# Hematoporphyrin

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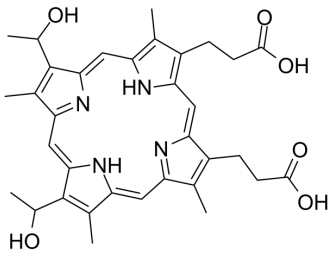
| **Cat. No.:** | HY-B0754 |
| **CAS No.:** | 14459-29-1 |
| **Molecular Formula:** | $C_{34}H_{38}N_4O_6$ |
| **Molecular Weight:** | 598.69 |
| **Target:** | Endogenous Metabolite; Apoptosis |
| **Pathway:** | Metabolic Enzyme/Protease; Apoptosis |
| **Storage:** | -20°C, protect from light<br>* The compound is unstable in solutions, freshly prepared is recommended. |




## SOLVENT & SOLUBILITY

**In Vitro**

DMSO : 150 mg/mL (250.55 mM; Need ultrasonic)

**Preparing Stock Solutions**

| Solvent / Mass / Concentration | 1 mg | 5 mg | 10 mg |
|---|---|---|---|
| 1 mM | 1.6703 mL | 8.3516 mL | 16.7031 mL |
| 5 mM | 0.3341 mL | 1.6703 mL | 3.3406 mL |
| 10 mM | 0.1670 mL | 0.8352 mL | 1.6703 mL |

Please refer to the solubility information to select the appropriate solvent.

**In Vivo**

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (4.18 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: 2.5 mg/mL (4.18 mM); Suspended solution; Need ultrasonic

## BIOLOGICAL ACTIVITY

**Description**

Hematoporphyrin (Hematoporphyrin IX), a photosensitizer, is a substrate for affinity chromatography of heme-binding proteins. Hematoporphyrin can induce apoptosis in U87 glioma cells and decrease tumor growth in vivo when exposed to red light[1][2][3].

**$IC_{50}$ & Target**

Human Endogenous Metabolite

**In Vitro**

Hematoporphyrin (20-120 nM; 60 min) dose-dependently inhibits cell viability in U87 and U251 glioma cells, with $IC_{50}$s of 85 and 166 nM, respectively[2].
Hematoporphyrin (85 nM; 60 min) induces cell apoptosis via induction of ROS in U87 cells[2].
Hematoporphyrin (85 nM; 60 min) induces morphological changes of U87 cells under the red light, including shrinking, fragmentation[2].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Viability Assay[2]

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| Cell Line: | U87 and U251 cells |
| Concentration: | 20, 40, 60, 80, 100, 120 nM |
| Incubation Time: | 60 min |
| Result: | Inhibited cell viability in a dose-dependent manner.<br>Was more effective under the red light than white light. |

Apoptosis Analysis[2]

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| Cell Line: | U87 cells |
| Concentration: | 85 nM |
| Incubation Time: | 60 min |
| Result: | Induced apoptotic nuclei in U87 cells with low cell density.<br>Induced the ROS and decreased the mitochondrial membrane potential. |

**In Vivo**

Hematoporphyrin (5-10 mg/kg; i.p. for 2 months) with the irradiation of red light rapidly decreases the tumor size of rats, due to necrosis caused both by direct action of the photoactivated porphyrin on the tumor cells and by secondary effects on blood vessels[3].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

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| Animal Model: | Wistar albino rats of both sexes (20 d; 60-80 g) bearing a subcutaneous solid Yoshida hepatoma AH-130[3] |
| Dosage: | 5, 10 mg/kg |
| Administration: | I.p. daily during the initial 10 days and biweekly for the next 2 months |
| Result: | No tumor could be palpated a few days after exposure of the rats to light.<br>The skin healed completely and regrowth of the hair occurred.<br>Massive coagulation necrosis of the tumor 24 h after phototreatment (×40). |

## CUSTOMER VALIDATION

- Nat Biomed Eng. 2022 Dec 22.
- ACS Nano. 2023 Nov 21.
- Nat Commun. 2022 Jun 16;13(1):3468.
- Chem Eng J. 390 (2020) 124521.
- Free Radic Biol Med. 2023 Jul 25;207:239-246.

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## REFERENCES

[1]. Olsen, K.W., Affinity chromatography of heme-binding proteins: synthesis and characterization of hematin- and hematoporphyrin-agarose. Methods Enzymol, 1986. 123: p. 324-31.

[2]. Yuan SX, et, al. Underlying mechanism of the photodynamic activity of hematoporphyrin□induced apoptosis in U87 glioma cells. Int J Mol Med. 2018 Apr;41(4):2288-2296.

[3]. Tomio L, et, al. Effect of hematoporphyrin and red light on AH-130 solid tumors in rats. Acta Radiol Oncol. 1983;22(1):49-53.



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