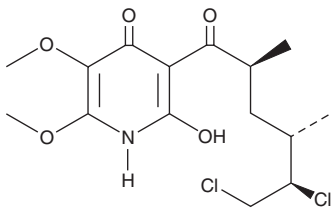
PRODUCT INFORMATION

Atpenin A5

Item No. 11898

CAS Registry No.:	119509-24-9
Formal Name:	3-[(2S,4S,5R)-5,6-dichloro-2,4-dimethyl-1-oxohexyl]-4-hydroxy-5,6-dimethoxy-2(1H)-pyridinone
Synonym:	Antibiotic FO-125A5
MF:	$C_{15}H_{21}Cl_2NO_5$
FW:	366.2
Purity:	≥95%
UV/Vis.:	λ_{max}: 237, 272, 324 nm
Supplied as:	A crystalline solid
Storage:	-20°C
Stability:	≥4 years
Item Origin:	Synthetic; originally from fungal strain FO-125



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Laboratory Procedures

Atpenin A5 is supplied as a crystalline solid. A stock solution may be made by dissolving the atpenin A5 in the solvent of choice. Atpenin A5 is soluble in organic solvents such as ethanol, methanol, and DMSO, which should be purged with an inert gas.

Description

Mitochondrial complex II (succinate dehydrogenase or succinate:ubiquinone oxidoreductase) is a functional member of the Krebs cycle and the aerobic respiratory chain that couples the oxidation of succinate to fumarate with the reduction of quinone to quinol. Atpenin A5, an antifungal antibiotic isolated from *Penicillium* sp. found in soil, is a highly specific ubiquinone-binding site inhibitor of succinate dehydrogenase (IC_{50}s = 12 and 3.7 nM in nematode and mammalian mitochondria, respectively, versus IC_{50}s > 100 µM for inhibition of complex I and complex III enzymes).[1,2] Atpenin A5 has cardioprotective effects against simulated ischemia-reperfusion injury in cardiomyocytes. Several mechanisms through which this occurs, including activation of mitochondrial ATP-sensitive potassium channels or modulation of mitochondrial reactive oxygen species generation, have been proposed.[3,4]

References

1. Horsefield, R., Yankovskaya, V., Sexton, G., *et al*. Structural and computational analysis of the quinone-binding site of complex II (succinate-ubiquinone oxidoreductase): A mechanism of electron transfer and proton conduction during ubiquinone reduction. *J. Biol. Chem.* **281(11)**, 7309-7316 (2006).
2. Miyadera, H., Shiomi, K., Ui, H., *et al*. Atpenins, potent and specific inhibitors of mitochondrial complex II (succinate-ubiquinone oxidoreductase). *Proc. Natl. Acad. Sci. USA* **100(2)**, 473-477 (2003).
3. Wojtovich, A.P. and Brookes, P.S. The complex II inhibitor atpenin A5 protects against cardiac ischemia-reperfusion injury *via* activation of mitochondrial KATP channels. *Basic Res. Cardiol.* **104(2)**, 121-129 (2009).
4. Dröse, S., Bleier, L., and Brandt, U. A common mechanism links differently acting complex II inhibitors to cardioprotection: Modulation of mitochondrial reactive oxygen species production. *Mol. Pharmacol.* **79(5)**, 814-822 (2011).

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