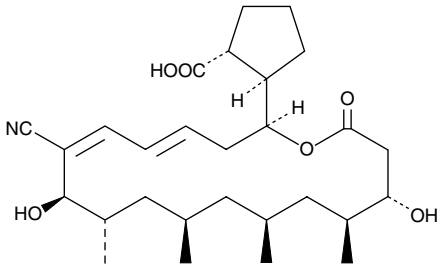
Product Information

Borrelidin

Item No. 14436

CAS Registry No.: 7184-60-3
Formal Name: (1R)-2R-[7-cyano-8R,16S-dihydroxy-9S,11R,13S,15S-tetramethyl-18-oxooxacyclooctadeca-4E,6Z-dien-2S-yl]-cyclopentanecarboxylic acid
Synonyms: NSC 216128, Treponemycin
MF: $C_{28}H_{43}NO_6$
FW: 489.6
Purity: ≥98%
Stability: ≥1 year at -20°C
Supplied as: A white to off-white powder



Laboratory Procedures

For long term storage, we suggest that borrelidin be stored as supplied at -20°C. It should be stable for at least one year.

Borrelidin is supplied as a white to off-white powder. A stock solution may be made by dissolving the borrelidin in the solvent of choice. Borrelidin is soluble in organic solvents such as methanol and DMSO.

Borrelidin is sparingly soluble in aqueous solutions. To enhance aqueous solubility, dilute the organic solvent solution into aqueous buffers or isotonic saline. If performing biological experiments, ensure the residual amount of organic solvent is insignificant, since organic solvents may have physiological effects at low concentrations. We do not recommend storing the aqueous solution for more than one day.

Borrelidin is a secondary metabolite produced by *Streptomyces* and other bacteria. It displays potent antiangiogenic activity, preventing tube formation in rat aorta explants (IC_{50} = 0.8 nM) and inducing apoptosis in endothelial cells.[1,2] Borrelidin also alters the splicing of VEGF mRNA, producing an antiangiogenic isoform of the growth factor.[3] It has long been known as a powerful inhibitor of both eukaryotic and bacterial threonyl tRNA synthetase.[4] Borrelidin is also an effective anti-malarial drug, as it kills *P. falciparum* with an IC_{50} value of 1.8 nM.[5] At higher doses, it inhibits cyclin-dependent kinase in yeast (IC_{50} = 24 µM), resulting in growth arrest in the G_1 phase.[6]

References

1. Wakabayashi, T., Kageyama, R., Naruse, N., *et al.* Borrelidin is an angiogenesis inhibitor; Disruption of angiogenic capillary vessels in a rat aorta matrix culture model. *J. Antibiot.* **50(8)**, 671-676 (1997).
2. Kawamura, T., Liu, D., Towle, M.J., *et al.* Anti-angiogenesis effects of borrelidin are mediated through distinct pathways: Threonyl-tRNA synthetase and caspases are independently involved in suppression of proliferation and induction of apoptosis in endothelial cells. *J. Antibiot.* **56(8)**, 709-715 (2003).
3. Woolard, J., Vousden, W., Moss, S.J., *et al.* Borrelidin modulates the alternative splicing of VEGF in favour of anti-angiogenic isoforms. *Chem. Sci.* **2011(2)**, 273-278 (2011).
4. Paetz, W. and Nass, G. Biochemical and immunological characterization of threonyl-tRNA synthetase of two borrelidin-resistant mutants of *Escherichia coli* K12. *Eur. J. Biochem.* **35**, 331-337 (1973).
5. Otoguro, K., Ui, H., Ishiyama, A., *et al. In vitro* and *in vivo* antimalarial activities of a non-glycosidic 18-membered macrolide antibiotic, borrelidin, against drug-resistant strains of *Plasmodia. J. Antibiot.* **56(8)**, 727-729 (2003).
6. Tsuchiya, E., Yukawa, M., Miyakawa, T., *et al.* Borrelidin inhibits a cyclin-dependent kinase (CDK), Cdc28/Cln2, of *Saccharomyces cerevisiae. J. Antibiot.* **54(1)**, 84-90 (2001).

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