Product Data Sheet

Product Name: 2-Hydroxypropyl-β-cyclodextrin
Cat. No.: GC13602

Chemical Properties

Cas. No.	128446-35-5		
Formula	$(C_6H_9O_5)_7(C_3H_7O)n$	M.Wt	1541.6
Solubility	DMF: 30 mg/ml,DMSO: 30 mg/ml,Ethanol: 30 mg/ml,PBS (pH 7.2): 50 mg/ml	Storage	Store at 2-8°C
General tips	For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20°C 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

Protocol

Cell experiment: Cells are incubated with (2-Hydroxypropyl)-β-cyclodextrin at various concentrations (5, 7.5, 10, 15, 20 mM) for 72 hours. Cell viability is assessed using a trypan blue dye exclusion method and cell proliferation is evaluated using a modified methyl-thiazol-diphenyl- tetrazolium (MTT) assay[2].

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Animal experiment: Mice: Mice are intraperitoneally injected with 200 μL vehicle (saline) or (2-Hydroxypropyl)-β-cyclodextrin (50 or 150 mM) for 20 consecutive days 3 days after transplantation, and survival is monitored daily. Leukemic cell engraftment is confirmed by detection of GFP-positive cells in the recipient's BM using flow cytometry[2].

References:

[1]. Song W, et al. 2-Hydroxypropyl-β-cyclodextrin promotes transcription factor EB-mediated activation of autophagy: implications for therapy. J Biol Chem. 2014 Apr 4;289(14):10211-22.
[2]. Yokoo M, et al. 2-Hydroxypropyl-β-Cyclodextrin Acts as a Novel Anticancer Agent. PLoS One. 2015 Nov 4;10(11):e0141946.

Background

(2-Hydroxypropyl)-β-cyclodextrin is a widely used drug delivery vehicle to improve the stability and bioavailability.

Cell treatment with (2-Hydroxypropyl)-β-cyclodextrin results in the activation of the transcription factor EB, a master regulator of lysosomal function and autophagy, and in enhancement of the cellular autophagic clearance capacity[1]. (2-Hydroxypropyl)-β-cyclodextrin treatment reduces intracellular cholesterol resulting in significant leukemic cell growth inhibition through G2/M cell-cycle arrest and apoptosis. The IC50 values for (2-Hydroxypropyl)-β-cyclodextrin after 72 hours exposure are in the range of 3.86–10.09 mM. (2-Hydroxypropyl)-β-cyclodextrin also shows anticancer effects against CML cells expressing a T315I BCR-ABL mutation (that confers resistance to most ABL tyrosine kinase inhibitors), and hypoxia-adapted CML cells that have characteristics of leukemic stem cells. In addition, colony forming ability of human primary AML and CML cells is inhibited by (2-Hydroxypropyl)-β-cyclodextrin[2].

(2-Hydroxypropyl)-β-cyclodextrin administration promotes transcription factor EB-mediated clearance of proteolipid aggregates that accumulate due to inefficient activity of the lysosome-autophagy system in cells derived from a patient with a lysosomal storage disorder[1]. Intraperitoneal injection of (2-Hydroxypropyl)-β-cyclodextrin significantly improves survival in leukemia mouse models. Systemic administration of (2-Hydroxypropyl)-β-cyclodextrin to mice has no significant adverse effects[2].

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References:

[1]. Song W, et al. 2-Hydroxypropyl-β-cyclodextrin promotes transcription factor EB-mediated activation of autophagy: implications for therapy. J Biol Chem. 2014 Apr 4;289(14):10211-22.
[2]. Yokoo M, et al. 2-Hydroxypropyl-β-Cyclodextrin Acts as a Novel Anticancer Agent. PLoS One. 2015 Nov 4;10(11):e0141946.

Caution: Product has not been fully validated for medical applications. For research use only.
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