Small Molecules

Trichostatin A

Epigenetic modifier; Inhibits histone deacetylase (HDAC)1 and HDAC6

Catalog #	72282	1 mg
	72284	5 mg

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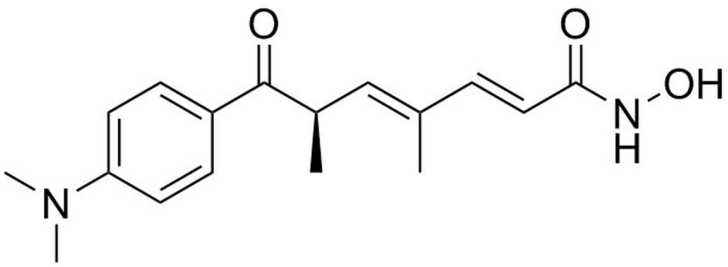
Product Description

Trichostatin A is a potent and reversible inhibitor of histone deacetylase (HDAC), therefore acting as an epigenetic modifier by preventing the removal of acetyl groups from lysine residues on histone tails. HDAC inhibition is achieved by direct binding to the enzyme and chelation of the catalytic zinc ion. Trichostatin A inhibits both class I and class II HDACs, including HDAC1 (IC_{50} = 6 nM), HDAC4 (IC_{50} = 38 nM), and HDAC6 (IC_{50} = 8.6 nM; Furumai et al.; Yoshida et al.).

Alternative Names:	TSA
CAS Number:	58880-19-6
Chemical Formula:	$C_{17}H_{22}N_2O_3$
Molecular Weight:	302.4 g/mol
Purity:	≥ 95%
Chemical Name:	7-[4-(dimethylamino)phenyl]-N-hydroxy-4,6R-dimethyl-7-oxo-2E,4E-heptadienamide
Structure:	



Properties

Physical Appearance:	A crystalline solid
Storage:	Product stable at -20°C as supplied. Protect from prolonged exposure to light. Stable as supplied for 12 months from date of receipt.
Solubility:	· DMSO ≤ 65 mM For example, to prepare a 10 mM stock solution in DMSO, resuspend 1 mg in 331 µL of fresh DMSO. 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. Compound has low solubility in aqueous media. 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

MAINTENANCE AND SELF-RENEWAL
· Prevents dedifferentiation of primary rat hepatocytes in culture, maintaining liver-specific cellular functions (Henkens et al.).
REPROGRAMMING
· Increases the reprogramming efficiency of mouse embryonic fibroblasts to induced pluripotent stem (iPS) cells (Huangfu et al.).
· Resets epigenetic memory in mouse iPS cells, in combination with 5-Azacytidine (Catalog #72012; Kim et al.).
· Increases the efficiency of cloned mouse embryo development by somatic cell nuclear transfer (Kishigami et al.).
DIFFERENTIATION
· Promotes differentiation of hepatocytes from human mesenchymal stem cells (Snykers et al.).

References

Furumai R et al. (2001) Potent histone deacetylase inhibitors built from trichostatin A and cyclic tetrapeptide antibiotics including trapoxin. Proc Natl Acad Sci USA 98(1): 87–92.
Henkens T et al. (2007) Trichostatin A, a critical factor in maintaining the functional differentiation of primary cultured rat hepatocytes. Toxicol Appl Pharmacol 218(1): 64–71.
Huangfu D et al. (2008) Induction of pluripotent stem cells by defined factors is greatly improved by small-molecule compounds. Nat Biotechnol 26(7): 795–797.
Kim K et al. (2010) Epigenetic memory in induced pluripotent stem cells. Nature 467(7313): 285–90.
Kishigami S et al. (2006) Significant improvement of mouse cloning technique by treatment with trichostatin A after somatic nuclear transfer. Biochem Biophys Res Commun 340(1): 183–9.
Snykers S et al. (2007) Chromatin remodeling agent trichostatin A: a key-factor in the hepatic differentiation of human mesenchymal stem cells derived of adult bone marrow. BMC Dev Biol 7: 24.
Yoshida M et al. (1990) Potent and specific inhibition of mammalian histone deacetylase both in vivo and in vitro by trichostatin A. J Biol Chem 265(28): 17174–9.

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