(±)-Carnitine chloride

Cat. No.: HY-B1453
CAS No.: 461-05-2
Molecular Formula: C₇H₁₆ClNO₃
Molecular Weight: 197.66
Target: Reactive Oxygen Species
Pathway: Immunology/Inflammation; Metabolic Enzyme/Protease; NF-κB

Storage:
- 4°C, sealed storage, away from moisture
- * In solvent: -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture)

**SOLVENT & SOLUBILITY**

**In Vitro**

- H₂O : ≥ 100 mg/mL (505.92 mM)
- DMSO : 25 mg/mL (126.48 mM; Need ultrasonic)

* "≥" means soluble, but saturation unknown.

<table>
<thead>
<tr>
<th>Solvent</th>
<th>Mass</th>
<th>1 mg</th>
<th>5 mg</th>
<th>10 mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 mM</td>
<td></td>
<td>5.0592 mL</td>
<td>25.296 mL</td>
<td>50.5919 mL</td>
</tr>
<tr>
<td>5 mM</td>
<td></td>
<td>1.0118 mL</td>
<td>5.0592 mL</td>
<td>10.1184 mL</td>
</tr>
<tr>
<td>10 mM</td>
<td></td>
<td>0.5059 mL</td>
<td>2.5296 mL</td>
<td>5.0592 mL</td>
</tr>
</tbody>
</table>

Preparing Stock Solutions:

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

**In Vivo**

1. Add each solvent one by one: PBS
   Solubility: 150 mg/mL (758.88 mM); Clear solution; Need ultrasonic

2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (12.65 mM); Clear solution

3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (12.65 mM); Clear solution

4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (12.65 mM); Clear solution

**BIOLOGICAL ACTIVITY**

**Description**

(±)-Carnitine chloride exists in two isomers, known as D and L. L-carnitine plays an essential role in the β-oxidation of fatty acids and also shows antioxidant, and anti-inflammatory activities.

**In Vitro**

The main role of L-carnitine is to shuttle long-chain fatty acids across the inner mitochondrial membrane. After L-carnitine and acyl-CoA become acyl-carnitine by activation of carnitine palmitoyl transferase (CPT)-I, the transported acyl-carnitine is
changed into acyl-CoA by CPT-II in the mitochondria matrix. Palmitoyl-CoA-induced mitochondrial respiration is increased by L-carnitine treatment, and then is accelerated by the presence of ADP. This acceleration is induced by treatment with L-carnitine in a concentration-dependent manner, and is saturated at 5 mM L-carnitine\(^1\). Pretreatment with L-carnitine augments Nrf2 nuclear translocation, DNA binding activity and heme oxygenase-1 (HO-1) expression in H\(_2\)O\(_2\)-treated HL7702 cells. L-carnitine protects HL7702 cells against H\(_2\)O\(_2\)-induced cell damage through Akt-mediated activation of Nrf2 signaling pathway\(^2\).

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

### In Vivo

L-carnitine is found to down-regulate the ubiquitin proteasome pathway and increase IGF-1 concentrations in animal models. L-carnitine administration for 2 weeks of hindlimb suspension alleviates the decrease in weight and fiber size in the soleus muscle. In addition, L-carnitine suppresses atrogin-1 mRNA expression, which has been reported to play a pivotal role in muscle atrophy\(^3\). Simultaneous treatment with L-carnitine attenuates the renal fibrosis (which correlated with a reduction of plasma TGF-β1 levels) and the pro-oxidative and proinflammatory status reported in L-NAME groups, with a concomitant increase in the expression of PPAR-γ\(^4\).

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### PROTOCOL

#### Kinase Assay\(^1\)

Mitochondria (0.6 mg protein/mL) are incubated in 2.5 mM Hepes (pH7.4) containing 225 mM mannitol, 75 mM sucrose and 100 \(\mu\)M ethylene glycol tetraacetic acid (EGTA) with or without 5 mM L-carnitine at 25°C. To measure oxygen uptake, 10 min after inorganic phosphate (Pi) 4 mM are added, the mitochondria are treated with palmitoyl-CoA (50 \(\mu\)M) and then ADP is added (200 \(\mu\)M). Oligomycin (5 \(\mu\)M) and rotenone (10 \(\mu\)M) are added 3-4 min after the ADP treatment. HPG (0-10 mM), which can specifically inhibit carnitine palmitoyl transferase (CPT)-I activity in the mitochondria, is added in the Hepes medium before incubation of the mitochondria\(^1\).

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#### Animal Administration\(^3\)

Rats: After 1 week of acclimatization, rats are randomly assigned to a hindlimb suspension group, hindlimb suspension with L-carnitine administration group, and a pair-fed group. The L-carnitine group are administered a 1250 mg L-carnitine/kg dissolved in distilled water orally using a sonde. The body weight is measured every morning at 09:00 and L-carnitine solution is ingested every morning at 10:00. The experiment is conducted for 14 days\(^3\).

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### REFERENCES

