

Product Data Sheet

Product Name: FeTPPS
Cat. No.: GC43663

Chemical Properties

Cas. No. 90384-82-0

Chemical Name Fe(III)5,10,15,20-tetrakis(4-sulfonatophenyl)porphyrinato chloride

SMILES [Cl-][Fe+3]123[N-]4C5=CC=C4C(C6=CC=C(S([O-])(=O)=O)C=C6)=C(C=C7)[N]1=C7C(C8=CC=C(S([O-])(=O)=O)C=C8)=C(C=C9)[N-]2C9=C(C%10=CC=C(S([O-])(=O)=O)C=C%10)C%11=[N]3C(C=C%11)=C5C%12=CC=C(S([O-])(=O)=O)C=C%12.[H+].[H+].[H+].[H+]

Formula C₄₄H₂₄ClFeN₄O₁₂S₄•4H M.Wt 1024.3

Solubility 5 mg/ml in water Storage Store at -20°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.

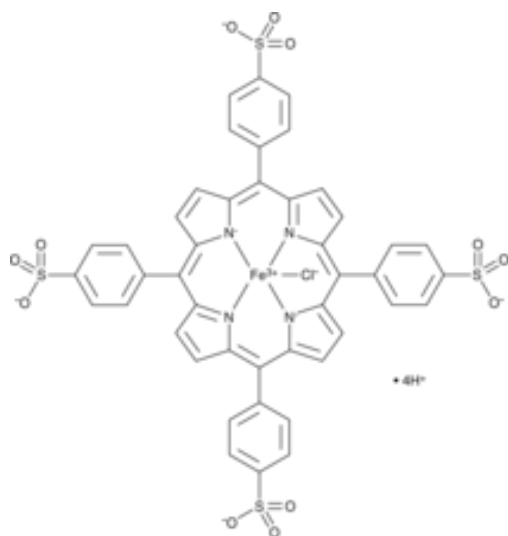
Caution: Product has not been fully validated for medical applications. For research use only.

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Structure



Protocol

Cell experiment [1]:

Cell lines Cardiomyocytes

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Preparation Method

The MTT assay was used to assess cell viability. Cardiomyocytes in multiwell microtiter plates were treated for 24h with SIN-1, H₂O₂, FeTPPS, and/or cyclosporin A, as indicated. H₂O₂, 10 and 100μM, and cyclosporin A, 0.1 or 1.0μM. FeTPPS, 50μM, was chosen from concentration response data over a range. MTT dye was added to each well for the final 4h of the experiment, and solubilization solution was added to stop the reactions. As the absorbance curve of the MTT dye exhibits a linear portion ranging from 570 to 655nm, the absorbance was determined at 570nm on a multiwell plate reader using BioLinx 2.2 data capture software. Background absorbance of medium in the absence of cells was subtracted. All samples were assayed in duplicate, and the mean for each experiment was calculated. Experiments were conducted a minimum of five and a maximum of 14 times.

Reaction Conditions

50μM; 24h

Applications

FeTPPS reduces cell death caused by SIN-1 and SIN-1 plus H₂O₂.

Animal experiment [2]:

Animal models

Controlled cortical impact injury (CCI) mice model

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In this study, a traumatic brain injury (TBI) model was established in mice using the CCI method. The mice were randomly divided into four groups (n=10 in each group): TBI+Vehicle group, TBI+FeTPPS group, Sham+Vehicle group, and Sham+FeTPPS group. TBI was performed by craniotomy on the right side and using an impactor to cause moderate brain injury (impact head diameter 4mm, Preparation Method depth 3mm, speed 1.5m/s); the Sham group only underwent craniotomy without impact. 1h and 4h after TBI or Sham surgery, normal saline or FeTPPS (30mg/kg, intraperitoneal injection) were administered, respectively. Postoperative behavioral tests such as Morris water maze, tail suspension, rotarod, and open field were performed, and brain water content, sway test, and blood sampling for biochemical indicators were measured 24h later.

Dosage form 10mg/kg, 30mg/kg; ip; two injections

Applications FeTPPS reduces secondary damage and improves neurobehavioral functions after traumatic brain injury.

References:

- [1]. Klassen S S, Rabkin S W. The metalloporphyrin FeTPPS but not by cyclosporin A antagonizes the interaction of peroxynitrate and hydrogen peroxide on cardiomyocyte cell death[J]. Naunyn-Schmiedeberg's archives of pharmacology, 2009, 379(2): 149-161.
- [2]. Bruschetta G, Impellizzeri D, Campolo M, et al. FeTPPS reduces secondary damage and improves neurobehavioral functions after traumatic brain injury[J]. Frontiers in Neuroscience, 2017, 11: 6.

Background

FeTPPS is a metalloporphyrin-based ONOO^- decomposition catalyst [1]. FeTPPS catalyzes the decomposition of peroxynitrite (ONOO^-), reducing its nitrating/oxidative damage to proteins, DNA, and lipids [2-3]. FeTPPS is primarily used in the study of oxidative stress-related disease models [4].

In cardiomyocytes, FeTPPS (50 μM ; 24h) reduces cell death caused by SIN-1 and SIN-1 plus H_2O_2

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[5]. In spermatids, exposure to FeTPPS (25-50 μ M; 24h) ameliorates nitrosative stress [6].

In controlled cortical impact injury (CCI) mice model, FeTPPS (10mg/kg, 30mg/kg; ip; two injections) reduces secondary damage and improves neurobehavioral functions after traumatic brain injury. [7]. In a high-fat diet mice model, FeTPPS (50-60mg/kg; po; 8 weeks) treatment more than doubled the insulin-induced drop in blood glucose levels [8].

References:

- [1]. Haber A, Gross Z. Catalytic antioxidant therapy by metallodrugs: lessons from metallocorroles[J]. Chemical Communications, 2015, 51(27): 5812-5827.
- [2]. Uribe P, Barra J, Painen K, et al. FeTPPS, a Peroxynitrite Decomposition Catalyst, Ameliorates Nitrosative Stress in Human Spermatozoa[J]. Antioxidants, 2023, 12(6): 1272.
- [3]. Zhang P, Ma L, Yang Z, et al. 5, 10, 15, 20-Tetrakis (4-sulfonatophenyl) porphyrinato iron (III) chloride (FeTPPS), a peroxynitrite decomposition catalyst, catalyzes protein tyrosine nitration in the presence of hydrogen peroxide and nitrite[J]. Journal of Inorganic Biochemistry, 2018, 183: 9-17.
- [4]. Duan X, Wen Z, Shen H, et al. Intracerebral hemorrhage, oxidative stress, and antioxidant therapy[J]. Oxidative medicine and cellular longevity, 2016, 2016(1): 1203285.
- [5]. Klassen S S, Rabkin S W. The metalloporphyrin FeTPPS but not by cyclosporin A antagonizes the interaction of peroxynitrate and hydrogen peroxide on cardiomyocyte cell death[J]. Naunyn-Schmiedeberg's archives of pharmacology, 2009, 379(2): 149-161.
- [6]. Uribe P, Barra J, Painen K, et al. FeTPPS, a Peroxynitrite Decomposition Catalyst, Ameliorates Nitrosative Stress in Human Spermatozoa[J]. Antioxidants, 2023, 12(6): 1272.
- [7]. Bruschetta G, Impellizzeri D, Campolo M, et al. FeTPPS reduces secondary damage and improves neurobehavioral functions after traumatic brain injury[J]. Frontiers in Neuroscience, 2017, 11: 6.
- [8]. Duplain H, Sartori C, Dessen P, et al. Stimulation of peroxynitrite catalysis improves insulin sensitivity in high fat diet-fed mice[J]. The Journal of physiology, 2008, 586(16): 4011-4016.

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