

## Product Data Sheet

Product Name: L-Palmitoylcarnitine

Cat. No.: GC30745

### Chemical Properties

Cas. No. 2364-67-2

SMILES CCCCCCCCCCCCCCCC(O[C@H](CC([O-])=O)C[N+](C)(C)C)=O

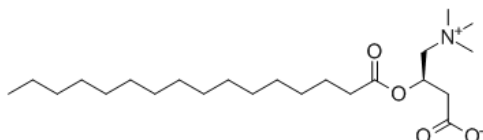
Formula  $C_{23}H_{45}NO_4$  M.Wt 399.61

Solubility Ethanol : 25 mg/mL (Need ultrasound) 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

#### Kinase experiment [1]:

**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

---

The enzymatic reactions were conducted in 50mM Tris–HCl buffer (pH 7.8) at 37 °C. Initially, the proteases, plasmin (30nM) and tPA (20nM), and serial dilutions of L-Palmitoylcarnitine (6.25–100μM) were incubated in buffer at 37°C for 5min, followed by the addition of their corresponding chromogenic substrates, CS-41 (0.2mM) for plasmin and CS-05 (0.2mM) for tPA, to initiate the reaction. The rate of substrate hydrolysis was monitored continuously at 405nm.

### Preparation Method

### Reaction Conditions

6.25–100μM; 5min

### Applications

L-Palmitoylcarnitine enhanced the abilities of plasmin and tPA to hydrolyze their chromogenic substrates. L-Palmitoylcarnitine could directly bind to two enzymes (plasmin and tPA) that are responsible for thrombolysis and fibrin(ogen)olysis. Through high-affinity interactions with plasmin ( $K_D=6.47\text{nM}$ ) and tPA ( $K_D=4.46\text{nM}$ ).

### Cell experiment [2]:

### Cell lines

Guinea-pig ventricular myocytes

### Preparation Method

Guinea-pig ventricular myocytes were incubated with L-Palmitoylcarnitine (1–10μM) at 35°C for 10min.

### Reaction Conditions

1–10μM; 10min

### Applications

L-Palmitoylcarnitine largely inhibited the outward current transient associated with Na/K pump current.

**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

---

### Animal experiment [3]:

Animal models      Male C57BL/6 mice

Preparation Method      FeCl<sub>3</sub>-induced mouse thrombosis model and transient middle cerebral artery occlusion (tMCAO) mouse models were treated with L-Palmitoylcarnitine (0, 0.25, 1, 4mg/kg) administered via tail vein injections.

Dosage form      0, 0.25, 1, 4mg/kg; i.v.; a single administration

Applications      L-Palmitoylcarnitine administration significantly inhibited FeCl<sub>3</sub>-induced arterial thrombosis. It also mitigated intracerebral thrombosis and inflammation in a transient middle cerebral artery occlusion (tMCAO) mouse model.

### References:

- [1] Yang J, Cha L, Wang Y P, et al. L-Palmitoylcarnitine potentiates plasmin and tPA to inhibit thrombosis. Nat Prod Bioprospect. 2023 Nov 8;13(1):48.
- [2] Tanaka M, Gilbert J, Pappano A J. Inhibition of sodium pump by l-palmitoylcarnitine in single guinea-pig ventricular myocytes. J Mol Cell Cardiol. 1992 Jul;24(7):711-9.
- [3] Yang J, Cha L, Wang Y P, et al. L-Palmitoylcarnitine potentiates plasmin and tPA to inhibit thrombosis. Nat Prod Bioprospect. 2023 Nov 8;13(1):48.

### Background

L-Palmitoylcarnitine is an important endogenous fatty acid metabolite that simultaneously enhanced the ATP sensitivity of the ion channel with IC<sub>50</sub> value fell from 62.0 ± 2.7 to 30.3 ± 5.5 μM [1]. L-Palmitoylcarnitine is a critical regulator in fatty acids metabolism, especially in mitochondrial fatty acid β-oxidation[2]. L-Palmitoylcarnitine weakly inhibits pyruvate-supported respiration in mitochondria but does not affect pyruvate utilization. It has stronger inhibitory effect on acetylcarnitine oxidation[3].

In vitro, L-Palmitoylcarnitine (1–10 μM) incubated guinea-pig ventricular myocytes at 35°C for 10min largely inhibited the outward current transient associated with Na/K pump current[4]. L-

**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

---

Palmitoylcarnitine (10nM to 10μM) incubated isolated guinea-pig ventricular myocytes for 40min produced concentration- and time-dependent changes of resting potential (RP) and action potential duration at 50% repolarization (APD<sub>50</sub>)<sup>[5]</sup>.

In vivo, L-Palmitoylcarnitine (0, 0.25, 1, 4mg/kg) administrated into FeCl<sub>3</sub>-induced mouse thrombosis model and transient middle cerebral artery occlusion (tMCAO) mouse models via tail vein injections significantly inhibited FeCl<sub>3</sub>-induced arterial thrombosis, and also mitigated intracerebral thrombosis and inflammation in a transient middle cerebral artery occlusion (tMCAO) mouse model<sup>[6]</sup>.

### References:

- [1] Haruna T, Horie M, Takano M, et al. Alteration of the membrane lipid environment by L-palmitoylcarnitine modulates K(ATP) channels in guinea-pig ventricular myocytes. *Pflugers Arch.* 2000;441(2-3):200-207.
- [2] Liu Q Y, Li P W, Ma J L, et al. Arsenic exposure at environmentally relevant levels induced metabolic toxicity in development mice: Mechanistic insights from integrated transcriptome and metabolome. *Environ Int.* 2024 Aug;190:108819.
- [3] Hutson S M, van Dop C, Lardy H A. Metabolism of pyruvate and carnitine esters in bovine epididymal sperm mitochondria. *Arch Biochem Biophys.* 1977 May;181(1):345-52.
- [4] Tanaka M, Gilbert J, Pappano A J. Inhibition of sodium pump by L-palmitoylcarnitine in single guinea-pig ventricular myocytes. *J Mol Cell Cardiol.* 1992 Jul;24(7):711-9.
- [5] Mészáros J, Pappano A J. Electrophysiological effects of L-palmitoylcarnitine in single ventricular myocytes. *Am J Physiol.* 1990 Apr;258(4 Pt 2):H931-8.
- [6] Yang J, Cha L, Wang Y P, et al. L-Palmitoylcarnitine potentiates plasmin and tPA to inhibit thrombosis. *Nat Prod Bioprospect.* 2023 Nov 8;13(1):48.

**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](mailto:tech@glpbio.com)

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