

Product Data Sheet

Product Name: Pifithrin- α (PFT α)

Cat. No.: GC10538

Chemical Properties

Cas. No. 63208-82-2

Chemical Name 2-(2-imino-4,5,6,7-tetrahydro-1,3-benzothiazol-3-yl)-1-(4-methylphenyl)ethanone;hydrobromide

SMILES CC1=CC=C(C=C1)C(=O)CN2C3=C(CCCC3)SC2=N.Br

Formula $C_{16}H_{18}N_2OS \cdot HBr$

M.Wt 367.3

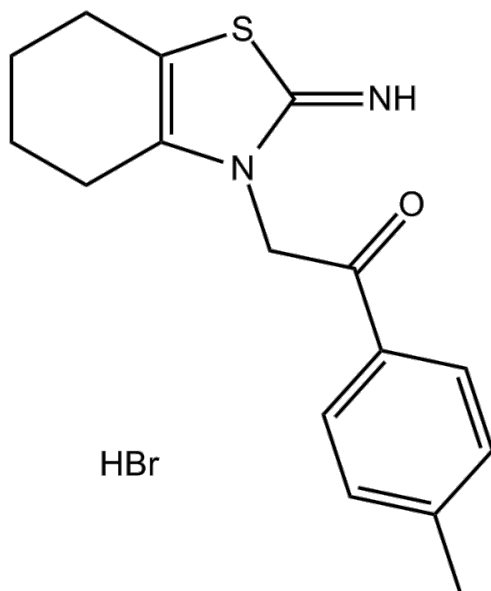
Solubility ≥ 17.45 mg/mL in DMSO, ≥ 7.12 mg/mL in EtOH with ultrasonic and warming

Storage Store at $-20^{\circ}C$

General tips For obtaining a higher solubility, please warm the tube at $37^{\circ}C$ and shake it in the ultrasonic bath for a while. Stock solution can be stored below $-20^{\circ}C$ 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

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

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Cell experiment [1]:

Cell lines HepG2 cells

Preparation Method Cells seeded in a 96-well plate at a concentration of 10^5 cells/ml for 24 h, were treated with various doses TPT, PFT α alone or both (for this group, cells were pretreated with PFT α for 2 h prior to TPT treatment). After 48 h incubation, the cells were pretreated with PFT α for 2 h prior to TPT treatment)

Reaction Conditions 1-100 μ M; 2 h

Applications The IC_{50} of TPT for HepG2 cells after 10 μ M PFT α pretreated, was lower than the effect of TPT alone. PFT α decreases the p-p53 levels and p-p53 activity.

Animal experiment [2]:

Animal models Adult male Sprague-Dawley rats

Preparation Method Transient Focal Ischemia Model

Dosage form 0.4 μ g/ μ l; 20 μ l; i.c.v + 0.2mg/100gm, i.p; twice a day for three days

Applications Delayed Pifithrin- α treatment improved locomotor behavior in stroke rats.

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References:

- [1]. Guo J, Tang Q, et,al. Pifithrin- α enhancing anticancer effect of topotecan on p53-expressing cancer cells. Eur J Pharm Sci. 2019 Feb 1;128:61-72. doi: 10.1016/j.ejps.2018.11.024. Epub 2018 Nov 22. PMID: 30472223.
- [2]. Luo Y, Kuo CC, et,al. Delayed treatment with a p53 inhibitor enhances recovery in stroke brain. Ann Neurol. 2009 May;65(5):520-30. doi: 10.1002/ana.21592. PMID: 19475672; PMCID: PMC2690614.

Background

Pifithrin- α (PFT- α) is a p53 inhibitor^[1]. Pifithrin- α widely used in neuroscience to block neuronal apoptotic cell death^[2]. Pifithrin- α is also a potent stimulant of aryl hydrocarbon receptor (AhR) ^[3].

Pifithrin- α (10 μ M;48h) reduces meth-induced degeneration of dopaminergic neurons ^[4]. Treatment with Pifithrin- α (1 μ M; 12-24 h) prevents ROS formation in hMp84-overexpressing A375 cells^[5]. The IC₅₀ of TPT for HepG2 cells after 10 μ M PFT α pretreated(1-100 μ M; 2 h), was 4.8 to 14.4 folds lower than the effect of TPT alone. PFT α decreases the p-p53 levels and p-p53 activity, not affects p53 expression in p53 positive tumor cells^[6].

Pifithrin- α (2 mg/kg; i.v) reduced the number of apoptotic cells in the ischemic brain by inhibiting the binding of p53 to its DNA sites as it reduced the expression of the p53-related gene p21WAF^[7].Delayed Pifithrin- α (0.4 μ g/ μ l; 20 μ l; i.c.v + 0.2mg/100gm, i.p; twice a day for three days) treatment improved locomotor behavior in stroke rats^[8]. Pifithrin- α reduced dopaminergic neurodegeneration in animal models of Parkinson s disease(10 μ g)^[9], prevented cell death of dopaminergic transplants in 6-OHDA-lesioned rats(2 mg/kg/day; i.p ; 5 days)^[10], improved the survival of neuroprogenitor cells in subventricular zone of stroke rats, and reduced traumatic brain injury^[11].

References:

- [1]. Komarov PG, Komarova EA, et,al. A chemical inhibitor of p53 that protects mice from the side effects of cancer therapy. Science 285:1733-1737

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- [2]. Zhu X, Yu QS, et.al. Novel p53 inactivators with neuroprotective action: syntheses and pharmacological evaluation of 2-imino-2,3,4,5,6,7-hexahydrobenzothiazole and 2-imino-2,3,4,5,6,7-hexahydrobenzoxazole derivatives. J Med Chem 45:5090-5097
- [3]. Hoagland MS, Hoagland EM, et.al. The p53 inhibitor pifithrin-alpha is a potent agonist of the aryl hydrocarbon receptor. J Pharmacol Exp Ther. 2005 Aug;314(2):603-10. doi: 10.1124/jpet.105.084186. Epub 2005 Apr 20. PMID: 15843497.
- [4]. Chen YH, Bae E, et.al. Pifithrin-Alpha Reduces Methamphetamine Neurotoxicity in Cultured Dopaminergic Neurons. Neurotox Res. 2019 Aug;36(2):347-356. doi: 10.1007/s12640-019-00050-w. Epub 2019 May 8. PMID: 31069753.
- [5]. Moretti D, Del Bello B, et.al. Calpain-3 impairs cell proliferation and stimulates oxidative stress-mediated cell death in melanoma cells. PLoS One. 2015 Feb 6;10(2):e0117258. doi: 10.1371/journal.pone.0117258. PMID: 25658320; PMCID: PMC4319969.
- [6]. Guo J, Tang Q, et.al. Pifithrin- α enhancing anticancer effect of topotecan on p53-expressing cancer cells. Eur J Pharm Sci. 2019 Feb 1;128:61-72. doi: 10.1016/j.ejps.2018.11.024. Epub 2018 Nov 22. PMID: 30472223.
- [7]. Leker RR, Aharonowiz M, et.al. The role of p53-induced apoptosis in cerebral ischemia: effects of the p53 inhibitor pifithrin alpha. Exp Neurol. 2004 Jun;187(2):478-86. doi: 10.1016/j.expneurol.2004.01.030. PMID: 15144874.
- [8]. Luo Y, Kuo CC, et.al. Delayed treatment with a p53 inhibitor enhances recovery in stroke brain. Ann Neurol. 2009 May;65(5):520-30. doi: 10.1002/ana.21592. PMID: 19475672; PMCID: PMC2690614.
- [9]. Liang ZQ, Li YL, et.al. NF-kappaB contributes to 6-hydroxydopamine-induced apoptosis of nigral dopaminergic neurons through p53. Brain Res 1145:190-203
- [10]. Chou J, Greig NH, et.al. Enhanced survival of dopaminergic neuronal transplants in hemi-Parkinsonian rats by the p53 inactivator PFT- α . Cell Transplant 20:1351-1359
- [11]. Huang YN, Yang LY, et.al. Neuroprotective effects of pifithrin- α against traumatic brain injury in the striatum through suppression of neuroinflammation, oxidative stress, autophagy, and apoptosis. Sci Rep. 2018 Feb 5;8(1):2368. doi: 10.1038/s41598-018-19654-x. PMID: 29402897; PMCID: PMC5799311.

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