Product Data Sheet

Product Name: Reutericyclin
Cat. No.: GN10008

Chemical Properties

Cas. No.	303957-69-9		
Chemical Name	(R,E)-4-acetyl-1-(dec-2-enoyl)-5-hydroxy-2-isobutyl-1H-pyrrol-3(2H)-one		
SMILES	OC(N1C(/C=C/CCCCCCC)=O)=C(C(C)=O)C([C@H]1CC(C)C)=O		
Formula	$C_{20}H_{31}NO_4$	M.Wt	349.47
Solubility	DMSO : 33.33 mg/mL (95.38 mM; Need ultrasonic)	Storage	Store at -20°C
General tips	For obtaining a higher solubility , please warm the tube at 37 ℃ and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20℃ for several months.		
Shipping Condition	Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.		
Structure	Reutericyclin		

Protocol

Cell experiment [1]:

Cell lines	C. difficile 9689 (toxinotype 0), BAA-1803 (toxinotype III, NAP1) and BAA-1875 (toxinotype V, NAP7)
Preparation method	Limited solubility. General tips for obtaining a higher concentration: Please warm the tube at 37 ℃ for 10 minutes and/or shake it in the ultrasonic bath for a while. Stock solution can be stored below -20℃ for several months.

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Reaction Conditions	37oC
Applications	Reutericyclin is very active against three unrelated tests trains, with mean MICs of 0.09–0.5 mg/L. Moreover, Reutericyclin is bactericidal, causing a >3 log reduction in cells and retains potent bactericidal activity against all 24 h stationary phase cultures. It also shows fast concentration dependent killing.

References:

1. Hurdle JG, Heathcott AE, Yang L, Yan B, Lee RE. Reutericyclin and related analogues kill stationary phase Clostridium difficile at achievable colonic concentrations. J Antimicrob Chemother. 2011 Aug; 66(8):1773-6.

Background

Reutericyclin is a small molecular weight antibiotic isolated from Lactobacillus reuteri. This strain was isolated from an industrial sourdough, SER, in 1988. Reutericyclin is active against a broad range of gram-positive bacteria in concentrations of less than 1mg/L and the inhibitory spectrum includes those lactic acid bacteria relevant in sour-dough fermentations. [1]
Application of antimicrobial compounds, such as nisin and the tetramic acid reutericyclin, in combination with moderate heat and pressure may be suitable to achieve minimal processing of foods and control of endospore outgrowth and viability. Nisin and reutericyclin were selected as antimicrobials that target cell membranes but have different modes of action. Nisin is not inactivated by heat or pressure; reutericyclin is a heat- and pressure stable tetramic acid derivative. [2]

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The naturally occurring tetramic acid reutericyclin, selectively dissipated the bacterial transmembrane potential, resulting in narrow-spectrum activity against gram-positive bacteria. Reutericyclin could be a novel approach for controlling C. difficile. Reutericyclin, unlike bacteriocins, is resistant to enzymatic proteolysis, easy to synthesize and easy to chemically modify in order to improve its antibacterial and physicochemical properties. Reutericyclin exerted rapid bactericidal activity against non-dividing stationary phase cells at concentrations close to those causing growth inhibition of logarithmic cells. [3]

References:

[1]. Gänzle MG, Vogel RF. Contribution of reutericyclin production to the stable persistence of Lactobacillus reuteri in an industrial sourdough fermentation. Int J Food Microbiol. 2003 Jan 15;80(1):31-45.

[2]. Hofstetter S, Gebhardt D, Ho L, Gänzle M et al. Effects of nisin and reutericyclin on resistance of endospores of Clostridium spp. to heat and high pressure. Food Microbiol. 2013 May;34(1):46-51. doi: 10.1016/j.fm.2012.11.001. Epub 2012 Nov 12.

[3]. Hurdle JG, Heathcott AE, Yang L et al. Reutericyclin and related analogues kill stationary phase Clostridium difficile at achievable colonic concentrations. J Antimicrob Chemother. 2011 Aug;66(8):1773-6. doi: 10.1093/jac/dkr201. Epub 2011 May 31.

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