Small Molecules

Monensin (Sodium Salt)

Ionophorous antibiotic

Catalog #100-1162

5 g

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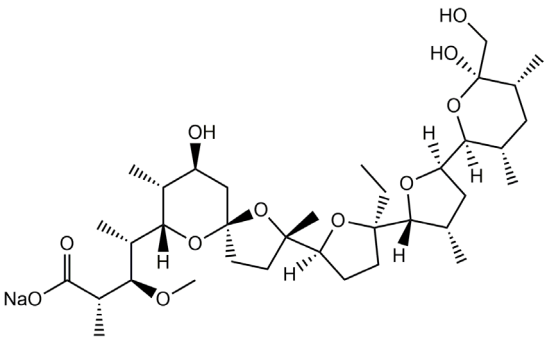
Product Description

Monensin (sodium salt) is a natural ionophore antibiotic isolated from *Streptomyces cinnamonensis* (Łowicki & Huczyński). Monensin can form complexes with cations and transport them in both electroneutral and electrogenic exchanges across the lipid bilayer. This transport between intracellular and extracellular spaces allows monensin to affect the pH and sodium-potassium balance of cells, leading to its antibacterial properties (Huczyński et al.).

Alternative Names:	Monensin A; NSC 343257
CAS Number:	22373-78-0
Chemical Formula:	$C_{36}H_{61}O_{11}$ • Na
Molecular Weight:	692.9 g/mol
Purity:	≥ 98%
Chemical Name:	2-[5-ethyltetrahydro-5-[tetrahydro-3-methyl-5-[tetrahydro-6-hydroxy-6-hydroxymethyl-3,5-dimethyl-2H-pyran-2-yl]-2-furyl]-2-furyl]-9-hydroxy-β-methoxy-α,γ,2,8-tetramethyl-1,6-dioxaspiro[4.5]decane-7-butyric acid, monosodium salt
Structure:	

Properties

Physical Appearance:	A crystalline solid
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:	• Absolute ethanol ≤ 20 mM For example, to prepare a 10 mM stock solution in absolute ethanol, resuspend 1 g in 144 mL of absolute ethanol. 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 absolute ethanol 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 absolute ethanol concentration above 0.1% due to potential cell toxicity.

Published Applications

CANCER RESEARCH
· Inhibits aldehyde dehydrogenase activity leading to oxidative stress in VCaP and LNCaP cells (Ketola et al.).
· Induces cell cycle arrest and apoptosis in SNU-C1 cells by decreasing the levels of CDK2, CDK4, CDK6, cyclin D1 and cyclin A proteins (Park et al.).
· Inhibits the proliferation of primary murine acute myeloid leukemia (AML) cells but not of normal hematopoietic progenitors. Causes the down-regulation of MYB expression, loss of cell viability, and induction of differentiation and apoptosis in AML cells (Yusenko et al.).
· Selectively kills human gastric cancer stem-like cells AGS and KATO III (Pádua et al.).

References

Huczyński A et al. (2008) Synthesis and antimicrobial properties of monensin A esters. Bioorg Med Chem Lett 18(8): 2585–89.

Huczyński A et al. (2012) Monensin A acid complexes as a model of electrogenic transport of sodium cation. Biochim Biophys Acta - Biomembr 1818(9): 2108–19.

Ketola K et al. (2010) Monensin is a potent inducer of oxidative stress and inhibitor of androgen signaling leading to apoptosis in prostate cancer cells. Mol Cancer Ther 9(12): 3175–85.

Łowicki D & Huczyński A. (2013) Structure and antimicrobial properties of monensin A and its derivatives: summary of the achievements. Biomed Res Int 2013: 1–14.

Pádua D et al. (2020) A SOX2 reporter system identifies gastric cancer stem-like cells sensitive to monensin. Cancers (Basel) 12(2): 495.

Park W et al. (2003) Monensin-mediated growth inhibition of SNU-C1 colon cancer cells via cell cycle arrest and apoptosis. Int J Oncol. 22: 377-382.

Yusenko M V. et al. (2020) Monensin, a novel potent MYB inhibitor, suppresses proliferation of acute myeloid leukemia and adenoid cystic carcinoma cells. Cancer Lett 479: 61–70.

Related Small Molecules

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