PRODUCT INFORMATION

Product Name: Camptothecin
Catalog Number: 6208, 6209, 6210
Size: 25 mg/vial, 100 mg/vial, 250 mg/vial
Storage Temperature: -20°C

Product Description
Molecular Formula: $C_{20}H_{16}N_2O_4$
Molecular Weight: 348.36
CAS Number: 7689-03-4

Camptothecin is a potent cytotoxic pentacyclic alkaloid known for its potent apoptosis inducing properties (Reviewed in Thomas et al. (1)). Originally isolated from the *Camptotheca acuminata, Nyssaceae* tree, native to China, these alkaloid extracts were used extensively in traditional Chinese medicine (2). Camptothecin and its analogs have been demonstrated to inhibit topoisomerase I (topo I), causing cells in S phase to enter into apoptosis. Camptothecin binds to and stabilizes the topo I – DNA backbone complex (covalent binary complex). This stabilized complex diminishes the rate of topo I release from the broken strand, thus slowing the religation and subsequent DNA synthesis process (1, 3, 4,).

Brief Protocol

1. Dissolve camptothecin powder in tissue culture grade DMSO to obtain a 2 mg/mL camptothecin stock concentration.
2. Prepare 50 – 100 uL aliquots of the DMSO solublilized camptothecin and store them frozen at < -20° C. A frozen vial of camptothecin may be re-thawed 2X before discarding. Vials which have been thawed 1X should be marked to indicate this so that they only go through one more freeze thaw before being discarded.
3. Spike cell cultures at a camptothecin concentration range of 2 – 4 μg/mL which yields a cell culture camptothecin concentration of 6 – 12 μM. This camptothecin concentration range works well for inducing Jurkat or HL 60 cell suspensions which usually run in the $1 \times 10^5 - 1 \times 10^6$ cell/mL concentration range. At this concentration range successful apoptosis induction has been achieved after a 4 hour (37° C) incubation period.
    a. Example Calculation:
    Camptothecin MW = 348.36 2 μg/mL = 2 mg/L
    2 mg/L / 348.35 mg/m mole = 0.006 mM = 6 μM
    A 4 μg/mL camptothecin cell culture concentration = 12 μM camptothecin concentration
4. Perform time course studies on your particular cell line to ascertain the optimal camptothecin concentration and exposure time required to achieve good apoptosis induction levels for your experiments.
5. Proceed with your experimental apoptosis induction model system.

References

1. Thomas, C.J. et al. 2004. Camptothecin: current perspectives. *Bioorg. Med. Chem*. 12: 1585-1604.
2. Wall, M.E. et al. 1966. Plant antitumor agents. I. The isolation and structure of camptothecin, a novel alkaloidal leukemia and tumor inhibitor from *Camptotheca acuminata. J. Am. Chem. Soc*. 88: 3888-3890.
3. Hsiang, Y., et al. 1985. Camptothecin induces protein-linked DNA breaks via mammalian DNA topoisomerase I. *J. Biol. Chem*. 260: 14873-14878.
4. Hertzberg, R.P., et al. 1989. On the mechanism of topoisomerase I inhibition by camptothecin: Evidence for binding to an enzyme-DNA complex. *Biochemistry* 28: 4629-4638.