Product Data Sheet

Product Name: Cycloheximide
Cat. No.: GC17198

Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cas No.</td>
<td>66-81-9</td>
</tr>
<tr>
<td>Chemical Name</td>
<td>4-[(2R)-2-[(1S,3S,5S)-3,5-dimethyl-2-oxocyclohexyl]-2-hydroxyethyl]piperidine-2,6-dione</td>
</tr>
<tr>
<td>Canonical SMILES</td>
<td>CC1CC(C(=O)C(C1)C(CC2CC(=O)NC(=O)C2)O)C</td>
</tr>
<tr>
<td>Formula</td>
<td>C_{15}H_{23}NO_{4}</td>
</tr>
<tr>
<td>M.Wt</td>
<td>281.4</td>
</tr>
<tr>
<td>Solubility</td>
<td>≥ 14.07 mg/mL in DMSO, ≥ 57.6 mg/mL in EtOH, ≥ 14.05 mg/mL in Water with ultrasonic and warming</td>
</tr>
<tr>
<td>Storage</td>
<td>4°C, protect from light</td>
</tr>
<tr>
<td>General tips</td>
<td>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.</td>
</tr>
<tr>
<td>Shipping Condition</td>
<td>Evaluation sample solution: ship with blue ice All other available size: ship with RT, or blue ice upon request.</td>
</tr>
</tbody>
</table>

Structure

Protocol

Cell experiment [1]:

Cell lines: Hepatocyte

Preparation Method: Hepatocyte suspensions (2 x 10^6 cells/ml) were incubated in polycarbonate flasks, at 37°C, under a constant stream of 95% O₂ - 5% CO₂, with constant shaking (72 cycles/min), for 15 min before addition of cycloheximide.

Caution: Product has not been fully validated for medical applications. For research use only.

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Hepatocytes were treated with a range of concentrations of cycloheximide from $1 \times 10^{-7}$ to $5 \times 10^{-3}$ M. Low, non-toxic dose of cycloheximide provides reasonable assurance that protein synthetic ability could be perturbed without causing undue alterations in other biochemical functions of the cell. A nontoxic dose of cycloheximide (1 μM) inhibited termination to a greater extent than other translational steps. This effect showed a dose-dependent manner.

**Animal experiment [2]:**

**Animal models** Male Sprague-Dawley rats weighing between 160-230 g

**Preparation Method** Mice were maintained on Purina Chow and water ad libitum. Food was withdrawn from the animals the night before they were given 14C-ANIT. Cycloheximide was injected 1/2, 1, 2, 4, 8 or 24 h before ANIT administration.

**Dosage form** 2 mg/kg

Cycloheximide is capable of protecting against ANIT-induced hyperbilirubinemia even if given 24 h before ANIT. It became apparent that cycloheximide treatment resulted in substantially reduced amounts of ANIT-equivalents in all tissues examined, even if cycloheximide was given 24 h before ANIT.

**References:**


**Background**

Cycloheximide is an antibiotic that inhibits protein synthesis at the translation level, acting exclusively on cytoplasmic (80s) ribosomes of eukaryotes. Cycloheximide affected all the energy-dependent stages in the protein-synthesizing process. However, the initiation seems the most sensitive. Cycloheximide also affects respiration, ion uptake, amino acid biosynthesis, and DNA and RNA synthesis, effects that are probably secondary to its effect on protein synthesis.[2]

In vitro study indicated that Cycloheximide at 1 μM inhibited [3H]leucine incorporation into both cellular and secreted proteins by at least 86%, without having deleterious effects on membrane integrity as indicated by trypan blue uptake and lactate dehydrogenase release. Larger size class polysomes (7+) were increased by Cycloheximide treatment and remained increased during recovery. [2]

In vivo analysis indicated that Cycloheximide produced initial hyperactivity. This initial hyperactivity was apparent within 3 minutes after injection of the Cycloheximide. Cycloheximide affects activity by acting on the brain, and this is unrelated to its inhibition of protein synthesis. In addition, Cycloheximide’s effects on activity did not appear to be responsible for its amnesic action. However, Cycloheximide might have some other property, unrelated to inhibition of cerebral protein synthesis, that is responsible for its amnesic effect.[1]

References:

