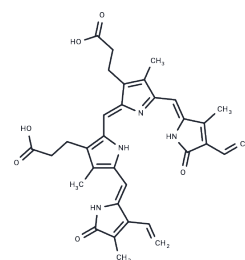


Biliverdin

Chemical Properties

CAS No. :	114-25-0
Formula:	C33H34N4O6
Molecular Weight:	582.65
Storage:	Keep away from direct sunlight, Powder: -20°C for 3 years In solvent: -80°C for 1 year <small>Actual storage temperature shall be subject to the COA.</small>



Biological Description

Description	Biliverdin, produced through the oxidation of bilirubin, can also be synthesized through a non-protoporphyrin pathway in <i>Corynebacterium glutamicum</i> . Biliverdin is investigated in biochemical and microbial research contexts focused on heme degradation pathways, oxidative stress response systems, microbial metabolic engineering, and bile pigment-associated cellular signaling mechanisms.
Targets(IC50)	Endogenous Metabolite
In vitro	<p>Methods: The metabolic pathway of biliverdin production was summarized. Combined with in vitro assays, its mechanisms regulating immunity, vascular physiology, inflammatory response and oxidative stress were explored.</p> <p>Results:</p> <ol style="list-style-type: none"> 1. Biliverdin is a degradation product of heme. Heme released from ruptured erythrocytes is catalyzed by heme oxygenase to generate biliverdin IX-α, carbon monoxide and ferrous iron. Biliverdin IX-α is further converted into bilirubin IX-α by NADPH-dependent biliverdin reductase. 2. Biliverdin accumulation elevates biliverdin reductase activity, thereby modulating innate immune function. It inhibits vascular smooth muscle proliferation, exerts vascular antioxidant effects, and suppresses intimal hyperplasia and angiogenesis. 3. Biliverdin downregulates pro-inflammatory factors such as TLR-4 and upregulates anti-inflammatory factor IL-10, effectively alleviating inflammation [1]. It scavenges hydroxyl peroxides, inhibits mitochondrial superoxide production at concentrations of 0.1-1 μM, and reduces systemic oxidative stress [1-2].
In vivo	<p>Methods: Rat balloon angioplasty and vascular graft injury models, as well as mouse graft injury model were established. Biliverdin was intraperitoneally injected at 50 μmol/kg for 2 consecutive weeks. Vascular intimal hyperplasia, immune cell infiltration and splenocyte proliferation were observed.</p> <p>Results: Biliverdin markedly inhibited intimal hyperplasia after angioplasty and vascular transplantation, and reduced neointimal formation induced by balloon injury [1,3]. Drug treatment decreased immune cell infiltration in graft tissues and suppressed proliferative activity of mouse splenocytes [3].</p>

Solubility Information

A DRUG SCREENING EXPERT

Solubility	DMSO: 2.4 mg/mL (4.12 mM), Sonication and heating are recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)
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Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	1.7163 mL	8.5815 mL	17.163 mL
5 mM	0.3433 mL	1.7163 mL	3.4326 mL
10 mM	0.1716 mL	0.8581 mL	1.7163 mL
50 mM	0.0343 mL	0.1716 mL	0.3433 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

McDonnell MC, et al. Biochemistry, Biliverdin. 2023 May 1. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan.

Jansen, T., & Daiber, A. (2012). Direct Antioxidant Properties of Bilirubin and Biliverdin. Is there a Role for Biliverdin Reductase?. *Frontiers in pharmacology*, 3, 30.

Ollinger, R., et al., (2007). Therapeutic applications of bilirubin and biliverdin in transplantation. *Antioxidants & redox signaling*, 9(12), 2175-2185.

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