

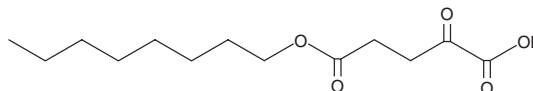
# PRODUCT INFORMATION



## 5-Octyl- $\alpha$ -ketoglutarate

Item No. 16105

**CAS Registry No.:** 1616344-00-3  
**Formal Name:** 2-oxo-pentanedioic acid, 5-octyl ester  
**Synonym:**  $\alpha$ -KG octyl ester  
**MF:** C<sub>13</sub>H<sub>22</sub>O<sub>5</sub>  
**FW:** 258.3  
**Purity:**  $\geq$ 98%  
**Supplied as:** A crystalline solid  
**Storage:** -20°C  
**Stability:**  $\geq$ 4 years



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

### Laboratory Procedures

5-Octyl- $\alpha$ -ketoglutarate is supplied as a crystalline solid. A stock solution may be made by dissolving the 5-octyl- $\alpha$ -ketoglutarate in the solvent of choice. 5-Octyl- $\alpha$ -ketoglutarate is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide (DMF), which should be purged with an inert gas. The solubility of 5-octyl- $\alpha$ -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. Organic solvent-free aqueous solutions of 5-octyl- $\alpha$ -ketoglutarate can be prepared by directly dissolving the crystalline solid in aqueous buffers. The solubility of 5-octyl- $\alpha$ -ketoglutarate in PBS, pH 7.2, is approximately 1 mg/ml. We do not recommend storing the aqueous solution for more than one day.

### Description

In addition to its role in the Krebs cycle,  $\alpha$ -ketoglutarate (2-oxoglutarate) has roles as a substrate or modulator of enzymes. 5-Octyl- $\alpha$ -ketoglutarate, also known as  $\alpha$ -ketoglutarate octyl ester, is a stable, cell-permeable molecule that generates free  $\alpha$ -ketoglutarate upon hydrolysis of the ester bond by cytoplasmic esterases.<sup>1</sup> It is used in experiments to increase levels of intracellular  $\alpha$ -ketoglutarate.<sup>1</sup> 5-Octyl- $\alpha$ -ketoglutarate has been shown to modulate a variety of enzymes and signaling pathways, particularly in the context of glycolysis, hypoxia, and cancer.<sup>1-5</sup>

### References

1. MacKenzie, E.D., Selak, M.A., Tennant, D.A., *et al.* Cell-permeating  $\alpha$ -ketoglutarate derivatives alleviate pseudohypoxia in succinate dehydrogenase-deficient cells. *Mol. Cell. Biol.* **27**(9), 3282-3289 (2007).
2. Xu, W., Yang, H., Liu, Y., *et al.* Oncometabolite 2-hydroxyglutarate is a competitive inhibitor of  $\alpha$ -ketoglutarate-dependent dioxygenases. *Cancer Cell* **19**, 17-30 (2011).
3. Xiao, M., Yang, H., Xu, W., *et al.* Inhibition of  $\alpha$ -KG-dependent histone and DNA demethylases by fumarate and succinate that are accumulated in mutations of FH and SDH tumor suppressors. *Genes Dev.* **26**(12), 1326-1338 (2012).
4. Eckle, T., Brodsky, K., Bonney, M., *et al.* HIF1A reduces acute lung injury by optimizing carbohydrate metabolism in the alveolar epithelium. *PLoS Biol.* **11**(9), 1-25 (2013).
5. Chin, R.M., Fu, X., Pai, M.Y., *et al.* The metabolite  $\alpha$ -ketoglutarate extends lifespan by inhibiting ATP synthase and TOR. *Nature* **510**(7505), 397-401 (2014).

#### 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