

Product Data Sheet

Product Name: Xanthurenic acid

Cat. No.: GC11459

Chemical Properties

Cas. No. 59-00-7

Chemical Name 8-hydroxy-4-oxo-1,4-dihydroquinoline-2-carboxylic acid

SMILES OC1=C(C2=CC=CC=C2)NC(C(=O)O)=CC2=O

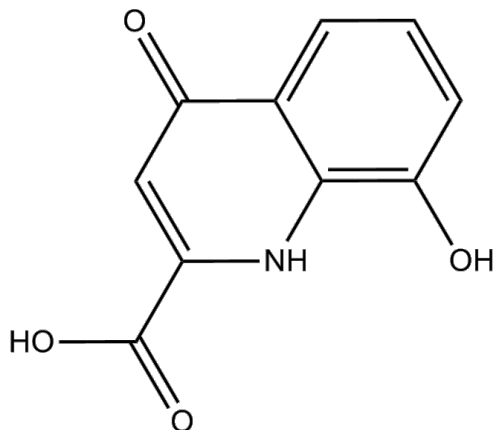
Formula $C_{10}H_7NO_4$ M.Wt 205.17

Solubility 0.1 M NaOH: 2 mg/ml 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 Primary vascular smooth muscle cells (VSMCs), Retinal pigment epithelium (RPE) cells

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

Preparation Method Confluent cells culture were pre-incubated without or with Xanthurenic acid (20 μ M) in MEM medium for 3h. The medium was removed and replaced with medium containing 100nM Mitotracker CMXRos. After an incubation for 45min Mitotracker CMXRos was removed and replaced by MEM medium. cells were cultivated for the next 20h, stained additionally with antibody against gelsolin and then observed by fluorescence microscopy.

Reaction Conditions 20 μ M; 3h

Applications Xanthurenic acid induces mitochondrial damage.

Animal experiment [2]:

Animal models Adult male albino Wistar rats

Preparation Method Animals were treated during 21 consecutive days with Xanthurenic acid (100mg/kg/day; dissolved in 1% bicarbonate solution). The drug was i.p injected in a 1mL volume. The Xanthurenic acid effect was compared to that of the neuroleptic haloperidol (0.5mg/kg i.p in 1mL) given daily for 21 days. Control animals were daily i.p injected with 1mL of vehicle for the same period. After the treatment schedule (i.e., on day 22) spontaneously firing dopaminergic neurons within the substantia nigra compacta (SN) and the ventral tegmental area (VTA) nucleus were counted.

Dosage form 100mg/kg for 21 days; i.p.

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

Applications Xanthurenic acid treatment reduced significantly the number of active neurons per track in the VTA. In contrast, Xanthurenic acid treatment did not change the number of firing neurons in the SN.

References:

- [1]Malina H Z, Richter C, Mehl M, et al. Pathological apoptosis by xanthurenic acid, a tryptophan metabolite: activation of cell caspases but not cytoskeleton breakdown[J]. BMC physiology, 2001, 1: 1-8.
- [2]Taleb O, Maammar M, Klein C, et al. A role for xanthurenic acid in the control of brain dopaminergic activity[J]. International Journal of Molecular Sciences, 2021, 22(13): 6974.

Background

Xanthurenic acid is an endogenous group II metabotropic glutamate receptor agonist involved in sensory transmission in the thalamus^[1]. Xanthurenic acid is synthesized from 3-hydroxykynurenine (3-HK) and may play a physiological role in attention and cognitive processes^[2]. Xanthurenic acid can interact with Bcl-2 family proteins, induce mitochondrial apoptosis pathways and impair mitochondrial function^[3]. Xanthurenic acid can induce gametogenesis in parasitic Plasmodium ^[4].

In vitro, Xanthurenic acid (20μM) treatment of vascular smooth muscle cells and retinal pigment epithelial cells for 3h induced mitochondrial damage, resulting in mitochondrial migration, cytochrome c release, and destruction of mitochondria and nucleus^[5].

In vivo, Xanthurenic acid (100mg/kg) treated by intraperitoneal injection for 21 days in adult male albino Wistar rats significantly reduced the number of active neurons per channel in the ventral tegmental area (VTA), but did not change the number of firing neurons in the substantia nigra pars compacta (SN)^[6].

References:

- [1] Copeland C S, Neale S A, Salt T E. Actions of Xanthurenic acid, a putative endogenous Group II metabotropic glutamate receptor agonist, on sensory transmission in the thalamus[J]. Neuropharmacology, 2013, 66: 133-142.

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

- [2] Sathyaikumar K V, Tararina M, Wu H Q, et al. Xanthurenic acid formation from 3-hydroxykynurenine in the mammalian brain: neurochemical characterization and physiological effects[J]. Neuroscience, 2017, 367: 85-97.
- [3] Malina H Z, Hess O M. Xanthurenic acid translocates proapoptotic Bcl-2 family proteins into mitochondria and impairs mitochondrial function[J]. BMC cell biology, 2004, 5: 1-7.
- [4] Billker O, Lindo V, Panico M, et al. Identification of xanthurenic acid as the putative inducer of malaria development in the mosquito[J]. Nature, 1998, 392(6673): 289-292.
- [5] Malina H Z, Richter C, Mehl M, et al. Pathological apoptosis by xanthurenic acid, a tryptophan metabolite: activation of cell caspases but not cytoskeleton breakdown[J]. BMC physiology, 2001, 1: 1-8.
- [6] Taleb O, Maammar M, Klein C, et al. A role for xanthurenic acid in the control of brain dopaminergic activity[J]. International Journal of Molecular Sciences, 2021, 22(13): 6974.

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA