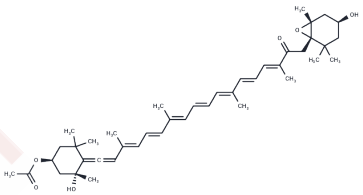
Data Sheet (Cat.No.T7600)

TargetMol

Fucoxanthin

Chemical Properties



CAS No. : 3351-86-8

Formula: C42H58O6

Molecular Weight: 658.91

Storage: Keep away from direct sunlight,Keep away from moisture
Powder: -20°C for 3 years | In solvent: -80°C for 1 year
Actual storage temperature shall be subject to the COA.

Biological Description

Description	Fucoxanthin (all-trans-Fucoxanthin) is a marine carotenoid (natural product), a multifunctional bioactive molecule with oral activity and cell permeability. It exhibits anti-obesity, anti-diabetic, anti-inflammatory, antioxidant, and anticancer activities, and is used in metabolic and tumor research.
Targets(IC50)	ERK,Others,Caspase,Antibacterial,NO Synthase,c-Myc,PPAR
In vitro	**Methods**: The MTT assay was used to verify the in vitro activity of Fucoxanthin. Cells were incubated for 72 hours at concentrations of 1, 10, 20, and 50 μM, applied to breast cancer cell lines MCF7, SKBR3, MDA-MB-231, and non-tumorigenic breast cell line MCF12A. Subsequently, combination experiments with cisplatin and doxorubicin were conducted using the same incubation and detection procedures. **Results**: Fucoxanthin exhibited dose-dependent cytotoxicity against all tested cell lines. Combination with doxorubicin enhanced the killing effect on SKBR3 and MDA-MB-231 cells, with 10 μM Fucoxanthin combined with 1 μM doxorubicin showing the most significant effect on MDA-MB-231. [1] **Methods**: MTT assay, QCV assay, scratch migration assay, and Matrigel invasion assay were performed in multiple human cancer cells (U2OS, MCF7, DLD-1, A549, H1299, SKOV3) and normal fibroblasts (MRC5, TIG-3). Cells were treated with 0–2.5 μM Fucoxanthin (for cytotoxicity) or ≤5 μM (for migration/invasion) for 48 h. **Results**: It showed selective toxicity against cancer cells and significantly inhibited migration and invasion capabilities. [2] **Methods**: Antioxidant activity was measured by DPPH, ABTS free radical scavenging, and FRAP assays, with Fucoxanthin incubation concentrations of 30-150 μM; DPPH was incubated in the dark for 30 min. For ACE inhibition experiments, rabbit lung ACE was used with incubation concentrations of 300-1500 μM Fucoxanthin, incubated at 37℃ for 30 min. Enzyme kinetic analysis was performed with different concentrations of HHL and Fucoxanthin. **Results**: It showed dose-dependent antioxidant activity. It exhibited mixed non-competitive inhibition against ACE, with IC50 of 822.64±17.69 μM and Ki of 600 μM. [3]
In vivo	**Methods**: In a streptozotocin (STZ)-induced diabetic Sprague-Dawley (SD) rat model, Fucoxanthin was administered by oral gavage at a dose of 200 mg/kg/day (dissolved in distilled water) for 12 consecutive weeks.

In vivo	**Results**: Fucoxanthin effectively improved renal function, alleviated glomerulosclerosis, reversed the decrease in renal Sirt1 and Nrf2 protein levels, and reduced oxidative stress indicators. [4]

Solubility Information

Solubility	DMSO: 140 mg/mL (212.47 mM),Sonication is recommended. H2O: Insoluble, (< 1 mg/ml refers to the product slightly soluble or insoluble)

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	1.5177 mL	7.5883 mL	15.1766 mL
5 mM	0.3035 mL	1.5177 mL	3.0353 mL
10 mM	0.1518 mL	0.7588 mL	1.5177 mL
50 mM	0.0304 mL	0.1518 mL	0.3035 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Note: The dilution table applies only to solid products. For liquid products, please calculate the stock solution based on the stated concentration and/or density.

Reference

Malhão, Fernanda et al. Fucoxanthin Holds Potential to Become a Drug Adjuvant in Breast Cancer Treatment: Evidence from 2D and 3D Cell Cultures. Molecules (Basel, Switzerland) vol. 26,14 4288. 15 Jul. 2021.

Zhu Q, Zhou Y, Wang H, et al.Fucoxanthin triggers ferroptosis in glioblastoma cells by stabilizing the transferrin receptor.Medical Oncology.2023, 40(8): 230.

Garg, Sukant et al. Marine Carotenoid Fucoxanthin Possesses Anti-Metastasis Activity: Molecular Evidence. Marine drugs vol. 17,6 338. 5 Jun. 2019.

Raji, Vijayan et al. Purification of fucoxanthin from Sargassum wightii Greville and understanding the inhibition of angiotensin 1-converting enzyme: An in vitro and in silico studies. International journal of biological macromolecules vol. 148 (2020): 696-703.

Yang, Guanyu et al. Fucoxanthin regulates Nrf2 signaling to decrease oxidative stress and improves renal fibrosis depending on Sirt1 in HG-induced GMCs and STZ-induced diabetic rats. European journal of pharmacology vol. 913 (2021): 174629.