Paclitaxel

Cat. No.: HY-B0015

CAS No.: 33069-62-4

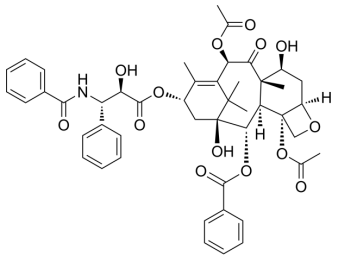
Molecular Formula: $C_{47}H_{51}NO_{14}$

Molecular Weight: 853.91

Target: ADC Cytotoxin; Autophagy; Microtubule/Tubulin; Apoptosis

Pathway: Antibody-drug Conjugate/ADC Related; Autophagy; Cell Cycle/DNA Damage; Cytoskeleton; 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 : 100 mg/mL (117.11 mM; Need ultrasonic)
H_2O : < 0.1 mg/mL (insoluble)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	1.1711 mL	5.8554 mL	11.7108 mL
	5 mM	0.2342 mL	1.1711 mL	2.3422 mL
	10 mM	0.1171 mL	0.5855 mL	1.1711 mL

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

In Vivo

1. Add each solvent one by one: 50% PEG300 >> 50% saline
   Solubility: 10 mg/mL (11.71 mM); Suspended solution; Need ultrasonic
2. Add each solvent one by one: corn oil
   Solubility: 10 mg/mL (11.71 mM); Suspended solution; Need ultrasonic
3. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.08 mg/mL (2.44 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: 2.08 mg/mL (2.44 mM); Suspended solution; Need ultrasonic
5. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (2.44 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Paclitaxel is a naturally occurring antineoplastic agent and stabilizes tubulin polymerization. Paclitaxel can cause both mitotic arrest and apoptotic cell death. Paclitaxel also induces autophagy[1][2].

IC_{50} & Target	Traditional Cytotoxic Agents

In Vitro

Paclitaxel (20 nM; 48 hours) induces programmed cell death and exists a block at the G2/M phase of the cell cycle[1].
?Paclitaxel (20 nM; 48 hours) induces a consistent increase in the level of p53[1].

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

Apoptosis Analysis[1]

Cell Line:	MCF-7, MDA-MB-231 cells
Concentration:	20 nM
Incubation Time:	48 hours
Result:	Induced programmed cell death.

Cell Cycle Analysis[1]

Cell Line:	MCF-7, MDA-MB-231 cells
Concentration:	20 nM
Incubation Time:	48 hours
Result:	>60% of MCF-7 cells and 50% of MDA-MB-231 cells were in the G2/M phase following 24 h treament.

Western Blot Analysis[1]

Cell Line:	MCF-7 cells (harboring wild-type p53)
Concentration:	20 nM
Incubation Time:	48 hours
Result:	Induced a consistent increase in the level of p53.

In Vivo

Paclitaxel (1-20 mg/kg; i.p.; 1 time/2 days for five cycles) obviously induces liver metastases at the low-Paclitaxel group with little influence on primary tumor growth[3].

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

Animal Model:	MDA-231 xenograft-bearing mice[3]
Dosage:	1, 20 mg/kg
Administration:	Intraperitoneal injection; five cycles (1 time/2 days)
Result:	Liver metastases were obviously induced in the low-PTX (1 mg/kg) group with little influence on primary tumor growth compared with high-PTX group.

CUSTOMER VALIDATION

- Cell. 2022 Sep 1;185(18):3356-3374.e22.
- Cell. 2021 Sep 2;184(18):4753-4771.e27.

- Cell Res. 2023 Mar;33(3):215-228.
- Signal Transduct Target Ther. 2022 Sep 12;7(1):317.
- Nat Nanotechnol. 2021 Oct;16(10):1150-1160.

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REFERENCES

[1]. Choi YH, et al. Paclitaxel-induced growth arrest and apoptosis is associated with the upregulation of the Cdk inhibitor, p21WAF1/CIP1, in human breast cancer cells. Oncol Rep. 2012 Dec;28(6):2163-9.

[2]. Dziadyk JM, et al. Paclitaxel-induced apoptosis may occur without a prior G2/M-phase arrest. Anticancer Res. 2004 Jan-Feb;24(1):27-36.

[3]. Li Q, et al. Low doses of paclitaxel enhance liver metastasis of breast cancer cells in the mouse model. FEBS J. 2016 Aug;283(15):2836-52.

[4]. Pan Z, et al. Paclitaxel attenuates Bcl-2 resistance to apoptosis in breast cancer cells through an endoplasmic reticulum-mediated calciumrelease in a dosage dependent manner. Biochem Biophys Res Commun. 2013 Feb 13. pii: S0006-291X(13)00259-3.

[5]. Cadamuro M, et al. Low dose paclitaxel reduces S100A4 nuclear import to inhibit invasion and hematogenous metastasis of cholangiocarcinoma. Cancer Res. 2016 Jun 21.

[6]. Li Q, et al. Low doses of paclitaxel enhance liver metastasis of breast cancer cells in the mouse model. FEBS J. 2016 Jun 16.

[7]. Yilmaz E, et al. Sensory neuron subpopulation-specific dysregulation of intracellular calcium in a rat model of chemotherapy-induced peripheral neuropathy. Neuroscience. 2015 Aug 6;300:210-8.

[8]. Jing C, et al. E7080 enhances the antitumor effects of paclitaxel in anaplastic thyroid cancer. Am J Cancer Res. 2017 Apr 1;7(4):903-912.

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