Small Molecules

Camptothecin

Topoisomerase I inhibitor

Catalog #100-1164

500 mg

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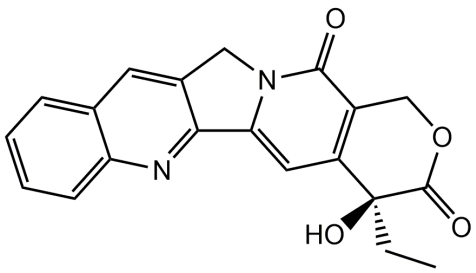
Product Description

Camptothecin is an alkaloid isolated from *Camptotheca acuminata* and an inhibitor of topoisomerase I (Thomas et al.). Topoisomerase I is an enzyme that facilitates the proliferation of eukaryotic cells by relaxing DNA torsional strain at the replication fork during DNA replication (Liu et al.). By binding to the DNA cleavage complex of topoisomerase I, camptothecin prevents DNA religation, leading to DNA damage and cell death (Beretta et al.).

Alternative Names:	Not applicable
CAS Number:	7689-03-4
Chemical Formula:	$C_{20}H_{16}N_2O_4$
Molecular Weight:	348.4 g/mol
Purity:	≥ 98%
Chemical Name:	(S)-4-Ethyl-4-hydroxy-1H-pyrano-[3',4':6,7]indolizino[1,2-b]quinoline-3,14(4H,12H)-dione
Structure:	



Properties

Physical Appearance:	A beige 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:	• DMSO ≤ 14 mM • Absolute ethanol ≤ 14 mM For example, to prepare a 9 mM stock solution in DMSO, resuspend 10 mg in 3.19 mL of 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 or absolute ethanol concentration above 0.1% due to potential cell toxicity.

Published Applications

CANCER RESEARCH
· Can be used as an apoptosis induction positive control (cell-type dependent) in combination with Caspase-3/7 Activity Flow Cytometry Kit, Green (Catalog #100-0923), Caspase-3/7 Activity Plate Reader Assay Kits (Catalog #100-0922/100-0920), and FITC-C6-DEVD-FMK (Catalog #100-0924).
· Demonstrates cytotoxicity against several human tumor cell lines, including HT29, LOX, SKOV3, and SKVLB (Hentze et al.).
· Downregulates mixed lineage leukemia 5 (MLL5) proteins in HCT116 cells (Cheng et al.).
· Induces apoptosis in various human cancer cell lines (HeLa, K562, CCRF-CEM, HCT-15, RBE, PC3, and C-33A) via a microRNA-125b-mediated mitochondrial pathway (Zeng et al.).

References

Beretta GL et al. (2013) Camptothecin resistance in cancer: insights into the molecular mechanisms of a DNA-damaging drug. Curr Med Chem 20(12): 1541–65.

Cheng F et al. (2011) Camptothecin-induced downregulation of MLL5 contributes to the activation of tumor suppressor p53. Oncogene 30(33): 3599–611.

Efferth T et al. (2007) Molecular target-guided tumor therapy with natural products derived from traditional chinese medicine. Curr Med Chem 14(19): 2024–32.

Hentze H et al. (2004) Topoisomerase inhibitor camptothecin sensitizes mouse hepatocytes in vitro and in vivo to TNF-mediated apoptosis. Hepatology 39(5): 1311–20.

Liu LF et al. (2006) Mechanism of action of camptothecin. Ann N Y Acad Sci 922(1): 1–10.

Zeng CW et al. (2012) Camptothecin induces apoptosis in cancer cells via microRNA-125b-mediated mitochondrial pathways. Mol Pharmacol 81(4): 578–86.

Related Small Molecules

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