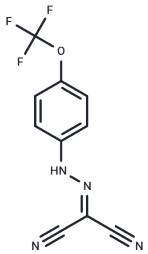
Data Sheet (Cat.No.T6834)

TargetMol

FCCP

Chemical Properties



CAS No. : 370-86-5

Formula: C10H5F3N4O

Molecular Weight: 254.17

Storage: 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	FCCP (Trifluoromethoxy carbonylcyanide phenylhydrazone) is an oxidative phosphorylation (OXPHOS) inhibitor and mitochondrial proton carrier uncoupler. FCCP is often used as an apoptosis inducer.
Targets(IC50)	ATPase,PTEN,OXPHOS,Mitochondrial Metabolism
In vitro	**METHODS**: Rat ventricular myocytes were treated with FCCP (10-1000 nM) for 1400 sec, and cellular oxygen consumption was measured using a Clark Oxygen Electrode. **RESULTS**: Oxygen consumption increased significantly, immediately, and in a dose-dependent manner after the addition of FCCP. [1] **METHODS**: Rat adrenal medullary chromaffinoma cells PC12 were treated with FCCP (30 μM) for 0.5-2 h. The rate of protein synthesis was measured using [3H]methionine. **RESULTS**: FCCP treatment produced a strong inhibition (68%) of protein synthesis rate for at least 2 hours. [2]
In vivo	**METHODS**: To test the effect on stroke, FCCP (1 mg/kg) was injected intraperitoneally into a C57BL/6J mouse model of stroke, followed by one hour of transient middle cerebral artery occlusion (tMCAO). **RESULTS**: Infarct volumes in the cortex, striatum, and whole hemisphere were significantly increased in mice pretreated with FCCP. Mice receiving FCCP had significantly increased neurologic deficit scores compared to carriers. [3] **METHODS**: To assay anti-tumor activity in vivo, FCCP (1 mg/kg) and cisplatin (2 mg/kg) were intraperitoneally injected every two days for two weeks into C57BL/6 mice harboring mouse ovarian epithelial carcinoma tumor ID8. **RESULTS**: The combination of FCCP and cisplatin inhibited tumor growth via OMA1-induced mitochondrial and ER stress. [4]
Cell Research	Protein synthesis rate is assayed in 24-mm diameter multi-well dishes with fresh medium containing 0.175 Ci/mmol of [3H]methionine (200 μM), for 30 min at 37°C. PC12 cells are treated with FCCP for different period of times. (Only for Reference)

Solubility Information

Solubility	DMSO: 55 mg/mL (216.39 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)

In vivo Formulation	10% DMSO+40% PEG300+5% Tween 80+45% Saline: 2.55 mg/mL (10.03 mM),Solution. *Please add the solvents sequentially, clarifying the solution as much as possible before adding the next one. Dissolve by heating and/or sonication if necessary. Working solution is recommended to be prepared and used immediately. The formulation provided above is for reference purposes only. In vivo formulations may vary and should be modified based on specific experimental conditions.*

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	3.9344 mL	19.6719 mL	39.3437 mL
5 mM	0.7869 mL	3.9344 mL	7.8687 mL
10 mM	0.3934 mL	1.9672 mL	3.9344 mL
50 mM	0.0787 mL	0.3934 mL	0.7869 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

Brennan JP, et al. FCCP is cardioprotective at concentrations that cause mitochondrial oxidation without detectable depolarisation. Cardiovasc Res. 2006 Nov 1;72(2):322-30.
Liu H, Sun Y, Xu H, et al. PTEN-induced putative kinase 1 regulates mitochondrial quality control and is essential for the maturation of human induced pluripotent stem cell-derived cardiomyocytes. Genes & Diseases. 2022
Muñoz F, et al. Carbonyl cyanide p-trifluoromethoxyphenylhydrazone (FCCP) induces initiation factor 2 alpha phosphorylation and translation inhibition in PC12 cells. FEBS Lett. 2001 Mar 9;492(1-2):156-9.
Liang S, Zhu C, Suo C, et al. Mitochondrion-Localized SND1 Promotes Mitophagy and Liver Cancer Progression Through PGAM5. Frontiers in Oncology. 2022, 12: 857968-857968
Shi J, Zhang F, Chen L, et al. Systemic mitochondrial disruption is a key event in the toxicity of bacterial pore-forming toxins to Caenorhabditis elegans. Environmental Microbiology. 2021 Sep;23(9):4896-4907
Grasmick KA, et al. Uncoupling of the Electron Transport Chain Compromises Mitochondrial Oxidative Phosphorylation and Exacerbates Stroke Outcomes. J Neuroinfect Dis. 2018;9(4):283.
Cheng M, et al. The Mitochondrial PHB2/OMA1/DELE1 Pathway Cooperates with Endoplasmic Reticulum Stress to Facilitate the Response to Chemotherapeutics in Ovarian Cancer. Int J Mol Sci. 2022 Jan 25;23(3):1320.
Zheng B X, Long W, Zheng W, et al.Mitochondria-Selective Dicationic Small-Molecule Ligand Targeting G-Quadruplex Structures for Human Colorectal Cancer Therapy.Journal of Medicinal Chemistry.2024
Jiang Z.SLC25A19 is required for NADH homeostasis and mitochondrial respiration.Free Radical Biology and Medicine.2024
Muffels I J J, Rodenburg R, Willemen H L D, et al.Imaging Flow Cytometry reveals divergent mitochondrial phenotypes in mitochondrial disease patients.iScience.2024
Muffels I J J, Waterham H R, D'Alessandro G, et al.Imaging flow cytometry-based cellular screening elucidates pathophysiology in individuals with Variants of Uncertain Significance.Genome Medicine.2025, 17(1): 12.
Non-canonical hepatic androgen receptor mediates glucagon sensitivity in female mice through the PGC1α/ERRα/mitochondria axis