

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].

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

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Animal experiment: Mice: Mice are intraperitoneally injected with 200 μ L 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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