Small Molecules

Stavudine

HIV reverse transcriptase inhibitor

Catalog #100-1167

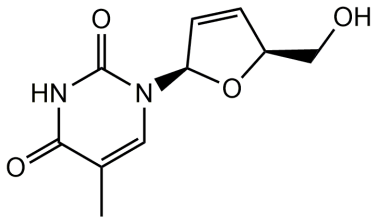
500 mg

STEMCELL™ TECHNOLOGIES
Scientists Helping Scientists™ | WWW.STEMCELL.COM
TOLL FREE PHONE 1 800 667 0322 • PHONE +1 604 877 0713
INFO@STEMCELL.COM • TECHSUPPORT@STEMCELL.COM
FOR GLOBAL CONTACT DETAILS VISIT OUR WEBSITE

Product Description

Stavudine is a nucleoside analog of thymidine and HIV reverse transcriptase inhibitor (Tai-Shun et al.). Stavudine is phosphorylated by kinases that turn it into stavudine triphosphate, which competes with the natural substrate thymidine triphosphate to be incorporated into the viral DNA by HIV reverse transcriptase. When stavudine triphosphate is incorporated into the viral DNA chain, it terminates DNA replication prematurely and inhibits HIV replication (Hurst & Noble).

Alternative Names:	BMY 27857; d4T; Zerit
CAS Number:	3056-17-5
Chemical Formula:	$C_{10}H_{12}N_2O_4$
Molecular Weight:	224.2 g/mol
Purity:	≥ 98%
Chemical Name:	2',3'-Didehydro-3'-deoxy-thymidine
Structure:	



Properties

Physical Appearance:	A white powder
Storage:	Product stable at -20°C as supplied. As a precaution, STEMCELL recommends storing all small molecules away from direct light. For long-term storage, store with a desiccant. Stable as supplied for 12 months from date of receipt.
Solubility:	• Water ≤ 85 mM • DMSO ≤ 85 mM

For example, to prepare a 10 mM stock solution in water, resuspend 10 mg in 4.46 mL of water.

Prepare stock solution fresh before use. Information regarding stability of small molecules in solution has rarely been reported; however, as a general guide we recommend storage in DMSO at -20°C. Aliquot into working volumes to avoid repeated freeze-thaw cycles. The effect of storage of stock solution on compound performance should be tested for each application.

For use as a cell culture supplement, stock solution should be diluted into culture medium immediately before use. Avoid final DMSO concentration above 0.1% due to potential cell toxicity.

Published Applications

CANCER RESEARCH

· Induces mitochondrial reactive oxygen species (ROS) and enhances mitochondrial oxidative stress in human hepatoma cells (Velsor et al.).
· Reported to induce cellular senescence in human fibroblasts. Fibroblasts treated with stavudine exhibited mitochondrial dysfunction, slowed division rates, and increased ROS levels in early culture passages. In later passages, fibroblasts became senescent on the basis of p16 and p21 protein expression and senescence-associated β-galactosidase (SA-β-gal) activity (Caron et al.).

DISEASE MODELING

· Reduces NLRP3 inflammasome-associated inflammation and stimulates Aβ autophagy by THP-1-derived macrophages in an in vitro model of Alzheimer's disease (La Rosa et al.).

References

Caron M et al. (2008) Contribution of mitochondrial dysfunction and oxidative stress to cellular premature senescence induced by antiretroviral thymidine analogues. Antivir Ther 13(1): 27–38.

Hurst M & Noble S. (1999) Stavudine. Drugs 58(5): 919–49.

La Rosa F et al. (2019) Stavudine reduces NLRP3 inflammasome activation and modulates amyloid-β autophagy H. Lei (Ed.). J Alzheimer's Dis 72(2): 401–12.

Tai-Shun L et al. (1987) Potent and selective in vitro activity of 3'-deoxythymidin-2'-ene (3'-deoxy-2',3'-didehydrothymidine) against human immunodeficiency virus. Biochem Pharmacol 36(17): 2713–8.

Velsor LW et al. (2004) Mitochondrial oxidative stress in human hepatoma cells exposed to stavudine. Toxicol Appl Pharmacol 199(1): 10–9.

Related Small Molecules

For a complete list of small molecules available from STEMCELL Technologies, visit www.stemcell.com/smallmolecules, or contact us at techsupport@stemcell.com.

This product is hazardous. Please refer to the Safety Data Sheet (SDS).