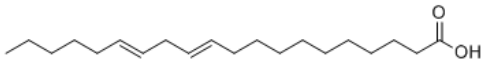
Product Data Sheet

Product Name: Eicosadienoic acid
Cat. No.: GC30726

Chemical Properties

Cas. No.	2091-39-6		
SMILES	CCCCC/C=C/C/C=C/CCCCCCCCCC(O)=O		
Formula	$C_{20}H_{36}O_2$	M.Wt	308.5
Solubility	0.15 M Tris-HCl pH 8.5: >1 mg/ml (from Oleic Acid),DMF: >100 mg/ml (from Oleic Acid),DMSO: >100 mg/ml (from Oleic Acid),Ethanol: >100 mg/ml (from Oleic Acid),PBS pH 7.2: <100 µ g/ml (from Oleic Acid)	Storage	Store at -20°C
General tips	For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20°C for several months.		
Shipping Condition	Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.		
Structure			



Protocol

Cell experiment [1]:

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Cell lines	RAW 264.7 cells
Preparation Method	The murine RAW 264.7 macrophage-like cells were cultured in DMEM supplemented with 10% (v/v) heated–inactivated FBS, and maintained in a 5% CO_2 fully humidified environment at 37°C. Macrophages (5×10^5/ml) were seeded in a 100mm tissue culture plate, and allowed to adhere for 4h at 37°C. After cells had adhered, the culture medium was replaced by serum containing DMEM medium supplemented. To determine whether the uptake of Eicosadienoic acid was dose-dependent, the same number of macrophages (5×10^5/ml) was cultured in the same DMEM medium supplemented with different final concentrations of Eicosadienoic acid (0, 10, 25, 50, or 100μM) for 24h. To monitor cell viability, an assay based on the exclusion of 3-(4,5-Dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT), and trypan blue dye was used.
Reaction Conditions	0, 10, 25, 50, 100, 200, and 400μM; 24h
Applications	When the concentration is less than 200μM, Eicosadienoic acid has no negative impact on cell viability.

References:

[1]Huang YS, Huang WC, Li CW, Chuang LT. Eicosadienoic acid differentially modulates production of pro-inflammatory modulators in murine macrophages. *Mol Cell Biochem*. 2011;358(1-2):85-94.

Background

Eicosadienoic acid can inhibit the activity of mouse 5'-monophosphoadenosine diphosphate reductase (IMPDH), and its binding to IMPDH is competitive (K_i = 3.1μM) [1]. Eicosadienoic acid is a rare natural n-6 type polyunsaturated fatty acid mainly present in animal tissues. It is metabolized into stearidonic acid (SCA) in macrophages [2]. Eicosadienoic acid is used to study the effects of fatty acid composition on the fluidity and function of cell membranes [3].

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In vitro, Eicosadienoic acid (0, 10, 25, 50 and 100μM; 24 hours) increased the proportion of n-6 type polyunsaturated fatty acids (such as LA, GLA, DGLA, AA and adrenal acid) in mouse RAW264.7 macrophages in a dose-dependent manner, and significantly reduced the percentage of monounsaturated fatty acids (MUFA) [4]. Eicosadienoic acid (10μM; 24 hours) inhibited the decrease in cell viability induced by lipopolysaccharide (LPS) in RAW264.7 cells, and downregulated the expression of iNOS and COX-2 in cells and the level of ROS [5].

References:

[1] Mizushina Y, Dairaku I, Yanaka N, et al. Inhibitory action of polyunsaturated fatty acids on IMP dehydrogenase. Biochimie. 2007;89(5):581-590.
[2] Yagaloff KA, et al. Essential fatty acids are antagonists of the leukotriene B4 receptor. Prostaglandins Leukot Essent Fatty Acids. 1995 May;52(5):293-7.
[3] Yang X, Sheng W, Sun G Y, et al. Effects of fatty acid unsaturation numbers on membrane fluidity and α-secretase-dependent amyloid precursor protein processing[J]. Neurochemistry international, 2011, 58(3): 321-329.
[4] Huang YS, Huang WC, Li CW, Chuang LT. Eicosadienoic acid differentially modulates production of pro-inflammatory modulators in murine macrophages. *Mol Cell Biochem*. 2011;358(1-2):85-94.
[5] Pereira D M, Correia-da-Silva G, Valentão P, et al. Anti-inflammatory effect of unsaturated fatty acids and ergosta-7, 22-dien-3-ol from Marthasterias glacialis: Prevention of CHOP-mediated ER-stress and NF-κB activation[J]. PloS one, 2014, 9(2): e88341.

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