

## Product Data Sheet

Product Name: 3-hydroxy-DL-Kynurenine

Cat. No.: GC45336

### Chemical Properties

Cas. No. 2147-61-7

Chemical Name  $\alpha$ ,2-diamino-3-hydroxy- $\gamma$ -oxo-benzenebutanoic acid

SMILES OC1=CC=CC(C(CC(N)C(O)=O)=O)=C1N

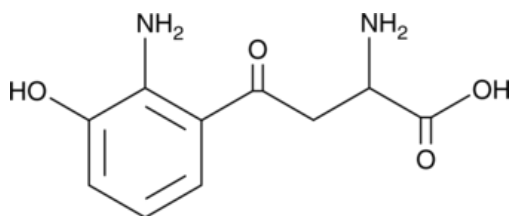
Formula  $C_{10}H_{12}N_2O_4$  M.Wt 224.2

Solubility DMF: 0.5 mg/ml, DMSO: 1 mg/ml, Ethanol: 2 mg/ml, PBS (pH 7.2): 0.5 mg/ml  
Storage Store at -20°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 Murine CD4<sup>+</sup> T 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

---

CD3/CD28 bead-stimulated CD4<sup>+</sup> T cells were incubated for 72 hours in the presence of 3-hydroxy-DL-Kynurenine at concentrations varying from 0 to 100μM.

Reaction Conditions 0-100μM; 72h

Applications 3-hydroxy-DL-Kynurenine significantly inhibited CD4<sup>+</sup> T-cell proliferation in a dose-dependent manner with IC<sub>50</sub> of approximately 70μM.

### Animal experiment [2]:

Animal models Male Wistar rats

Preparation Method 3-hydroxy-DL-Kynurenine was administered as a single 50nmol intrastriatal injection dissolved in 1μL DMSO into the rat striatum.

Dosage form 1μL of 50nmol; intrastriatal injection; a single administration

Applications 3-hydroxy-DL-Kynurenine induced lesion around the injected area characterized by a dose-dependent, well-defined cavity surrounded by necrosis and reactive gliosis.

### References:

[1]Sarah S Zaher, Germain C, Fu H, et al. 3-hydroxykynurenine suppresses CD4<sup>+</sup> T-cell proliferation, induces T-regulatory-cell development, and prolongs corneal allograft survival. Invest Ophthalmol Vis Sci. 2011 Apr 22;52(5):2640-8.

[2]Nakagami Y, Saito H, Katsuki H. 3-Hydroxykynurenine toxicity on the rat striatum in vivo. Jpn J Pharmacol. 1996 Jun;71(2):183-6.

### Background

**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

---

3-hydroxy-DL-Kynurenine is a potential endogenous neurotoxin which significantly inhibited CD4<sup>+</sup> T-cell proliferation in a dose-dependent manner with IC<sub>50</sub> value of approximately 70μM. 3-hydroxy-DL-Kynurenine is a metabolic intermediate of the kynurenine pathway, the major metabolic pathway of tryptophan (Trp). Increased levels of 3-hydroxy-DL-Kynurenine have been described in several neurodegenerative disorders<sup>[1][2]</sup>.

In vitro, human colon cancer HCT116 cells treated with 3-hydroxy-DL-Kynurenine (0.008-2mM) for 6-48h disrupted TCA cycle metabolism, depleted glutathione levels and reduced cell viability in a dose-dependent manner<sup>[3]</sup>. Neuronally derived hybrid cell line (N18-RE-105) was treated with increasing concentration of 3-hydroxy-DL-Kynurenine for 24h. 3-hydroxy-DL-Kynurenine was toxic to greater than 85% of cultured cells at concentrations in excess of 100μM. N18-RE-105 exposed to 500μM 3-hydroxy-DL-Kynurenine for 2h did not induced significant cell lysis, yet marked cell death emerged 22h after harvest<sup>[4]</sup>. Human neurons and astrocytes treated with 3-hydroxy-DL-Kynurenine (0.1–1000μM) for 24h significantly increased intracellular NAD<sup>+</sup> levels at a low concentration of 100nM but substantially decreased NAD<sup>+</sup> levels at higher concentrations. Treatment with 3-hydroxy-DL-Kynurenine increased extracellular LDH activity at concentrations above 100nM in both cell types<sup>[5]</sup>.

In vivo, kynurenine 3-monooxygenase (KMO) is a pivotal enzyme in the kynurenine pathway (KP) and normally oxidizes kynurenine (KYN) to 3-hydroxy-DL-Kynurenine in the presence of reduced NADPH and molecular oxygen. Endotoxic shock was induced in KMO<sup>-/-</sup> C57BL/6N mice with 15mg/kg LPS. KMO<sup>-/-</sup> mice given 10mg/kg 3-hydroxy-DL-Kynurenine i.p. every 12h after LPS survived significantly longer than PBS-treated KMO<sup>-/-</sup> mice by inhibiting inflammation via halving serum IL-6 and blocking ATF4 nuclear translocation<sup>[6]</sup>. Intrastriatal injection of 1μl of 3-hydroxy-DL-Kynurenine (50nmol) dissolved in DMSO into Wistar rats brain induced lesion at the injected area characterized by a dose-dependent, well-defined cavity surrounded by necrosis and reactive gliosis<sup>[7]</sup>.

### References:

- [1] Okuda S, Nishiyama N, Saito N, and Katsuki H. 3-Hydroxykynurenine, an endogenous oxidative stress generator, causes neuronal cell death with apoptotic features and region selectivity. J Neurochem. 1998 Jan;70(1):299-307.
- [2] Sarah S Zaher, Germain C, Fu H, et al. 3-hydroxykynurenine suppresses CD4<sup>+</sup> T-cell proliferation,

**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

---

induces T-regulatory-cell development, and prolongs corneal allograft survival. Invest Ophthalmol Vis Sci. 2011 Apr 22;52(5):2640-8.

[3] Buchanan J L, Rauckhorst A J, Taylor E B. 3-hydroxykynurenine is a ROS-inducing cytotoxic tryptophan metabolite that disrupts the TCA cycle. bioRxiv. 2023 Jul 10:2023.07.10.548411.

[4] Eastman C L, Guilarte T R. Cytotoxicity of 3-hydroxykynurenine in a neuronal hybrid cell line. Brain Res. 1989 Aug 28;495(2):225-31.

[5] Braidy N, Grant R, Brew B J, et al. Effects of Kynurenine Pathway Metabolites on Intracellular NAD Synthesis and Cell Death in Human Primary Astrocytes and Neurons. Int J Tryptophan Res. 2009;2:61-9.

[6] Hoshi M, Kubo H, Ando T, et al. 3-Hydroxykynurenine Regulates Lipopolysaccharide-Stimulated IL-6 Production and Protects against Endotoxic Shock in Mice. Immunohorizons. 2021 Jun 28;5(6):523-534.

[7] Nakagami Y, Saito H, Katsuki H. 3-Hydroxykynurenine toxicity on the rat striatum in vivo. Jpn J Pharmacol. 1996 Jun;71(2):183-6.

**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