Product Data Sheet

Oxoadipic Acid

Cat. No.: C8657

CAS No.: 3184-35-8

Formula: $C_6H_8O_5$

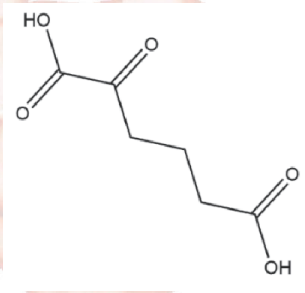
M.Wt: 160.13

Synonyms: 2-Oxoadipic Acid, 2-Ketoadipic Acid, α-Ketoadipic Acid；α-Oxoadipic Acid

Target: /

Pathway: Metabolic Enzyme/Protease

Storage: -20℃, 3 years (Powder)



Solvent & Solubility

In Vitro

Oxoadipic acid is supplied as a solid. A stock solution may be made by dissolving the Oxoadipic acid in water or DMSO (sonicated). We do not recommend storing the aqueous solution for more than one day.

Preparing Stock Solutions

Mass / Solvent / Concentration	1mg	5mg	10mg
1 mM	6.2453 mL	31.2266 mL	62.4532 mL
5 mM	1.2491 mL	6.2453 mL	12.4906 mL
10 mM	0.6245 mL	3.1227 mL	6.2453 mL

Please refer to the solubility information to select the appropriate solvent.

If you choose water as the stock solution, please dilute it to the working solution first, and then filter it through a 0.22 μm membrane to sterilize it before use.

Biological Activity

Shortsummary

2-Oxoadipic acid (CAS No. 3184-35-8) is an intermediate in the catabolism of L-tryptophan, L-lysine, and hydroxylysine.[1][2] Urinary excretion of 2-oxoadipic acid is increased in patients with α-ketoadipic aciduria, a rare inborn error of metabolism affecting the conversion of 2-oxoadipic acid to glutaryl-coenzyme A (glutaryl-CoA).

In Vitro

Cell Viability Assay [3]

Cell Line:	Human neuroblastoma cells (SH-SY5Y), human fibroblasts (obtained from the Newcastle Biobank)
Preparation method:	Human neuroblastoma cells (SH-SY5Y) were seeded at 2×10^5 cells/well in

		6-well plates and cultured for 24 hours to allow adherence. Human fibroblasts were seeded at 1×10⁵ cells/well in 6-well plates and cultured for 24 hours. Subsequently, different drug treatments were applied. After drug treatment, the cells were incubated at 37°C with 5% CO_2 for 4 days. During this period, cell morphology was observed daily, and the drug-containing medium was replaced every 2 days.
	Reacting conditions:	The experiment was divided into the following groups: blank control group (equal volume of medium only), 2-oxoadipic acid group (final concentration of 5 μM 2-oxoadipic acid), quinolinic acid group (final concentration of 50 μM quinolinic acid (Cat. B6228)), and combination treatment group (5 μM 2-oxoadipic acid plus 50 μM quinolinic acid). Each group included three biological replicates and was cultured at 37°C with 5% CO_2 for 4 days.
	Applications:	This protocol is used to investigate the toxic effects of 2-oxoadipic acid on neurons and fibroblasts, as well as its synergistic toxicity with quinolinic acid. The results provide a basis for studying the effects of metabolite accumulation caused by mitochondrial dicarboxylate carrier (SLC25A21) deficiency and the related disease mechanisms.
In Vitro	**Strain Viability Assay [4]**	
	Strain type and preparation method:	Wild-type strain: Chromobacterium violaceum (C. violaceum ATCC 12472T, WT), which is sensitive to chloramphenicol (MIC = 8 μg/mL) and streptomycin (MIC = 10 μg/mL). Resistant strains: Chloramphenicol-resistant (ChlR) and streptomycin-resistant (StrpR) strains were constructed through adaptive laboratory evolution (ALE). These strains were obtained by serially passaging the wild-type strain on LB agar (LBA) plates containing sublethal concentrations of antibiotics (10 μg/mL chloramphenicol or streptomycin) for 3 weeks, followed by single-colony purification. The purified strains were cryopreserved in 50% glycerol and, prior to use, were revived and activated in LB medium containing the corresponding antibiotic (10 μg/mL).
	Dosage form:	Oxoadipic acid was prepared into LB medium at a final concentration of 2 mg/mL. Due to solubility differences, the final concentration of lactic acid was adjusted to 0.27 mg/mL.
	Reacting conditions:	Dilute overnight cultures of WT, ChlR, and StrpR strains to an OD_{600} = 0.002, and mix them in equal volumes with LB medium containing 2 mg/mL 2-oxoadipic acid. Inoculate the mixture into 96-well flat-bottom plastic plates. Grouping and Treatment: Set up a T0 group (add the corresponding antibiotic at the start of incubation (0 h): chloramphenicol for ChlR, streptomycin for StrpR) and a T6 group (add the

	antibiotic after 6 hours of incubation). Each group has 3 biological replicates and is incubated at 30°C for 30 hours. At the same time, set up control groups: LB medium + bacteria only (no 2-Oxoadipic acid or antibiotics) LB medium + bacteria + antibiotics (no 2-Oxoadipic acid)
Other notes:	1. The technical data provided above is for reference only, as we have not validated the method. 2. Please do not determine experimental conditions based solely on a single article. It is recommended to conduct a pilot experiment before the formal experiment to determine the optimal experimental conditions (such as animal strain, age, dosage, frequency, duration, detection time points, indicators, etc.).

References

[1] Xia ZW, Inoue Y, Ohse M, Shinka T, Kuhara T. A study on alpha-ketoadipic aciduria by gas chromatographic-mass spectrometry. World J Gastroenterol. 2000 Oct;6(5):766-769. doi: 10.3748/wjg.v6.i5.766. PMID: 11819692; PMCID: PMC4688861.

[2] Gray RG, O'Neill EM, Pollitt RJ. Alpha-aminoadipic aciduria: chemical and enzymatic studies. J Inherit Metab Dis. 1980;2(4):89-92. doi: 10.1007/BF01805664. PMID: 6796766.

[3] Mitochondrial oxodicarboxylate carrier deficiency is associated with mitochondrial DNA depletion and spinal muscular atrophy–like disease. Boczonadi, Veronika et al. Genetics in Medicine, Volume 20, Issue 10, 1224 – 1235

[4] Banerjee D, Parmar D, Bhattacharya N, Ghanate AD, Panchagnula V, Raghunathan A. A scalable metabolite supplementation strategy against antibiotic resistant pathogen Chromobacterium violaceum induced by NAD+/NADH+ imbalance. BMC Syst Biol. 2017 Apr 26;11(1):51. doi: 10.1186/s12918-017-0427-z. PMID: 28446174; PMCID: PMC5405553.

Caution

FOR RESEARCH PURPOSES ONLY.

NOT FOR HUMAN, VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

Specific storage and handling information for each product is indicated on the product datasheet. Most APExBIO products are stable under the recommended conditions. Products are sometimes shipped at a temperature that differs from the recommended storage temperature. Shortterm storage of many products are stable in the short-term at temperatures that differ from that required for long-term storage. We ensure that the product is shipped under conditions that will maintain the quality of the reagents. Upon receipt of the product, follow the storage recommendations on the product data sheet.