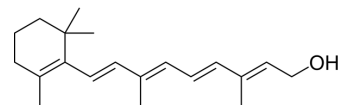


Vitamin A

Cat. No.:	HY-B1342
CAS No.:	68-26-8
Molecular Formula:	C ₂₀ H ₃₀ O
Molecular Weight:	286.45
Target:	Endogenous Metabolite
Pathway:	Metabolic Enzyme/Protease
Storage:	-20°C, protect from light, stored under nitrogen * The compound is unstable in solutions, freshly prepared is recommended.



SOLVENT & SOLUBILITY

In Vitro	Ethanol : 100 mg/mL (349.10 mM; Need ultrasonic)						
	Preparing Stock Solutions	Solvent Concentration	Mass	1 mg	5 mg	10 mg	
				1 mM	3.4910 mL	17.4551 mL	34.9101 mL
				5 mM	0.6982 mL	3.4910 mL	6.9820 mL
				10 mM	0.3491 mL	1.7455 mL	3.4910 mL
Please refer to the solubility information to select the appropriate solvent.							
In Vivo	1. Add each solvent one by one: 10% EtOH >> 40% PEG300 >> 5% Tween-80 >> 45% saline Solubility: ≥ 5 mg/mL (17.46 mM); Clear solution						
	2. Add each solvent one by one: 10% EtOH >> 90% corn oil Solubility: ≥ 2.5 mg/mL (8.73 mM); Clear solution						

BIOLOGICAL ACTIVITY

Description	Vitamin A (Vitamin A1) is an endogenous metabolite.
IC ₅₀ & Target	Human Endogenous Metabolite
In Vitro	It is found that contribution of hepatic microsomes (RDHs) to Retinol metabolism is greater than that of cytosol (ADHs), evidenced by higher Cl _{int} (V _{max} /K _m) of Vitamin A formation in microsomes than in cytosol ^[1] . MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	The results show that compare with control (CON) rats, high-fat diet (HFD) significantly lowers basal level of Vitamin A1 in plasma, but markedly elevates basal levels of Retinol in kidney, adipose tissue and liver. The results show that Vitamin A1 absorption in HFD rats is faster than that in CON rats, evidenced by significantly shorter T _{max} (3.0±0.0 h for HFD rats vs

5.8±1.1 h for CON rats, p<0.05)^[1]. The plasma Vitamin A levels in methionine-choline deficient diet (MCD) rats are significantly lower than in the controls while the hepatic Vitamin A levels in MCD rats are markedly higher. The hepatic expression of Retinol-metabolizing enzymes and binding proteins (GRBP-I, ALDH1A1, and ALDH1A2) in MCD rats is significantly higher than that in control rats^[2].

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

PROTOCOL

Kinase Assay ^[1]

Activity of alcohol dehydrogenases (ADHs)/retinol dehydrogenases (RDHs) and retinal dehydrogenases (RALDHs) are assessed. Briefly, hepatic ADHs/RDHs and RALDHs activities are evaluated with Retinal formation in the presence of β -nicotinamide adenine dinucleotide (β -NAD⁺) and β -Nicotinamide adenine dinucleotide phosphate (β -NADP⁺), respectively. The incubation mixture consists of hepatic cytosol/microsomes (at the final concentration of 0.5 mg/mL), and a series concentrations of Retinol, 4.0 mM co-factor, 5 mM MgCl₂, 91 μ M butylated hydroxytoluene in a total volume of 500 μ L. The reaction is initiated by the addition of Retinol pre-incubated for 5 min at 37°C. Following 15 min incubation, the reaction is quenched by extraction with equal volume of n-butanol/methanol, 95:5 (v:v) containing 0.005% butylated hydroxytoluene^[1].

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Animal Administration ^[2]

Wistar rats (male, aged 4 wk) are used in this study. Two groups of 6 rats are given free access to the following diets: the standard diet (control group) and the methionine-choline deficient diet (MCD) group. Each diet contains Retinol (1000 IU/100g). After 6 wk, the rats are sacrificed by exsanguination under isoflurane anesthesia after an overnight fast. Blood is collected in heparinized tubes, and plasma is separated for storage at -80°C. The liver, intestine, testes, and kidneys are removed, immediately frozen in liquid nitrogen, and stored at -80°C^[2].

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

REFERENCES

[1]. Zhang M, et al. High-fat diet enhanced retinal dehydrogenase activity, but suppressed retinol dehydrogenase activity in liver of rats. J Pharmacol Sci. 2015 Apr;127(4):430-8.

[2]. Miyazaki H, et al. Retinol status and expression of retinol-related proteins in methionine-choline deficient rats. J Nutr Sci Vitaminol (Tokyo). 2014;60(2):78-85.

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

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