Pyrimethamine

Cat. No.: HY-18062  
CAS No.: 58-14-0  
Molecular Formula: C₁₂H₁₃ClN₄  
Molecular Weight: 248.71  
Target: Antifolate; Parasite  
Pathway: Cell Cycle/DNA Damage; Anti-infection  
Storage:
- Powder: -20°C 3 years, 4°C 2 years
- In solvent: -80°C 6 months, -20°C 1 month

SOLVENT & SOLUBILITY

In Vitro
DMSO: 25 mg/mL (100.52 mM; Need ultrasonic)

<table>
<thead>
<tr>
<th>Preparing Stock Solutions</th>
<th>Solvent Concentration</th>
<th>1 mg</th>
<th>5 mg</th>
<th>10 mg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 mM</td>
<td>4.0207 mL</td>
<td>20.1037 mL</td>
<td>40.2075 mL</td>
</tr>
<tr>
<td></td>
<td>5 mM</td>
<td>0.8041 mL</td>
<td>4.0207 mL</td>
<td>8.0415 mL</td>
</tr>
<tr>
<td></td>
<td>10 mM</td>
<td>0.4021 mL</td>
<td>2.0104 mL</td>
<td>4.0207 mL</td>
</tr>
</tbody>
</table>

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

In Vivo
1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
Solubility: ≥ 2.5 mg/mL (10.05 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% corn oil
Solubility: ≥ 2.5 mg/mL (10.05 mM); Clear solution

BIOLOGICAL ACTIVITY

Description
Pyrimethamine (RP4753) is a medication used for protozoal infections; interferes with tetrahydrofolic acid synthesis from folic acid by inhibiting the enzyme dihydrofolate reductase (DHFR). IC50 Value: 15.4 nM (Plasmodium falciparum) [1]
Target: DHFR; antifolate
in vitro: Three susceptibility levels (susceptible, intermediate, and resistant) were observed in the response of culture-adapted clones and strains to pyrimethamine (IC50 < 100, 100-2,000, and > 2,000 nM) and cycloguanil (IC50 < 50, 50-500, and > 500 nM). Based on these susceptibility levels, 73 and 68 of 96 fresh clinical isolates were susceptible to pyrimethamine (mean IC50 15.4 nM) and cycloguanil (mean IC50 11.1 nM), respectively [1]. We tested pyrimethamine (previously reported to suppress SOD1 expression), several compounds currently in trials in human and murine ALS, and a set of 1040 FDA-approved compounds. In a PC12 cell-based assay, no compounds reduced SOD1 promoter activity without concomitant cytotoxicity.
Additionally, pyrimethamine failed to repress levels of SOD1 protein in HeLa cells or homogenates of liver, spinal cord and brain of wild-type mice [3]. In vivo: (131)I-Pyrimethamine (specific activity: 7.08 MBq/mol) was injected intravenously into the tail vein of the control and infected rats. Static whole body images of the rats were acquired under the gamma camera at 5 min, 45 min, 2 h, 6 h, and 24 h following the intravenous administration of the radioactivity (3.7 MBq/rat) [2]. The 10-day treatment with 10mg/kg/day of fluconazole combined with 40/1mg/kg/day sulfadiazine and pyrimethamine resulted in 93% survival of CF1 mice acutely infected with the highly virulent T. gondii RH strain, versus 36% of mice treated with just sulfadiazine and pyrimethamine [4].

Toxicity: Sulfadoxine/pyrimethamine is well tolerated as treatment and when used as intermittent preventive treatment in pregnant African women. Sulfadoxine/pyrimethamine is no longer used as prophylaxis because it may cause toxic epidermal necrolysis and Stevens Johnson syndrome [5].

REFERENCES


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