Acetylcysteine

**Chemical Properties**

- **CAS No.:** 616-91-1
- **Formula:** C₅H₉NO₃S
- **Molecular Weight:** 163.19
- **Appearance:** Solid
- **Storage:** 0-4°C for short term (days to weeks), or -20°C for long term (months).

**Biological Description**

**Description**
Acetylcysteine is the N-acetyl derivative of CYSTEINE. It is used as a mucolytic agent to reduce the viscosity of mucous secretions. It has also been shown to have antiviral effects in patients with HIV due to inhibition of viral stimulation by reactive oxygen intermediates.

**Targets (IC₅₀)**
- ACY1: None
- GluR: None
- NAPQI: None
- NF-κB: None
- ROS: None
- TNF-α: None

**In vitro**
N-acetylcysteine prevents apoptotic DNA fragmentation and maintains long-term survival in the absence of other trophic support in serum-deprived PC12 cells. N-acetylcysteine also prevents the death of PC12 cells and sympathetic neurons[2]. N-acetylcysteine activates the Ras-extracellular signal-regulated kinase (ERK) pathway in PC12 cells. N-acetylcysteine protects neuronal cells from death evoked by the withdrawal of trophic support. N-acetylcysteine increases nitric oxide (NO) release from protein-bound stores in vascular tissue. N-acetylcysteine pretreatment of PC12 cells interferes with NGF-dependent signaling and neurite outgrowth, and it is suggested that N-acetylcysteine interferes with redox-sensitive steps in the NGF mechanism[3].

**In vivo**
N-acetylcysteine (150, 300 mg/kg) treatment significantly reduces liver transaminases in all groups of treatment, mostly in group N-acetylcysteine 300. Lung glutathione peroxidase is significantly increased in group N-acetylcysteine 300 (P=0.04), while the other oxidation biomarkers show no significant differences[1].

**Cell Research**
For survival experiments, washed cells are resuspended in RPM1 1640 medium and plated in 0.5 mL at a density of 8-10×10⁵ per well in 24 well plastic culture dishes coated with rat tail collagen. To feed, but to avoid loss of floating cells, fresh medium (0.2 mL) is added to the cultures on days 1, 5, and 10. For experiments involving “primed” PC12 cells, cultures are pretreated for 1-2 weeks with NGF in RPM1 1640 medium supplemented with 1% heat-inactivated horse serum. The cells are then washed and passaged into serum-free RPM1 1640 medium.

**Animal Research**
Animal Model: Rats
Solubility Information

<table>
<thead>
<tr>
<th>Solubility</th>
<th>DMSO: 31 mg/mL (190 mM)</th>
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<tbody>
<tr>
<td></td>
<td>Ethanol: 31 mg/mL (190 mM)</td>
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<tr>
<td></td>
<td>Water: 30 mg/mL (183.8 mM)</td>
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<td>(&lt; 1 mg/ml refers to the product slightly soluble or insoluble)</td>
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</tbody>
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Preparing Stock Solutions

<table>
<thead>
<tr>
<th></th>
<th>1mg</th>
<th>5mg</th>
<th>10mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 mM</td>
<td>6.128 mL</td>
<td>30.639 mL</td>
<td>61.278 mL</td>
</tr>
<tr>
<td>5 mM</td>
<td>1.226 mL</td>
<td>6.128 mL</td>
<td>12.256 mL</td>
</tr>
<tr>
<td>10 mM</td>
<td>0.613 mL</td>
<td>3.064 mL</td>
<td>6.128 mL</td>
</tr>
<tr>
<td>50 mM</td>
<td>0.123 mL</td>
<td>0.613 mL</td>
<td>1.226 mL</td>
</tr>
</tbody>
</table>

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. The storage conditions and period of the stock solution: -80 °C for 6 months; -20 °C for 1 month. Please use it as soon as possible.

Reference


Inhibitors · Natural Compounds · Compound Libraries

This product is for Research Use Only · Not for Human or Veterinary or Therapeutic Use.

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