Etoposide

Cat. No.: HY-13629
CAS No.: 33419-42-0
Molecular Formula: \(C_{29}H_{32}O_{13}\)
Molecular Weight: 588.56
Target: Topoisomerase; Autophagy; Mitophagy; Apoptosis
Pathway: Cell Cycle/DNA Damage; Autophagy; Apoptosis
Storage: 4°C, protect from light
* In solvent: -80°C, 6 months; -20°C, 1 month (protect from light)

SOLVENT & SOLUBILITY

In Vitro

DMSO: \(\geq 39\) mg/mL (66.26 mM)
* "\(\geq\)" means soluble, but saturation unknown.

<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>1.6991 mL</td>
<td>8.4953 mL</td>
<td>16.9906 mL</td>
</tr>
<tr>
<td></td>
<td>5 mM</td>
<td>0.3398 mL</td>
<td>1.6991 mL</td>
<td>3.3981 mL</td>
</tr>
<tr>
<td></td>
<td>10 mM</td>
<td>0.1699 mL</td>
<td>0.8495 mL</td>
<td>1.6991 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: \(\geq 2.5\) mg/mL (4.25 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: \(\geq 2.5\) mg/mL (4.25 mM); Clear solution

BIOLOGICAL ACTIVITY

Description
Etoposide (VP-16; VP-16-213), a chemotherapy medication used for the treatments of a number of types of cancer, inhibits DNA synthesis by forming a complex with topoisomerase II and DNA. Etoposide arrests cell cycle in G2 and induces apoptosis.

IC\(_{50}\) & Target
Topoisomerase II

In Vitro
Etoposide is capable of causing cytotoxicity on pancreatic \(\beta\)-cells by inducing apoptosis through the JNK/ERK-mediated GSK-3 downstream-triggered mitochondria-dependent signaling pathway in RIN-m5F cells\(^{[1]}\). Etoposide and Bevacizumab significantly abolish P1 sphere-forming ability, an effect associated with apoptosis of this subset of cells\(^{[2]}\).
| In Vivo | Etoposide (50 μM) and Bevacizumab-treated hypoxic cells injected intravenously into immunodeficient mice reveals a reduced capacity to induce lung colonies, which also appear with a longer latency period\(^2\). Etoposide (10 mg/kg/day, i.v.) with ifosfamide and carboplatin, reduces the tumor volume in the hepatoblastoma cell injected NMRI nude mice\(^3\). |

| PROTOCOL |  |

| Kinase Assay \(^1\) | RIN-m5F cells are seeded and treated with Etoposide (10-50 μM) in the absence or presence of Z-DEVD-FMK (20 μM). At the end of treatments (for 24 h), the cell lysates are incubated at 37°C with 10 μM Ac-DEVD-AMC, a caspase-3/CPP32 substrate, for 1 h. The fluorescence of the cleaved substrate is measured by a spectrofluorometer with an excitation wavelength at 380 nm and an emission wavelength at 460 nm. Protein levels of cell lysate samples are determined using the bicinchoninic acid protein assay kit with an absorption band of 570 nm to normalize the cell numbers between control and etoposide-treated groups. MCE has not independently confirmed the accuracy of these methods. They are for reference only. |

| Cell Assay \(^1\) | RIN-m5F cell is a rat pancreatic β-cell line, and cultured in a humidified chamber with a 5% CO\(_2\)-95% air mixture at 37°C and maintained in RPIM 1640 medium supplemented with 10% fetal bovine serum (FBS) and antibiotics (100 U/mL of penicillin and 100 μg/mL of streptomycin). RIN-m5F cells are seeded (2 × 10\(^4\) cells/well) in 96-well plates and allowed to adhere and recover overnight. The cells are changed to fresh media and then incubated with Etoposide (1-100 μM) in the absence or presence of the pharmacological inhibitors (lithium chloride (LiCl)-50 μM; SP600125-20 μM; PD98059-20 μM) for 24 h. MCE has not independently confirmed the accuracy of these methods. They are for reference only. |

| Animal Administration \(^3\) | The in vivo model for nude mice HB (NMHB) has been established. Only HB cells with embryonal components are grafted and reproduced successfully in this model. Each NMHB subsequently is transplanted into 50 mice for treatment groups. Treatment is initiated when the majority of the tumors reach a volume of 50-100 mm\(^3\). The mice are stratified according to their tumor volume and randomly assigned to groups of ten animals each. The animals injected with tumor are given ifosfamide, cisplatin, doxorubicin, etoposide (10 mg/kg/day, i.v.), and carboplatin as single agents in two blocks. One group of ten animals for each original xenograft served as a control group. After initiation of treatment, the tumor growth is recorded at 5-day intervals for 25-30 days and the relative tumor volumes are calculated. Twenty-four hours before the animals are sacrificed, bromodeoxyuridine (BrdU) is injected intraperitoneally for the semiquantitative determination of proliferation activity of the tumor cells (50 μg of BrdU/g body weight). MCE has not independently confirmed the accuracy of these methods. They are for reference only. |

| CUSTOMER VALIDATION |  |

| REFERENCES |  |

- Cancer Lett. 2017 Nov 1;408:43-54.

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