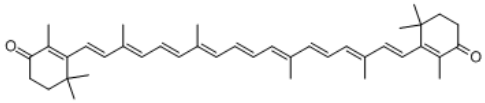
Product Data Sheet

Product Name: Canthaxanthin (E 161g)
Cat. No.: GC30495

Chemical Properties

Cas. No.	514-78-3		
SMILES	CC(/C=C/C(C(C)(CCC1=O)C)=C1C)=C\C=C\C(C)=C\C=C\C=C(C)\C=C\C=C(C)\C=C\C(C(C)(CCC2=O)C)=C2C		
Formula	$C_{40}H_{52}O_2$	M.Wt	564.84
Solubility	DMSO : 5 mg/mL (8.85 mM)	Storage	Store at -20°C, protect from light, stored under nitrogen,unstable in solution, ready to use.
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	Cumulus-oocyte complexes (COCs)
Preparation Method	COCs were cultured in vitro maturation (IVM) cultured medium supple- mented with 0, 20, 40 and 80μM Canthaxanthin during the first 22h. After IVM, parthenogenetic activation (PA) was performed and embryos were cultured for 7 days. Then, blastocysts from each concentration of Canthaxanthin were collected and evaluated- ated for total blastocyst cell numbers and mRNA expression levels of Bax, Bcl2, Caspase3 and Oct4.
Reaction Conditions	0, 20, 40, 80μM; 22h
Applications	Canthaxanthin significantly improved blastocyst formation rates after PA. In addition, both PA-derived blastocysts from the 40μM Canthaxanthin-treated group showed significantly increased mRNA expression of Bcl2 and Oct4 and decreased Caspase3 expression level.

Animal experiment [2]:

Animal models	Female C57BL/6 mice
Preparation Method	Animals was divided into two groups (N: 8 mice per group): control group and experimental group. The experimental mice were administered with Canthaxanthin (20mg/kg) by intragastric gavage for 8 weeks (5 time/week). At the end of the experiment, blood and organ tissues were collected for further analysis.

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Dosage form	20mg/kg; 5 time/week for 8 weeks; p.o.
Applications	The levels of p16 and p21 were reduced in the Canthaxanthin treatment group. These observations indicated that Canthaxanthin exhibited potential anti-aging effects. Furthermore, we also detected the expression of Ki67 and found that the Ki67 was increased in the Canthaxanthin treatment group. In addition, endothelin-1 expression was also reduced, suggesting that vascular damage was reduced after Canthaxanthin treatment.

References:

[1]Taweechaipaisankul A, Jin J X, Lee S, et al. The effects of canthaxanthin on porcine oocyte maturation and embryo development in vitro after parthenogenetic activation and somatic cell nuclear transfer[J]. Reproduction in Domestic Animals, 2016, 51(6): 870-876.
[2]Wang Z, Li L, Liao S, et al. Canthaxanthin Attenuates the Vascular Aging or Endothelial Cell Senescence by Inhibiting Inflammation and Oxidative Stress in Mice[J]. Frontiers in Bioscience-Landmark, 2023, 28(12): 367.

Background

Canthaxanthin (E 161g) is an orange-red carotenoid with multiple biological activities such as antioxidant and anti-tumor activities[1]. Canthaxanthin is an intermediate product obtained during the metabolism of β-carotene to astaxanthin. It can exert beneficial biological activities in animals, mainly related to its antioxidant and scavenging abilities, thereby preventing skin aging and some other diseases, promoting tissue regeneration and enhancing the immune system[2]. Canthaxanthin can inhibit liver and heart aging and fibrosis[3, 4].

In vitro, Canthaxanthin (0, 20, 40, 80μM) treatment of cumulus-oocyte complexes (COCs) for 22h significantly increased the blastocyst formation rate after parthenogenetic activation (PA), increased the mRNA expression of Bcl2 and Oct4, and reduced the expression of caspase3[5]. Canthaxanthin (1-5μM) treatment of undifferentiated PC12 cells reduced $A\beta_{(25-35)}$-induced cell death and reduced intracellular ROS accumulation[6].

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In vivo, oral administration of Canthaxanthin (20mg/kg) to aged C57BL/6 mice for 8 weeks significantly alleviated vascular aging in the mice, reduced the expression levels of p16 and p21, and increased the expression level of Ki67[7].

References:

[1] Jurić S, Jurić M, Król-Kilińska Ż, et al. Sources, stability, encapsulation and application of natural pigments in foods[J]. Food Reviews International, 2022, 38(8): 1735-1790.
[2] Castangia I, Manca M L, Razavi S H, et al. Canthaxanthin biofabrication, loading in green phospholipid vesicles and evaluation of in vitro protection of cells and promotion of their monolayer regeneration[J]. Biomedicines, 2022, 10(1): 157.
[3] Li J, Xian L, Zheng R, et al. Canthaxanthin shows anti-liver aging and anti-liver fibrosis effects by down-regulating inflammation and oxidative stress in vivo and in vitro[J]. International Immunopharmacology, 2022, 110: 108942.
[4] Wang Z, Liu W, Zhang M, et al. Canthaxanthin Mitigates Cardiovascular Senescence in Vitro and in Vivo[J]. Frontiers in Bioscience-Landmark, 2024, 29(2): 70.
[5] Taweechaipaisankul A, Jin J X, Lee S, et al. The effects of canthaxanthin on porcine oocyte maturation and embryo development in vitro after parthenogenetic activation and somatic cell nuclear transfer[J]. Reproduction in Domestic Animals, 2016, 51(6): 870-876.
[6] Chang C S, Chang C L, Lai G H. Reactive oxygen species scavenging activities in a chemiluminescence model and neuroprotection in rat pheochromocytoma cells by astaxanthin, beta-carotene, and canthaxanthin[J]. The Kaohsiung Journal of Medical Sciences, 2013, 29(8): 412-421.
[7] Wang Z, Li L, Liao S, et al. Canthaxanthin Attenuates the Vascular Aging or Endothelial Cell Senescence by Inhibiting Inflammation and Oxidative Stress in Mice[J]. Frontiers in Bioscience-Landmark, 2023, 28(12): 367.

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