

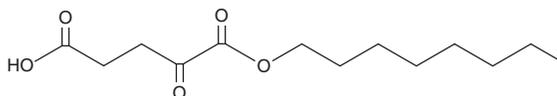
PRODUCT INFORMATION



Octyl- α -ketoglutarate

Item No. 11970

CAS Registry No.: 876150-14-0
Formal Name: 2-oxo-pentanedioic acid, 1-octyl ester
Synonym: α -KG octyl ester
MF: C₁₃H₂₂O₅
FW: 258.3
Purity: \geq 95%
Supplied as: A solution in methyl acetate
Storage: -20°C
Stability: \geq 2 years



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Laboratory Procedures

Octyl- α -ketoglutarate is supplied as a solution in methyl acetate. To change the solvent, simply evaporate the methyl acetate under a gentle stream of nitrogen and immediately add the solvent of choice. Solvents such as ethanol, DMSO, and dimethyl formamide (DMF) purged with an inert gas can be used. The solubility of octyl- α -ketoglutarate in ethanol is approximately 20 mg/ml and approximately 10 mg/ml in DMSO and DMF.

Further dilutions of the stock solution into aqueous buffers or isotonic saline should be made prior to performing biological experiments. Ensure that the residual amount of organic solvent is insignificant, since organic solvents may have physiological effects at low concentrations. If an organic solvent-free solution of octyl- α -ketoglutarate is needed, it can be prepared by evaporating the methyl acetate and directly dissolving the neat oil in aqueous buffers. The solubility of octyl- α -ketoglutarate in PBS, pH 7.2, is approximately 2 mg/ml. We do not recommend storing the aqueous solution for more than one day.

Description

Hypoxia-inducible factor 1 α (HIF-1 α) turnover is initiated by prolyl hydroxylases (PHD), which hydroxylate proline residues on HIF-1 α , facilitating ubiquitination. PHD activity is linked to the tricarboxylic acid (TCA) cycle, since the intermediate α -ketoglutarate is a PHD substrate and succinate and fumarate inhibit PHD. Mutations in enzymes associated with the TCA cycle occur in certain cancers.¹ Octyl- α -ketoglutarate is a stable, cell-permeable form of α -ketoglutarate, which accumulates rapidly and preferentially in cells with a dysfunctional TCA cycle.² When used at 1 mM, it stimulates PHD activity, increasing HIF-1 α turnover.^{2,3} In addition, Octyl- α -ketoglutarate competitively blocks succinate- or fumarate-mediated inhibition of PHD.²

References

1. Gottlieb, E. and Tomlinson, I.P.M. Mitochondrial tumour suppressors: A genetic and biochemical update. *Nat. Rev. Cancer* **5**, 857-866 (2005).
2. MacKenzie, E.D., Selak, M.A., Tennant, D.A., *et al.* Cell-permeating α -ketoglutarate derivatives alleviate pseudohypoxia in succinate dehydrogenase-deficient cells. *Mol. Cell. Biol.* **27(9)**, 3282-3289 (2007).
3. Zhao, S., Lin, Y., Xu, W., *et al.* Glioma-derived mutations in IDH1 dominantly inhibit IDH1 catalytic activity and induce HIF-1 α . *Science* **324(5924)**, 261-265 (2009).

WARNING

THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA

This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent via email to your institution.

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CAYMAN CHEMICAL

1180 EAST ELLSWORTH RD
ANN ARBOR, MI 48108 · USA

PHONE: [800] 364-9897
[734] 971-3335

FAX: [734] 971-3640

CUSTSERV@CAYMANCHEM.COM
WWW.CAYMANCHEM.COM