Small Molecules

Decitabine

DNA methyltransferase inhibitor

Catalog #100-1174

50 mg

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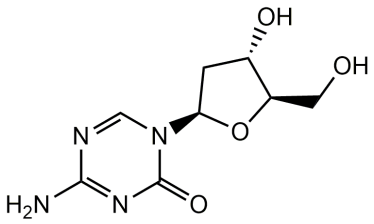
Product Description

Decitabine is a hypomethylating agent that inhibits DNA synthesis by binding to DNA methyltransferase. Decitabine is a cytosine nucleoside analog that is incorporated into DNA strands during DNA replication. When DNA methyltransferase binds to DNA to replicate the methylation onto the daughter strand, decitabine binds to the DNA methyltransferase and prevents it from continuing DNA replication (Kantarjian et al.).

Alternative Names:	5-aza-2'-deoxycytidine; 5-AzadCyD; NSC-127716
CAS Number:	2353-33-5
Chemical Formula:	$C_8H_{12}N_4O_4$
Molecular Weight:	228.2 g/mol
Purity:	≥ 98%
Chemical Name:	4-amino-1-(2-deoxy-β-D-erythro-pentofuranosyl)-1,3,5-triazin-2(1H)-one
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 ≤ 45 mM • DMSO ≤ 105 mM For example, to prepare a 10 mM stock solution in water, resuspend 10 mg in 4.38 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
· Inhibits proliferation in A375, SKMEL1, SKMEL3, SKMEL28, MeWo, and B16 human cutaneous melanoma cell lines (Alcazar et al.).
· Induces apoptosis in human leukemia cell lines U937 and HL60 by increasing generation of reactive oxygen species (Shin et al.).
· Induces cell cycle arrest at G2/M phase in AGS gastric and A549 lung carcinoma cells (Shin et al.).
· Reduces the proliferative capacity and marginally increases apoptosis in the Kasumi-1AML cell line (Flotho et al.).
· Induces cellular senescence by upregulation of p16ink4a in oral squamous cell carcinoma and hepatocellular carcinoma cell lines (Suh et al.; Timmermann et al.).
· Induces cellular senescence in HepG2 and Hep3B cell lines and p53-dependent tumor cell senescence, as well as a high number of DNA double-strand breaks (Venturelli et al.).

References

Alcazar O et al. (2012) Epigenetic regulation by decitabine of melanoma differentiation in vitro and in vivo. Int J Cancer 131(1): 18–29.

Flotho C et al. (2009) The DNA methyltransferase inhibitors azacitidine, decitabine and zebularine exert differential effects on cancer gene expression in acute myeloid leukemia cells. Leukemia 23(6): 1019–28.

Kantarjian H et al. (2006) Decitabine improves patient outcomes in myelodysplastic syndromes. Cancer 106(8): 1794–803.

Shin DY et al. (2012) Decitabine, a DNA methyltransferase inhibitor, induces apoptosis in human leukemia cells through intracellular reactive oxygen species generation. Int J Oncol 41(3): 910–8.

Shin DY et al. (2013) Decitabine, a DNA methyltransferases inhibitor, induces cell cycle arrest at G2/M phase through p53-independent pathway in human cancer cells. Biomed Pharmacother 67(4): 305–11.

Suh SI et al. (2000) 5-aza-2′-deoxycytidine leads to down-regulation of aberrant p16ink4a RNA transcripts and restores the functional retinoblastoma protein pathway in hepatocellular carcinoma cell lines. Cancer Lett 160(1): 81–8.

Timmermann S et al. (1998) Re-expression of endogenous p16ink4a in oral squamous cell carcinoma lines by 5-aza-2′-deoxycytidine treatment induces a senescence-like state. Oncogene 17(26): 3445–53.

Venturelli S et al. (2013) Differential induction of apoptosis and senescence by the DNA methyltransferase inhibitors 5-azacytidine and 5-aza-2′-deoxycytidine in solid tumor cells. Mol Cancer Ther 12(10): 2226–36.

Related Small Molecules

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