Paclitaxel

Cat. No.: HY-B0015

CAS No.: 33069-62-4

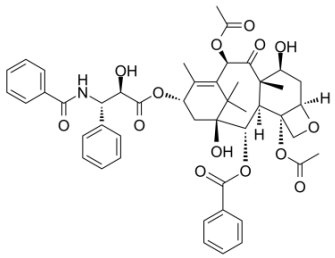
Molecular Formula: $C_{47}H_{51}NO_{14}$

Molecular Weight: 853.91

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

Pathway: Cell Cycle/DNA Damage; Cytoskeleton; Antibody-drug Conjugate/ADC Related; Apoptosis; Autophagy

Storage: 4°C, protect from light
* In solvent : -80°C, 6 months; -20°C, 1 month (protect from light)



SOLVENT & SOLUBILITY

In Vitro

DMSO : ≥ 50 mg/mL (58.55 mM)

H_2O : < 0.1 mg/mL (insoluble)

* "≥" means soluble, but saturation unknown.

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: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.08 mg/mL (2.44 mM); Clear solution
2. 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
3. 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

- Nucleic Acids Res. 2020 Apr 6;48(6):2912-2923.
- Cell Syst. 2019 Jul 24;9(1):35-48.e5.
- Cell Mol Immunol. 2020 May;17(5):496-506.
- Nano Res. 13, 273-281(2020).
- Cell Chem Biol. 2020 Nov 19;27(11):1359-1370.e8.

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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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