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Product Information

Thymine 1-β-D-arabinofuranoside

Product Number **T 3766**
Storage Temperature 2-8 °C

Product Description

Molecular Formula: C₁₀H₁₄N₂O₆
Molecular Weight: 258.2
CAS Number: 605-23-2
Melting Point: 248-249 °C¹
λ_{max}: 268 nm¹
Extinction Coefficient: E^{mM} = 9.53 (100 mM phosphate buffer, pH 7.0)
Optical Rotation: +90° (5 mg/ml in water at 20 °C)¹
Synonym: 1-β-D-arabinofuranosylthymine, ARA-T

This product is an analogue of the nucleoside thymine. It is an antiviral agent that has been involved in numerous studies with HIV, herpes simplex virus, varicella-zoster virus and cytomegalovirus. ARA-T is an older antiviral agent that has since been supplanted by more effective treatments such as ganciclovir and acyclovir.²

Nucleoside analogues such as ARA-T function as an antiviral through inhibition of DNA polymerase. When introduced to a cell, ARA-T becomes phosphorylated to the 5'-triphosphate form (ARA-TTP) by thymidine kinase.³ This ARA-TTP is then available for attempted incorporation into host and viral DNA during DNA synthesis by polymerase. When DNA polymerase attempts to incorporate this analogue, the polymerization reaction stalls and cannot proceed any further. Abortive replication is toxic to both virus and host organisms.⁴

Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

Preparation Instructions

This product is soluble in 0.5 M hydrochloric acid (20 mg/ml), with heating less than 5 minutes at 95 °C required, yielding a clear, colorless solution.

References

1. Reist, E. J., et al., Potential anticancer agents. LXI. A novel synthesis of "spongo" nucleosides. *J. Am. Chem. Soc.*, **83**, 2208 (1961).
2. Rubsam, L. Z., et al., Superior cytotoxicity with ganciclovir compared with acyclovir and 1-beta-D-arabinofuranosylthymine in herpes simplex virus-thymidine kinase-expressing cells: a novel paradigm for cell killing. *Cancer Res.*, **58(17)**, 3873-3782 (1998).
3. Suzuki, S., et al., A proposed mechanism for the selective inhibition of human cytomegalovirus replication by 1-(2'-deoxy-2'-fluoro-beta-D-arabinofuranosyl)-5-fluorouracil. *Mol. Pharmacol.*, **31(3)**, 301-306 (1987).
4. Klein R. J., and Friedman-Kien, A. E., Effect of eight antiviral drugs on the reactivation of herpes simplex virus in explant cultures of latently infected mouse trigeminal ganglia. *J. Invest. Dermatol.*, **83(5)**, 344-346 (1984).

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