

10,12-Tricosadiynoic acid

Cat. No.:	HY-135425
CAS No.:	66990-30-5
Molecular Formula:	C ₂₃ H ₃₈ O ₂
Molecular Weight:	346.55
Target:	Acyltransferase
Pathway:	Metabolic Enzyme/Protease
Storage:	4°C, protect from light, stored under nitrogen * In solvent : -80°C, 6 months; -20°C, 1 month (protect from light, stored under nitrogen)



SOLVENT & SOLUBILITY

In Vitro	DMSO : 100 mg/mL (288.56 mM; Need ultrasonic)					
		Solvent Concentration	Mass			
	Preparing Stock Solutions			1 mg	5 mg	10 mg
		1 mM		2.8856 mL	14.4279 mL	28.8559 mL
		5 mM		0.5771 mL	2.8856 mL	5.7712 mL
	10 mM		0.2886 mL	1.4428 mL	2.8856 mL	
Please refer to the solubility information to select the appropriate solvent.						
In Vivo	<ol style="list-style-type: none"> Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline Solubility: 5 mg/mL (14.43 mM); Suspended solution; Need ultrasonic Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline) Solubility: 5 mg/mL (14.43 mM); Suspended solution; Need ultrasonic Add each solvent one by one: 10% DMSO >> 90% corn oil Solubility: ≥ 5 mg/mL (14.43 mM); Clear solution 					

BIOLOGICAL ACTIVITY

Description	10,12-Tricosadiynoic acid is a highly specific, selective, high affinity and orally active acyl-CoA oxidase-1 (ACOX1) inhibitor. 10,12-Tricosadiynoic acid can treat high fat diet- or obesity-induced metabolic diseases by improving mitochondrial lipid and ROS metabolism ^[1] .
IC ₅₀ & Target	Acyl-CoA oxidase-1 (ACOX1) ^[1] .
In Vitro	10,12-Tricosadiynoic acid-CoA rapidly inhibits ACOX1 activity in a time- and concentration-dependent manner. The activity of ACOX1 decreases by nearly 95% after 5 min of incubation with 10 eq of 10,12-Tricosadiynoic acid-CoA. ACOX1 activity is

inhibited only if free 10,12-Tricosadiynoic Acid is activated as the CoA thioester, the substrate form. Inhibition of ACOX1 by 10,12-Tricosadiynoic acid-CoA is irreversible. And the kinetics parameters KI and kinact are calculated to be 680 nm and 3.18 min⁻¹, respectively^[1].

10,12-Tricosadiynoic acid is the precursor of 10,12-Tricosadiynoic acid-CoA and is transformed into 10,12-Tricosadiynoic acid-CoA by peroxisomal very long chain acyl-CoA synthetase (VLACS) after entering into cells, and it inhibits ACOX1 in vivo^[1].

10,12-Tricosadiynoic acid (500 nM) inhibits acyl-CoA oxidase-1 (ACOX1) activity. 10,12-Tricosadiynoic acid treatment abrogates the protective effect by Sirt5 siRNA^[2].

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

In Vivo

10,12-Tricosadiynoic acid (100 µg/kg; oral gavage; daily; for 8 weeks; male Wistar rats) treatment increases hepatic mitochondrial fatty acid oxidation (FAO) via activation of the SIRT1-AMPK (adenosine 5'-monophosphate-activated protein kinase) pathway and proliferator activator receptor α and reduces hydrogen peroxide accumulation in high fat diet-fed rats, which significantly decreases hepatic lipid and ROS contents, reduces body weight gain, and decreases serum triglyceride and insulin levels^[1].

10,12-Tricosadiynoic acid (0 mg/kg, 37.5 mg/kg, 75 mg/kg, and 150 mg/kg diet) treatment does not affect weight gain, but significantly decreases peroxisomal β-oxidation in the liver, and increased body fat accumulation in Nile tilapia. The fish with impaired peroxisomal β-oxidation exhibited higher contents of serum lipid and peroxidation products, and alanine aminotransferase activity, and significantly lowered hepatic activities of superoxide dismutase and catalase^[3].

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

Animal Model:	Male Wistar rats (210-230 g) fed with high fat diet ^[1]
Dosage:	100 µg/kg
Administration:	Oral gavage; daily; for 8 weeks
Result:	Reduced hydrogen peroxide accumulation in high fat diet-fed rats, which significantly decreased hepatic lipid and ROS contents, reduced body weight gain, and decreased serum triglyceride and insulin levels.

REFERENCES

[1]. Zeng J, et al. Specific Inhibition of Acyl-CoA Oxidase-1 by an Acetylenic Acid Improves Hepatic Lipid and Reactive Oxygen Species (ROS) Metabolism in Rats Fed a High Fat Diet. *J Biol Chem.* 2017 Mar 3;292(9):3800-3809.

[2]. Takuto Chiba, et al. Sirtuin 5 Regulates Proximal Tubule Fatty Acid Oxidation to Protect against AKI. *J Am Soc Nephrol.* 2019 Dec;30(12):2384-2398.

[3]. Yan Liu, et al. Impaired peroxisomal fat oxidation induces hepatic lipid accumulation and oxidative damage in Nile tilapia. *Fish Physiol Biochem.* 2020 Aug;46(4):1229-1242.

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

Tel: 609-228-6898

Fax: 609-228-5909

E-mail: tech@MedChemExpress.com

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA