For Research Use Only

2-Deoxy-D-glucose

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Catalog Number: CM00910

产品信息

Catalog Number:
CM00910

CAS号:
154-17-6

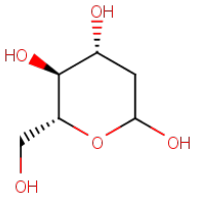
分子式:
$C_6H_{12}O_5$

主要靶点:
Hexokinase|Apoptosis|HSV

主要通路:
代谢|微生物学|凋亡

分子量:
164.16

溶解度:
H2O:16.4 mg/mL (100 mM),DMSO:16.4 mg/mL (100 mM)



体外活性

2-Deoxy-D-glucose(2-DG) activates AKT function through phosphatidylinositol 3-kinase (PI3K) and is independent of glycolysis or mTOR inhibition. 2-DG treatments disrupts the binding between insulin-like growth factor 1 (IGF-1) and IGF-binding protein 3 (IGFBP3) so that the free form of IGF-1 could be released from the IGF-1-IGFBP3 complex to activate IGF-1 receptor (IGF1R) signaling. 2-DG-induced activation of many survival pathways can be jointly attenuated through IGF1R inhibition. 2-DG also induces time- and dose-dependent ERK phosphorylation[1]. 2-DG is readily transported into cells and is phosphorylated by hexokinase, but cannot be metabolized further and accumulates in the cell. This leads to ATP depletion and the induction of cell-death[2]. 2DG significantly suppresses proliferation, causes apoptosis and reduces migration of murine endothelial cells, inhibiting formation of lamellipodia and filopodia and causing disorganization of F-actin filaments in murine endothelial cell[5].

体内活性

Treatment of cancer patients with relatively high doses of 2-DG (greater than 200 mg/kg) was largely ineffective in managing tumor growth. Side effects of 2-DG included elevated blood glucose levels, progressive weight loss with lethargy, and behavioral symptoms of hypoglycemia[2]. 2-DG enhances isoflurane-induced loss of righting reflex in mice. By reducing metabolism, 2-DG treatment can decrease body temperature in rodent, enhancing sensitivity to anesthetics[3]. 2-DG diet significantly increased serum ketone body level and brain expression of enzymes required for ketone body metabolism. The 2-DG-induced maintenance of mitochondrial bioenergetics was paralleled by simultaneous reduction in oxidative stress. Further, 2-DG treated mice exhibited a significant reduction of both amyloid precursor protein (APP) and amyloid beta (A β) oligomers, which was paralleled by significantly increased α -secretase and decreased γ -secretase expression, indicating that 2-DG induced a shift towards a non-amyloidogenic pathway. 2-DG increased expression of genes involved in A β clearance pathways, degradation, sequestering, and transport. Concomitant with increased bioenergetic capacity and reduced β -amyloid burden, 2-DG significantly increased expression of neurotrophic growth factors, BDNF and NGF, thus reduces pathology in female mouse model of Alzheimer's disease[4].

细胞实验

2×10^3 H460 or H157 cells are seeded in 96-well cell culture plates. Cells are treated with 5 mM 2-DG only, 5 or 10 μM IGF1R inhibitor II only, or a combination of 2-DG and IGF1R inhibitor II. Cell growth inhibition is determined after 48 h by the CellTiter 96® AQueous nonradioactive cell proliferation assay. (Only for Reference)

描述

2-Deoxy-D-glucose is an analog of glucose, which is a glycolytic inhibitor with antiviral activity.

储存

Powder: -20°C for 3 years | In solvent: -80°C for 2 years