Small Molecules

Fumonisin B1

Inhibitor of sphingolipid synthesis and protein serine/threonine phosphatases

Catalog #	73682	1 mg
	73684	10 mg

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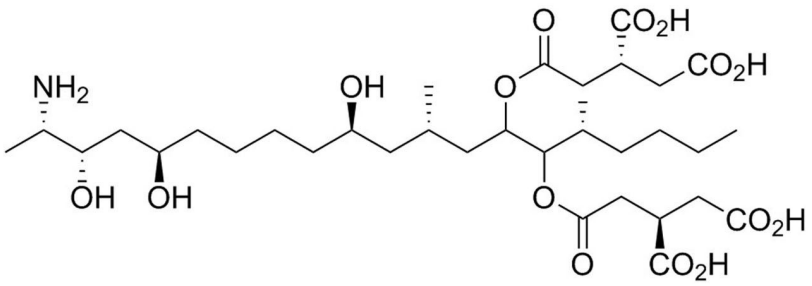
Product Description

Fumonisin B1 is a mycotoxin produced by Fusarium moniliforme that has been shown to potently inhibit sphingosine N-acyltransferase (ceramide synthase; Wang et al.), thereby disrupting the synthesis of sphingolipids, a key component of plasma membranes (IC_{50} = 0.1 µM). Fumonisin B1 also inhibits protein serine/threonine phosphatases (PPs; PP1, PP2A, PP2B, PP2C, and PP5/T/K/H) with IC_{50} values of 80 - 3000 µM. PP5 is the most sensitive with an IC_{50} of 80 µM (Fukuda et al.). Fumonisin B1, together with Alfatoxin B1, increases reactive oxygen species (ROS) levels and oxidative damage in rat spleen cells (Mary et al.).

Molecular Name:	Fumonisin B1
Alternative Names:	Not applicable
CAS Number:	116355-83-0
Chemical Formula:	$C_{34}H_{59}NO_{15}$
Molecular Weight:	721.8 g/mol
Purity:	≥ 95%
Chemical Name:	2-[2-[19-amino-6-(3,4-dicarboxybutanoyloxy)-11,16,18-trihydroxy-5,9-dimethylicosan-7-yl]oxy-2-oxoethyl]butanedioic acid
Structure:	

Properties

Physical Appearance:	A crystalline solid
Storage:	Product stable at -20°C as supplied. Protect product from prolonged exposure to light. For long-term storage, store with a desiccant. Stable as supplied for 12 months from date of receipt.
Solubility:	· PBS (pH 7.2) ≤ 1.3 mM · DMSO ≤ 6.9 mM · Absolute ethanol ≤ 13 mM For example, to prepare a 5 mM stock solution in DMSO, resuspend 1 mg in 277 µL 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. 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

MAINTENANCE
· Reversibly blocks cell proliferation and DNA synthesis in Swiss 3T3 cells (Meivar-Levy et al.).
· Blocks hexadecylphosphocholine (HePC)-induced apoptosis in human keratinocyte cell lines (Wieder et al.).
DIFFERENTIATION
· Disrupts dendrite growth in cerebellar Purkinje neurons (Furuya et al).
· Inhibits axonal branching in cultured hippocampal neurons (Schwarz et al.).
CANCER RESEARCH
· Attenuates the response of mouse lymphoma cell lines to platelet-activating factor and blocks HePC-induced apoptosis by inhibiting ceramide formation (Balsinde et al.).

References

Balsinde J et al. (1997) Inflammatory activation of arachidonic acid signaling in murine P388D1 macrophages via sphingomyelin synthesis. J Biol Chem 272(33): 20373–7.
Fukuda H et al. (1996) Inhibition of protein serine/threonine phosphatases by fumonisin B1, a mycotoxin. Biochem Biophys Res Commun 220(1): 160–5.
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Mary VS et al. (2012) Reactive oxygen species sources and biomolecular oxidative damage induced by aflatoxin B1 and fumonisin B1 in rat spleen mononuclear cells. Toxicology 302(2-3): 299–307.
Meivar-Levy I et al. (1997) The role of sphingolipids in the maintenance of fibroblast morphology. The inhibition of protrusional activity, cell spreading, and cytokinesis induced by fumonisin B1 can be reversed by ganglioside GM3. J Biol Chem 272(3): 1558–64.
Schwarz A et al. (1995) A regulatory role for sphingolipids in neuronal growth. Inhibition of sphingolipid synthesis and degradation have opposite effects on axonal branching. J Biol Chem 270(18): 10990–8.
Wang E et al. (1991) Inhibition of sphingolipid biosynthesis by fumonisins. Implications for diseases associated with Fusarium moniliforme. J Biol Chem 266(22): 14486–90.
Wieder T et al. (1998) Induction of ceramide-mediated apoptosis by the anticancer phospholipid analog, hexadecylphosphocholine. J Biol Chem 273(18): 11025–31.

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