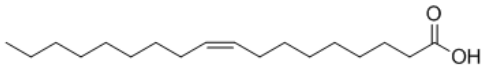
Product Data Sheet

Product Name: Oleic acid (9-cis-Octadecenoic acid)
Cat. No.: GC30110

Chemical Properties

Cas. No.	112-80-1		
SMILES	CCCCCCCC/C=C\CCCCCCCC(O)=O		
Formula	$C_{18}H_{34}O_2$	M.Wt	282.46
Solubility	DMSO : ≥ 62.5 mg/mL (221.27 mM)	Storage	Store at 2-8°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]:	
Cell lines	Hec-1B cells

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Preparation Method	Hec-1B cells were cultured in McCoy's 5A medium supplemented with 10% fetal bovine serum (FBS), 100U/ml of penicillin and 100μg/ml of streptomycin at 37°C in an incubator with 5% CO_2. Cells (4000/well) were seeded in 96-well plates and cultured at 37°C in 5% CO_2 overnight and then treated with 0.1, 1, 10, 50, 100, 250, and 500μM Oleic acid for 72h, cell proliferation was assessed.
Reaction Conditions	0.1, 1, 10, 50, 100, 250, and 500μM; 72h
Applications	Oleic acid treatment reduced cell proliferation of Hec-1B cells in a dose-dependent manner.
Animal experiment [2]:	
Animal models	Male C57BL/6 mice
Preparation Method	Male C57BL/6 mice (10-week-old) were housed in a specific-pathogen-free environment under a 12h/12h light-dark cycle and fed rodent diet ad libitum. After mice orally received Oleic acid (160mg/kg/day) or saline for 14 days, cardiac remodeling was induced by chronic infusion of Ang II at a dose of 1000ng/kg per minute for 2 weeks with a pump. Mice were anesthetized with 3.0% isoflurane mixed with oxygen (100%; airflow velocity: 1L/minute) was used to maintain anesthesia. An incision was made in the skin on the back of the mouse, and the pump was implanted into the subcutaneous tissue. After being sutured and regaining consciousness, the mice were returned to their original cages and fed individually until the end of the experiment. Heart was excised and prepared for histology.
Dosage form	160mg/kg/day; 2 weeks; p.o.

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Applications	Oleic acid treatment attenuated Angiotensin II-induced cardiac remodeling and reduced collagen deposition in the hearts of mice.

References:

[1] Deng B, Kong W, Suo H, et al. Oleic acid exhibits anti-proliferative and anti-invasive activities via the PTEN/AKT/mTOR pathway in endometrial cancer[J]. Cancers, 2023, 15(22): 5407.

[2] Liu T, Wen H, Li H, et al. Oleic acid attenuates Ang II (angiotensin II)-induced cardiac remodeling by inhibiting fgf23 (fibroblast growth factor 23) expression in mice[J]. Hypertension, 2020, 75(3): 680-692.

Background

Oleic acid (9-cis-Octadecenoic acid) is a monounsaturated Omega-9 fatty acid found in plants and animals[1]. It is a Na+/K+ ATPase activator[2].

Oleic acid (9-cis-Octadecenoic acid) or EPA treatment alone inhibited cell viability, similar to PA treatment, but PA and OA (PA+OA) or combined PA and EPA (PA+EPA) treatment increased cell viability in HepG2 cells compared with PA treatment alone PA+OA.The growth and proliferation effects of the treatment are consistent with previous observations that Oleic acid (9-cis-Octadecenoic acid) attenuates PA-induced apoptosis through OA-activated autophagy[4]. Oleic acid (9-cis-Octadecenoic acid) and palmitic acid can induce lipid deposition in HepG2 cells and increase expression of every component of mTOR/S6K1/SREBP-1c pathway[3]. Oleic acid (9-cis-Octadecenoic acid) caused a concentration- and time-dependent damage with typical apoptotic features in cortical and hippocampal cultures from embryonic and neonatal rats, respectively, as well as in human neuroblastoma SH-SY5Y cells[7].

Oleic acid (9-cis-Octadecenoic acid) in semisolids, especially Pemulen TR2-based ones, presented suitable characteristics for cutaneous administration and its anti-inflammatory activity seems to occur via glucocorticoid receptors. Oleic acid (9-cis-Octadecenoic acid) was also capable to reduce croton oil-induced skin inflammation. Besides, the ex vivo skin permeation study indicated that OA reaches the receptor medium, which correlates with a systemic absorption in vivo[5].In mice,the reduction of

dopamine and oxidant effect during cytarabine treatment could result in brain injury but could be prevented by Oleic acid (9-cis-Octadecenoic acid)supplementation[6].

References:

[1]: Jack-Hays MG, Xie Z, et,al. Activation of Na+/K(+)-ATPase by fatty acids, acylglycerols, and related amphiphiles: structure-activity relationship. Biochim Biophys Acta. 1996 Feb 21;1279(1):43-8. doi: 10.1016/0005-2736(95)00245-6. PMID: 8624359.
[2]: Li S, Zhou T, et,al.High metastaticgastric and breast cancer cells consume oleic acid in an AMPK dependent manner. PLoS One. 2014 May 13;9(5):e97330. doi: 10.1371/journal.pone.0097330. PMID: 24823908; PMCID: PMC4019637.
[3]: Zhou YP, Wu R, et,al. [Comparison of effects of oleic acid and palmitic acid on lipid deposition and mTOR / S6K1 / SREBP-1c pathway in HepG2 cells]. Zhonghua Gan Zang Bing Za Zhi. 2018 Jun 20;26(6):451-456. Chinese. doi: 10.3760/cma.j.issn.1007-3418.2018.06.012. PMID: 30317760.
[4]: Sun Y, Wang J, et,al.Oleic Acid and Eicosapentaenoic Acid Reverse Palmitic Acid-induced Insulin Resistance in Human HepG2 Cells via the Reactive Oxygen Species/JUN Pathway. Genomics Proteomics Bioinformatics. 2021 Oct;19(5):754-771. doi: 10.1016/j.gpb.2019.06.005. Epub 2021 Feb 23. PMID: 33631425; PMCID: PMC9170756.
[5]: Pegoraro NS, Camponogara C, et,al.Oleic acid-containing semisolid dosage forms exhibit in vivo anti-inflammatory effect via glucocorticoid receptor in a UVB radiation-induced skin inflammation model. Inflammopharmacology. 2020 Jun;28(3):773-786. doi: 10.1007/s10787-019-00675-5. Epub 2019 Dec 4. PMID: 31802387.
[6]: GuzmÁn DC, Brizuela NO, et,al. Oleic Acid Protects Against Oxidative Stress Exacerbated by Cytarabine and Doxorubicin in Rat Brain. Anticancer Agents Med Chem. 2016;16(11):1491-1495. doi: 10.2174/1871520615666160504093652. PMID: 27141883.
[7]: Zhu Y, Schwarz S, et,al.Oleic acid causes apoptosis and dephosphorylates Bad. Neurochem Int. 2005 Jan;46(2):127-35. doi: 10.1016/j.neuint.2004.08.003. PMID: 15627513.