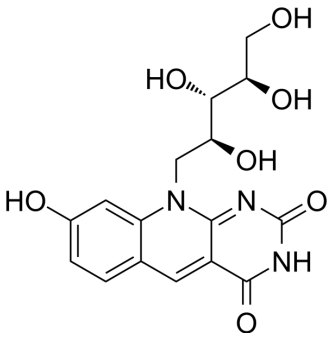
Coenzyme FO



Cat. No.:	HY-136497
CAS No.:	37333-48-5
Molecular Formula:	$C_{16}H_{17}N_3O_7$
Molecular Weight:	363.32
Target:	Bacterial; Endogenous Metabolite
Pathway:	Anti-infection; Metabolic Enzyme/Protease
Storage:	Powder -20°C 3 years 4°C 2 years In solvent -80°C 6 months -20°C 1 month

SOLVENT & SOLUBILITY

In Vitro

DMSO : 10 mg/mL (27.52 mM; Need ultrasonic)
Ethanol : < 1 mg/mL (ultrasonic;warming;heat to 60°C) (insoluble)

Preparing Stock Solutions

Concentration / Solvent / Mass	1 mg	5 mg	10 mg
1 mM	2.7524 mL	13.7620 mL	27.5239 mL
5 mM	0.5505 mL	2.7524 mL	5.5048 mL
10 mM	0.2752 mL	1.3762 mL	2.7524 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: 1 mg/mL (2.75 mM); Suspended solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: 0.53 mg/mL (1.46 mM); Suspended solution; Need ultrasonic

BIOLOGICAL ACTIVITY

Description

Coenzyme FO, a deazaflavin chromophore, acts as an important hydride acceptor/donor in the central methanogenic pathway[1][2].

In Vitro

The formation of Coenzyme FO is mediated by two separate radical SAM active sites, one each in the CofG and CofH enzymes or both in the FbiC enzyme. These two radical SAM domains constitute the functional domains of Fo synthase. F420 is biosynthesized in Methanocaldococcus jannaschii by the action of eight enzymes with the formation of the deazaflavin chromophore (Fo) as the remaining unsolved step[1].
Coenzyme F420 is the central low-redox-potential electron carrier in methanogenic metabolism. Coenzyme F420 is reduced under hydrogen by the action of F420-dependent hydrogenase[3].

Coenzyme F420 acts as a hydride transfer coenzyme for an F420-specific glucose-6-phosphate dehydrogenase (Fgd) in mycobacteria. Coenzyme F420 is found in all methanogenic and certain nonmethanogenic archaea, where it participates in energy metabolism, NADP reduction, oxygen detoxification, and sulfite reduction. By converting NO2 back to NO with F420H2, M. tuberculosis could decrease the effectiveness of antibacterial action of macrophages[4].

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

REFERENCES

[1]. Purwantini E, et al. Conversion of NO2 to NO by reduced coenzyme F420 protects mycobacteria from nitrosative damage. Proc Natl Acad Sci U S A. 2009;106(15):6333-6338.

[2]. Mills DJ, et al. De novo modeling of the F(420)-reducing [NiFe]-hydrogenase from a methanogenic archaeon by cryo-electron microscopy. Elife. 2013;2:e00218. Published 2013 Mar 5.

[3]. de Poorter LMI, et al. Hydrogen concentrations in methane-forming cells probed by the ratios of reduced and oxidized coenzyme F420. Microbiology. 2005;151(Pt 5):1697-1705.

[4]. Philmus B, et al. Biosynthetic versatility and coordinated action of 5'-deoxyadenosyl radicals in deazaflavin biosynthesis. J Am Chem Soc. 2015;137(16):5406-5413.

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