biological experiments. Ensure that the residual amount of organic solvent is insignificant, since organic solvents may have physiological effects at low concentrations. Organic solvent-free aqueous solutions of dyphylline can be prepared by directly dissolving the crystalline solid in aqueous buffers. The solubility of dyphylline in PBS, pH 7.2, is approximately 1 mg/ml. We do not recommend storing the aqueous solution for more than one day.

Description

Dyphylline is a xanthine derivative that acts as an A_1 and A_2 adenosine receptor antagonist and phosphodiesterase inhibitor and exhibits bronchodilator and vasodilator effects.[1,2] It also moderately inhibits microsomal prostaglandin E synthase-1 with an IC_{50} value of 200 µM and downregulates ABCG2 drug transporter expression in multidrug resistant tumor cells.[3,4]

References

1. Cushley, M.J. and Holgate, S.T. Bronchodilator actions of xanthine derivatives administered by inhalation in asthma. *Thorax*. **40**, 176-179 (1985).
2. Schwabe, U., Ukena, D., and Lohse, M.J. Xanthine derivatives as antagonists at A_1 and A_2 adenosine receptors. *Naunyn-Schmiedeberg's Arch. Pharmacol.* **330**, 212-221 (1985).
3. Ding, R., Shi, J., Pabon, K., *et al.* Xanthines down-regulate the drug transporter ABCG2 and reverse multidrug resistance. *Mol. Pharm*. **81(3)**, 328-337 (2012).
4. Kim, W.-I., Choi, K.-A., Do, H.-S., *et al.* Expression and purification of human mPGES-1 in *E. coli* and identification of inhibitory compounds from a drug-library. *BMB Reports* **41(11)**, 808-813 (2008).

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