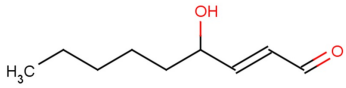
Data Sheet (Cat.No.T10148)

TargetMol
A DRUG SCREENING EXPERT

4-Hydroxynonenal

Chemical Properties



CAS No.:	75899-68-2
Formula:	C9H16O2
Molecular Weight:	156.22
Appearance:	Colorless oil.
Storage:	0-4℃ for short term (days to weeks), or -20℃ for long term (months).

Biological Description

Description	4-Hydroxynonenal (4-HNE) is an oxidative/nitrosative stress biomarker. It is a substrate and an inhibitor of acetaldehyde dehydrogenase 2 (ALDH2).
Targets(IC_{50})	Human Endogenous Metabolite: None
In vitro	4-Hydroxynonenal is both a substrate and an inhibitor of ALDH2; inhibition of ALDH2 by 4-Hydroxynonenal is reversible at low concentration and becomes irreversible when the concentration of 4-HNE reaches 10 μM. 4-Hydroxynonenal can induce antioxidant defense mechanisms to restrain its own production and to enhance cellular protection against oxidative stress. 4-Hydroxynonenal, the product of lipid peroxidation, is mutagenic and genotoxic in viruses, bacteria, and mammalian cells. It reacts with all four DNA bases but with different efficiency: G >C > A >T. 4-Hydroxynonenal-dG represents the best biomarker of the genotoxic effects of 4-Hydroxynonenal and these adducts are primarily found in nuclear DNA [1].
In vivo	Following 24 h after fluid percussion injury (FPI), the mouse brain tissue is analyzed for the expression level of NADPH oxidase 1 (NOX1), inducible nitric oxide synthase (iNOS), 4-Hydroxynonenal (4-HNE. Both wild-type (Nrf2+/+) and Nrf2-deficient mice (Nrf2−/−) results in increased expression of 4-Hydroxynonenal following 15 psi injury (moderate injury) when compared to uninjured Nrf2+/+ and Nrf2−/− mice. Similar to the iNOS result, in Nrf2−/− KO mice, the expression level of 4-Hydroxynonenal is significantly high when compared to corresponding injured and uninjured Nrf2+/+ WT animals [2].

Solubility Information

Solubility	DMSO: 249 mg/mL(1593.91 mM) (< 1 mg/ml refers to the product slightly soluble or insoluble)

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	6.401 mL	32.006 mL	64.012 mL
5 mM	1.28 mL	6.401 mL	12.802 mL
10 mM	0.64 mL	3.201 mL	6.401 mL
50 mM	0.128 mL	0.64 mL	1.28 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. The storage conditions and period of the stock solution: - 80 ℃ for 6 months; - 20 ℃ for 1 month. Please use it as soon as possible.

Reference

1. Zhong H, et al. Role of lipid peroxidation derived 4-hydroxynonenal (4-HNE) in cancer: focusing on mitochondria. Redox Biol. 2015;4:193-9.

2. Csala M, et al. On the role of 4-hydroxynonenal in health and disease. Biochim Biophys Acta. 2015 May;1852(5):826-38.

3. Bhowmick S, et al. Traumatic brain injury-induced downregulation of Nrf2 activates inflammatory response and apoptotic cell death. J Mol Med (Berl). 2019 Nov 22.

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